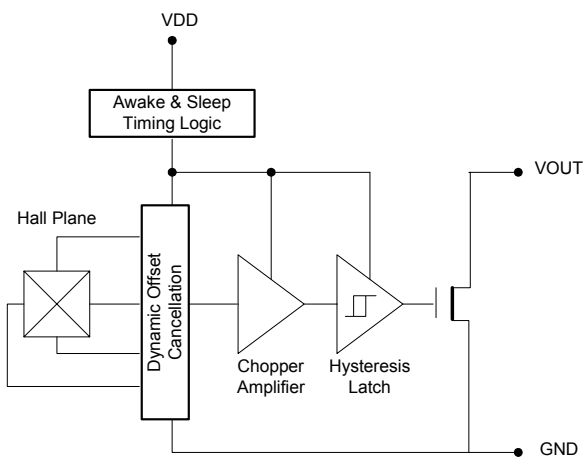


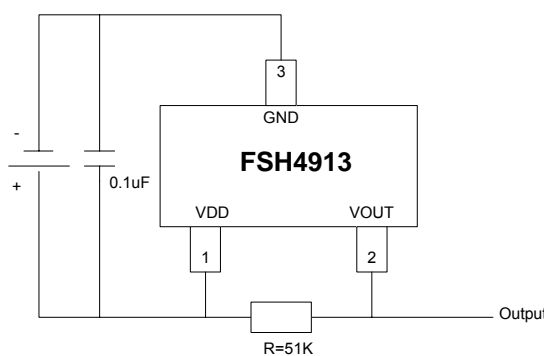
■ FEATURES

- 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.

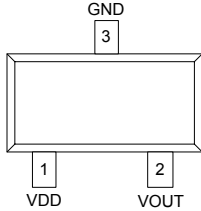
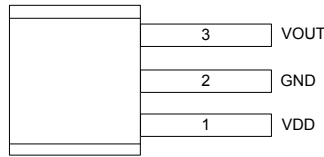
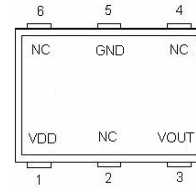
An onboard clock scheme is used to reduce the average operating current of the IC.

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 <sup>1)</sup>	$V_{DD}$	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

<sup>1)</sup> 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 <sup>1)</sup>	20	uA
Supply Current During Operating Time	$I_{DD(OP)}$			1.1 <sup>1)</sup>		mA
Supply Current During Standby Time	$I_{DD(STB)}$			2.5 <sup>1)</sup>		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		%

<sup>1)</sup> Operating voltage is 2.7V.

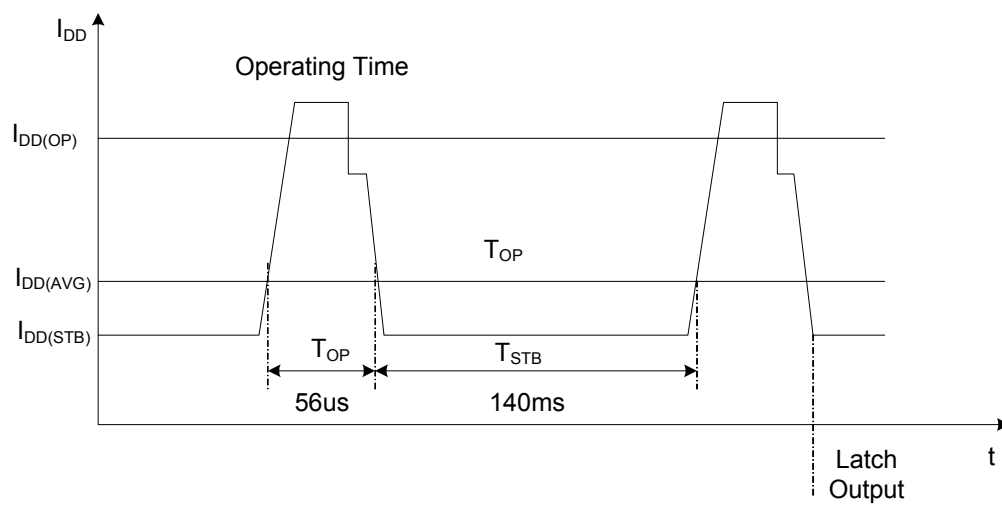
■ MAGNETIC CHARACTERISTICS

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

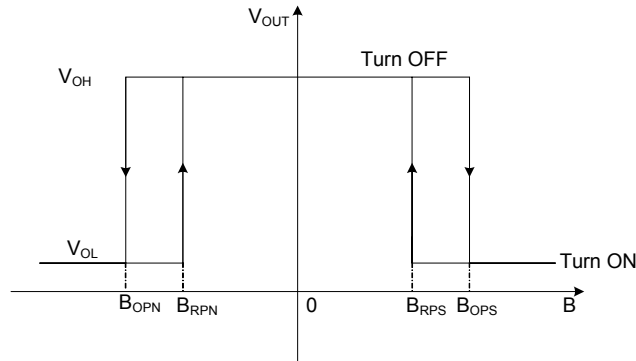
Note: If not other specified, typical characteristics apply at T<sub>A</sub> = 25 °C and V<sub>DD</sub> = 2.7 V

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■ TIMING DIAGRAM



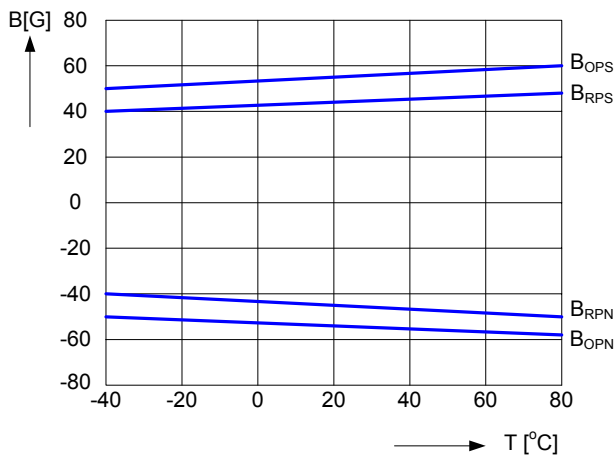
■ OUTPUT-SIGNAL FSH4913



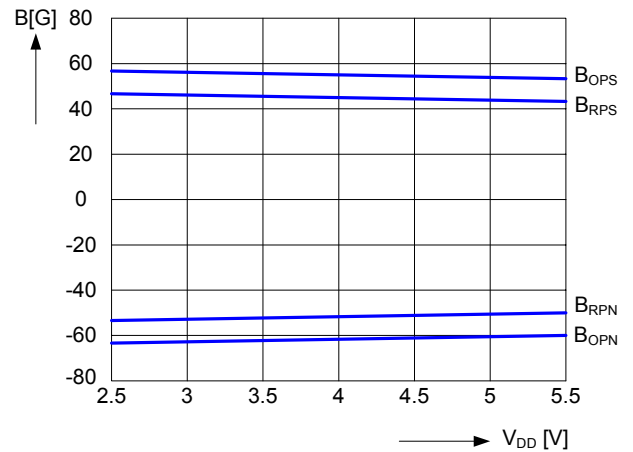
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■ TYPICAL PERFORMANCE CHARACTERISTICS

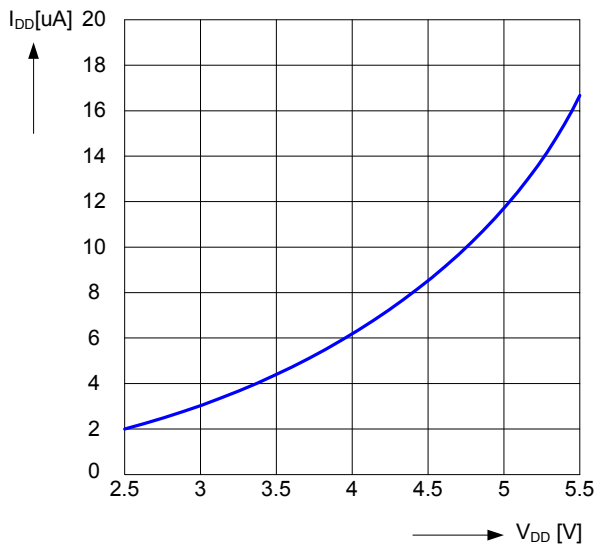
Magnetic switching points versus temperature ( $V_{DD}=2.7V$ )



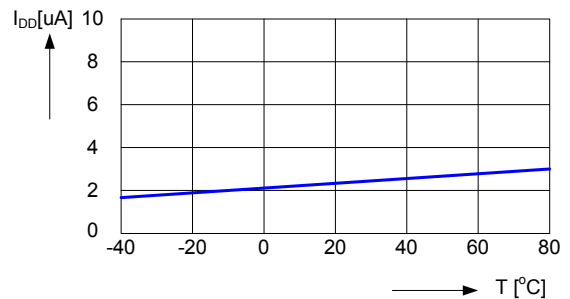
Magnetic switching points versus supply voltage



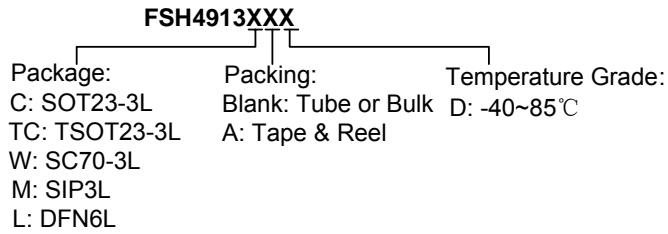
Average current versus supply voltage



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

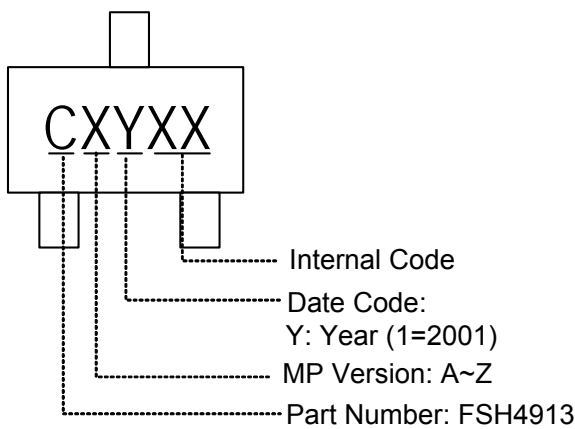


■ ORDERING INFORMATION

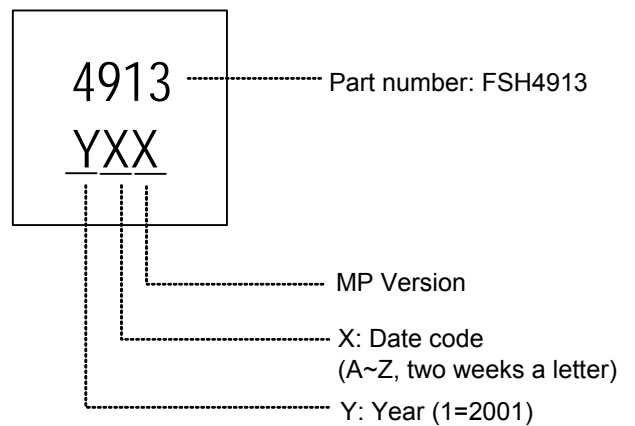


■ MARKING INFORMATION

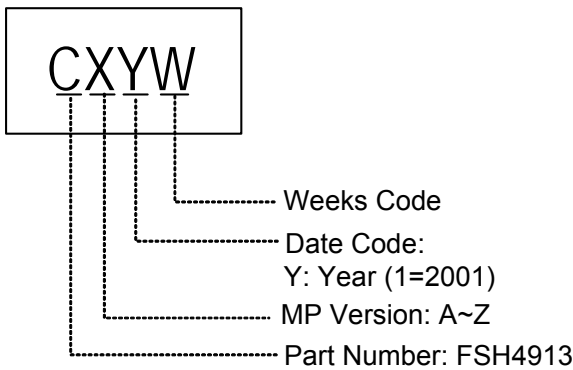
(1) SOT23-3L/TSOT23-3L



(2) SIP3L



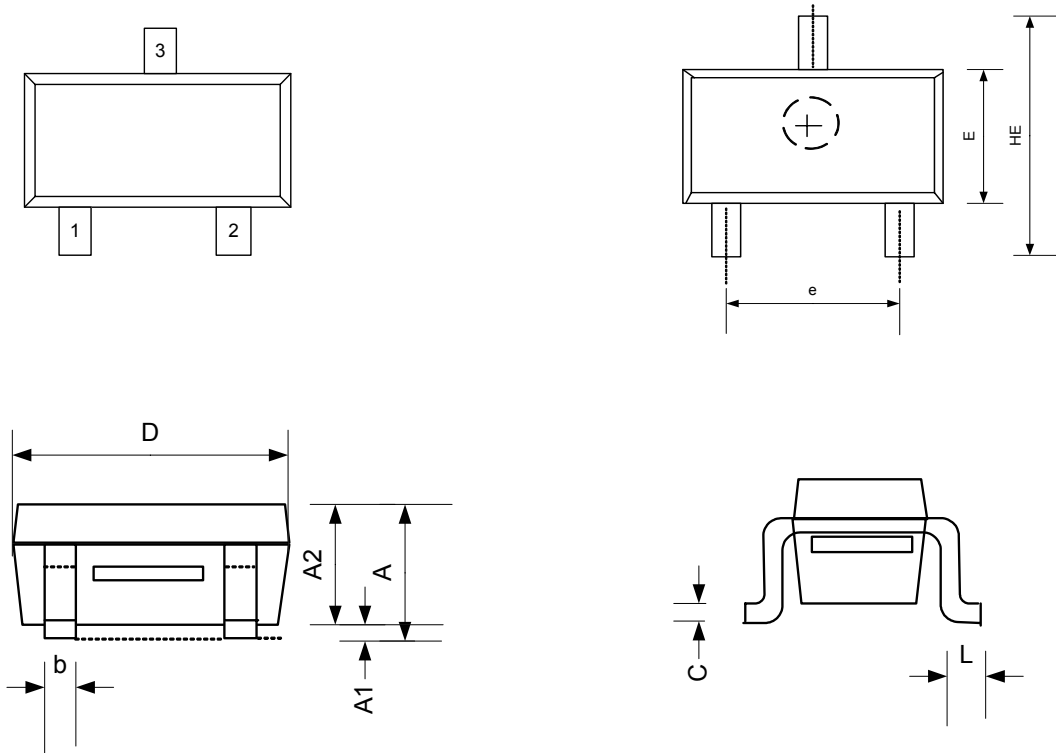
(3) SC70-3L/DFN6L



■ PACKAGE INFORMATION

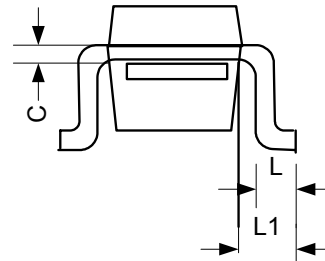
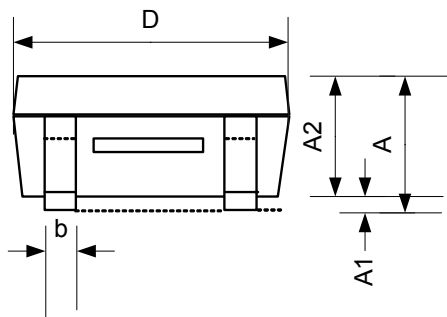
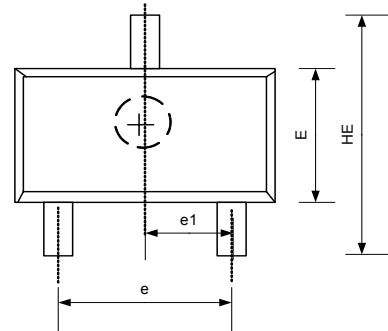
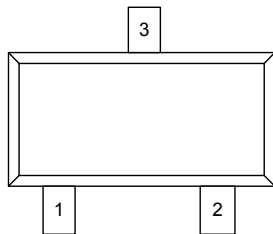
(1) SOT23-3L

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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 <sub>1</sub>	0.00		0.10	0.000		0.004
A <sub>2</sub>	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

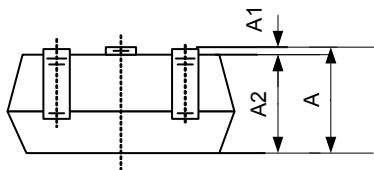
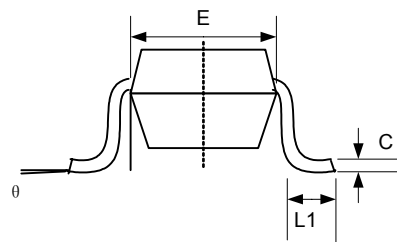
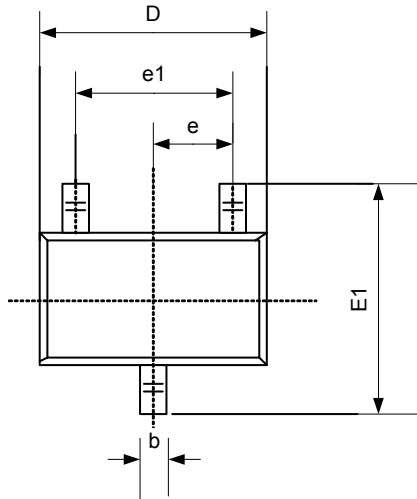
(2) TSOT23-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.750		0.800	0.030		0.032
A <sub>1</sub>	0.025		0.050	0.001		0.002
A <sub>2</sub>	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

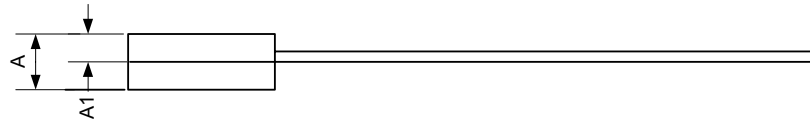
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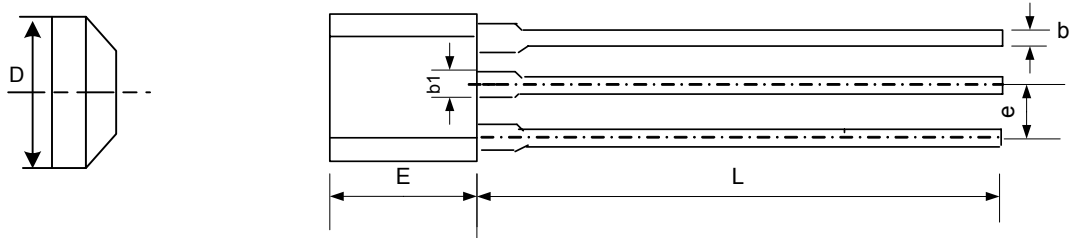
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.80		1.10	0.031		0.043
A <sub>1</sub>	0.00		0.10	0.000		0.004
A <sub>2</sub>	0.70	0.90	1.00	0.028	0.035	0.039
b	0.25		0.40	0.010		0.016
C	0.08		0.22	0.003		0.009
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.15	1.25	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

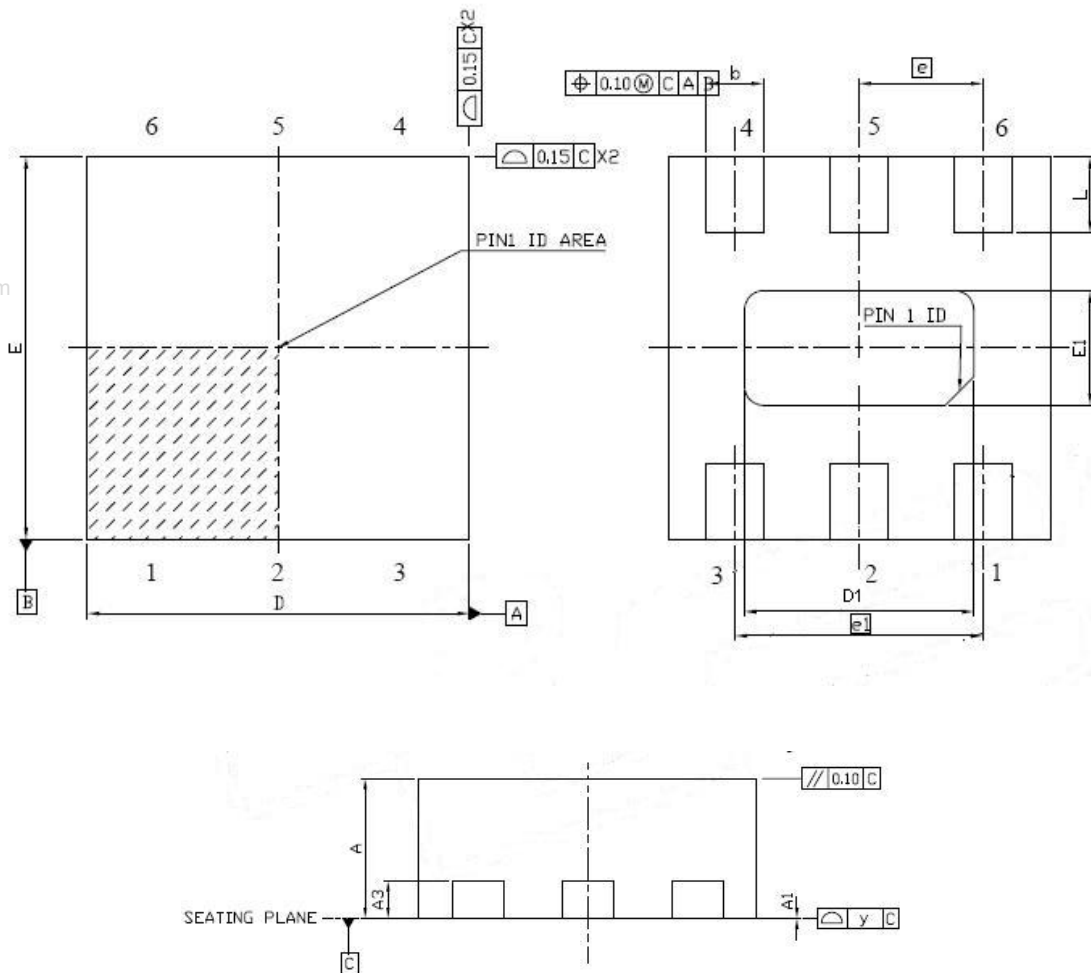


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Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.245		1.753	0.050		0.070
A1	0.750REF			0.03REF		
b	0.330		0.432	0.013		0.017
b1	0.406		0.508	0.016		0.020
D	3.962		4.216	0.158		0.169
E	2.870		3.124	0.115	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

(5) DFN6L



Symbol	Dimensions In Millimeters			Dimensions In Milliinch		
	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