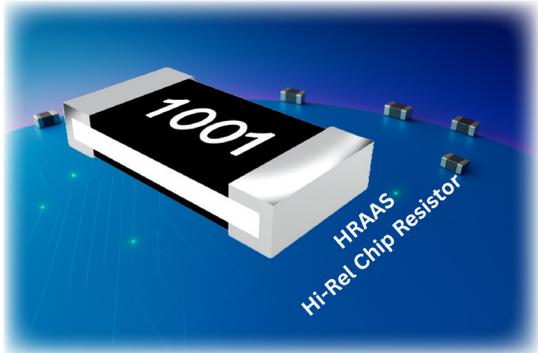


HRRAS High-Reliability High Power Anti-Surge Resistor



Features

- Thick film technology
- Power rating up to 3 watts at +70 °C
- High power surge withstanding
- Available with Sn, Sn/Pb, Au terminals
- MIL-PRF-55342 and Space Level screening available

Applications

- Satellite/Spacecraft
- Aerospace
- Avionics
- Military

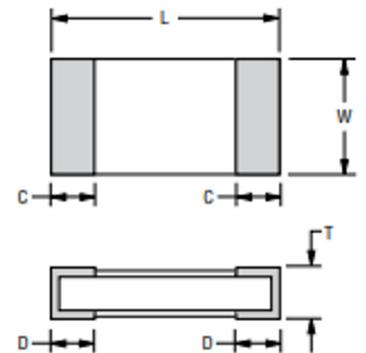
Electrical Characteristics

Characteristics	Model					
	HRRAS0603	HRRAS0805	HRRAS1206	HRRAS1210	HRRAS2010	HRRAS2512
Power Rating @70°C	0.125W	0.25W	0.5W	0.5W	1W	2W
Operating Temperature Range	-55°C to +155°C					
Derated to Zero Load	+155°C					
Maximum Working Voltage	50V	150V	200V	200V	200	300V
Maximum Overload Voltage	100V	300V	400V	400V	400V	600V
Resistance Tolerance	±1%, ± 5%					
Temperature Coefficient 1 ohm to 9.76 ohms (± 1%) 10 ohms to 1 megohm (± 1%) 1 ohms to 1 megohms (± 5%)	±200 PPM/°C ±100 PPM/°C ±200 PPM/°C	±150 PPM/°C ±100 PPM/°C ±200 PPM/°C			±100 PPM/°C ±100 PPM/°C ±200 PPM/°C	

Product Dimensions

mm
(inches)

Model	L	W	C	D	T
HRRAS0603	1.60 ± 0.10 (0.063 ± 0.004)	0.80 ± 0.10 (0.031 ± 0.004)	0.30 ± 0.20 (0.012 ± 0.008)	0.30 ± 0.20 (0.012 ± 0.008)	0.45 ± 0.10 (0.018 ± 0.004)
HRRAS0805	2.00 ± 0.10 (0.079 ± 0.004)	1.25 ± 0.10 (0.049 ± 0.004)	0.40 ± 0.20 (0.016 ± 0.008)	0.40 ± 0.20 (0.016 ± 0.008)	0.50 ± 0.10 (0.020 ± 0.004)
HRRAS1206	3.10 ± 0.10 (0.122 ± 0.004)	1.60 ± 0.10 (0.063 ± 0.004)	0.50 ± 0.25 (0.020 ± 0.010)	0.50 ± 0.25 (0.020 ± 0.010)	0.55 ± 0.10 (0.022 ± 0.004)
HRRAS1210	3.10 ± 0.10 (0.252 ± 0.008)	2.60 ± 0.10 (0.122 ± 0.008)	0.50 ± 0.25 (0.020 ± 0.010)	0.50 ± 0.25 (0.020 ± 0.010)	0.55 ± 0.10 (0.022 ± 0.004)
HRRAS2010	5.00 ± 0.20 (0.197 ± 0.008)	2.50 ± 0.20 (0.098 ± 0.008)	0.65 ± 0.25 (0.026 ± 0.010)	0.60 ± 0.25 (0.024 ± 0.010)	0.60 ± 0.10 (0.024 ± 0.004)
HRRAS2512	6.40 ± 0.20 (0.252 ± 0.008)	3.10 ± 0.20 (0.122 ± 0.008)	0.60 ± 0.25 (0.024 ± 0.010)	1.80 ± 0.25 (0.071 ± 0.010)	0.60 ± 0.15 (0.024 ± 0.006)

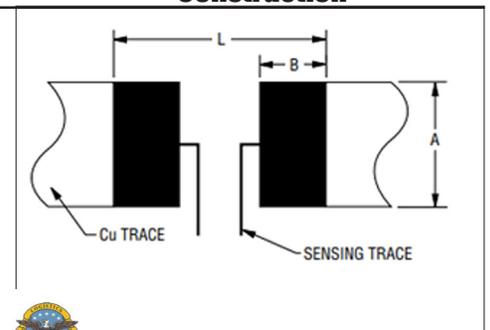


Recommended Pad Layout

mm
(inches)

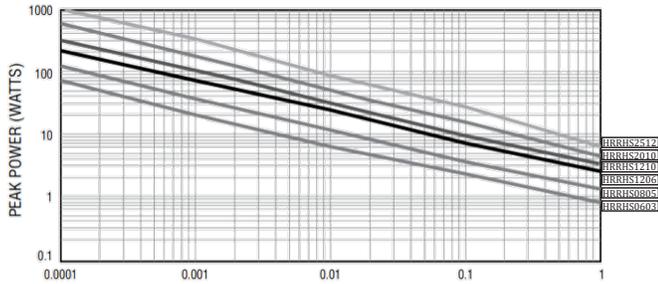
Model	A	L	B	Model	A	L	B
HRRAS0603	0.90 (0.035)	1.00 (0.039)	3.00 (0.118)	HRRAS1210	3.00 (0.118)	1.30 (0.051)	4.70 (0.185)
HRRAS0805	1.30 (0.051)	1.15 (0.045)	3.50 (0.138)	HRRAS2010	3.00 (0.118)	1.50 (0.059)	6.80 (0.268)
HRRAS1206	1.80 (0.071)	1.30 (0.051)	4.70 (0.185)	HRRAS2512	3.70 (0.146)	2.45 (0.096)	7.60 (0.299)

Construction

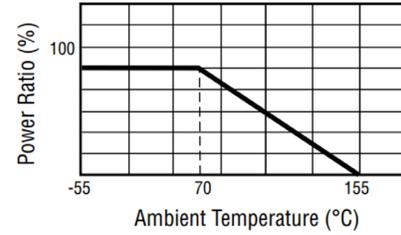


HRRAS High-Reliability High Power Anti-Surge Resistor

Surge Performance



Derating Curve



Typical Part Marking

HRRAS0603, HRRAS0805, HRRAS1206, HRRAS1210, HRRAS2010, HRRAS2510	HRRAS0805, HRRAS1206, HRRAS1210, HRRAS2010, HRRAS2512
± 5% (E96) 3 digits identify the resistance value	± 1% (E24/E96) 4 digits identify the resistance value
	
301=30 X 10 ¹ = 300 ohms	1542=154 X 10 ² = 15.4K ohms

HRRHS0603	HRRHS0603
± 1% (E24) 3 digits identify the resistance value	± 1% (E96) 4 digits identify the resistance value
	
222=22 X 10 ² = 2.2K ohms	01B=1K ohms (Refer to the table below)

E96 Marking for HRRH, 1%

Code	R Value														
01	100	13	133	25	178	37	237	49	316	61	422	73	562	85	750
02	102	14	137	26	182	38	243	50	324	62	432	74	576	86	768
03	105	15	140	27	187	39	249	51	332	63	442	75	590	87	787
04	107	16	143	28	191	40	255	52	340	64	453	76	604	88	806
05	110	17	147	29	196	41	261	53	348	65	464	77	619	89	825
06	113	18	150	30	200	42	267	54	357	66	475	78	634	90	845
07	115	19	154	31	205	43	274	55	365	67	487	79	649	91	866
08	118	20	158	32	210	44	280	56	374	68	499	80	665	92	887
09	121	21	162	33	215	45	287	57	383	69	511	81	681	93	909
10	124	22	165	34	221	46	294	58	392	70	532	82	698	94	931
11	127	23	169	35	226	47	301	59	402	71	536	83	715	95	953
12	130	24	174	36	232	48	309	60	412	72	549	84	732	96	976

This table shows the first two digits for the three-digit E96 part marking scheme. The third character is a letter multiplier:
 A=100 B=101 C=102 D=103 E=104 X=10-1

HRRAS High-Reliability High Power Anti-Surge Resistor

Standard Screening Options

- Option 1: 100% visual inspection per MIL-PRF-55342, AS9102 FAIR, MIL-STD-1580 DPA.
- Option 2: Group A and B Screening per MIL-PRF-55342, AS9102 FAIR, MIL-STD-1580 DPA
- Option 3: Group A, B, and C Screening per MIL-PRF-55342, AS9102 FAIR, MIL-STD-1580 DPA.
- Option 4: Group A, B, and Qualification Screening per MIL-PRF-55342, AS9102 FAIR, MIL-STD-1580 DPA.
- Option 5: Customer Source Control Drawing (SCD) defined screening. AEM will customize screening based on customer requirements.
- Note: (see AEM Detail Specification for more details).

Ordering Information

HRRAS 1206 220 F W x x

HRRAS-High Reliability-High Power Resistor

1206-EIA Package Size

220 - Resistance Code

J-Resistance Tolerance (F = 1%, J = 5%)

Temperature Coefficient of Resistance TCR (W = ± 200 PPM/°C, X = ± 100 PPM/°C)

Screening Options: 1, 2, 3, 4, 5 (see screening options on the left)

Terminal Code:
 PB: Sn/Pb plated;
 SN: Sn plated;
 AU: Au plated

AEM part numbers:

AEM Part No.	Package Size	Resistance Code	Resistance Value (Ohms)	Resistance Tolerance	AEM Part No.	Package Size	Resistance Code	Resistance Value (Ohms)	Resistance Tolerance
HRRAS0603-1000FXxx	0603	1000	100	1%	HRRAS1206-5R10FXxx	1206	5R10	5.1	1%
HRRAS0603-2101FXxx	0603	2101	2.1K	1%	HRRAS1206-100JWxx	1206	100	10	5%
HRRAS0603-22R1FXxx	0603	220	220	1%	HRRAS1206-151JWxx	1206	151	150	5%
HRRAS0805-1000FXxx	0805	1000	100	1%	HRRAS2512-2R87FXxx	2512	2R87	2.87	1%
HRRAS0805-3010FXxx	0805	3010	301	1%	HRRAS2512-47R0FXxx	2512	47R0	47	1%
HRRAS1206-1R00FXxx	1206	1R00	1	1%	HRRAS2512-102JWxx	2512	102	1K	5%
HRRAS1206-2202FXxx	1206	2202	22K	1%					

Note: Last (xx) are screening and termination codes respectively. (From left to right)

Note: Other resistor values maybe available within same size and tolerances. Contact AEM for info.

