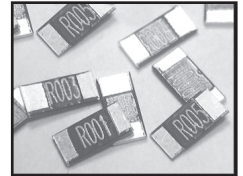


### FEATURES

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

**RoHS  
Compliant**  
includes all homogeneous materials



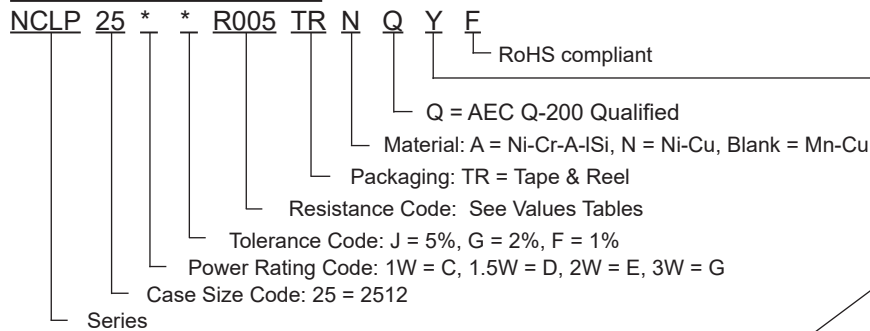
See Part Number System for Details

### 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)
NCLP25...NF	2512	Ni-Cu	1W (C)	±1% (F) ±2% (G) ±5% (J)	±50ppm	3mΩ ~ 100mΩ	-55°C ~ +170°C
			1.5W (D)				
			2W (E)				
			3W (G)				
		Ni-Cr-Al-Si	1W (C)			120mΩ ~ 500mΩ	
			2W (E)				
NCLP25...F	2512	Mn-Cu	1W (C)	±50ppm	±50ppm	1mΩ ~ 60mΩ	
			1.5W (D)				
			2W (E)				
			3W (G)				

\*Contact NIC regarding availability of values not shown

### PART NUMBER SYSTEM



"Y" denotes suitable for automotive equipment, sourced to special production and inspection at IATF-16949 certified production site

\*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

Ni-Cr-Al-Si Construction: Thermal EMF = +1μV/°C

RATED CURRENT:  $I = \sqrt{P/R}$

EXAMPLE: Part Number NCLP25E\_R001TRNF

P = 2W

R = 0.001W (1milli-ohm)

$I = \sqrt{P/R} = \sqrt{2 / 0.001} = 44.7A$



## ENVIRONMENTAL CHARACTERISTICS

Item	Specification	Test Method	Reference Standard
	2512		
Temperature Coefficient of Resistance	Within specified value	+25°C ~ +125°C	IEC60115-1 4.8 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 JIS-C5201 4.25.1
Short Time Overload	<±0.5%	5 x rated power for 5 seconds	IEC60115-1 4.13 JIS-C5201 4.13
Moisture Resistance (no load)	<±1%	+85°C, 85% RH, 1000 hours	IEC60115-1 4.24.2 1a JIS-C5201 4.24.2 1a
Temperature Cycling	<±0.5%	-55°C & +125°C, 1000 cycles 15 minutes at each temperature	IEC60115-1 4.19 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 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%	+125°C for 1,000 hours	IEC60115-1 4.23.2 JIS-C5201 4.23.2
Low Temperature Storage	<±0.5%	-55°C for 45 minutes	IEC60115-1 4.23.4 JIS-C5201 4.23.4
Substrate Bending	<±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
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 and 2W) AVAILABLE VALUES (Ni-Cu)

Part Number	Resistance Value (mΩ)	Available Power Ratings	Available Tolerance	Available TCR
NCLP25__R003TRNF <a href="#">NCLP25__R003TRNQYF</a>	3	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R004TRNF <a href="#">NCLP25__R004TRNQYF</a>	4	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R010TRNF <a href="#">NCLP25__R010TRNQYF</a>	10	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R011TRNF <a href="#">NCLP25__R011TRNQYF</a>	11	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R012TRNF <a href="#">NCLP25__R012TRNQYF</a>	12	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R015TRNF <a href="#">NCLP25__R015TRNQYF</a>	15	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R018TRNF <a href="#">NCLP25__R018TRNQYF</a>	18	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R020TRNF <a href="#">NCLP25__R020TRNQYF</a>	20	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R022TRNF <a href="#">NCLP25__R022TRNQYF</a>	22	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R025TRNF <a href="#">NCLP25__R025TRNQYF</a>	25	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R030TRNF <a href="#">NCLP25__R030TRNQYF</a>	30	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R033TRNF <a href="#">NCLP25__R033TRNQYF</a>	33	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R039TRNF <a href="#">NCLP25__R039TRNQYF</a>	39	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R040TRNF <a href="#">NCLP25__R040TRNQYF</a>	40	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R047TRNF <a href="#">NCLP25__R047TRNQYF</a>	47	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm

\_\_ insert desired power rating and tolerance code. Use part numbers in blue with "QY" in suffix for AEC-Q200 qualified version.



Part Number	Resistance Value (mΩ)	Available Power Ratings	Available Tolerance	Available TCR
NCLP25__R050TRNF <a href="#">NCLP25__R050TRNQYF</a>	50	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R057TRNF <a href="#">NCLP25__R057TRNQYF</a>	57	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R060TRNF <a href="#">NCLP25__R060TRNQYF</a>	60	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R068TRNF <a href="#">NCLP25__R068TRNQYF</a>	68	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R070TRNF <a href="#">NCLP25__R070TRNQYF</a>	70	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R075TRNF <a href="#">NCLP25__R075TRNQYF</a>	75	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R080TRNF <a href="#">NCLP25__R080TRNQYF</a>	80	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R085TRNF <a href="#">NCLP25__R085TRNQYF</a>	85	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R090TRNF <a href="#">NCLP25__R090TRNQYF</a>	90	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R100TRNF <a href="#">NCLP25__R100TRNQYF</a>	100	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm

-- insert desired power rating and tolerance code. Use part numbers in blue with "QY" in suffix for AEC-Q200 qualified version.

## 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 <a href="#">NCLP25__R001TRQYF</a>	1	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R0011TRF <a href="#">NCLP25__R0011TRQYF</a>	1.1	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R002TRF <a href="#">NCLP25__R002TRQYF</a>	2.0	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R003TRF <a href="#">NCLP25__R003TRQYF</a>	3.0	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R005TRF <a href="#">NCLP25__R005TRQYF</a>	5.0	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R007TRF <a href="#">NCLP25__R007TRQYF</a>	7.0	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R008TRF <a href="#">NCLP25__R008TRQYF</a>	8.0	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R010TRF <a href="#">NCLP25__R010TRQYF</a>	10	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R015TRF <a href="#">NCLP25__R015TRQYF</a>	15	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R020TRF <a href="#">NCLP25__R020TRQYF</a>	20	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R027TRF <a href="#">NCLP25__R027TRQYF</a>	27	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R030TRF <a href="#">NCLP25__R030TRQYF</a>	30	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R033TRF <a href="#">NCLP25__R033TRQYF</a>	33	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R050TRF <a href="#">NCLP25__R050TRQYF</a>	50	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R060TRF <a href="#">NCLP25__R060TRQYF</a>	60	1W (C), 1.5W (D), 2W (E), 3W (G)	±1% (F), ±2% (G), ±5% (J)	±50ppm

-- insert desired power rating and tolerance code. Use part numbers in blue with "QY" in suffix for AEC-Q200 qualified version.

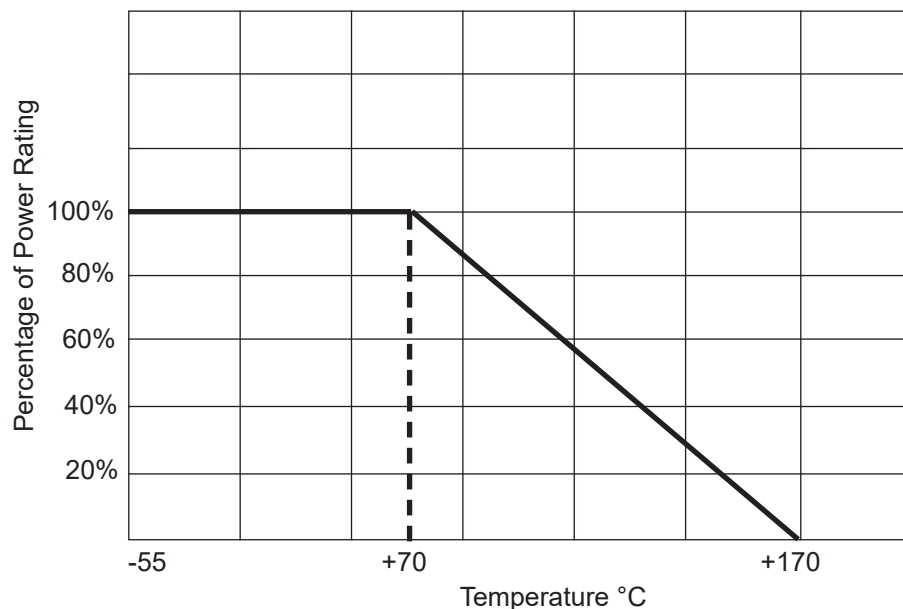


## NCLP25 (1W, 1.5W and 2W, 2512 CASE SIZE) AVAILABLE VALUES (Ni-Cr-Al-Si)

Part Number	Resistance Value (mΩ)	Available Power Ratings	Available Tolerance	Available TCR
NCLP25__R120TRAF NCLP25__R120TRAQYF	120	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R130TRAF NCLP25__R130TRAQYF	130	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R140TRAF NCLP25__R140TRAQYF	140	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R150TRAF NCLP25__R150TRAQYF	150	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R180TRAF NCLP25__R180TRAQYF	180	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R200TRAF NCLP25__R200TRAQYF	200	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R220TRAF NCLP25__R220TRAQYF	220	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R240TRAF NCLP25__R240TRAQYF	240	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R270TRAF NCLP25__R270TRAQYF	270	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R280TRAF NCLP25__R280TRAQYF	280	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R300TRAF NCLP25__R300TRAQYF	300	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R400TRAF NCLP25__R400TRAQYF	400	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25__R500TRAF NCLP25__R500TRAQYF	500	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm

\_\_ insert desired power rating and tolerance code. Use part numbers in blue with "QY" in suffix for AEC-Q200 qualified version.

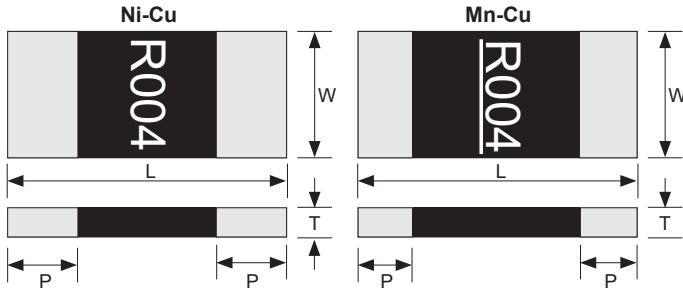
**Power Derating Curve:** For operation above 70°C, power rating must be derated according to the following chart:



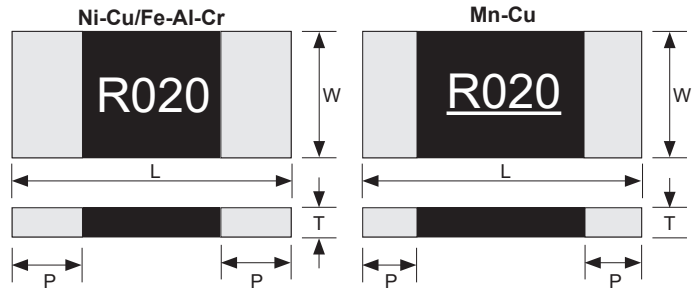
## DIMENSIONS AND PART MARKING

Case Size		L	W	T	P
2512	R ≤ 4mΩ	6.4 ± 0.2	3.2 ± 0.2	0.7 ± 0.2	2.0 ± 0.2
	R > 4mΩ				0.9 ± 0.2

Marking for Values ≤ 4mΩ

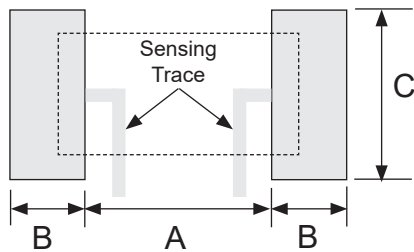


Marking for Values > 4mΩ

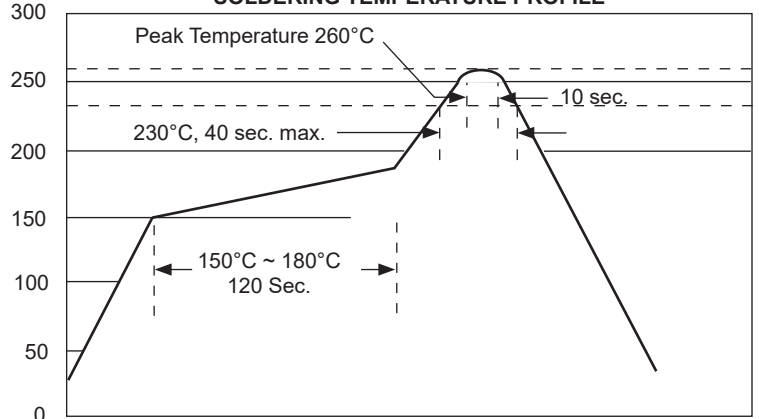


## RECOMMENDED LAND PATTERN DIM. (mm)

Case Size		A	B	C
2512	1mΩ ~ 4mΩ	1.3	3.1	4.0
	5mΩ ~ 500mΩ	4.1	2.1	4.0



## RECOMMENDED REFLOW SOLDERING TEMPERATURE PROFILE



## 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 ± 0.2	6.9 ± 0.2	1.25 ± 0.15	4.0 ± 0.05	4.0 ± 0.1	1.75 ± 0.1	5.5 ± 0.05	1.5 <sup>+0.1/-0</sup>	1.5 min.	12.0 ± 0.2	4,000

