NOMCA

RoHS

COMPLIANT HALOGEN

FREE



Vishay Dale Thin Film

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



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.

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 $(\Delta R \pm 0.015 \%)$
- Low TCR tracking ± 5 ppm/°C
- AEC-Q200 ESD rated 1 kV (< 10 kΩ)
- AEC-Q200 ESD rated 2 kV (>10 kΩ)
- Compliant to RoHS Directive 2011/65/EU
- Halogen-free according to IEC 61249-2-21 definition

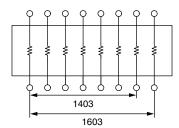
Note

* Pb containing terminations are not RoHS compliant, exemptions may apply

TYPICAL PERFORMANCE

\bullet	ABSOLUTE	TRACKING
TCR	25	5
	ABSOLUTE	RATIO
TOL.	0.10	0.05

SCHEMATICS



The 03 circuit provides a choice of 7 or 8 equal value resistors each connected between a common lead (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

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STANDARD ELECTRICAL SPECIFICATIONS			
TEST	SPECIFICATIONS	CONDITIONS	
Material	Tantalum nitride (Ta2N)	-	
Pin/Lead Number	14, 16	-	
Resistance Range	1 k Ω to 50 k Ω each resistor	-	
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 ± 1 %	+ 25 °C	
Tolerance: Ratio	± 0.05 % to ± 0.1 %	+ 25 °C	
Power Rating: Resistor	100 mW ((typical) (03) schematic)	Maximum at + 70 °C	
Power Rating: Package	400 mW/500 mW	Maximum at + 70 °C	
Stability: Absolute	$\Delta R \pm 0.05 \%$	1000 h at + 125 °C	
Stability: Ratio	∆R ± 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	$\Delta R \pm 0.01 \%$	1 year at + 25 °C	
Shelf Life Stability: Ratio	$\Delta R \pm 0.002 \%$	1 year at + 25 °C	

DIMENSIONS AND IMPRINTING in inches and millimeters					
	DIMENSION	14		16	
		INCHES	MILLIMETERS	INCHES	MILLIMETERS
	Н	0.235	5.969	0.235	5.969
H E	E	0.154	3.911	0.154	3.910
Index Area	0	0.340	8.363	0.390	9.906
	А	0.063	1.600	0.063	1.600
→ h x 45°	е	0.050	1.270	0.050	1.270
	В	0.015	0.381	0.015	0.381
	С	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 (Ta2N)		
Substrate Material	Ceramic		
Body	Molded epoxy		
Terminals	Copper alloy		
Lead (Pb)-free Option	100 % matte tin plate or Ni/Pd/Au solder free option		

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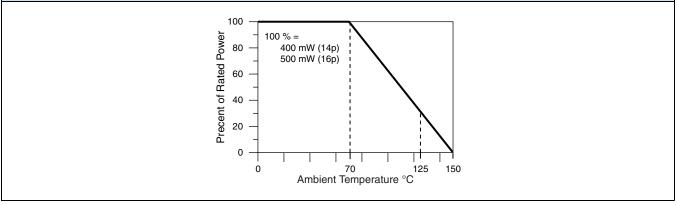


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ORDERING INFORMATION CHECK LIST (Customs)				
Special requirements should be identified in advance, but as a minimum, you should have the following information ready.				
ELECTRICAL	MECHANICAL			
 Resistors, by value and tolerance Reference resistor(s) and matching of which resistors to whichreference resistors Reference by ratio Absolute temperature coefficient of resistivity Temperature tracking of subordinate resistors to reference resistor(s) Maximum operating voltage Resistor power ratings Operating temperature range 	 Maximum allowable seated height (from PC board to top of network) Special marking concerns Schematic pin out of package 			

ENVIRONMENTAL TESTS (Vishay Performance vs. AEC-Q200 Requirements)					
ENVIRONMENTAL TEST		CONDITONS	LIMITS PER AQEC-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 ℃ to + 125 ℃	± 0.25 %	0.004 %	0.004 %
Moisture Resistance	ΔR	MIL-STD-202 method 106	± 0.20 %	0.007 %	0.007 %
Biased Humidity	∆ R	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	∆ R	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 Discharg	Δ R	AEC-Q200-002 at 1 kV, human body	± 0.50 %	0.065 %	
	Δ Π	AEC-Q200-002 at 2 kV, human body	± 0.50 %		0.170 %
Solderability		J-STD-002 method B and B1	95 %	Acceptable	Acceptable
Terminal Strenght	ΔR	AEC-Q200-006 at 1 kg for 60 s		Acceptable	Acceptable
Flame Retardance		AEC-Q200-001 Para 4.0		Acceptable	Acceptable

DERATING CURVE



Revision: 24-Feb-12

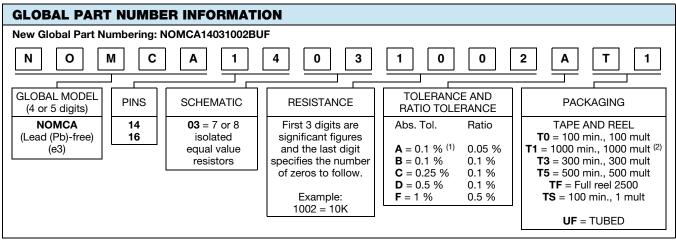
3 For technical questions, contact: <u>thinfilm@vishay.com</u> Document Number: 60117

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Notes

⁽¹⁾ Tolerance available 1K and up

⁽²⁾ Preferred packaging code



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