Specification.No.	Rev.Symbol	Page		Distribution No.
MOSC－D－0002	C	0／10		

Specification

For Miniature Paint Insulated Fixed Metal Oxide Film Resistors,Flame Proof

Model MOSC

HOKURIKU ELECTRIC INDUSTRY CO.,LTD.

COMPONENTS DIVISION・FILM RESISTOR FACTORY

Established Date	Revised Date	Applied Date
2. APR. 2010	7. MAY. 2014	7. MAY. 2014

To be kept at	Approved by	F.Maeda
Engineering Section	Checked by	S.Takasaki
	Drawn up by	M.Haruta

REVISION RECORD

☐REGULATION ☐STANDARD ☐SPECIFICATION ☐DRAWING

REGULATION・STANDARD・SPECIFICATION・DRAWING No.			TITLE		
MOSC－D－0002			Miniature Paint Insulated Fixed Metal Oxide Film Resistors,Flame Proof		
DATE	Rev.No.	CONTENT	REASON	ISSUED	CHECKED
2010.4.2	初版				
2011.04.26	B	SHEETNo.8/10 8.ﾃｰﾋﾟﾝｸﾞ加工 3)ﾊﾟﾅｻｰﾄﾗｼﾞｱﾙﾃｰﾋﾟﾝｸﾞ(RP) MOSC1/2W粘着ﾃｰﾌﾟ幅(W)変更 12.5min. →5.5min.	改訂記号を和文MOSC-D-0001に合わせ、"A"を欠版とする。 ・MOS1／2WRPﾃｰﾋﾟﾝｸﾞ 粘着テープ幅変更による	春田	高崎
2014.5.7	C	製品寸法，包装仕様より、ストレートバラ仕様を削除 8.テーピング加工 RPﾊﾟﾅｻｰﾄﾗｼﾞｱﾙﾃｰﾋﾟﾝｸﾞ 2W追加 1/2W～1W → 1/2W～2W 11.最小受注単位 6 000pcs./ﾛｯﾄ →2 000pcs/ﾛｯﾄ	・ストレートバラ品の生産中止及び、最小受注単位の見直し他	春田	高崎

Products Specification; MOSC	No.ＭＯＳＣ－Ｄ－０００２Ｃ

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1. Application

This specification covers Miniature Paint Insulated Fixed Metal Oxide Film Resistors(The product which is produced by the Chinese OEM maker); MOSC.

2. Model No. designation

A model No. is designated as follows.

ex.

ＭＯＳＣ	１ Ｗ	１０２	Ｊ	ＴＵ６５(TP,RP,L,RY)
Model	Rated Wattage	Resistance	Tolerance	Forming

3. Ratings

1) Ratings

Ratings are shown at table 1.Ratings.

table 1.Ratings

Items	Contents			
type	MOSC1/2	MOSC1	MOSC2	MOSC3
Rated wattage	0.5 W	1 W	2 W	3 W
Max. operational voltage	250 V	350 V	350 V	350 V
Max. overload voltage	400 V	600 V	600 V	600 V
Max. intermittent overload voltage	500 V	750 V	750 V	750 V
Dielectric withstanding voltage	250 V	350 V	350 V	350 V
Rated ambient temperature	70 ℃			
Operating temperature range	-55 ℃~+200 ℃			
Resistance tolerance	class G(±2 %),J(±5 %),K(±10 %)			
Minimum resistance value	0.1 Ω	0.1 Ω	0.1 Ω	0.1 Ω
Maximum resistance value	10 kΩ	100 kΩ	100 kΩ	100 kΩ

*In case of under 0.2 Ω of resistance value, resistance tolerance is only class J and K.

*Rated wattage is the maximum continuous power applicable at ambient temperature from -55 ˚C to 70 ˚C.

*Max. operational voltage is the D.C. or rms A.C. maximum voltages that fixed by each resistor size. If calculated rated voltage is over Max. operational voltage, this Max. operational voltage is rated voltage.

*In case of ambient temperature above 70 ˚C,power rating shall be in accordance with Fig 1.Derating curve.

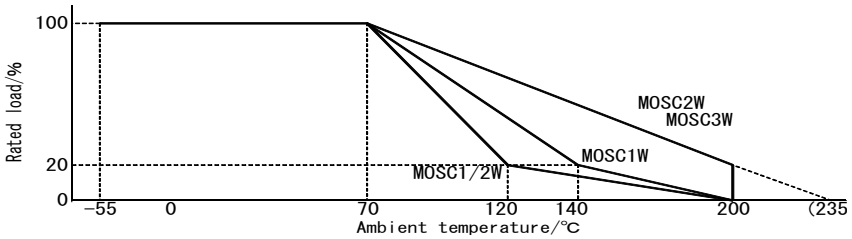


Fig 1.Derating curve

2) Rated voltage

Rated voltage is the D.C. or rms A.C. maximum voltage at ambient temperature from -55 ˚C to 70 ˚C.Rated voltage shall be determined from following formula. If Rated voltage is over Max. operational voltage, then rated voltage is equal to Max. operational voltage on table1.

$$\text{Rated voltage[V]} = \sqrt{\text{rated wattage[W]} \times \text{nominal resistance[Ω]}}$$

Products Specification; MOSC	No.MOSC－D－00002C

Items	Contents

4. Nominal Resistance

Nominal resistance are that following basic value multiplied by 10^{-1}, 10^{0}, 10^{1}, 10^{2}, 10^{3}, 10^{4}, 10^{5}.

table2.

series	Basic value									
E-24	1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.0	2.2	2.4
	2.7	3.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2
	6.8	7.5	8.2	9.1						

5. Dimensions and Constructions

1) Dimensions

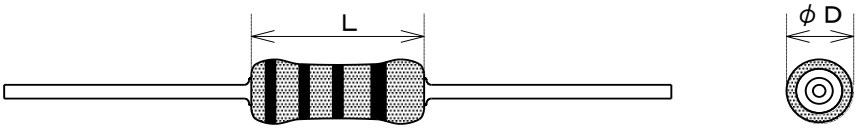


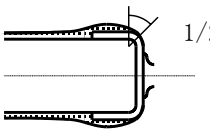
Fig2. outline

(mm)

Model	Body length L	Body dia. D
MOSC1/2W	6.5±1.0	2.2±0.5
MOSC1W	9.0±1.0	3.5±1.0
MOSC2W	12.0±1.5	4.0±1.0
MOSC3W	15.0±1.5	5.5±1.0

Painting method

Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the arc angle.



Products Specification; MOSC　No.ＭＯＳＣ－Ｄ－０００２Ｃ

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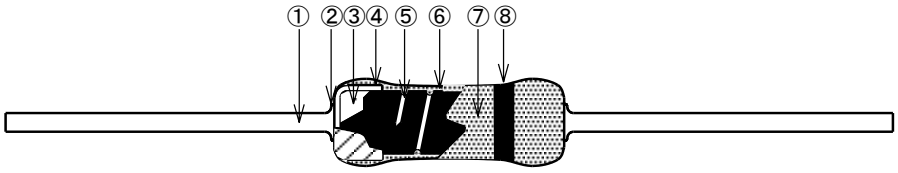
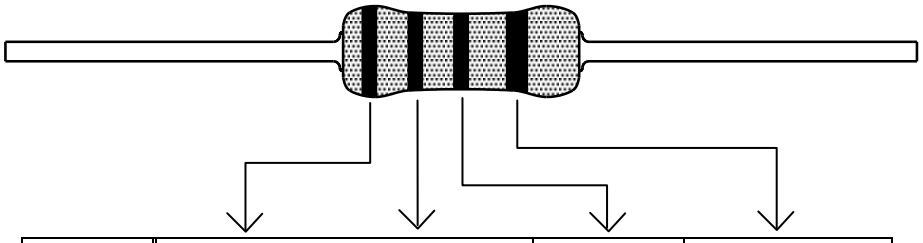
2) Constructions



No.	parts	material
①	lead wire	rich tin plated copper wire(Sn-2Cu)
②	contact of cap and lead wire	welding
③	ceramic base	alumina ceramic of the kind
④	cap	tin plated iron base
⑤	helical cutting groove	-
⑥	conductive film	metal oxide film(10 Ω and over), plated metal film(less than 10 Ω)
⑦	insulation coat	silicone paint of the kind(green) flame proof(UL94V-0)
⑧	color code	silicone resin of the kind

3) Marking

Markings are four color bands.



color	resistance basic value		multi-plier	tolerance
	1st digit	2nd digit		
black	0	0	10^{0}	－
brown	1	1	10^{1}	－
red	2	2	10^{2}	G(± 2 %)
orange	3	3	10^{3}	－
yellow	4	4	10^{4}	－
green	5	5		－
blue	6	6		－
violet	7	7		－
grey	8	8		－
white	9	9		－
gold	－	－	10^{-1}	J(± 5 %)
silver	－	－	10^{-2}	K(±１０ %)

Products Specification; MOSC　No.ＭＯＳＣ－Ｄ－０００２Ｃ

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6. Characteristics and Test method

Characteristics and test method are shown table 4. Characteristics.

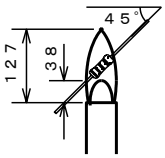
table 4. Characteristics

No.	Items	Characteristics	Test method
1	Resistance value	class G(± 2 %), J(± 5 %), K(±10 %)	JIS-C-5201-1 4.5
2	Temperature coefficient of resistance	±３００ ｐｐｍ／ ℃	A resistance temperature coefficient is computed from the difference of resistance (R2) with t1+100 ℃ (t2) on the basis of the resistance (R1) in normal temperature (t1). T.C.R.=((R2-R1)/R1)/(t2-t1) × 10^6 ppm/℃
3	Short-time overload	resistance change within ±(1.0 %+0.05 Ω)	JIS-C-5201-1 4.13 Rated voltage×2.5 5 s
4	Damp heat (steady state)	resistance change within ±(5.0 %+0.05 Ω)	JIS-C-5201-1 4.24 1) test temp. 40 ℃±2 ℃ 2) relative humidity 90 % to 95 % 3) duration 1 000 h +48/-0 h Rated wattage: 90 min ON, 30 min OFF
5	Endurance (rated load)	resistance change within ±(5.0 %+0.05 Ω)	JIS-C-5201-1 4.25.1 1) test temp 70 ℃±2 ℃ 2) duration 1 000 h +48/-0 h Rated wattage: 90 min ON, 30 min OFF
6	Resistance to soldering heat	resistance change within ±(1.0 %+0.05 Ω)	JIS-C-5201-1 4.18 temp. of solder and duration of immersion 260 ℃±5 ℃, 10 s±1 s or 350 ℃±10 ℃, 3.5 s±0.5 s
7	solder-ability	95 %min. coverage	JIS-C-5201-1 4.17 1) temp. of solder 245 ℃±5 ° C 2) duration of immersion 5.0 s±0.5 s 3) preparation not applied
8	Change of temperature	resistance change within ±(1.0 %+0.05 Ω)	JIS-C-5201-1 4.19 1) test temperature -25 ℃ ± 3 ℃ (30 min) to normal temperature (2 to 3 min) +85 ℃ ± 3 ℃ (30 min) to normal temperature (2 to 3 min) 2) number of cycles 5cycles
9	Resistance to vibration	resistance change within ±(1.0 %+0.05 Ω)	1) condition A(10 Hz to 55 Hz) 2) XYZ3-direction each 2 h (6 h in total)
10	Intermittent overload	resistance change within ±(5.0 %+0.05 Ω)	JIS-C-5201-1 4.39 1) applicable more than 100 Ω 2) Rated voltage×3 1 s ON, 25 s OFF 3) 10 000 +400/-0 cycles
11	Dielectric withstanding voltage	Flash over, burning, insulation damages should not be observed.	1) V-Block 2) test voltage 1/2 W:250 V 1～3 W:350 V 3) duration time 60 s +10/-0 s 4) voltage increasing rate 100 V/s

Products Specification; MOSC	No.MOSC－D－00022C

Items	Contents

table 4.Characteristics(continued)

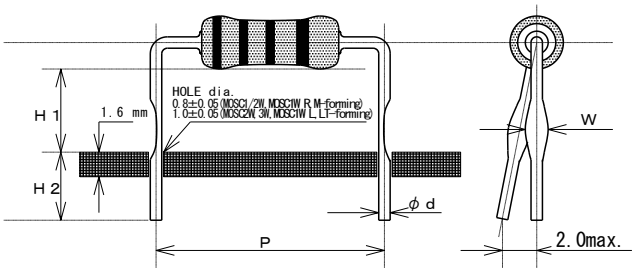
No.	Items	Characteristics	Test method
12	Terminal strength (tensile strength)	lead wire break and terminal loose should not be observed.	JIS-C-5201-1 4.16 1)tensile force 10 N 2)maintained time 10 s±1 s
	Terminal strength (torsional strength)		1)torsional angle 360 ° 2)torsional times 5times (0 °→360 °→0 ° counted as twice)
	Terminal strength (bending strength)		1)bending force 5 N 2)bending time twice(0 °→+90 °→0 °→−90 °→0 °)
13	Insulation resistance	10 GΩmin.	JIS-C-5201-1 4.6.1.1 1)V-Block 2)test voltage 100 V 3)measured at applied voltage maintained for 1 min.
14	Flame retardance (Flame resistance test)	flame 5 s max.in total	calorific value of 38 kJ/m^3 maintained 15 s then removed 15 s counted 1cycle.This cycle is carried out 5 times. outer flame 127 mm inner flame 38 mm an angle 45 ° 
	Flame retardance (Over-load burning resistance)		applying A.C.voltages corresponding to 2 times, 4 times , 8 times, 16 times and 32 times rated wattage each for 1 min. until disconnection. (regard disconnection as 100 times or more the nominal resistance value) Don't exceed either one of 4 times max.operational voltage or 3 000 V.
15	Resistance to solvent	no remarkable outward changes	JIS-C-5201-1 4.29 1)kind of solvent Isopropyl alcohol 2)temp.20 °C to 25 °C 3)duration 60 s±10 s

Products Specification; MOSC	No.MOSC－D－00002C

Items	Contents

7. Shape and dimensions of a product

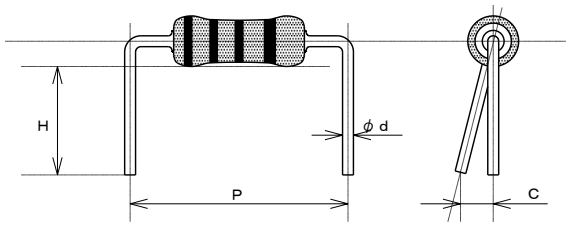
1) Stand-off forming



(mm)

Model	symbol	φ d	P	H1	H2	W
MOSC1/2W	L	0.6 +0.1/-0.05	10.0±1.0	6.0±1.0	5.0±1.0	1.2±0.2
	LT	0.6±0.1	10.0±1.0	8.0±1.0	5.0±1.0	1.0min.
	R	0.6±0.05	10.0±1.0	4.0±1.5	3.5±0.5	1.2±0.2
MOSC1W	L	0.8±0.1	15.0±1.0	6.0±1.0	5.0±1.0	1.4±0.2
	LT	0.8±0.1	12.5±1.0	8.0±1.0	5.0±1.0	1.25min.
	R	0.65±0.1	12.5±1.5	4.0±1.5	3.5±0.5	1.2±0.2
	M	0.65±0.1	12.5±1.5	4.0±1.5	4.0±1.5	1.2±0.2
MOSC2W	LS	0.8±0.1	15.0±1.0	6.0±1.0	5.5±1.0	1.4±0.2
	LT	0.8±0.1	15.0±1.0	8.0±1.0	5.0±1.0	1.4±0.2
	R	0.8±0.05	15.0±1.0	6.0±1.0	3.5±0.5	1.4±0.2
	M	0.8±0.1	15.0±1.0	6.0±1.5	5.0±1.5	1.4±0.2
MOSC3W	LS	0.8±0.1	20.0±1.0	6.5±1.0	5.5±1.0	1.4±0.2
	LT	0.8±0.1	20.0±1.0	8.0±1.0	5.0±1.0	1.4±0.2
	R	0.8±0.05	20.0±1.0	10.0±2.0	3.5±0.5	1.4±0.2

2) C12.5×4 forming



(mm)

Model	symbol	φ d	P	H	C
MOSC1W	C12.5×4	0.8±0.1	12.5±1.5	4.0 +1.0/-0.5	2.0max.

Products Specification; MOSC	No.MOSC－D－00002C

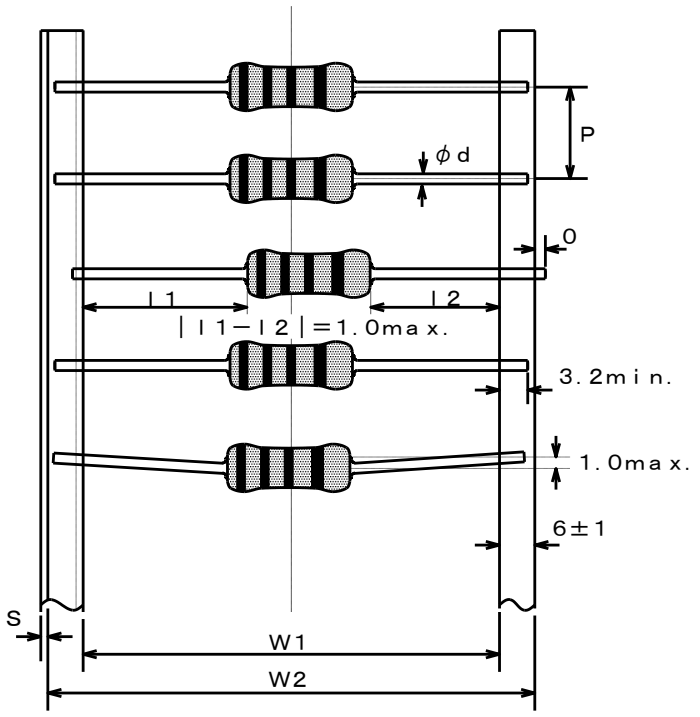
Items	Contents

8. Taping

symbol	taping name	application
TP	Axial panasert taping	MOSC1/2 W
TU	Axial universal taping	MOSC1/2 W～3 W
TUH, TU65, TU65H	Axial universal taping	MOSC1 W
RP	Radial panasert taping	MOSC1/2 W～2 W
RY	RYtype-Radial panasert taping	MOSC1 W～3 W

1) Axial panasert taping : TP

2) Axial universal taping : TU (TUH, TU65, TU65H)



(mm)

symbol	Model	φ d	W1	W2	P	S
TP	MOSC1/2W	0.6 +0.1/-0.05	26+1.0/-0	39.0±1.0	5.0±0.3	0.8max.
TU	MOSC1/2W	0.6 +0.1/-0.05	52±1.0	64.5±0.5	5.0±0.3	0.8max.
TU, TUH	MOSC1W	0.8 ±0.1				
TU65, TU65H	MOSC1W	0.65±0.1				
TU	MOSC2W	0.8 ±0.1				
TU	MOSC3W	0.8 ±0.1	52±1.0	64.5±0.5	10.0±0.3	0.8max.

・Integrated pitch tolerance is ±2.0 mm/20 pitches.
・No drop out is permissible.

Products Specification; MOSC　No.ＭＯＳＣ－Ｄ－０００２Ｃ

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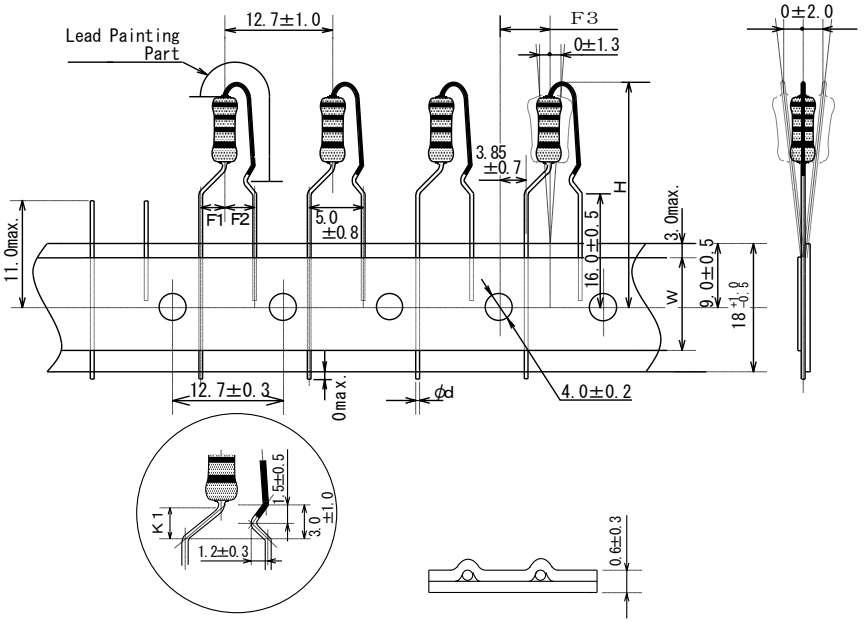
3) Radial pana-sert taping

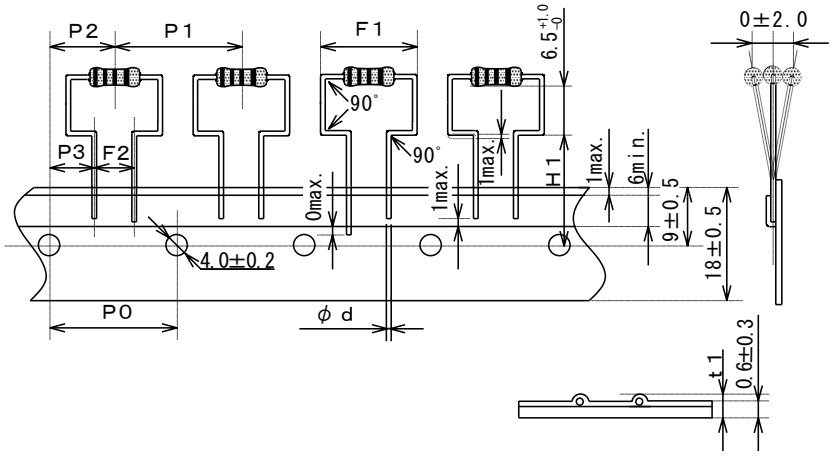


(mm)

symbol	Model	H	φ d	F 1	F 2	F 3	K 1	W
RP	MOSC 1/2W	28.5 max.	0.60 +0.1/-0.05	2.5±0.5	2.5±0.5	6.35±1.0	3.0 +0/-0.5	5.5 min.
	MOSC 1W	32.0 max.	0.65±0.1				2.5±0.5	12.5 min.
	MOSC 2W	35.5 max.		2.0±0.5	3.0±0.5	5.85±1.0		

*Continuous lacks of parts are 3 pcs. Max.

4) RY-type Radial pana-sert taping



symbol	Model	φ d	P 0	P 1	P 2	P 3
RY	MOSC1W	0.8±0.1	15.0±0.3	30.0±1.0	7.5±1.0	3.75±0.5
	MOSC2W					
	MOSC3W					

(mm)

F 1	F 2	H 1	t 1
14.0max.	7.5 +0.6/-0.2	18.0±1.0	1.7max.
17.0max.		19.0±1.0	
21.0max.			

*Continuous lack of parts are 3 pcs. Max.

Products Specification; MOSC　No.ＭＯＳＣ－Ｄ－０００２Ｃ

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9. Packaging

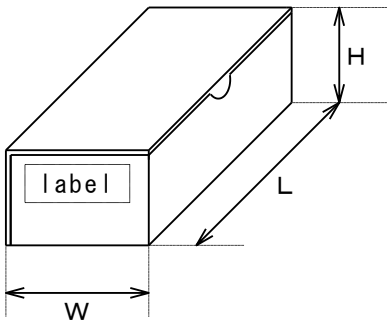
1) quantity

	sym -bol	pack -aging	quantity			
			MOSC1/2 W	MOSC1 W	MOSC2 W	MOSC3 W
Stand-off forming	L	bag	100pcs.	100pcs.	―――	―――
	LS	bag	―――	―――	100pcs.	100pcs.
	R	bag	100pcs.	100pcs.	100pcs.	100pcs.
	LT	bag	100pcs.	100pcs.	100pcs.	100pcs.
	M		―――	100pcs.	100pcs.	100pcs.
C12.5×4 forming	C12.5 ×4	bag	―――	100pcs.	―――	―――
Axial panasert taping	TP	box	2 000pcs.	―――	―――	―――
Axial universal taping	TU	box	2 000pcs.	2 000pcs.	2 000pcs.	2 000pcs.
	TUH	box	―――	2 000pcs.	―――	―――
	TU65	box	―――	2 000pcs.	―――	―――
	TU65H	box	―――	2 000pcs.	―――	―――
Radial panasert taping	RP	box	2 000pcs.	2 000pcs.	2 000pcs.	―――
RYtype-Radia panasert taping	RY	box	―――	1 000pcs.	500pcs.	500pcs.

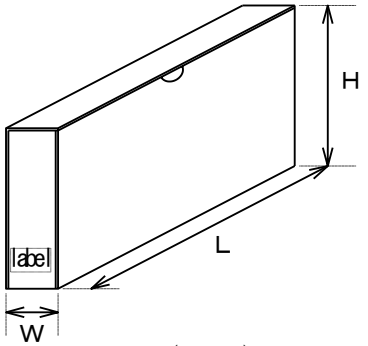
2) label

	the items mentioned
Stand-off forming	Model No. designation, quantity, lot ID number, maker trade mark
Taping	Model No. designation, quantity, lot ID number, maker trade mark

3) taping box dimension



Taping box(TP･TU)



Taping box(RP･RY)

(mm)

symbol		Model	H	W	L
Axial panasert (TP)		MOSC1/2W	５０±５	５０±５	２５２±５
Axial universal (TU)	TU	MOSC1/2W	５０±５	８０±５	２５２±５
	TU65H	MOSC1W	１１０±５	８０±５	２５２±５
	TU65	MOSC1W	８０±５	８０±５	３５０±５
	TU	MOSC2W,3W	１１５±５	８０±５	３６０±５
ＲＰ		MOSC1/2W	１３０±５	４５±５	３２５±５
		MOSC1W	１７０±５	５５±５	３２５±５
		MOSC2W	２２０±５	５５±５	３２５±５
ＲＹ		MOSC1W	１５５±５	５０±５	３４０±５
		MOSC2W	１００±５	５０±５	３４０±５
		MOSC3W	１７０±５	５５±５	３４０±５

※ MOSC1W TU type has two box size."TU65H"is short type,"TU65"is long type.

Products Specification; MOSC　No.ＭＯＳＣ－Ｄ－０００２Ｃ

Ｉｔｅｍｓ	Ｃｏｎｔｅｎｔｓ

10. Producing district and factory name

country of origin	production factory
CHINA	Chinese OEM maker

11. Minimum order unit

2 000pcs.／Lot.

12. Notes

1) Storing condition
It is desirable that the Resistor are stored the room temperature at 0 to 30 ℃ and relative humidity under 65 %, are not at high-temperature, high-humidity, dusty, harmful gas, for example hydrogen chloride and sulfate gas etc. Please not store for a long time, and mount within a year after delivered.

2) Power derating
Even if have use it in a derating curve, in consideration of self-fever, ambient temperature of a resistor, heat influence from the other parts. We ask for enough load deratings in case of use in a stable state for a long term.

3) Resistor placing
In case of the Resistor are placed around another electric parts, the distance is 5mm at least.

4) Soldering
In soldering, soldering heat effect to the Resistor is as little as possible, the advised condition are under 265 ℃ and within 11 s. In case of work by soldering iron, please work in iron temperature less than 360 ℃, less than 4 s.

5) Shock to the Resistor
When the Resistor is shocked, there is danger that the Resistor breaks. So in use of insertion machine, please adjust it for no damaging to the Resistor.Please avoid dropping in a high, too.

6) Forming
In forming, don't force heavily on Resistor body and welding point. Bending forms are not forced curve.

7) For environmental protection
We don't use Class Ⅰ ODC and PBBOs,PBBs in a products and the process.

8) RoHS directive
This resistor is a product satisfying a RoHS.

9) Cautions for Resistors
・This specification shows the quality and performance as a resistor simple. Before adoption, please evaluate and check your product in which the resistor was mounted.
・This products are designed and manufactured for general standard use in general electronic equipment (AV equipment, household electric appliances, office equipment, information and communication equipment, etc.).

When there is a danger that a human life and other serious damage will occur by the fault of this products at transportation equipment (such as train, automobile, vessel, etc.), traffic signal, medical equipment, aerospace equipment, electric heating appliances, burning appliances, gas apparatus, rotation equipment, disaster prevention, and crime prevention equipment, please design fail-safe systems and ensure safety, such as the following.

＊Systems with protective circuits and a protective equipment
＊Systems with redundant circuits and others to do not cause danger by a single failure