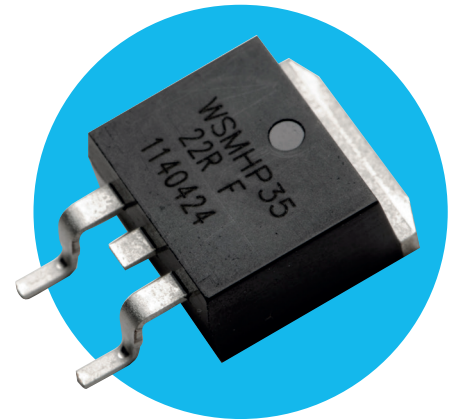


## Surface Mount High Power Resistors

### WSMHP Series

- TO-263 surface mount package
- Very low thermal resistance
- Non-inductive, 20, 25 and 35 watt high power resistors
- Low profile package for high density PCB installation
- Suitable for board mounting with either solder or clip
- AEC-Q200 qualified



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

### Electrical Data

|                           |        | WSMHP20                             | WSMHP25 | WSMHP35 | Conditions                            |
|---------------------------|--------|-------------------------------------|---------|---------|---------------------------------------|
| Power rating              | watts  | 20                                  | 25      | 35      | Heatsink with 25°C flange temperature |
| Power rating              | watts  | 2.5                                 |         |         | Without heatsink                      |
| Thermal resistance        | °C/W   | 3.3                                 |         |         | Resistor hotspot to flange            |
| Limiting element voltage  | volts  | 500                                 |         |         | dc or ac rms                          |
| Resistance range          | ohms   | 0R5 – 100K                          |         |         |                                       |
| Dielectric strength       | volts  | 2000                                |         |         | dc for 60s                            |
| Working temperature range | °C     | -55 to 175                          |         |         |                                       |
| Insulation resistance     | ohms   | >10G                                |         |         | Between terminals and tab             |
| Tolerances                | %      | ≤1R0: ±5 >1R0: ±1, ±5               |         |         |                                       |
| TCR                       | ppm/°C | ≤3R0: ±300 >3R0-10R: ±100 >10R: ±50 |         |         | 25 to 105°C                           |
| Standard values           |        | E24 preferred                       |         |         |                                       |

### Physical Data

| Dimensions (mm) & Weight (g) |            |
|------------------------------|------------|
| A                            | 10.1 ±0.3  |
| B                            | 10.1 ±0.3  |
| C                            | 4.6 ±0.2   |
| D                            | 5.0 ±1     |
| E                            | 1.27 ±0.3  |
| F                            | 2.54 ±0.5  |
| G                            | 3.2 ±0.2   |
| H                            | 0.43 ±0.07 |
| J                            | 0.88 ±0.12 |
| K                            | 1.32 ±0.15 |
| L                            | 5.08 ±0.1  |
| M                            | 1.35 ±0.1  |
| O                            | 1.5 ±0.5   |
| P                            | 2.54 ±0.1  |
| Q                            | 6.9 ±0.3   |
| T                            | 6.0 ±1     |
| Wt                           | 1.5 nom.   |

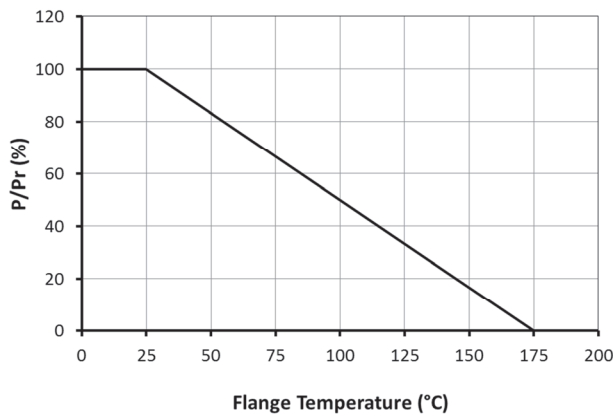
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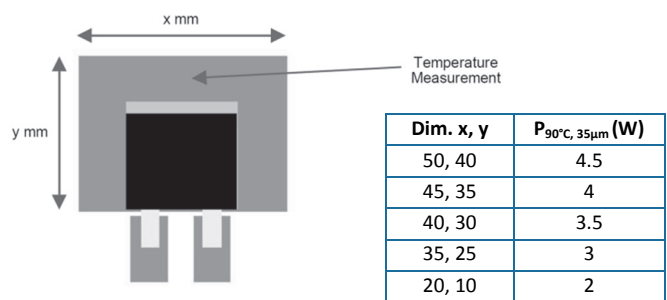
## Performance Data

| Test  |      | Performance   |
|---|------|---------------|
| <b>Load at Rated Power:</b> 2000hrs at rated power  | ±ΔR% | 1             |
| <b>Short Term Overload:</b> 2 x rated power with applied voltage not to exceed 1.5 x maximum continuous operating voltage for 5 seconds | ±ΔR% | 0.3           |
| <b>High Temperature Exposure:</b> MIL-STD-202 method 108, at 175°C for 1000hrs, no load   | ±ΔR% | 0.25          |
| <b>Temperature Cycling:</b> JESD22 method JA-104, -55°C/175°C, 1000cycles   | ±ΔR% | 0.3           |
| <b>Biased Humidity:</b> MIL-STD-202 method 103, 1000hrs 85°C/85% RH, 10% of operating power   | ±ΔR% | 0.5           |
| <b>Mechanical Shock:</b> MIL-STD-202 method 213   | ±ΔR% | 0.5           |
| <b>Vibration:</b> MIL-STD-202 method 204, peak acceleration 5g for 20min, 12 cycles each of 3 orientations, 10-2000Hz                   | ±ΔR% | 0.2           |
| <b>Resistance to Soldering Heat:</b> JIS-C-5201-1 4.18 IEC 60115-1 4.18, 260±5°C for 10 seconds   | ±ΔR% | 0.5           |
| <b>HBM ESD:</b> AEC-Q200-002, human body 25kV (AD)  | ±ΔR% | 1             |
| <b>Solderability:</b> J-STD-002, 240±5°C for 3 seconds  |      | ≥90% coverage |
| <b>Moisture Resistance:</b> MIL-STD-202 method 106, 10 cycles, 24hours  | ±ΔR% | 0.5           |
| <b>Bending Strength:</b> AEC-Q200-005, Bending 2mm for 60 seconds   | ±ΔR% | 0.25          |
| <b>Terminal Strength:</b> AEC-Q200-006, 1.8Kg for 60 seconds  | ±ΔR% | 0.2           |

Temperature Derating

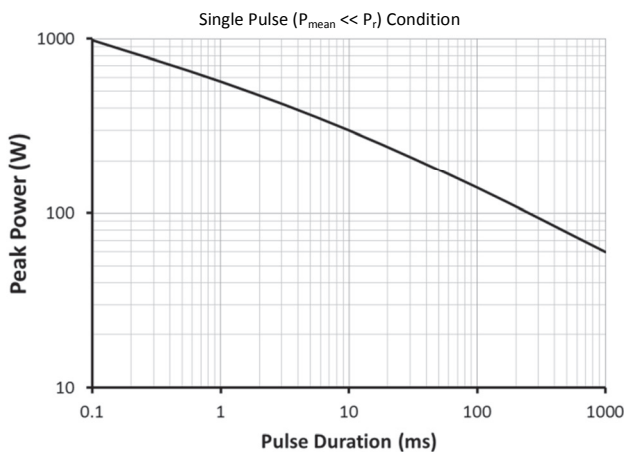


Typical Thermal Performance on FR4 Pad Heatsink



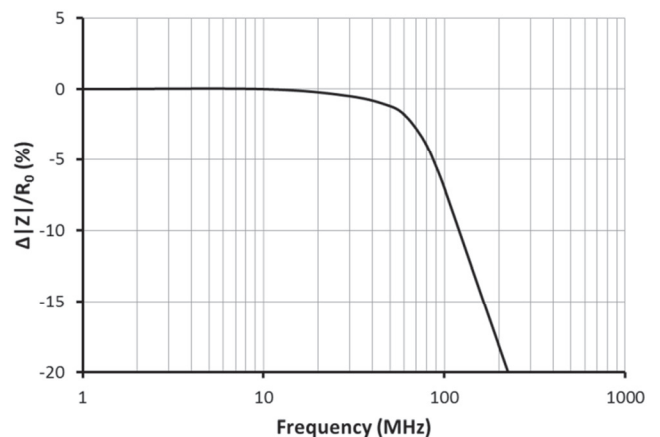
Characterisation carried out using 35μm PCB copper pad weights, with temperature of 90°C used as a maximum reference on the PCB. P<sub>90°C, 35μm</sub> (W) is power when the measurement point reaches 90°C.

Pulse Performance



Pulse performance for durations ≥1s is dependent on mounting conditions. The short term overload power limit is 2 x power rating for 5s.

Typical High Frequency Performance



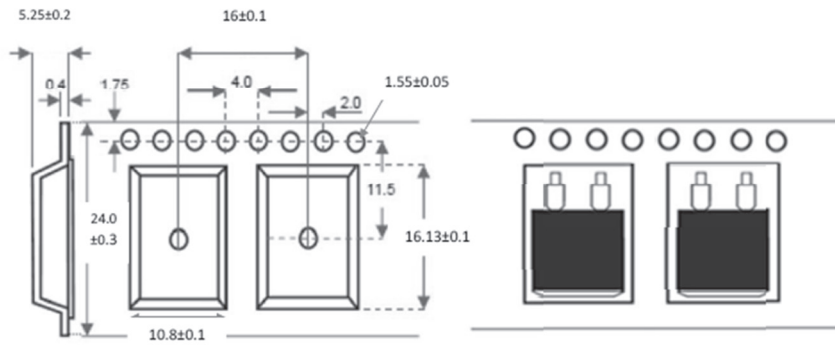
Typical high frequency characteristics for WSMHP35-220R. Self resonant frequency is 1GHz.

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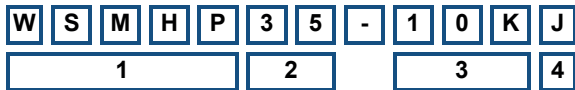
## Packing

WSMHP components are packed on 330mm diameter reels, with 100mm inner diameter, in tape of width 24mm and with a quantity of 500 pieces per reel. The dimensions of the tape and orientation of the component are as shown below.



## Ordering Procedure

Example: WSMHP35-10KJ (WSMHP35 at 10 kilohms ±5%, Pb-free)



| 1     | 2      | 3                | 4         | Packing                  |
|-------|--------|------------------|-----------|--------------------------|
| Type  | Rating | Value            | Tolerance |                          |
| WSMHP | 20     | 3 / 4 characters | F = ±1%   | Plastic tape<br>500/reel |
|       | 25     | R = ohms         | J = ±5%   |                          |
|       | 35     | K = kilohms      |           |                          |

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