

## CC6207M

### MicroPower, Ultra-Sensitive, Full polarity Hall effective switch

#### General Description

CC6207M is a micropower, ultra sensitive, Full polarity hall effect switch, which can directly replace the traditional magnetic reed switch. It is mainly designed for battery-powered, hand held equipment, like mobile phone, cordless phone, Laptop, PDA, etc

CC6207M includes hall sensor, Voltage stabilizing module, a small-signal amplifier, dynamic offset cancellation, Latch module and CMOS output. Because CC6207M uses advanced BiCMOS technology, the overall circuit structure is optimized, so that the product can obtain very low input error feedback. Besides, Superior high-temperature performance is made possible through Dynamic Offset Cancellation, which reduces the residual offset voltage normally caused by device package over molding, temperature dependencies, and thermal stresses. At the same time, the product adopts its miniaturized packaging process, which makes the product have higher performance and market advantages.

Either North or South pole of sufficient strength will turn the output on.

CC6207M is available in TO-92S, SOT23-3 and DFN4L packages. The operating temperature is -40~125°C.

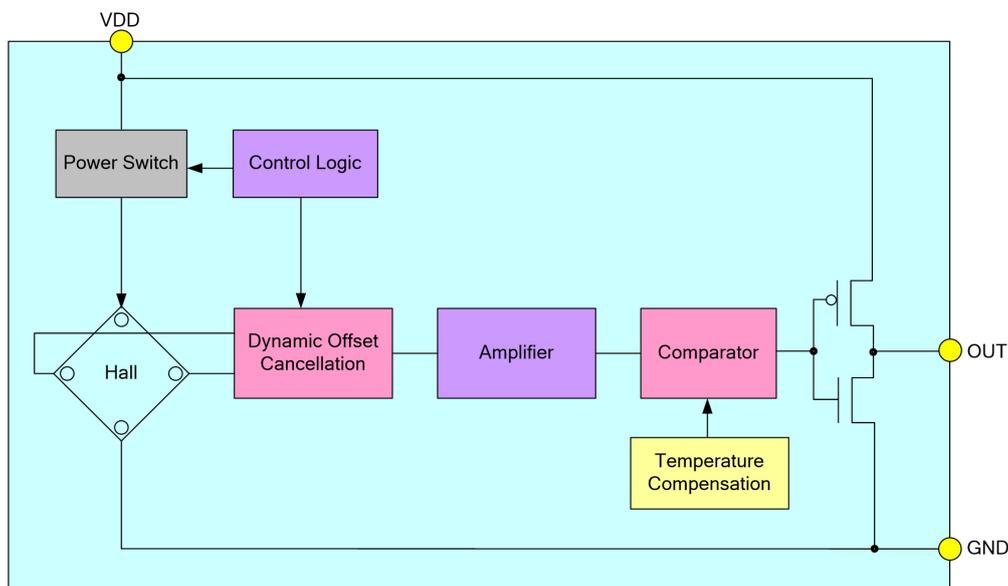
#### Features

- ◆ Wide operating voltage, 2~5V
- ◆ Micropower
- ◆ Fast response speed (Work frequency 32Hz)
- ◆ Operating with North or South pole
- ◆ Superior temperature stability
- ◆ Extremely Low Switch-point Drift
- ◆ ESD (HBM) 6000V
- ◆ Small package size (SOT23-3, DFN4L)
- ◆ RoHS compliant

#### Application

- ◆ PDA, IPAD
- ◆ Instrument, Meter
- ◆ Laptop

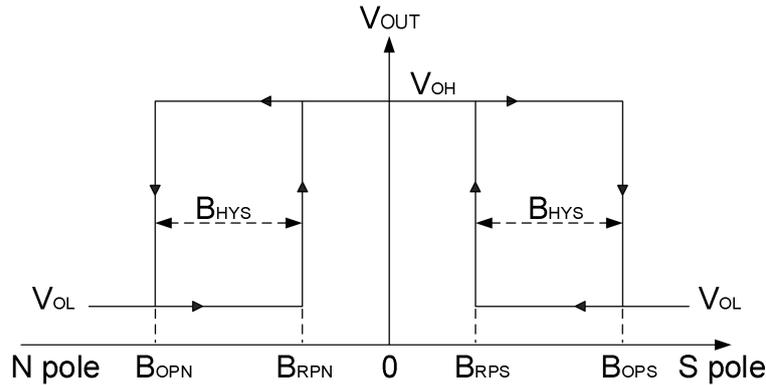
#### Function Block Diagram



## Ordering Information

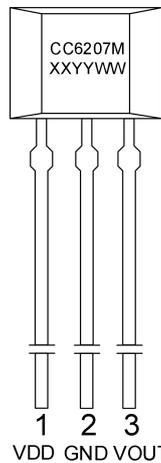
Part No.	Packing Form	Package Code
CC6207MTO	bulk, 1000 pcs/bulk	TO-92S
CC6207MST	tape reel, 3000 pcs/reel	SOT23-3
CC6207MDN	tape reel, 5000 pcs/reel	DFN4L

## Output Voltage vs. Magnetic Pole

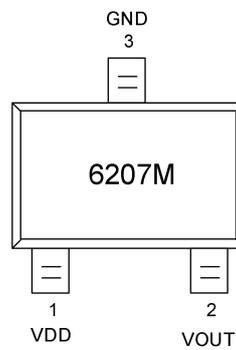


Note: The magnetic field is applied to the screen printing surface of the chip

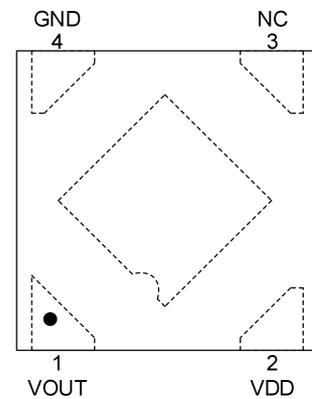
## PIN Configurations



TO-92S package



SOT23-3 package



DFN4L package

PIN Name	PIN NO.			Function
	TO-92S	SOT23-3	DFN4L	
VDD	1	1	2	Supply Power
GND	2	3	4	Ground
VOUT	3	2	1	Output
NC	-	-	3	NC

## Absolute Maximum Ratings

Parameter	symbol	value	unit
Supply Voltage	VDD	-0.3~5.5	V
Magnetic Flux Density	B	unlimited	Gs
Junction Temperature	T <sub>a</sub>	-40~125	°C
Storage Temperature	T <sub>s</sub>	-50~160	°C
ESD (HBM)	-	6000	V
Humidity Level	-	MSL3	-

**Note:** Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute-maximum rated conditions for extended periods may degrade device reliability.

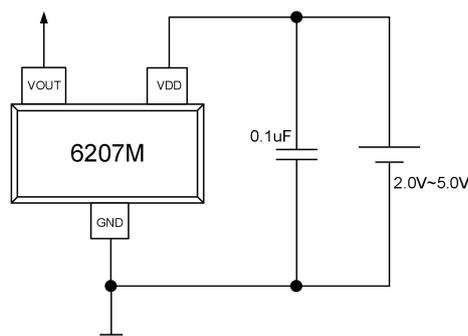
## Electrical Parameters (VDD=3.5V @ 25° C room temperature, unless specified otherwise)

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
Supply Power	V <sub>DD</sub>	-	2	5	5.5	V
Output High Voltage	V <sub>OH</sub>	I <sub>OUT(SOURCE)</sub> =0.5mA	VDD-0.2	-	-	V
Output Low Voltage	V <sub>OL</sub>	I <sub>OUT(SINK)</sub> =0.5mA	-	-	0.2	V
Supply Current	I <sub>DD (EN)</sub>		-	0.7	-	mA
	I <sub>DD (DIS)</sub>		-	1.6	-	uA
Average Current	I <sub>DD (AVG)</sub>	V <sub>OUT</sub> pin suspended	-	3	-	uA
Awake Time	T <sub>AWAKE</sub>		-	70	-	us
Output source current	I <sub>OUT(SOURCE)</sub>		-	-	0.5	mA
Output sink current	I <sub>OUT(SINK)</sub>		-	-	0.5	mA
Period	T <sub>PERIOD</sub>		-	32	-	ms
Duty Cycle	D.C.		-	0.2%	-	

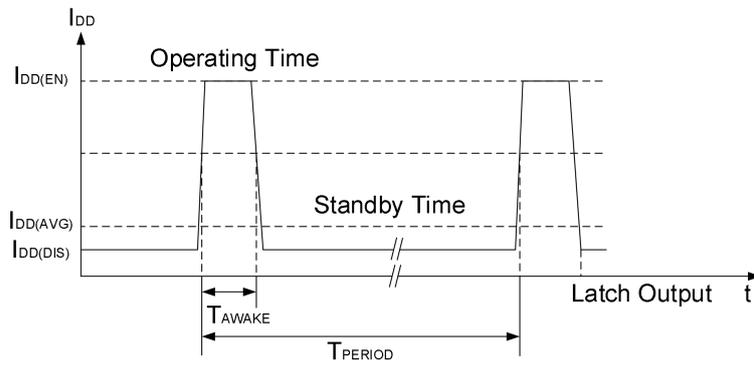
## Magnetic Specifications (the magnetic field is positive when the south pole is applied to the chip screen printing surface)

Parameter	Symbol	Condition	Min	Typ.	Max	Unit
South Operating Point	B <sub>OPS</sub>	VDD=3.5V @ T <sub>a</sub> =25°C	10	20	30	Gauss
South Release Point	B <sub>RPS</sub>	VDD=3.5V @ T <sub>a</sub> =25°C	5	15	25	Gauss
North Operating Point	B <sub>OPN</sub>	VDD=3.5V @ T <sub>a</sub> =25°C	-30	-20	-10	Gauss
North Release Point	B <sub>RPN</sub>	VDD=3.5V @ T <sub>a</sub> =25°C	-25	-15	-5	Gauss
Hysteresis	B <sub>HYS</sub>	VDD=3.5V @ T <sub>a</sub> =25°C	2	5	8	Gauss

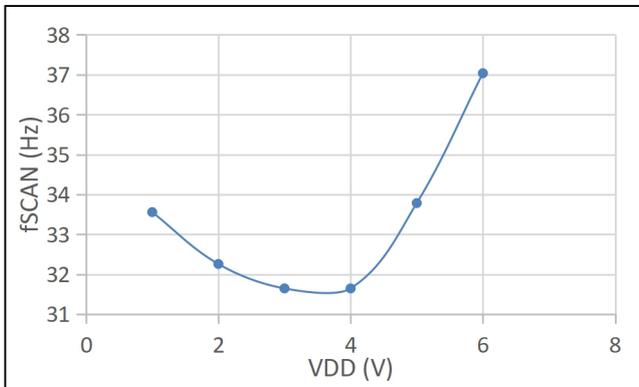
## Typical Application Circuit



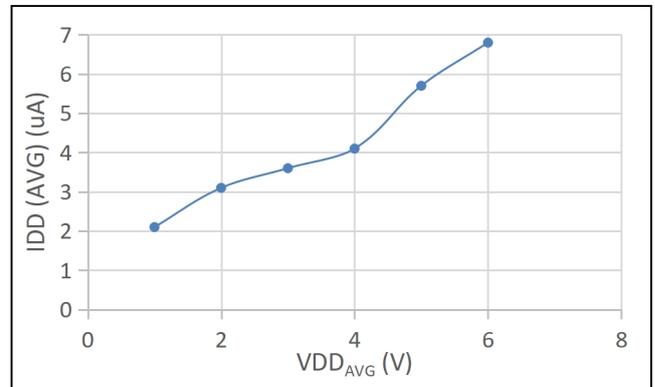
## Working sequence diagram



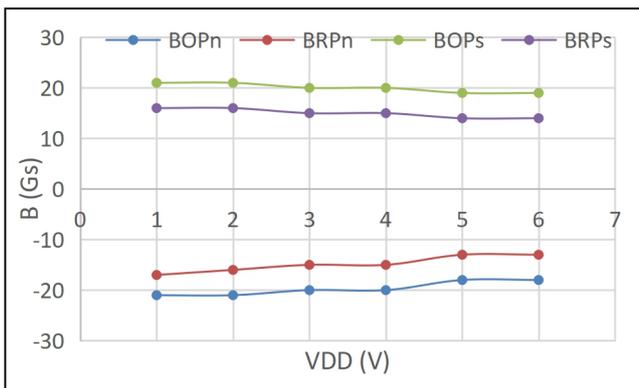
## Waveform (VDD=3.5V @ 25°C room temperature, unless specified otherwise)



f<sub>SCAN</sub> vs. V<sub>DD</sub>



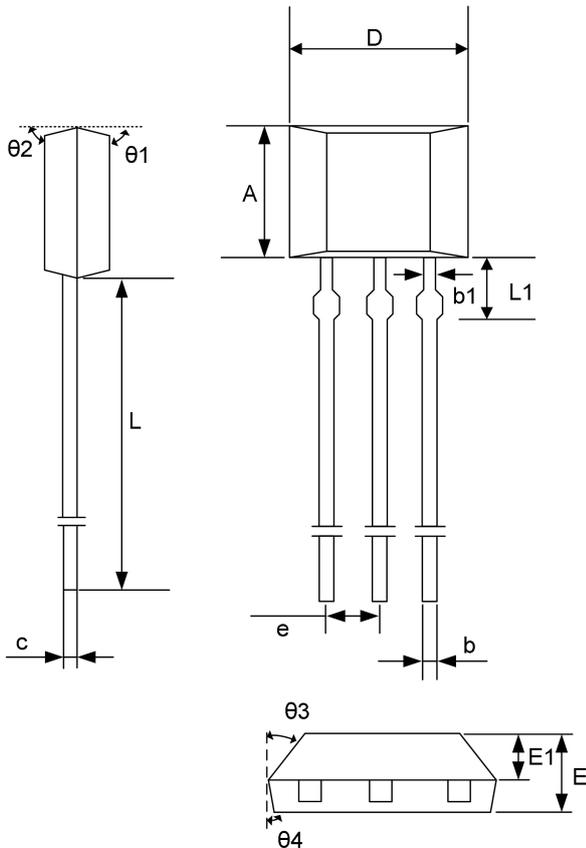
I<sub>DD(AVG)</sub> vs. V<sub>DD(AVG)</sub>



B vs. V<sub>DD</sub>

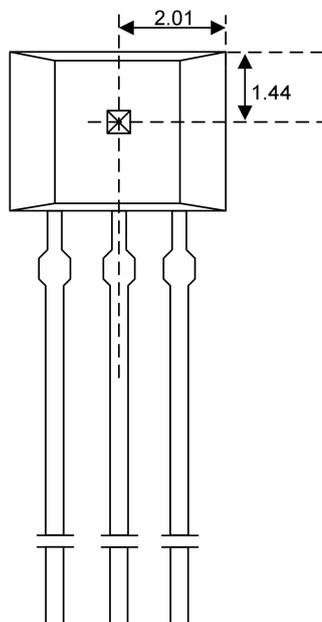
## Package Information

(1) TO-92S package



Symbol	Millimeter		
	Min	Typ	Max
A	2.90	3.00	3.10
b	0.35	0.39	0.56
b1	-	0.44	-
c	0.36	0.38	0.51
D	3.9	4.0	4.1
e	1.27BSC		
E	1.42	1.52	1.62
E1	-	0.75	-
L	13.5	14.5	15.5
L1	-	1.6	-
$\theta_1$	-	6°	-
$\theta_2$	-	3°	-
$\theta_3$	-	45°	-
$\theta_4$	-	3°	-

## Hall Location



## Notes:

All dimensions are in millimeters

## Marking:

1<sup>st</sup> Line: CC6207M - Name of the device

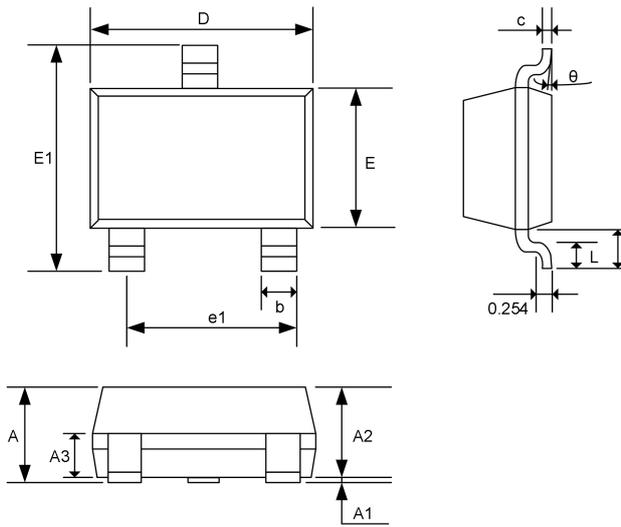
2<sup>nd</sup> line: XXYYWW

XX – code

YY – last 2 digits of year

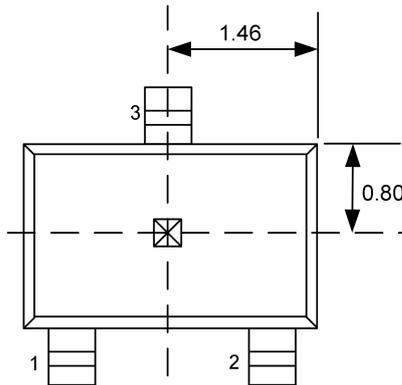
WW – week

(2) SOT23-3 Package



Symbol	Millimeter		
	Min	Typ	Max
A	-	-	1.35
A1	0.04	0.08	0.12
A2	1.00	1.10	1.20
A3	0.55	0.65	0.75
b	0.37	0.40	0.43
c	0.11	0.16	0.21
D	2.77	2.90	3.07
E	1.40	1.60	1.80
E1	2.70	2.85	3.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.55
L1	0.55	0.65	0.75
θ	0°	-	8°

Hall Location



Notes:

All dimensions are in millimeters

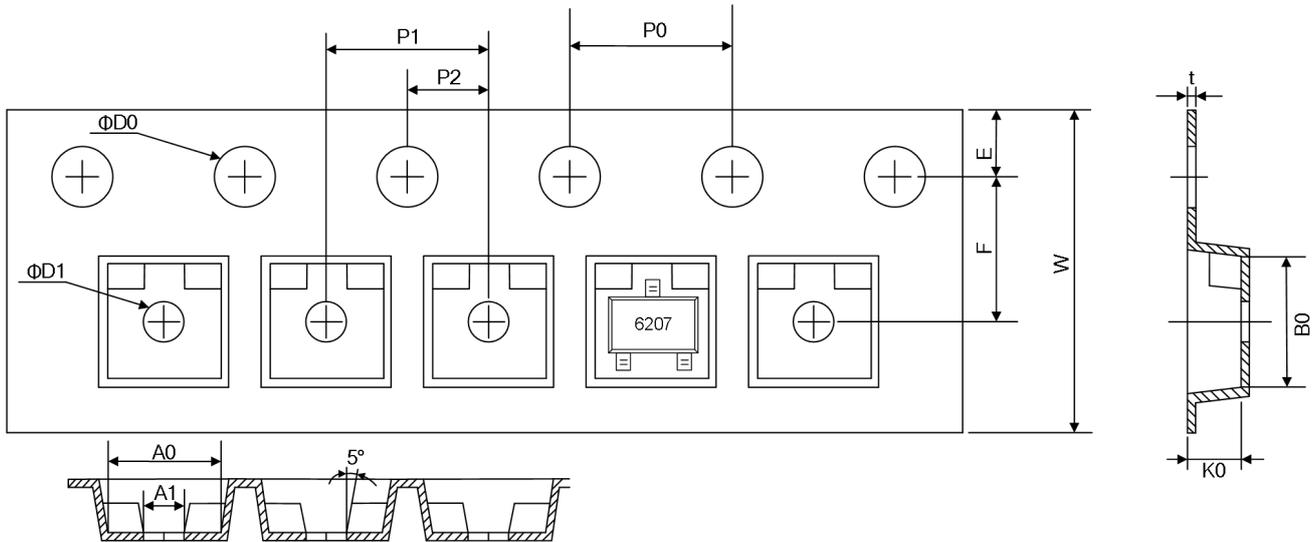
Marking:

1<sup>st</sup> Line: 6207M - Name of the device



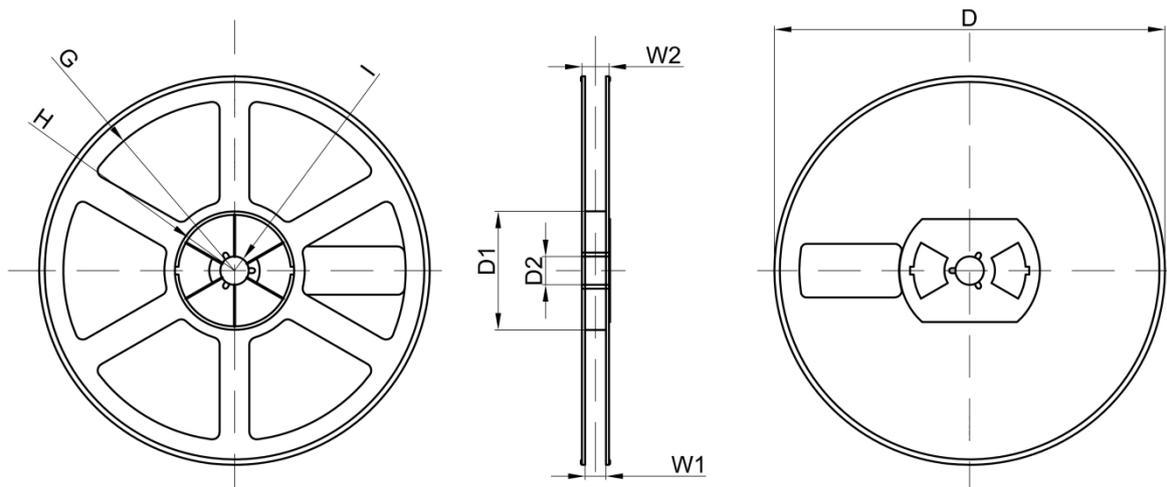
## Packaging & Tape reel

SOT23-3



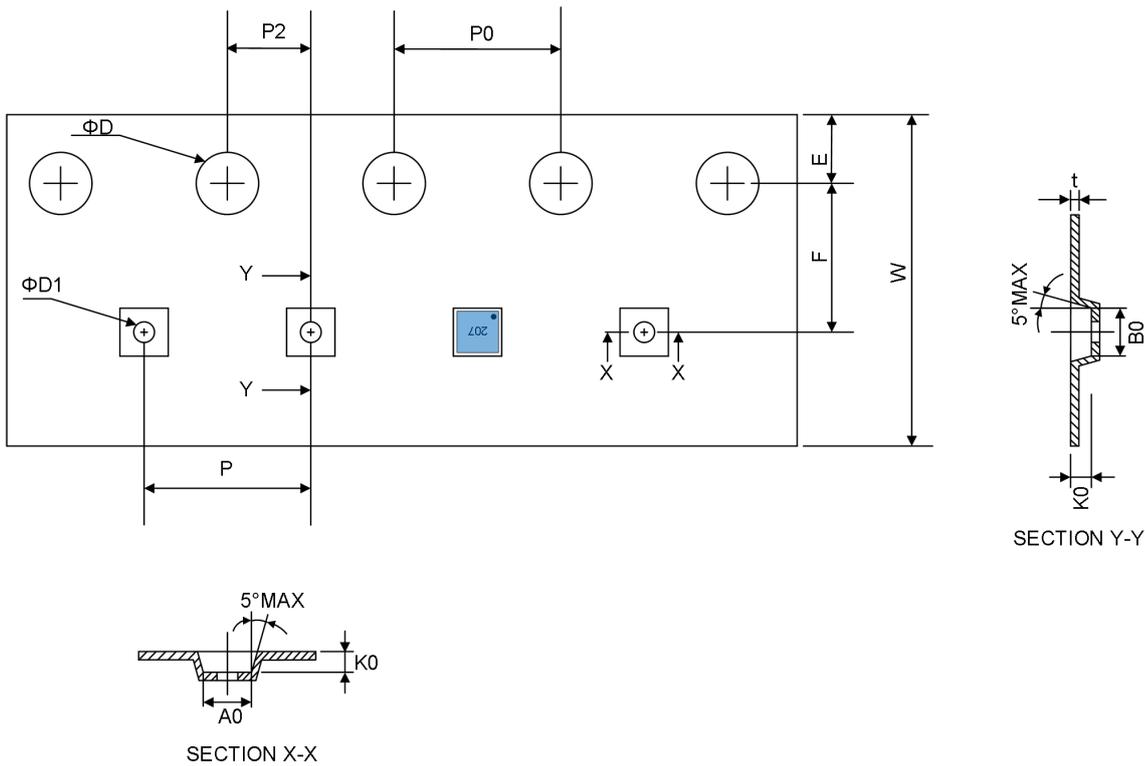
**Note:** Each plate has  $50 \pm 2$  grids in front of the tape and  $105 \pm 2$  in the tail

Symbol	Millimeter		
	Min	Typ	Max
W	7.90	8.00	8.10
E	1.65	1.75	1.85
F	3.40	3.50	3.60
D0	1.40	1.50	1.60
D1	0.90	1.00	1.10
P0	3.90	4.00	4.10
P1	3.90	4.00	4.10
P2	1.95	2.00	2.05
t	0.20	0.25	0.30
A0	3.15	3.20	3.25
A1	0.85	0.95	1.05
B0	3.20	3.25	3.30
K0	1.27	1.32	1.37
10*P0	39.80	40.00	40.20



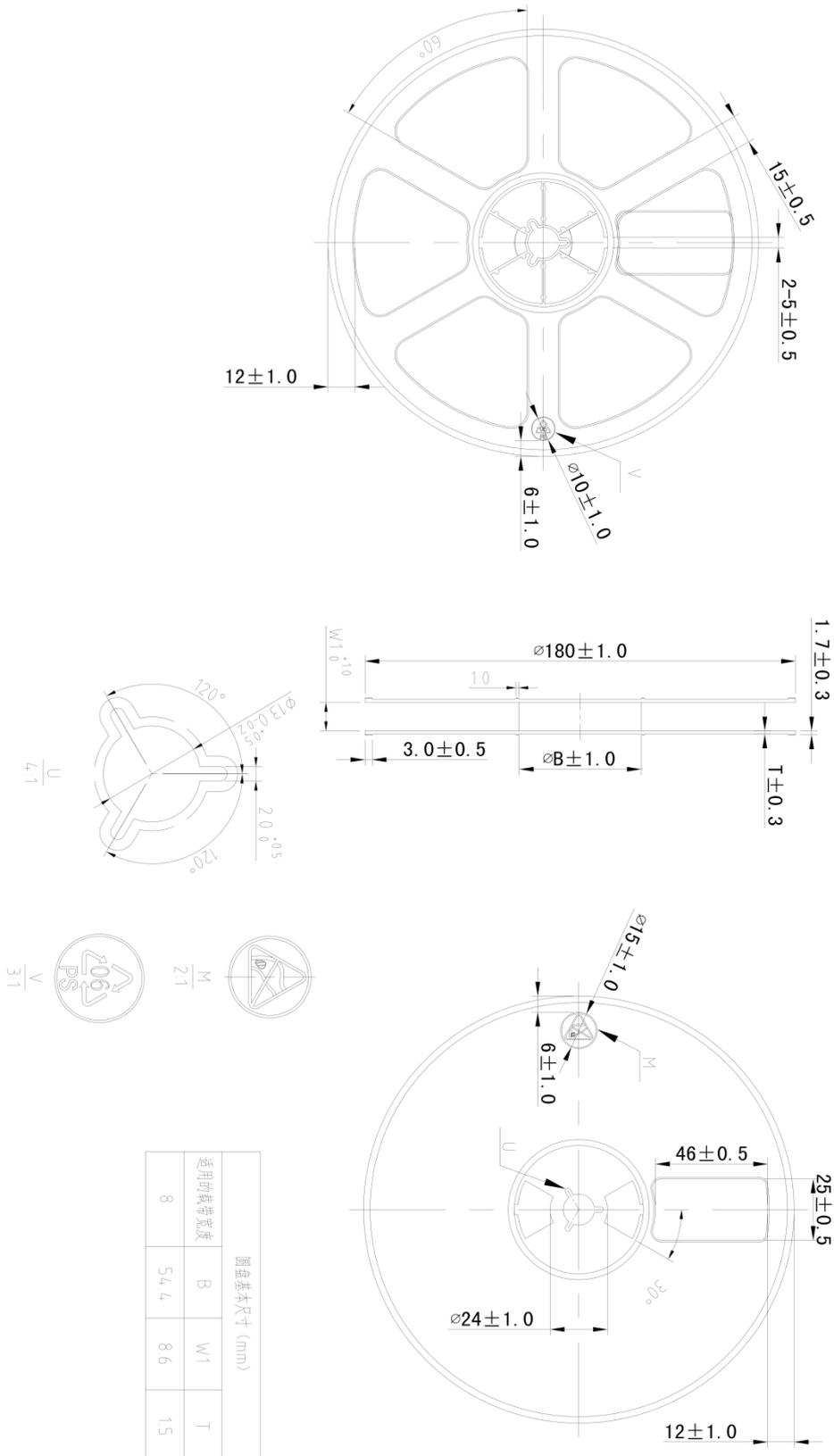
Symbol	Millimeter		
	Min	Typ	Max
D	-	Φ178	-
D1	-	54.40	-
D2	-	13.00	-
G	-	R78.00	-
H	-	R25.60	-
I	-	R6.50	-
W1	-	9.50	-
W2	-	12.30	-

DFN4L



**Note:** Each plate has  $30 \pm 2$  grids in front of the tape and  $140 \pm 2$  in the tail

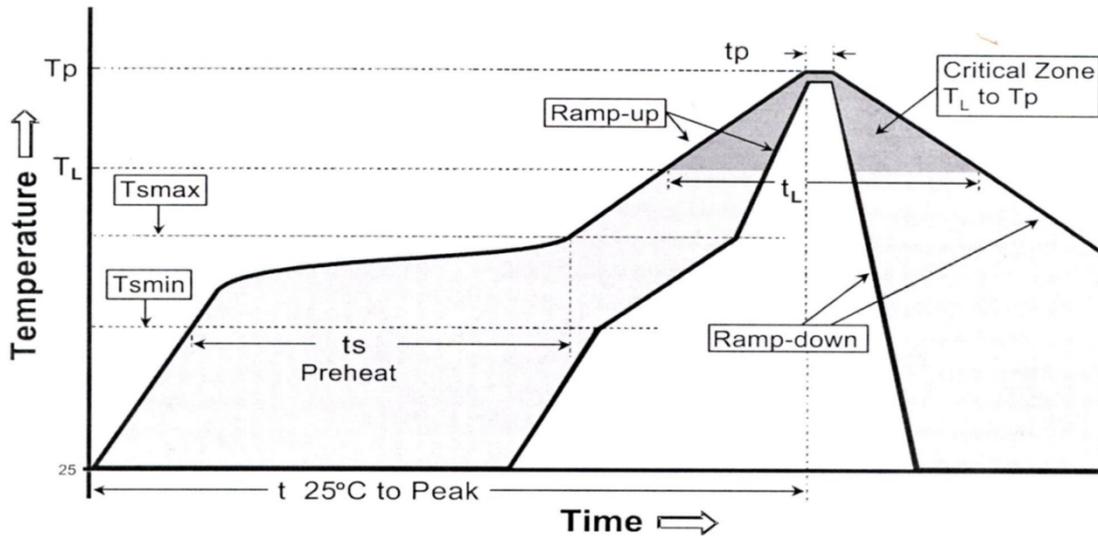
Symbol	Millimeter		
	Min	Typ	Max
E	1.65	1.75	1.85
F	3.45	3.50	3.55
P2	1.95	2.00	2.05
D	1.40	1.50	1.60
D1	0.45	0.50	0.55
P0	3.90	4.00	4.10
W	7.90	8.00	8.30
P	3.90	4.00	4.10
A0	1.11	1.16	1.21
B0	1.11	1.16	1.21
K0	0.48	0.53	0.58
t	0.23	0.25	0.27
10*P0	39.80	40.00	40.20



## Recommended welding conditions

### SOT23-3 Welding conditions

#### 1、 thermal reflow profile



#### 2、 Thermal reflow setting

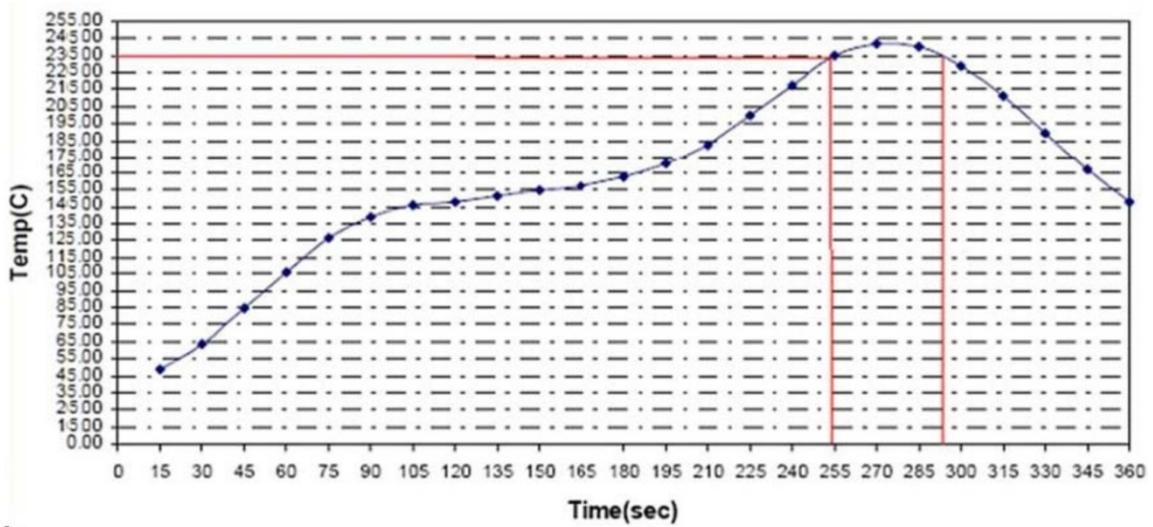
Distribution Map Features	Package thickness <2.5mm & Package volume<350mm <sup>3</sup>
Average tilt rise rate ( $T_L$ to $T_p$ )	Maximum 3°C/s
Preheat	
-Minimum Temperature ( $T_{smin}$ )	100°C
-Maximum Temperature ( $T_{smax}$ )	150°C
-Time (min-max) ( $t_s$ )	60s -120s
$T_{smax}-T_L$ Tilt rise rate	
Keep the above time	
-Temperature ( $T_L$ )	183°C
-Time ( $t_L$ )	60s -150s
Peak Temperature ( $T_p$ )	260 +0/-5°C
Time within 5°C of actual peak temperature ( $t_p$ )	20s - 40s
Tilt descent rate	Maximum 6°C/s
Time from 25°C to peak temperature	Maximum 6 min

#### 3、 Manual welding conditions

Manual welding conditions	260°C/10s
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## DFN4L Welding conditions

### 1、thermal reflow profile



### 2. Thermal reflow setting

Peak Temperature	245~252°C
Minimum Welding Temperature	240°C
Maximum warming rate	3°C/s
Maximum cooling rate	-4°C/s
Time of Temperature rising (150°C)	135s
Time of Temperature rising (150~200°C)	75s
Time of Temperature rising (25~200°C)	210s
Time of Temperature rising (200~217°C)	15s
Time of Temperature rising (>217°C)	70s
Total time 217~255°C	35~40s
Total time (>255°C)	0

## CrossChip

CrossChip Microsystems Inc. was founded in 2013, is a high-tech enterprise, engaged in integrated circuit design and sales. The company has strong technical strength, has more than 40 patents, mainly used in Hall sensor signal processing, with the following product lines:

- ✓ High precision linear Hall sensor
- ✓ All kinds of Hall switches
- ✓ Single phase motor drive
- ✓ Single chip current sensor
- ✓ AMR Magnetoresistance sensor

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