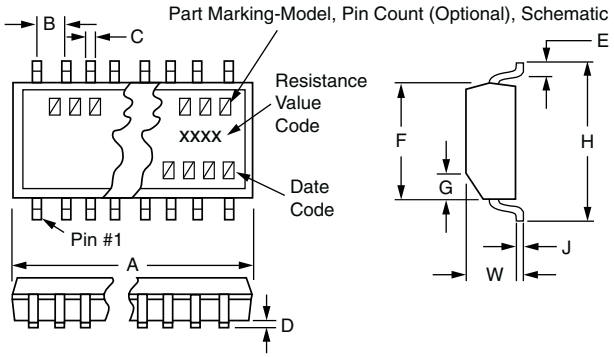
STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride	-
Pin/Lead Number	16, 20, 24	-
Resistance Range	10 Ω to 47 kΩ	Per E-24 table
TCR: Absolute	± 100 ppm/°C	-55 °C to +125 °C
TCR: Tracking	n/a	-
Tolerance: Absolute	± 5 % standard (± 2 % available) ± 1 % standard (check factory)	Per E-24 table Per E-96 table
Tolerance: Ratio	NA	-
Power Rating: Resistor	100 mW max.	At +70 °C
Power Rating: Package	16 = 1.0 W, 20 = 1.2 W, 24 = 1.4 W	0 °C to +70 °C
Stability: Absolute	-	-
Stability: Ratio	-	-
Voltage Coefficient	5 ppm/V (typical)	-
Working Voltage	50 V_{DC}	-
Operating Temperature Range	-55 °C to +125 °C	-
Storage Temperature Range	-55 °C to +150 °C	-
Noise	< -35 dB	-
Thermal EMF	-	-
Shelf Life Stability: Absolute	-	-
Shelf Life Stability: Ratio	-	-

DIMENSIONS AND IMPRINTING in inches (millimeters)



DIMENSION	VTSR-xxxx	VSSR-xxxx	VSOR-xxxx
A - 16 PIN	0.206 ± 0.003 (5.23 ± 0.08)	0.193 ± 0.004 (4.90 ± 0.010)	0.390 ± 0.010 (9.91 ± 0.25)
A - 20 PIN	0.256 ± 0.003 (6.50 ± 0.08)	0.341 ± 0.003 (8.66 ± 0.08)	NA
A - 24 PIN	0.306 ± 0.003 (7.77 ± 0.08)	0.341 ± 0.003 (8.66 ± 0.08)	NA
B (Ref.)	0.0256 (0.65)	0.025 (0.64)	0.050 (1.27)
C (Ref.)	0.0087 (0.22)	0.010 (0.25)	0.016 (0.41)
D	0.004 (0.10)	0.006 (0.15)	0.008 (0.20)
E (Typ.)	0.024 (0.61)	0.025 (0.64)	0.030 (0.76)
F	0.173 ± 0.003 (4.39 ± 0.08)	0.154 ± 0.003 (3.91 ± 0.08)	0.152 ± 0.003 (3.86 ± 0.08)
G	0.015 × 45° (0.38)	0.015 × 45° (0.38)	0.015 × 45° (0.38)
H	0.252 ± 0.005 (6.40 ± 0.13)	0.236 ± 0.008 (5.99 ± 0.20)	0.236 ± 0.005 (5.99 ± 0.13)
J (Ref.)	0.005 (0.13)	0.010 (0.25)	0.008 (0.20)
W	0.043 ± 0.005 (1.09 ± 0.13)	0.064 ± 0.005 (1.63 ± 0.13)	0.064 ± 0.005 (1.63 ± 0.13)

MARKING

MODEL	PIN COUNT (Optional)	SCHEMATIC	RESISTANCE		RESISTANCE	DATE CODE
VXXX	**XX**	**XX**	**XXXX**		**XXX**	**XXXX**
VSOR VSSR VTSR	16 20 24	01, 03, 05 or 47	1 % RESISTANCE e.g.: 43R2 4 digits are used to express ohmic values only less than 100 Ω. R is used to designate the decimal position	**OR**	1 %, 2 %, 5 % RESISTANCE e.g.: 103 = 10K The first 2 digits are significant figures, the last digit specifies the number of zeros to follow.	

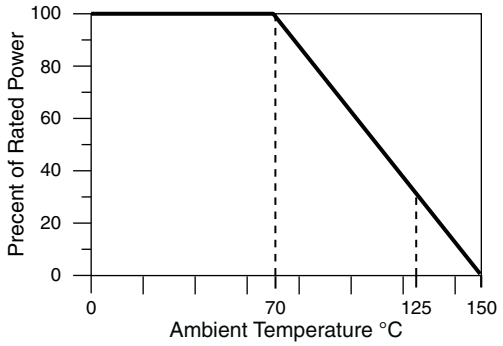
MECHANICAL SPECIFICATIONS

Resistive Element	Tantalum nitride
Substrate Material	Silicon
Body	Molded epoxy
Terminals	Copper alloy
Plating	100 % matte tin
Lead Coplanarity	0.0005"
Marking Resistance to Solvents	Permanency testing per MIL-STD-202, method 215

PACKAGING INFORMATION

MODEL	LEADS	TAPE AND REEL	TUBES
VTSR (TSSOP)	16	2500	94
	20	2500	74
	24	2500	62
VSSR (QSOP)	16	2500	98
	20	2500	55
	24	2500	55
VSOR (SOIC)	16	2500	48

DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: VTSR1601103JTF

V	T	S	R	1	6	0	1			1	0	3			J	T	F	
V	S	O	R	1	6	0	5	3	3	1	4	7	1		G	T	F	

GLOBAL MODEL	PIN COUNT	SCHEMATIC	RESISTANCE (3, 4 or 6 digits)	TOLERANCE	PACKAGING
VTSR **VSSR** **VSOR** Lead (Pb)-free (e3) date code > 2705	**20** (not VSOR) **24** (not VSOR)	**01** (bussed) **03** (isolated)	XXX: ≥ 100R and all 1 %, 2 % and 5 % First 2 digits are significant figures. Last digit specifies number of zeros to follow. XXXX: < 100R 1 % First 3 digits are significant figures. Last digit specifies number of zeros to follow.	**F** = 1.0 % **G** = 2.0 % **J** = 5.0 %	TAPE AND REEL **TF** = Full reel 2500 **UF** = Tubed
	16 (not VTSR) **20** (not VSOR)	**05** (terminator) **47** (terminator)	xxx xxx First 2 digits are significant figures. Last digit specifies number of zeros.	**G** = 2.0 % **J** = 5.0 %	

Historical Part Number example: VSSR2001102GT/R (for reference purposes only)

VSSR	20	01	102	G	T/R
MODEL	PIN COUNT	SCHEMATIC	RESISTANCE	TOLERANCE	PACKAGING

Vishay Dale Thin Film Land Patterns

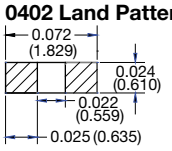
1. Scope

This technical note provides sample land patterns for Vishay Dale Thin Film SMT resistive products. The following drawings are based on IPC-SM-782 Surface Mount Design and Land Pattern Standard. These drawings are for reference only Vishay Thin Film recommends that the user contacts their PC board supplier for actual land patterns required. The pads are intended for lead (Pb)-free and tin / lead solder types.

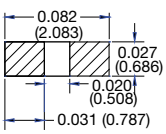
2. Product Series

Thin Film Surface Mount Chip Resistors (FC, L, P, PTN, PLT, PLTT. PLTU, PAT, PATT, PNM, M/D55342 QPL Series)

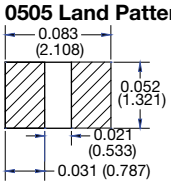
0402 Land Pattern



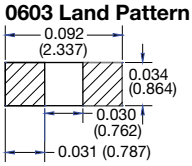
0502 Land Pattern



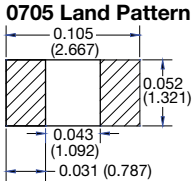
0505 Land Pattern



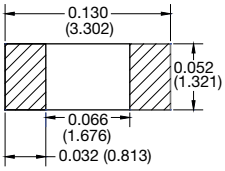
0603 Land Pattern



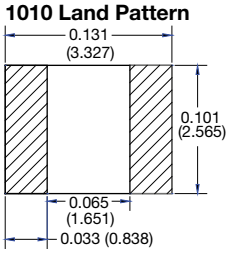
0705 Land Pattern



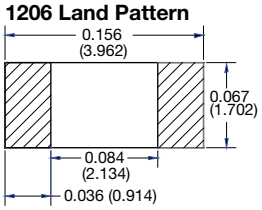
1005 Land Pattern



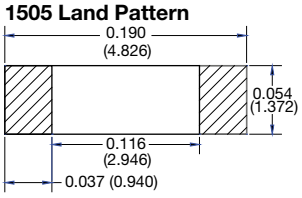
1010 Land Pattern



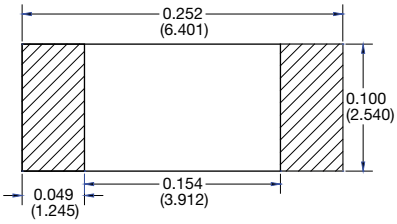
1206 Land Pattern



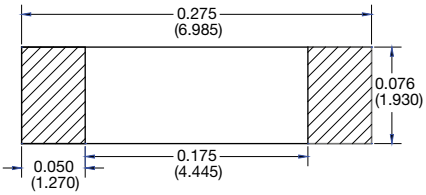
1505 Land Pattern



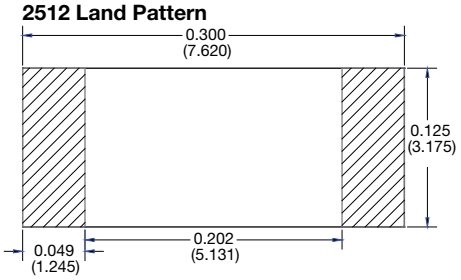
2010 Land Pattern



2208 Land Pattern

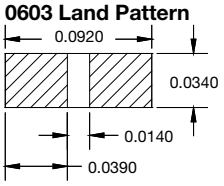


2512 Land Pattern

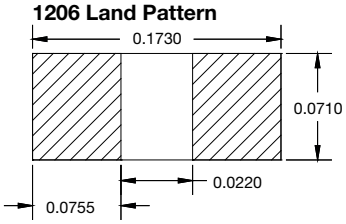


Thin Film Surface Mount Chip Resistors (PHP, PCAN Series)

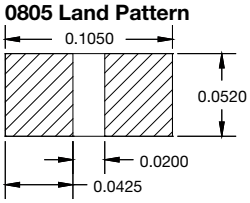
0603 Land Pattern



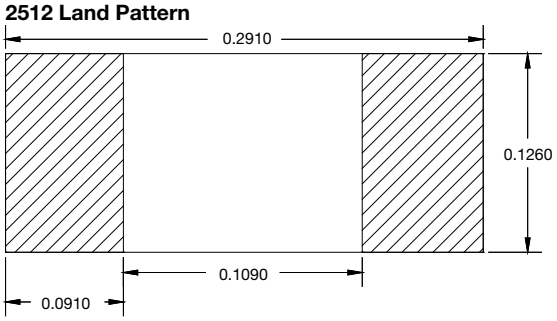
1206 Land Pattern



0805 Land Pattern

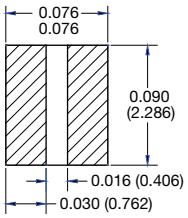


2512 Land Pattern

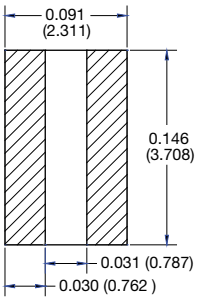


Thin Film Surface Mount Chip Resistors Long Axis Termination (L Series)

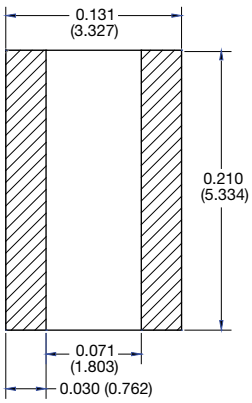
0508 Land Pattern



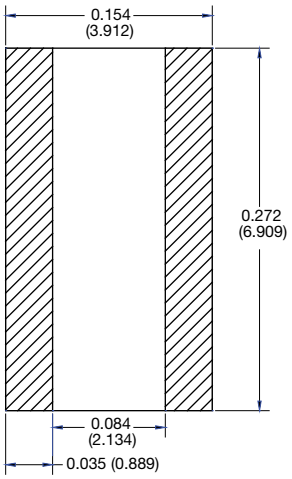
0612 Land Pattern



1020 Land Pattern

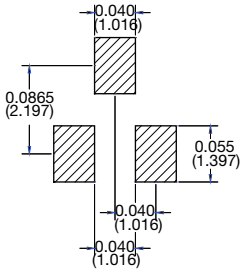


1225 Land Pattern

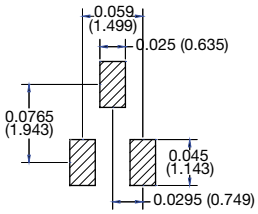


Surface Mount Networks (MPM, MP3, MP4 Series)

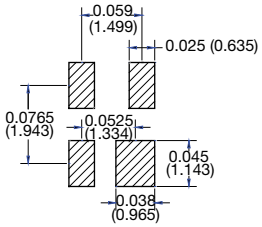
SOT-23 (MPM, MPMA)



SC70-3 (MP3)

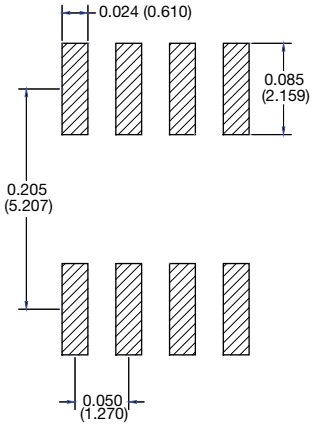


SC70-4 (MP4)

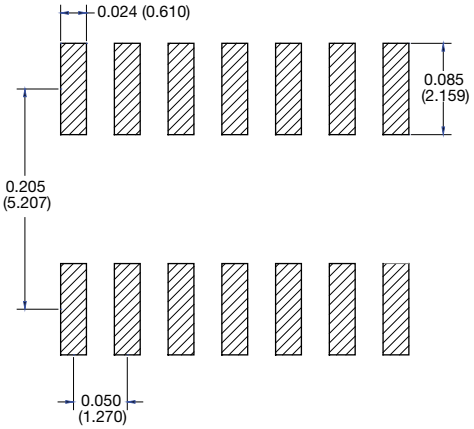


Surface Mount Networks SOIC Narrow Body 150 mils (ORN, CSO, MOMC, HTRN, AORN, MORN Series)

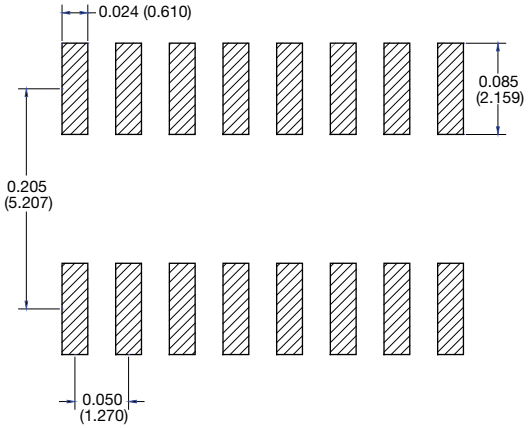
SOIC-8
(ORN, HTRN, AORN, CSO-8)



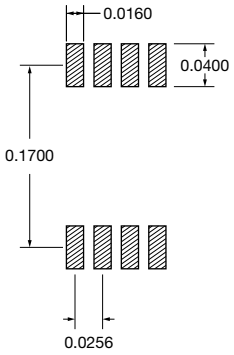
SOIC-14
(NOMC-14, NOMCA-14, CSO-14)



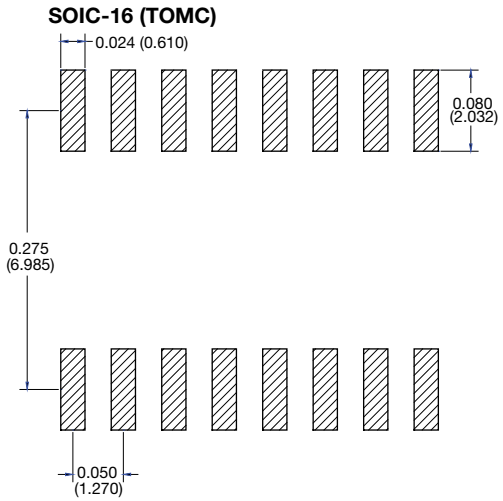
SOIC-16
(NOMC-16, NOMCA-16, CSO-16, VSOR-16)



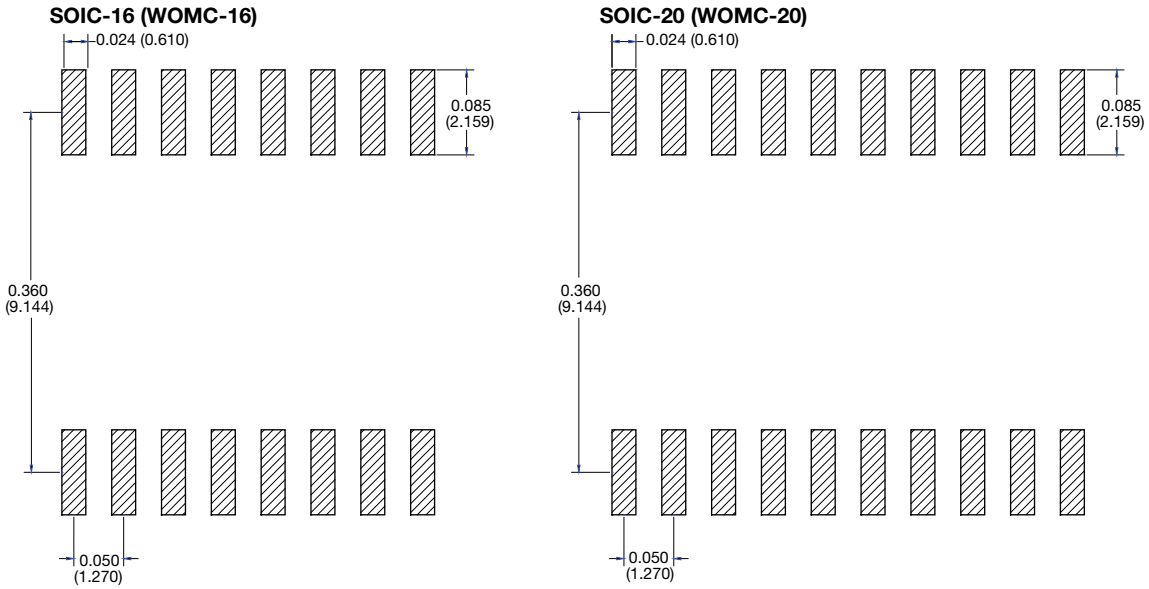
MORN MSOP MO-187AA
(MORN-8)



Surface Mount Networks SOIC Medium Body 220 mils (TOMC Series)



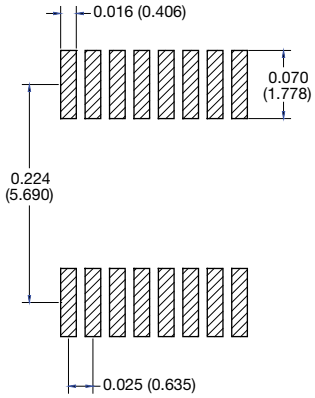
Surface Mount Networks SOIC Wide Body 300 mils (WOMC Series)



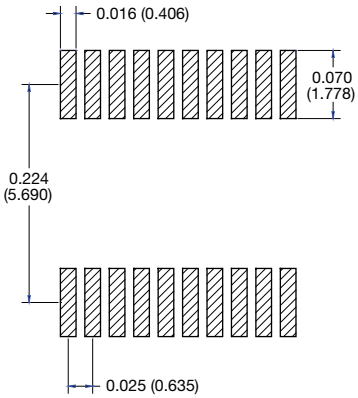
Surface Mount Networks High Density SSOP, TSOP (VSSR, VTSR Series)

SSOP MO-137

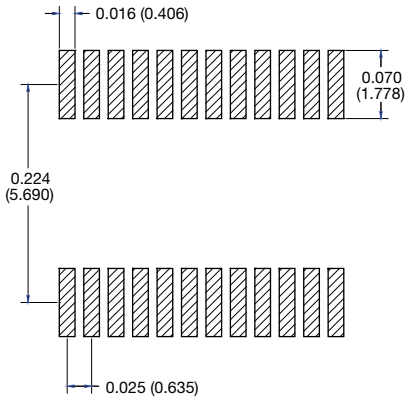
OSOP-16, VSSR-16



OSOP-20, VSSR-20

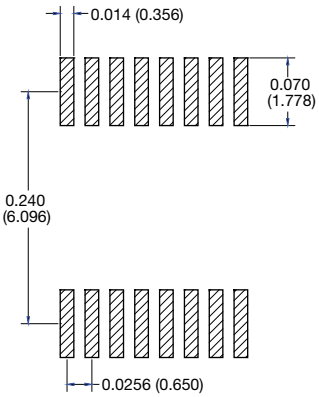


OSOP-24, VSSR-24, HD-CSO-24

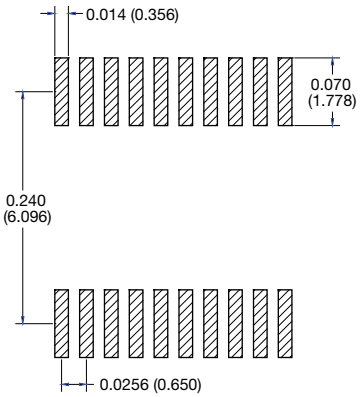


TSSOP MO-153

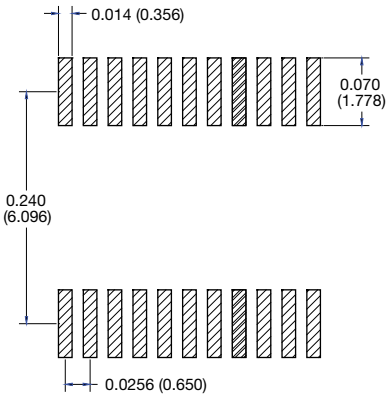
VTSR-16



VTSR-20

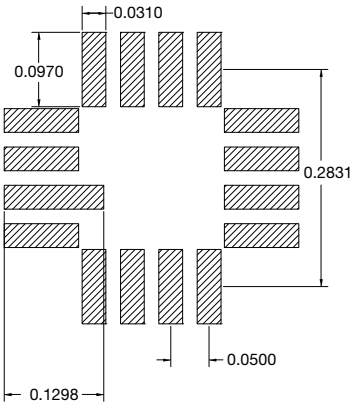


VTSR-24

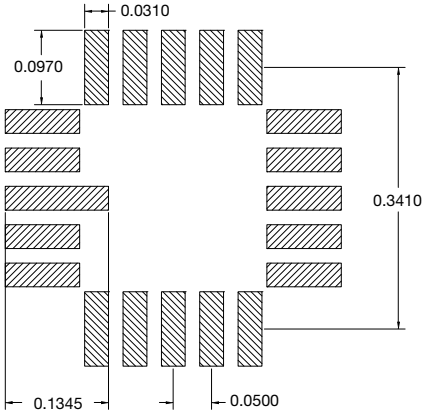


Surface Mount Leadless Networks (LCC Series)

16 Pin LCC

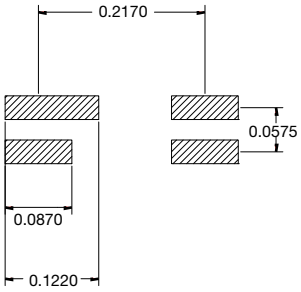


20 Pin LCC



Surface Mount Leadless Networks (MPH Series)

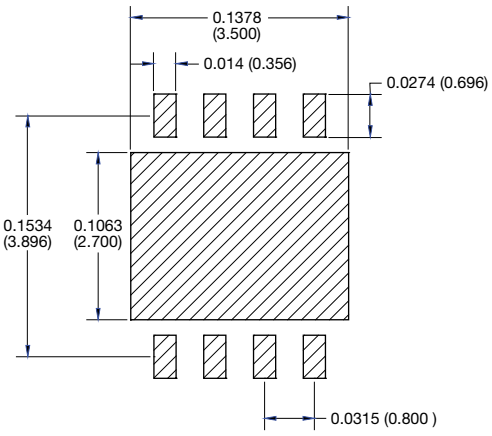
4 Pin LCC



Surface Mount Leadless Packages DUAL/ QUAD Flat No Lead (DFN, QFN Series)

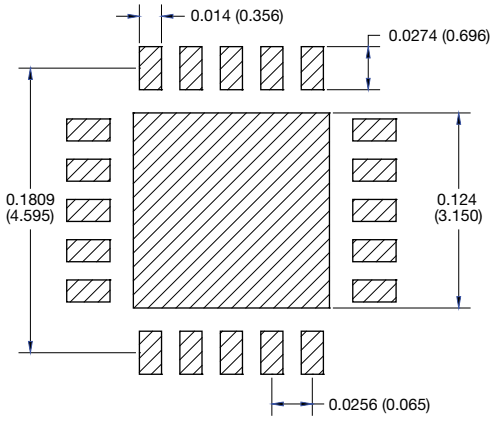
DFN MLP

DFN-8 4 x 5 mm Sq



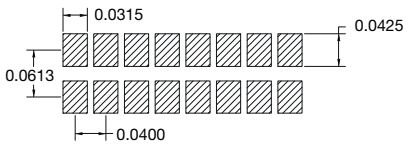
QFN MLP

QFN-20 5 x 5 mm Sq

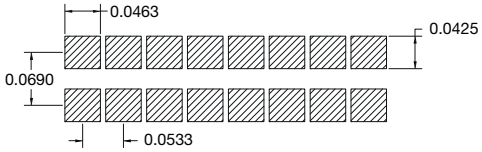


Surface Mount Leadless Resistor Arrays (PR Series)

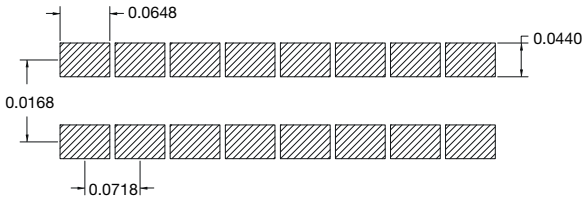
PR 100 (2 to 8 resistors)



PR 135 (2 to 8 resistors)



PR 182 (2 to 8 resistors)

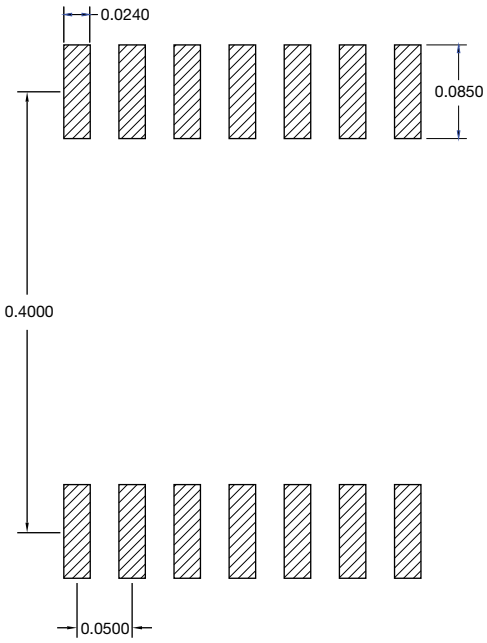


Note

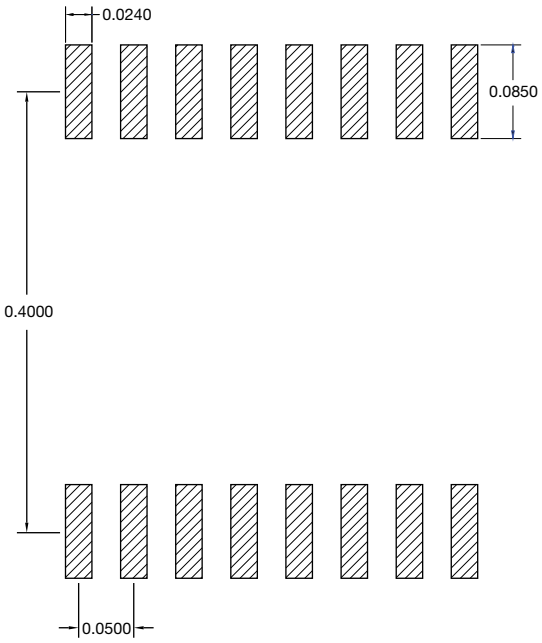
- All dimensions in inches (mm)

Flatpack

14 Pin Bottom Brazed Flatpack



16 Pin Bottom Brazed Flatpack



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