Current Sensing Chip Resistors

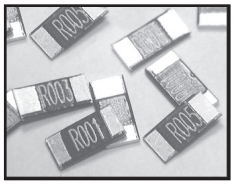
NCLP Series

FEATURES

- HIGH POWER SURFACE MOUNTABLE 2512 CASE SIZE
- AEC Q-200 QUALIFIED
- WIDE RANGE OF RESISTANCE VALUES (UP TO 500mΩ)
- METAL STRIP CONSTRUCTION
- PRECISON 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)				
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

NCLP 25 * * R005 TR N Q Y F

- F — RoHS compliant
- Y — "Y" denotes suitable for automotive equipment, sourced to special production and inspection at TS-16949 certified production site
- Q = AEC Q-200 Qualified
- N — Material: A = Fe-Al-Cr, N = Ni-Cu, Blank = Mn-Cu
- TR — Packaging: TR = Tape & Reel
- R005 — Resistance Code: See Values Tables
- * — Tolerance Code: J = 5%, G = 2%, F = 1%
- * — Power Rating Code: 1W = C, 1.5W = D, 2W = E, 3W = G
- 25 — Case Size Code: 25 = 2512
- NCLP — Series

*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: $\sqrt{\text{Power rating (Watts) x Resistance (Ohms)}}$

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

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

ENVIRONMENTAL CHARACTERISTICS

Item	Specification	Test Method	Reference Standard
	2512		
Temperature Coefficient of Resistance	Within specified value	+25°C ~ +125°C	IEC60115-1 4.8 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% (<0.5%)	+85°C, 85% RH, 1000 hours	IEC60115-1 4.24.2 1a 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 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) +170°C for 1,000 hours	IEC60115-1 4.23.2 JIS-C5201 4.23.2
Low Temperature Storage	<±0.5%	-55°C for 1,000 hours (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, 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

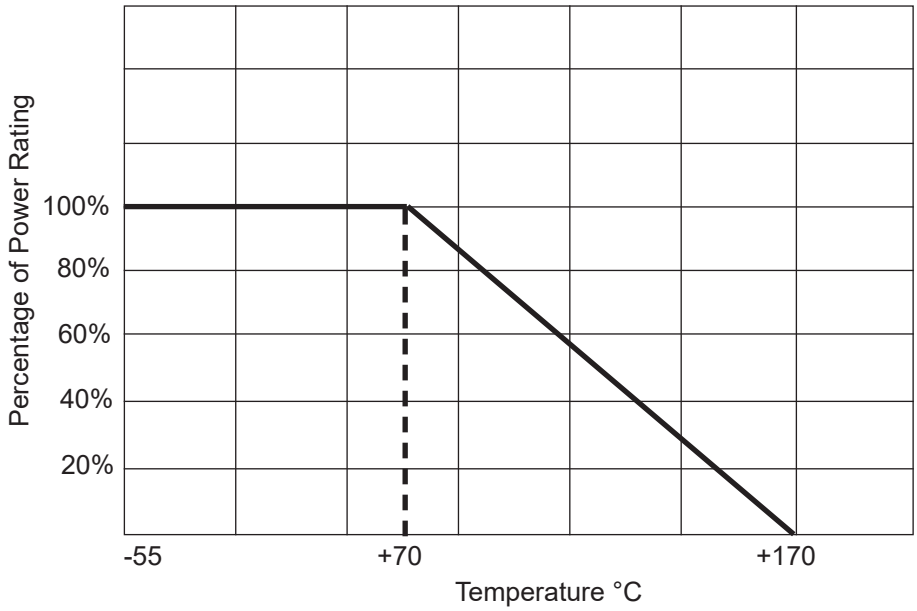
NCLP25 (2512 CASE SIZE 1W, 1.5W, 2W and 3W) AVAILABLE VALUES (Mn-Cu)

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)

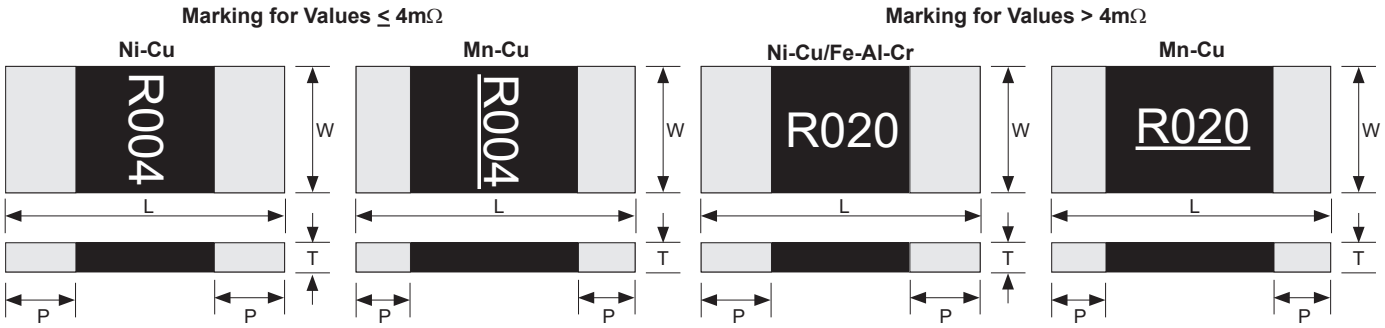
Part Number	Resistance Value (mΩ)	Available Power Ratings	Available Tolerance	Available TCR
NCLP25_ _ R120TRAF	120	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25_ _ R130TRAF	130	1W (C), 1.5W (D), 2W (E)	±1% (F), ±2% (G), ±5% (J)	±50ppm
NCLP25_ _ R140TRAF	140	1W (C), 1.5W (D), 2W (E)	±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

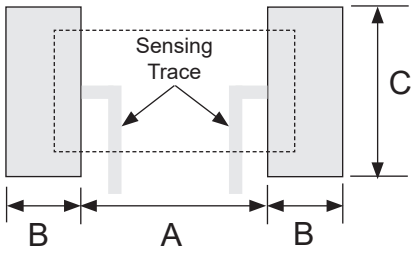
Case Size		L	W	T	P
2512	R ≤ 4mΩ	6.4 ± 0.2	3.2 ± 0.2	0.7 ± 0.2	2.0 ± 0.2
	R > 4mΩ				0.9 ± 0.2



RECOMMENDED LAND PATTERN DIM. (mm)

Case Size		A	B	C
2512	1mΩ ~ 3mΩ	1.3	3.1	4.0
	4mΩ ~ 500mΩ	4.1	2.1	4.0

Reflow Soldering Heat Profile and Limits
→ 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



EMBOSSED PLASTIC TAPE DIMENSIONS (mm)

Case Size	A	B	K	P	P_1	E	F	D_0	D_1	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	$1.5^{+0.1}/_{-0}$	1.5 min.	12.0 ± 0.2	4,000