

## LMP3117DF 30V P-Channel MOSFET

### Features

- -30V/-44A,  $R_{DS(ON)} < 14.5m\Omega @ V_{GS} = -10V$
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- TO-252-2L package design

### Product Description

These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been

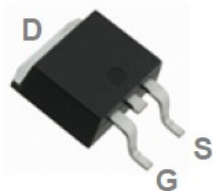
especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

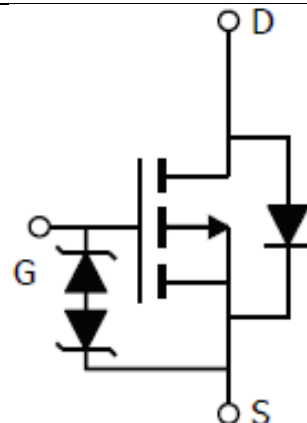
These devices are well suited for high efficiency fast switching applications.

### Applications

- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Application

### Pin Configuration

LMP3117DF (TO-252-2L)	
	
PIN	Description
3	Source
1	Gate
2	Drain



**Ordering Information**

Ordering Information					
Part Number	P/N	PKG code	Pb Free code	Package	Quantity
LMP3117DF	LMP3117	D	F	TO-252-2L	2500

**Marking Information**

Marking Information		
Part Marking	Part Number	LFC code
3117DF XWMMMM	3117DF	XWMMMM

**Absolute Maximum Ratings**

(T<sub>C</sub>=25°C Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage		-30	V
V <sub>GS</sub>	Gate-Source Voltage		±25	V
I <sub>D</sub>	Continuous Drain Current <sup>1</sup>	T <sub>C</sub> =25°C	-44	A
		T <sub>C</sub> =100°C	-27	
I <sub>DM</sub>	Pulsed Drain Current		-150	A
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>2</sup>		40	mJ
P <sub>D</sub>	Power Dissipation <sup>1</sup>	T <sub>C</sub> =25°C	32	W
		T <sub>C</sub> =100°C	12.5	
T <sub>J</sub>	Operating Junction Temperature Range		-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range		-55 to +150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient <sup>1</sup>		62.5	°C/W
R <sub>θJC</sub>	Thermal Resistance-Junction to Case		3	°C/W

**Electrical Characteristics**

(T<sub>C</sub>=25°C Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.2	-1.6	-2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±100	nA
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V			-1	uA
V <sub>SD</sub>	Diode Forward Voltage <sup>3</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A			-1	V
R <sub>DS(on)</sub>	Drain-Source On-Resistance <sup>3</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A		10.9	14.5	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6A		17.5	23	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-3A		10.7		
Gate charge characteristics						
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A		22		nC
Q <sub>gs</sub>	Gate-Source Charge			8.7		
Q <sub>gd</sub>	Gate-Drain Charge			7.2		
Dynamic characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1.0MHz		2215		pF
C <sub>oss</sub>	Output Capacitance			310		
C <sub>rss</sub>	Reverse Transfer Capacitance			237		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, R <sub>g</sub> =3.3Ω, I <sub>D</sub> =-15A		8		ns
t <sub>r</sub>	Rise Time			73.7		
t <sub>d(off)</sub>	Turn-Off Time			61.8		
t <sub>f</sub>	Fall Time			24.4		

# Typical Performance Characteristics

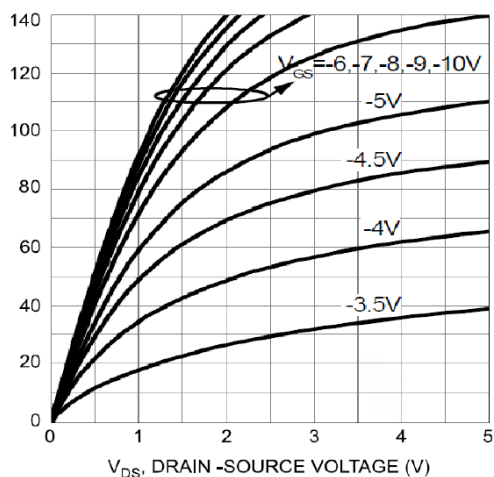


Figure 1. Output Characteristics

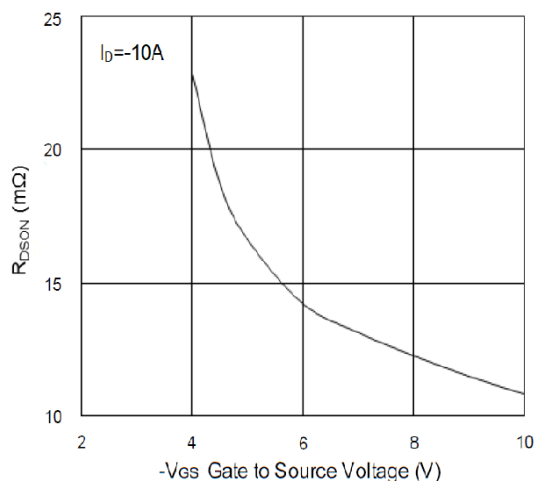


Figure 2. On-Resistance Variation with  $V_{GS}$

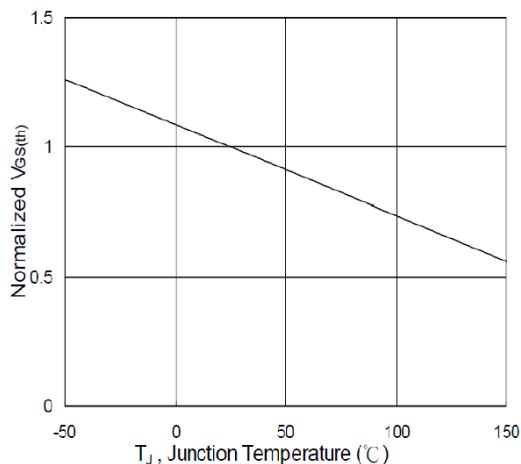


Figure 3. Normalized  $V_{GS(th)}$  vs.  $T_J$

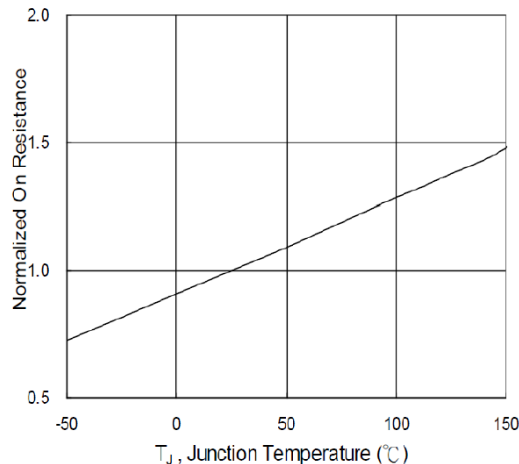


Figure 4. Normalized  $R_{DS(on)}$  vs.  $T_J$

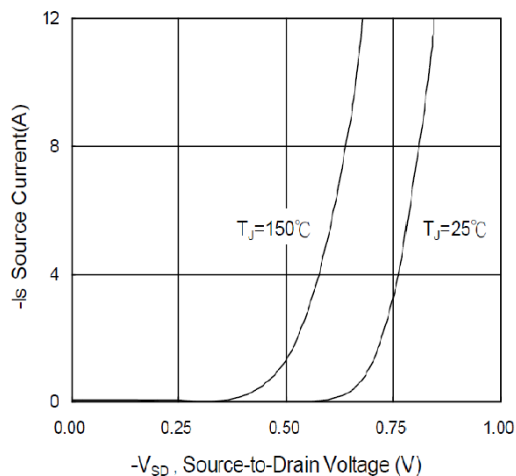


Figure 5. Diode Forward Voltage vs. Current

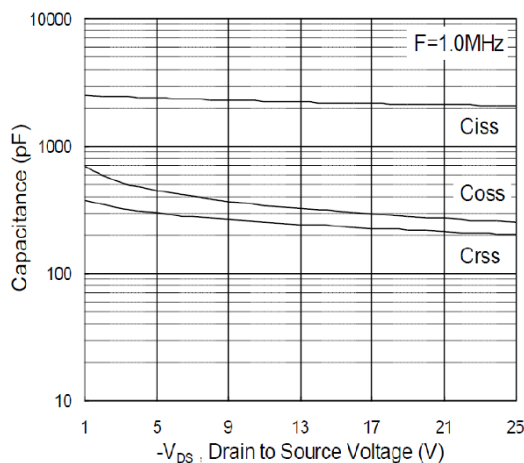


Figure 6. Capacitance

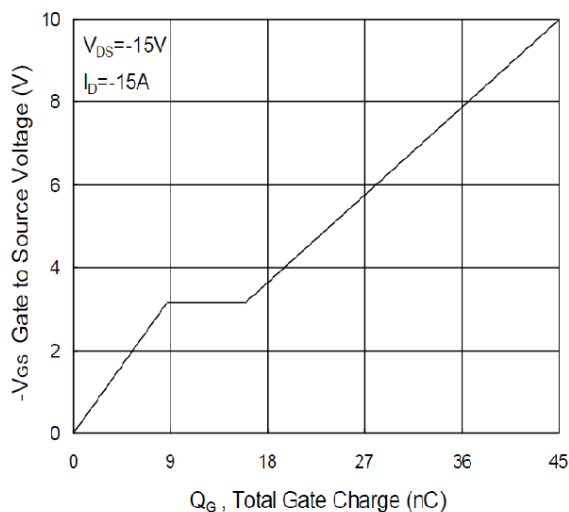
**Typical Performance Characteristics(continue)**


Figure 7. Gate Charge Waveform

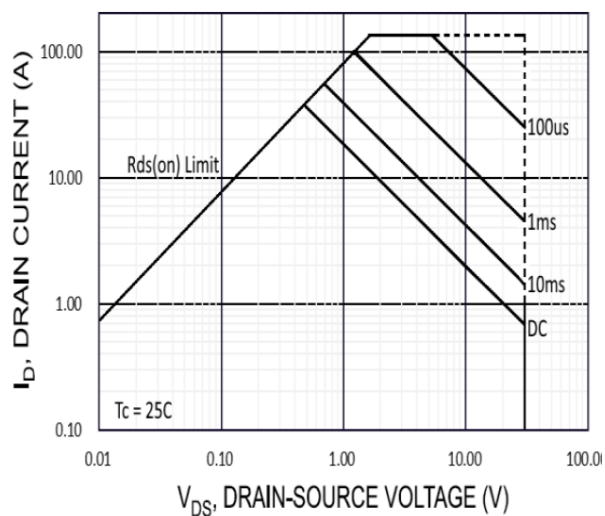


Figure 8. Maximum Safe Operating Area

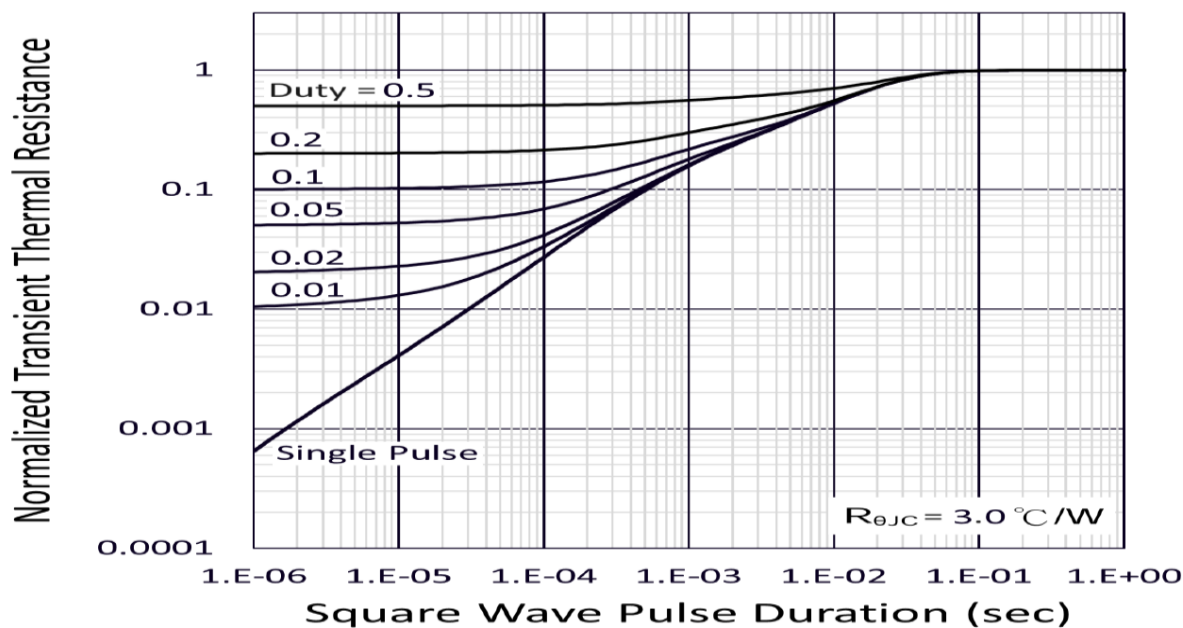
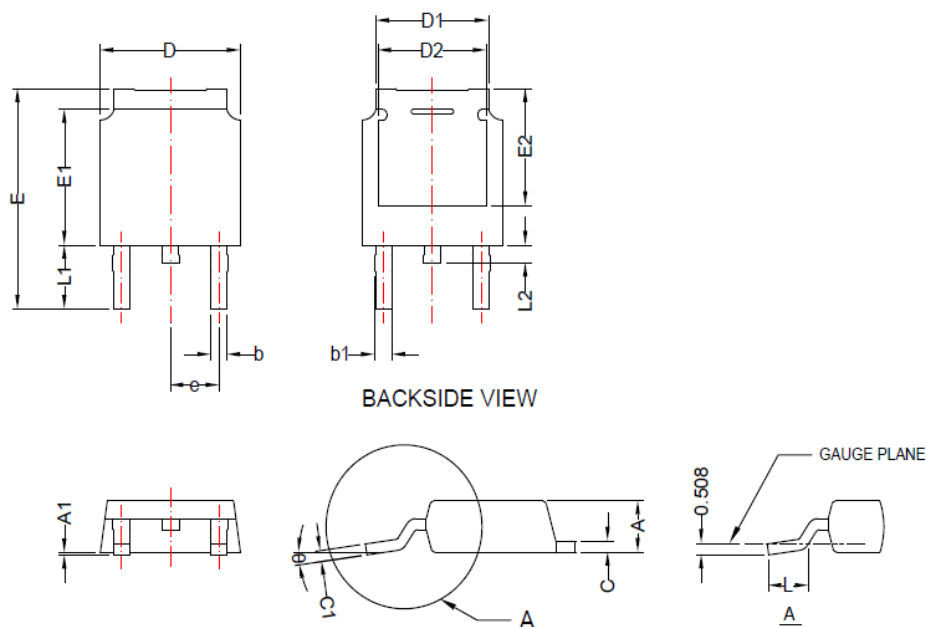


Figure 9. Normalized Transient Thermal Resistance

**Package Dimension:**
**TO-252(AA)**


THE PACKAGE TOP MAY BE SMALLER THAN THE PACKAGE BOTTOM. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMS OF THE PLASTIC BODY EXCLUSIVE OF MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN THE TOP AND BOTTOM OF THE PLASTIC BODY.

DIMENSION D DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.15mm PER DNE. DIMENSION E1 DOES NOT INCLUDE MOLD FLASH, PROTRUSION, OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL EXCEED 0.15mm INCHES PER DNE.

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.40	0.086	0.094
A1	0.00	0.15	0.000	0.006
b	0.64	0.90	0.025	0.035
b1	0.76	1.14	0.030	0.045
c	0.40	0.89	0.016	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.73	0.250	0.265
D1	4.95	5.46	0.195	0.215
D2	4.32	---	0.170	---

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