

## Specifications Per

- IEC 60115-1
- EN 140401-803

## Features

- SMD enabled structure
- Superior frequency response
- Excellent solderability termination
- Excellent in heat dissipation than chip resistor
- Stronger mechanical structure to endure vibration and thermal shock
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

## DIMENSIONS

Type	Body Length (L, mm)	Cap Diameter (D1, mm)	Body Diameter (D2, mm)	Soldering Spot (B, mm)	Net Weight Per 1000 pcs
HFT102	2.10 ± 0.10	1.10 ± 0.1	D1+0.02/ -0.1	0.5 Min.	7 grams
HFT204	3.52 ± 0.15	1.35 ± 0.1	D1+0.02/ -0.15	0.6 Min.	17 grams
HFT207	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
HFT101	5.90 ± 0.20	2.20 ± 0.1	D1+0.02/ -0.2	1.0 Min.	66 grams
HFT201	8.50 ± 0.50	3.00 ± 0.2	D1+0.05/ -0.35	1.3 Min.	186 grams

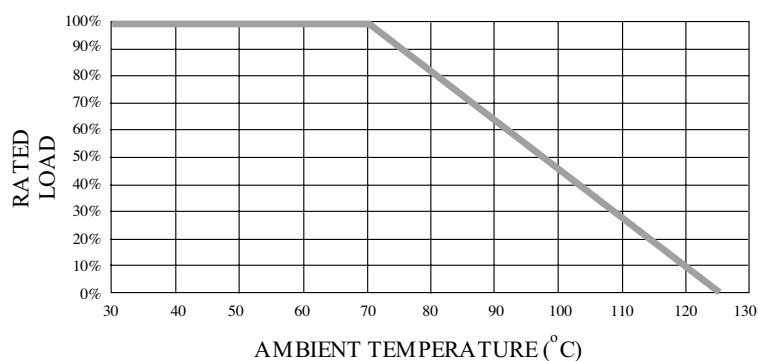
## GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage*	Maximum Overload Voltage**	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
HFT102	1/5W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	24.9Ω	75Ω	±0.1%~5%	E-24 / E-192
HFT204	1/4W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	24.9Ω	75Ω	±0.1%~5%	E-24 / E-192
HFT207	1/3W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	24.9Ω	75Ω	±0.1%~5%	E-24 / E-192
HFT101	1W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	24.9Ω	75Ω	±0.1%~5%	E-24 / E-192
HFT201	2W	$\sqrt{PxR}$	$2.5x\sqrt{PxR}$	24.9Ω	75Ω	±0.1%~5%	E-24 / E-192

\* Rated Continuous Maximum Working Voltage (RCWV) should be determined from  $RCWV = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$

\*\* Short-time Overload (STOL) test should be determined from  $STOL = 2.5 \times RCWV$

## POWER DERATING CURVE



## ■ PART NUMBER

Example: HFT204F50R0TKZTR3K0

HFT204	F	50R0	TKZ	TR3K0
Type	Tolerance*	Resistance	TCR	Packaging
	B (0.1%) C (0.25%) D(0.5%) F (1%) J (5%)	50Ω <b>4-character code</b> containing - 3 significant digits 1 letter multiplier  <b>OHM MULTIPLIER</b> R = 1 K = 10 <sup>3</sup> M = 10 <sup>6</sup> G = 10 <sup>9</sup>	<b>3-character code</b>  TKZ = Default Product Temperature Coefficient.  Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.**	<b>5-character code</b>  TR = Tape Reel  (pieces per reel) <u>HFT102</u> 3K0 = 3,000 6K0 = 6,000 10K = 10,000  <u>HFT204</u> 3K0 = 3,000 6K0 = 6,000*** 10K = 10,000***  <u>HFT207/HFT101</u> <u>2K0 = 2,000</u> <u>6K0 = 6,000***</u> <u>10K = 10,000***</u>  <u>HFT201</u> <u>2K5 = 2,500</u>

\* Listed values may not be applicable to all resistance values. Please check with us before placing order.

\*\* For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.

\*\*\* upon request

## ■ TECHNICAL SUMMARY

Characteristics	Limits
Dielectric Withstanding Voltage, VAC or DC	HFT102: 150V HFT204: 200V HFT207, HFT101: 500V HFT201: 700V
Temperature Coefficient, PPM / °C*	±50, ±100
Operating Temperature Range, °C	-55 ~ +125
Film Temperature, °C	125
Insulation Resistance, MΩ	>10 <sup>4</sup>
Tin Whisker (JESD201 Temperature Cycling & High Temp. /Humidity Storage), μm	<5
Failure Rate in Time, pcs / 10 <sup>9</sup> device hours	<1

\* Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).

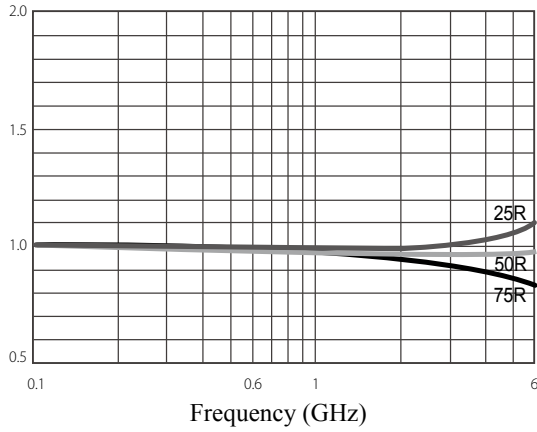
Quality • Reliability  
Cost-Down via Innovation

## FUNCTIONAL PERFORMANCE

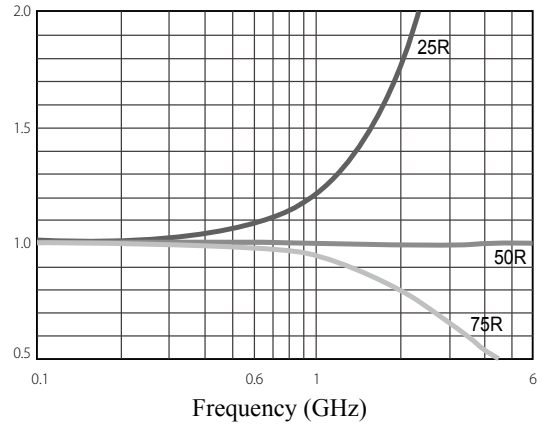
### RF-BEHAVIOR

HFT

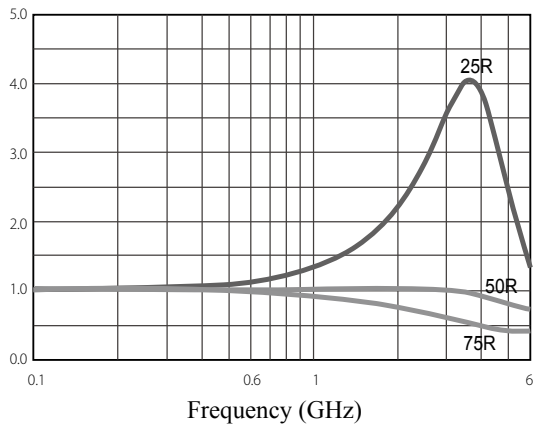
IZI/R for HFT102 MELF resistors



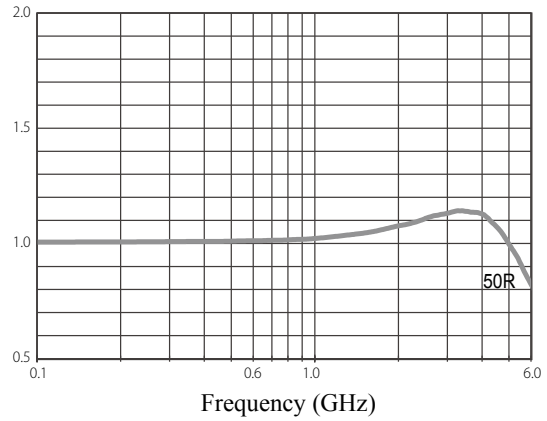
IZI/R for HFT204 MELF resistors



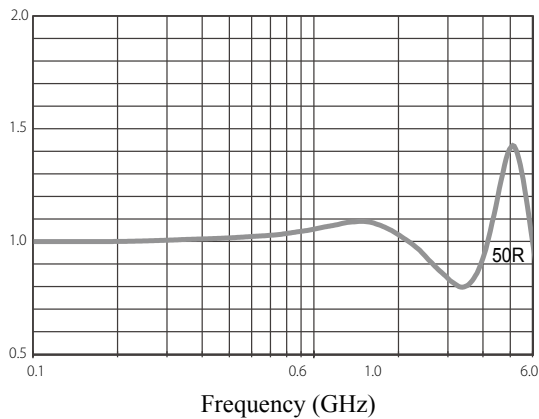
IZI/R for HFT207 MELF resistors



IZI/R for HFT101 MELF resistors



IZI/R for HFT201 MELF resistors

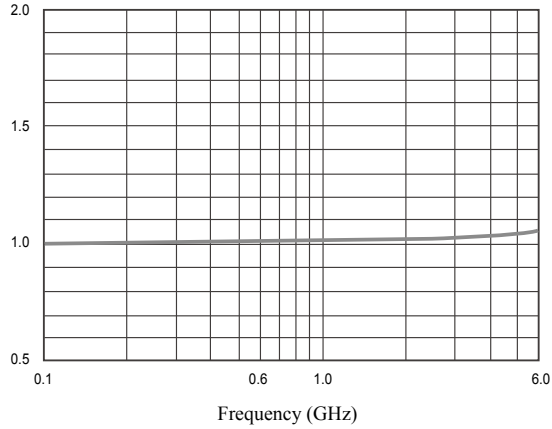


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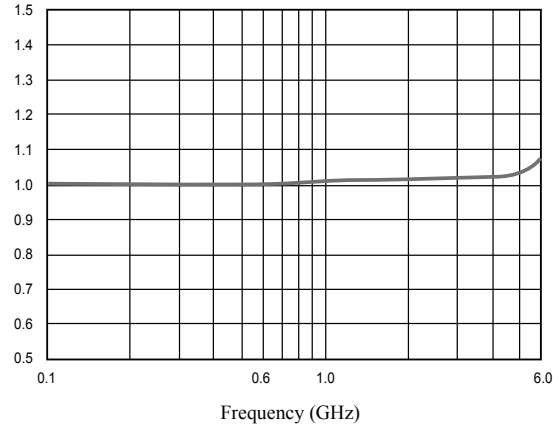
## FUNCTIONAL PERFORMANCE

### VSWR

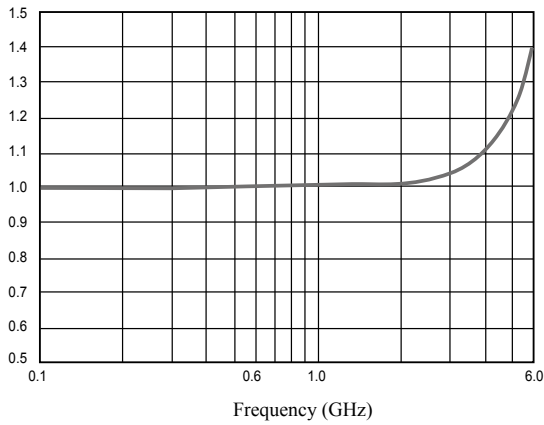
HFT102 50R MELF Resistor



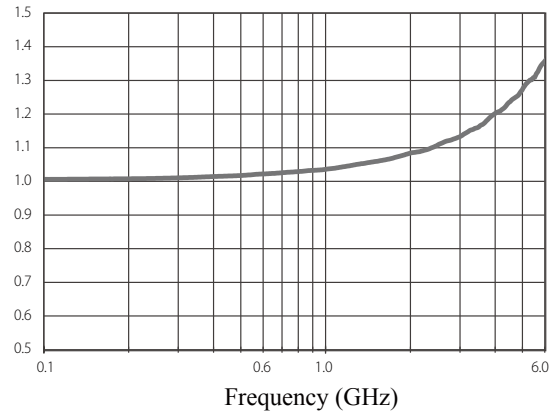
HFT204 50R MFLF Resistor



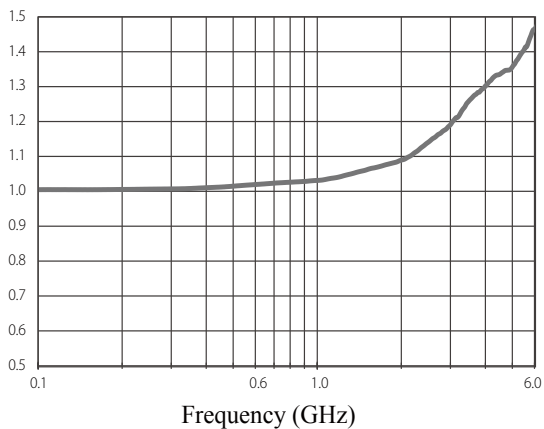
HFT207 50R MFLF Resistor



HFT101 50R MELF Resistor



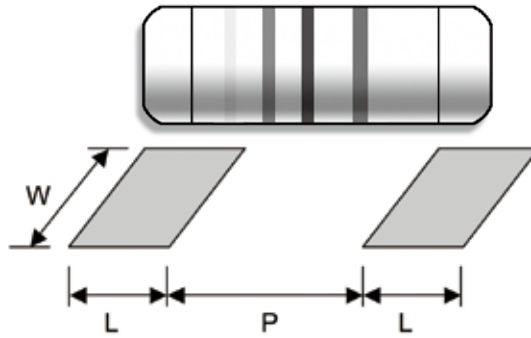
HFT201 50R MELF Resistor



Quality • Reliability  
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HFT

## ■ SUGGESTED PAD LAYOUT



Type	Soldering Mode	Pad Length (L, mm, Min.)	Pad Spacing (P, mm)	Pad Width (W, mm, Min.)
HFT102	Reflow	0.8	0.9 ± 0.05	1.3
	Wave	1.2	0.7 ± 0.05	1.3
HFT204	Reflow	1.3	1.6 ± 0.1	1.6
	Wave	1.5	1.5 ± 0.1	1.8
HFT207	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0
HFT101	Reflow	2.0	3.0 ± 0.1	3.0
	Wave	2.5	3.0 ± 0.1	3.0
HFT201	Reflow	3.0	4.9 ± 0.3	3.7
	Wave	3.5	4.8 ± 0.3	4.0

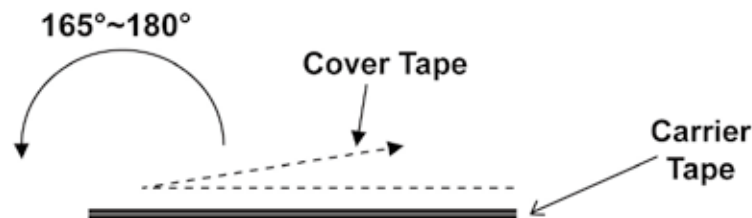
For better heat dissipation / lower heat resistance, increase W & L.

## ■ COVER TAPE PEELING SPECIFICATION

Recommended peeling force:

HFT102, HFT204, HFT207, HFT101: 50±5gf

HFT201: 70±10gf



## PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Overload	<b>IEC 60115-1 4.13</b> 5 seconds 2.5x rated voltage (not over max. overload voltage)	±0.5%
Load Life In Humidity	<b>IEC 60115-1 4.24</b> 56 days rated load (not over max. working voltage) at (40±2)°C and (93±3)% relative humidity	±2%
Load Life	<b>IEC 60115-1 4.25.1</b> Rated load (not over max. working voltage) 1,000 hours with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±2%
Periodic Electric Overload	<b>IEC 60115-1 4.39</b> 3.9x rated voltage (not over max. overload voltage) with 0.1s ON, 2.5s OFF for 1,000 cycles	±2%
Resistance To Soldering Heat	<b>IEC 60115-1 4.18.2</b> Dip the resistor into a solder bath measured (260±5)°C and hold it for a 10±1 seconds	±0.5%
Solderability	<b>IEC 60115-1 4.17.2</b> Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% min. coverage
Vibration	<b>IEC 60115-1 4.22</b> Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±0.25%
Thermal Endurance	<b>IEC 60115-1 4.25.3</b> 1000 hours at 125°C without load	±2%
Thermal Shock	<b>IEC 60115-1 4.19</b> -55°C 30minutes, +125°C 30minutes, 5 cycles	±0.5%
Single pulse high voltage overload	<b>IEC 60115-1 4.27</b> 10 pulses of 10/700µs at 10x rated voltage with interval of 60 sec.	±1%
Electrostatic discharge (Human body model)	<b>IEC 60115-1 4.38</b> 3 positive & 3 negative discharges with 1.5KV for HFT102 or 2KV for HFT204 or 4KV for HFT207, HFT101, HFT201	±2%
Climatic test	<b>IEC 60115-1 4.23</b> 4.23.2 - dry heat: 16 hours 125°C 4.23.3 - damp heat: 24 hours 55°C with 95% relative humidity 4.23.4 - cold: 2 hours -55°C 4.23.5 - negative air pressure: 2 hour 8.5KPa at (25±10)°C 4.23.6 - damp heat cyclic: 5 days 55°C with 95% relative humidity 4.23.7 - DC load: rated voltage at -55°C and 125°C each 1 Min.	±1%
Bending test	<b>IEC 60115-1 4.33</b> Pressing depth 2mm, 3 times	±0.25%
Flammability	<b>IEC 60115-1 4.35</b> Needle flame test 10s	No burning after 30s