KOA SPEER ELECTRONICS, INC.

MF, MFS, RK

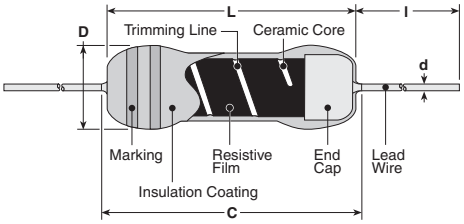
general purpose metal film leaded resistor

EU RoHS COMPLIANT

features

- Semi-precision metal film resistors
- The discharge path resistor is recognized by UL 1676 and c-UL (CAS-C22.2 No.1-M94). (File No. E159326) (RK only)
- Meets requirements of MIL-R-22684
- Suitable for automatic machine insertion
- MFS two times the power rating of the standard body type
- Marking: Blue-gray body color with color-coded bands
- Products with lead-free terminations meet EU RoHS and China RoHS requirements
- AEC-Q200 Qualified: MF1/4, MFS1/4, MFS1/2

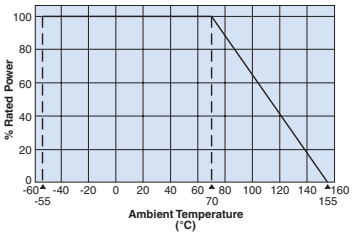
dimensions and construction



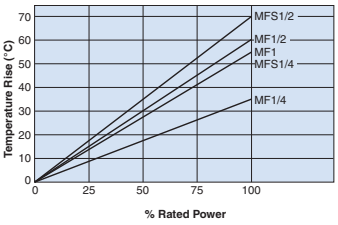
Type	Dimensions inches (mm) L (ref.)	C (max.)	D	d (nom.)	l*
MFS1/4	.126±.008 (3.2±0.2)	.133 (3.4)	.066 $^{+.007}_{-.004}$ (1.7 $^{+0.2}_{-0.1}$)	.018 (0.45)	1.10±.118 (28.0±3.0)
MF1/4	.248±.02 (6.3±0.5)	.280 (7.1)	.091±.012 (2.3±0.3)	.024 (0.6)	
MFS1/2	.248±.02 (6.3±0.5)	.280 (7.1)	.091±.012 (2.3±0.3)	.024 (0.6)	
MF1/2	.354±0.4 (9.0±1.0)	.437 (11.1)	.138±.016 (3.5±0.4)	.024 (0.6)	
MF1	.610±.02 (15.5±0.5)	.721 (18.3)	.217±.02 (5.5±0.5)	.031 (0.8)	1.50±.118 (38.0±3.0)
RK1/4	.248±.02 (6.3±0.5)	.280 (7.1)	.091±.012 (2.3±0.3)	.024 (0.6)	0.94 min. (24.0 min.)
RK1/2	.374±.04 (9.5±1.0)	.437 (11.1)	.138±.016 (3.5±0.4)	.024 (0.6)	
RK1	.610±.04 (15.5±1.0)	.720 (18.3)	.217±.02 (5.5±0.5)	.031 (0.8)	1.50±.118 (38.0±3.0)

* Lead length changes depending on taping and forming.

Derating Curve



Surface Temperature Rise



ordering information

New Part # | MF | 1/4 | L | C | T52 | R | R20 | J

Type	Power Rating	T.C.R.	Termination Material	Taping and Forming	Packaging	Nominal Resistance	Tolerance
MF	1/4: 0.25W	E: ±25	C: SnCu	1/4: T26, T52, VT, VTP, VTE, MT, M, U, M10, M12.5	A: Ammo	+2%: 2 significant figures + 1 multiplier	B: ±0.1%
MFS	1/2: 0.50W	C: ±50		1/2: T26, T52, VTP, VTE, M12.5, M15	R: Reel	+0.5%,+1%: 3 significant figures + 1 multiplier	C: ±0.25%
RK	1: 1W	D: ±100		1: T521		"R" indicates decimal on value <100Ω	D: ±0.5%
		L: ±200					F: ±1%
		G: ±250					G: ±2%
		B: ±350					J: ±5%

For further information on packaging, please refer to Appendix C.

applications and ratings

Part Designation	Power Rating @ 70°C	Minimum Dielectric Withstanding Voltage	T.C.R. (ppm/°C)	Resistance Range (Ω) (B±0.1%) E-96	(C±0.25%) E-96	(D±0.5%) E-24 E-192	(F±1.0%) E-24 E-96	(G±2.0%) E-24	(J±5.0%) E-24	Absolute Maximum Working Voltage	Absolute Maximum Overload Voltage	Operating Temperature Range
MFS1/4C	0.25W	300V	C: ±50	—	—	49.9 - 562k	10 - 1M	—	—	250V	300V	-55°C to +155°C
MFS1/4D			D: ±100									

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use. 12/18/12

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applications and ratings (continued)

Part Designation	Power Rating @ 70°C	Minimum Dielectric Withstanding Voltage	T.C.R. (ppm/°C)	Resistance Range (Ω) (B±0.1%) E-96	(C±0.25%) E-96	(D±0.5%) E-24 E-192	(F±1.0%) E-24 E-96	(G±2.0%) E-24	(J±5.0%) E-24	Absolute Maximum Working Voltage	Absolute Maximum Overload Voltage	Operating Temperature Range
MF1/4C	0.25W	500V	C: ±50	—	—	10- 2.21M	10 - 2.21M	—	—	250V	500V	-55°C to +155°C
MF1/4D			D: ±100	—	—							
MF1/4L			L: ±200	—	—	—	1.0 - 10	0.51 - 10				
MFS1/2C	0.50W	500V	C: ±50	—	—	10 - 1M	10 - 2.21M	10 - 2.2M	—	350V	700V	
MFS1/2D			D: ±100									
MF1/2C	0.50W	700V	C: ±50	—	—	10 - 5.05M	10 - 4.99M	—	—	350V	700V	
MF1/2D			D: ±100	—	—		10 - 5.11M					
MF1/2L			L: ±200	—	—	—	1.0 - 10	0.51 - 10Ω				
MF1C	1W	700V	C: ±50	47.5 - 1.0M	47.5 - 2.49M	10 - 5.11M	1.0 - 6.81M	—	—	350V	700V	
MF1D			D: ±100	—	—							
MF1E			E: ±25	47.5 - 1.0M	47.5 - 2.49M	47.5 - 4.64M	47.5 - 5.11M	—	—			
RK1/4D	0.25W	500V	D: ±100	—	—	—	3.09M - 25M	—	—	500V	700V	
RK1/4L			L: ±200	—	—	—	—	3.3M - 33M	3.3M - 33M			
RK1/4B			B: ±350	—	—	—	100k - 25M	100k - 33M	100k - 33M			
RK1/2D	0.50W	700V	D: ±100	—	—	—	5.11M - 33M	—	—	700V	1000V	
RK1/2L			L: ±200	—	—	—	—	6.2M - 33M	6.2M - 33M			
RK1/2B			B: ±350	—	—	—	100k - 35M	100k - 51M	100k - 51M			
RK1BC	1W	1000V	B: ±350	—	—	—	100k - 51M	100k - 100M	100k - 100M	1000V	1500V	
RK1/2G*	0.50W	700V	G: ±250	—	—	—	—	—	1M - 12M	350V	700V	

* Discharge path resistor

environmental applications

Performance Characteristics

Parameter	Requirement Δ R ±(% + 0.05Ω) Limit	Typical	Test Method
Resistance	Within specified tolerance	—	25°C
T.C.R.	Within specified T.C.R.	—	Room temperature, +100°C
Overload (Short Time)	RK: ±1%, RK1/2G: ±2.5% MF: ±0.5%	RK: ±0.6%, RK1/2G: ±1% MF: ±0.3%	Rated voltage x 2.5 or max. overload voltage for 5 seconds, whichever is less; MFS1/2: Rated voltage x 2 or max. overload voltage for 5 seconds, whichever is less
Resistance to Solder Heat	RK: ±1%; RK1/2G: ±5%; MFS: ±0.75%; MF1/4, MFS1/2, MF1/2: ±0.5%,	RK: ±0.5%; RK1/2G: ±1% MFS1/4: ±0.4%; MF1/4, MFS1/2, MF1/2: ±0.25%	260°C ± 5°C, 10 seconds ± 1 second or 350°C ± 10°C, 3.5 seconds ± 0.5 second
Dielectric Withstanding Voltage	No breakdown	—	1 minute
Insulation Resistance	Not less than 10,000MΩ	—	100V, 1 minute
Rapid Change of Temperature	RK,MF: ±1%; RK1/2G: ±5%	MF: ±0.3%; RK: ±0.5%, RK1/2G: ±1%	-55°C (30 minutes), +155°C (30 minutes), 5 cycles
Moisture Resistance	RK: ±5%; RK1/2G: ±10%; MFS1/4: ±1.5%; MF1/4, MFS1/2, MF1/2: ±1%	RK: ±2%; RK1/2G: ±5%; MFS1/4: ±1%; MF1/4, MFS1/2, MF1/2: ±0.75%	40°C ± 2°C, 90 - 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Endurance at 70°C	RK: ±5%; RK1/2G: ±10%; MFS1/4: ±1.5%; MF1/4, MFS1/2, MF1/2: ±1%	RK: ±2%; RK1/2G: ±5%; MFS1/4: ±1%; MF1/4, MFS1/2, MF1/2: ±0.75%	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Resistance to Solvent	No abnormality in appearance. Marking shall be easily legible	—	The resistor shall be immersed for 5 seconds in IPA
Impulse	No such abnormalities as short-circuit, burnout, breakdown, etc.	—	Discharge from 1000pF capacitor 50 pulses. Internal 2.5 seconds. Charge voltage: 1.25kV (RK1/4), 2.5kV (RK1/2) and 6kV (RK1)

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