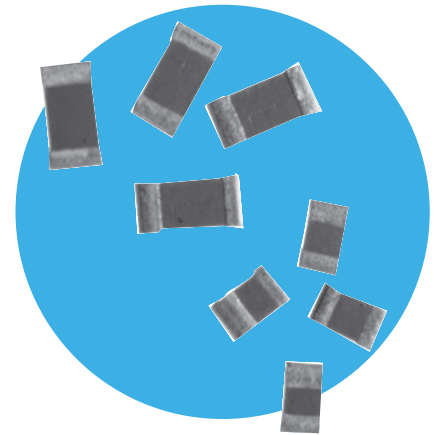


High Value Surface Mounted Resistors

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

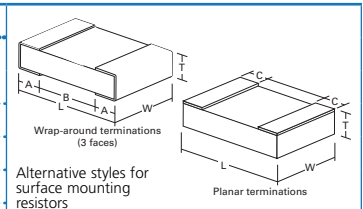
The high resistance value of these devices is such that power dissipation is always small. The rating is therefore determined by voltage considerations only, as shown in the table below.

| | | 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 | 0 to -2500 | 0 to -2000 | | 0 to -1500 | 0 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 ¹ | | |
| 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 |



¹This 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 | 0.7 |
| | | 0805 | 1 | 0.4 |
| | | 1005 | 0.8 | 0.3 |
| | | 1206 | 0.2 | 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)



| 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) | |
| | 3/4 characters | | | | I | | 0603F | 5000/reel |
| | M = megohms | | | | | K = ±10% | 0805F, 1206F | 3000/reel |
| | 1005 | G | All sizes | Gold pad planar | G = gigohms | Y = ±50% | SnPb solderable | |
| | 1206 | | | | PB | | 0603F | 5000/reel |
| | | | | | | | | 0805F, 1206F |
| | | | | | | | Gold pad planar | |
| | | | | | | | I | xxxxG Waffle |

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.

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