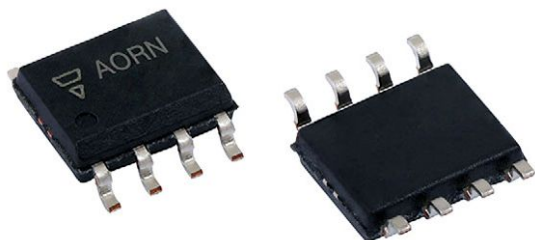
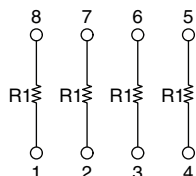
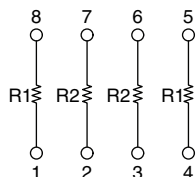


Molded, 50 mil Pitch, Dual-In-Line Thin Film Resistor, Precision Automotive, AEC-Q200 Qualified, Networks



The AORN series features a narrow body (0.150") small outline SMT package. The network is constructed with a tantalum nitride resistor film on a high purity alumina substrate for improved ESD and moisture protection.

SCHEMATICS



Note

- Consult factory for additional divider ratios and resistance values

FEATURES

- Moisture resistant tantalum nitride resistive film (MIL STD 202, method 106)
- Standard 8 pin count (0.150" narrow body) JEDEC® MS-012
- Rugged molded case construction
- Excellent long term ratio stability ($\Delta R \pm 0.015\%$)
- Low TCR tracking ± 5 ppm/°C
- Passes sulfur resistance test per ASTM B 809
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

Note

* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

TYPICAL APPLICATIONS

- Voltage divider circuits
- Engine control units
- Signal conditioning
- Feedback circuits

TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
TCR	25	5
	ABSOLUTE	RATIO
TOL.	0.10	0.05

STANDARD DIVIDER VALUES

RATIO R_1/R_2	R_1	R_2
100:1	100 kΩ	1 kΩ
50:1	50 kΩ	1 kΩ
25:1	25 kΩ	1 kΩ
20:1	20 kΩ	1 kΩ
10:1	10 kΩ	1 kΩ
5:1	10 kΩ	2 kΩ
2:1	10 kΩ	5 kΩ
1:1	100 kΩ	
	100 kΩ	
	49.9 kΩ	
	24.9 kΩ	
	20.0 kΩ	
	10.0 kΩ	
	4.99 kΩ	
	2.0 kΩ	
	1.0 kΩ	

STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride (Ta ₂ N)	-
Pin/Lead Number	8	-
Resistance Range	1 kΩ to 100 kΩ per resistor	-
TCR: Absolute	± 25 ppm/°C (standard)	-55 °C to +155 °C
TCR: Tracking	± 5 ppm/°C (typical)	-55 °C to +155 °C
Tolerance: Absolute	± 0.10 % to ± 1 %	At +25 °C temperature
Tolerance: Ratio	± 0.05 % to ± 0.1 %	At +25 °C temperature
Power Rating: Resistor	100 mW	Maximum at +70 °C
Power Rating: Package	400 mW	Maximum at +70 °C
Stability: Absolute	ΔR ± 0.05 %	1000 h at +155 °C
Stability: Ratio	ΔR ± 0.015 %	1000 h at +155 °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 +155 °C	-
Storage Temperature Range	-55 °C to +155 °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

The diagram illustrates the physical characteristics and dimensions of an AORN resistor. It includes three views: a top view, a side view, and an end view.

- Top View:** Shows a rectangular body with four vertical leads. Dimensions include *A* (height), *B* (lead width), *C* (lead pitch), *D* (body width), and *I* (lead thickness). Markings on the top surface include "AORN", "x x x x", a dot, and four boxes for the Resistance Value Code and Date Code.
- Side View:** Shows the profile of the resistor with dimensions *E* (lead height), *F* (body height), *G* (total height), and *Ø* (lead angle).
- End View:** Shows the bottom of the resistor with dimension *H* (bottom thickness) relative to the Seating Plane.

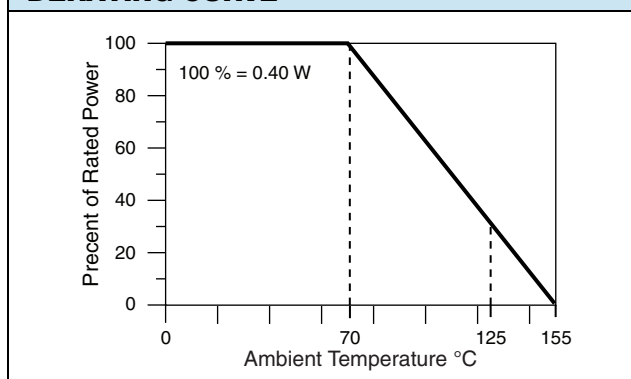
DIMENSION	INCHES	MILLIMETERS
A	0.154 ± 0.003	3.90 ± 0.09
B	0.016 ± 0.002	0.4 ± 0.06
C	0.050	1.27
D	0.193 ± 0.004	4.90 ± 0.1
E	0.008 ± 0.001	0.20 ± 0.03
F	0.032 ± 0.016	0.81 ± 0.4
G	0.236 ± 0.008	6.00 ± 0.2
H	0.068 max.	1.73
I	0.007 ± 0.003	0.18 ± 0.07
Ø	2° to 6°	2° to 6°

MECHANICAL SPECIFICATIONS

Resistive Element	Tantalum nitride (Ta ₂ N)
Substrate Material	Ceramic
Body	Molded epoxy
Terminals	Copper alloy
Lead Frame Finish	Ni/Pd/Au solder free ⁽¹⁾

Note

- Gold thickness less than 10 μ"

DERATING CURVE


**ENVIRONMENTAL TESTS**

ENVIRONMENTAL TEST		CONDITONS	SUGGESTED PRODUCT LIMITS	TYPICAL VISHAY PERFORMANCE < 10K	TYPICAL VISHAY PERFORMANCE > 10K
Max. Ambient Temperature at Rated Wattage			+70 °C	+70 °C	+70 °C
Max. Ambient Temperature at Power Derating			+155 °C	+155 °C	+155 °C
High Temperature Exposure	ΔR	MIL-STD-202, 108, 1000 h at 155 °C	$\pm 0.20 \%$	0.08 %	0.045 %
Temperature Cycling	ΔR	JESD22, A104, 1000 cycles, -55 °C to +155 °C	$\pm 0.25 \%$	0.012 %	0.010 %
Moisture Resistance	ΔR	MIL-STD-202 method 106	$\pm 0.20 \%$	0.007 %	0.007 %
Biased Humidity	ΔR	MIL-STD-202, 103, 1000 h at 85 °C, 85 % RH, 10 % P	$\pm 0.25 \%$	0.075 %	0.075 %
Life	ΔR	MIL-STD-202, 108, 1000 h at 155 °C	$\pm 0.50 \%$	0.199 %	0.221 %
Mechanical Shock	ΔR	MIL-STD-202 method 213, condition C	$\pm 0.25 \%$	0.004 %	0.002 %
Vibration	ΔR	MIL-STD-202 method 204, 10 Hz to 2 kHz	$\pm 0.25 \%$	0.004 %	0.002 %
Resistance to Soldering Heat	ΔR	MIL-STD-202, 204, condition B	$\pm 0.10 \%$	-0.008 %	0.016 %
Electrostatic Discharge	ΔR	AEC-Q200-002 at 1 kV, human body	$\pm 0.50 \%$	-0.028 %	
		AEC-Q200-002 at 2 kV, human body	$\pm 0.50 \%$		0.108 %
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

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: AORN 5-1

A	O	R	N		5	-	1	A	U	F																												
A	O	R	N	1	0	0	1	A	U	F																												
GLOBAL MODEL (4 digits)				DIVIDER ⁽¹⁾ or RESISTANCE (3, 4 or 5 digits)			TOLERANCE % (ABSOLUTE / RATIO)		PACKAGING																													
AORN 8 pin SOIC, surface-mount (e4)				<table><tr><td>2 - 1</td><td>1001</td></tr><tr><td>5 - 1</td><td>2001</td></tr><tr><td>10 - 1</td><td>4991</td></tr><tr><td>20 - 1</td><td>1002</td></tr><tr><td>25 - 1</td><td>2002</td></tr><tr><td>50 - 1</td><td>2492</td></tr><tr><td>100 - 1</td><td>4992</td></tr><tr><td></td><td>1003</td></tr></table>			2 - 1	1001	5 - 1	2001	10 - 1	4991	20 - 1	1002	25 - 1	2002	50 - 1	2492	100 - 1	4992		1003	or		<table><tr><td colspan="2">A = 0.1 / 0.05</td></tr><tr><td colspan="2">B = 0.1 / 0.1</td></tr><tr><td colspan="2">C = 0.25 / 0.1</td></tr><tr><td colspan="2">D = 0.5 / 0.1</td></tr><tr><td colspan="2">F = 1.0 / 0.5</td></tr></table>		A = 0.1 / 0.05		B = 0.1 / 0.1		C = 0.25 / 0.1		D = 0.5 / 0.1		F = 1.0 / 0.5		TAPE AND REEL T0 = 100 min., 100 mult. T1 = 1000 min., 1000 mult. T3 = 300 min., 300 mult. T5 = 500 min., 500 mult. TF = full reel 3000 TS = 100 min., 1 mult. UF = TUBED	
2 - 1	1001																																					
5 - 1	2001																																					
10 - 1	4991																																					
20 - 1	1002																																					
25 - 1	2002																																					
50 - 1	2492																																					
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D = 0.5 / 0.1																																						
F = 1.0 / 0.5																																						

Note⁽¹⁾ Examples:

- 2-1 = ratio between resistance values
- 1001 = four 1K resistors



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