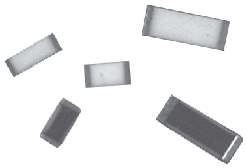
Commercial Thin Film Resistor, Surface Mount Chip



Actual Size
0505

For applications requiring low noise, stability, low temperature coefficient of resistance, and low voltage coefficient, all Vishay's proven precision thin film wraparound resistors will meet your exact requirements. Manufactured with the same material and processes as QPL and manufactured in a QPL facility.

FEATURES

- Moisture resistant (SPM) special passivation method
- Non-standard values available
- Pre-tinned terminations over nickel barrier (gold available)
- Very low noise and voltage coefficient (< -35 dB, 0.1 ppm/V)
- Non-inductive
- Laser-trimmed tolerances to 0.02 %
- In-lot tracking less than 5 ppm/°C
- Epoxy bondable termination available
- Sulfur resistant (per ASTM B809-95 humid vapor test)
- Flame resistant UL 94 V-0
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

RoHS* Available

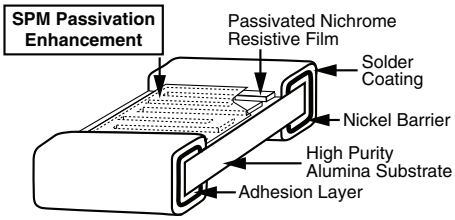
HALOGEN FREE Available

GREEN (5-2008) Available

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details.

CONSTRUCTION



TYPICAL PERFORMANCE

	ABSOLUTE
TCR	25
TOL.	0.1

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Passivated nichrome	-
Resistance Range	10 Ω to 6.19 MΩ	-
TCR: Absolute	± 10 ppm/°C to 100 ppm/°C	-55 °C to +125 °C
Tolerance: Absolute	± 0.02 % to ± 5 %	+25 °C
Stability: Absolute	Δ*R* ± 0.02 %	2000 h at 70 °C
Stability: Ratio	-	-
Voltage Coefficient	0.1 ppm/V (typical)	-
Working Voltage	75 V to 200 V	-
Operating Temperature Range	-55 °C to +155 °C	-
Storage Temperature Range	-55 °C to +155 °C	-
Noise	< -35 dB (typical)	-
Shelf Life Stability: Absolute	Δ*R* ± 0.01 %	1 year at +25 °C

COMPONENT RATINGS

CASE SIZE [1]	POWER RATING (mW)	WORKING VOLTAGE (V)	RESISTANCE RANGE (Ω)	
			≥ 0.1 %	< 0.1 %
0402	50	75	24.9 to 100K	250 to 100K
0502	100	75	20 to 150K	250 to 150K
0505	150	75	20 to 301K	250 to 301K
0603	150	75	10 to 261K	250 to 261K
0705	250	100	10 to 475K	250 to 475K
0805	250	100	10 to 475K	250 to 475K
1005	250	100	10 to 649K	250 to 649K
1010	500	150	50 to 1M	250 to 1M
1206	400	200	10 to 1.5M [2]	250 to 1M
1505	400	150	10 to 1M	250 to 1M
2208	800	150	10 to 3.16M [2]	250 to 1M
2010	800	200	10 to 4.02M [2]	250 to 1M
2512	1000	200	10 to 6.19M [2]	250 to 1M

Notes

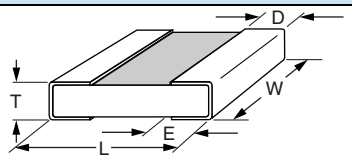
[1] 0705 and 0805 are the same (only use 0805 when ordering)

[2] Values > 1M best TCR ± 25 ppm/°C

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DIMENSIONS in inches



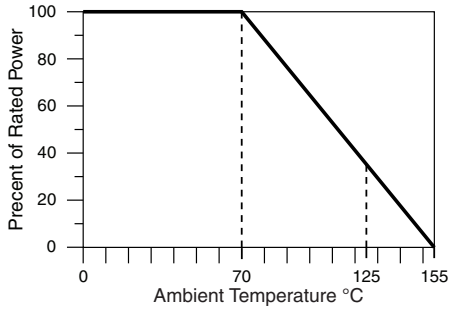
CASE SIZE	TERM	L	W	T	D	E
0402	B	0.042 ± 0.008	0.022 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.010 ± 0.005
0502	B	0.055 ± 0.006	0.025 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.015 ± 0.005
0505	B	0.055 ± 0.006	0.050 ± 0.005	0.012 to 0.033	0.010 ± 0.005	0.015 ± 0.005
0603	B	0.064 ± 0.006	0.032 ± 0.005	0.020 max.	0.012 ± 0.005	0.015 ± 0.005
0705, 0805 (1)	B	0.080 ± 0.006	0.050 ± 0.005	0.015 to 0.033	0.016 ± 0.008	0.015 ± 0.005
1005	B	0.105 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1010	B	0.105 ± 0.007	0.100 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
1206	B	0.126 ± 0.008	0.063 ± 0.005	0.015 to 0.033	0.020 + 0.005/- 0.010	0.020 + 0.005/- 0.010
1505	B	0.155 ± 0.007	0.050 ± 0.005	0.015 to 0.033	0.015 ± 0.005	0.015 ± 0.005
2010	B	0.209 ± 0.009	0.098 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005
2208	B	0.230 ± 0.007	0.075 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005
2512	B	0.259 ± 0.009	0.124 ± 0.005	0.015 to 0.033	0.020 ± 0.005	0.020 ± 0.005

Note
(1) 0705 and 0805 are the same (only use 0805 when ordering).

ENVIRONMENTAL TESTS

ENVIRONMENTAL TEST	10 kΩ Δ*R* ± (%)	100 kΩ Δ*R* ± (%)
Thermal Shock	0.02	0.02
Short Time Overload	0.01	0.01
Low Temperature Operation	0.01	0.01
Resistance to Solder Heat	0.04	0.03
Moisture Resistance	0.02	0.01
High Temperature Exposure	0.03	0.06
Load Life (10 000 h, + 70 °C)	0.05	0.05
TCR	± 25 ppm/°C	± 25 ppm/°C

DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: P-1206E1002BBTS

P	-	1	2	0	6	E	1	0	0	2	B	B	T	S

GLOBAL MODEL
P-

CASE SIZE
0402
0502
0505
0603
0805
1005
1010
1206
1505
2208
2010
2512

TCR CHARACTERISTIC
Y = ± 10 ppm/°C (2)
D = ± 15 ppm/°C
E = ± 25 ppm/°C
H = ± 50 ppm/°C
K = ± 100 ppm/°C

Note
(2) ≥ 49.9 Ω

RESISTANCE
The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point.
Example:
10R0 = 10 Ω
1001 = 1 kΩ
1002 = 10 kΩ

TOLERANCE
Q = ± 0.02 % (3)
A = ± 0.05 % (3)
B = ± 0.1 %
D = ± 0.5 %
F = ± 1 %
G = ± 2 %
J = ± 5 %

Note
(3) For values ≥ 250 Ω

TERMINATION
B = Wraparound Sn/Pb solder 63 % Sn/37 % Pb w/ nickel barrier
G = Wraparound Au over Ni (gold) termination epoxy bondable RoHS-compliant - e4
S = Wraparound electroplated 100 % pure matte tin RoHS-compliant e3

PACKAGING
BULK
BS = 100 min., 1 mult
WAFFLE
WS = 100 min., 1 mult
W0 = 100 min.,100 mult
WI = 100 min.,1 mult (4)
WP = 100 min.,1 mult (5)
TAPE AND REEL
T0 = 100 min., 100 mult
T1 = 1000 min., 1000 mult (6)
T3 = 300 min., 300 mult
T5 = 500 min., 500 mult
TF = Full reel
TS = 100 min., 1 mult
TI = 100 min., 1 mult (4)
TP = 100 min., 1 mult (5)

Notes
(4) Item single lot date code
(5) Package unit single lot date code
(6) Preferred packaging code

Historical Part Number Example: P0805H6801BBT (for reference purposes only)

P	0805	H	6801	B	B	T
STYLE	CASE SIZE	TCR CHARACTERISTIC	OHMIC VALUE	TOLERANCE	TERMINATION	PACKAGING

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Vishay Dale Thin Film Land Patterns

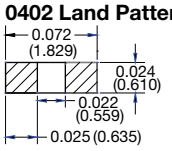
1. Scope

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.

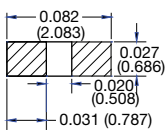
2. Product Series

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

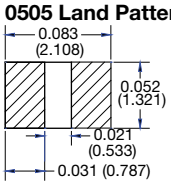
0402 Land Pattern



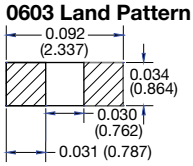
0502 Land Pattern



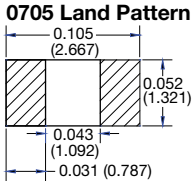
0505 Land Pattern



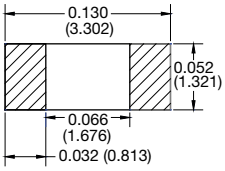
0603 Land Pattern



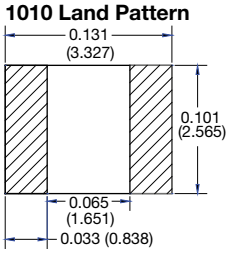
0705 Land Pattern



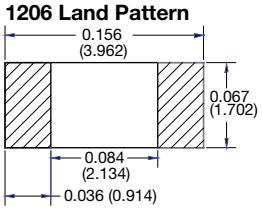
1005 Land Pattern



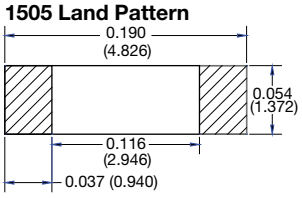
1010 Land Pattern



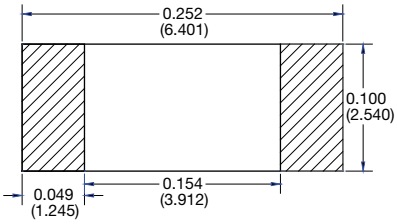
1206 Land Pattern



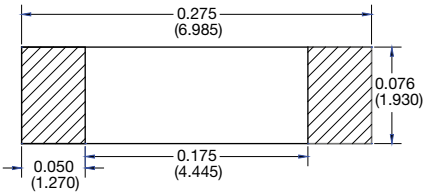
1505 Land Pattern



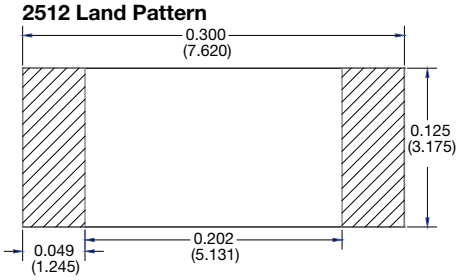
2010 Land Pattern



2208 Land Pattern



2512 Land Pattern

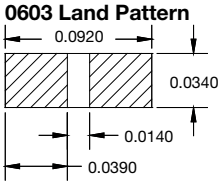


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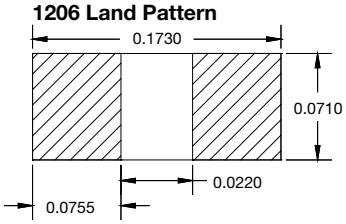
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Thin Film Surface Mount Chip Resistors (PHP, PCAN Series)

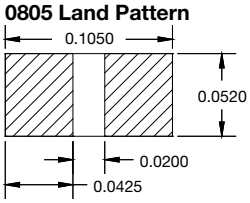
0603 Land Pattern



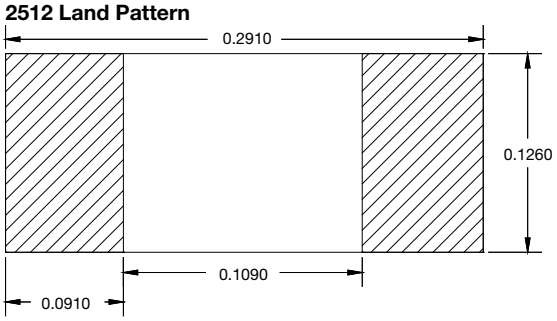
1206 Land Pattern



0805 Land Pattern

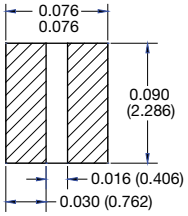


2512 Land Pattern

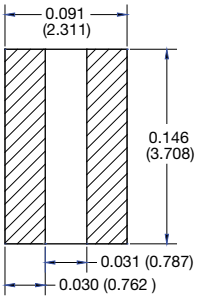


Thin Film Surface Mount Chip Resistors Long Axis Termination (L Series)

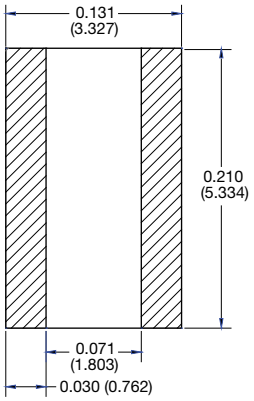
0508 Land Pattern



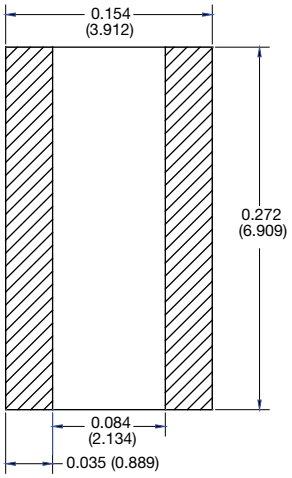
0612 Land Pattern



1020 Land Pattern



1225 Land Pattern

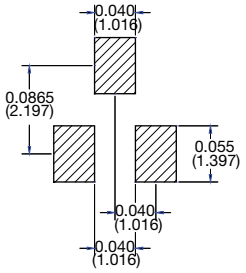


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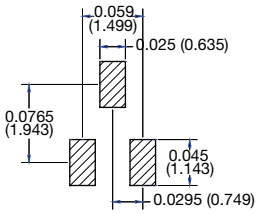
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Surface Mount Networks (MPM, MP3, MP4 Series)

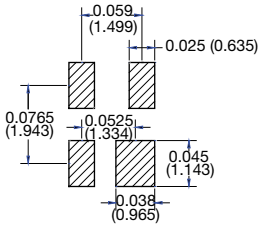
SOT-23 (MPM, MPMA)



SC70-3 (MP3)

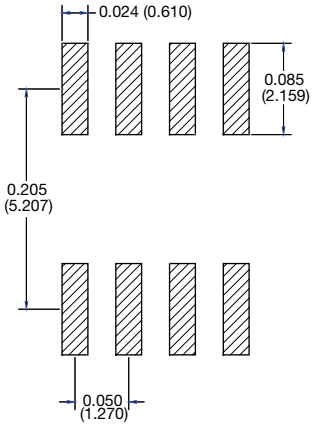


SC70-4 (MP4)

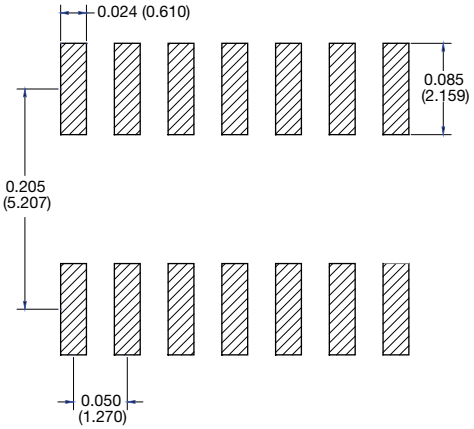


Surface Mount Networks SOIC Narrow Body 150 mils (ORN, CSO, MOMC, HTRN, AORN, MORN Series)

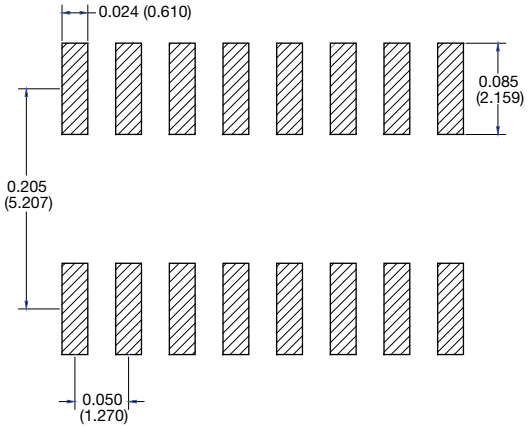
SOIC-8
(ORN, HTRN, AORN, CSO-8)



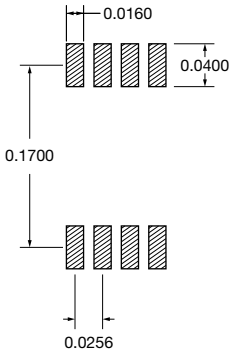
SOIC-14
(NOMC-14, NOMCA-14, CSO-14)



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



MORN MSOP MO-187AA
(MORN-8)

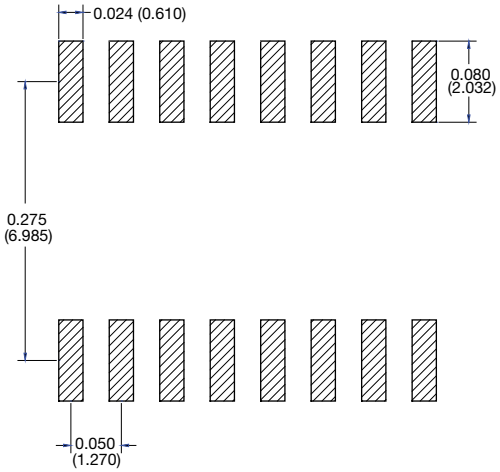


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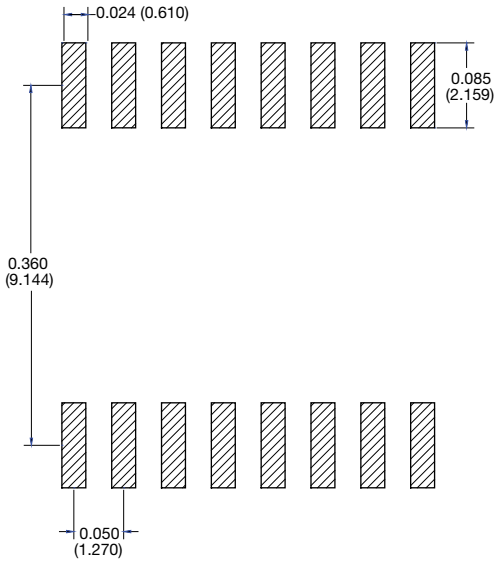
Surface Mount Networks SOIC Medium Body 220 mils (TOMC Series)

SOIC-16 (TOMC)

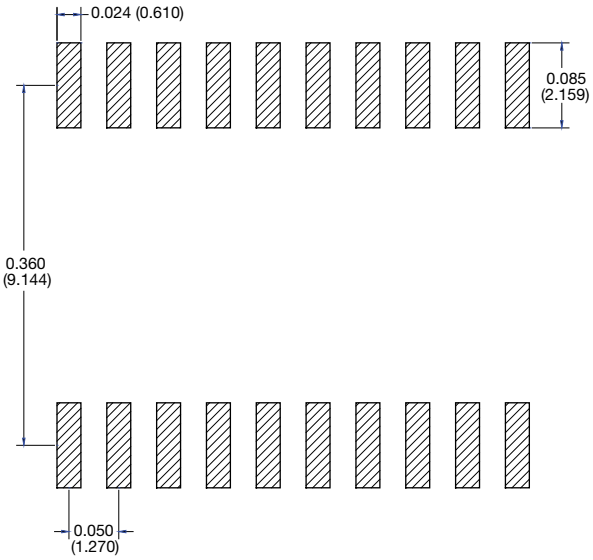


Surface Mount Networks SOIC Wide Body 300 mils (WOMC Series)

SOIC-16 (WOMC-16)



SOIC-20 (WOMC-20)



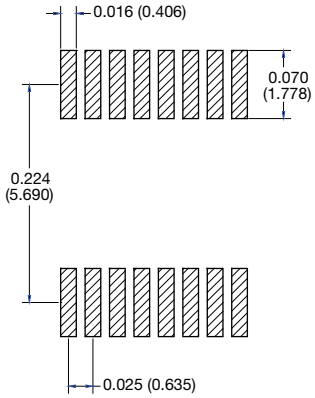
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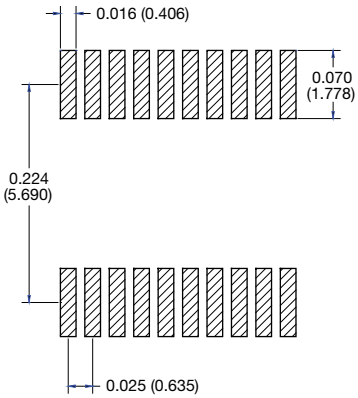
Surface Mount Networks High Density SSOP, TSOP (VSSR, VTSR Series)

SSOP MO-137

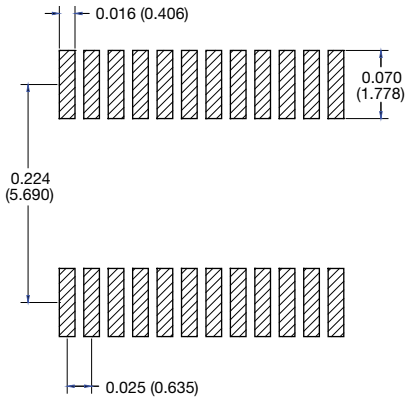
OSOP-16, VSSR-16



OSOP-20, VSSR-20

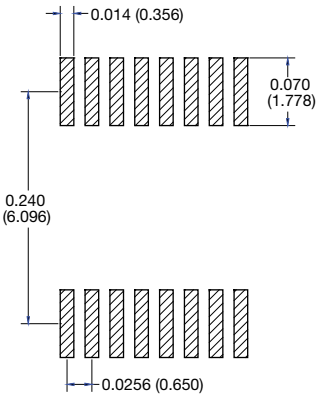


OSOP-24, VSSR-24, HD-CSO-24

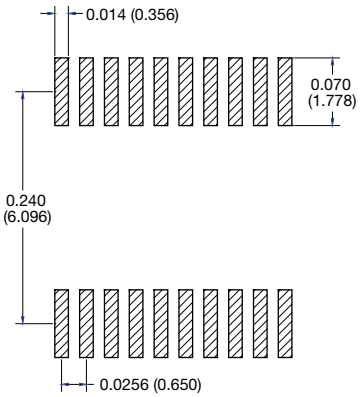


TSSOP MO-153

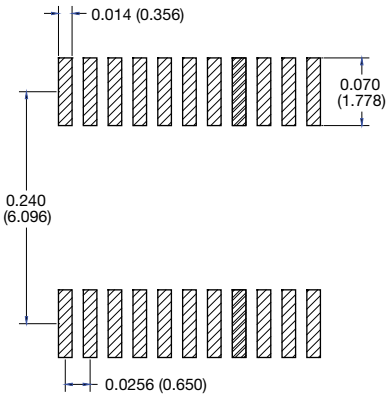
VTSR-16



VTSR-20



VTSR-24

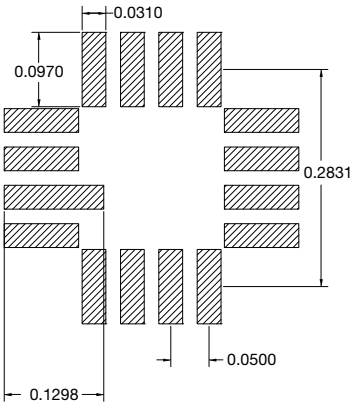


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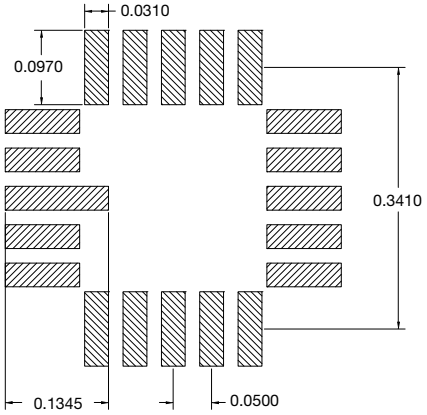
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Surface Mount Leadless Networks (LCC Series)

16 Pin LCC

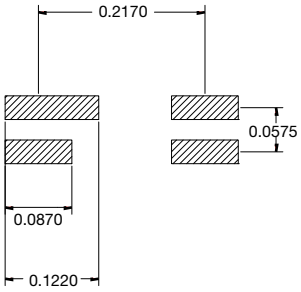


20 Pin LCC



Surface Mount Leadless Networks (MPH Series)

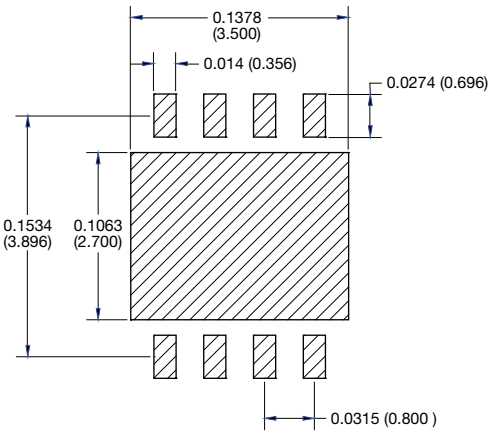
4 Pin LCC



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

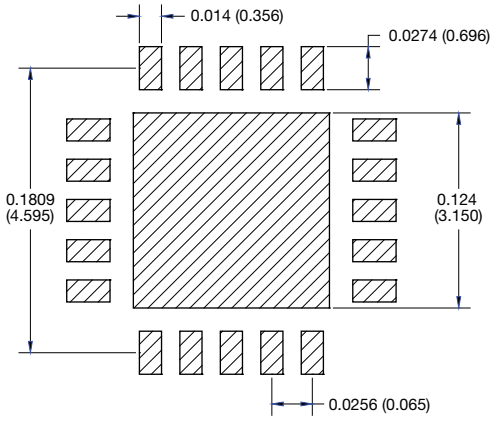
DFN MLP

DFN-8 4 x 5 mm Sq



QFN MLP

QFN-20 5 x 5 mm Sq

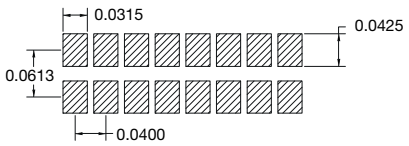


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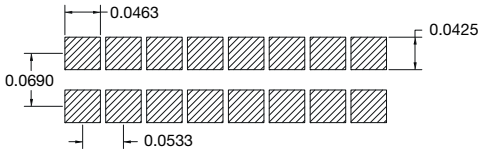
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Surface Mount Leadless Resistor Arrays (PR Series)

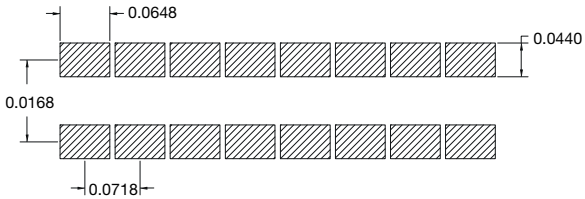
PR 100 (2 to 8 resistors)



PR 135 (2 to 8 resistors)



PR 182 (2 to 8 resistors)

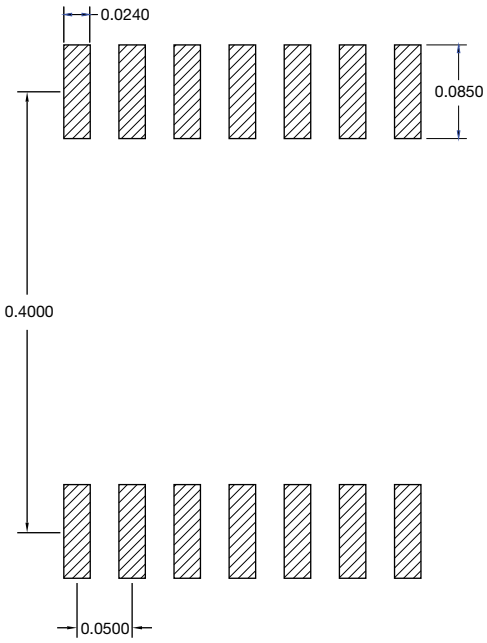


Note

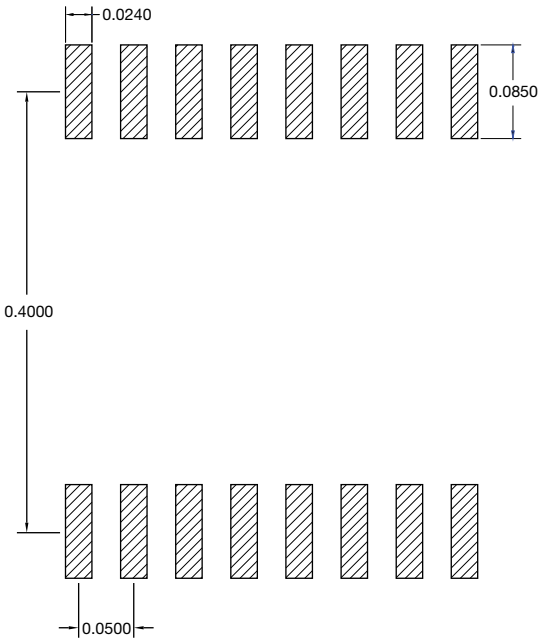
- All dimensions in inches (mm)

Flatpack

14 Pin Bottom Brazed Flatpack



16 Pin Bottom Brazed Flatpack



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