

GSMBSS139TX6F

60V Dual N-Channel MOSFETs

Product Description

The N-Channel enhancement mode power field effect transistor is 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.

The device is well suited for high efficiency fast switching applications.

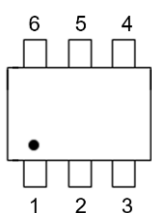
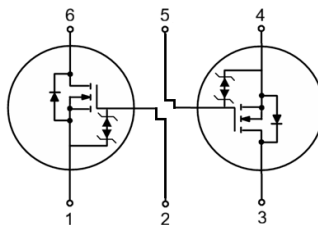
Features

- $R_{DS(ON)}=1.44\Omega@V_{GS}=10V$
- $R_{DS(ON)}=2.25\Omega@V_{GS}=4.5V$
- $R_{DS(ON)}=4.05\Omega@V_{GS}=2.5V$
- SOT-363 Package
- RoHS Compliant and Halogen Free

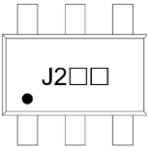
Applications

- Portable Equipment
- Load Switch
- Driver

Packages & Pin Assignments

SOT-363			Equivalent Circuit		
 <p>Top View</p>					
Pin	Symbol	Description	Pin	Symbol	Description
1	S1	Source 1	6	D1	Drain 1
2	G1	Gate 1	5	G2	Gate 2
3	D2	Drain 2	4	S2	Source 2

Ordering and Marking Information

Ordering Information			
Part Number	Package	Part Marking	Quantity / Reel
G SMBSS139TX6F	SOT-363	J2□□	3,000 PCS
G SMBSS139T □ F			
- Product Code: G SMBSS139T	- Package Code: □ is X6 for SOT-363	- Green Level: F for RoHS Compliant and Halogen Free	
Marking Information			
	- Product Code: J2	- GS Code: □□	
	● The dot denotes Pin1		

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

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	60	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current	T _A =25°C	0.32
		T _A =70°C	0.26
I _{DM}	Pulsed Drain Current ¹	0.88	A
P _D	Power Dissipation ²	T _A =25°C	0.3
		T _A =70°C	0.195
R _{θJA}	Thermal Resistance-Junction to Ambient ²	410	°C/W
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C

NOTE:

- Single pulse width is limited by max junction temperature.
- The device was mounted on 1in² FR-4 board with 2oz.copper.

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	-	-	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =50V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.8	-	1.5	V
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =0.5A	-	-	1.44	Ω
		V _{GS} =4.5V, I _D =0.2A	-	-	2.25	
		V _{GS} =2.5V, I _D =0.1A	-	-	4.05	
g _{fs}	Forward Transconductance	V _{DS} =25V, I _D =0.2A	100	-	-	mS
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	28.8	-	pF
C _{oss}	Output Capacitance		-	3.8	-	
C _{rss}	Reverse Transfer Capacitance		-	2.9	-	
Q _g	Total Gate Charge	V _{DS} =25V, I _D =0.2A V _{GS} =4.5V	-	0.6	-	nC
Q _{gs}	Gate-Source Charge		-	0.22	-	
Q _{gd}	Gate-Drain Charge		-	0.2	-	
t _{d(on)}	Turn-On Delay Time	V _{DD} =25V, I _D =0.2A V _{GS} =10V, R _g =25Ω	-	3.8	-	ns
t _r	Turn-On Rise Time		-	7.5	-	
t _{d(off)}	Turn-Off Delay Time		-	19	-	
t _f	Turn-Off Fall Time		-	15	-	
Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =0.5A	-	-	1.4	V

Typical Performance Characteristics

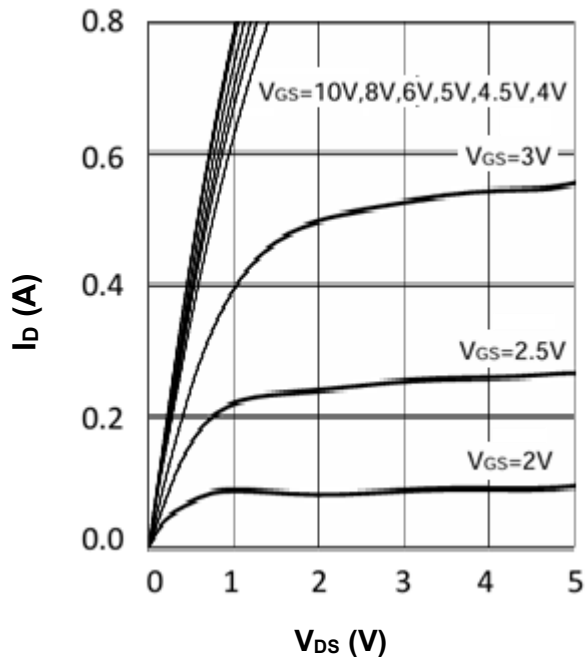


FIG.1 Output Characteristics

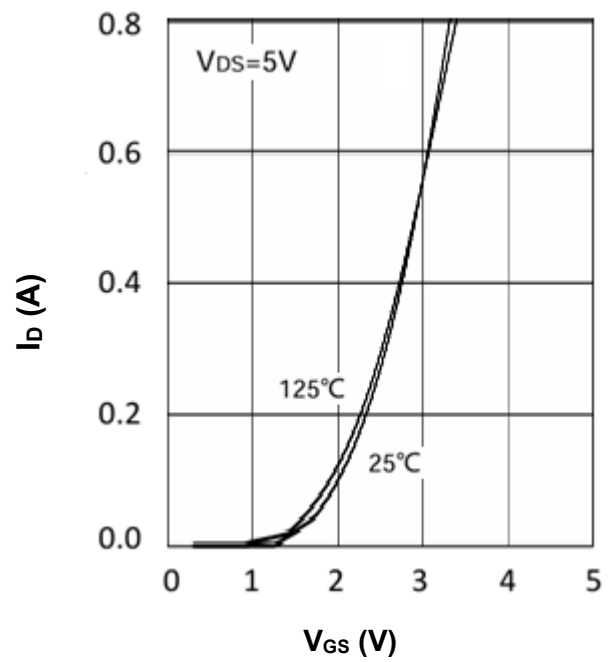


FIG.2 Transfer Characteristics

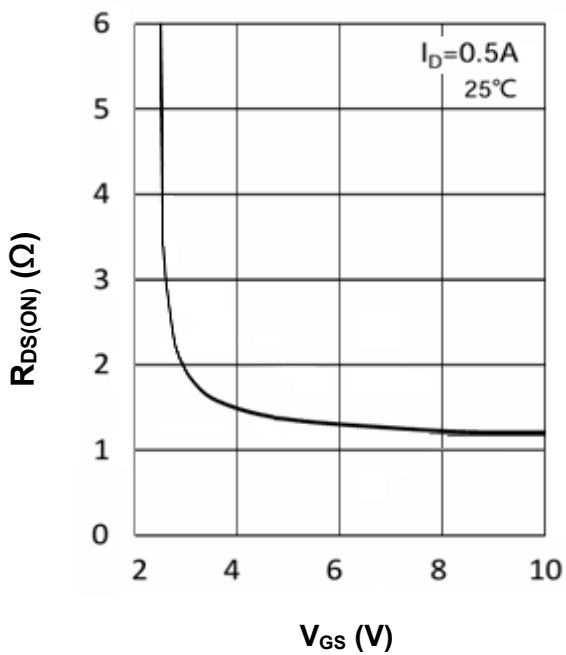


FIG.3 On-Resistance vs. Gate Voltage

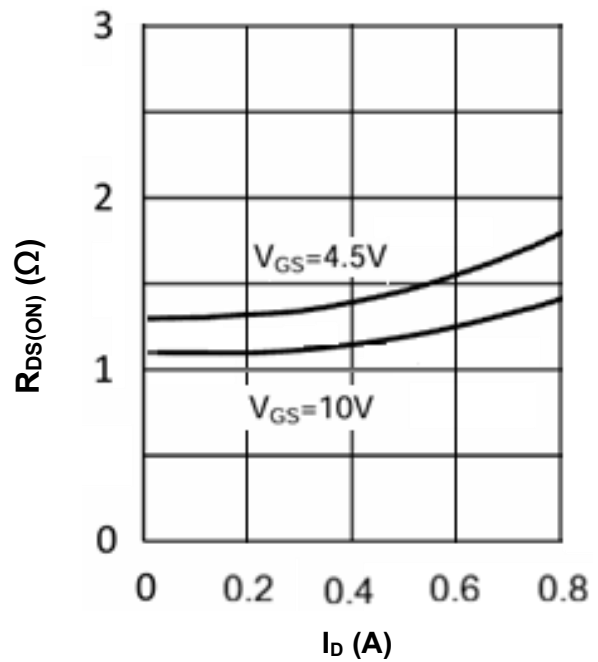


FIG.4 On-Resistance vs. Drain Current

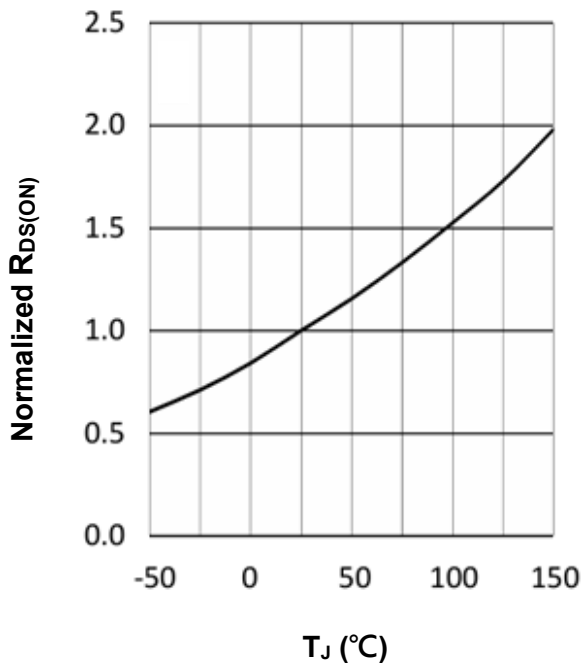


FIG.5 Normalized On-Resistance vs. T_J

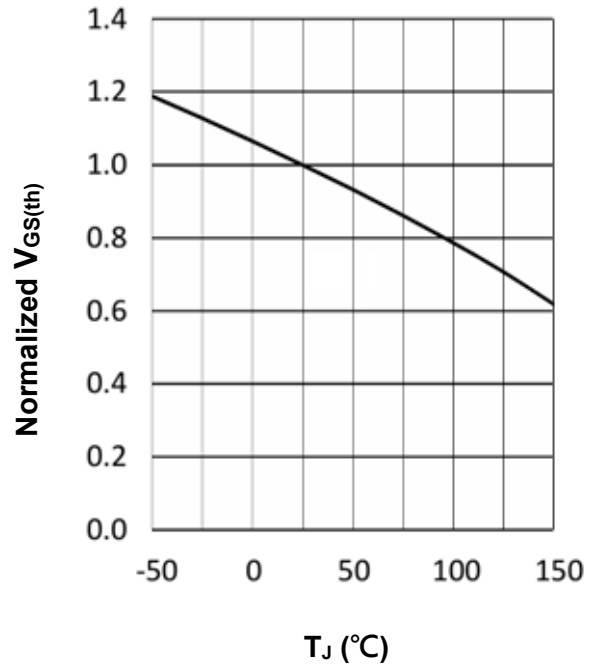


FIG.6 Normalized V_{GS(th)} vs. T_J

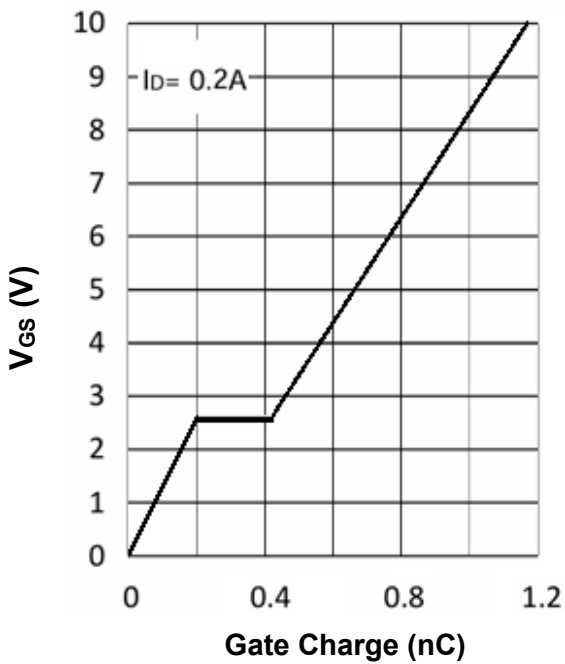


FIG.7 Gate Charge Characteristics

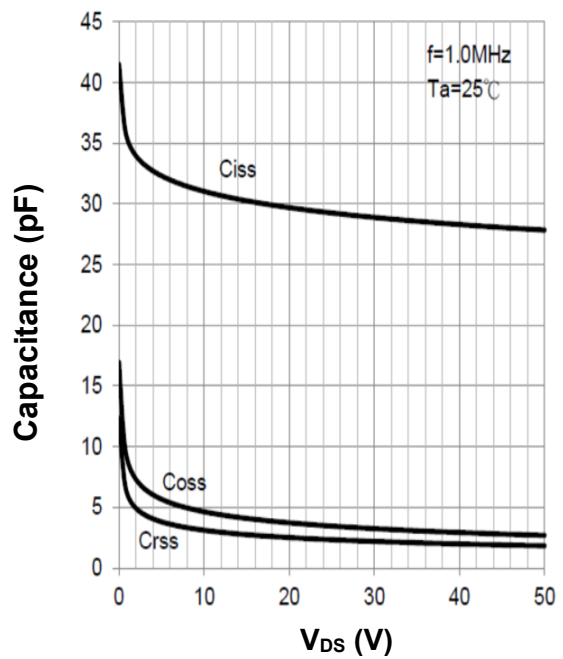


FIG.8 Capacitance Characteristics

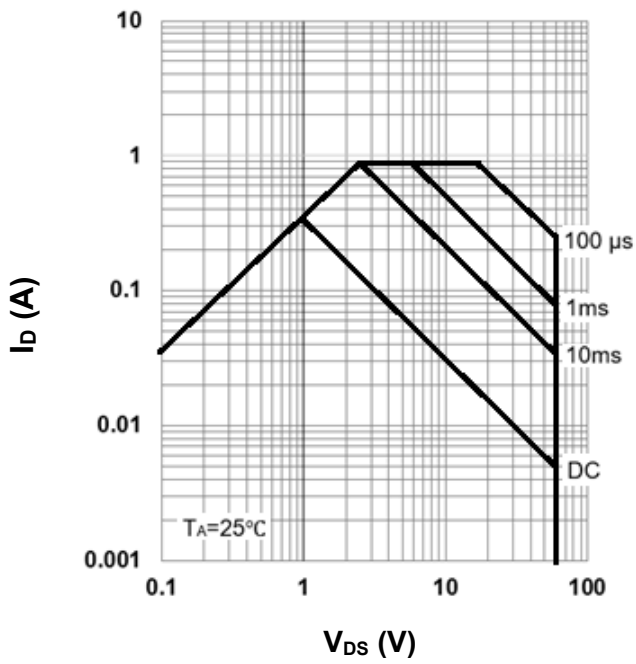


FIG.9 Maximum Safe Operation Area

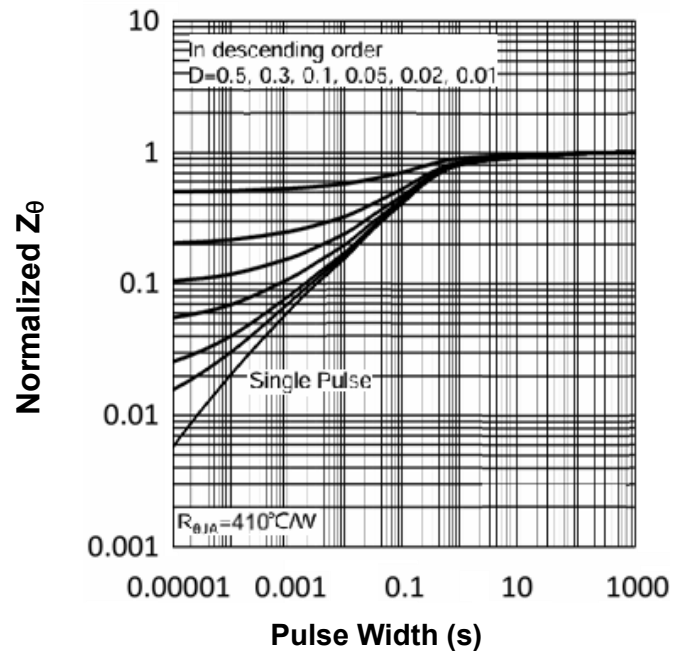


FIG.10 Normalized Transient Impedance

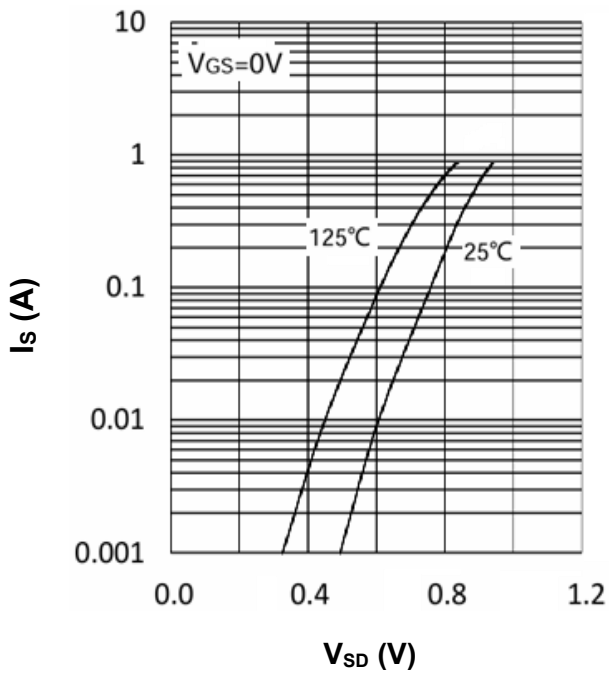
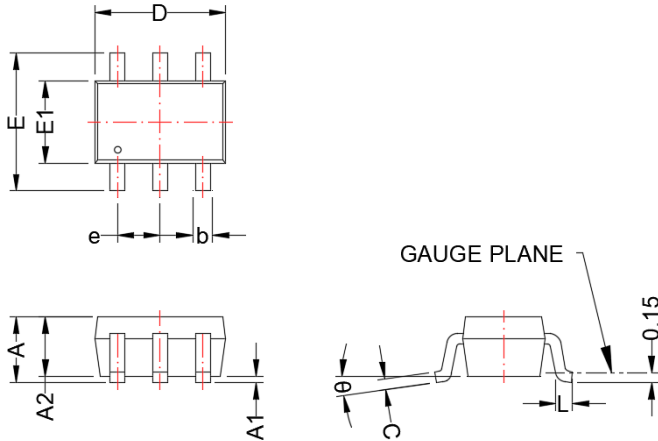


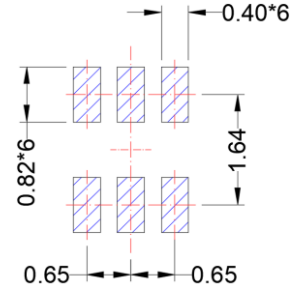
FIG.11 Body-Diode Characteristics

SOT-363

Package Dimension (2)



Recommended Land Pattern



Unit:mm

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.80	1.10	0.031	0.043
A1	0.00	0.10	0.000	0.004
A2	0.70	1.00	0.028	0.039
b	0.15	0.30	0.006	0.012
c	0.08	0.25	0.003	0.010
D	1.80	2.20	0.071	0.087
E	1.80	2.40	0.071	0.094
E1	1.15	1.35	0.045	0.053
e	0.65 BSC		0.026 BSC	
L	0.26	0.46	0.010	0.018
θ	0°	8°	0°	8°





NOTE:



Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

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