

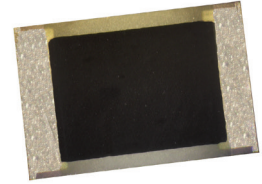
N-Series

0402 0505 0603 0805 1005 1206 2010 2512 2525 3725

Thick Film High Power Chip Resistors and Terminations on Aluminum Nitride

Features

- High stability thick film resistive element
- Very high power dissipation
- AlN substrate material
- Tight TCRs
- Standard resistance range is 10Ω to 2KΩ†, other values available*
- Standard tolerance is 2% or 5%, other tolerances available*
- Operating temperature: -55°C to +155°C
- Maximum working voltage: $E = \sqrt{PR}$
- Available in bulk or tape and reel*



Thick Film

Dimensions

| Part Number | Length | Width | Height Option 'C' | Height Option 'D' | Height Option 'G' | Height Option 'T' |
|-------------|--------|--------|-------------------|-------------------|-------------------|-------------------|
| 0402 | 0.040 | 0.020" | 0.015" Max | N/A | N/A | N/A |
| 0505 | 0.050" | 0.050" | 0.015" Max | 0.020" Max | 0.035" Max | N/A |
| 0603 | 0.060" | 0.030" | 0.015" Max | N/A | N/A | N/A |
| 0805 | 0.080" | 0.050" | 0.015" Max | 0.020" Max | 0.035" Max | N/A |
| 1005 | 0.100" | 0.050" | N/A | 0.020" Max | 0.035" Max | N/A |
| 1206 | 0.126" | 0.063" | N/A | 0.020" Max | 0.035" Max | N/A |
| 2010 | 0.197" | 0.098" | N/A | 0.020" Max | 0.035" Max | 0.050" Max |
| 2512 | 0.250" | 0.120" | N/A | 0.020" Max | 0.035" Max | 0.050" Max |
| 2525 | 0.250" | 0.250" | N/A | N/A | 0.035" Max | 0.050" Max |
| 3725 | 0.375" | 0.250" | N/A | N/A | 0.035" Max | 0.050" Max |

Termination Style Availability

| | WA | SS | SB | SG | SZG | CS | EW | EZW | DE | PW |
|------|----|----|----|----|-----|-----|-----|-----|-----|-----|
| 0402 | • | • | • | • | N/A | N/A | N/A | N/A | N/A | • |
| 0505 | • | • | • | • | N/A | N/A | N/A | N/A | N/A | • |
| 0603 | • | • | • | • | N/A | N/A | N/A | N/A | N/A | • |
| 0805 | • | • | • | • | N/A | • | • | N/A | N/A | • |
| 1005 | • | • | • | • | N/A | • | • | N/A | • | N/A |
| 1206 | • | • | • | • | N/A | • | • | N/A | • | N/A |
| 2010 | • | • | • | • | • | • | • | • | • | N/A |
| 2512 | • | • | • | • | • | • | • | • | • | N/A |
| 2525 | • | • | • | • | • | • | • | • | • | N/A |
| 3725 | • | • | • | • | • | • | • | • | • | N/A |

• Indicates Availability

Ordering Information

Example: 33Ω, 2%, 2010 Center Strip style resistor on 0.015" substrate with PtAg terminations

N D 3 - 2010 S CS 33R0 G
Substrate Thickness
 C - 0.010"¹
 D - 0.015"
 G - 0.025"
 T - 0.040"²
Termination Material
 3 - PtAg
 8 - ULR PtAg
 7 - Au over PtAu³
 C - PtAg w/ Sn62 Solder
 H - ULR PtAg w/ Sn62 Solder
 P - PtAg w/ Sn96 Solder
 R - ULR PtAg w/ Sn96 Solder
Case Size
 0402 0505 0603 2010 0805
 2512 1005 2525 1206 3725

Trim Method
 Blank for normal trim
 S - Scrub cut

Resistance value†
 The first three digits are significant values. The fourth is the number of zeroes following. The R indicates a decimal point for resistance values less than 100Ω.

Style
 WA SB CS DE PW
 SS EW EZW⁴ SZG⁵ SG⁶

Indicates RoHS compliance

1. 0.010" Substrate available in sizes 0805 and smaller.
2. 0.040" Substrate available in sizes 2010 and larger.
3. Au over PtAu terminal metalization available on Single Sided, Single Sided with Backplane and Single Wrap to Ground only. A NX7- Single Wrap to Ground style features bondable terminal on input pad only, ground pad in PtAu.
4. 'EZW' denotes an Extended Wrap to Ground terminal style with a trapezoidal resistor body available in sizes 2010 and larger.
5. 'SZG' denotes a Single Wrap to Ground terminal style with a trapezoidal resistor body available in sizes 2010 and larger.
6. 'SG' denotes a Single Wrap to Ground terminal style with a rectangular resistor body.

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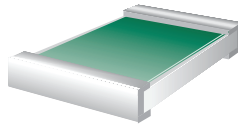
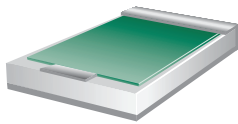
*Consult factory • † Max value for 0505 and 2525 sizes is 1KΩ • N Series ver. B 6/2017 • ISO9001:2008

Additional options available. Please contact factory.

For detailed dimensional information, outline drawing is available from factory.

| Thickness | 0.010" | | | 0.015" | | | 0.025" | | | 0.040" | | | |
|-----------|----------------|------|------|--------|------|------|--------|------|------|--------|------|------|-------|
| | Baseplate Temp | 50°C | 70°C | 100°C | 50°C | 70°C | 100°C | 50°C | 70°C | 100°C | 50°C | 70°C | 100°C |
| Size | 0402 | 13W | 11W | 7.1W | 8.8W | 7.3W | 4.7W | N/A | N/A | N/A | N/A | N/A | N/A |
| | 0505 | 45W | 37W | 24W | 30W | 25W | 16W | 20W | 16W | 10W | N/A | N/A | N/A |
| | 0603 | 24W | 20W | 13W | 16W | 13W | 8.7W | 9.5W | 7.7W | 5.2W | N/A | N/A | N/A |
| | 0805 | 75W | 55W | 37W | 50W | 37W | 25W | 30W | 25W | 16W | N/A | N/A | N/A |
| | 1005 | N/A | N/A | N/A | 60W | 48W | 30W | 40W | 30W | 20W | N/A | N/A | N/A |
| | 1206 | N/A | N/A | N/A | 105W | 85W | 55W | 70W | 55W | 35W | N/A | N/A | N/A |
| | 2010 | N/A | N/A | N/A | 150W | 120W | 75W | 90W | 75W | 48W | 60W | 48W | 30W |
| | 2512 | N/A | N/A | N/A | 200W | 150W | 100W | 120W | 100W | 60W | 70W | 60W | 38W |
| | 2525 | N/A | N/A | N/A | 400W | 300W | 200W | 240W | 190W | 120W | 150W | 120W | 75W |
| | 3725 | N/A | N/A | N/A | 640W | 500W | 340W | 380W | 310W | 200W | 250W | 200W | 125W |

Terminal Styles

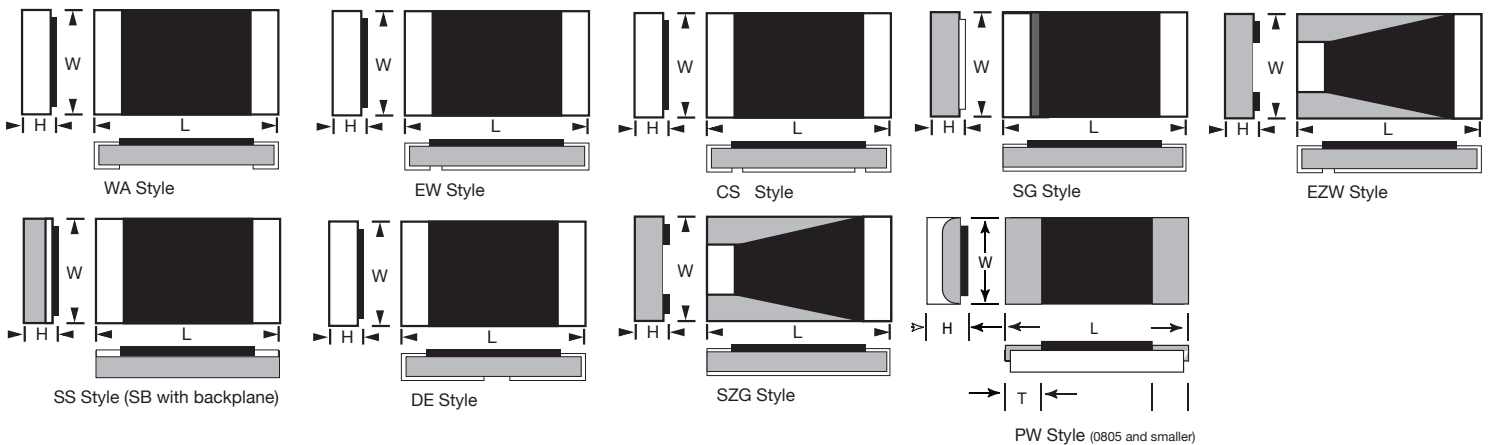


SG - Single wrap with groundplane WA- Full wraparound
 Various additional styles are available. Please see reverse.

Terminal Materials

- 3 ✓ PtAg (platinum silver) for epoxy or solder attachment
- 8 ✓ ULR PtAg (platinum silver) for epoxy or solder attachment
- 7 ✓ Gold over PtAu (platinum gold) for bonding
- C Sn62 Solder coated PtAg for solder attachment
- H ULR PtAg Solder coated Sn96 for solder attachment
- P ✓ Sn96 Solder coated PtAg for solder attachment
- R ✓ ULR PtAg Solder coated Sn96 for solder attachment

Dimensional Outline



A Word About Thermal Management

Tests of aluminum nitride “SG” 50Ω terminations demonstrate the above power capacities, assuming a thermally conductive application where the steady-state baseplate temperature of the chip is maintained at or below the values identified in the above table and the maximum film temperature did not exceed 150°C. The data also shows that the ratio of temperature rise versus power applied increases with increasing chip size (for a given thickness) so the above criteria should be carefully considered when operating larger chips. As with any application, actual performance of these chips will depend on a host of circuit dependent parameters.