LMNBSS139JZF 60V N-Channel Enhancement Mode MOSFET

Features

- $R_{DS(ON)}$=2.5Ω@V_{GS}=4.5V
- $R_{DS(ON)}$=4Ω@V_{GS}=2.5V
- Improved dv/dt capability
- Fast switching
- ESD Protected: 1500V

Product Description

The N-Channel enhancement mode power field effect transistors 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.

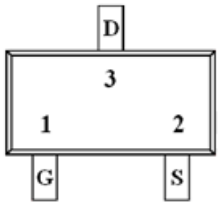
These devices are well suited for high efficiency fast switching applications.

Applications

- Notebook
- Load Switch
- LED applications

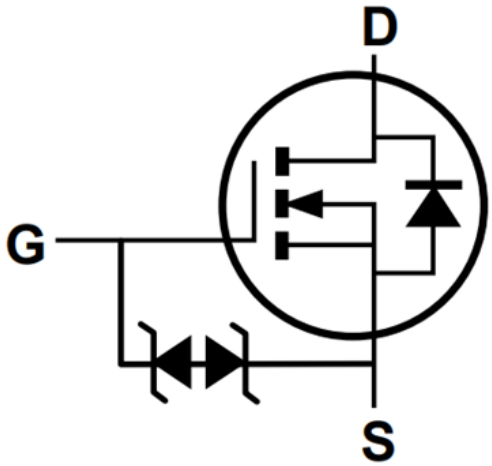
Pin Configuration

LMNBSS139JZF (SOT-23)



Top Views

Pin	Description
1	Gate
2	Source
3	Drain



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Ordering Information

Part Number	P/N	PKG Code	Pb Free Code	Package	Quantity Reel
LMNBSS139JZF	LMNBSS139	JZ	F	SOT-23	3000 pcs

Marking Information

Part Marking	Part Number	LFC code
J2 XWMM	J2	XWMM

Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25ºC	0.2	A
		T_A=70ºC	0.16	
I_{DM}	Pulsed Drain Current		0.8	A
P_D	Total Power Dissipation	T_A=25ºC	0.225	W
		T_A=70ºC	0.14	
T_J	Operating Junction Temperature Range		-55 to +150	ºC
T_{STG}	Storage Temperature Range		-55 to +150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		556	ºC/W

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Electrical Characteristics

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.8		1.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±10	uA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=25V, V_{GS}=0V			0.1	uA
		V_{DS}=50V, V_{GS}=0V			0.5	uA
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V, I_D=0.2A			2.5	Ω
		V_{GS}=2.5V, I_D=0.1A			4	
g_{FS}	Forward Transconductance	V_{DS}=25V, I_D=0.2A	0.1			S
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=0.5A			1.2	V
Dynamic						
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, V_{GS}=4.5V, I_D=0.2A		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		

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Typical Performance Characteristics

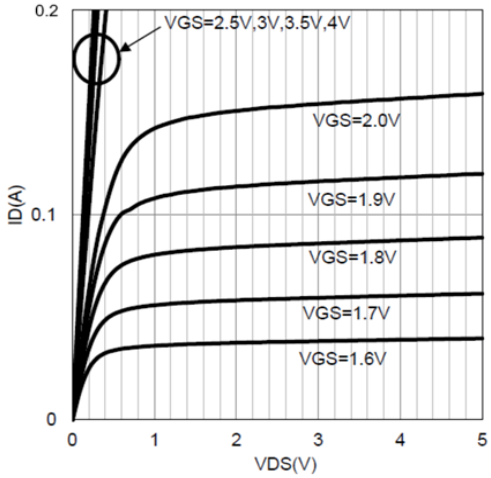

Fig.1 Typical Output Characteristics

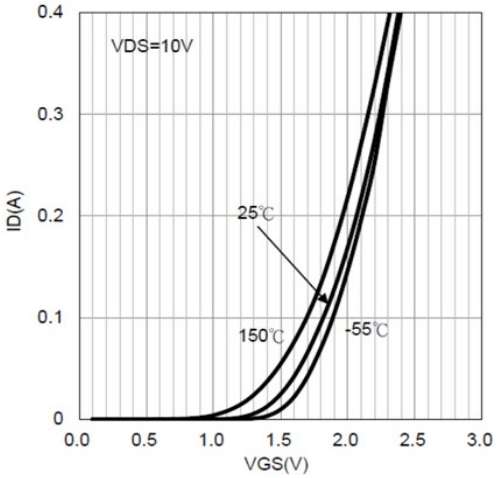

Fig.2 Typical Transfer Characteristics

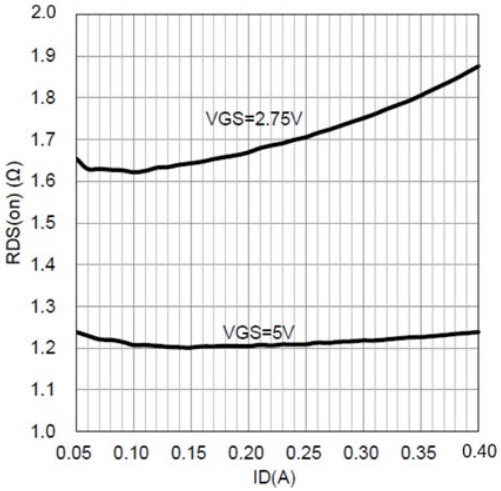

Fig.4 Typical On-Resistance vs. I_D and V_{GS}

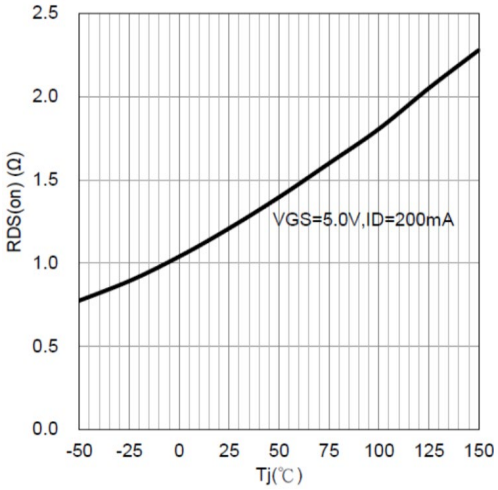

Fig.3 Typical Drain-Source On-Resistance vs. Junction Temperature

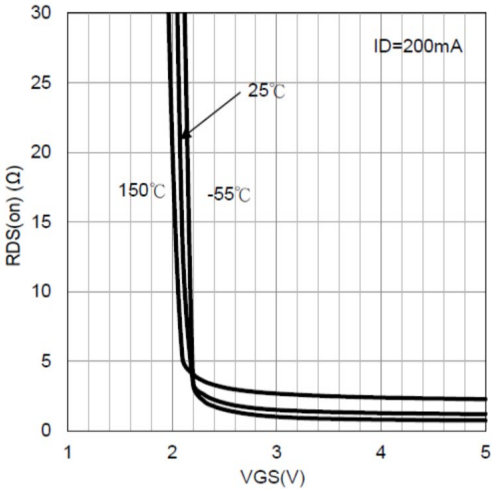

Figure 5. Drain-Source On-State Resistance vs.V_{GS}

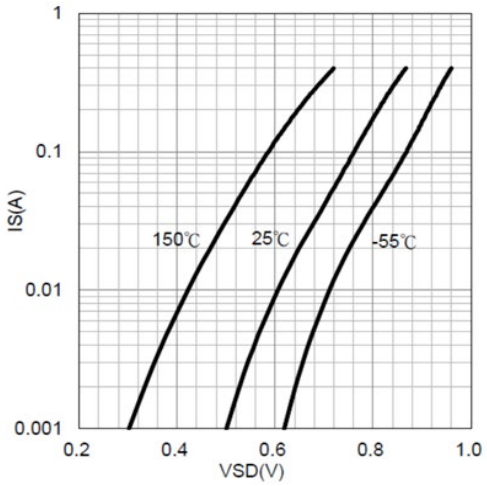

Fig. 6 Diode Forward Voltage vs. Current

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Typical Performance Characteristics (continue.)

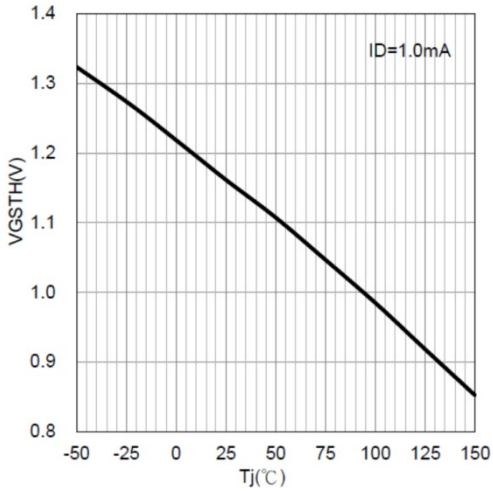

Fig.7 Gate Threshold Voltage vs. T_J

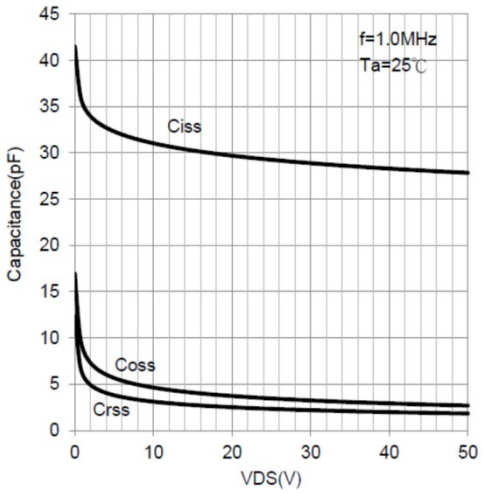

Fig.8 Capacitance vs. V_{DS}

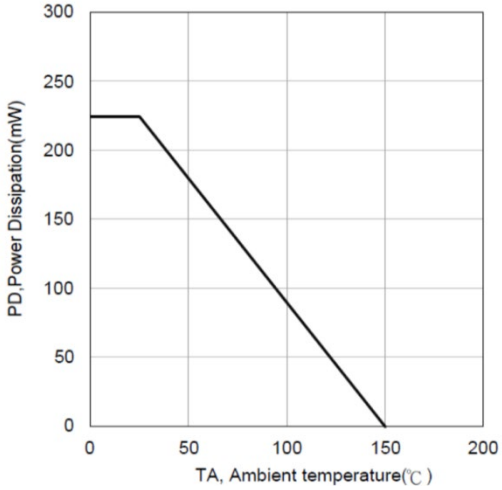

Fig.9 Power Dissipation vs. Ambient Temperature

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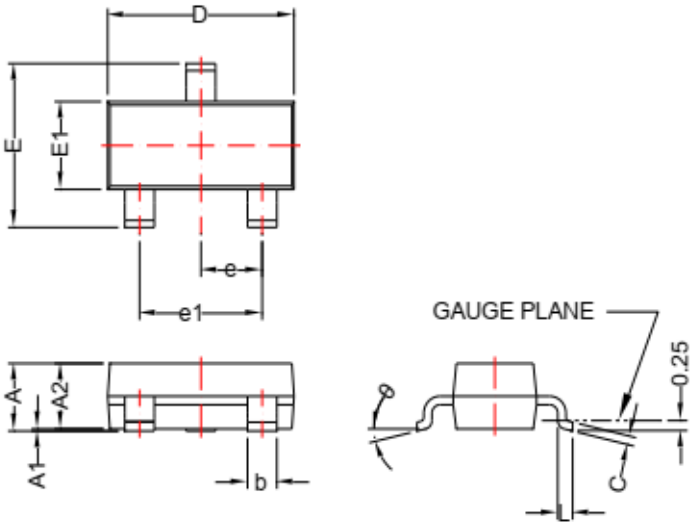
Package Dimension

SOT-23



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.750	1.170	0.030	0.046
A1	0.010	0.150	0.000	0.006
A2	0.700	1.020	0.028	0.040
b	0.300	0.500	0.012	0.020
c	0.080	0.200	0.003	0.008
D	2.800	3.040	0.110	0.120
E	2.100	2.640	0.083	0.104
E1	1.200	1.400	0.047	0.055
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0º	8º	0º	8º

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