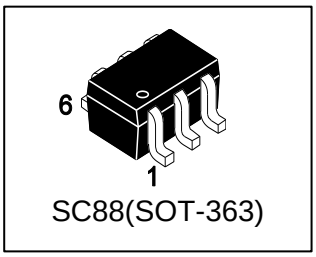
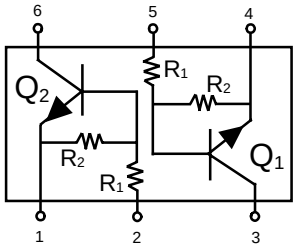
LMUN5211DW1T1G

Dual Bias Resistor Transistors
NPN Silicon Surface Mount Transistors
with Monolithic Bias Resistor Network



SC88(SOT-363)



1. FEATURES

- Simplifies circuit design
- Reduces board space.
- Reduces Component Count
- Humidity:32%~68%RH Temperature：20~30℃
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

2. DEVICE MARKING AND RESISTOR VALUES

Device	Marking	R1(K)	R2(K)	Vin(V)	Shipping
LMUN5211DW1T1G	7A	10	10	-10~+40	3000/Tape&Reel
LMUN5211DW1T3G	7A	10	10	-10~+40	13000/Tape&Reel

3. MAXIMUM RATINGS(Ta = 25ºC)

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	VCEO	50	V
Collector–Base Voltage	VCBO	50	V
Emitter–Base Breakdown Voltage	VEBO	6	V
Collector Current — Continuous	IC	100	mA

4. THERMAL CHARACTERISTICS

Parameter (One Junction Heated)	Symbol	Limits	Unit
Total Device Dissipation, (Note 1) @ TA = 25ºC Derate above 25ºC	PD	 187 1.5	 mW mW/ºC
Thermal Resistance, Junction–to–Ambient(Note 1)	RΘJA	670	ºC/W
Parameter (Both Junctions Heated)	**Symbol**	**Limits**	**Unit**
Total Device Dissipation, (Note 1) @ TA = 25ºC Derate above 25ºC	PD	 250 2	 mW mW/ºC
Thermal Resistance, Junction–to–Ambient(Note 1)	RΘJA	493	ºC/W
Thermal Resistance, Junction–to–Lead(Note 1)	RΘJL	188	ºC/W
Junction and Storage temperature	TJ,Tstg	−55~+150	ºC

1. FR–4 @ Minimum Pad

5. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

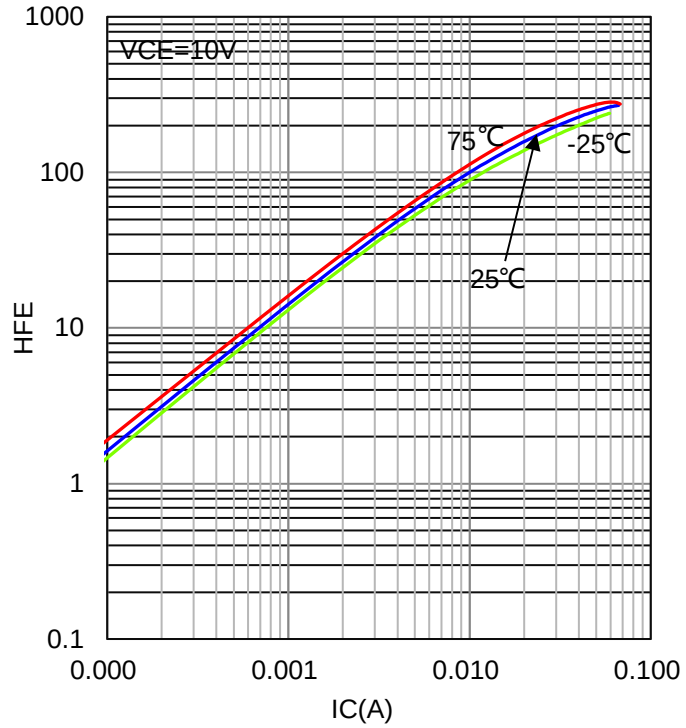
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 2.0 mA, IB = 0)	VBR(CEO)	50	-	-	V
Collector–Base Breakdown Voltage (IC = 10 μA, IE = 0)	VBR(CBO)	50	-	-	V
Emitter–Base Breakdown Voltage (IE = 1mA, IC = 0)	VBR(EBO)	6	-	-	V
Collector-Base Cutoff Current (VCB = 50 V, IE = 0)	ICBO	-	-	100	nA
Collector-Emitter Cutoff Current (VCE = 50 V, IB = 0)	ICEO	-	-	500	nA
Emitter-Base Cutoff Current (VEB = 6.0 V, IC = 0)	IEBO	-	-	0.5	mA

ON CHARACTERISTICS (Note 2.)

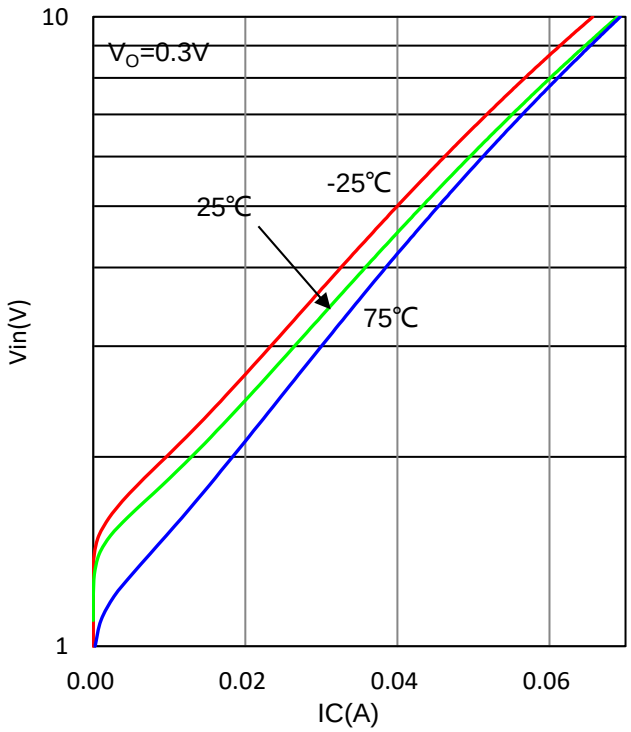
DC Current Gain (IC = 5.0 mA, VCE = 10 V)	HFE	35	-	-	
Collector–Emitter Saturation Voltage (IC = 10 mA, IB = 0.3 mA)	VCE(sat)	-	-	0.25	V
On-State Input Voltage (VCE=0.2V, IC=5mA)	VI(on)	-	1.5	-	V
Off-State Input Voltage (VCE=5V, IC=0.1mA)	VI(off)	-	1	-	V
Output Voltage (on) (VCC = 5.0 V, VB = 2.5 V, RL =1.0KΩ)	VOL	-	-	0.2	V
Output Voltage (off) (VCC = 5.0 V, VB = 0.5 V, RL =1.0KΩ)	VOH	4.9	-	-	V
Input Resistor	R1	7	10	13	KΩ
Resistor Ratio	R1/R2	0.8	1	1.2	

2. Pulse Test: Pulse Width < 300 μs, Duty Cycle < 2.0%

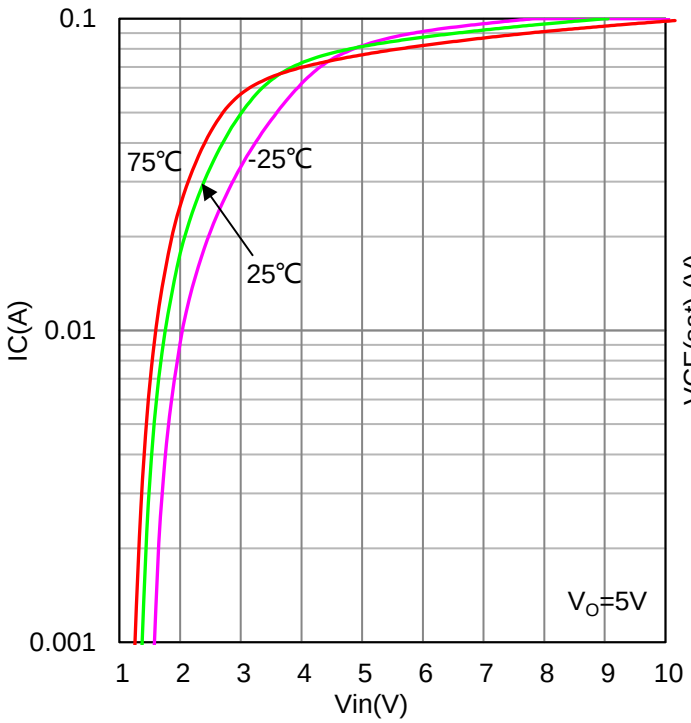
6.ELECTRICAL CHARACTERISTICS CURVES



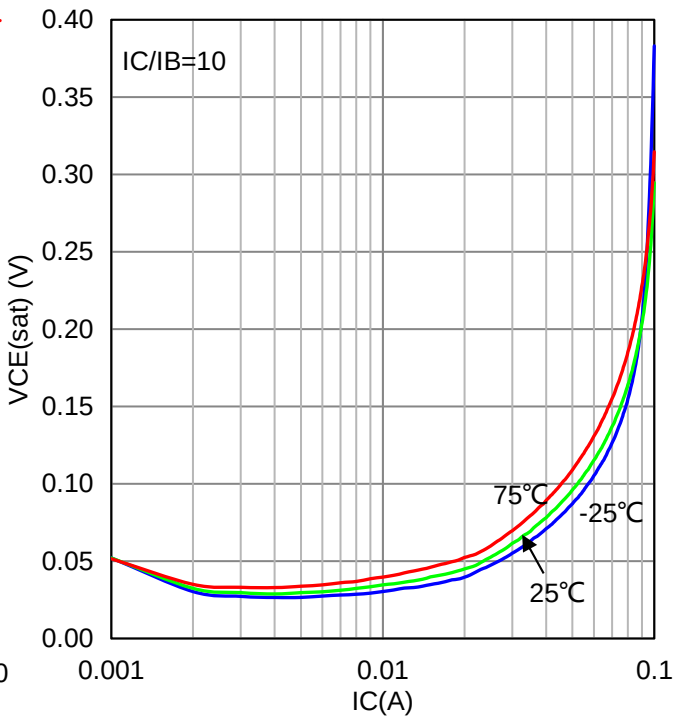
HFE vs. IC



Vin vs. IC(VO=0.3V)

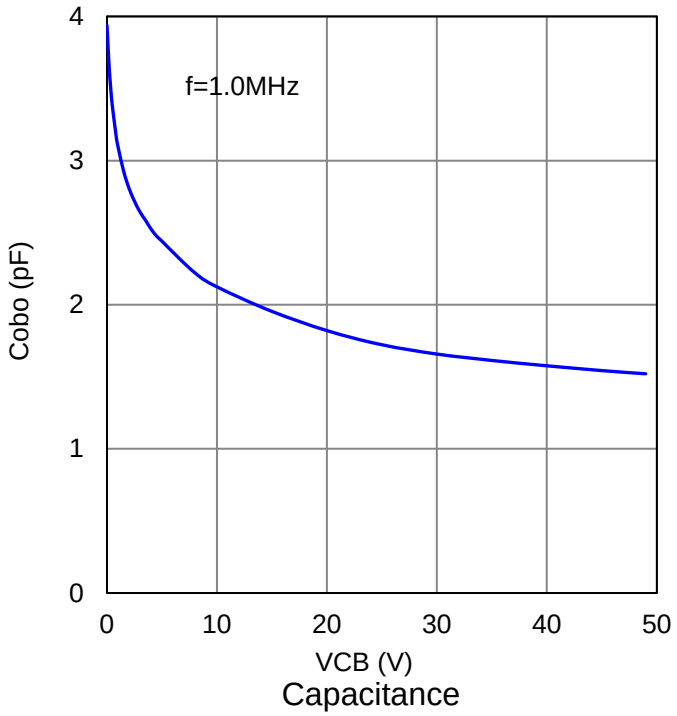


IC vs. Vin

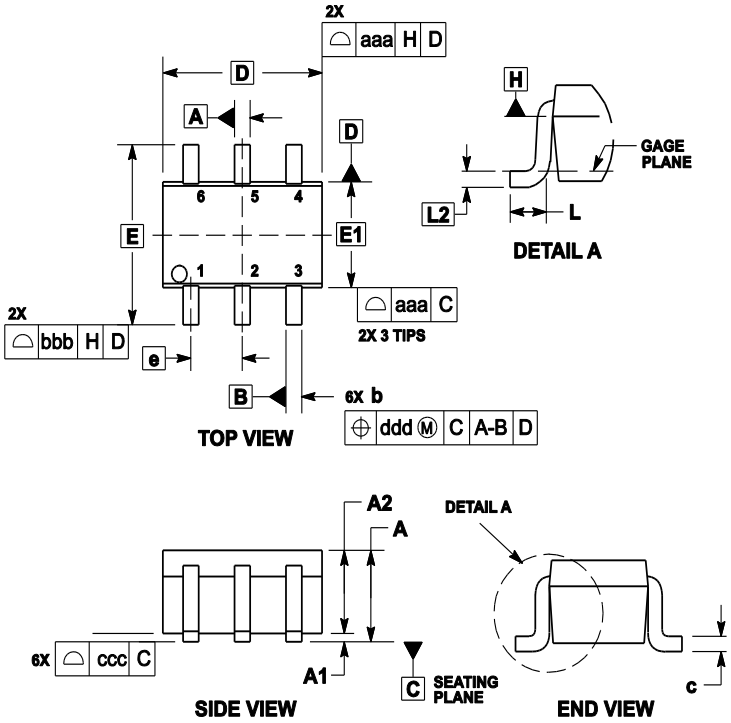


VCE(sat) vs. IC

6.ELECTRICAL CHARACTERISTICS CURVES(Con.)



7.OUTLINE AND DIMENSIONS

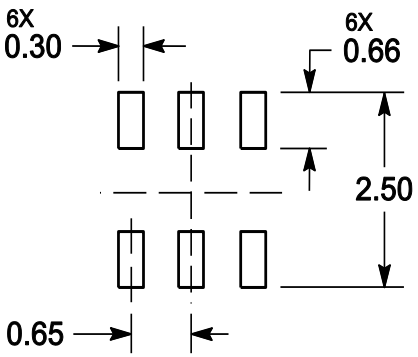


Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.10	---	---	0.043
A1	0.00	---	0.10	0	---	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.01
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.07	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.01		
bbb	0.30			0.01		
ccc	0.10			0.00		
ddd	0.10			0.00		

8.SOLDERING FOOTPRINT



DISCLAIMER

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.

- Before you use our Products for new Project, you are requested to carefully read this document and fully under--stand its contents. LRC shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any LRC’s Products against warning, caution or note contained in this document.

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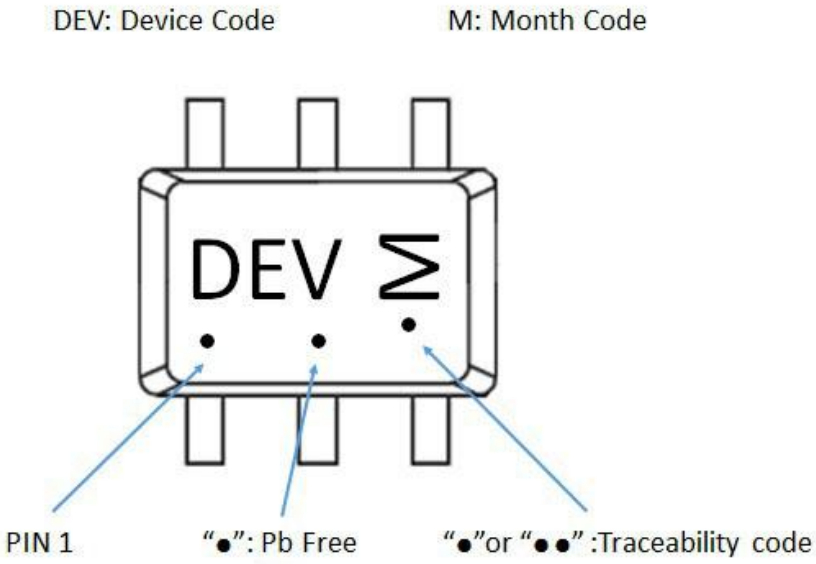
SC88、SC88 OP2 Explanation for marking	ME-023
	Page 1 of 1

1. Marking Details



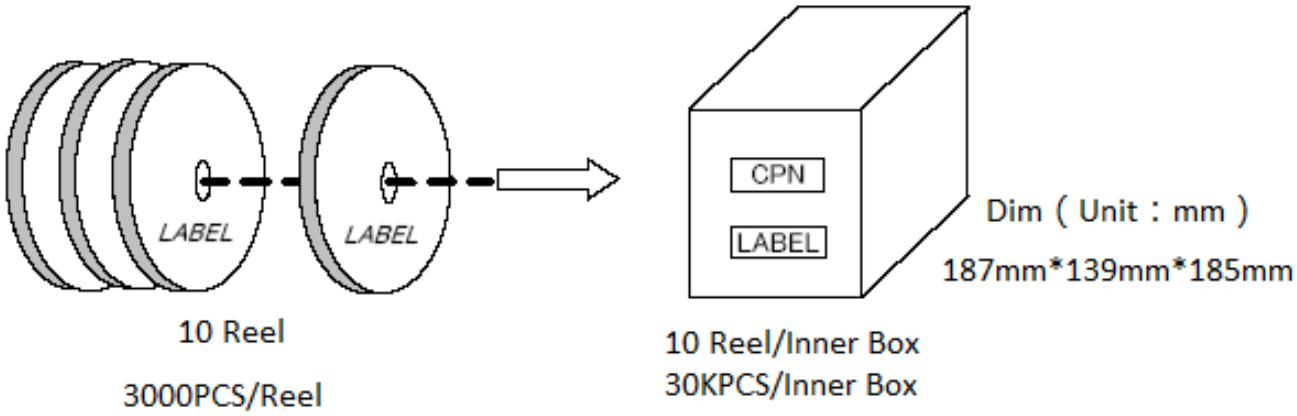
2. Marking Outline

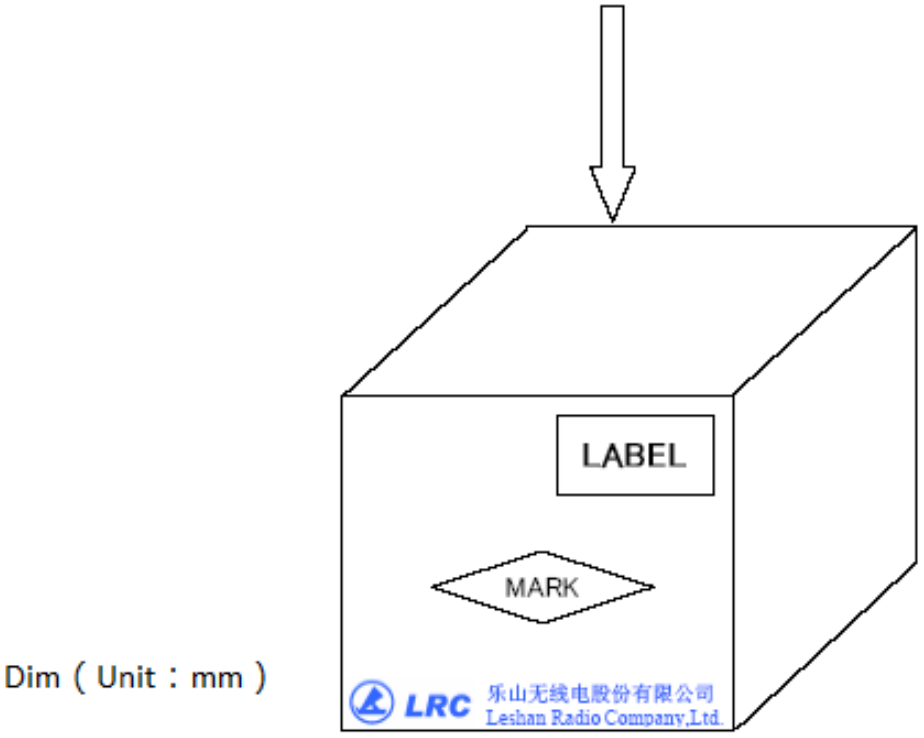
Color of resin : Black

Marking method : Direct laser marking

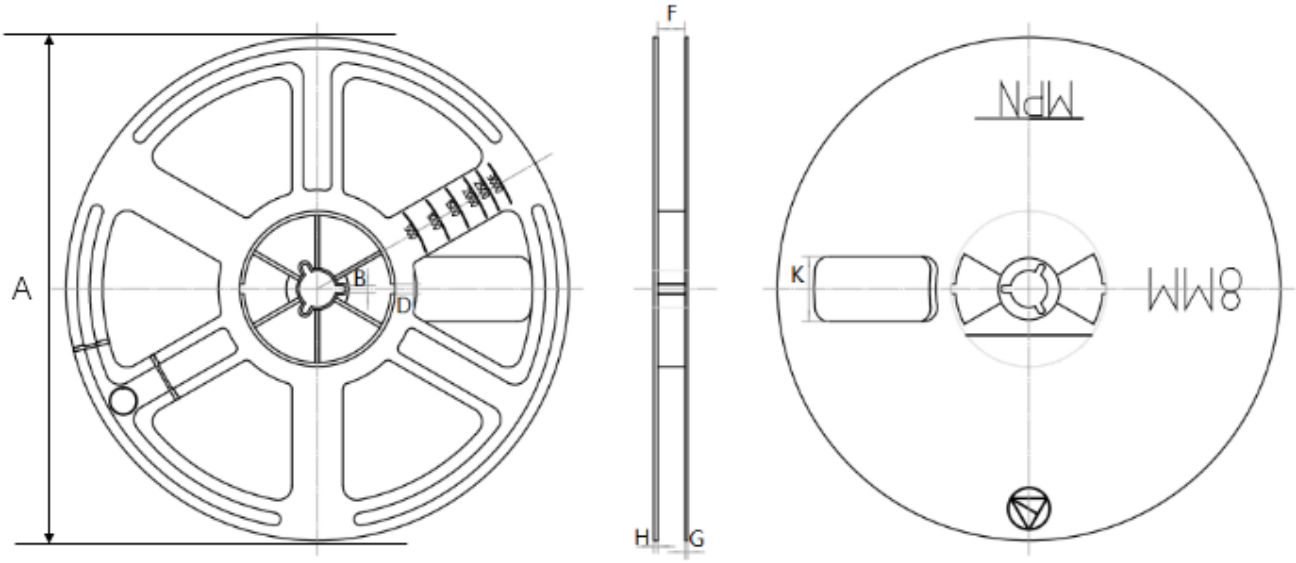
Month code : Confidentiality

1.0 Packing method





2.0 Reel dimensions



Unit: mm

A	B	D	F	G	H	K
178	2.4±0.3	3.5±0.5	9.6±1.2	$0.85^{+0.1}_{-0.05}$	$1.2^{+0.3}_{-0.05}$	$23^{+1}_{-0.5}$

3.0 Product orientation

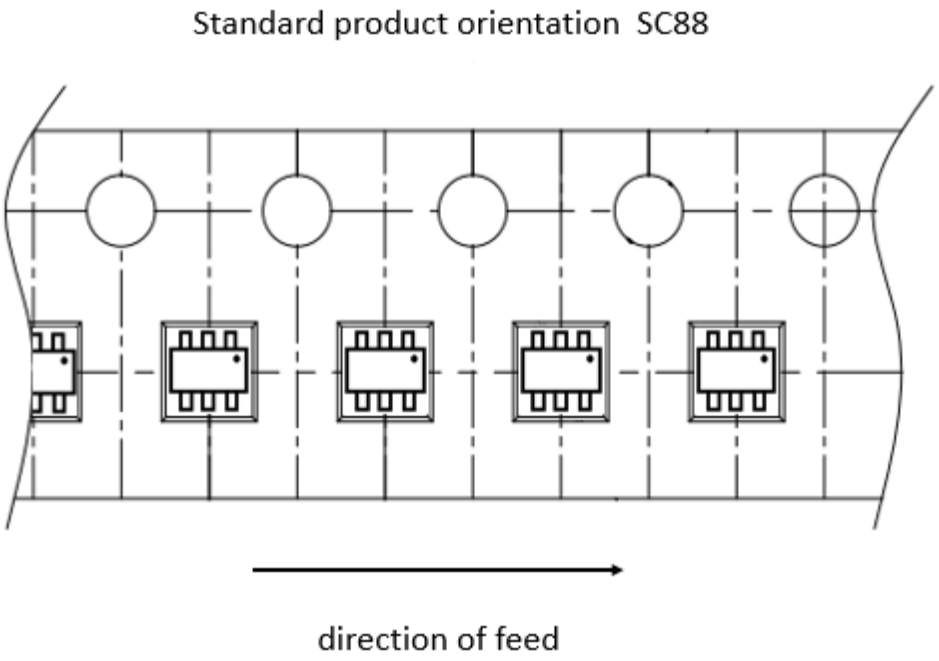
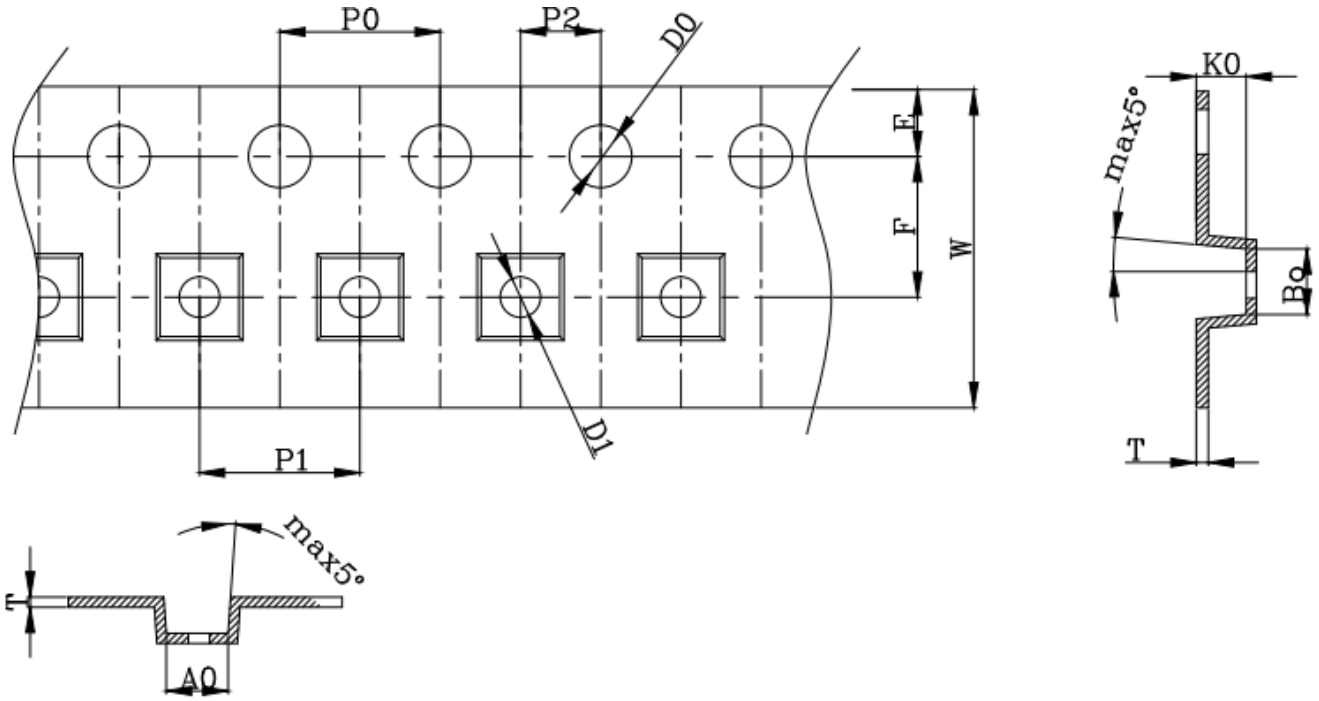


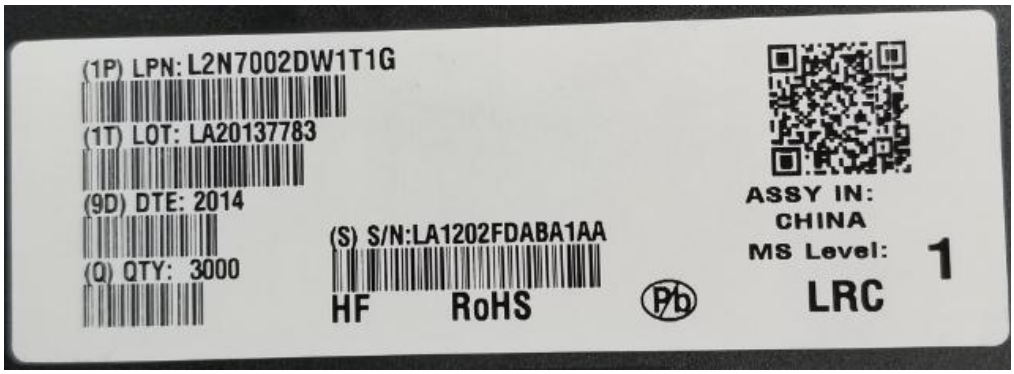
Fig 2. Product orientation in carrier tape

4.0 Carrier tape dimensions



Symbol	A0	B0	K0	P0	P1	P2
Spec(mm)	2.24±0.1	2.34±0.1	1.22±0.1	4.0±0.1	4.0±0.1	2.00±0.05
Symbol	T	E	F	D0	D1	W
Spec(mm)	0.20±0.02	1.75±0.1	3.5±0.05	1.55±0.05	1.0±0.1	8.0 ±0.1

5.0 Barcode label



Note：

1. Example of typical reel barcode lable.
2. The HF/RoHS/Pb-free,MSL level may vary depending upon different P/N.

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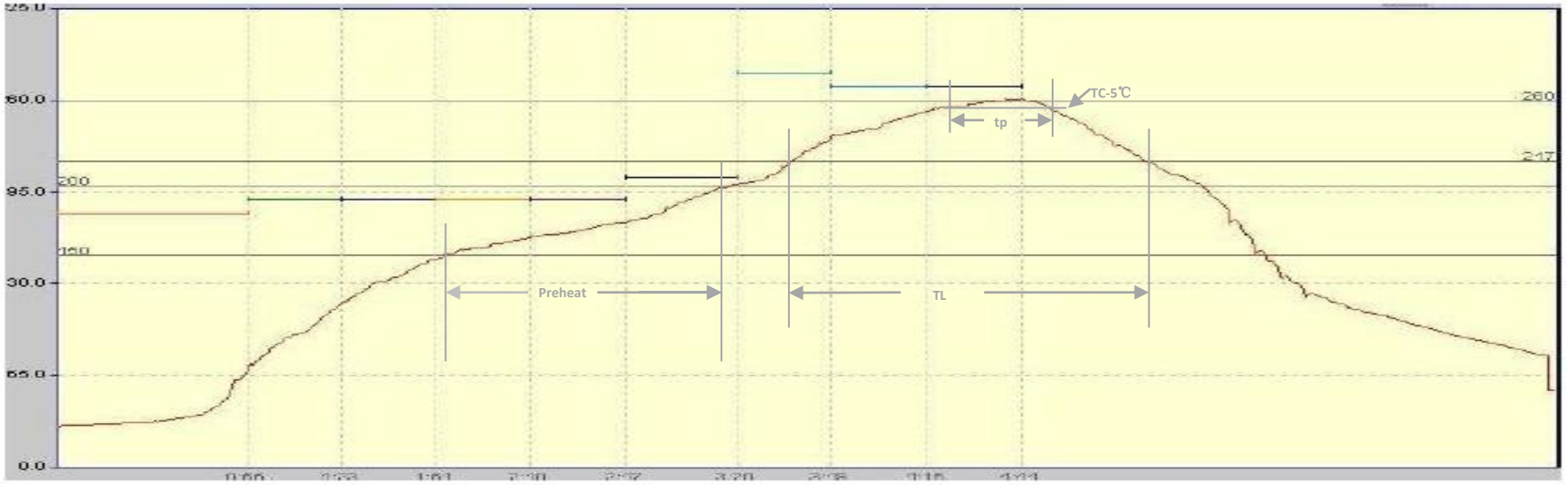
Recommended Reflow Soldering Profile

Limiting Values*

The below temperature profile for moisture sensitivity characterization is based on the IPC/JEDEC joint industry standard: J-STD-020F.

Profile Feature	Pb-free assembly(Requirement)	Actual
Preheat		
Temperature minmum(T_{smin})	150℃	150℃
Temperature maxmum(T_{smax})	200℃	200℃
Time(t_{smin} to t_{smax})	60s to 120s	115s
Time maintained above		
Temperature(T_L)	217℃	217℃
Time(t_L)	60s to 150s	111s
Peak/classification temperature(T_p)	260℃	260℃
Number of allowed reflow cycles	3	3
Time within 5℃ of actual peak temperature(T_p)	>30s	32s

* Applicable for LRC surface mounted devices.

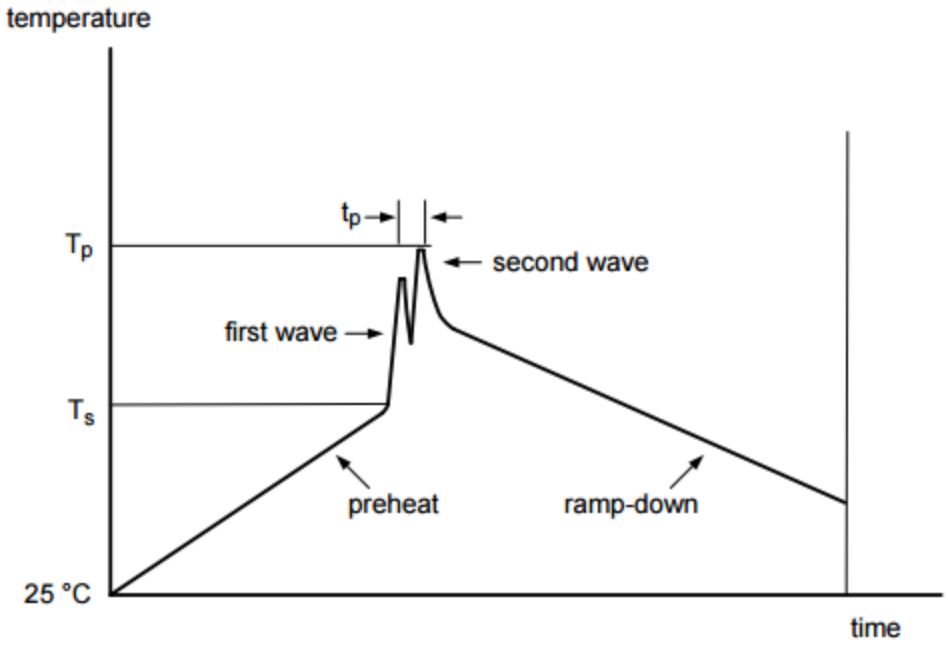


Wave Soldering Profile

Limiting Values*

Profile Feature	Pb-free assembly
Average ramp-up rate	~200℃/s
Heating rate during preheat	Typical 1-2,max 4℃/s
Final preheat temperature Heating rate temperature Ts	~130℃
Peak temperature(T_p)	260℃
Time within peak temperature(T_p)	10s
Ramp-down rate	5℃/s maximum

* Applicable for LRC through-hole devices.



Resistance to Solder heat

Surface Mount Solid State Devices:

Soldering Dip Temperature:260+5/-0, Time: 10 +/- 1seconds

Remark:

Follow JEDEC industry standard: JESD22-A111. Applicable for Surface Mount Solid State Devices.

Through-hole Devices:

SnPb solder bath temperature: 260℃ ± 5 ℃, Time:10 +2/-0 seconds

Pb-free solder bath temperature: 270 ℃ ± 5 ℃, Time: 7+2/-0 seconds

Remark:

Follow JEDEC industry standard: JESD22-B106D. Applicable for Through-Hole Mounted Devices.

Recommended Manual Soldering Condition

Limiting Values*

Soldering Temperature:350+/-10℃
Time: Max. 3 seconds

Note:

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