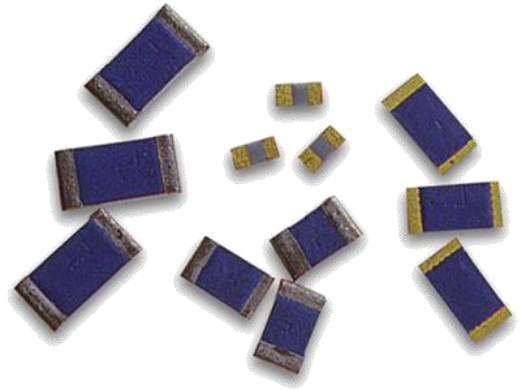


## HR Series

### Features:

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



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

## Electrical Data

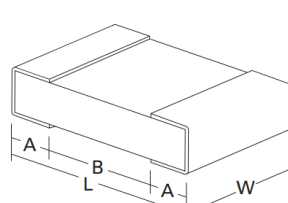
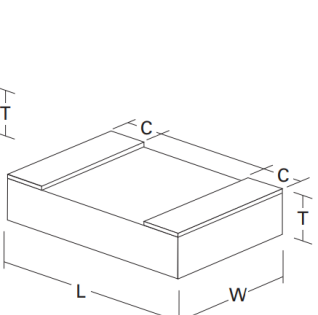
		0503	0603	0805	1005	1206	2512
Limiting element voltage	V	50	75	100	150	200	200
Resistance range <sup>1,3</sup>	Ω	10M to 20G		100M to 50G			27M to 10G
Resistance tolerance	%	≤500M: 10 >500M: 25, 50		≤1G: 5, 10 >1G: 25, 50			5, 10, 20
Values		E24 preferred <sup>4</sup>					
TCR <sup>3</sup>	ppm/°C	+250 to -2500	+250 to -2000		+250 to -1500	+250 to -1000	
Power rating	W	Due to high ohmic values no power rating applies. The maximum power is $LEV^2/R$ .					
Ambient temperature range	°C	-55 to +155					

Note 1: Higher values are available – consult factory for details. Note 2: Anti-sulphur termination types are available – consult factory for details.

Note 3: Resistance value measurements are made at 15V. Note 4: Special values may be requested.

## Physical Data

Dimensions in mm and weight in mg							
	L	W	T max.	A	B <sup>1</sup> min.	C	Wt. nom.
0503G	1.25±0.1	0.63±.1	0.5	-	-	0.2±0.1	1.5
0603F	1.6±0.1	0.8±0.1	0.55	0.3±0.15	0.6	-	2.2
0603G				-	-	0.3±0.15	
0805F	2.0±0.15	1.25±0.15	0.6	0.3±0.15	0.9	-	4.7
0805G				-	-	0.3±0.1	
1005G	2.5±0.2	1.25±0.2	0.7	-	-	0.4±0.15	6.5
1206F	3.2±0.2	1.6±0.2		0.4±0.2	1.7	-	8.5
1206G				-	-	0.4±0.15	
2512F	6.3±0.2	3.2±0.2		0.7±0.2	4.3	-	38.1

**F-style wrap-around and G-style planar termination options.**

Note 1: 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 termination is suitable for soldering.

#### 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.

### Solderability

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

### Performance Data

Test	Method	Maximum	Typical
Load life	1000 hours, cyclic load at T <sub>A</sub> = 70°C, LEV ±ΔR%	2	1
Short term overload	2.5 x LEV for 5 s ±ΔR%	1	0.2
Shelf-life test	12 months, room temperature, unpowered ±ΔR%	2	1
Temperature cycle	5 cycles, -55°C to +155°C ±ΔR%	1	0.3
Resistance to solder heat	260 ± 5°C, 10 ± 1s ±ΔR%	1	0.5
Voltage proof	V	0503:100V, 0603: 300V, 0805 to 1206: 500V, 2512: 400V	

Voltage coefficient of resistance (VCR)	%/V	Maximum	Typical
	0603	-2	-0.7
	0805	-1	-0.4
	1005	-0.8	-0.3
	1206	-0.2	-0.05
	2512	-0.1	-0.02

### 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 through-hole 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

Solderable wraparound chips are supplied in plastic tape and reeled to IEC 286-3. The 2512 size is packed at 4mm pitch on 12mm wide tape, and the smaller sizes are on 8mm wide tape. Other dimensions conform to:

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/ApplicationNotes/PS003-Packing-of-Specialist-Chip-Resistors.pdf>

Gold pad planar chips are supplied in waffle packs.

### Ordering Procedure

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



1	2	3		4	5	6		
Type	Size	Termination		Value	Tolerance	Termination Finish & Packing		
HR	0503	F	0603, 0805, 1206, 2512	Solderable wraparound	E24 3/4 characters M = megohms G = gigohms	Solderable wraparound		
	0603					J = ±5%	I = Pb-free PB = SnPb	0603F
	0805	G	0503, 0603, 0805, 1005, 1206	Gold pad planar	M = ±20% S = ±25% Y = ±50%	I = Pb-free	0805F,	3000/7" reel
	1005						1206F	
	1206						2512F	4000/7" reel
	2512					Gold pad planar		
						I	xxxxG	Waffle