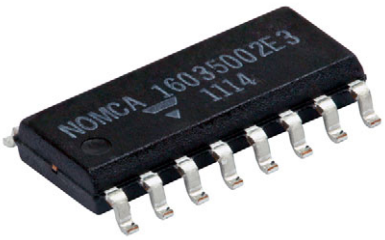
Molded, 50 mil Pitch, Dual-In-Line Thin Film Resistor, Precision Automotive, AEC-Q200 Qualified, Networks



FEATURES

- Standard 14 pins and 16 pins counts (0.150" narrow body) JEDEC® MS-012 variation AB and AC
- Rugged molded case construction
- Excellent long term ratio stability (ΔR ± 0.015 %)
- Low TCR tracking ± 5 ppm/°C
- AEC-Q200 ESD rated 1 kV (< 10 kΩ)
- AEC-Q200 ESD rated 2 kV (>10 kΩ)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

Packages | Footprints | Product Page

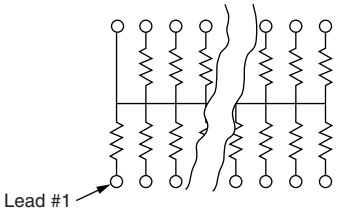
The NOMCA series features a standard 14 pin or 16 pin narrow body (0.150") small outline SMT package. The network is constructed with tantalum nitride resistor film on high purity alumina substrate for improved ESD and moisture protection. Custom schematics are available consult factory.

TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
TCR	25	5
	ABSOLUTE	RATIO
TOL.	0.10	0.05

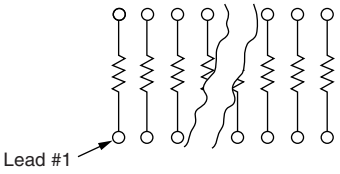
SCHEMATICS

01 Schematic



The 01 circuit provides a choice of 13 or 15 equal value resistors (14 or 16). Custom schematics available.

03 Schematic



The 03 circuit provides a choice of 7 or 8 equal value resistors (14 or 16). Custom schematics available.

STANDARD RESISTANCE OFFERING (Equal Value Resistors)
ISOLATED (03) SCHEMATIC
1 kΩ
2 kΩ
5 kΩ
10 kΩ
20 kΩ
50 kΩ

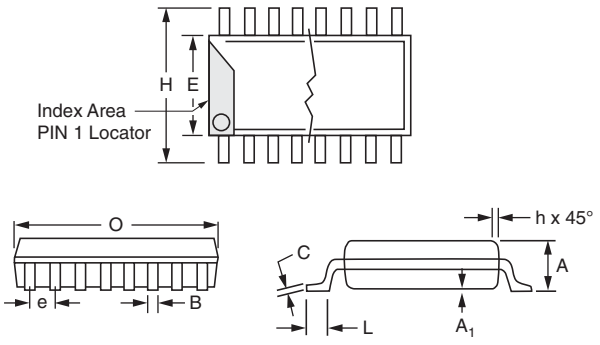
Note

- Consult factory for additional values

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride (Ta_2N)	-
Pin/Lead Number	14, 16	-
Resistance Range	1 kΩ to 50 kΩ each resistor (bussed (01) schematic) 1 kΩ to 100 kΩ each resistor (isolated (03) schematic)	- -
TCR: Absolute	± 25 ppm/°C (standard)	-55 °C to +125 °C
TCR: Tracking	± 5 ppm/°C (typical)	-55 °C to +125 °C
Tolerance: Absolute	± 0.10 % to ± 5 %	+25 °C
Tolerance: Ratio	± 0.05 % to ± 0.5 %	+25 °C
Power Rating: Resistor	50 mW ((typical) for (01) schematic); 100 mW ((typical) for (03) schematic)	Maximum at +70 °C
Power Rating: Package	400 mW; 500 mW	Maximum at +70 °C
Stability: Absolute	ΔR ± 0.05 %	1000 h at +125 °C
Stability: Ratio	ΔR ± 0.015 %	1000 h at +125 °C
Voltage Coefficient	< 0.1 ppm/V	-
Working Voltage	100 V max. not to exceed $\sqrt{P \times R}$	-
Operating Temperature Range	-55 °C to +125 °C	-
Storage Temperature Range	-55 °C to +150 °C	-
Noise	≤ -30 dB	-
Thermal EMF	0.08 µV/°C	-
Shelf Life Stability: Absolute	ΔR ± 0.01 %	1 year at +25 °C
Shelf Life Stability: Ratio	ΔR ± 0.002 %	1 year at +25 °C

DIMENSIONS AND IMPRINTING in inches and millimeters



DIMENSION	14		16	
	INCHES	MILLIMETERS	INCHES	MILLIMETERS
H	0.235	5.969	0.235	5.969
E	0.154	3.911	0.154	3.910
O	0.340	8.363	0.390	9.906
A	0.063	1.600	0.063	1.600
e	0.050	1.270	0.050	1.270
B	0.015	0.381	0.015	0.381
C	0.008	0.203	0.008	0.203
L	0.025	0.635	0.025	0.635
A^1	0.006	0.152	0.006	0.152
h	0.015	0.381	0.015	0.381

MECHANICAL SPECIFICATIONS

Resistive Element	Tantalum nitride (Ta_2N)
Substrate Material	Ceramic
Body	Molded epoxy
Terminals	Copper alloy
Lead (Pb)-free Option	100 % matte tin plate or Ni/Pd/Au solder free option

ORDERING INFORMATION CHECK LIST (Customs)

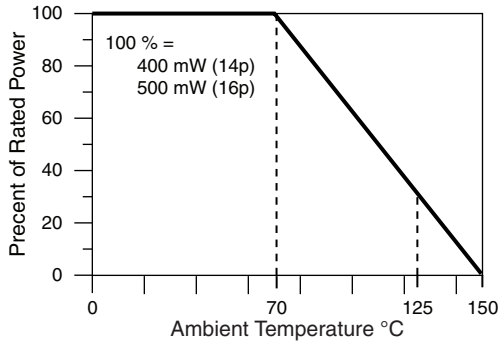
Special requirements should be identified in advance, but as a minimum, you should have the following information ready.

ELECTRICAL	MECHANICAL
1. Resistors, by value and tolerance 2. Reference resistor(s) and matching of which resistors to which reference resistors 3. Reference by ratio 4. Absolute temperature coefficient of resistivity 5. Temperature tracking of subordinate resistors to reference resistor(s) 6. Maximum operating voltage 7. Resistor power ratings 8. Operating temperature range	1. Maximum allowable seated height (from PC board to top of network) 2. Special marking concerns 3. Schematic pin out of package

ENVIRONMENTAL TESTS (Vishay Performance vs. AEC-Q200 Requirements)

ENVIRONMENTAL TEST		CONDITONS	LIMITS PER AEC-Q200	TYPICAL VISHAY PERFORMANCE < 10K	TYPICAL VISHAY PERFORMANCE > 10K
Resistance Temperature Characteristic		-55 °C to +125 °C	± 25 ppm/°C	15 ppm/°C	15 ppm/°C
Max. Ambient Temperature at Rated Wattage			+70 °C	+70 °C	+70 °C
Max. Ambient Temperature at Power Derating			+150 °C	+150 °C	+150 °C
High Temperature Exposure	**ΔR**	MIL-STD-202, 108, 1000 h at 125 °C	± 0.20 %	0.005 %	0.012 %
Temperature Cycling	**ΔR**	JESD22, A104, 1000 cycles, - 55 °C to + 125 °C	± 0.25 %	0.004 %	0.004 %
Moisture Resistance	**ΔR**	MIL-STD-202 method 106	± 0.20 %	0.007 %	0.007 %
Biased Humidity	**ΔR**	MIL-STD-202, 103, 1000 h at 85 °C, 85 % RH, 10 % P	± 0.25 %	0.021 %	0.033 %
Life	**ΔR**	MIL-STD-202, 108, 1000 h at 125 °C	± 0.10 %	0.012 %	0.029 %
Mechanical Shock	**ΔR**	MIL-STD-202 method 213, condition C	± 0.25 %	0.001 %	0.001 %
Vibration	**ΔR**	MIL-STD-202 method 204, 10 Hz to 2 kHz	± 0.25 %	0.001 %	0.001 %
Resistance to Soldering Heat	**ΔR**	MIL-STD-202, 204, condition B	± 0.10 %	-0.002 %	0.001 %
Electrostatic Discharge	**ΔR**	AEC-Q200-002 at 1 kV, human body	± 0.50 %	0.065 %	
		AEC-Q200-002 at 2 kV, human body	± 0.50 %		0.170 %
Solderability		J-STD-002 method B and B1	95 %	Acceptable	Acceptable
Terminal Strength	**ΔR**	AEC-Q200-006 at 1 kg for 60 s		Acceptable	Acceptable
Flame Retardance		AEC-Q200-001 Para 4.0		Acceptable	Acceptable

DERATING CURVE



GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: NOMCA14031002BUF

N	O	M	C	A	1	4	0	3	1	0	0	2	A	T	1

GLOBAL MODEL (4 or 5 digits)	PINS	SCHEMATIC	RESISTANCE	TOLERANCE AND RATIO TOLERANCE		PACKAGING
				Abs. Tol.	Ratio	
NOMCA (Lead (Pb)-free) (e3)	**14** **16**	**01** = 13 or 15 bussed equal resistors **03** = 7 or 8 isolated equal value resistors	First 3 digits are significant figures and the last digit specifies the number of zeros to follow. Example: 1002 = 10K	**A** = 0.1 % (1)	0.05 %	TAPE AND REEL **T0** = 100 min., 100 mult **T1** = 1000 min., 1000 mult (2) **T3** = 300 min., 300 mult **T5** = 500 min., 500 mult **TF** = Full reel 2500 **TS** = 100 min., 1 mult **UF** = TUBED
				B = 0.1 %	0.1 %	
				C = 0.25 %	0.1 %	
				D = 0.5 %	0.1 %	
				F = 1 %	0.5 %	
				G = 2 %		
				J = 5 %		

Notes

(1) Tolerance available 1K and up

(2) Preferred packaging code

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