Chip Resistor Arrays/Networks

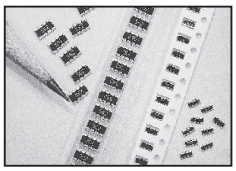
NRSNS Series

FEATURES

- MINIATURE SIZE AND LOW PROFILE
- ANTI-SULFUR & AEC-Q200 QUALIFIED
- HIGH DENSITY PACKAGING OFFERS SIGNIFICANT SPACE SAVINGS
- LOWER PRODUCTION COSTS WITH LESS PLACEMENT (4 RESISTORS IN ONE PACKAGE)
- REFLOW SOLDERING APPLICABLE

RoHS Compliant
includes all homogeneous materials

*See Part Number System for Details

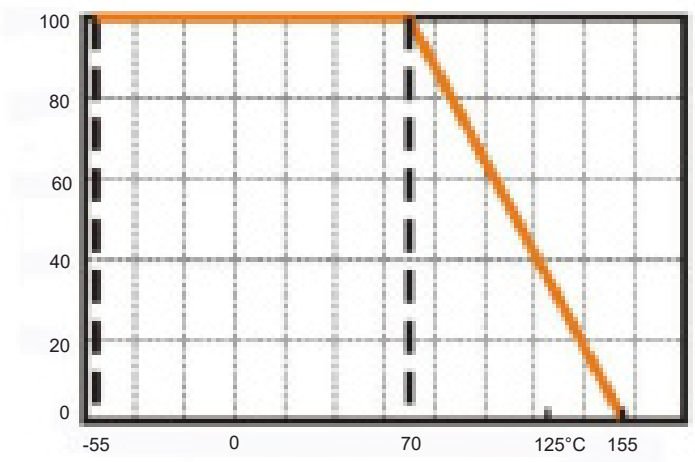


SPECIFICATIONS

Type	NRSNSA4I2	
Termination Type	Convex	
Size W x L (mm)	1.0 x 1.0	
No. of Resistors & Circuit	2R Isolated	
Power Rating per Resistor @ +70°C	1/16 (.0625W)	
Resistance Tolerance	F (±1%)	J (±5%)
Resistance Range	10Ω ~ 1MΩ	
Temperature Coefficient	±300ppm	
Maximum Working Voltage*	50V	
Maximum Overload Voltage	100V	
Operating Temperature Range	-55°C ~ +155°C (derated as shown)	

* Maximum allowable continuous voltage for all resistors is the lower of the two values: "MAXIMUM WORKING VOLTAGE" as specified, or $\sqrt{\text{Power rating (WATTS) x Resistance (OHM}}$

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

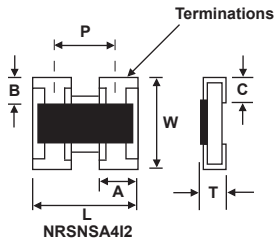


ZERO OHM JUMPER SPECIFICATIONS

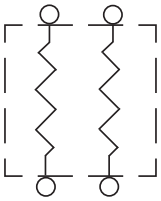
Part Number	NRSNSA4I2ZOTRQYF
Termination Type	Convex
Size W x L (mm)	1.0 x 1.0
No. of Resistors & Circuit	2R Isolated
Power Rating @ +70°C	1/16W
Max. Resistance	50mΩ
Rated Current	1A
Peak Current	1.5A
Operating Temperature	-55°C ~ +155°C (derated as shown)

PART DIMENSIONS (mm)

Type	W	L	P	T	A	B	C
NRSNSA4I2	1.00 ± 0.10	1.00 ± 0.10	0.65 ± 0.10	0.35 ± 0.10	0.34 ± 0.10	0.20 ± 0.15	0.25 ± 0.17



CIRCUIT SCHEMATICS



NRSNSA4I2
Circuit Type "I"
Isolated

PART NUMBER SYSTEM (5% TOLERANCE E-24 VALUES)

NRSNS A 4I2 J 103 TR 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
- TR — Tape & Reel Packaging
- 103 — Resistance Code: First 2 figures are significant, 3rd digit is the multiplier, "R" indicates a decimal point.
- J — Tolerance Code: J=5%
- 4I2 — Configuration Designator (See circuit schematics and component diagrams for explanation)
- A — Termination Type (A = Convex)
- NRSNS — Series

PART NUMBER SYSTEM (1% TOLERANCE E-24 & E-96 VALUES)

NRSNS A 4I2 F 1002 TR 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
- TR — Tape & Reel Packaging
- 1002 — Resistance Code: First 2 figures are significant, 3rd digit is the multiplier, "R" indicates a decimal point.
- F — Tolerance Code: F=1%
- 4I2 — Configuration Designator (See circuit schematics and component diagrams for explanation)
- A — Termination Type (A = Convex)
- NRSNS — Series

ENVIRONMENTAL SPECIFICATIONS

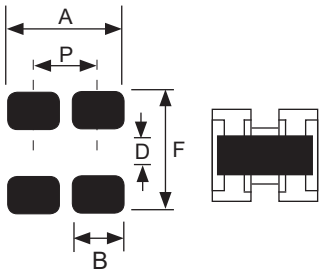
Item	Specification		Test Method
	1% & 5% Tolerance	Zero Ohm Jumper	
DC Resistance & TCR JIS C5201-1 (1998) Clause 4.8	As specified	N/A	Resistance at reference temperature (+20°C +5°C -1°C) to test temperature
Resistance to Soldering Heat MIL-STD-202, Method 201	ΔR ±0.5%+0.05Ω	<50mΩ	Unmounted chips completely immersed in SAC solder bath at 270°C ± 5°C for 10 sec. ±1 sec.
Solderability J-STD-202	>95% coverage No visable damage		a) Bake sample @ +155°C for 4 hours, dip in solder bath at 235°C for 5 sec. b) Steam sample 1 hour, dip in solder bath at 260°C for 7 sec.
Temperature Cycling JESD22, Method JA-104	ΔR ±0.5%+0.05Ω	<50mΩ	1,000 cycles, -55°C ~ +155°C, dwell time 5 ~ 10 minutes
Load Life MIL-STD-202, Method 108	ΔR ±1%+0.05Ω No visible damage	<50mΩ	1,000 hrs ±48 hrs, +125°C ± 2°C, 35% of operating power
Humidity Load Life MIL-STD-202, Method 103	ΔR ±1%+0.05Ω No visible damage	<50mΩ	1,000 hrs ± 48 hrs, +85°C, 85%RH, 10% of operating power
Moisture Resistance MIL-STD-202, Method 106	ΔR ±0.5%+0.10Ω No visible damage	<50mΩ	10 cycles, 24 hours/cycle, +65°C ± 2°C, 80 ~ 100%RH
High Temperature Exposure MIL-STD-202, Method 108	ΔR ±1%+0.05Ω No visible damage	<50mΩ	1,000 hrs ±48 hrs, +125°C ± 3°C, without load
Thermal Shock MIL-STD-202, Method 107	ΔR ±0.5%+0.05Ω No visible damage	<50mΩ	300 cycles, -55°C ~ +125°C, dwell time 15 minutes, maximum transfer time 20 seconds
Board Flex AEC-Q200-005	ΔR ±1.0%+0.05Ω No visible damage	<50mΩ	Resistors mounted on a 90mm glass epoxy resin PCB(FR4), bending once 2mm for 10 seconds
Vibration MIL-STD-202, Method 204	ΔR ±1.0%+0.05Ω No visible damage	<50mΩ	5g's for 20 minutes, 12 cycles each in 3 orientations
ESD AEC-Q200-002	ΔR ±1.0%+0.05Ω No visible damage	<50mΩ	Test contact 1KV
Terminal Strength AEC-Q200-006	No remarkable damage or removal of the termination		Force of 1Kg applied for 60 seconds ± 1 second

Note: Anti-Sulfuration ASTM B-809-95 +105°C, 1000 hours, within ±1%

LAND PATTERN DIMENSIONS (mm)

Type	Reflow Soldering				
	A	B	D	P	F
NRSNSA4I2	1.20 ± 0.05	0.40 +0/-0.05	0.50 ± 0.05	0.65	1.30 +0.20/-0.10

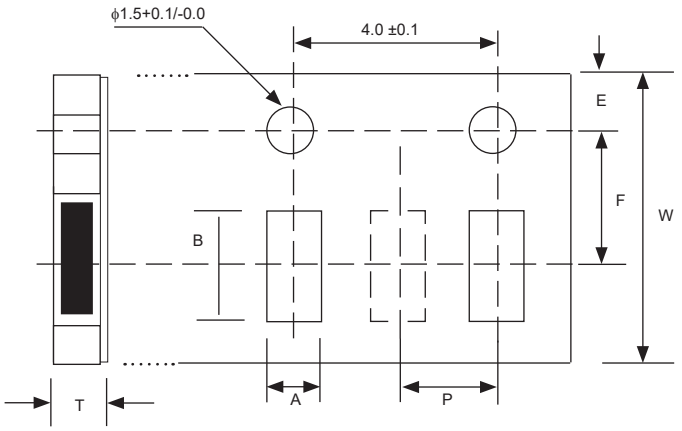
NRSNSA4I2



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

TAPE DIMENSIONS (mm)

Type	Material	A	B	E	F	P	W	T
NRSNSA4I2	Paper	1.15 ± 0.1	1.15 ± 0.1	1.75 ± 0.10	3.5 ± 0.20	2.0 ± 0.05	8.0 ± 0.3	0.6 max.



REEL DIMENSIONS (mm)

Type	A	B	C	D	W	Qty/Reel
NRSNSA4I2	ϕ178 ±2.0	ϕ60 ±1.0	ϕ13.0 ±0.2	ϕ21.0 ±1.0	9.0 ±0.5	10,000