MicroPower, Ultra-sensitive Hall Effect Switch

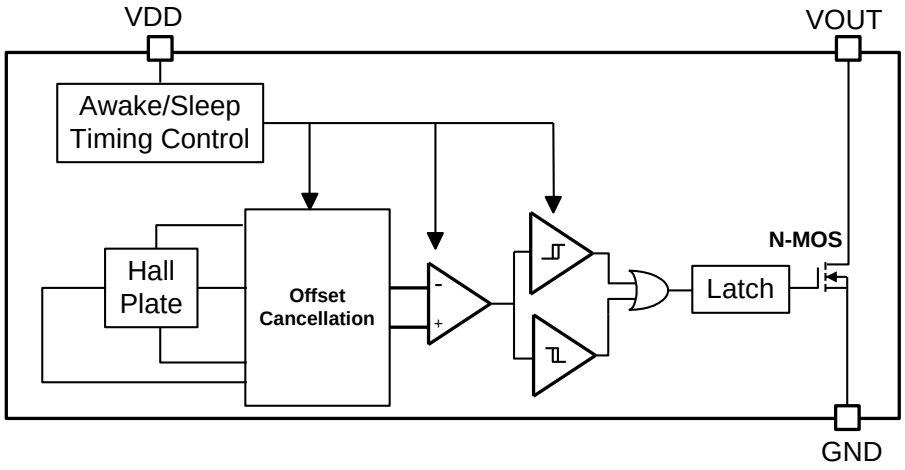
❖ GENERAL DESCRIPTION

AZ8103/A is a three-terminal Hall Effect sensor device with a output driver, mainly designed for battery–operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). For AZ8103, either north or South Pole of sufficient strength will turn the output on. The output will be turned off under no magnetic field. While the magnetic flux density (B) is larger than operate point (Bop), the output will be turned on (low), the output is latched until B is lower than release point (Brp), then turned off.

❖ FEATURES

- Micro Power Operation for Battery Applications
- 2.4V to 5.5V battery operation
- Chopper Stabilized Technology
- Operation with North or South Pole
- High sensitivity and high stability of the magnetic switching points
- 3-pin SOT-23/Thin SOT-23 and UDFN-3L (2X2) and SIP-3L Pb-Free packages

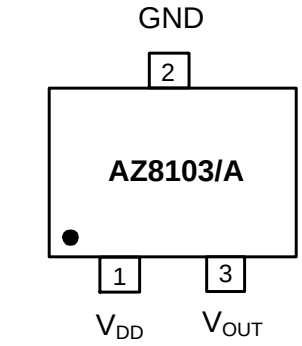
❖ BLOCK DIAGRAM



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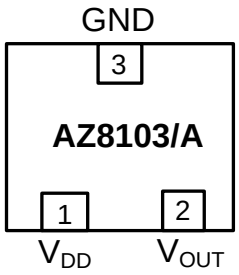
❖ PIN ASSIGNMET

The packages of AZ8103/A are TSOT-23-3L, SOT-23-3L, UDFN-3L and SIP-3L; the pin assignment is given by:



(SOT-23-3L/TSOT-23-3L)

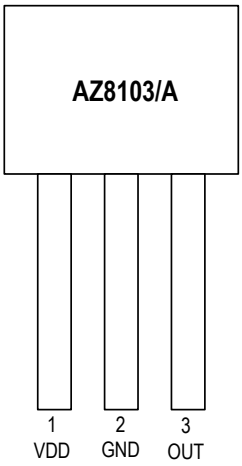
(TOP VIEW)



(UDFN-3L 2X2)

(TOP VIEW)

(Top View)



SIP-3L

Name	Description
VDD	Power Input
GND	Ground
Output	AZ8103: B>Bops or B<Bopn, Output is Low. B<Brps or B> Brpn, Output is High. AZ8103A: B>Bops or B<Bopn, Output is High. B<Brps or B> Brpn, Output is Low.

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❖ ORDER/MARKING INFORMATION

Order Information	Top Marking (SIP-3L)
AZ8103 X XX X Output: Blank: Pull High; A: Pull Low Package Type: R: SOT-23-3L; RT: TSOT-23-3L; X3: UDFN-3L (2X2); I3: SIP-3L (For AZ8103 Only) Packing: Blank : Bag; A : Taping	2 4 8 X X X Year Week EX：2013 Year_8 Week → 308
Top Marking (SOT-23-3L/TSOT-23-3L)	**Top Marking (UDFN-3L)**
L L Y W X → ID code:internal WW: 01~26 (A~Z) 27~52 (a~z) Year: A= 2010 1= 2011 ⋮ 9= 2019 Identification code Z1: AZ8103 Z2: AZ8103A	L L → Identification Code Z1: AZ8103 Z2: AZ8103A Y W X → ID Code: Internal Week: 01~26(A~Z) 27~52(a~z) Year : A = 2010 1 = 2011 ⋮ 9 = 2019

❖ ABSOLUTE MAXIMUM RATINGS (at T_A=25°C)

Characteristics		Symbol	Rating	Unit
VDD Pin Voltage		V_{DD}	- 0.3 to 6V	V
Output Pin Voltage		V_{OUT}	- 0.3 to 6V	V
Output Current		I_{OUT}	2	mA
Power Dissipation		PD	$(T_J-T_A) / \theta_{JA}$	mW
Storage Temperature Range		T_{ST}	-65 to +150	°C
Junction Temperature		T_J	+125	°C
Operating Temperature Range		T_{OP}	-40 to +85	°C
Thermal Resistance from Junction to case	SOT-23-3L	θ_{JC}	181	°C/W
	TSOT-23-3L			
	UDFN-3L		25	
	SIP-3L		148	
Thermal Resistance from Junction to ambient	SOT-23-3L	θ_{JA}	250	°C/W
	TSOT-23-3L			
	UDFN -3L		120	
	SIP-3L		206	

Note : θ_{JA} is measured with the PCB copper area of approximately 1 in^2(Multi-layer).

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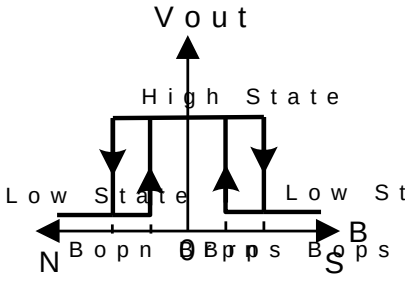
❖ ELECTRICAL CHARACTERISTICS (V_{DD} = 2.75V, T_A=25°C, unless otherwise specified)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}		2.4	-	5.5	V
Supply Current	I_{DD}	Awake state	-	2	4	mA
		Sleep state	-	7	12	uA
		Average	-	9	16	uA
Output Saturation Voltage	V_{OSAT}	I_{OUT}=1mA	-	0.1	0.3	V
Output Leakage Current	I_{O-LEAK}	V_{OUT}=5.5V, B<Brp	-	0.01	1	uA
Output Wake-Up Time	$T_{wake-up}$		-	70	120	us
Period	T_{Period}		-	70	120	ms
Duty Cycle	D.C		-	0.1	-	%

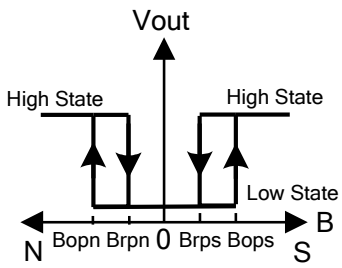
❖ MAGNETIC CHARACTERISTICS (V_{DD} = 2.75V, T_A=25°C, unless otherwise specified)

Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Operating Points	B_{OPS}		-	35	55	Gauss
	B_{OPN}		-55	-35	-	
Release Points	B_{RPS}		10	25	-	
	B_{RPN}		-	-25	-10	
Hysteresis	B_{Hys}		-	10	-	

1. AZ8103:

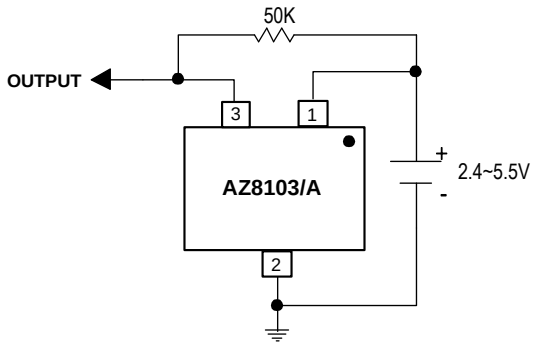


2. AZ8103A:



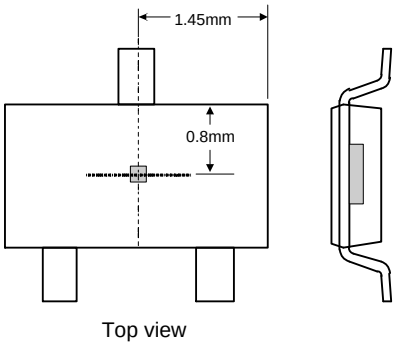
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❖ APPLICATION CIRCUIT

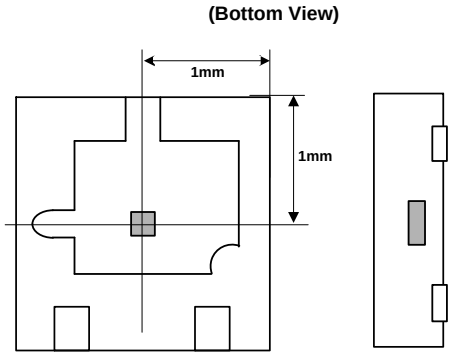


❖ SENSOR LOCATION

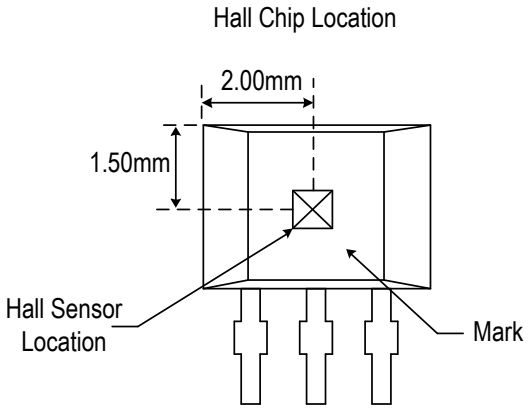
1. SOT-23-3L/TSOT-23-3L



2. UDFN-3L

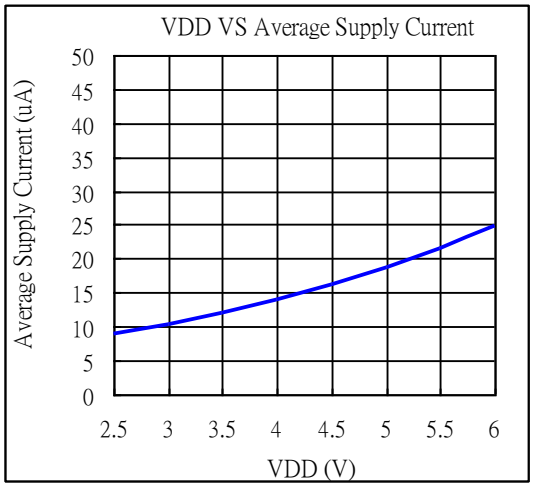


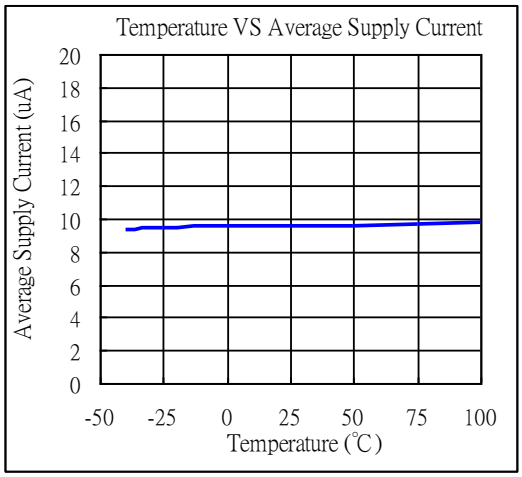
3. SIP-3L

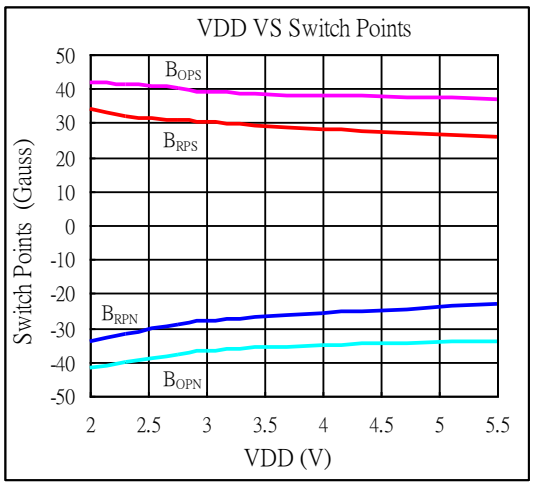


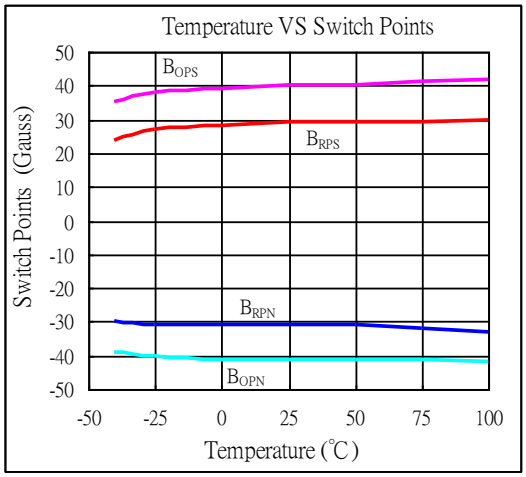
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❖ TYPICAL CHARACTERISTICS





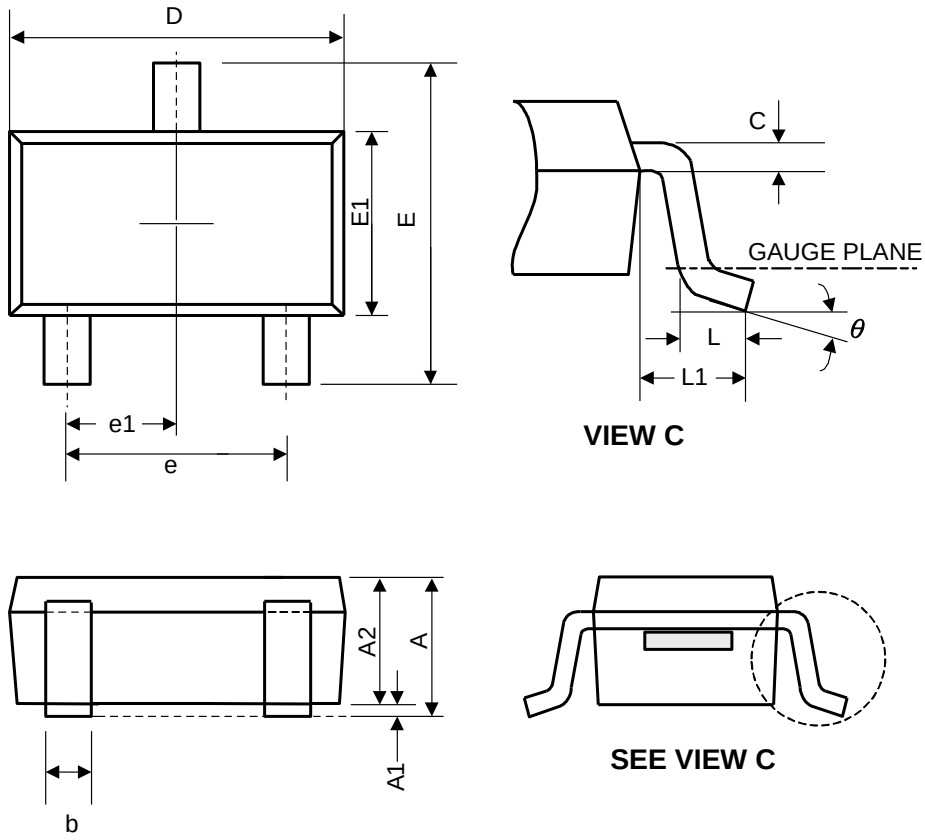




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❖ PACKAGE OUTLINES

(1) SOT-23-3L

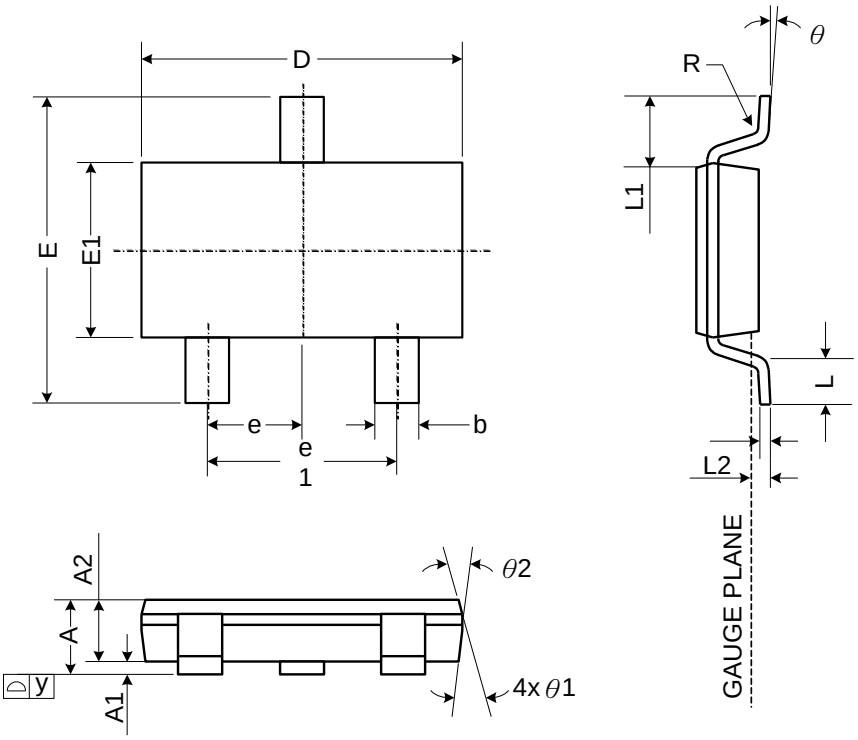


Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.45	-	-	0.057
A1	0.00	0.08	0.15	-	-	0.006
A2	0.90	1.10	1.30	0.035	0.043	0.051
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.08	0.15	0.22	0.003	0.006	0.009
D	2.70	2.90	3.10	0.106	0.114	0.122
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.40	1.60	1.80	0.055	0.063	0.071
L	0.30	0.45	0.60	0.012	0.018	0.024
L1	0.50	0.60	0.70	0.020	0.024	0.028
e	1.9 BSC			0.075 BSC		
e1	0.95 BSC			0.037 BSC		
θ	0°	4°	8°	0°	4°	8°

JEDEC outline: NA

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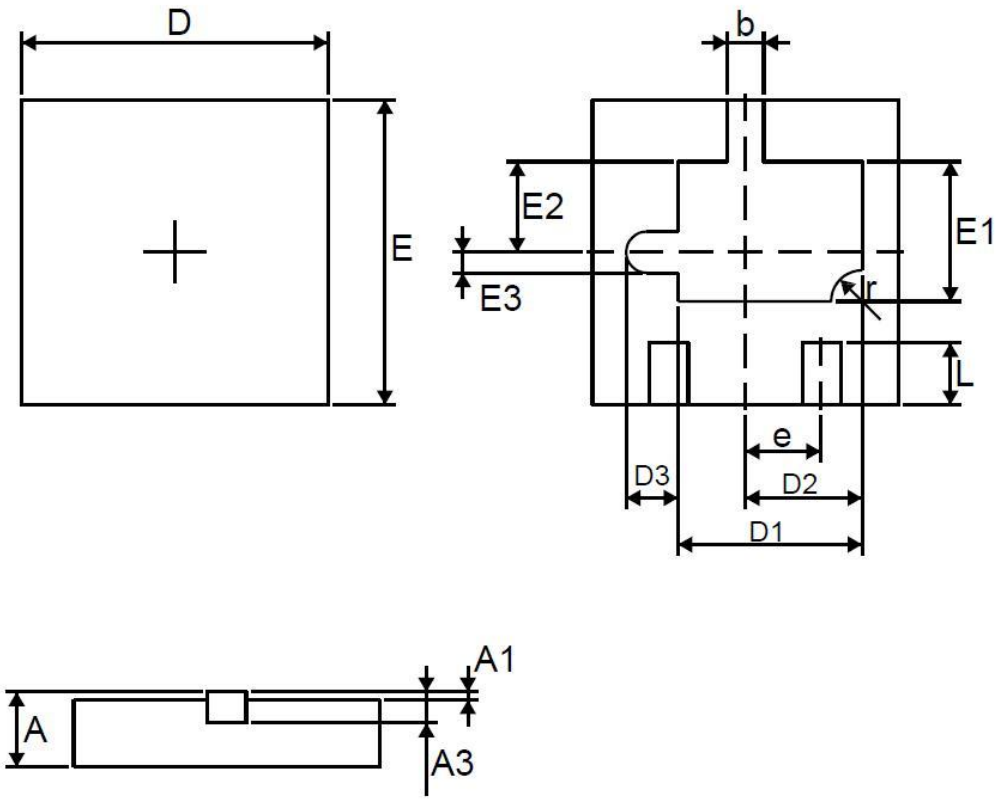
(2) TSOT-23-3L



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.75	-	0.90	0.030	-	0.035
A1	0.00	-	0.10	0.000	-	0.004
A2	0.70	0.75	0.80	0.028	0.030	0.031
b	0.35	-	0.51	0.014	-	0.020
C	0.10	-	0.25	0.004	-	0.010
D	2.80	2.90	3.00	0.110	0.114	0.118
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
e	0.95 BSC.			0.037 BSC.		
e1	1.90 BSC.			0.075 BSC.		
L	0.37	-	-	0.015	-	-
L1	0.60 REF.			0.024 REF.		
L2	0.25 BSC.			0.010 BSC.		
y	-	-	0.10	-	-	0.004
R	0.10	-	-	0.004	-	-
θ	0°	-	8°	0°	-	8°
θ1	7° NOM.			7° NOM.		
θ2	5° NOM.			5° NOM.		

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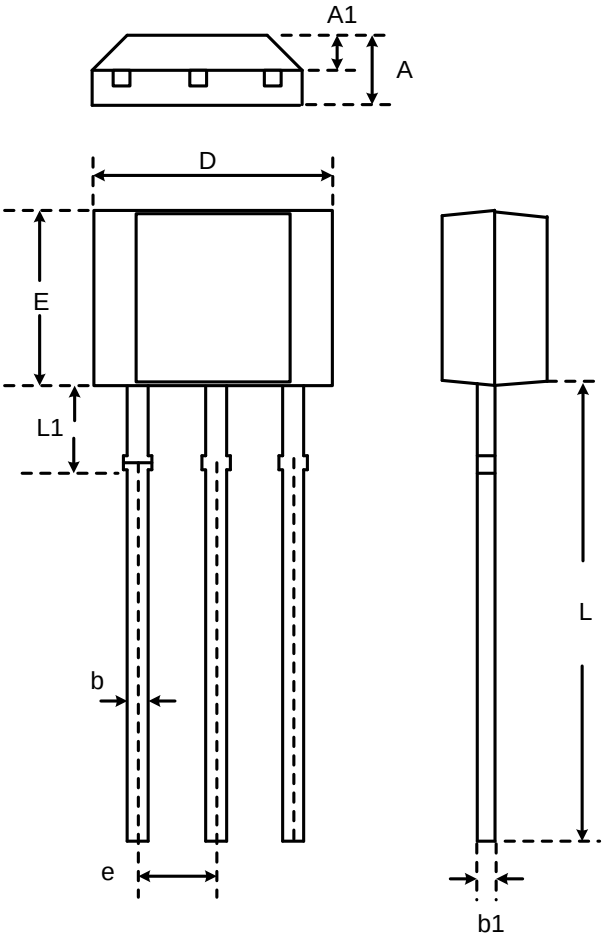
(3) UDFN-3L (2X2X0.5mm)



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.450	-	0.550	0.018	-	0.022
A1	0.000	-	0.05	0.000	-	0.002
A3	0.152REF.			0.006REF.		
D	1.924	-	2.076	0.076	-	0.082
E	1.924	-	2.076	0.076	-	0.082
D1	1.100	-	1.300	0.043	-	0.051
D2	0.325REF.			0.030REF.		
D3	0.763REF.			0.013REF.		
E1	0.800	-	1	0.031	-	0.039
E2	0.600REF.			0.024REF.		
E3	0.138REF.			0.005REF.		
k	0.200MIN.			0.008MIN.		
b	0.200	-	0.300	0.008	-	0.012
e	0.500TYP.			0.020TYP.		
L	0.324	-	0.476	0.013	-	0.019
r	-	0.2	-	-	0.008	-

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(4) SIP-3L



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.42	-	1.62	0.056	-	0.064
A1	0.75 BSC.			0.030 BSC.		
b	0.38	-	0.56	0.015	-	0.022
b1	0.36	-	0.51	0.014	-	0.020
D	3.9	-	4.1	0.154	-	0.161
e	1.27 BSC			0.050 BSC		
E	2.9	-	3.1	0.114	-	0.122
L	14.5 BSC			0.571 BSC		
L1	1.6 BSC			0.063 BSC		

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