GSM3117DF

30V P-Channel MOSFETs

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.

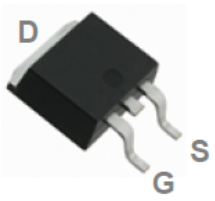
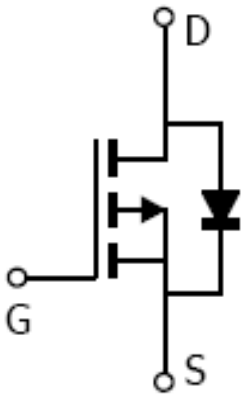
Features

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

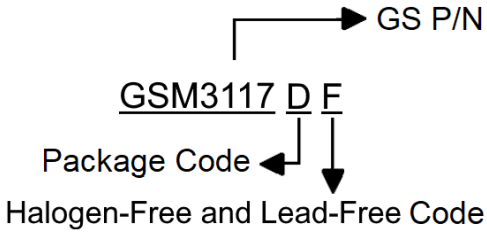
Applications

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

Packages & Pin Assignments

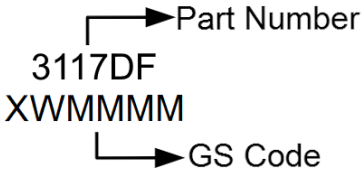
GSM3117DF (TO-252-2L)	
 Top View	
Description	
Gate	
Drain	
Source	

Ordering Information



Part Number	Package	Quantity Reel
GSM3117DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current[1]	T_C=25℃	-44	A
		T_C=100℃	-27	
I_{DM}	Pulsed Drain Current		-150	A
E_{AS}	Single Pulse Avalanche Energy[2]		40	mJ
P_D	Power Dissipation[1]	T_C=25℃	32	W
		T_C=100℃	12.5	
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient[1]		62.5	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		3	℃/W

Electrical Characteristics

T_J=25℃ Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-1.2	-1.6	-2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±25V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-30V, V_{GS}=0V			-1	uA
V_{SD}	Diode Forward Voltage[3]	V_{GS}=0V, I_S=-1A			-1	V
$R_{DS(on)}$	Drain-Source On-Resistance[3]	V_{GS}=-10V, I_D=-10A		10.9	14.5	mΩ
		V_{GS}=-4.5V, I_D=-6A		17.5	23	
gfs	Forward Transconductance	V_{DS}=-10V, I_D=-3A		10.7		
Gate charge characteristics						
Q_g	Total Gate Charge	V_{DD}=-15V, V_{GS}=-4.5V, I_D=-15A		22		nC
Q_{gs}	Gate-Source Charge			8.7		
Q_{gd}	Gate-Drain Charge			7.2		
Dynamic characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1.0MHz		2215		pF
C_{oss}	Output Capacitance			310		
C_{rss}	Reverse Transfer Capacitance			237		
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V, V_{GS}=-10V, Rg=3.3Ω, I_D=-15A		8		ns
t_r	Rise Time			73.7		
$t_{d(off)}$	Turn-Off Time			61.8		
t_f	Fall Time			24.4		

Note

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The E_{AS} data shows Max. rating . The test condition is V_{DD}=-20V, V_{GS}=-10V, L=0.1mH, I_{AS}=-19A.
3. The data tested by pulsed , pulse width ≦300us , duty cycle ≦2%.

Typical Performance Characteristics

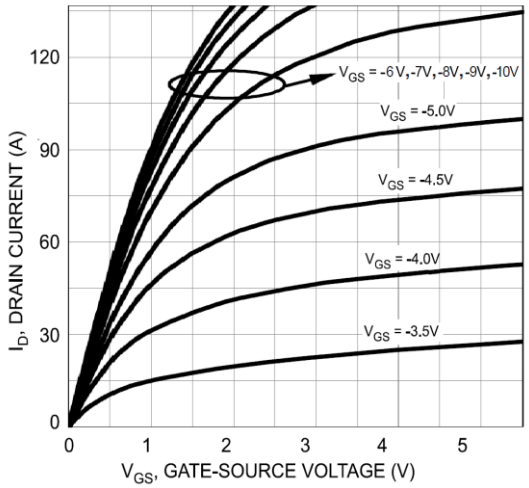


Figure 1. Output Characteristics

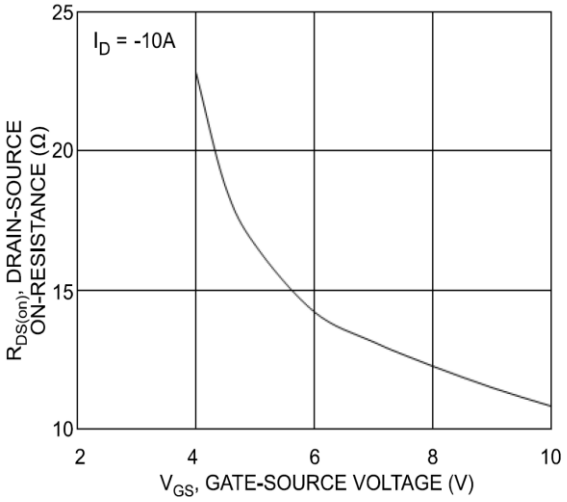


Figure 2. On-Resistance Variation with V_{GS}

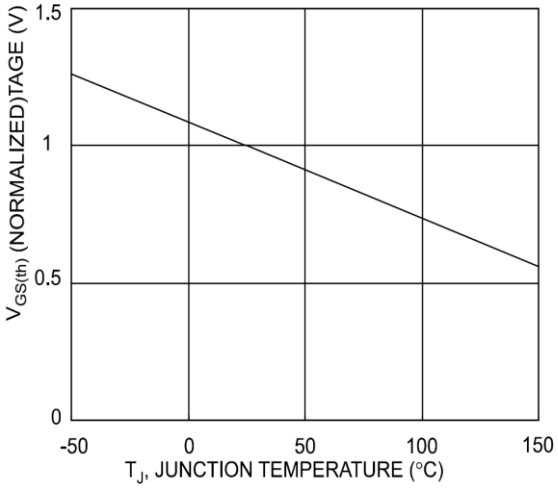


Figure 3. Normalized $V_{GS(th)}$ vs. T_J

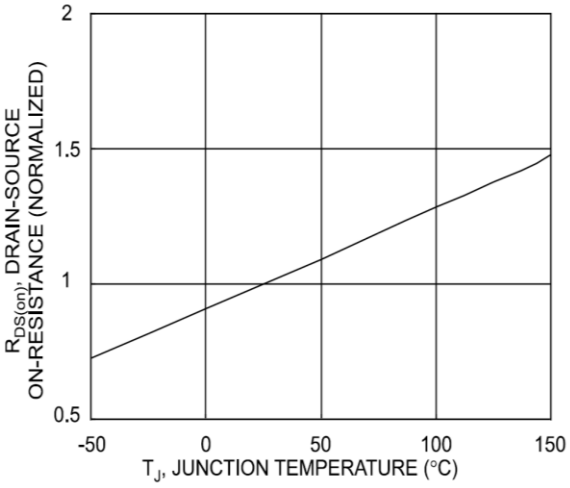


Figure 4. Normalized R_{DSON} vs. T_J

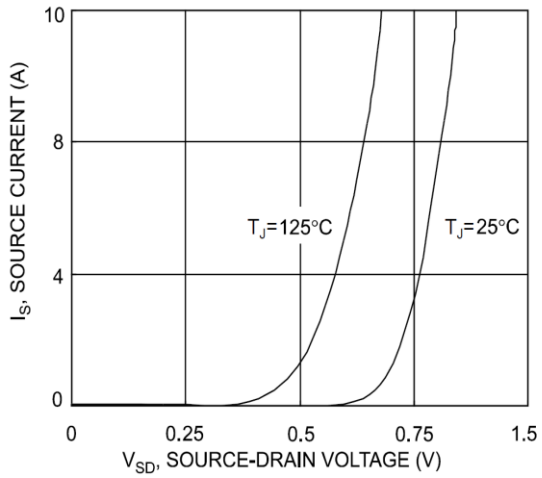


Figure 5. Diode Forward Voltage vs. Current

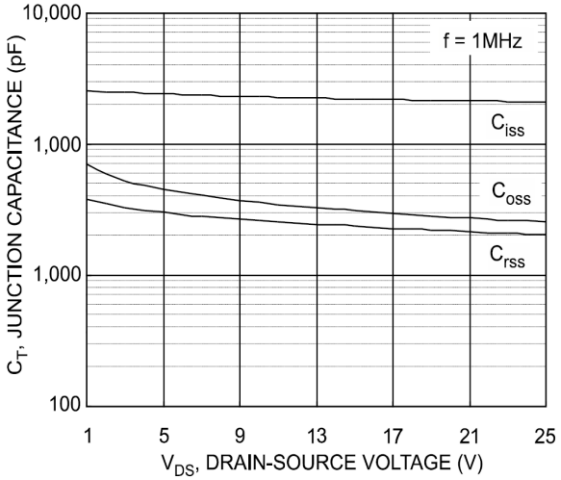


Figure 6. Capacitance

Typical Performance Characteristics (Continue)

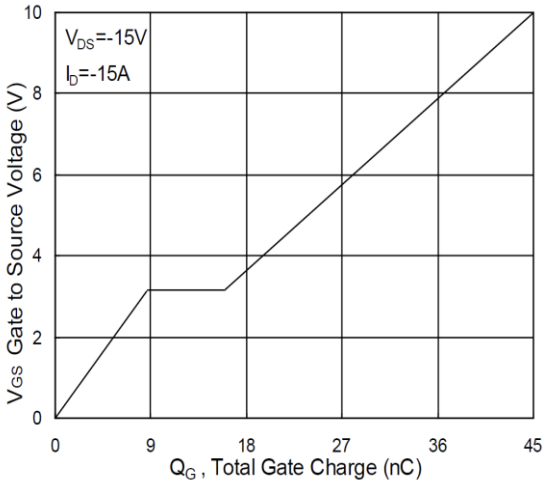


Figure 7. Gate Charge Waveform

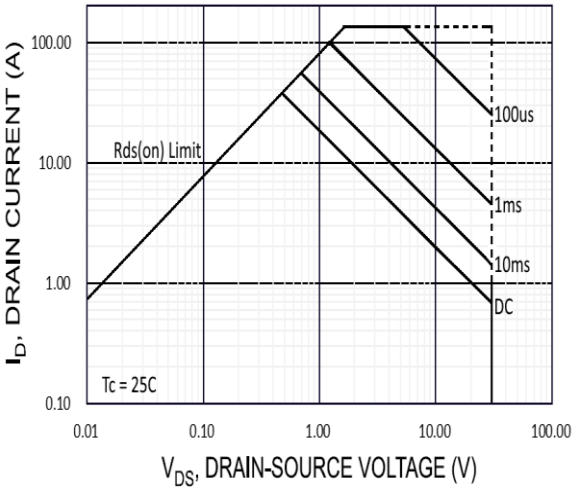


Figure 8. Maximum Safe Operating Area

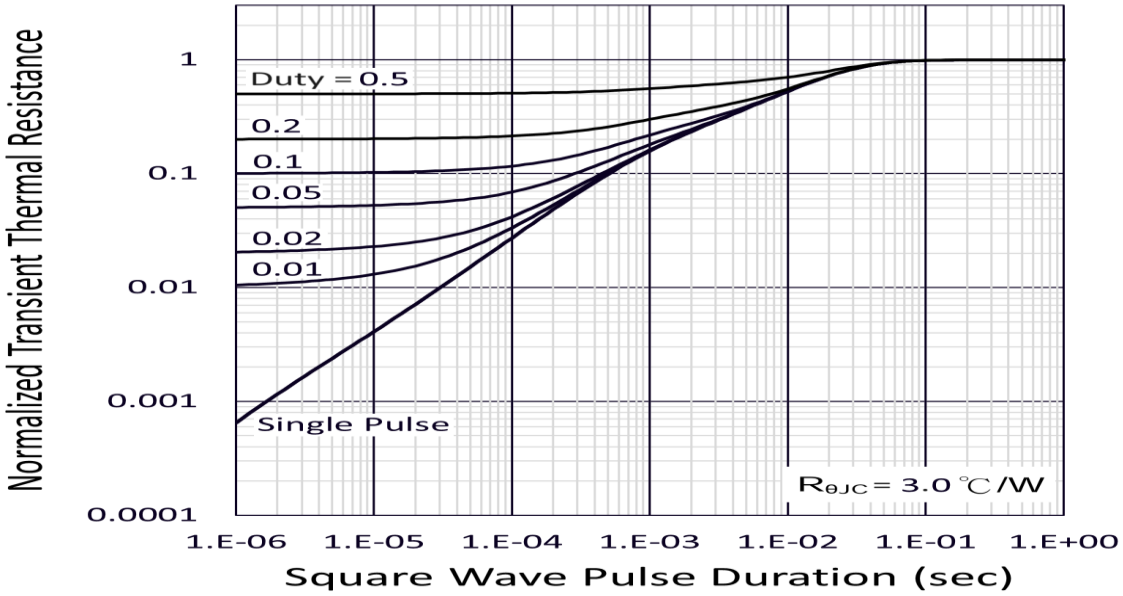
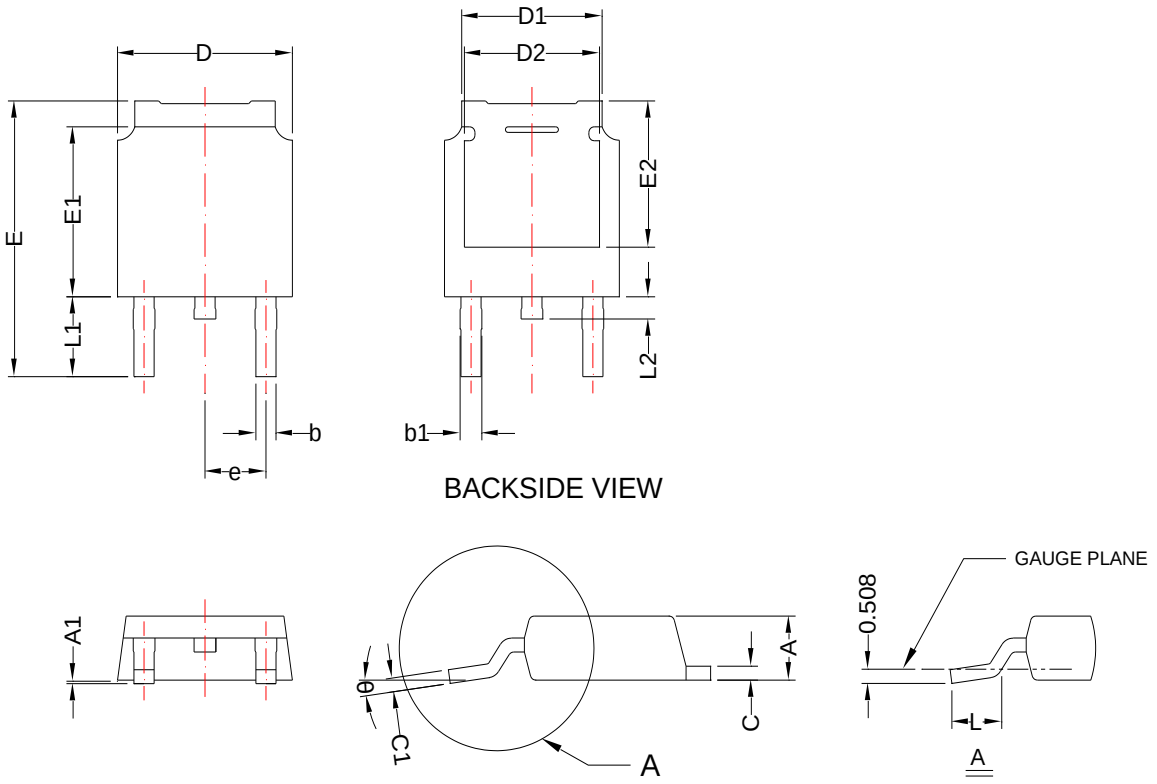


Figure 9. Normalized Transient Thermal Resistance

Package Dimension

TO-252(AA)



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

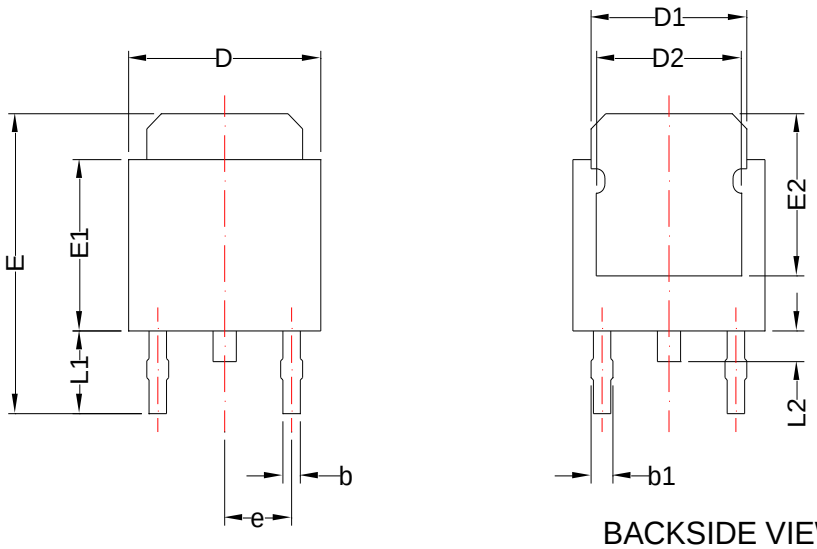
DIMENSION D DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.15mm PER DNE. DIMENSION E1 DOES NOT INCLUDE MOLD FLASH, PROTRUSION. OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL EXCEED 0.15mm INCHES PER DNE.

Dimensions

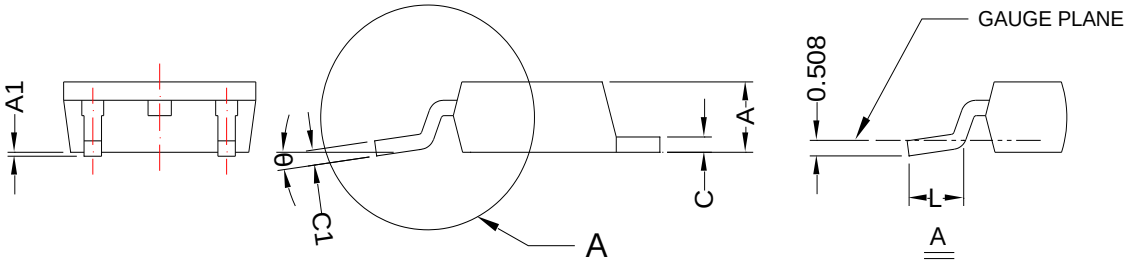
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.18	2.40	0.086	0.094
A1	0.00	0.15	0.000	0.006
b	0.64	0.90	0.025	0.035
b1	0.76	1.14	0.030	0.045
c	0.40	0.89	0.016	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.73	0.250	0.265
D1	4.95	5.46	0.195	0.215
D2	4.32	---	0.170	---

E	9.40	10.41	0.370	0.410
E1	5.97	6.22	0.235	0.245
E2	4.95	---	0.195	---
e	2.286 BSC		0.090 BSC	
L	1.40	1.77	0.055	0.070
L1	2.67	3.07	0.105	0.121
L2	---	1.20	---	0.047
θ	0°	8°	0°	8°

TO-252(AB)



BACKSIDE VIEW



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	0.50	0.90	0.020	0.035
b1	0.60	1.14	0.024	0.045
c	0.45	0.89	0.018	0.035
c1	0.40	0.61	0.016	0.024
D	6.35	6.80	0.250	0.268
D1	4.95	5.50	0.195	0.217
D2	3.81	---	0.150	---

E	9.40	10.41	0.370	0.410
E1	5.33	5.80	0.210	0.228
E2	4.57	---	0.180	---
e	2.286 BSC		0.090 BSC	
L	1.40	1.78	0.055	0.070
L1	2.40	3.00	0.094	0.118
L2	---	1.20	---	0.047
θ	0°	8°	0°	8°

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CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587