



**LOW OHM  
POWER RESISTORS**

**HRE  
SERIES  
Size 4026**

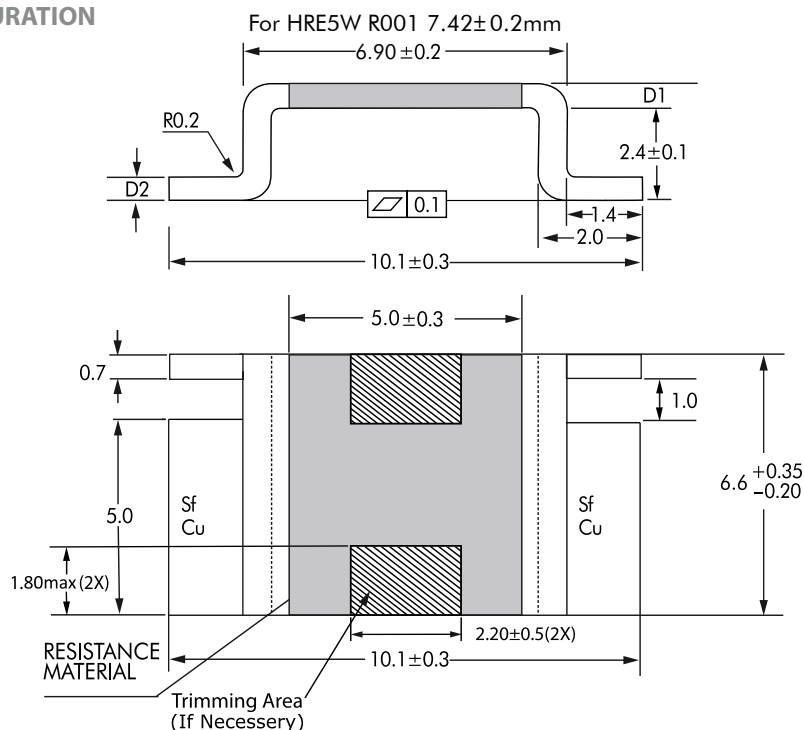
- Open frame electron beam welded punched out type
- Power Rating at 100°C - upto 5W
- Power Rating at 70°C - upto 12W  
R0002 to R005





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## PHYSICAL CONFIGURATION



## DIMENSIONAL TABLE

SR NO.	HTR TYPE	RESISTANCE VALUE	TOLERANCE	WATTAGE AT 100° C	WATTAGE AT 70° C	D1 (mm)	D2 (mm)	INTERNAL HEAT RESISTANCE (Rthi)	TCR (ppm)	TYPICAL WT. PER PC (gms)
1	HRE5W R0002	R0002	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	5W	12W	1.30 ± 0.10	0.40 ± 0.10	4° K/W	< 50	1.30
2	HRE5W R0003	R0003	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	5W	11W	0.99 ± 0.10	0.40 ± 0.10	5° K/W	< 50	0.91
3	HRE5W R0005	R0005	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	5W	9W	0.65 ± 0.10	0.40 ± 0.10	8° K/W	< 50	0.45
4	HRE5W R001	R001	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	5W	8W	1.13 ± 0.10	0.66 ± 0.10	9° K/W	< 50	0.81
5	HRE4W R0007	R0007	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	4W	8W	0.47 ± 0.10	0.40 ± 0.10	12° K/W	< 50	0.33
6	HRE4W R001	R001	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	4W	7W	0.35 ± 0.10	0.40 ± 0.10	14° K/W	< 50	0.27
7	HRE4W R002	R002	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	4W	6W	0.50 ± 0.10	0.40 ± 0.10	14° K/W	< 50	0.40
8	HRE3W R003	R003	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	3W	5W	0.34 ± 0.10	0.40 ± 0.10	21° K/W	< 50	0.27
9	HRE3W R004	R004	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	3W	4W	0.34 ± 0.10	0.40 ± 0.10	28° K/W	< 50	0.27
10	HRE2W R005	R005	± 0.25, ± 0.5, ± 1, ± 2, ± 3, ± 5%	2W	3W	0.34 ± 0.10	0.40 ± 0.10	33° K/W	< 50	0.27

## APPLICATIONS

- Current sensor for power hybrid applications.
- High current applications for automotive market.
- Frequency converters.
- Power modules.

## FEATURES

- 5W constant power possible in R0002.
- Constant current carrying capability upto 160amp (R0002).
- Sturdy copper connectors.
- Maximum solder temperature upto 350°C for 30 seconds.

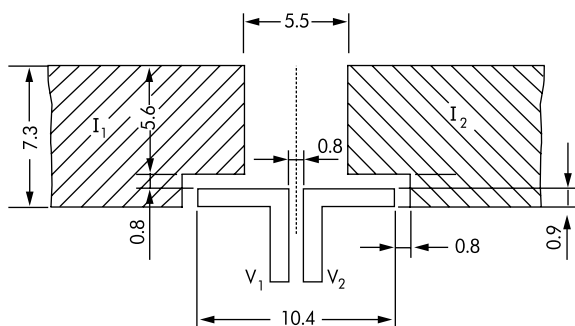


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**ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS**

PARAMETER / PERFORMANCE TEST & TEST METHOD	PERFORMANCE REQUIREMENTS
<b>Power Rating</b>	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 100° C & linearly derated to zero at +140° C. For Manganin (< 1% Stability) - Full power dissipation at 130° C and linearly derated to zero at +170° C.
<b>Inductance</b>	< 3nH
<b>Temperature Range</b>	- 65° C to +170° C (Suitably derated as per derating curve provided)
<b>Voltage Rating / Limiting Voltage / Max. Working Voltage</b> (Subject to max. Terminal Temperature of 130° C)	$\sqrt{P \times R}$
<b>Low Temperature Storage and Operation</b> [-65° C for 250 h]	$\Delta R \pm 0.1\%$ - Average
<b>Temperature Coefficient of Resistance</b> (Ambient Temperature Range 20° C - 60° C)	<50 ppm / K (Depending on Resistance Value)
<b>Temperature Cycling -2000 cycles</b> (-55° C to 150° C)	$\Delta R \pm 0.5\%$ - Average
<b>Life Test / Operational Life - 2000 h rated power with Temperature limitation on Terminal kept at 130° C</b>	$\Delta R \pm 1\%$ - Average
<b>Moisture Resistance</b> [MIL-STD-202 method106]	$\Delta R \pm 0.1\%$ - Average
<b>Mechanical Shock</b> [100 g. 6 ms half sine]	$\Delta R \pm 0.2\%$ - Typical
<b>Vibration, High Frequency</b> [20 g. 10-2000 Hz]	$\Delta R \pm 0.2\%$ - Typical
<b>Bias Humidity</b> [+85° C, 85% RH, 1000h]	$\Delta R \pm 0.5\%$ - Typical
<b>Resistance to Soldering Heat</b>	260°C for 10 sec / 8h steam aging
<b>High Temperature Exposure</b> – 2000h / 170°C	$\Delta R \pm 1\%$ - Average (In covered condition)

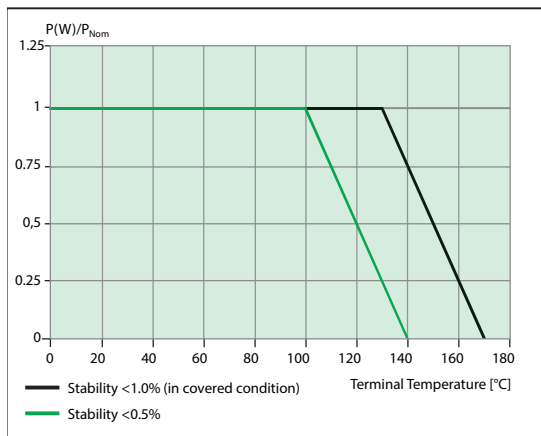
**RECOMMENDED PCB - LAYOUT**



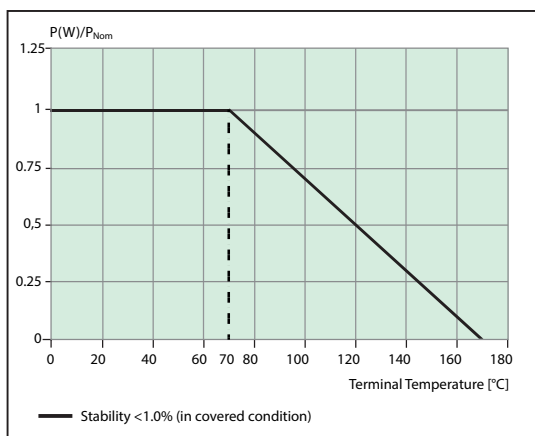
**RECOMMENDED SOLDER PROFILE**

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

**TYPICAL POWER DERATING CURVE FOR RESISTOR WHEN FULL POWER IS AT 100°C & 130°C**

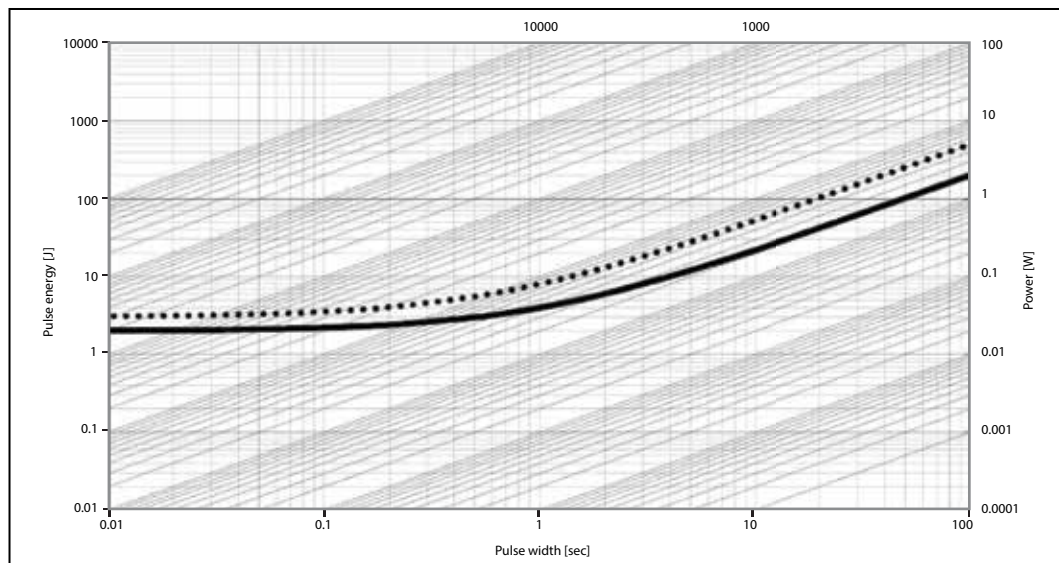


**TYPICAL POWER DERATING CURVE FOR RESISTOR WHEN FULL POWER IS AT 70°C**



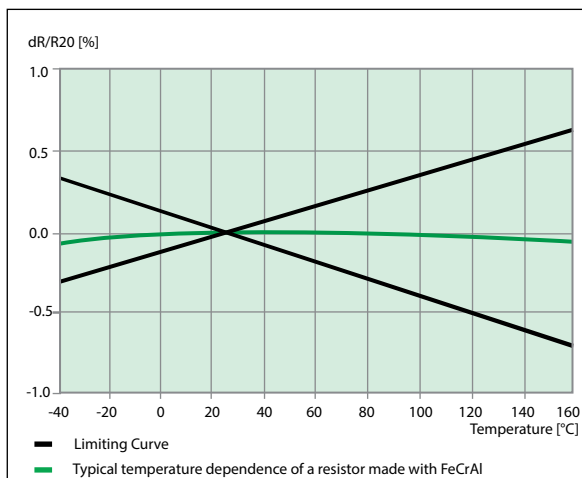
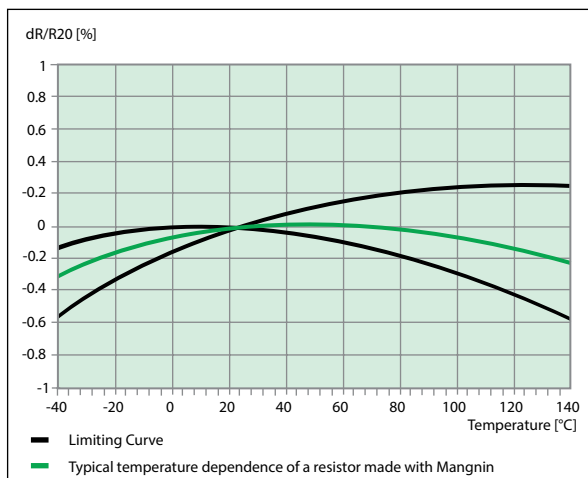
In case the Design Engineer requires a specific graph of a particular component it can be supplied on request.

**MAXIMUM PULSE ENERGY WITH RESPECT TO PULSE POWER FOR PERMANENT 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 ELECTRICAL RESISTANCE**





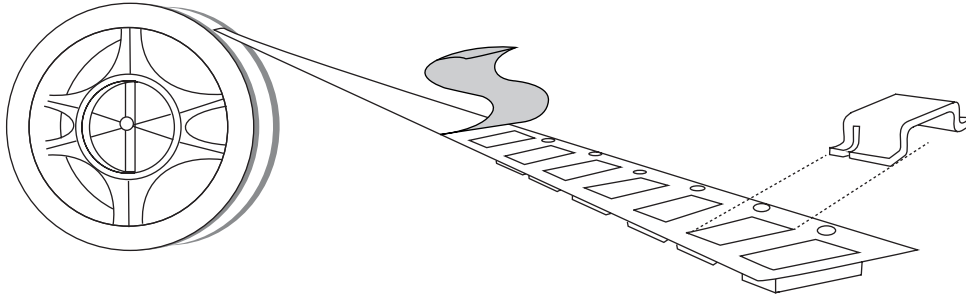
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## PACKAGING

### A. BULK

Resistors shall be packed in plastic Box-K44 of approximate size 162x104x37 mm-1500 pcs/box & this box will be vacuum sealed with polythene of 100 micron. With enclose silica gel.

### B. TAPE & REEL PACKING



SPECIFICATION	TAPEWIDTH	PARTS PER REEL
EIA-481-D	24mm	1400 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
HRE	HRE4W	Tape & Reel – HRE4WTR	R002	± 1%	HTR R002 1% DATECODE
HRE	HRE4W	Bulk - HRE4W	R0007	± 0.5%	HTR R0007 0.5% DATECODE
HRE	HRE3W	Tape & Reel – HRE3WTR	R005	± 5%	HTR R005 5% DATECODE

Part no of HRE4W, Tape and reel with resistance value R002 and 1% tolerance, will be **HRE4WTR R002 ±1%**

Part no of HRE4W, Bulk with resistance value R001 and 0.5% tolerance, will be **HRE4W R0007 ±0.5%**

Part no of HRE3W, Tape and reel with resistance value R005 and 5% tolerance, will be **HRE3WTR R005 ±5%**