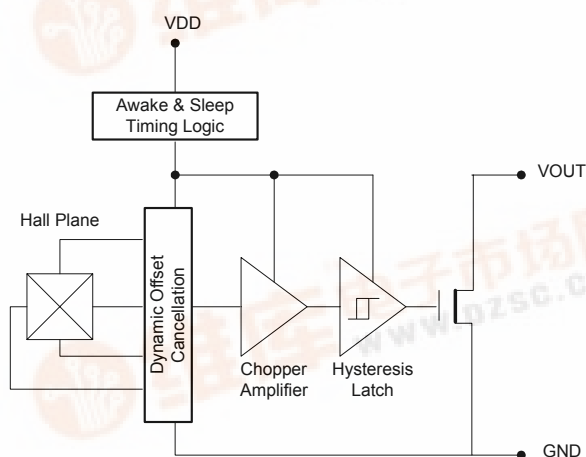


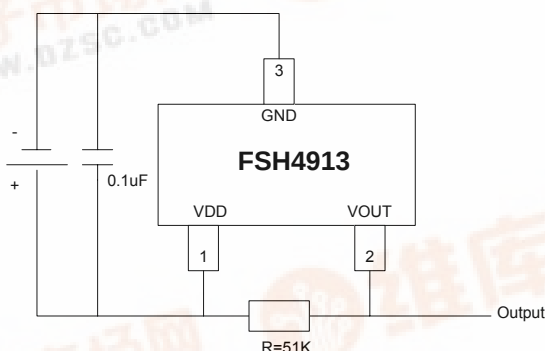
FEATURES

- Micro power design
- Operation with North or South pole(omni polar)
- 2.4V to 5.5V battery operation
- High sensitivity and high stability of the magnetic switching points
- High resistance to mechanical stress
- Digital output signal
- Good RF noise immunity
- -40°C to 85°C operating temperature
- Packages: SOT23-3L, TSOT23-3L, SC70-3L, SIP3L and DFN6L

FUNCTIONAL BLOCK DIAGRAM



TYPICAL APPLICATION



GENERAL DESCRIPTION

The FSH4913 is an Integrated Hall effect sensor designed specifically to meet the requirements of low-power devices. e.g. as an On/Off switch in Cellular Flip-Phones, with battery operating voltages of 2.4V to 5.5V.

Precise magnetic switching points and high temperature stability are achieved through the unique design of the internal circuit.

An onboard clock scheme is used to reduce the average operating current of the IC.

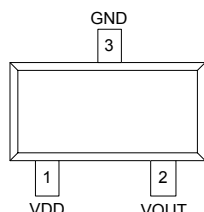
During the operate phase the IC compares the actual magnetic field detected with the internally compensated switching points. The output is switched at the end of each operating phase.

During the Stand-by phase the output stage is latched and the current consumption of the device reduced to some μA.

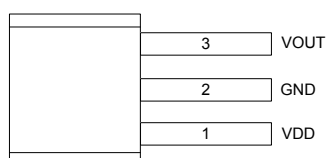
The IC switching behavior is Omnipolar, i.e. it can be switched on with either the North or South pole of a magnet.

PIN CONFIGURATION

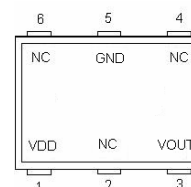
(1) SOT23-3L/TSOT23-3L/SC70-3L
(Top View)



(2) SIP3L
(Top View)



(3) DFN6L
(Top View)



Pin			Symbol	Function
SOT23/TSOT23/SC70	SIP3L	DFN6L		
1	1	1	VDD	Supply Voltage
2	3	3	VOUT	Signal Output (Open Drain)
3	2	5	GND	Ground
		2	NC	Not Connected
		4	NC	Not Connected
		6	NC	Not Connected

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Unit
Supply Voltage	V_{DD}	5.5	V
Supply Current	I_{DD}	2.5	mA
Output Voltage	V_O	5.5	V
Output Current	I_O	1	mA
Operating Temperature Range	T_A	-40 to 85	°C
Junction Temperature	T_J	-40 to 150	°C
Storage Temperature	T_{STG}	-40 to 150	°C
Magnetic Flux Density	B	unlimited	mT
Power Dissipation	P_D	230	mW

Note: Stress above the listed absolute maximum rating may cause permanent damage to the device

OPERATING RANGE

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage ¹⁾	V_{DD}	2.4	2.7	5.5	V
Output Voltage	V_O	-0.3	2.7	5.5	V
Ambient Temperature	T_A	-40	25	85	°C

¹⁾ A Ceramic Bypass Capacitor of 0.1uF at V_{DD} to GND is highly recommended.

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Averaged Supply Current	$I_{DD(AVG)}$			3 ¹⁾	20	uA
Supply Current During Operating Time	$I_{DD(OP)}$			1.1 ¹⁾		mA
Supply Current During Standby Time	$I_{DD(STB)}$			2.5 ¹⁾		uA
Output Saturation Voltage	$V_{O(SAT)}$	$I_O=1mA$		0.1	0.3	V
Output Leakage Current	$I_{O(LEAK)}$			0.01	1	uA
Operating Time	T_{OP}			56		us
Standby Time	T_{STB}			140		ms
Duty Cycle	T_{OP} / T_{STB}			0.04		%

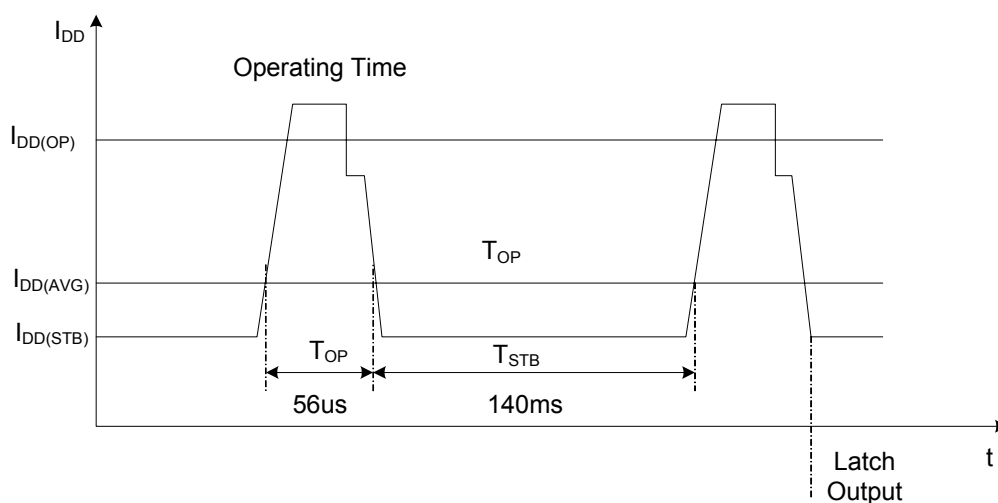
¹⁾ Operating voltage is 2.7V.

MAGNETIC CHARACTERISTICS

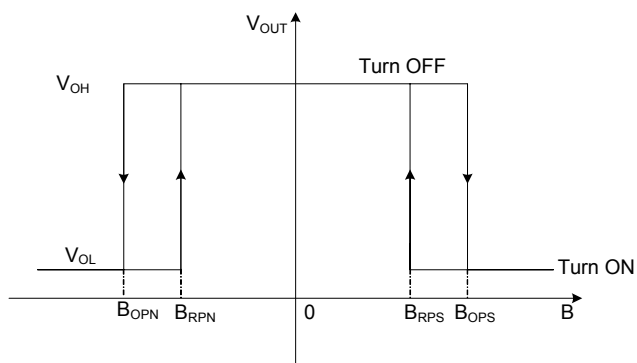
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operate Points (Output ON)	B _{OPS}	40	55	70	G
	B _{OPN}	-70	-55	-40	G
Release Points (Output OFF)	B _{RPS}	30	45	60	G
	B _{RPN}	-60	-45	-30	G
Hysteresis	B _{HYS}	5	10	15	G

Note: If not other specified, typical characteristics apply at $T_A = 25\text{ }^{\circ}\text{C}$ and $V_{DD} = 2.7\text{ V}$

TIMING DIAGRAM

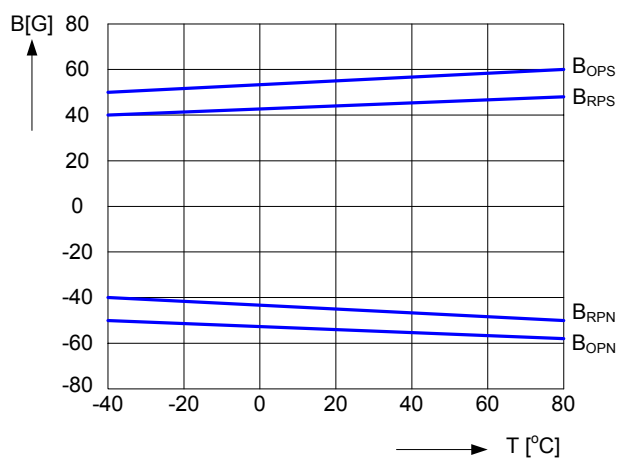


■ OUTPUT-SIGNAL FSH4913

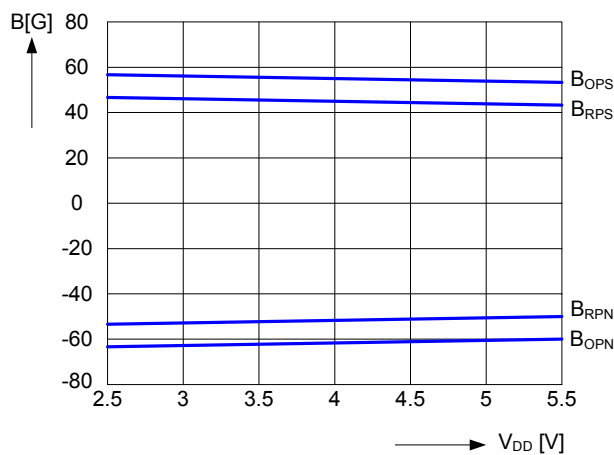


■ TYPICAL PERFORMANCE CHARACTERISTICS

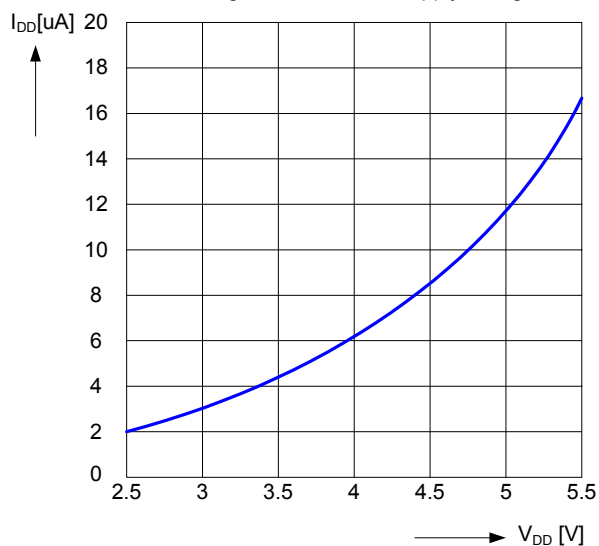
Magnetic switching points versus temperature ($V_{DD}=2.7V$)



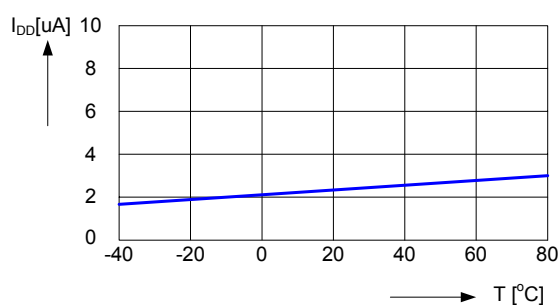
Magnetic switching points versus supply voltage



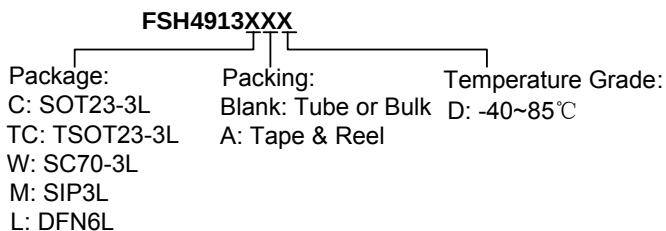
Average current versus supply voltage



Average current versus temperature ($V_{DD}=2.7V$)

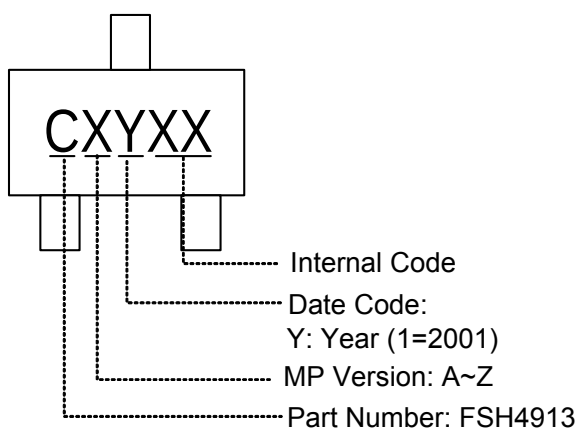


ORDERING INFORMATION

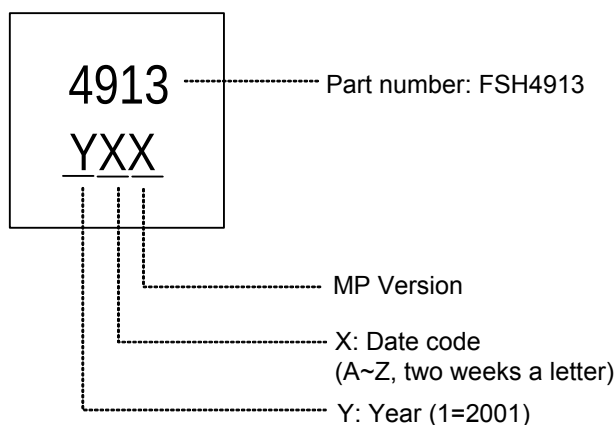


MARKING INFORMATION

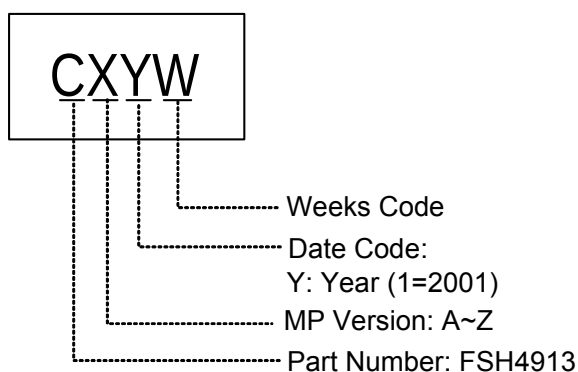
(1) SOT23-3L/TSOT23-3L



(2) SIP3L

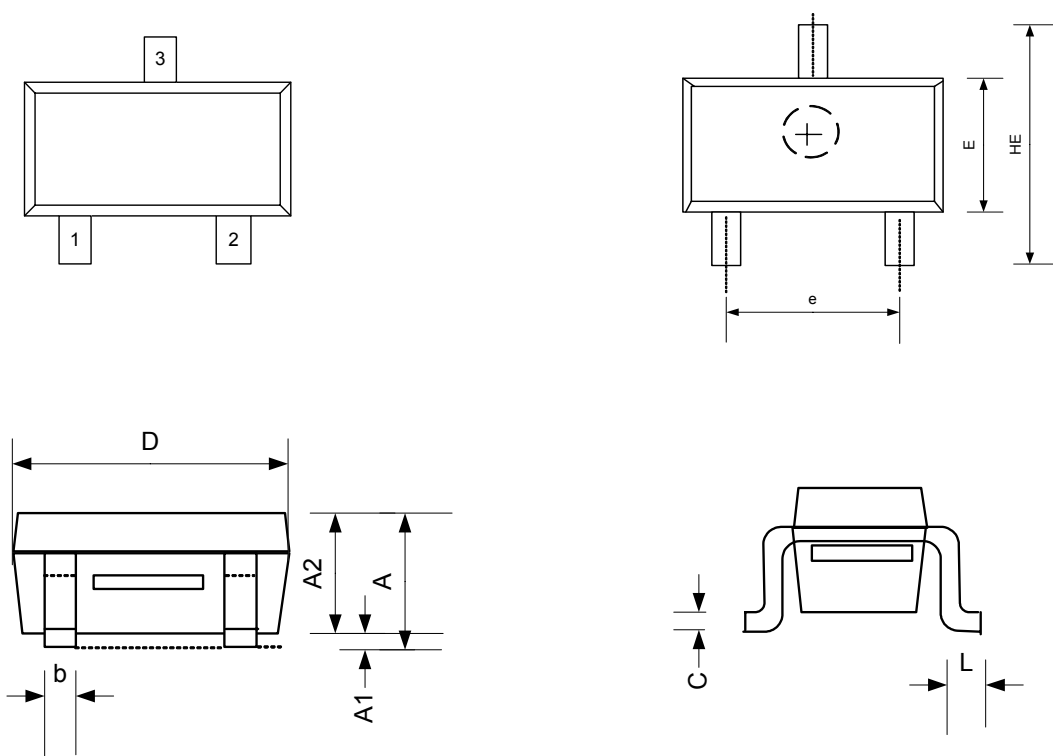


(3) SC70-3L/DFN6L



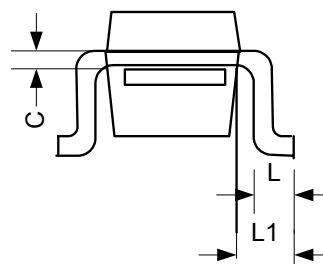
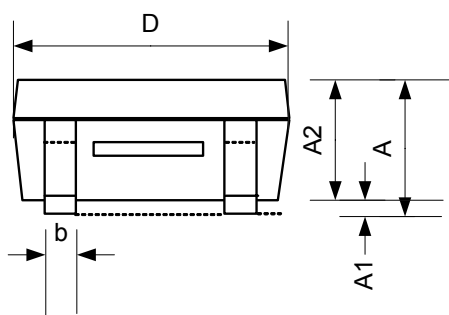
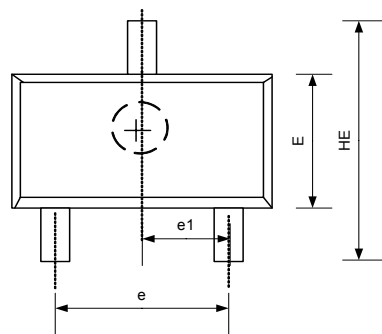
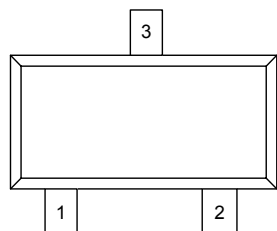
■ PACKAGE INFORMATION

(1) SOT23-3L



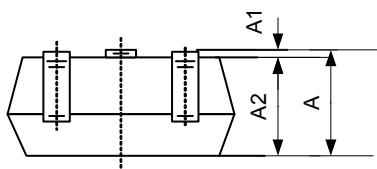
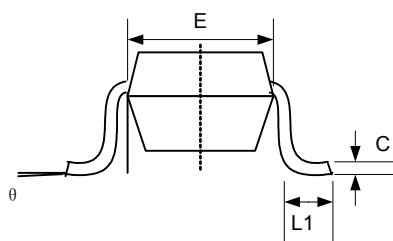
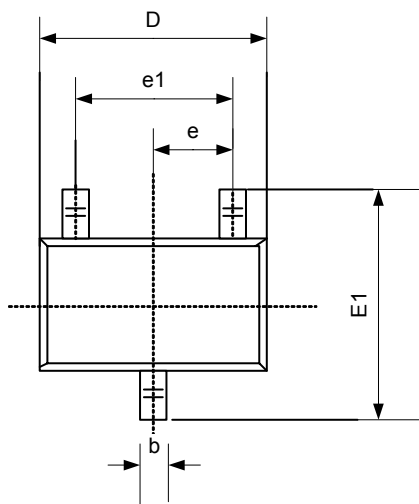
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.00	1.20	1.40	0.039	0.047	0.055
A ₁	0.00		0.10	0.000		0.004
A ₂	1.00	1.15	1.30	0.039	0.045	0.051
b	0.35		0.50	0.014		0.020
C	0.10	0.175	0.25	0.004	0.007	0.010
D	2.70	2.90	3.10	0.106	0.114	0.122
E	1.40	1.60	1.80	0.055	0.063	0.071
e	1.70	2.00	2.30	0.067	0.079	0.091
HE	2.40	2.70	3.00	0.094	0.106	0.118
L	0.30		0.55	0.012		0.022

(2) TSOT23-3L



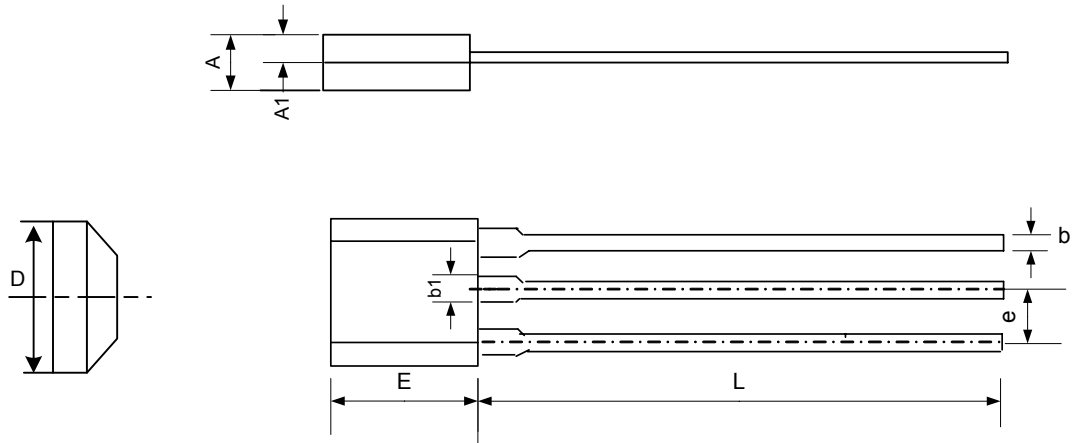
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.750		0.800	0.030		0.032
A ₁	0.025		0.050	0.001		0.002
A ₂	0.700	0.750	0.775	0.028	0.030	0.031
b	0.350		0.500	0.014		0.020
C	0.100		0.200	0.004		0.008
D	2.800	2.900	3.000	0.112	0.116	0.120
E	1.500	1.600	1.700	0.060	0.064	0.068
e1	0.950 BSC			0.038 BSC		
e	1.900 BSC			0.076 BSC		
HE	2.600	2.800	3.000	0.104	0.112	0.120
L	0.370	0.450	0.600	0.015	0.018	0.024
L1	0.600 REF			0.024 REF		

(3) SC70-3L



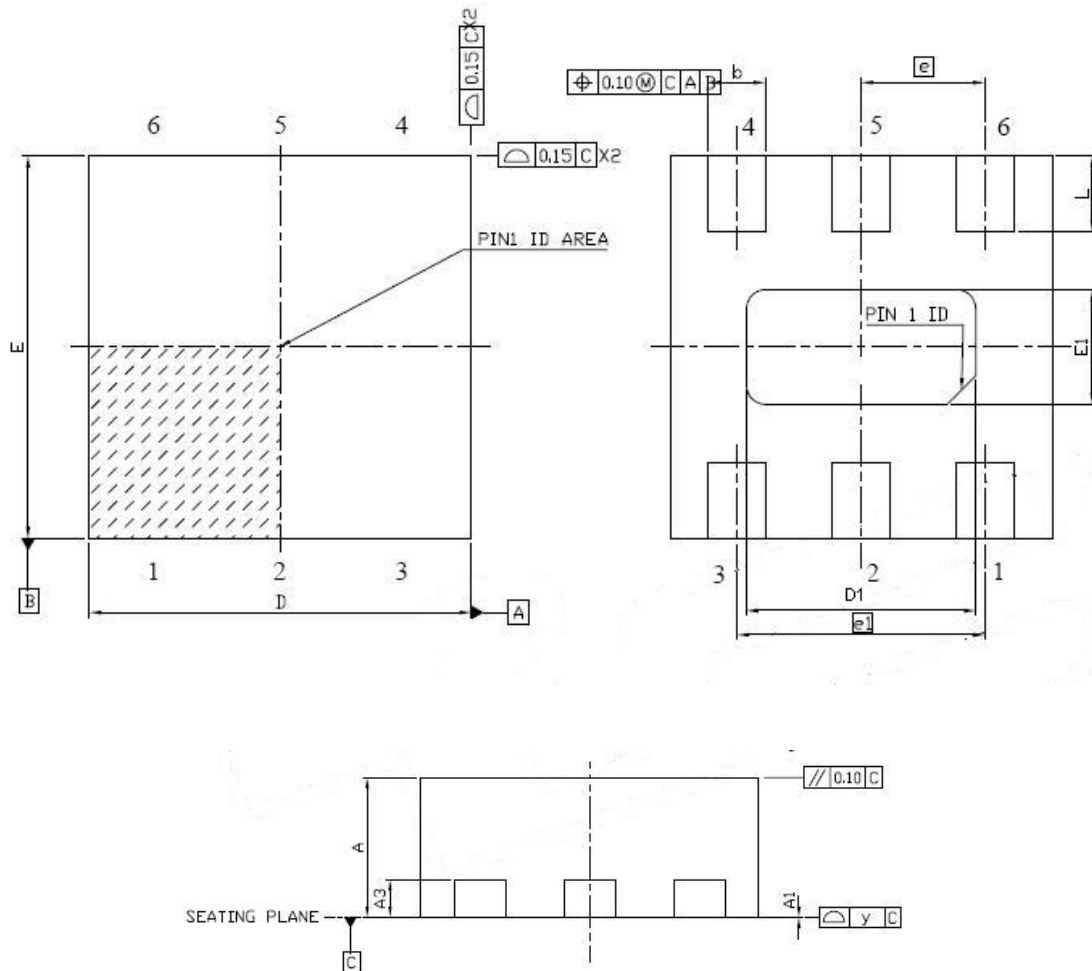
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.80		1.10	0.031		0.043
A ₁	0.00		0.10	0.000		0.004
A ₂	0.70	0.90	1.00	0.028	0.035	0.039
b	0.25		0.40	0.010		0.016
C	0.08		0.22	0.003		0.009
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.15	1.25	1.35	0.045	0.049	0.053
E1	1.80	2.10	2.40	0.071	0.083	0.094
e	0.65			0.0255		
e1	1.30			0.051		
L1	0.26	0.36	0.46	0.010	0.014	0.018
θ	0°	4°	8°	0°	4°	8°

(4) SIP3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.245		1.753	0.050		0.070
A1	0.750REF			0.03REF		
b	0.330		0.432	0.013		0.017
b1	0.406		0.508	0.016		0.020
D	3.962		4.216	0.158		0.169
E	2.870		3.124	0.115		0.125
L	13.60		15.60	0.544		0.624
e	1.27REF			0.051REF		

(5) DFN6L



Symbol	Dimensions In Millimeters			Dimensions In Milli-inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.70	0.75	0.80	27.6	29.5	31.5
A1	0.00	0.02	0.05	0	0.8	2
A3	0.20REF			8REF		
b	0.20	0.30	0.40	8	12	16
D	1.90	2.00	2.10	75	79	83
D1	0.00	1.20	1.25	0	47.2	49.2
E	1.90	2.00	2.10	75	79	83
E1	0.00	0.60	0.65	0	23.6	25.6
e	0.65BSC			25.6BSC		
e1	1.30BSC			51.2BSC		
L	0.40REF			15.7REF		
y			0.08			3