



## Features

- High power and current handing capability
- Lead free product is acquired
- Surface mount package

## Application

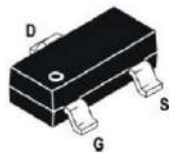
- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

## Product Summary

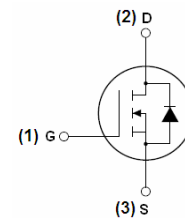
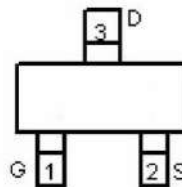


$V_{DS}$	-20	V
$R_{DS(on),TYP@ V_{GS}=-4.5 V}$	32	m $\Omega$
$I_D$	-4.1	A

top view



SOT-23



N-Channel

## Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	$I_D$	-4.1	A
	$T_C = 70^{\circ}\text{C}$		-3.2	
	$T_A = 25^{\circ}\text{C}$		-3	
	$T_A = 70^{\circ}\text{C}$		-2.3	
Drain Current -Pulsed (Note 1)		$I_{DM}$	-15	A
Maximum Power Dissipation		$P_D$	1.7	W
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 To 150	$^{\circ}\text{C}$

## Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	74	$^{\circ}\text{C}/\text{W}$
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### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics (Note 3)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45	-0.7	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-4.1A$	-	32	42	m $\Omega$
		$V_{GS}=-2.5V, I_D=-3A$	-	50	75	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-2A$	6	-	-	S
<b>Dynamic Characteristics (Note4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-4V, V_{GS}=0V,$ $F=1.0MHz$	-	740	-	PF
Output Capacitance	$C_{oss}$		-	290	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	190	-	PF
<b>Switching Characteristics (Note 4)</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-4V, I_D=-3.3A,$ $R_L=-1.2\Omega, V_{GEN}=-4.5V, R_g=1\Omega$	-	12	-	nS
Turn-on Rise Time	$t_r$		-	35	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	$t_f$		-	10	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-4V, I_D=-4.1A, V_{GS}=-4.5V$	-	7.8	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.2	-	nC
Gate-Drain Charge	$Q_{gd}$		-	1.6	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-1.6A$	-	-	-1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	1.6	A

### Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 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

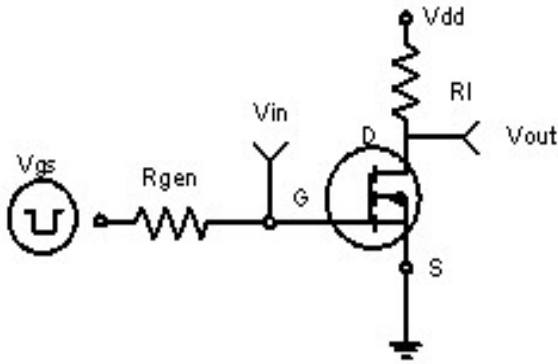


Figure 1: Switching Test Circuit

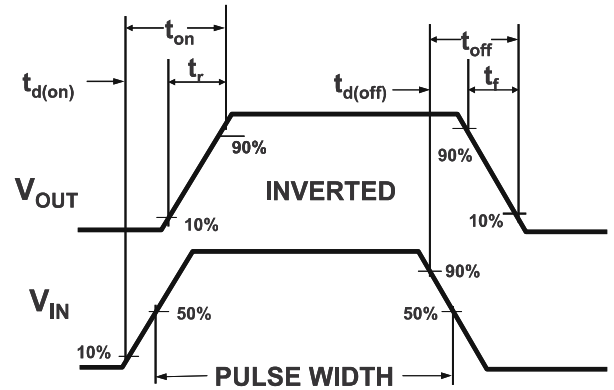
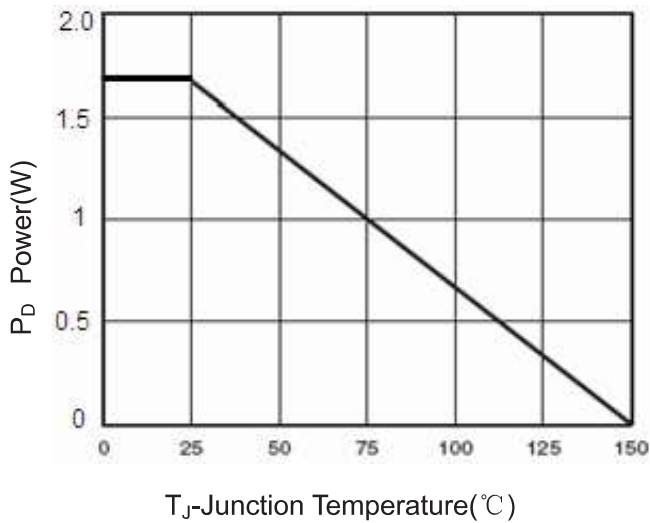
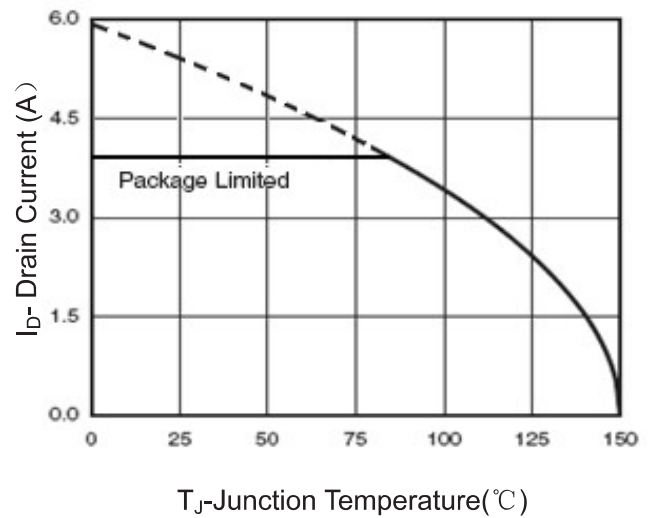


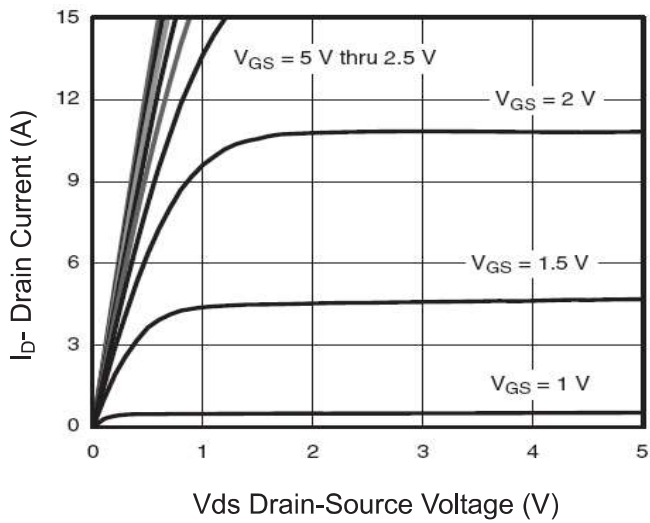
Figure 2: Switching Waveforms



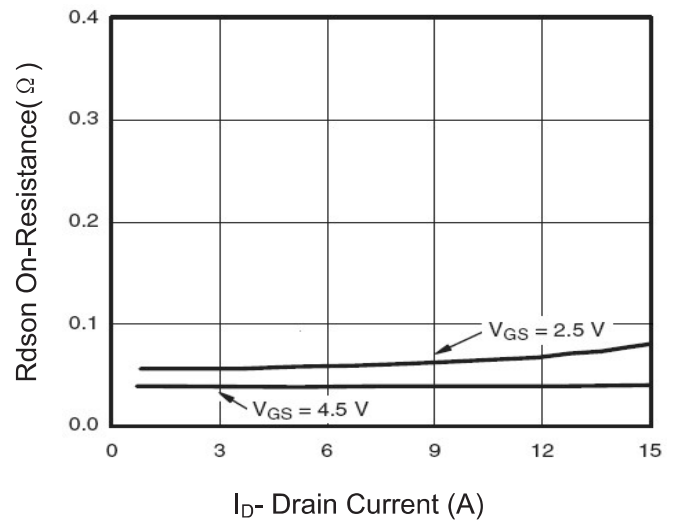
T<sub>J</sub>-Junction Temperature(°C)  
Figure 3 Power Dissipation



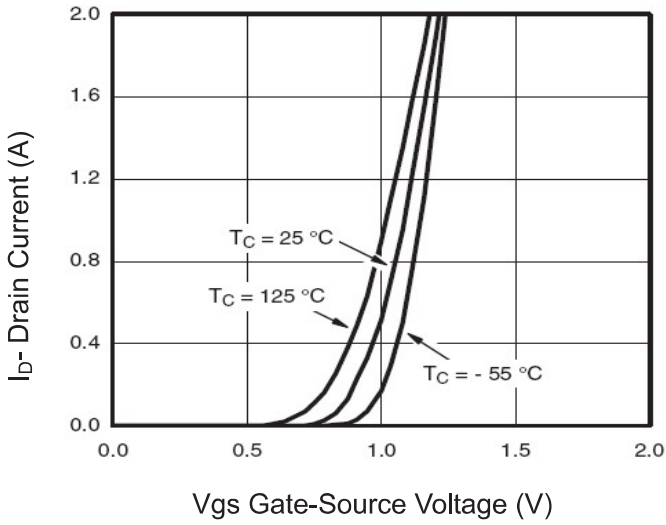
T<sub>J</sub>-Junction Temperature(°C)  
Figure 4 Drain Current



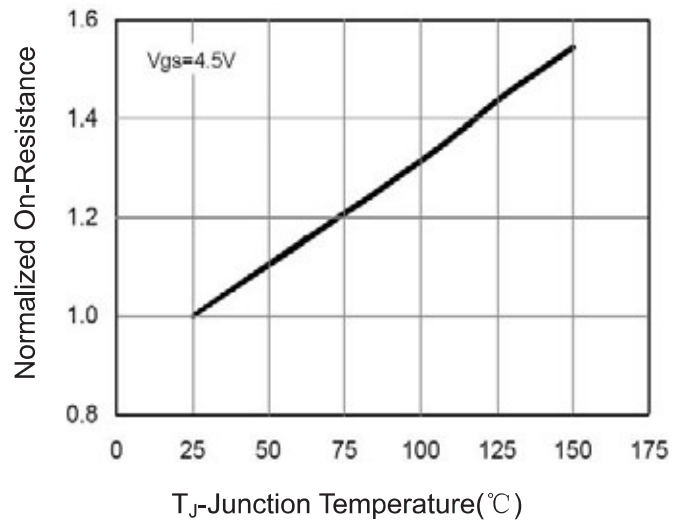
V<sub>ds</sub> Drain-Source Voltage (V)  
Figure 5 Output Characteristics



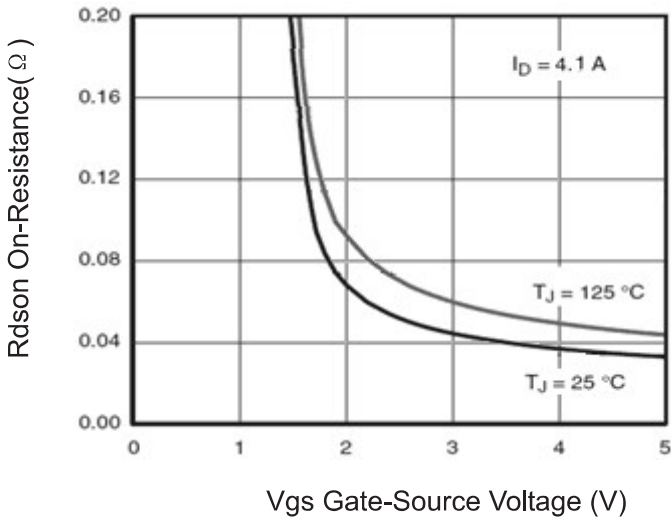
I<sub>D</sub>- Drain Current (A)  
Figure 6 Drain-Source On-Resistance



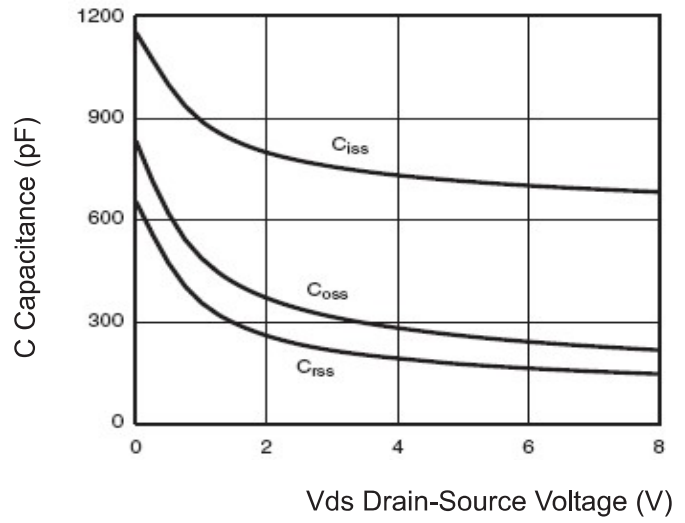
**Figure 7 Transfer Characteristics**



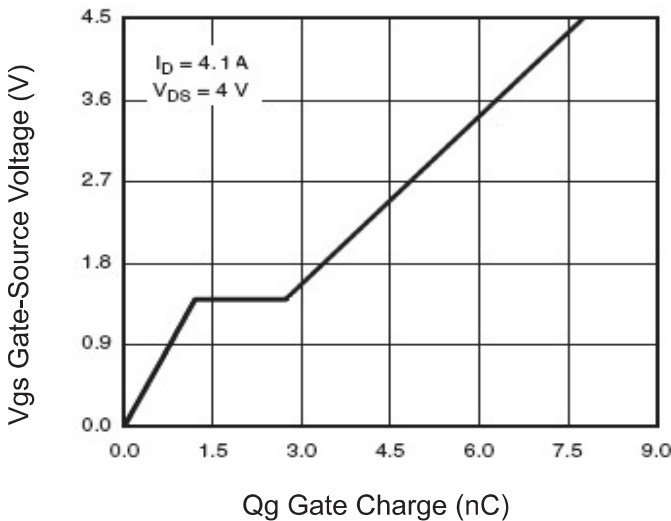
**Figure 8 Drain-Source On-Resistance**



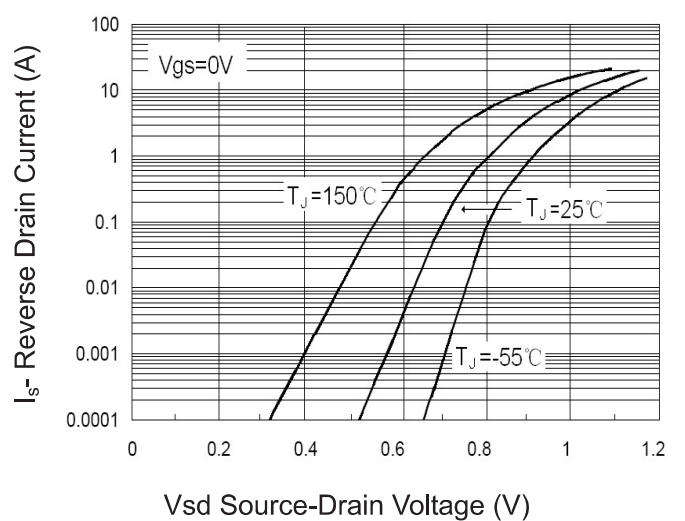
**Figure 9 Rds(on) vs Vgs**



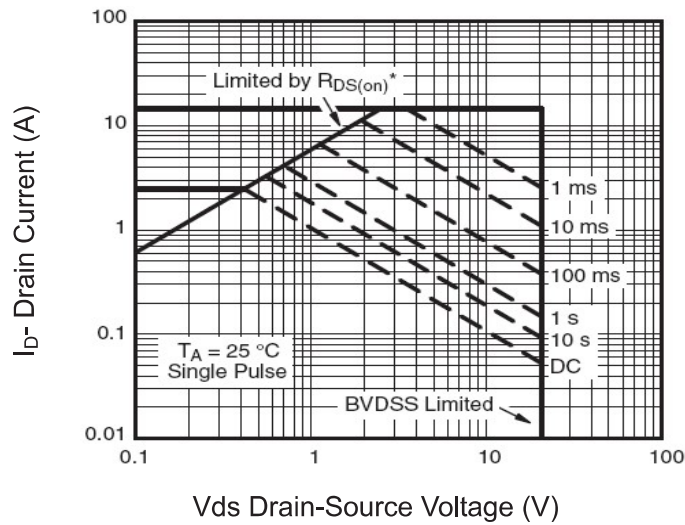
**Figure 10 Capacitance vs Vds**



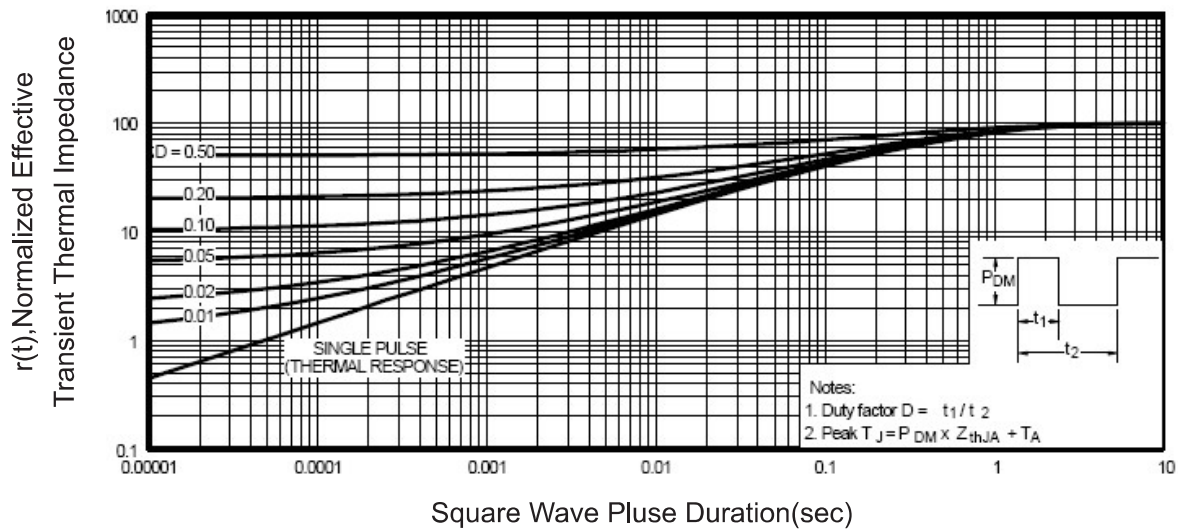
**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**



**Figure 13 Safe Operation Area**



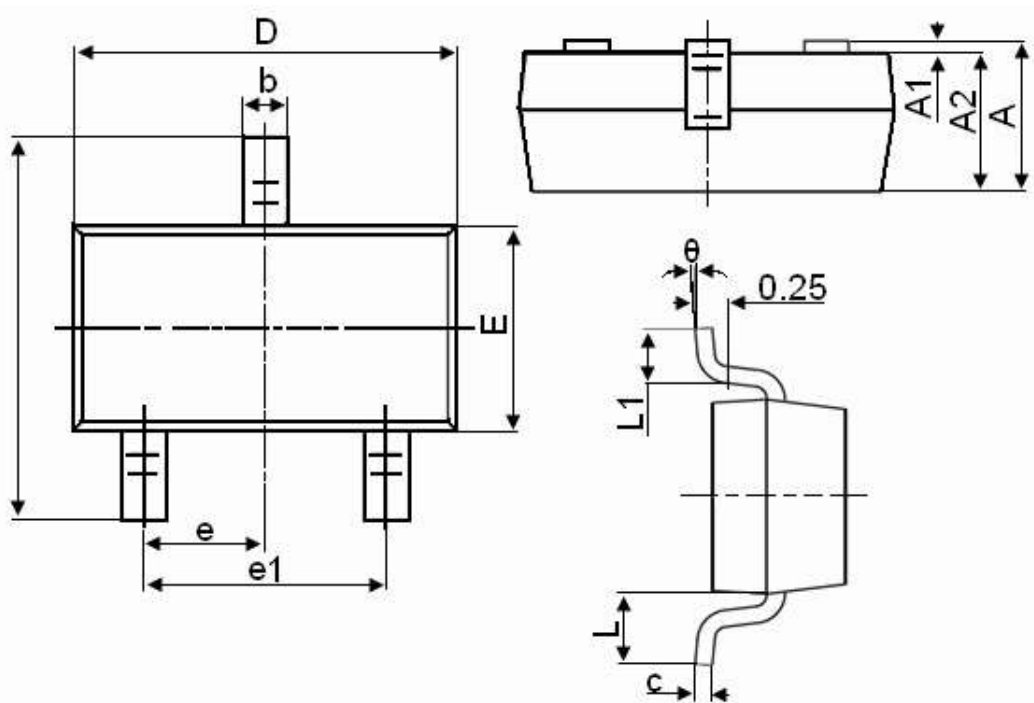
**Figure 14 Normalized Maximum Transient Thermal Impedance**

## Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM3415ZA-R	3415	SOT23	Tape&Reel	3000/Reel

PACKAGE	MARKING
SOT23	<div style="border: 1px solid black; width: 60px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">           3415         </div>

## SOT-23 Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

### Notes

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

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