

GSMBSS139KX7F

60V N-Channel MOSFET

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.

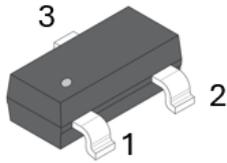
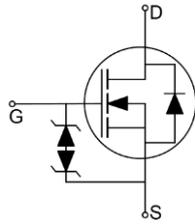
Features

- $R_{DS(ON)} = 2.25\Omega @ V_{GS}=4.5V$
- ESD Protected: 1500V
- SOT-523 Package Design
- RoHS Compliant and Halogen Free

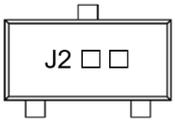
Applications

- Load Switch
- Portable Appliances

Packages & Pin Assignments

SOT-523			Equivalent Circuit		
					
Pin	Symbol	Description	Pin	Symbol	Description
1	G	Gate	3	D	Drain
2	S	Source			

Ordering and Marking Information

Ordering Information			
Part Number	Package	Part Marking	Quantity / Reel
G SMBSS139KX7F	SOT-523	J2□□	3,000 PCS
G SMBSS139K 1 2			
- Product Code: G SMBSS139K		- Package Code: 1 is X7 for SOT-523	
		- Green Level: 2 is F for RoHS Compliant and Halogen Free	
Marking Information			
		- Product Code: J2	
		- GS Code: □□	

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	0.2	A
I _{DM}	Pulsed Drain Current ¹		0.8	A
P _D	Power Dissipation	T _A =25°C	0.225	W
R _{θJA}	Thermal Resistance-Junction to Ambient ²		556	°C/W
T _J	Operating Junction Temperature Range		-55 to +150	°C
T _{STG}	Storage Temperature Range		-55 to +150	°C
T _L	Maximum Lead Temperature for Soldering Purpose, for 10 Seconds		260	°C

NOTE:

- Single pulse width is limited by max junction temperature.
- The device 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	-	-	0.5	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	0.85	-	1.45	V
R _{DS(ON)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D =0.2A	-	-	2.25	Ω
		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	-	22.8	-	pF
C _{oss}	Output Capacitance		-	3.5	-	
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 =0.2A	-	-	1.2	V

Typical Performance Characteristics

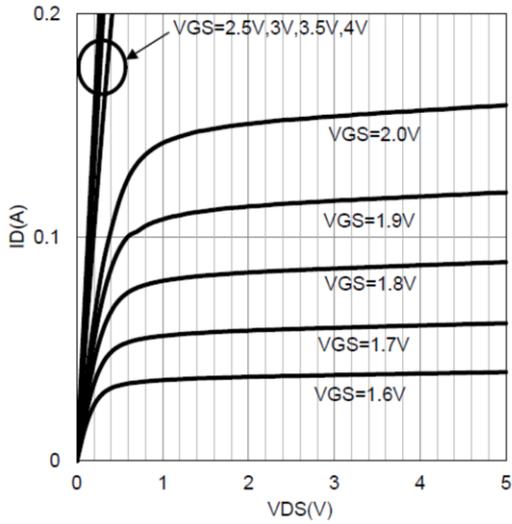


FIG.1 Output Characteristics

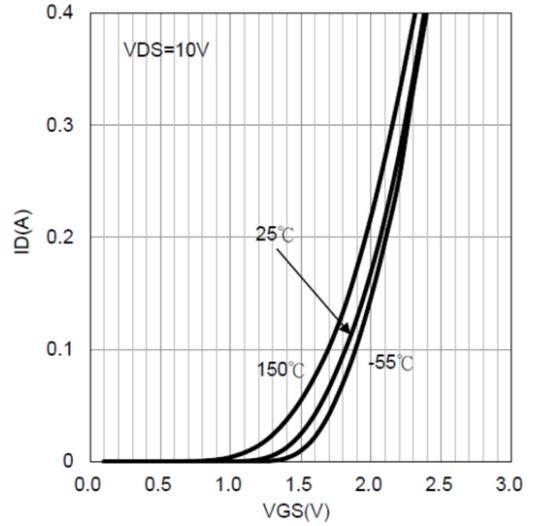


FIG.2 Transfer Characteristics

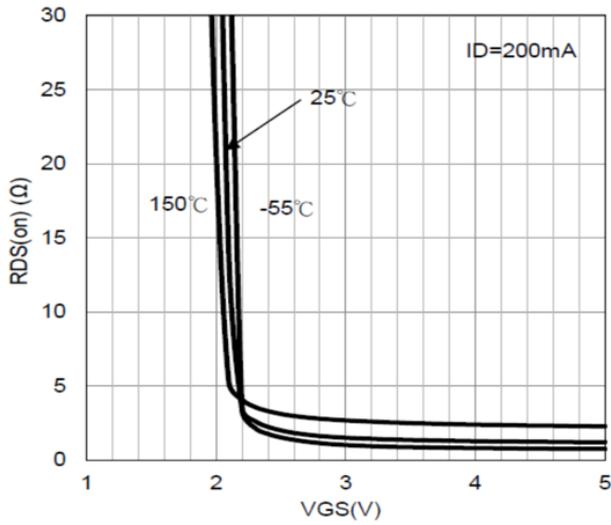


FIG.3 On-Resistance vs. Gate Voltage

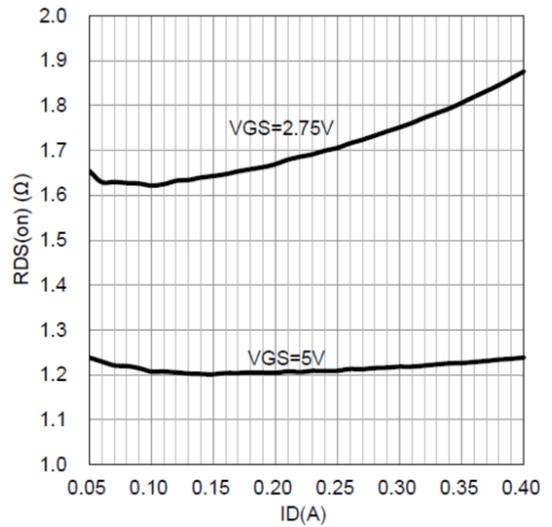


FIG.4 On-Resistance vs. Drain Current

Typical Performance Characteristics

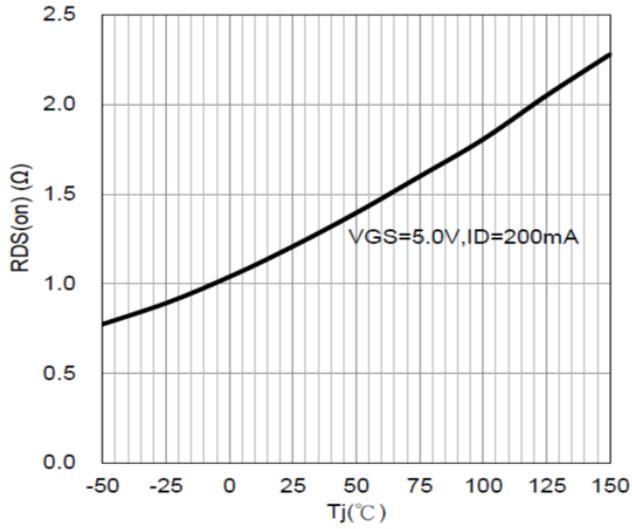


FIG.5 On-Resistance vs. T_j

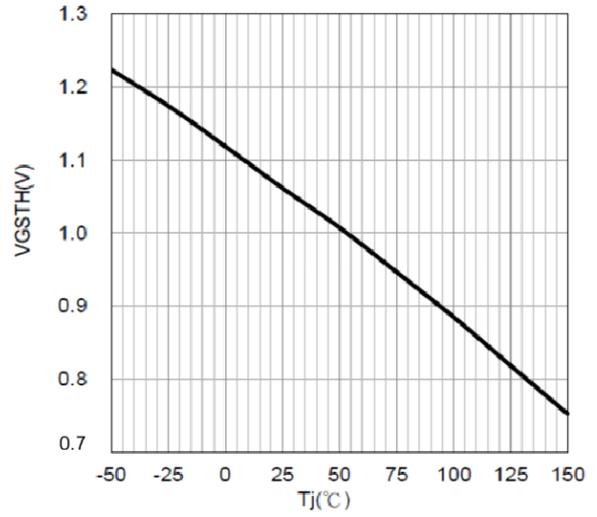


FIG.6 V_{GS(th)} vs. T_j

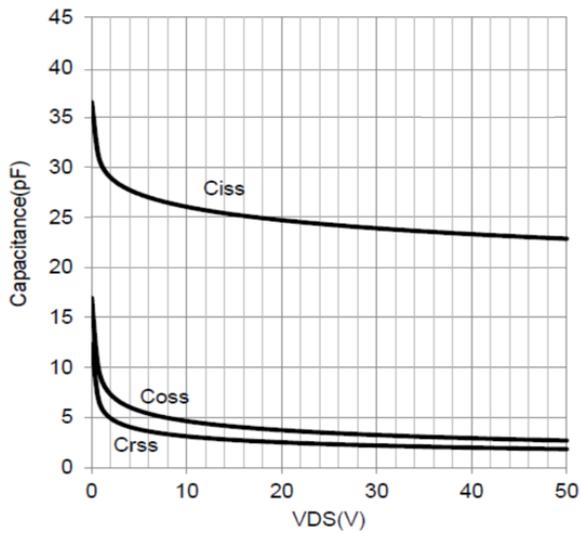


FIG.7 Capacitance Characteristics

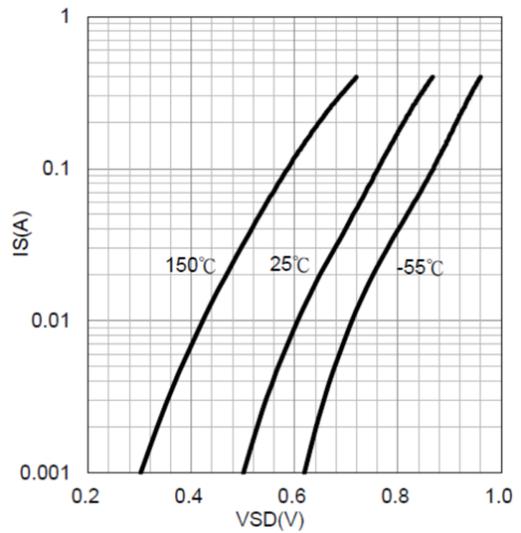
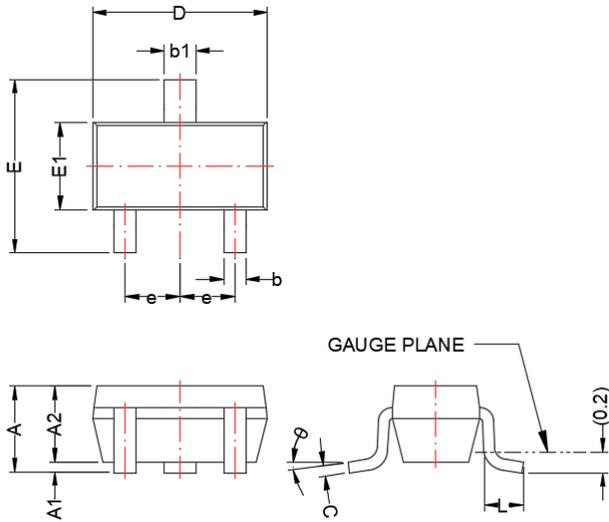


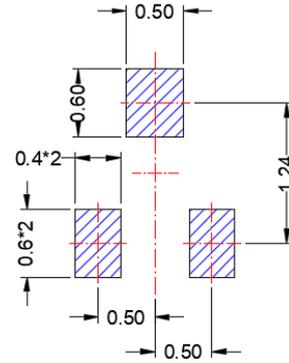
FIG.8 Body-Diode Characteristics

SOT-523

Package Dimension



Recommended Land Pattern



Unit: mm

Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.60	0.95	0.024	0.037
A1	0.00	0.10	0.000	0.004
A2	0.60	0.85	0.024	0.033
b	0.15	0.30	0.006	0.012
b1	0.25	0.40	0.010	0.016
c	0.08	0.25	0.003	0.010
D	1.40	1.80	0.055	0.071
E	1.40	1.80	0.055	0.071
E1	0.70	0.90	0.028	0.035
e	0.50 BSC		0.020 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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