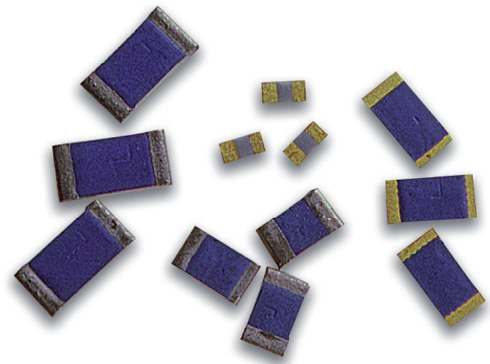


## High Value Surface Mounted Resistors

### HR Series

- Custom designs / sizes available
- Resistance range to 50G ohms
- Terminations available for wire bonding or soldering
- Low voltage coefficient of resistance



All Pb-free parts comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

## Electrical Data

### Power Rating

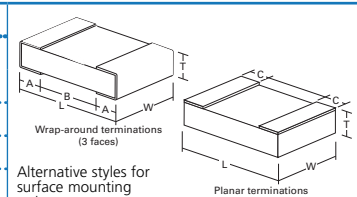
The high resistance value of these devices is such that power dissipation is always small. The rating is therefore determined by voltage considerations only, as shown in the table below.

		0503	0603	0805	1005	1206	Notes
Resistance range*	ohms	10M to 20G		100M to 50G			Measured at 15volts
Limiting element voltage	volts	50	75	100	150	200	
Ambient temperature range	°C	-55 to +155					
TCR	ppm/°C	+250 to -2500	+250 to -2000		+250 to -1500	+250 to -1000	Measured at 15volts
Resistance tolerance	%	10M to 500M: 10 >500M: 25, 50	10M to 1G0: 5, 10 >1G0: 10, 25, 50	100M to 1G: 5, 10 >1G to 50G: 25, 50			

\*Higher values available, consult factory for details

## Physical Data

Dimensions (mm) & Weight (mg)							
Style	L	W	T max	Wrap around		C	Wt
				A	B <sup>1</sup>		
0503	1.25±0.1	0.63±.1	0.5	Not available		0.20±0.1	1.5
0603	1.6±0.1	0.8±0.1	0.55	0.3±0.15	0.6 min	0.3±0.15	2.2
0805	2.0±0.15	1.25±0.15	0.6	0.3±0.15	0.9 min	0.3±0.1	4.7
1005	2.5±0.2	1.25±0.2	0.7	Not available		0.4±0.15	6.5
1206	3.2±0.2	1.6±0.2	0.7	0.4±0.2	1.7 min	0.4±0.15	8.5



<sup>1</sup>This dimension determines the number of conductors which may pass under the surface mounted device.

### Construction

The resistor material is screen printed onto a 96% alumina substrate and covered with a protection comprising of a glaze followed by an organic coating. This construction gives an insulated device.

### Marking

All relevant information is recorded on the primary package or reel.

### Terminations

Planar (or single-sided) termination is gold and suitable for wire-bonding; wrap around is suitable for soldering.

### Solderability

Wrap-around terminations on HR resistors have good 'leach' resistance properties. They will withstand immersion in solder at 260°C for 30 seconds.

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

## HR Series

### Performance Data

		Maximum	Typical
Load (1000 hrs @70°C)	±ΔR%	2	1
Short term overload ( 6.25x Pr or 2.5x LEV for 5s)	±ΔR%	1	0.2
Shelf life (12 months)	±ΔR%	2	1
Temperature cycle (5 cycles, -55/+155°C)	±ΔR%	1	0.3
Resistance to solder heat (260±5°C for 10±1s)	±ΔR%	1	0.5
Voltage proof	volts	0503:100 0603: 300 0805 to 1206:500	
Voltage coefficient of resistance (10V to 25V)	%/V		
		0603	2
		0805	1
		1005	0.8
		1206	0.2
		0805 to 1206:500	0.3
			0.05

### Application Notes

#### Mounting

This chip resistor is ideally suited for handling by automatic methods due to its rectangular shape and the small dimensional tolerances. Electrical connection to a ceramic substrate or to a printed circuit board can be made by wire bonding to planar terminations or by reflow soldering of wrap-around terminations. The 'F' terminations provide good leach properties and ensure reliable contact. Due to the robust construction the resistor chip can be immersed in the solder bath for 30 seconds at 260°C. This enables the resistor to be mounted on one side of a printed circuit and wire-leaded components on the other side. The resistor must be kept dry during use to avoid leakage. The presence of moisture will not damage the resistor in any way.

#### Packaging

Resistor chips are supplied taped and reeled on standard 8mm tape to IEC 286-3.

#### Planar Terminations

Resistor chips are supplied in waffle packs.

### Ordering Procedure

**Example: HR1206F-10GYI** (1206 with solderable wraparound terminations, 10 gigohms ±50%, Pb-free)

H	R	1	2	0	6	F	-	1	0	G	Y	I	
1	2		3	4		5	6						

1	2	3		4	5	6			
Type	Size	Termination		Value	Tolerance	Termination & Packing			
HR	0503	F	0603, 0805, 1206	Solderable wraparound	E24 or E96	J = ±5%	Pb-free solderable (RoHS)		
	0603				3/4 characters	K = ±10%		I	0603F
	0805				M = megohms	5 = ±25%	0805F,1206F		3000/reel
	1005	G	All sizes	Gold pad planar	G = gigohms	Y = ±50%	SnPb solderable		
1206	PB				0603F	5000/reel			
							0805F,1206F	3000/reel	
						Gold pad planar			
						I	xxxxG	Waffle	

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