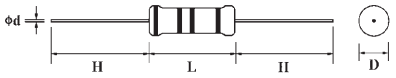
Metal Oxide Film Fixed Resistors

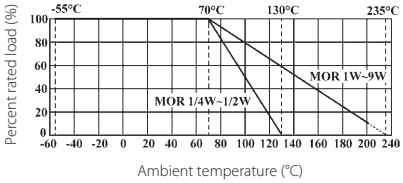
Feature

- Excellent flame retardant coating
- High stability even in bad environment
- High purity ceramic core
- Meet EIA-RC2655A requirements
- High safety standard

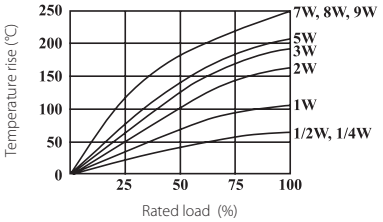
Dimension (mm)



Derating Curve



Heat Rise Chart



Specification

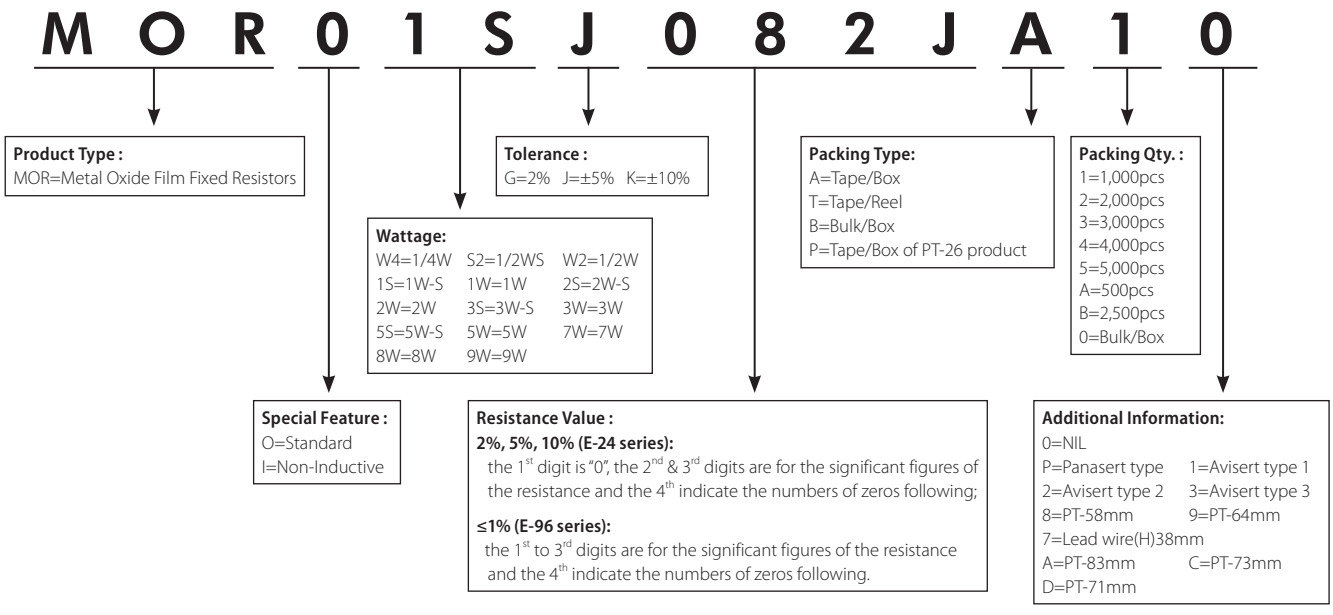
Part No.	Type	Power Rating 70°C	Dimension (mm)					MAX. Working Voltage	MAX. Overlaod Voltage	Dielectric Withstanding Voltage	Resistance Range
			D	L	d ±0.05	H±3	PT				
MOR0W4	MOR-25	1/4W	2.2±0.5	6.5±1.0	0.54	28	52	250V	400V	250V	0.1Ω~470KΩ
MOR0S2	MOR-50-S	1/2W-S	2.2±0.5	6.5±1.0	0.54	28	52	250V	400V	250V	0.1Ω~470KΩ
MOR0W2	MOR-50	1/2W	3.0±0.6	9.5±1.0	0.54	28	52	250V	400V	250V	0.1Ω~560KΩ
MOR01S	MOR-100-S	1W-S	3.5±0.6	9.5±1.0	0.54	28	52	350V	600V	350V	0.1Ω~560KΩ
MOR01W	MOR-100	1W	4.5±0.6	11.5±1.0	0.70	25	52	350V	600V	350V	0.1Ω~560KΩ
MOR02S	MOR-200-S	2W-S	4.5±0.6	11.5±1.0	0.70	25	52	350V	600V	350V	0.1Ω~560KΩ
MOR02W	MOR-200	2W	5.0±0.6	15.5±1.0	0.70	28	64	350V	600V	350V	0.1Ω~560KΩ
MOR03S	MOR-300-S	3W-S	5.0±0.6	15.5±1.0	0.70	28	64	350V	600V	350V	0.1Ω~560KΩ
MOR03W	MOR-300	3W	6.0±0.6	17.5±1.0	0.75	28	64	500V	800V	500V	0.1Ω~560KΩ
MOR05S	MOR-500-S	5W-S	6.0±0.6	17.5±1.0	0.75	28	64	500V	800V	500V	0.1Ω~560KΩ
MOR05W	MOR-500	5W	8.0±0.6	24.5±1.0	0.75	38	90	750V	1000V	750V	0.1Ω~680KΩ
MOR07W	MOR-700	7W	8.0±0.6	29.5±1.0	0.75	38	B/B	750V	1000V	750V	20Ω~150KΩ
MOR08W	MOR-800	8W	8.0±0.6	39.5±1.0	0.75	38	B/B	750V	1000V	750V	30Ω~200KΩ
MOR09W	MOR-900	9W	8.0±0.6	52.5±1.0	0.75	38	B/B	750V	1000V	750V	50Ω~200KΩ

- Standard E-24 Series ±5% tolerance
- Standard Gray base color for Normal Size product,Blue color for Small Size product
- Standard Non-Flammable coating
- Non-Inductive type available case by case

Performance Specification

Temperature coefficient	**1/4W, 1/2WS:** ≤100K Ω: ±350PPM/°C; 100KΩ<R≤470KΩ: 0~-700PPM/°C **1/2W, 1WS:** ≤120K Ω: ±350PPM/°C; 120KΩ<R≤560KΩ: 0~-700PPM/°C **1W, 2W, 2WS, 3W, 3WS, 5WS:** ≤150K Ω: ±350PPM/°C; 150KΩ<R≤560KΩ: 0~-700PPM/°C **5W:** ≤180K Ω: ±350PPM/°C; 180KΩ<R≤680KΩ: 0~-700PPM/°C **7W, 8W, 9W:** ±350PPM/°C
Short-time Overload	Normal size, ΔR/R ≤ ±(1%+0.05 Ω), with no evidence of mechanical damage Small size, ΔR/R ≤ ±(2%+0.05 Ω), with no evidence of mechanical damage
Dielectric withstanding voltage	No evidence of flashover, mechanical damage,arcing or insulation breakdown
Pulse Overload	Normal size, ΔR/R ≤ ±(2%+0.05 Ω), with no evidence of mechanical damage Small size, ΔR/R ≤ ±(5%+0.05 Ω), with no evidence of mechanical damage
Terminal strength	No evidence of mechanical damage
Soldering heat	ΔR/R ≤ ± (1%+0.05 Ω), with no evidence of mechanical damage
Solderability	Coverage must be over 95%.
Resistance to solvent	No deterioration of protective coating and markings
Rapid change of temperature	ΔR/R ≤ ± (2%+0.05 Ω) with no evidence of mechanical damage
Humidity (Steady State)	ΔR/R ≤ ± (2%+0.05 Ω) with no evidence of mechanical damage
Load life in humidity	<100kΩ: ± (5%+0.05Ω) ≥100kΩ: ±(10%+0.05Ω)
Load life	<100kΩ: ± (5%+0.05Ω) ≥100kΩ: ±(10%+0.05Ω)
Flame retardant	Resistor insulation is self-extinguishing within 10 seconds after externally applied flame is removed

Ordering Procedure (Example: MOR 1W-S 5% 8.2Ω T/B-1000)



Remark: For more details, please check page 135, Part No. System

Part No. System

1	2	3	4	5	6	7	8	9	10	11	12	13	14

The standard Part No. includes 14 digits with the following explanation:

1. 1st~4th digits:
   a) This is to indicate the SMD Resistor size. Example: 1206, TC05 or HV03;
   b) For Resistor Network & Coated type, the 1st~3rd digits are to indicate the product type and the 4th digit is the special feature. Example: RNLA = Resistor Newtork Circuit A type; CFRF = Carbon Film Fixed Resistors Non-Flame type; MORI = Metal Oxide Film Fixed Resistor Non-Inductive type.
   c) For Cement Fixed Resistors, these 4 digits are to indicate the product type but if the product type has only 3 digits, the 4th digit will be "0". Example: PRW0=PRW type; PRWC=PRWC type.

2. 5th~ 6th digits:
   a) This is to indicate the wattage or power rating. To distinguish the sizes and the numbers, the following codes are used, and please refer to the following chart for details: W = Normal Size; S = Small Size; U = Ultra Small Size; "1" ~ "G" to denotes "1" ~ "16" as Hexadecimal:

1/16W ~ 1/2W (<1W)

Wattage	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16
Normal Size	W2	W3	W4	W5	W6	W7	W8	W9	WA	WB	WC	WD	WE	WF	WG
Small Size	S2	S3	S4	S5	S6	S7	S8	S9	SA	SB	SC	SD	SE	SF	SG
Ultra Small Size	U2	U3	U4	U5	U6	U7	U8	U9	UA	UB	UC	UD	UE	UF	UG

1W ~ 16W (≥1W)

Wattage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Normal Size	IW	2W	3W	4W	5W	6W	7W	8W	9W	AW	BW	CW	DW	EW	FW	GW
Small Size	1S	2S	3S	4S	5S	6S	7S	8S	9S	AS	BS	CS	DS	ES	FS	GS
Ultra Small Size	1U	2U	3U	4U	5U	6U	7U	8U	9U	AU	BU	CU	DU	EU	FU	GU

   b) For power rating less than 1W, the 5th digit will be the letters W, S or U to represent the size required & the 6th digit will be a number or a letter code. Example: WA = 1/10W; U2 = 1/2W-SS
   c) For power rating of 1W to 16W, the 5th digit will be a number or a letter code and the 6th digit will be the letters of W, S or U. Example: AW = 10W; 3S = 3W-S.
   d) For power rating between 20W to 99W, the 5th & 6th digits will show the whole numbers of the power rating itself. Example: 20 = 20W; 75 = 75W.
   e) For power rating of 100W & over, the 5th & 6th digits will be indicated with "00" and the actual wattage being indicated at the last 3 digits (12th~14th) of the Part No.
   f) For special power ratings, the following codes are to be used:
      1). WH = 1/32W (10P8 Chip Network)
      2). 07 = 3/4WS (Chip 2010 size)
      3). 04 = 0.4W-SS (0.4 watt Ultra Small size)
      4). 06 = 0.6W-S (0.6 watt Small size)
      5). 2A = 2.5W 6). 6A = 6.5W 7). WK= 2/3W
      8). 1A =1.5W 9). 1.25W =1Q
   g) For Resistor Network, since the power rating is fixed as 1/8W for A circuit & 1/5W for B circuit, the 5th & 6th digit is to be used to denote the number of pins required. Example: 09 = 9pins; 12 = 12pins.
   h) For Jumper Wires the 5th & 6th digits will be indicated with "00" .
   i) For Thin Film Chip Resistors, these 2 digits will be used to indicated the requested Temperature coefficient:
      1). 05 = 5PPM 2). 10 = 10PPM 3). 15 = 15PPM 4). 25 = 25PPM 5). 50 = 50PPM

3. The 7th digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resisance Tolerance. As for Metal Film Fixed Resistor products, it is also to denote the standard PPM as follows:

B = ±0.1% (15PPM)
C = ±0.25% (25PPM)
D = ±0.5% (50PPM)
F = ±1% (50PPM)
G = ±2% (100PPM)
J = ±5% (200PPM)
K = ±10%
W = ±0.05%
L = ±0.01%

Remark: *if it is not one of the above standard "tolerance-TCR", the requirement should be clearly stated when placing order. Example: ±1% (25PPM), the 7th digit still shows "F" but separately note the requirement of "25PPM"*

4. The 8^{th} to 11^{th} digits is to denote the Resistance Value:

a) For the standard resistance values of E-24 series in 5% & 10% tolerance, the 8^{th} digit is "0", the 9^{th} & 10^{th} digits are to denote the significant figures of the resistance and the 11^{th} digit is the number of zeros following

b) For the standard resistance values of E-96 series in ≤2% tolerance, the 8^{th} digit to the 10^{th} digits are to denote the significant figures of the resistance and the 11^{th} digit is the number of zeros following.

c) For the code to the significant figures to E-24 & E-96 series, please refer to page 170 & 171 of the standards Resistance Value list.

d) The following numbers and the letter codes is to be used to indicate the number of zeros in the 11^{th} digit:

$0 = 10^0$	$1 = 10^1$	$2 = 10^2$	$3 = 10^3$	$4 = 10^4$	$5 = 10^5$	$6 = 10^6$
$J = 10^{-1}$	$K = 10^{-2}$	$L = 10^{-3}$	$M = 10^{-4}$	$N = 10^{-5}$	$P = 10^{-6}$	

e) For Cement Resistors the 8^{th} digit will be coded with "W" or "P" to denote Wire-wound type or Power Film type respectively of the Cement Fixed Resistor proudct. The 9^{th} to 11^{th} please refer to point 4.a

Example:

E-24 series	E-96 series	Cement Resistors
0120 = 12 ohm	1210 = 121 ohm	W120 = 12 ohm Wire-wound type
0123 = 12K ohm	1302 = 13K ohm	W12J = 1.2 ohm Wire-wound type
012J = 1.2 ohm	196J = 19.6 ohm	P273 = 27 kohm Powe Film type

5. The 12^{th}, 13^{th} & 14^{th} digits:

a) The 12^{th} digit is to denote the Packaging type with the following codes:

A = Tape / Box (Ammo Pack)	C = Bulk in Cassette (for Chip product)	
B = Bulk / Box	T = Tape / Reel	P = Tape / Box of PT-26 product

b) The 13^{th} digit is normally to indicate the Packing Quantity of Tape/Box or Tape/Reel packaging types. Except for Chip products Bulk packing, this digit should be filled "0" or other products with "Bulk/Box packaging requirement. The following letter codes is to be used for some packaging quantities.

A = 500pcs	B = 2,500pcs	C = 10,000pcs	N = 12,500pcs	E = 15,000pcs
D = 20,000pcs	G = 25,000pcs	L = 45,000pcs	H = 50,000pcs	J = 60,000pcs

Example:

CHIP product	Other products
TD = T/R-20,000	A5 = T/B-5,000
TE = T/R-15,000	TB = T/R-2,500
T4 = T/R-4,000	B0 = B/B

c) For the Forming type products, the 13^{th} & 14^{th} digits are used to denote the forming types of the product with the following letter codes:

MF = M type with Flattened lead wire	F0 = F type
MK = M type with Kinked lead wire	F1 = F1 type
ML = M type with normal lead wire	F2 = F2 type
MC = M type with kinked lead wire	F3 = F3 type

d) For power rating over 100watt, the 12^{th} to the 14^{th} digits are to denote the actual wattage of the products:
Example: 100 = 100watt 150 = 150watt 225 = 225watt

e) For some products, the 14^{th} digit alone can use to denote special features or additional information with the following codes:

P = Panasert type	1 = Avisert 1 type	2 = Avisert 2 type
3 = Avisert 3 type	A = CO 1/4W - A type	B = CO 1/4W - B type

E = used to denote the "Environment Protection, lead Free type" of SMD category resistors (now, this became the Standard type of SMD)

f) For some products, the 14th digit alone can use to denote special features or additional information with the following codes:
B=1/32W G=1/16W F=1/10W G=1/8W H=1/6W J=1/4W K=1/3W M=1/2W
N=3/4W P=1W S=Special