



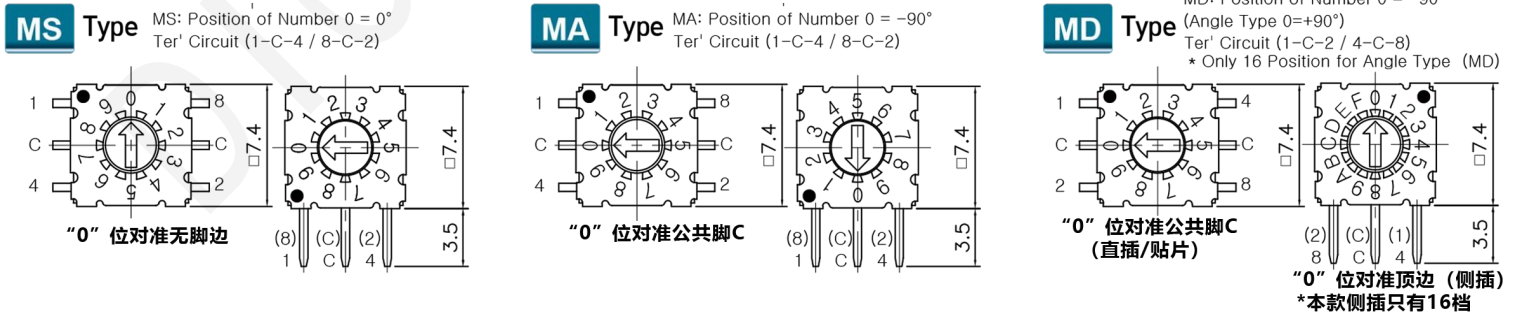
General Specification 基本参数

1.Rating: 额定功率	100mA, DC 42V (Switching) 400mA, DC 42V (None-Switching)
2.Contact Resistance: 接触电阻	80mΩ Max.
3.Insulation Resistance: 绝缘电阻	100MΩ Min at DC 250V
4.Operating Force: 操作扭力	120±30gf Max.
5.Life Cycle: 使用寿命	25,000 steps
6.Sealing: 防护等级	IP67 (Dust& Water proof) (防水防尘)
7.Operating Temperature Range: 使用温度	-40°C +85°C

HOW TO ORDER 选型规则

MS Type 系列型号	D Actuator 旋钮样式	R Code 编码方式	10 Position 档位数	S Terminal 引脚	TR Packing 包装
MS Position of printed No.0 (0°) Ter' Circuit (1-C-4 / 8-C-2) 0位对空边 (脚序1-C-4, 8-C-2) MA Position of printed No.0 (-90°) Ter' Circuit (1-C-4 / 8-C-2) 0位对C脚 (脚序1-C-4, 8-C-2) MD Position of printed No.0 (-90°) Ter' Circuit (1-C-2 / 4-C-8) 0位对C脚 (脚序1-C-2, 4-C-8) 侧插0位对顶边	D Arrow (H0mm) 箭头槽 0mm高 S Spindle (H 4.5mm) 花柄 4.5mm高 K Slotted spindle (Height = 4.2mm) 一字槽轴 4.2mm高 G Slotted spindle (Height = 1mm) 开槽轴 1mm高	R Real Code 二进制正码 C Complement Code 二进制反补码 G Gray code 格雷码 M 0-3四档波段开关	04 04 Position 10 10 Position 16 16 Position	- Through-Hole (Ter' 3x3) 直插 (3对3脚) C Through-Hole (Ter' 3x2) 直插 (3对2脚) S SMD Gull Wing (Ter' 3x3) 贴片 (3对3脚) SC SMD Gull Wing (Ter' 3x2) 贴片 (3对2脚) J J - Hook SMD (Ter' 3x3) 内弯形贴片 (3对3脚) JC J - Hook SMD (Ter' 3x2) 内弯形贴片 (3对2脚) H Right Angle 5.08mm 侧插 脚距5.08mm H1 Right Angle 2.54mm 侧插 脚距2.54mm	- Tube Packing 管装 TR Reel Packing 编带

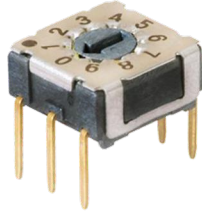
1. Type 系列型号



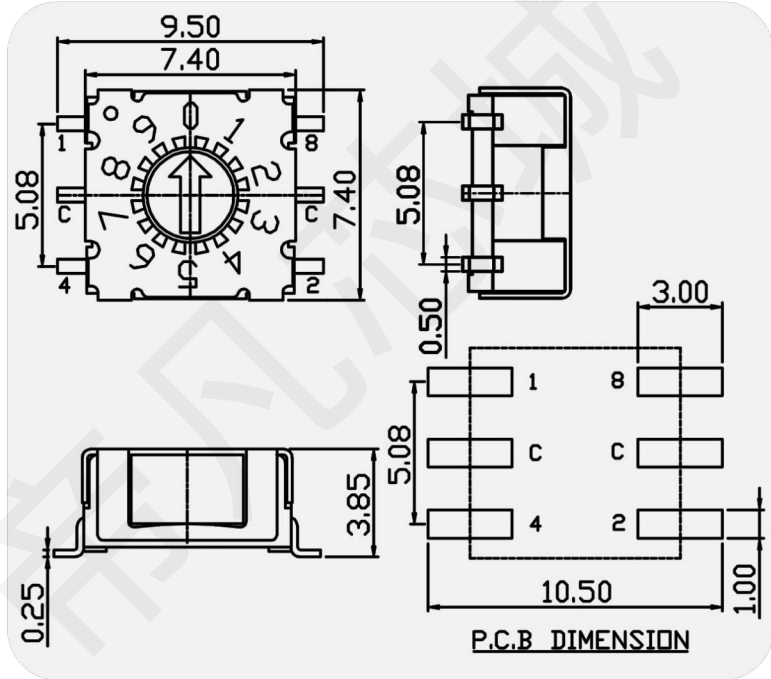
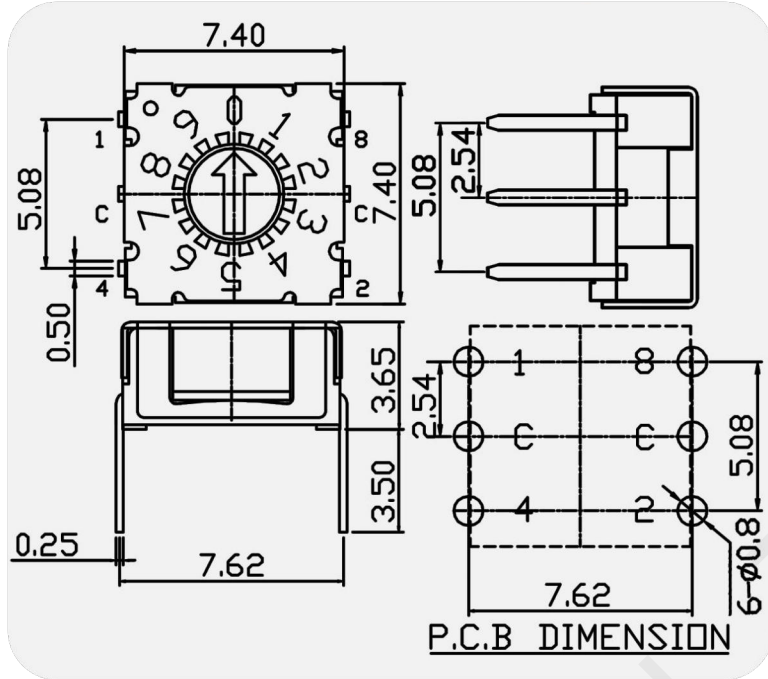
2. General Dimension 基本尺寸



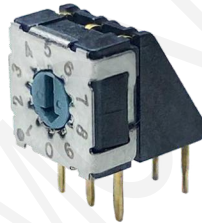
- Through-Hole(3x3)
3对3直插脚



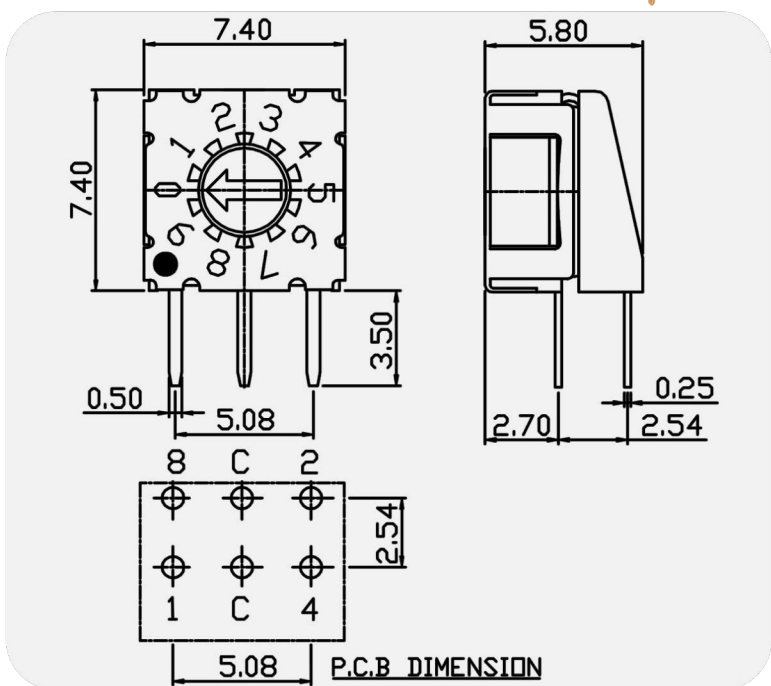
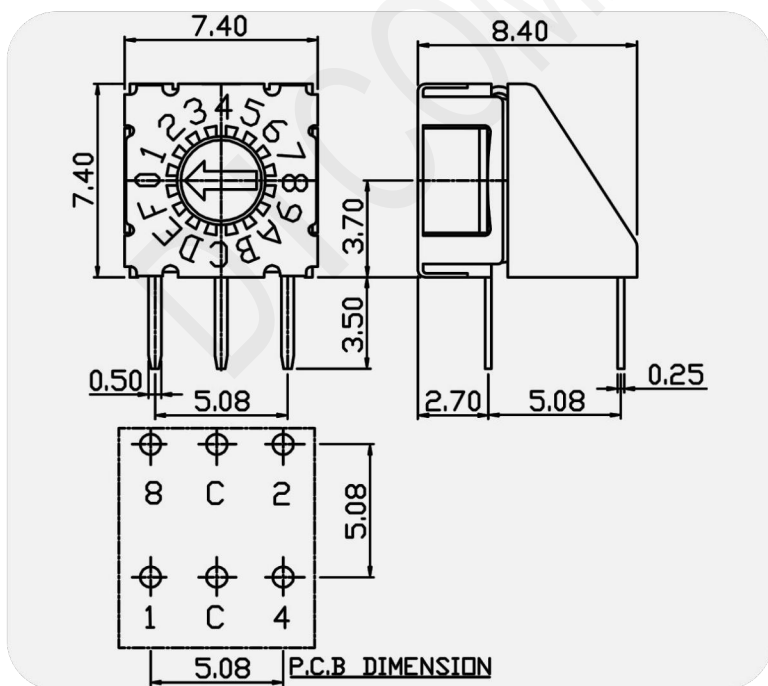
S SMD Gull Wing(3x3)
3对3贴片脚



H Right Angle 5.08mm
5.08mm侧插脚

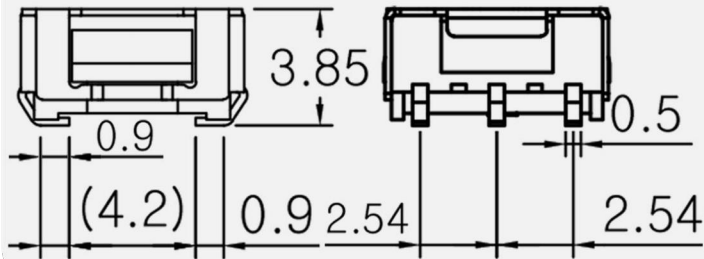
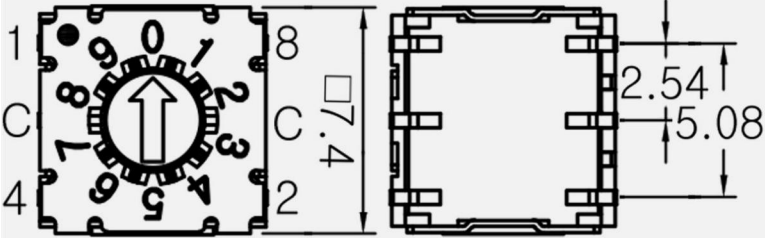
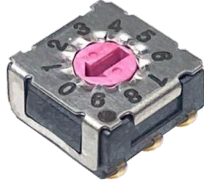


H1 Right Angle 2.54mm
2.54mm侧插脚



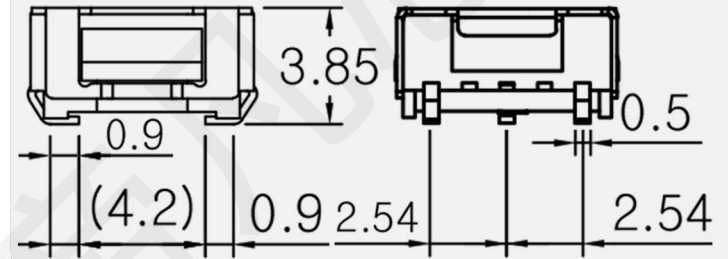
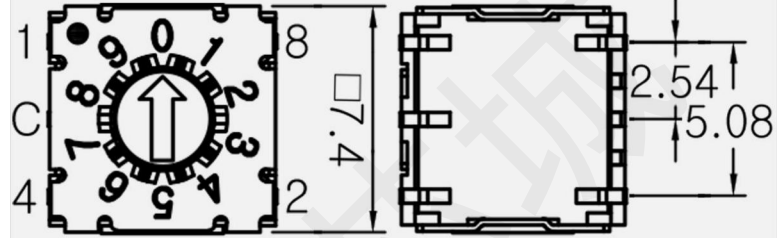
J

JSMD (Ter' 3X3)
内弯J型贴片脚
(3对3脚)



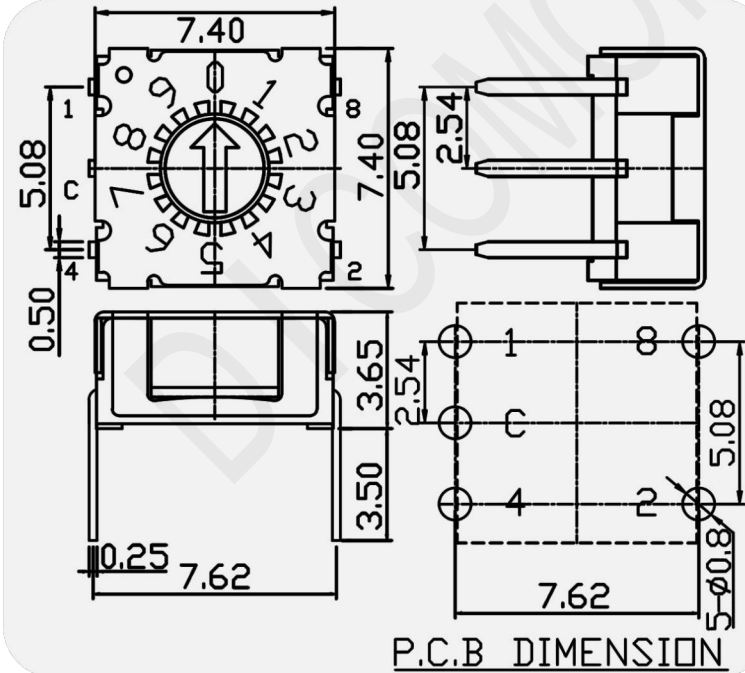
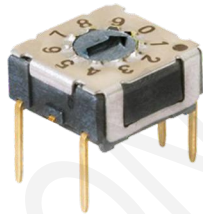
JC

JSMD (Ter' 3X2)
内弯J型贴片脚
(3对2脚)



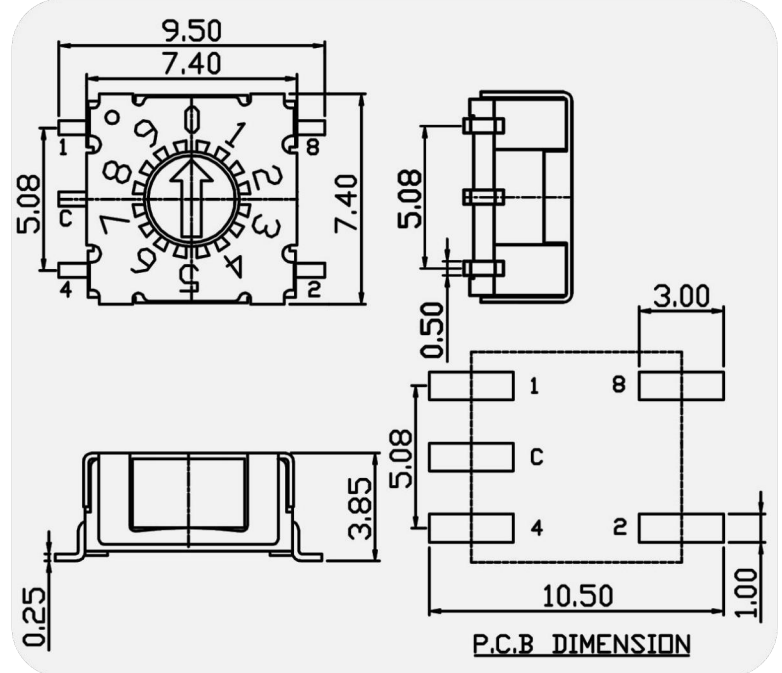
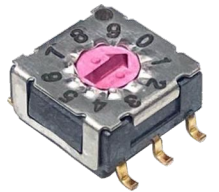
C

Through-Hole(3x2)
3对2直插脚



SC

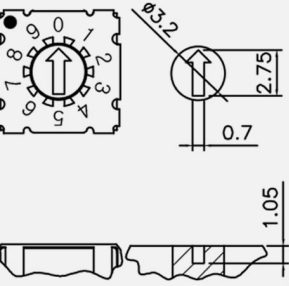
SMD Gull Wing(3x2)
3对2贴片脚



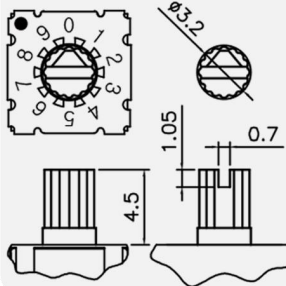
3. Actuator 旋钮样式



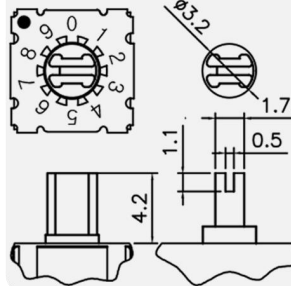
D Arrow (Height = 0mm)
箭头槽



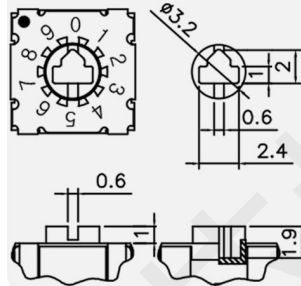
S Spindle (Height = 4.5mm)
高4.5mm花柄



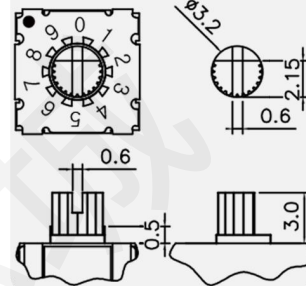
K Slotted Spindle (Height = 4.2mm)
高4.2mm槽沟柄



G Slotted Spindle (Height = 1mm)
高4.2mm槽沟柄



M Slotted Spindle (Height = 3mm)
高3mm槽沟半柄



4. Code & Position 编码方式 & 档位数



R Real Code 二进制正码

Position	16	10	08	06	04	Real Code
						C 1 2 4 8
0	0	0	0	0	0	0
1	0	0	0	1	0	1
2	0	0	1	0	0	2
3	0	0	1	1	0	3
4	0	1	0	0	0	4
5	0	1	0	1	0	5
6	0	1	1	0	0	6
7	0	1	1	1	0	7
8	1	0	0	0	0	8
9	1	0	0	1	0	9
10	1	0	1	0	0	A
11	1	0	1	1	0	B
12	1	1	0	0	0	C
13	1	1	0	1	0	D
14	1	1	1	0	0	E
15	1	1	1	1	0	F

04 POSITION: C 2, C 1, 1

06/08/10/16 POSITION: 1 8, C C, 4 2

C Complement Code 二进制反补码

Position	16	10	08	06	04	Complement Code
						C 1 2 4 8
0	0	0	0	0	0	0
1	0	0	0	1	0	1
2	0	0	1	0	0	2
3	0	0	1	1	0	3
4	0	1	0	0	0	4
5	0	1	0	1	0	5
6	0	1	1	0	0	6
7	0	1	1	1	0	7
8	1	0	0	0	0	8
9	1	0	0	1	0	9
10	1	0	1	0	0	A
11	1	0	1	1	0	B
12	1	1	0	0	0	C
13	1	1	0	1	0	D
14	1	1	1	0	0	E
15	1	1	1	1	0	F

04 POSITION: C 2, C 1, 1

06/08/10/16 POSITION: 1 8, C C, 4 2

G Gray Code 格雷码

Position	10	08	06	04	02	Gray Code
						C 1 2 4 8
0	0	0	0	0	0	0
1	0	0	0	1	0	1
2	0	0	1	0	0	2
3	0	0	1	1	0	3
4	0	1	0	0	0	4
5	0	1	0	1	0	5
6	0	1	1	0	0	6
7	0	1	1	1	0	7
8	1	0	0	0	0	8
9	1	0	0	1	0	9
10	1	0	1	0	0	A
11	1	0	1	1	0	B
12	1	1	0	0	0	C
13	1	1	0	1	0	D
14	1	1	1	0	0	E
15	1	1	1	1	0	F

10/16 POSITION: 1 8, C C, 4 2

M 0-3四档波段开关

Position	04	Decimal Code
		C 0 1 2 3
0	0	0
1	0	1
2	0	2
3	0	3

(Top View)

Only MS Type: 1 2, C C, 0 3

N 1-4四档波段开关

Position	04	Decimal Code
		C 1 2 3 4
1	1	1
2	1	2
3	1	3
4	1	4

(Top View)

Only MS Type: 1 4, C C, 3 2

MS Series Mini Rotary DIP Switch Specification

MS 系列编码开关 电气参数

1. Style:

This specification describes "7.4X7.4 size of Mini Rotary Dip Switch" which is M series.

1.1 Operating / Storage Temperature Range : -60°C ~ +125°C

2. Rating:

2.1 None-Switching : 400 mA, DC 42V

2.2 Switching : 100 mA, DC 42V

3. Type of Actuation : Rotating

4. Electrical Characteristics

ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
4-1	Visual Examination	By visual examination check without any out pressure & testing.	There shall be no defects that affect the serviceability of the product.
4-2	Contact Resistance	① To be measured between the two terminals associated with each switch pole. ② Measurements shall be made with a 1kHz shall current contact resistance meter.	80mΩ max. (initial)
4-3	Insulation Resistance	250V DC	100 MΩ min.
4-4	Dielectric withstanding Voltage	250V AC(50Hz or 60Hz)shall be applied between all the adjacent terminal and between the terminal and the frame for 1 minute.	There shall be no breakdown or flashover.

5. Mechanical Characteristics

ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
5-1	Operation Force	Operating direction shall be clockwise or counter clockwise direction	120gf ·cm ±30 max
5-2	Operation Life	Measurements shall be made following the test set forth below: 1)100mA, 42V DC resistive load 2)Rate of operation: 15~20 cycles/ minute 3)Step of operation: 25,000 steps	1)As shown in item 4-3,4-4 2)Contact Resistance: 200mΩ max 3)Final-after test

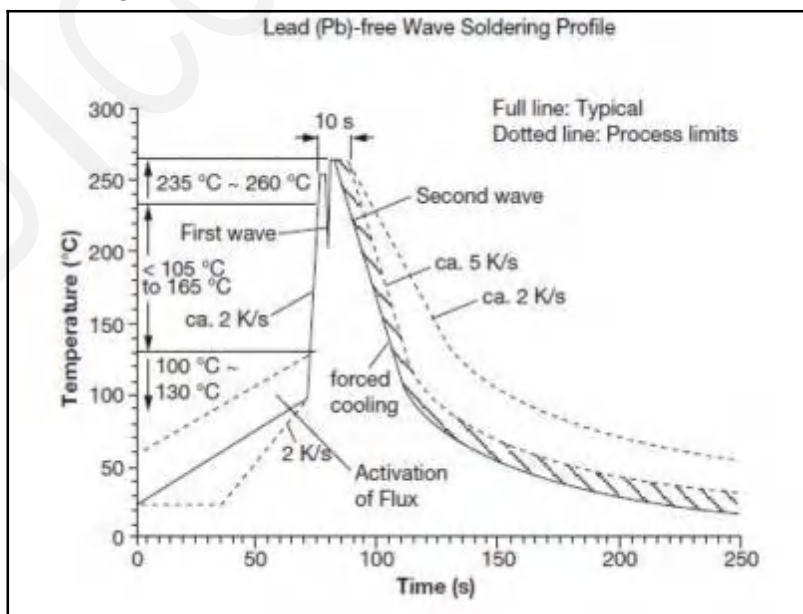
6. Environmental Characteristics

ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
6-1	Resistance Low Temperature	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made: 1)Temperature: $-60^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 2)Time: 96 hours	1)As shown in item 4-3, 4-4, 5-1 2)Contact Resistance: 200m Ω max
6-2	Resistance High Temperature	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made: 1)Temperature: $125^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 2)Time: 96 hours	1)As shown in item 4-3, 4-4, 5-1 2)Contact Resistance: 200m Ω max
6-3	Resistance Humidity	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made: 1)Temperature: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 2)Relative humidity: 90~95% 3)Time: 96 hours	1)As shown in item 4-4, 5-1 2)Contact Resistance: 200m Ω max 3)Insulation Resistance: 10 M Ω min

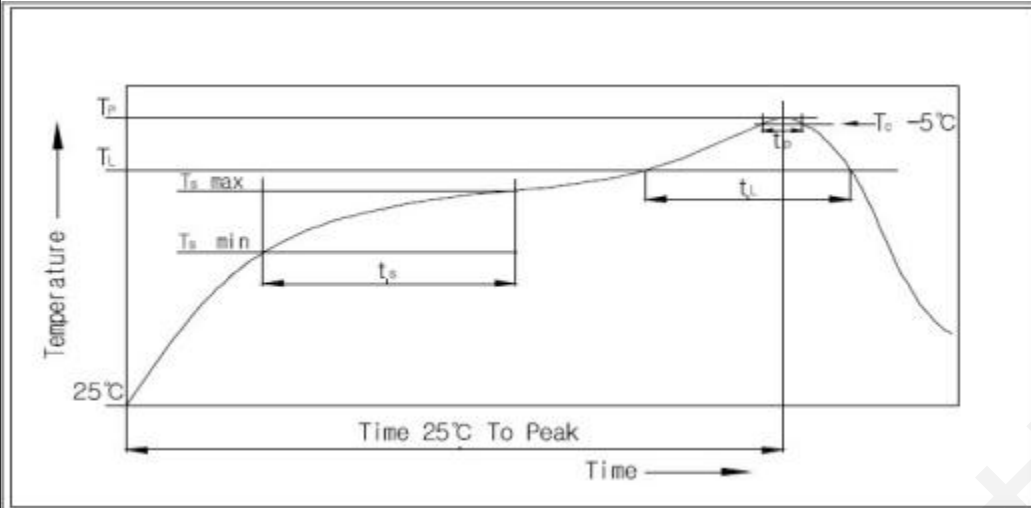
7. This item is "RoHS" Compliant

8. Manual Soldering : Max 350°C, 3 sec.

9. Wave Soldering Conditions:



10. Reflow Soldering Conditions: (SMD type only)



10-1 Condition for Soldering

Profile Feature	Pb-Free Assembly
Average Ramp-UP Rate($T_s \text{ max}$ to TP)	3°C/second max
Preheat	
- Temperature Min($T_s \text{ min}$)	150°C
- Temperature Max($T_s \text{ max}$)	200°C
- Time ($t_s \text{ min}$ to $t_s \text{ max}$)	60-180seconds
Time maintained above:	
- Temperature (TL)	217°C
- Time (tL)	60-150seconds
Peak/ Classification Temperature(TP)	260°C +0°C/ -5°C
Time within 5°C of actual Peak Temperature(TP)	Min 30 seconds
Ramp-Down Rate	6°C/sec max
Time 25°C to Peak Temperature	8 minutes max