

MT4903

P-Channel Enhancement Mode Field Effect Transistor

Product Summary

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Typ
-30V	-3.0A	100@ V _{GS} =-4.5V
		67@ V _{GS} =-10V

Features

- Super high dense cell design for low R_{DS(ON)}
- Rugged and reliable
- Simple drive requirement
- Sot-23-6 package

Applications

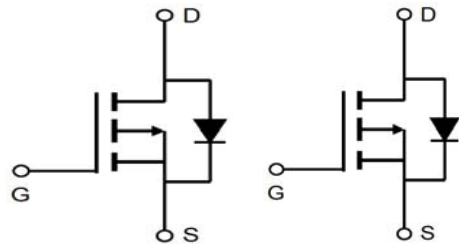
- Portable battery packs
- Load switch



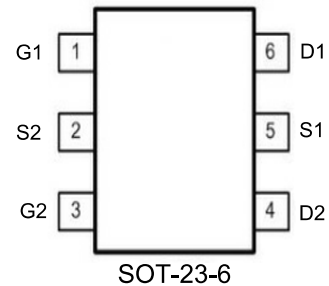
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Simplified Schematic



MARKING DIAGRAM & PIN ASSIGNMENT



Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	-3.0	A
Drain Current-Pulsed ^(Note 1)	I _{DM}	-13	A
Maximum Power Dissipation	P _D	1.0	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	R _{θJA}	125	°C/W
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Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
• Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1.2	-1.8	-2.2	V
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±10	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
		V _{DS} = -30V, V _{GS} = 0V, T _J = 85°C	-	-	-30	
R _{DS(on)}	Drain Source On State Resistance ³	V _{GS} =-4.5V, I _D =-1A	-	100	-	mΩ
		V _{GS} =-10V, I _D =-2A	-	67	-	
g _{fs}	Forward Transconductance ³	V _{DS} =-5V, I _D =-2A	5	-	-	S
V _{SD}	Diode Forward Voltage ³	V _{GS} = 0V, I _S = -2.6A	-	-0.8	-1.2	V
• Dynamic Characteristics⁴						
C _{iss}	Input Capacitance	V _{DS} = -10V, V _{GS} =0V, f=1MHz	-	325	-	pF
C _{oss}	Output Capacitance		-	63	-	
C _{rss}	Reverse Transfer Capacitance		-	37	-	
Q _g	Total Gate Charge	V _{DS} = -10V, V _{GS} = -4.5V, I _D = -2A	-	3.2	-	nC
Q _{gs}	Gate-Source Charge		-	0.6	-	
Q _{gd}	Gate-Drain Charge		-	0.9	-	
t _{d(on)}	Turn-On Delay Time	V _{DD} = -10V, R _L = 1.5Ω I _D = -1.0A, V _{GEN} = -10V, R _G = 3Ω	-	11	-	nSec
t _r	Rise Time		-	5.5	-	
T _{d(off)}	Turn-Off Delay Time		-	22	-	
t _f	Fall Time		-	8	-	
R _g	Gate Resistance	V _{GS} =0, V _{DS} =0, f=1MHz	-	3	-	Ω
t _{rr}	Body Diode Reverse Recovery Time	I _F = -2A, di/dt = 100A/μs	-	25	-	nSec
Q _{rr}	Body Diode Reverse Recovery Charge		-	10	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

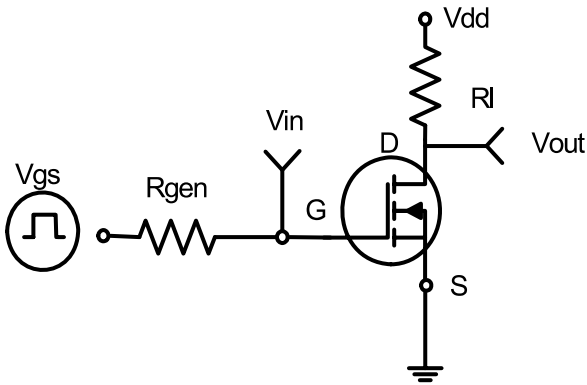


Figure 1: Switching Test Circuit

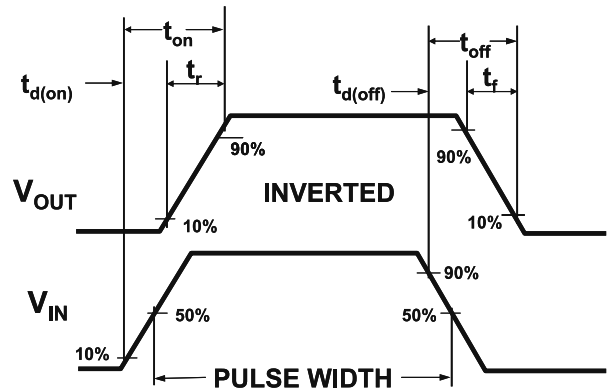


Figure 2: Switching Waveforms

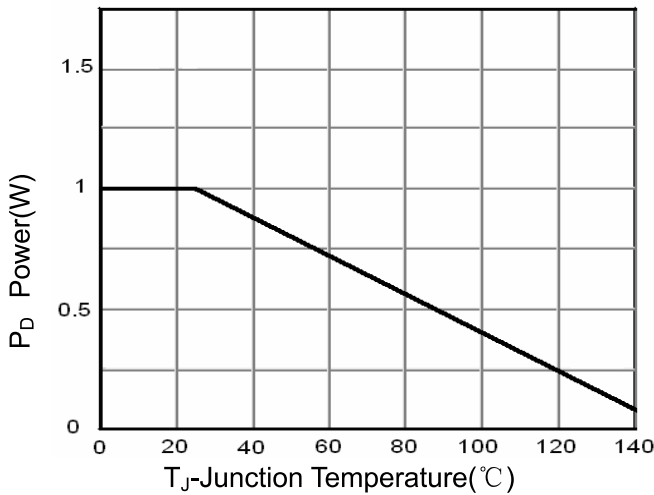


Figure 3 Power Dissipation

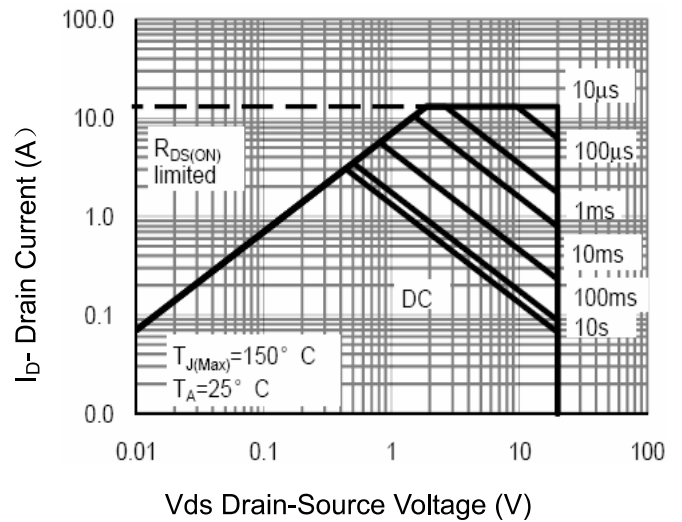


Figure 4 Safe Operation Area

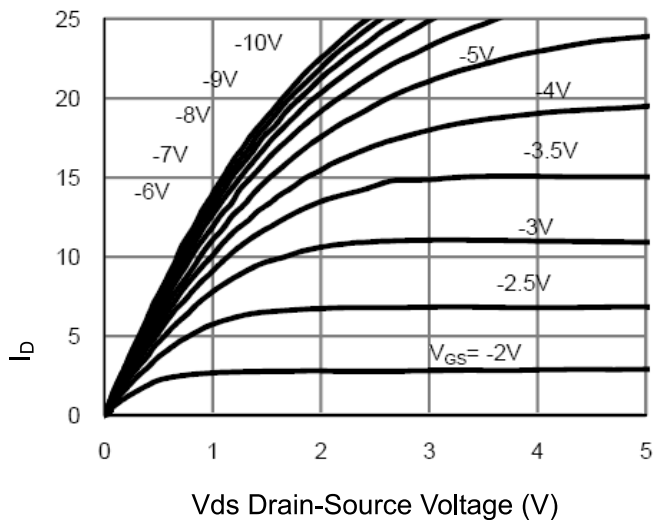


Figure 5 Output Characteristics

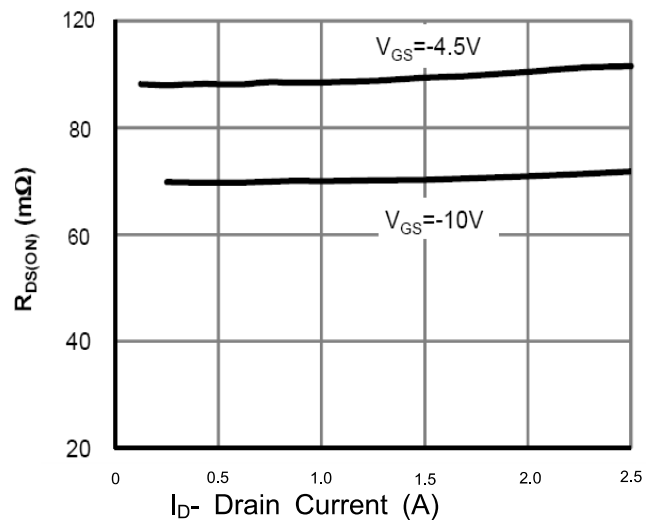


Figure 6 Drain-Source On-Resistance

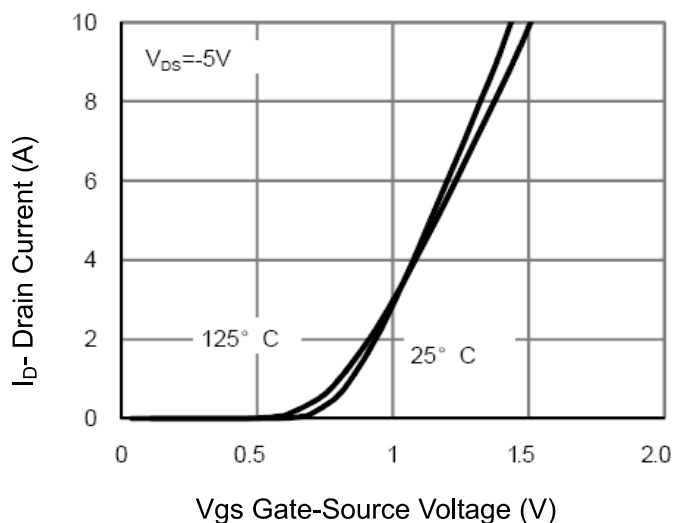


Figure 7 Transfer Characteristics

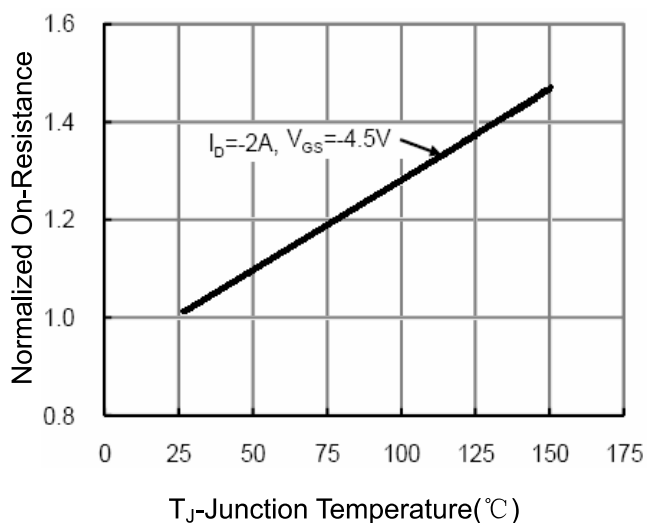


Figure 8 Drain-Source On-Resistance

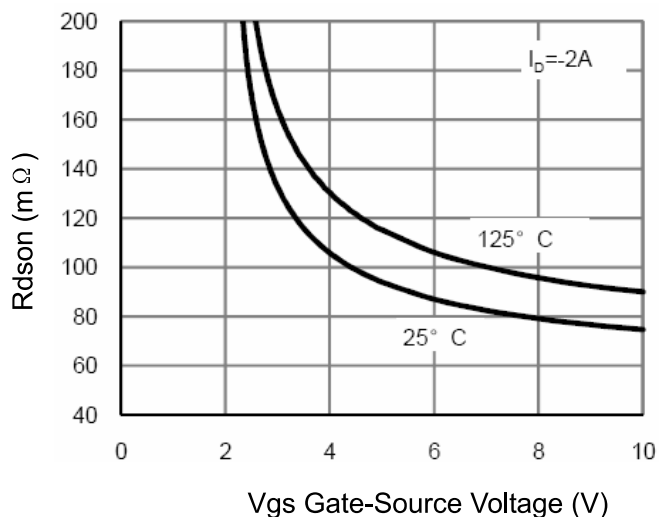


Figure 9 Rdson vs Vgs

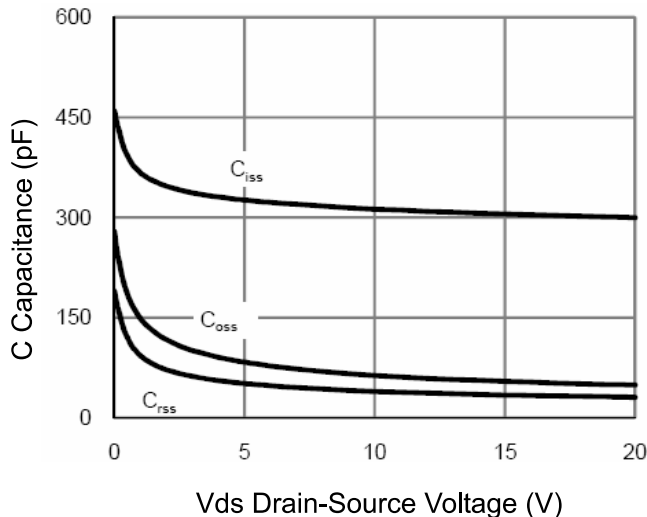


Figure 10 Capacitance vs Vds

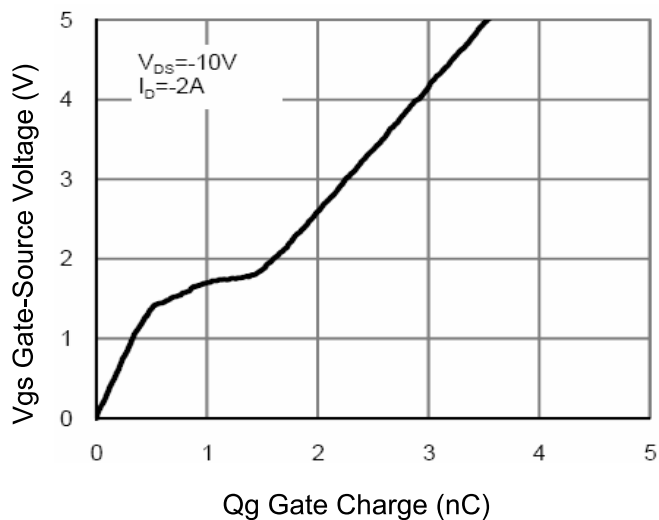


Figure 11 Gate Charge

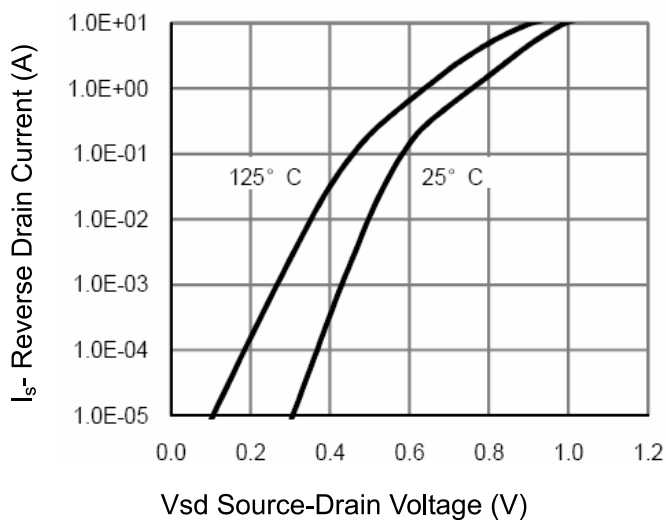


Figure 12 Source- Drain Diode Forward

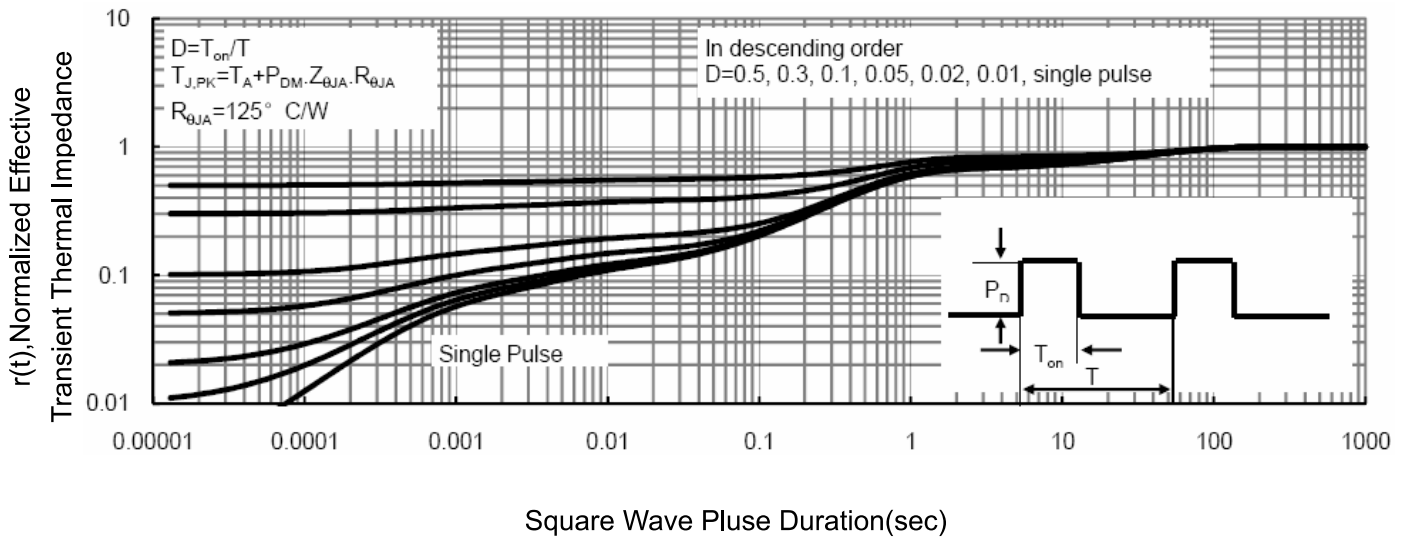
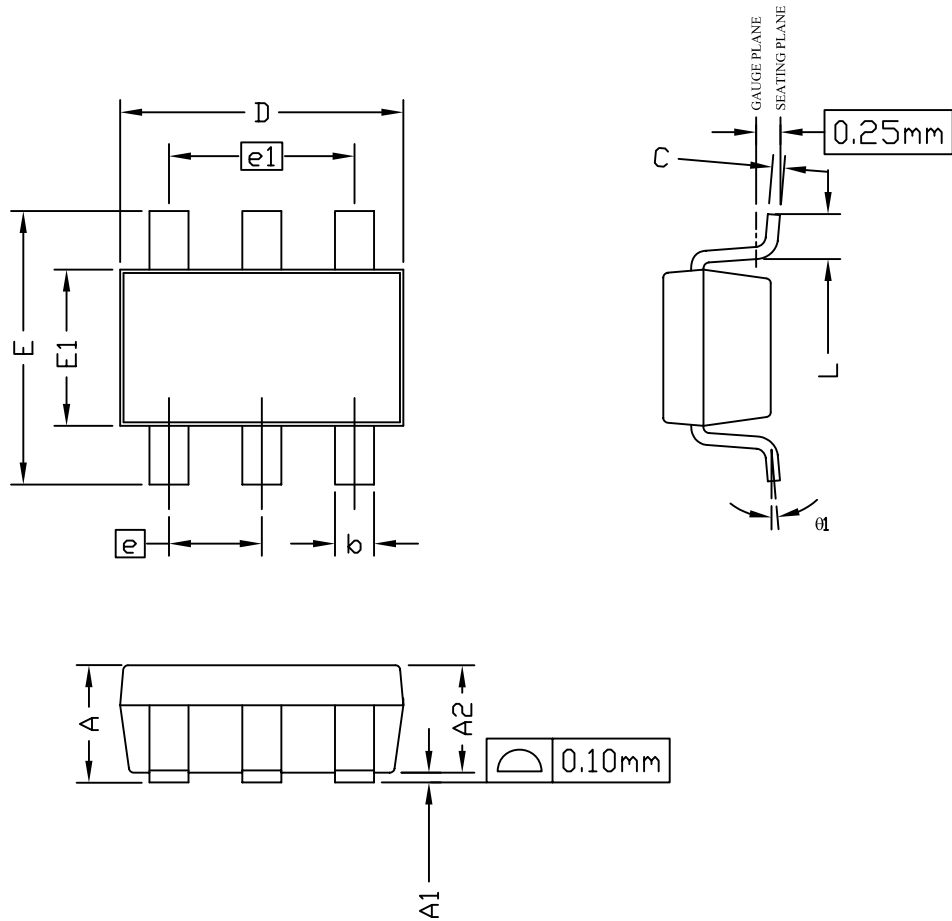


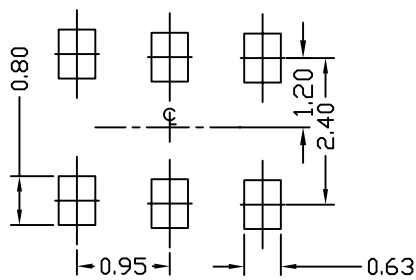
Figure 13 Normalized Maximum Transient Thermal Impedance

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Version	rev B

SOT23_6 PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	---	1.25	0.035	---	0.049
A1	0.00	---	0.15	0.00	---	0.006
A2	0.70	1.10	1.20	0.028	0.043	0.047
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.08	0.13	0.20	0.003	0.005	0.008
D	2.70	2.90	3.10	0.106	0.114	0.122
E	2.50	2.80	3.10	0.098	0.110	0.122
E1	1.50	1.60	1.70	0.059	0.063	0.067
e	0.95 BSC.			0.037BSC.		
e1	1.90 BSC.			0.075 BSC.		
L	0.30	---	0.60	0.012	---	0.024
θ1	0°	---	8°	0°	---	8°

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 5 MILS EACH.
2. DIMENSION "L" IS MEASURED IN GAGE PLANE.
3. TOLERANCE ±0.100 mm(4 mil) UNLESS OTHERWISE SPECIFIED.
4. FOLLOWED FROM JEDEC MO-178C & MO-193C.
5. CONTROLLING DIMENSIONS IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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