

300mA High PSRR Low Dropout Voltage Regulator

General Description

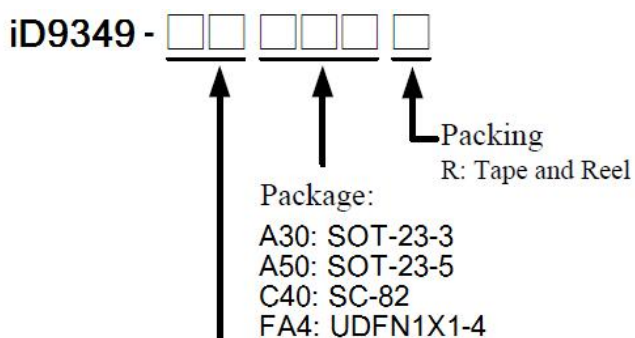
The iD9349 is a 300mA, low dropout and low noise linear regulator with high ripple rejection ratio and fast turn-on time. It has fixed output voltage ranging from 1.5V to 3.3V.

The iD9349 includes a voltage reference unit, an error amplifier, resistor net for voltage setting, a current limit circuit.

These ICs perform with low dropout voltage.

The iD9349 works well with low ESR ceramic capacitors, suitable for portable RF and wireless battery-powered applications with stringent space requirements and demanding performance. It also offers ultra low noise output and has low quiescent current.

Ordering Information



Output Voltage	Voltage Code
1.5	15
1.8	18
2.5	25
2.8	28
3.0	30
3.3	33

Other voltage outputs may be available. For further details, please contact an iDesyn sales or distributor.

Features

- Ultra-Low-Noise Application
- Wide 2V to 6V Operating Range
- Quick Start-up
- Current Limiting Protection
- Thermal Shutdown Protection
- Low Dropout : 220mV @ 150mA, 3.3V
- High Ripple Rejection 65dB@10kHz
- Standby Current Less 0.1μA
- Low Supply Current: 25μA

Applications

- Battery-Powered Equipment
- Portable Instruments
- Digital Camera
- WLAN Communication
- Hand-Held Instruments

Marking Information

For marking information, please contact our sales representative directly or through distributor around your location.

Typical Application Circuit

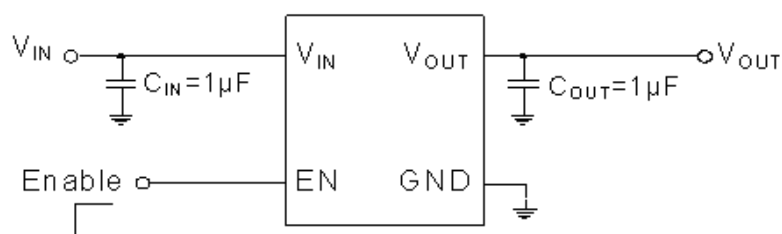


Figure 1. SC-82/UDFN1X1-4 Package

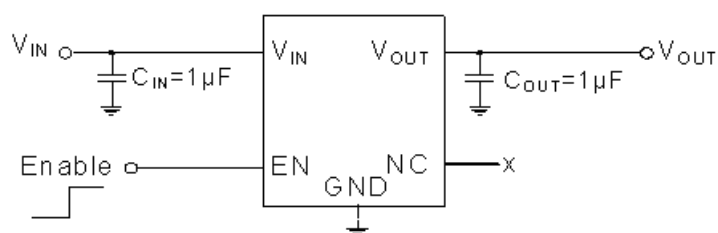


Figure 2. SOT-23-5 Package

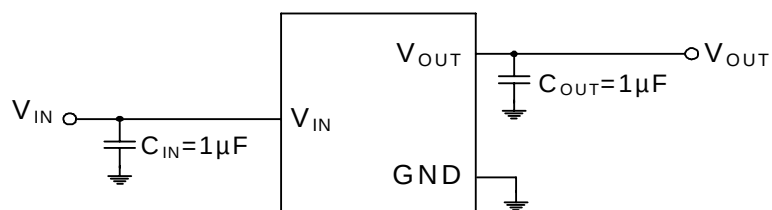


Figure 3. SOT-23-3 Package

Absolute Maximum Ratings (Note1)Supply Voltage V_{IN} 6.5VPower Dissipation, P_D @ $T_A=25^{\circ}\text{C}$

SC-82 300mW

SOT-23-3 & SOT-23-5 400mW

UDFN1X1-4 400mW

Thermal Resistance, θ_{JA} SC-82 333 $^{\circ}\text{C/W}$ SOT-23-3 & SOT-23-5 250 $^{\circ}\text{C/W}$ UDFN1X1-4 250 $^{\circ}\text{C/W}$ Lead Temperature 260 $^{\circ}\text{C}$ Storage Temperature -65 $^{\circ}\text{C}$ to 150 $^{\circ}\text{C}$

ESD Susceptibility

HBM (Human Body Mode) 2kV

MM (Machine Mode) 200V

Recommended Operating ConditionsInput Voltage V_{IN} 2 V to 6V

EN Input Voltage 0V to 6V

Junction Temperature -40 $^{\circ}\text{C}$ to 125 $^{\circ}\text{C}$ Ambient Operating Temperature -40 $^{\circ}\text{C}$ to 85 $^{\circ}\text{C}$

Electrical Characteristics (Unless otherwise specified $V_{IN}=V_{OUT}+1V$, $T_A=25^{\circ}C$)

Parameters	Symbol	Condition	Min	Typ	Max	Units
Operating Voltage Range (Note 2)	V_{IN}				6	V
Standby Current	I_{SBY}	$V_{EN} = GND, Shutdown$		0.01	0.1	μA
Supply Current Limit	I_{LIMIT}	$R_{LOAD} = 1\Omega$		360		mA
Quiescent Current	I_Q	$V_{OUT} = 2.8V, I_{OUT}=0$		25		μA
Dropout Voltage (Note 3)	V_{DROP}	$I_{OUT} = 150mA$	$V_{OUT} < 1.5V$		1000	mV
			$V_{OUT} = 1.5V$	480	700	mV
			$V_{OUT} = 2.5V$	280	500	mV
			$V_{OUT} = 2.8V$	230	350	mV
			$V_{OUT} = 3.3V$	220	340	mV
Line Regulation	ΔV_{LINE}	$V_{IN} = (V_{OUT} + 1V) \text{ to } 5.5V$, $I_{OUT} = 1mA$			10	mV/V
Output Noise Voltage	eNO	10Hz to 100kHz, $I_{OUT} = 200mA, C_{OUT} = 1\mu F$		100		μV_{RMS}
Load Regulation	$\% \Delta V_{LOAD}$	$I_{OUT} = 1mA \text{ to } 150mA$		0.005	0.015	% /mA
Output Voltage Accuracy	ΔV_{OUT}	$I_{OUT} = 1mA$	-2		+2	%
Fast Discharge N-MOSFET Turn On Resistance	$R_{DISCHARGE}$	$V_{IN} = 4V, V_{EN} = 0V$		60		Ω
Enable Pull Down Resistance	RPD		0.7	2.0	8.0	M Ω
Power Supply Rejection Rate	f = 100Hz	$C_{OUT} = 1\mu F, I_{OUT} = 10mA$		70		dB
	f = 10kHz			65		

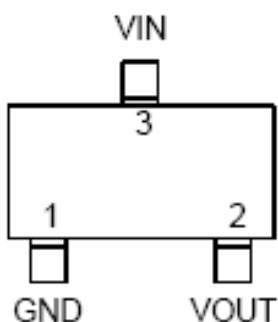
Note 1: Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2: $V_{IN(MIN)} = V_{OUT} + V_{DROPOUT}$

Note 3: The dropout voltage is defined as $(V_{IN} - V_{OUT})$ when V_{OUT} is 100mV below the target value of V_{OUT} .

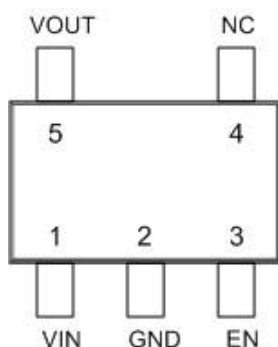
Pin Configurations

(Top View)



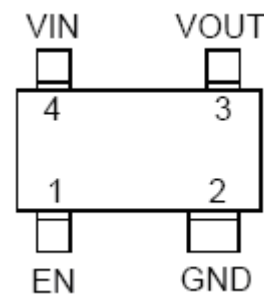
SOT-23-3

(Top View)



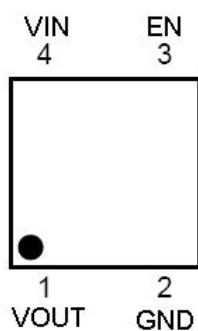
SOT-23-5

(Top View)



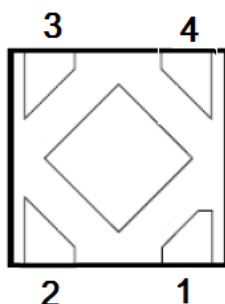
SC-82

(Top View)



UDFN1X1-4

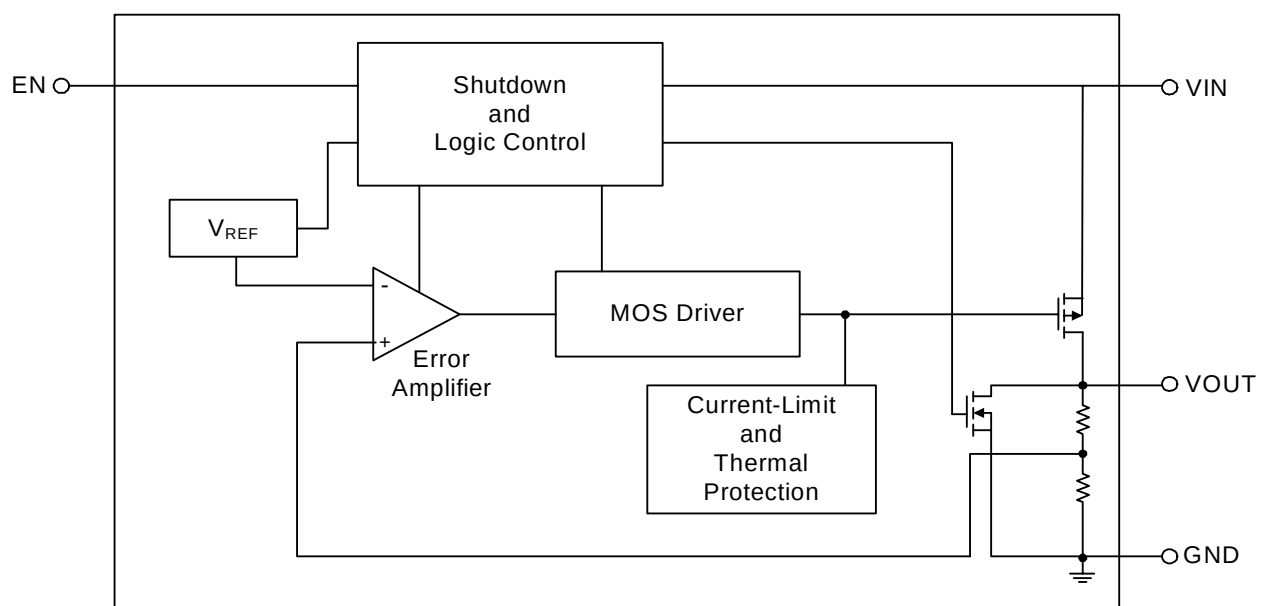
(Bottom View)



Pin Description

Pin Name	Pin Function
EN	Chip Enable (Active High). Note that this pin is high impedance.
GND	Ground
VOUT	Output Voltage
VIN	Input Voltage
NC	No Internal Connection (Floating or Connecting to GND)

Function Block Diagram

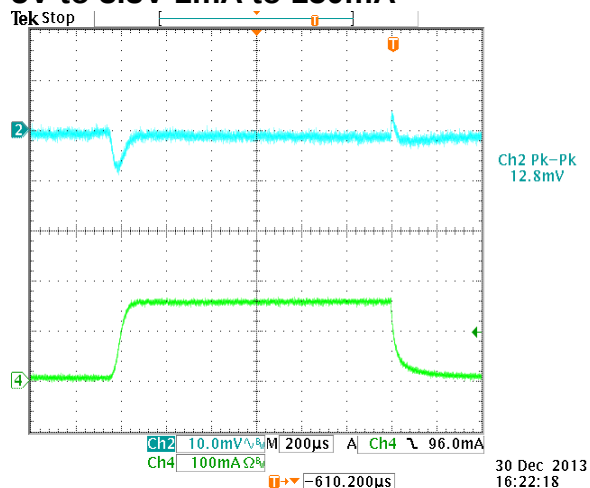


Typical Operating Characteristics

(Unless otherwise specified $V_{IN}=V_{OUT}+1V$, $T_A=25^{\circ}C$)

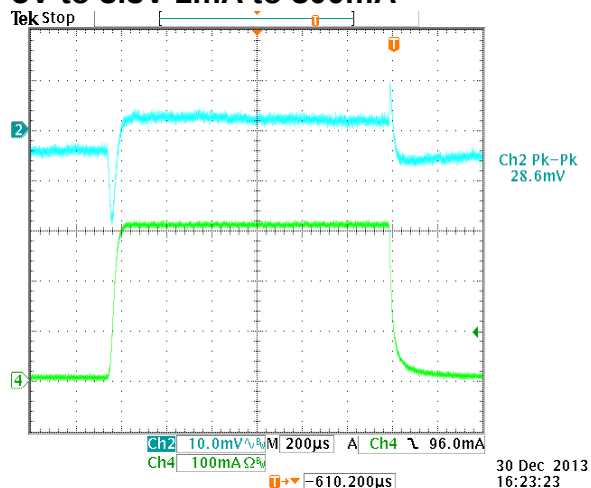
Load Transient

5V to 3.3V 1mA to 150mA



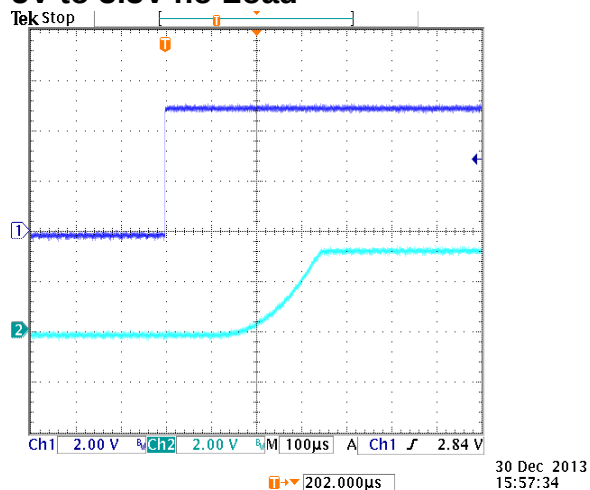
Load Transient

5V to 3.3V 1mA to 300mA



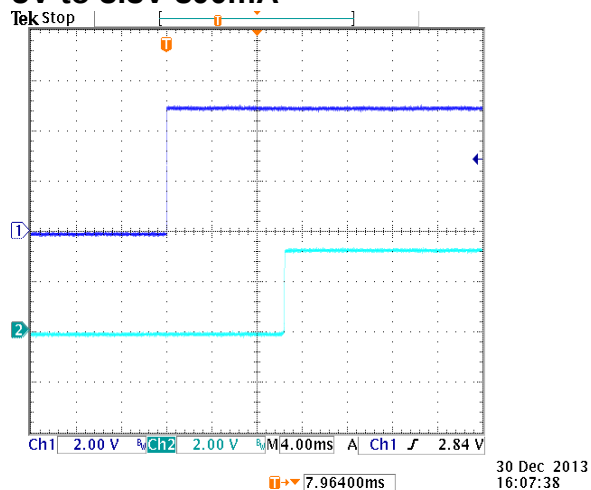
Start up

5V to 3.3V no Load



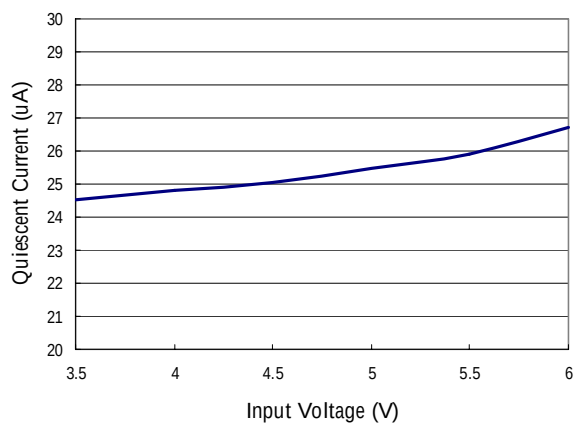
Start up

5V to 3.3V 300mA

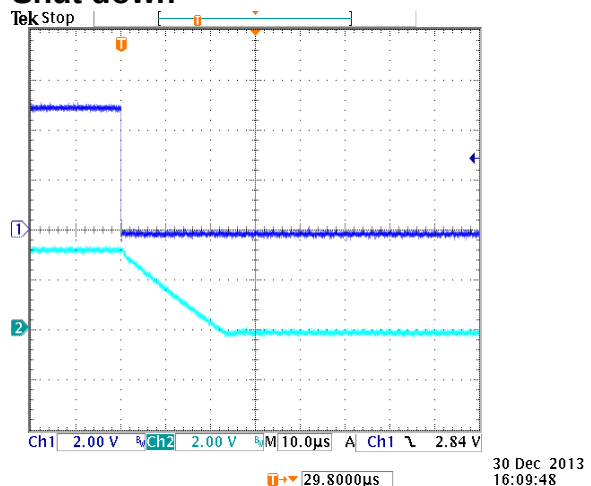


Quiescent Current (Vout=3.3V)

Quiescent Current VS Input Voltage

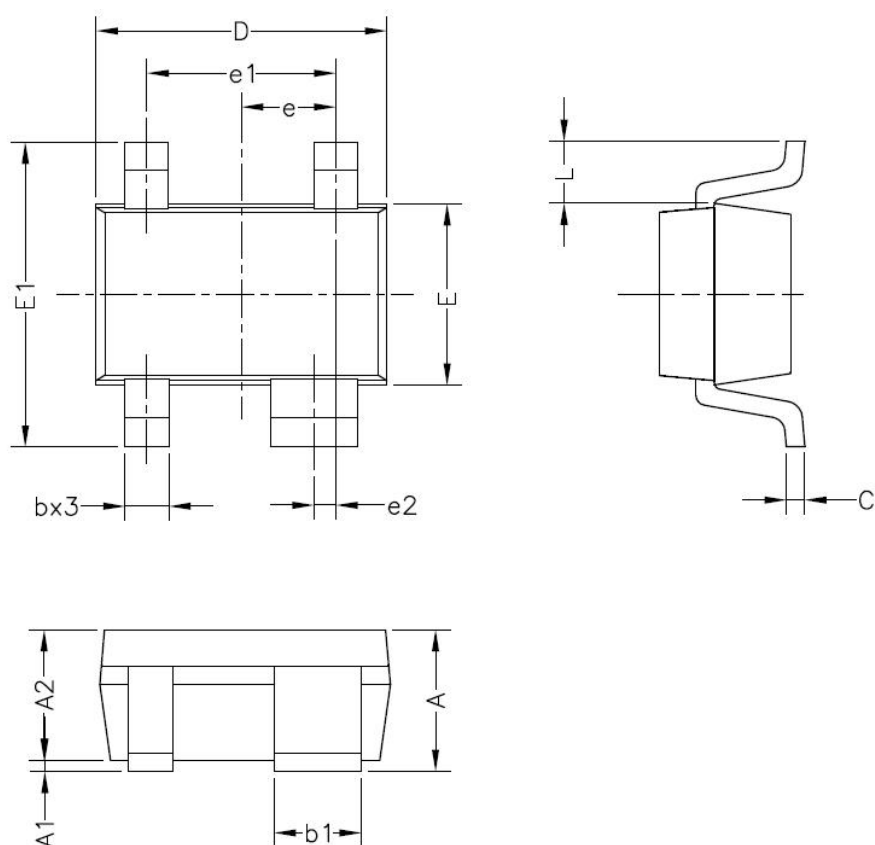


Shut down



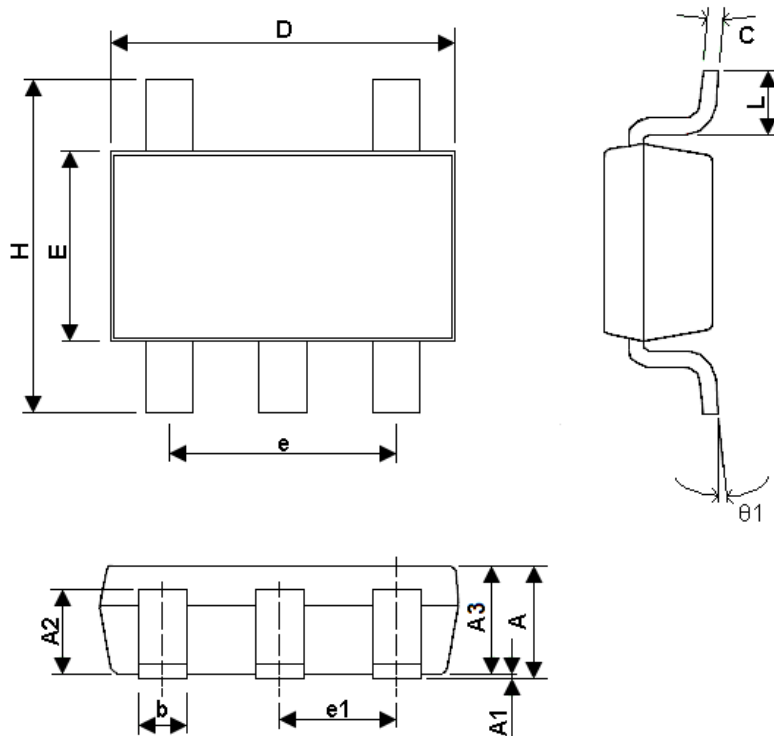
Packaging

SC-82



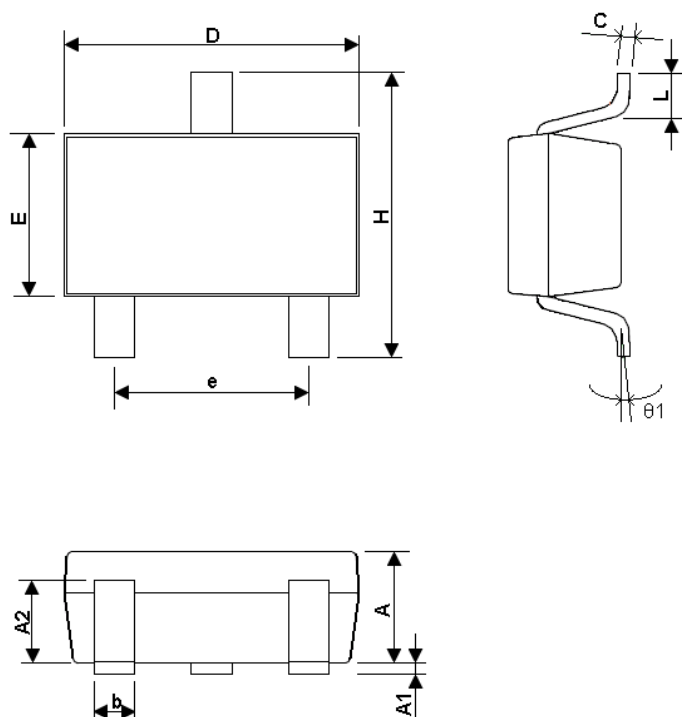
SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	---	1.05	0.033	---	0.041
A1	0.00	---	0.10	0.000	---	0.004
A2	0.85	---	0.95	0.033	---	0.037
b	0.20	---	0.40	0.008	---	0.016
b1	0.5	---	0.7	0.020	---	0.028
C	0.10	---	0.15	0.004	---	0.006
D	1.90	---	2.10	0.075	---	0.083
E	1.15	---	1.35	0.045	---	0.053
E1	2.00	---	2.30	0.080	---	0.091
e	0.65 BSC.			0.026 BSC.		
e1	1.30 BSC.			0.052 BSC.		
e2	0.15 BSC.			0.006 BSC.		
L	0.425 REF.			0.017 REF.		

SOT-23-5



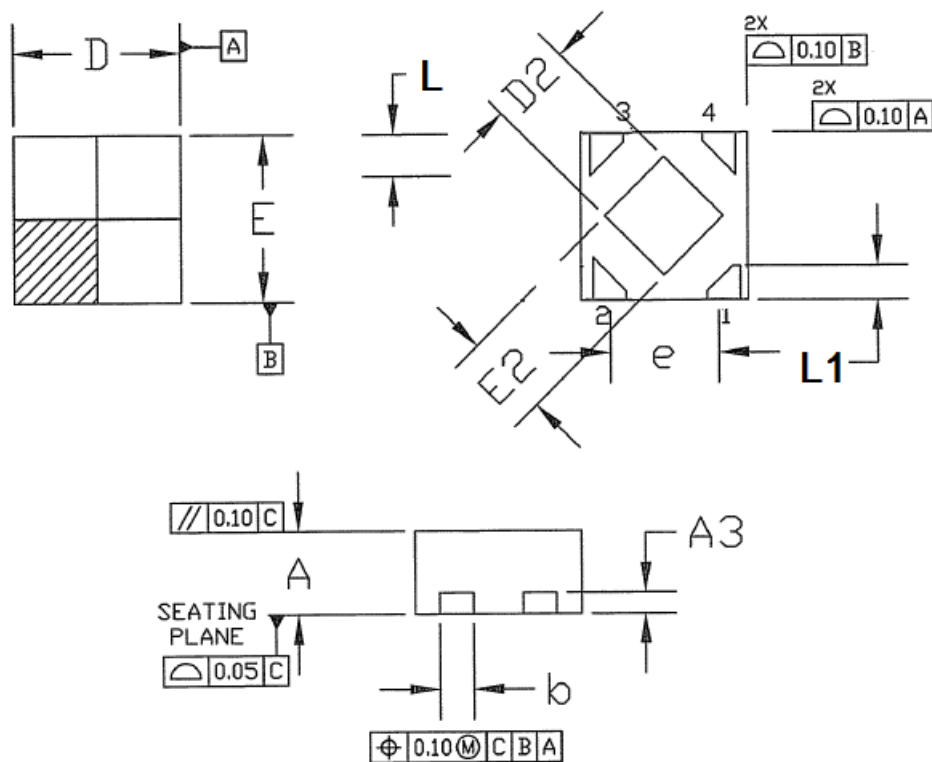
SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.00	---	---	0.039
A1	0.00	---	0.10	0.000	---	0.004
A2	0.58	0.68	0.78	0.023	0.027	0.030
A3	0.84	0.87	0.90	0.033	0.034	0.035
b	0.35	0.40	0.50	0.014	0.016	0.020
C	0.10	0.125	0.15	0.004	0.005	0.006
D	2.70	2.90	3.10	0.106	0.114	0.122
E	1.50	1.60	1.80	0.059	0.063	0.071
e	---	1.90(TYP)	---	---	0.075(TYP)	---
H	2.60	2.80	3.00	0.102	0.110	0.118
L	0.370	---	---	0.015	---	---
$\theta 1$	1°	5°	9°	1°	5°	9°
e1	---	0.95(TYP)	---	---	0.037	---

SOT-23-3



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCH		
	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	0.80	0.90	0.027	0.031	0.035
b	0.35	0.40	0.50	0.013	0.016	0.020
C	0.10	0.15	0.25	0.004	0.006	0.001
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	---	1.90(TYP)	---	---	0.075	---
H	2.60	2.80	3.00	0.102	0.110	0.118
L	0.370	---	---	0.015	---	---
$\theta 1$	1°	5°	9°	1°	5°	9°

UDFN1X1-4



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.55	0.58	0.62	0.018	0.020	0.022
A3	0.100 REF			0.004 REF		
b	0.2	0.25	0.3	0.006	0.008	0.010
D	0.90	1.00	1.10	0.035	0.039	0.043
D2	0.43	0.48	0.53	0.016	0.020	0.024
E	0.90	1.00	1.10	0.035	0.039	0.043
E2	0.43	0.48	0.53	0.016	0.020	0.024
e	0.65 BSC			0.026 BSC		
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.27	0.32	0.37	0.006	0.008	0.010