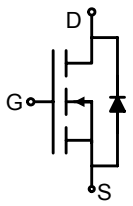
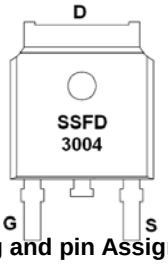
DESCRIPTION

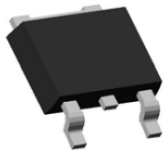
The SSFD3004 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge .This device is suitable for use as a load switch or in PWM applications.



Schematic diagram



Marking and pin Assignment



TO-252E-2-M top view

GENERAL FEATURES

- V_{DS} = 30V,I_D =55A
  $R_{DS(ON)}$ < 9.5mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$ < 5.5mΩ @ V_{GS}=10V
- High Power and current handing 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
SSFD3004	SSFD3004	TO-252E-2-M	-	-	-

ABSOLUTE MAXIMUM RATINGS(TA=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D(25℃)	55	A
	I_D(70℃)	46	A
	I_{DM}	100	A
Avalanche Current@L=0.3mH	IAR	60	A
Single Pulse Avalanche Energy(NOTE 5)	EAS	500	mJ
Maximum Power Dissipation	P_D	50	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	41	℃/W

ELECTRICAL CHARACTERISTICS (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=20A		7.5	9.5	mΩ
		V_{GS}=10V, I_D=30A		4.4	5.5	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=30A	25			S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz		1800		PF
Output Capacitance	C_{oss}			450		PF
Reverse Transfer Capacitance	C_{rss}			300		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=15V,V_{GS}=10V,R_{GEN}=3Ω I_D=1A		8		nS
Turn-on Rise Time	t_r			10		nS
Turn-Off Delay Time	$t_{d(off)}$			30		nS
Turn-Off Fall Time	t_f			9		nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=10A,V_{GS}=10V		30		nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			9		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=1A		0.7	1.2	V

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in^2 FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.
5. Limited by TJmax, starting TJ = 25°C, L = 0.3mH RG =50Ω, IAS = 50A, VGS =10V. Part not recommended for use above this value

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

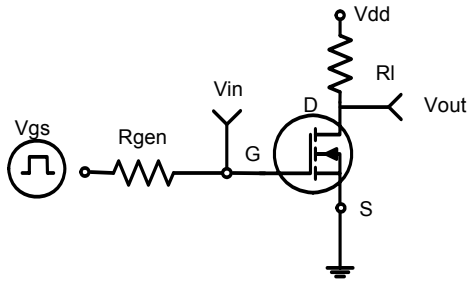


Figure 1:Switching Test Circuit

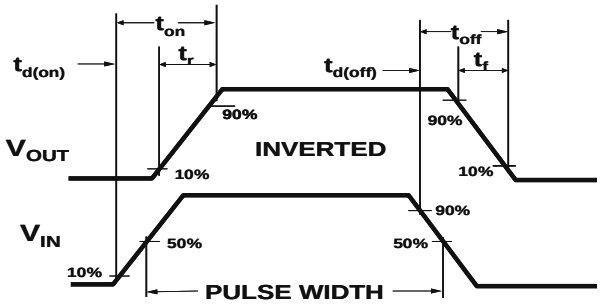


Figure 2:Switching Waveforms

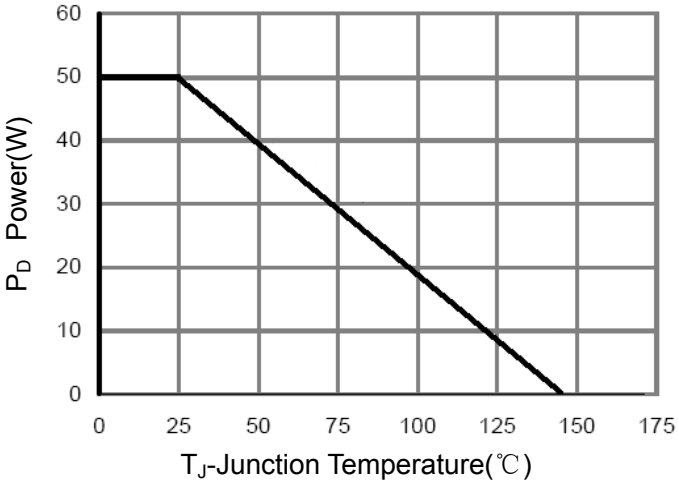


Figure 3 Power Dissipation

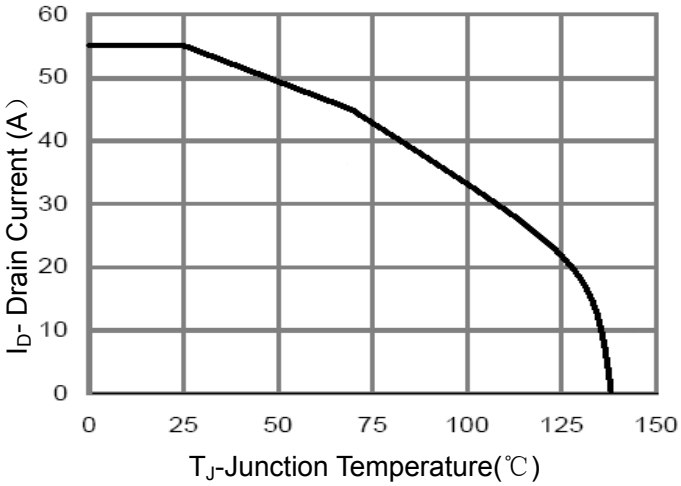


Figure 4 Drain Current

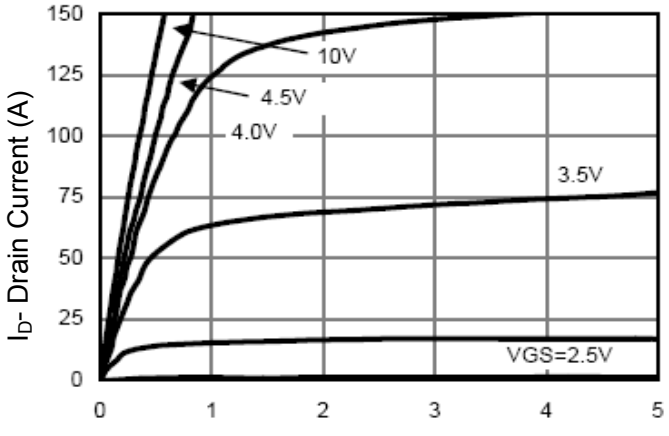


Figure 5 Output CHARACTERISTICS

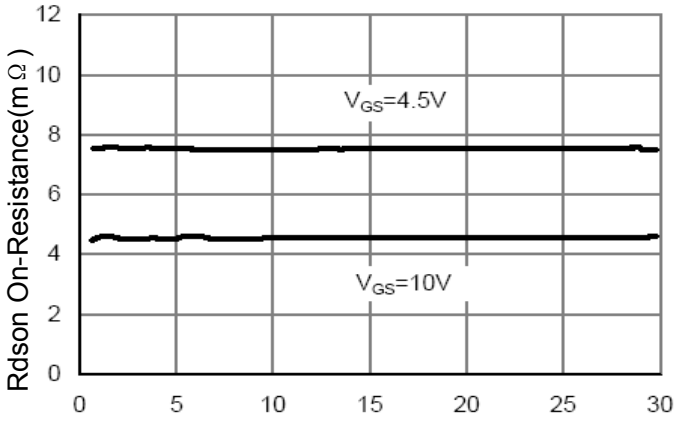


Figure 6 Drain-Source On-Resistance

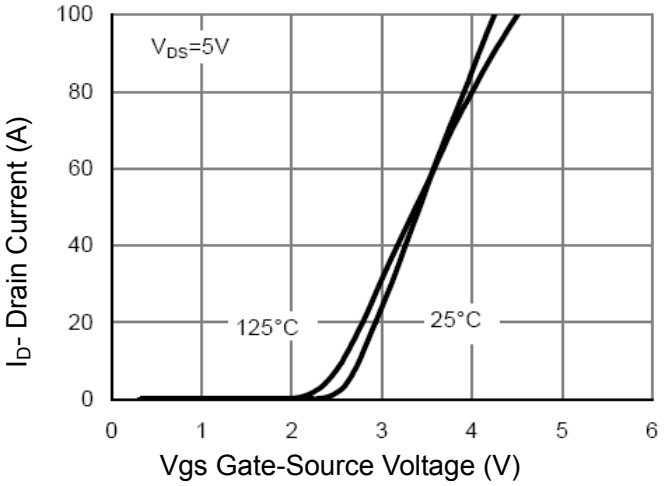


Figure 7 Transfer Characteristics

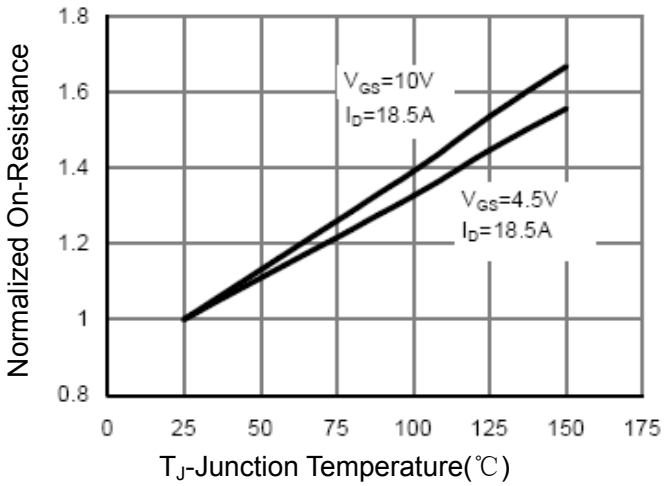


Figure 8 Drain-Source On-Resistance

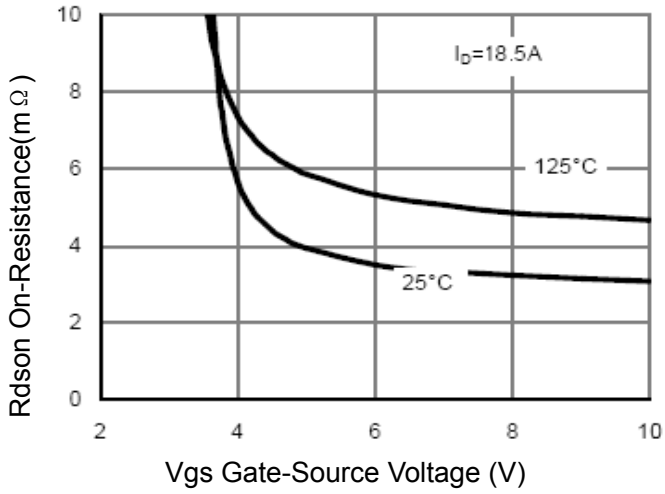


Figure 9 Rdson vs Vgs

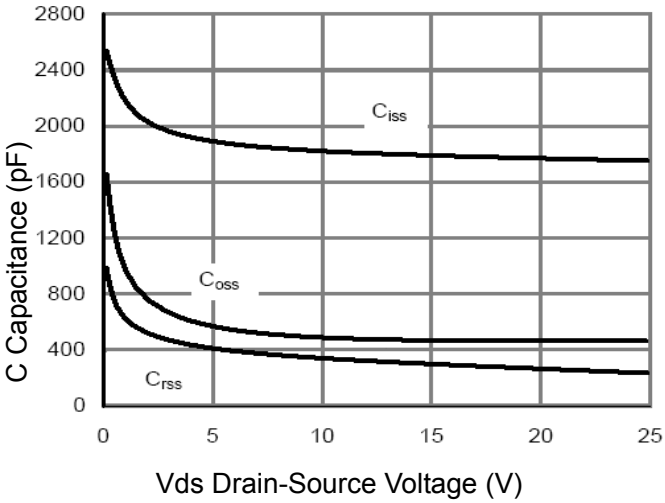


Figure 10 Capacitance vs Vds

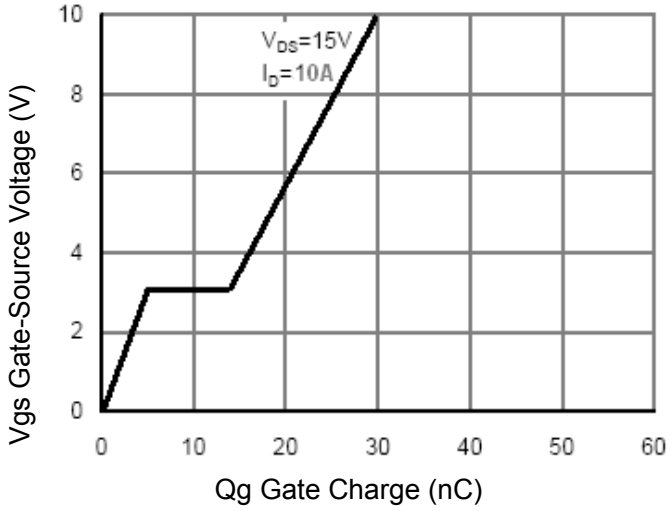


Figure 11 Gate Charge

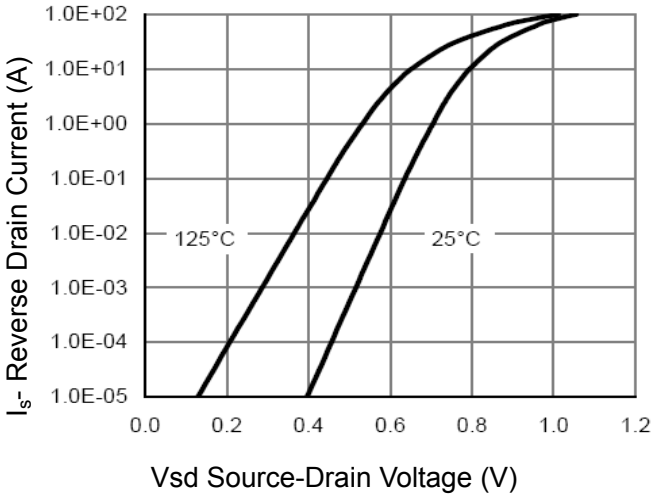


Figure 12 Source- Drain Diode Forward

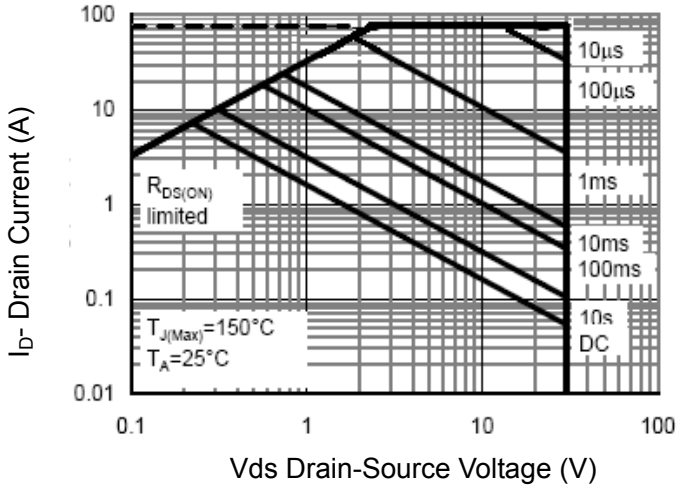


Figure 13 Safe Operation Area

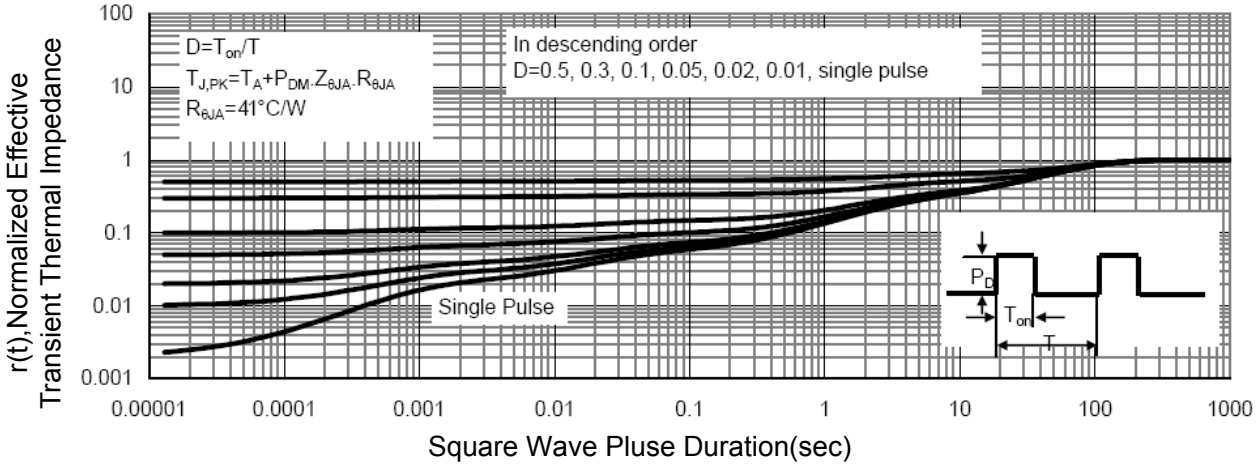
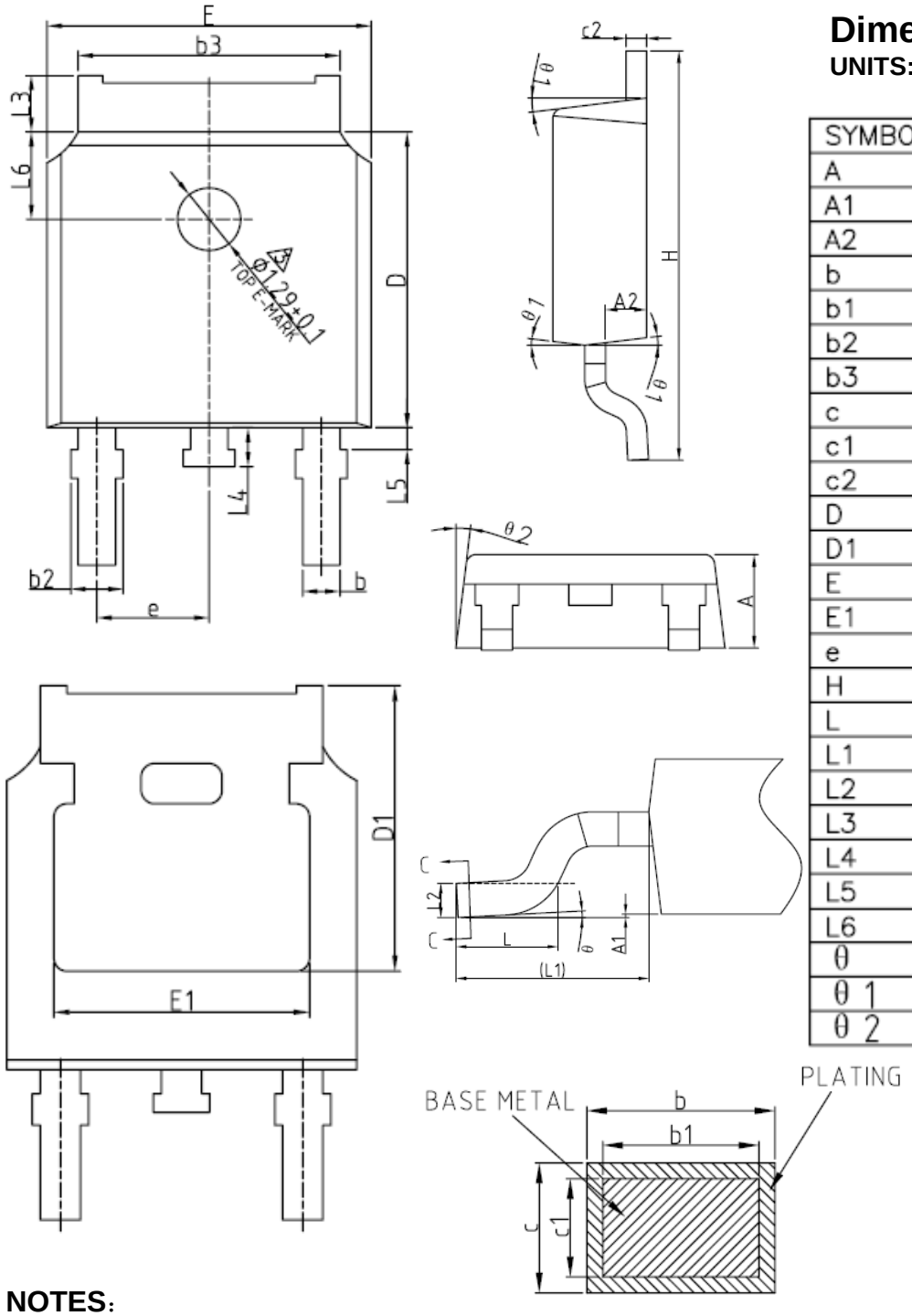


Figure 14 Normalized Maximum Transient Thermal Impedance

TO-252E-2-M PACKAGE INFORMATION



Dimensions in Millimeters

UNITS:mm

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	–	0.10
A2	0.90	1.01	1.10
b	0.72	–	0.85
b1	0.71	0.76	0.81
b2	0.72	–	0.90
b3	5.13	5.33	5.46
c	0.47	–	0.60
c1	0.46	0.51	0.56
c2	0.47	–	0.60
D	6.00	6.10	6.20
D1	5.25	–	–
E	6.50	6.60	6.70
E1	4.70	–	–
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.51BSC		
L3	0.90	–	1.25
L4	0.60	0.80	1.00
L5	0.15	–	0.75
L6	1.80REF		
θ	0°	–	8°
θ1	5°	7°	9°
θ2	5°	7°	9°

NOTES:

1. Dimensions are inclusive of plating
2. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 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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