MH 182 Hall-Effect sensor is a temperature stable, stress-resistant latch. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

MH 182 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, and a short circuit protected open-drain output. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

This device requires the presence of both south and north polarity magnetic fields for operation. In the presence of a south polarity field of sufficient strength, the device output latches on, and only switches off when a north polarity field of sufficient strength is present.

MH 182 is rated for operation between the ambient temperatures –40°C and 85°C for the E temperature range, and –40°C to 125°C for the K temperature range. The two package styles available provide magnetically optimized solutions for most applications. Package SO is an SOT-23, a miniature low-profile surface-mount package, while package UA is a three-lead ultra mini SIP for through-hole mounting.

The package type is in a Green version was verified by third party Lab.

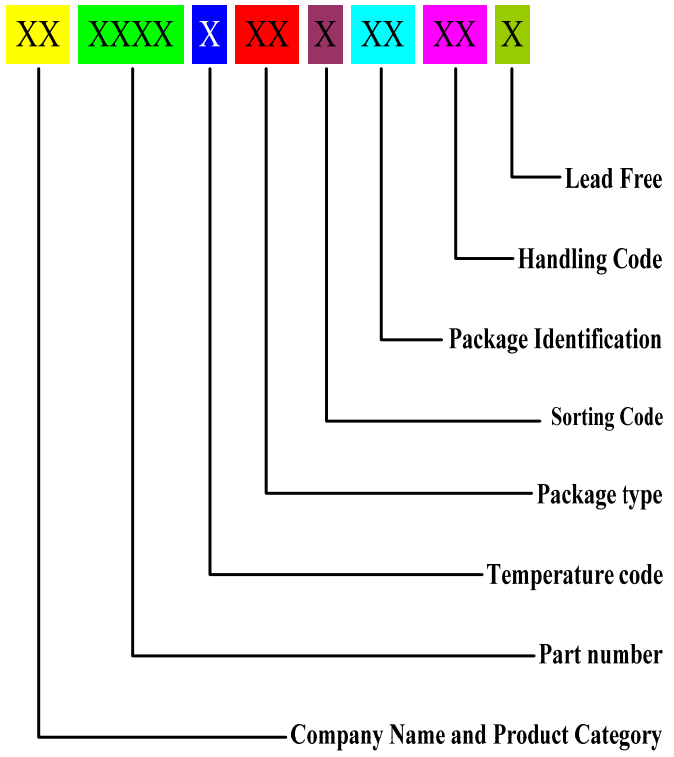
Features and Benefits

- Chopper stabilized amplifier stage
- Optimized for BLDC motor applications
- New miniature package / thin, high reliability package
- Operation down to 3.0V
- 100% tested at 125 ℃ for K.
- Custom sensitivity / Temperature selection are available.

Applications

- High temperature Fan motor
- 3 phase BLDC motor application
- Speed sensing
- Position sensing
- Current sensing
- Revolution counting
- Solid-State Switch
- Linear Position Detection
- Angular Position Detection
- Proximity Detection

Ordering Information



Company Name and Product Category

MH:MST Hall Effect/MP:MST Power MOSFET

Part number

181,182,183,184,185,248,249…

Temperature range

E: 85 Degree C, K: 125 Degree C, L: 150 Degree C

Package type

UA:TO-92S,VK:TO-92S(4pin),VF:TO-92S(5pin),SO:SOT-23,

SQ:QFN-3,ST:TSOT-23,SN:SOT-553,SF:SOT-89(5pin)

Sorting

α, β,Blank…..

Package Identification Code

01,02,03…..

Handling Code

BLANK: ESD bag, TR: Tape & Reel

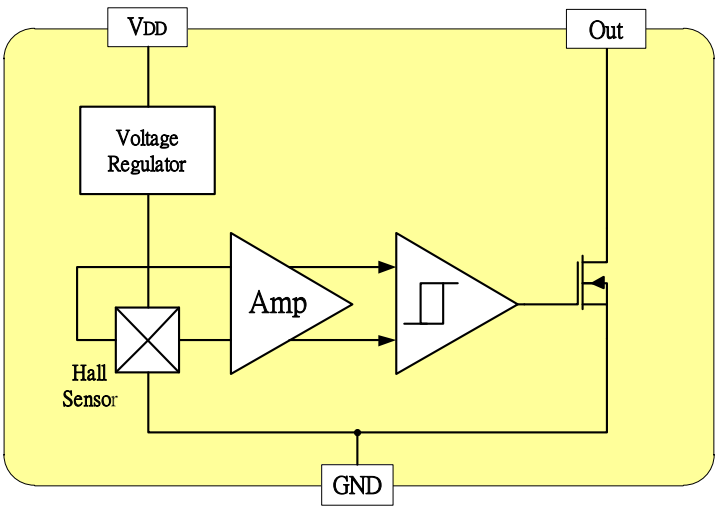
Lead Free Code

BLANK: Lead Free Device ,G: Green

Part No.	Temperature Suffix	Package Type
MH 182	K (-40℃ to + 125℃)	UA (TO-92S)
	K (-40℃ to + 125℃)	SO (SOT-23)
	E (-40℃ to + 85℃)	UA (TO-92S)
	E (-40℃ to + 85℃)	SO (SOT-23)

KUA spec is using in industrial and automotive application. Special Hot Testing is utilized.

Functional Diagram



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Absolute Maximum Ratings *At (Ta=25°C)*

Characteristics		Values	Unit
Supply voltage,(V_{DD})		26	V
Out voltage, (V_{OUT})		26	V
Reverse voltage , (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current , (I_{OUT})		50	mA
Operating Temperature Range, (Ta)	"E" version	-40 to +85	°C
	"K" version	-40 to +125	°C
Storage temperature range, (Ts)		-65 to +150	°C
Maximum Junction Temp,(Tj)		150	°C
Thermal Resistance	(θ_{ja}) UA / SO	206 / 543	°C / W
	(θ_{jc}) UA / SO	148 / 410	°C / W
Package Power Dissipation, (P_D) UA / SO		606 / 230	mW

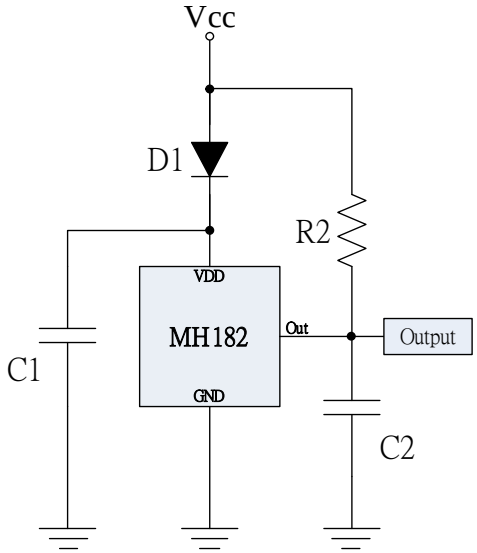
***Note**: Do not apply reverse voltage to* V_{DD} *and* V_{OUT} *Pin, It may be caused for Miss function or damaged device.*

Electrical Specifications

DC Operating Parameters T_A=+25℃, V_{DD}=12V (Unless otherwise specified)

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Operating	3.0		24.0	Volts
Supply Current	B<Bop			5.0	mA
Output Saturation Voltage	I_{OUT} = 20 mA, B>B_{OP}			400.0	mV
Output Leakage Current	I_{OFF} B<B_{RP}, V_{OUT} = 12V			15.0	uA
Output Rise Time	V_{DD} = 12V, R_L=1kΩ, CL =20pF			0.45	uS
Output Fall Time	R_L=1kΩ; C_L=20pF			0.45	uS

Typical application circuit



D1：1N4148 or 100Ω
C1：1000PF
C2：15PF
R2：10KΩ

MH 182 Magnetic Specifications

DC Operating Parameters T_A=25℃, V_{SUPPLY}=12V

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Operate Point	Bop		10		60	Gauss
Release Point	Brp		-60		-10	Gauss
Hysteresis	Bhys			80		Gauss

MH182-α Magnetic Specifications

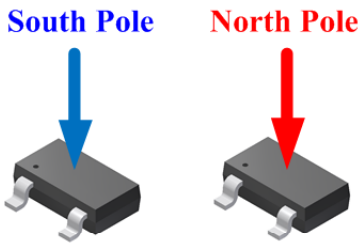
DC Operating Parameters T_A=25℃, V_{SUPPLY}=12V

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Operate Point	Bop		10		40	Gauss
Release Point	Brp		-40		-10	Gauss
Hysteresis	Bhys			70		Gauss

Output Behavior versus Magnetic Pole

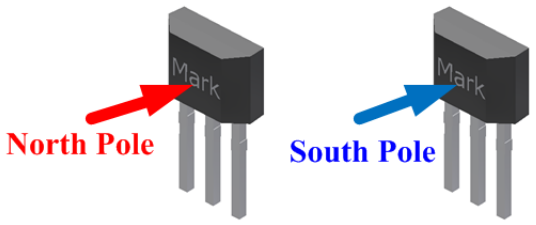
DC Operating Parameters Ta = -40 to 125℃, Vdd = 3.0 to 24V (unless otherwise specified)

Parameter	*Test condition(SO)*	*OUT(SO)*	*Test condition(UA)*	*OUT(UA)*
North pole	B>Bop	Low	B>Bop	Open
South pole	B<Brp	Open	B<Brp	Low



OUT=Open (Pull-up Voltage)

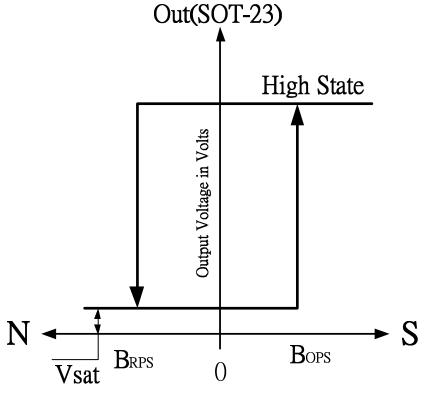
OUT=Low (V_{DSon})



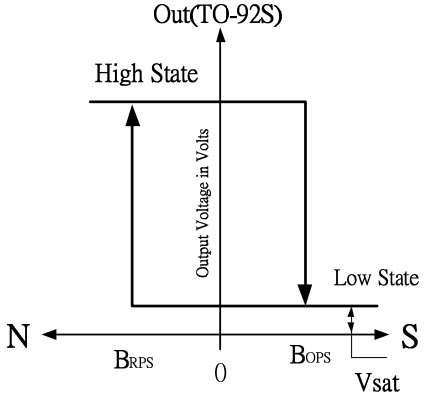
OUT=Open (Pull-up Voltage)

OUT=Low (V_{DSon})

SO package

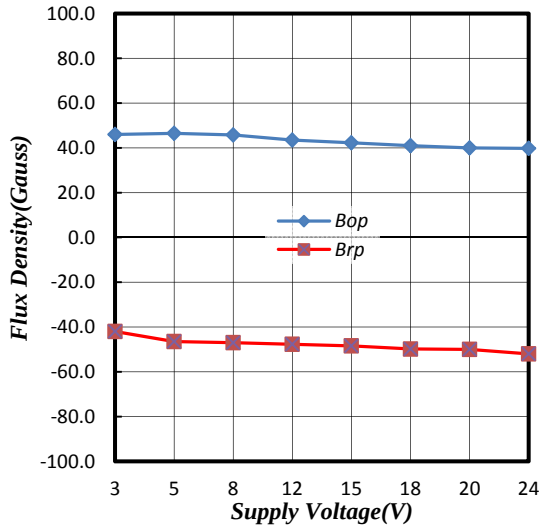


UA package

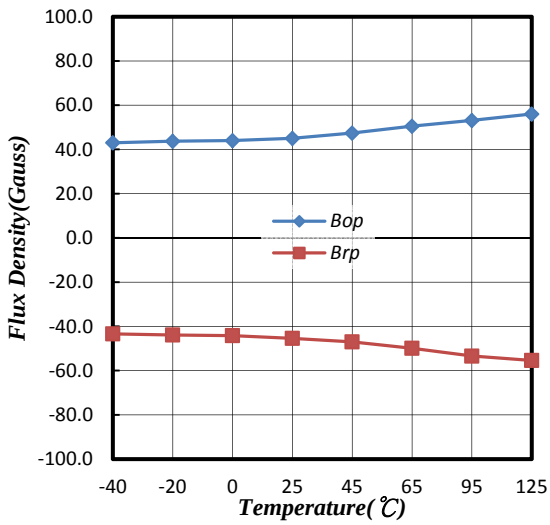


Performance Graph

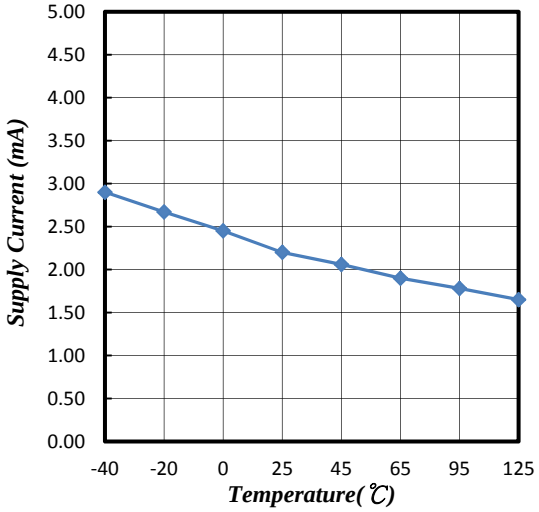
Typical Supply Voltage(V_{DD}) Versus Flux Density



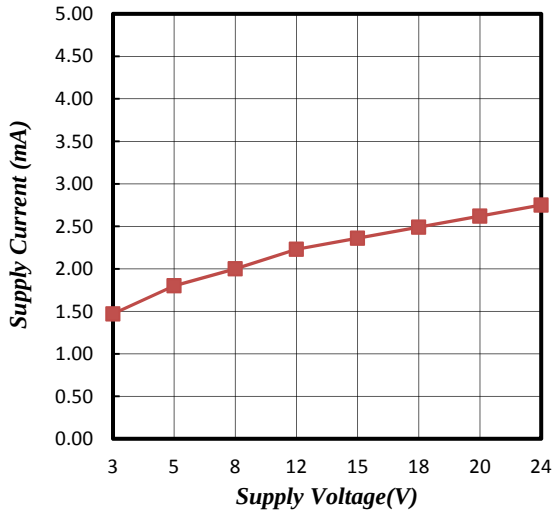
Typical Temperature(T_A) Versus Flux Density



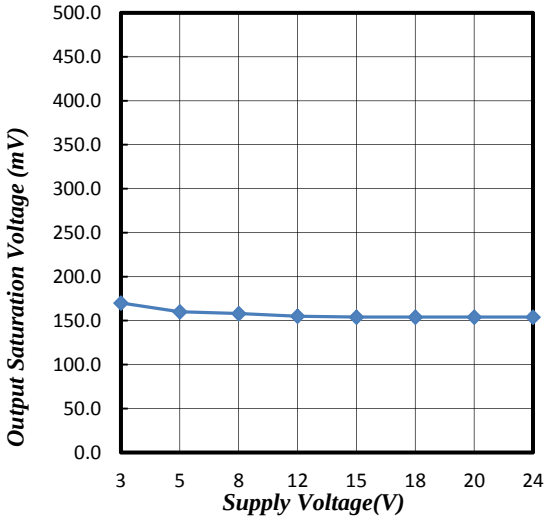
Typical Temperature(T_A) Versus Supply Current(I_{DD})



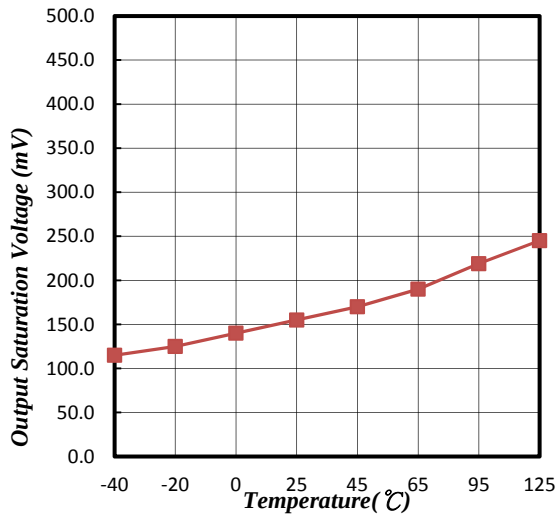
Typical Supply Voltage(V_{DD}) Versus Supply Current(I_{DD})



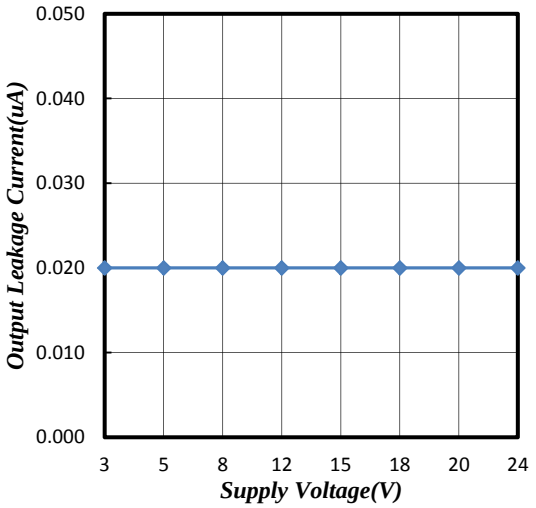
Typical Supply Voltage(V_{DD}) Versus Output Voltage(V_{DSON})



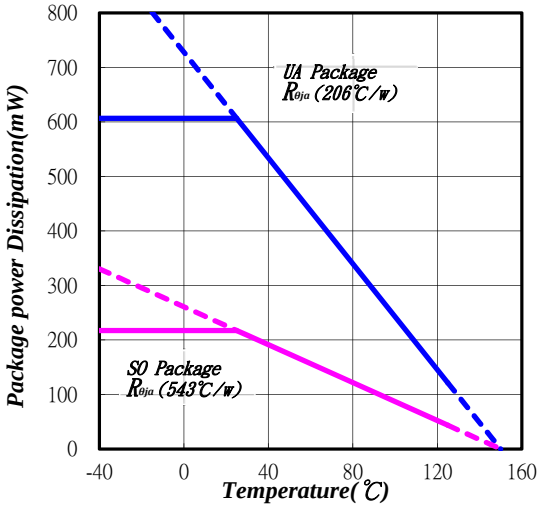
Typical Temperature(T_A) Versus Output Voltage(V_{DSON})



Typical Supply Voltage(V_{DD}) Versus Leakage Current(I_{OFF})



Power Dissipation versus Temperature(T_A)



Package Power Dissipation

The power dissipation of the Package is a function of the pad size. This can vary from the minimum pad size for soldering to a pad size given for maximum power dissipation. Power dissipation for a surface mount device is determined by $T_{J(max)}$, the maximum rated junction temperature of the die, $R_{\theta JA}$, the thermal resistance from the device junction to ambient, and the operating temperature, Ta. Using the values provided on the data sheet for the package, PD can be calculated as follows:

$$P_D = \frac{T_{J(max)} - Ta}{R_{\theta ja}}$$

The values for the equation are found in the maximum ratings table on the data sheet. Substituting these values into the equation for an ambient temperature Ta of 25°C, one can calculate the power dissipation of the device which in this case is 606 milliwatts.

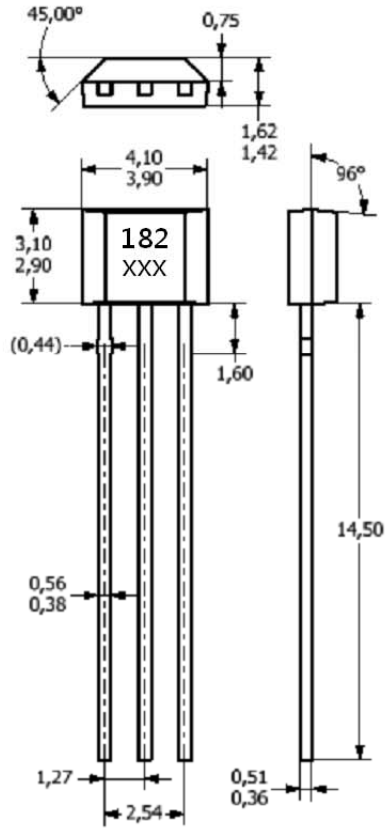
$$P_D(UA) = \frac{150°C - 25°C}{206°C/_W} = 606mW$$

The 206°C/W for the UA package assumes the use of the recommended footprint on a glass epoxy printed circuit board to achieve a power dissipation of 606 milliwatts. There are other alternatives to achieving higher power dissipation from the Package. Another alternative would be to use a ceramic substrate or an aluminum core board such as Thermal Clad. Using a board material such as Thermal Clad, an aluminum core board, the power dissipation can be doubled using the same footprint.

Sensor Location, Package Dimension and Marking

MH 182 Package

UA Package



NOTES:

1). Controlling dimension: mm

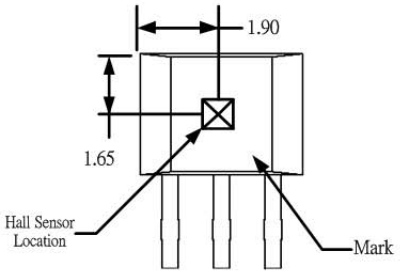
2). Leads must be free of flash and plating voids

3). Do not bend leads within 1 mm of lead to package interface.

4). PINOUT:

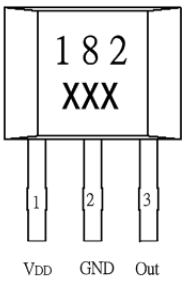
Pin 1	V_{DD}
Pin 2	GND
Pin 3	Output

Hall Chip location



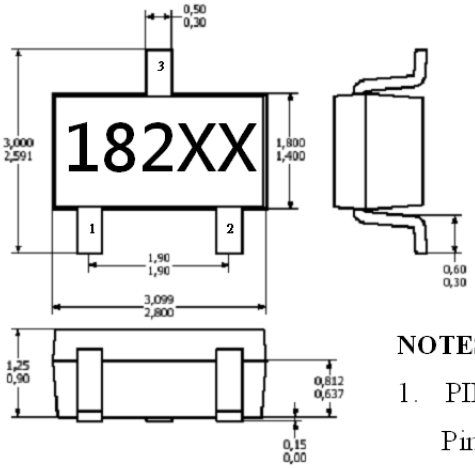
Output Pin Assignment

(Top view)



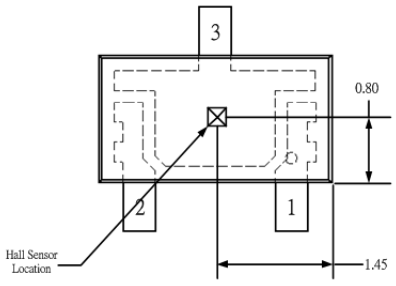
Package (SOT-23)

(Top View)



Hall Plate Chip Location

(Bottom view)



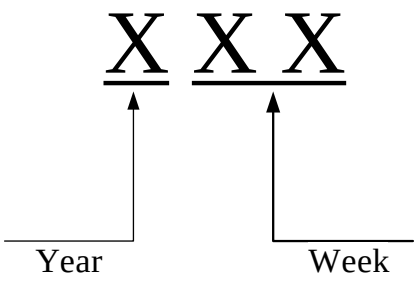
NOTES:

1. PINOUT (See Top View at left :)

Pin 1	V_{DD}
Pin 2	Output
Pin 3	GND

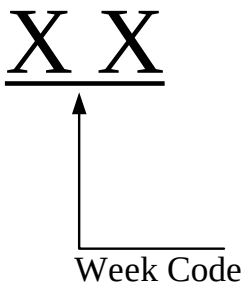
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum

MH 182 (TO-92S) Package Date Code



EX：2010 Year_8 Week → 008

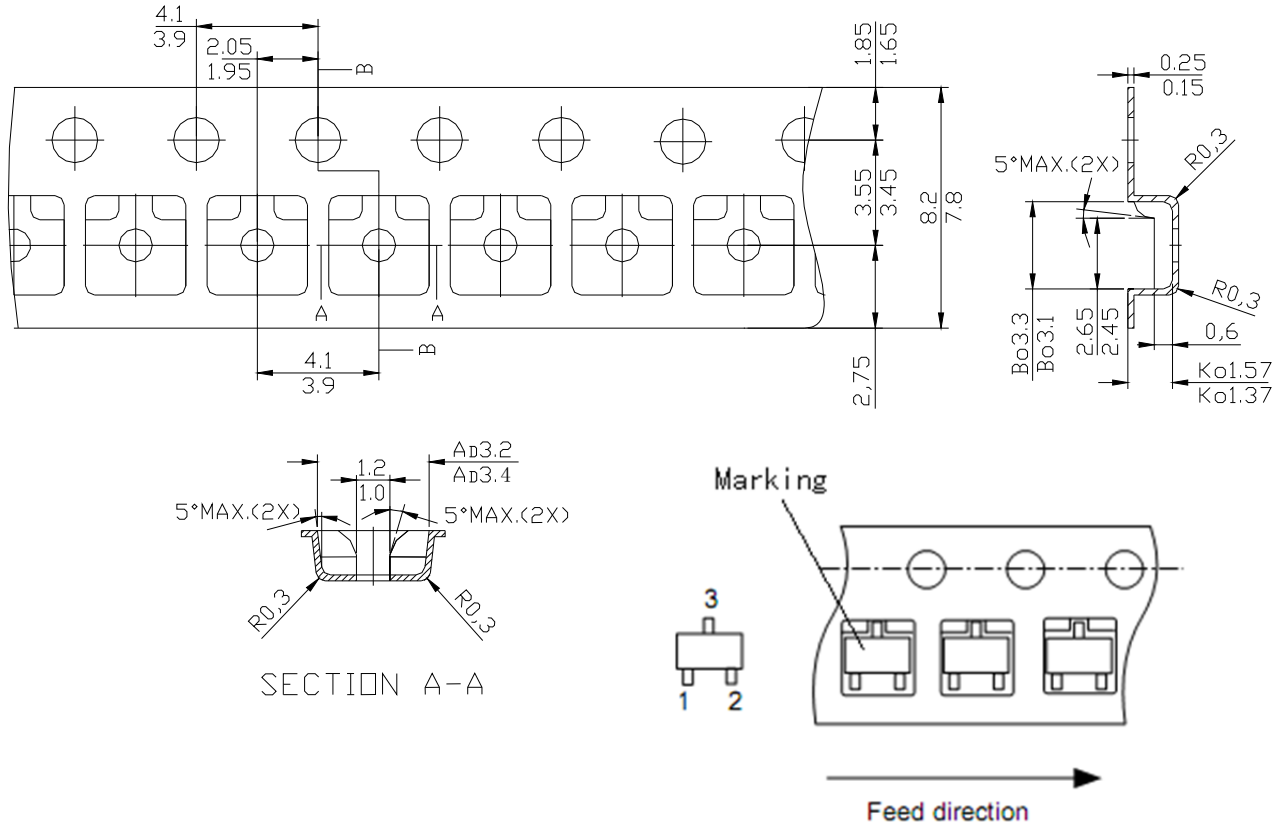
MH 182 SO(SOT-23) Package Date Code

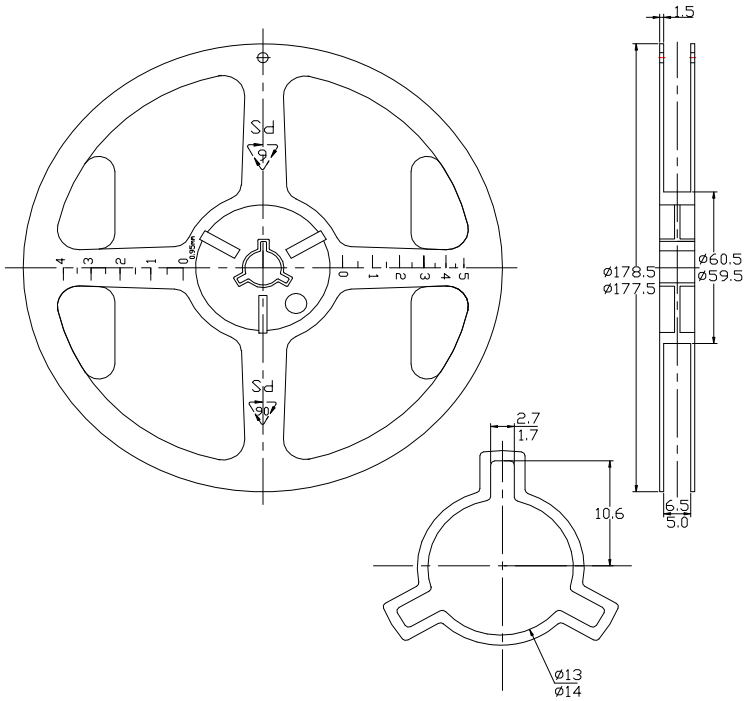


week	1	2	3	4	5	6	7	8	9	10	11	12	13
code	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KK	KL	KM
week	14	15	16	17	18	19	20	21	22	23	24	25	26
code	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ
week	27	28	29	30	31	32	33	34	35	36	37	38	39
code	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM
week	40	41	42	43	44	45	46	47	48	49	50	51	52
code	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ

EX：2010 Year_8 Week → KH

Sot-23 package Tape On Reel Dimension



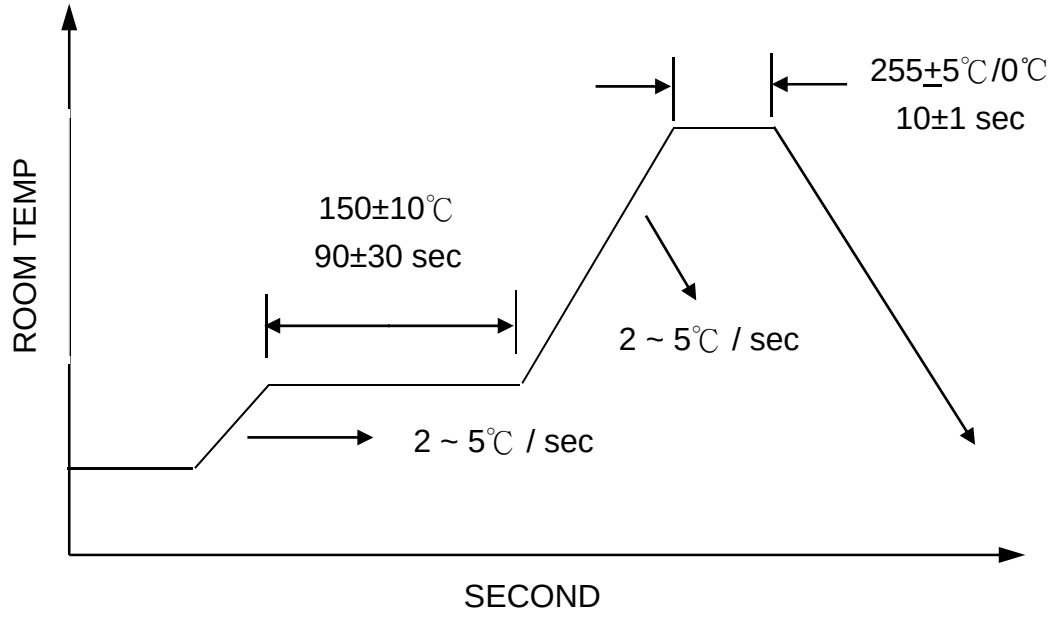


NOTES:

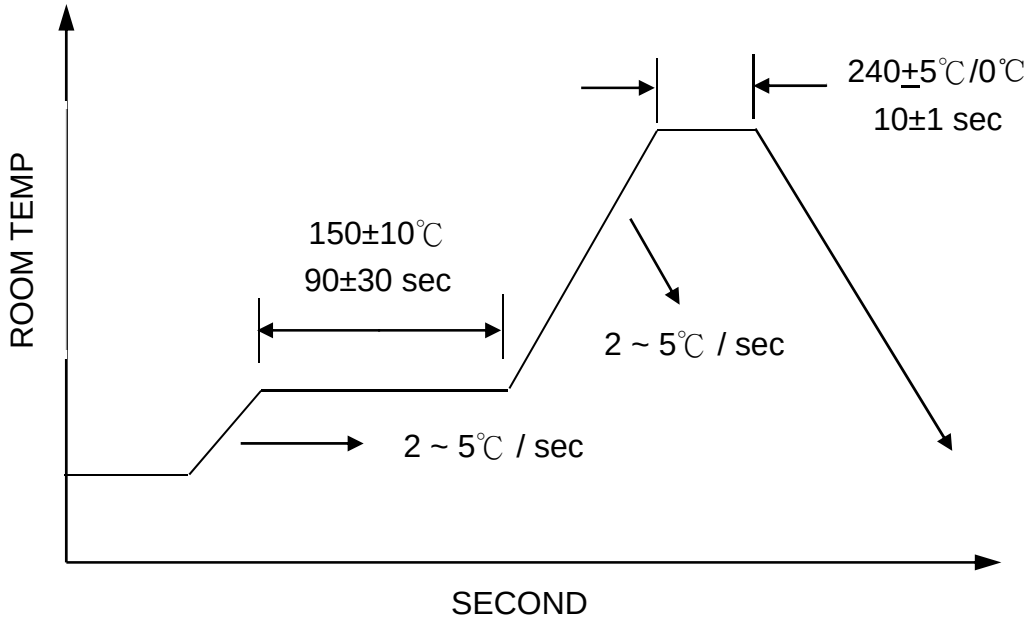
1. Material: Conductive polystyrene;
2. DIM in mm;
3. 10 sprocket hole pitch cumulative tolerance ±0.2;
4. Camber not to exceed 1mm in 100mm;
5. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole;
6. (S.R. OHM/SQ) Means surface electric resistivity of the carrier tape.

IR reflow curve

Lead Temperature (Soldering,10 sec)



SO Soldering Condition



UA Soldering Condition

Packing specification:

Package	per Reel/Bag	per inner box	per carton
TO-92S-3L	1,000pcs/bag	10bag /box	8 box/carton
SOT-23-3L	3,000pcs/reel	10 reel/box	box/carton

TO-92S-3L	Weight	SOT-23-3L	Weight
1000pcs/bag	0.11kg	3000pcs/reel	0.18kg
10 bags/box	1.24kg	10 reels/box	1.99kg
8 boxes/carton	10.09kg	2 boxes/carton	4.9kg

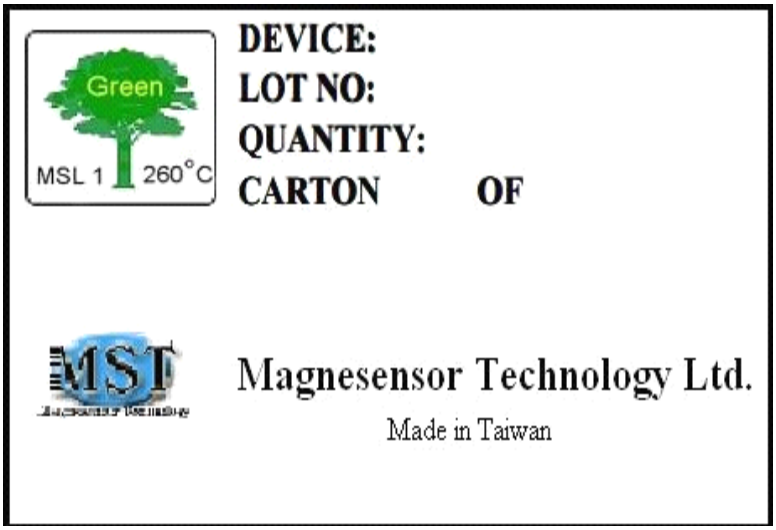
Inner box label:

Bag and inner box PB free Label

Bag and inner box Green Label

Size: 3.4cm*6.4cm

Carton label:



Size: 5.6 cm * 9.8 cm

Combine:

When combine lot, one reel could have two D/C； No more than two; One carton could have two devices, no more than two;