LMNBSS139K 60V N-Channel MOSFET

Features

- 60V, 0.2A, $R_{DS(ON)}$=2.5Ω@V_{GS}=4.5V
- Improved dv/dt capability
- Fast switching
- Green Device Available
- ESD Protected: 1500V
- SOT-523 Package Design

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.

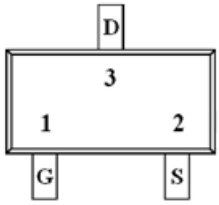
These devices are well suited for high efficiency fast switching applications.

Applications

- Notebook
- Load Switch
- LED applications

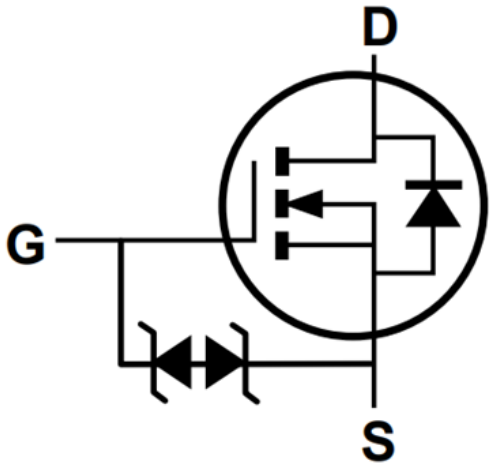
Pin Configuration

LMNBSS139KX7F (SOT-523)



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
LMNBSS139KX7F	LMNBSS139K	X7	F	SOT-523	3000 pcs

Marking Information

Part Marking	Part Number	LFC code
J2 WM	J2	WM

Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter	Limits	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
I_{DM}	Pulsed Drain Current	0.8	A
P_D	Power Dissipation(T_A=25ºC)	0.225	W
	Power Dissipation(Derate above 25ºC)	0.0018	W/ºC
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
TL	Maximum Lead Temperature for Soldering Purpose, for 10 Seconds	260	ºC

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Electrical Characteristics

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	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	0.85		1.45	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			2.25	Ω
		V_{GS}=2.5V, I_D=0.1A			4.05	
g_{FS}	Forward Transconductance	V_{DS}=25V, I_D=0.2A	0.1			S
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		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, I_D=1A, V_{GS}=10V, R_G=25Ω		3.8		ns
$t_{d(off)}$	Turn-Off Delay Time			19		

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Typical Performance Characteristics

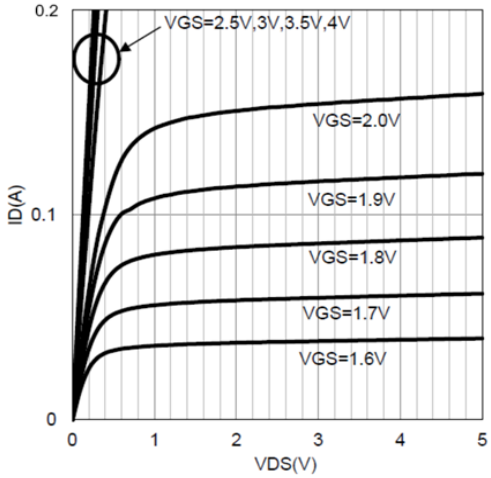

Fig.1 Typical Output Characteristics

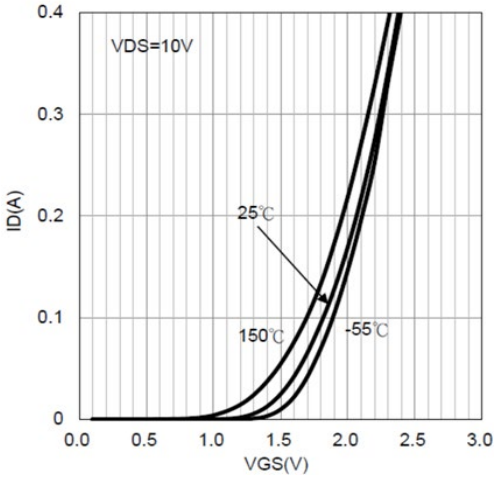

Fig.2 Typical Transfer Characteristics

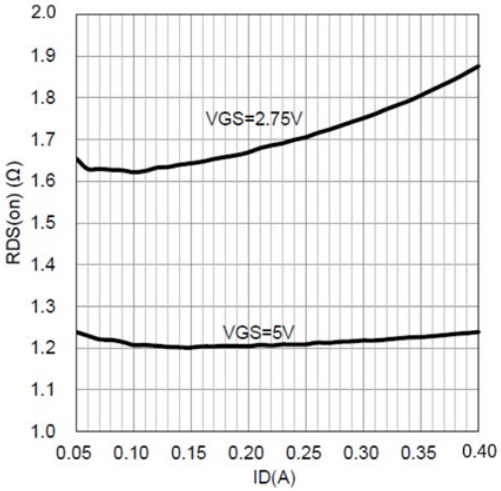

Fig.4 Typical On-Resistance vs. I_D and V_{GS}

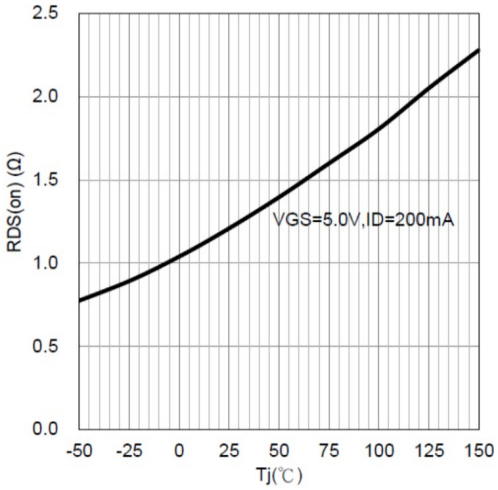

Fig.3 Typical Drain-Source On-Resistance vs. Junction Temperature

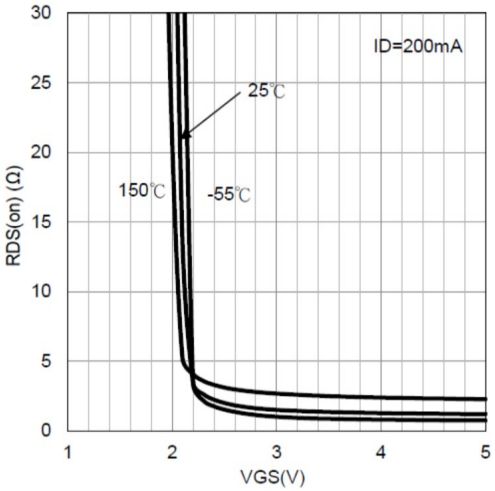

Figure 5. Drain-Source On-State Resistance vs.V_{GS}

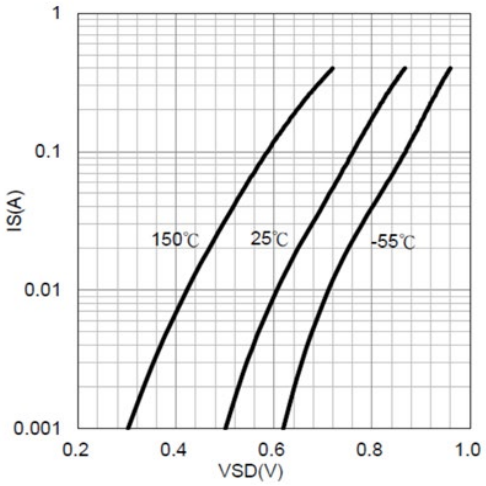

Fig. 6 Diode Forward Voltage vs. Current

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Typical Performance Characteristics (continue.)

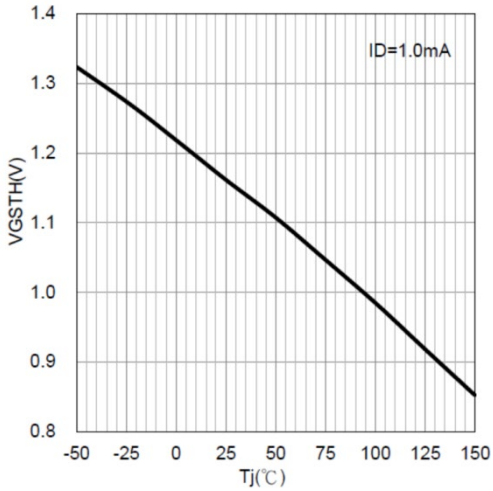

Fig.7 Gate Threshold Voltage vs. T_J

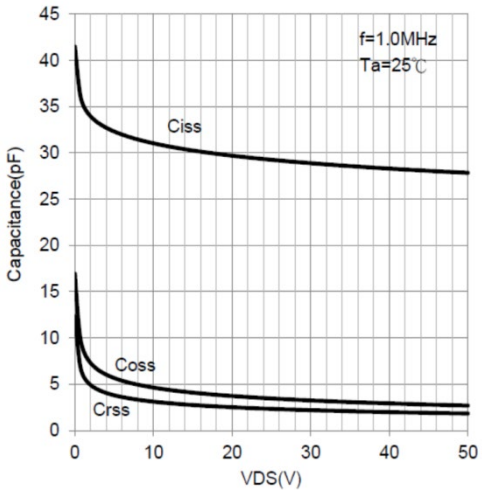

Fig.8 Capacitance vs. V_{DS}

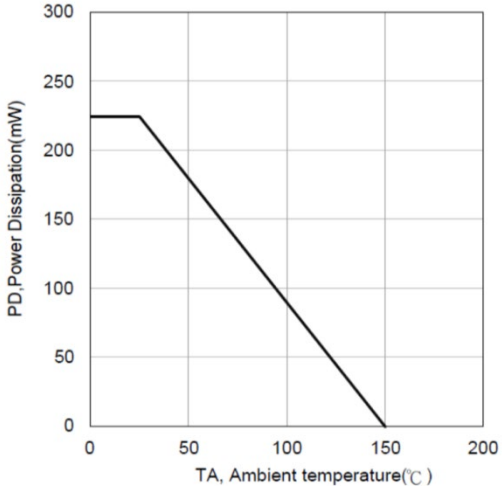

Fig.9 Power Dissipation vs. Ambient Temperature

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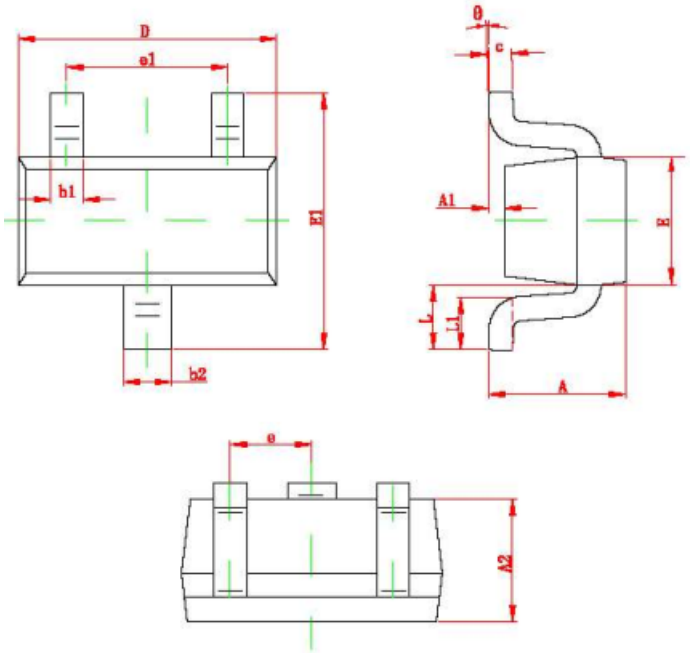
Package Dimension

SOT-523



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.013
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP		0.020 TYP	
e1	0.900	1.100	0.035	0.043
L	0.550 REF		0.022 REF	
L1	0.280	0.440	0.011	0.017
θ	0º	8º	0º	8º

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