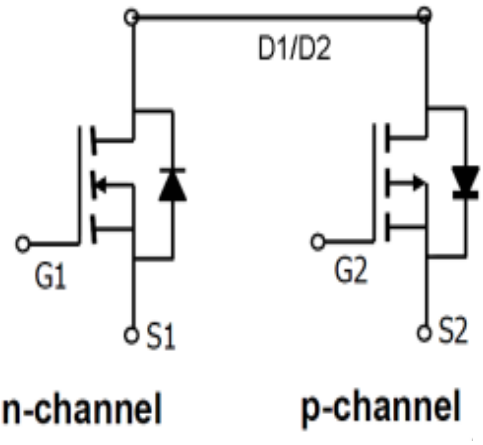
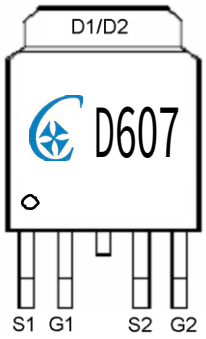
N-ch and P-ch Fast Switching MOSFET

D607 DATASHEET

DESCRIPTION

The D607 is the highest performance trench N-Ch and P-Ch MOSFETs With extreme high cell density,which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.





GENERAL FEATURES

Features

n-channel	p-channel
V_{DS} (V) = 30V	-30V
I_D = 12A (V_{GS}=10V)	-12A (V_{GS} = -10V)
$R_{DS(ON)}$	$R_{DS(ON)}$
< 29 mΩ (V_{GS}=10V)	< 55 mΩ (V_{GS} = -10V)
< 40 mΩ (V_{GS}=4.5V)	< 68 mΩ (V_{GS} = -4.5V)

100% UIS Tested!

Application

- Drivers: Relays, lamps, Memories.
- Battery operated systems.
- CCFL Back-light Inverter

■ **Absolute Maximum Ratings** (T_A=25℃unless otherwise noted)

Symbol	Parameter	Rating		Unit
		N-Ch	P-Ch	
VDSS	Drain-Source Voltage	30	-30	V
VGSS	Gate-Source Voltage	±20	±20	
ID	Continuous Drain Current ,(VGS=10V)	12	-12	A
I_{DM}	Drain Current (Pulse)	40	-40	A
TJ	Maximum Junction Temperature	-55 TO 175		°C
TSTG	Storage Temperature Range	-55 TO 175		
PD	Maximum Power Dissipation (Ta=25℃)	25	25	W

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Static Parameter							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA		30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=36V,V_{GS}=0V	T_J=25℃			1	μA
			T_J=85℃			30	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA		1.0	1.5	2.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=12A			21	29	mΩ
		V_{GS}= 4.5V, I_D=5A			27	40	
Diode Forward Voltage	V_{SD}	I_S=2A,V_{GS}=0V			0.8	1.3	V
Thermal Resistance Junction to Ambient	$R_{\theta JA}$				23		°C/W
Dynamic Parameters							
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHZ			490		pF
Output Capacitance	C_{oss}				92		
Reverse Transfer Capacitance	C_{rss}				68		
Switching Parameters							
Total Gate Charge	Q_g	V_{GS}=4.5V,V_{DS}=15V,I_D=5.6A			5.2		nC
Gate-Source Charge	Q_{gs}				0.9		
Gate-Drain Charge	Q_{gd}				1.3		
Reverse time	t_r	V_{GS}=4.5V,V_{DD}=15V, I_D=1A, R_{GEN}=2.8Ω			2.5		ns
Fall Time	t_{rr}				3.5		
Turn-on Delay Time	$t_{D(on)}$				4.5		
Turn-off Delay Time	$t_{D(off)}$				14.5		

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Static Parameter							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D= -250uA		-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-32V ,V_{GS}=0V	T_J=25℃			-1	μA
			T_J=85℃			-30	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA		-1	-1.5	-2.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= -10V , I_D= -8A			40	55	mΩ
		V_{GS}= -4.5V, I_D= -5A			53	68	
Diode Forward Voltage	V_{SD}	I_S=2A,V_{GS}=0V			-0.8	-1.2	V
Thermal Resistance Junction to Ambient	$R_{\theta JA}$				23		°C/W
Dynamic Parameters							
Input Capacitance	C_{iss}	V_{DS}=-15V,V_{GS}=0V,f=1MHZ			520		pF
Output Capacitance	C_{oss}				98		
Reverse Transfer Capacitance	C_{rss}				74		
Switching Parameters							
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V,I_D=-4.1A			6.8		nC
Gate-Source Charge	Q_{gs}				1.0		
Gate-Drain Charge	Q_{gd}				1.4		
Turn-on Delay Time	t_r	V_{GS}=-10V,V_{DD}=-15V, R_L=15Ω ,I_D=-1A, R_{GEN}=2.5Ω			14		ns
Turn-on Rise Time	t_{rr}				61		
Turn-Off Delay Time	$t_{D(on)}$				19		
Turn-Off Fall Time	$t_{D(off)}$				7		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. T_j=25℃, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25Ω

C. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

N- Channel Typical Electrical and Thermal Characteristics (Curves)

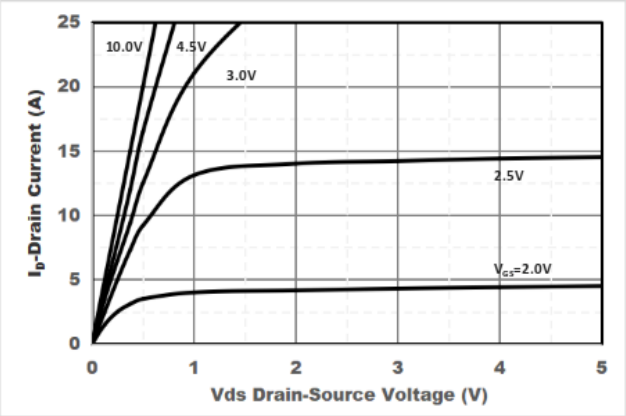


Figure1. Output Characteristics

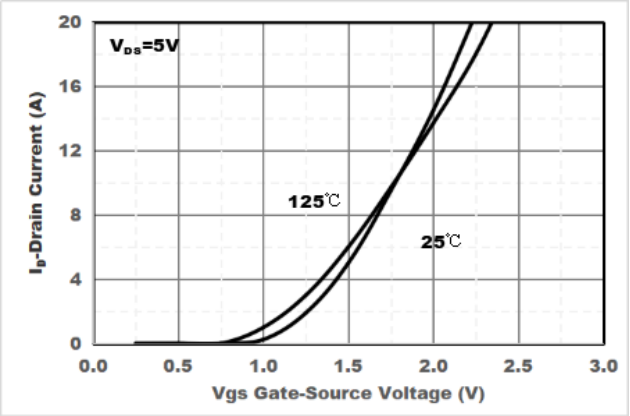


Figure2. Transfer Characteristics

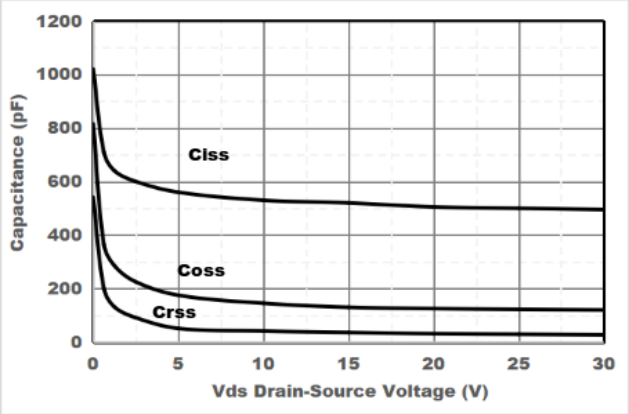


Figure3. Capacitance Characteristics

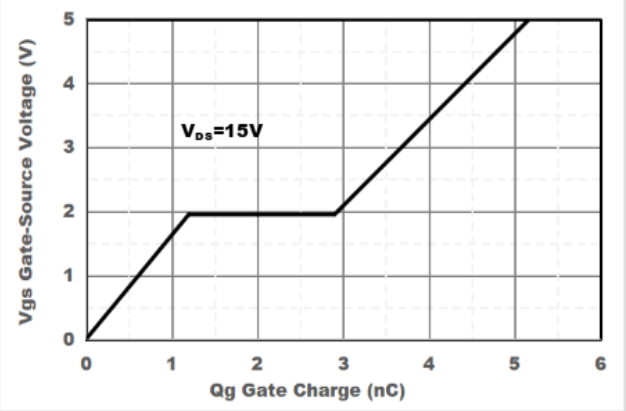


Figure4. Gate Charge

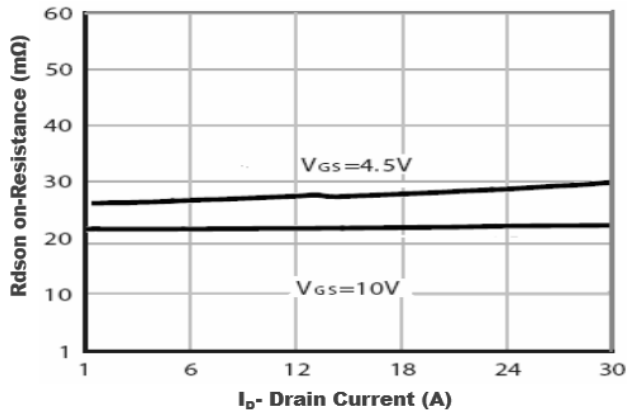


Figure5. Drain-Source on Resistance

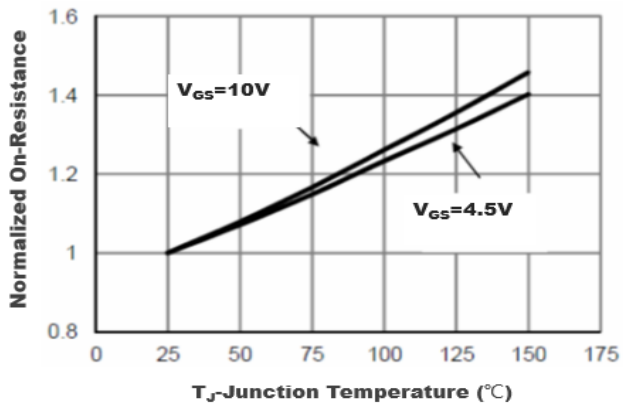


Figure6. Drain-Source on Resistance

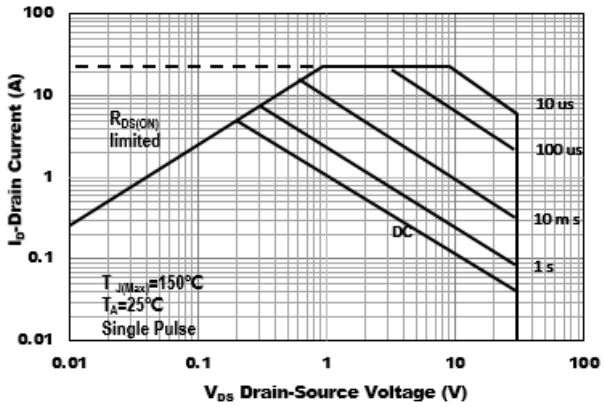


Figure7. Safe Operation Area

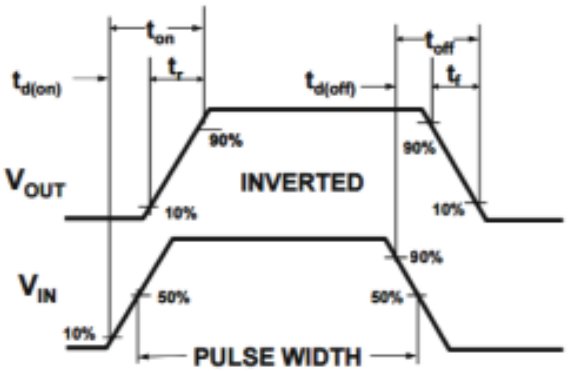


Figure8. Switching wave

P- Channel Typical Electrical and Thermal Characteristics (Curves)

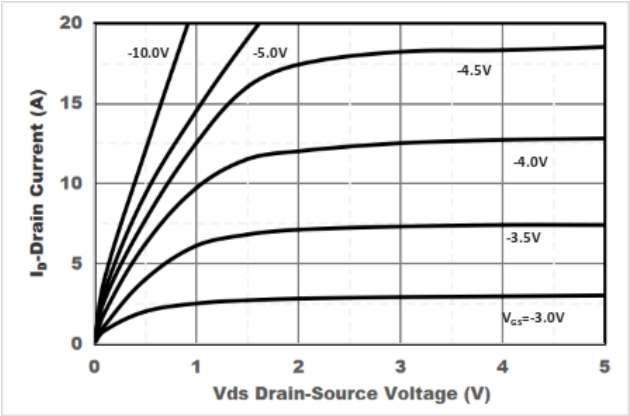


Figure1. Output Characteristics

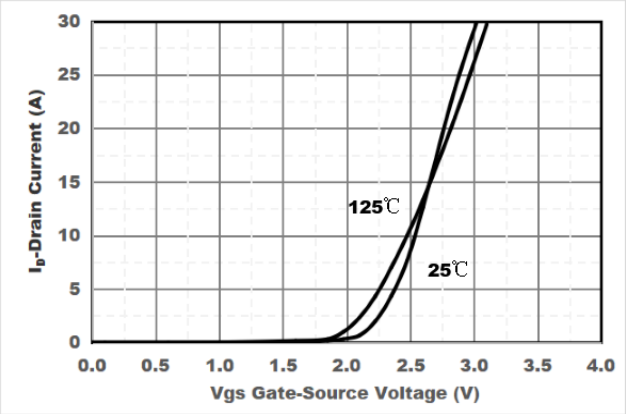


Figure2. Transfer Characteristics

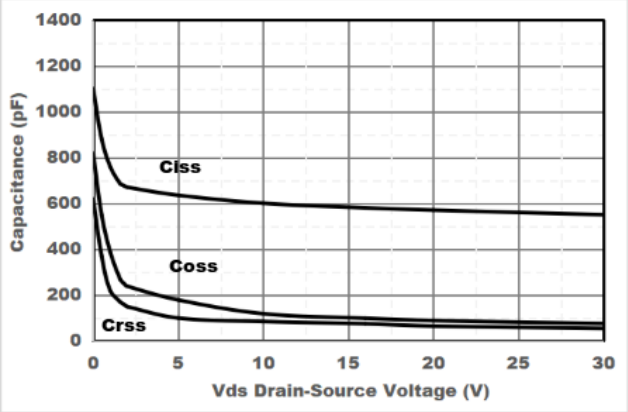


Figure3. Capacitance Characteristics

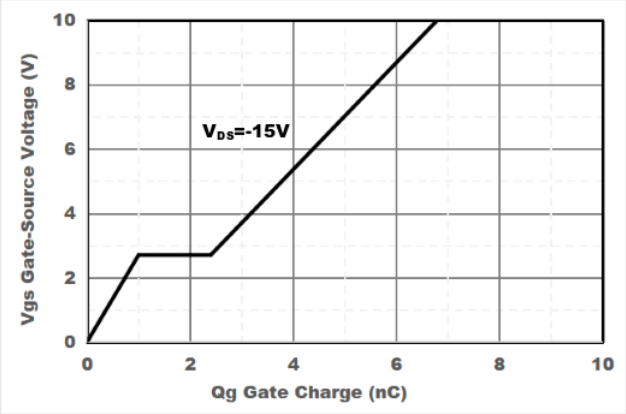


Figure4. Gate Charge

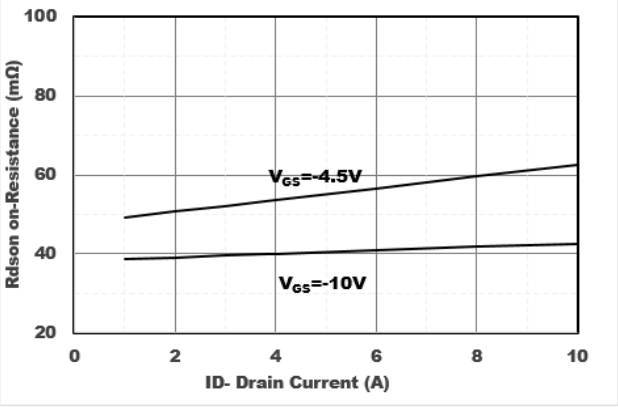


Figure5. Drain-Source on Resistance

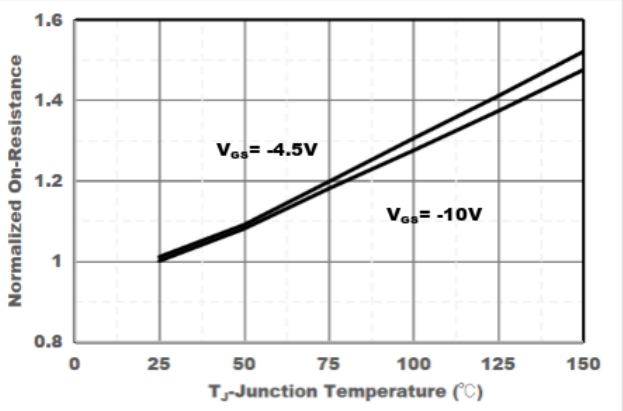


Figure6. Drain-Source on Resistance

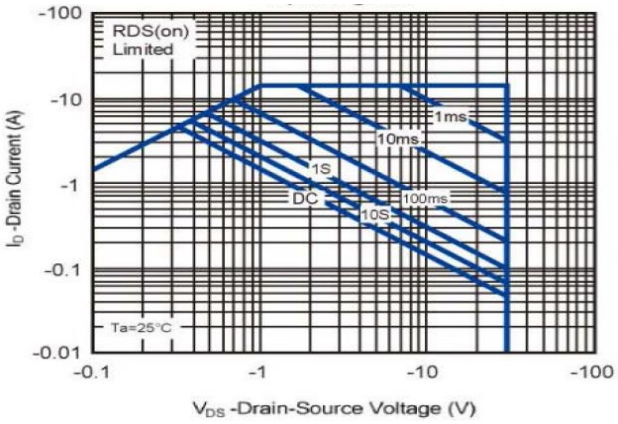


Figure7. Safe Operation Area

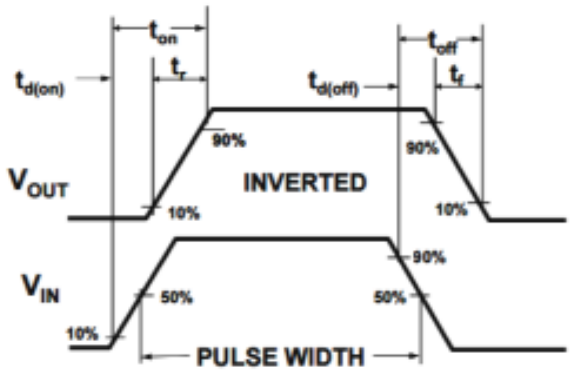
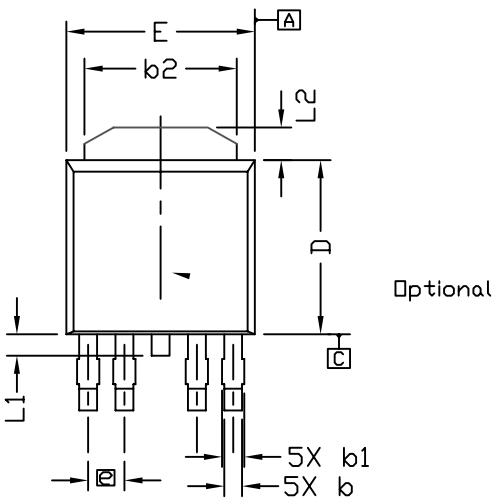
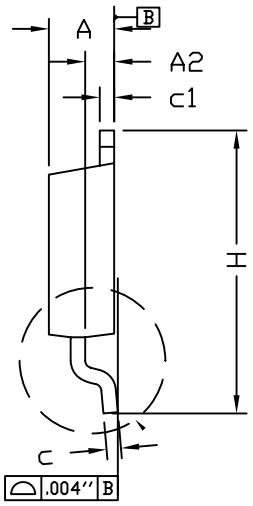


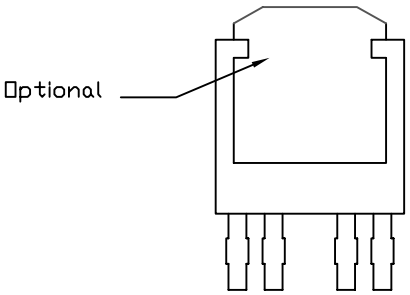
Figure8. Switching wave

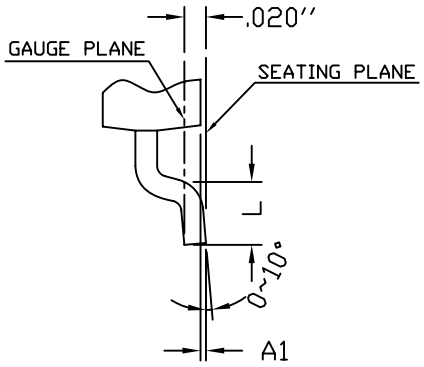
Package Information

TO252-4L PACKAGE

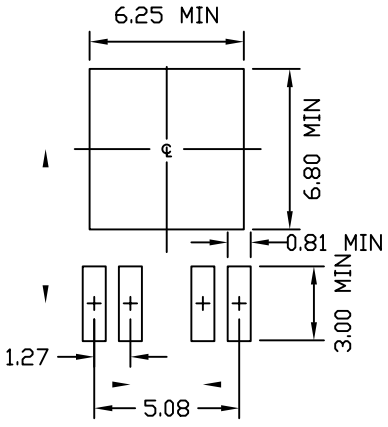








RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOL	DIMENSION IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.184	2.286	2.388	0.086	0.090	0.094
A1	0.000	-----	0.127	0.000	-----	0.005
A2	0.889	-----	1.143	0.035	-----	0.045
b	0.508	-----	0.711	0.020	-----	0.028
b1	0.584	-----	0.787	0.023	-----	0.031
b2	4.953	-----	5.461	0.195	-----	0.215
c	0.457	0.508	0.610	0.018	0.020	0.024
c1	0.457	-----	0.610	0.018	-----	0.024
D	5.969	6.096	6.223	0.235	0.240	0.245
E	6.350	6.604	6.731	0.250	0.260	0.265
e		1.270 BSC.			0.050 BSC.	
H	9.398	-----	10.414	0.370	-----	0.410
L	1.270	-----	2.032	0.050	-----	0.080
L1	-----	-----	1.016	-----	-----	0.040
L2	0.889	-----	1.270	0.035	-----	0.050

NOTE
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH SHOULD BE LESS THAN 6 MIL.
2. DIMENSION L IS MEASURED IN GAUGE PLANE.
3. TOLERANCE 0.10 mm UNLESS OTHERWISE SPECIFIED.
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
5. REFER TO JEDEC TO-252 (AD).