DataSheet No.: E13010

Version: V0

Date: 2023/04/28

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MMFR

Precision Metal Film Molded Resistor

Resistance	10Ω-1MΩ
Tolerance	±0.05%
TCR	±5ppm/°C
Load Life	±0.05%

Applications

Precision Instrumentation

Better Solution for Sustainable High End Manufacturing

Precision Metal Film Molded Resistor
Tight Tolerance, Low TCR, High Load Life Stability

Introduction

MMFR series uses 96% alumina ceramic cores, combined with precision metal film deposition technology, to achieve the target resistance through laser trimming. The lowest TCR of MMFR series is ±5ppm/℃. Load life stability is significantly improved compared to general metal film resistor. At +70℃ ambient temperature, the maximum resistance change after loading the rated power for 1000 hours is ±0.05%, with strong moisture resistance. The leaded structure is conducive to reducing the impact of PCB stress on resistor. Highly suitable for electronic circuits with high requirements of TCR and stability.

Electrical Parameters

Size	Rated Power (+70℃)	Max. Operating Voltage	Max. Overload Voltage	Operating Temperature	E-Series Value	TCR ppm/℃	Resistance Ω	Tolerance %
MMFR2568	0.25W	250V	500V	-50℃~+125℃	E24, E96	±5	10≤R≤1M	±0.05, ±0.1, ±0.5, ±1.0
MMFR3710	0.5W	300V	600V	-50℃~+125℃	E24, E96	±5	10≤R≤1M	±0.05, ±0.1, ±0.5, ±1.0
MMFR5215	0.75W	350V	700V	-50℃~+125℃	E24, E96	±5	10≤R≤1M	±0.05, ±0.1, ±0.5, ±1.0
MMFR6518	1.0W	400V	800V	-50℃~+125℃	E24, E96	±5	10≤R≤1M	±0.05, ±0.1, ±0.5, ±1.0

Dimensions & Packaging

Unit: mm

Size	L	D	d	Packaging	Quantity Per Bulk
2568	6.8±0.4	2.5±0.4	0.6±0.05	Bulk	200pcs
3710	10.0±0.4	3.7±0.4	0.6±0.05	Bulk	100pcs
5215	14.8±0.4	5.2±0.4	0.6±0.05	Bulk	100pcs
6518	18.3±0.4	6.5±0.4	0.8±0.05	Bulk	100pcs

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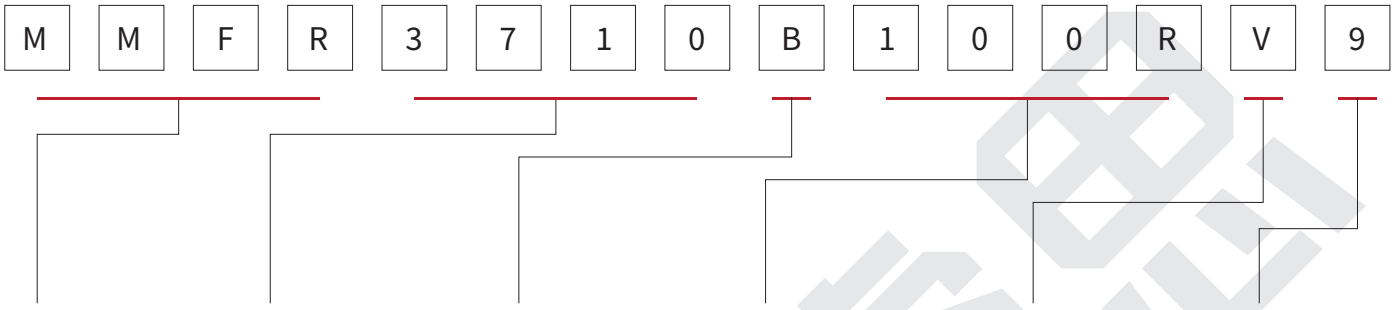
Part Number Information

Example: MMFR3710B100RV9 (MMFR 3710 ±0.1% 100Ω ±5ppm/°C Standard)



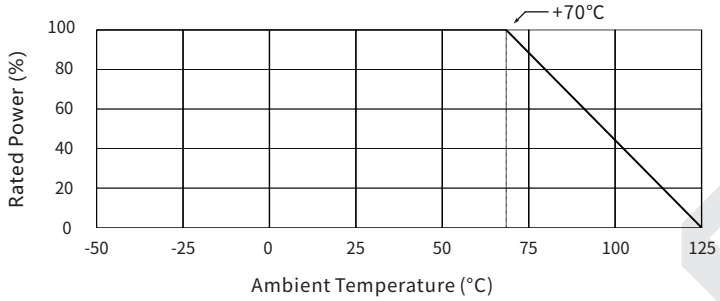
Series	Size	Tolerance	Resistance	TCR	Code
MMFR	2568	A=±0.05%	10R0=10Ω	V=±5ppm/°C	9=Standard
	3710	B=±0.1%	1K00=1000Ω		0-8=Custom
	5215	D=±0.5%	1M00=1000000Ω		
	6518	F=±1.0%			

For more options of resistance, tolerance and TCR, please contact us.

Performance

Test	Test Method	Standards	Max.
Load Life	70±2°C, 1000h, RCWV or maximum operating voltage (the lower one)	IEC 60115-1 4.25	±0.05%+0.05Ω
TCR	+85°C, +25°C Ref.	IEC 60115-1 4.8	Within the nominal value range
Resistance to Solder Heat	+260±3°C, 10±1s, immersed 3±0.5mm of the body	IEC 60115-1 4.18	±0.05%+0.05Ω
Short-Time Overload	10x RCWV or 2x maximum operating voltage (the lower one) for 5s	IEC60115-1 4.13	±0.02% No visible damage
Resistance to Solvent	Immerse in IPA for 5 min with ultrasonic	IEC 60115-1 4.30	Clear marking No visible damage
Solderability	235±5°C, 3±0.5s	IEC 60115-1 4.17	95% coverage
Moisture Resistance	40±2°C, 90-95% RH for 56 days, 0.1xRCWV or the maximum operating voltage (the lower one)	IEC 60115-1, 4.24	±0.05%+0.05Ω
Dielectric Withstanding Voltage	Apply a AC voltage with an effective maximum overload voltage between the electrode and the substrate at a speed of approximately 100V/s, for 60s	IEC 60115-1 4.7	No breakdown or flashover
Insulation Resistance	Apply a DC voltage of 100V between the electrode and the substrate for 60s and measure the insulation resistance	IEC 600115-1 4.6	10000MΩ, minimum

Derating Curve



Marking

The first line: The first four digits represent brand and the second four digits represent resistance;
The second line: The first digit represents tolerance, the second and third digits represent TCR, and the last four digits represent date code.

Illustration

RESI (Brand)、10R0 (Resistance 10Ω)、B (Tolerance ±0.1%)、T5 (TCR ±5ppm/°C)
2320 (Date Code. Week 20 of 2023)

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Popular Part Numbers

Part Number	Size	Tolerance	Resistance	TCR	Power	
MMFR2568B10R0V9	2568	±0.1%	10Ω	±5ppm/°C	0.25W	250V
MMFR2568B20R0V9	2568	±0.1%	20Ω	±5ppm/°C	0.25W	250V
MMFR2568B50R0V9	2568	±0.1%	50Ω	±5ppm/°C	0.25W	250V
MMFR2568B100RV9	2568	±0.1%	100Ω	±5ppm/°C	0.25W	250V
MMFR2568B120RV9	2568	±0.1%	120Ω	±5ppm/°C	0.25W	250V
MMFR2568B200RV9	2568	±0.1%	200Ω	±5ppm/°C	0.25W	250V
MMFR2568B250RV9	2568	±0.1%	250Ω	±5ppm/°C	0.25W	250V
MMFR2568B500RV9	2568	±0.1%	500Ω	±5ppm/°C	0.25W	250V
MMFR2568B1K00V9	2568	±0.1%	1KΩ	±5ppm/°C	0.25W	250V
MMFR2568B2K00V9	2568	±0.1%	2KΩ	±5ppm/°C	0.25W	250V
MMFR2568B5K00V9	2568	±0.1%	5KΩ	±5ppm/°C	0.25W	250V
MMFR2568B10K0V9	2568	±0.1%	10KΩ	±5ppm/°C	0.25W	250V
MMFR2568B20K0V9	2568	±0.1%	20KΩ	±5ppm/°C	0.25W	250V
MMFR2568B50K0V9	2568	±0.1%	50KΩ	±5ppm/°C	0.25W	250V
MMFR2568B100KV9	2568	±0.1%	100KΩ	±5ppm/°C	0.25W	250V
MMFR2568B200KV9	2568	±0.1%	200KΩ	±5ppm/°C	0.25W	250V
MMFR2568B500KV9	2568	±0.1%	500KΩ	±5ppm/°C	0.25W	250V
MMFR2568B1M00V9	2568	±0.1%	1MΩ	±5ppm/°C	0.25W	250V
MMFR3710B10R0V9	3710	±0.1%	10Ω	±5ppm/°C	0.5W	300V
MMFR3710B20R0V9	3710	±0.1%	20Ω	±5ppm/°C	0.5W	300V
MMFR3710B50R0V9	3710	±0.1%	50Ω	±5ppm/°C	0.5W	300V
MMFR3710B100RV9	3710	±0.1%	100Ω	±5ppm/°C	0.5W	300V
MMFR3710B200RV9	3710	±0.1%	200Ω	±5ppm/°C	0.5W	300V
MMFR3710B250RV9	3710	±0.1%	250Ω	±5ppm/°C	0.5W	300V
MMFR3710B500RV9	3710	±0.1%	500Ω	±5ppm/°C	0.5W	300V
MMFR3710B1K00V9	3710	±0.1%	1KΩ	±5ppm/°C	0.5W	300V
MMFR3710B2K00V9	3710	±0.1%	2KΩ	±5ppm/°C	0.5W	300V
MMFR3710B5K00V9	3710	±0.1%	5KΩ	±5ppm/°C	0.5W	300V
MMFR3710B10K0V9	3710	±0.1%	10KΩ	±5ppm/°C	0.5W	300V
MMFR3710B20K0V9	3710	±0.1%	20KΩ	±5ppm/°C	0.5W	300V
MMFR3710B50K0V9	3710	±0.1%	50KΩ	±5ppm/°C	0.5W	300V
MMFR3710B100KV9	3710	±0.1%	100KΩ	±5ppm/°C	0.5W	300V
MMFR3710B200KV9	3710	±0.1%	200KΩ	±5ppm/°C	0.5W	300V
MMFR3710B500KV9	3710	±0.1%	500KΩ	±5ppm/°C	0.5W	300V
MMFR3710B1M00V9	3710	±0.1%	1MΩ	±5ppm/°C	0.5W	300V
MMFR5215B10R0V9	5215	±0.1%	10Ω	±5ppm/°C	0.75W	350V
MMFR5215B20R0V9	5215	±0.1%	20Ω	±5ppm/°C	0.75W	350V
MMFR5215B50R0V9	5215	±0.1%	50Ω	±5ppm/°C	0.75W	350V
MMFR5215B100RV9	5215	±0.1%	100Ω	±5ppm/°C	0.75W	350V
MMFR5215B200RV9	5215	±0.1%	200Ω	±5ppm/°C	0.75W	350V
MMFR5215B250RV9	5215	±0.1%	250Ω	±5ppm/°C	0.75W	350V
MMFR5215B500RV9	5215	±0.1%	500Ω	±5ppm/°C	0.75W	350V
MMFR5215B1K00V9	5215	±0.1%	1KΩ	±5ppm/°C	0.75W	350V
MMFR5215B2K00V9	5215	±0.1%	2KΩ	±5ppm/°C	0.75W	350V
MMFR5215B5K00V9	5215	±0.1%	5KΩ	±5ppm/°C	0.75W	350V
MMFR5215B10K0V9	5215	±0.1%	10KΩ	±5ppm/°C	0.75W	350V
MMFR5215B20K0V9	5215	±0.1%	20KΩ	±5ppm/°C	0.75W	350V
MMFR5215B50K0V9	5215	±0.1%	50KΩ	±5ppm/°C	0.75W	350V
MMFR5215B100KV9	5215	±0.1%	100KΩ	±5ppm/°C	0.75W	350V
MMFR5215B200KV9	5215	±0.1%	200KΩ	±5ppm/°C	0.75W	350V
MMFR5215B500KV9	5215	±0.1%	500KΩ	±5ppm/°C	0.75W	350V
MMFR5215B1M00V9	5215	±0.1%	1MΩ	±5ppm/°C	0.75W	350V

Popular Part Numbers

Part Number	Size	Tolerance	Resistance	TCR	Power	Max. Operating Voltage
MMFR6518B10R0V9	6518	±0.1%	10Ω	±5ppm/°C	1.0W	400V
MMFR6518B20R0V9	6518	±0.1%	20Ω	±5ppm/°C	1.0W	400V
MMFR6518B50R0V9	6518	±0.1%	50Ω	±5ppm/°C	1.0W	400V
MMFR6518B100RV9	6518	±0.1%	100Ω	±5ppm/°C	1.0W	400V
MMFR6518B200RV9	6518	±0.1%	200Ω	±5ppm/°C	1.0W	400V
MMFR6518B250RV9	6518	±0.1%	250Ω	±5ppm/°C	1.0W	400V
MMFR6518B500RV9	6518	±0.1%	500Ω	±5ppm/°C	1.0W	400V
MMFR6518B1K00V9	6518	±0.1%	1KΩ	±5ppm/°C	1.0W	400V
MMFR6518B2K00V9	6518	±0.1%	2KΩ	±5ppm/°C	1.0W	400V
MMFR6518B5K00V9	6518	±0.1%	5KΩ	±5ppm/°C	1.0W	400V
MMFR6518B10K0V9	6518	±0.1%	10KΩ	±5ppm/°C	1.0W	400V
MMFR6518B20K0V9	6518	±0.1%	20KΩ	±5ppm/°C	1.0W	400V
MMFR6518B50K0V9	6518	±0.1%	50KΩ	±5ppm/°C	1.0W	400V
MMFR6518B100KV9	6518	±0.1%	100KΩ	±5ppm/°C	1.0W	400V
MMFR6518B200KV9	6518	±0.1%	200KΩ	±5ppm/°C	1.0W	400V
MMFR6518B500KV9	6518	±0.1%	500KΩ	±5ppm/°C	1.0W	400V
MMFR6518B1M00V9	6518	±0.1%	1MΩ	±5ppm/°C	1.0W	400V
MMFR6518B11R0V9	6518	±0.1%	11Ω	±5ppm/°C	1.0W	400V
MMFR6518B12R0V9	6518	±0.1%	12Ω	±5ppm/°C	1.0W	400V
MMFR6518B13R0V9	6518	±0.1%	13Ω	±5ppm/°C	1.0W	400V
MMFR6518B15R0V9	6518	±0.1%	15Ω	±5ppm/°C	1.0W	400V
MMFR6518B18R0V9	6518	±0.1%	18Ω	±5ppm/°C	1.0W	400V
MMFR6518B22R0V9	6518	±0.1%	22Ω	±5ppm/°C	1.0W	400V
MMFR6518B24R0V9	6518	±0.1%	24Ω	±5ppm/°C	1.0W	400V
MMFR6518B27R0V9	6518	±0.1%	27Ω	±5ppm/°C	1.0W	400V
MMFR6518B30R0V9	6518	±0.1%	30Ω	±5ppm/°C	1.0W	400V
MMFR6518B33R0V9	6518	±0.1%	33Ω	±5ppm/°C	1.0W	400V
MMFR6518B47R0V9	6518	±0.1%	47Ω	±5ppm/°C	1.0W	400V
MMFR6518B51R0V9	6518	±0.1%	51Ω	±5ppm/°C	1.0W	400V
MMFR6518B110RV9	6518	±0.1%	110Ω	±5ppm/°C	1.0W	400V
MMFR6518B120RV9	6518	±0.1%	120Ω	±5ppm/°C	1.0W	400V
MMFR6518B130RV9	6518	±0.1%	130Ω	±5ppm/°C	1.0W	400V
MMFR6518B150RV9	6518	±0.1%	150Ω	±5ppm/°C	1.0W	400V
MMFR6518B180RV9	6518	±0.1%	180Ω	±5ppm/°C	1.0W	400V
MMFR6518B220RV9	6518	±0.1%	220Ω	±5ppm/°C	1.0W	400V
MMFR6518B240RV9	6518	±0.1%	240Ω	±5ppm/°C	1.0W	400V
MMFR6518B270RV9	6518	±0.1%	270Ω	±5ppm/°C	1.0W	400V
MMFR6518B300RV9	6518	±0.1%	300Ω	±5ppm/°C	1.0W	400V
MMFR6518B330RV9	6518	±0.1%	330Ω	±5ppm/°C	1.0W	400V
MMFR6518B470RV9	6518	±0.1%	470Ω	±5ppm/°C	1.0W	400V
MMFR6518B510RV9	6518	±0.1%	510Ω	±5ppm/°C	1.0W	400V
MMFR6518B1K10V9	6518	±0.1%	1.1KΩ	±5ppm/°C	1.0W	400V
MMFR6518B1K20V9	6518	±0.1%	1.2KΩ	±5ppm/°C	1.0W	400V
MMFR6518B1K30V9	6518	±0.1%	1.3KΩ	±5ppm/°C	1.0W	400V
MMFR6518B1K50V9	6518	±0.1%	1.5KΩ	±5ppm/°C	1.0W	400V
MMFR6518B1K80V9	6518	±0.1%	1.8KΩ	±5ppm/°C	1.0W	400V
MMFR6518B2K20V9	6518	±0.1%	2.2KΩ	±5ppm/°C	1.0W	400V
MMFR6518B2K40V9	6518	±0.1%	2.4KΩ	±5ppm/°C	1.0W	400V
MMFR6518B2K50V9	6518	±0.1%	2.5KΩ	±5ppm/°C	1.0W	400V
MMFR6518B2K70V9	6518	±0.1%	2.7KΩ	±5ppm/°C	1.0W	400V
MMFR6518B3K00V9	6518	±0.1%	3KΩ	±5ppm/°C	1.0W	400V

Popular Part Numbers

Part Number	Size	Tolerance	Resistance	TCR	Power	Max. Operating Voltage
MMFR6518B3K30V9	6518	±0.1%	3.3KΩ	±5ppm/°C	1.0W	400V
MMFR6518B4K70V9	6518	±0.1%	4.7KΩ	±5ppm/°C	1.0W	400V
MMFR6518B5K10V9	6518	±0.1%	5.1KΩ	±5ppm/°C	1.0W	400V
MMFR6518B11K0V9	6518	±0.1%	11KΩ	±5ppm/°C	1.0W	400V
MMFR6518B12K0V9	6518	±0.1%	12KΩ	±5ppm/°C	1.0W	400V
MMFR6518B13K0V9	6518	±0.1%	13KΩ	±5ppm/°C	1.0W	400V
MMFR6518B15K0V9	6518	±0.1%	15KΩ	±5ppm/°C	1.0W	400V
MMFR6518B18K0V9	6518	±0.1%	18KΩ	±5ppm/°C	1.0W	400V
MMFR6518B22K0V9	6518	±0.1%	22KΩ	±5ppm/°C	1.0W	400V
MMFR6518B24K0V9	6518	±0.1%	24KΩ	±5ppm/°C	1.0W	400V
MMFR6518B25K0V9	6518	±0.1%	25KΩ	±5ppm/°C	1.0W	400V
MMFR6518B27K0V9	6518	±0.1%	27KΩ	±5ppm/°C	1.0W	400V
MMFR6518B30K0V9	6518	±0.1%	30KΩ	±5ppm/°C	1.0W	400V
MMFR6518B33K0V9	6518	±0.1%	33KΩ	±5ppm/°C	1.0W	400V
MMFR6518B47K0V9	6518	±0.1%	47KΩ	±5ppm/°C	1.0W	400V
MMFR6518B51K0V9	6518	±0.1%	51KΩ	±5ppm/°C	1.0W	400V
MMFR6518B110KV9	6518	±0.1%	110KΩ	±5ppm/°C	1.0W	400V
MMFR6518B150KV9	6518	±0.1%	150KΩ	±5ppm/°C	1.0W	400V
MMFR6518B250KV9	6518	±0.1%	250KΩ	±5ppm/°C	1.0W	400V
MMFR6518B300KV9	6518	±0.1%	300KΩ	±5ppm/°C	1.0W	400V
MMFR6518B470KV9	6518	±0.1%	470KΩ	±5ppm/°C	1.0W	400V
MMFR6518B510KV9	6518	±0.1%	510KΩ	±5ppm/°C	1.0W	400V

Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2023/4/28	LFY

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