KOA SPEER ELECTRONICS, INC.

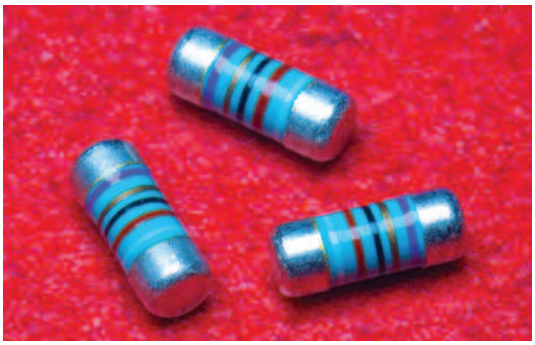
RM412D/2H, RN412A/2D/2E/2H

Not Recommended For New Design

melf type resistors

EU RoHS COMPLIANT

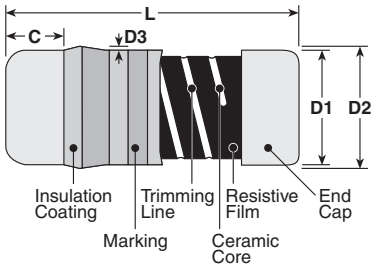
current sense



features

- Free direction for mounting due to cylindrical design
- High precision products (Resistance tolerance ±0.1% and T.C.R.±25×10^{-6}/K) available (RN41)
- The electrode strength is firm
- The noise characteristics is excellent
- Suitable for reflow, flow and iron solderings
- Products meet EU-RoHS requirements

dimensions and construction



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Type (Inch/DIN Size Code)	Dimensions inches (mm) L	C	D1	D2 (max.)	D3 (max.)
2A (0805/0102)	.079±.004 (2.0±0.1)	.012 (0.3 min.)	.049±.002 (1.25±0.05)	.053 (1.35)	.003 (0.07)
2D (1206/0203)	.126±.008 (3.2±0.2)	.02 (0.5 min.)	.061±.006 (1.55±0.15)	.069 (1.75)	.004 (0.1)
2E/2H (2309/0207)	.232±.008 (5.9±0.2)	.02 (0.5 min.)	.087±.004 (2.2±0.1)	.094 (2.4)	.006 (0.15)

ordering information

RM41	2D	T	TE	1R0	J	50*
Type	Size	Termination Material	Packaging	Nominal Resistance	Tolerance	T.C.R. (ppm/°C)
RN41 RM41	** 2A: 0.125W ** 2D: 0.2W ** 2H: 0.5W ** 2E: 0.25W	T: Sn	TE: 7" embossed plastic (2A - 3,000 pieces/reel) (2D - 2,000 pieces/reel) (2E - 1,000 pieces/reel) (2H - 1,500 pieces/reel)	±5%: 2 significant figures + 1 multiplier. "R" indicates decimal on values <10Ω ±1%: 3 significant figures + 1 multiplier. "R" indicates decimal on values <100Ω	C: ±0.25% D: ±0.5% F: ±1% J: ±5%	25: ±25 50: ±50 100: ±100 200: ±200

* T.C.R. noted for RN41 only
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11/24/20

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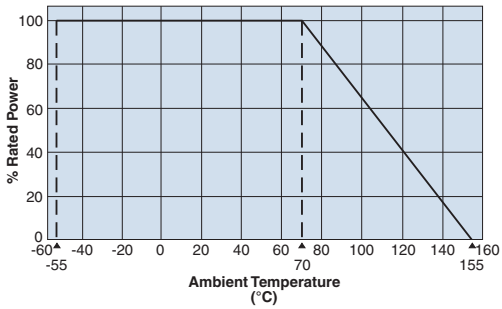
applications and ratings

Part Designation	Power Rating @ 70°C	Rated Ambient Temp.	T.C.R. (ppm/°C) Max.	Resistance Range		Max. Working Voltage	Max. Overload Voltage
				E-24, E-96 (F±1%)	E-24 (J±5%)		
** RN412A	1/8W (.125W)	70°C	±100	100Ω-100kΩ	—	150V	200V
** RN412D	1/5W (.2W)	70°C	±50	10Ω-604kΩ	—		300V
** RN412E	1/4W (.25W)	70°C	±25	—	—	250V	500V
			±50	10Ω-1M	—		
** RN412H	1/2W (.5W)	70°C	±200	—	0.22Ω-100kΩ	250V	600V
** RM412D	1/5W (.2W)	70°C	±350	—	0.22Ω-8.2Ω (E-12)	—	—
** RM412H	1/2W (.5W)	70°C	±350	—			

** Not Recommended for New Design Operating Temperature Range: -55°C to +155°C

environmental applications

Derating Curve



For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the derating curve.

Performance Characteristics

Parameter	Type	Requirement Δ R ±(%+0.05Ω) Limit	Typical	Test Method
Resistance	RN41 RM41	Within specified tolerance	—	25°C
T.C.R.	RN41 RM41	Within specified T.C.R.	—	+25°C/-55°C and +25°C /+125°C
Overload (Short time)	RN41	±0.5%	±0.3%	Rated voltage x 2.5 for 5 seconds or Max. overload voltage, whichever is lower, for 5 seconds
	RM41	±0.5%	±0.3%	
Intermittent Overload	RN41	±1%: 2A,2D, 2H 0.5: 2E	—	Rated voltage x 4 (RN41: 2Ax3) or Max. intermittent overload voltage, whichever is lower, 10,000 cycles, 2A:200V, 2D:300V, 2E:500V, RN412H:600V
Resistance to Soldering Heat	RN41	±2%: 2H (10Ω>) ±1%: 2H (10Ω≤) ±0.5%: RN 2A-2E	±1%: 2H (10Ω>) ±0.5%: 2H (10Ω≤) ±0.3%: RN 2A-2E	260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature	RN41	±0.5%: 2A-2E ±1%: 2H	±0.3%: 2A-2E ±0.7% 2H	-55°C (30 minutes), +125°C (30 minutes), 5 cycles
	RM41	±1%	±0.75%	
Moisture Resistance	RN41	±1%: 2D, 2E ±3%: 2A; ±5%: 2H	±0.75%: 2D, 2E ±1.5%: 2A; ±3%: 2H	40°C ± 2°C, 90 ~ 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	RM41	±5%	±3%	
Endurance at 70°C	RN41	±1%: 2D, 2E ±3%: 2A; ±5%: 2H	±0.5%: 2D, 2E ±1.5%: 2A; ±3%: 2H	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	RM41	±5%	±3%	
High Temperature Exposure	RN41	±1%	±0.75%	155°C, 2 hours

Not Recommended for New Design: Sizes 2A, 2D, 2E and 2H

11/24/20

Performance Characteristics

Parameter	Type	Requirement Δ R ±(%+0.05Ω) Limit	Typical	Test Method
Resistance	RN41 RM41	Within specified tolerance	—	25°C
T.C.R.	RN41 RM41	Within specified T.C.R.	—	+25°C/-55°C and +25°C /+125°C
Overload (Short time)	RN41	±0.5%	±0.3%	Rated voltage x 2.5 for 5 seconds or Max. overload voltage, whichever is lower, for 5 seconds
	RM41	±0.5%	±0.3%	
Intermittent Overload	RN41	±1%: 2A,2D, 2H 0.5: 2E	—	Rated voltage x 4 (RN41: 2Ax3) or Max. intermittent overload voltage, whichever is lower, 10,000 cycles, 2A:200V, 2D:300V, 2E:500V, RN412H:600V
Resistance to Soldering Heat	RN41	±2%: 2H (10Ω>) ±1%: 2H (10Ω≤) ±0.5%: RN 2A-2E	±1%: 2H (10Ω>) ±0.5%: 2H (10Ω≤) ±0.3%: RN 2A-2E	260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature	RN41	±0.5%: 2A-2E ±1%: 2H	±0.3%: 2A-2E ±0.7% 2H	-55°C (30 minutes), +125°C (30 minutes), 5 cycles
	RM41	±1%	±0.75%	
Moisture Resistance	RN41	±1%: 2D, 2E ±3%: 2A; ±5%: 2H	±0.75%: 2D, 2E ±1.5%: 2A; ±3%: 2H	40°C ± 2°C, 90 ~ 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	RM41	±5%	±3%	
Endurance at 70°C	RN41	±1%: 2D, 2E ±3%: 2A; ±5%: 2H	±0.5%: 2D, 2E ±1.5%: 2A; ±3%: 2H	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	RM41	±5%	±3%	
High Temperature Exposure	RN41	±1%	±0.75%	155°C, 2 hours

Not Recommended for New Design: Sizes 2A, 2D, 2E and 2H