
Diodes	8
Transistors	15
Optoelectronic Devices	24
Integrated Circuits	33

Contents, alpha-numeric

Type	Page	Type	Page	Type	Page	Type	Page
AA 112	12	BC 327	16	BD 203	18	BF 509	23
AA 113	12	BC 328	16	BD 204	18	BF 509 S	23
AA 117	8	BC 337	16	BD 233	18	BF 679 T	23
AA 118	12	BC 338	16	BD 234	18	BF 680	23
AA 119	12	BC 368	16	BD 235	18	BF 869 ▼	22
AA 132	8	BC 369	16	BD 236	18	BF 870 ▼	22
AA 133	8	BC 413	16	BD 237	18	BF 871 ▼	22
AA 134	8	BC 414	16	BD 238	18	BF 872 ▼	22
AA 137	12	BC 415	16	BD 433	18	BF 963	23
AA 138	12	BC 416	16	BD 434	18	BF 914	23
		BC 431	16	BD 435	18	BF 960	23
BA 111	11	BC 432	16	BD 436	18	BF 961	23
BA 121	11	BC 546	16	BD 437	18	BFR 90 ▼	22
BA 124	11	BC 547	16	BD 438	18	BFR 91 ▼	22
BA 125	11	BC 548	16	BD 439	18	BFR 96 ▼	22
BA 147/...	8	BC 549	16	BD 440	18		
BA 157	10	BC 550	16	BD 441	18	BFS 17	22
BA 158	10	BC 556	16	BD 442	18	BFS 19	22
BA 159	10	BC 557	16	BD 643	18	BFS 20	22
BA 173	9	BC 558	16	BD 644	18	BFS 62	22
BA 176	9	BC 559	16	BD 645	18		
BA 178	9	BC 560	16	BD 646	18	BFT 95	22
BA 182	9	BC 635	17	BD 647	18	BFT 95 A ▼	22
BA 204	8	BC 636	17	BD 648	18	BFT 96 ▼	22
BA 243	9	BC 637	17	BD 649	18	BFT 96 A ▼	22
BA 244	8	BC 638	17	BD 650	18		
BA 479	12	BC 639	17	BD 675	18	BFW 92	22
		BC 640	17	BD 676	18		
BAV 17	8			BD 677	18	BFX 34 ○	22
BAV 18	8			BD 678	18	BFX 65	22
BAV 19	8	BCW 60	17	BD 679	18	BFX 89	22
BAV 20	8	BCW 61	17	BD 680	18		
BAV 21	8			BD 681	18	BFY 56 A	22
				BD 682	18	BFY 88 ○	22
BAW 24	9	BCX 70	17			BFY 90 ○	22
BAW 25	9	BCX 71	17				
BAW 26	9			BDY 42	21	BPW 13	30
BAW 27	9	BCY 58	17/20	BDY 43	21	BPW 14	30
		BCY 59 ○	17/20	BDY 44	21	BPW 16	30
BAY 68	9	BCY 72	17/20	BDY 45	21	BPW 16 N	30
BAY 69	9	BCY 77 ▼	17/20	BDY 46	21	BPW 17	30
BAY 86	8	BCY 78	17/20	BDY 47	21	BPW 17 N	30
BAY 87	8	BCY 79 ○	17/20			BPW 20	30
BAY 88	8			BF 115	22	BPW 21 ○	30
BAY 89	8			BF 167	22	BPW 24	30
BAY 92	9	BD 127	18	BF 173	22	BPW 28	30
BAY 93	9	BD 128	18	BF 184	22	BPW 34	30
		BD 129	18	BF 185	22	BPW 35	30
BB 105	11	BD 135	18	BF 198	22	BPW 39	30
BB 109	11	BD 136	18	BF 199	22	BPW 40	30
BB 204	11	BD 137	18	BF 240	22	BPW 41 ▼	30
BB 205	11	BD 138	18	BF 241	22	BPW 42 ▼	30
BB 209	11	BD 139	18	BF 254	22	BPW 43 ▼	30
BB 304 ▼	11	BD 140	18	BF 255	22		
BB 505 ▼	11	BD 165	18	BF 257	22	BPX 99	29
		BD 166	18	BF 258	22		
BC 107	15	BD 167	18	BF 259	22	BPY 70	30
BC 108	15	BD 168	18	BF 310	22		
BC 109	15	BD 169	18	BF 311	22	BSS 44	20
BC 140	15/20	BD 170	18	BF 314	22	BSS 45 ○	20
BC 141	15/20	BD 175	18	BF 362	23	BSS 46 ○	20
BC 160	15	BD 176	18	BF 363	23		
BC 161	15	BD 177	18	BF 414	22	BSV 15	20
BC 177	15	BD 178	18	BF 422	22	BSV 16	20
BC 178	15	BD 179	18	BF 423	22	BSV 57 B	19
BC 179	15	BD 180	18	BF 440	22	BSV 60	20
BC 182	15	BD 185	18	BF 441	22		
BC 212	15	BD 186	18	BF 469	22	BSW 39	20
BC 237	15	BD 187	18	BF 470	22	BSW 40	20
BC 238	15	BD 188	18	BF 471	22		
BC 239	15	BD 189	18	BF 472	22	BSX 45	20
BC 307	15	BD 190	18	BF 479	23	BSX 46	20
BC 308	15	BD 201	18	BF 479 T	23	BSY 55	20
BC 309	15	BD 202	18	BF 506	23	BSY 56	20

Type	Page	Type	Page	Type	Page	Type	Page
BU 126	21	CQX 28	26	TBA 810 T	34	V 170 P	25
BU 204	19	CQX 29	26	TBA 990	40	V 194 P	28
BU 205	19	CQX 30	26	TCA 830	34	1N 484 A	8
BU 206	19	CQX 31	26	TCA 830 A	34	1N 4001	10
BU 207	19	CQX 32	26	TDA 440	41	1N 4002	10
BU 208	19	CQX 35	24	TDA 440 T ▼	41	1N 4003	10
BU 208 A ▼	19	CQX 36	24	TDA 1061	12	1N 4004	10
BU 208 D ▼	19	CQX 37	25	TDA 1062	42	1N 4005	10
BU 209	19	CQX 38	25	TDA 1083	43	1N 4006	10
BU 226	19	CQX 39	25	TDA 1086	23/44	1N 4007	10
BU 526	21	CQX 40	25	TDA 1087	23/44	1N 4148 ○	9
		CQX 41 N	25	TDA 1093 ▼	42	1N 4149	9
BUX 30	21	CQX 42 N	25	TDA 1170 S ▼	44	1N 4151 ○	9
		CQX 43 N	25	TDA 1410 ▼	45	1N 4154	9
BUY 50	21	CQX 46 ▼	28	TDA 2002	35	1N 4446 ○	9
BY 201	10	CQX 86 A	26	TDA 2002 A	35	1N 4447	9
BY 202	10	CQX 86 K	26	TDA 2003 ▼	35	1N 4448 ○	9
BY 203	10	CQX 87 A	26	TDA 2030 ▼	35	1N 4449	9
BY 204	10	CQX 87 K	26	TDA 2140	45	2N 918	22
		CQX 88 A	26	TDA 2150	46	2N 929	17
BYV 12	10	CQX 88 K	26	TDA 2151	46	2N 930	17
BYV 13	10	CQX 89 A	26	TDA 2160	47	2N 1613	22
BYV 14	10	CQX 89 K	26	TDA 2161	47	2N 1711	17
BYV 15	10	CQX 90 A	26	TDA 4180 P	52	2N 1893	17
BYV 16	10	CQX 90 K	26	TDA 4400	48	2N 2218	20
		CQX 91 A	26	TDA 4410	48	2N 2218 A	20
BYW 32	10	CQX 91 K	26	TDA 4420	48/51	2N 2219	20
BYW 33	10	CQX 92 A	26	TDA 4421	48	2N 2219 A ○	20
BYW 34	10	CQX 92 K	26	TDA 4430	51	2N 2221	20
BYW 35	10	CQX 93 A	26	TDA 4431 ▼	51	2N 2221 A	20
BYW 36	10	CQX 93 K	26	TDA 4432 ▼	49	2N 2222	20
BYW 52 ○	10	CQX 95 ▼	25	TDA 4440 ▼	49	2N 2222 A	20
BYW 53 ○	10	CQX 96 ▼	24	TDA 4450 ▼	49	2N 2904	20
BYW 54 ○	10	CQX 97 ▼	24	TEA 1087 ▼	23/49	2N 2904 A	20
BYW 55 ○	10	CQY 31	28	UAA 145	52	2N 2905 ○	20
BYW 56 ○	10	CQY 32	28	UAA 146 ▼	52	2N 2906	20
BYW 72	10	CQY 33 N	28	U 102 P	32/54	2N 2906 A	20
BYW 73	10	CQY 34 N	28	U 106 BS	54	2N 2907 ○	20
BYW 74	10	CQY 35 N	28	U 111 B	54	2N 3019	20
BYW 75	10	CQY 36 N	28	U 112 BA	55	2N 3053	20
BYW 76	10	CQY 37	28	U 113 B	55	2N 3700 ○	20
BYW 82	10	CQY 37 N	28	U 123 P	32/55	2N 4033	20
BYW 83	10	CQY 40 L	24	U 143 M	51/56	2N 4036	20
BYW 84	10	CQY 41 N	24	U 145 M	56	2N 5447	17
BYW 85	10	CQY 42 L	24	U 190 M	51	2N 5448	17
BYW 86	10	CQY 72 L	24	U 191 M	51	2N 5449	17
		CQY 73 N	24	U 193 M	51	2N 5450	17
BYX 82	10	CQY 74 L	25	U 217 B ▼	57		
BYX 83	10	CQY 75 N	25	U 221 B	57		
BYX 84	10	CQY 80 ○	32	U 225 B	57		
BYX 85	10	CQY 85 N	24	U 237 B	59		
BYX 86	10	CQY 86 N	24	U 244 B ▼	59		
		CQY 87 N	25	U 247 B ▼	59		
BZ 102/...	13	CQY 88 N	24	U 254 B ▼	59		
		CQY 89	28	U 257 B ▼	59		
BZX 55/C...	13	CQY 98	28	U 264 B ▼	50		
BZX 85/C...	14	CQY 99	28	U 267 B ▼	59		
		SAS 660	51	U 250 B	58		
BZY 87/C...	14	SAS 670	51	U 318 M	59		
		SAS 6600	51	U 321 M	59		
CNY 18	32	SAS 6610	51	U 327 M	58		
CNY 21 ○	32	SAS 6700	51	U 334 M	58		
CNY 24 ▼	32	SAS 6710	51	U 353 M ▼	50		
CNY 36	32	TBA 120 S	37	U 354 M ▼	50		
CNY 37	32	TBA 120 T	37	U 401 B ▼ <small>HIGH()COM</small>	36		
		TBA 120 U	38	U 417 B ▼	43		
CQX 10	24	TBA 520	38	U 427 B ▼	59		
CQX 11	24	TBA 530	39	V 168 P	24		
CQX 12	25	TBA 540	39	V 169 P	24		
CQX 18	28	TBA 560 C	40				
CQX 19	28	TBA 800	33				
CQX 20	28	TBA 810 AS	33				
CQX 25 N	24	TBA 810 AT	34				
CQX 26 N	24	TBA 810 S	33				
CQX 27 N	25						

○ Can be delivered as "Qualified semi-conductor device"

Classification according to applications

Type	Page	Type	Page	Type	Page	Type	Page
Diodes		1N 4001	10	BC 547	16	RF transistors	
General purpose diodes		1N 4002	10	BC 548	16	BF 115	22
AA 117	8	1N 4003	10	BC 549	16	BF 167	22
AA 132	8	1N 4004	10	BC 550	16	BF 173	22
AA 133	8	1N 4005	10	BC 556	16	BF 184	22
AA 134	8	1N 4006	10	BC 557	16	BF 185	22
BA 147/...	8	1N 4007	10	BC 558	16	BF 198	22
BA 204	8			BC 559	16	BF 199	22
BAV 17	8	Capacitance diodes		BC 560	16	BF 240	22
BAV 18	8	BA 111	11	BC 635	17	BF 241	22
BAV 19	8	BA 121	11	BC 636	17	BF 254	22
BAV 20	8	BA 124	11	BC 637	17	BF 255	22
BAV 21	8	BA 125	11	BC 638	17	BF 257	22
BAY 86	8	BB 105	11	BC 639	17	BF 258	22
BAY 87	8	BB 109	11	BC 640	17	BF 259	22
BAY 88	8	BB 204	11	BCW 60	17	BF 310	22
BAY 89	8	BB 205	11	BCW 61	17	BF 311	22
1N 484 A		BB 209	11	BCX 70	17	BF 314	22
		BB 304 ▼	11	BCX 71	17	BF 362	23
		BB 505 ▼	11	BCY 58	17	BF 363	23
Switching diodes				BCY 59 ○	17	BF 414	22
BA 173	9	PIN-Diode		BCY 72	17	BF 422	22
BA 176	9	BA 479 ▼	12	BCY 77 ▼	17	BF 423	22
BA 178	9			BCY 78	17	BF 440	22
BA 182	9	Attenuator two port for AGC		BCY 79 ▼	17	BF 441	22
BA 243	9	TDA 1061	12	BFX 65	17	BF 469	22
BA 244	9			BSX 45	17	BF 470	22
BAW 24	9	Diodes for demodulator circuits		BSX 46	17	BF 471	22
BAW 25	9	AA 112	12	2N 929	17	BF 472	22
BAW 26	9	AA 113	12	2N 930	17	BF 479	23
BAW 27	9	AA 118	12	2N 1711	17	BF 479 T	23
BAY 68	9	AA 119	12	2N 1893	17	BF 869 ▼	22
BAY 69	9	AA 137	12	2N 5447	17	BF 870 ▼	22
BAY 92	9	AA 138	12	2N 5448	17	BF 871 ▼	22
BAY 93	9			2N 5449	17	BF 872 ▼	22
1N 4148 ○	9	Regulator diodes		2N 5450	17	BF 506	23
1N 4149	9	BZ 102/...	13			BF 509	23
1N 4151 ○	9			Switching transistors		BF 509 S	23
1N 4154	9	Z-diodes		BC 140	20	BF 679 T	23
1N 4446 ○	9	BZX 55/C...	13	BC 141	20	BF 680	23
1N 4447	9	BZX 85/C...	14	BCY 58	20	BF 914	23
1N 4448 ○	9	Regulator diodes		BCY 59 ○	20	BFR 90 ▼	22
1N 4449	9	BZY 87/...	14	BCY 72	20	BFR 91 ▼	22
Rectifier and Avalanche diodes				BCY 77 ▼	20	BFR 96 ▼	22
BA 157	10	Transistors		BCY 78	20	BFS 17	22
BA 158	10	AF transistors		BCY 79 ○	20	BFS 19	22
BA 159	10	BC 107	15	BFX 34 ○	20	BFS 20	22
BY 201	10	BC 108	15	BFY 56 A	20	BFS 62	22
BY 202	10	BC 109	15	BSS 44	20	BFT 95	22
BY 203	10	BC 140	15	BSS 45 ○	20	BFT 95 A ▼	22
BY 204	10	BC 141	15	BSS 46 ○	20	BFT 96 ▼	22
BYV 12	10	BC 160	15	BSV 15	20	BFT 96 A ▼	22
BYV 13	10	BC 161	15	BSV 16	20	BFW 92	22
BYV 14	10	BC 177	15	BSV 60	20	BFX 89	22
BYV 15	10	BC 178	15	BSW 39	20	BFY 88 ○	22
BYV 16	10	BC 179	15	BSW 40	20	BFY 90 ○	22
BYW 32	10	BC 182	15	BSX 45	20	2N 918	22
BYW 33	10	BC 212	15	BSX 46	20	2N 1613	22
BYW 34	10	BC 237	15	BSY 55	20		
BYW 35	10	BC 238	15	BSY 56	20	Dual RF transistors	
BYW 36	10	BC 239	15	2N 2218	20	TDA 1086	23/44
BYW 52 ○	10	BC 307	15	2N 2218 A	20	TDA 1087	23/44
BYW 53 ○	10	BC 308	15	2N 2219	20	TEA 1087 ▼	23/49
BYW 54 ○	10	BC 309	15	2N 2219 A ○	20		
BYW 55 ○	10	BC 327	16	2N 2221	20	Dual gate MOS FET's	
BYW 56 ○	10	BC 328	16	2N 2221 A	20	BF 963 ▼	23
BYW 72	10	BC 338	16	2N 2222	20	BF 960	23
BYW 73	10	BC 368	16	2N 2222 A	20	BF 961	23
BYW 74	10	BC 369	16	2N 2904	20		
BYW 75	10	BC 413	16	2N 2904 A	20	AF power transistors	
BYW 76	10	BC 414	16	2N 2905 ○	20	BD 127	18
BYW 82	10	BC 415	16	2N 2905 A ○	20	BD 128	18
BYW 83	10	BC 416	16	2N 2906	20	BD 129	18
BYW 84	10	BC 431	16	2N 2906 A	20	BD 135	18
BYW 85	10	BC 432	16	2N 2907 ○	20	BD 136	18
BYW 86	10	BC 546	16	2N 2907 A ○	20	BD 137	18
				2N 3019	21	BD 138	18
				2N 3053	21	BD 139	18
				2N 3700 ○	21	BD 140	18
				2N 4033	21	BD 165	18
				2N 4036	21	BD 166	18
						BD 167	18
						BD 168	18
						BD 169	18
						BD 170	18

Type	Page	Type	Page	Type	Page	Type	Page
BD 175	18	CQX 35	24	GaAlAs CW		TDA 1410 ▼	45
BD 176	18	CQX 25 N	24	Laser diode		TDA 2140	45
BD 177	18	CQY 85 N	24	CQX 20	28	TDA 2150	46
BD 178	18	CQX 10	24			TDA 2151	46
BD 179	18			Photo switches		TDA 2160	47
BD 180	18	Orange-red LED's		BPX 99	29	TDA 2161	47
BD 185	18					TDA 4400	48
BD 186	18	CQX 38	24	Photo transistors		TDA 4410	48
BD 187	18	CQX 39	24			TDA 4420	48/51
BD 188	18	CQX 41 N	24	BPW 13	30	TDA 4421	51
BD 189	18	CQX 42 N	24	BPW 14	30	TDA 4430	51
BD 190	18	CQX 43 N	24	BPW 16	30	TDA 4431 ▼	51
BD 201	18	CQX 40	24	BPW 16 N	30	TDA 4432 ▼	49
BD 202	18			BPW 17	30	TDA 4440 ▼	49
BD 203	18	Green light LED's		BPW 17 N	30	TDA 4450 ▼	49
BD 204	18	CQY 72 L	24	BPW 39	30	TEA 1087 ▼	23/49
BD 233	18	V 169 P	24	BPW 40	30	U 264 B ▼	50
BD 234	18	CQX 36	24	BPW 42 ▼	30	U 353 M ▼	50
BD 235	18	CQX 96 ▼	24			U 354 M ▼	50
BD 236	18	CQX 97 ▼	24	Photo voltaic cells (Solar cells)		U 417 B ▼	43
BD 237	18	CQX 26 N	24	BPW 35	30		
BD 238	18	CQY 86 N	24	BPY 70	30	Trigger, sensor and remote control circuits	
BD 433	18	CQY 73 N	24			SAS 660	52
BD 434	18	CQX 11	24	Photo diodes and photo voltaic cells		SAS 670	52
BD 435	18					SAS 6600	52
BD 436	18	Yellow light LED's		BPW 20	30	SAS 6610	52
BD 437	18	CQY 74 L	25	BPW 21 ○	30	SAS 6700	52
BD 438	18	V 170 P	25	BPW 24	30	SAS 6710	52
BD 439	18	CQX 37	25	BPW 34	30	TDA 4180 P	53
BD 440	18	CQX 27 N	25	BPW 41 ▼	30	TDA 4430	51
BD 441	18	CQY 87 N	25	BPW 43 ▼	30	TDA 4431 ▼	51
BD 442	18	CQY 75 N	25			TDA 4432 ▼	49
BD 643	18	CQX 12	25	Photo avalanche diode		UAA 145	53
BD 644	18			BPW 28	30	UAA 146 ▼	53
BD 645	18	One colour LED's in hermetically sealed case				U 102 P	32/54
BD 646	18			Coupling devices		U 106 BS	54
BD 647	18	CQX 28	26	CNY 18	32	U 111 B	54
BD 648	18	CQX 29	26	CNY 21 ○	32	U 112 BA	55
BD 649	18	CQX 30	26	CNY 24 ▼	32	U 113 B	55
BD 650	18			CNY 36	32	U 123 P	32/55
BD 675	18	Orange-red and green light LED's		CNY 37	32	U 143 M	51/56
BD 676	18	CQX 95	25	CQY 80 ○	32	U 145 M	56
BD 677	18	Two colours LED's in hermetically sealed case				U 190 M	51
BD 678	18			Photo threshold switch		U 191 M	51
BD 679	18	CQX 31	26	U 102 P	32/54	U 193 M	51
BD 680	18	CQX 32	26			U 217 B ▼	57
BD 681	18			Pulse amplifier		U 221 B	57
BD 682	18			U 123 P	32/55	U 225 B	57
		Light emitting diodes displays				U 237 B	58
Power switching transistors		CQX 86 A	26	Integrated circuits		U 244 B ▼	58
BDY 42	21	CQX 86 K	26	For AF applications		U 247 B ▼	58
BDY 43	21	CQX 87 A	26	TBA 800	33	U 254 B ▼	58
BDY 44	21	CQX 87 K	26	TBA 810 AS	33	U 257 B ▼	58
BDY 45	21	CQX 88 A	26	TBA 810 AT	34	U 267 B ▼	58
BDY 46	21	CQX 88 K	26	TBA 810 S	33	U 250 B	53
BDY 47	21	CQX 89 A	26	TBA 810 T	34	U 318 M	59
BU 126	21	CQX 89 K	26	TCA 830	34	U 321 M	59
BU 526	21	CQX 90 A	26	TCA 830 A	34	U 327 M	58
BUX 30	21	CQX 90 K	26	TDA 2002	35	U 334 M	58
BUY 50	21	CQX 91 A	26	TDA 2002 A	35	U 353 M ▼	50
		CQX 91 K	26	TDA 2003 ▼	35	U 354 M ▼	50
Power transistors for horizontal deflection circuits		CQX 92 A	26	TDA 2030 ▼	35	U 427 B ▼	50
BU 204	19	CQX 92 K	26	U 401 B <small>HIGH()COM</small> ▼	36		
BU 205	19	CQX 93 A	26			For RF applications	
BU 206	19	CQX 93 K	26	TBA 120 S	37	TBA 120 T	37
BU 207	19			TBA 120 U	38	TBA 520	38
BU 208	19	GaAs diodes (infrared)		TBA 530	39	TBA 540	39
BU 208 A ▼	19	CQX 18	28	TBA 560 C	40	TBA 990	40
BU 208 D ▼	19	CQX 19	28	TDA 440	41	TDA 440 T ▼	41
BU 209	19	CQX 46 ▼	28	TDA 440 T	41	TDA 1062	42
BU 226	19	CQY 31	28	TDA 1063	42	TDA 1083	43
		CQY 32	28	TDA 1086	23/44	TDA 1086	23/44
Unijunction transistor		CQY 33 N	28	TDA 1087	23/44	TDA 1087	23/44
BSV 57	19	CQY 34 N	28	TDA 1093 ▼	42	TDA 1170 S ▼	44
		CQY 35 N	28				
Complementary transistors	19	CQY 36	28				
		CQY 36 N	28				
Opto-electronic devices		CQY 37	28				
Light emitting diodes		CQY 37 N	28				
Red light LED's		CQY 98	28				
CQY 40 L	24	CQY 99	28				
V 168 P	24	V 194 P ▼	28				

○ Can be delivered as "Qualified semiconductor device"

Symbols

A	Anode	i_F	Forward current, instantaneous total value
A	Radiant sensitive area	I_F	Forward continuous current
AQL	Acceptable quality level	I_{FAV}	Average forward current
B	Base	I_{FM}	Forward peak current
C	Collector	I_k	Short circuit current
C_D	Diode capacitance	I_P	Peak point current
C_{urb}	Feedback capacitance, common base configuration	I_{ph}	Photo current
$C_{üre}$	Feedback capacitance, common emitter configuration	i_R	Reverse current, instantaneous total value
D	Drain	I_R	Reverse current
E	Emitter	I_{ra}	Reverse light current
E_A	Illumination at standard illuminant A (IEC 306-1)	I_V	Valley point current
F	Noise figure	I_V	Luminous intensity
f	Frequency	I_Z	Z-current (Zener current)
Δf	Frequency range	K	Cathode
F_c	Noise figure of mixer stages	k	Coupling factor, current transfer ratio
f_g	Cut-off frequency	P_i	Input power
f_T	Gain bandwidth product	P_q	Output power
G	Gate	P_{RSM}	Peak reverse surge power dissipation
G	Power gain	P_{tot}	Total power dissipation
h_{FE}	DC forward current transfer ratio in common emitter configuration	P_V	Power dissipation, general
h_{fe}	Short circuit forward current transfer ratio in common emitter configuration (small signal value)	r_{BB}	Interbase resistance
I_{B1}	Control current	r_f	Differential forward resistance
I_{B2}	Reverse control current	R_L	Load resistance
$I_{(BR)}$	Breakdown current (peak value)	r_s	Series resistance
I_C	Collector current	R_{thJA}	Thermal resistance between junction and ambient
I_{ca}	Collector light current	R_{thJC}	Thermal resistance between junction and case
I_{CAV}	Average collector current	r_{zj}	Z-resistance at constant junction temperature
I_{CBO}	Collector cut-off current, with open emitter	S	Source
I_{CES}	Collector cut-off current, with short circuit between base and emitter	T	Period
I_{CM}	Collector peak current	t_{amb}	Ambient temperature
I_{DD}	Drain supply current	t_{case}	Case temperature
I_E	Emitter current	t_f	Fall time
I_{EB20}	Emitter cut-off current of the Diode emitter – base 2	t_j	Junction temperature
		TK_{UF}	Temperature coefficient of forward voltage
		TK_{UZ}	Temperature coefficient of Z-voltage
		t_{off}	Turn-off time
		t_{on}	Turn-on time
		t_p	Pulse duration
		$\frac{t_p}{T}$	Duty cycle
		t_r	Rise time
		t_{rr}	Reverse recovery time
		U_{B2B1}	Interbase voltage

Symbols

$U_{(BR)}$	Breakdown voltage
$U_{(BR)CEO}$	Breakdown voltage, collector-emitter with open base
U_{CB}	Collector-base voltage
U_{CE}	Collector-emitter voltage
U_{CEO}	Collector-emitter voltage with open base
U_{CER}	Collector-emitter voltage with a resistance connecting base to emitter
U_{CERM}	Collector-emitter peak voltage with a resistance connecting base to emitter
U_{CEsat}	Collector-emitter saturation voltage
U_{DD}	Drain supply voltage
U_{EB2}	Emitter-base 2 voltage
U_F	Forward voltage
U_{is}	DC isolation voltage
U_O	Open circuit voltage
U_o	Open circuit voltage (at radiation/irradiation)
U_R	Reverse voltage
U_{RWM}	Crest working reverse voltage
U_S	Supply voltage
U_{SS}	Source supply voltage
U_Z	Z-operation voltage (range)
$ \gamma_{fb} $	Short circuit forward transfer admittance in common base configuration (small single value)
$ \gamma_{fe} $	Short circuit forward transfer admittance in common emitter configuration (small signal value)
α	Angle of half sensitivity (at detectors) /
α	Angle of half intensity (at emitters)
λ	Wave length
η_i	Intrinsic stand-off ratio
Φ_e	Radiant power (Radiant flux)
τ	Response time
φ	Phase angle
▼	New type
○	Available as qualified semiconductor device

All values are valid at $t_{amb} = 25^\circ\text{C}$, unless otherwise specified

Color code for diodes with JEDEC designation

The JEDEC type designation for "1 N" with a four digit number is given by four colour coded rings.

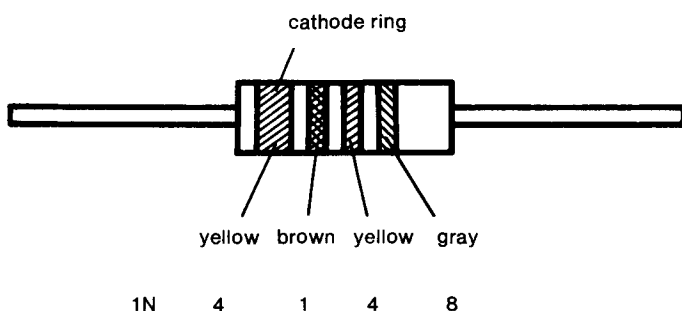
The colour code begins at the cathode side.

The first of the colour rings has double width.

The colour coding is corresponding with the following table:

Colour	Number	Colour	Number
black	0	green	5
brown	1	blue	6
red	2	violet	7
orange	3	gray	8
yellow	4	white	9

Example:



Pair conditions of silicon AF transistors

The silicon AF transistors are measured according to the following pair conditions:

Group	Code	h_{FE} -range
2,5	A	13,2 ... 19,0
	B	17,0 ... 23,6
	C	21,2 ... 30,0
	D	26,5 ... 37,5
4	E	33,5 ... 47,5
	F	42,5 ... 60,0
6	G	53,0 ... 75,0
	H	67,0 ... 95,0
10	I	85,0 ... 118
	K	106 ... 150
16	L	132 ... 190
	M	170 ... 236
25	N	212 ... 300
	O	265 ... 375
40	P	335 ... 475
	R	425 ... 600
60	S	530 ... 750
	T	670 ... 950

The transistors can be supplied only in the above shown groups.

The values of the h_{FE} -range limits are taken from the DIN progression R 40.

Diodes

General purpose diodes

Type	Fig. Nr.	Maximum ratings			Characteristics						
		P_V at $t_{amb} = 45^\circ\text{C}$ mW	I_F mA	U_R V	R_{thJA} $^\circ\text{C/W}$	U_F at V	I_F mA	I_R at μA	U_R and V	t_j $^\circ\text{C}$	t_{rr} μs
AA 117 ¹⁾	1		50 ²⁾	90	≤ 400	1,20 (<1,85)	10	40	75	25	
AA 132 ¹⁾	1		50 ²⁾	100	≤ 400	1,35 (<1,8)	10	38 (<120)	60	25	
AA 133 ¹⁾	1		50 ²⁾	130	≤ 400	1,35 (<1,8)	10	55 (<160)	100	25	
AA 134 ¹⁾	1		50 ²⁾	55	≤ 400	1,35 (<1,8)	10	70 (<200)	50	25	
BA 147/25	1		150	25	≤ 500	≤ 1	50	≤ 15	10	100	
BA 147/50	1		150	50	≤ 500	≤ 1	50	≤ 15	10	100	
BA 147/100	1		150	100	≤ 500	≤ 1	50	≤ 30	50	100	
BA 147/150	1		150	150	≤ 500	≤ 1	50	≤ 50	100	100	
BA 147/230	1		150	230	≤ 500	≤ 1	50	≤ 75	150	100	
BA 147/300	1		150	300	≤ 500	≤ 1	50	≤ 100	200	100	
BA 204	2		150	50	≤ 350	≤ 1	100	$\leq 0,1$	30	25	$\leq 0,01^4)$
BAV 17	2		250	25	≤ 350	≤ 1	100	≤ 15	20	100	$\leq 0,05^3)$
BAV 18	2		250	60	≤ 350	≤ 1	100	≤ 15	50	100	$\leq 0,05^3)$
BAV 19	2		250	120	≤ 350	≤ 1	100	≤ 15	100	100	$\leq 0,05^3)$
BAV 20	2		250	200	≤ 350	≤ 1	100	≤ 15	150	100	$\leq 0,05^3)$
BAV 21	2		250	250	≤ 350	≤ 1	100	≤ 15	200	100	$\leq 0,05^3)$
BAY 86	1	250	250	50	≤ 420	≤ 1	100	≤ 10	50	100	$\leq 3^4)$
BAY 87	1	250	250	100	≤ 420	≤ 1	100	≤ 15	100	100	$\leq 3^4)$
BAY 88	1	250	250	300	≤ 420	≤ 1	100	≤ 20	300	100	$\leq 3^4)$
BAY 89	1	190	250	500	≤ 420	≤ 1	100	≤ 30	500	100	$\leq 10^4)$
1N 484 A	1	250	200	130		≤ 1	100	≤ 15	125	150	

Remarks: ¹⁾ Germanium diodes; ²⁾ I_{FAV} at $U_R = 0$; ³⁾ $I_F = I_R = 30\text{ mA}$, $R_L = 100\ \Omega$, $i_R = 3\text{ mA}$; ⁴⁾ $I_F = I_R = 10\text{ mA}$, $R_L = 100\ \Omega$, $i_R = 1\text{ mA}$

Data book reference: B 2 B

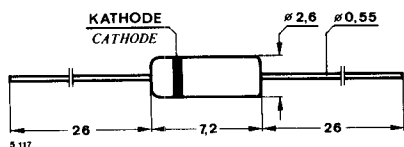


Fig. 1: 51 A 2 DIN 41880
JEDEC DO 7

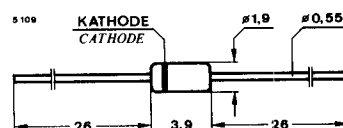


Fig. 2: 54 A 2 DIN 41880
JEDEC DO 35

Diodes

Switching diodes

Type	Fig. Nr.	Maximum ratings			Characteristics								Notes
		P_V at $I_{amb} = 45^\circ\text{C}$ mW	I_F mA	U_R V	R_{thJA} $^\circ\text{C}/\text{W}$	U_F at V	I_F mA	C_D at pF	U_R V	r_f at Ω	I_F mA	t_{rr} μs	
BA 173	1		300	300	≤ 450	≤ 1	100	≤ 2	150			0,35 ¹⁾	Clamping diode
BA 176	1					$\leq 1,5$	400						Aerial protection diode ²⁾
BA 178	3		100	35	≤ 400	$\leq 1,2$	100	$\leq 1,3$	30	$\leq 1,3$	5		RF switching diode
BA 182	3		100	35	≤ 400	$\leq 1,2$	100	≤ 1	20	$\leq 0,7$	5		RF switching diode
BA 243	2		100	20	≤ 350	≤ 1	100	≤ 2	15	≤ 1	10		RF switching diode
BA 244	2		100	20	≤ 350	≤ 1	100	≤ 2	15	$\leq 0,5$	10		RF switching diode
BAW 24	2	440	600	40	≤ 350	$\leq 1,2$	200	≤ 4	0			0,006 ³⁾	
BAW 25	2	440	600	40	≤ 350	≤ 1	200	≤ 4	0			0,006 ³⁾	
BAW 26	2	440	600	60	≤ 350	$\leq 1,2$	200	≤ 4	0			0,006 ³⁾	
BAW 27	2	440	600	60	≤ 350	$\leq 1,25$	400	≤ 4	0			0,006 ³⁾	
BAY 68	2	440	115	25	≤ 350	≤ 1	100	≤ 5	0			0,01 ¹⁾	
BAY 69	2	440	115	50	≤ 350	≤ 1	100	≤ 5	0			0,01 ¹⁾	
BAY 92	1	230 ⁴⁾	100	600	≤ 450	≤ 1	100	≤ 4	10			0,35 ¹⁾	
BAY 93	2	440	115	20	≤ 350	≤ 1	10	≤ 5	0			0,015 ¹⁾	
1N 4148 ○	2	440	200	75	≤ 350	≤ 1	10	≤ 4	0			0,008 ¹⁾	
1N 4149	2	440	200	75	≤ 350	≤ 1	10	≤ 2	0			0,008 ¹⁾	
1N 4151 ○	2	440	200	50	≤ 350	≤ 1	50	≤ 2	0			0,004 ¹⁾	
1N 4154	2	440	200	25	≤ 350	≤ 1	30	≤ 4	0			0,004 ¹⁾	
1N 4446 ○	2	440	200	75	≤ 350	≤ 1	20	≤ 4	0			0,008 ¹⁾	
1N 4447	2	440	200	75	≤ 350	≤ 1	20	≤ 2	0			0,008 ¹⁾	
1N 4448 ○	2	440	200	75	≤ 350	≤ 1	100	≤ 4	0			0,008 ¹⁾	
1N 4449	2	440	200	75	≤ 350	≤ 1	30	≤ 2	0			0,008 ¹⁾	

Remarks: ¹⁾ $I_F = I_R = 10 \text{ mA}$, $i_R = 1 \text{ mA}$; ²⁾ $I_R = 1 \mu\text{A}$, $U_{(BR)} = 100 \text{ V}$, $\frac{t_D}{T} = 0,01$, $t_p = 0,3 \text{ ms}$; ³⁾ $I_F = I_R = 10 \dots 100 \text{ mA}$, $i_R = 0,1 I_R$; ⁴⁾ at $t_{amb} = 25^\circ\text{C}$

Data book reference: B 2 B ○ Can be delivered as "Qualified semiconductor device"

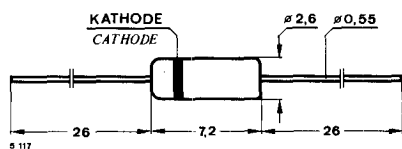


Fig. 1: 51 A 2 DIN 41880
JEDEC DO 7

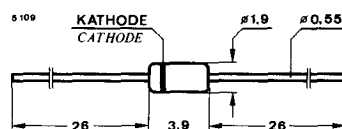


Fig. 2: 54 A 2 DIN 41880
JEDEC DO 35

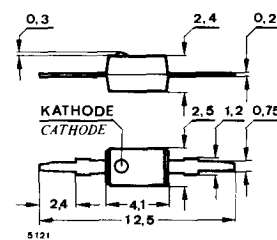


Fig. 3: Plastic case
SOD 23

Diodes

Rectifier and Avalanche diodes

Type	Group	Fig. Nr.	Maximum ratings		Characteristics				Notes
			I_{FAV} mA	U_R V	R_{thJA} °C/W	U_F at V	I_F mA	$t_{rr}^{2)}$ ns	
BA 157		5	400	400	≤ 100	≤ 1,5	1000	≤ 300	Fast rectifier diodes
BA 158		5	400	600	≤ 100	≤ 1,5	1000	≤ 300	
BA 159		5	400	1000	≤ 100	≤ 1,5	1000	≤ 300	
BY 201	2	5	1000 ¹⁾	200	≤ 100	≤ 1,2	1000	≤ 350 ³⁾	Fast rectifier diodes
	3	5	1000 ¹⁾	300	≤ 100	≤ 1,2	1000	≤ 350 ³⁾	
	4	5	1000 ¹⁾	400	≤ 100	≤ 1,2	1000	≤ 350 ³⁾	
	5	5	1000 ¹⁾	500	≤ 100	≤ 1,2	1000	≤ 350 ³⁾	
	6	5	1000 ¹⁾	600	≤ 100	≤ 1,2	1000	≤ 350 ³⁾	
BY 202	2	6	1500 ¹⁾	200	≤ 70	≤ 1,0	1000	≤ 350 ³⁾	Fast rectifier diodes
	3	6	1500 ¹⁾	300	≤ 70	≤ 1,0	1000	≤ 350 ³⁾	
	4	6	1500 ¹⁾	400	≤ 70	≤ 1,0	1000	≤ 350 ³⁾	
	5	6	1500 ¹⁾	500	≤ 70	≤ 1,0	1000	≤ 350 ³⁾	
	6	6	1500 ¹⁾	600	≤ 70	≤ 1,0	1000	≤ 350 ³⁾	
BY 203	12	5	250	1200	≤ 100	≤ 2,4	200	≤ 550	Fast rectifier diodes
	16	5	250	1600	≤ 100	≤ 2,4	200	≤ 550	
	20	5	250	2000	≤ 100	≤ 2,4	200	≤ 550	
BY 204	4	5	400	400	≤ 100	≤ 1,2	200	≤ 550	Fast rectifier diodes
	8	5	400	800	≤ 100	≤ 1,2	200	≤ 550	
	10	5	400	1000	≤ 100	≤ 1,2	200	≤ 550	
BYV 12		8	1500	100	≤ 100	≤ 1,5	1000	≤ 300 ⁶⁾	Fast rectifier diodes
BYV 13		8	1500	400	≤ 100	≤ 1,5	1000	≤ 300 ⁶⁾	
BYV 14		8	1500	600	≤ 100	≤ 1,5	1000	≤ 300 ⁶⁾	
BYV 15		8	1500	800	≤ 100	≤ 1,5	1000	≤ 300 ⁶⁾	
BYV 16		8	1500	1000	≤ 100	≤ 1,5	1000	≤ 300 ⁶⁾	
BYW 32		8	2000	200	≤ 100	≤ 1,2	1000	≤ 200 ⁹⁾	
BYW 33		8	2000	300	≤ 100	≤ 1,2	1000	≤ 200 ⁹⁾	
BYW 34		8	2000	400	≤ 100	≤ 1,2	1000	≤ 200 ⁹⁾	
BYW 35		8	2000	500	≤ 100	≤ 1,2	1000	≤ 200 ⁹⁾	
BYW 36		8	2000	600	≤ 100	≤ 1,2	1000	≤ 200 ⁹⁾	
BYW 52 ○		8	2000	200	≤ 100	≤ 1	1000	-	Äquiv. 1N 5059 Äquiv. 1N 5060 Äquiv. 1N 5061 Äquiv. 1N 5062 Controlled-Avalanche-characteristics
BYW 53 ○		8	2000	400	≤ 100	≤ 1	1000	-	
BYW 54 ○		8	2000	600	≤ 100	≤ 1	1000	-	
BYW 55 ○		8	2000	800	≤ 100	≤ 1	1000	-	
BYW 56 ○		8	2000	1000	≤ 100	≤ 1	1000	-	
BYW 72		9	3000	200	≤ 90	≤ 1,2	3000	≤ 200 ⁹⁾	Fast rectifier diodes
BYW 73		9	3000	300	≤ 90	≤ 1,2	3000	≤ 200 ⁹⁾	
BYW 74		9	3000	400	≤ 90	≤ 1,2	3000	≤ 200 ⁹⁾	
BYW 75		9	3000	500	≤ 90	≤ 1,2	3000	≤ 200 ⁹⁾	
BYW 76		9	3000	600	≤ 90	≤ 1,2	3000	≤ 200 ⁹⁾	
BYW 82 ○		9	3000	200	≤ 90	≤ 1	3000	-	
BYW 83 ○		9	3000	400	≤ 90	≤ 1	3000	-	
BYW 84 ○		9	3000	600	≤ 90	≤ 1	3000	-	
BYW 85 ○		9	3000	800	≤ 90	≤ 1	3000	-	
BYW 86 ○		9	3000	1000	≤ 90	≤ 1	3000	-	
BYX 82		8	1500	200	≤ 100	≤ 1	1000	-	Rectifier diodes
BYX 83		8	1500	400	≤ 100	≤ 1	1000	-	
BYX 84		8	1500	600	≤ 100	≤ 1	1000	-	
BYX 85		8	1500	800	≤ 100	≤ 1	1000	-	
BYX 86		8	1500	1000	≤ 100	≤ 1	1000	-	
1N 4001		5	1000	50	≤ 85	≤ 1,1	1000	-	
1N 4002		5	1000	100	≤ 85	≤ 1,1	1000	-	
1N 4003		5	1000	200	≤ 85	≤ 1,1	1000	-	
1N 4004		5	1000	400	≤ 85	≤ 1,1	1000	-	
1N 4005		5	1000	600	≤ 85	≤ 1,1	1000	-	
1N 4006		5	1000	800	≤ 85	≤ 1,1	1000	-	
1N 4007		5	1000	1000	≤ 85	≤ 1,1	1000	-	

Remarks: ¹⁾ I_O ; ²⁾ $I_F = I_R = 10$ mA, $i_R = 1$ mA; ³⁾ $I_F = I_R = 1$ A, $i_R = 100$ mA; ⁷⁾ $I_F = 30$ mA, $U_R = 3$ V, $R_L = 100$ Ω, $i_R = 3$ mA; ⁸⁾ $I_F = 100$ mA, $I_R = 200$ mA, $i_R = 50$ mA; ⁹⁾ $I_F = 0,5$ A, $I_R = 1$ A, $i_R = 0,25$ A

Data book reference: B 2 B ○ Can be delivered as "Qualified semiconductor device"

Diodes

Capacitance diodes

Type	Group	Fig. Nr.	Maximum rat. U_R V	Characteristics							
				$C_D(U_R = 3 V)$ $C_D(U_R = 25 V)$	$C_D(U_R = 3 V)$ $C_D(U_R = 30 V)$	$C_D(U_R = 2 V)$ $C_D(U_R = 8 V)$	C_D at pF	U_R V	r_s at Ω	U_R or V	C_D pF
BA 111		1	20	-	-	-	45...65	2	0,5	2	-
BA 121		1	30	-	-	-	8...12	2	0,9	2	-
BA 124	50	1	30	-	-	-	44...51	2	0,5	2	-
	55	1	30	-	-	-	49...56	2	0,5	2	-
	60	1	30	-	-	-	54...61	2	0,5	2	-
	65	1	30	-	-	-	59...66	2	0,5	2	-
BA 125	35	1	30	-	-	-	29...36	2	0,5	2	-
	40	1	30	-	-	-	34...41	2	0,5	2	-
	45	1	30	-	-	-	39...46	2	0,5	2	-
	50	1	30	-	-	-	46...51	2	0,5	2	-
BB 105	A	3	28	4...5	-	-	2,3...2,8	25	$\approx 0,8$	-	9
	B	3	28	4,5...6	-	-	2,0...2,3	25	$\approx 0,8$	-	9
	G	3	28	4...6	-	-	1,8...2,8	25	$\approx 1,2$	-	9
BB 109		3	28	5...6,5	-	-	4,3...6	25	0,5	-	10
BB 204	gn	7	30	-	2,5...2,8	-	34...39	3	$\approx 0,4$	-	38
	bl	7	30	-	2,5...2,8	-	37...42	3	$\approx 0,4$	-	38
BB 205	A	3	28	4,3...5,3	-	-	2,0...2,5	25	$\approx 0,8$	-	9
	B	3	28	5,0...6	-	-	1,9...2,2	25	$\approx 0,8$	-	9
	G	3	28	4,3...6	-	-	1,8...2,6	25	$\approx 1,2$	-	9
BB 209		3	28	> 6,8	-	-	2,6...3,0	25	0,85	-	12
BB 304	rt	7	30	-	-	1,65...1,75	42...43,5	2	$\approx 0,4$	-	38
	gb	7	30	-	-	1,65...1,75	43...44,5	2	$\approx 0,4$	-	38
	w	7	30	-	-	1,65...1,75	44...45,5	2	$\approx 0,4$	-	38
	gn	7	30	-	-	1,65...1,75	45...46,5	2	$\approx 0,4$	-	38
	bl	7	30	-	-	1,65...1,75	46...47,5	2	$\approx 0,4$	-	38
BB 505	B	4	28	4,5...5,8	-	-	2,0...2,3	25	$\approx 0,8$	-	9
	G	4	28	4,3...6	-	-	1,8...2,5	25	$\approx 1,2$	-	9

Data book reference: B 2 B

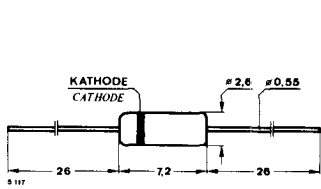


Fig. 1: 51 A 2 DIN 41880
JEDEC DO 7

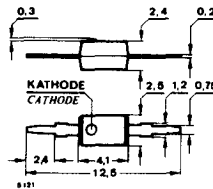


Fig. 3: Plastic case
(SOD 23)

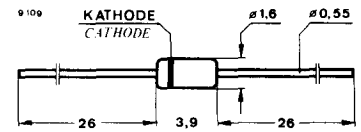


Fig. 4: 54 A 2 DIN 41880
JEDEC DO 35

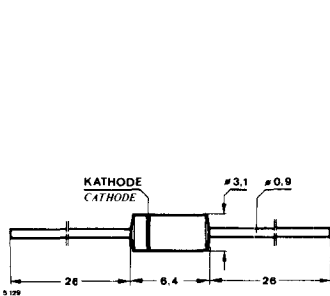


Fig. 5: Plastic case
 \approx JEDEC DO 7

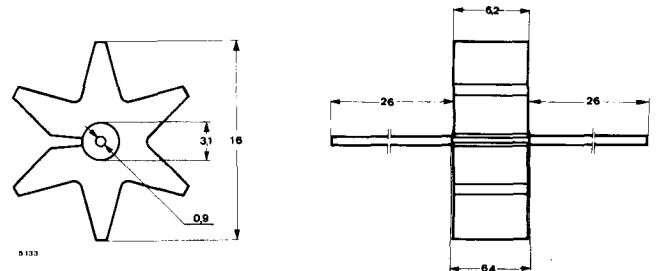


Fig. 6: Plastic case with heat sink

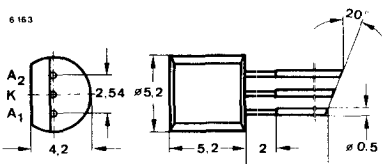


Fig. 7: 10 B 3 DIN 41868
JEDEC TO 92

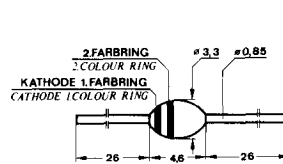


Fig. 8: Sintered glass case

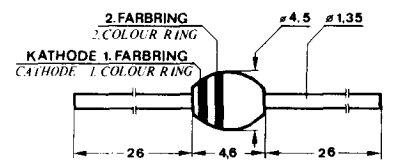


Fig. 9: Sintered glass case

Diodes

Diodes for demodulator circuits

Type	Fig. Nr.	Maximum ratings		Characteristics			Notes
		at $t_{amb} = 25^{\circ}\text{C}$		R_{thJA} $^{\circ}\text{C/W}$	U_F V	I_F mA	
U_R V	I_F mA						
AA 112	1	15	30	≤ 400	0,95 (<1,5)	10	For ratio detectors with low load resistance. Matched pairs are available.
AA 113	1	60	25	≤ 400	1,1 (<1,6)	10	For ratio detectors with high load resistance. Matched pairs are available.
AA 118	1	90	50 ¹⁾	≤ 400	1,05 (<1,55)	10	For phase discriminators. Matched pairs available.
AA 119	1	30	35 ¹⁾	≤ 400	1,5 (<2,2)	10	For ratio detectors with high load resistance. Matched pairs are available.
AA 137	1	30	20	≤ 400	0,9 (<1,5)	10	For ACC in TV sets.
AA 138	1	15	20	≤ 400	0,9 (<1,5)	10	For demodulators in TV sets.

Remarks: ¹⁾ $I_{FAV}, U_R = 0$

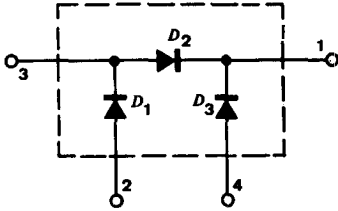
PIN-Diode

Type	Fig. Nr.	Maximum ratings		Characteristics								Notes	
		U_R V	I_F mA	U_F at I_F V	I_R at U_R nA	V	C_D at f pF	MHz	r_f and z_r at f Ω	k Ω	MHz		
BA 479	3	30	50	< 1	50	< 50	30	< 0,5	0,5	< 50	> 9	100	For adjustable attenuators

Data book reference: B 2 B

TDA 1061 Silicon Planar PIN Diodes as a π -circuit

Applications: Attenuator two-port for AGC input signal in television tuners and antenna amplifiers.



Features:

- Large frequency range, 40 MHz ... 1 GHz
- Constant input and output impedance throughout the range of regulation

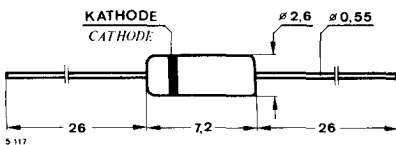


Fig. 1: 51 A 2 DIN 41880
JEDEC DO 7

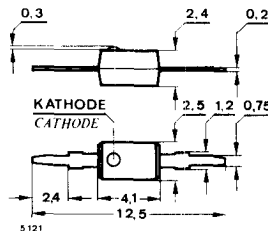


Fig. 3: Plastic case
(SOD 23)

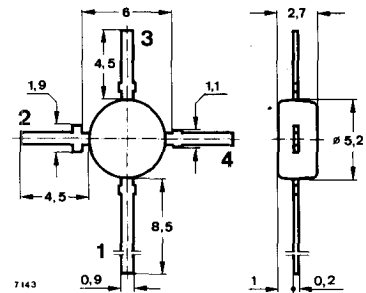


Fig. 10: 50 B 4 DIN 41867
JEDEC TO 50

Diodes

Regulator diodes

Type	Fig. Nr.	Maximum ratings		Characteristics						
		I_F mA	R_{thJA} °C/W	U_F at V	I_F mA	I_R at μA	U_R V	r_f at Ω	I_F μA	TK_{UF} at $I_F = 5$ mA $10^{-4}/^{\circ}C$
BZ 102/0V7	1	250	≤ 420	0,65-0,75	5	1	5	6,5	5	-26
BZ 102/1V4	1	130	≤ 420	1,3-1,5	5	1	5	13,0	5	-26
BZ 102/2V1	1	80	≤ 420	1,9-2,3	5	1	5	19,5	5	-26
BZ 102/2V8	1	60	≤ 420	2,6-3,0	5	1	5	26,0	5	-26
BZ 102/3V4	1	50	≤ 420	3,2-3,7	5	1	5	32,5	5	-26

Z diodes

$P_V = 500$ mW Fig. No. 2

Type	$U_Z^{2)}$ V	TK_{UZ} at $I_Z = 5$ mA $10^{-4}/^{\circ}C$	r_{zj} Ω	r_{zj} at $I_Z = 1$ mA Ω	I_R at nA	U_R V	$I_R^{1)}$ at μA	U_R V
BZX 55/C 2 V 4	2,28 ... 2,56	-9 ... -6	< 85	< 600	< 10 000	1	< 50	1
BZX 55/C 2 V 7	2,5 ... 2,9	-9 ... -6	< 85	< 600	< 10 000	1	< 50	1
BZX 55/C 3 V 0	2,8 ... 3,2	-8 ... -5	< 85	< 600	< 4 000	1	< 40	1
BZX 55/C 3 V 3	3,1 ... 3,5	-8 ... -5	< 85	< 600	< 2 000	1	< 40	1
BZX 55/C 3 V 6	3,4 ... 3,8	-8 ... -5	< 85	< 600	< 2 000	1	< 40	1
BZX 55/C 3 V 9	3,7 ... 4,1	-8 ... -5	< 85	< 600	< 2 000	1	< 40	1
BZX 55/C 4 V 3	4,0 ... 4,6	-6 ... -3	< 75	< 600	< 1 000	1	< 20	1
BZX 55/C 4 V 7	4,4 ... 5,0	-5 ... +2	< 60	< 600	< 500	1	< 10	1
BZX 55/C 5 V 1	4,8 ... 5,4	-2 ... +2	< 35	< 550	< 100	1	< 2	1
BZX 55/C 5 V 6	5,2 ... 6,0	-0,5 ... +5	< 25	< 450	< 100	1	< 2	1
BZX 55/C 6 V 2	5,8 ... 6,6	3 ... 6	< 10	< 200	< 100	2	< 2	2
BZX 55/C 6 V 8	6,4 ... 7,2	3 ... 7	< 8	< 150	< 100	3	< 2	3
BZX 55/C 7 V 5	7,0 ... 7,9	3 ... 7	< 7	< 50	< 100	5	< 2	5
BZX 55/C 8 V 2	7,7 ... 8,7	3 ... 8	< 7	< 50	< 100	6	< 2	6
BZX 55/C 9 V 1	8,5 ... 9,6	3 ... 9	< 10	< 50	< 100	7	< 2	7
BZX 55/C 10	9,4 ... 10,6	3 ... 10	< 15	< 70	< 100	7,5	< 2	7,5
BZX 55/C 11	10,4 ... 11,6	3 ... 11	< 20	< 70	< 100	8,5	< 2	8,5
BZX 55/C 12	11,4 ... 12,7	3 ... 11	< 20	< 90	< 100	9	< 2	9
BZX 55/C 13	12,4 ... 14,1	3 ... 11	< 26	< 110	< 100	10	< 2	10
BZX 55/C 15	13,8 ... 15,6	3 ... 11	< 30	< 110	< 100	11	< 2	11
BZX 55/C 16	15,3 ... 17,1	3 ... 11	< 40	< 170	< 100	12	< 2	12
BZX 55/C 18	16,8 ... 19,1	3 ... 11	< 50	< 170	< 100	14	< 2	14
BZX 55/C 20	18,8 ... 21,2	3 ... 11	< 55	< 220	< 100	15	< 2	15
BZX 55/C 22	20,8 ... 23,3	4 ... 12	< 55	< 220	< 100	17	< 2	17
BZX 55/C 24	22,8 ... 25,6	4 ... 12	< 80	< 220	< 100	18	< 2	18
BZX 55/C 27	25,1 ... 28,9	4 ... 12	< 80	< 220	< 100	20	< 2	20
BZX 55/C 30	28 ... 32	4 ... 12	< 80	< 220	< 100	22	< 2	22
BZX 55/C 33	31 ... 35	4 ... 12	< 80	< 220	< 100	24	< 2	24
BZX 55/C 36	34 ... 38	4 ... 12	< 80	< 220	< 100	27	< 2	27
BZX 55/C 39	37 ... 41	4 ... 12	< 90	< 500	< 100	28	< 2	28
BZX 55/C 43	40 ... 46 ³⁾	4 ... 12	< 100 ³⁾	< 700 ⁴⁾	< 100	32	< 2	32
BZX 55/C 47	44 ... 50 ³⁾	4 ... 12	< 120 ³⁾	< 1000 ⁴⁾	< 100	35	< 2	35
BZX 55/C 51	48 ... 54 ³⁾	4 ... 12	< 135 ³⁾	< 1000 ⁴⁾	< 100	38	< 2	38
BZX 55/C 56	52 ... 60 ³⁾	4 ... 12	< 150 ³⁾	< 1500 ⁴⁾	< 100	42	< 2	42
BZX 55/C 62	58 ... 66 ³⁾	4 ... 12	< 170 ³⁾	< 1500 ⁴⁾	< 100	47	< 2	47
BZX 55/C 68	64 ... 72 ³⁾	4 ... 12	< 200 ³⁾	< 2000 ⁴⁾	< 100	51	< 2	51
BZX 55/C 75	70 ... 79 ³⁾	4 ... 12	< 240 ³⁾	< 2000 ⁴⁾	< 100	56	< 2	56

Remarks: ¹⁾ $t_j = 150^{\circ}C$; ²⁾ please request for tight tolerances; ³⁾ $I_Z = 2,5$ mA; ⁴⁾ $I_Z = 0,5$ mA

Data book reference: B 2 B

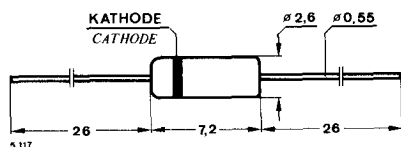


Fig. 1: 51 A 2 DIN 41880 JEDEC DO 7

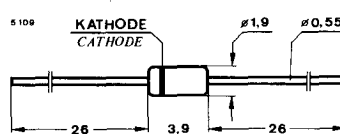


Fig. 2: 54 A 2 DIN 41880 JEDEC DO 35

Diodes

Z diodes

BZX 85/... ¹⁾		$P_V = 1,3 \text{ W}$	Fig. Nr. 14					
Type	U_Z V	and TK_{U_Z} $10^{-4}/^{\circ}\text{C}$	and r_{zj} at Ω	I_Z mA	r_{zj} at Ω	I_Z mA	I_R at μA	U_R V
BZX 85/C 2 V 7	2,5...2,9	-8...-5	< 20	80	< 400	1	< 150	1
BZX 85/C 3 V 0	2,8...3,2	-8...-5	< 20	80	< 400	1	< 100	1
BZX 85/C 3 V 3	3,1...3,5	-8...-5	< 20	80	< 400	1	< 40	1
BZX 85/C 3 V 6	3,4...3,8	-8...-5	< 15	60	< 500	1	< 20	1
BZX 85/C 3 V 9	3,7...4,1	-7...-2	< 15	60	< 500	1	< 10	1
BZX 85/C 4 V 3	4,0...4,6	-7...+1	< 13	50	< 500	1	< 3	1
BZX 85/C 4 V 7	4,4...5,0	-3...+4	< 13	45	< 600	1	< 3	1,5
BZX 85/C 5 V 1	4,8...5,4	-1...+4	< 10	45	< 500	1	< 1	2
BZX 85/C 5 V 6	5,2...6,0	0...+4,5	< 7	45	< 400	1	< 1	2
BZX 85/C 6 V 2	5,8...6,6	+1...+5,5	< 4	35	< 300	1	< 1	3
BZX 85/C 6 V 8	6,4...7,2	+1,5...+6	< 3,5	35	< 300	1	< 1	4
BZX 85/C 7 V 5	7,0...7,9	+2...+6,5	< 3	35	< 200	0,5	< 1	4,5
BZX 85/C 8 V 2	7,7...8,7	+3...+7	< 5	25	< 200	0,5	< 1	5
BZX 85/C 9 V 1	8,5...9,6	+3,5...+7,5	< 5	25	< 200	0,5	< 1	6,5
BZX 85/C 10	9,4...10,6	+4...+8	< 7	25	< 200	0,5	< 0,5	7
BZX 85/C 11	10,4...11,6	+4,5...+8	< 8	20	< 300	0,5	< 0,5	7,7
BZX 85/C 12	11,4...12,7	+4,5...+8,5	< 9	20	< 350	0,5	< 0,5	8,4
BZX 85/C 13	12,4...14,1	+5...+8,5	< 10	20	< 400	0,5	< 0,5	9,1
BZX 85/C 15	13,8...15,6	+5,5...+9	< 15	15	< 500	0,5	< 0,5	10,5
BZX 85/C 16	15,3...17,1	+5,5...+9	< 15	15	< 500	0,5	< 0,5	11
BZX 85/C 18	16,8...19,1	+6...+9	< 20	15	< 500	0,5	< 0,5	12,5
BZX 85/C 20	18,8...21,2	+6...+9	< 24	10	< 600	0,5	< 0,5	14
BZX 85/C 22	20,8...23,3	+6...+9,5	< 25	10	< 600	0,5	< 0,5	15,5
BZX 85/C 24	22,8...25,6	+6...+9,5	< 25	10	< 600	0,5	< 0,5	17
BZX 85/C 27	25,1...28,9	+6...+9,5	< 30	8	< 750	0,25	< 0,5	19
BZX 85/C 30	28...32	+6...+9,5	< 30	8	< 1000	0,25	< 0,5	21
BZX 85/C 33	31...35	+6...+9,5	< 35	8	< 1000	0,25	< 0,5	23
BZX 85/C 36	34...38	+6...+9,5	< 40	8	< 1000	0,25	< 0,5	25
BZX 85/C 39	37...41	+6...+9,5	< 50	6	< 1000	0,25	< 0,5	27
BZX 85/C 43	40...46	+6...+9,5	< 50	6	< 1000	0,25	< 0,5	30
BZX 85/C 47	44...50	+6...+9,5	< 90	4	< 1500	0,25	< 0,5	33
BZX 85/C 51	48...54	+6...+9,5	< 115	4	< 1500	0,25	< 0,5	36
BZX 85/C 56	52...60	+6...+9,5	< 120	4	< 2000	0,25	< 0,5	39
BZX 85/C 62	58...66	+6...+9,5	< 125	4	< 2000	0,25	< 0,5	43
BZX 85/C 68	64...72	+6...+9,5	< 130	4	< 2000	0,25	< 0,5	48
BZX 85/C 75	70...80	+6...+9,5	< 135	4	< 2000	0,25	< 0,5	53

Remarks: ¹⁾ please request for tight tolerances

Regulator diodes

Type	Fig. Nr.	Maximum ratings P_V at $t_{amb} = +45^{\circ}\text{C}$ W	Characteristics		
			U_F V	and r_f Ω	at I_F mA
BZY 87/0V7	1	0,2	0,65-0,75	≤ 8	5
BZY 87/1V4	1	0,2	1,3-1,5	≤ 20	5
BZY 87/2V1	1	0,2	1,9-2,3	≤ 30	5
BZY 87/2V8	1	0,2	2,6-3,0	≤ 40	5
BZY 87/3V4	1	0,2	3,2-3,7	≤ 50	5

Data book reference: B 2 B; Complementary transistors see page 19

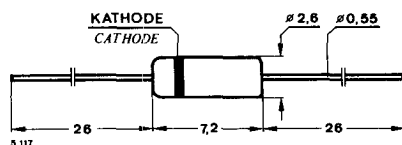


Fig. 1: 51 A 2 DIN 41880
JEDEC DO 7

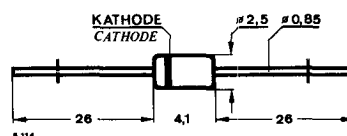


Fig. 14: 51 A 2 DIN 41880
JEDEC DO 41

AF transistors

Type	Group	Structure	Fig. Nr.	Maximum ratings			Characteristics						
				P_{tot} at $t_{amb} = +45^\circ\text{C}$ W	I_C mA	U_{CEO} V	f_T at I_C MHz	I_C mA	h_{FE} at I_C and U_{CE}	I_C mA	U_{CE} V	F at f dB	f kHz
BC 107	A	NPN	1	0,26	100	45	300	10	110-220	2	5	≤ 10	¹⁾
	B	NPN	1	0,26	100	45	300	10	200-450	2	5	≤ 10	¹⁾
BC 108	A	NPN	1	0,26	100	20	300	10	110-220	2	5	≤ 10	¹⁾
	B	NPN	1	0,26	100	20	300	10	200-450	2	5	≤ 10	¹⁾
	C	NPN	1	0,26	100	20	300	10	420-800	2	5	≤ 10	¹⁾
BC 109	B	NPN	1	0,26	100	20	300	10	200-450	2	5	≤ 4	0,03-15
	C	NPN	1	0,26	100	20	300	10	420-800	2	5	≤ 4	0,03-15
BC 140	6	NPN	2	0,65	1000	40	≥ 50	50	40-95	100	1	-	-
	10	NPN	2	0,65	1000	40	≥ 50	50	67-150	100	1	-	-
	16	NPN	2	0,65	1000	40	≥ 50	50	106-236	100	1	-	-
BC 141	6	NPN	2	0,65	1000	60	≥ 50	50	40-95	100	1	-	-
	10	NPN	2	0,65	1000	60	≥ 50	50	67-150	100	1	-	-
	16	NPN	2	0,65	1000	60	≥ 50	50	106-236	100	1	-	-
BC 160	6	PNP	2	0,65	1000	40	≥ 50	50	40-95	100	1	-	-
	10	PNP	2	0,65	1000	40	≥ 50	50	67-150	100	1	-	-
	16	PNP	2	0,65	1000	40	≥ 50	50	106-236	100	1	-	-
BC 161	6	PNP	2	0,65	1000	60	≥ 50	50	40-95	100	1	-	-
	10	PNP	2	0,65	1000	60	≥ 50	50	67-150	100	1	-	-
	16	PNP	2	0,65	1000	60	≥ 50	50	106-236	100	1	-	-
BC 177	VI	PNP	1	0,26	100	45	130	10	70-130	2	5	≤ 10	¹⁾
	A	PNP	1	0,26	100	45	130	10	110-220	2	5	≤ 10	¹⁾
	B	PNP	1	0,26	100	45	130	10	200-450	2	5	≤ 10	¹⁾
BC 178	VI	PNP	1	0,26	100	25	130	10	70-130	2	5	≤ 10	¹⁾
	A	PNP	1	0,26	100	25	130	10	110-220	2	5	≤ 10	¹⁾
	B	PNP	1	0,26	100	25	130	10	200-450	2	5	≤ 10	¹⁾
	C	PNP	1	0,26	100	25	130	10	420-800	2	5	≤ 10	¹⁾
BC 179	A	PNP	1	0,26	100	20	130	10	110-220	2	5	≤ 4	0,03-15
	B	PNP	1	0,26	100	20	130	10	200-450	2	5	≤ 4	0,03-15
	C	PNP	1	0,26	100	20	130	10	420-800	2	5	≤ 4	0,03-15
BC 182	A	NPN	3	0,3	200	50	≥ 150	10	125-260 ¹⁾	2	5	≤ 10	¹⁾
	B	NPN	3	0,3	200	50	≥ 150	10	240-500 ¹⁾	2	5	≤ 10	¹⁾
BC 212	A	PNP	3	0,3	200	50	≥ 200	10	100-300 ¹⁾	2	5	≤ 10	¹⁾
	B	PNP	3	0,3	200	50	≥ 200	10	200-400 ¹⁾	2	5	≤ 10	¹⁾
BC 237	A	NPN	3	0,3	100	45	300	10	110-220	2	5	≤ 10	¹⁾
	B	NPN	3	0,3	100	45	300	10	200-450	2	5	≤ 10	¹⁾
BC 238	A	NPN	3	0,3	100	20	300	10	110-220	2	5	≤ 10	¹⁾
	B	NPN	3	0,3	100	20	300	10	200-450	2	5	≤ 10	¹⁾
	C	NPN	3	0,3	100	20	300	10	420-800	2	5	≤ 10	¹⁾
BC 239	B	NPN	3	0,3	100	20	300	10	200-450	2	5	≤ 4	0,03-15
	C	NPN	3	0,3	100	20	300	10	420-800	2	5	≤ 4	0,03-15
BC 307	VI	PNP	3	0,3	100	45	130	10	70-130	2	5	≤ 10	¹⁾
	A	PNP	3	0,3	100	45	130	10	110-220	2	5	≤ 10	¹⁾
	B	PNP	3	0,3	100	45	130	10	200-450	2	5	≤ 10	¹⁾
BC 308	VI	PNP	3	0,3	100	25	130	10	70-130	2	5	≤ 10	¹⁾
	A	PNP	3	0,3	100	25	130	10	110-220	2	5	≤ 10	¹⁾
	B	PNP	3	0,3	100	25	130	10	200-450	2	5	≤ 10	¹⁾
	C	PNP	3	0,3	100	25	130	10	420-800	2	5	≤ 10	¹⁾
BC 309	A	PNP	3	0,3	100	20	130	10	110-220	2	5	≤ 4	0,03-15
	B	PNP	3	0,3	100	20	130	10	200-450	2	5	≤ 4	0,03-15
	C	PNP	3	0,3	100	20	130	10	420-800	2	5	≤ 4	0,03-15

Remarks: ¹⁾ h_{fe} ; ²⁾ $\Delta f = 200$ Hz; ³⁾ $\Delta f = 1$ Hz

Data book reference: B 2 D; Complementary transistors see page 19

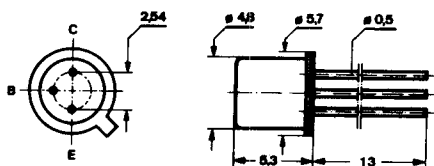


Fig. 1: 18 A 3 DIN 41876
JEDEC TO 18

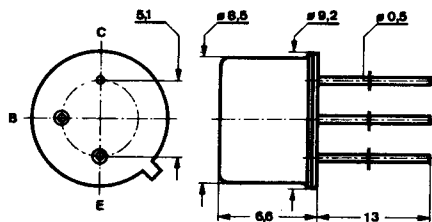


Fig. 2: 5 C 3 DIN 41873
JEDEC TO 39

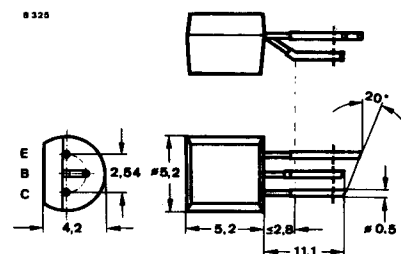


Fig. 3: 10 A 3 DIN 41868
JEDEC TO 92 Z

AF transistors

(Continued)

Type	Group	Structure	Fig. Nr.	Maximum ratings			Characteristics						
				P_{tot} at $t_{amb} = +45^\circ\text{C}$ W	I_C mA	U_{CEO} V	f_T at I_C MHz	I_C mA	h_{FE} at	I_C and U_{CE} mA	V	F at	f
												dB	kHz
BC 327	10	PNP	3	0.625 ⁴⁾	800	45	100	10	67-150	100	1	-	-
	16	PNP	3	0.625 ⁴⁾	800	45	100	10	106-236	100	1	-	-
	25	PNP	3	0.625 ⁴⁾	800	45	100	10	170-375	100	1	-	-
	40	PNP	3	0.625 ⁴⁾	800	45	100	10	265-600	100	1	-	-
BC 328	10	PNP	3	0.625 ⁴⁾	800	25	100	10	67-150	100	1	-	-
	16	PNP	3	0.625 ⁴⁾	800	25	100	10	106-236	100	1	-	-
	25	PNP	3	0.625 ⁴⁾	800	25	100	10	170-375	100	1	-	-
	40	PNP	3	0.625 ⁴⁾	800	25	100	10	265-600	100	1	-	-
BC 337	10	NPN	3	0.625 ⁴⁾	800	45	100	10	67-150	100	1	-	-
	16	NPN	3	0.625 ⁴⁾	800	45	100	10	106-236	100	1	-	-
	25	NPN	3	0.625 ⁴⁾	800	45	100	10	170-375	100	1	-	-
	40	NPN	3	0.625 ⁴⁾	800	45	100	10	265-600	100	1	-	-
BC 338	10	NPN	3	0.625 ⁴⁾	800	25	100	10	67-150	100	1	-	-
	16	NPN	3	0.625 ⁴⁾	800	25	100	10	106-236	100	1	-	-
	25	NPN	3	0.625 ⁴⁾	800	25	100	10	170-375	100	1	-	-
	40	NPN	3	0.625 ⁴⁾	800	25	100	10	265-600	100	1	-	-
BC 368		NPN	4	0.8 ⁶⁾	1000	20	65	10	85-375	500	1	-	-
BC 369		PNP	4	0.8 ⁶⁾	1000	20	65	10	85-375	500	1	-	-
BC 413	B	NPN	3	0.25	100 ⁵⁾	30	250	10	180-460	2	5	≤ 3	0.03-15
	C	NPN	3	0.25	100 ⁵⁾	30	250	10	380-800	2	5	≤ 3	0.03-15
BC 414	B	NPN	3	0.25	100 ⁵⁾	45	250	10	180-460	2	5	≤ 3	0.03-15
	C	NPN	3	0.25	100 ⁵⁾	45	250	10	380-800	2	5	≤ 3	0.03-15
BC 415	A	PNP	3	0.25	100 ⁵⁾	35	200	10	120-220	2	5	≤ 2	0.03-15
	B	PNP	3	0.25	100 ⁵⁾	35	200	10	180-460	2	5	≤ 2	0.03-15
	C	PNP	3	0.25	100 ⁵⁾	35	200	10	380-800	2	5	≤ 3	0.03-15
BC 416	A	PNP	3	0.25	100 ⁵⁾	45	200	10	120-220	2	5	≤ 2	0.03-15
	B	PNP	3	0.25	100 ⁵⁾	45	200	10	180-460	2	5	≤ 2	0.03-15
	C	PNP	3	0.25	100 ⁵⁾	45	200	10	380-800	2	5	≤ 2	0.03-15
BC 431	10	NPN	3	0.625 ⁴⁾	500	60	100	10	67-150	100	1	-	-
	16	NPN	3	0.625 ⁴⁾	500	60	100	10	106-236	100	1	-	-
BC 432	10	PNP	3	0.625 ⁴⁾	500	60	100	10	67-150	100	1	-	-
	16	PNP	3	0.625 ⁴⁾	500	60	100	10	106-236	100	1	-	-
BC 546	A	NPN	3	0.5 ⁶⁾	100	65	300	10	110-220	2	5	≤ 10	1 ²⁾
	B	NPN	3	0.5 ⁶⁾	100	65	300	10	200-450	2	5	≤ 10	1 ²⁾
BC 547	A	NPN	3	0.5 ⁶⁾	100	45	300	10	110-220	2	5	≤ 10	1 ²⁾
	B	NPN	3	0.5 ⁶⁾	100	45	300	10	200-450	2	5	≤ 10	1 ²⁾
BC 548	A	NPN	3	0.5 ⁶⁾	100	30	300	10	110-220	2	5	≤ 10	1 ²⁾
	B	NPN	3	0.5 ⁶⁾	100	30	300	10	200-450	2	5	≤ 10	1 ²⁾
	C	NPN	3	0.5 ⁶⁾	100	30	300	10	420-800	2	5	≤ 10	1 ²⁾
BC 549	B	NPN	3	0.5 ⁶⁾	100	30	300	10	200-450	2	5	≤ 4	0.03-15
	C	NPN	3	0.5 ⁶⁾	100	30	300	10	420-800	2	5	≤ 4	0.03-15
BC 550	B	NPN	3	0.5 ⁶⁾	100	45	300	10	200-450	2	5	≤ 3	0.03-15
	C	NPN	3	0.5 ⁶⁾	100	45	300	10	420-800	2	5	≤ 3	0.03-15
BC 556	VI	PNP	3	0.5 ⁶⁾	100	65	150	10	70-130	2	5	≤ 10	1 ²⁾
	A	PNP	3	0.5 ⁶⁾	100	65	150	10	110-220	2	5	≤ 10	1 ²⁾
BC 557	VI	PNP	3	0.5 ⁶⁾	100	45	150	10	70-130	2	5	≤ 10	1 ²⁾
	A	PNP	3	0.5 ⁶⁾	100	45	150	10	110-220	2	5	≤ 10	1 ²⁾
	B	PNP	3	0.5 ⁶⁾	100	45	150	10	200-450	2	5	≤ 10	1 ²⁾
BC 558	VI	PNP	3	0.5 ⁶⁾	100	30	150	10	70-130	2	5	≤ 10	1 ²⁾
	A	PNP	3	0.5 ⁶⁾	100	30	150	10	110-220	2	5	≤ 10	1 ²⁾
	B	PNP	3	0.5 ⁶⁾	100	30	150	10	200-450	2	5	≤ 10	1 ²⁾
	C	PNP	3	0.5 ⁶⁾	100	30	150	10	420-800	2	5	≤ 10	1 ²⁾
BC 559	A	PNP	3	0.5 ⁶⁾	100	30	150	10	110-220	2	5	≤ 4	0.03-15
	B	PNP	3	0.5 ⁶⁾	100	30	150	10	200-450	2	5	≤ 4	0.03-15
	C	PNP	3	0.5 ⁶⁾	100	30	150	10	420-800	2	5	≤ 4	0.03-15
BC 560	A	PNP	3	0.5 ⁶⁾	100	45	150	10	110-220	2	5	≤ 2	0.03-15
	B	PNP	3	0.5 ⁶⁾	100	45	150	10	200-450	2	5	≤ 2	0.03-15
	C	PNP	3	0.5 ⁶⁾	100	45	150	10	420-800	2	5	≤ 2	0.03-15

Remarks: ²⁾ $\Delta f = 200$ Hz; ⁴⁾ $t_{case} \leq 45^\circ\text{C}$; ⁵⁾ I_{CM} ; ⁶⁾ $t_{amb} \leq 25^\circ\text{C}$

Data book reference: B 2 D; Complementary transistors see page 19

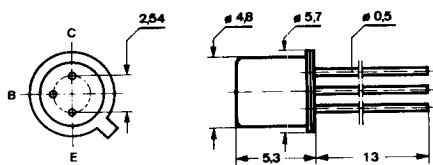


Fig. 1: 18 A 3 DIN 41 876
JEDEC TO 18

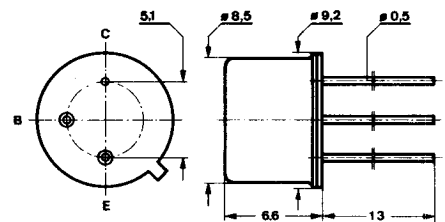


Fig. 2: 5 C 3 DIN 41 873
JEDEC TO 39

AF transistors

(Continued)

Type	Group	Structure	Fig. Nr.	Maximum ratings			Characteristics						
				P_{tot} at $t_{amb} = +45^\circ C$ W	I_C mA	U_{CEO} V	f_T at I_C MHz	h_{FE} at I_C mA	I_C and U_{CE}		F at f dB	kHz	
BC 635		NPN	4	1,0 ⁶⁾	1000	45	50	50	40-250	150	2	-	-
BC 636		PNP	4	1,0 ⁶⁾	1000	45	50	50	40-250	150	2	-	-
BC 637		NPN	4	1,0 ⁶⁾	1000	60	50	50	40-160	150	2	-	-
BC 638		PNP	4	1,0 ⁶⁾	1000	60	50	50	40-160	150	2	-	-
BC 639		NPN	4	1,0 ⁶⁾	1000	80	50	50	40-160	150	2	-	-
BC 640		PNP	4	1,0 ⁶⁾	1000	80	50	50	40-160	150	2	-	-
BCW 60	A	NPN	5	0,15	200	32	250	10	120-220	2	5	≤ 6	1 ²⁾
	B	NPN	5	0,15	200	32	250	10	180-310	2	5	≤ 6	1 ²⁾
	C	NPN	5	0,15	200	32	250	10	250-460	2	5	≤ 6	1 ²⁾
	D	NPN	5	0,15	200	32	250	10	380-630	2	5	≤ 6	1 ²⁾
BCW 61	A	PNP	5	0,15	200	32	150	1	120-220	2	5	≤ 6	1 ²⁾
	B	PNP	5	0,15	200	32	150	1	180-310	2	5	≤ 6	1 ²⁾
	C	PNP	5	0,15	200	32	150	1	250-460	2	5	≤ 6	1 ²⁾
	D	PNP	5	0,15	200	32	150	1	380-630	2	5	≤ 6	1 ²⁾
BCX 70	G	NPN	5	0,15	200	45	250	10	120-220	2	5	≤ 6	1 ²⁾
	H	NPN	5	0,15	200	45	250	10	180-310	2	5	≤ 6	1 ²⁾
	J	NPN	5	0,15	200	45	250	10	250-460	2	5	≤ 6	1 ²⁾
	K	NPN	5	0,15	200	45	250	10	380-630	2	5	≤ 6	1 ²⁾
BCX 71	G	PNP	5	0,15	200	45	150	1	120-220	2	5	≤ 6	1 ²⁾
	H	PNP	5	0,15	200	45	150	1	180-310	2	5	≤ 6	1 ²⁾
	J	PNP	5	0,15	200	45	150	1	250-460	2	5	≤ 6	1 ²⁾
	K	PNP	5	0,15	200	45	150	1	380-630	2	5	≤ 6	1 ²⁾
BCY 58	VII	NPN	1	0,35	200	32	250	10	120-220	2	5	≤ 6	1 ²⁾
	VIII	NPN	1	0,35	200	32	250	10	180-310	2	5	≤ 6	1 ²⁾
	IX	NPN	1	0,35	200	32	250	10	250-460	2	5	≤ 6	1 ²⁾
	X	NPN	1	0,35	200	32	250	10	380-630	2	5	≤ 6	1 ²⁾
BCY 59 ○	VII	NPN	1	0,35	200	45	250	10	120-220	2	5	≤ 6	1 ²⁾
	VIII	NPN	1	0,35	200	45	250	10	180-310	2	5	≤ 6	1 ²⁾
	IX	NPN	1	0,35	200	45	250	10	250-460	2	5	≤ 6	1 ²⁾
	X	NPN	1	0,35	200	45	250	10	380-630	2	5	≤ 6	1 ²⁾
BCY 72		PNP	1	0,31	200 ⁵⁾	25	≥ 200	10	≥ 50	10	1	≤ 6	0,01-10
BCY 77	VII	PNP	1	1	100	60	200	10	120-220	2	5	≤ 6	1 ²⁾
	VIII	PNP	1	1	100	60	200	10	180-310	2	5	≤ 6	1 ²⁾
	IX	PNP	1	1	100	60	200	10	250-460	2	5	≤ 6	1 ²⁾
BCY 78	VII	PNP	1	0,31	200	32	200	10	120-220	2	5	≤ 6	1 ²⁾
	VIII	PNP	1	0,31	200	32	200	10	180-310	2	5	≤ 6	1 ²⁾
	IX	PNP	1	0,31	200	32	200	10	250-460	2	5	≤ 6	1 ²⁾
BCY 79 ○	VII	PNP	1	0,31	200	45	200	10	120-220	2	5	≤ 6	1 ²⁾
	VIII	PNP	1	0,31	200	45	200	10	180-310	2	5	≤ 6	1 ²⁾
	IX	PNP	1	0,31	200	45	200	10	250-460	2	5	≤ 6	1 ²⁾
BFX 65		PNP	1	0,32	50	45	-	-	170	0,01	5	≤ 3	1 ²⁾
BSX 45	6	NPN	2	5 ⁴⁾	1000	40	> 50	50	40-100	100	1	3,5	1 ²⁾
	10	NPN	2	5 ⁴⁾	1000	40	> 50	50	63-160	100	1	3,5	1 ²⁾
	16	NPN	2	5 ⁴⁾	1000	40	> 50	50	100-250	100	1	3,5	1 ²⁾
BSX 46	6	NPN	2	5 ⁴⁾	1000	60	> 50	50	40-100	100	1	3,5	1 ²⁾
	10	NPN	2	5 ⁴⁾	1000	60	> 50	50	63-160	100	1	3,5	1 ²⁾
	16	NPN	2	5 ⁴⁾	1000	60	> 50	50	100-250	100	1	3,5	1 ²⁾
2N 929		NPN	1	0,3 ⁶⁾	30	45	≥ 30	0,5	40-120	0,01	5	≤ 4	0,03-15
2N 930		NPN	1	0,3 ⁶⁾	30	45	≥ 30	0,5	100-300	0,01	5	≤ 3	0,03-15
2N 1711		NPN	2	0,7	800	50 ⁷⁾	≥ 70	50	70-300	5	10	≤ 8	1
2N 1893		NPN	2	0,7	-	100 ⁷⁾	≥ 50	50	40-120	150	10	-	-
2N 5447		PNP	3	0,25	200	25	≥ 100	50	60-300	50	5	-	-
2N 5448		PNP	3	0,25	200	30	≥ 100	50	30-150	50	5	-	-
2N 5449		NPN	3	0,3	800	30	≥ 100	50	100-300	100	2	-	-
2N 5450		NPN	3	0,3	800	30	≥ 100	50	50-150	100	2	-	-

Remarks: ²⁾ $\Delta f = 200$ Hz; ⁴⁾ $t_{case} \leq 45^\circ C$; ⁵⁾ I_{CM} ; ⁶⁾ $t_{amb} \leq 25^\circ C$; ⁷⁾ $U_{CER}, R_{BE} \leq 10 \Omega$

Data book reference: B 2 D; Complementary transistors see page 19

○ Can be delivered as "Qualified semiconductor device"

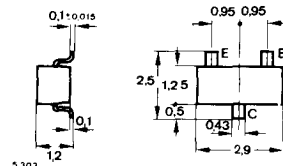
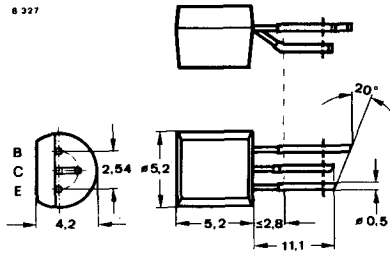
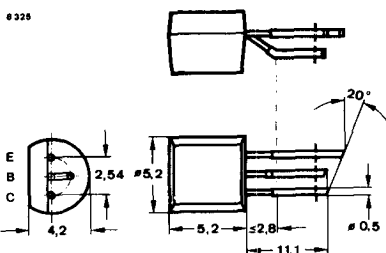


Fig. 3: 10A 3 DIN 41 868 JEDEC TO 92 Z

Fig. 4: 10A 3 DIN 41 868 JEDEC TO 92 Z

Fig. 5: 23A 3 DIN 41 869 (SOT 23)

AF-Power transistors

Type	Structure	Fig. Nr.	Maximum ratings			Characteristics							
			P_{tot} at $t_{case} = +25^{\circ}C$ W	I_C A	U_{CEO} V	f_T at I_C MHz	I_C mA	h_{FE} at I_C and U_{CE} A	U_{CE} V	U_{CEsat} at I_C and h_{FE} V	I_C A	h_{FE}	
BD 127	NPN	6	17,5 ¹⁾	0,5	250	-	-	50	1	15	-	-	-
BD 128	NPN	6	17,5 ¹⁾	0,5	300	-	-	50	1	15	-	-	-
BD 129	NPN	6	17,5 ¹⁾	0,5	350	-	-	50	1	15	-	-	-
BD 135	NPN	6	8 ²⁾	1	45	≥ 50	50	40-250	0,15	2	$\leq 0,5$	0,5	10
BD 136	PNP	6	8 ²⁾	1	45	≥ 50	50	40-250	0,15	2	$\leq 0,5$	0,5	10
BD 137	NPN	6	8 ²⁾	1	60	≥ 50	50	40-160	0,15	2	$\leq 0,5$	0,5	10
BD 138	PNP	6	8 ²⁾	1	60	≥ 50	50	40-160	0,15	2	$\leq 0,5$	0,5	10
BD 139	NPN	6	8 ²⁾	1	80	≥ 50	50	40-160	0,15	2	$\leq 0,5$	0,5	10
BD 140	PNP	6	8 ²⁾	1	80	≥ 50	50	40-160	0,15	2	$\leq 0,5$	0,5	10
BD 165	NPN	6	20	1,5	45	≥ 3	500	≥ 15	0,5	2	$\leq 0,5$	0,5	10
BD 166	PNP	6	20	1,5	45	≥ 3	500	≥ 15	0,5	2	$\leq 0,5$	0,5	10
BD 167	NPN	6	20	1,5	60	≥ 3	500	≥ 15	0,5	2	$\leq 0,5$	0,5	10
BD 168	PNP	6	20	1,5	60	≥ 3	500	≥ 15	0,5	2	$\leq 0,5$	0,5	10
BD 169	NPN	6	20	1,5	80	≥ 3	500	≥ 15	0,5	2	$\leq 0,5$	0,5	10
BD 170	PNP	6	20	1,5	80	≥ 3	500	≥ 15	0,5	2	$\leq 0,5$	0,5	10
BD 175	NPN	6	30	3	45	≥ 3	250	≥ 15	1	2	$\leq 0,8$	1	10
BD 176	PNP	6	30	3	45	≥ 3	250	≥ 15	1	2	$\leq 0,8$	1	10
BD 177	NPN	6	30	3	60	≥ 3	250	≥ 15	1	2	$\leq 0,8$	1	10
BD 178	PNP	6	30	3	60	≥ 3	250	≥ 15	1	2	$\leq 0,8$	1	10
BD 179	NPN	6	30	3	80	≥ 3	250	≥ 15	1	2	$\leq 0,8$	1	10
BD 180	PNP	6	30	3	80	≥ 3	250	≥ 15	1	2	$\leq 0,8$	1	10
BD 185	NPN	6	40	4	30	≥ 2	1000	≥ 15	2	2	≤ 1	2	10
BD 186	PNP	6	40	4	30	≥ 2	1000	≥ 15	2	2	≤ 1	2	10
BD 187	NPN	6	40	4	45	≥ 2	1000	≥ 15	2	2	≤ 1	2	10
BD 188	PNP	6	40	4	45	≥ 2	1000	≥ 15	2	2	≤ 1	2	10
BD 189	NPN	6	40	4	60	≥ 2	1000	≥ 15	2	2	≤ 1	2	10
BD 190	PNP	6	40	4	60	≥ 2	1000	≥ 15	2	2	≤ 1	2	10
BD 201	NPN	7	60	8	45	≥ 3	300	≥ 30	3	2	≤ 1	3	10
BD 202	PNP	7	60	8	45	≥ 3	300	≥ 30	3	2	≤ 1	3	10
BD 203	NPN	7	60	8	60	≥ 3	300	≥ 30	2	2	≤ 1	3	10
BD 204	PNP	7	60	8	60	≥ 3	300	≥ 30	2	2	≤ 1	3	10
BD 233	NPN	6	25	2	45	≥ 3	250	≥ 25	1	2	$\leq 0,6$	1	10
BD 234	PNP	6	25	2	45	≥ 3	250	≥ 25	1	2	$\leq 0,6$	1	10
BD 235	NPN	6	25	2	60	≥ 3	250	≥ 25	1	2	$\leq 0,6$	1	10
BD 236	PNP	6	25	2	60	≥ 3	250	≥ 25	1	2	$\leq 0,6$	1	10
BD 237	NPN	6	25	2	80	≥ 3	250	≥ 25	1	2	$\leq 0,6$	1	10
BD 238	PNP	6	25	2	80	≥ 3	250	≥ 25	1	2	$\leq 0,6$	1	10
BD 433	NPN	6	36	4	22	≥ 3	250	≥ 50	2	1	$\leq 0,5$	2	10
BD 434	PNP	6	36	4	22	≥ 3	250	≥ 50	2	1	$\leq 0,5$	2	10
BD 435	NPN	6	36	4	32	≥ 3	250	≥ 50	2	1	$\leq 0,5$	2	10
BD 436	PNP	6	36	4	32	≥ 3	250	≥ 50	2	1	$\leq 0,5$	2	10
BD 437	NPN	6	36	4	45	≥ 3	250	≥ 40	2	1	$\leq 0,6$	2	10
BD 438	PNP	6	36	4	45	≥ 3	250	≥ 40	2	1	$\leq 0,6$	2	10
BD 439	NPN	6	36	4	60	≥ 3	250	≥ 40	2	1	$\leq 0,8$	2	10
BD 440	PNP	6	36	4	60	≥ 3	250	≥ 40	2	1	$\leq 0,8$	2	10
BD 441	NPN	6	36	4	80	≥ 3	250	≥ 40	2	1	$\leq 0,8$	2	10
BD 442	PNP	6	36	4	80	≥ 3	250	≥ 40	2	1	$\leq 0,8$	2	10

Remarks: ¹⁾ $t_{case} \leq 45^{\circ}C$; ²⁾ $t_{case} \leq 70^{\circ}C$

AF-Power darlington transistors

Type	Structure	Fig. Nr.	Maximum ratings			Characteristics							
			P_{tot} at $t_{case} = +25^{\circ}C$ W	I_C A	U_{CEO} V	f_T at I_C MHz	I_C mA	h_{FE} at I_C and U_{CE} A	U_{CE} V	U_{CEsat} at I_C and h_{FE} V	I_C A	h_{FE}	
BD 643	NPN	7	62,5	8	45	7	3000	≥ 750	4	3	≤ 2	4	250
BD 644	PNP	7	62,5	8	45	7	3000	≥ 750	4	3	≤ 2	4	250
BD 645	NPN	7	62,5	8	60	7	3000	≥ 750	3	3	≤ 2	3	250
BD 646	PNP	7	62,5	8	60	7	3000	≥ 750	3	3	≤ 2	3	250
BD 647	NPN	7	62,5	8	80	7	3000	≥ 750	3	3	≤ 2	3	250
BD 648	PNP	7	62,5	8	80	7	3000	≥ 750	3	3	≤ 2	3	250
BD 649	NPN	7	62,5	8	100	7	3000	≥ 750	3	3	≤ 2	3	250
BD 650	PNP	7	62,5	8	100	7	3000	≥ 750	3	3	≤ 2	3	250
BD 675	NPN	6	40	4	45	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 676	PNP	6	40	4	45	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 677	NPN	6	40	4	60	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 678	PNP	6	40	4	60	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 679	NPN	6	40	4	80	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 680	PNP	6	40	4	80	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 681	NPN	6	40	4	100	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50
BD 682	PNP	6	40	4	100	≥ 1	1500	≥ 750	1,5	3	$\leq 2,5$	1,5	50

Power transistors for horizontal deflection output circuits

Type	Structure	Fig. Nr.	Maximum ratings			Characteristics					Notes
			P_{tot} at $t_{case} = +90^{\circ}C$ W	I_{CAV} A	U_{CESM} V	f_T at I_C MHz	I_C mA	U_{CEsat} at I_C and h_{FE} V	I_C A	h_{FE}	
BU 204	NPN	8	10,0	2,5	1300	7,5	100	≤ 5	2,0	2,0	For black and white TV receivers
BU 205	NPN	8	10,0	2,5	1500	7,5	100	≤ 5	2,0	2,0	
BU 206	NPN	8	10,0	2,5	1700	7,5	100	≤ 5	2,0	1,8	
BU 207	NPN	8	12,5	5,0	1300	7,0	100	≤ 5	4,5	2,3	For colour TV receivers
BU 208	NPN	8	12,5	5,0	1500	7,0	100	≤ 5	4,5	2,3	
BU 209	NPN	8	12,5	5,0	1700	7,0	100	≤ 5	3,0	2,3	
BU 226	NPN	8	32 ¹⁾	1,5	2000	-	-	≤ 10	1,5	1,5	For black and white TV receivers
BU 208 A	NPN	8	12,5	5,0	1500	7,0	100	≤ 1	4,5	2,3	For colour TV receivers
BU 208 D ²⁾	NPN	8	12,5	5,0	1500	7,0	100	-	-	-	

Remarks: ¹⁾ $t_{case} \geq 25^{\circ}C$, ²⁾ with integrated invers diode

Data book reference: B 2 C

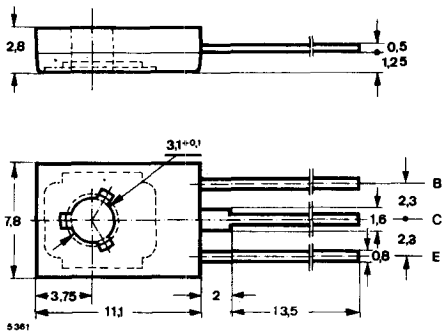


Fig. 6: 12 A 3 DIN 41869
JEDEC TO 125 (SOT 32)

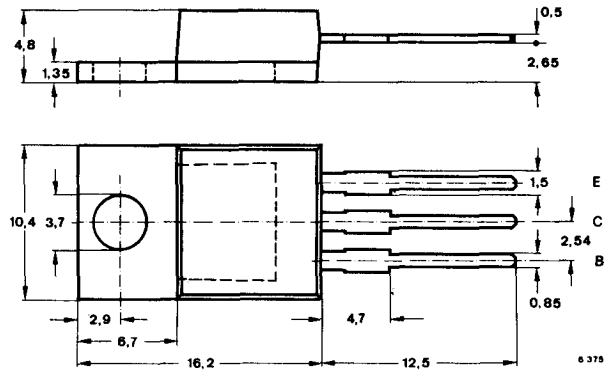


Fig. 7: 14 A 3 DIN 41869
JEDEC TO 220

Unijunction transistor

Type	Group	Fig. Nr.	Maximum ratings			Characteristics							
			P_{tot} at $t_{amb} = +45^{\circ}C$ W	U_{B2B1} V	$-U_{EB2}$ V	r_{BB} at U_{B2B1} k Ω	V	$-I_{EB20}$ at U_{EB1} nA	V	I_P at U_{B2B1} μA	V	η_i	I_V mA
BSV 57	B	15	0,24	35	35	4,7-9,1	3	≤ 20	-35	≤ 6	25	0,68-0,82	≥ 4

Data book reference: B 2 D

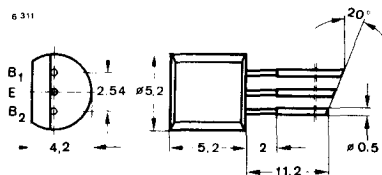


Fig. 15: 10 B 3 DIN 41868
JEDEC TO 92

Complementary transistors

BC 107 with BC 177	BC 546 with BC 556	BD 139 and BD 140 ¹⁾	BD 439 and BD 440 ¹⁾
BC 108 with BC 178	BC 547 with BC 557	BD 175 and BD 176 ¹⁾	BD 441 and BD 442 ¹⁾
BC 109 with BC 179	BC 548 with BC 558	BD 177 and BD 178 ¹⁾	BD 643 with BD 644
BC 140 and BC 160 ¹⁾	BC 635 and BC 636 ¹⁾	BD 179 and BD 180 ¹⁾	BD 645 with BD 646
BC 141 and BC 161 ¹⁾	BC 637 and BC 638 ¹⁾	BD 201 with BD 202	BD 647 with BD 648
BC 237 with BC 307	BC 639 and BC 640 ¹⁾	BD 203 with BD 204	BD 649 with BD 650
BC 238 with BC 308	BCW 60 with BCW 61	BD 233 and BD 234 ¹⁾	BD 675 with BD 676
BC 239 with BC 309	BCX 70 with BCX 71	BD 235 and BD 236 ¹⁾	BD 677 with BD 678
BC 327 and BC 337 ¹⁾	BCY 58 with BCY 78	BD 237 and BD 238 ¹⁾	BD 679 with BD 680
BC 328 with BC 338 ¹⁾	BCY 59 with BCY 79	BD 433 and BD 434 ¹⁾	BD 681 with BD 682
BC 368 and BC 369 ¹⁾	BD 135 and BD 136 ¹⁾	BD 435 and BD 436 ¹⁾	
BC 431 and BC 432 ¹⁾	BD 137 and BD 138 ¹⁾	BD 437 and BD 438 ¹⁾	

Remarks: ¹⁾ matched pairs available. Pair conditions see page 7

Switching transistors

Type	Group	Structure	Fig. Nr.	Maximum ratings			Characteristics								
				P_{tot} at $t_{amb} = +45^\circ\text{C}$ W	I_C A	U_{CEO} V	U_{CEsat} at I_C V	h_{FE} at I_C A	I_C and U_{CE} mA	U_{CE} V	t_{on} ns	t_{off} at I_C and $I_{B1}; I_{B2}$ ns	I_C mA	$I_{B1}; I_{B2}$ mA	
BC 140	6	NPN	2	0,65	1	40	0,6	1	40-95	100	1	≤ 250	≤ 850	100	5; 5
	10	NPN	2	0,65	1	40	0,6	1	67-150	100	1	≤ 250	≤ 850	100	5; 5
	16	NPN	2	0,65	1	40	0,6	1	106-236	100	1	≤ 250	≤ 850	100	5; 5
BC 141	6	NPN	2	0,65	1	60	0,6	1	40-95	100	1	≤ 250	≤ 850	100	5; 5
	10	NPN	2	0,65	1	60	0,6	1	67-150	100	1	≤ 250	≤ 850	100	5; 5
	16	NPN	2	0,65	1	60	0,6	1	106-236	100	1	≤ 250	≤ 850	100	5; 5
BCY 58	VII	NPN	1	0,35	0,2	32	≤ 0,35	0,01	120-220	2	5	≤ 150	≤ 800	10	1; 1
	VIII	NPN	1	0,35	0,2	32	≤ 0,35	0,01	180-310	2	5	≤ 150	≤ 800	10	1; 1
	IX	NPN	1	0,35	0,2	32	≤ 0,35	0,01	250-460	2	5	≤ 150	≤ 800	10	1; 1
	X	NPN	1	0,35	0,2	32	≤ 0,35	0,01	380-630	2	5	≤ 150	≤ 800	10	1; 1
BCY 59 ○	VII	NPN	1	0,35	0,2	45	≤ 0,35	0,01	120-220	2	5	≤ 150	≤ 800	10	1; 1
	VIII	NPN	1	0,35	0,2	45	≤ 0,35	0,01	180-310	2	5	≤ 150	≤ 800	10	1; 1
	IX	NPN	1	0,35	0,2	45	≤ 0,35	0,01	250-460	2	5	≤ 150	≤ 800	10	1; 1
	X	NPN	1	0,35	0,2	45	≤ 0,35	0,01	380-630	2	5	≤ 150	≤ 800	10	1; 1
BCY 72		PNP	1	0,35	0,2 ⁵⁾	25	≤ 0,5	0,05	≥ 50	10	1	≤ 65	≤ 420	10	1; 1
BCY 77	VII	PNP	1	0,35	100	60	≤ 0,25	0,01	120-220	2	5	≤ 150	≤ 800	10	1; 1
	VIII	PNP	1	0,35	100	60	≤ 0,25	0,01	180-310	2	5	≤ 150	≤ 800	10	1; 1
	IX	PNP	1	0,35	100	60	≤ 0,25	0,01	250-460	2	5	≤ 150	≤ 800	10	1; 1
BCY 78	VII	PNP	1	0,35	0,2	32	≤ 0,25	0,01	120-220	2	5	≤ 150	≤ 800	10	1; 1
	VIII	PNP	1	0,35	0,2	32	≤ 0,25	0,01	180-310	2	5	≤ 150	≤ 800	10	1; 1
	IX	PNP	1	0,35	0,2	32	≤ 0,25	0,01	250-460	2	5	≤ 150	≤ 800	10	1; 1
BCY 79 ○	VII	PNP	1	0,35	0,2	45	≤ 0,25	0,01	120-220	2	5	≤ 150	≤ 800	10	1; 1
	VIII	PNP	1	0,35	0,2	45	≤ 0,25	0,01	180-310	2	5	≤ 150	≤ 800	10	1; 1
	IX	PNP	1	0,35	0,2	45	≤ 0,25	0,01	250-460	2	5	≤ 150	≤ 800	10	1; 1
BFX 34 ○		NPN	2	0,77	5	60	≤ 1	5	40-150	2000	2	≤ 600	≤ 1200	5000	500; 500
BFY 56 A		NPN	2	0,71	1	55	≤ 0,25	0,15	40-150	150	1	≤ 225	≤ 800	150	7,5; 7,5
BSS 44		PNP	2	0,77	5	60	≤ 1	5	≥ 40	2000	2	80	450	500	50; 50
BSS 45 ○		NPN	2	0,77	5	80	≤ 1,4	5	≥ 30	2000	2	≤ 300	≤ 1000	≤ 1000	50; 50
BSS 46 ○		PNP	2	0,77	5	80	≤ 1,4	5	≥ 30	2000	2	≤ 300	≤ 1000	≤ 1000	50; 50
BSV 15	6	PNP	2	3,2 ⁴⁾	1	40	≤ 1	0,5	40-100	100	1	≤ 500	≤ 650	100	5; 5
	10	PNP	2	3,2 ⁴⁾	1	40	≤ 1	0,5	63-160	100	1	≤ 500	≤ 650	100	5; 5
	16	PNP	2	3,2 ⁴⁾	1	40	≤ 1	0,5	100-250	100	1	≤ 500	≤ 650	100	5; 5
BSV 16	6	PNP	2	3,2 ⁴⁾	1	60	≤ 1	0,5	40-100	100	1	≤ 500	≤ 650	100	5; 5
	10	PNP	2	3,2 ⁴⁾	1	60	≤ 1	0,5	63-160	100	1	≤ 500	≤ 650	100	5; 5
	16	PNP	2	3,2 ⁴⁾	1	60	≤ 1	0,5	100-250	100	1	≤ 500	≤ 650	100	5; 5
BSV 60		NPN	2	6,2 ⁴⁾	3	40	≤ 0,9	2	50-150	2000	2	≤ 500	≤ 1000	1000	50; 50
BSW 39	6	NPN	2	0,70	1	80	≤ 0,75	1	40-100	100	1	50	300	500	50; 50
	10	NPN	2	0,70	1	80	≤ 0,75	1	63-160	100	1	50	300	500	50; 50
	16	NPN	2	0,70	1	80	≤ 0,75	1	100-250	100	1	50	300	500	50; 50
BSW 40	6	PNP	2	0,70	1	80	≤ 0,75	1	40-100	100	1	50	300	500	50; 50
	10	PNP	2	0,70	1	80	≤ 0,75	1	63-160	100	1	50	300	500	50; 50
	16	PNP	2	0,70	1	80	≤ 0,75	1	100-250	100	1	50	300	500	50; 50
	25	PNP	2	0,70	1	80	≤ 0,75	1	160-400	100	1	50	300	500	50; 50
BSX 45	6	NPN	2	4,4 ⁴⁾	1	40	≤ 1	1	40-100	100	1	≤ 200	≤ 850	100	5; 5
	10	NPN	2	4,4 ⁴⁾	1	40	≤ 1	1	63-160	100	1	≤ 200	≤ 850	100	5; 5
	16	NPN	2	4,4 ⁴⁾	1	40	≤ 1	1	100-250	100	1	≤ 200	≤ 850	100	5; 5
BSX 46	6	NPN	2	4,4 ⁴⁾	1	60	≤ 1	1	40-100	100	1	≤ 200	≤ 850	100	5; 5
	10	NPN	2	4,4 ⁴⁾	1	60	≤ 1	1	63-160	100	1	≤ 200	≤ 850	100	5; 5
	16	NPN	2	4,4 ⁴⁾	1	60	≤ 1	1	100-250	100	1	≤ 200	≤ 850	100	5; 5
BSY 55		NPN	2	0,80	0,5	80	≤ 0,6	0,15	40-120	150	10	< 200	< 750	150	15; 15
BSY 56		NPN	2	0,80	0,5	80	≤ 0,6	0,15	100-300	150	10	< 200	< 750	150	15; 15
2 N 2218		NPN	2	0,70	0,8	30	≤ 1,6	0,5	40-120	150	10	25	150	150	15; 15
2 N 2218 A		NPN	2	0,70	0,8	40	≤ 1	0,5	40-120	150	10	25	150	150	15; 15
2 N 2219		NPN	2	0,70	0,8	30	≤ 1,6	0,5	100-300	150	10	25	150	150	15; 15
2 N 2219 A ○		NPN	2	0,70	0,8	40	≤ 1	0,5	100-300	150	10	25	150	150	15; 15
2 N 2221		NPN	1	0,43	0,8	30	≤ 1,6	0,5	40-120	150	10	25	150	150	15; 15
2 N 2221 A		NPN	1	0,43	0,8	40	≤ 1	0,5	40-120	150	10	25	150	150	15; 15
2 N 2222		NPN	1	0,43	0,8	30	≤ 1,6	0,5	100-300	150	10	25	150	150	15; 15
2 N 2222 A		NPN	1	0,43	0,8	40	≤ 1	0,5	100-300	150	10	25	150	150	15; 15
2 N 2904		PNP	2	0,53	0,6	40	≤ 1,6	0,5	40-120	150	10	< 45	< 100	150	15; 15
2 N 2904 A		PNP	2	0,53	0,6	60	≤ 1,6	0,5	40-120	150	10	< 45	< 100	150	15; 15
2 N 2905 ○		PNP	2	0,53	0,6	40	≤ 1,6	0,5	100-300	150	10	< 45	< 100	150	15; 15
2 N 2905 A ○		PNP	2	0,53	0,6	60	≤ 1,6	0,5	100-300	150	10	< 45	< 100	150	15; 15
2 N 2906		PNP	1	0,35	0,6	40	≤ 1,6	0,5	40-120	150	10	< 45	< 100	150	15; 15
2 N 2906 A		PNP	1	0,35	0,6	60	≤ 1,6	0,5	40-120	150	10	< 45	< 100	150	15; 15
2 N 2907 ○		PNP	1	0,35	0,6	40	≤ 1,6	0,5	100-300	150	10	< 45	< 100	150	15; 15
2 N 2907 A ○		PNP	1	0,35	0,6	60	≤ 1,6	0,5	100-300	150	10	< 45	< 100	150	15; 15

Remarks: ⁴⁾ $t_{case} = 45^\circ\text{C}$; ⁵⁾ I_{CM} ; ⁷⁾ $t_{case} \leq 25^\circ\text{C}$

Switching transistors

(Continued)

Type	Group	Structure	Fig. Nr.	Maximum ratings			Characteristics								
				P_{tot} at $t_{amb} = +45^\circ\text{C}$ W	I_C A	U_{CEO} V	U_{CEsat} at I_C V	I_C A	h_{FE} at I_C and U_{CE}	I_C mA	U_{CE} V	t_{on} ns	t_{off} ns	I_C mA	$I_{B1}; I_{B2}$ mA mA
2 N 3019		NPN	2	0,71	1	80	$\leq 0,5$	0,5	100-300	150	10	-	-	-	-
2 N 3053		NPN	2	0,89	1	40	$\leq 1,4$	0,15	50-250	150	10	-	-	-	-
2 N 3700	○	NPN	1	0,44	1	80	$\leq 0,5$	0,5	100-300	150	10	-	-	-	-
2 N 4033		NPN	2	0,71	1	80	$\leq 0,5$	0,5	100-300	100	5	< 100	< 400	500	50; 50
2 N 4036		PNP	2	0,88	1	65	$\leq 0,65$	0,15	40-140	150	10	< 110	< 700	150	15; 15

Data book reference: B 2 D ○ Can be delivered as "Qualified semiconductor device"

Power switching transistors

Type	Structure	Fig. Nr.	Maximum ratings			Characteristics							
			P_{tot} at $t_{case} = 45^\circ\text{C}$ W	I_C A	U_{CEO} V	t_f at I_C μs	I_C A	h_{FE} at I_C and U_{CE}	I_C A	U_{CE} V	U_{CEsat} at I_C V	I_C A	h_{FE}
BDY 42	NPN	8	60	5	250	≤ 1	2,5	≥ 20	1	2	$\leq 1,5$	5	3,3
BDY 43	NPN	8	60	5	300	≤ 1	2,5	≥ 20	1	2	$\leq 1,5$	5	3,3
BDY 44	NPN	8	60	5	350	≤ 1	2,5	≥ 20	1	2	$\leq 1,5$	5	3,3
BDY 45	NPN	8	95	15	250	≤ 1	5	≥ 20	2	2	$\leq 1,5$	15	3
BDY 46	NPN	8	95	15	300	≤ 1	5	≥ 20	2	2	$\leq 1,5$	15	3
BDY 47	NPN	8	95	15	350	≤ 1	5	≥ 20	2	2	$\leq 1,5$	15	3
BU 126	NPN	8	40 ¹⁾	3	300	≤ 1	2,5	≥ 15	1	5	≤ 10	2,5	10
BU 526	NPN	8	86 ¹⁾	8	400	≤ 1	4	≥ 6	4	5	≤ 5	8	2,6
BUX 30 ²⁾	NPN	8	90 ¹⁾	10	400	≤ 2	5	≥ 150	5	3	≤ 3	10	25
BUY 50	NPN	8	95	15	250 ³⁾	≤ 1	5	≥ 20	2	2	$\leq 1,5$	15	3

Remarks: ¹⁾ $t_{case} = 25^\circ\text{C}$; ²⁾ Darlington transistor; ³⁾ Avalanche energy $E_R \leq 150$ mWs, $R_{BE} = 2$ k Ω , $I_C = 5$ A

Data book reference: B 2 C

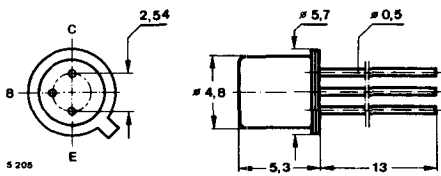


Fig. 1: 18 A 3 DIN 41 876
JEDEC TO 18

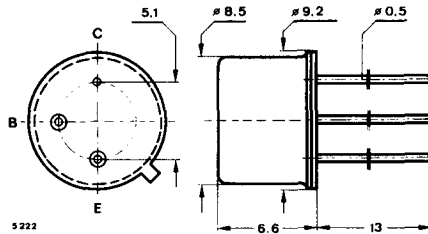


Fig. 2: 5 C 3 DIN 41 873
JEDEC TO 39

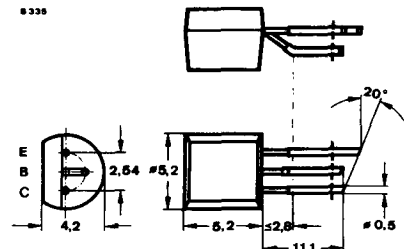


Fig. 3: 10 A 3 DIN 41 868
JEDEC TO 92; Z

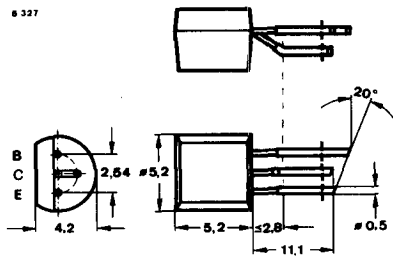


Fig. 4: 10 A 3 DIN 41 868
JEDEC TO 92 Z

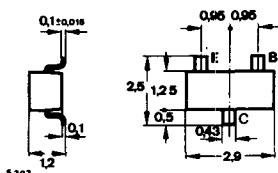


Fig. 5: 23 A 3 DIN 41 869
(SOT 23)

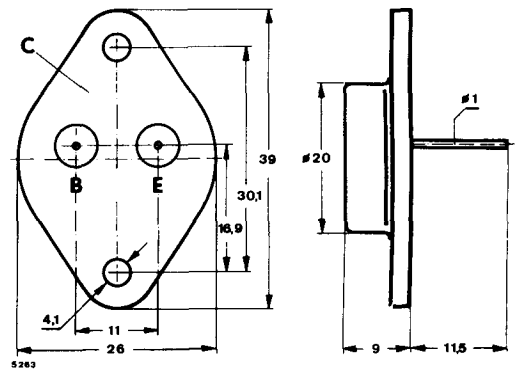


Fig. 8: 3 B 2 DIN 41 872
JEDEC TO 3

RF transistors

Single transistors

Type	Structure	Fig. Nr.	Maximum ratings			Characteristics											
			P_{tot} at $t_{amb} = +45^\circ\text{C}$ W	I_C mA	U_{CEO} V	h_{FE} at I_C and U_{CE}	f_T at I_C MHz	$C_{üre}$ at U_{CB} pF	γ_{fe} at I_C and f mS	F at f dB	F at f MHz						
BF 115	NPN	9	0,145	30	30	48-167	1	10	230	1	0,65	10	35	1	0,45	1,2	1
BF 167 ¹⁾	NPN	9	0,13	25	30	≥ 27	4	10	350	4	0,15	10	105	4	35	3	35
BF 173	NPN	9	0,2	25	25	≥ 38	7	10	550	5	0,23	10	145	7	35	-	-
BF 184 ¹⁾	NPN	9	0,145	30	20	67-220	1	10	260	1	0,65	10	35	1	10,7	3,5	1
BF 185	NPN	9	0,145	30	20	36-125	1	10	200	1	0,65	10	35	1	10,7	3,5	1
BF 198 ¹⁾	NPN	10	0,3	25	30	≥ 27	4	10	400	4	0,22	10	105	4	35	3	35
BF 199	NPN	10	0,3	25	25	≥ 38	7	10	550	5	0,32	10	175	7	35	3	-
BF 240 ¹⁾	NPN	10	0,3	25	40	67-220	1	10	430	1	0,27	10	-	-	-	1,6	100
BF 241	NPN	10	0,3	25	40	36-125	1	10	400	1	0,27	10	-	-	-	1,6	100
BF 254 ¹⁾	NPN	10	0,3	30	20	67-220	1	10	260	1	0,85	10	35	1	10,7	2 ²⁾	1
BF 255	NPN	10	0,3	30	20	36-125	1	10	200	1	0,85	10	35	1	10,7	2,5 ²⁾	1
BF 257	NPN	2 ¹⁰⁾	5 ⁶⁾	100	160	≥ 25	30	10	90	10	4,2	30	-	-	-	-	-
BF 258	NPN	2 ¹⁰⁾	5 ⁶⁾	100	250	≥ 25	30	10	90	10	4,2	30	-	-	-	-	-
BF 259	NPN	2 ¹⁰⁾	5 ⁶⁾	100	300	≥ 25	30	10	90	10	4,2	30	-	-	-	-	-
BF 310	NPN	10	0,3	25	30	≥ 29	4	10	≤ 580	1	$\leq 0,13$ ³⁾	10	≥ 80 ⁴⁾	4	36	-	-
BF 311	NPN	10	0,3	40	25	≥ 40	15	10	750	5	0,35	10	370	15	36	-	-
BF 314	NPN	3 ¹⁰⁾	0,3	25	30	≥ 29	4	10	450	1	0,1 ³⁾	10	36 ⁴⁾	1	100	3	100
BF 414	PNP	3 ¹⁰⁾	0,3	25	30	≥ 30	1	10	400	1	0,09 ³⁾	10	-	-	-	2	100
BF 422	NPN	4	0,83 ⁶⁾	20	250	≥ 50	25	20	≥ 60	10	-	-	-	-	-	-	-
BF 423	PNP	4	0,83 ³⁾	20	250	≥ 50	25	20	≥ 60	10	-	-	-	-	-	-	-
BF 440 ¹⁾	PNP	10	0,3	25	40	60-220	1	10	250	1	0,4	10	≥ 80	4	36	-	-
BF 441	PNP	10	0,3	25	40	30-125	1	10	250	1	0,4	10	≥ 80	4	36	-	-
BF 469	NPN	6 ¹¹⁾	1,8 ⁶⁾	20	250	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 470	PNP	6 ¹¹⁾	1,8 ⁶⁾	20	250	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 471	NPN	6 ¹¹⁾	2 ¹⁰⁾	30	300 ⁷⁾	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 472	PNP	6 ¹¹⁾	2 ¹⁰⁾	30	300 ⁷⁾	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 869	NPN	16/17	5 ⁵⁾	50	250	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 870	PNP	16/17	5 ⁵⁾	50	250	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 871	NPN	16/17	5 ⁵⁾	50	300 ⁷⁾	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BF 872	PNP	16/17	5 ⁵⁾	50	300 ⁷⁾	≥ 50	25	20	≥ 60	10	$\leq 1,8$	30	-	-	-	-	-
BFR 90	NPN	13	0,18 ¹²⁾	25	15	50	14	10	5000	14	0,4	10	-	-	-	2,4	500
BFR 91	NPN	13	0,18 ¹²⁾	35	12	50	30	5	5000	14	0,8	5	-	-	-	1,9	500
BFR 96	NPN	13	0,5 ¹²⁾	75	15	≥ 25	50	10	5000	14	$< 1,4$	10	-	-	-	3,8	800
BFS 17	NPN	5	0,2 ⁶⁾	25	15	20-150	2	1	1000	2	0,65	5	-	-	-	4,5	500
BFS 19	NPN	5	0,2 ⁶⁾	30	20	65-225	1	10	260	1	0,85	10	-	-	-	4	100
BFS 20	NPN	5	0,11 ⁶⁾	25	20	≥ 40	7	10	450	5	0,3	10	-	-	-	-	-
BFS 62	NPN	11	0,2	25	25	≥ 35	7	10	≥ 580	5	$\leq 0,33$	10	≥ 74	5	200	4	200
BFT 95	PNP	13	0,2 ⁶⁾	25	15	60	10	5	5000	10	0,5	10	-	-	-	2	1000
BFT 95 A	PNP	13	0,2 ¹²⁾	25	15	60	10	5	3600	15	0,5	10	-	-	-	2,5	1000
BFT 96	PNP	13	0,5 ¹²⁾	75	15	80	50	5	5000	50	-	-	-	-	-	4	1000
BFT 96 A	PNP	13	0,5	75	15	80	50	5	3600	50	-	-	-	-	-	4,5	1000
BFW 92	NPN	13	0,13 ⁹⁾	25	15	≥ 20	25	1	1600	25	0,6	5	-	-	-	4	500
BFX 89	NPN	11	0,175	25	15	≥ 20	2	1	≥ 800	4	-	-	-	-	-	$\leq 6,5$	500
BFY 88 ○	NPN	9	0,175	25	25	≥ 40	5	1	850	5	0,2	10	≥ 160	7	36	3,5	200
BFY 90 ○	NPN	11	0,2 ⁶⁾	25	15	≥ 25	2	1	≥ 1300	20	0,6	5	45	2	500	≤ 5	500
2 N 918	NPN	11	0,2 ⁶⁾	-	15	≥ 20	3	1	≥ 600	4	-	-	-	-	-	≤ 6	60
2 N 1613	NPN	2 ¹⁰⁾	0,7	800	50 ⁷⁾	≥ 20	0,1	10	≥ 60	50	-	-	-	-	-	≤ 12	10 ⁻³⁾

Remarks: ¹⁾ controlled; ²⁾ F_c ; ³⁾ $C_{ürb}$; ⁴⁾ γ_{fb} ; ⁵⁾ $t_{case} \leq 25^\circ\text{C}$; ⁶⁾ $t_{amb} \leq 25^\circ\text{C}$; ⁷⁾ $U_{CER}, R_{BE} \leq 10 \Omega$; ⁸⁾ $t_{case} \leq 110^\circ\text{C}$; ⁹⁾ $t_{amb} \leq 73^\circ\text{C}$; ¹⁰⁾ see page 21; ¹¹⁾ see page 19; ¹²⁾ $t_{amb} \leq 60^\circ\text{C}$

Data book reference: B 2 D ○ Can be delivered as "Qualified semiconductor device"

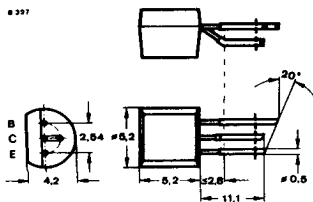


Fig. 4: 10 A 3 DIN 41868
JEDEC TO 92 Z

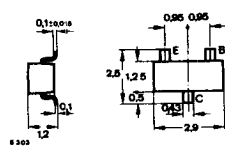


Fig. 5: 23 A 3 DIN 41869
(SOT 23)

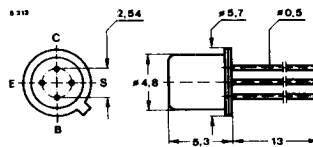


Fig. 9: 18 A 4 DIN 41876
JEDEC TO 72

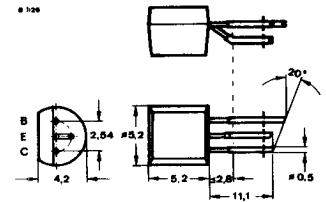


Fig. 10: 10 A 3 DIN 41868
JEDEC TO 92 Z

Optoelectronic devices

Red light emitting diodes

Type	Case	Fig. Nr.	Characteristics				Spectral curve see page 27
			α	I_V and mcd	U_F at	I_F mA	
CQY 40 L	∅ 5 mm plastic dull red	1	60°	1,6	1,6	20	4
V 168 P	∅ 5 mm plastic dull red	1	60°	3,0	1,6	20	4
CQX 35 A	∅ 5 mm plastic clear white	1	25°	5,0	1,6	20	4
CQX 35 B	∅ 5 mm plastic clear white	1	25°	8,0	1,6	20	4
CQX 25 N	∅ 3 mm plastic clear white	2	25°	2,6	1,6	20	4
CQY 85 N A	∅ 3 mm plastic dull red	2	60°	1,6	1,6	20	4
CQY 85 N B	∅ 3 mm plastic dull red	2	60°	3,0	1,6	20	4
CQY 41 N	∅ 1,8 mm plastic dull red	3	40°	1,6	1,6	20	4
CQX 10 ¹⁾	2,54 x 5,08 mm plastic dull red	4	50°	1,6	1,6	20	4

Remarks: ¹⁾ Center to center spacing

Data book reference: S 8 A

Orangered light emitting diodes

Type	Case	Fig. Nr.	Characteristics				Spectral curve see page 27
			α	I_V and mcd	U_F at	I_F mA	
CQX 38 A	∅ 5 mm plastic dull light red	1	60°	6,0	2,2	20	9
CQX 38 B	∅ 5 mm plastic dull light red	1	60°	12	2,2	20	9
CQX 39 A	∅ 5 mm plastic clear white	1	25°	15	2,2	20	9
CQX 39 B	∅ 5 mm plastic clear white	1	25°	40	2,2	20	9
CQX 41 N A	∅ 3 mm plastic dull light red	2	60°	6,0	2,2	20	9
CQX 41 N B	∅ 3 mm plastic dull light red	2	60°	12,0	2,2	20	9
CQX 42 N A	∅ 3 mm plastic clear white	2	25°	7,0	2,2	20	9
CQX 42 N B	∅ 3 mm plastic clear white	2	25°	15,0	2,2	20	9
CQX 43 N	∅ 1,8 mm plastic dull light red	3	40°	5,0	2,2	20	9
CQX 40 ¹⁾	2,54 x 5,08 mm plastic dull light red	4	50°	5,0	2,2	20	9

Remarks: ¹⁾ Center to center spacing

Data book reference: S 8 A

Green light emitting diodes

Type	Case	Fig. Nr.	Characteristics				Spectral curve see page 27
			α	I_V and mcd	U_F at	I_F mA	
CQY 72 L	∅ 5 mm plastic dull green	1	60°	2,0	2,7	20	7
V 169 P	∅ 5 mm plastic dull green	1	60°	4,0	2,7	20	7
CQX 36 A	∅ 5 mm plastic clear white	1	25°	5,0	2,7	20	7
CQX 36 B	∅ 5 mm plastic clear white	1	25°	15	2,7	20	7
CQX 96 A	∅ 5 mm plastic clear white	1	24°	40	2,7	20	7
CQX 96 B	∅ 5 mm plastic clear white	1	24°	70	2,7	20	7
CQX 97 A	∅ 5 mm plastic clear white	1	160°	4,0	2,7	20	7
CQX 97 B	∅ 5 mm plastic clear white	1	160°	7,0	2,7	20	7
CQX 26 N	∅ 3 mm plastic clear white	2	25°	4,0	2,7	20	7
CQY 86 N A	∅ 3 mm plastic dull green	2	60°	2,0	2,7	20	7
CQY 86 N B	∅ 3 mm plastic dull green	2	60°	4,0	2,7	20	7
CQY 73 N	∅ 1,8 mm plastic dull green	3	40°	2,0	2,7	20	7
CQX 11 ¹⁾	2,54 x 5,08 mm plastic dull green	4	50°	2,6	2,7	20	7

Remarks: ¹⁾ Center to center spacing

Data book reference: S 8 A

Optoelectronic devices

Yellow light emitting diodes

Type	Case	Fig. Nr.	Characteristics				Spectral curve see page 27
			α	I_V and mcd	U_F at I_F	I_F mA	
CQY 74 L	∅ 5 mm plastic dull yellow	1	60°	3,0	2,7	20	8
V 170 P	∅ 5 mm plastic dull yellow	1	60°	5,0	2,7	20	8
CQX 37 A	∅ 5 mm plastic clear white	2	25°	5,0	2,7	20	8
CQX 37 B	∅ 5 mm plastic clear white	2	25°	30	2,7	20	8
CQX 27 N	∅ 3 mm plastic clear white	2	25°	5,0	2,7	20	8
CQY 87 N A	∅ 3 mm plastic dull yellow	2	60°	3,0	2,7	20	8
CQY 87 N B	∅ 3 mm plastic dull yellow	2	60°	5,0	2,7	20	8
CQY 75 N	∅ 1,8 mm plastic dull yellow	3	40°	3,0	2,7	20	8
CQX 12 ¹⁾	2,54 x 5,08 mm plastic dull yellow	4	50°	4,2	2,7	20	8

Remarks: ¹⁾ Center to center spacing

Data book reference: S 8 A

Orange-red and green light emitting diode

Type	Case	Luminous colour	Fig. Nr.	Characteristics				Spectral curve (see page 27)
				α	I_V and mcd	U_F at I_F	I_F mA	
CQX 95	∅ 5 mm Plastic dull/white	orange-red	5	60°	6,0	2,2	20	9
		green	5	60°	6,0	2,4	20	7

Data book reference: S 8 A

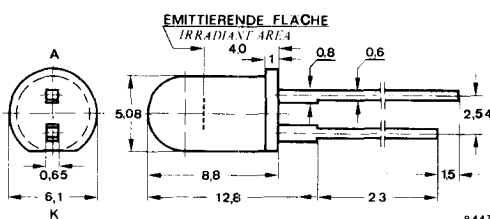


Fig. 1: Plastic case ∅ 5

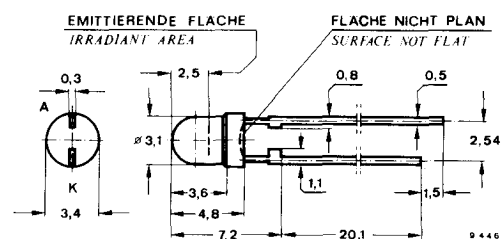


Fig. 2: Plastic case ∅ 3

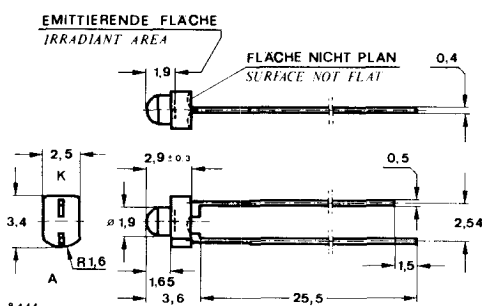


Fig. 3: Plastic case ∅ 1,8

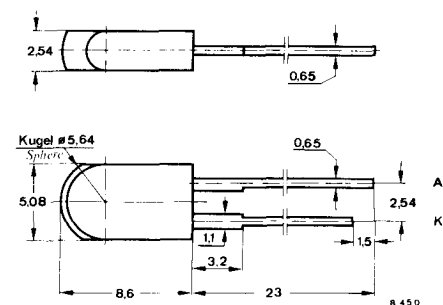


Fig. 4: Plastic case 2.5 x 5.08

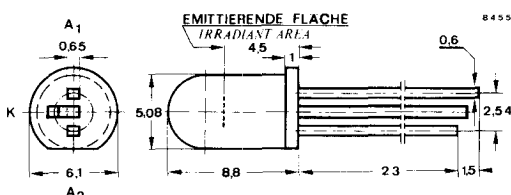


Fig. 5: Plastic case ∅ 5

Optoelectronic devices

Light emitting diodes in hermetically sealed case

Type	Case	Fig. Nr.	Luminous colour	Characteristics				Spectral curve see page 27
				α	I_V and mcd	U_F at I_F	I_F mA	
CQX 28	≈ JEDEC TO 52 dull white	6	red	50°	2,0	1,6	20	4
CQX 29	≈ JEDEC TO 52 dull white	6	green	50°	2,6	2,7	20	7
CQX 30	≈ JEDEC TO 52 dull white	6	yellow	50°	4,2	2,7	20	8
CQX 31 ¹⁾	≈ JEDEC TO 52 dull white	7	red	50°	2,0	1,6	20	4
			green		2,6	2,7		7
CQX 32 ¹⁾	≈ JEDEC TO 52 dull white	7	red	50°	2,0	1,6	20	4
			yellow		4,2	2,7		8

Remarks: ¹⁾ bi colour

Light emitting diode displays

Type	Version	Character height mm	Fig. Nr.	I_V and U_F at $I_F = 20$ mA mcd V	Luminous colour	Spectral curve see page 27	
CQX 86 A	7-Segment 1½-digit with + and - sign	13	8	0,7 1,65	red	4	
CQX 86 K		13	8	1,5 2,7	orangered	9	
CQX 88 A		13	8	0,7 2,7	green	7	
CQX 88 K		13	8	1,0 2,7	yellow	8	
CQX 90 A		7-Segment 2-digit	13	9	0,7 1,65	red	4
CQX 90 K			13	9	1,5 2,7	orangered	9
CQX 92 A			13	9	0,7 2,7	green	7
CQX 92 K	13		9	1,0 2,7	yellow	8	
CQX 87 A	7-Segment 2-digit		13	9	0,7 1,65	red	4
CQX 87 K			13	9	1,5 2,7	orangered	9
CQX 89 A		13	9	0,7 2,7	green	7	
CQX 89 K		13	9	1,0 2,7	yellow	8	
CQX 91 A		7-Segment 2-digit	13	9	0,7 1,65	red	4
CQX 91 K			13	9	1,5 2,7	orangered	9
CQX 93 A	7-Segment 2-digit	13	9	0,7 2,7	green	7	
CQX 93 K		13	9	1,0 2,7	yellow	8	

Data book reference: S 8 A

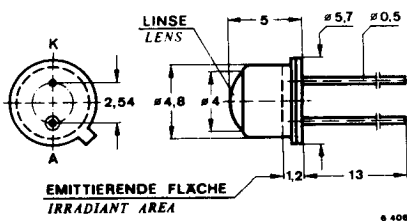


Fig. 6: ≈ 18 A 2 DIN 41 876
≈ JEDEC TO 52

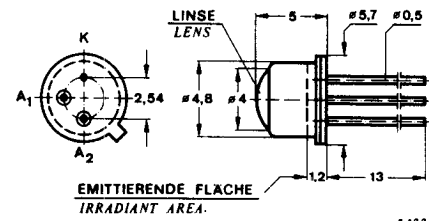
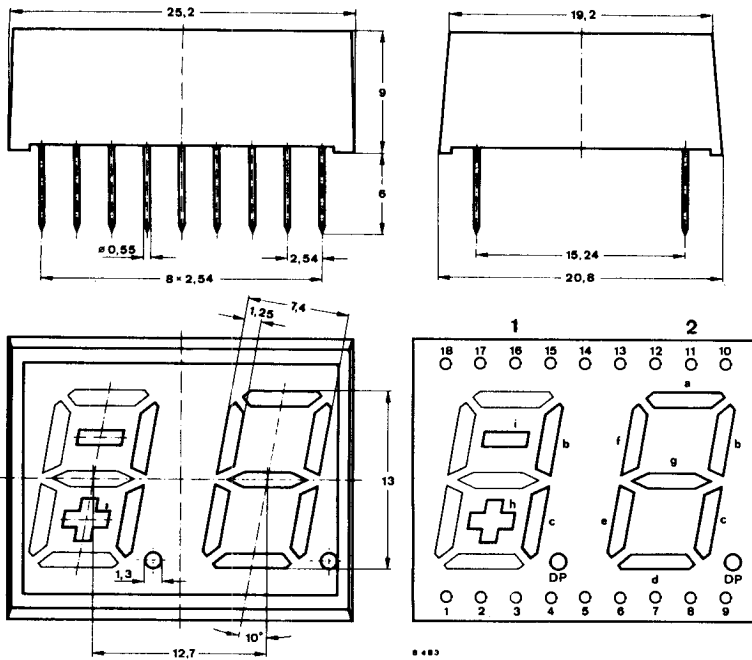


Fig. 7: ≈ 18 A 3 DIN 41 876
≈ JEDEC TO 52

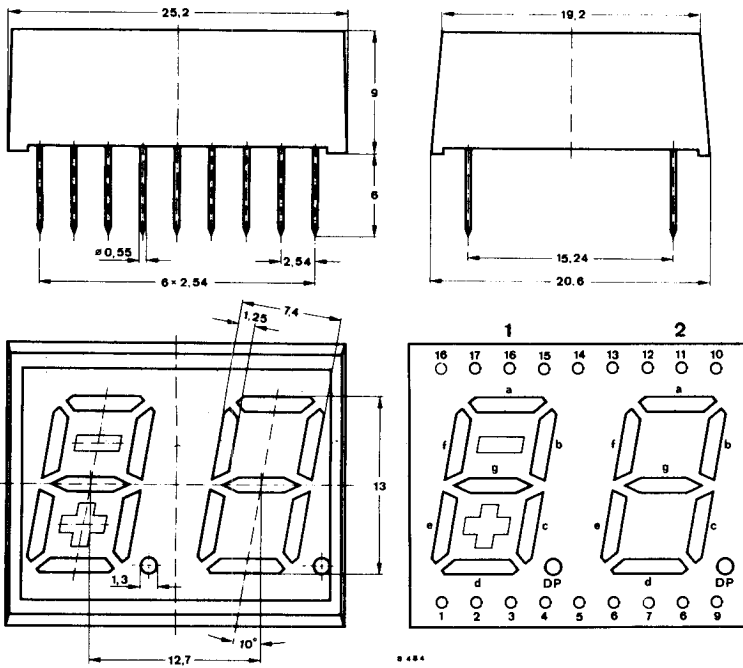
Optoelectronic devices



Pin connections
CQX 86, CQX 88
CQX 90, CQX 92

Pin	Segment	Digit
1	i	1
2	h	1
3	c	1
4	DP	1
5	e	2
6	d	2
7	g	2
8	c	2
9	DP	2
10	b	2
11	a	2
12	f	2
13	Anode/Cathode	2
14	Anode/Cathode	1
15	b	1

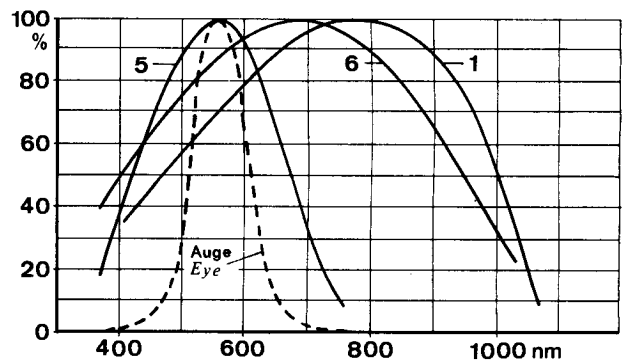
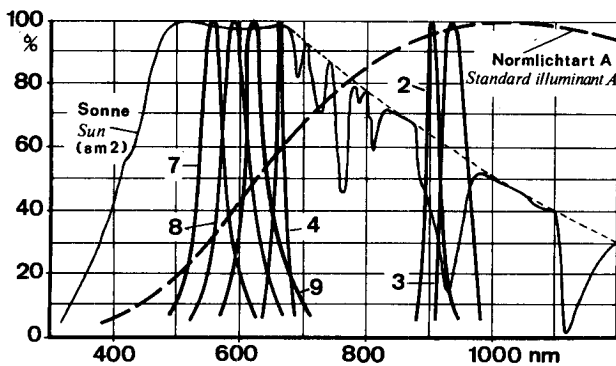
Fig. 8: Special case



Pin connections
CQX 87, CQX 89
CQX 91, CQX 93

Pin	Segment	Digit
1	e	1
2	d	1
3	c	1
4	DP	1
5	e	2
6	d	2
7	g	2
8	c	2
9	DP	2
10	b	2
11	a	2
12	f	2
13	Anode/Cathode	2
14	Anode/Cathode	1
15	b	1
16	a	1
17	g	1
18	f	1

Fig. 9: Special case



Optoelectronic devices

GaAs diodes (infrared)

Type	Group	Fig. Nr.	Characteristics						Spectral curve (see page 27)
			α	Φ_e and mW	I_e at mW/sr	I_F mA	t_r at $I_F = 1$ A ns	t_f ns	
CQX 18	A	12	150°	0,7 ... 1,4	-	20	1000	1000	≈ 3
	B	12	150°	> 1,1	-	20	1000	1000	≈ 3
CQX 19		13	40°	20	40	250	700	830	≈ 3
CQY 31		14	80°	1	0,25	100	100	100	2
CQY 32		15	10°	1	4,5	100	100	100	2
CQY 33 N	A	14	80°	2 ... 4	1,2	100	500	600	≈ 3
	B	14	80°	3 ... 6	1,2	100	500	600	≈ 3
	C	14	80°	> 5	1,2	100	500	600	≈ 3
CQY 34 N	A	16	25°	2 ... 4	13	100	500	600	≈ 3
	B	16	25°	3 ... 6	13	100	500	600	≈ 3
	C	16	25°	> 5	13	100	500	600	≈ 3
CQY 35 N	A	15	10°	2 ... 4	20	100	500	600	≈ 3
	B	15	10°	3 ... 6	20	100	500	600	≈ 3
	C	15	10°	> 5	20	100	500	600	≈ 3
CQY 36		18a	80°	2	0,4	50	500	600	≈ 3
CQY 36 N		18	80°	2	0,4	50	500	600	≈ 3
CQY 37		19a	25°	2	2,2	50	500	600	≈ 3
CQY 37 N		19	25°	2	2,2	50	500	600	≈ 3
CQX 46		20	50°	15	10	100	400	450	3
CQY 98		21	40°	15	20	100	400	450	3
CQY 99		22	60°	15	20	100	1000	1000	3
V 194 P	A	17	120°	4 ... 8	1,6	100	500	600	≈ 3
	B	17	120°	6 ... 12	1,6	100	500	600	≈ 3
	C	17	120°	> 10	1,6	100	500	600	≈ 3

Data book reference: S 8 A

GaAlAs CW Laserdiode

Type	Fig. Nr.	α_2	α_1	Fig. Nr.	Φ_e at I_F		I_e at kW/cm ² sr	Φ_e mW	$I(TO)$ mA	λ_p nm	$\Delta\lambda$ nm	t_r at Φ_e	
					mW	mA						ns	mW
CQX 20	11	50°	10°	10	> 5	< 300	> 200	5	200	820	2,5	1	≥ 2

Data book reference: S 8 A

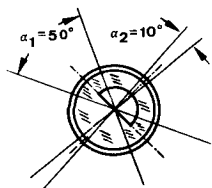


Fig. 10: Top view: The drawn angles α_1 and α_2 are the projections of the angles of half intensity into the plane of the emitting area.

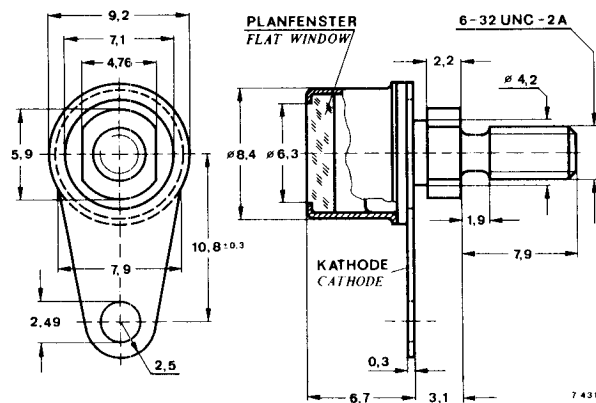


Fig. 11: Special case

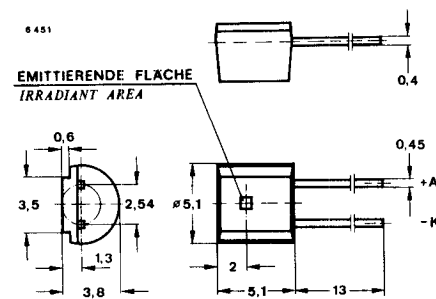


Fig. 12: Plastic case
≈ 10 B 3 DIN 41 868
≈ JEDEC TO 92

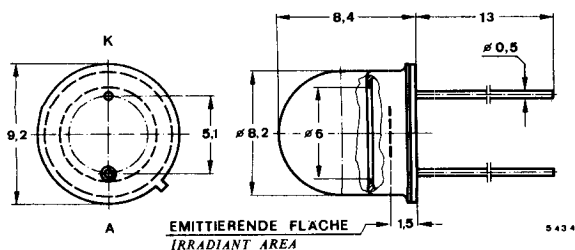


Fig. 13: Metal base with clear plastic lens covering

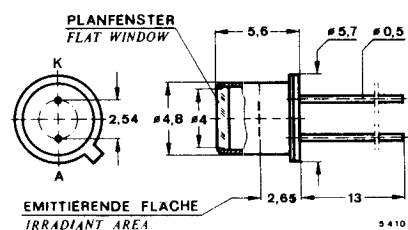


Fig. 14: ≈ 18 C 2 DIN 41 876
≈ JEDEC TO 18

Optoelectronic devices

Photo switches

Type	Fig. Nr.	Application	Characteristics			Spectral curve see page 27
			α	I_{ca} mA	E_A at klx	
BPX 99	23	Darlington	25°	30	0,1	1

Data book reference: S 8 A

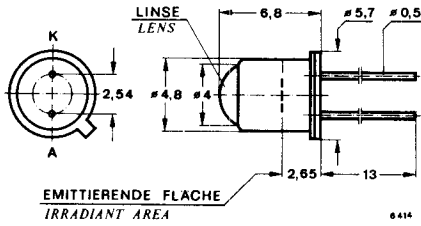


Fig. 15: 18 C 2 DIN 41 876
≈ JEDEC TO 18

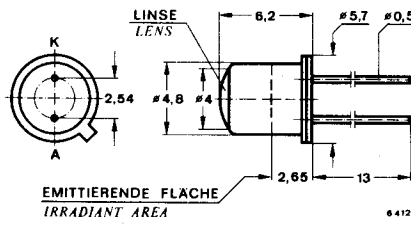


Fig. 16: 18 C 2 DIN 41 876
≈ JEDEC TO 18

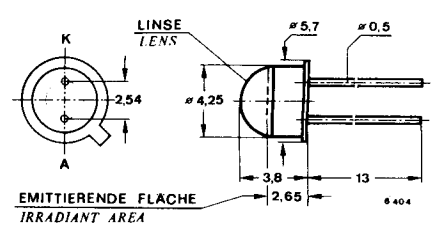


Fig. 17: 18 C 2 DIN 41 876
≈ JEDEC TO 18

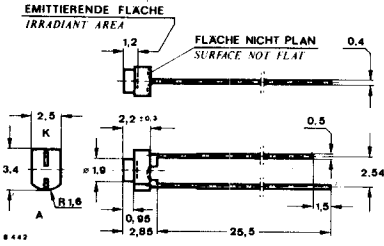


Fig. 18: Plastic case \varnothing 1,8

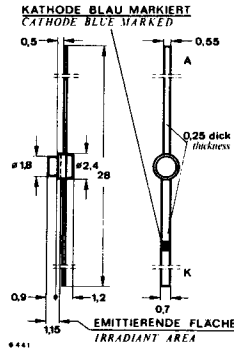


Fig. 18a: Plastic case \varnothing 1,8

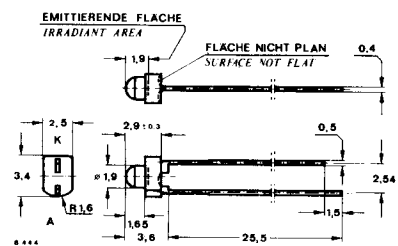


Fig. 19: Plastic case \varnothing 1,8

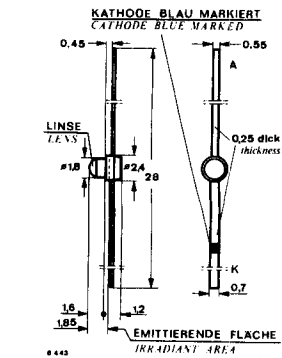


Fig. 19a: Plastic case \varnothing 1,8

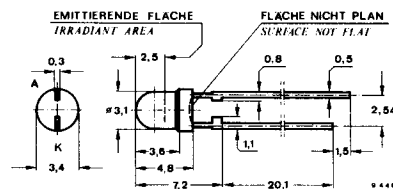


Fig. 20: Plastic case \varnothing 3

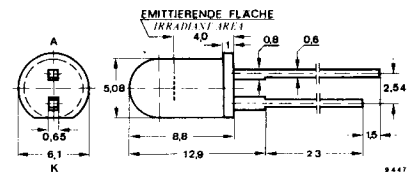


Fig. 21: Plastic case \varnothing 5

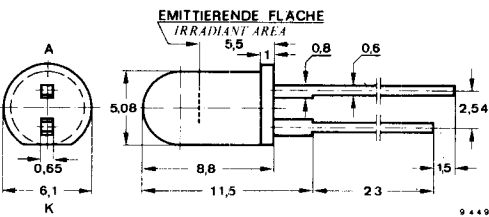


Fig. 22: Plastic case \varnothing 1,8

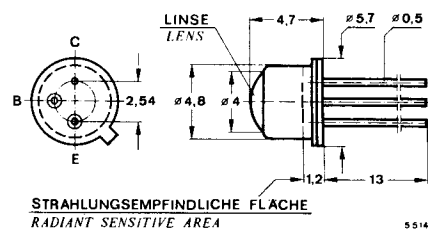


Fig. 23: 18 A 3 DIN 41 876
JEDEC TO 18

Optoelectronic devices

Photo transistors

Type	Group	Fig. Nr.	Maximum ratings		Characteristics				Spectral curve (see page 27)
			P_{tot} at $t_{amb} = +25^\circ\text{C}$ W	U_{CEO} V	α	$I_{ca}^{1)}$ mA	$t_r^{2)}$ at $U_S = 5\text{ V}, R_L = 100\ \Omega$ μs	$t_f^{3)}$ μs	
BPW 13	A	24	0,375	32	80°	0,2 ... 0,4	1,6	1,7	1
	B	24	0,375	32	80°	0,3 ... 0,6	1,6	1,7	1
	C	24	0,375	32	80°	> 0,5	1,6	1,7	1
BPW 14	A	25	0,375	32	25°	2 ... 4	1,6	1,7	1
	B	25	0,375	32	25°	3 ... 6	1,6	1,7	1
	C	25	0,375	32	25°	> 5,0	1,6	1,7	1
BPW 16		27a	0,05	32	80°	0,4	1,6	1,7	1
BPW 16 N		27	0,05	32	80°	0,4	1,6	1,7	1
BPW 17		28a	0,05	32	25°	3,0	1,6	1,7	1
BPW 17 N		28	0,05	32	25°	3,0	1,6	1,7	1
BPW 39	A	26	0,15	32	130°	0,5 ... 1,6	1,6	1,7	1
	B	26	0,15	32	130°	> 1,3	1,6	1,7	1
BPW 40		29	0,1	32	40°	> 3	1,6	1,7	1
BPW 42		30	0,1	32	80°	3	-	-	≈ 1

Remarks: ¹⁾ $E_A = 1\text{ klx}$; ²⁾ $I_C = 1\text{ mA}$, GaAs diode as emitter; ³⁾ $E_A = 100\text{ lx}$

Data book reference: S 8 A

Photo voltaic cells (Solar cells)

Type	Fig. Nr.	A mm ²	Characteristics				Spectral curve (see page 27)	
			α	U_0 and I_k at $E_A = 1\text{ klx}$ mV	I_k mA	t_r at $U_S = 5\text{ V}, R_L = 100\ \Omega$ μs		t_f μs
BPW 35	34	94	120°	380	0,3	-	-	≈ 6
BPY 70	34a	360	120°	400	3,0	14	7	≈ 1

Data book reference: S 8 A

Photo diodes and photo voltaic cells

Type	Fig. Nr.	A mm ²	Characteristics				Spectral curve (see page 27)			
			α	U_0 and I_k at $E_A = 1\text{ klx}$ mV	I_k μA	I_{ra} at U_R at $E_A = 1\text{ klx}$ μA		V	t_r at $I_{ph} = 100\ \mu\text{A}, R_L = 1\text{ k}\Omega$ μs	t_f μs
BPW 20	31	7,5	100°	430	33	33	5	3,5	3,5	6
BPW 21	31	7,5	100°	380	7	7	5	3,5	3,5	5
BPW 24 ¹⁾	32	0,64	40°	380	35	45	20	²⁾	²⁾	≈ 1
BPW 34 ¹⁾	36	7,5	120°	400	80	85	5	-	-	≈ 1
BPW 41 ¹⁾	35	7,5	130°	320	70	75	5	0,05 ³⁾	0,05 ⁴⁾	≈ 1
BPW 43 ¹⁾	37	0,25	50°	400	12	15	5	4	4	≈ 1

Remarks: ¹⁾ Photo PIN diode; ²⁾ Response time $\tau = 2\text{ ns}$ at HeNe-Laser, $\lambda = 630\text{ nm}$; ³⁾ t_{on} ; ⁴⁾ t_{off}

Data book reference: S 8 A ○ Can be delivered as "Qualified semiconductor device"

Photo avalanche diode

Type	Fig. Nr.	ϕ mm ²	α	P_V mW	$U(BR)$ V	%	G_B GHz	I_{ro} nA	$\lambda_{0,5}$ nm
BPW 28	33	0,2	70°	100	170	≥ 20	≥ 200	1	450...950

Data book reference: S 8 A

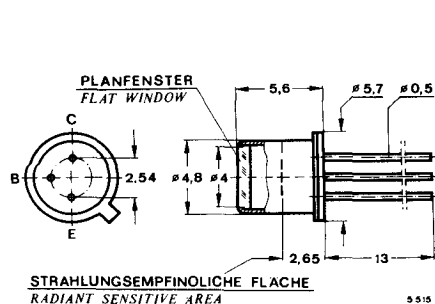


Fig. 24: 18 A 3 DIN 41 876
JEDEC TO 18

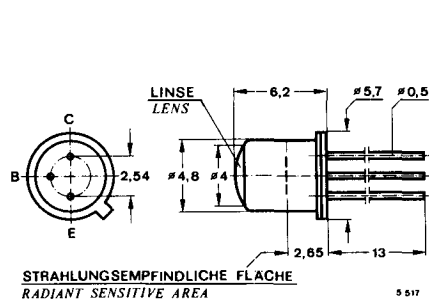


Fig. 25: 18 C 3 DIN 41 876
≈ JEDEC TO 18

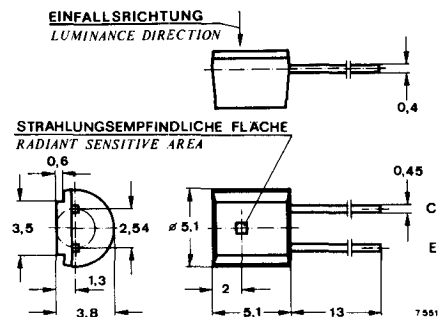


Fig. 26: Plastic case
≈ 10 B 3 DIN 41 868
≈ JEDEC TO 92

Optoelectronic devices

Coupling devices

Type	Fig. Nr.	Maximum ratings						Characteristics				
		Emitter		Receiver			U_{is} V	k	at I_F mA	t_r at $I_F = 10$ mA μs	t_f μs	
I_F mA	$P_V^{1)}$ mW	I_C mA	U_{CEO} V	$P_V^{1)}$ mW								
CNY 18	38	60	100	150	32	150	500	> 0,25	10	1,6	1,7	
CNY 21	39	50	120	50	32	130	10.000	0,5	10	1,6	1,7	
CNY 24	40	50	120	50	32	130	10.000	1,0	30	1,6	1,7	
CNY 36 ²⁾	42	60	100	100	32	150	-	0,04	20	2,5	3,3	
CNY 37 ²⁾	43	60	100	100	32	150	-	0,04	20	2,5	3,3	
CQY 80	41	60	100	50	32	150	4400	0,6	10	1,6	1,7	

Remarks: ¹⁾ $t_{amb} = 25^\circ C$; ²⁾ Interrupter modules

Data book reference: S 8 A ○ Can be delivered as "Qualified semiconductor device"

Photo-threshold switch (see also Integrated circuits)

Type	Case	Fig. Nr.	Maximum ratings		Characteristics			
			P_{tot} mW	I_C mA	λ_p nm	$E_A(TO)$ lx	t_r ns	t_f ns
U 102 P	MO 002	44	400	70	660	5	100	100

Photo pulse amplifier (see also Integrated circuits)

Type	Case	Fig. Nr.	Maximum ratings		Characteristics			
			P_{tot} mW	I_Q mA	λ_p nm	$\lambda_{0,5}$ nm	A_{uo} dB	U_q/U_{nq} dB
U 123 P	DIP 6-lead	45	210	10	840	620 ... 970	94	15

Data book reference: S 8 A

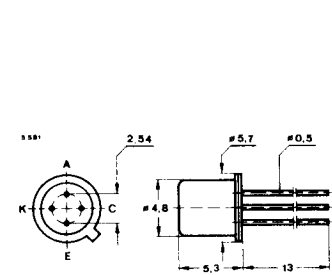


Fig. 38: 18 A 4 DIN 41 876
JEDEC TO 72

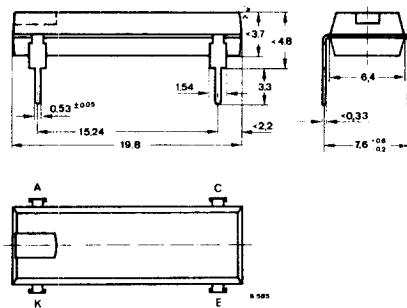


Fig. 39: \approx 20 A 14 DIN 41 866
 \approx JEDEC TO 116

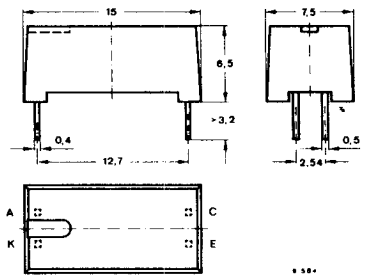


Fig. 40: Plastic case

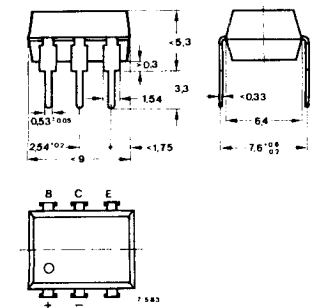


Fig. 41: DIP 6-lead

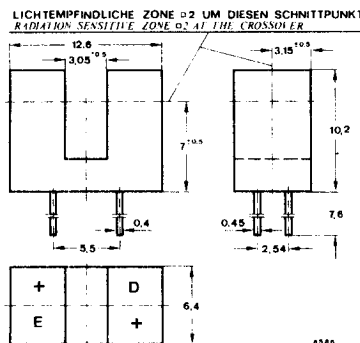


Fig. 42: Plastic case

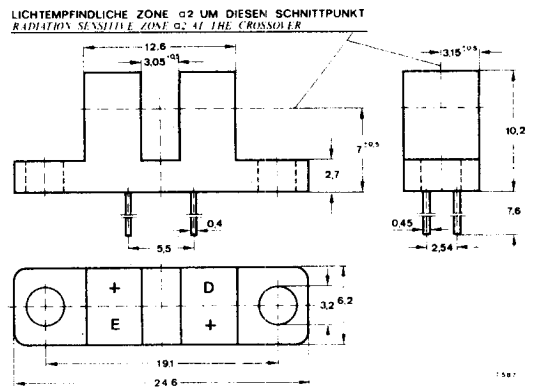


Fig. 43: Plastic case

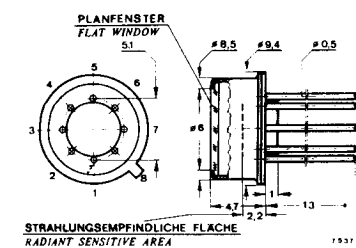


Fig. 44: 5 G 8 DIN 41 873
JEDEC MO 002 AG

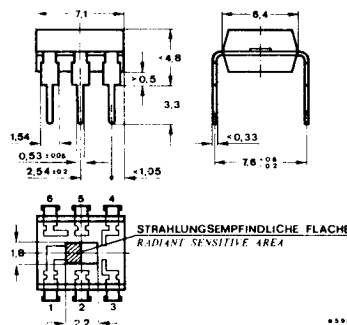


Fig. 45: Plastic case

Integrated circuits for AF applications

TBA 800

Audio power amplifier, especially for TV-receivers

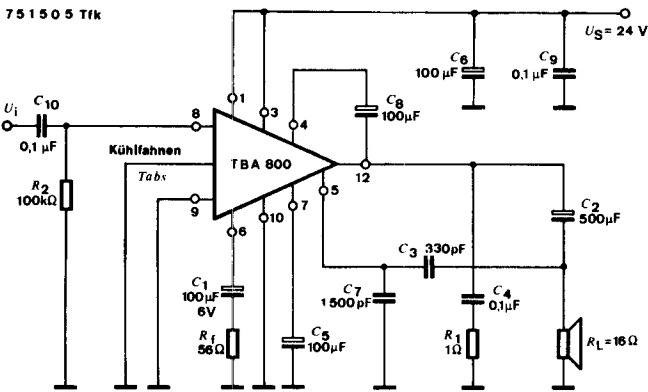
Supply voltage	Pin 1, Pin 3	U_S	5...30	V
Output power $U_S = 24 \text{ V}$, $R_L = 16 \Omega$, $f = 1 \text{ kHz}$, $k = 10\%$		P_q	(> 4.4) 5	W
Input voltage $U_S = 24 \text{ V}$, $P_q = 5 \text{ W}$, $f = 1 \text{ kHz}$, $R_L = 16 \Omega$, $R_f = 56 \Omega$	Pin 8	U_i	80	mV
Voltage amplification with closed loop $U_S = 24 \text{ V}$, $R_L = 16 \Omega$, $f = 1 \text{ kHz}$, $R_f = 56 \Omega$		A_{uof}	42 (< 45)	dB
Input noise voltage $U_S = 24 \text{ V}$, $B = 40...20\,000 \text{ Hz}$, $R_f = 56 \Omega$	Pin 8	U_{ni}	5	μV

Features:

- High output current, up to 1.5 A
- Wide range of supply voltage
- High output power without heat sink 2,5 W with heat sink 5,0 W
- Very high efficiency 70%

Case:

QIP special
Dimensions see page 60
Number 1



TBA 810 S · TBA 810 AS

Audio power amplifier

Supply voltage	Pin 1	U_S	4...20	V
Output power $R_L = 4 \Omega$, $f = 1 \text{ kHz}$, $k = 10\%$	$U_S = 16 \text{ V}$ $U_S = 6 \text{ V}$	P_q P_q	7 1	W W
Input voltage $U_S = 14,4 \text{ V}$, $P_q = 6 \text{ W}$, $f = 1 \text{ kHz}$, $R_L = 4 \Omega$	Pin 8 $R_f = 56 \Omega$ $R_f = 22 \Omega$	U_i U_i	80 35	mV mV
Voltage amplification with closed loop $U_S = 14,4 \text{ V}$, $R_L = 4 \Omega$, $f = 1 \text{ kHz}$, $R_f = 56 \Omega$		A_{uof}	37 (< 40)	dB
Input noise voltage $U_S = 14,4 \text{ V}$, $B = 20...20\,000 \text{ Hz}$	Pin 8	U_{ni}	2	μV

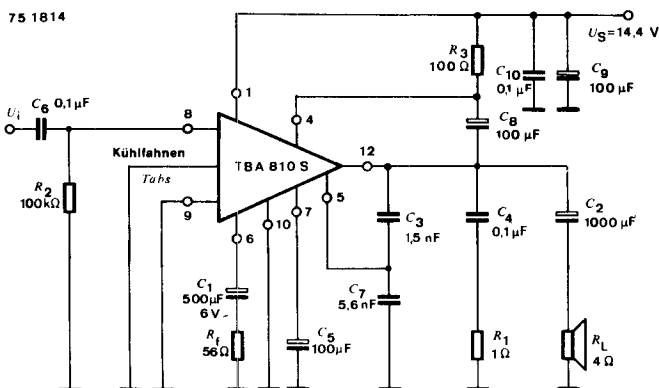
Features:

- High output current, up to 2 A
- High output power 7 W
- Low harmonic distortion

Case:

TBA 810 S: QIP special
Dimensions see page 60
Number 1

TBA 810 AS: QIP special
Dimensions see page 60
Number 2



Integrated circuits for AF applications

TBA 810 T · TBA 810 AT

Audio power amplifier

Supply voltage range	Pin 1	U_S	4 ... 25	V
Output power				
$R_L = 4 \Omega$, $f = 1 \text{ kHz}$, $k = 10 \%$				
$U_S = 20 \text{ V}$		P_q	10	W
$U_S = 14,4 \text{ V}$		P_q	6	W
$U_S = 6 \text{ V}$		P_p	1	W
Band width (-3)				
$U_S = 14,4 \text{ V}$, $R_L = 4 \Omega$, $C_3 = 420 \text{ pF}$		B	40 ... 20000	Hz
Distortion				
$U_S = 14,4 \text{ V}$, $R_L = 4 \Omega$, $P_q = 0,05 \dots 3 \text{ W}$		k	0,3	%

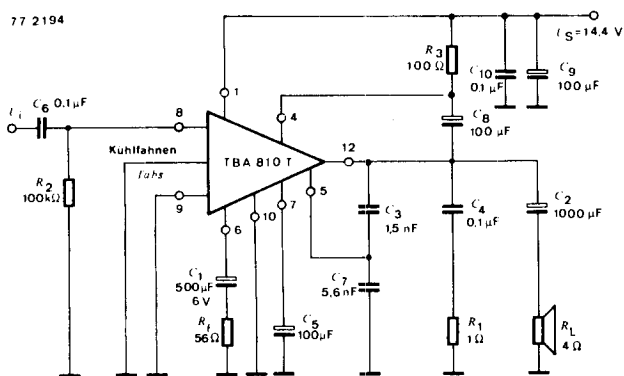
Features:

- Thermal shut-down
- High output current, up to 3 A
- Wide range of supply voltage, 4 to 25 V
- High output power 7 W
- Low cross-over distortion
- Low harmonic distortion
- Very high efficiency 70%

Case:

TBA 810 T: QIP special
Dimensions see page 60
Number 1

TBA 810 AT: QIP special
Dimensions see page 60
Number 2



TCA 830 · TCA 830 A

Audio power amplifier

Supply voltage range	Pin 1	U_S	3,5...20	V
Input voltage				
$U_S = 12 \text{ V}$, $P_q = 50 \text{ mW}$				
$f = 1 \text{ kHz}$, $R_L = 4 \Omega$, $R_f = 56 \Omega$	Pin 8	U_i	6,5	mV
Voltage amplification				
$R_L = 4 \Omega$, $f = 1 \text{ kHz}$, $R_f = 56 \Omega$ with closed loop		A_{uof}	37 (< 40)	dB
Output noise voltage				
$U_S = 12 \text{ V}$, $B = 30 \dots 15 \text{ 000 Hz}$, $R_G = 10 \text{ k}\Omega$, $U_i = 0$		U_{na}	500	μV

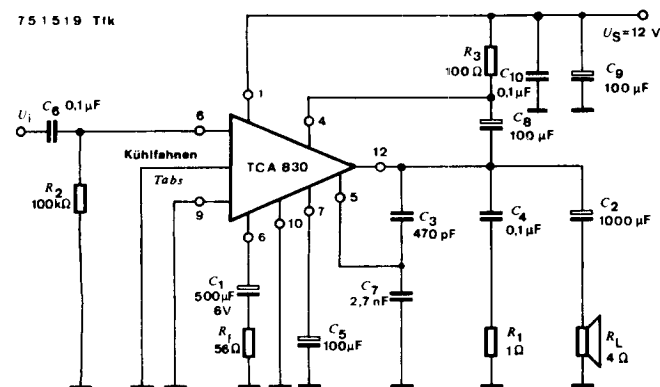
Features:

- High output current, up to 1.5 A
- High output power, up to 4 W
- Low harmonic distortion

Case:

TCA 830: QIP special
Dimensions see page 60
Number 1

TCA 830 A: QIP special
Dimensions see page 60
Number 2

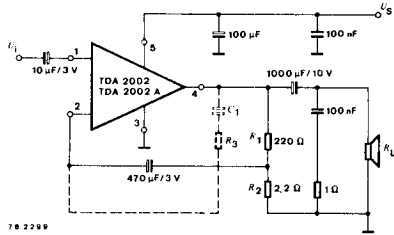


Integrated circuits for AF applications

TDA 2002 · TDA 2002 A

Audio power amplifier especially for car radios

Supply voltage range	Pin 5	U_S	8 ... 18	V
Output power				
$U_S = 14,4 \text{ V}$, $f = 1 \text{ kHz}$, $k = 10\%$, $R_L = 4 \Omega$		P_q	5,2	W
$R_L = 2 \Omega$		P_q	8	W
Peak supply voltage				
$t_p \leq 50 \text{ ms}$	TDA 2002	U_{SP}	40	V



78 2299

Features:

- Very low number of external components
- Designed for low impedance load 4Ω as well as 2Ω
- High output power

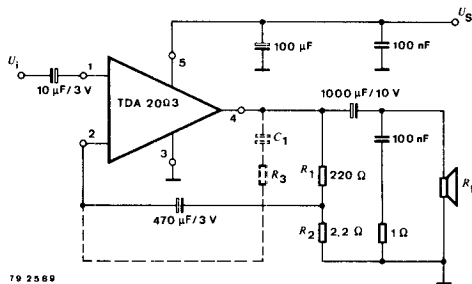
Case:

Plastic case 5-lead
 \approx JEDEC TO 220
 Dimensions see page 60
 Number 3 or 6

TDA 2003

Audio power amplifier especially for car radios

Supply voltage range	Pin 5	U_S	8 ... 18	V
Output power				
$U_S = 14,4 \text{ V}$, $f = 1 \text{ kHz}$, $k = 10\%$		P_q	6	W
$A_u = 40 \text{ dB}$, $R_L = 4 \Omega$		P_q	10	W
$R_L = 2 \Omega$				
Input noise voltage	Pin 1	U_{ni}	1	μV



79 2089

Features:

- Very low number of external components
- Designed for low impedance load 4Ω as well as 2Ω
- High output power
- Low noise

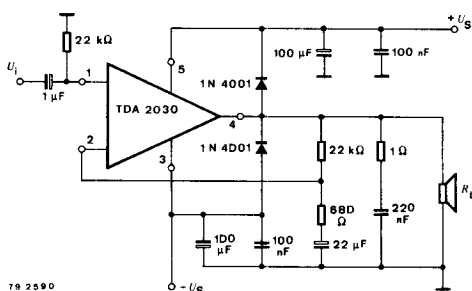
Case:

Plastic case 5-lead
 \approx JEDEC TO 220
 Dimensions see page 60
 Number 3 or 6

TDA 2030

Audio amplifier for radios and TV receivers

Supply voltage range	Pin 5	U_S	$\pm 6 \dots \pm 18$	V
Output power				
$U_S = \pm 14 \text{ V}$, $f = 1 \text{ kHz}$, $A_u = 30 \text{ dB}$, $R_L = 4 \Omega$, $k = 10\%$		P_q	18	W
$k = 0,5\%$		P_q	14	W
Input noise voltage	Pin 1	U_{ni}	3	μV



79 2590

Features:

- Very low number of external components
- Designed for low impedance load 4Ω as well as 8Ω
- High output power

Case:

Plastic case 5-lead
 \approx JEDEC TO 220
 Dimensions see page 60
 Number 3 or 6

Integrated circuits for AF applications

U 401 B HIGH()COM

Broadband compander circuit to reduce noise during recording and playback in cassette recorders just as for radio systems

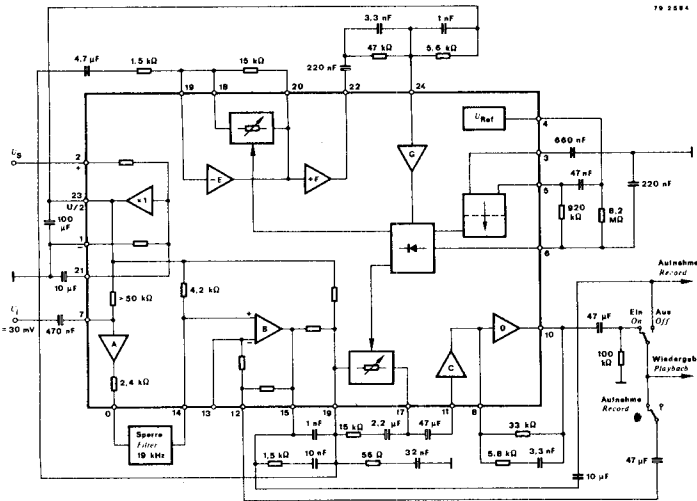
Supply voltage range	Pin 2	U_S	12...20	V
Supply quiescent current	Pin 2	I_{SB}	7	mA
Amplification $f = 1$ kHz, position playback	Pin 7 and Pin 15	A_u	26	dB
Signal to noise ratio Pin 7, $R_G = 10$ k Ω	Pin 8	$\frac{U_q}{U_{qn}}$	80	dB
Compander gain in signal to noise ratio		A_u	20	dB

Features:

- Wide supply voltage range, usable in bipolar or unipolar circuits
- Extreme high noise suppression even at low frequencies
- No frequency change response with level shifting between recording and playback
- No additional distortion due to faults in the transmission equipment
- Short circuit protected
- Low harmonic distortion
- Low internal noise

Case:

20 B 24 DIN 41 866
DIP 24-lead
Dimensions see page 60
Number 13



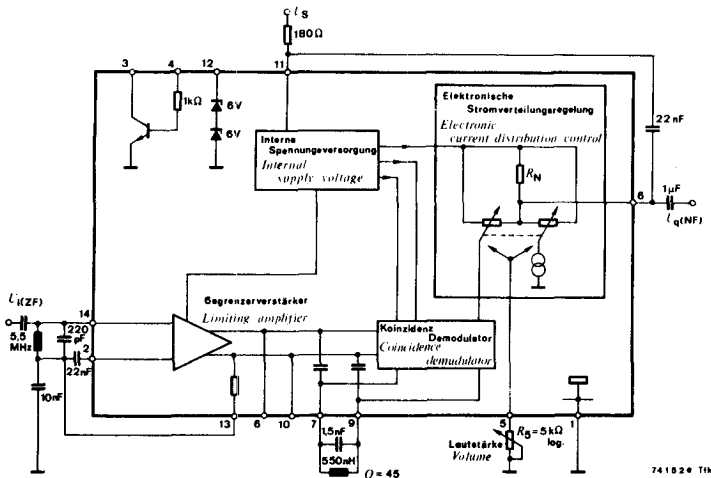
This circuit is intended for HIGH()COM noise reduction. It is available only to the licenses of AEG-TELEFUNKEN 6000 Frankfurt, for the production of equipment with HIGH()COM noise reduction.

Integrated circuits for RF applications

TBA 120 S

FM IF amplifier and detector for television and radio receivers

Supply voltage range	U_S	6...18 V	V
Input limiting voltage $f = 5.5 \text{ MHz}$, $\Delta f = \pm 50 \text{ kHz}$, $f_{\text{mod}} = 1 \text{ kHz}$, $Q \approx 45$,	Pin 14	U_i	30 (< 60) μV
Attenuation		$20 \lg \left(\frac{U_{q\text{max}}(\text{NF})}{U_{q\text{min}}(\text{NF})} \right)$	(> 70) 75 dB



Features:

- Exceptional limiting sensitivity
- Minimum number of external components
- Large power supply range

Case:

20 A 14 DIN 41866
JEDEC MO 001 AA (TO 116) or
QIP 14-lead
Dimensions see page 60
Number 4 or 5

TBA 120 T

FM IF amplifier and detector

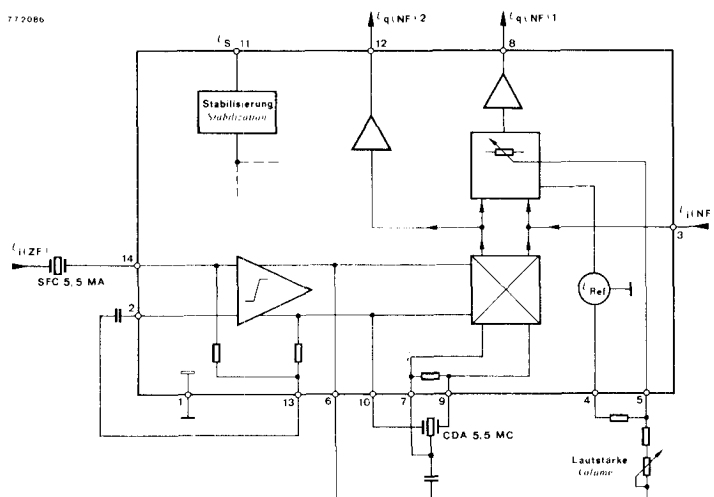
Supply voltage range	U_S	10...18	V
Input limiting voltage $f = 5.5 \text{ MHz}$, $\Delta f = \pm 50 \text{ kHz}$, $f_{\text{FM}} = 1 \text{ kHz}$, Pin 14		U_i	30 (< 60) μV
Volume setting range	Pin 8	$\frac{U_{q\text{max}}}{U_{q\text{min}}}$	(> 70) 85 dB
AF-voltage amplification $R_5 = 20 \text{ k}\Omega$	Pin 8/3	A_u	7.5

Features:

- Input and demodulator provided for operating with ceramic-resonators
- No selection of volume-input characteristics
- Independent sound output for VCR and headphone
- Additional sound input for video playback unit
- Insensitive against ripple and inconstant supply voltage (10 V ... 18 V)
- High residual carrier suppression prevents harmonic distortion

Case:

20 A 14 DIN 41 866
JEDEC MO 001 AC
Dimensions see page 60
Number 4 or 5

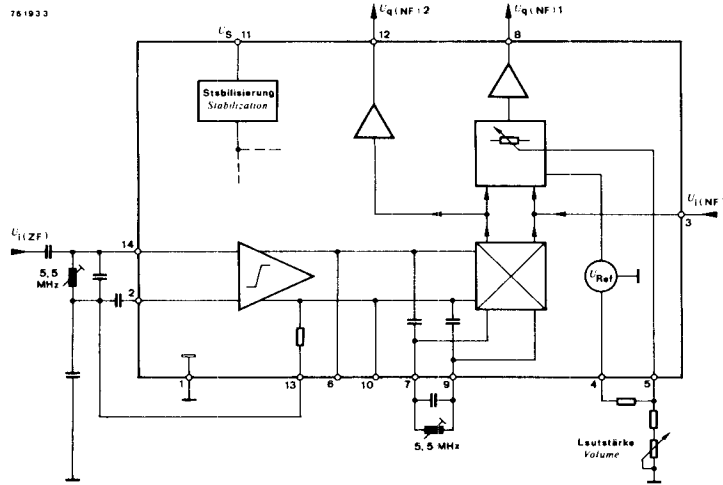


Integrated circuits for RF applications

TBA 120 U

FM IF amplifier and demodulator for television receivers

Supply voltage range	U_S	10...18	V
Input limiting voltage $f = 5.5 \text{ MHz}, \Delta f = \pm 50 \text{ kHz},$ $f_{FM} = 1 \text{ kHz}, Q = 45,$	Pin 14	U_i	30 (< 60)
Attenuation	Pin 8	$\frac{U_{qmax}}{U_{qmin}}$	(> 70) 85
AF amplification $R_5 = 20 \text{ k}\Omega$	Pin 8/3	A_u	7.5



Features:

- No grouping of volume control tuning characteristics
- Independent AF-output for VCR and headphone
- Additional AF-input for video play back
- Rugged against noise and fluctuation of the supply voltage
- High residual carrier attenuation prevents the harmonic

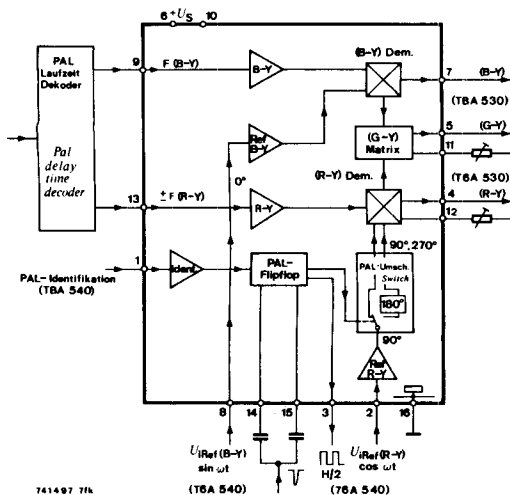
Case:

20 A 14 DIN 41866
JEDEC MO 001 AA (TO 116) or
QIP 14-lead or DIP 14-lead
Dimensions see page 60
Number 4 or 5

TBA 520

Synchronous demodulator for PAL colour television receivers

Supply voltage	U_S	12	V		
Chroma signal amplification $U_{i(R-Y)} = 50 \text{ mV}, f = 4.4 \text{ MHz}$	$A_{u(R-Y)}$	6			
Ratio of blue to red demodulator gains	$\frac{A_{u(B-Y)}}{A_{u(R-Y)}}$	1.78			
Colour difference output signal for colour bar standard signal $f = 4.4 \text{ MHz}$					
$U_{i(B-Y)} = 166.5 \text{ mV}_{SS}$	R-Y	Pin 4	U_q	1.4	V _{SS}
$U_{i(R-Y)} = 233.0 \text{ mV}_{SS}$	G-Y	Pin 5	U_q	0.82	V _{SS}
	B-Y	Pin 7	U_q	1.78	V _{SS}



Features:

- High demodulating linearity
- Low output rest carrier

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
or QIP 16-lead
Dimensions see page 60
Number 4 or 5

Integrated circuits for RF applications

TBA 530

RGB matrix and pre-amplifier for PAL colour television receivers

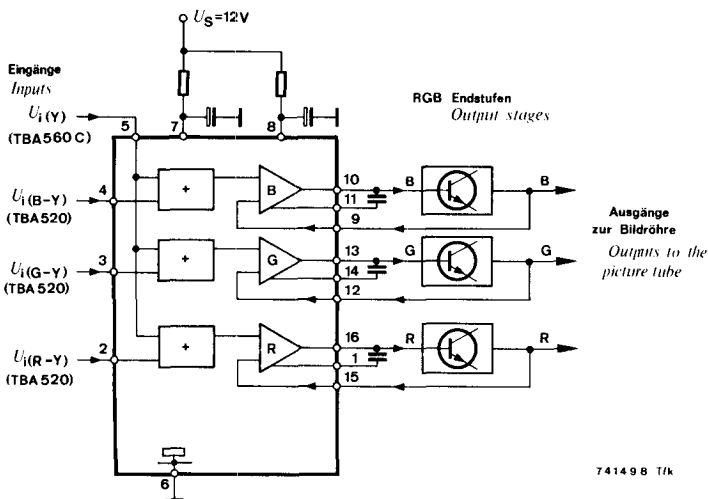
Supply voltage	U_S	12	V	
Input d.c. voltage	R-Y Pin 2	U_i	1.4	V _{ss}
	G-Y Pin 3	U_i	0.82	V _{ss}
	B-Y Pin 4	U_i	1.78	V _{ss}
	Y Pin 5	U_i	1	V _{ss}
Voltage amplification (including RGB output stages)				
$f = 0.5$ MHz	A_U	100		
3-dB Bandwidth	f	> 6	MHz	

Features:

- Associated with TBA 520 direct drive of RGB-output transistors possible
- RGB drive circuit with or without clamping possible

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
or QIP 16-lead or DIP 16-lead
Dimensions see page 60
Number 7 or 8



741498 Tfk

TBA 540

Reference circuit for PAL-colour TV receivers for generating colour carrier, colour killer, PAL-identification signals and control voltage for chroma amplifier

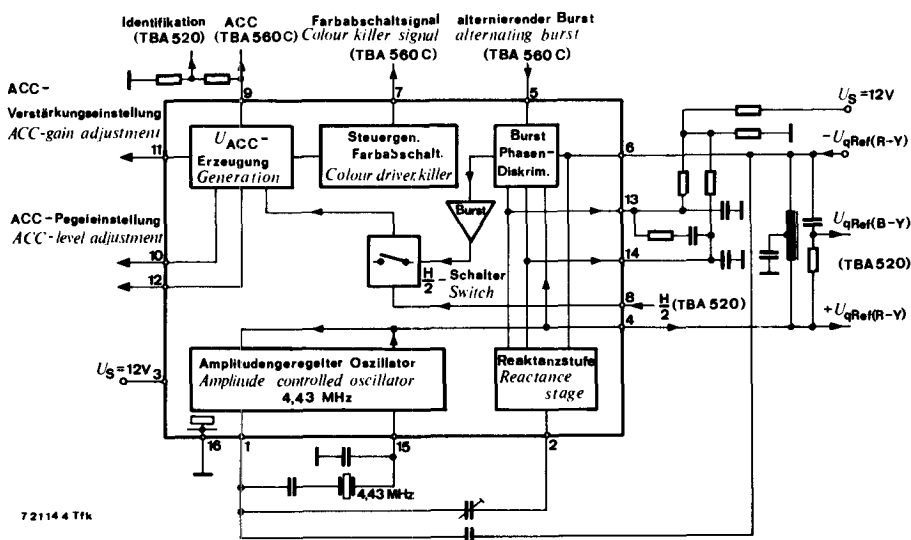
Supply voltage	Pin 3	U_S	12	V
Drive voltage for colour killer				
Switching position 1 "ON"	Pin 7	U_{Q1}	11	V
0 "OFF"	Pin 7	U_{Q0}	< 0.27	V
Lock-in-range of subcarrier oscillator		Δf_{Fang}	± 300	Hz
Phase difference between reference and burst signal at a frequency difference of 200 Hz	Pin 4, Pin 5	$\Delta \varphi$	$\pm 5^\circ$	

Features:

- Wide lock-in and holding range of reference oscillator
- Controlled oscillator amplitude

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
or QIP 16-lead
Dimensions see page 60
Number 7 or 8



721144 Tfk

Data book reference: S 8 E

Integrated circuits for RF applications

TBA 560 C

Luminance and chroma-combination for PAL colour television receivers

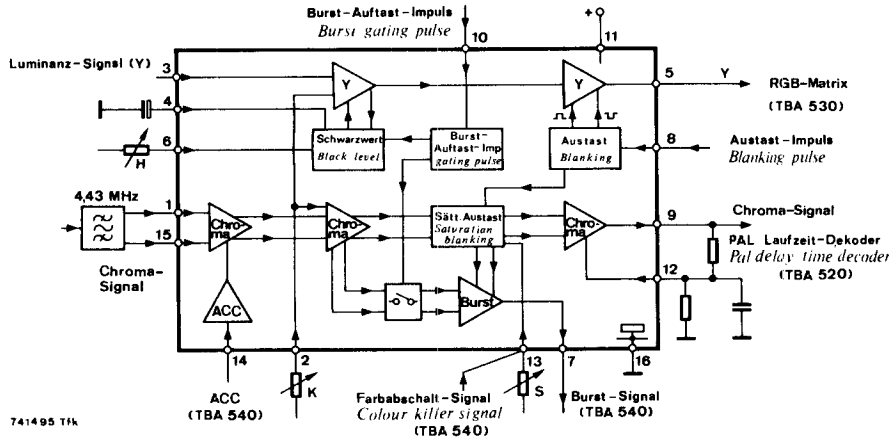
Supply voltage	Pin 11	U_S	12	V
Control range of chroma amplification	Pin 1-15 / Pin 9-16	$20 \log \left(\frac{A_{u\max}}{A_{u\min}} \right)$	26	dB
Maximum chroma output voltage	Pin 9	U_q	> 2.5	V _{SS}
max. contrast	$U_{I(2)} = 5.5 \text{ V}$			
max. saturation	$U_{I(13)} = 6.0 \text{ V}$			
$k \leq 5\%$				
Temperature drift of black level (Y) at nominal brightness	Pin 5	U_Q	50°C 20°C	< 60
$U_{I(6)} = 1.25 \text{ V}$				mV

Features:

- Electronic adjustment for brightness, contrast and chroma saturation
- Minimum temperature dependence of the black level
- Luminance output signal suitable for direct use in the integrated RGB-matrix circuit TBA 530

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
or QIP 16-lead or DIP 16-lead
Dimensions see page 60
Number 7 or 8



741495 T1x

TBA 990

Synchronous demodulator for PAL colour television receivers

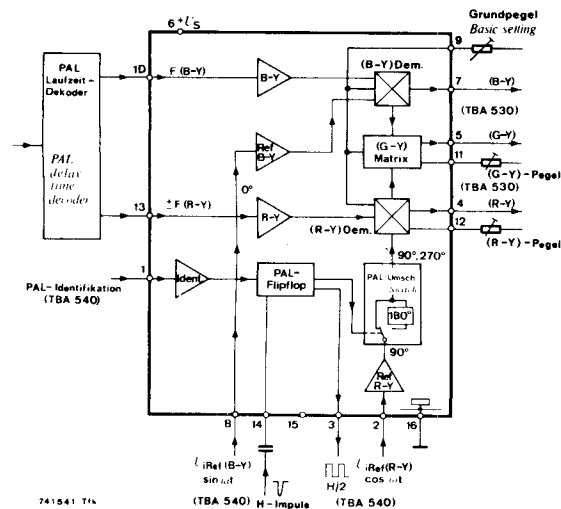
Supply voltage	Pin 6	U_S	12	V
Chroma signal amplification				
$U_{i(R-Y)} = 50 \text{ mV}, f = 4.4 \text{ MHz}$		$A_{u(R-Y)}$	3.8	
Ratio of blue to red demodulator gains		$\frac{A_{u(B-Y)}}{A_{u(R-Y)}}$	1.78	
Colour difference output signal				
$m = 0.7$				
R-Y	Pin 4	U_q	> 1.6	V _{SS}
G-Y	Pin 5	U_q	> 0.9	V _{SS}
B-Y	Pin 6	U_q	> 2.0	V _{SS}

Features:

- High demodulating linearity
- Low output rest carrier

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
or QIP 16-lead or DIP 16-lead
Dimensions see page 60
Number 7 or 8



741541 T1x

Integrated circuits for RF applications

TDA 440

Video IF amplifier for colour and monochrome television receivers

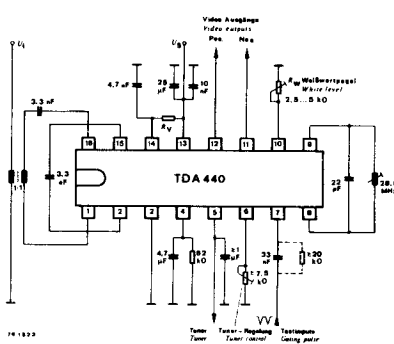
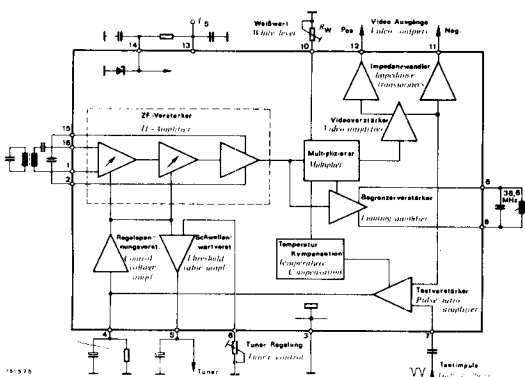
Supply voltage range	Pin 13	U_S	10...15	V
Negative video DC output voltage With white level adjustable				
Pin 10 $R_W = \infty$ $R_W = 0$	Pin 11	U_Q U_Q	< 4.8 > 6.5	V V
Composite video output level				
$U_Q = 5.5$ V (Pin 11)	Pin 11	$-u_q$	3.3	V _{SS}
$U_Q = 6.4$ V (Pin 11)	Pin 11	$-u_q$	4.2	V _{SS}
AGC range		$\Delta A(ZF)$	(> 50) 56	dB
Symmetrical input voltage				
$-u_q = 3.3$ V _{SS} (Pin 11)	Pin 1-16	u_i	150 (< 220)	μ V
Maximum IF voltage level present at video outputs over the full AGC range				
$f = 38.9$ MHz	Pin 11, 12	u_{HF}	< 30	mV
$f = 77.8$ MHz	Pin 11, 12	u_{HF}	< 50	mV
Suppression of vision carrier/colour subcarrier IP (1.07 MHz) with respect to colour subcarrier level		a_{IM}	> 40	dB

Features:

- High gain – high stability
- Negative video signal hardly affected by supply voltage variations
- Minimum differential error
- DC output component adjustable (peak white)

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7 or 8



TDA 440 T

Video IF amplifier for quasi-parallel sound in television receivers

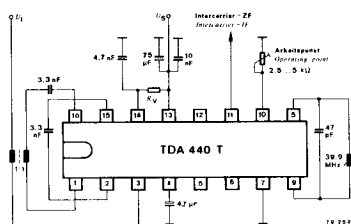
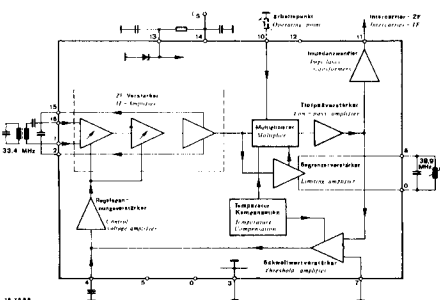
Supply voltage range	Pin 13	U_S	10...15	V
Supply current	Pin 13	I_S	19	mA
Supply voltage	Pin 14	U_S	5,8	V
Negative video DC output voltage With white level adjustable				
Pin 10 $R_W = \infty$ $R_W = 0$	Pin 11	U_Q U_Q	3,6 $\geq 6,5$	V V
Intercarrier output voltage	Pin 11	u_q	900	mV
Symmetrical sound carrier input voltage for control action, picture carrier 8 dB below sound carrier	Pin 1-16	u_i	100	μ V

Features:

- Reduced noise influence against intercarrier IF
- Possibility to reduce 1.1 MHz noise by lowering sound carrier in the video IF section
- Large detuning width of the input signal
- Very few external components

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7



Integrated circuits for AF applications

TDA 1062

FM-Tuner for AC-line and car-radios, mixer, modulator and phasesensitive detectors up to 200 MHz.

Supply voltage	U_S	9...15	V
Power amplification			
$U_S = 10\text{ V}$, $f = 95\text{ MHz}$, $R_G = R_L = 50\ \Omega$	G_P	typ. 30	dB
Oscillator pulling			
$P_i = 0\text{ dBm}$	without AFC	A_{f_0}	typ. 10 kHz
	with AFC	A_{f_0}	typ. 22 kHz
Noise figure	F	typ. 5,5	dB

Features:

- Excellent large signal behavior
- High oscillator frequency stability, even by large input signals
- Low noise figure
- Adaptable to capacitance diode, variometer or variable capacitor tuning
- Low radiation

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

TDA 1093

FM-Interface for TDA 1062

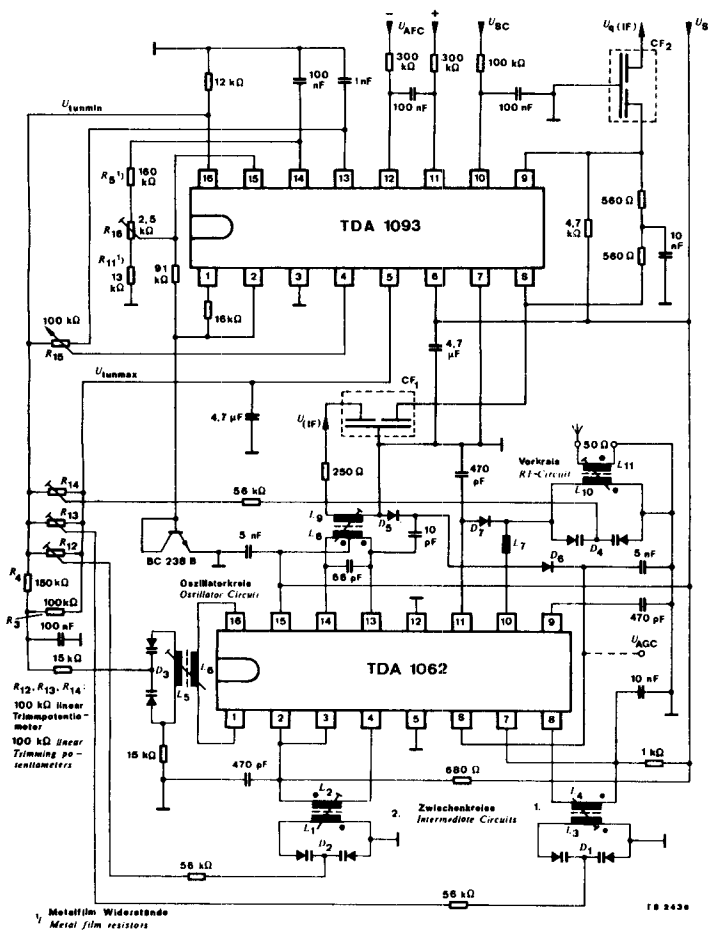
Supply voltage range	U_S	7,5...18	V
Quiescent drain current	I_{SB}	3	mA
Minimum tuning voltage	U_{tunmin}	1,8	V
Maximum tuning voltage	U_{tunmax}	$U_S - 1\text{ V}$	V

Features:

- Regulation of the tuning voltage against supply voltages variations
- Adjustable programmable tuning voltage
- Adjustable programmable thermal compensation of the tuned circuits
- Programmable AFC
- Buffer stage for tuning voltage source
- Transistor stage for FM IF amplification or other functions

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7



Integrated circuits for RF applications

TDA 1083

AM/FM- and Audio-Amplifier (One chip radio)

Supply voltage range	U_S	3 ... 12	V
Quiescent drain current			
$U_S = 6\text{ V}$	I_{SB}	14	mA
$U_S = 9\text{ V}$	I_{SB}	17	mA
$U_S = 12\text{ V}$	I_{SB}	20	mA
Limiting threshold (-3 dB)	Pin 2		
FM-mode $f = 10.7\text{ MHz}$	U_i	50	μV
RF amplification			
$f = 460\text{ kHz}$	A_U	70	dB
AF output power			
$k = 10\%$, $U_S = 7.5\text{ V}$, $R_L = 8\ \Omega$	P_Q	700	mW
$U_S = 12\text{ V}$, $R_L = 25\ \Omega$	P_Q	700	mW
AF voltage amplification			
$f = 1\text{ kHz}$	A_U	40	dB

Features:

- Large supply voltage range
- High AM-Sensitivity
- Limiting threshold voltage
- Audio output power $P_Q = 0.7\text{ W}$
- AFC-connection for VHF-Tuner
- AM-FM switching without high frequency voltages

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

U 417 B (Pin-compatible with TDA 1083)

AM-/FM-and Audio-Amplifier (One chip radio)

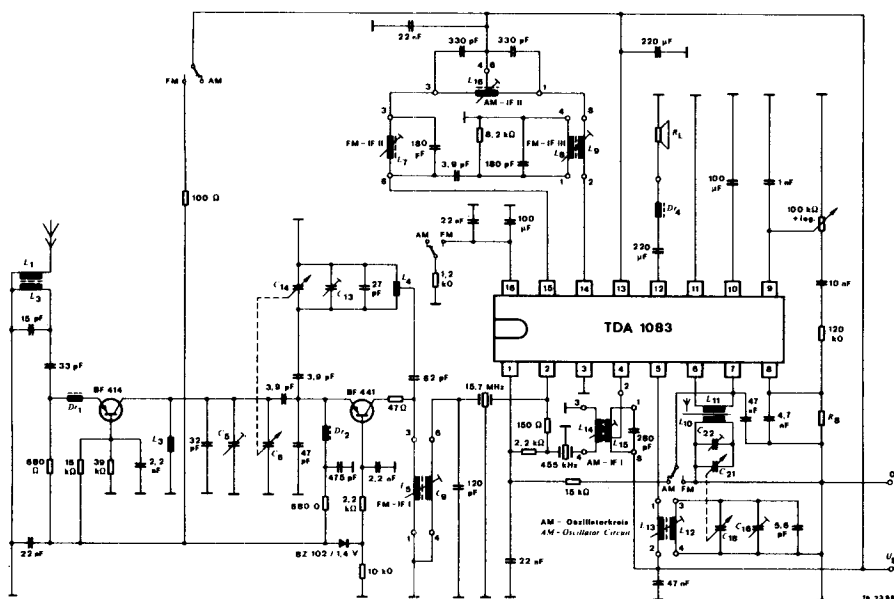
Supply voltage range	U_S	3 ... 15	V
Quiescent drain current			
$U_S = 9\text{ V}$	I_{SB}	12	mA
Limiting threshold (-3 dB)	Pin 2		
FM-mode $f = 10.7\text{ MHz}$	U_i	50	μV
RF amplification			
$f = 460\text{ kHz}$	A_U	70	dB
AF output power			
$U_S = 9\text{ V}$, $R_L = 8\ \Omega$	P_Q	1	W
AF voltage amplification			
$f = 1\text{ kHz}$	A_U	40	dB

Features:

- Large supply voltage range
- High AM-Sensitivity
- Limiting threshold voltage
- Audio output power $P_Q = 1\text{ W}$
- AFC-connection for VHF-Tuner
- AM-FM switching without high frequency voltages

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7



Integrated circuits for RF applications

TDA 1086

Monolithic integrated NPN double transistors
Cascade amplifier stage especially for mixer stages up to 300 MHz

Total power dissipation $t_{amb} \leq 55^\circ\text{C}$	P_{tot}	200	mW
DC forward current transfer ratio $I_C = 3\text{ mA}$	h_{FE}	> 40	
Gain bandwidth product $I_C = 3\text{ mA}$	f_T	600	MHz
Noise figure $I_C = 3\text{ mA}$	F	< 7	dB
Unilateral gain $I_C = 3\text{ mA}, f = 200\text{ MHz}$	G_u	26	dB

Features:

- High usable amplification
- No reversion problems
- Low oscillator power
- High conversion transconductance with
- With emitter negative feedback $R_e \approx 15\ \Omega$:
Excellent large signal behaviour and low input conductance

Case:

50 B 4 DIN 41 867
JEDEC TO 50
Dimensions see page 22
Number 14

TDA 1087

Monolithic integrated NPN double transistors
High current cascade amplifier stage up to 300 MHz

Total power dissipation $t_{amb} \leq 55^\circ\text{C}$	P_{tot}	280	mW
DC forward current transfer ratio $I_C = 20\text{ mA}$	h_{FE}	> 40	
Gain bandwidth product $I_C = 10\text{ mA}$	f_T	680	MHz
Noise figure $I_C = 10\text{ mA}$	F	< 7	dB
Unilateral gain $I_C = 10\text{ mA}, f = 200\text{ MHz}$	G_u	49	dB

Features:

- Low feedback
- High input signal opportunity
- High internal resistance
- High dynamic stability

Case:

50 B 4 DIN 41 867
JEDEC TO 50
Dimensions see page 22
Number 14

TDA 1170 S

Monolithic integrated vertical deflection circuit in TV receivers

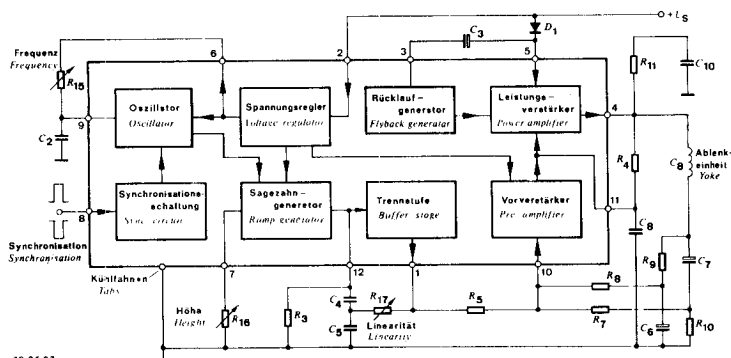
Supply voltage	Pin 2	U_S	35	V
Total power dissipation $t_{case} = 90^\circ$		P_{tot}	5	W
Flyback voltage	Pin 4-5	U_q	58	V
Peak output current $f = 50\text{ Hz}, t \leq 10\ \mu\text{s}$	Pin 4	I_q	2,5	A

Features:

- Wide supply voltage range
- Flyback generator
- Low saturation voltage of the output stages
- Wide pull-in range

Case:

Qip special
Dimensions see page 60
Number 1

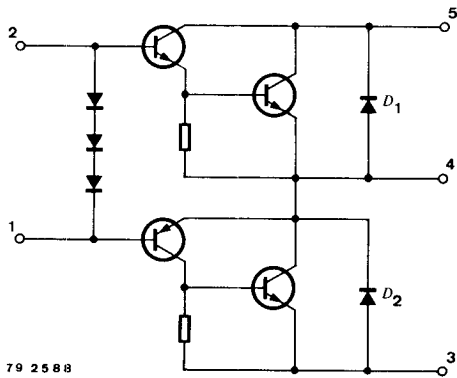


Integrated circuits for RF applications

TDA 1410

Monolithic integrated Quasi-complementary Darlington power stage for output stage in colour television receivers, power stage for operational amplifiers and audio power stages

Collector-base voltage	U_{CBO}	50	V
Collector-emitter voltage	U_{CEO}	36	V
Output current	Pin 4	I_Q	3
Total power dissipation			
$t_{case} = 60^\circ$	P_{tot}	30	W



Features:

- Wide supply voltage range
- High output current
- Minimum number of external components

Case:

Plastic case 5-lead
JEDEC TO 220
Dimensions see page 60
Number 3 or 6

TDA 2140

PAL subcarrier reference oscillator for colour TV receivers

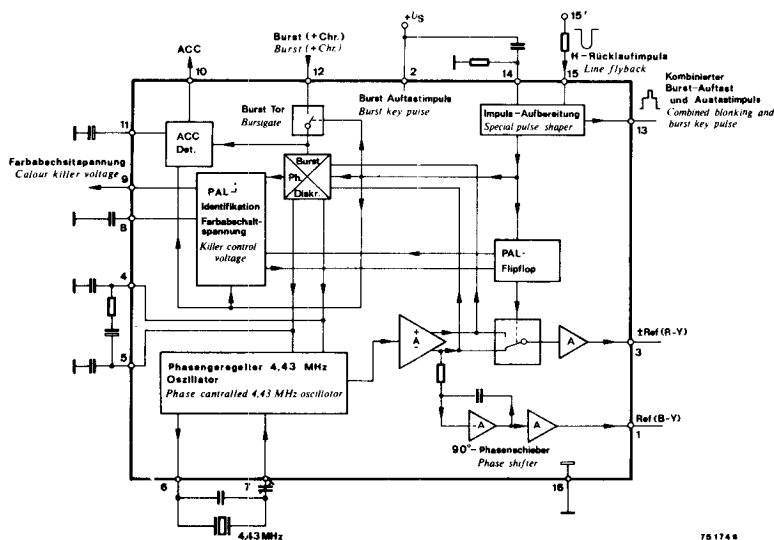
Supply voltage	U_S	12	V
Power dissipation	P_{tot}	0.8	W
Flyback input resistance	R_i	1	k Ω
Drive voltage for the colour killer			
correct phase of PAL flipflop	U_Q	12	V
incorrect phase of PAL flipflop	U_Q	0.2	V
Pull in range	$\pm \Delta f$	> 400	Hz

Features:

- High noise immunity in ACC and APC circuits obtained by means of detectors activated only during the burst time
- Internal generation of a combined blanking and burst key pulse by means of the flyback pulse
- When the antenna signal decreases, chroma saturation is automatically reduced before colour killer action
- No adjustments of ACC level and gain are needed
- Integrated 90° phase shifter

Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

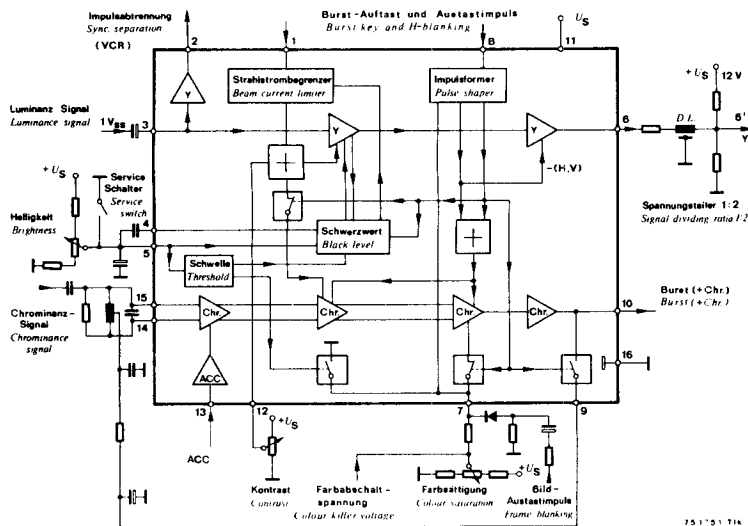


Integrated circuits for RF applications

TDA 2150

Luminance and chrominance amplifier for colour TV receivers

Supply voltage	U_S	12	V
Power dissipation	P_{tot}	0,8	W
Luminance input signal 100% white beam	Pin 3	U_i	1
Luminance output signal $U_{12} = 12\text{ V}$	Pin 6	U_q	2,0...2,4
Chrominance input signal	Pin 14-15	U_i	< 80
Chrominance output signal $k \geq 5\%$	Pin 10	U_q	3



Features:

- Very low spread of the D.C. controls for brightness, contrast and colour saturation in order to avoid pre-settings completely
- Tracked D.C. contrast control in chrominance and luminance channels
- Independent video signal output for the sync. separator especially at VCR playback operation
- Generation of a luminance service signal for adjusting the CRT cathode bias

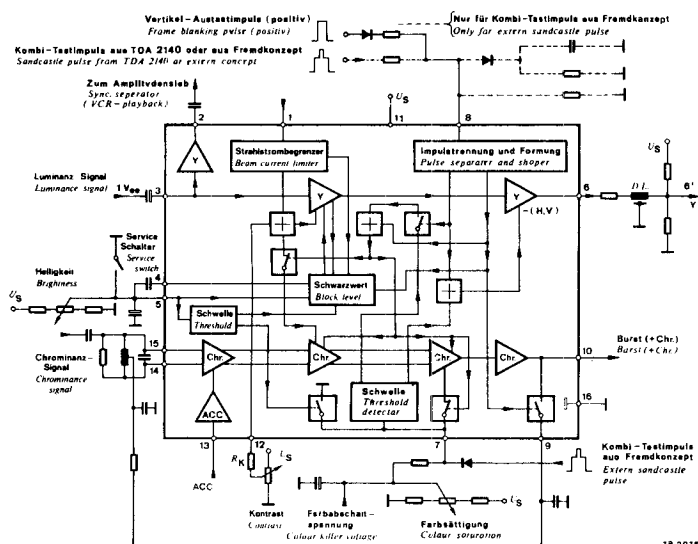
Case:

20 A 16 DIN 41866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

TDA 2151

Luminance and chrominance amplifier for colour TV receivers

Supply voltage	U_S	12	V
Power dissipation	P_{tot}	0,8	W
Luminance input signal 100% white beam	Pin 3	U_i	1
Luminance output signal $U_{12} = 12\text{ V}$	Pin 6	U_q	2,0...2,4
Chrominance input signal	Pin 14-15	U_i	< 80
Chrominance output signal $k \geq 5\%$	Pin 10	U_q	3
Contrast reduction at beam current limiter action			25...80 %
Programming resistor	Pin 12	R_K	0...7,5 kΩ



Features:

- Very low spread of the DC controls of brightness, contrast and colour saturation in order to avoid pre-settings completely
- Tracked DC, contrast control in chrominance and luminance channels
- Generation of a luminance service signal for adjusting the CRT cathode bias
- Compatible with every available concept in the market for combined test pulse generation

Case:

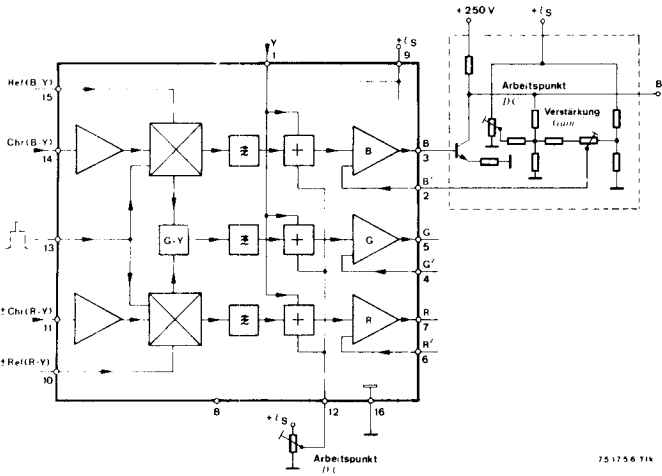
20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

Integrated circuit for RF application

TDA 2160

Synchronous demodulator and RGB matrix for colour TV receivers

Supply voltage	U_S	< 13,2	V
Power dissipation	P_{tot}	0,8	W
Luminance input resistance	Pin 1	R_i	50 k Ω
Blanking input pulse	Pin 13	I_i	> 10 μ A
Amplification ratio		$\frac{A(B-Y)}{A(R-Y)}$	1,78
Gain of luminance channels including video power stages		A_U	100



75 1756 TIN

Features:

- High stability of the DC output voltage ensured by applying heavy feedback from the output stages
- Large bandwidth
- Low subcarrier leakage ensured by means of integrated active filters
- Large range of the output black level adjustments
- Large dynamic swing of the output signals
- Good electrical stability of the RGB amplifiers ensured by internal frequency compensations

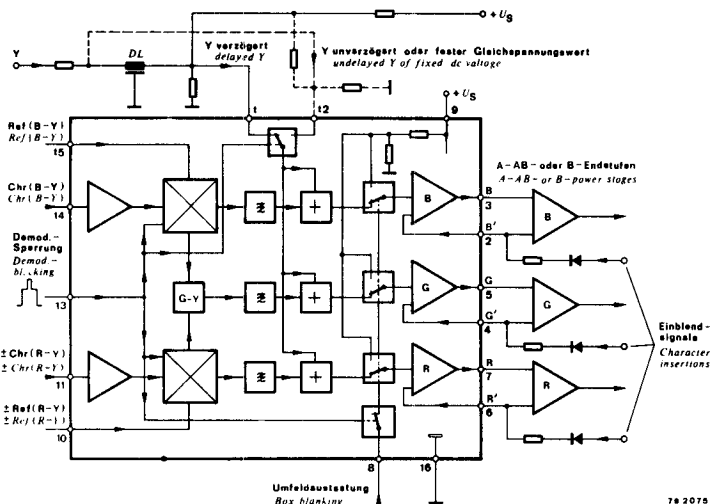
Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

TDA 2161

Synchronous and RGB matrix for colour TV receivers

Supply voltage	U_S	12	V
Power dissipation	P_{tot}	0,8	W
Luminance input resistance	Pin 1	R_i	50 k Ω
Blanking input pulse	Pin 13	I_i	> 10 μ A
Gain ratio		$\frac{A(B-Y)}{A(R-Y)}$	1,78
Gain of luminance channels including video power stages		A_U	100
Field black out pulse	Pin 8	U_i	2.8 ... 5 V



78 2075

Features:

- High stability of the DC output voltage ensured by applying heavy feedback from the output stages
- Large bandwidth
- Good electrical stability of the RGB amplifiers ensured by internal frequency compensations
- Field black out for signal fade-in

Case:

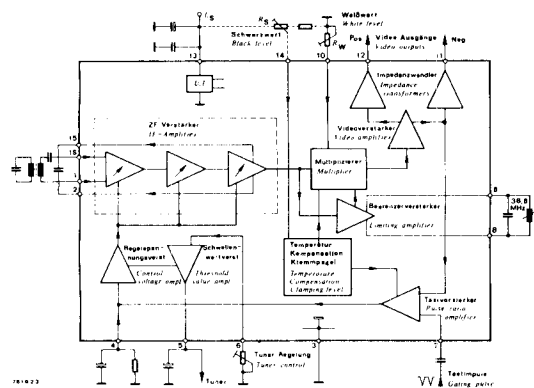
20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

Integrated circuit for RF application

TDA 4400 with PNP-Tuners · TDA 4410 with NPN-Tuners

Video IF-amplifier for colour and monochrome television receivers.

Supply voltage range	Pin 13	U_S	10 ... 15	V
Negative video DC output voltage With white level adjustable				
Pin 10 $R_W = \infty$ $R_W = 0$	Pin 11	U_Q U_Q	< 4,5 > 6,5	V V
Composite video output level				
$U_Q = 5,5$ V (Pin 11)	Pin 11	$-u_q$	3,3	V _{SS}
$U_Q = 6,4$ V (Pin 11)	Pin 11	$-u_q$	4,2	V _{SS}
AGC range		$\Delta A(ZF)$	(> 50) 56	dB
Symmetrical input voltage				
$-u_q = 3,3$ V _{SS} (Pin 11)	Pin 1-16	u_i	150 (< 220)	μ V
Maximum IF voltage level present at video outputs over the full AGC range				
$f = 38,9$ MHz	Pin 11, 12	u_{HF}	< 30	mV
$f = 77,8$ MHz (2. Harmonische)	Pin 11, 12	u_{HF}	< 50	mV
Suppression of sound carrier/colour subcarrier IP (1.07 MHz) with respect to colour subcarrier level		a_{IM}	48	dB
Differential gain of negative comp. video output signal, for full black to white swing	Pin 13	d	3	%

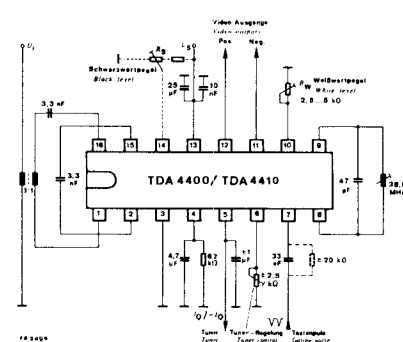


Features:

- High gain – high stability
- Negative video signal hardly affected by supply voltage variations
- Minimum differential error
- Positive as well as neg. video signal available from low-impedance outputs
- White- and black level adjustable
- Very low intermodulation products

Case:

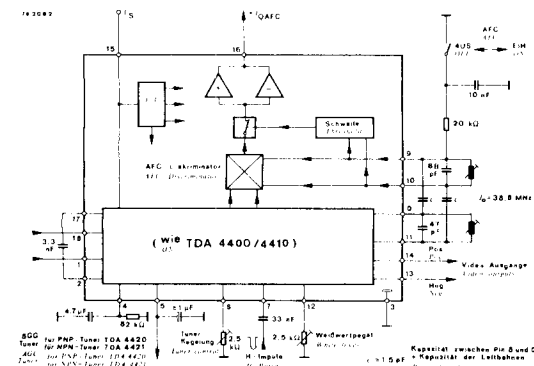
20 A 16 DIN 41 866
JEDEC MO 001 AC or
QIP 16-lead
Dimensions see page 60
Number 7 or 8



TDA 4420 with PNP-Tuners-AGC · TDA 4421 with NPN-Tuners-AGC

Video-IF-amplifier for colour and monochrome television receivers.

Supply voltage range	Pin 15	U_S	10 ... 15	V
Peak black clamping level at negative video output	Pin 13	u_{QSW}	1,75...1,9...2,15	V
AGC range		ΔA_{ZF}	58	dB
Differential distortion of negative comp. video output signal, for full black to white swing	Pin 13	d	3	%
IMA (1,07 MHz)		a_{IM}	48	dB
AFC voltage	Pin 16	U_{QAFC}	1...(U_S -1,5V)	V
Max. AFC current	Pin 16	I_{QAFC}	± 5	mA
AFC-slope	Pin 16	$\frac{\Delta I_{QAFC}}{\Delta f}$	± 1	$\frac{\text{mA}}{100 \text{ kHz}}$
DC control voltage for AFC switching "OFF"	Pin 9, 10	I_{OFF}	300	μ A

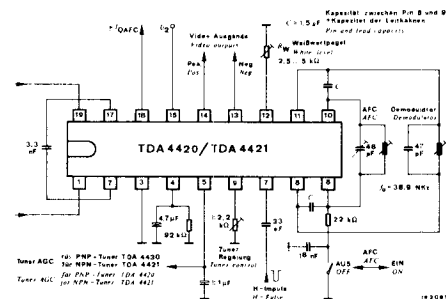


Features:

- High gain – high stability
- Negative video signal hardly affected by supply voltage variations
- Minimum differential error
- Fast AGC action – gating largely independent of pulse shape and amplitude
- Gating pulse control for transmission search system
- White level adjustable
- Large AFC output current swing (push-pull output)
- Switchable AFC

Case:

DIP 18-lead
Dimensions see page 60
Number 10

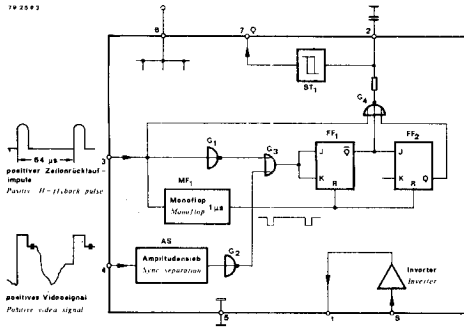


Integrated circuits for RF applications

TDA 4432

Television transmission identification circuit for generating a stop signal for automatic tuning systems, automatic muting at reception of non TV-signals

Supply voltage range	U_S	14,2...15,8	V
Supply current	I_S	10	mA



Features:

- Digital differentiation of transmitter signals with or without modulation
- Suitable for positive or negative flyback pulses
- Digital control signal output

Case:

20 A 8 DIN 41 866
DIP 8-lead
Dimensions see page 60
Number 12

TDA 4440 with PNP-Tuner · TDA 4450 with NPN-Tuner

Video-IF-amplifier, Video-Demodulator

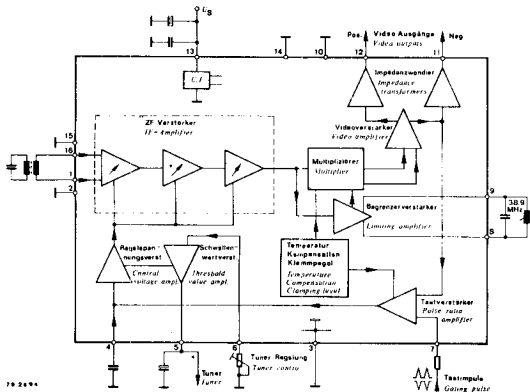
Supply voltage range	Pin 13	U_S	10...15	V
BAS-output voltage $R_L = \infty$	Pin 11	$-u_q$	3	V_{pp}
Negative video output voltage	Pin 11	U_Q	5,5	V
Positive video output voltage	Pin 12	U_Q	2	V
Gating pulse $R_V = 10 \text{ k}\Omega$	Pin 7	$\pm U_i$	5	V_{pp}
AGC range		$\Delta A_U(\text{IF})$	60	dB
Symmetrical input voltage $-u_q = 3 V_{pp}$ (Pin 11)	Pin 1-16	u_i	90	μV

Features:

- Very low intermodulation products
- Minimal differential error
- Constant input impedance independent of AGC
- Video signal hardly affected by supply voltage variations
- Fixed video output voltage with small tolerance range
- Positive or negative gating pulse

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC or
QIP 16-lead
Dimensions see page 60
Number 7 or 8



TEA 1087

Monolithic integrated NPN-double transistors
High current cascade amplifier stage IF-preamplifier for surface wave filters

Total power dissipation $t_{amb} \leq 55^\circ\text{C}$	P_{tot}	750	mW
Gain bandwidth product $I_C = 20 \text{ mA}$	f_T	700	MHz
Noise figure $I_C = 10 \text{ mA}$	F	2,8	dB
Unilateral gain $I_C = 20 \text{ mA}, f = 40 \text{ MHz}$	G_U	36	dB

Features:

- High gain
- Low feedback
- High input signal opportunity
- High internal resistance
- High dynamic stability

Case:

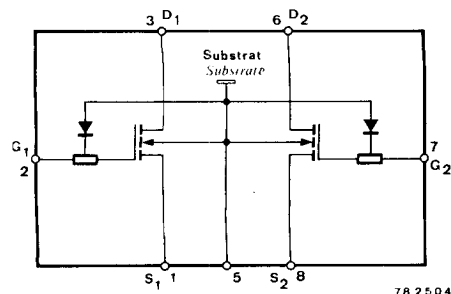
10 A 3 DIN 41 868
JEDEC TO92 Z
Dimensions see page 21
Number 3

Integrated circuits for RF applications

U 353 M

Low ohmic pair of powerless controlled switches for signal sources up to 10 MHz in N-Channel-SI-Gate-Technology

Channel resistance			
$U_{GS} = 12\text{ V}, U_{DS} = 0, f = 1\text{ MHz}, U_{pp} = 0,1\text{ V}$	R_{ON}	≤ 5	Ω



Shield on top side of the case connected with pin 5

Features:

- On-state resistance $\leq 5\ \Omega$
- Low capacitances
- Protected gates
- Wattless control

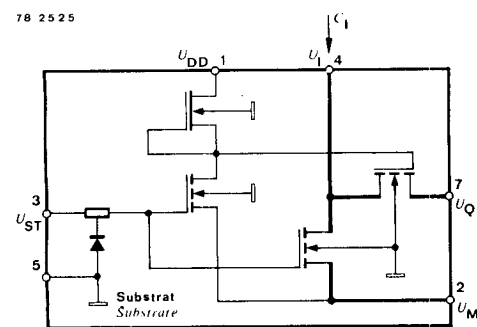
Case:

20 A 8 DIN 41 866
DIP 8-lead
Dimensions see page 60
Number 12

U 354 M

Low ohmic powerless controlled switch for signal sources up to 10 MHz in N-Channel-SI-Gate-Technology

Channel resistance			
$U_{ST} = 0, U_i = 0, U_{pp} = 0,1\text{ V}, f = 1\text{ MHz}$	R_{ON}	≤ 4	Ω
$U_{ST} = 12\text{ V}, U_i = 0, U_{pp} = 0,1\text{ V}, f = 1\text{ MHz}$	R_{ON}	≤ 4	Ω



Shield on top side of the case connected with pin 5

Features:

- On-state resistance $\leq 4\ \Omega$
- Low capacitances
- Protected gates
- Wattless control

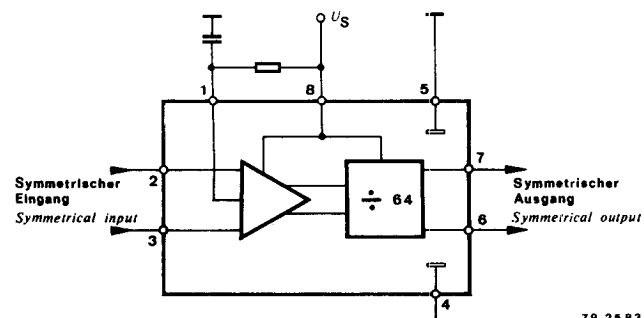
Case:

20 A 8 DIN 41 866
DIP 8-lead
Dimensions see page 60
Number 12

U 264 B

GHz frequency divider for frequency synthesizers in TV-tuners

Supply voltage range	U_S	4...6	V
Maximal input voltage	U_{imax}	500	mV
Power dissipation	P_{tot}	340	mW
Input voltage	U_i	≤ 10	mV
Frequency range	f	10...1000	MHz



Features:

- High input sensitivity
- Large operation frequency range
- Large signal compatibility
- High dynamic stability
- Low power dissipation
- Wide supply voltage range
- Few external components

Case:

20 A 8 DIN 41 866
DIP 8-lead
Dimensions see page 60
Number 12

Integrated circuit for RF application

EPM-System

Electronic Program Memory-System

Electronic system for TV receivers to tune and memorize 16 TV stations

The basic system is containing the following IC's:

TDA 4420 - Video -IF +AF amplifier (bipolar)

TDA 4430 - TV signal identification (bipolar)
or **TDA 4431**

U 193 M - Control functions, digital tuning voltage generator,
nonvolatile memory for 16 TV programmes (N-MOS)

Additional IC's for system completion:

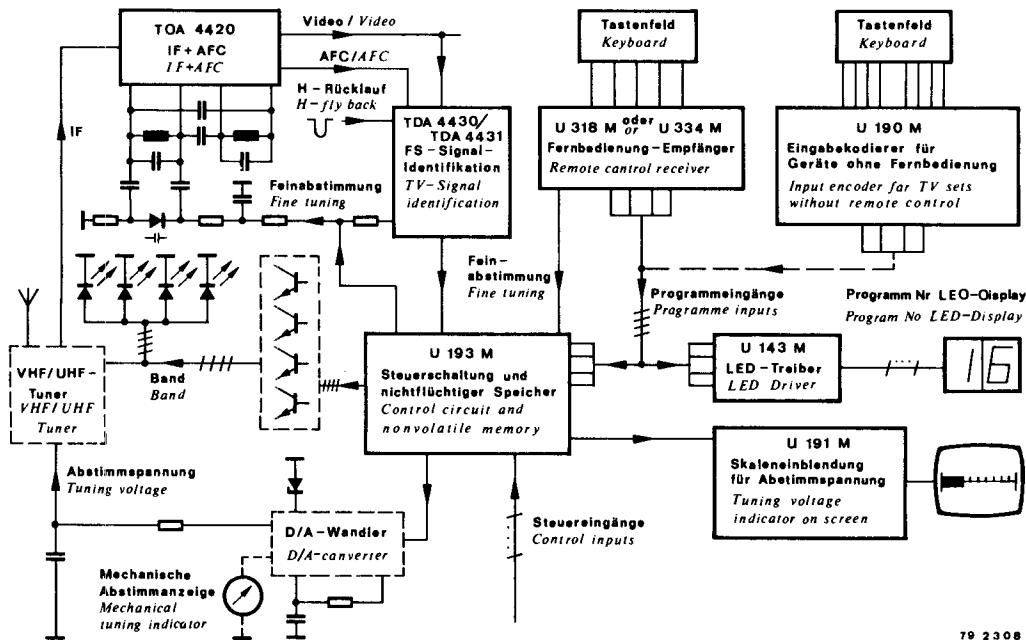
U 143 M - LED-display driver (P-MOS)

U 190 M - Keyboard encoder for 16 program keys
(TV sets without remote control-N-MOS)

U 191 M - Character generator indicating a tuning voltage scale
and band information on screen (N-MOS)

Features:

- Control functions and nonvolatile memory integrated on one chip
- Identification of TV stations during the automatic search
 - **TDA 4430** - Digital transmitter identification
Tristate control output
Constant output voltage
 - **TDA 4431** - High sensitive analogue identification
Adjustable sensitivity
Tristate control output
Control output for search speed
Constant output voltage
- Soft frequency stability requirements concerning tuner, tuning voltage generator, dc/ac-converter and tuning voltage reference by a quasi closed tuning loop and an automatic frequency offset of recalled stations from the memory into a safe AFC pull in range
- Memorable fine tuning for each of the 16 programmes
- Fast searching run, externally adjustable:
UHF - 8 s, VHF - 4 s
- Simple manual tuning for service
- Provided for complete manual tuning with two speeds each in up and down direction



79 2308

Cases:

TDA 4420, U 190 M

20 A 18 DIN 41 866
DIP 18-lead
Dimensions see page 60
Number 10

TDA 4430

DIP 18-lead
Dimensions see page 60
Number 12

TDA 4431

20 A 14 DIN 41 866
JEDEC MO 001 AA (TO 116)
Dimensions see page 60
Number 4

U 143 M, U 191 M

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

U 193 M

20 B 28 DIN 41 866
JEDEC MO 015 AH
DIP 28-lead
Dimensions see page 60
Number 14

Data book reference: S 8 E

Integrated Trigger, Sensor and remote control circuits

SAS 660 · SAS 670

Electronic touch plate (touch driven double contact four-channel-switch) for program selection of radio and television receivers, lift controls, test equipments etc.

Tuning voltage	Pin 7	U_{SA}	29 ... 37	V
Indicator voltage	Pin 8	U_{SL}	11 ... 15	V
Indicator current of one output $U_{SL} = 13,5$ V	Pin 8	I_{SL}	55	mA
Switching sensitivity for sensor "ON" $U_{SA} = 33$ V, $U_{SL} = 13,5$ V, $R_p = 3,9$ M $\Omega \pm 10\%$		I_{ITA}	25	nA

Features:

- High input sensitivity
- High noise immunity
- Low saturation voltage and temperature drift of switching transistors
- The indicating outputs (e.g. lamps) provide high load current
- Minimum of external components

SAS 6600 · SAS 6700

Electronic touch plate as SAS 660/SAS 670, but with reduced sensitivity

All datas, block diagram, test circuit and case etc. are corresponding to SAS 660/SAS 670, out cludes:

Tuning voltage	Pin 7	U_{SA}	17 ... 36	V
Indicator voltage	Pin 8	U_{SL}	10 ... 25	V
Indicator current of one output $U_{SL} = 13,5$ V	Pin 8	I_{SL}	55	mA
Switching sensitivity for sensor "ON" $U_{SA} = 33$ V, $U_{SL} = 13,5$ V, $R_p = 3,9$ M $\Omega \pm 10\%$		I_{ITA}	20 ... 250	nA

Additional special features:

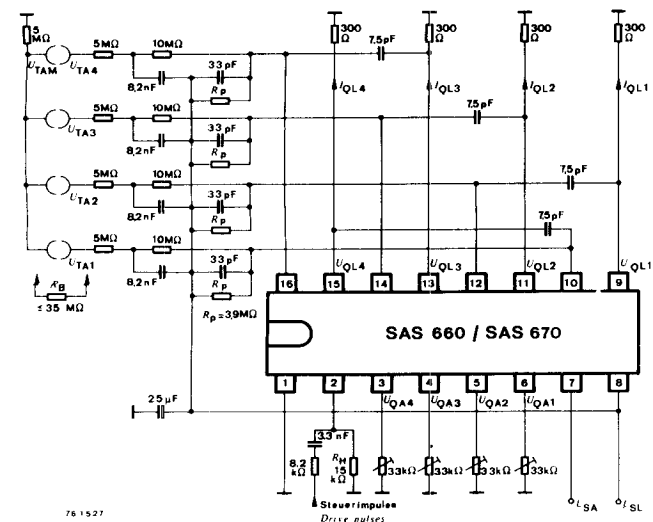
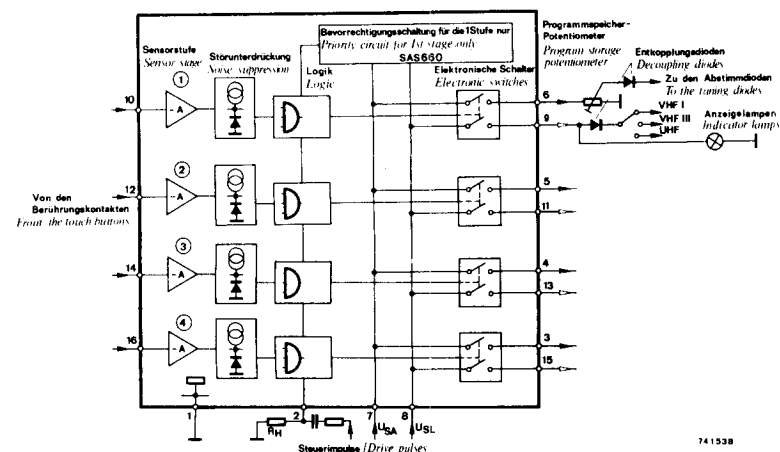
- The selected programs is maintained by switching-off the voltage U_{SL} (pin 8) when $U_{SA} = 17 ... 36$ V.

SAS 6610 · SAS 6710

Electronic touch plate as SAS 6600/SAS 6700

Additional special features:

- Sensor inputs with protecting diodes
Provides for equipments with bridge-connected rectifier without mains decoupling.



Case:

SAS 660/SAS 670 and SAS 660 S/SAS 670 S

20 A 16 DIN 41 866

JEDEC MO 001 AC

or QIP 16-lead

Dimensions see page 60

Number 7 or 8

Integrated Trigger, Sensor and remote control circuits

TDA 4180 P

Front end amplifier for remote control systems
i. e.: ultrasonic or infrared transmission

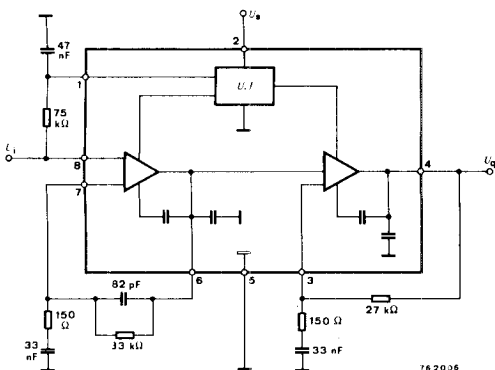
Supply voltage	U_S	12 ... 17	V
Frequency range	f	30 ... 45	kHz
Voltage amplification			
$U_q \leq 1 \text{ V}, f = 40 \text{ kHz}$	A	≥ 83	dB
Frequency response			
	$A(40 \text{ kHz})$	≥ 6	dB
	$A(15 \text{ kHz})$		
Input voltage sensitivity			
$\frac{N_s + N_n}{N_n} = 2, f = 40 \text{ kHz}$	U_i	≤ 15	μV

Features:

- High sensitivity
- High gain, externally adjustable by the values of the resistors R_{3-4} and R_{6-7}
- Band-pass response can be influenced by RC_{3-5} , RC_{7-5} and RC_{6-7}
- Overdrivable

Case:

DIP 18-lead
Dimensions see page 60
Number 12



UAA 145 · UAA 146

Phase control circuit

$U_{S1} = 13...16 \text{ V}, -I_{S13} = 15 \text{ mA}$			
$U_{S3} = 0 \text{ V}$ (Reference point)			
$t_{amb} = 25^\circ\text{C}$			
Output saturation voltage			
$U_{S1} = U_{I2} = 16 \text{ V},$			
$U_{I7} = U_{\varphi 8} = 0 \text{ V}, I_{I11} = 50 \mu\text{A}$			
$I_{Q10} = 20 \text{ mA}, I_{Syn 9} = -0.3 \text{ mA}$	U_{Q10}	0.3 (< 1.0)	V
$I_{Q14} = 20 \text{ mA}, I_{Syn 9} = +0.3 \text{ mA}$	U_{Q14}	0.3 (< 1.0)	V
Pulse phasing difference for two half-waves			
$f = 50 \text{ Hz}$	$\Delta\varphi$	$< \pm 3^\circ$	
Inter-IC phasing difference			
$f = 50 \text{ Hz}$	$\Delta\varphi$	$< \pm 3^\circ$	
Maximum synchronic current	$I_{Syn 9}$	± 20	mA
Maximum output current	$I_{Q10/14}$	20	mA

Application:

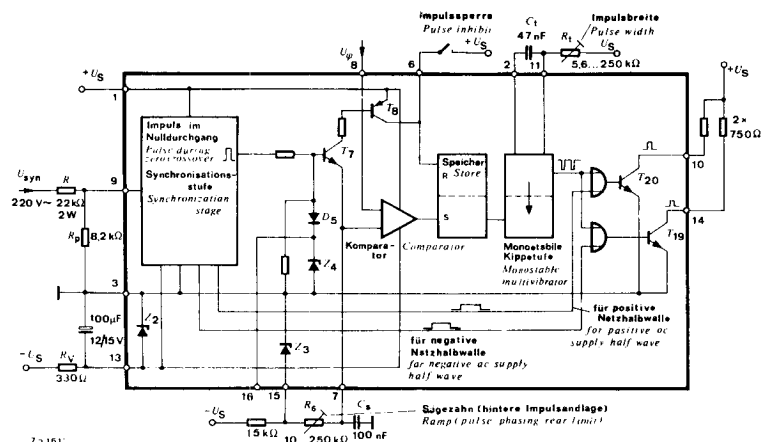
The monolithic integrated circuit UAA 145 and UAA 146 permits the number of components in thyristor drive circuits to be drastically reduced. The versatility of the device is further enhanced by the provision of a large number of pins giving access to internal circuit points.

Features:

- Suitable for phase-control in high-precision regulators
- Separate pulse outputs for the positive and the negative half-cycle of the sync signal
- Output pulse-width is freely adjustable
- Phase angle variable from $< 0^\circ$ to $< 180^\circ$
- High-impedance shift input
- Less than 3° pulse symmetry between two half-cycles or those of different UAA 145 units
- No multiple pulse generation due to noisy shift input
- Output pulse blocking feasible

Case:

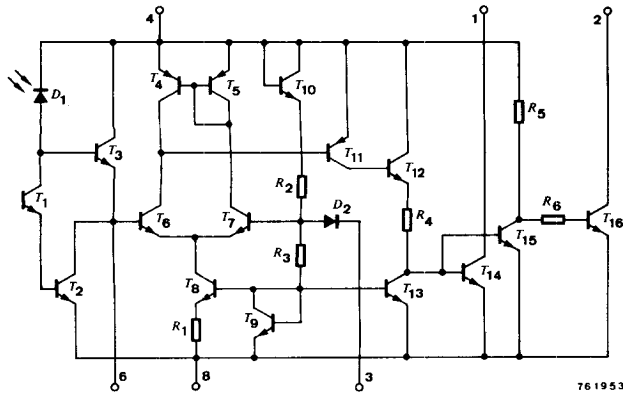
DIP special
Dimensions see page 60
Number 11



Integrated Trigger, Sensor and remote control circuits

U 102 P

Photo Threshold Switch



Applications:

Exposure and illumination control
Light barrier with direct relay control
Twilight switch

Features:

- Integrated switch and photo detector on one chip
- External controlled light sensitivity
- External controlled hysteresis
- Output stages with open collector
 $U_{CE} = 25 \text{ V}$, $I_C = 70 \text{ mA}$
- Quiescent current $I_{SB} = 2.5 \text{ mA}$

Case:

≈ 5 G 8 DIN 41 873
Dimensions see page 32
Number 44

U 106 BS

Zero voltage switch

Supply voltage	$-U_S$	8	V
Current consumption	$-I_S$	15	mA
Ignition pulse	$-i_q$	250	mA

Applications:

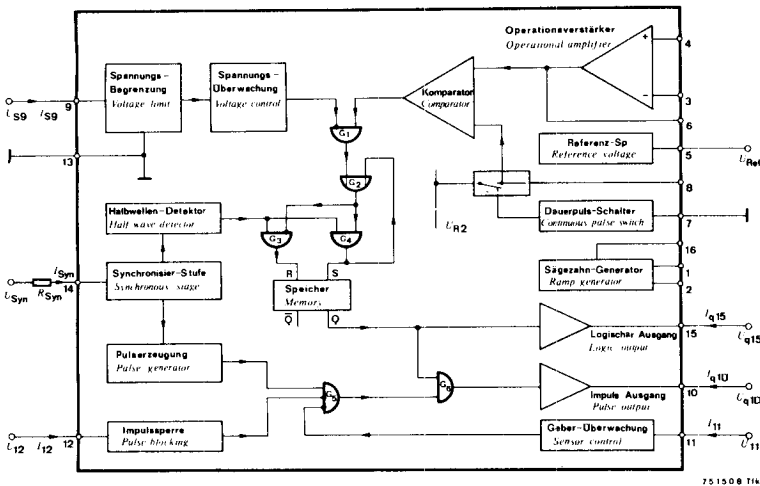
Thyristor- and triac control in the zero crossing mode for static switch, burst firing, two-point driver, proportional driver, power timer, etc. in one and three phase power supply.

Features:

- Simple a.c. or d.c. power supply requirement and definite IC-switching characteristics
- Very few external components
- Full wave drive – no d.c. current components in the load circuit
- Negative output current pulse up to 250 mA – short circuit protection
- Frequency compensated operational amplifier
- Ramp generator
- High resistant input sensor control

Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7



U 111 B

Phase control of ac loads

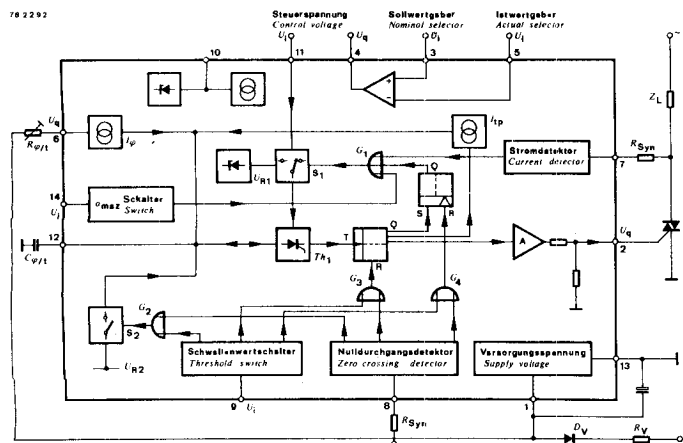
Supply voltage range	Pin 1			
DC operation	$-U_S$	12 ... 14,2	V	
Mains supply	$-U_S$	13,5 ... 17	V~	
Current consumption	Pin 1	$-I_S$	≤ 2,4	mA
Drive current	Pin 11	I_I	≤ 0,5	μA

Features:

- One supply voltage
- Low supply current
- Mains supply possible
- Power dissipation in series resistance $\leq 1.5 \text{ W}$
- Ignition pulse typ. 150 mA
- Output short circuit protected
- Only one time controlled capacitor ramp voltage and ignition pulse width
- Voltage and current synchronisation
- α_{max} switch
- Internal supply voltage control
- Input blocking pulse
- Free switchable operation amplifier
- Temperature stabilised reference source
- Integrated gate-protected resistance

Case:

20 A 14 DIN 41 866
JEDEC MO 001 AA (TO 116)
Dimensions see page 60
Number 4

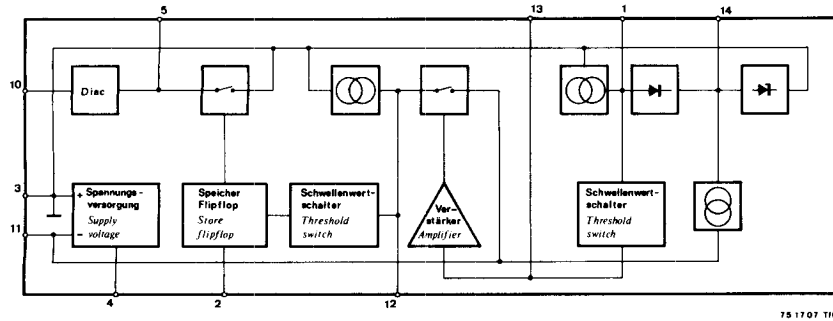


Integrated Trigger, Sensor and remote control circuits

U 112 BA

Triac Control Circuit with Touch Switch

Supply voltage	$-U_S$	21	V
Supply current	$\pm I_{SM}$	< 200	mA
Ignition pulse current	$\pm I_G$	500	mA
Drive current	$\pm I_I$	< 2	mA



Applications:

Two-wire touch switch with continuously adjustable phase control angle for ohmic and inductive loads.

Features:

- Operation through dropping resistor at 110/220 V mains
- Supply current $\leq 200 \mu\text{A}$
- Insensitive to mains noise and short-time interruption
- Preferred position OFF by longer mains failure
- Integrated Triac trigger stage with low breakover current $\leq 100 \mu\text{A}$ and high breakdown voltage between on state and breakover voltage $\geq 10 \text{ V}$
- Remote control of switching function is possible by integrated touch switch U 113 B through two-wire line (phase and control line)
- Interchangeable with mechanical switches without changing the installation

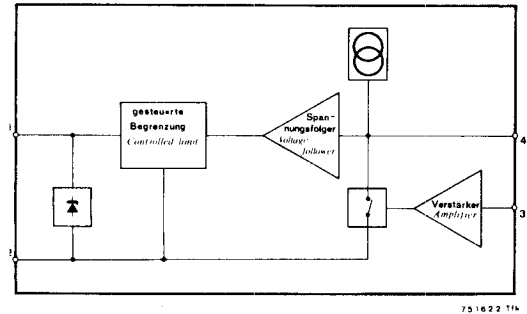
Case:

20 A 14 DIN 41 866
JEDEC MO 001 AA (TO 116)
Dimensions see page 60
Number 14

U 113 B

Touch Switch

Sensor input current	$\pm I_I$	< 2	mA
----------------------	-----------	-----	----



Applications:

Bounce-free sensor switch e.g. Remote control for U 112 B, single ramp generator, constant current source

Features:

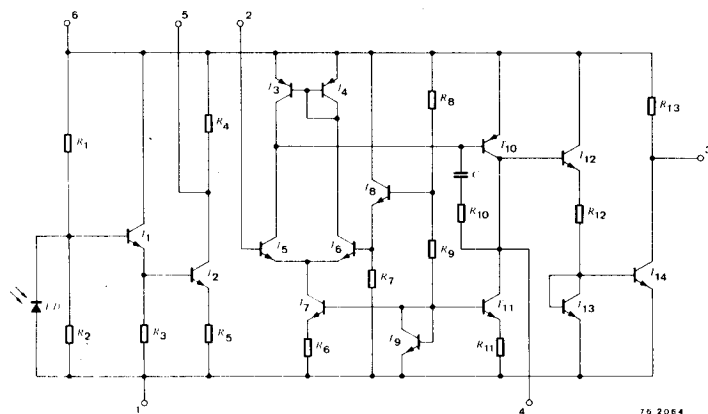
- Functions without mains supply
- The circuit functions even by induced noise pulses
- Minimum need of components

Case:

DIP 4-lead
Dimensions see page 60
Number 9

U 123 P

Photo Pulse Amplifier



Applications:

Pulse light barrier, photo pulse amplifier

Features:

- Integrated operational amplifier and photo detector on one chip
- External controlled photo sensitivity through R_{2-3}
- Quiescent current $I_{SB} = 11 \text{ mA}$
- For $R_{2-3} \geq 50 \text{ k}\Omega$ internal frequency compensation
- No influence on primary illumination up to $E = 15 \text{ klx}$, $f = 100 \text{ Hz}$ (fluorescent lamps)

Case:

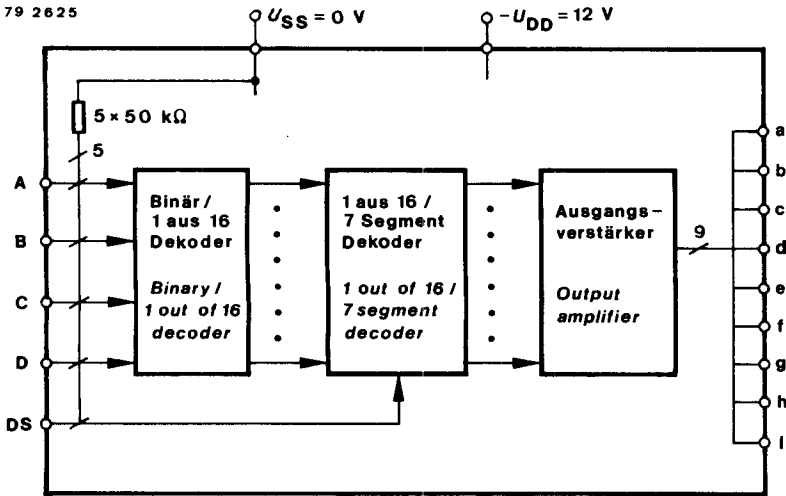
Special case, clear plastic
Dimensions see page 32
Number 41

Integrated Trigger, Sensor and remote control circuits

U 143 M

Driver circuit for LED digits

Supply voltage	$-U_{DD}$	12	V
Quiescent drain current	$-I_{SSB}$	1.5	mA
Reverse output current	$-I_{QR}$	50	μ A
$-U_Q = 13,2 \text{ V}, t_{\text{amb}} = 70^\circ\text{C}, Q_1 \dots Q_9$			



Application:

Control the 7-segment LED digits in TV channel displays

Features:

- Display numbers from 1 to 16
- LED control with R_V
- Output currents $-I_{Q1} \dots -I_{Q9} = 10 \text{ mA}$
- Input code BCD+1
- Pull-up input resistors 50 k Ω
- Separate input for dark switching

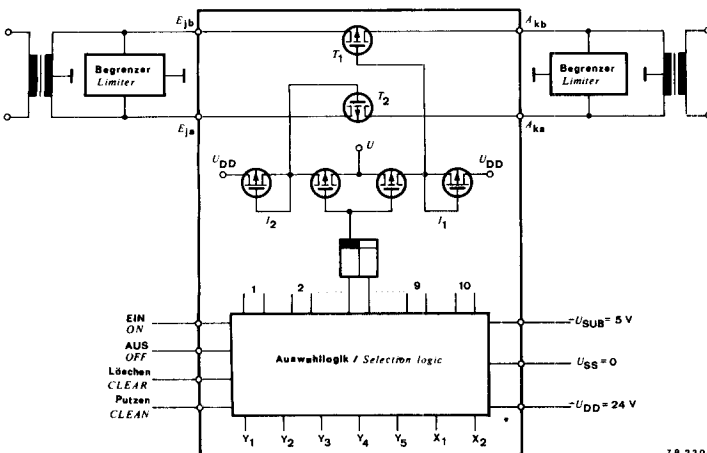
Case:

20 A 16 DIN 41 866
JEDEC MO 001 AC
DIP 16-lead
Dimensions see page 60
Number 7

U 145 M

Cross point switches for PABEX

Supply voltage ranges				
$U_{GG} = 5 \text{ V}$	Pin ..	U_{DD}	+0,3 ... -27,5	V
$-U_{DD} = 24 \text{ V}$	Pin ..	U_{GG}	-0,3 ... + 8,5	V
Supply currents				
	Pin ..	$-I_{DD}$	≤ 12	mA
	Pin ..	I_{GG}	$\leq 14,5$	mA



Features:

- Integrated driver logic
- Balanced switching network
- No flow of dc current in speech path
- TTL drivable
- Internally protected inputs
- Signal inputs are galvanically separated from signal path

Case:

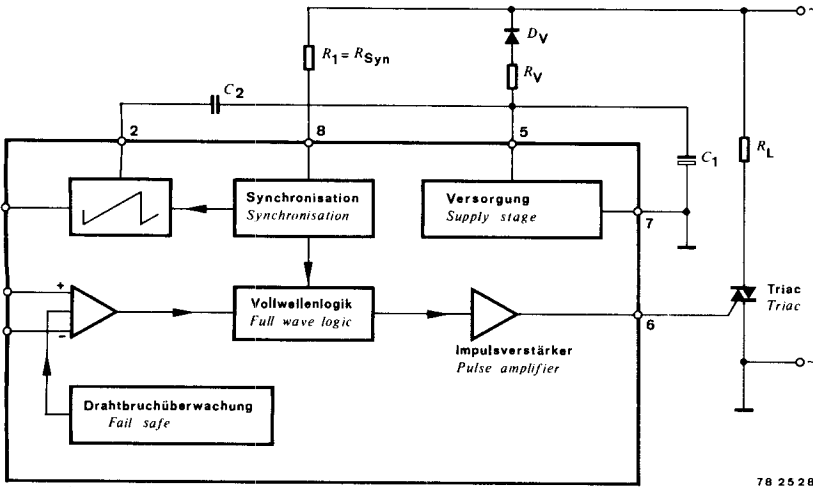
20 B 28 DIN 41 866
JEDEC MO 015 AH
DIP 28-lead
Dimensions see page 60
Number 16

Integrated Trigger, Sensor and remote control circuits

U 217 B

Zero voltage switch

Supply voltage range	$-U_S$	8,6...9,9	V
Supply current	$-I_S$	30	mA
Output pulse	$-i_q$	100	mA



78 2528

Applications:

Triac control in the zero crossing mode for static switch, burst firing, two-point driver proportional driver, power timer, etc. in one and three phase power supply from $16^{2/3}$ up to 400 Hz

Features:

- Simple a.c. or d.c. power supply requirement and definite IC-switching characteristics
- Supply voltage control
- Very few external components
- Full wave drive – no d.c. current component in the load circuit
- Negative output current pulse typ. 100 mA – short circuit protected
- Simple power control
- Ramp generator
- Sensor fail safe

Case:

DIP 8-lead
Dimensions see page 60
Number 12

Applications:

Sensor control stair light time switch with sensor and/or touch remote control and adjustable brightness

Features:

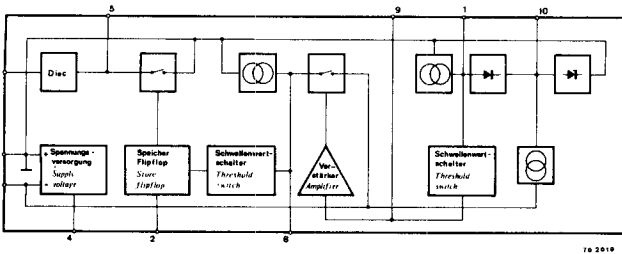
- Operation as two-wire-switch available
- Supply current $\leq 200 \mu\text{A}$
- Switch current $\pm 25 \text{ mA}$
- Sensor input sensitivity $\leq 1 \mu\text{A}$
- Trigger current up to $\pm 500 \text{ mA}$
- Integrated firing stage with $\Delta U = 10 \text{ V}$
- Controllable with U 113 B and/or mechanical keys by using a two-wire-line
- Interchangeable with mechanical switches without changing the installation

Case:

DIP 10-lead
Dimensions see page 60
Number 14

U 221 B

Monolithic Integrated Sensor Stair Case



78 2019

U 225 B

Limiter to limit the voltage on symmetrical two wire speech branches in PABEX

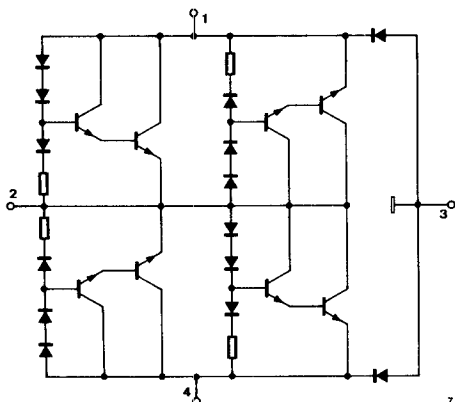
Supply voltage	Pin 3	$-U_S$	$5 \text{ V} \pm 10\%$
Input voltage	Pin 1 or 4	$\pm U_1$	$\leq 3,2$ V
Input current	Pin 1 or 4	I_1	1 ... 20 μA

Features:

- Symmetrical limitation of noise voltage to $\pm 3.2 \text{ V}$
- Simultaneously effective for a- and b- branch
- Low ohmic due to active circuit
- High input current 1.2 A

Case:

20 A 4 DIN 41 866
Dimensions see page 60
Number 9



78 2305

Integrated Trigger, Sensor and remote control circuits

U 250 B - U 327 M - U 334 M - U 427 B

Universal IR remote control (PCM) system for the consumer electronic field, especially for TV sets, radios and additional equipments

U 250 B - Amplifier circuit

Supply voltage range	U_S	10,8 ... 13,2	V
Voltage gain	A_U	1300	dB
Bandwidth $\Delta A_U = -3$ dB	B	8	kHz
Center frequency	f	36	kHz

U 327 M - Transmitter

Supply voltage range	U_S	6 ... 10	V
Quiescent supply current	I_{SB}	< 8	μ A
Clock frequency - ceramic resonator	f_C	485	kHz
Output signal duty cycle	$\frac{t_p}{T}$	$2,75 \cdot 10^{-3}$	

U 334 M - Receiver

Supply voltage range	U_S	10,8 ... 13,2	V
Clock frequency - quartz -	f_C	4,43	MHz

U 427 B

Driver for IR-Transmitter diodes

Supply voltage range	U_S	1...10	V
Control range	U_I	3...10	V
Control current	I_I	1	mA

Features:

- An internal signal limiter without saturation prevents overdriving
- Good ambient light compatibility by separating into a quasi static and a dynamic input
- Steep bandpath characteristic by active filters
- No external resonator circuit
- Accepts extremely steep input pulse slopes by compensating the IR diode capacity

Features:

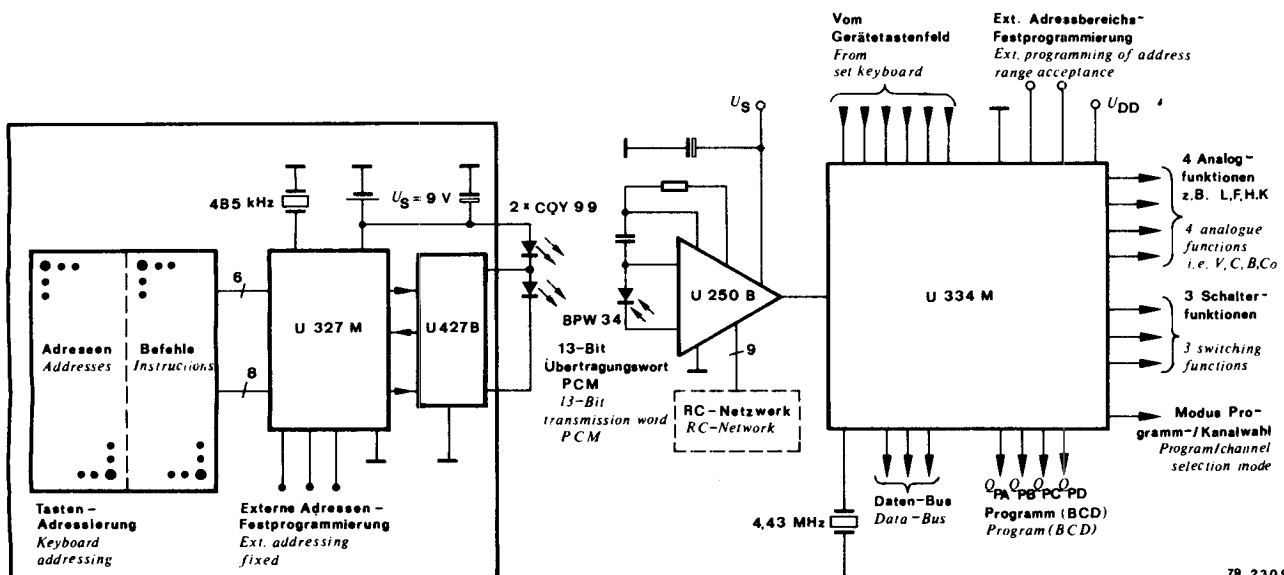
- 8 x 40 commands
- PCM transmission
- High noise immunity by two carrier frequencies
- Minimum number of external components by keyboard scanner
- Low quiescent current consumption by standby circuit
- Low current consumption by energy saving signal coding
- Externally programmable to 8 addresses for TV, radio etc.

Features:

- High noise immunity by two carrier frequencies and several code checks within word reception
- High speed word transmission by noise immune PCM without word comparison
- Keyboard input for 5 x 8 keys for the local set control
- External programming for acceptance of 4 address ranges

Features:

- Current stabilisation starts at $U_S = 1$ V
- Constant current $I_{CM} = 1,5$ A
- Additional switching transistor $I_C = 20$ mA



79 2309

Cases:

U 250 B
20 A 16 DIN 41866
JEDEC MO 001 AC
Dip 16-lead
Dimensions see page 60
Number 7

U 327 M
20 B, 24 DIN 41866
DIP 24-lead
Dimensions see page 60
Number 15

U 334 M
20 B 28 DIN 41866
DIP 28-lead
Dimensions see page 60
Number 16

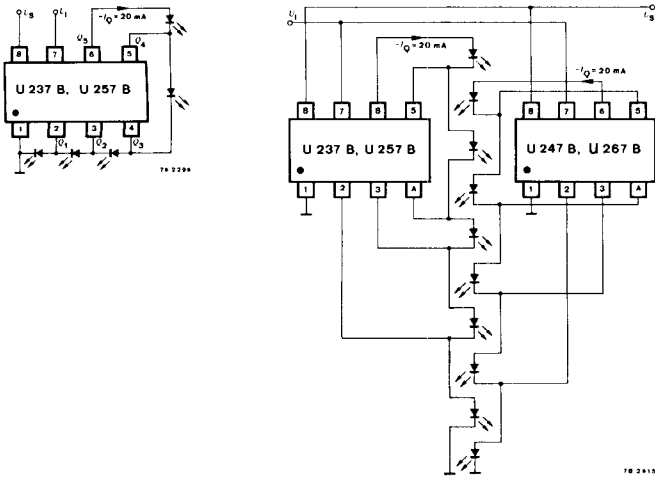
U 427 B
20 A 8 DIN 41866
DIP 8-lead
Dimensions see page 60
Number 12

Integrated Trigger, Sensor and remote control circuits

U 237 B · U 247 B · U 257 B · U 267 B

Driver for LED displays with 5 or 10 diodes

Supply voltage range	Pin 8	U_S	12...25	V
Output current (in series)	Pin 6	I_Q	20	mA
Input threshold distance	Pin 7	ΔU_I	$\leq \pm 30$	mV



Features:

- Wide supply voltage range
- High LED current
- Low power dissipation due to series connection of LED's
- Different colour LED's can be connected arbitrary
- No peripheral components are necessary
- High input resistance
- Eligible between:
 - 5 LED's line with linear scale division with U 237 B or U 247 B
 - 5 LED's line with logarithmic scale division with U 257 B or U 267 B
 - 10 LED's line with linear scale division with U 237 B and U 247 B
 - 10 LED's line with logarithmic scale division with U 257 B and U 267 B

Case:

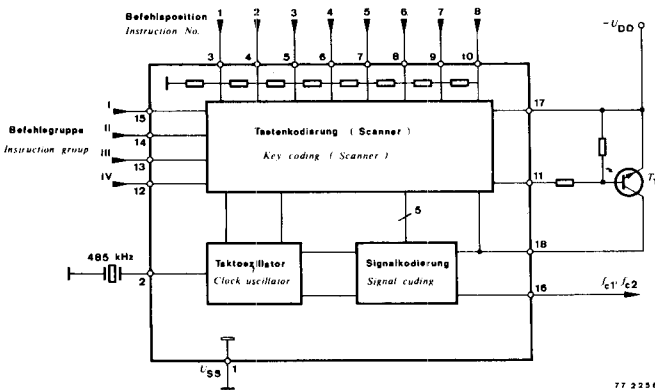
20 A 8 DIN 41 866
DIP 8-lead
Dimensions see page 60
Number 12

U 321 M, U 318 M

IR remote control for TV receivers

U 321 M – Senderschaltung

Supply voltage range	U_S	6,2...10	V
Quiescent supply current	I_{SB}	< 10	μA



Features:

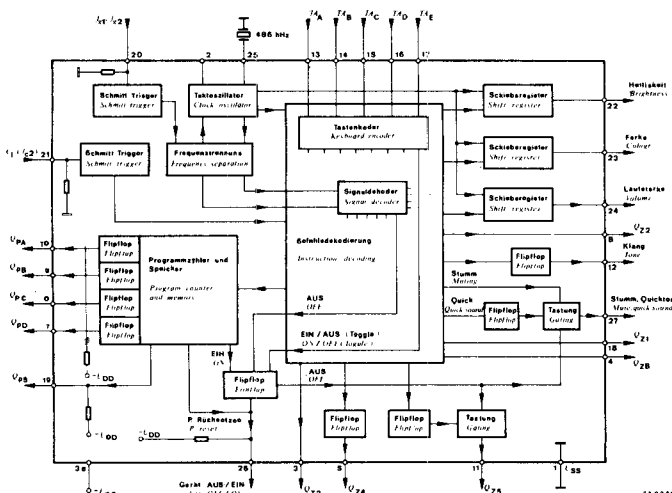
- 32 commands
- High transmission reliability by two carrier frequencies
- Minimum numbers of external components

Case:

20 A 18 DIN 41 866
DIP 18-lead
Dimensions see page 60
Number 10

U 318 M – Receiver

Supply voltage range	$-U_{DD}$	11...13	V
Supply current	I_S	20	mA



Features:

- High transmission reliability by two carrier frequencies
- Integrated separation circuit for the two carriers
- Minimum number of external components

Case:

20 B 28 DIN 41 866
DIP 28-lead
Dimensions see page 60
Number 10

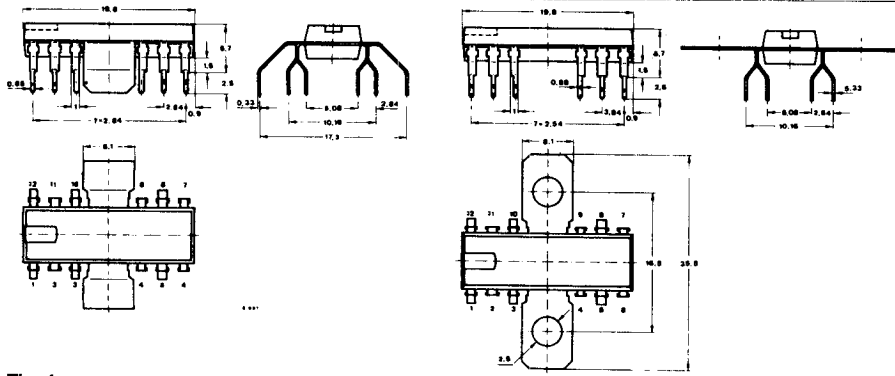


Fig. 1

Fig. 2

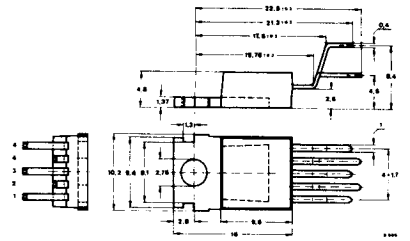


Fig. 3

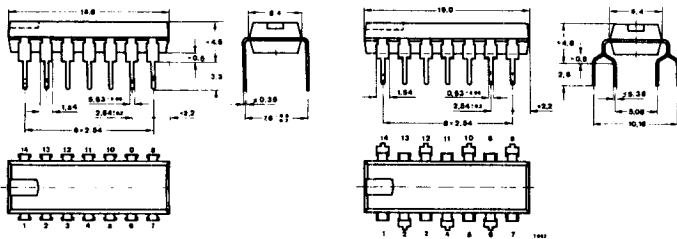


Fig. 4

Fig. 5

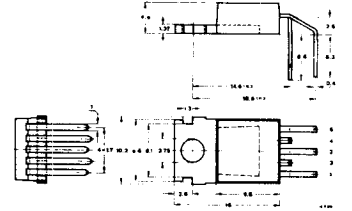


Fig. 6

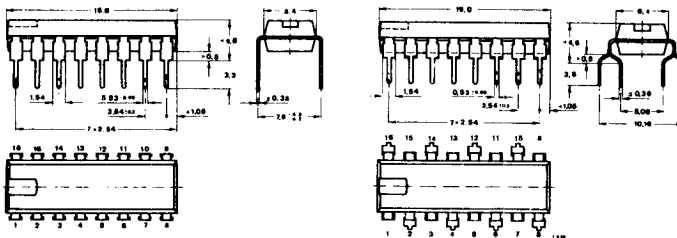


Fig. 7

Fig. 8

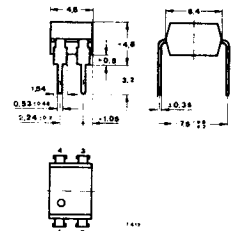


Fig. 9

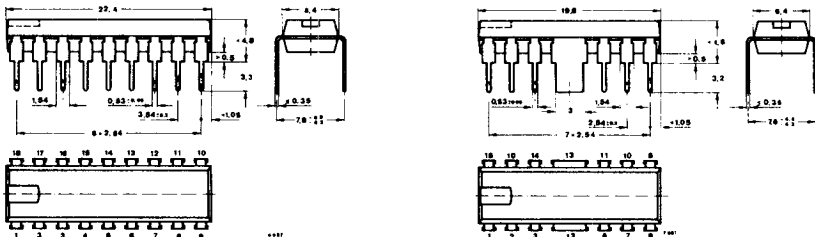


Fig. 10

Fig. 11

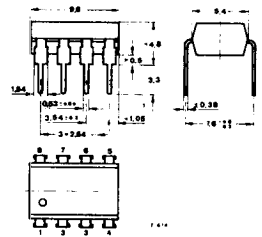


Fig. 12

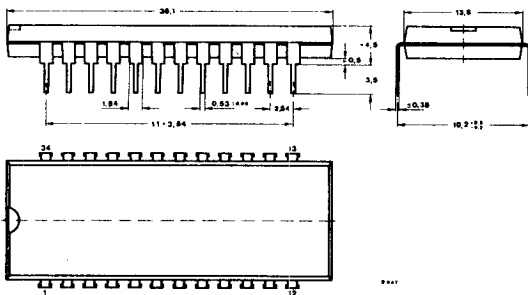


Fig. 13

Fig. 14

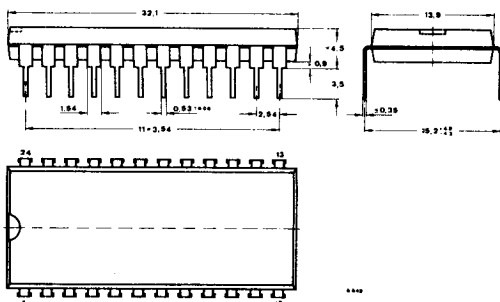
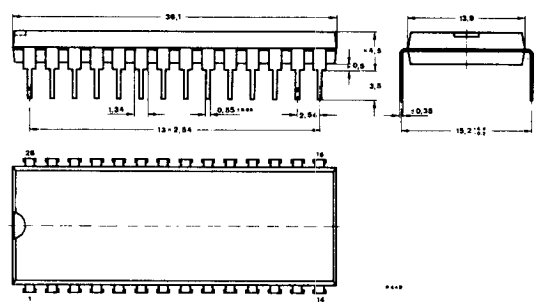


Fig. 15

Fig. 16



AEG-TELEFUNKEN
Serienprodukte
Geschäftsbereich Halbleiter
Export
P. O. B. 1109
D-7100 Heilbronn
Tel.: 88 21 · Telex: 07-28 746

Europa

Belgien

Société Anonyme belge
AEG-TELEFUNKEN
Rue Souveraine 40
B-1050 Bruxelles
Tel.: 512 79 40/513 3970
Telex: 21359

Bulgarien

E. van Hazebrouck KG
Savigny-Str. 37
6000 Frankfurt/Main 1
Tel.: 0611/749041
Telex: 04-11071

Dänemark

AEG DANSK
Electricitets Aktieselskab
Roskildevej 8-10
DK-2620 Albertslund
(København)
Tel.: 64 85 22
Telex: 33122

Finnland

Sähköliikkeiden OY
P. O. B.88
SF-01301 Vantaa 30
Tel. 8381
Telex 12431

Frankreich

AEG-TELEFUNKEN
France S.A.
Department Composants
Electroniques
6, Blvd. du Général Leclerc
Bureau 612
92115 Clichy
Tel. : 7 39 33 10
Telex: 620827

Griechenland

TELEFEX S.A.
101 Thessalonikis Street
Moschaton (58)-Athens
Tel.: 4 8193 46/4 81 79 46/7/8
Telex: 213487

Großbritannien

AEG-TELEFUNKEN (UK) Ltd.
217 Bath Road
Slough SL 1 4AW
Berkshire
Tel.: 87 2101
Telex: 847 541

Italien

AEG-TELEFUNKEN
Societa Italiana per Azioni
Viale Brianza, 20
Casella Postale 47
I-20092 Cinisello Balsamo/Milano
Tel.: 61798
Telex: 31473

Jugoslawien

Interexport
Abteilung 4/15-3-27
P.P. 789
YU-11001 Beograd
Tel.: 620055
Telex: 11240

Luxemburg

AEG-TELEFUNKEN
Luxembourg S.A.R.L.
2, Rue Albert Borschette
Luxembourg-Kirchberg
Tel.: 4368 68
Telex: 2513

Niederlande

AEG-TELEFUNKEN
Nederland N.V.
Aletta Jacobslaan 1-7
Amsterdam C
NL-1000 BV Amsterdam
Tel.: 5 116 333
Telex: 11234

Norwegen

AEG-TELEFUNKEN Norge A.S.
Dag Hammarskjölds vei 47
Postboks 187,
Økern, N-Oslo 5
Tel.: 15 6590
Telex: 19961

Österreich

Österreichische
AEG-TELEFUNKEN G.m.b.H.
Brünner Str. 52
A-1210 Wien
Tel.: 3801
Telex: 74889

Polen

THM EXIMPOL S.A.
ul. Stawki 2/Etage 28
PL-00-950 Warszawa
Tel.: 39 86 54
Telex: 814 640

Portugal

AEG-TELEFUNKEN
Portuguesa S.A.R.L.
Rua Joao Saraiva, 4/6
Apartado 5149
Lisboa 5
Tel.: 891171
Telex: 12173

Schweden

SATTCO AB
Dalvägen 10
S-17136 Solna
Tel.: 830280
Telex: 11588

Schweiz

Elektron AG
Riedhofstrasse 11
CH-8804 Au ZH
Tel.: 7830111
Telex: 75755

Spanien

AEG Ibérica de
Electricidad, S.A.
General Mola 112-114
Apartado 235
Madrid 2
Tel.: 2 62 7600
Telex: 27635

Ungarn

MERCATOR S.A.R.L.
Thököly ut 156
P.O.B. 77
H-1441 Budapest XIV
Tel.: 83 31 77, 83 31 63
Telex: 225046

Afrika :Angola

Sociedade Luso-Alema Lda.
Caixa Postal 1222
Luanda
Tel.: 7 3960/61/62
Telex: 3137

Marokko

ElectRa S.A.
4, Rue Canizares
Casablanca
Tel.: 262861/62
Telex : 22933

Südafrika

International Components
(Pty) Ltd.
P.O.Box 32423
Braamfontein, 2017

Mittel- und SüdamerikaBrasilien

Industria Electronica
STEVENSON S.A.
Caixa Postal 4061
Rua Dom Constantino
Baradas 88
Sao Paulo SP 04134
Tel.: 275 1322
Telex: 1125651

Mexiko

TELEFUNKEN Mexicana
S.A. de C.V.
Poniente 146, No. 730
Aptdto. Postal 75-158
Mexico 16, D.F.
Tel.: 567 9233
Telex: 1775681

Venezuela

AEG-TELEFUNKEN
VENEZOLANA S.A.
Boleita Norte
Calle Vargas
Apartado de Altamira 68912
Caracas 106
Tel.: 361411
Telex: 25342

NordamerikaKanada

Bayly Engineering Ltd.
167, Hunt Street
Ajax Ontario, L1 S1 P6
Tel.: 6838200
Telex: 6981293

USA

AEG-TELEFUNKEN
Corporation
P.O.B. 3800
Route 22-Orr drive
Sommerville, New Jersey 08876
Tel.: 7 229800
Telex: 833409

AsienHongkong

AUDIO MECHANICAL CORP. LTD.
1104 Hang Seng Bank Building
18 Carnavon Road, Tsimshatsui,
Kowloon, Hong Kong
Tel.: 3-688413
Telex: 84524

Indien

NGEF Ltd.
Bank of Baroda
Building
16, Parliament Street
P.O.Box 633
New Delhi 110001
Tel.: 310893
Telex: 2577

Iran

Sherkate Sahami Khass
AEG-TELEFUNKEN Iran
Ave. Karim-Khan Zand
AEG-Building
Teheran
Tel.: 827143-7/830341-5
Telex: 212679

Israel

ELOTAS
Electro-Vista Industries Ltd.
P.O.Box 2659
Tel Aviv
Tel.: 269 930
Telex: 3 2387 IL

Japan

AEG-TELEFUNKEN
Liaison Office
Room 608, Sanno Grand Bldg.
14-2, Nagata-cho, 2 chome
Chiyoda-ku
Tokio 100
Tel.: 5817774/75
Telex: 26181

Singapore

Seow Kuan Co. (Pte.) Ltd.
4-6, Dhoby Ghaut
Singapore 9
Tel.: 30351/52

Türkei

Server Ataman
Istiklal Caddesi 378/4
P.K. Beyoglu 366
Istanbul-Beyoglu
Tel.: 44 2168
Telex: 23412

**Australien und
Ozeanien**Australischer Bund

Amalgamated Wireless
(Australasia) Ltd.
47, York Street
G.P.O.B. 2516
Sydney N.S.W. 2001
Tel.: 20233
Telex: 21515

Neuseeland

AWA
New Zealand Ltd.
Wineera Drive
P.O.B. 830
Porirura, Wellington
Tel.: 75 069
Telex: 31001