

## DESCRIPTION

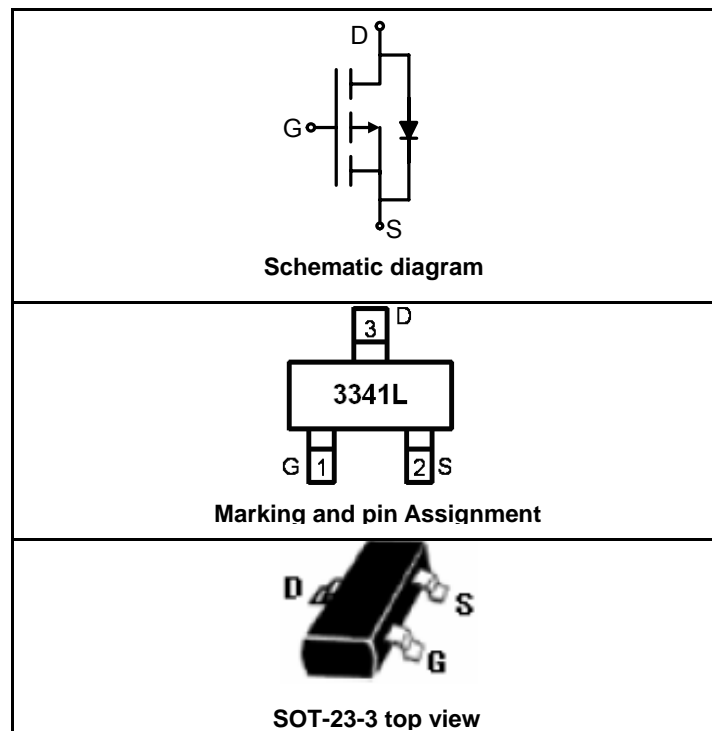
The SSF3341L uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.

## GENERAL FEATURES

- $V_{DS} = -30V, I_D = -4.2A$   
 $R_{DS(ON)} < 120m\Omega @ V_{GS} = -2.5V$   
 $R_{DS(ON)} < 65m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 50m\Omega @ V_{GS} = -10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

## Application

- PWM applications
- Load switch
- Power management



## PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3341L	SSF3341L	SOT-23-3	Ø180mm	8 mm	3000 units

## ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	±12	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D (25^\circ C)$	-4.2	A
	$I_D (70^\circ C)$	-3.5	A
	$I_{DM}$	-30	A
Maximum Power Dissipation	$P_D$	1	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	°C

## THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	90	°C/W
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## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

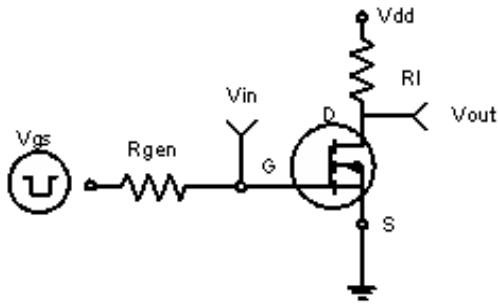
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-24V, V_{GS}=0V$			-1	µA
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$			±100	nA

ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7		-2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.2A$		42	50	mΩ
		$V_{GS}=-4.5V, I_D=-4A$		53	65	
		$V_{GS}=-2.5V, I_D=-1A$		80	120	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-5A$		10		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$		950		PF
Output Capacitance	$C_{oss}$			120		PF
Reverse Transfer Capacitance	$C_{rss}$			70		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-3.2A$ $V_{GS}=-10V, R_{GEN}=6\Omega$		6.5		nS
Turn-on Rise Time	$t_r$			3		nS
Turn-Off Delay Time	$t_{d(off)}$			30		nS
Turn-Off Fall Time	$t_f$			12		nS
Total Gate Charge	$Q_g$	$V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V$		9.6		nC
Gate-Source Charge	$Q_{gs}$			2		nC
Gate-Drain Charge	$Q_{gd}$			2.6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-1A$			-1.2	V

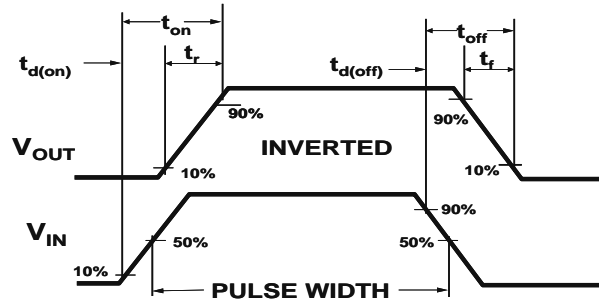
## NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in<sup>2</sup> FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

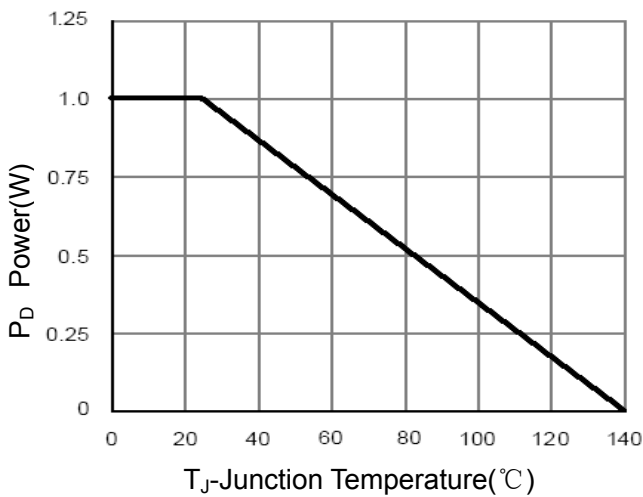
## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



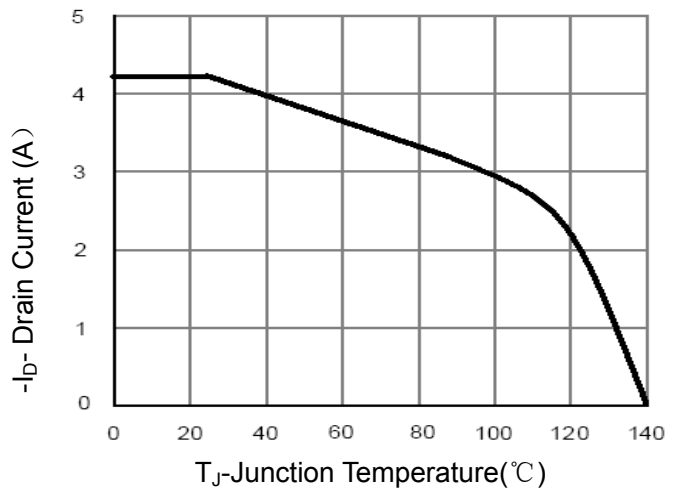
**Figure 1: Switching Test Circuit**



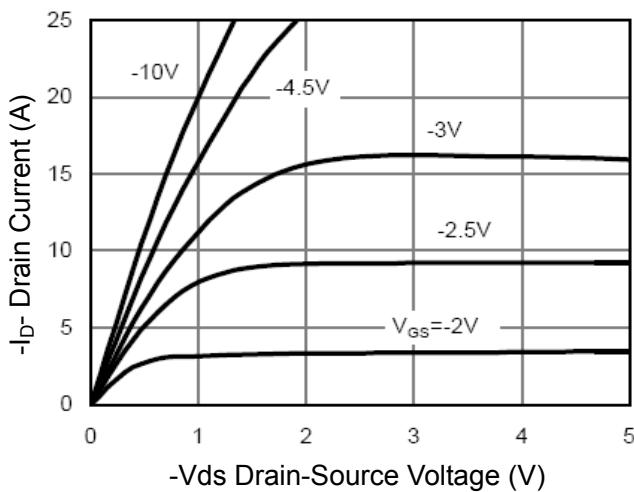
**Figure 2: Switching Waveforms**



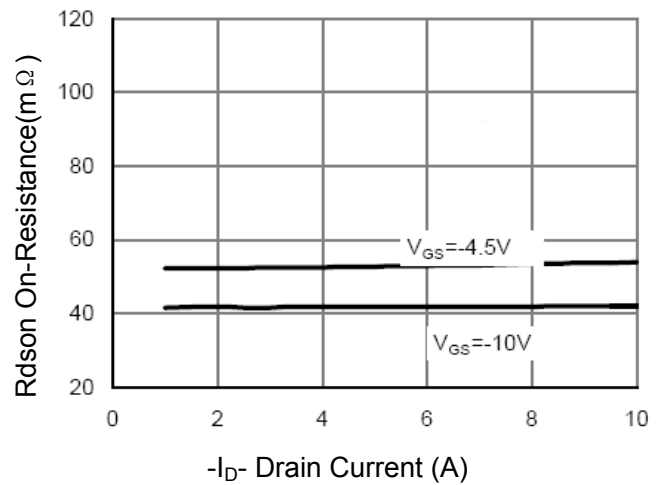
**Figure 3 Power Dissipation**



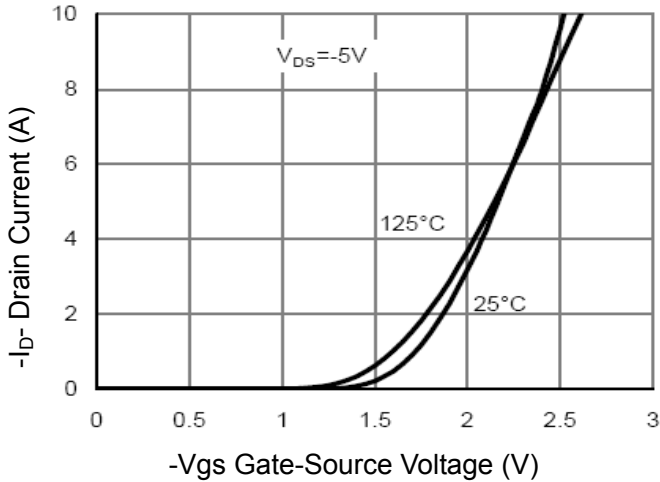
**Figure 4 Drain Current**



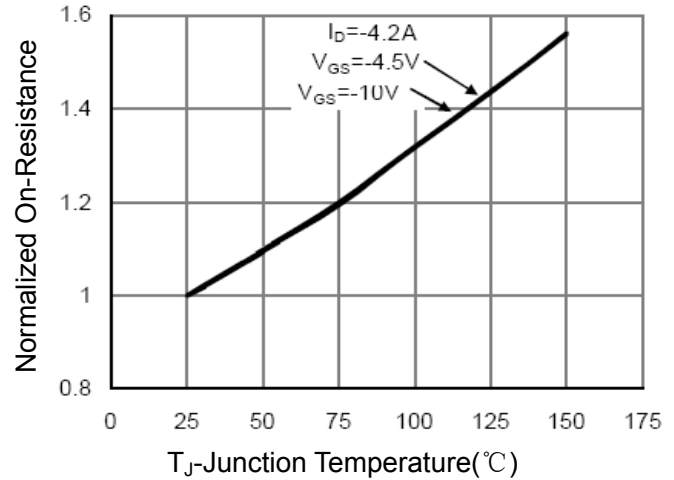
**Figure 5 Output CHARACTERISTICS**



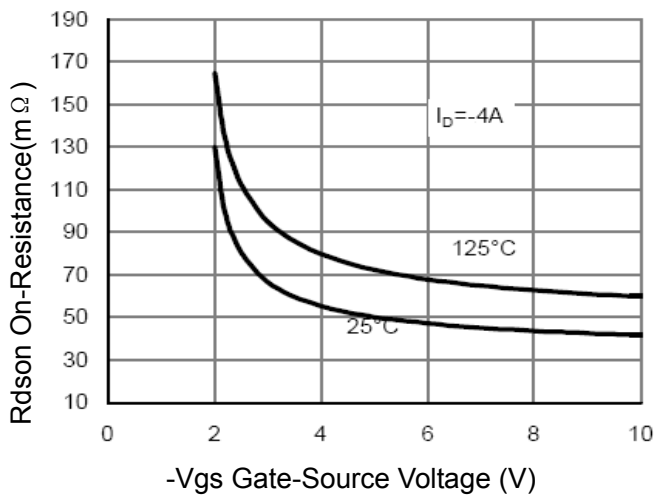
**Figure 6 Drain-Source On-Resistance**



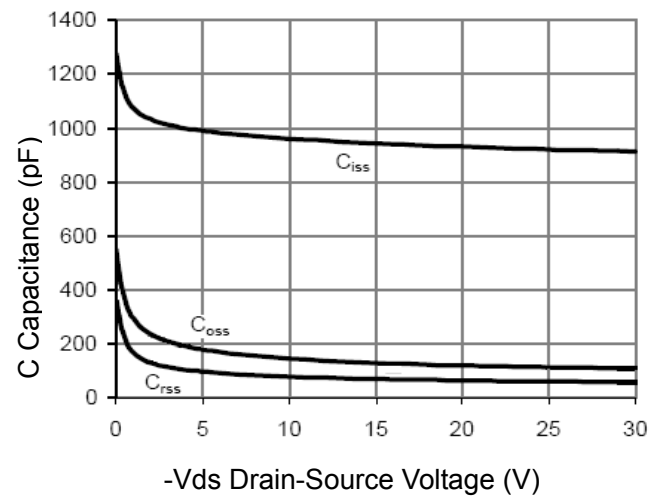
**Figure 7 Transfer Characteristics**



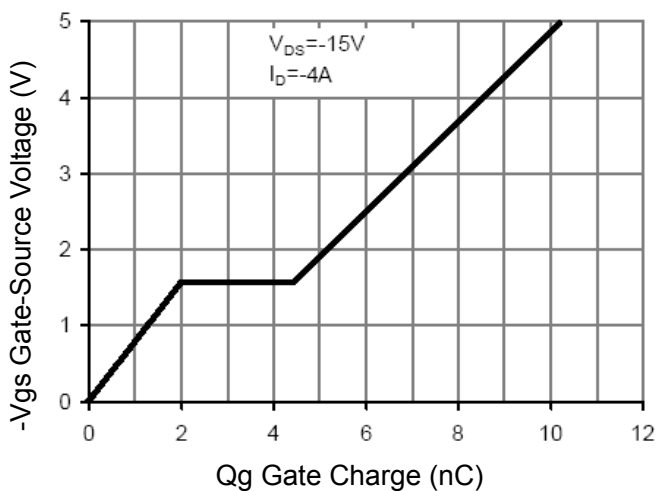
**Figure 8 Drain-Source On-Resistance**



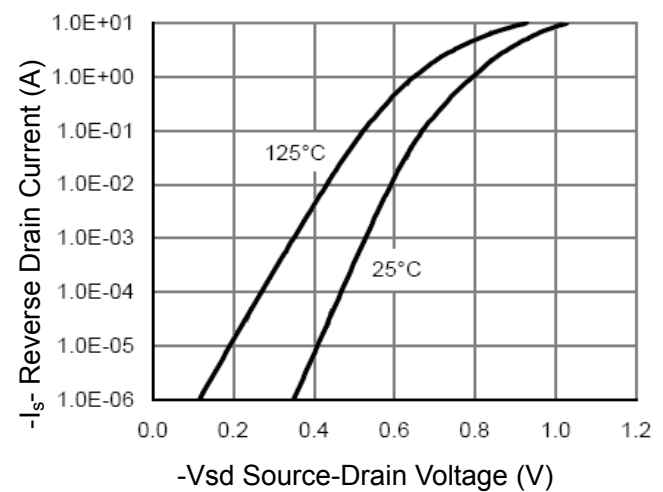
**Figure 9 Rds(on) vs Vgs**



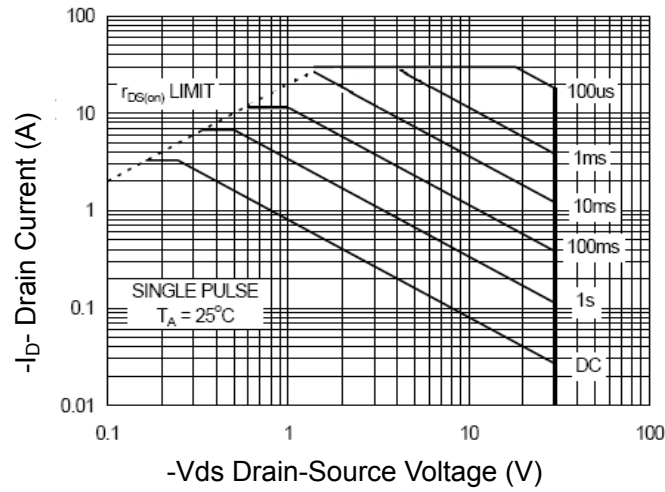
**Figure 10 Capacitance vs Vds**



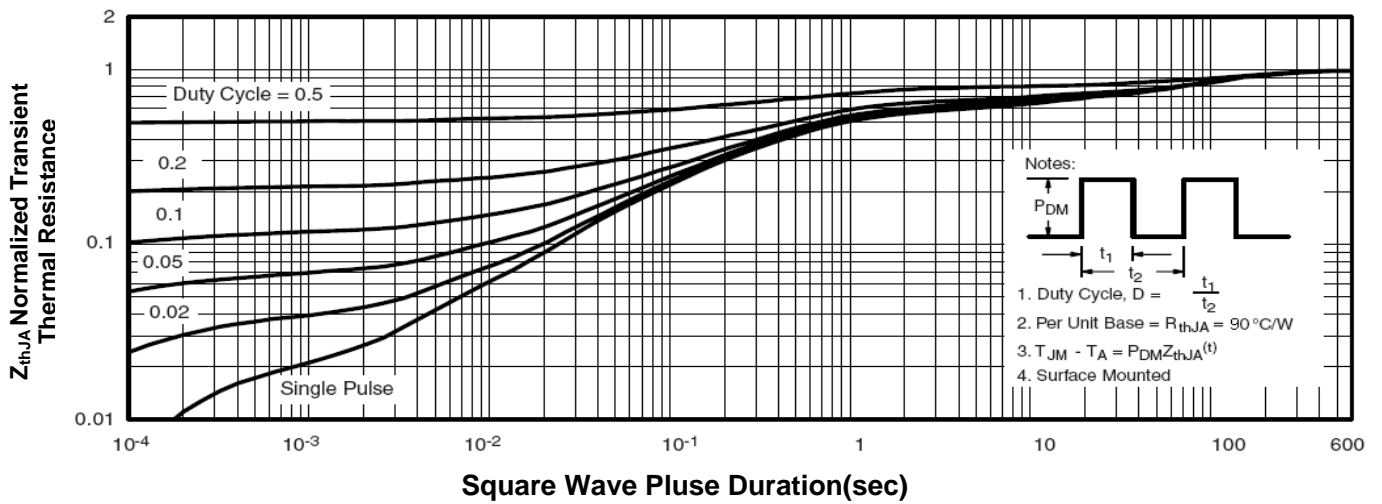
**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**

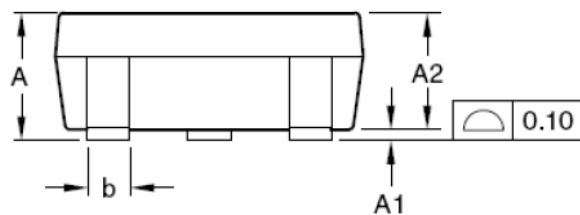
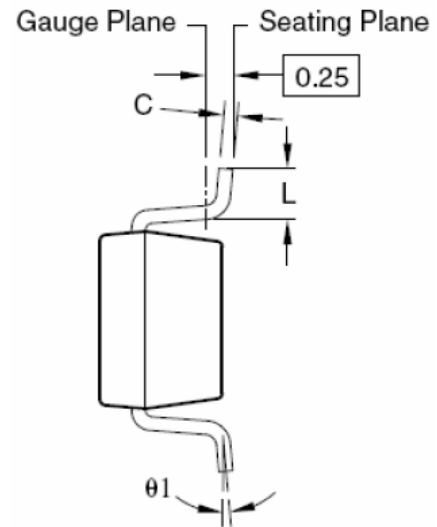
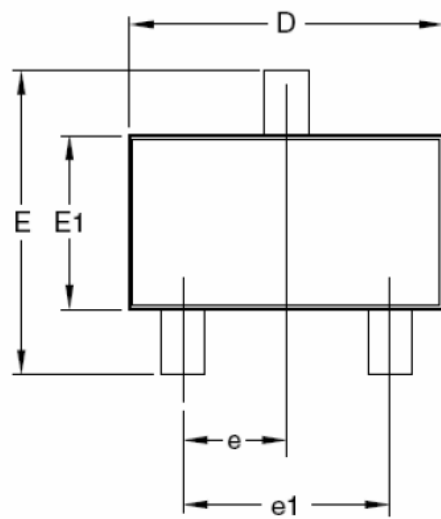


**Figure 13 Safe Operation Area**

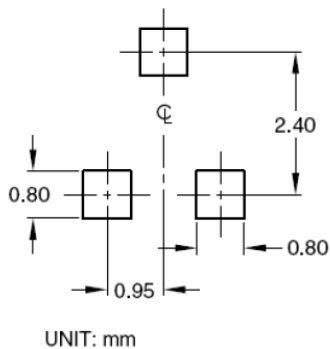


**Figure 14 Normalized Maximum Transient Thermal Impedance**

## SOT23-3 PACKAGE INFORMATION



### RECOMMENDED LAND PATTERN



### Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.90	—	1.25
A1	0.00	—	0.13
A2	0.70	1.00	1.15
b	0.30	0.40	0.50
C	0.08	0.13	0.20
D	2.80	2.90	3.10
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	—	0.60
$\theta 1$	0°	5°	8°

### Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.035	—	0.049
A1	0.000	—	0.005
A2	0.028	0.039	0.045
b	0.012	0.016	0.020
C	0.003	0.005	0.008
D	0.110	0.114	0.122
E	0.102	0.110	0.118
E1	0.055	0.063	0.071
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	—	0.024
$\theta 1$	0°	5°	8°

### NOTES:

1. Tolerance  $\pm 0.10\text{mm}$  (4 mil) unless otherwise specified
2. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
3. Dimension L is measured in gauge plane.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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