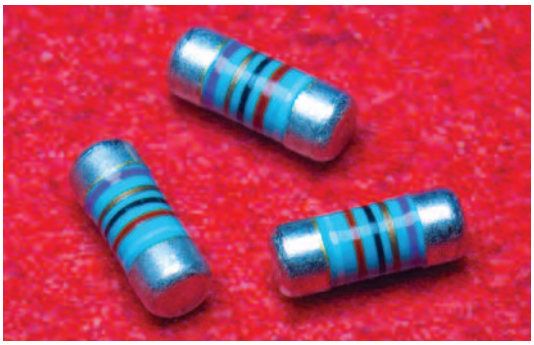
RN41, RD41, CC

melf type resistors

EU RoHS COMPLIANT

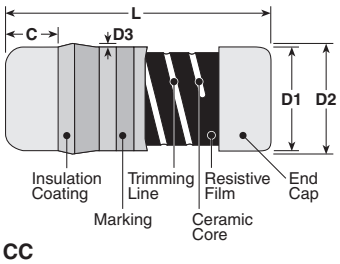


features

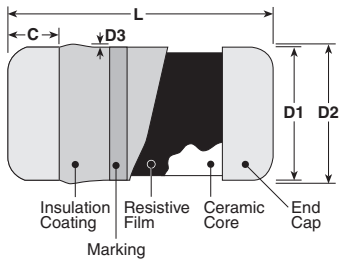
- Free direction for mounting due to cylindrical design
- High precision products (Resistance tolerance ±0.1% and T.C.R.±25×10^{-6}/K) available (RN41)
- The electrode strength is firm
- The noise characteristics are excellent
- Suitable for reflow, flow and iron soldering
- Products meet EU-RoHS requirements
- AEC-Q200 tested (RN41 2ES/3AS, CC 12M/25)

dimensions and construction

RN41, RD41



CC



Type (Inch/DIN Size Code)	Dimensions inches (mm) L	C	D1	D2 (max.)	D3 (max.)
2ES (1406/0204)	.138±.008 (3.5±0.2)	.02 ~ .035 (0.5 ~ 0.9)	.055±.004 (1.4±0.1)	.061 (1.55)	.004 (0.1)
CC12M (1406/0204)	.138±.008 (3.5±0.2)	.02 ~ .035 (0.5 ~ 0.9)	.055±.004 (1.4±0.1)	.061 (1.55)	.004 (0.1)
2E (2309/0207)	.232±.008 (5.9±0.2)	.02 (0.5 min.)	.087±.004 (2.2±0.1)	.094 (2.4)	.006 (0.15)
3AS (2309/0207)	.232±.008 (5.9±0.2)	.02 (0.5 min.)	.087±.004 (2.2±0.1)	.094 (2.4)	.006 (0.15)
CC25 (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

RN41	2ES	T	TE	1001	F	50*
Type	**Size**	**Termination Material**	**Packaging**	**Nominal Resistance**	**Tolerance**	**T.C.R. (ppm/°C)**
RN41 RD41	2ES: 0.25W, 0.4W 2E: 0.25W 3AS: 1W	T: Sn	TE: 7" embossed plastic (2ES - 3,000 pieces/reel) (2E, 3AS - 1,500 pieces/reel)	±2%, ±5%: 2 significant figures + 1 multiplier. "R" indicates decimal on values <10Ω ±0.1%, ±0.25%, ±0.5%, ±1%: 3 significant figures + 1 multiplier. "R" indicates decimal on values <100Ω	B: ±0.1% C: ±0.25% D: ±0.5% F: ±1% G: ±2% J: ±5%	25: ±25 50: ±50 Nil: RD41

* T.C.R. noted for RN41 only

CC12M	T	TE
Type	**Termination Material**	**Packaging**
CC12M CC25	T: Sn	TE: 7" embossed plastic

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

07/15/21

applications and ratings

Part Designation	Power Rating @ 70°C	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (ppm/°C) Max.	Resistance Range (Ω)						Max. Working Voltage	Max. Overload Voltage
					E-24, E-96 (B±0.1%)	E-24, E-96 (C±0.25%)	E-24, E-96 (D±0.5%)	E-24, E-96 (F±1%)	E-24 (G±2%)	E-24 (J±5%)		
RN412ES	1/4W (.25W)	70°C	90°C	±25	43-511k	100-100k	100-604k	—		—	200V	400V
		70°C	90°C	±50	—	—	—	1-5.11M		0.22-0.91		
RN412ES	2/5W (.4W)*1*2	—	90°C	±50	—	—	—	1-5.11M		0.22-0.91	200V	400V
RN413AS	1W*1*2	70°C	—	±50	—	—	—	1-1M		0.22-0.91	400V	600V
RD412ES	1/4W (.25W)	70°C	—	—*3	—	—	—	—	2.2 - 1.0M	2.2 - 1.0M	200V	400V
RD412E	1/4W (.25W)	70°C	—	—*3	—	—	—	—	1.0 - 2.2M	1.0 - 2.2M	300V	600V

Rated voltage = $\sqrt{\text{Power Rating X Resistance Value}}$ or Maximum Working Voltage, whichever is lower
Operating Temperature Range: -55°C to +155°C

*1 A power rating is guaranteed at the terminal part temperature
If any questions should arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature," please give priority to the "Rated Terminal Part Temperature." Prior to use and for more details refer to "Introduction of the derating curves on the terminal part temperature" in the beginning of the catalog.

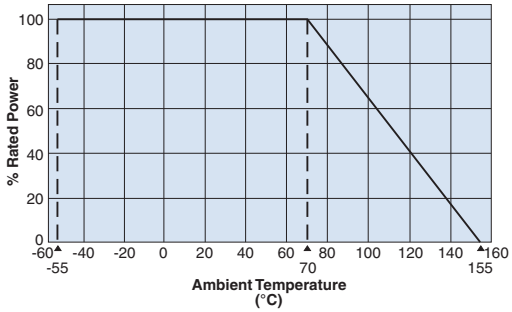
*2 A power rating shall be guaranteed with a method shown in the Performance Characteristics. Please contact factory prior to use.

*3 Please contact factory for T.C.R. of RD41

Part Designation	Current Rating	Rated Ambient Temp.	Maximum Resistance
CC12M	2A	+70°C	20 mΩ or less
CC25	5A		

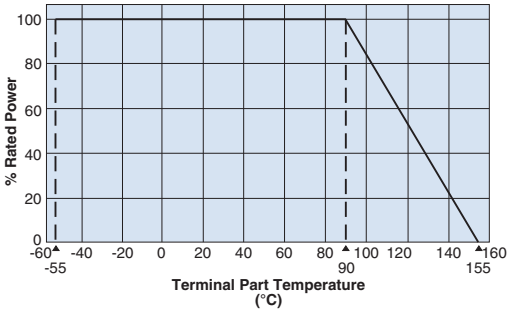
environmental applications

Derating Curve



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

Please contact us about CC series' derating curve.



For resistors operated at a terminal part temperature of described for each size or above, a power rating shall be derated in accordance with the derating curve.

Please refer to "Introduction of the derating curve based on the terminal part temperature" in the beginning of our catalog before use.

Performance Characteristics

Parameter	Type	Requirement Δ R ±(%+0.05Ω)*4 Limit	Typical	Test Method
Resistance	RN41 RD41	Within specified tolerance	—	25°C
T.C.R.	RN41 RD41	Within specified T.C.R.	—	+25°C/+125°C
Overload (Short time)	RN41	2ES: Test Group D	±0.3%	Rated voltage x 2.5 for 5 seconds or Max. overload voltage, whichever is lower, for 5 seconds
	RD41	±1%	±0.5%	
Intermittent Overload	RD41	±1%	—	Rated voltage x 4 or Max. intermittent overload voltage, whichever is lower, 10,000 cycles
Resistance to Soldering Heat	RN41	2ES: Test Group D	—	260°C ± 5°C, 10 seconds ± 1 second
	RD41	±1%	±0.5%	
Rapid Change of Temperature	RN41	2ES: Test Group D	—	-55°C (30 minutes), +125°C (30 minutes), 5 cycles
	RD41	±1%	±0.75%	
Moisture Resistance	RN41	2ES: Test Group C	—	40°C ± 2°C, 90 ~ 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	RD41	±5%	±2.5%	
Endurance at 70°C	RN41	2ES: Test Group A	—	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	RD41	±2%	±1%	
Low Temperature Exposure	RD41	±1%	±0.75%	-55°C, 1 hour
High Temperature Exposure	RN41	2ES: Test Group C	±0.75%	155°C, 2 hours RN41: 2ES, 3AS: 155°C, 1000 hours
	RD41	±2%	±1%	

*4 Performance requirement for RN41 3AS are different from above, so consult with KOA about the detail.

CC

Parameter	Requirement Δ Real R Limit	Typical	Test Method
Resistance	20mΩ Max. after the test	7.5mΩ Max. after the test	25°C
Resistance to Solder Heat			260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature			-55°C (30 minutes), +125°C (30 minutes), 5 cycles
Moisture Resistance			40°C ± 2°C, 90 - 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Endurance at 70°C			70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle

*Stability Class

Stability Class	Resistance Range	Limit Resistance Changing Attests (Test Group) A	B	C	D
0.25	10~332kΩ	±(0.25 + 0.05Ω)	±(0.50 + 0.05Ω)	±(0.25 + 0.05Ω)	±(0.05 + 0.05Ω)
0.5	1~<10Ω			±(0.50 + 0.05Ω)	±(0.10 + 0.05Ω)
1	0.22~<1Ω			±(1.00 + 0.05Ω)	±(0.25 + 0.05Ω)
2	>332kΩ~5.11MΩ	±(0.50 + 0.05Ω)	±(1.00 + 0.05Ω)	±(2.00 + 0.05Ω)	±(0.50 + 0.05Ω)