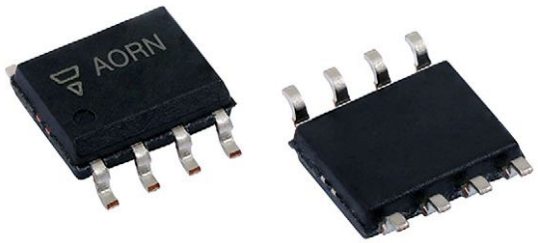
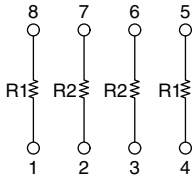
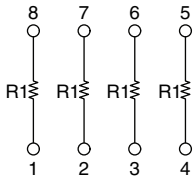
Molded, 50 mil Pitch, Dual-In-Line Thin Film Resistor, Precision Automotive, AEC-Q200 Qualified, Networks



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 (ΔR ± 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

Pb-free
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

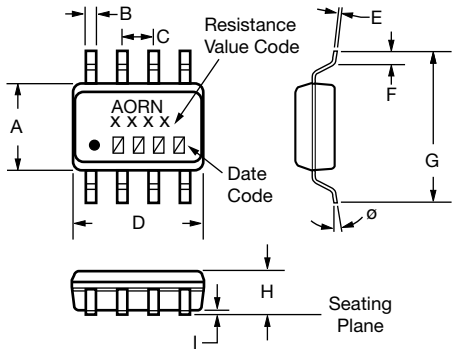
STANDARD DIVIDER VALUES		
RATIO R_1/R_2	R_1	R_2
100:1	100 kΩ	1 kΩ
50:1	50 kΩ	1 kΩ
25:1	25 kΩ	1 kΩ
20:1	20 kΩ	1 kΩ
10:1	10 kΩ	1 kΩ
5:1	10 kΩ	2 kΩ
2:1	10 kΩ	5 kΩ
1:1	100 kΩ	
	100 kΩ	
	49.9 kΩ	
	24.9 kΩ	
	20.0 kΩ	
	10.0 kΩ	
	4.99 kΩ	
	2.0 kΩ	
	1.0 kΩ	

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STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Tantalum nitride (Ta_2N)	-
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



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°

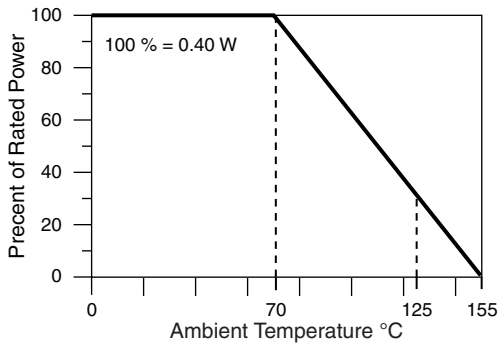
MECHANICAL SPECIFICATIONS

Resistive Element	Tantalum nitride (Ta2N)
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



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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	± 0.20 %	0.08 %	0.045 %
Temperature Cycling	**ΔR**	JESD22, A104, 1000 cycles, -55 °C to +155 °C	± 0.25 %	0.012 %	0.010 %
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 %	0.075 %	0.075 %
Life	**ΔR**	MIL-STD-202, 108, 1000 h at 155 °C	± 0.50 %	0.199 %	0.221 %
Mechanical Shock	**ΔR**	MIL-STD-202 method 213, condition C	± 0.25 %	0.004 %	0.002 %
Vibration	**ΔR**	MIL-STD-202 method 204, 10 Hz to 2 kHz	± 0.25 %	0.004 %	0.002 %
Resistance to Soldering Heat	**ΔR**	MIL-STD-202, 204, condition B	± 0.10 %	-0.008 %	0.016 %
Electrostatic Discharg	**ΔR**	AEC-Q200-002 at 1 kV, human body	± 0.50 %	-0.028 %	
		AEC-Q200-002 at 2 kV, human body	± 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)	**2 - 1** **5 - 1** **10 - 1** **20 - 1** **25 - 1** **50 - 1** **100 - 1** or **1001** **2001** **4991** **1002** **2002** **2492** **4992** **1003**	**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

Note

[1] Examples:

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

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