Low Current Consumption, High Sensitivity CMOS Hall IC

■ General Description

The LN4915 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 2.0V-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 Voltage 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, it can be switched on with either the north or south pole of a magnet.

LN4915 is higher sensitivity of magnetic induction than LN4913, it can be used in security systems、sensing magnet smaller occasions.

■ Features

- Micro power design
- 2.0 V to 5.5 V battery operation
- High sensitivity and high stability of the magnetic Switching points
- High resistance to mechanical stress
- Digital output signal
- Switching for both poles of a magnet (omnipolar)
- Not suitable for automotive application

■ Operating Parameters

Operating temperature range

$T_{MIN} \le T_A \le T_{MAX}$	$-40°C \le T_A \le 85°C$
Operating voltage range	$2.0V \le VDD \le 6.0V$

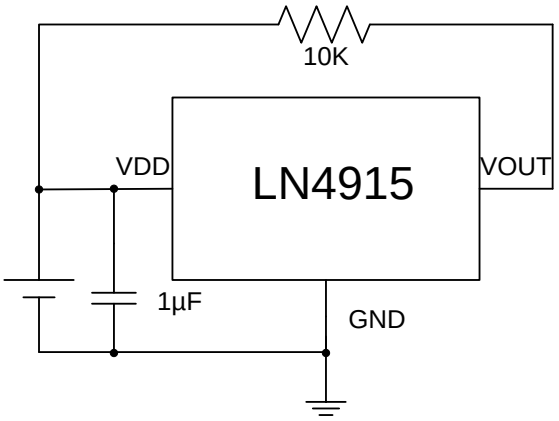
■ Application

- Mobile phones
- Notebook
- Portable electronic devices

■ Package

- SOT-23-3
- TSOT-23-3
- TO-92
- TO-92S

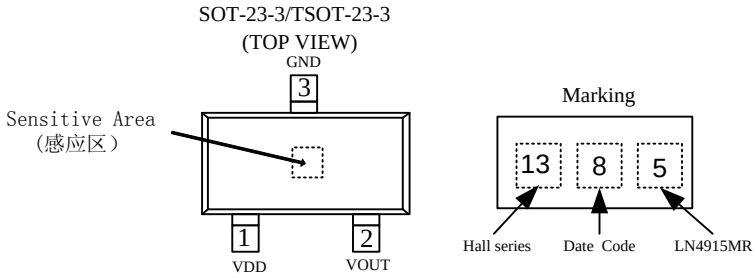
■ Typical Application Circuit



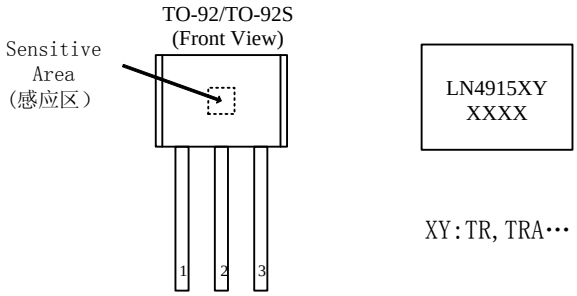
■ Ordering Information

Part Number	Package Code	Package	Lot Number	Part Number	Package Code	Package	Lot Number
LN4915MR	M	SOT-23-3	15XY	LN4915SRA	S	TO-92S	XXXX
LN4915NR	N	TSOT-23-3	15XY	LN4915TRB	T	TO-92	XXXX
LN4915TR	T	TO-92	XXXX	LN4915SRB	S	TO-92S	XXXX
LN4915SR	S	TO-92S	XXXX	LN4915TRA	T	TO-92	XXXX

■ Pin Configuration

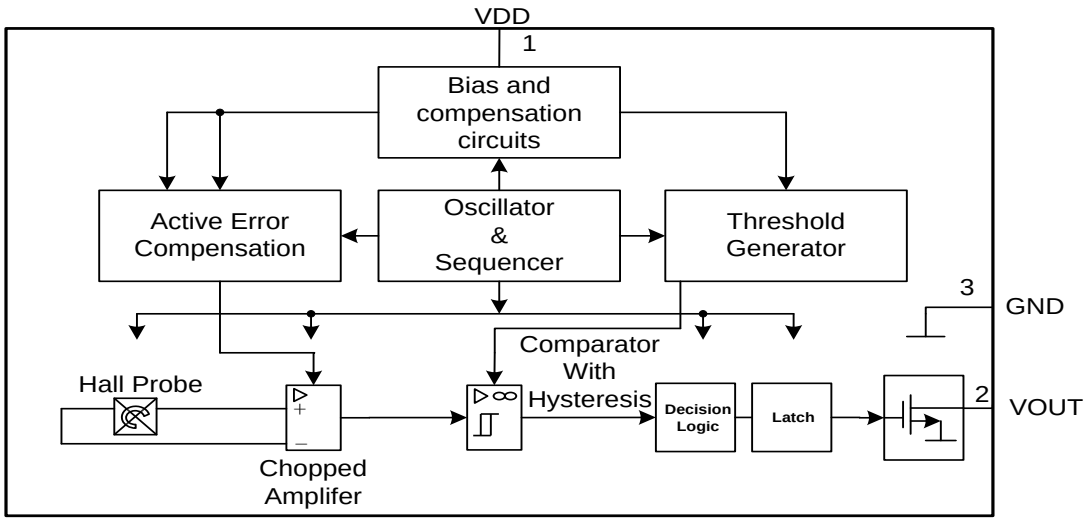


Pin Number	Pin Name	Function Description
2	VOUT	Output Pin
3	GND	Ground
1	VDD	Supply Voltage



Ordering Name	Package	Pin Name			Marking
		1	2	3	
LN4915TR	TO-92	VDD	VOUT	GND	4915
LN4915SR	TO-92S	VDD	VOUT	GND	4915
LN4915TRA	TO-92	VOUT	GND	VDD	4915A
LN4915SRA	TO-92S	VOUT	GND	VDD	4915A
LN4915TRB	TO-92	VDD	GND	VOUT	4915B
LN4915SRB	TO-92S	VDD	GND	VOUT	4915B

■ Function Block Diagram



■ Absolute Maximum Ratings

Symbol	Characteristics	Values	Unit
Vdd	Supply voltage	2.0-6.0	V
I_{DD}	Operating current	-1-4.5	mA
V_{OUT}	Output voltage	-0.3-6.0	V
I_{OUT}	Output current	-1-2.0	mA
T_S	Storage temperature range	-40～+150	℃
T_J	Maximum junction temperature	150	℃
-	ESD Protection	4000	V

■ Electrical Characteristics

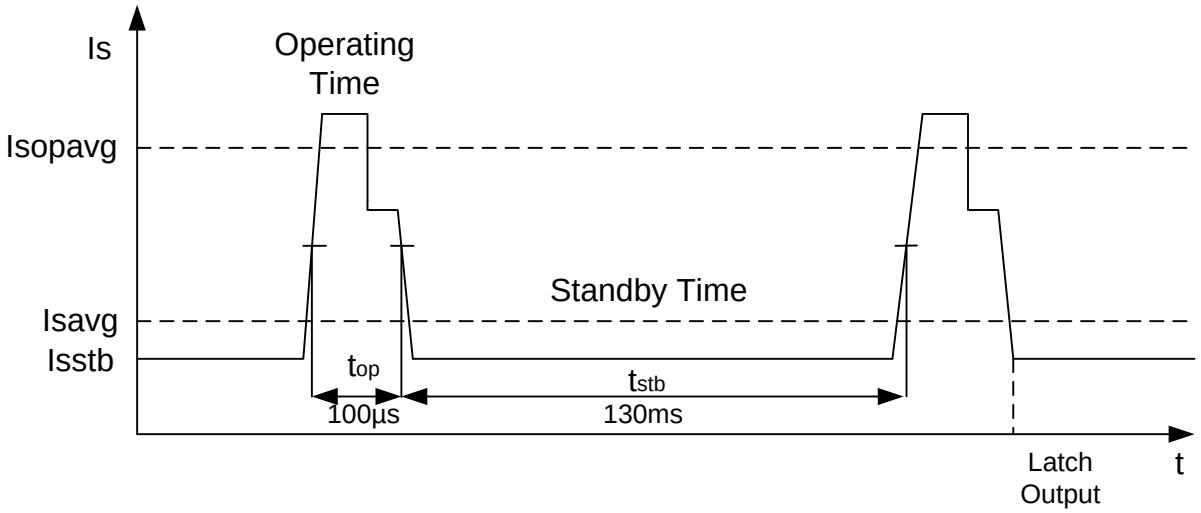
AC/DC Characteristics (T_A=+25℃,V_{DD}=3.0V,Unless otherwise specified)

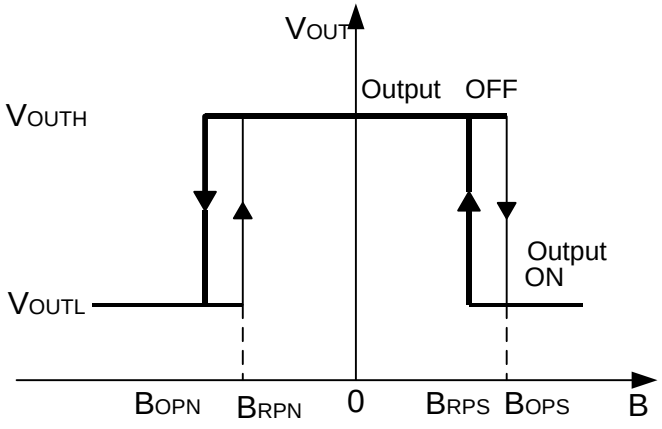
Symbol	Characteristic	Conditions	Min	Typ	Max	Unit
VDD	Supply voltage	—	2.0	—	5.5	V
I_{SAVG}	Averaged supply current		1	3	10	uA
I_{SOPAVG}	Averaged current during operating time		0.5	2.0	3.5	mA
I_{SOPT}	Peak current during operating time				4.5	mA
I_{SSTB}	Supply current during standby time		1	1.9	8	uA
V_{QSAT}	Output Saturation Voltage	IOUT=1mA		0.13	0.4	V
I_{QLEAK}	Output on Leakage Current			0.01	1	uA
t_r	Output rise time	R_L=2.7KΩ C_L=10pF		0.5	1	us
r_f	Output fall time	R_L=2.7KΩ C_L=10pF		0.1	1	us
t_{op}	Operating time		25	100	160	us
t_{stb}	Standby time		60	140	240	ms
t_{op}/t_{stb}	Duty cycle			0.071		%
t_{stu}	Start-up time of IC			12	20	us

■ Mangentic Characteristics

(T_A=+25℃,V_{DD}=2.7V, Unless otherwise specified)

Symbol	Min	Typ	Max	Unit
BOPS	1	1.5	2	mT
BOPN	-2	-1.5	-1	mT
BRPS	0.8	1.1	1.5	mT
BRPN	-1.8	-1.1	-0.8	mT
BHYS	0.1	0.4	0.7	mT

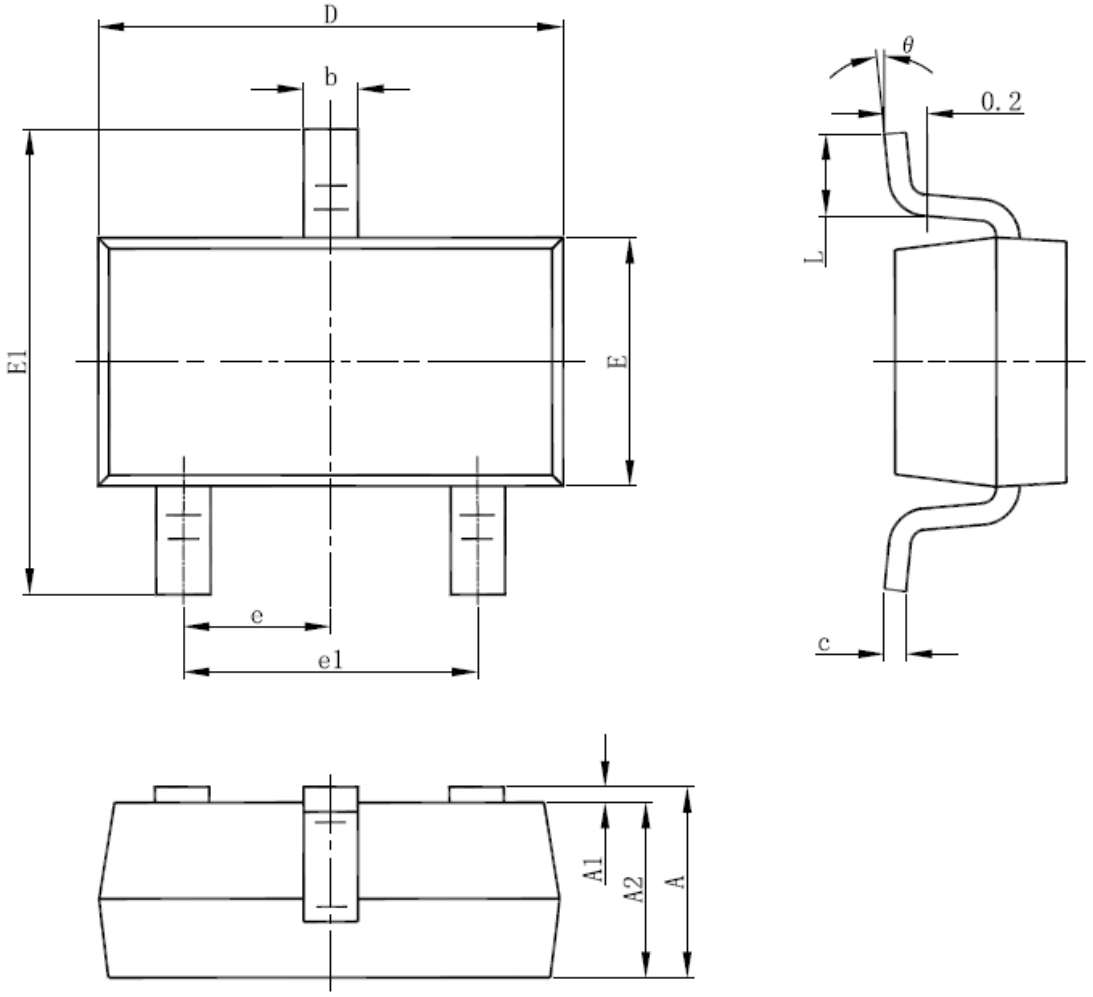




VOUT as function of the applied B-Field

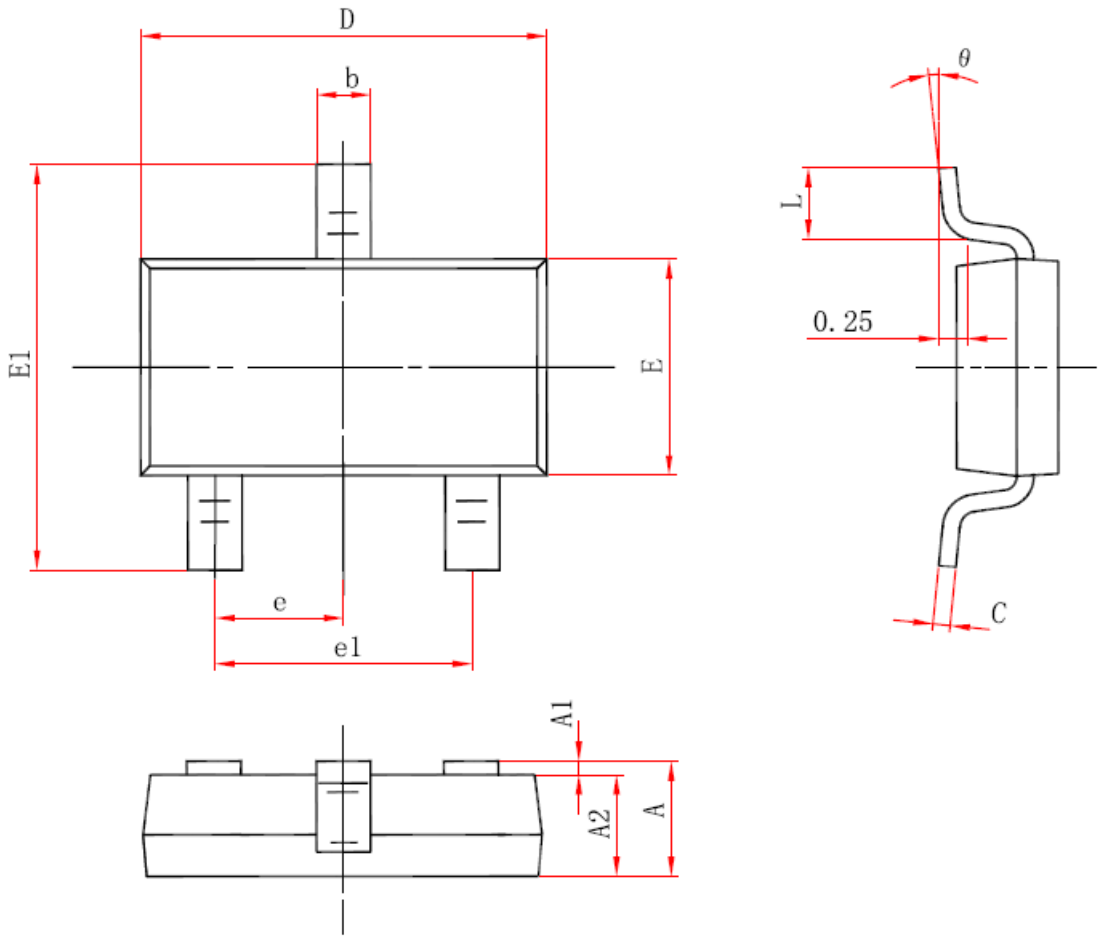
■ Package

- **SOT-23-3**



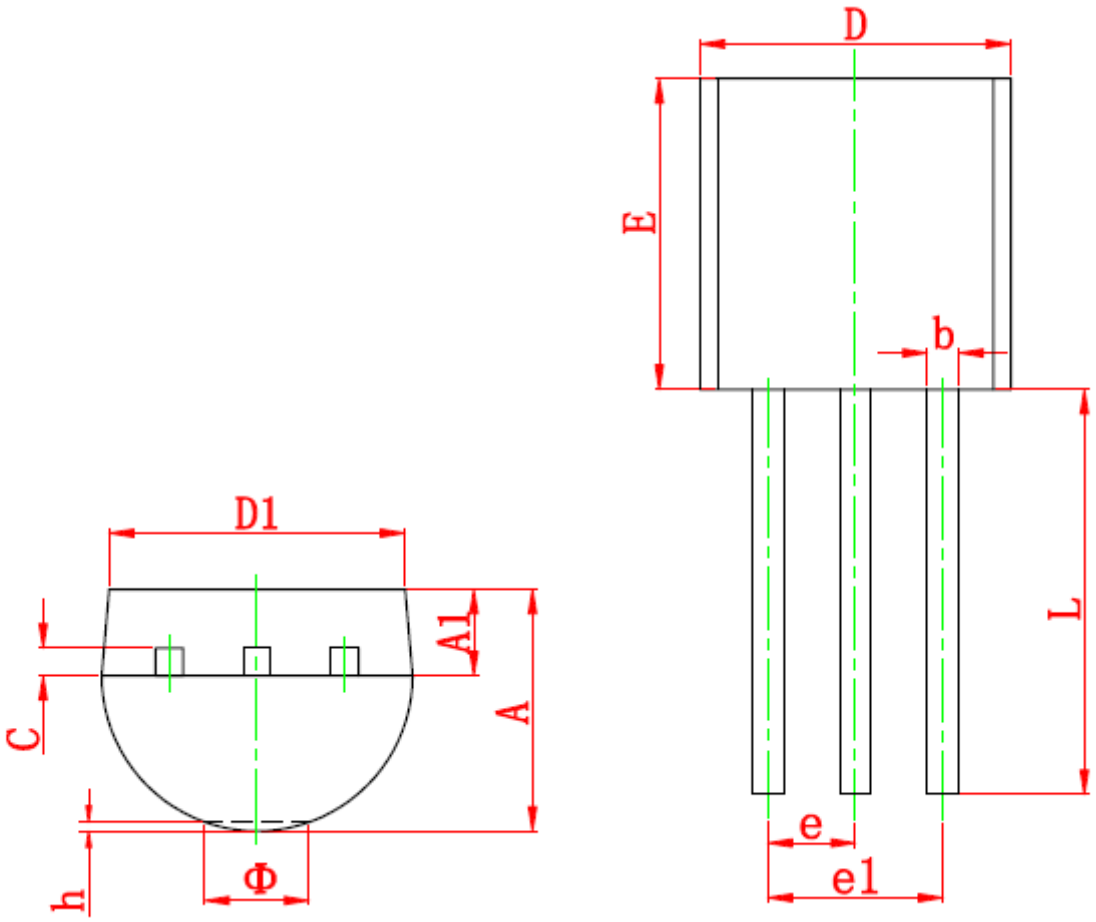
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

- **TSOT-23-3**



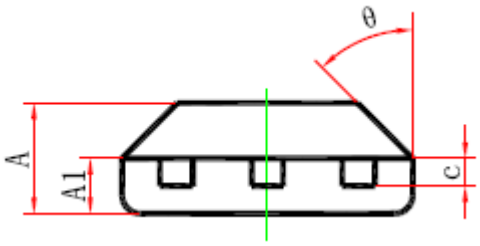
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.350	0.500	0.014	0.020
c	0.080	0.200	0.003	0.008
D	2.820	3.020	0.111	0.119
E	1.600	1.700	0.063	0.067
E1	2.650	2.950	0.104	0.116
e	0.95（BSC）		0.037(BSC)	
e1	1.90（BSC）		0.075(BSC)	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

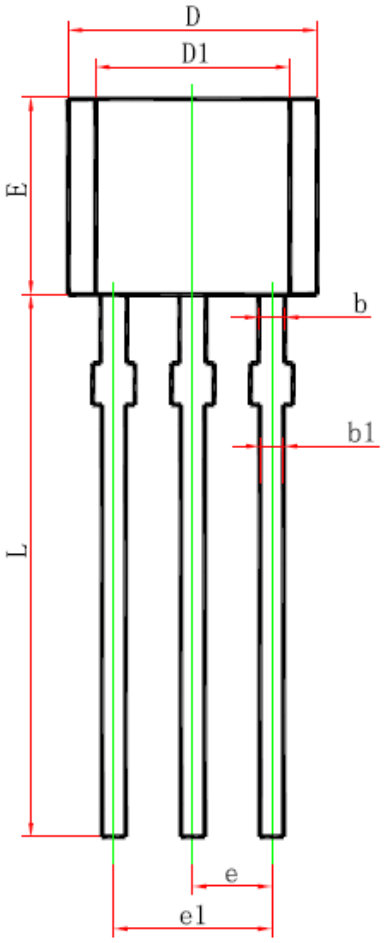
- **TO-92**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

- **TO-92S**





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.420	0.550	0.017	0.022
b1	0.360	0.480	0.014	0.019
c	0.360	0.510	0.014	0.020
D	3.900	4.100	0.154	0.161
D1	2.970	3.270	0.117	0.129
E	3.050	3.250	0.120	0.128
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	15.100	15.500	0.594	0.610
θ	45° TYP		45° TYP	