Integrated Circuits

Package Information

Tape and Reel Information
A separate 'Tape and Reel' document is also available from the CML website

Latest changes to this document - *June 2011*
Packages Q6 and Q7 added to packages portfolio.

Publication No: D/Packs/25 June 2011

CML Microcircuits Package Information

Legend

Cerdip
ceramic dual-in-line

CLCC
ceramic leaded chip carrier

DIL
dual-in-line

LQFP
low-profile quad flat pack

PDIP
plastic dual-in-line

PLCC
plastic leaded chip carrier

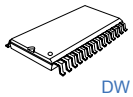
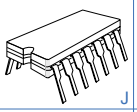
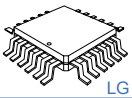
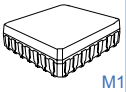
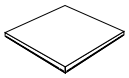
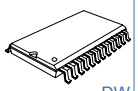
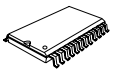
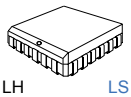
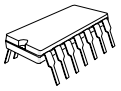
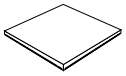
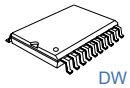
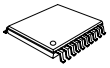
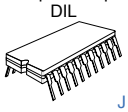
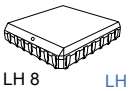
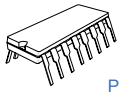
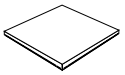
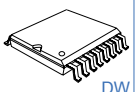
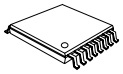
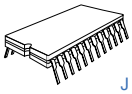
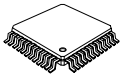
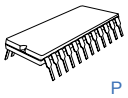
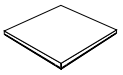
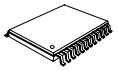
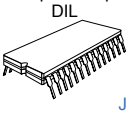
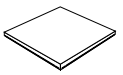
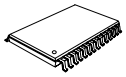
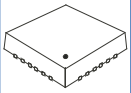
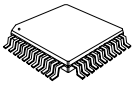
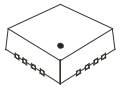
SSOP
shrunk small-outline package

SOIC
small-outline integrated circuit

TQFP
thin quad flat pack

TSSOP
thin shrunk small-outline package

VQFN
very-thin quad flat pack

	D	E	J	L	M	P	Q
1	28-pin SOIC  DW	28-pin TSSOP 	14-pin cerdip DIL  J	24-pin PLCC  LG	28-pin ceramic CLCC  M1	8-pin PDIP  P	64-pin VQFN 
2	24-pin SOIC  DW	24-pin TSSOP  TN	16-pin cerdip DIL  J	24-pin PLCC  LH LS		14-pin PDIP  P	56-pin VQFN 
3	20-pin SOIC  DW	20-pin TSSOP 	22-pin cerdip DIL  J	28-pin PLCC  LH 8 LH		16-pin PDIP  P	48-pin VQFN 
4	16-pin SOIC  DW	16-pin TSSOP 	24-pin cerdip DIL  J	48-pin LQFP 		24-pin PDIP  P	40-pin VQFN 
5	24-pin SSOP  DS		28-pin cerdip DIL  J				32-pin VQFN 
6	28-pin SSOP 			44-pin PLCC 			24-pin VQFN 
7				44-pin LQFP 			16-pin VQFN 
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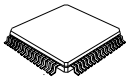
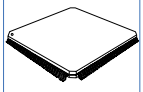
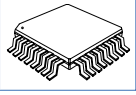
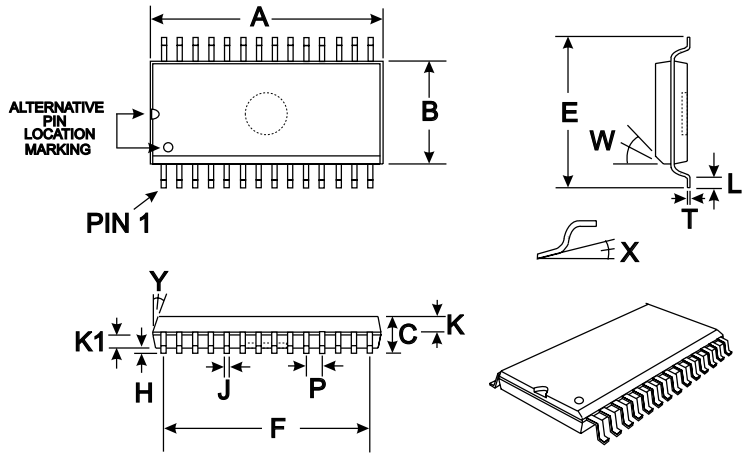
9				64-pin LQFP 			
10				144-pin LQFP 			
11				32-pin TQFP 			

Note: For the purposes of this document, the physical IC connection descriptions of 'lead', 'leadless' and 'pin', etc. are represented by the single term of 'pin'.

CML Microcircuits Package Information .....

28-Pin SOIC, DW (D1)



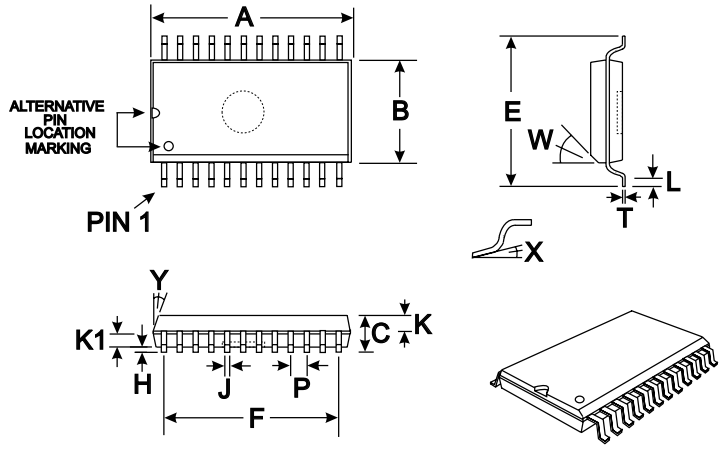
DIM.	MIN.	TYP.	MAX.
* A	0.697 (17.70)		0.711 (18.06)
* B	0.286 (7.26)		0.299 (7.59)
C	0.088 (2.24)		0.105 (2.67)
E	0.390 (9.90)		0.419 (10.64)
F		0.650 (16.51)	
H	0.003 (0.08)		0.020 (0.51)
J	0.013 (0.33)		0.018 (0.46)
K		0.041 (1.04)	
K1		0.041 (1.04)	
L	0.016 (0.41)		0.050 (1.27)
P		0.050 (1.27)	
T	0.009 (0.23)		0.0125 (0.32)
W		45°	
X	0°		10°
Y		7°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees
Co-Planarity of leads within 0.004" (0.1mm)

24-Pin SOIC, DW (D2)



DIM.	MIN.	TYP.	MAX.
* A	0.597 (15.16)		0.613 (15.57)
* B	0.286 (7.26)		0.299 (7.59)
C	0.093 (2.36)		0.105 (2.67)
E	0.390 (9.90)		0.419 (10.64)
F		0.550 (14.1)	
H	0.003 (0.08)		0.020 (0.51)
J	0.013 (0.33)		0.020 (0.51)
K		0.041 (1.04)	
K1		0.041 (1.04)	
L	0.016 (0.41)		0.050 (1.27)
P		0.050 (1.27)	
T	0.009 (0.23)		0.0125 (0.32)
W		45°	
X	0°		10°
Y		7°	

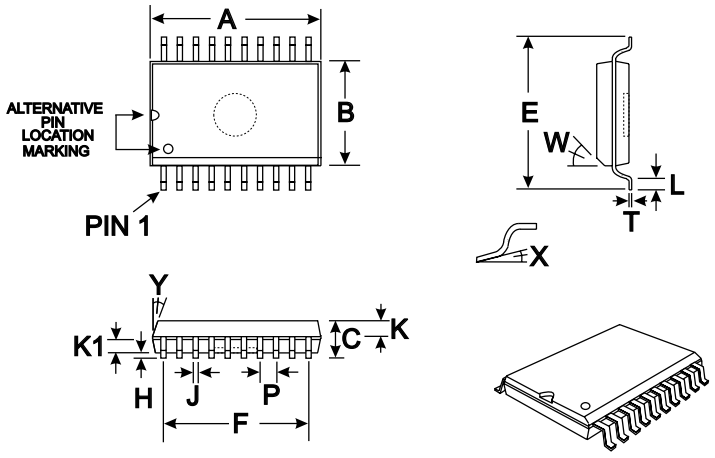
NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees
Co-Planarity of leads within 0.004" (0.1mm)

CML Microcircuits Package Information .....

20-Pin SOIC, DW (D3)



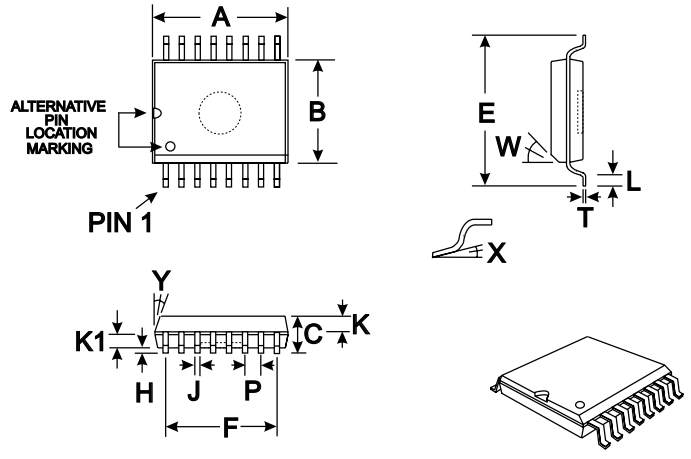
DIM.	MIN.	TYP.	MAX.
* A	0.495 (12.57)		0.510 (12.95)
* B	0.286 (7.26)		0.299 (7.59)
C	0.088 (2.24)		0.105 (2.67)
E	0.390 (9.90)		0.419 (10.64)
F		0.450 (11.43)	
H	0.003 (0.08)		0.020 (0.51)
J	0.013 (0.33)		0.020 (0.51)
K		0.041 (1.04)	
K1		0.041 (1.04)	
L	0.016 (0.41)		0.050 (1.27)
P		0.050 (1.27)	
T	0.009 (0.23)		0.0125 (0.32)
W		45°	
X	0°		10°
Y		7°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees
Co-Planarity of leads within 0.004” (0.1mm)

16-Pin SOIC, DW (D4)



DIM.	MIN.	TYP.	MAX.
* A	0.395 (10.03)		0.413 (10.49)
* B	0.286 (7.26)		0.299 (7.59)
C	0.088 (2.24)		0.105 (2.67)
E	0.390 (9.90)		0.419 (10.64)
F		0.350 (8.89)	
H	0.003 (0.08)		0.020 (0.51)
J	0.013 (0.33)		0.020 (0.51)
K		0.041 (1.04)	
K1		0.041 (1.04)	
L	0.016 (0.41)		0.050 (1.27)
P		0.050 (1.27)	
T	0.009 (0.23)		0.0125 (0.32)
W		45°	
X	0°		10°
Y		7°	

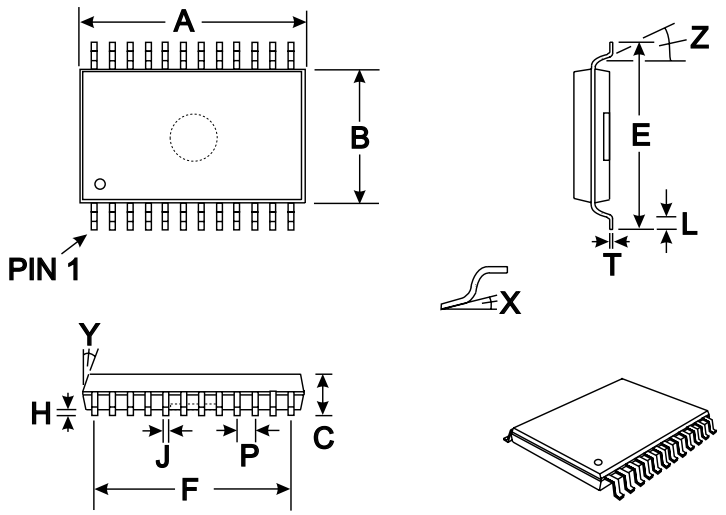
NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees
Co-Planarity of leads within 0.004” (0.1mm)

CML Microcircuits Package Information .....

24-Pin SSOP (D5)



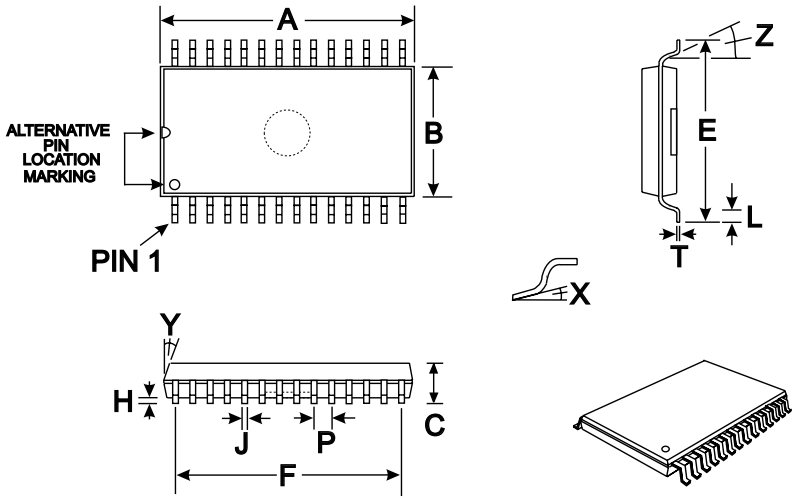
	DIM.	MIN.	TYP.	MAX.
*	A	7.90		8.50
*	B	5.00		5.60
	C	1.67		2.00
	E	7.40		8.20
	F		7.15	
	H	0.05		0.21
	J	0.22		0.38
	L	0.55		0.95
	P		0.65	
	T	0.09		0.25
	X	0°		8°
	Y	7°		9°
	Z	4°		12°

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees
Co-Planarity of leads within 0.1mm

28-Pin SSOP (D6)



	DIM.	MIN.	TYP.	MAX.
*	A	9.90		10.50
*	B	5.00		5.60
	C	1.67		2.00
	E	7.40		8.20
	F		8.45	
	H	0.05		0.21
	J	0.22		0.38
	L	0.55		0.95
	P		0.65	
	T	0.09		0.25
	X	0°		8°
	Y	7°		9°
	Z	4°		12°

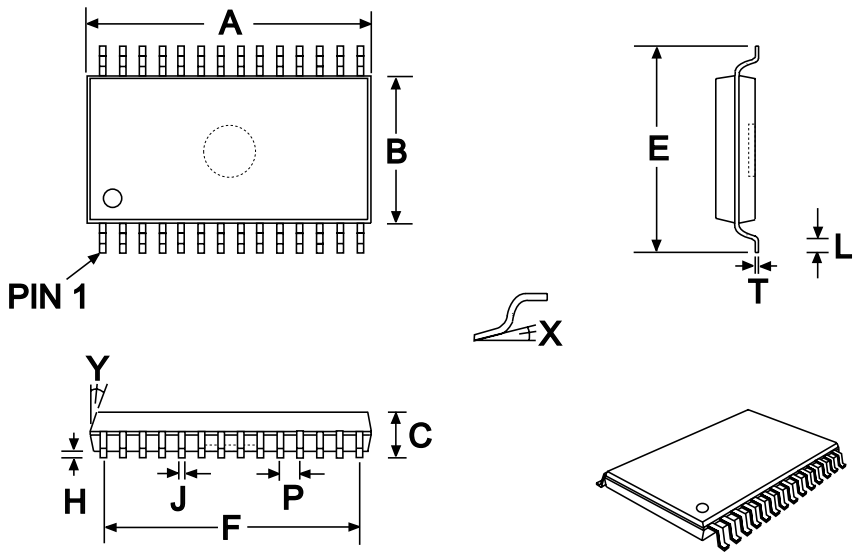
NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees
Co-Planarity of leads within 0.1mm

CML Microcircuits Package Information .....

28-Pin TSSOP (E1)



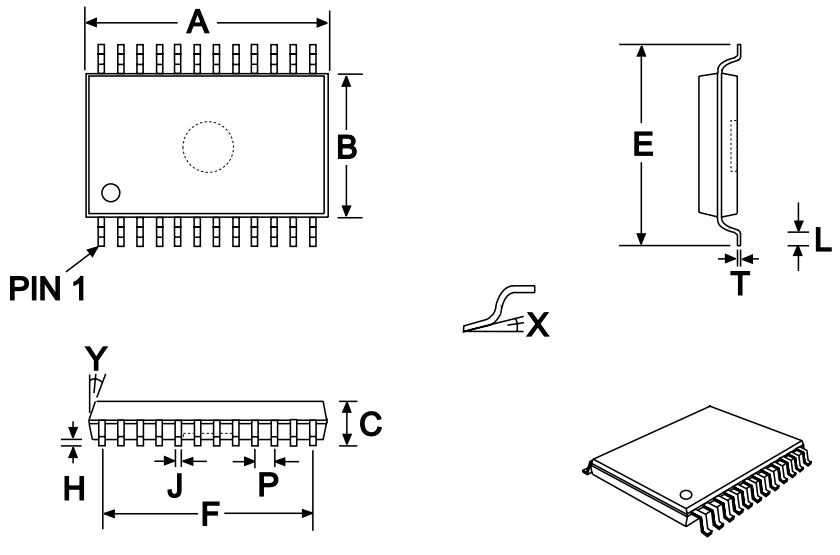
	DIM.	MIN.	TYP.	MAX.
*	A	9.60		9.80
*	B	4.30		4.50
	C	--------		1.20
	E	6.20		6.60
	F		8.45	
	H	0.05		0.15
	J	0.17		0.30
	L	0.45		0.75
	P		0.65	
	T	0.08		0.20
	X	0°		8°
	Y		12°	

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees

24-Pin TSSOP (E2)



	DIM.	MIN.	TYP.	MAX.
*	A	7.70		7.90
*	B	4.30		4.50
	C	--------		1.20
	E	6.20		6.60
	F		7.15	
	H	0.05		0.15
	J	0.17		0.30
	L	0.45		0.75
	P		0.65	
	T	0.08		0.20
	X	0°		8°
	Y		12°	

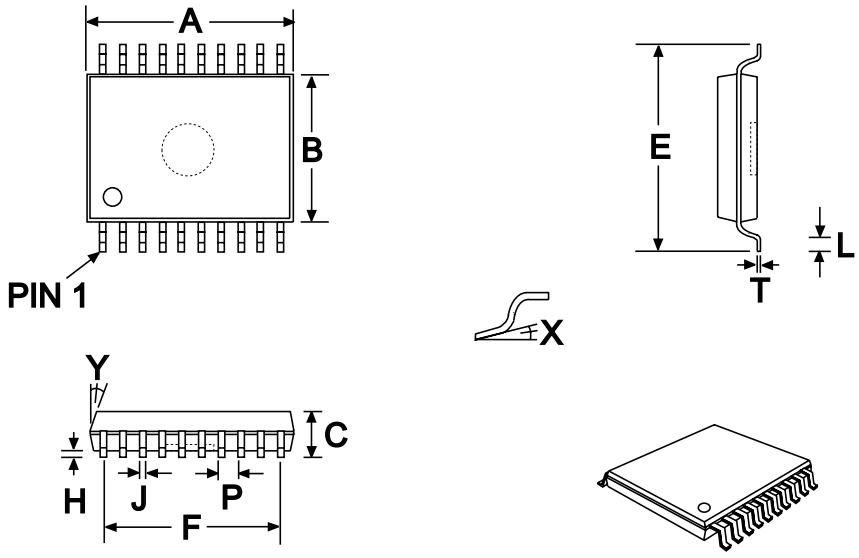
NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees

CML Microcircuits Package Information .....

20-Pin TSSOP (E3)



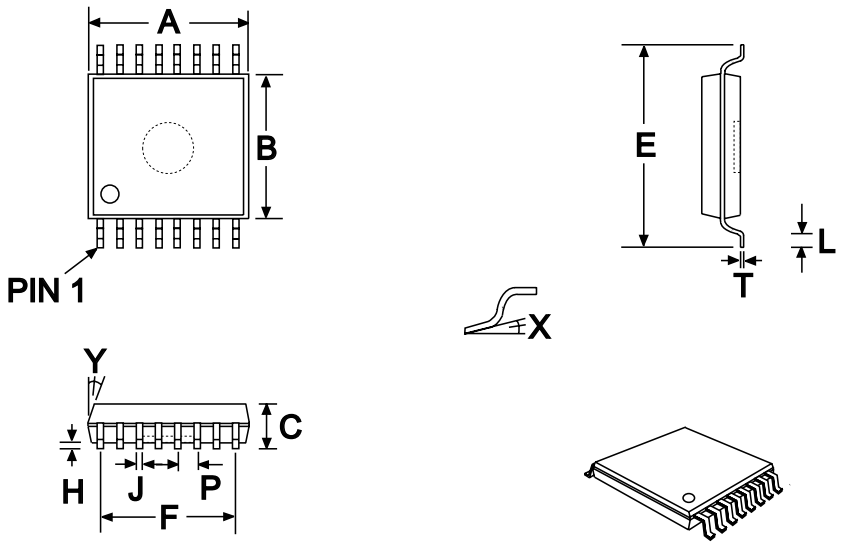
	DIM.	MIN.	TYP.	MAX.
*	A	6.40		6.60
*	B	4.30		4.50
	C	--------		1.20
	E	6.20		6.60
	F		5.85	
	H	0.05		0.15
	J	0.17		0.30
	L	0.45		0.75
	P		0.65	
	T	0.08		0.20
	X	0°		8°
	Y		12°	

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees

16-Pin TSSOP (E4)



	DIM.	MIN.	TYP.	MAX.
*	A	4.90		5.10
*	B	4.30		4.50
	C	--------		1.20
	E	6.20		6.60
	F		4.55	
	H	0.05		0.15
	J	0.17		0.30
	L	0.45		0.75
	P		0.65	
	T	0.08		0.20
	X	0°		8°
	Y		12°	

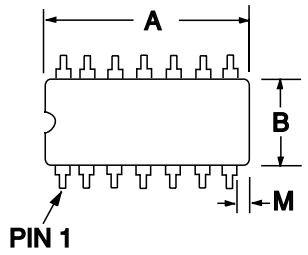
NOTE :

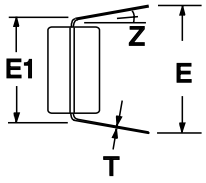
* A & B are reference data and do not include mold deflash or protrusions.

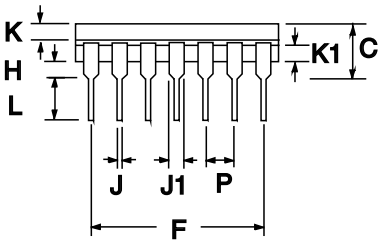
All dimensions in mm
Angles are in degrees

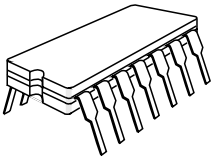
CML Microcircuits Package Information .....

14-Pin Cerdip DIL; J (J1)





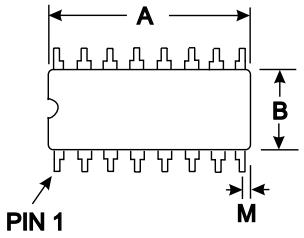


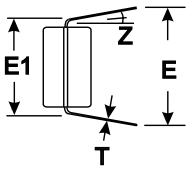


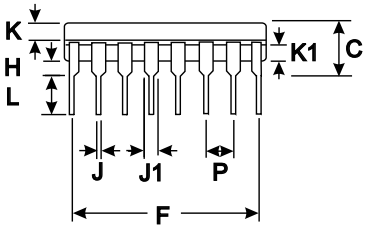
DIM.	MIN.	TYP.	MAX.
A	0.754 (19.15)		0.766 (19.46)
B	0.245 (6.22)		0.251 (6.38)
C	0.165 (4.19)		0.230 (5.84)
E	0.360 (9.14)		0.400 (10.16)
E1	0.305 (7.75)		0.315 (8.00)
F		0.600 (15.24)	
H	0.015 (0.38)		
J		0.018 (0.46)	
J1		0.060 (1.52)	
K	0.075 (1.91)		0.080 (2.03)
K1	0.075 (1.91)		0.080 (2.03)
L	0.115 (2.92)		0.200 (5.08)
M		0.080 (2.03)	
P		0.100 (2.54)	
T		0.010 (0.25)	
Z		8°	

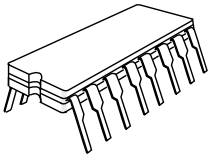
NOTE : All dimensions in inches (mm.)
Angles in degrees

16-Pin Cerdip DIL; J (J2)







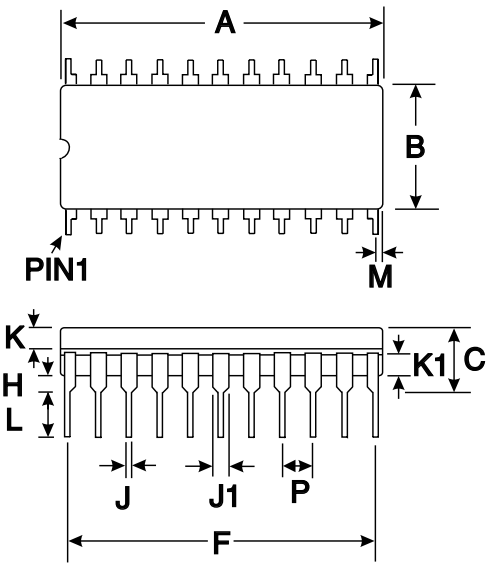


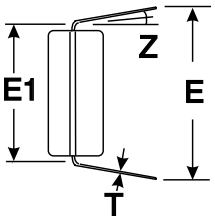
DIM.	MIN.	TYP.	MAX.
A	0.753 (19.13)		0.767 (19.48)
B	0.285 (7.24)		0.291 (7.39)
C	0.144 (3.66)		0.230 (5.84)
E	0.370 (9.40)		0.415 (10.54)
E1	0.300 (7.62)		0.317 (8.05)
F		0.70 (17.78)	
H	0.015 (0.38)		
J		0.018 (0.46)	
J1		0.055 (1.40)	
K	0.053 (1.35)		0.080 (2.03)
K1	0.075 (1.91)		0.080 (2.03)
L	0.115 (2.92)		0.200 (5.08)
M		0.030 (0.76)	
P		0.100 (2.54)	
T		0.010 (0.25)	
Z		10°	

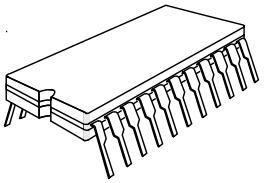
NOTE :
All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

22-Pin Cerdip DIL; J (J3)



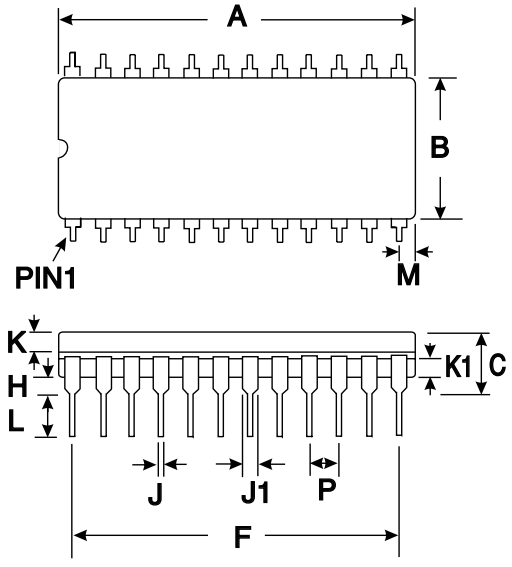


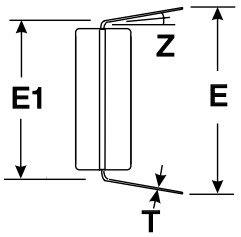


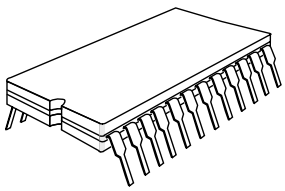
DIM.	MIN.	TYP.	MAX.
A	1.060 (26.92)		1.080 (27.43)
B	0.376 (9.55)		0.384 (9.75)
C	0.165 (4.19)		0.230 (5.84)
E	0.466 (11.84)		0.515 (13.08)
E1	0.408 (10.36)		0.418 (10.62)
F		1.000 (25.40)	
H	0.015 (0.38)		
J		0.018 (0.46)	
J1		0.055 (1.40)	
K	0.058 (1.47)		0.080 (2.03)
K1	0.075 (1.91)		0.080 (2.03)
L	0.115 (2.92)		0.171 (4.34)
M		0.035 (0.89)	
P		0.100 (2.54)	
T		0.010 (0.25)	
Z		9°	

NOTE :
All dimensions in inches (mm.)
Angles are in degrees

24-Pin Cerdip DIL; J (J4)





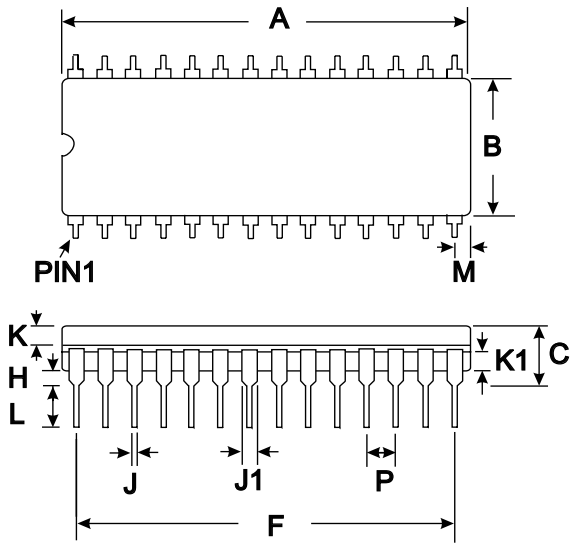


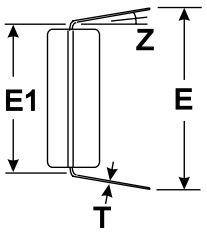
DIM.	MIN.	TYP.	MAX.
A	1.240 (31.50)		1.260 (32.00)
B	0.514 (13.06)		0.583 (14.81)
C	0.165 (4.19)		0.230 (5.84)
E	0.600 (15.24)		0.680 (17.27)
E1	0.594 (15.09)		0.615 (15.62)
F		1.100 (27.94)	
H	0.015 (0.38)		
J		0.018 (0.46)	
J1		0.055 (1.40)	
K	0.050 (1.27)		0.080 (2.03)
K1	0.074 (1.88)		0.080 (2.03)
L	0.115 (2.92)		0.200 (5.08)
M		0.05 (1.27)	
P		0.100 (2.54)	
T		0.010 (0.25)	
Z		6°	

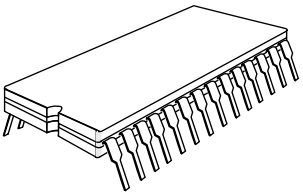
NOTE :
All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

28-Pin Cerdip DIL; J (J5)







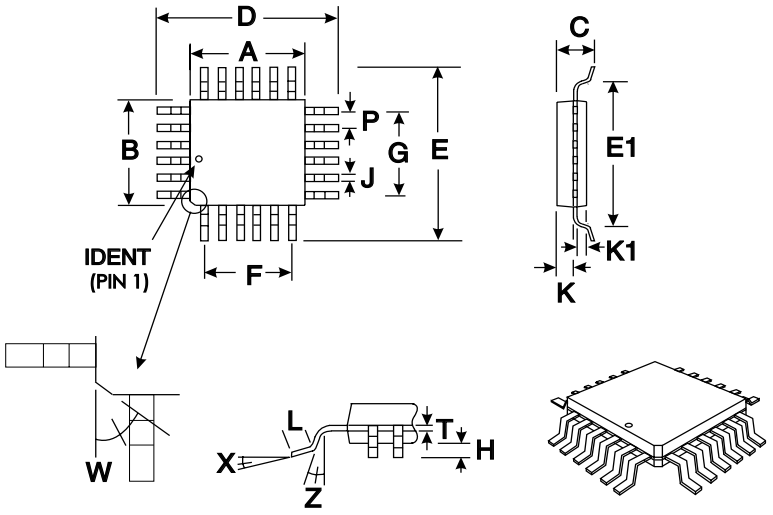
DIM.	MIN.	TYP.	MAX.
A	1.440 (36.58)		1.460 (37.08)
B	0.510 (12.95)		0.530 (13.46)
C	0.165 (4.19)		0.230 (5.84)
E	0.640 (16.26)		0.715 (18.16)
E1	0.608 (15.44)		0.620 (15.75)
F		1.300 (33.02)	
H	0.015 (0.38)		
J		0.018 (0.46)	
J1		0.055 (1.40)	
K	0.050 (1.27)		0.080 (2.03)
K1	0.075 (1.91)		0.080 (2.03)
L	0.115 (2.92)		0.171 (4.34)
M		0.05 (1.27)	
P		0.100 (2.54)	
T		0.010 (0.25)	
Z		6°	

NOTE :

All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

24-Pin PLCC; LG (L1)



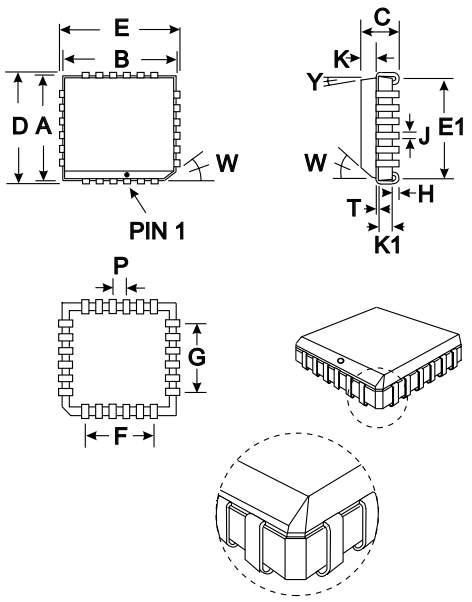
	DIM.	MIN.	TYP.	MAX.
*	A	0.390 (9.91)		0.404 (10.26)
*	B	0.390 (9.91)		0.404 (10.26)
	C			0.098 (2.49)
	D			0.616 (15.65)
	E			0.616 (15.65)
	E1		0.524 (13.31)	
	F		0.250 (6.35)	
	G		0.250 (6.35)	
	H		0.004 (0.10)	
	J	0.018 (0.46)		0.022 (0.56)
	K	0.045 (1.14)		0.055 (1.40)
	K1		0.033 (0.84)	
	L	0.031 (0.80)		0.039 (1.00)
	P	0.049 (1.24)		0.051 (1.30)
	T	0.006 (0.15)		0.009 (0.23)
	W		45°	
	X		6°	
	Z		6°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

24-Pin PLCC; LS (L2)



	DIM.	MIN.	TYP.	MAX.
*	A	0.382 (9.70)		0.409 (10.40)
*	B	0.382 (9.70)		0.409 (10.40)
	C	0.128 (3.25)		0.146 (3.70)
	D	0.417 (10.59)		0.435 (11.05)
	E	0.417 (10.59)		0.435 (11.05)
	E1		0.366 (9.30)	
	F		0.250 (6.35)	
	G		0.250 (6.35)	
	H		0.023 (0.58)	
	J	0.018 (0.46)		0.022 (0.56)
	K		0.048 (1.22)	
	K1		0.059 (1.50)	
	P	0.049 (1.24)		0.051 (1.30)
	T	0.006 (0.15)		0.009 (0.23)
	W	30°		60°
	Y		6°	

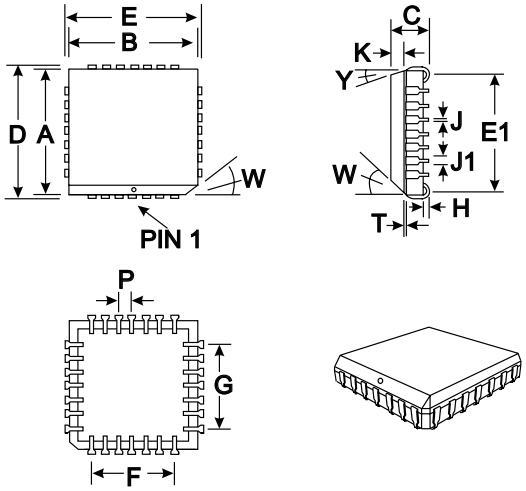
NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

28-Pin PLCC; LH (L3)



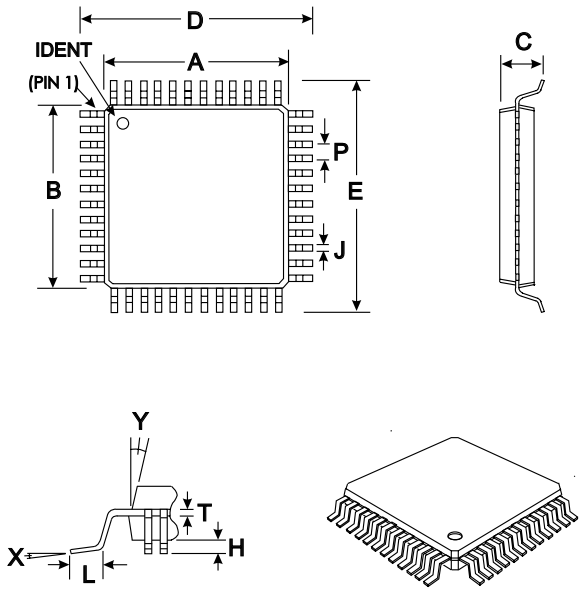
DIM.	MIN.	TYP.	MAX.
* A	0.450 (11.43)		0.456 (11.58)
* B	0.450 (11.43)		0.456 (11.58)
C	0.165 (4.19)		0.180 (4.57)
D	0.470 (11.94)		0.510 (12.95)
E	0.470 (11.94)		0.510 (12.95)
E1		0.423 (10.74)	
F		0.300 (7.62)	
G		0.300 (7.62)	
H	0.020 (0.51)		
J	0.013 (0.33)		0.021 (0.53)
J1		0.031 (0.79)	
K	0.060 (1.52)		0.075 (1.91)
P		0.050 (1.27)	
T		0.010 (0.25)	
W		45°	
Y		7°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

48-Pin LQFP (L4)



DIM.	MIN.	TYP.	MAX.
* A	6.91		7.11
* B	6.91		7.11
C	1.40		1.60
D	8.74		9.25
E	8.74		9.25
H	0.05		0.15
J	0.10		0.28
L	0.35		0.76
P		0.50	
T		0.13	
X	0°		7°
Y	11°		13°

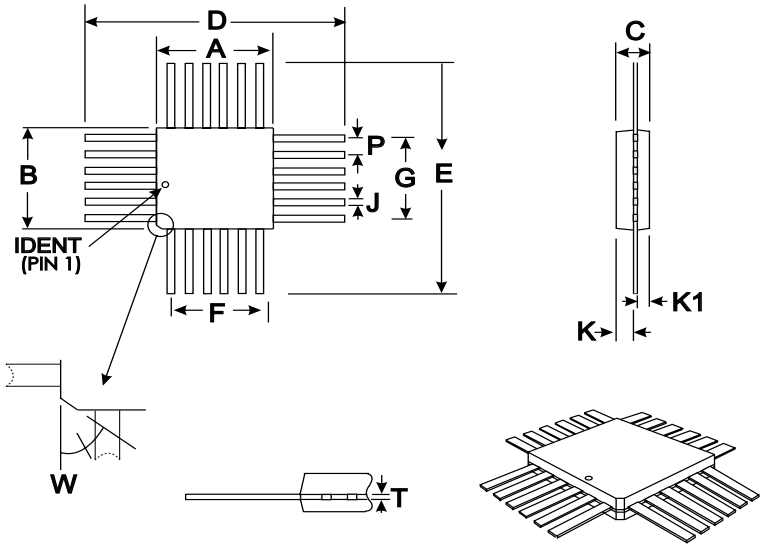
NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees
Co-Planarity of leads within 0.1mm

CML Microcircuits Package Information .....

24-Pin PLCC; L (L5)



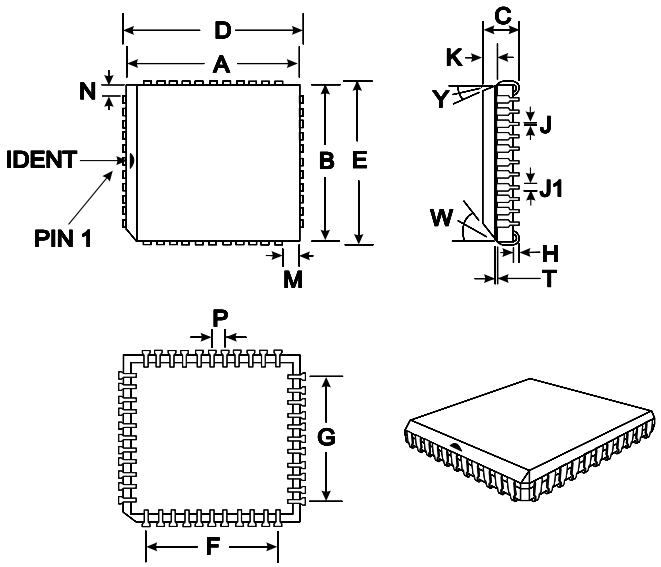
	DIM.	MIN.	TYP.	MAX.
*	A	0.390 (9.91)		0.404 (10.26)
*	B	0.390 (9.91)		0.404 (10.26)
	C	0.087 (2.21)		0.094 (2.39)
	D		0.846 (21.49)	
	E		0.846 (21.49)	
	F		0.250 (6.35)	
	G		0.250 (6.35)	
	J	0.018 (0.46)		0.022 (0.56)
	K	0.045 (1.14)		0.055 (1.40)
	K1		0.033 (0.84)	
	P	0.049 (1.24)		0.051 (1.30)
	T	0.006 (0.15)		0.009 (0.23)
	W		45°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

44-Pin PLCC; LH (L6)



	DIM.	MIN.	TYP.	MAX.
*	A	0.650 (16.51)		0.656 (16.66)
*	B	0.650 (16.51)		0.656 (16.66)
	C			0.180 (4.57)
	D	0.685 (17.40)		0.695 (17.65)
	E	0.685 (17.40)		0.695 (17.65)
	F		0.500 (12.7)	
	G		0.500 (12.7)	
	H	0.020 (0.51)		
	J	0.013 (0.33)		0.021 (0.53)
	J1		0.029 (0.74)	
	K		0.070 (1.78)	
	M		0.062 (1.57)	
	N		0.062 (1.57)	
	P		0.050 (1.27)	
	T		0.010 (0.25)	
	W		0.30 (7.62) x 45°	
	Y		7°	

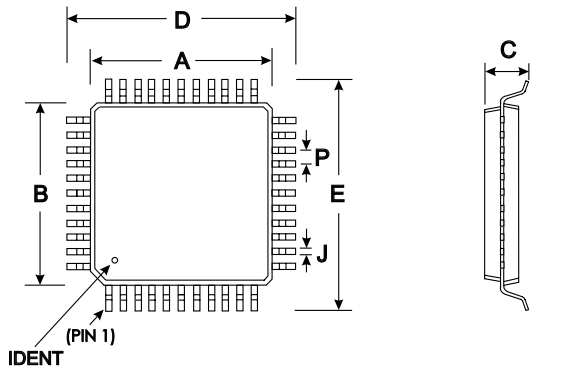
NOTE :

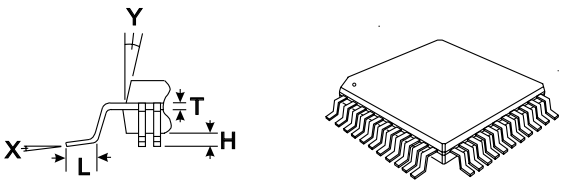
* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

44-Pin LQFP; L7





	DIM.	MIN.	TYP.	MAX.
*	A	9.90		10.11
*	B	9.90		10.11
	C	1.40		1.60
	D	11.80		12.20
	E	11.80		12.20
	H	0.04		0.16
	J	0.24		0.45
	L	0.40		0.75
	P		0.80	
	T	0.09		0.20
	X	0°		7°
	Y	10°		14°

NOTE :

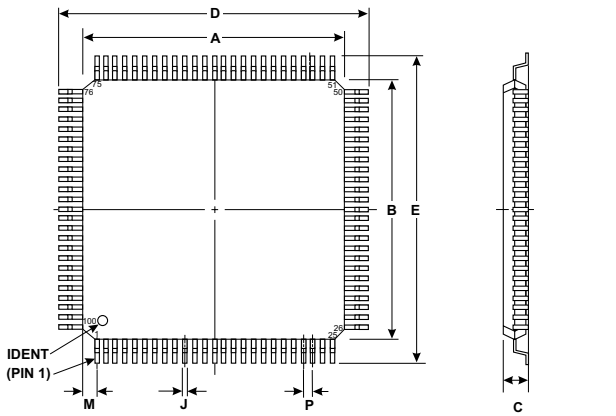
* A & B are reference data and do not include mold deflash or protrusions.

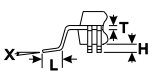
All dimensions in mm

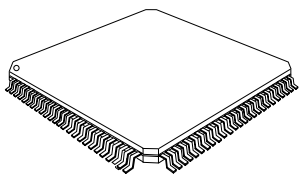
Angles in degrees

Co-Planarity of leads within 0.1mm

100-Pin LQFP; L8







	DIM.	MIN.	TYP.	MAX.
*	A	13.8		14.2
*	B	13.8		14.2
	C	1.40		1.60
	D	15.8		16.2
	E	15.8		16.2
	H	0.05		0.15
	J	0.17		0.27
	L	0.45		0.75
	M		1.00	
	P		0.50	
	T	0.09		0.20
	X	0°		7°

NOTES : All dimensions in mm

Angles in degrees

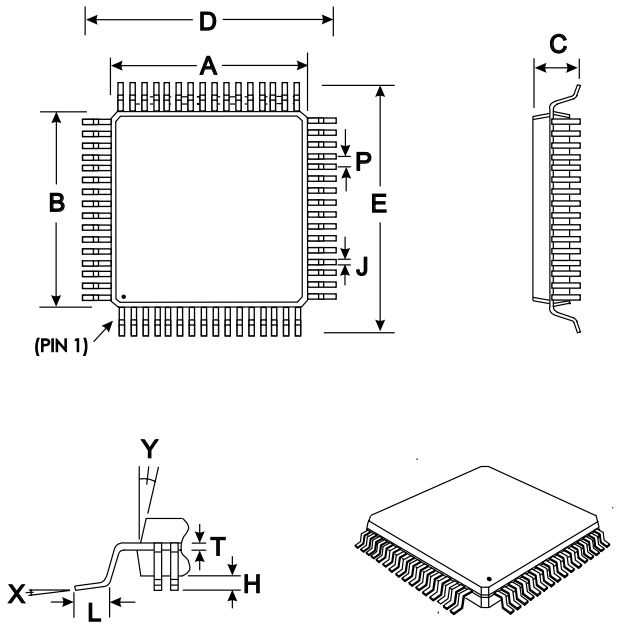
* A & B are reference data and do not include mold deflash or protrusions.

Each lead centerline is located within 0.08 mm of its true position (T.P.) at maximum material condition

Co-Planarity of leads within 0.1mm

CML Microcircuits Package Information .....

64-Pin LQFP; L9



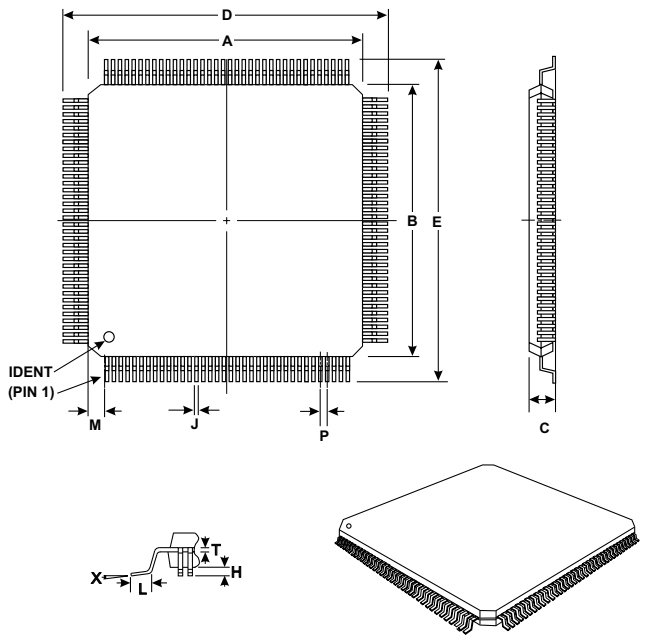
	DIM.	MIN.	TYP.	MAX.
*	A	9.80		10.20
*	B	9.80		10.20
	C	1.40		1.60
	D	11.80		12.20
	E	11.80		12.20
	H	0.05		0.15
	J	0.17		0.27
	L	0.45		0.75
	P		0.50	
	T	0.09		0.20
	X	0°		7°
	Y	11°		13°

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees
Co-Planarity of leads within 0.1mm

144-Pin LQFP; L10



	DIM.	MIN.	TYP.	MAX.
*	A	19.8		20.2
*	B	19.8		20.2
	C	1.40		1.60
	D	21.8		22.2
	E	21.8		22.2
	H	0.05		0.15
	J	0.17		0.27
	L	0.45		0.75
	M		1.00	
	P		0.50	
	T	0.09		0.20
	X	0°		7°

NOTES : All dimensions in mm
Angles in degrees

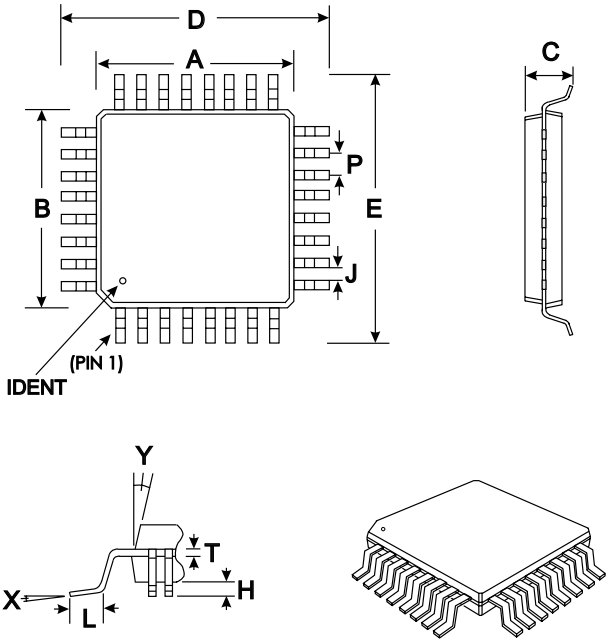
* A & B are reference data and do not include mold deflash or protrusions.

Each lead centerline is located within 0.08 mm of its true position (T.P.) at maximum material condition

Co-Planarity of leads within 0.1mm

CML Microcircuits Package Information .....

32-Pin TQFP; L11



	DIM.	MIN.	TYP.	MAX.
*	A	6.80		7.20
*	B	6.80		7.20
	C	1.00		1.20
	D	8.80		9.20
	E	8.80		9.20
	H	0.05		0.15
	J	0.30		0.45
	L	0.45		0.75
	P		0.80	
	T	0.09		0.20
	X	0°		7°
	Y	11°		13°

NOTE :

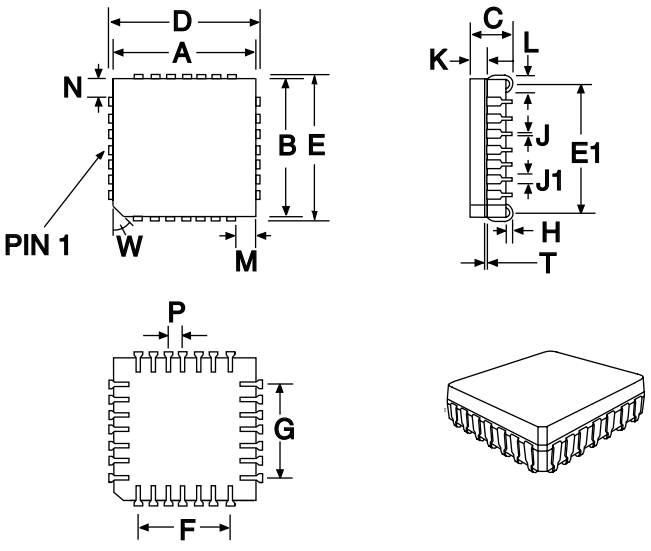
* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm

Angles in degrees

Co-Planarity of leads within 0.1mm

28-Pin Ceramic CLCC; M1



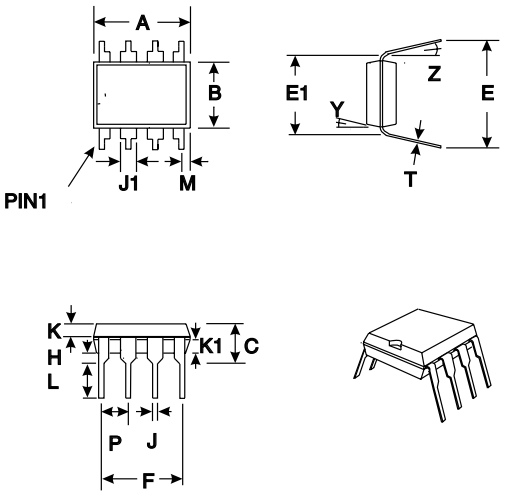
DIM.	MIN.	TYP.	MAX.
A	0.447 (11.35)		0.457 (11.6)
B	0.447 (11.35)		0.457 (11.6)
C	0.160 (4.07)		0.170 (4.32)
D	0.474 (12.05)		0.490 (12.45)
E	0.474 (12.05)		0.490 (12.45)
E1	0.395 (10.03)		0.426 (10.82)
F		0.300 (7.62)	
G		0.300 (7.62)	
H	0.037 (0.94)		0.044 (1.12)
J		0.019 (0.48)	
J1		0.028 (0.71)	
K		0.065 (1.65)	
L		0.065 (1.65)	
M	0.060 (1.5)		0.065 (1.65)
N	0.060 (1.5)		0.065 (1.65)
P		0.05 (1.27)	
T		0.023 (0.59)	
W		45°	

NOTE : All dimensions in inches (mm.)

Angles in degrees

CML Microcircuits Package Information .....

8-Pin PDIP; P (P1)



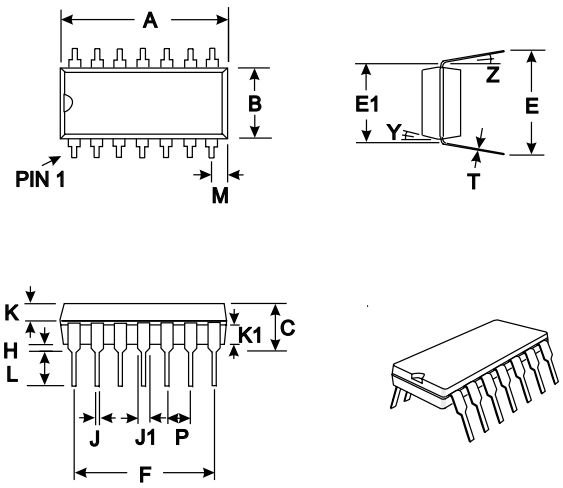
DIM.	MIN.	TYP.	MAX.
* A	0.346 (8.790)		0.400 (10.16)
* B	0.240 (6.10)		0.260 (6.60)
C	0.145 (3.68)		0.200 (5.08)
E	0.300 (7.62)		0.390 (9.91).
E1	0.290 (7.37)		0.325 (8.25)
F		0.30 (7.62)	
H		0.030 (0.76)	
J	0.015 (0.38)		0.023 (0.58)
J1	0.045 (1.14)		0.065 (1.65)
K		0.062 (1.58)	
K1		0.062 (1.58)	
L	0.121 (3.07)		0.150 (3.81)
M		0.029 (0.74)	
P		0.100 (2.54)	
T	0.008 (0.20)		0.015 (0.38)
Y		7°	
Z		5°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

14-Pin PDIP; P (P2)



DIM.	MIN.	TYP.	MAX.
* A	0.740 (18.80)		0.810 (20.57)
* B	0.240 (6.10)		0.260 (6.60)
C	0.127 (3.23)		0.200 (5.08)
E	0.300 (7.62)		0.390 (9.91).
E1	0.290 (7.37)		0.325 (8.26)
F		0.60 (15.24)	
H	0.015 (0.38)		0.07 (1.78)
J	0.015 (0.38)		0.023 (0.58)
J1	0.045 (1.14)		0.065 (1.65)
K	0.056 (1.42)		0.064 (1.63)
K1	0.056 (1.42)		0.064 (1.63)
L	0.121 (3.07)		0.150 (3.81)
M		0.072 (1.83)	
P		0.100 (2.54)	
T	0.008 (0.20)		0.015 (0.38)
Y		7°	
Z		5°	

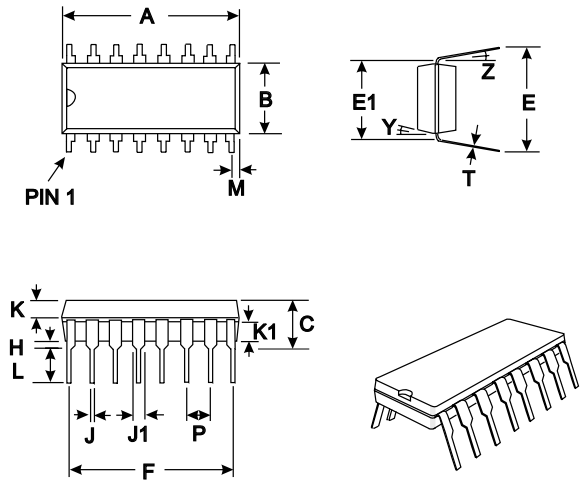
NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

16-Pin PDIP; P (P3)



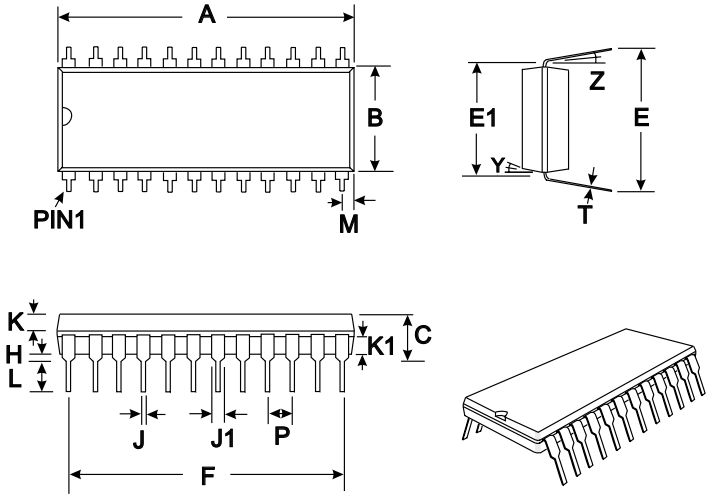
DIM.	MIN.	TYP.	MAX.
* A	0.740 (18.80)		0.810 (20.57)
* B	0.240 (6.10)		0.262 (6.65)
C	0.127 (3.23)		0.200 (5.08)
E	0.300 (7.62)		0.390 (9.91).
E1	0.290 (7.37)		0.325 (8.26)
F		0.70 (17.78)	
H	0.015 (0.38)		0.040 (1.02)
J	0.015 (0.38)		0.023 (0.58)
J1	0.040 (1.02)		0.065 (1.65)
K	0.056 (1.42)		0.064 (1.63)
K1	0.056 (1.42)		0.064 (1.63)
L	0.121 (3.07)		0.150 (3.81)
M		0.028 (0.71)	
P		0.100 (2.54)	
T	0.008 (0.20)		0.015 (0.38)
Y		7°	
Z		5°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

24-Pin PDIP; P (P4)



DIM.	MIN.	TYP.	MAX.
* A	1.200 (30.48)		1.270 (32.26)
* B	0.500 (12.70)		0.555 (14.10)
C	0.142(3.61)		0.220 (5.59)
E	0.600 (15.24)		0.670 (17.02)
E1	0.590 (14.99)		0.625 (15.88)
F		1.10 (27.94)	
H	0.015 (0.38)		0.045 (1.14)
J	0.015 (0.38)		0.023 (0.58)
J1	0.040 (1.02)		0.065 (1.65)
K	0.066 (1.68)		0.074 (1.88)
K1	0.060 (1.52)		0.074 (1.88)
L	0.121 (3.07)		0.160 (4.06)
M		0.180 (4.58)	
P		0.100 (2.54)	
T	0.008 (0.20)		0.015 (0.38)
Y		7°	
Z		4°	

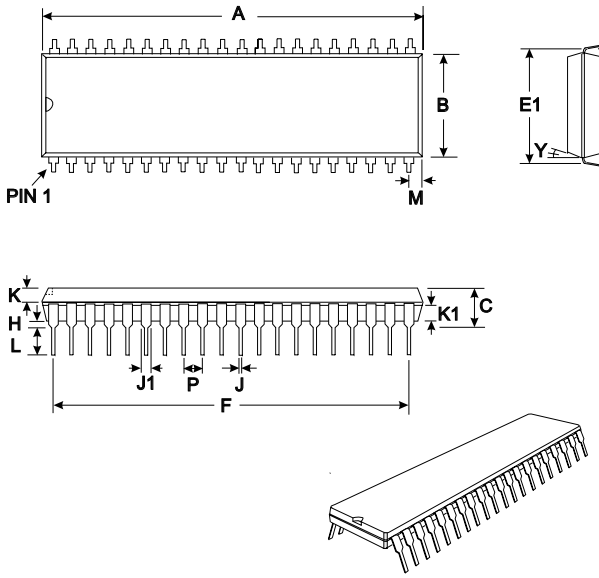
NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

40-Pin PDIP; P (P5)



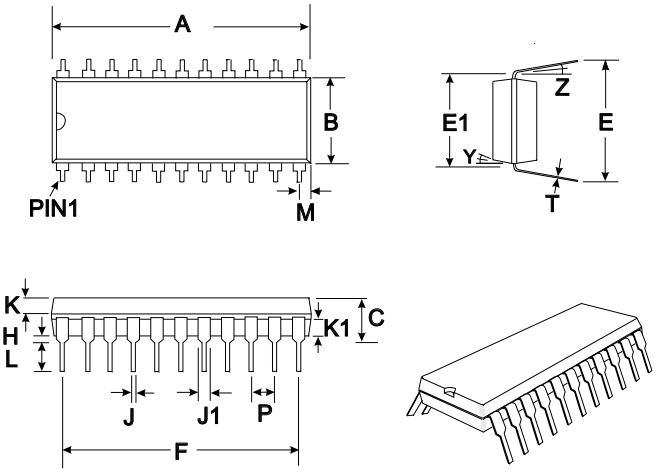
DIM.	MIN.	TYP.	MAX.
* A	2.040 (51.82)		2.060 (52.32)
* B	0.530 (13.46)		0.555 (14.10)
C	0.146 (3.71)		0.195 (4.95)
E	0.600 (15.24)		0.670 (17.02)
E1	0.595 (15.11)		0.625 (15.88)
F		1.90 (48.26)	
H	0.015 (0.38)		0.045 (1.14)
J		0.018 (0.46)	
J1		0.050 (1.27)	
K	0.066 (1.68)		0.074 (1.88)
K1	0.060 (1.52)		0.074 (1.88)
L	0.121 (3.07)		0.150 (3.81)
M		0.070 (1.79)	
P		0.100 (2.54)	
T	0.008 (0.20)		0.015 (0.38)
Y		7°	
Z		3°	

NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

22-Pin PDIP (P6)



DIM.	MIN.	TYP.	MAX.
* A	1.080 (27.43)		1.10 (27.94)
* B	0.330 (8.38)		0.360 (9.14)
C	0.146 (3.71)		0.200 (5.08)
E	0.388 (9.85)		0.490 (12.44)
E1	0.390 (9.90)		0.420 (10.67)
F		1.0 (25.40)	
H	0.020 (0.51)		0.045 (1.14)
J	0.015 (0.38)		0.022 (0.56)
J1	0.040 (1.02)		0.065 (1.65)
K	0.066 (1.68)		0.076 (1.93)
K1	0.060 (1.52)		0.076 (1.93)
L	0.114 (2.89)		0.162 (4.11)
M		0.047 (1.14)	
P		0.100 (2.54)	
T	0.006 (0.15)		0.015 (0.38)
Y		20°	
Z		4°	

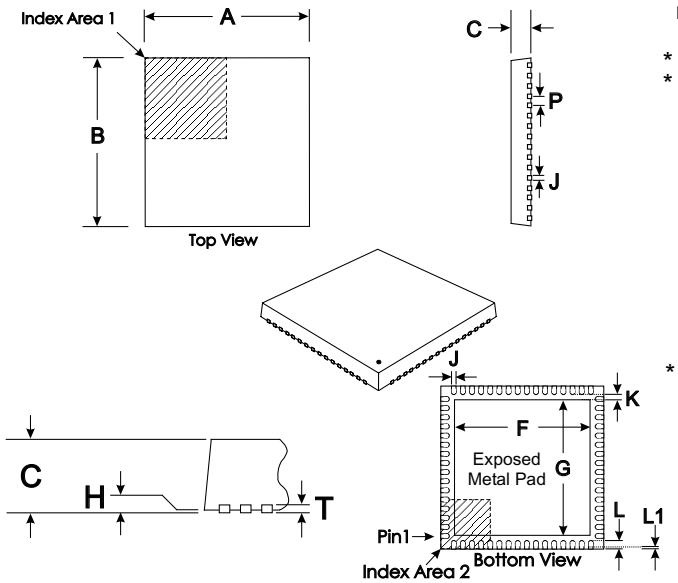
NOTE :

* A & B are reference datum's and do not include mold deflash or protrusions.

All dimensions in inches (mm.)
Angles are in degrees

CML Microcircuits Package Information .....

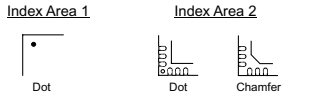
64-Pin VQFN (Q1)



DIM.	MIN.	TYP.	MAX.
* A		9.00 BSC	
* B		9.00 BSC	
C	0.80	0.90	1.00
F	7.00		7.80
G	7.00		7.80
H	0.00		0.05
J	0.18	0.25	0.30
K	0.20		
L	0.30	0.40	0.50
L1	0		0.15
P		0.50	
T		0.20	

NOTE :
* A & B are reference data and do not include mold deflash or protrusions.

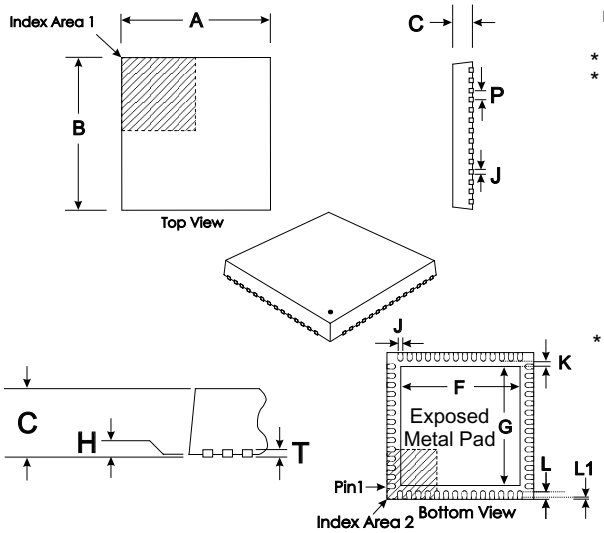
All dimensions in mm
Angles are in degrees



Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required

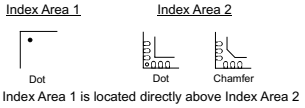
56-Pin VQFN (Q2)



DIM.	MIN.	TYP.	MAX.
* A		8.00 BSC	
* B		8.00 BSC	
C	0.80	0.90	1.00
F	4.25		6.25
G	4.25		6.25
H	0.00		0.05
J	0.18	0.25	0.30
K	0.20		
L	0.30	0.40	0.50
L1	0		0.15
P		0.50	
T		0.20	

NOTE :
* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees

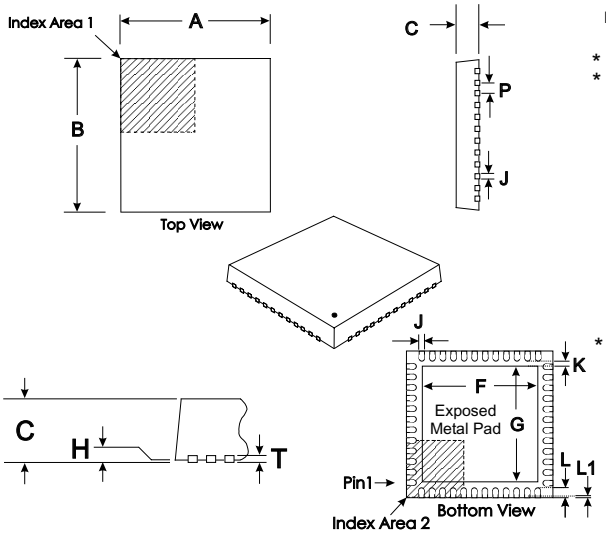


Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required

CML Microcircuits Package Information .....

48-Pin VQFN (Q3)



DIM.	MIN.	TYP.	MAX.
* A		7.00 BSC	
* B		7.00 BSC	
C	0.80	0.90	1.00
F	4.60		5.65
G	4.60		5.65
H	0.00		0.05
J	0.18	0.25	0.30
K	0.20		
L	0.30	0.40	0.50
L1	0		0.15
P		0.50	
T		0.20	

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

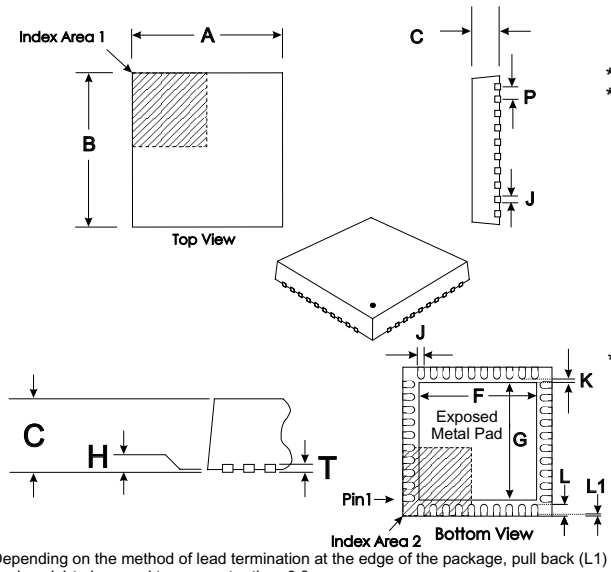
All dimensions in mm
Angles are in degrees

Index Area 1 Index Area 2

Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required

40-Pin VQFN (Q4)



DIM.	MIN.	TYP.	MAX.
* A		6.00 BSC	
* B		6.00 BSC	
C	0.80	0.90	1.00
F	2.75		4.30
G	2.75		4.30
H	0.00		0.05
J	0.18	0.25	0.30
K	0.20		
L	0.30	0.40	0.50
L1	0		0.15
P		0.50	
T		0.20	

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees

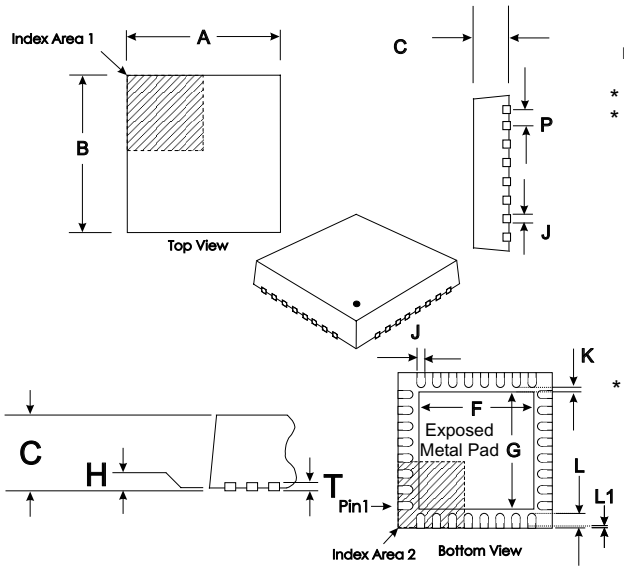
Index Area 1 Index Area 2

Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required

CML Microcircuits Package Information .....

32-Pin VQFN (Q5)

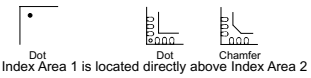


	DIM.	MIN.	TYP.	MAX.
*	A		5.00 BSC	
*	B		5.00 BSC	
	C	0.80	0.90	1.00
	F	3.00		3.80
	G	3.00		3.80
	H	0.00		0.05
	J	0.18	0.25	0.30
	K	0.20		
	L	0.30		0.55
	L1	0		0.15
	P		0.50	
	T		0.20	

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

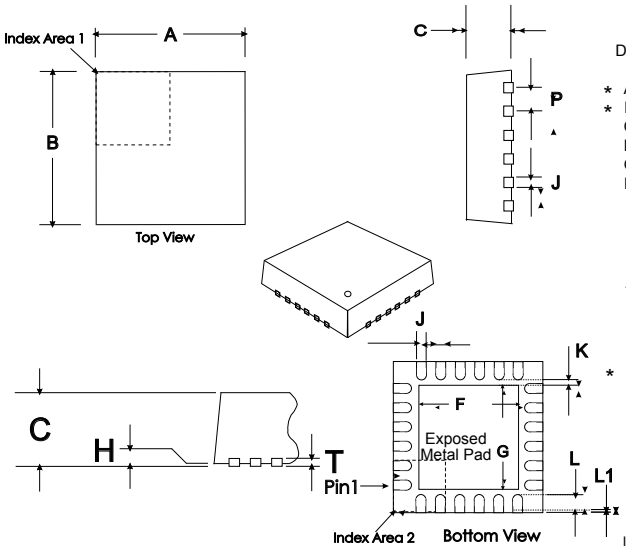
All dimensions in mm
Angles are in degrees



Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required

24-Pin VQFN (Q6)

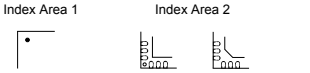


	DIM.	MIN.	TYP.	MAX.
*	A		4.00 BSC	
*	B		4.00 BSC	
	C	0.80	0.90	1.00
	F	2.55		2.80
	G	2.55		2.80
	H	0.00		0.05
	J	0.18	0.25	0.30
	K	0.20		
	L	0.25		0.50
	L1	0		0.15
	P		0.50	
	T		0.20	

NOTE :

* A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees

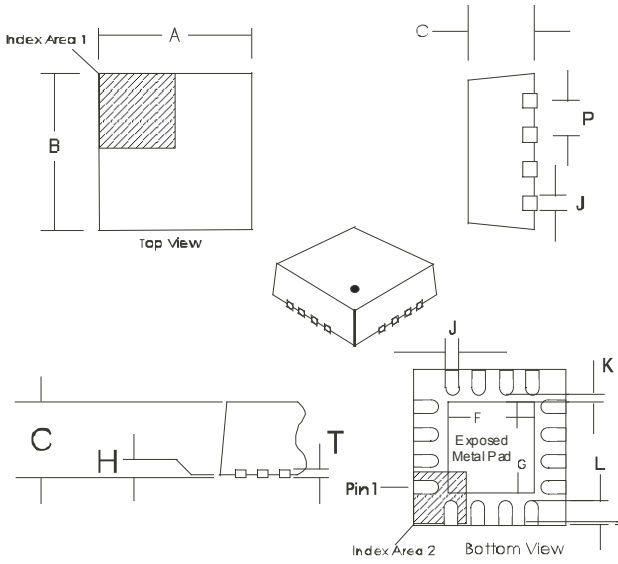


Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required

CML Microcircuits Package Information .....

16-Pin VQFN (Q7)

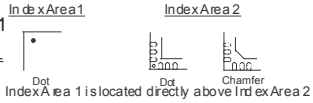


DIM.	MIN.	TYP.	MAX.
* A		4.00 BSC	
* B		4.00 BSC	
C	0.80	0.90	1.00
F	2.55		2.80
G	2.55		2.80
H	0.00		0.05
J	0.25	0.30	0.35
K	0.20		
L	0.30		0.50
L1	0		0.15
P		0.65	
T		0.20	

NOTE :

A & B are reference data and do not include mold deflash or protrusions.

All dimensions in mm
Angles are in degrees



Index Area 1 is located directly above Index Area 2

Depending on the method of lead termination at the edge of the package, pull back (L1) may be present.
L minus L1 to be equal to, or greater than 0.3mm
The underside of the package has an exposed metal pad which should ideally be soldered to the pcb to enhance the thermal conductivity and mechanical strength of the package fixing. Where advised, an electrical connection to this metal pad may also be required