

GSMDL02N15

150V N Channel MOSFET

Product Description

These N-Channel enhancement mode power field effect transistors are 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.

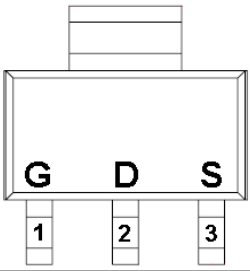
Features

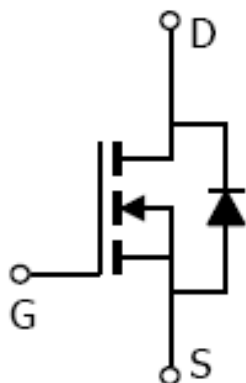
- 150V, 1.4A, $R_{DS(ON)} = 480m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- SOT-223 package design

Applications

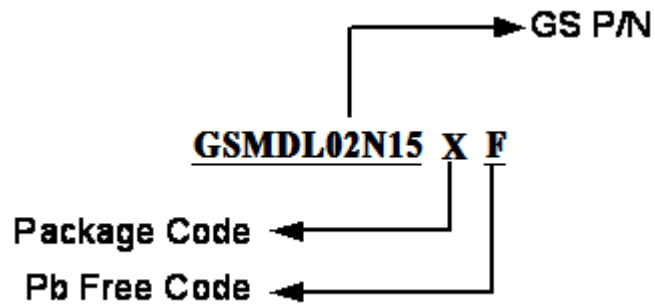
- Portable Equipment
- Battery Powered System
- Load Switch

Packages & Pin Assignments

GSMDL02N15XF (SOT-223)		
		
Pin	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

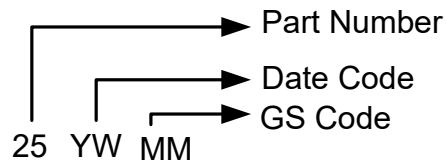


Ordering Information



Part Number	Package	Quantity Reel
GSMDL02N15XF	SOT-223	3000 PCS

Marking Information



Absolute Maximum Ratings

T_A=25°C Unless otherwise noted

Symbol	Parameter	Typical	Unit
V _{DS}	Drain-Source Voltage	150	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current	T _C =25°C	1.4
		T _C =100°C	0.88
I _{DM}	Pulsed Drain Current (note 1)	5.6	A
P _D	Power Dissipation (T _C =25°C)	1.56	W
	Power Dissipation (Derate above 25°C)	0.012	W/°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	80	°C/W

Electrical Characteristics

($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	150			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=150, V_{GS}=0V$ $T_J=25^{\circ}\text{C}$			1	uA
		$V_{DS}=120V, V_{GS}=0V,$ $T_J=125^{\circ}\text{C}$			10	
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=1A$		380	480	m Ω
		$V_{GS}=6V, I_D=0.5A$		410	520	
g_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=1A$		1.7		S
V_{SD}	Diode Forward Voltage	$I_S=1.0A, V_{GS}=0V$ $T_J=25^{\circ}\text{C}$			1	V
Dynamic						
C_{iss}	Input Capacitance	$V_{DS}=25V,$ $V_{GS}=0V, f=1\text{MHz}$		350		pF
C_{oss}	Output Capacitance			34		
C_{rSS}	Reverse Transfer Capacitance			26		
Q_g	Total Gate Charge (Note 2,3)	$V_{DS}=75V,$ $V_{GS}=10V, I_D=1.0A$		8.1		nC
Q_{gs}	Gate-Source Charge (Note 2,3)			2.0		
Q_{gd}	Gate-Drain Charge (Note 2,3)			2.7		
$t_{d(on)}$	Turn-On Time (Note 2,3)	$V_{DD}=75V,$ $R_G=10\Omega, I_D=1.0A,$ $V_{GS}=10V$		8.2		ns
T_r				5.8		
$t_{d(off)}$	Turn-Off Time (Note 2,3)			14.8		
T_f				8.0		

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

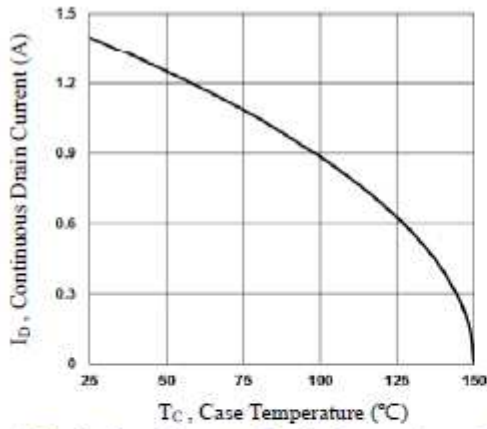


Fig.1 Continuous Drain Current vs. T_c

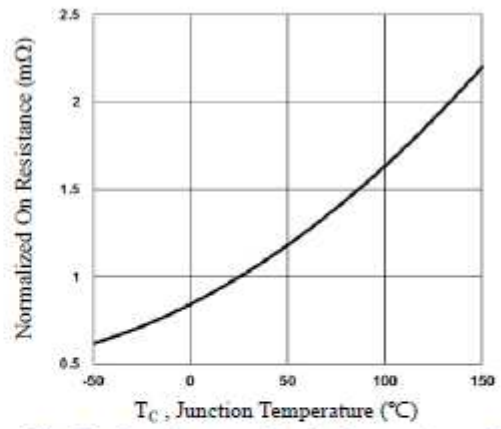


Fig.2 Continuous Drain Current vs. T_c

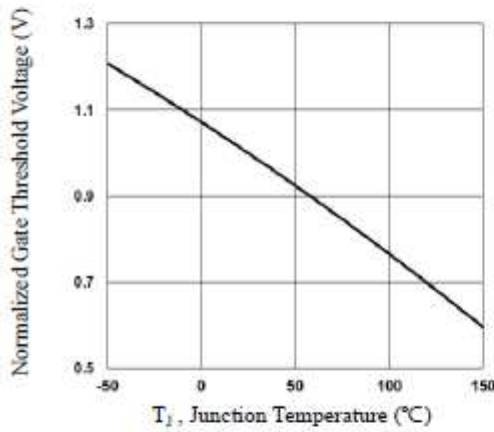


Fig.3 Normalized V_{th} vs. T_j

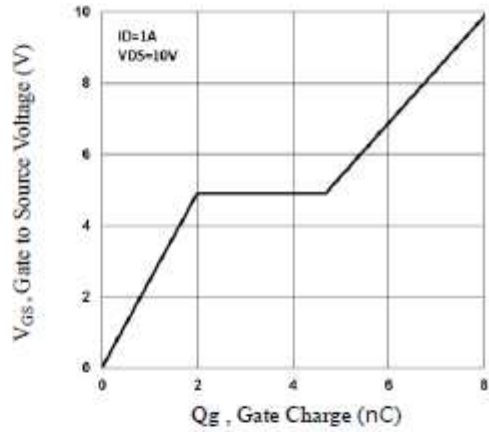


Fig.4 Gate Charge Waveform

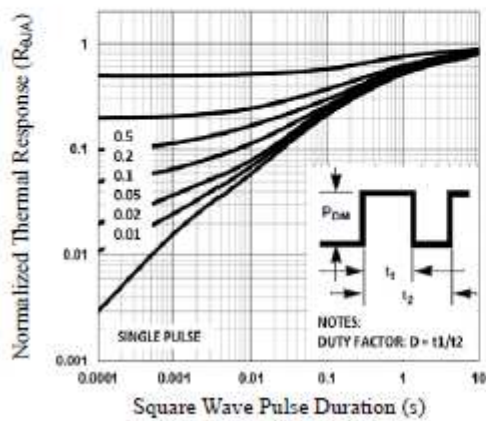


Fig.5 Normalized Transient Impedance

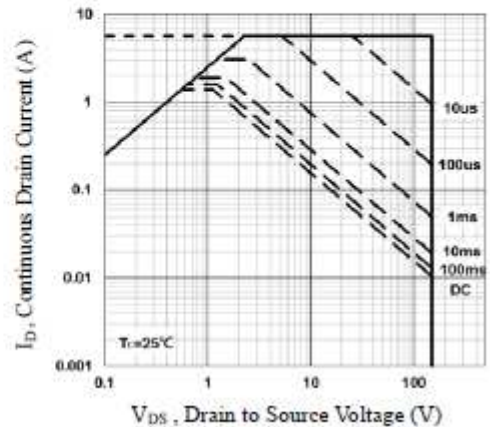
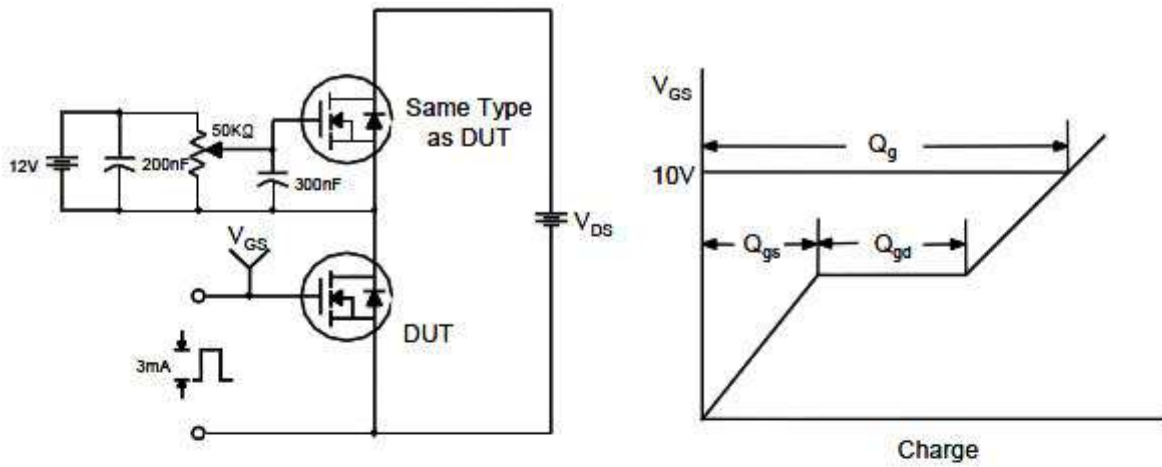
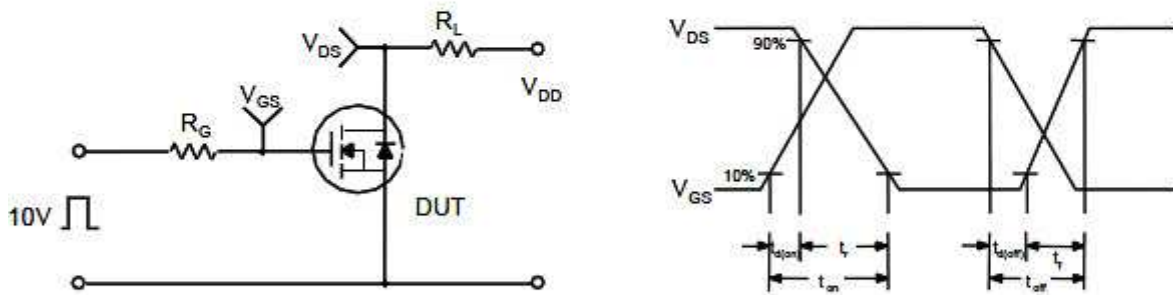


Fig.6 Maximum Safe Operation Area

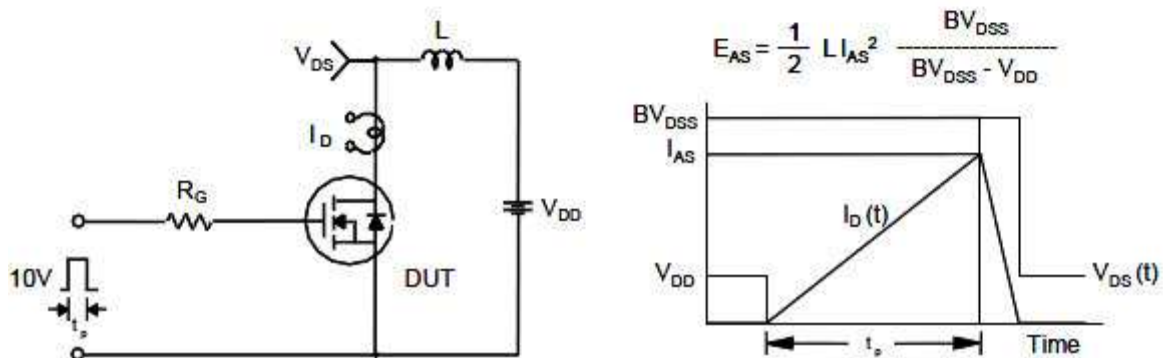
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

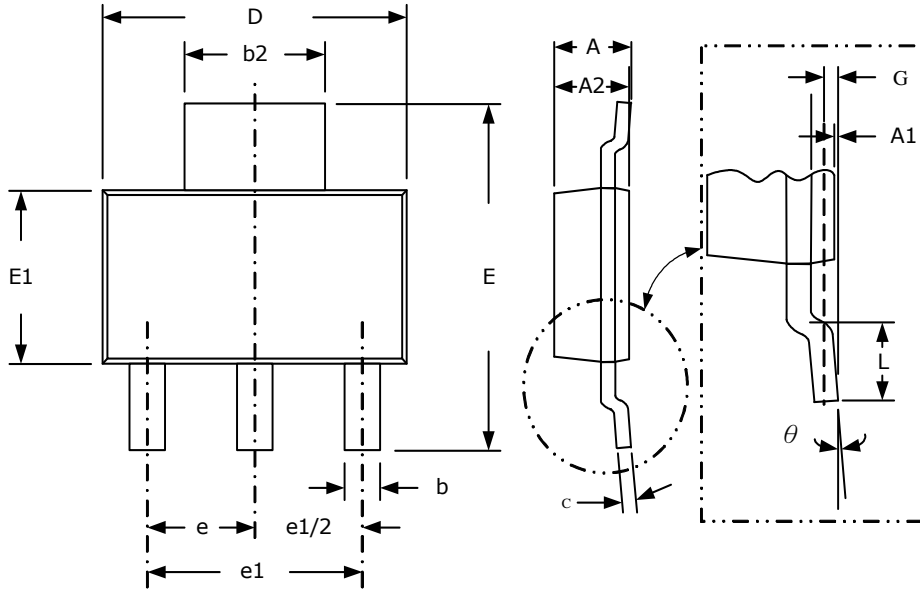


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-223 PLASTIC PACKAGE









Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	-	1.80	-	.071
A1	0.02	0.10	.001	.004
A2	1.55	1.65	.061	.065
c	0.66	0.84	.026	.033
D	2.90	3.10	.114	.122
E	0.23	0.33	.009	.013
E1	6.30	6.70	.248	.264
L	6.70	7.30	.264	.288
L1	3.30	3.70	.130	.146
θ	2.30 (TYP)		.091 (TYP)	
b	4.60 (TYP)		.181 (TYP)	
e	0.90	-	.035	-
e1	0.25 (TYP)		.010 (TYP)	

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