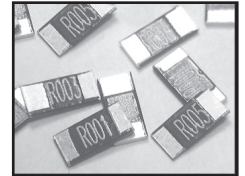


### FEATURES

- HIGH POWER SURFACE MOUNTABLE 2512 CASE SIZE
- **AEC Q-200 QUALIFIED**
- WIDE RANGE OF RESISTANCE VALUES (UP TO 500mΩ)
- METAL STRIP CONSTRUCTION
- PRECISION TOLERANCE ( $\pm 1\%$ )
- REFLOW COMPATIBLE

**RoHS  
Compliant**  
includes all homogeneous materials



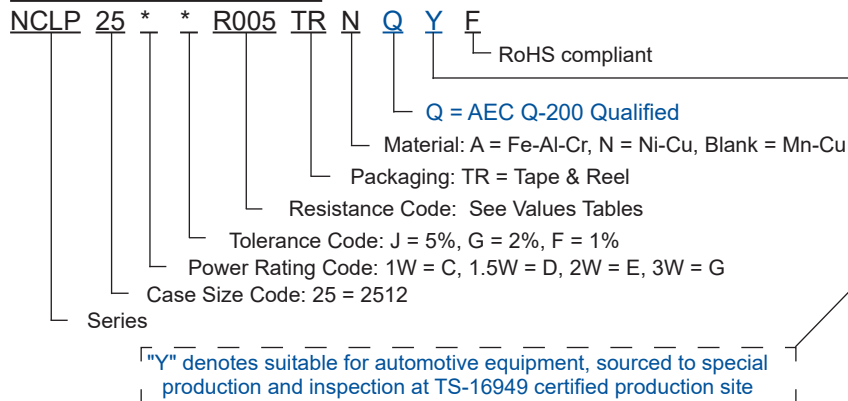
See Part Number System for Details

### SPECIFICATIONS

| Type        | EIA Size | Material<br>(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) |
|-------------|----------|-----------------------------------------------------|----------------------|-------------------------------|--------------------------------------------------|-------------------|----------------------------------|
| NCLP25...NF | 2512     | Ni-Cu                                               | 1W (C)               | ±1% (F)<br>±2% (G)<br>±5% (J) | ±50ppm                                           | 3mΩ ~ 100mΩ       | -55°C ~ +170°C                   |
|             |          |                                                     | 1.5W (D)             |                               |                                                  |                   |                                  |
|             |          |                                                     | 2W (E)               |                               |                                                  |                   |                                  |
|             |          |                                                     | 3W (G)               |                               |                                                  |                   |                                  |
| NCLP25...F  | 2512     | Mn-Cu                                               | 1W (C)               |                               | ±50ppm                                           | 1mΩ ~ 60mΩ        |                                  |
|             |          |                                                     | 1.5W (D)             |                               |                                                  |                   |                                  |
|             |          |                                                     | 2W (E)               |                               |                                                  |                   |                                  |
|             |          |                                                     | 3W (G)               |                               |                                                  |                   |                                  |
| NCLP25...AF | 2512     | Fe-Al-Cr                                            | 1W (C)               |                               | ±50ppm                                           | 120mΩ ~ 500mΩ     |                                  |
|             |          |                                                     | 1.5W (D)             |                               |                                                  |                   |                                  |
|             |          |                                                     | 2W (E)               |                               |                                                  |                   |                                  |

\*Contact NIC regarding availability of values not shown

### PART NUMBER SYSTEM



\*Insert appropriate power rating and tolerance codes, Contact NIC regarding availability of other values

### THERMAL EMF CHARACTERISTICS:

Mn-Cu Construction: Thermal EMF = -1μV/°C

Ni-Cu Construction: Thermal EMF = -40μV/°C

Fe-Al-Cr Construction: Thermal EMF = 1.45μV/°C

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

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

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



### ENVIRONMENTAL CHARACTERISTICS

| Item                                  | Specification                              | Test Method                                                                       | Reference Standard                          |
|---------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------|
|                                       | 2512                                       |                                                                                   |                                             |
| Temperature Coefficient of Resistance | Within specified value                     | +25°C ~ +125°C                                                                    | IEC60115-1 4.8<br>JIS-C5201 4.8             |
| Load Life                             | <±1%                                       | 1,000 hours at rated power, +70°C, 1.5 hours ON, 0.5 hours OFF                    | IEC60115-1 4.25.1<br>JIS-C5201 4.25.1       |
| Short Time Overload                   | <±0.5%                                     | 5 x rated power for 5 seconds                                                     | IEC60115-1 4.13<br>JIS-C5201 4.13           |
| Moisture Resistance (no load)         | <±1% (<0.5%)                               | +85°C, 85% RH, 1000 hours                                                         | IEC60115-1 4.24.2 1a<br>JIS-C5201 4.24.2 1a |
| Temperature Cycling                   | <±0.5%                                     | -55°C & +155°C (+125°C), 300 cycles, (1000 cycles) 15 minutes at each temperature | IEC60115-1 4.19<br>JIS-C5201 4.19           |
| Resistance to Soldering Heat          | <±0.5%                                     | +260°C ± 5°C for 10 sec. ±1 sec., Two cycles (20 sec. ±1 sec. for 2512 size)      | IEC60115-1 4.18<br>JIS-C5201 4.18           |
| Solderability                         | At least 95% coverage of electrode surface | +245°C ± 5°C, 2 sec. ± 0.5sec.                                                    | IEC60115-1 4.17<br>JIS-C5201 4.17           |
| High Temperature Exposure             | <±1%                                       | (+125°C) +170°C for 1,000 hours                                                   | IEC60115-1 4.23.2<br>JIS-C5201 4.23.2       |
| Low Temperature Storage               | <±0.5%                                     | -55°C for 1,000 hours (45 minutes)                                                | IEC60115-1 4.23.4<br>JIS-C5201 4.23.4       |
| Substrate Bending                     | <±0.5%                                     | Bending within 2mm                                                                | IEC60115-1 4.33<br>JIS-C5201 4.33           |
| Insulation Resistance                 | >100MΩ                                     | 100VDC for 1 minute                                                               | IEC60115-1 4.6<br>JIS-C5201 4.6             |
| Mechanical Shock                      | <±0.5%                                     | 100g's, 6ms, half sine pulses                                                     | N/A                                         |
| Vibration Resistance                  | <±0.5%                                     | 5g's for 20 minutes, 12 cycles, 10~2000Hz                                         | N/A                                         |
| Flammability                          | No flaming drips allowed                   | Electric test not required                                                        | UL-94 V-0 or V-1                            |

### NCLP25 (2512 CASE SIZE 1W, 1.5W, 2W and 3W) AVAILABLE VALUES (Ni-Cu)

| Part Number      | Resistance Value (mΩ) | Available Power Ratings          | Available Tolerance       | Available TCR |
|------------------|-----------------------|----------------------------------|---------------------------|---------------|
| NCLP25__R003TRNF | 3.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R004TRNF | 4.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R010TRNF | 10                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R011TRNF | 11                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R012TRNF | 12                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R015TRNF | 15                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R018TRNF | 18                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R020TRNF | 20                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R022TRNF | 22                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R025TRNF | 25                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R030TRNF | 30                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R033TRNF | 33                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R039TRNF | 39                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R040TRNF | 40                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R047TRNF | 47                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R050TRNF | 50                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R057TRNF | 57                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R060TRNF | 60                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R068TRNF | 68                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R070TRNF | 70                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R075TRNF | 75                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R080TRNF | 80                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R085TRNF | 85                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R090TRNF | 90                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R100TRNF | 100                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |

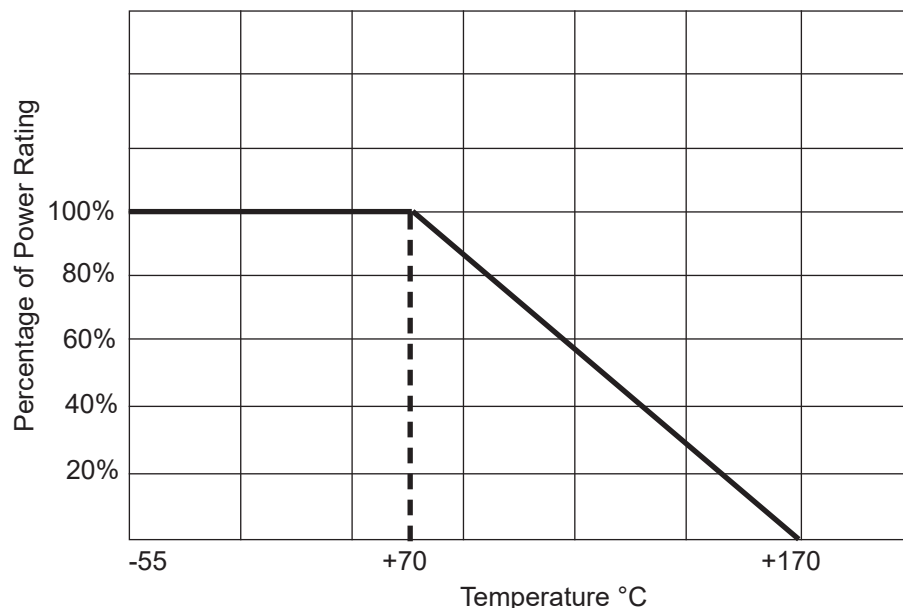
## NCLP25 (2512 CASE SIZE 1W, 1.5W, 2W and 3W) AVAILABLE VALUES (Mn-Cu)

| Part Number      | Resistance Value (mΩ) | Available Power Ratings          | Available Tolerance       | Available TCR |
|------------------|-----------------------|----------------------------------|---------------------------|---------------|
| NCLP25__R001TRF  | 1.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R0011TRF | 1.1                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R002TRF  | 2.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R003TRF  | 3.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R005TRF  | 5.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R007TRF  | 7.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R008TRF  | 8.0                   | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R010TRF  | 10                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R015TRF  | 15                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R020TRF  | 20                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R027TRF  | 27                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R030TRF  | 30                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R033TRF  | 33                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R050TRF  | 50                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R060TRF  | 60                    | 1W (C), 1.5W (D), 2W (E), 3W (G) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |

## NCLP25 (1W, 1.5W and 2W, 2512 CASE SIZE) AVAILABLE VALUES (Fe-Al-Cr)

| Part Number      | Resistance Value (mΩ) | Available Power Ratings  | Available Tolerance       | Available TCR |
|------------------|-----------------------|--------------------------|---------------------------|---------------|
| NCLP25__R120TRAF | 120                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R130TRAF | 130                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R140TRAF | 140                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R150TRAF | 150                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R180TRAF | 180                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R200TRAF | 200                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R220TRAF | 220                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R240TRAF | 240                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R270TRAF | 270                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R280TRAF | 280                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R300TRAF | 300                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R400TRAF | 400                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |
| NCLP25__R500TRAF | 500                   | 1W (C), 1.5W (D), 2W (E) | ±1% (F), ±2% (G), ±5% (J) | ±50ppm        |

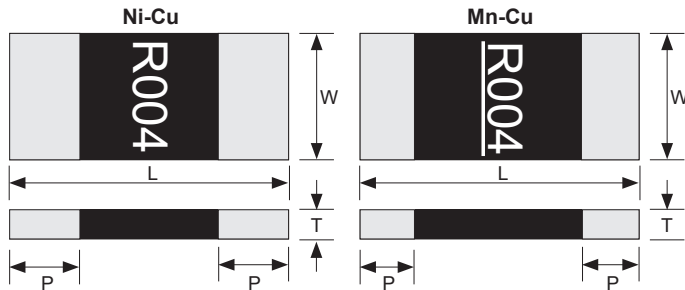
**Power Derating Curve:** For operation above 70°C, power rating must be derated according to the following chart:



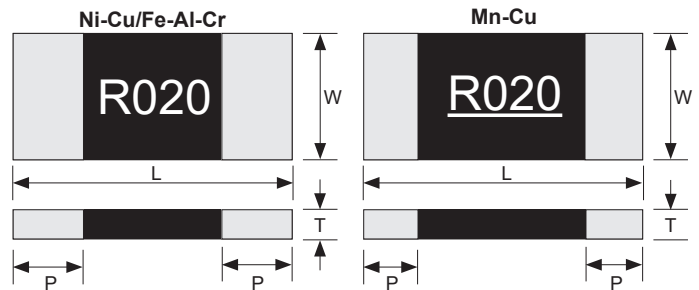
## DIMENSIONS AND PART MARKING

| Case Size |                          | L             | W             | T             | P             |
|-----------|--------------------------|---------------|---------------|---------------|---------------|
| 2512      | $R \leq 4\text{m}\Omega$ | $6.4 \pm 0.2$ | $3.2 \pm 0.2$ | $0.7 \pm 0.2$ | $2.0 \pm 0.2$ |
|           | $R > 4\text{m}\Omega$    |               |               |               | $0.9 \pm 0.2$ |

### Marking for Values $\leq 4\text{m}\Omega$



### Marking for Values $> 4\text{m}\Omega$



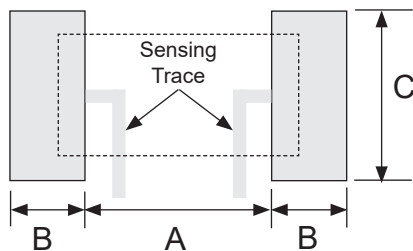
## RECOMMENDED LAND PATTERN DIM. (mm)

| Case Size |                                          | A   | B   | C   |
|-----------|------------------------------------------|-----|-----|-----|
| 2512      | $1\text{m}\Omega \sim 3\text{m}\Omega$   | 1.3 | 3.1 | 4.0 |
|           | $4\text{m}\Omega \sim 500\text{m}\Omega$ | 4.1 | 2.1 | 4.0 |



### Reflow Soldering Heat Profile and Limits

→ [www.niccomp.com/resource/files/resistive/NIC-ChipR-Reflow-Sept2020-Rev2.pdf](http://www.niccomp.com/resource/files/resistive/NIC-ChipR-Reflow-Sept2020-Rev2.pdf)  
Wave soldering? – Please review your wave soldering process profile with NIC: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)



## EMBOSSED PLASTIC TAPE DIMENSIONS (mm)

| Case Size | A             | B             | K               | P              | P <sub>1</sub> | E              | F              | D <sub>0</sub>    | D <sub>1</sub> | W              | Quantity per Reel |
|-----------|---------------|---------------|-----------------|----------------|----------------|----------------|----------------|-------------------|----------------|----------------|-------------------|
| 2512      | $3.6 \pm 0.2$ | $6.9 \pm 0.2$ | $1.25 \pm 0.15$ | $4.0 \pm 0.05$ | $4.0 \pm 0.1$  | $1.75 \pm 0.1$ | $5.5 \pm 0.05$ | $1.5^{+0.1}_{-0}$ | 1.5 min.       | $12.0 \pm 0.2$ | 4,000             |

