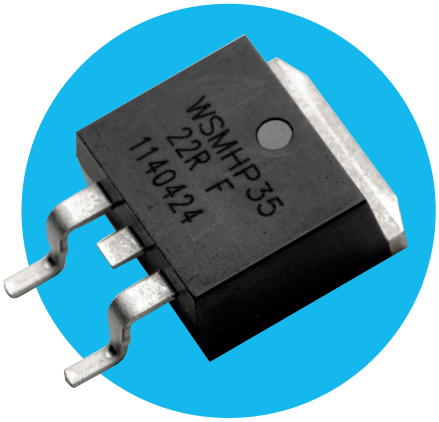
Resistors

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

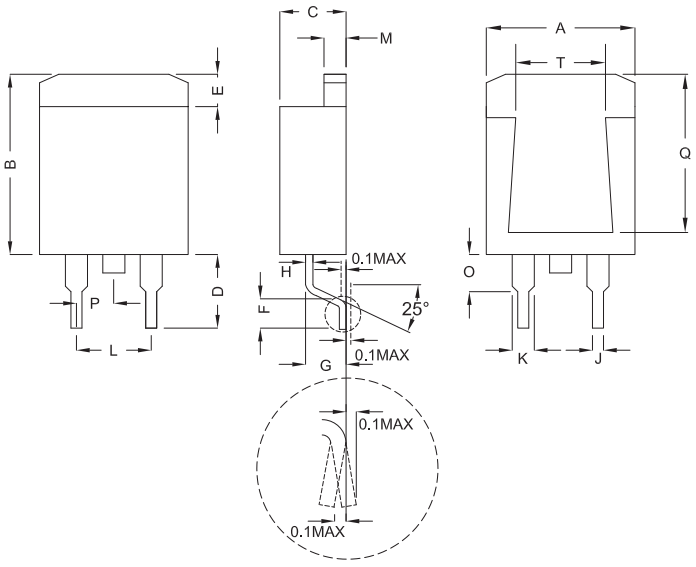
All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

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.



General Note

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BI Technologies IRC Welwyn

www.ttelectronics.com/resistors

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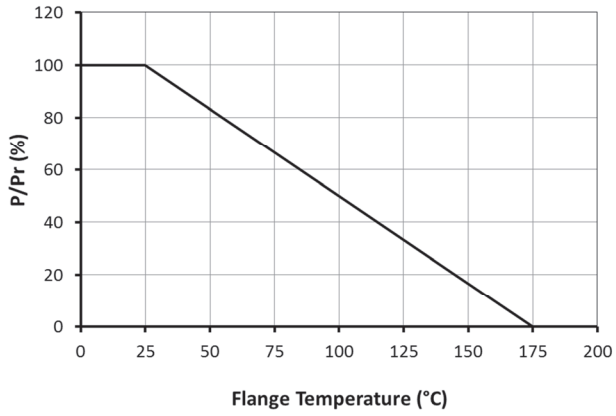
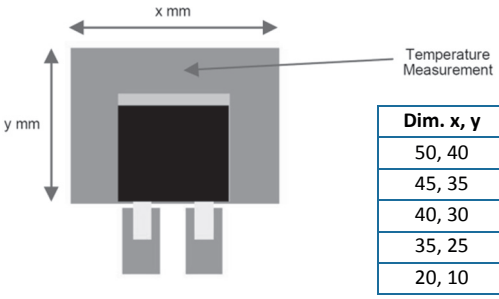
Performance Data

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

Temperature Derating



Typical Thermal Performance on FR4 Pad Heatsink

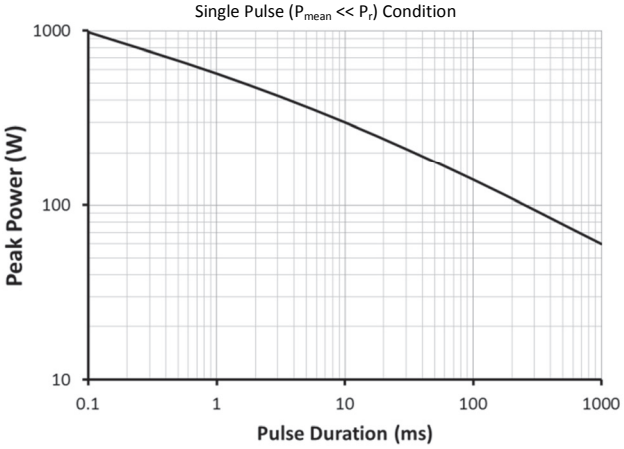


Dim. x, y	$P_{90°C, 35µm}$ (W)
50, 40	4.5
45, 35	4
40, 30	3.5
35, 25	3
20, 10	2

Characterisation carried out using 35µm PCB copper pad weights, with temperature of 90°C used as a maximum reference on the PCB. $P_{90°C, 35µm}$ (W) is power when the measurement point reaches 90°C.

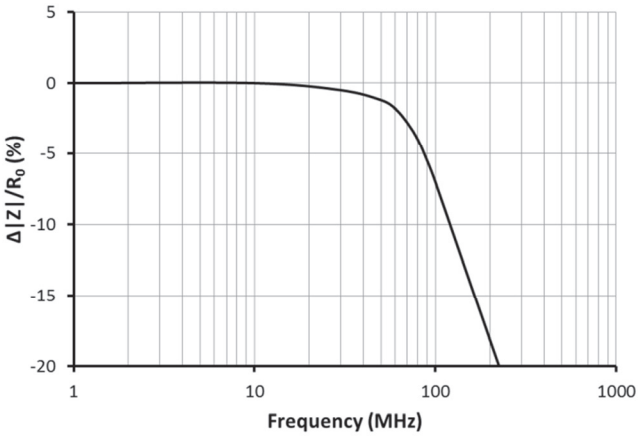
Pulse Performance

Single Pulse (P_{mean} << P_r) Condition



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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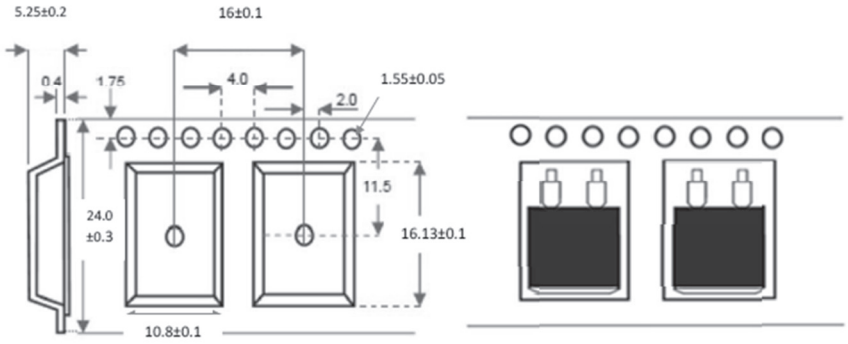
Packing

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)

W	S	M	H	P	3	5	-	1	0	K	J
1					2			3			4

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

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WSMHP20-470RJ WSMHP20-91RF WSMHP35-47RF WSMHP25-200RF WSMHP20-22RF WSMHP35-270RJ WSMHP35-51RF WSMHP20-47RJ WSMHP25-130RJ WSMHP35-7R5J WSMHP35-47RJ WSMHP20-100RJ WSMHP25-1K0J WSMHP35-4R0F WSMHP25-3R3J WSMHP25-100RF WSMHP35-200RF WSMHP35-3R3J WSMHP20-100RF WSMHP35-1K0F WSMHP35-56RF WSMHP35-1K0J WSMHP25-1R0J WSMHP35-100RF WSMHP20-10RJ WSMHP20-1R5J WSMHP20-1R0J WSMHP35-12RF WSMHP35-15RJ WSMHP25-50RF WSMHP20-15RF WSMHP25-8R0F WSMHP35-1R0J WSMHP35-1R5F WSMHP35-3R0J WSMHP25-10RF WSMHP35-5R0J WSMHP35-12RJ WSMHP35-27RF WSMHP35-20RF WSMHP35-470RF WSMHP35-50RF WSMHP35-2R0J WSMHP25-1R5F WSMHP20-20RF WSMHP35-2R0F WSMHP35-10RF WSMHP35-15RF WSMHP20-10RF WSMHP25-20RF WSMHP35-100RJ WSMHP35-10RJ WSMHP20-20RJ WSMHP25-5R0F WSMHP35-2R5F WSMHP25-25RF WSMHP35-300RF WSMHP35-30RF WSMHP25-0R5J WSMHP35-3R3F WSMHP35-150RJ WSMHP25-12RF WSMHP35-3K3F PWC1206LF6K8F PWC1206LF3K83J PWC2010LF51RF PWC2512LF470KF PWC2512LF348KF PWC2010LF287RJ PWC1206LF8K45J PWC1206LF8M06F PWC1206LF348RJ PWC1206LF2K1F PWC2512LF7K68J PWC2010LF402RF PWC2512LF33RF PWC2512LF2R05J PWC2010LF2M05J PWC2512LF215RF PWC2010LF2M37F PWC1206LF8R06F PWC2010LF22R6F PWC2010LF21KF PWC2010LF1M74F PWC1206LF37K4F PWC1206LF30KF PWC1206LF2M37F PWC2010LF191KJ PWC2010LF16R9F PWC2010LF953RF PWC2512LF7K32J PWC2512LF68R1F PWC1206LF845KJ PWC1206LF4K53F PWC2010LF4K53J PWC1206LF510KJ PWC1206LF523RF PWC2512LF5M49J PWC1206LF43R2F PWC1206LF42K2F