

CC6207

MicroPower, Ultra-Sensitive Hall effective switch

FEATURES

- ◆ Wide operating voltage, 2~5V
- ◆ micro power
- ◆ Fast response speed, working frequency is 40Hz
- ◆ Operating with North or South pole
- ◆ Superior temperature stability
- ◆ Extremely Low Switch-point Drift
- ◆ ESD (HBM) 6kV
- ◆ Small package size: SOT23-3 and DFN1010-4L package
- ◆ Comply with RoHS requirements

APPLICATION

- ◆ Instruments and Meters
- ◆ PDA
- ◆ Laptop

GENERAL DESCRIPTION

CC6207 is a micro-power, ultra sensitive, full polarity, and with latch output hall switch sensing device, which can directly replace the traditional magnetic reed switch. It is especially suitable for portable electronic products using battery power supply, such as mobile phones, laptops, Bluetooth headsets, forehead temperature guns and other kinds of low-power consumer products.

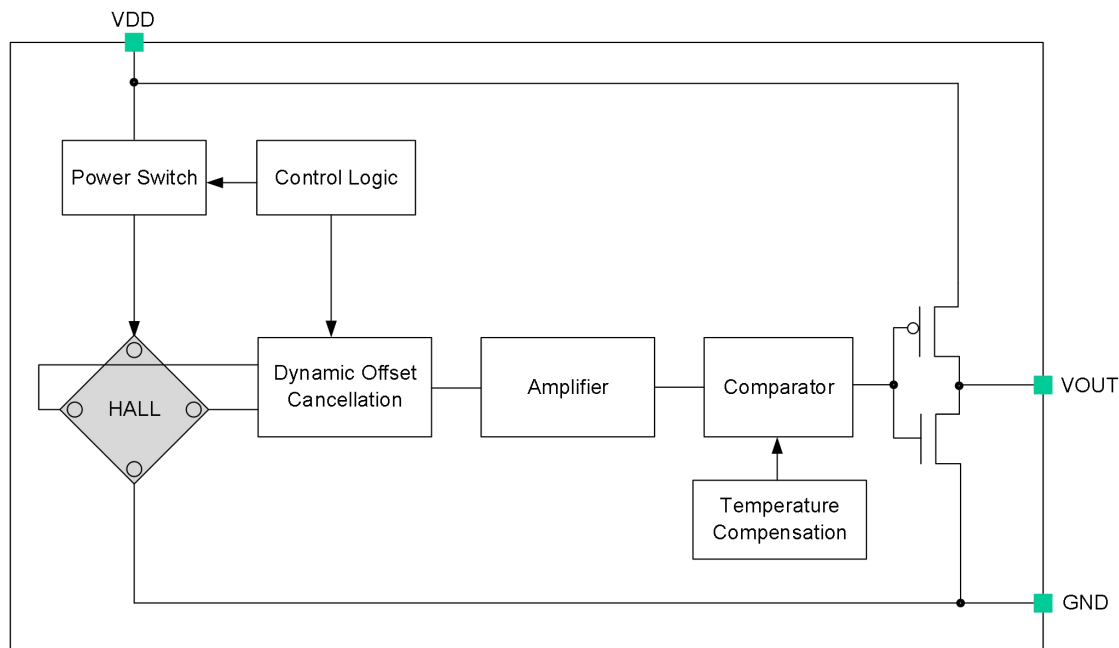
The CC6207 is fully polarised for magnetic field discrimination, i.e. it can be activated as soon as the magnetic north pole or south pole is close by, and the output is switched off when the magnetic field is withdrawn. Unlike other Hall sensors, the CC6207 does not require a specific south or north pole to operate, reducing the need to identify magnetic poles during assembly.

CC6207 includes hall sensor, Voltage stabilizing module, a small-signal amplifier, dynamic offset cancellation, latch module and CMOS output stage. Because CC6207 uses advanced BiCMOS technology, the overall circuit structure is optimized, so that the product can obtain very low input error feedback.

The product adopts dynamic offset cancellation technology, which eliminates misalignment voltages caused by package stresses, thermal stresses, and temperature gradients to improve device uniformity. At the same time, the product adopts its miniaturized packaging process, which makes the product have higher performance and market advantages.

CC6207 is available in TO-92S, SOT23-3 and DFN1010-4 packages. The operating temperature is -40°C to 125°C.

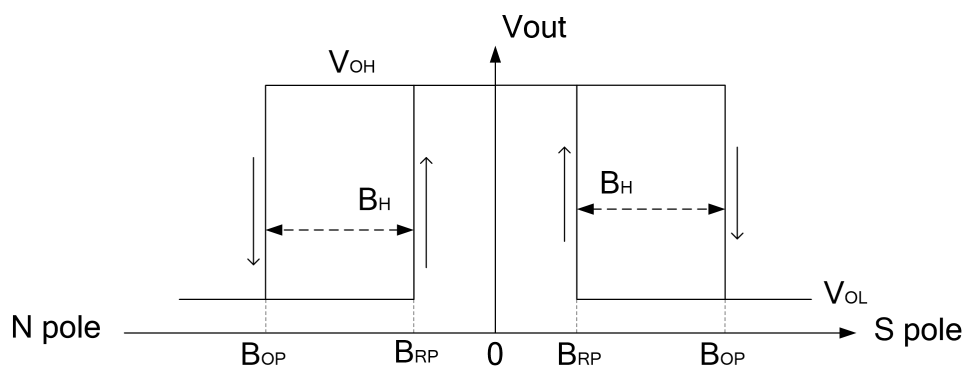
FUNCTION BLOCK DIAGRAM



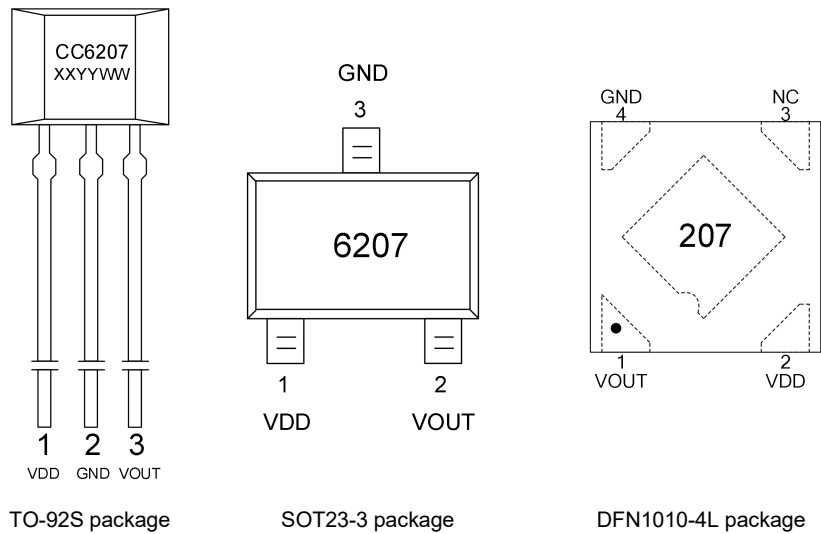
ORDERING INFORMATION

Part No.	Package Code	Packing Form
CC6207TO	TO-92S	bulk, 1000 pcs/bulk
CC6207ST	SOT23-3	tape reel, 3000 pcs/reel
CC6207DN	DFN1010-4L	tape reel, 5000 pcs/reel
CC6207BP1010	DFN1010-4L	tape reel, 5000 pcs/reel

OUTPUT VOLTAGE vs. MAGNETIC POLE



PIN CONFIGURATIONS



Pin Name	PIN NO.			FUNCTION
	TO-92S	TSOT23-3	DFN1010-4L	
V _{DD}	1	1	2	Supply voltage
GND	2	3	4	GND
V _{OUT}	3	2	1	OUT
-	-	-	3	NC

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Supply Voltage	V _{DD}	-0.3~5.5	V
Magnetic Flux Density	B	unlimited	Gauss
Junction Temperature	T _A	-40~125	°C
Storage Temperature	T _S	-50~160	°C
ESD(HBM)		6	kV
Moisture Sensitivity Level		MSL3	

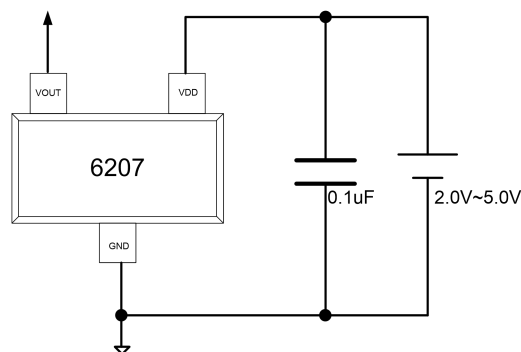
ELECTRICAL PARAMETERS (V_{DD}=3.5V @ 25°C room temperature, unless specified otherwise)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V _{DD}	-	2	5	5.5	V
Output High Voltage	V _{OH}	I _{OUT(SOURCE)} =0.5mA	V _{DD} -0.2	-	-	V
Output Low Voltage	V _{OL}	I _{OUT(SINK)} =0.5mA	-	-	0.2	V
Average Current	I _{DD(AVG)}	V _{OUT} pin is NC.	-	3	-	uA
Enable Current	I _{DD(EN)}		-	0.7	-	mA
Disable Current	I _{DD(DIS)}		-	1.6	-	uA
Output Source Current	I _{OUT(SOURCE)}		-	-	0.5	mA
Output Sink Current	I _{OUT(SINK)}		-	-	0.5	mA
Awake Time	T _{AWAKE}		-	50	100	us
Period	T _{PERIOD}		-	22	-	ms
Duty Cycle	D.C.		-	0.2	-	%

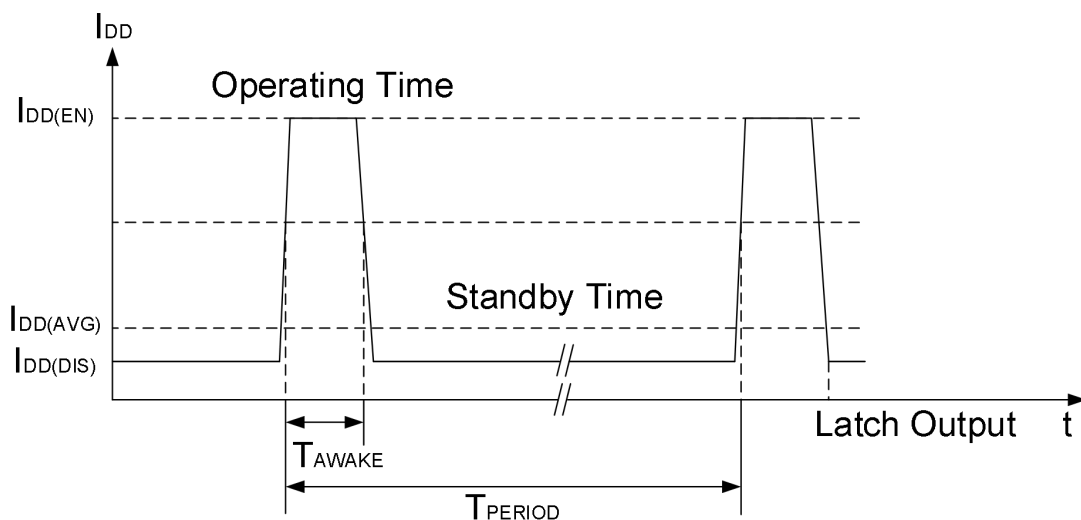
MAGNETIC SPECIFICATIONS (The magnetic field is applied to the chip screen printing surface with the south pole as positive)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Point(south)	B _{OPS}	V _{DD} =3.5V @ T _a =25°C	10	20	30	Gs
Release Point(south)	B _{RPS}	V _{DD} =3.5V @ T _a =25°C	5	15	25	Gs
Operating Point(north)	B _{OPN}	V _{DD} =3.5V @ T _a =25°C	-30	-20	-10	Gs
Release Point(north)	B _{RPN}	V _{DD} =3.5V @ T _a =25°C	-25	-15	-5	Gs
Hysteresis	B _{HYS}	V _{DD} =3.5V @ T _a =25°C	2	5	8	Gs

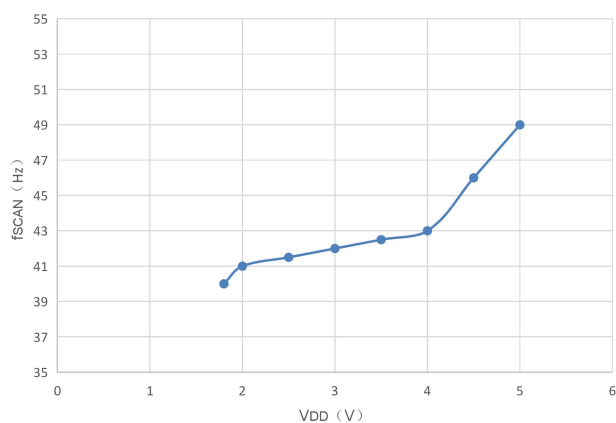
TYPICAL APPLICATION CIRCUIT



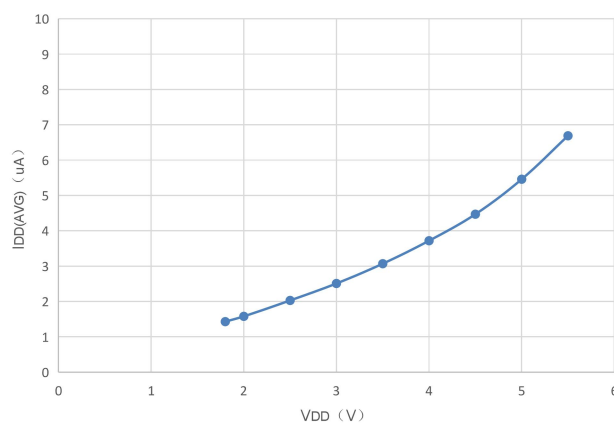
OPERATING TIMING DIAGRAM



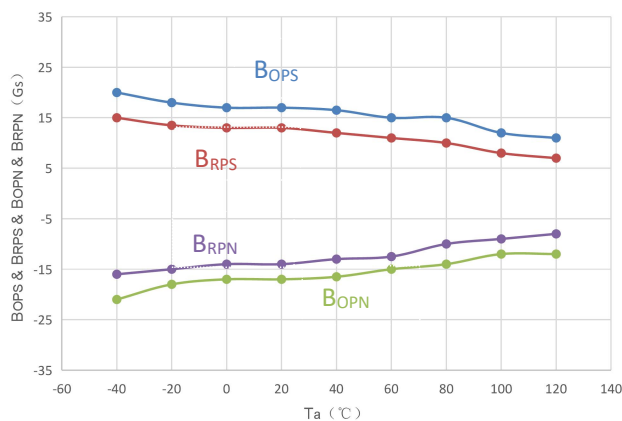
Curve & Waveform (VDD=3.5V @ 25°C room temperature, unless specified otherwise)



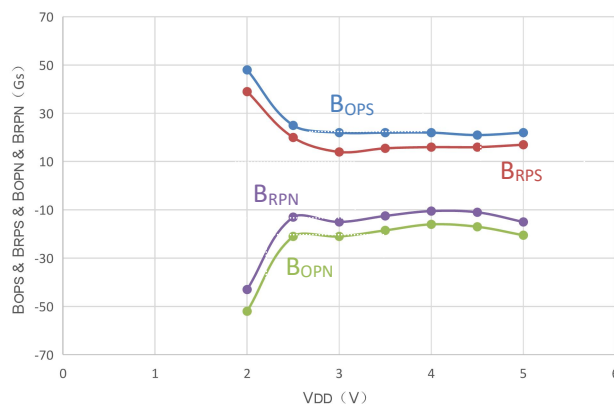
f_SCAN VS. VDD



I_DD(AVG) VS. VDD



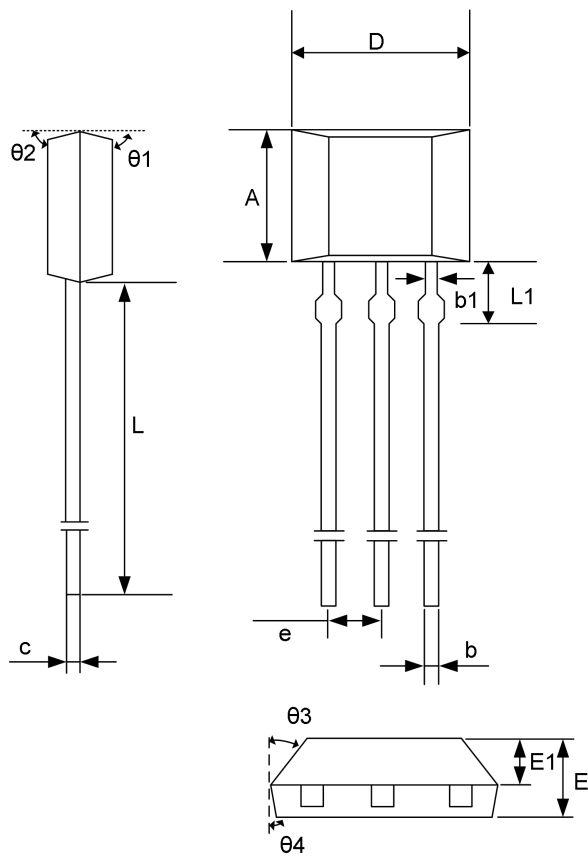
B vs. T_a



B vs. VDD

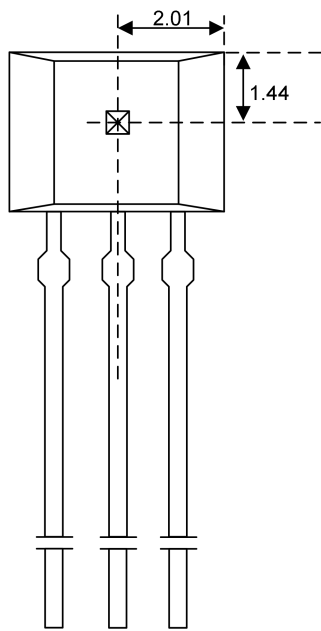
PACKAGE INFORMATION

(1)TO-92S Package



符号	毫米		
	最小值	典型值	最大值
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:

1st Line: CC6207 - Name of the device

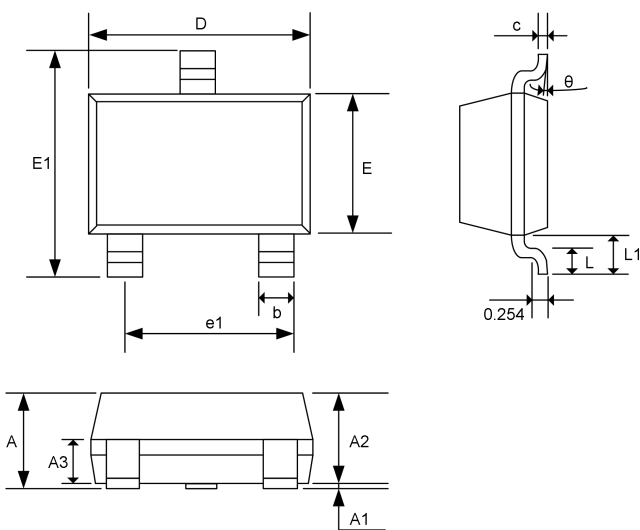
2nd Line: YYWW

YY - assembly year (last 2 digits)

WW - production batch number

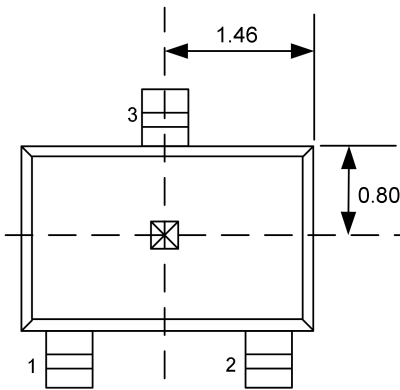


(2)SOT23-3 package



符号	毫米		
	最小值	典型值	最大值
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°

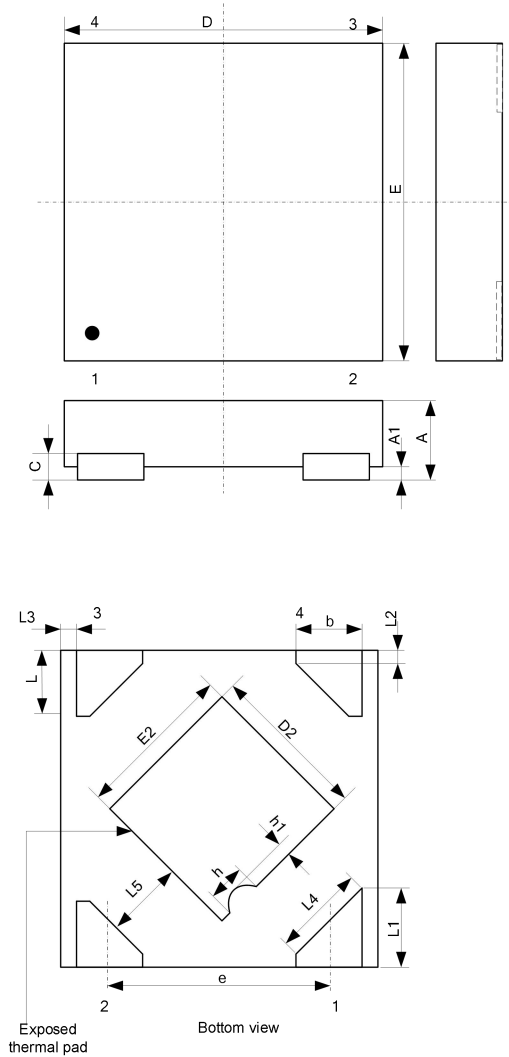
Hall location



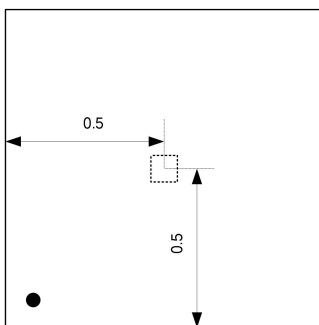
Notes:
All dimensions are in millimeters

Marking:
6207

(3)DFN1010-4L package



Hall location



Symbol	Millimeter		
	Min.	Typ	Max.
A	0.35	-	0.40
A1	0.00	0.02	0.05
b	0.20	0.25	0.30
c	0.07	0.12	0.17
D	0.95	1.00	1.05
D2	0.38	0.48	0.58
e	0.65BSC		
E	0.95	1.00	1.05
E2	0.38	0.48	0.58
L	0.20	0.25	0.30
L1	0.27	0.32	0.37
L2	0.077REF		
L3	0.05REF		
L4	0.34REF		
L5	0.20REF		
h	0.09REF		
h1	0.03REF		

Notes:

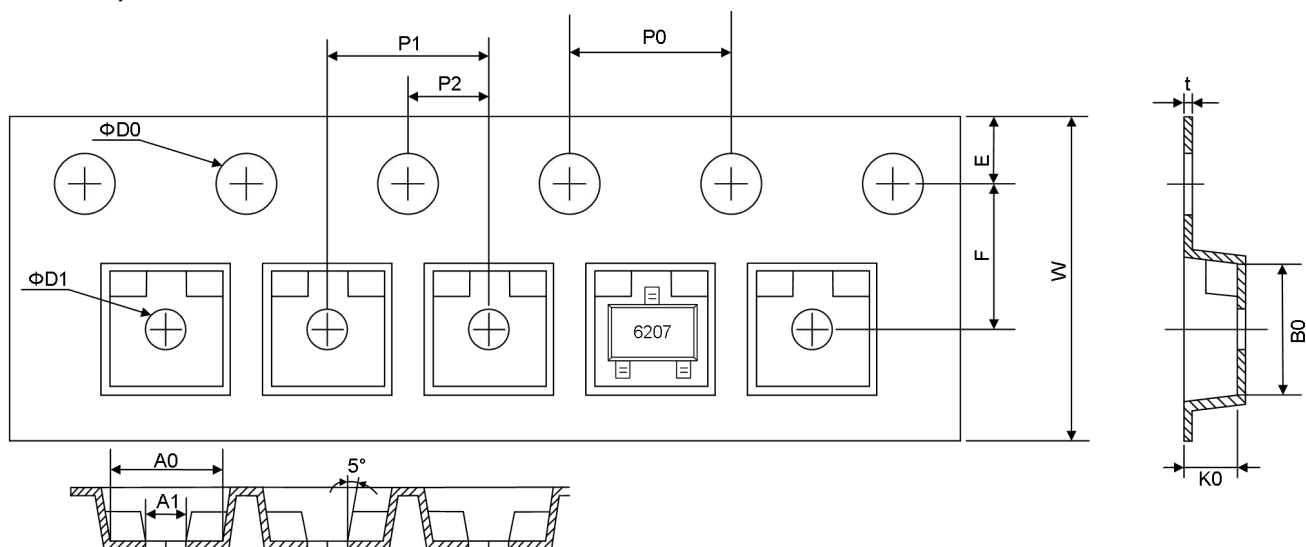
All dimensions are in millimeters

Marking:

207

TAPE AND REEL INFORMATION

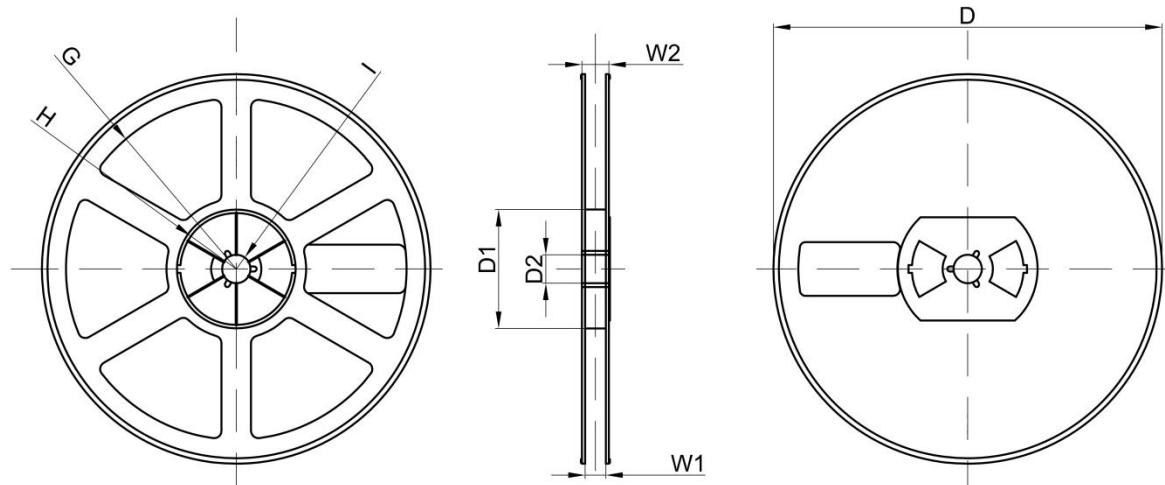
SOT23-3 Tape



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

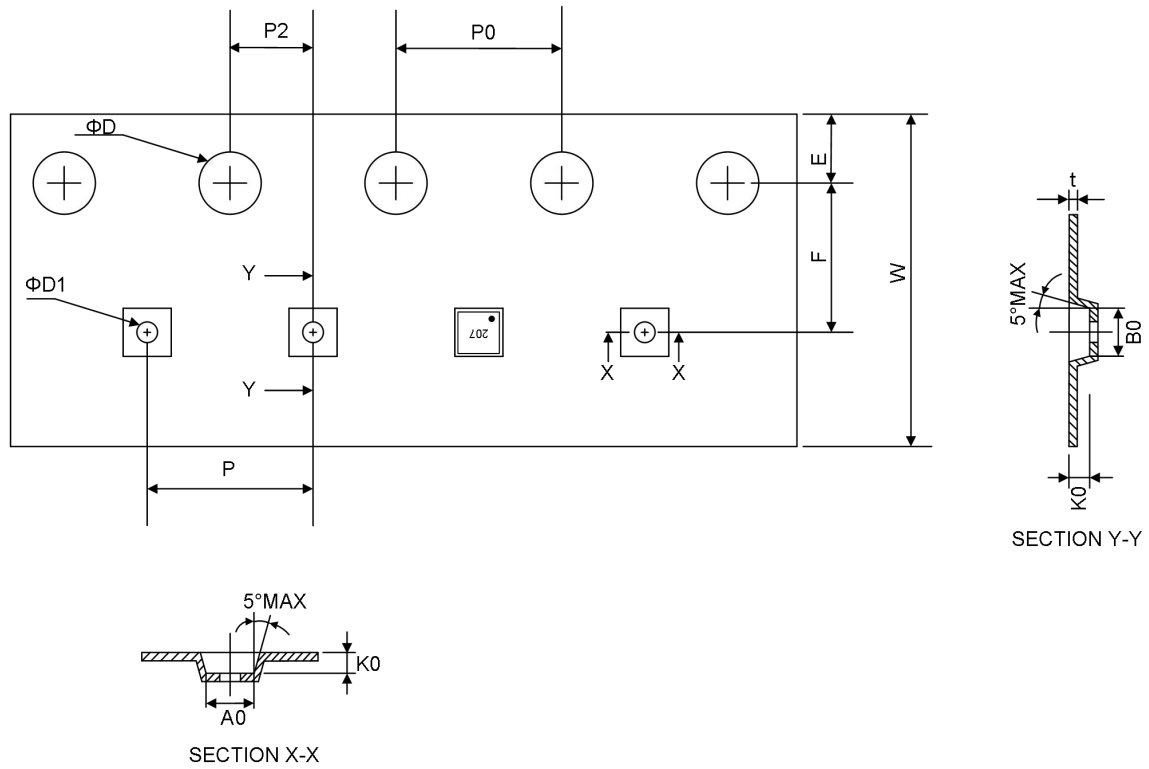
Note: Each plate has 50 ± 2 grids in front of the tape and 105 ± 2 in the tail

SOT23-3/TSOT23-3 Reel



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	-

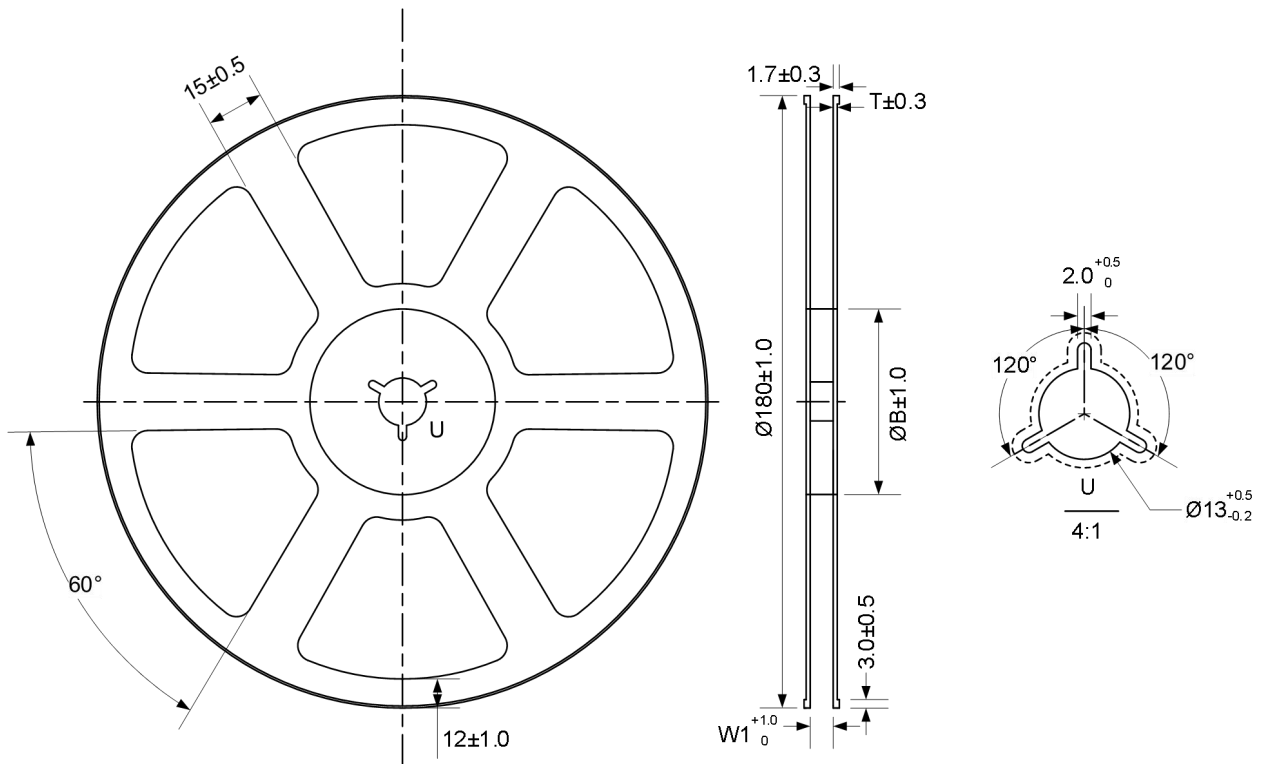
DFN1010-4L Tape



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

Note: Each plate has 30 ± 2 grids in front of the tape and 140 ± 2 in the tail.

DFN1010-4L Reel

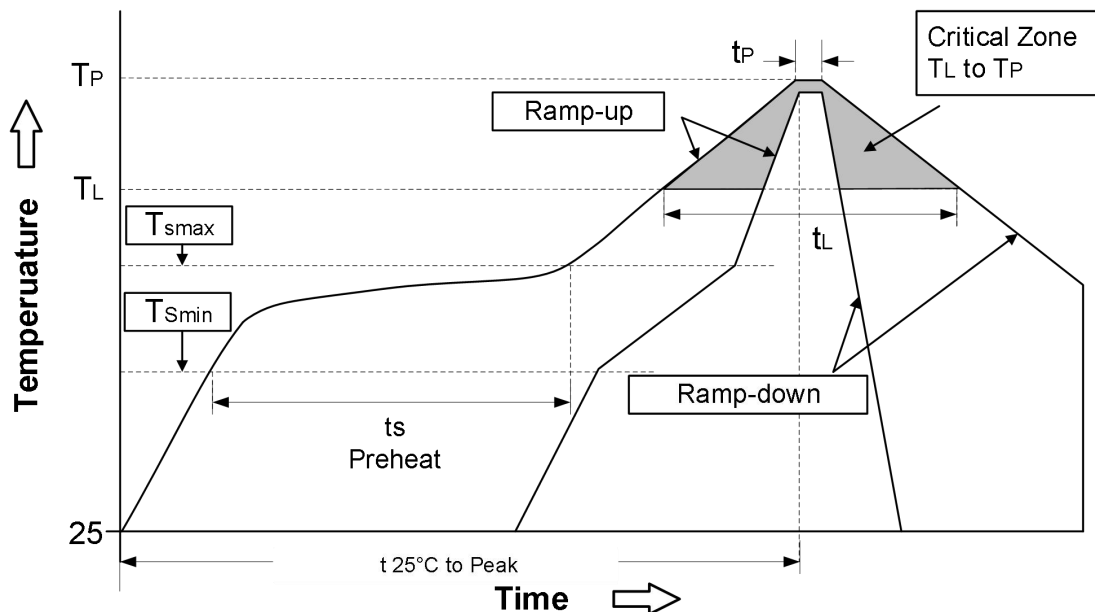


Reel Basic Size(mm)			
Applicable Carrier Tape Width	B	W1	T
8	54.5	8.6	15

RECOMMENDED WELDING CONDITIONS

SOT23-3 Welding Conditions

1、Thermal reflow profile



2、Thermal reflow setting

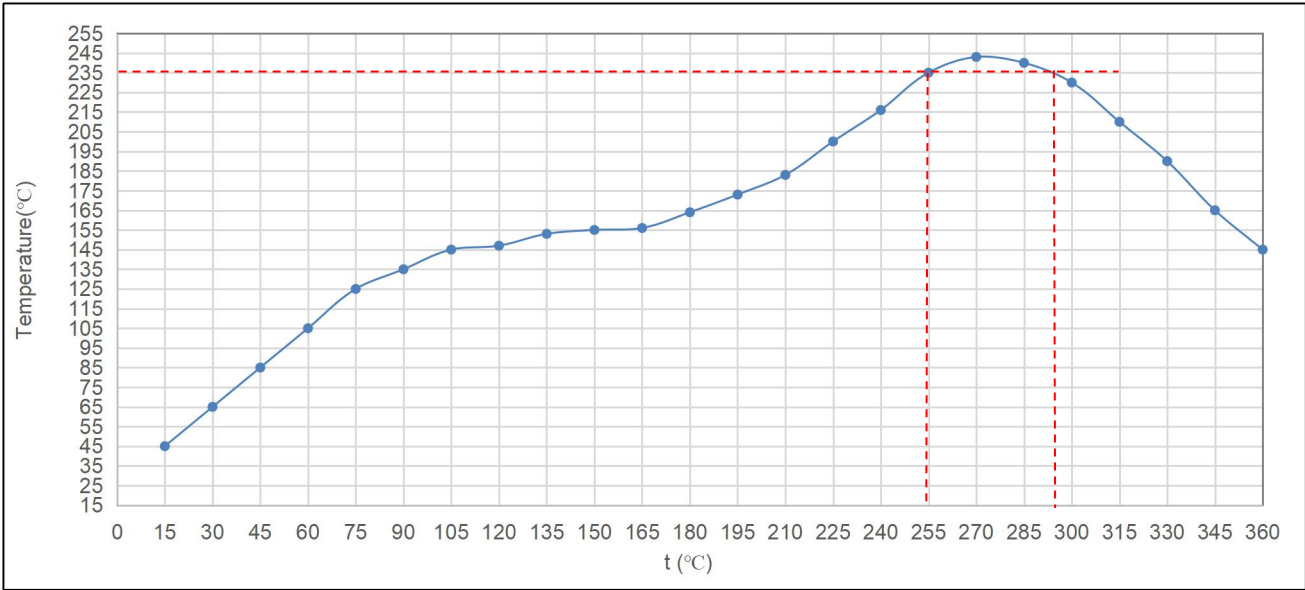
Distribution Map Features	Package thickness <2.5mm & Package volume<350mm ³
Average tilt rise rate (T_L to T_P)	Maximum 3°C/s
Preheat	
-Minimum Temperature (T_{smin})	100°C
-Maximum Temperature (T_{smax})	150°C
-Time (min-max) (t_s)	60-120s
$T_{smax}-T_L$ tilt rise rate	
Keep the above time	
-Temperature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

DFN1010-4L 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

REVISION HISTORY

Revision Date	Description of Revision	Revision
2024.07.05	在订购信息中补充 DFN1010-4L 封装的历史遗漏料号。 Supplement the ordering information with the historical missing material Part No. for the DFN1010-4L package.	rev1.5

CrossChip

CrossChip Microsystems Inc. was founded in 2013, is a national high-tech enterprise, engaged in integrated circuit design and sales. The company has strong technical strength, has more than 60 kinds of 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
- ✓ Isolation drive class chip

Contact us

Chengdu

Address: 4th floor, unit 2, building 3, No. 88, Tianchen Road, Gaoxinxi Zone, Chengdu, Sichuan Province

Tel: + 86 - 028 - 87787685

Email: support@crosschipmicro.com

Website: <https://www.crosschipmicro.com>

Shenzhen

Address: 605 room, 6F, Beike building, NO.18 Keyuan Rd, Yuehai Street, Nanshan District, Shenzhen

Shanghai

Address: Room 602, Building 1, Shengda Tiandi Yuanchuanggu, No. 88, Shengrong Road, Pudong New District, Shanghai

Suzhou

Address: NO.78 Jinshan Rd East, Suzhou High-tech Zone, Huqiu District, Suzhou City, Jiangsu Province