Low Ohmic Thick Film Chip Resistors

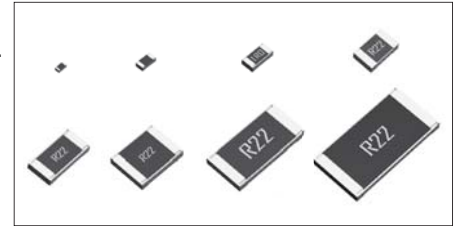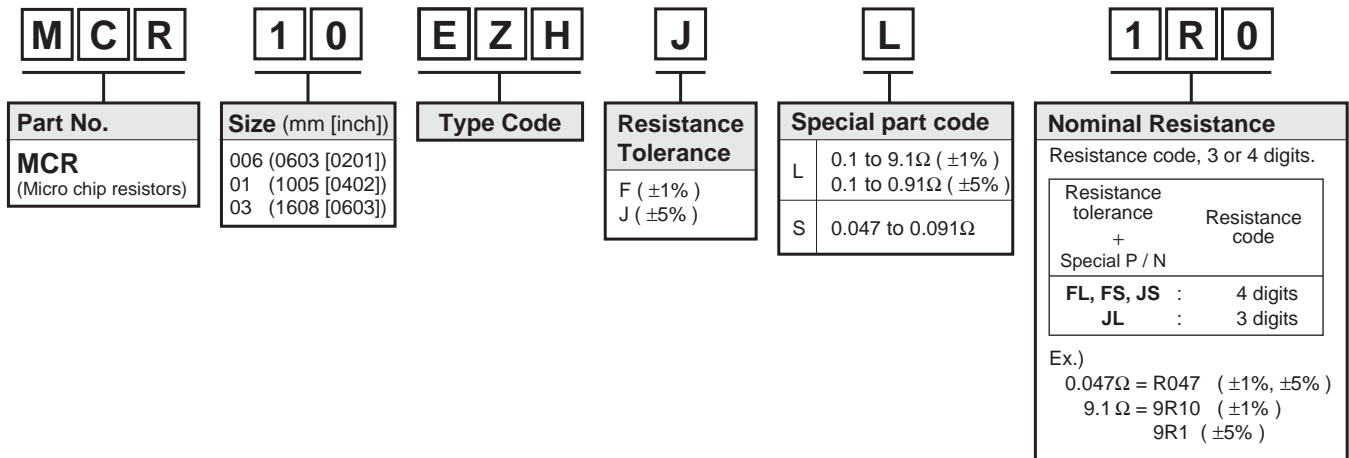## MCR Series < Not for Automotive application >

Datasheet

● Features

1) Very-low ohmic resistance from 47mΩ is in lineup by thick-film resistive element.

2) ROHM resistors have obtained ISO9001 / ISO / TS16949 certification

Part No.	Size		Type Code	Packing Specification	Quantity / Reel
	(mm)	(inch)			
MCR006	0603	0201	YRT	Paper tape (2mm Pitch)	15,000
MCR01	1005	0402	MRT		10,000
MCR03	1608	0603	ERT	Paper tape (4mm Pitch)	5,000

● Part Number Description

MCR	10	EZH	J	L	1R0

Part No.
MCR
(Micro chip resistors)

Size (mm [inch])
006 (0603 [0201])
01 (1005 [0402])
03 (1608 [0603])

Type Code

Resistance Tolerance
F (±1%)
J (±5%)

Special part code

| L | 0.1 to 9.1Ω (±1%) 0.1 to 0.91Ω (±5%) |
| S | 0.047 to 0.091Ω |

Nominal Resistance
Resistance code, 3 or 4 digits.

Resistance tolerance + Special P / N	Resistance code
FL, FS, JS :	4 digits
JL :	3 digits

Ex.)
0.047Ω = R047 (±1%, ±5%)
9.1 Ω = 9R10 (±1%)
   9R1 (±5%)

● Products List

Part No.	Type Code	Rated Power (70℃) (W)	Limiting Element Voltage (V)	Maximum Overload Voltage (V)	Temperature Coefficient (ppm / ℃)	Resistance Tolerance (%)	Resistance Range			Series	Operating Temperature Range (℃)
MCR006	YRT	0.05	0.67	1.34	±600 / −200	F(±1%)	1.0Ω	to	9.1Ω		−55 to +125
MCR01	MRT	0.063	0.76	1.52	±400	F(±1%)	1.0Ω	to	9.1Ω	E24	−55 to +155
MCR03	ERT	0.1	0.95	1.90	±400	F(±1%)	1.0Ω	to	9.1Ω		

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

●Chip Resistor Dimensions and Markings
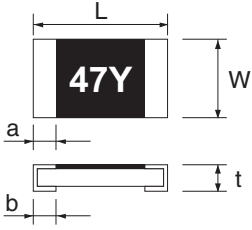
<Marking method>
There are three or four digits used for the calculation number according to IEC code and "R"is used for the decimal point.

(Unit : mm)

Part No.	Type Code	(mm)	(inch)	L	W	t	a	b	Marking existence
MCR006	YRT	0603	0201	0.6±0.03	0.3±0.03	0.23±0.03	0.15±0.05	0.15±0.05	No
MCR01	MRT	1005	0402	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	$0.25^{+0.05}_{-0.1}$	No
MCR03	ERT	1608	0603	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2	Yes *

∗Marking method of MCR03
The description of markings on the chip resistor are as shown below.

① Marking method :
・For the resistance value contained in E96 series.
The nominal resistance is expressed in 3 digits. The first 2 digits is symbol to the resistance value and the last one is symbol to multipliers.

    Example : $100k\Omega = 01d$ ($01d \rightarrow 100 \times 10^3 = 100,000\Omega = 100k\Omega$)
    Example : $3.01k\Omega = 47b$ ($47b \rightarrow 301 \times 10^1 = 3010\Omega = 3.01k\Omega$)

・For the resistance value not contained in E96 series and contained in E-24 series.
The marking is expressed by E-24 series in 3 digits and one short bar under the last marking letter.

    Example : $390\Omega = 39\underline{1}$

Symbol for E96 Series nominal resistance value

Symbol	E96	Symbol	E96	Symbol	E96	Symbol	E96
01	100	25	178	49	316	73	562
02	102	26	182	50	324	74	576
03	105	27	187	51	332	75	590
04	107	28	191	52	340	76	604
05	110	29	196	53	348	77	619
06	113	30	200	54	357	78	634
07	115	31	205	55	365	79	649
08	118	32	210	56	374	80	665
09	121	33	215	57	383	81	681
10	124	34	221	58	392	82	698
11	127	35	226	59	402	83	715
12	130	36	232	60	412	84	732
13	133	37	237	61	422	85	750
14	137	38	243	62	432	86	768
15	140	39	249	63	442	87	787
16	143	40	255	64	453	88	806
17	147	41	261	65	464	89	825
18	150	42	267	66	475	90	845
19	154	43	274	67	487	91	866
20	158	44	280	68	499	92	887
21	162	45	287	69	511	93	909
22	165	46	294	70	523	94	931
23	169	47	301	71	536	95	953
24	174	48	309	72	549	96	976

Symbol for multipliers

Symbol	A	b	C	d	E	F	X	Y
multipliers	10^0	10^1	10^2	10^3	10^4	10^5	10^{-1}	10^{-2}

●Land pattern Example
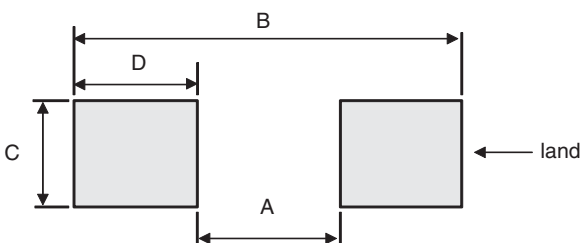
(Unit : mm)

Part No. \ Dimensions	Type Code	A	B	C	D
MCR006	YRT	0.3	0.84	0.3	0.27
MCR01	MRT	0.5	1.3	0.5	0.4
MCR03	ERT	1.0	2.0	0.8	0.5

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●Derating Curve

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

■ MCR006

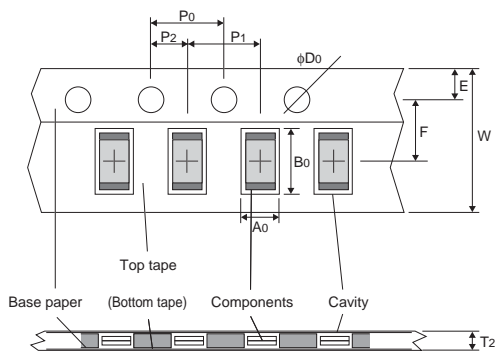■ MCR01 / 03
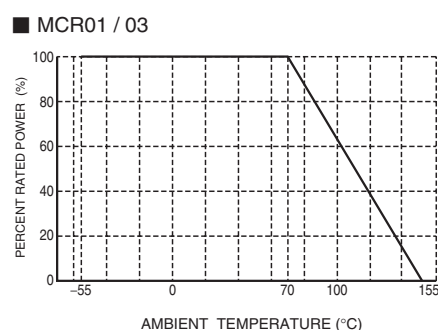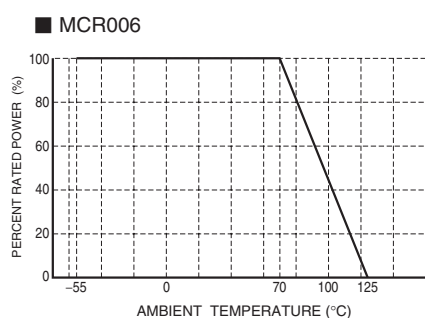
●Characteristics

Test Items	Guaranteed Value	Test Conditions
Resistance	See "Products List"	20°C
Variation of resistance with temperature	See "Products List"	Measurement : +20 / −55 / +20 / +125°C
Overload	± (2.0%+0.005Ω)	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%+0.005Ω) No remarkable abnormality on the appearance.	Soldering condition : 260±5°C Duration of immersion : 10±1s
Rapid change of temperature	± (1.0%+0.005Ω)	Test temp. −55°C to +125°C 100cycle (MCR006) −55°C to +125°C 5cycle (MCR01 / 03)
Damp heat, steady state	± (3.0%+0.005Ω)	40°C, 93%RH (Relative Humidity) Test time : 1,000h to 1,048h
Endurance at 70°C	± (3.0%+0.005Ω)	70°C Rated voltage (current) 1.5h : ON − 0.5h : OFF Test time : 1,000h to 1,048h
Endurance	± (3.0%+0.005Ω)	125°C (MCR006) 155°C (MCR01 / 03) Test time : 1,000h to 1,048h
Resistance to solvent	± (1.0%+0.005Ω) ※MCR006 only ± (0.5%+0.005Ω)	23±5°C, Immersion cleaning, 5±0.5min Solvent : 2−propanol
Bend strength of the end face plating	Without Open.	−

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

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●**Tape Dimensions**

■ Paper Tape

Part No.	Type Code	W	F	E	A0	B0
MCR006	YRT	8.0±0.2	3.5±0.05	1.75±0.1	0.38±0.03	0.68±0.03
MCR01	MRT	8.0±0.3	3.5±0.05	1.75±0.1	0.7±0.1	1.2±0.1
MCR03	ERT	8.0±0.3	3.5±0.05	1.75±0.1	1.0±0.2	1.8±0.1

Part No.	Type Code	D0	P0	P1	P2	T2
MCR006	YRT	$\phi 1.5 ^{+0.1}_{0}$	4.0±0.1	2.0±0.05	2.0±0.05	Max 0.5
MCR01	MRT	$\phi 1.5 ^{+0.1}_{0}$	4.0±0.1	2.0±0.1	2.0±0.05	Max 1.1
MCR03	ERT	$\phi 1.5 ^{+0.1}_{0}$	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1

●**Reel Dimensions**
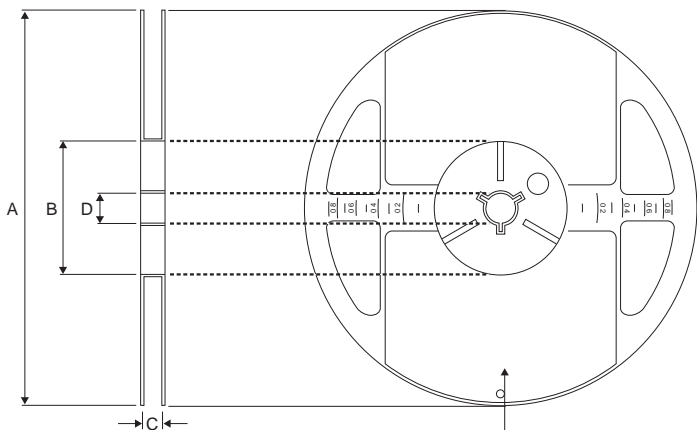
Label

ACCORDING TO EIAJ ET-7200B

Part No.	Type Code	A	B	C	D
MCR006	YRT				
MCR01	MRT	$\phi 180 ^{0}_{-1.5}$	$\phi 60 ^{+1.0}_{0}$	$9 ^{+1.0}_{0}$	$\phi 13 \pm 0.2$
MCR03	ERT				

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Notes

1) The information contained herein is subject to change without notice.

2) Before you use our Products, please contact our sales representative and verify the latest specifications :

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
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4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.

6) The Products are intended for use in general electronic equipment (i.e. AV/OA devices, communication, consumer systems, gaming/entertainment sets) as well as the applications indicated in this document.

7) The Products specified in this document are not designed to be radiation tolerant.

8) For use of our Products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a ROHM representative : transportation equipment (i.e. cars, ships, trains), primary communication equipment, traffic lights, fire/crime prevention, safety equipment, medical systems, servers, solar cells, and power transmission systems.

9) Do not use our Products in applications requiring extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters.

10) ROHM shall have no responsibility for any damages or injury arising from non-compliance with the recommended usage conditions and specifications contained herein.

11) ROHM has used reasonable care to ensur the accuracy of the information contained in this document. However, ROHM does not warrants that such information is error-free, and ROHM shall have no responsibility for any damages arising from any inaccuracy or misprint of such information.

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