

# GSMBSS139JZF

## 60V N-Channel Enhancement Mode 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.

The Device is well Suited for High Efficiency Fast Switching Applications.

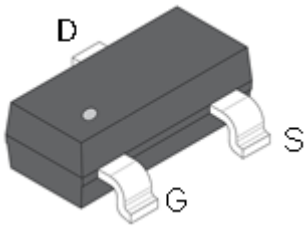
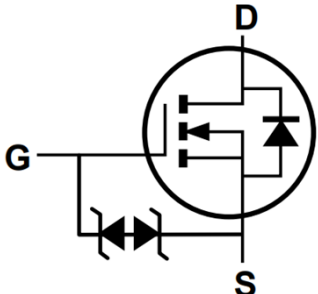
### Features

- $R_{DS(ON)}=2.5\Omega@V_{GS}=4.5V$
- $R_{DS(ON)}=4\Omega@V_{GS}=2.5V$
- Improved dv/dt Capability
- Fast Switching
- ESD Protected : 1500V

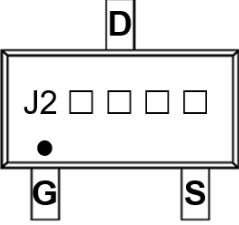
### Applications

- Notebook
- Load Switch
- LED Applications

### Packages & Pin Assignments

GSMBSS139JZF (SOT-23)		Equivalent Circuit
		
Pin	Description	
1	Gate	
2	Source	
3	Drain	

## Ordering and Marking Information

Ordering Information			
Part Number	Package	Part Marking	Quantity / Reel
GSMBSS139JZF	SOT-23	J2□□□□	3,000 PCS
<b>GSMBSS139</b> ① ② - <b>Product Code:</b> GSMBSS139 - <b>Package Code:</b> ① is <b>JZ</b> for SOT-23 - <b>Green Level:</b> ② is <b>F</b> for RoHS Compliant and Halogen Free			
Marking Information			
			
- <b>Product Code:</b> J2 - <b>GS Code:</b> □□□□			

## Absolute Maximum Ratings

T<sub>A</sub>=25°C, unless otherwise specified

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-Source Voltage	60	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	0.2
		T <sub>A</sub> =70°C	0.16
I <sub>DM</sub>	Pulsed Drain Current	0.8	A
P <sub>D</sub>	Total Power Dissipation	T <sub>A</sub> =25°C	0.225
		T <sub>A</sub> =70°C	0.14
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	556	°C/W

## Electrical Characteristics

T<sub>A</sub>=25°C, unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static characteristics</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.8	-	1.5	V
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±10	μA
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V	-	-	0.1	μA
		V <sub>DS</sub> =50V, V <sub>GS</sub> =0V	-	-	0.5	
R <sub>DS(ON)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.2A	-	-	2.5	Ω
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.1A	-	-	4	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =25V, I <sub>D</sub> =0.2A	0.1	-	-	S
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =0.5A	-	-	1.2	V
<b>Dynamic characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	-	22.8	-	pF
C <sub>oss</sub>	Output Capacitance		-	3.5	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	2.9	-	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =25V, I <sub>D</sub> =0.2A, V <sub>GS</sub> = 4.5V	-	0.6	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	0.22	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	0.2	-	
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DS</sub> =25V, V <sub>GS</sub> =10V, R <sub>g</sub> =25Ω, I <sub>D</sub> =0.2A	-	3.8	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	7.5	-	
t <sub>d(off)</sub>	Turn-Off Delay Time		-	19	-	
t <sub>f</sub>	Turn-Off Fall Time		-	15	-	

## Typical Performance Characteristics

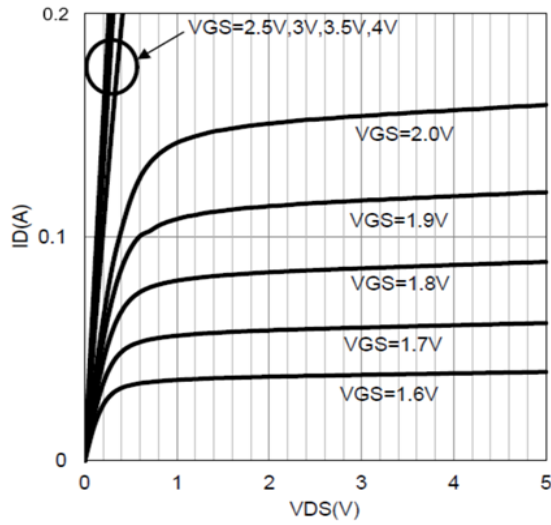


Figure 1. Typical Output Characteristics

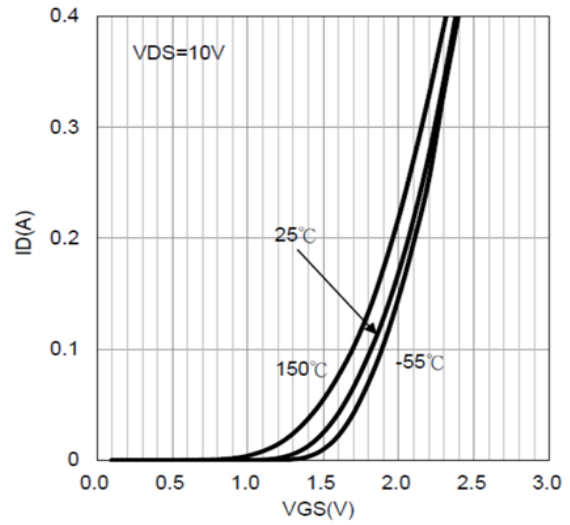


Figure 2. Typical Transfer Characteristics

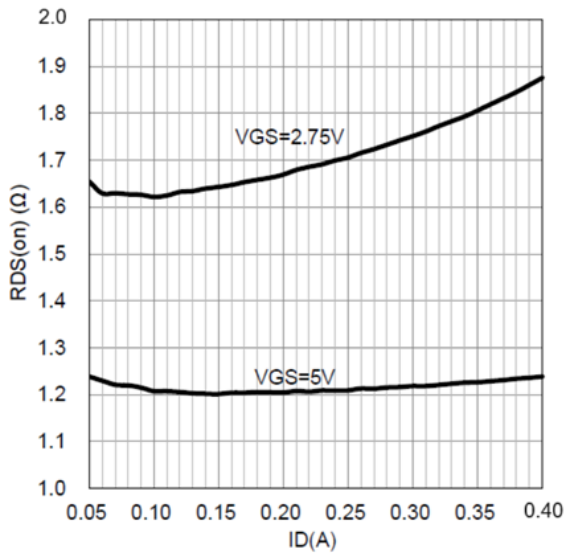


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

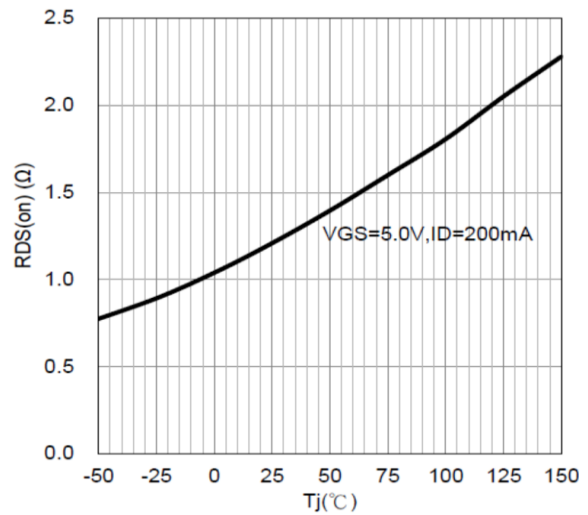


Figure 4. Drain-Source On-State Resistance vs. Junction Temperature

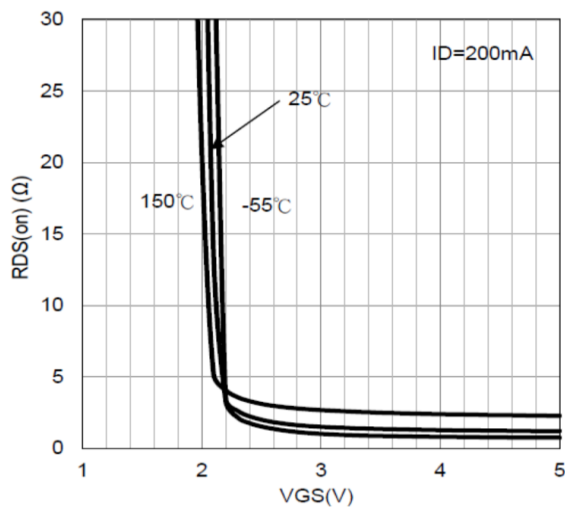


Figure 5. Drain-Source On-State Resistance vs. Gate-Source Voltage

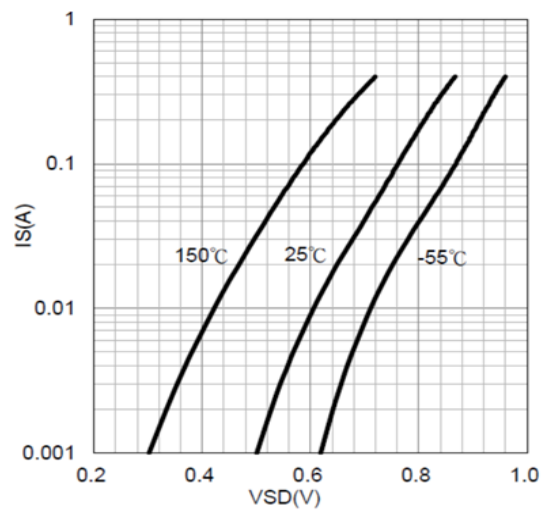


Figure 6. Diode Forward Voltage vs. Current

## Typical Performance Characteristics

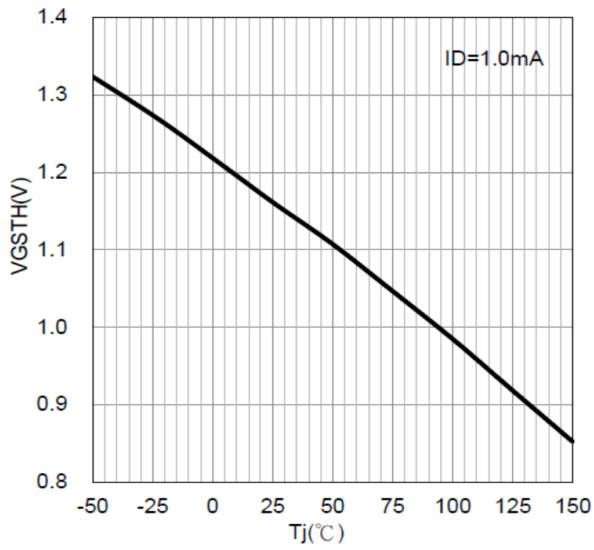


Figure 7. Gate Threshold Voltage vs. Junction Temperature

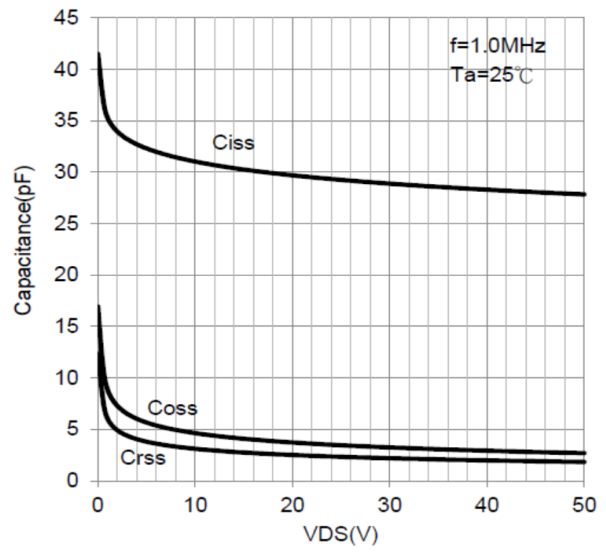


Figure 8. Capacitance vs. Drain-Source Voltage

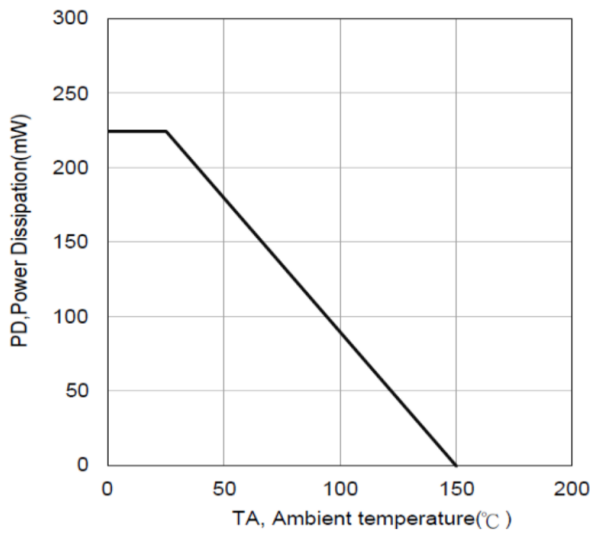
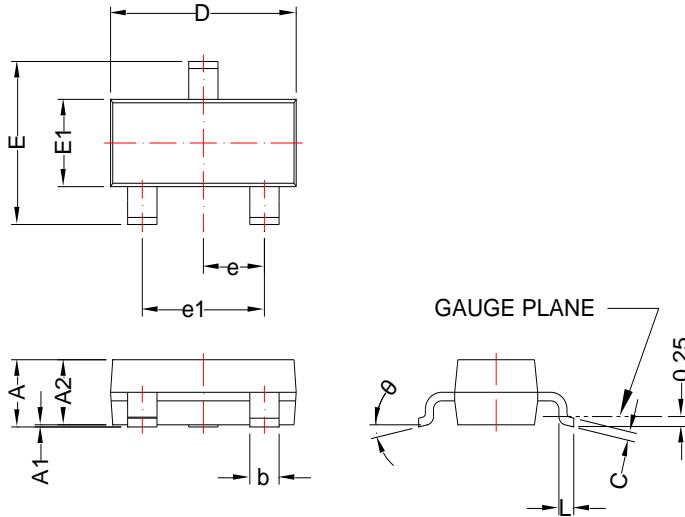


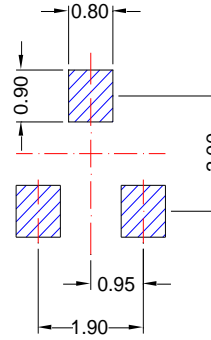
Figure 9. Power Dissipation vs. Ambient temperature

# SOT-23

## Package Dimension



## Recommended Land Pattern







Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.75	1.17	0.030	0.046
A1	0.01	0.15	0.000	0.006
A2	0.70	1.02	0.028	0.040
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.3	0.6	0.012	0.024
θ	0°	8°	0°	8°



Note:  
Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

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