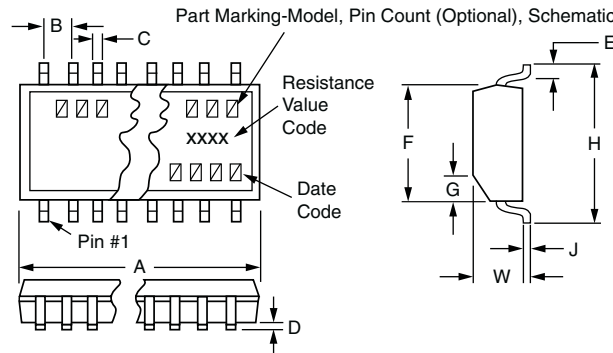




| STANDARD ELECTRICAL SPECIFICATIONS | | |
|------------------------------------|--|----------------------------------|
| TEST | SPECIFICATIONS | CONDITIONS |
| Material | Tantalum nitride | - |
| Pin/Lead Number | 16, 20, 24 | - |
| Resistance Range | 10 Ω to 47 kΩ | Per E-24 table |
| TCR: Absolute | ± 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) |

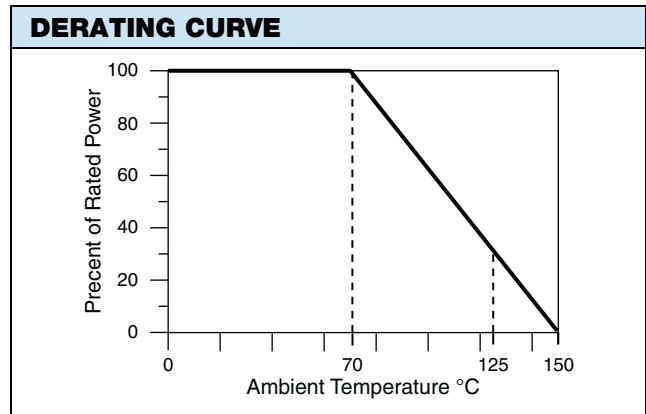
MARKING

| MODEL | PIN COUNT (Optional) | SCHEMATIC | RESISTANCE | RESISTANCE | DATE CODE |
|-------|----------------------|-----------|---|--|-----------|
| VXXX | XX | XX | XXXX | XXX | XXXX |
| VSOR | 16 | 01, 03, | 1 % RESISTANCE | 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. | |
| VSSR | 20 | 05 or 47 | e.g.: 43R2 | | |
| VTSR | 24 | | 4 digits are used to express ohmic values only less than 100 Ω. R is used to designate the decimal position | | |



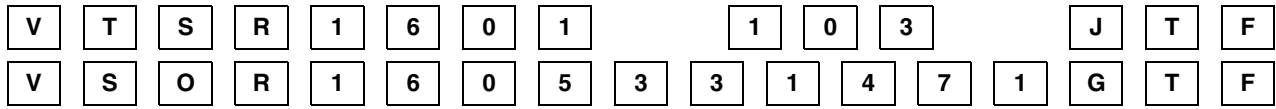
| MECHANICAL SPECIFICATIONS | |
|--------------------------------|--|
| Resistive Element | Tantalum nitride |
| Substrate Material | Silicon |
| Body | Molded epoxy |
| Terminals | Copper alloy |
| Plating | 100 % matte tin |
| Lead Coplanarity | 0.0005" |
| Marking Resistance to Solvents | Permanency 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 |



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: **VTSR1601103JTF**



| 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. xxx xxx First 2 digits are significant figures. Last digit specifies number of zeros. | 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) | | 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

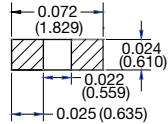
1. Scope

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.

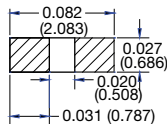
2. Product Series

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

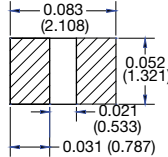
0402 Land Pattern



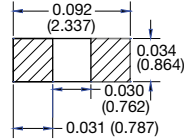
0502 Land Pattern



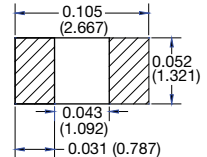
0505 Land Pattern



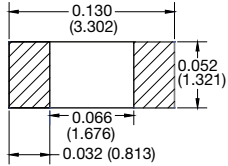
0603 Land Pattern



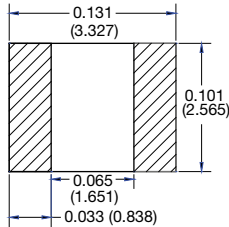
0705 Land Pattern



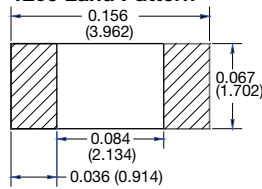
1005 Land Pattern



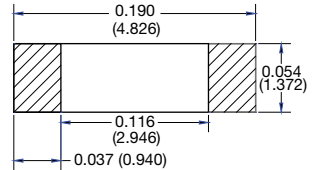
1010 Land Pattern



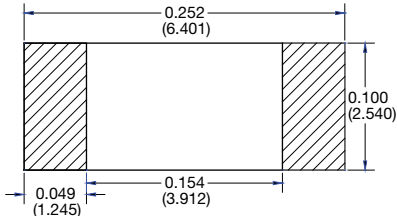
1206 Land Pattern



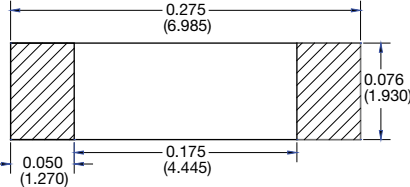
1505 Land Pattern



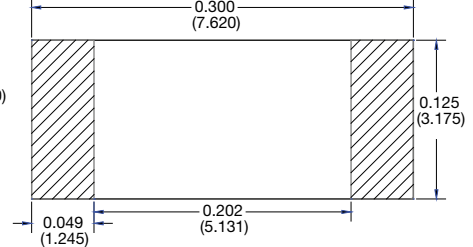
2010 Land Pattern



2208 Land Pattern

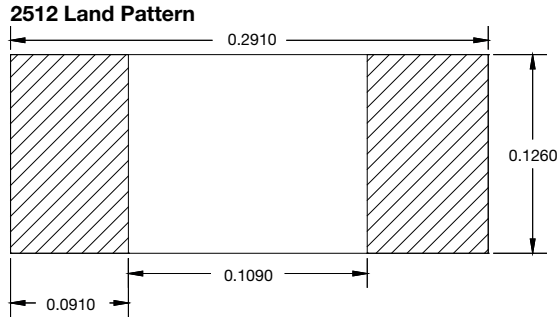
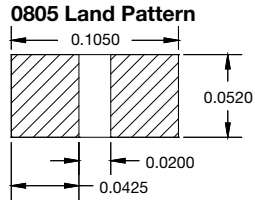
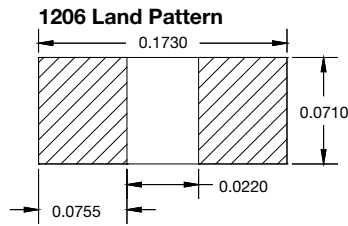
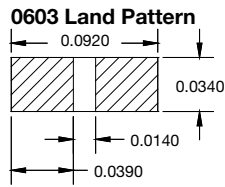


2512 Land Pattern

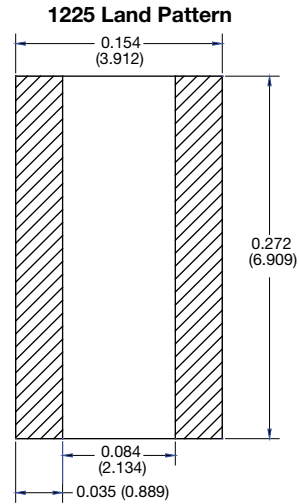
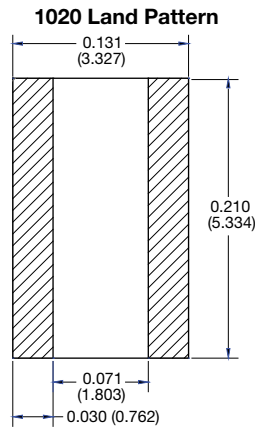
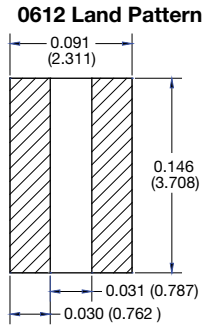
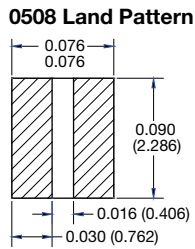




Thin Film Surface Mount Chip Resistors (PHP, PCAN Series)

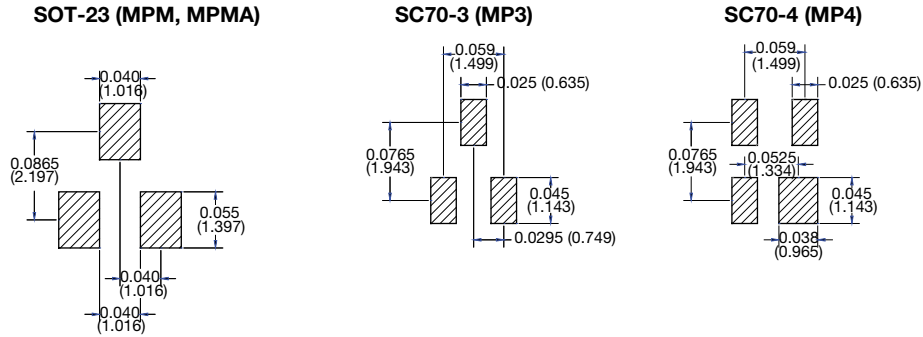


Thin Film Surface Mount Chip Resistors Long Axis Termination (L Series)

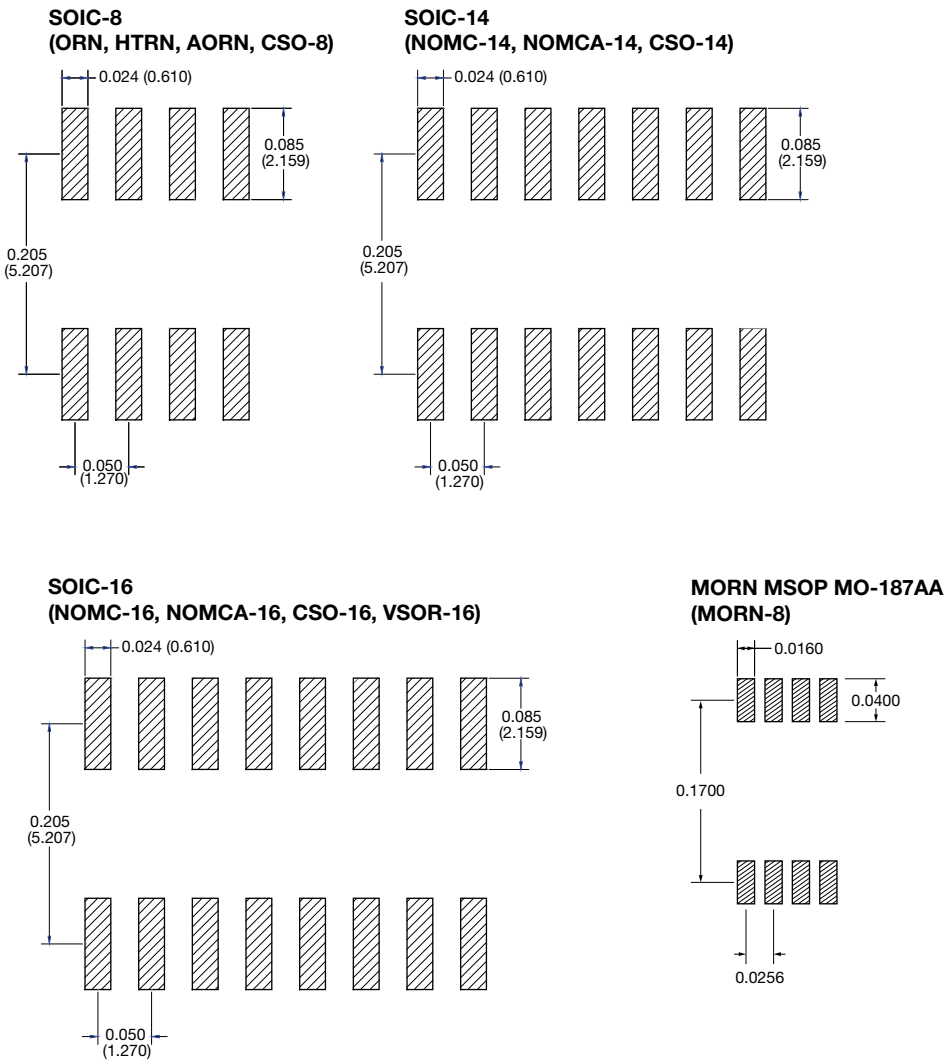




Surface Mount Networks (MPM, MP3, MP4 Series)

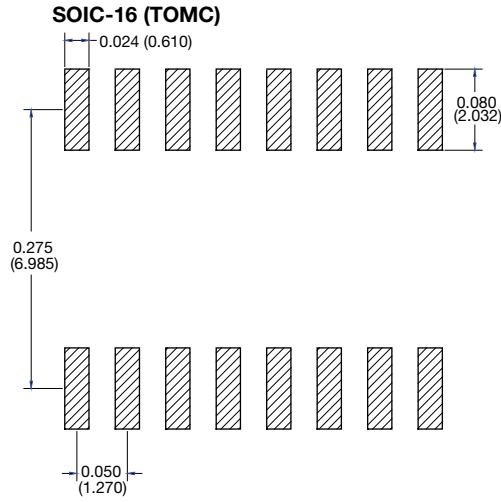


Surface Mount Networks SOIC Narrow Body 150 mils (ORN, CSO, MOMC, HTRN, AORN, MORN Series)

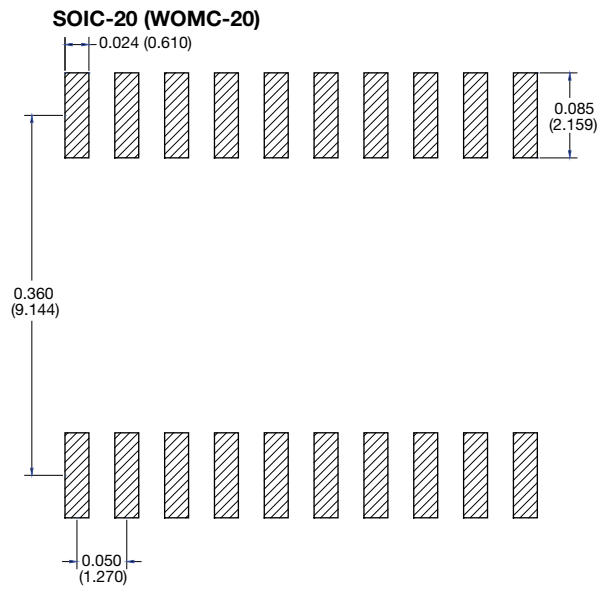
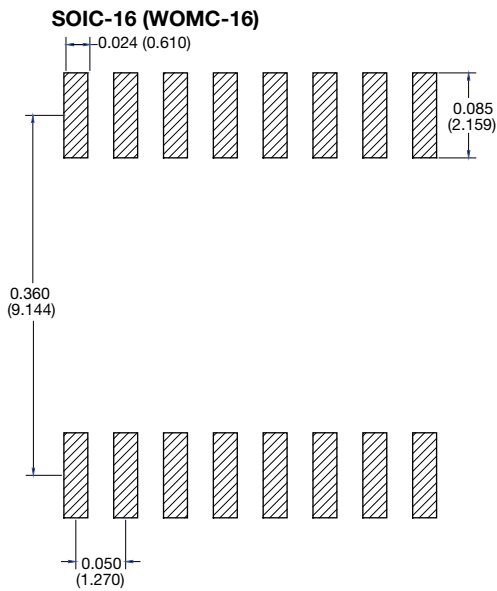




Surface Mount Networks SOIC Medium Body 220 mils (TOMC Series)



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

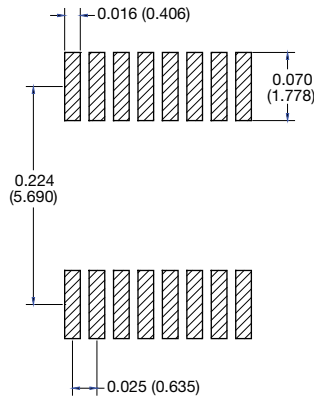




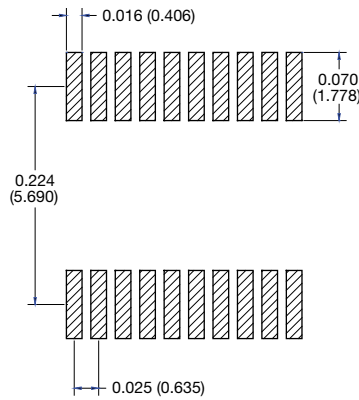
Surface Mount Networks High Density SSOP, TSOP (VSSR, VTSR Series)

SSOP MO-137

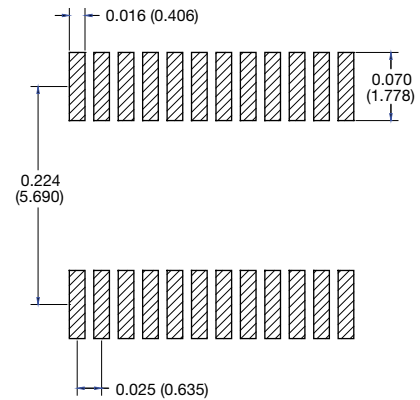
OSOP-16, VSSR-16



OSOP-20, VSSR-20

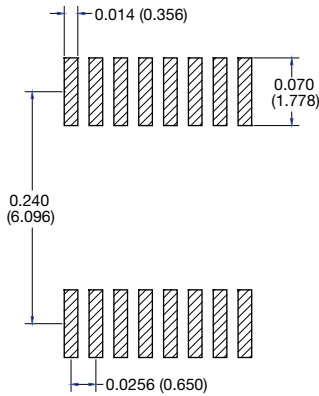


OSOP-24, VSSR-24, HD-CSO-24

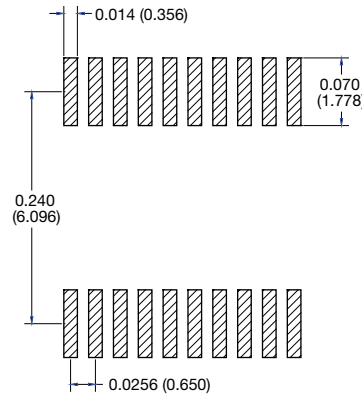


TSSOP MO-153

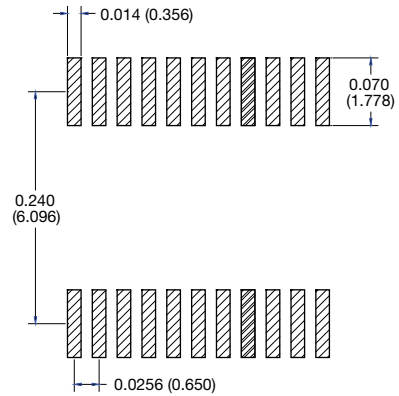
VTSR-16



VTSR-20

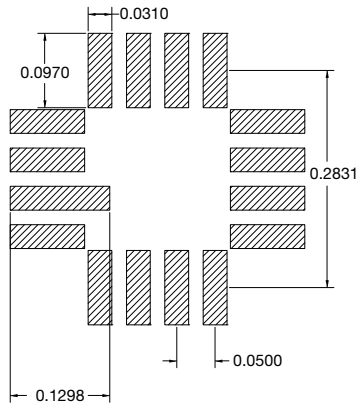


VTSR-24

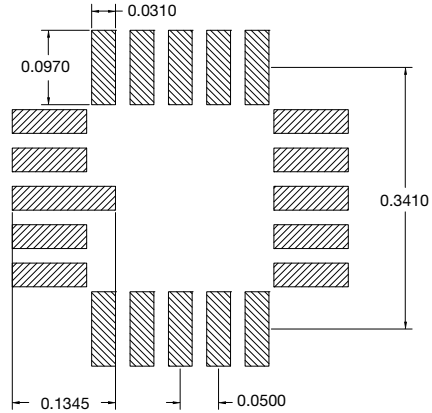


Surface Mount Leadless Networks (LCC Series)

16 Pin LCC

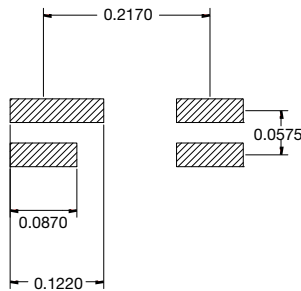


20 Pin LCC



Surface Mount Leadless Networks (MPH Series)

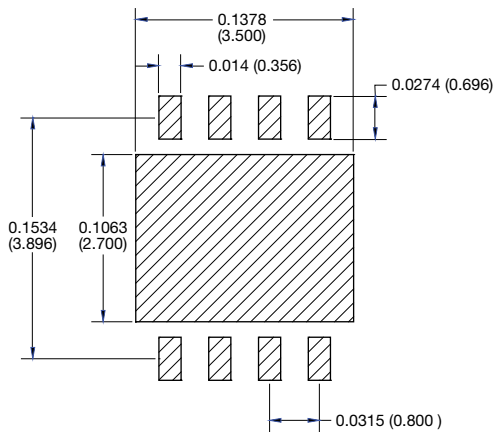
4 Pin LCC



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

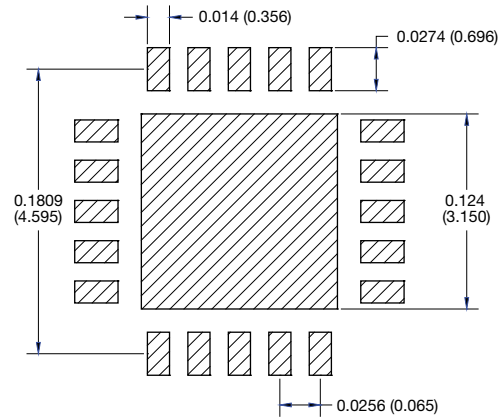
DFN MLP

DFN-8 4 x 5 mm Sq

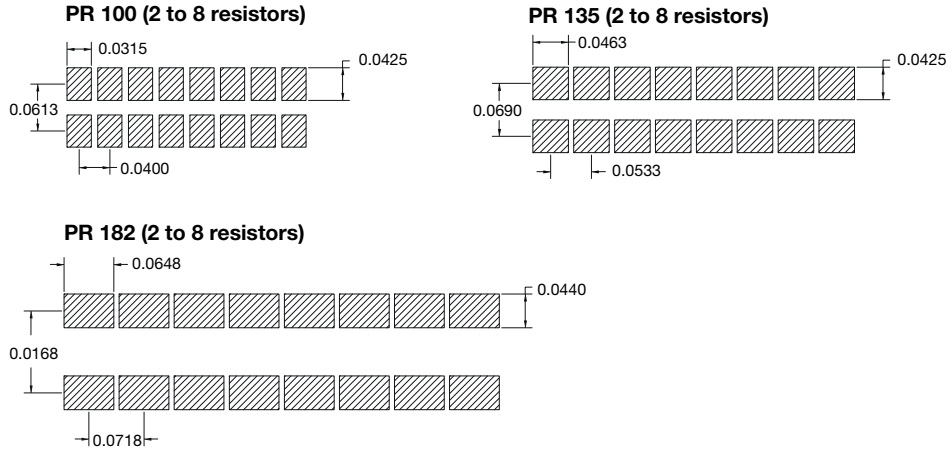


QFN MLP

QFN-20 5 x 5 mm Sq



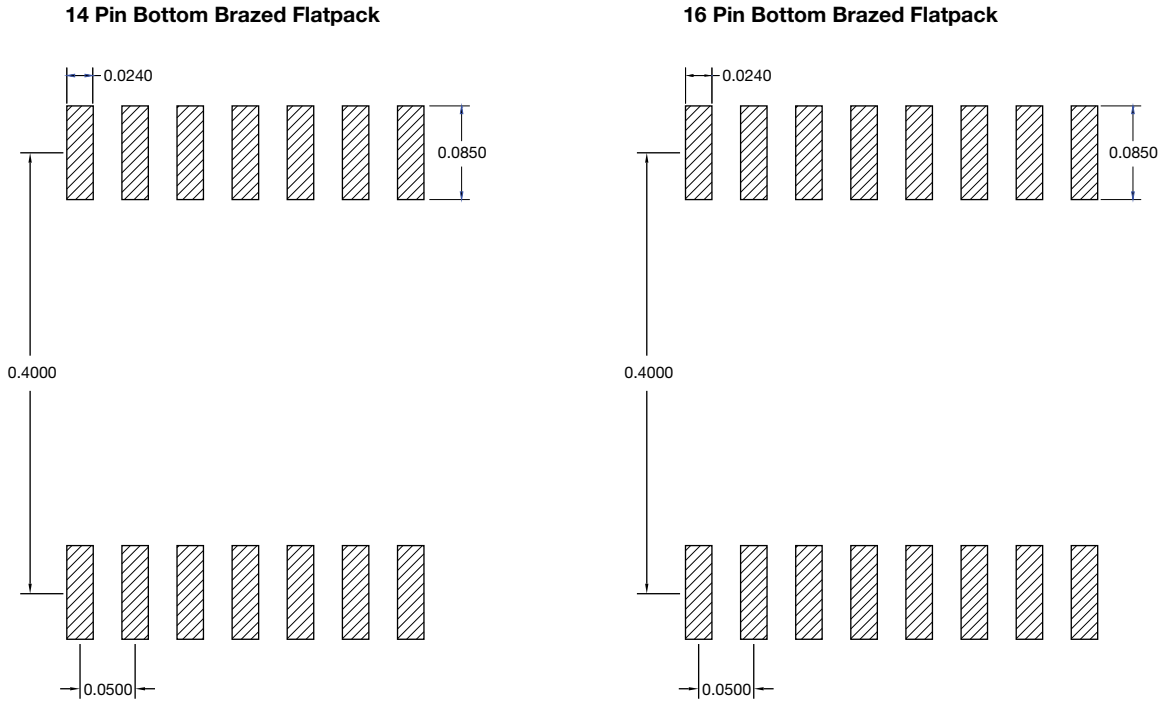
Surface Mount Leadless Resistor Arrays (PR Series)



Note

- All dimensions in inches (mm)

Flatpack





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:

[VSSR1603102JUF](#) [VSOR1603103GUF](#) [VSSR1601103JUF](#) [VSSR1603103JUF](#) [VSSR2001472JUF](#)
[VSSR1601472GTF](#) [VSSR2401472GTF](#) [VSSR1601103JTF](#) [VSSR1603103JTF](#) [VTSR2001102GUF](#)
[VSOR1601472JTF](#) [VSOR1603102GTF](#) [VSSR2001103GTF](#) [VSSR1603100JTF](#) [VSSR1601472JUF](#)
[VSSR1603330JTF](#) [VSSR2003330JTF](#) [VSOR1601472GTF](#) [VTSR2003330GTF](#) [VSSR1603472JTF](#) [VSSR1601101JTF](#)
[VSSR1603510GTF](#) [VTSR1603330GTF](#) [VSSR1601472JTF](#) [VSOR1603103JTF](#) [VSSR2401103JUF](#)
[VSOR1603203GTF](#) [VSSR1601102JTF](#) [VSSR1601272JUF](#) [VSSR2401102JTF](#) [VSSR2001472JTF](#) [VSSR2403330JUF](#)
[VTSR2001102GTF](#) [VSSR2403100JTF](#) [VSSR2401472JTF](#) [VSSR2403103JUF](#) [VSSR1603100GTF](#)
[VTSR2401472GTF](#) [VSSR1603472JUF](#) [VSSR1603220JTF](#) [VSSR1601222JTF](#) [VSSR2001103GUF](#)
[VSSR2401102JUF](#) [VTSR2001391GTF](#) [VSSR1601473JTF](#) [VSSR2003101JUF](#) [VSSR2401103JTF](#) [VSSR1601822JTF](#)
[VTSR2401473GTF](#) [VTSR1601103GUF](#) [VSSR2401103GTF](#) [VSSR2001102GTF](#) [VSSR1601222GTF](#)
[VSSR2403103JTF](#) [VSOR1603103GTF](#) [VSSR1603330GTF](#) [VSSR1601103GUF](#) [VSOR1603222JTF](#)
[VSOR1603472JTF](#) [VSOR1603101JTF](#) [VTSR1601103GTF](#) [VSSR1603220JUF](#)