

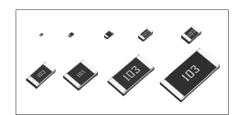
**Data Sheet** 

# Thick Film Chip Resistors

#### MCR Series < Automotive >

#### Features

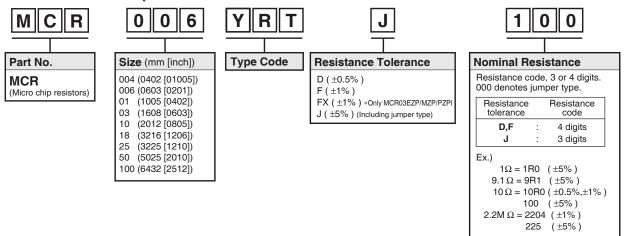
- 1) Full line up from ultra small size (01005) to 2512 with jumper type.
- 2) High reliability metal glazed thick film.
- 3) ROHM resistors have obtained ISO9001/ISO/TS16949 certification.
- 4) "Automotive" product is AEC-Q200 compliant.



	Si	ze	Туре	Code			
Part No.	(mm)	(inch)	GENERAL PURPOSE	AUTOMOTIVE *Corresponds to AEC-Q200	Packing Specification	Quantity / Reel	
MCR004	0402	01005	YZP	-	Paper tape (2mm pitch)	15,000	
WCH004	0402	01003	RZP	-	Embossed tape (1mm pitch)	40,000	
MCR006	0603	0201	YRT	YZP	Paper tape	15,000	
	4005	0.400	MRT	MZP	(2mm pitch)	10,000	
MCR01	1005	0402	PZ (*For further informa please refer to AUTO	ation on datasheet,	Bulk case	50,000	
	4000		ERT	EZP	Paper tape (4mm pitch)	5,000	
MCR03	1608	0603	MZP / (*For further informa please refer to AUTO	ation on datasheet,	MZP : Paper tape (2mm pitch) PZPI : Bulk case	MZP : 10,000 PZPI : 25,000	
MCR10	2012	0805	ERT	EZP	Paper tape	5,000	
MCR18	3216	1206	ERT	EZP	(4mm pitch)	3,000	
MCR25	3225	1210	JZ	TH .			
MCR50	5025	2010	JZ	TH .	Embossed tape (4mm pitch)	4,000	
MCR100	6432	2512	JZ	:H			

<sup>\*</sup>Please contact us for status of AEC-Q200 on "General purpose" products.

## ●Part Number Description



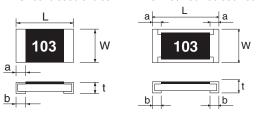
#### Products List

Part No.	Type Code	Rated Power (70°C)	Limiting Element Voltage	Maximum Overload Voltage	Temperature Coefficient	Resistance Tolerance	Resistance Range	Series	Operating Temperature Range
		(W)	(V)	(V)	(ppm / °C)	(%)			(°C)
					+600 / -200	J(±5%)	1.0Ω to 9.1Ω		
					±250	J(±3 /8)	10 $\Omega$ to 10M $\Omega$		
MCR006	YZP	0.05	25	_	±250	F(±1%)	10 $\Omega$ to 10M $\Omega$	E24	-55 to +125
WCHOOO	121				±200	D(±0.5%)	$10\Omega$ to $910\Omega$		
					±100	2(=0.070)	1kΩ to 1MΩ		
				Jumper type	: Rmax = 50n	n Ω / Imax. =	0.5A		
					+500 / -250	J(±5%)	$1.0\Omega$ to $9.1\Omega$	E24	
					±200		10Ω to 10MΩ		
MCR01	MZP PZPI	0.063	50	_	±100	F(±1%)	10Ω to 2.2MΩ	E24,E96	
	FZFI				±100 ±50	D(±0.5%)	10 $\Omega$ to 91 $\Omega$ 100 $\Omega$ to 1M $\Omega$	E24	
				.lumner tyne	: Rmax = 50	m O / Imax =			
				oumper type	±400		1.0Ω to 9.1Ω		•
					±200	J(±5%)	10Ω to 10MΩ	E24	
	EZP	0.1	50	100	±100	FX(±1%)	10Ω to 10MΩ		
MCR03	MZP				±100	` ′	10Ω to 91Ω	E24,E96	
	PZPI				±50	D(±0.5%)	100 $\Omega$ to 1M $\Omega$		
				Jumper type	: Rmax = 50	mΩ/Imax. =	: 1A		
					±400	J(±5%)	$1.0\Omega$ to $9.1\Omega$	E24	
		0.125		200	±200	J(±5%)	10 $\Omega$ to 10M $\Omega$	E24	
MCR10	EZP		150		±100	F(±1%)	10Ω to 2.2MΩ		
Monto	LZI	0.1		300	±100	D(±0.5%)	10Ω to 91Ω	E24,E96	
					±50	, ,	100Ω to 1MΩ		55 to +155
				Jumper type	: Rmax = 50	m 12 / Imax. =			
		0.25			±400 ±200	J(±5%)	1.0 $\Omega$ to 9.1 $\Omega$ 10 $\Omega$ to 10M $\Omega$	E24	
		0.25	200	400	±100	F(±1%)	10Ω to 2.2MΩ		
MCR18	EZP		200		±100	1 (±170)	10Ω to 91Ω	E24,E96	
		0.125			±50	D(±0.5%)	100 $\Omega$ to 1M $\Omega$	,	
				Jumper type	: Rmax = 50	mΩ/Imax. =	2A		
					500±350		$1.0\Omega$ to $2.0\Omega$		
					±500	J(±5%)	$2.2\Omega$ to $5.1\Omega$	E24	
MCR25	JZH	0.25	200	400	±200		$5.6\Omega$ to $3.3$ M $\Omega$		
					±100	F(±1%)	10Ω to 1MΩ	E24,E96	
				.lumner tyne	: Rmax = 50	` '			
				oumper type	500±350		1.0Ω to 2.0Ω		•
					±500		2.2 $\Omega$ to 9.1 $\Omega$		
		0.5	200	400	±200	J(±5%)	10Ω to 330kΩ	E24	
MCR50	JZH				±350		$360$ k $\Omega$ to $560$ k $\Omega$		
					±100	F(±1%)	10 $\Omega$ to 180k $\Omega$	E24,E96	
				Jumper type	: Rmax = 50	m $\Omega$ / Imax. =	: 3A		
					500±350		$1.0\Omega$ to $2.0\Omega$		
					±500	I/±E9/\	$2.2\Omega$ to $9.1\Omega$	F0.4	
MCR100	JZH	1	200	400	±350	J(±5%)	$10\Omega$ to $22\Omega$	E24	EE to : 105
WICHTOO	ULIT				±200		24Ω to 100kΩ		-55 to +125
					±100	F(±1%)	10Ω to 82kΩ	E24,E96	
				Jumper type	: Rmax = 50	$m\Omega$ / $lmax. =$	: 4A		

<sup>\*</sup>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

#### ■ MCR004 / 006 / 01 / 03 ■ MCR10 / 18 / 25 / 50 / 100



#### <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	а	b	Marking existence
MCR006	YZP	0603	0201	0.6±0.03	0.3±0.03	0.23±0.03	0.1±0.05	0.15±0.05	No
MCR01	MZP PZPI	1005	0402	1.0±0.05	0.5±0.05	0.35±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.1</sub>	No
MCR03	EZP MZP PZPI	1608	0603	1.6±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2	Yes *
MCR10	EZP	2012	0805	2.0±0.1	1.25±0.1	0.55±0.1	0.4±0.2	0.4±0.2	Yes
MCR18	EZP	3216	1206	3.2±0.15	1.6±0.15	0.55±0.1	0.5±0.25	0.5±0.25	Yes
MCR25	JZH	3225	1210	3.2±0.15	2.5±0.15	0.55±0.15	0.5±0.25	0.5±0.25	Yes
MCR50	JZH	5025	2010	5.0±0.15	2.5±0.15	0.55±0.15	0.6±0.25	0.6±0.25	Yes
MCR100	JZH	6432	2512	6.3±0.15	3.2±0.15	0.55±0.15	0.6±0.25	0.6±0.25	Yes

#### Marking method of jumper type

Jumper type	Marking existence
MCR006 / 01 / 25 / 50 / 100	No
MCR03 / 10 / 18	Yes

#### \*Marking method of MCR03

For MCR03 series resistors, the printing process restricts the marking to three digits/characters.

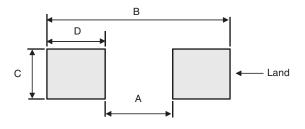
Consequently, 1% tolerance resistors with values from the E24 series will be marked the same as

5% resistors with the same value, but 1% tolerance resistors with values from the E96 series will not be marked.

#### Examples:

MCR03EZPJ243	(5% tolerance, E24 / 24 k $\Omega$ )	Marking = 243
MCR03EZPFX2402	(1% tolerance, E24 / 24 k $\Omega$ )	Marking = 243
MCR03EZPFX2432	(1% tolerance, E96 / 24.3 k $\Omega$ )	No Marking
MCR18EZPJ243	(5% tolerance, E24 / 24 k $\Omega$ )	Marking = 243
MCR18EZPF2402	(1% tolerance, E24 / 24 k $\Omega$ )	Marking = 2402
MCR18EZPF2432	(1% tolerance, E96 / 24.3 k $\Omega$ )	Marking = 2432

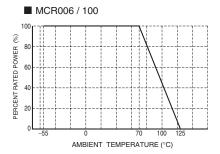
#### ●Land pattern Example

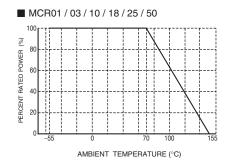


					(Unit : mm)
Dimensions Part No.	Type Code	Α	В	С	D
MCR006	YZP	0.3	0.84	0.3	0.27
MCR01	MZP PZPI	0.5	1.3	0.5	0.4
MCR03	EZP MZP PZPI	1.0	2.0	0.8	0.5
MCR10	EZP	1.2	2.6	1.15	0.7
MCR18	EZP	2.2	4.0	1.5	0.9
MCR25	JZH	2.2	4.0	2.3	0.9
MCR50	JZH	3.8	6.0	2.3	1.1
MCR100	JZH	5.1	8.1	3.0	1.5

### Derating Curve

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





### Characteristics

Test Items	Guarante	eed Value	Test Conditions
rest items	Resistor Type	Jumper Type	Test Conditions
Resistance	See "Pro	ducts List"	20°C
Variation of resistance with temperature	See "Pro	ducts List"	Measurement : +20 / -55 / +20 / +125°C
Overload	± (2.0%+0.1Ω)	Max. 50mΩ	Rated voltage (current) ×2.5, 2s.  Maximum overload voltage
Solderability		ating of minimum of e being immersed damage.	Rosin·Ethanol : 25% (Weight) Soldering condition : 235±5°C Duration of immersion : 2.0±0.5s
Resistance to soldering heat	$\pm (1.0\% + 0.05\Omega)$ No remarkable abnorm	Max. $50mΩ$ ality on the appearance.	Soldering condition : 260±5°C Duration of immersion : 10±1s
Rapid change of temperature	± (1.0%+0.05Ω)	Max. 50mΩ	Test temp55°C to +125°C 100cycle (MCR006 / 01 / 03) -55°C to +125°C 5cycle (MCR10 / 18 / 25 / 50 / 100)
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 (MCR006 / 25 / 50 / 100) 155°C (MCR01 / 03 / 10 / 18) Test time : 1,000h to 1,048h
Resistance to solvent	± (1.0%+0.05Ω)	Max. 50mΩ	23±5°C, Immersion cleaning, 5±0.5min Solvent : 2-propanol
Bend strength of	± (1.0%+0.05Ω)	Max. 50mΩ	
the end face plating	Without mechanical d	amage such as breaks.	-

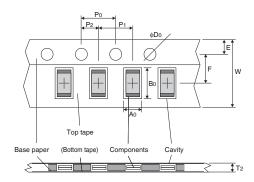
Compliance Standard(s) : IEC60115-8 JISC 5201-8

## Technical data

Parameter	Unit	MCR006 YZP	MCR01 MZP / PZPI	MCR03 EZP / MZP / PZPI	MCR10 EZP	MCR18 EZP	MCR25 JZH	MCR50 JZH	MCR100 JZH
Insulation resistance	МΩ	1000	1000	1000	1000	1000	1000	1000	1000
Failure rate	Fit	0.0016	0.0002	0.0009	0.0015	0.0018	0.0203	0.0201	0.0586
Weight	mg/pc	0.157	0.70	2.12	5.03	9.46	16.5	25.8	42.0

## Tape Dimensions

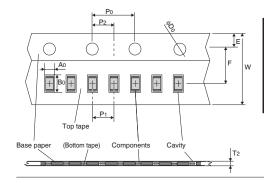
#### ■ Paper Tape



						(Unit : mm)
Part No.	Type Code	W	F	Е	A0	Bo
MCR006	YZP	8.0±0.2	3.5±0.05	1.75±0.1	0.38±0.03	0.68±0.03
MCR01	MZP	8.0±0.3	3.5±0.05	1.75±0.1	0.7±0.1	1.2±0.1
MCR03	EZP	8.0±0.3	3.5±0.05	1.75±0.1	1.1±0.1	1.9±0.1
MCR10	EZP	8.0±0.3	3.5±0.05	1.75±0.1	1.65 <sup>+0.2</sup> <sub>-0.1</sub>	2.4 <sup>+0.2</sup> <sub>-0.1</sub>
MCR18	EZP	8.0±0.3	3.5±0.05	1.75±0.1	1.95 <sup>+0.1</sup> <sub>-0.05</sub>	3.5 <sup>+0.15</sup> <sub>-0.05</sub>

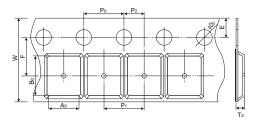
Part No.	Type Code	D0	Po	P1	P2	T2
MCR006	YZP	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	2.0±0.05	2.0±0.05	Max 0.5
MCR01	MZP	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	2.0±0.05	2.0±0.05	Max 1.1
MCR03	EZP	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MCR10	EZP	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MCR18	EZP	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1

## ■ Paper Tape (Narrow pitch taping)



						(Unit : mm)
Part No.	Type Code	W	F	Е	A0	B0
		8.0±0.3	3.5±0.05	1.75±0.1	1.1±0.1	1.9±0.1
MCR03	MZP	D0	P0	P1	P2	T2
		φ1.5 <sup>+0.1</sup> 0	4.0±0.1	2.0±0.5	2.0±0.05	Max 1.1

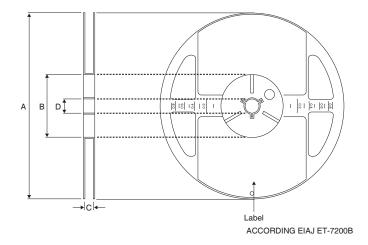
#### ■ Embossed Tape



						(Unit : mm)
Part No.	Type Code	W	F	Е	A0	B0
MCR25	JZH	8.0±0.3	3.5±0.05	1.75±0.1	3.0±0.1	3.5±0.1
MCR50	JZH	12±0.3	5.5±0.05	1.75±0.1	3.4±0.2	5.6±0.2
MCR100	JZH	12±0.3	5.5±0.05	1.75±0.1	3.5±0.2	6.7±0.2

Part No.	Type Code	D0	Po	P1	P2	T2
MCR25	JZH	φ1.5 <sup>+0.1</sup> <sub>0</sub>	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MCR50	JZH	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1
MCR100	JZH	φ1.5 <sup>+0.1</sup> 0	4.0±0.1	4.0±0.1	2.0±0.05	Max 1.1

#### •Reel Dimensions

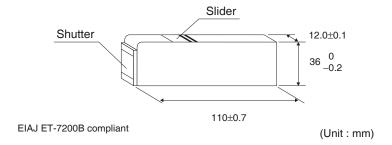


(Unit: mm)

Part No.	Type Code	Α	В	С	D
MCR006	YZP				
MCR01	MZP	φ180 <sup>0</sup> <sub>-1.5</sub>	ф60 <sup>+1.0</sup>	9 +1.0	ф13±0.2
MCR03	EZP MZP				
MCR10	EZP				
MCR18	EZP				
MCR25	JZH				
MCR50	JZH			13 +1.0	
MCR100	JZH			13 0	

## •Bulk case Dimensions

- MCR01PZPI
- MCR03PZPI



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