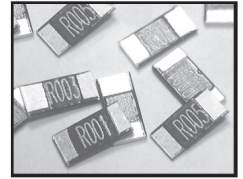


FEATURES

- SURFACE MOUNTABLE 0805, 1206, 2010 AND 2512 CASE SIZE
- LOW RESISTANCE METAL STRIP CONSTRUCTION
- PRECISION TOLERANCE ($\pm 1\%$)
- TAPED & REEL PACKAGING FOR EASY PICK AND PLACE
- REFLOW COMPATIBLE
- **MEETS THE REQUIREMENTS OF AEC-Q200***

*Contact NIC for supporting test data

**RoHS
Compliant**
includes all homogeneous materials



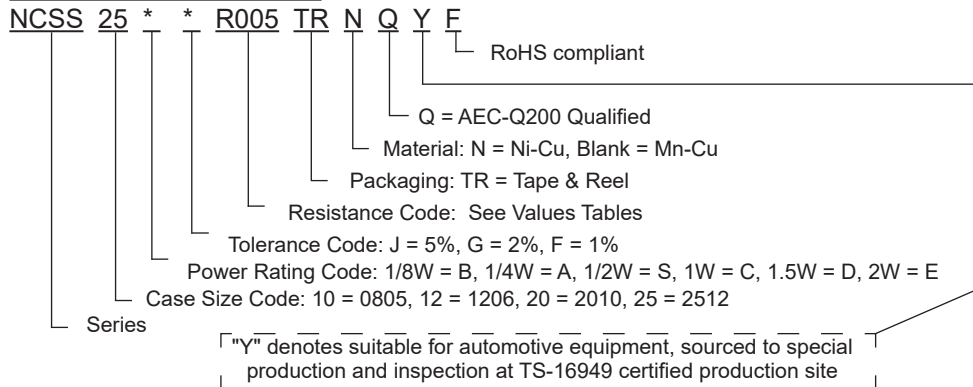
See Part Number System for Details

SPECIFICATIONS

| Type | EIA Size | Material (See Note on EMF Characteristics Below) | Power Rating at 70°C | Resistance Tolerance (Code) | Temperature Coefficient (ppm/°C, +25°C ~ +125°C) | Resistance Range* | Operating Temperature Range (°C) |
|--------|----------|---|----------------------|---|---|----------------------------|----------------------------------|
| NCSS10 | 0805 | Mn-Cu | 1/8W (B) | $\pm 1\%$ (F) $\pm 2\%$ (G) $\pm 5\%$ (J) | $\pm 100\text{ppm}$ | 5m Ω ~ 25m Ω | -55°C ~ +170°C |
| | | | 1/4W (A) | | | | |
| | | | 1/2W (S) | | | | |
| NCSS12 | 1206 | Mn-Cu | 1/4W (A) | | 1m Ω = $\pm 200\text{ppm}$ 2m Ω ~ 10m Ω = $\pm 100\text{ppm}$ >10m Ω = $\pm 75\text{ppm}$ | 1m Ω ~ 30m Ω | |
| | | | 1/2W (S) | | | | |
| | | | 1W (C) | | | | |
| NCSS20 | 2010 | Ni-Cu | 1/2W (S) | | 5m Ω ~ 10m Ω = $\pm 100\text{ppm}$ >10m Ω = $\pm 75\text{ppm}$ | 5m Ω ~ 50m Ω | |
| | | | 3/4W (I) | | | | |
| | | | 1W (C) | | | | |
| | | | 1.5W (D) | | | | |
| NCSS25 | 2512 | Ni-Cu | 1W (C) | 1m Ω = $\pm 275\text{ppm}$ 2m Ω ~ 10m Ω = $\pm 100\text{ppm}$ >10m Ω = $\pm 75\text{ppm}$ | 1m Ω ~ 50m Ω | | |
| | | | 1.5W (D) | | 1m Ω ~ 15m Ω | | |
| | | | 2W (E) | | 1m Ω ~ 10m Ω | | |
| NCSS25 | 2512 | Mn-Cu | 1W (C) | 1.5m Ω ~ 10m Ω = $\pm 100\text{ppm}$ >10m Ω = $\pm 75\text{ppm}$ | 1.5m Ω ~ 50m Ω | | |
| | | | 1.5W (D) | | 1.5m Ω ~ 10m Ω | | |
| | | | 2W (E) | | 1.5m Ω ~ 10m Ω | | |

*Contact NIC regarding availability of values not shown.

PART NUMBER SYSTEM



*Insert appropriate power rating and tolerance codes.

Operating Voltage: $\sqrt{\text{Power rating (Watts)} \times \text{Resistance (Ohms)}}$

Short Time Overload Voltage: $5x \sqrt{\text{Power rating (Watts)} \times \text{Resistance (Ohms)}}$

Operating Current: $\sqrt{\text{Power rating (Watts)} / \text{Resistance (Ohms)}}$

THERMAL EMF CHARACTERISTICS:

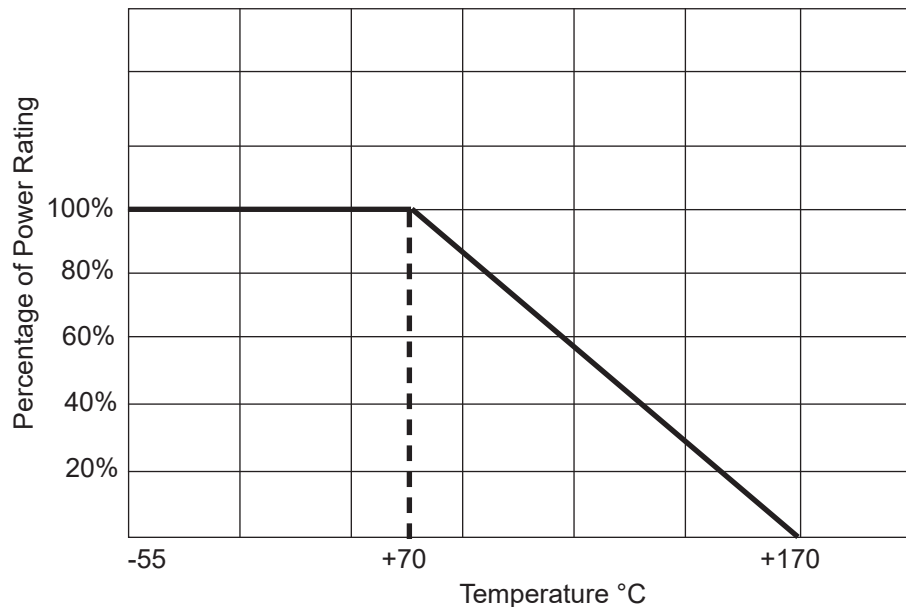
Standard Mn-Cu Construction: Thermal EMF = $-1\mu\text{V}/^\circ\text{C}$
Low Cost Ni-Cu Construction: Thermal EMF = $-40\mu\text{V}/^\circ\text{C}$



ENVIRONMENTAL CHARACTERISTICS

| Item | Specification | | | | Test Method | Reference Standard |
|---------------------------------------|--|--------|--------|--------|--|---|
| | 0805 | 1206 | 2010 | 2512 | | |
| Temperature Coefficient of Resistance | Within specified value | | | | +25°C ~ +125°C | IEC60115-1 4.8 JIS-C5201 4.8 |
| Load Life | <±1% | <±1% | <±1% | <±1% | 1,000 hours at rated power, +70°C, 1.5 hours ON, 0.5 hours OFF | IEC60115-1 4.25.1 JIS-C5201 4.25.1 |
| Short Time Overload | <±0.5% | <±0.5% | <±0.5% | <±0.5% | 5 x rated power for 5 seconds | IEC60115-1 4.13 JIS-C5201 4.13 |
| Moisture Resistance (no load) | <±1% | <±1.0% | <±1% | <±1% | +85°C, 85% RH, 1000 hours | IEC60115-1 4.24.2 1a JIS-C5201 4.24.2 1a |
| Temperature Cycling | <±0.5% | <±0.5% | <±0.5% | <±0.5% | -55°C & +155°C, 300 cycles, 15 minutes at each temperature | IEC60115-1 4.19 JIS-C5201 4.19 |
| Resistance to Soldering Heat | <±0.5% | <±0.5% | <±0.5% | <±0.5% | +260°C ± 5°C for 10 sec. ±1 sec., Two cycles (20 sec. ±1 sec. for 2512 size) | IEC60115-1 4.18 JIS-C5201 4.18 |
| Solderability | At least 95% coverage of electrode surface | | | | +245°C ± 5°C, 2 sec. ± 0.5sec. | IEC60115-1 4.17 JIS-C5201 4.17 |
| High Temperature Exposure | <±1% | <±1% | <±1% | <±1% | +170°C for 1,000 hours | IEC60115-1 4.23.2 JIS-C5201 4.23.2 |
| Low Temperature Storage | <±0.5% | <±0.5% | <±0.5% | <±0.5% | -55°C for 1,000 hours | IEC60115-1 4.23.4 JIS-C5201 4.23.4 |
| Substrate Bending | <±1% | <±0.5% | <±0.5% | <±0.5% | Bending within 2mm | IEC60115-1 4.33 JIS-C5201 4.33 |
| Insulation Resistance | >100MΩ | | | | 100VDC for 1 minute | IEC60115-1 4.6 JIS-C5201 4.6 |

Power Derating Curve: For operation above 70°C, power rating must be derated according to the following chart:



NCSS10 (0805 CASE SIZE 1/8W, 1/4W and 1/2W) AVAILABLE VALUES (Mn-Cu)

| Part Number | Resistance Value (mΩ) | Available Power Ratings | Available Tolerance | Available TCR |
|-------------------|-----------------------|------------------------------|---------------------------|---------------|
| NCSS10__R005TRQYF | 5.0 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS10__R006TRQYF | 6.0 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS10__R008TRQYF | 8.0 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS10__R009TRQYF | 9.0 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS10__R010TRQYF | 10 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS10__R020TRQYF | 20 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS10__R025TRQYF | 25 | 1/8W (B), 1/4W (A), 1/2W (S) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |

NCSS12 (1206 CASE SIZE 1/4W, 1/2W AND 1W) AVAILABLE VALUES (Mn-Cu)

| Part Number | Resistance Value (mΩ) | Available Power Ratings | Available Tolerance | Available TCR |
|-------------------|-----------------------|----------------------------|---------------------------|---------------|
| NCSS12__R001TRQYF | 1.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±200ppm |
| NCSS12__R002TRQYF | 2.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R003TRQYF | 3.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R004TRQYF | 4.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R005TRQYF | 5.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R006TRQYF | 6.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R007TRQYF | 7.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R008TRQYF | 8.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R009TRQYF | 9.0 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R010TRQYF | 10 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS12__R012TRQYF | 12 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS12__R014TRQYF | 14 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS12__R015TRQYF | 15 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS12__R020TRQYF | 20 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS12__R022TRQYF | 22 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS12__R025TRQYF | 25 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS12__R030TRQYF | 30 | 1/4W (A), 1/2W (S), 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |

NCSS20 (2010 CASE SIZE 1/2W, 3/4W, 1W and 1.5W) AVAILABLE VALUES (Ni-Cu)

| Part Number | Resistance Value (mΩ) | Available Power Ratings | Available Tolerance | Available TCR |
|--------------------|-----------------------|--------------------------------------|---------------------------|---------------|
| NCSS20__R005TRNQYF | 5.0 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS20__R006TRNQYF | 6.0 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS20__R010TRNQYF | 10 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS20__R015TRNQYF | 15 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS20__R020TRNQYF | 20 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS20__R022TRNQYF | 22 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS20__R024TRNQYF | 24 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS20__R030TRNQYF | 30 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS20__R050TRNQYF | 50 | 1/2W (S), 3/4W (I), 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |

NCSS25 (2512 CASE SIZE 1W, 1.5W and 2W) AVAILABLE VALUES (Ni-Cu)

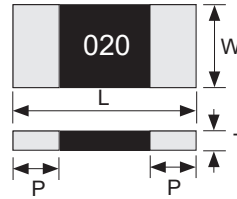
| Part Number | Resistance Value (mΩ) | Available Power Ratings | Available Tolerance | Available TCR |
|---------------------|-----------------------|--------------------------|---------------------------|---------------|
| NCSS25__R001TRNQYF | 1.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±275ppm |
| NCSS25__R002TRNQYF | 2.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R003TRNQYF | 3.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R004TRNQYF | 4.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R005TRNQYF | 5.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R006TRNQYF | 6.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R007TRNQYF | 7.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R008TRNQYF | 8.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R010TRNQYF | 10 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100ppm |
| NCSS25__R011TRNQYF | 11 | 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25__R012TRNQYF | 12 | 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25__R015TRNQYF | 15 | 1W (C), 1.5W (D) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R018TRNQYF | 18 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R020TRNQYF | 20 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R025TRNQYF | 25 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R030TRNQYF | 30 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R033TRNQYF | 33 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R035TRNQYF | 35 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R040TRNQYF | 40 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R050TRNQYF | 50 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |

NCSS25 (1W, 1.5W and 2W 2512 CASE SIZE) AVAILABLE VALUES (Mn-Cu)

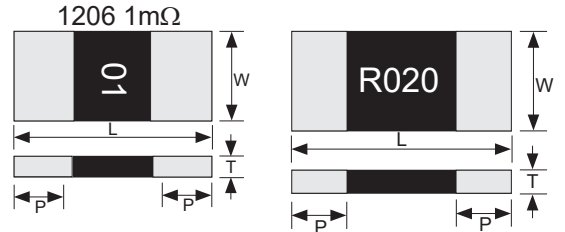
| Part Number | Resistance Value (mΩ) | Available Power Ratings | Available Tolerance | Available TCR |
|--------------------|-----------------------|--------------------------|---------------------------|---------------|
| NCSS25__R0015TRQYF | 1.5 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100 |
| NCSS25__R005TRQYF | 5.0 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100 |
| NCSS25__R010TRQYF | 10 | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±100 |
| NCSS25C__R020TRQYF | 20 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R025TRQYF | 25 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R030TRQYF | 30 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R040TRQYF | 40 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |
| NCSS25C__R050TRQYF | 50 | 1W (C) | ±1% (F), ±2% (G), ±5% (J) | ±75ppm |

COMPONENT DIMENSIONS AND PART MARKING

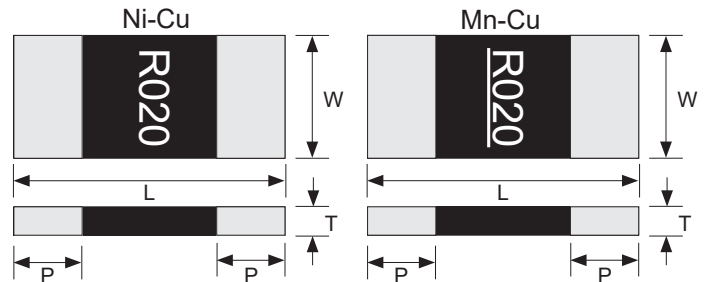
| Case Size | L | W | T | P |
|-----------|---------------|----------------|---------------|---------------|
| 0805 | 2.0 ± 0.1 | 1.25 ± 0.1 | 0.6 ± 0.2 | 0.4 ± 0.2 |



| Case Size | L | W | T | P |
|-----------|---------------|---------------|---|--|
| 1206 | 3.2 ± 0.2 | 1.6 ± 0.2 | $1\text{m}\Omega = 0.75 \pm 0.2$ $2\text{m}\Omega \sim 30\text{m}\Omega = 0.6 \pm 0.2$ | $1\text{m}\Omega = 1.1 \pm 0.3$ $2\text{m}\Omega \sim 30\text{m}\Omega = 0.5 \pm 0.3$ |
| 2010 | 5.0 ± 0.2 | 2.5 ± 0.2 | 0.6 ± 0.2 | 0.6 ± 0.3 |

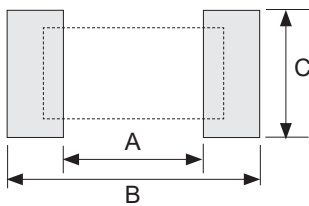


| Case Size | L | W | T | P | |
|-----------|---|---------------|---------------|---------------|---------------|
| 2512 | $R \leq 3\text{m}\Omega$ $R > 3\text{m}\Omega$ | 6.4 ± 0.2 | 3.2 ± 0.2 | 0.6 ± 0.2 | 2.0 ± 0.2 |
| | | | | | 0.9 ± 0.2 |



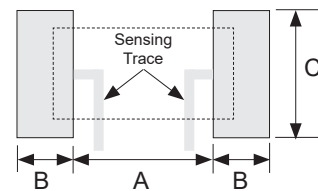
RECOMMENDED LAND PATTERN DIM. (mm)


| Case Size | A | B | C |
|-----------|-----|-----|-----|
| 0805 | 1.2 | 3.5 | 1.4 |



RECOMMENDED LAND PATTERN DIM. (mm)

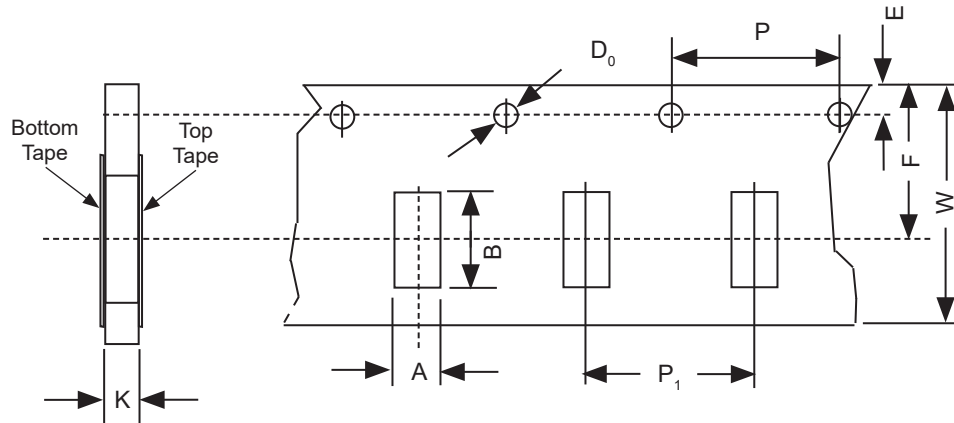
| Case Size | A | B | C | |
|-----------|---|-----|-----|-----|
| 1206 | $1\text{m}\Omega$ | 1.0 | 2.3 | 1.8 |
| | $2\text{m}\Omega \sim 30\text{m}\Omega$ | 1.6 | 1.7 | 1.8 |
| 2010 | 3.5 | 1.5 | 3.4 | |
| 2512 | $1\text{m}\Omega \sim 3\text{m}\Omega$ | 1.3 | 3.1 | 4.0 |
| | $4\text{m}\Omega \sim 50\text{m}\Omega$ | 4.1 | 2.1 | 4.0 |



 **Reflow Soldering Heat Profile and Limits**
 → www.nicomp.com/resource/files/resistive/NIC-ChipR-Reflow-Sept2020-Rev2.pdf
 Wave soldering? – Please review your wave soldering process profile with NIC: tpmg@nicomp.com

PAPER TAPE DIMENSIONS (mm)

| Case Size | A | B | K | P | P ₁ | E | F | D ₀ | W | Quantity per Reel |
|-----------|------------|-----------|------------|-----------|----------------|------------|------------|------------------------|-----------|-------------------|
| 0805 | 1.6 ± 0.15 | 2.4 ± 0.2 | 0.84 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 1.75 ± 0.1 | 3.5 ± 0.05 | 1.5 ^{+0.1/-0} | 8.0 ± 0.2 | 5,000 |
| 1206 | 2.0 ± 0.15 | 3.6 ± 0.2 | 0.84 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 1.75 ± 0.1 | 3.5 ± 0.05 | 1.5 ^{+0.1/-0} | 8.0 ± 0.2 | 5,000 |



EMBOSSED PLASTIC TAPE DIMENSIONS (mm)

| Case Size | A | B | K | P | P ₁ | E | F | D ₀ | D ₁ | W | Quantity per Reel |
|-----------|---------------------------|-----------|-------------|------------|----------------|------------|------------|------------------------|----------------|------------|-------------------|
| 2010 | 2.8 ± 0.2 | 5.3 ± 0.2 | 0.85 ± 0.15 | 4.0 ± 0.05 | 4.0 ± 0.1 | 1.75 ± 0.1 | 5.5 ± 0.05 | 1.5 ± 0.1 | 1.5 min. | 12.0 ± 0.2 | 4,000 |
| 2512 | 3.6 ^{+0.2/-0.18} | 6.9 ± 0.2 | 0.85 ± 0.15 | 4.0 ± 0.05 | 4.0 ± 0.1 | 1.75 ± 0.1 | 5.5 ± 0.05 | 1.5 ^{+0.1/-0} | 1.5 min. | 12.0 ± 0.2 | 4,000 |

