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LOW OHM POWER RESISTORS

HTE

SERIES
Size 2512 / 1206

- Open frame electron beam welded punched out type.
- Power Rating at 100°C - upto 4W
- Power Rating at 70°C - upto 6W
- R0003 to R01

AEC-Q200 Qualified

Pb-free RoHS COMPLIANT

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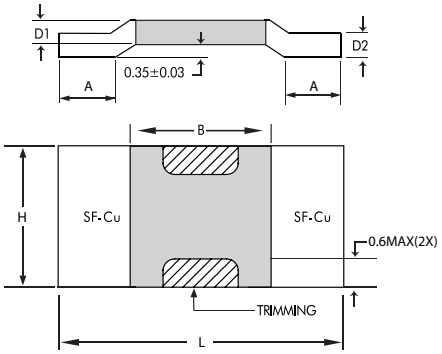
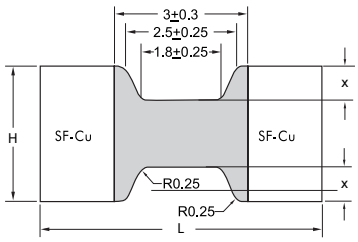
PHYSICAL CONFIGURATION



0.3 - 4 mohm



5 -10 mohm

'x' dimension will vary depending on resistance value

DIMENSION TABLE

SR NO.	HTR TYPE	REISTANCE VALUE	TOLERANCE	WATTAGE AT 100°C	WATTAGE AT 70°C	H ± 0.20	L	A	B (MM) ± 0.3	D1 (MM)	D2 (MM)	INTERNAL HEAT RESISTANCE (Rthi)	TCR (ppm)	TYPICAL WT. PER PC. (Gms)
1	HTE4W R0003 (2512)	R0003	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	4W	6W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.95 ± 0.10	0.95 ± 0.10	4°K/W	< 175	0.16
2	HTE4W R0005 (2512)	R0005	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	4W	6W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.80 ± 0.10	0.80 ± 0.10	7°K/W	< 115	0.14
3	HTE4W R001 (2512)	R001	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	4W	6W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.42 ± 0.10	0.42 ± 0.10	14°K/W	< 100	0.07
4	HTE3W R0013 (2512)	R0013	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	3W	5W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.33 ± 0.10	0.33 ± 0.10	16°K/W	< 100	0.06
5	HTE3.5W R002 (2512)	R002	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	3.5W	5W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.67 ± 0.10	0.67 ± 0.10	20°K/W	< 50	0.11
6	HTE3W R003 (2512)	R003	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	3W	4W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.45 ± 0.10	0.45 ± 0.10	30°K/W	< 50	0.08
7	HTE2W R004 (2512)	R004	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	2W	3W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.33 ± 0.10	0.33 ± 0.10	40°K/W	< 50	0.08
8	HTE1.5W R005 (2512)	R005	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	1.5W	2.5W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.33 ± 0.10	0.33 ± 0.10	50°K/W	< 50	0.08
9	HTE3W R006 (2512)	R006	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	3W	5W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.33 ± 0.10	0.33 ± 0.10	60°K/W	< 50	0.07
10	HTE1.5W R0068 (2512)	R0068	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	1.5W	2.5W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.33 ± 0.10	0.33 ± 0.10	60°K/W	< 50	0.07
11	HTE1W R01 (2512)	R01	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	1W	2W	3.05	6.35 ± 0.15	1.14+0.0/-0.4	3.0	0.33 ± 0.10	0.33 ± 0.10	70°K/W	< 50	0.07
12	HTE3W R000 (2512)	R000		imax = 100A		3.05	6.35 ± 0.15	1.14+0.0/-0.4	0.42mm copper					0.07
13	HTE2W R0003 (1206)	R0003	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	2W	3.5W	1.65	3.2 ±0.20	0.80 ±0.20	1.6	0.95 ± 0.15	1.25 ± 0.15	4°K/W	< 175	0.07
14	HTE2W R0005 (1206)	R0005	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	2W	3.5W	1.65	3.2 ±0.20	0.80 ±0.20	1.6	0.58 ± 0.15	0.90 ± 0.15	7°K/W	< 115	0.07
15	HTE2W R001 (1206)	R001	± 0.25, ± 0.5, ±1, ±2, ±3, ±5%	2W	3.5W	1.65	3.2 ±0.20	0.80 ±0.20	1.6	0.40 ± 0.15	0.80 ± 0.15	14°K/W	< 100	0.07

APPLICATIONS

- Sensor of current for power hybrid applications.
- Automotive sector for high current applications.
- Frequency convertors / Power modules.

FEATURES

- Ideal for mounting on DCB / IMS substrates.
- High temperature application due to nature of design.
- Excellent long term stability

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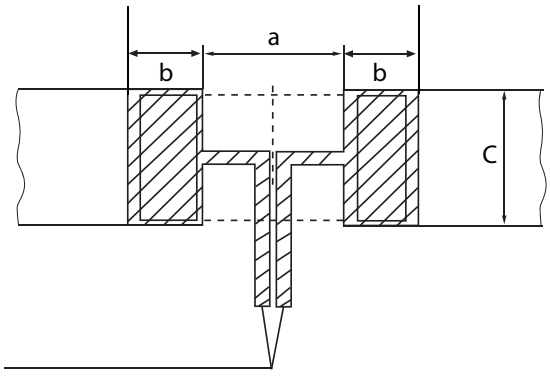
PARAMETER / PERFORMANCE TEST & TEST METHOD	PERFORMANCE REQUIREMENTS
Power Rating	For FeCrAl - Full power dissipation at 70° C and linearly derated to zero at +170° C. For Manganin (< 0.5% Improved Stability) - Full power dissipation at 120° C & linearly derated to zero at +140° C. For Manganin (< 1% Stability) - Full power dissipation at 150° C and linearly derated to zero at +170° C.
Inductance	< 2nH
Temperature Range	- 65° C to +170° C (Suitably derated as per derating curve provided)
Voltage Rating / Limiting Voltage / Max. Working Voltage (Subject to max. Terminal Temperature of 140° C)	$\sqrt{P \times R}$
Low Temperature Storage and Operation [-65° C for 250 h**]**	ΔR ± 0.1% - Average
Temperature Coefficient of Resistance (Ambient Temperature Range 20° C - 60° C)	From 50 ppm (Depending on Resistance Value)
Temperature Cycling -2000 cycles (-55° C to 150° C)	ΔR ± 0.5% - Average
Life Test / Operational Life - 2000 h rated power with Temperature limitation on Terminal kept at 140° C	ΔR ± 1% - Average
Moisture Resistance [MIL-STD-202 method106]	ΔR ± 0.2% - Average
Mechanical Shock [100 g. 6 ms half sine]	ΔR ± 0.2% - Typical
Vibration, High Frequency [20 g. 10-2000 Hz]	ΔR ± 0.2% - Typical
Bias Humidity [+85° C, 85% RH, 1000h]	ΔR ± 0.5% - Typical
Resistance to Soldering Heat	260°C for 10 sec / 8h steam aging
High Temperature Exposure – 2000h / 170°C	ΔR ± 1% - Average (In covered condition)

RECOMMENDED SOLDER PROFILE

Reflow and IR Soldering			
Temperature (°C)	260	255	217
Time (Sec)	Peak	40	90

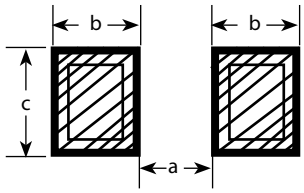
RECOMMENDED PCB - LAYOUT

Recommended PCB layout for high precision applications



Sense Terminals

Recommended PCB layout for normal application



Size	a	b	c
1206	1.40	2.10	1.80
2512	3.4	1.8	3.4

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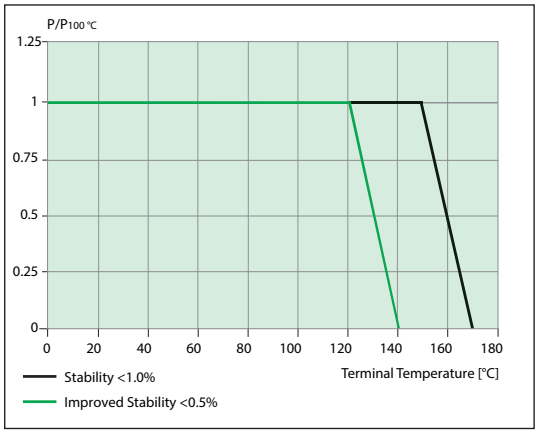
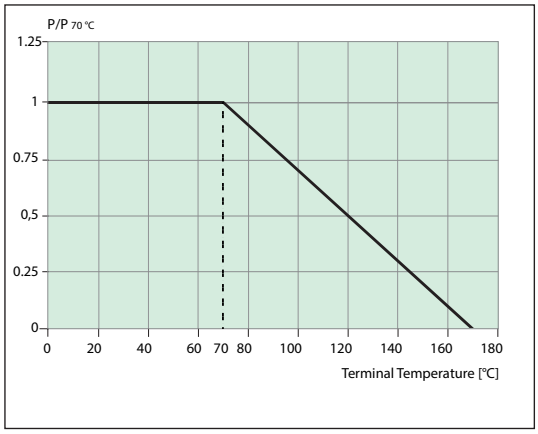
TYPICAL POWER DERATING CURVE FOR RESISTOR WHEN FULL POWER IS AT 120°C & 150°C

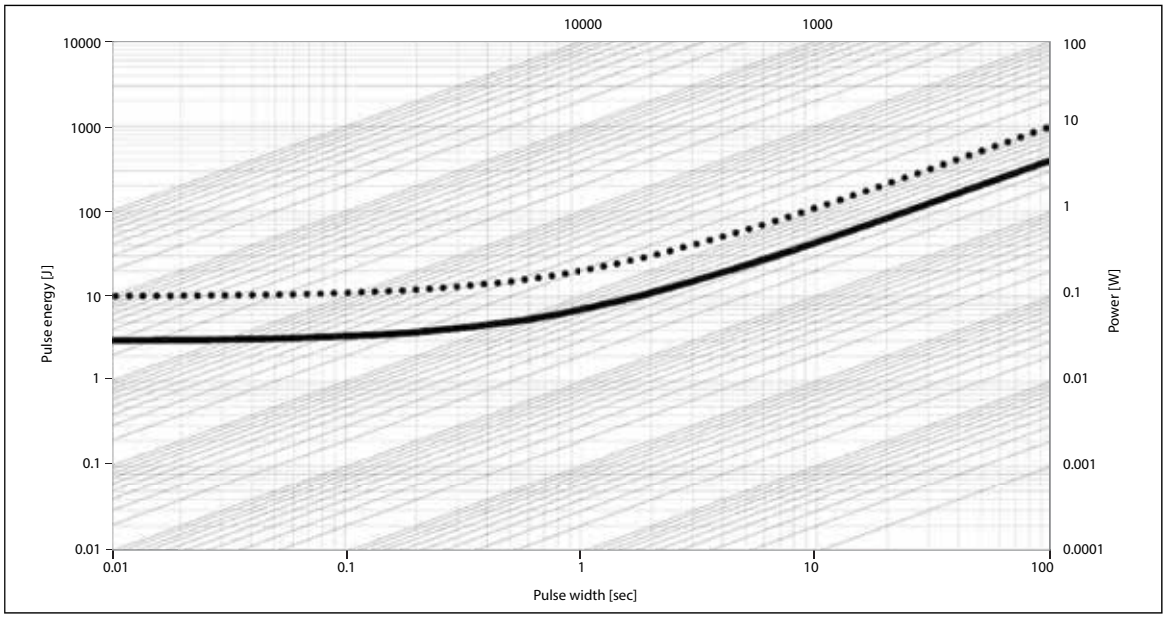


TYPICAL POWER DERATING CURVE FOR RESISTOR WHEN FULL POWER IS AT 70°C



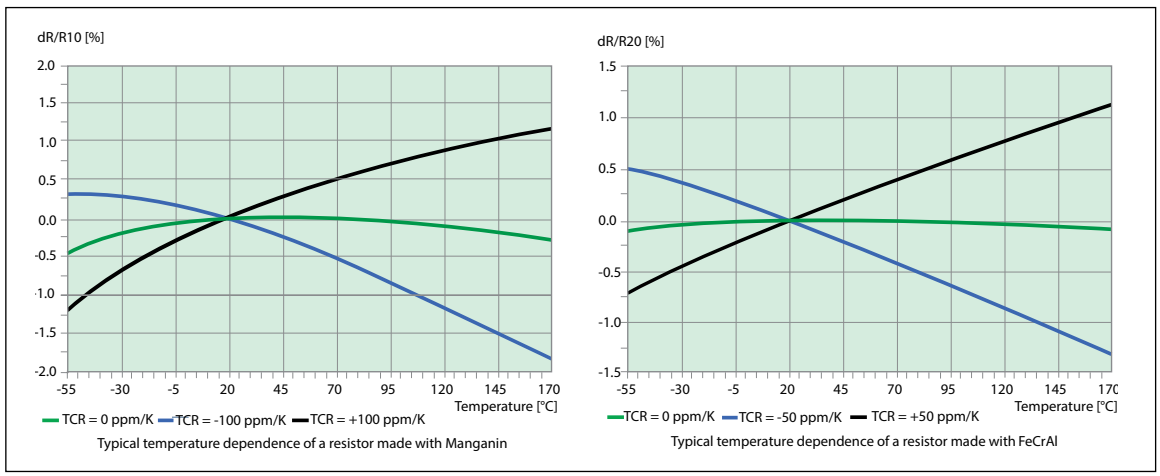
In case the Design Engineer requires a specific graph of a particular component it can be supplied on request.

MAXIMUM PULSE ENERGY WITH RESPECT TO PULSE POWER FOR PERMANANT OPERATION



In this graph the max. & min. curve are shown as ••• and ▬ for all resistance values, the area between the max. & min. curve is applicable.
In case the Design Engineer requires a specific graph of a particular component it can be supplied on request.

TYPICAL TEMPERATURE DEPENDANCE OF THE ELECTRICAL RESISTANCE



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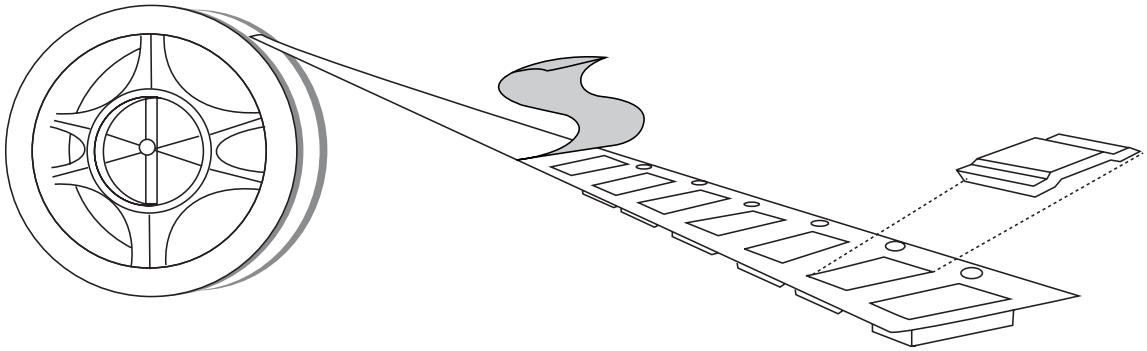
PACKAGING

A. BULK

Resistors shall be packed in plastic Box-K22 of approximate size 108X66X25mm- 3000pcs/box & this box will be vacuum sealed with polythene of 100 micron. With enclose silica gel.

B. TAPE & REEL PACKING



SPECIFICATION	SIZE	TAPEWIDTH	PARTS PER REEL
EIA-481-D	2512 (Except HTE 4W R0003 F)	12mm	7000 pcs
	HTE 4W R0003 F	12mm	6000 pcs
	1206	8mm	8000 pcs

STORAGE CONDITION

Shelf Life (packed) : Temp 25°C to 35°C, Humidity 30 to 80% RH, Shelf life-12 months floor

Floor Life (unpacked) : Temp 25°C to 35°C, Humidity 30 to 80% RH, Floor life-15 days

ORDERING INFORMATION AS AN EXAMPLE

SERIES	HTR PART NO.	TYPE	RESISTANCE VALUE	TOLERANCE	MARKING ON RESISTOR
HTE	HTE4W (2512)	Tape & Reel – HTE4WTR	R001	± 1%	HTR
HTE	HTE2W (1206)	Bulk - HTE2W	R001	± 0.5%	No marking
HTE	HTE2W (1206)	Tape & Reel – HTE2WTR	R0003	± 5%	No marking

Part no of HTE4W (2512), Tape and reel with resistance value R001 and 1% tolerance, will be **HTE4WTR (2512) R001 ±1%**

Part no of HTE2W (1206), Bulk with resistance value R001 and 0.5% tolerance, will be **HTE2W (1206) R001 ±0.5%**

Part no of HTE2W (1206), Tape and reel with resistance value R0003 and 5% tolerance, will be **HTE2WTR (1206) R0003 ±5%**