

## Single Hall Effect Latch

### Features

- Wide operating voltage range: 3.0V to 20V
- Maximum output sink current 50mA
- Open-Collector pre-driver
- Power reverse polarity protection
- Internal pull high pre-driver
- Available in SIP-3L,SOT-23(FS177Y) package

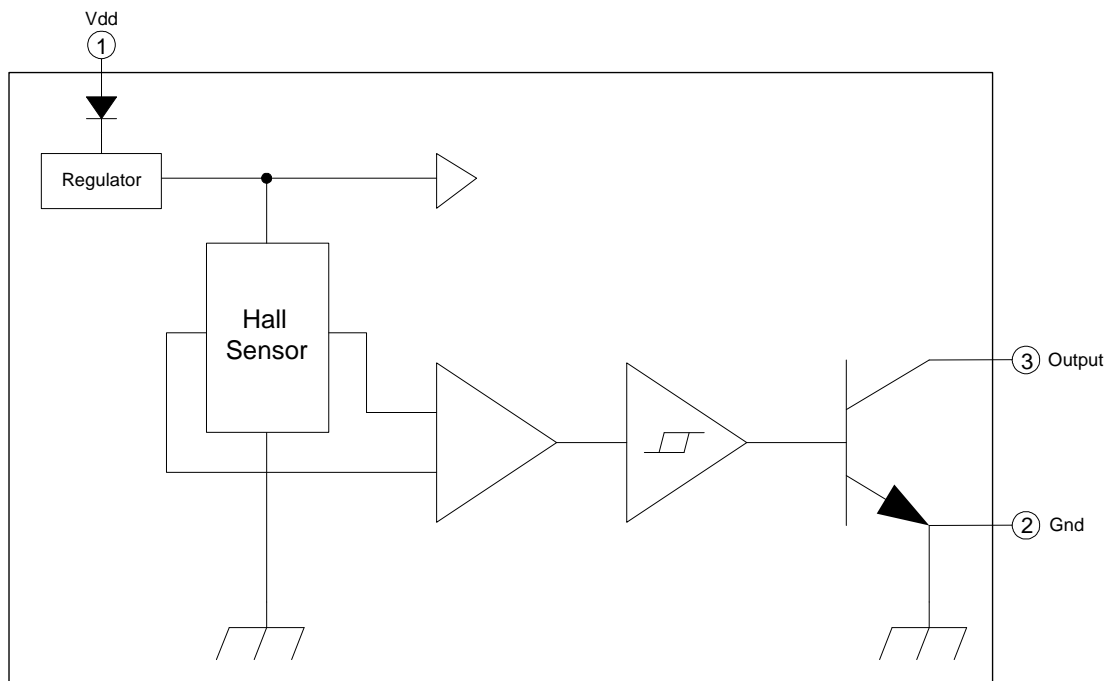

**Halogen Free**

### General Description

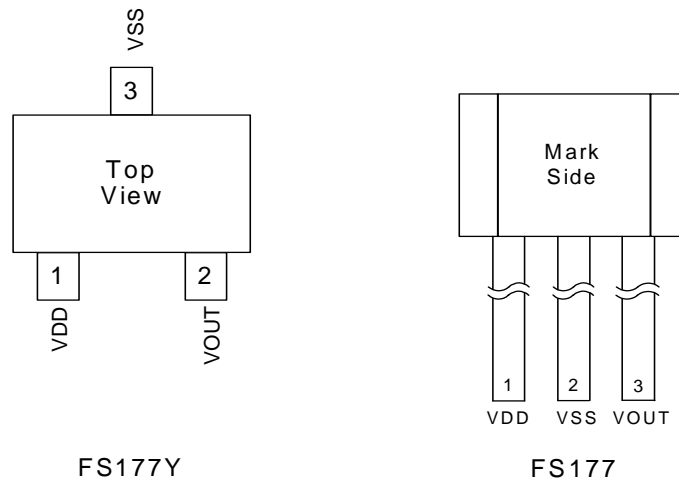
The FS177/FS177Y is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

A north pole of sufficient strength will turn the output ON. In the absence of a magnetic field, the output is OFF.

### Block Diagram



**Figure.1**

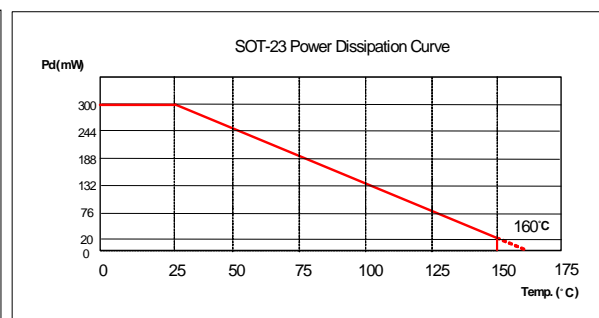
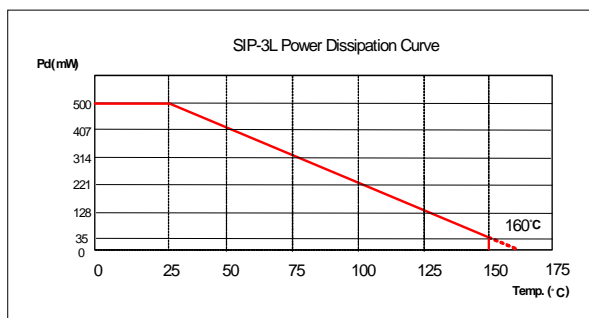
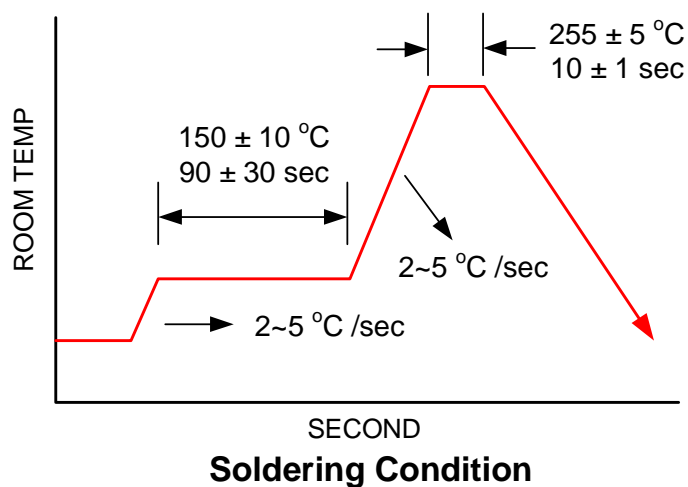
**Pin Connection**

**Figure.2**
**Pin Descriptions**

Name	I/O	FS177	FS177Y	Description
VDD	P	1	1	Positive power supply
VSS	G	2	3	Ground
VOUT	O	3	2	Driver output

Legend: I=input, O=output, I/O=input/output, P=power supply, G=ground

**Absolute Maximum Ratings**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operating Temperature	$T_{OP}$	-	-40		125	°C
Storage Temperature	$T_{ST}$	-	-65		150	°C
DC Supply Voltage	$V_{DD}$	-	3.0		20	V
Supply Current	$I_{DD}$	-			10	mA
Continuous Current	$I_{O(CONT)}$				50	mA
Junction temperature	$T_J$				160	°C
Power Dissipation	$P_D$	SIP-3L			500	mW
Power Dissipation	$P_D$	SOT-23			300	mW
Thermal Resistance	$\theta_{JC}$	SIP-3L		0.27		°C/mW
Thermal Resistance	$\theta_{JC}$	SOT-23		0.45		°C/mW
Lead Temperature		10sec			260	°C

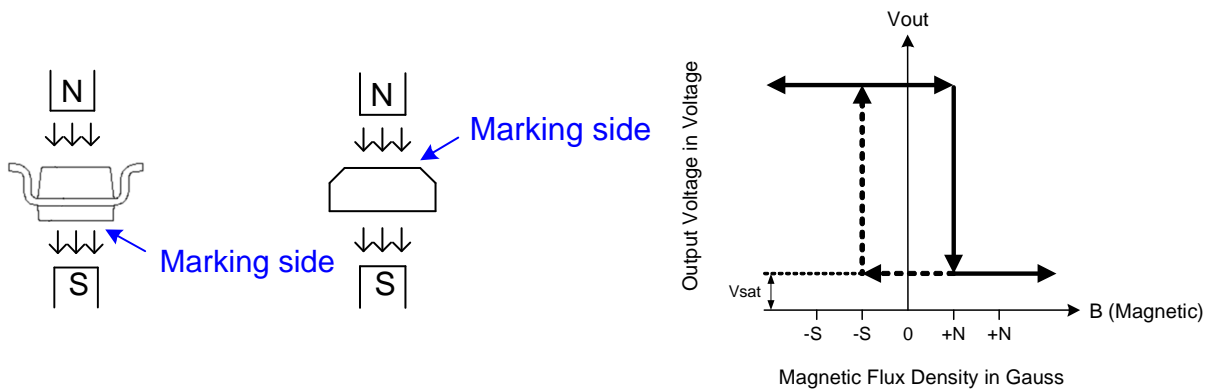

**Figure.3**

**Figure.4**

**Recommended Operating Conditions**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Supply Voltage	$V_{DD}$	-	3.0		20	V
Operating Temperature Range	$T_A$	-	-40		125	°C

**Electrical Characteristics  $V_{DD}=12.0V$ ,  $T_A=25^\circ C$  (unless otherwise specified)**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Average Supply Current(no load)	$I_{DD}$	-		3.5	10	mA
Output Saturation Voltage	$V_{SAT}$	$I_{out}= 20mA$		165	200	mV
Output Rise time	$t_r$	$R_L=500\Omega$ , $C_L=20pF$ (Figure 7)	0.2	-	0.75	$\mu s$
Output Fall time	$t_f$	$R_L=500\Omega$ , $C_L=20pF$ (Figure 7)	20	-	150	ns

**Hysteresis Characteristics**

**Figure.5**



## Magnetic Characteristics

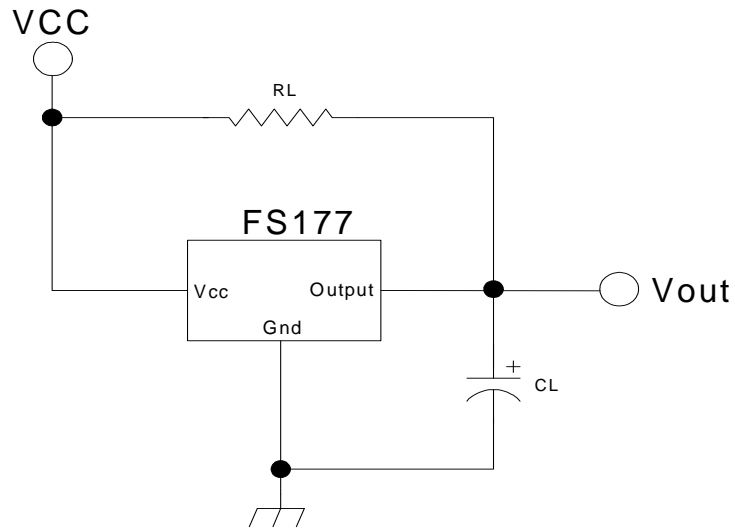
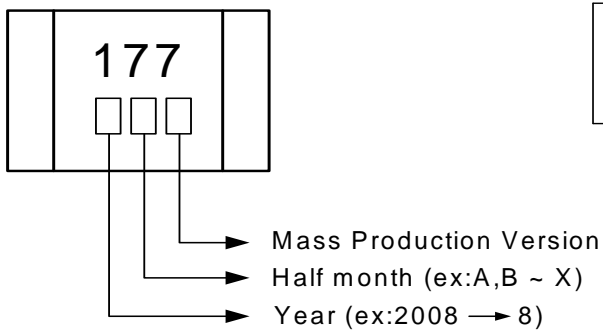
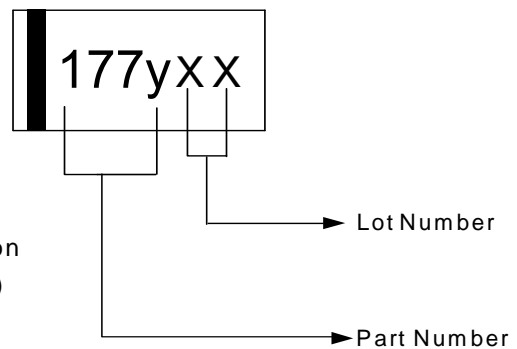
<i>FS177LF-A</i>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operate Points	B <sub>OP</sub>		+10	-	+50	G
Release Points	B <sub>RP</sub>		-50	-	-10	G
Hysteresis	B <sub>HYST</sub>		30	-	120	G

<i>FS177LF-B</i>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operate Points	B <sub>OP</sub>		+5	-	+70	G
Release Points	B <sub>RP</sub>		-70	-	-5	G
Hysteresis	B <sub>HYST</sub>		30	-	120	G

<i>FS177LF-C</i>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operate Points	B <sub>OP</sub>		-	-	+110	G
Release Points	B <sub>RP</sub>		-110	-	-	G
Hysteresis	B <sub>HYST</sub>		30	-	120	G

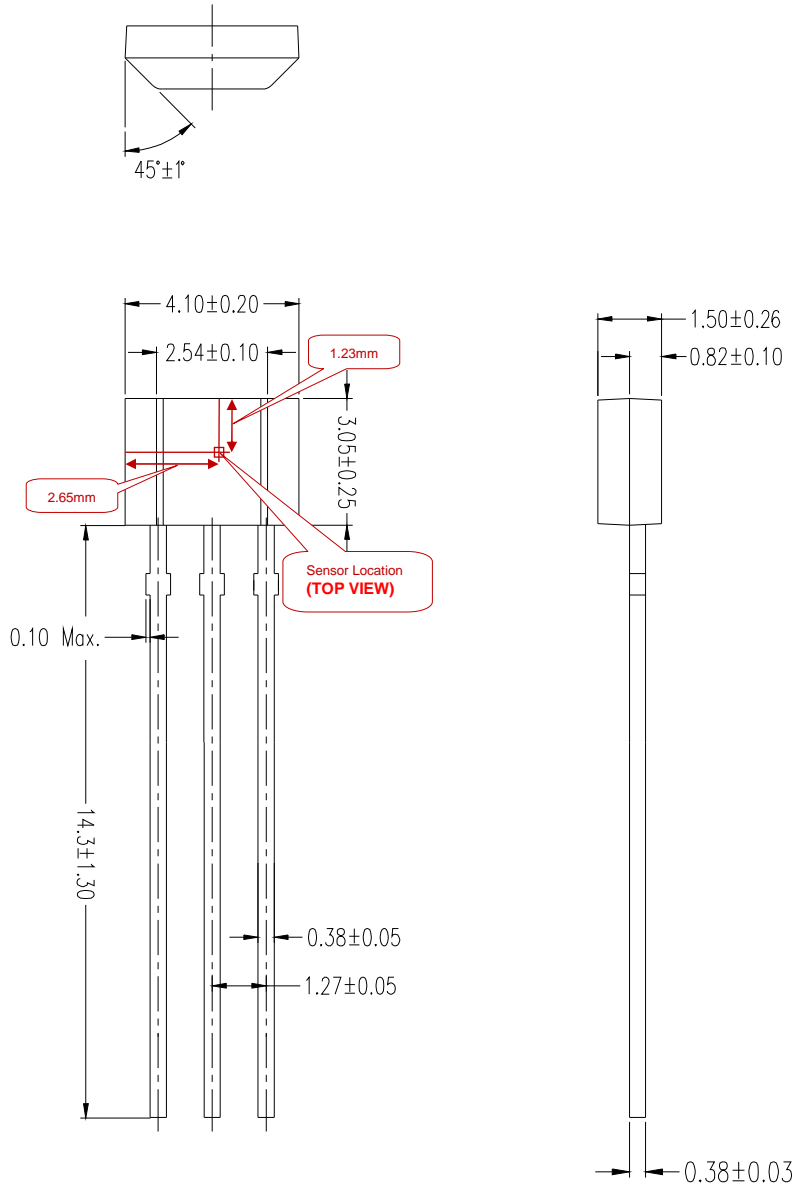
<i>FS177Y-G1</i>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operate Points	B <sub>OP</sub>		+10	-	+60	G
Release Points	B <sub>RP</sub>		-60	-	-10	G
Hysteresis	B <sub>HYST</sub>		30	-	120	G

<i>FS177Y-G1-B</i>						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operate Points	B <sub>OP</sub>		+5	-	+70	G
Release Points	B <sub>RP</sub>		-70	-	-5	G
Hysteresis	B <sub>HYST</sub>		30	-	120	G

**Test Circuit**

**Figure.6**
**Marking Information**
**SIP-3L:**

**SOT-23:**

**Figure.7**



Package Dimension (Unit: mm)  
SIP-3L(Pb Free)

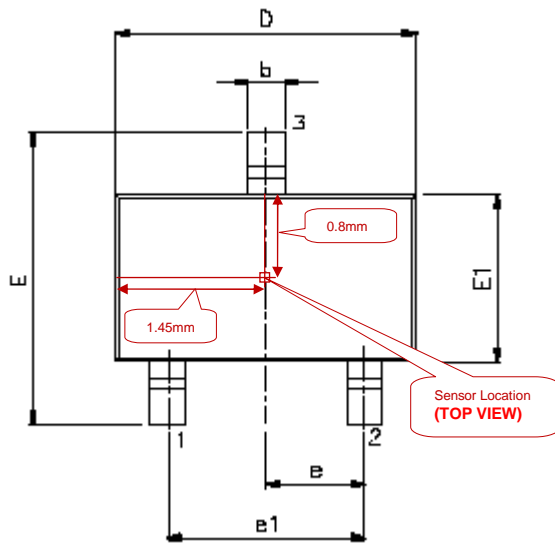




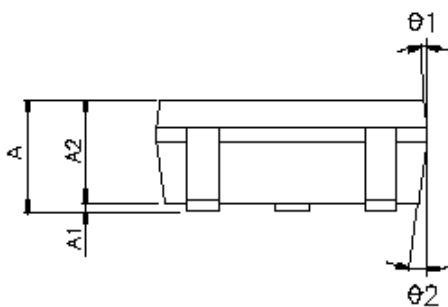
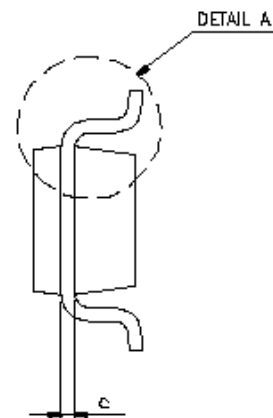
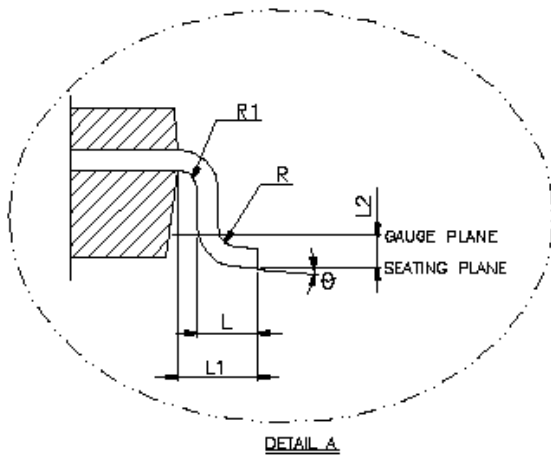
## Package Outline (LEAD FREE)

SOT23

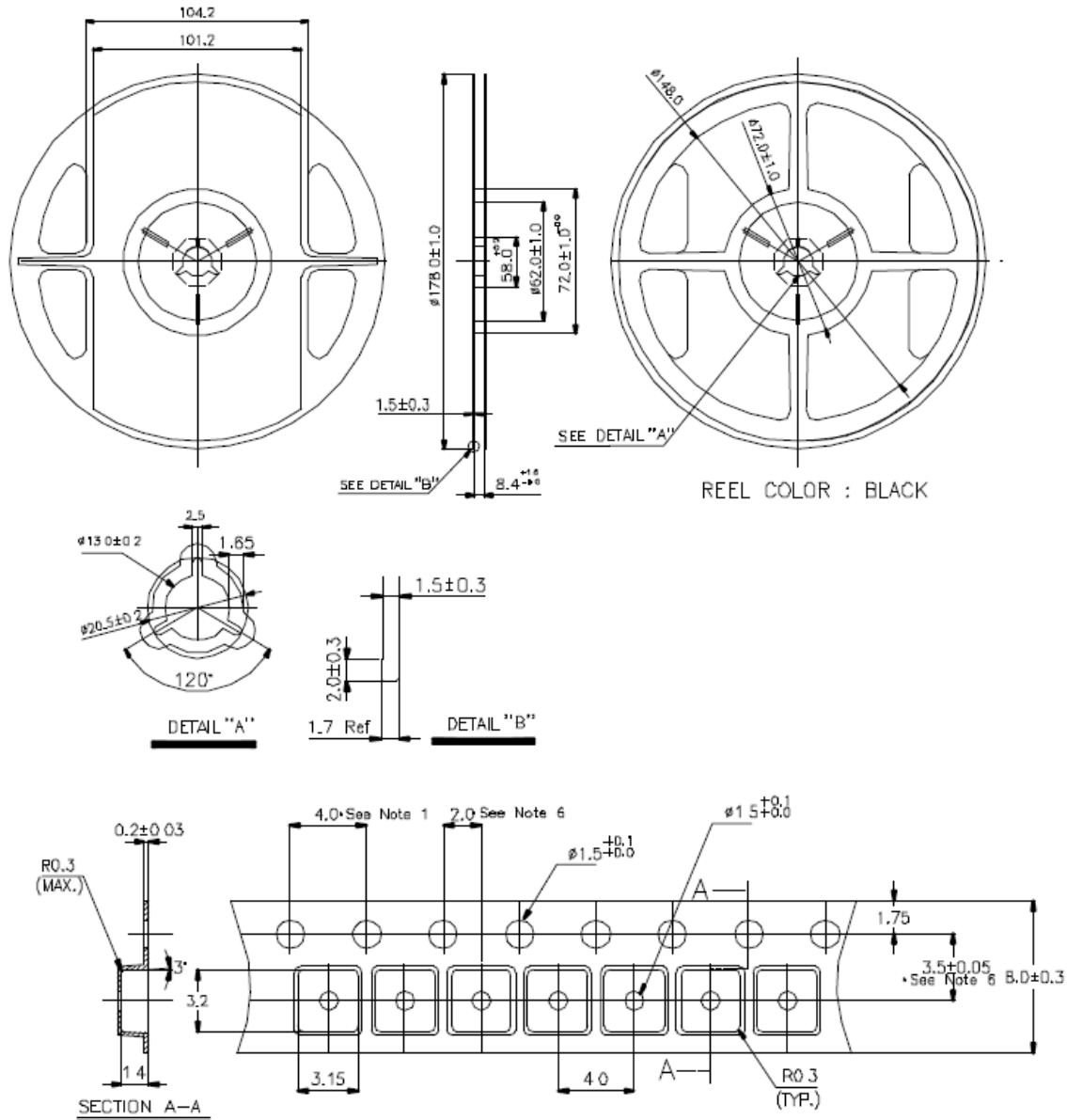
Unit : MM



Symbols	Dimension In Millimeters		
	Min	Nom	Max
A	-	-	1.45
A1	-	-	0.15
A2	0.90	1.15	1.30
b	0.30	-	0.50
c	0.08	-	0.22
D	2.90BSC		
E	2.80BSC		
E1	1.60BSC		
e	0.95BSC		
e1	1.90BSC		
L	0.30	0.45	0.60
L1	0.60BSC		
L2	0.25BSC		
R	0.10	-	-
R1	0..10	-	0.25
Θ	0°	4°	8°
Θ1, Θ2	5°	10°	15°





**(Tapping Reel)  
SOT23**

**PACKING QUANTITY SPECIFICATION**

3000ea / 1 Reel

4 Reels / 1 INSIDE BOX



## Order Information

Part Number	Operating Temperature	Package	Marking	MOQ
FS177LF-A	-40 °C to +125 °C	SIP-3L	-	1,000ea
FS177LF-B	-40 °C to +125 °C	SIP-3L	-	1,000ea
FS177LF-C	-40 °C to +125 °C	SIP-3L	-	1,000ea
FS177YR-G1	-40 °C to +125 °C	SOT-23	177yXX	3,000ea
FS177YRG1-B	-40 °C to +125 °C	SOT-23	177yXX	3,000ea