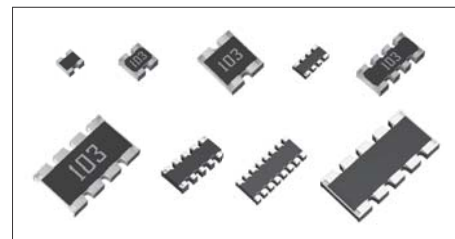


Chip Resistor Networks

MNR Series < Automotive >

●Features

- 1) Can be mounted even more densely than chip resistors.
- 2) Mounting cost can be reduced by less frequency of mounting times.
- 3) Convex electrodes secures visual inspection of fillets after soldering.
- 4) ROHM resistors have obtained ISO9001 / ISO / TS16949 certification.
- 5) "Automotive" product is AEC-Q200 compliant.



Part No.	Size		No. of terminals	No. of elements	Type Code		Resistance Range	Packing Specification	Quantity / Reel
	(mm)	(inch)			GENERAL PURPOSE	AUTOMOTIVE *Corresponds to AEC-Q200			
MNR02	1005 × 2	0402 × 2	4	2	MRAP	M0AP	10Ω to 1MΩ	Paper tape (2mm Pitch)	10,000
MNR04	1005 × 4	0402 × 4	8	4	MRAP	M0AP	1Ω to 1MΩ		
MNR12	1608 × 2	0603 × 2	4	2	ERAP	E0AP	10Ω to 1MΩ	Paper tape (4mm Pitch)	5,000
MNR14	1608 × 4	0603 × 4	8	4	ERAP	E0AP	2.2Ω to 1MΩ		
MNR15	1608 × 5	0603 × 5	10	8	ERRP	E0RP	56Ω to 100kΩ		
MNR18	1605 × 8	0602 × 8	16	8	ERAP	E0AP	10Ω to 1MΩ		
MNR32	3216 × 2	1206 × 2	4	2	J0AB		10Ω to 1MΩ	Embossed tape (4mm Pitch)	4,000
MNR34	3216 × 4	1206 × 4	8	4	J5AB		10Ω to 1MΩ		
MNR35	3216 × 5	1206 × 5	10	8	J5R		56Ω to 100kΩ		

*Please contact us for status of AEC-Q200 on "General purpose" products.

●Part Number Description

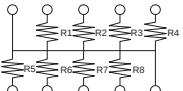
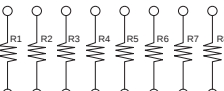
M	N	R	0	2	M	0	A	P	J	1	0	5											
Part No.			Size (mm [inch])			Type Code			Resistance Tolerance			Nominal Resistance											
MNR (Chip Resistor Networks)			02 (1005 [0402] × 2) 04 (1005 [0402] × 4) 12 (1608 [0603] × 2) 14 (1608 [0603] × 4) 15 (1608 [0603] × 5) 18 (1605 [0602] × 8) 32 (3216 [1206] × 2) 34 (3216 [1206] × 4) 35 (3216 [1206] × 5)						F (±1%) J (±5%)(Including jumper type)			Resistance code, 3 or 4 digits. 000 denotes jumper type.											
												<table><tr><td>Resistance tolerance</td><td></td><td>Resistance code</td></tr><tr><td>F</td><td>:</td><td>4 digits</td></tr><tr><td>J</td><td>:</td><td>3 digits</td></tr></table>			Resistance tolerance		Resistance code	F	:	4 digits	J	:	3 digits
Resistance tolerance		Resistance code																					
F	:	4 digits																					
J	:	3 digits																					
												Ex.) 1Ω = 1R0 (±5%) 9.1Ω = 9R1 (±5%) 10Ω = 10R0 (±1%) 100 (±5%) 1MΩ = 1004 (±1%) 105 (±5%)											

●Products List

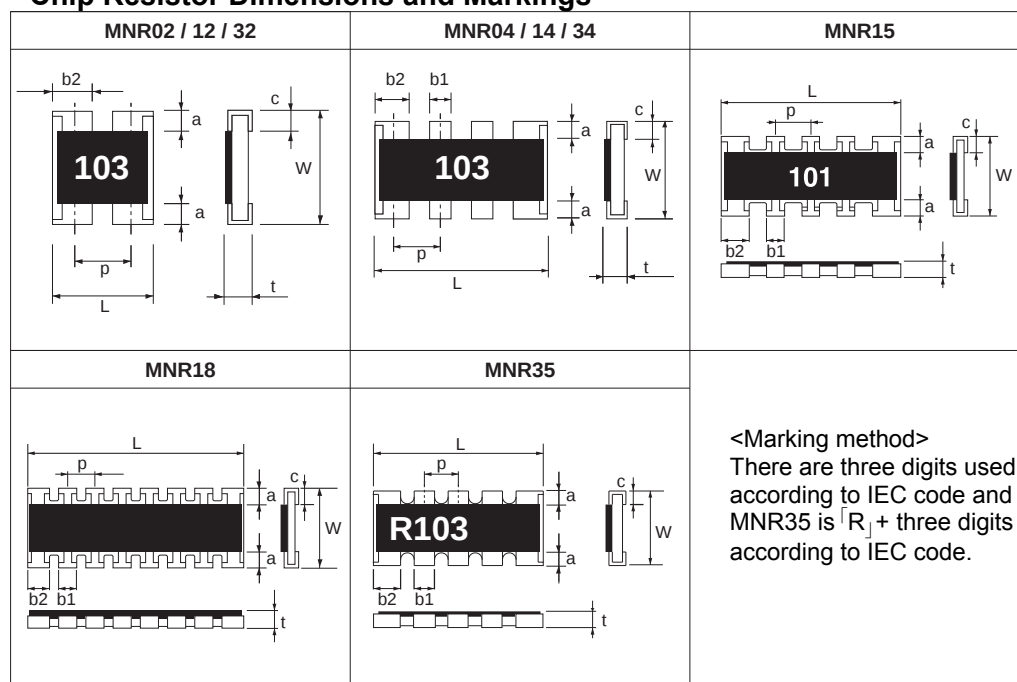
Part No.	Type Code	Rated Power (70°C) (W)	Limiting Element Voltage (V)	Maximum Overload Voltage (V)	Temperature Coefficient (ppm / °C)	Resistance Tolerance (%)	Resistance Range	Series	Operating Temperature Range (°C)
MNR02	M0AP	0.063 / Element	25	–	±200	J(±5%)	10Ω to 1MΩ	E24	–55 to +155
		Jumper type : Rmax = 50m Ω / Imax. = 1A (Element)							
MNR04	M0AP	0.063 / Element	25	50	+500/–250	J(±5%)	1Ω to 9.1Ω	E24	
					±200		10Ω to 1MΩ		
		Jumper type : Rmax = 50m Ω / Imax. = 1A (Element)							
MNR12	E0AP	0.063 / Element	50	–	±200	J(±5%)	10Ω to 1MΩ	E24	
					±100	F(±1%)	10Ω to 1MΩ		
		Jumper type : Rmax = 50m Ω / Imax. = 1A (Element)							
MNR14	E0AP	0.063 / Element	50	–	±500	J(±5%)	2.2Ω to 6.8Ω	E6	
					±200		10Ω to 1MΩ	E24	
					±100	F(±1%)	10Ω to 1MΩ		
		Jumper type : Rmax = 50m Ω / Imax. = 1A (Element)							
MNR15	E0RP	0.031 / Element	12.5	–	±200	J(±5%)	56Ω to 100kΩ	E24	
MNR18	E0AP	0.063 / Element	25	–	±200	J(±5%)	10Ω to 1MΩ	E24	
									Jumper type : Rmax = 50m Ω / Imax. = 1A (Element)
MNR32	J0AB	0.125 / Element	200	400	±200	J(±5%)	10Ω to 1MΩ	E24	
									Jumper type : Rmax = 50m Ωx / Imax. = 2A (Element)
MNR34	J5AB	0.125 / Element	200	400	±200	J(±5%)	10Ω to 1MΩ	E24	
									Jumper type : Rmax = 50m Ω / Imax. = 2A (Element)
MNR35	J5R	0.063 / Element	50	100	±200	J(±5%)	56Ω to 100kΩ	E12	

*Design and specifications are subject to change without notice. Carefully check the specification sheet supplied with the product before using or ordering it.

●Circuit Construction

MNR02 / 12 / 32	MNR04 / 14 / 34	MNR15 / 35	MNR18
 R1=R2	 R1=R2=R3=R4	 R1=R2=R3=R4=R5=R6=R7=R8	 R1=R2=R3=R4=R5=R6=R7=R8

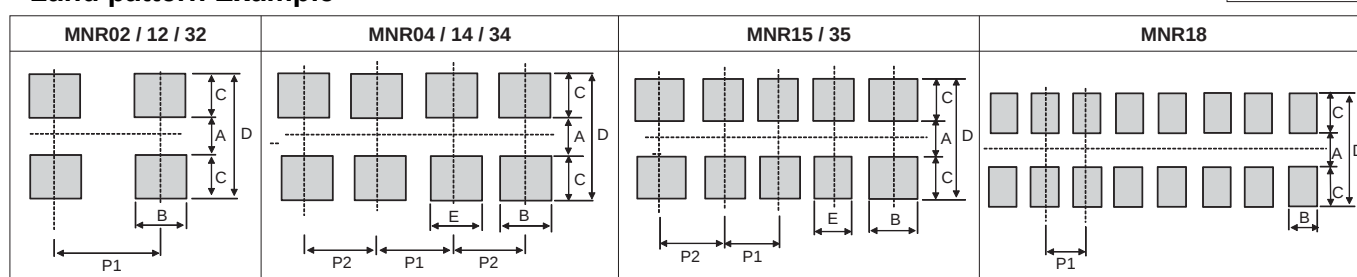
●Chip Resistor Dimensions and Markings



(Unit : mm)

Part No.	Type Code	(mm)	(inch)	L	W	t	a	b1	b2	c	p	Marking existence *including jumper type
MNR02	M0AP	1005 × 2	0402 × 2	1.0±0.1	1.0±0.1	0.35±0.1	0.2±0.1	—	0.33 ^{+0.1} ₀	0.25±0.1	0.68	No
MNR04	M0AP	1005 × 4	0402 × 4	2.0±0.2	1.0±0.1	0.35±0.1	0.2±0.1	0.3±0.1	0.4±0.1	0.25±0.1	0.5	No
MNR12	E0AP	1608 × 2	0603 × 2	1.6±0.1	1.6±0.1	0.5±0.1	0.3±0.2	—	0.6±0.15	0.25±0.15	0.8	Yes
MNR14	E0AP	1608 × 4	0603 × 4	3.2±0.1	1.6±0.1	0.5±0.1	0.3±0.2	0.4±0.15	0.6±0.15	0.25±0.15	0.8	Yes
MNR15	E0AP	1608 × 5	0603 × 5	3.2±0.1	1.6±0.1	0.5±0.1	0.3±0.1	0.32±0.15	0.48±0.15	0.3±0.1	0.64	Yes
MNR18	J5AB	1605 × 8	0602 × 8	3.8±0.1	1.6±0.1	0.45±0.1	0.3±0.2	0.3±0.1	0.3±0.1	0.3±0.2	0.5	No
MNR32	E0RP	3216 × 2	1206 × 2	2.6±0.2	3.1±0.2	0.55±0.1	0.5±0.3	—	1.0±0.2	0.5Max	1.27	Yes
MNR34	E0AP	3216 × 4	1206 × 4	5.2±0.4	3.1±0.2	0.55±0.1	0.5±0.3	0.8±0.2	1.0±0.2	0.5Max	1.27	Yes
MNR35	J5R	3216 × 5	1206 × 5	6.4±0.4	3.1±0.2	0.55±0.1	0.5±0.3	0.8±0.2	1.0±0.2	0.5Max	1.27	Yes

●Land pattern Example



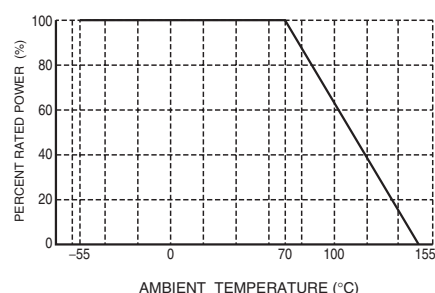
(Unit : mm)

Part No.	Type Code	A	B	C	D	E	P1	P2
MNR02	M0AP	0.5	0.4	0.5	1.5	—	0.65	—
MNR04	M0AP	0.5	0.4	0.5	1.5	0.3	0.5	0.55
MNR12	E0AP	1.0	0.4	0.8	2.6	—	0.8	—
MNR14	E0AP	1.0	0.4	0.8	2.6	—	0.8	0.8
MNR15	E0RP	1.0	0.48	0.7	2.4	0.32	0.64	0.72
MNR18	E0AP	1.0	0.3	0.7	2.4	—	0.5	—
MNR32	J0AB	2.1	0.8	1.0	4.1	—	1.27	—
MNR34	J5AB	2.1	0.8	1.0	4.1	0.8	1.27	1.27
MNR35	J5R	2.1	0.9	0.8	3.7	0.7	1.3	1.4

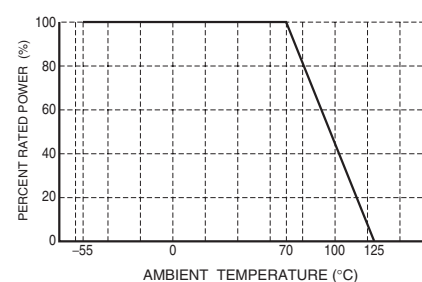
●Derating Curve

When the ambient temperature exceeds 70°C, power dissipation must be adjusted according to the derating curves below.

■ MNR02 / 04 / 12 / 14



■ MNR15 / 18 / 32 / 34 / 35



●Characteristics

Test Items	Guaranteed Value		Test Conditions
	Resistor Type	Jumper Type	
Resistance	See "Products List"		20°C
Variation of resistance with temperature	See "Products List"		Measurement : +20 / -55 / +20 / +125°C
Overload	± (2.0%+0.1Ω)	Max. 50mΩ	Rated voltage (current) ×2.5, 2s. Maximum overload voltage
Solderability	A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage.		Rosin-Ethanol : 25% (weight) Soldering condition : 235±5°C Duration of immersion : 2.0±0.5s
Resistance to soldering heat	± (1.0%+0.05Ω) ± (1.0%+0.1Ω)※MNR35 No remarkable abnormality on the appearance.	Max. 50mΩ	Soldering condition : 260±5°C Duration of immersion : 10±1s
Rapid change of temperature	± (1.0%+0.05Ω) ± (1.0%+0.1Ω)※MNR35	Max. 50mΩ	Test temp. : -55°C to +125°C 5cycle
Damp heat, steady state	± (3.0%+0.1Ω)	Max. 100mΩ	40°C, 93%RH (Relative Humidity) Test time : 1,000h to 1,048h
Endurance at 70°C	± (3.0%+0.1Ω)	Max. 100mΩ	70°C Rated voltage (current) 1.5h : ON – 0.5h : OFF Test time : 1,000h to 1,048h
Endurance	± (3.0%+0.1Ω)	Max. 100mΩ	125°C (MNR15 / 18 / 32 / 34 / 35) 155°C (MNR02 / 04 / 12 / 14) Test time : 1,000h to 1,048h
Resistance to solvent	± (1.0%+0.05Ω) ± (1.0%+0.1Ω)※MNR35	Max. 50mΩ	23±5°C, Immersion cleaning, 5±0.5min Solvent : 2-propanol
Bend strength of the end face plating	± (1.0%+0.05Ω) Without mechanical damage such as breaks.	Max. 50mΩ	—

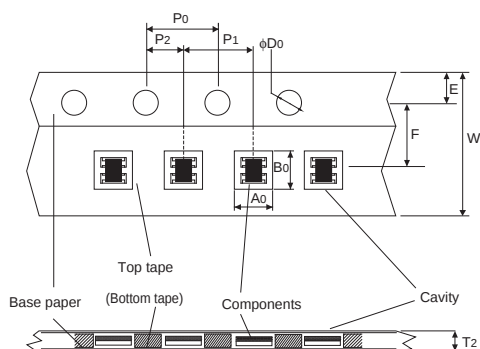
Compliance Standard(s) : IEC60115-8
JISC 5201-8

●Technical data

Parameter	Unit	MNR02 M0AP	MNR04 M0AP	MNR12 E0AP	MNR14 E0AP	MNR15 E0RP	MNR18 E0AP	MNR32 J0AB	MNR34 J5AB	MNR35 J5R
Insulation resistance	MΩ	1000	1000	1000	1000	—	—	—	—	—
Failure rate	Fit	0.0373	0.0037	0.0400	0.0088	0.4085	0.0175	0.3958	0.2010	1.1996
Weight	mg/pc	1.04	2.22	4.04	7.55	7.41	8.90	15.9	31.2	38.4

●Tape Dimensions

■ Paper Tape

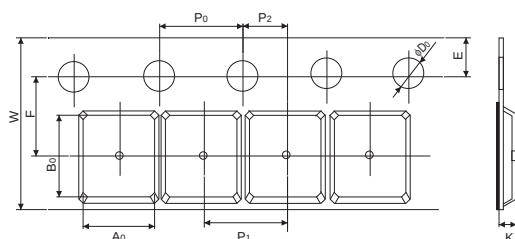


(Unit : mm)

Part No.	Type Code	W	F	E	A0	B0
MNR02	M0AP	8.0±0.3	3.5±0.05	1.75±0.1	1.17±0.1	1.17±0.1
MNR04	M0AP	8.0±0.3	3.5±0.05	1.75±0.1	1.2±0.1	2.2±0.1
MNR12	E0AP	8.0±0.3	3.5±0.05	1.75±0.1	1.8±0.1	1.8±0.1
MNR14	E0AP	8.0±0.3	3.5±0.05	1.75±0.1	1.8±0.1	3.4±0.1
MNR15	E0RP	8.0±0.3	3.5±0.05	1.75±0.1	1.8±0.1	3.4±0.1
MNR18	E0AP	8.0±0.3	3.5±0.05	1.75±0.1	1.95±0.15	4.1±0.15

Part No.	Type Code	D0	P0	P1	P2	T2
MNR02	M0AP	$\phi 1.5^{+0.1}_0$	4.0±0.1	2.0±0.1	2.0±0.05	Max 0.5
MNR04	M0AP	$\phi 1.5^{+0.1}_0$	4.0±0.1	2.0±0.1	2.0±0.05	Max 1.1
MNR12	E0AP	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MNR14	E0AP	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MNR15	E0RP	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MNR18	E0AP	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1

■ Embossed Tape



(Unit : mm)

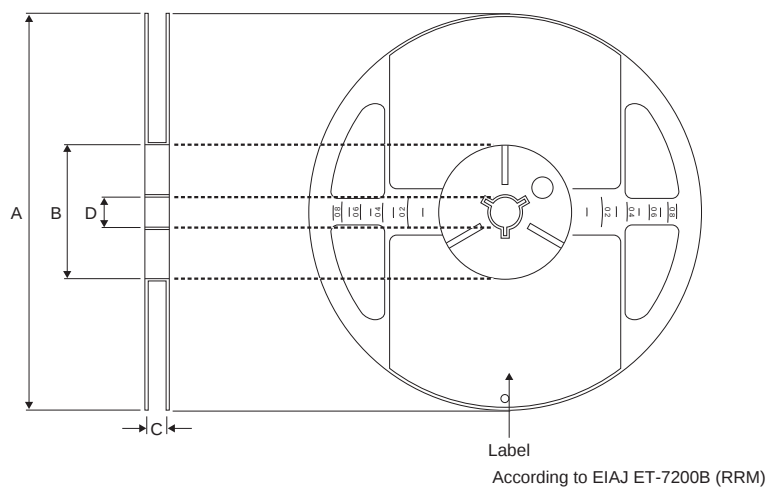
Part No.	Type Code	W	F	E	A0	B0
MNR32	J0AB	8.0±0.3	3.5±0.05	1.75±0.1	3.0±0.1	3.5±0.1
MNR34	J5AB	12.0±0.3	5.5±0.05	1.75±0.1	3.4±0.1	5.6±0.1
MNR35	J5R	12.0±0.3	5.5±0.05	1.75±0.1	3.4±0.1	6.6±0.1

Part No.	Type Code	D0	P0	P1	P2	K
MNR32	J0AB	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	0.9±0.1
MNR34	J5AB	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	1.0±0.15
MNR35	J5R	$\phi 1.5^{+0.1}_0$	4.0±0.1	4.0±0.1	2.0±0.05	1.0±0.15

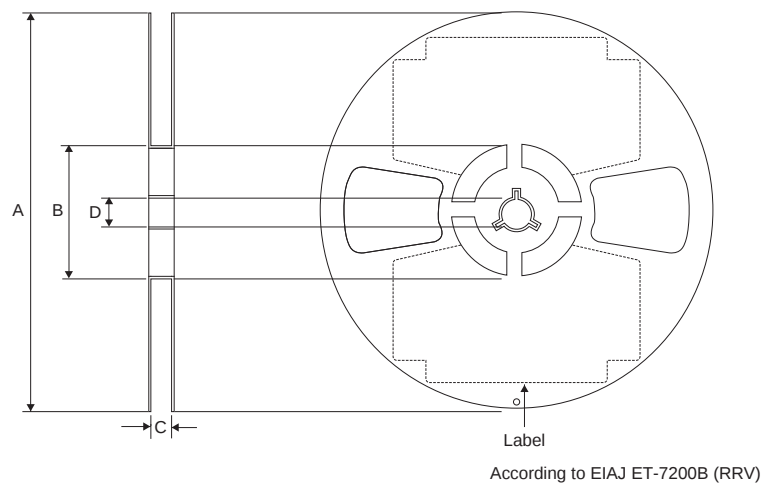
●Reel Dimensions

Using two kinds of reels for taping. (*MNR34/35 applies Fig. 1 only.)

■ Fig.1



■ Fig.2



(Unit : mm)

Part No.	Type Code	A	B	C	D	
MNR02	M0AP	$\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$	$\phi 60 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$	$9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$	$\phi 13 \pm 0.2$	
MNR04	M0AP					
MNR12	E0AP					
MNR14	E0AP					
MNR15	E0RP					
MNR18	E0AP					
MNR32	J0AB			$13 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$		
MNR34	J5AB					
MNR35	J5R					

Notes

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