

GSMDK2314

20V N-Channel MOSFETs

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.

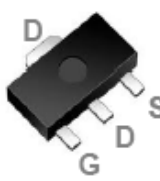
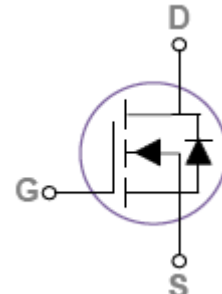
Features

- 20V, 5.6A, $R_{DS(ON)}=26m\Omega@V_{GS}=4.5V$
- Improved dv/dt capability
- Fast switching
- Suit for 1.8V Gate Drive Applications
- Green Device Available
- SOT-89 package design

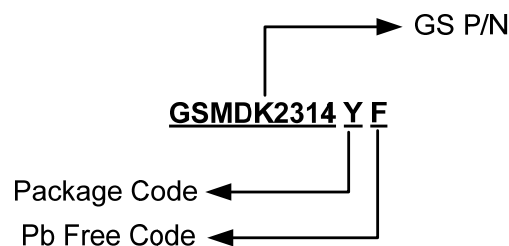
Applications

- Notebook
- Load Switch
- Hand-Held Instruments

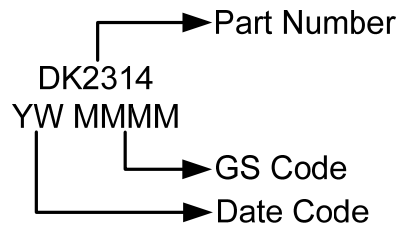
Packages & Pin Assignments

GSMDK2314YF (SOT-89)	
	
	
Pin	Description
1	Gate
2	Drain
3	Source

Ordering Information



Marking Information



Part Number	Package	Quantity
GSMDK2314YF	SOT-89	1000pcs

Absolute Maximum Ratings

$T_A=25^\circ\text{C}$ Unless otherwise noted

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	5.6
		$T_A=100^\circ\text{C}$	3.5
I_{DM}	Pulsed Drain Current	22.4	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.47	W
	Power Dissipation (Derate above 25°C)	0.012	W/ $^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	85	$^\circ\text{C}/\text{W}$

Electrical Characteristics

T_A=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA		0.02		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.4	0.6	1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			-2		mV/°C
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±10V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V			1	uA
		V _{DS} =16V, V _{GS} =0V, T _J =85°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			5.6	A
I _{SM}	Pulsed Source Current				22.4	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D =4A		22	26	mΩ
		V _{GS} =2.5V, I _D =3A		28	36	
		V _{GS} =1.8V, I _D =2A		39	51	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _S =3A		7		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A			1	V
Dynamic						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =4A		7.7	11	nC
Q _{gs}	Gate-Source Charge			0.9	1	
Q _{gd}	Gate-Drain Charge			2.4	5	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		535	775	pF
C _{oss}	Output Capacitance			60	85	
C _{rss}	Reverse Transfer Capacitance			34	50	
t _{d(on)}	Turn-On Time	V _{DD} =10V, I _D =1A, V _{GS} =4.5V, R _G =25Ω		4.1	8	ns
t _r				11.6	22	
t _{d(off)}	Turn-Off Time			23.9	45	
t _f				7.6	14	

Typical Performance Characteristics

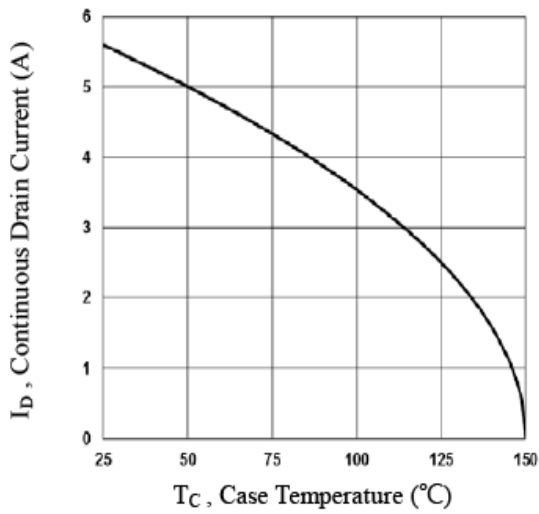


Fig.1 Continuous Drain Current vs. T_c

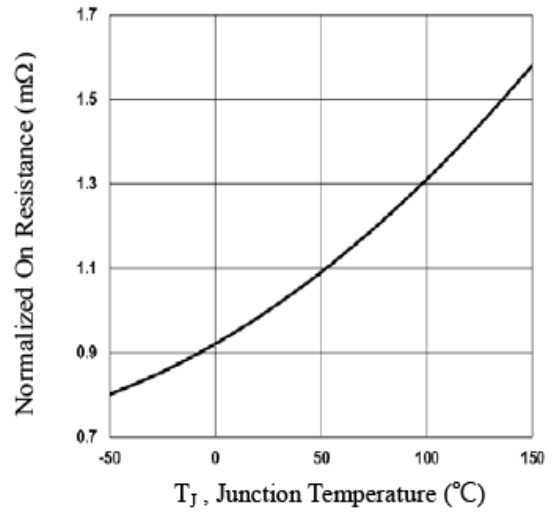


Fig.2 Normalized RDSON vs. T_j

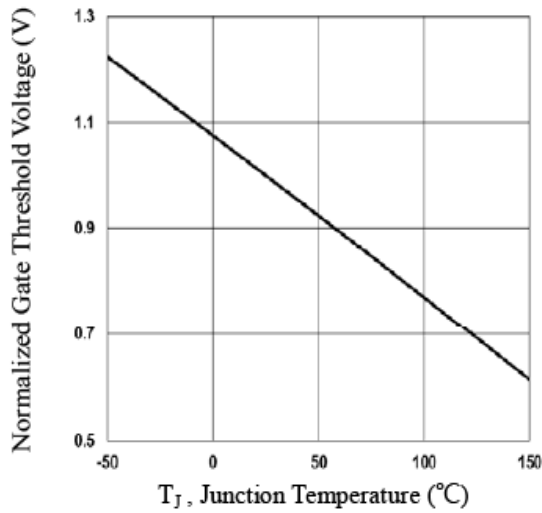


Fig.3 Normalized V_{th} vs. T_j

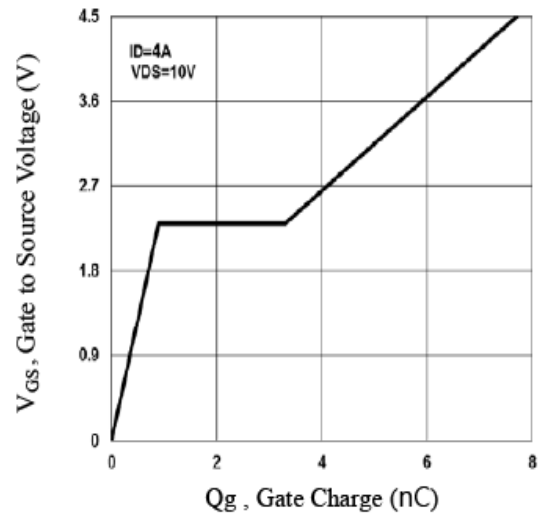


Fig.4 Gate Charge Waveform

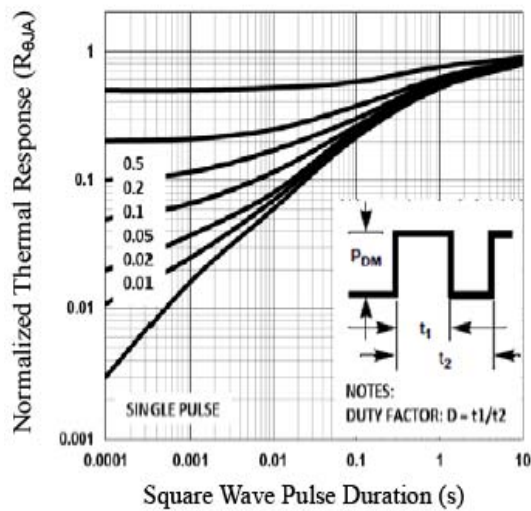


Fig.5 Normalized Transient Impedance

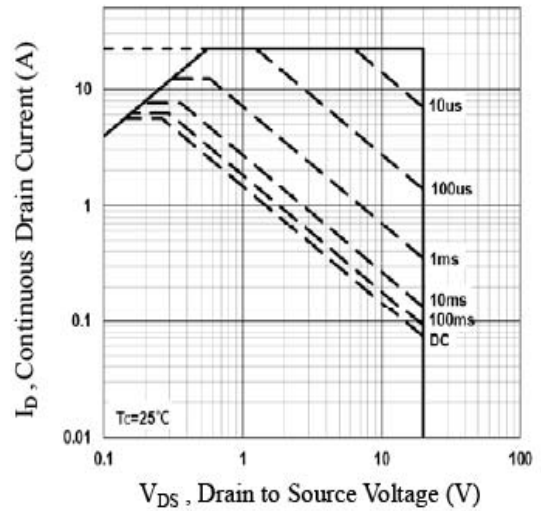
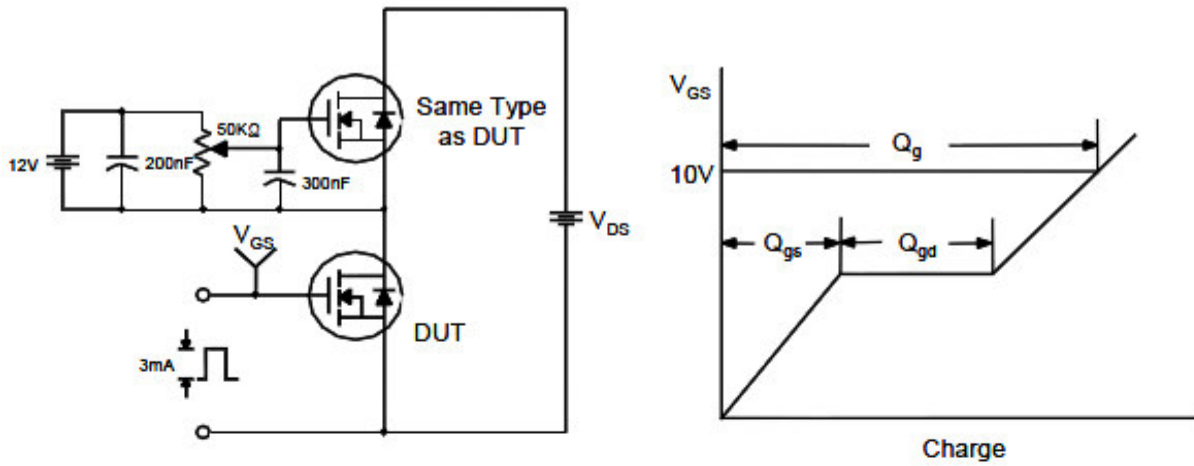


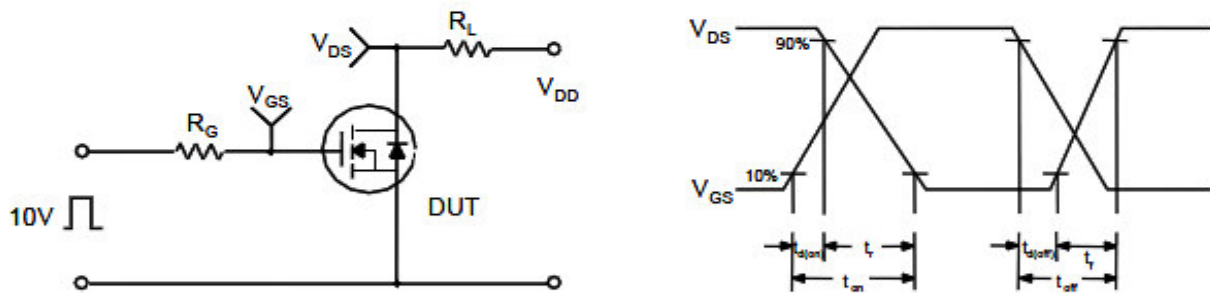
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

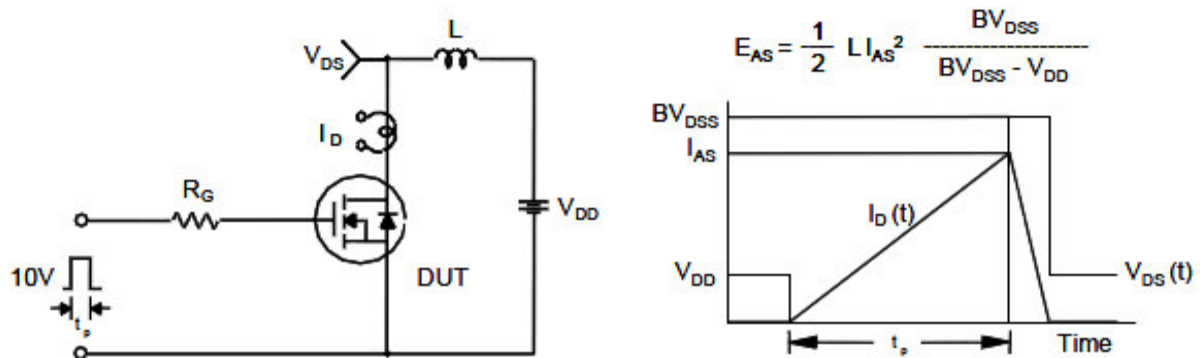
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

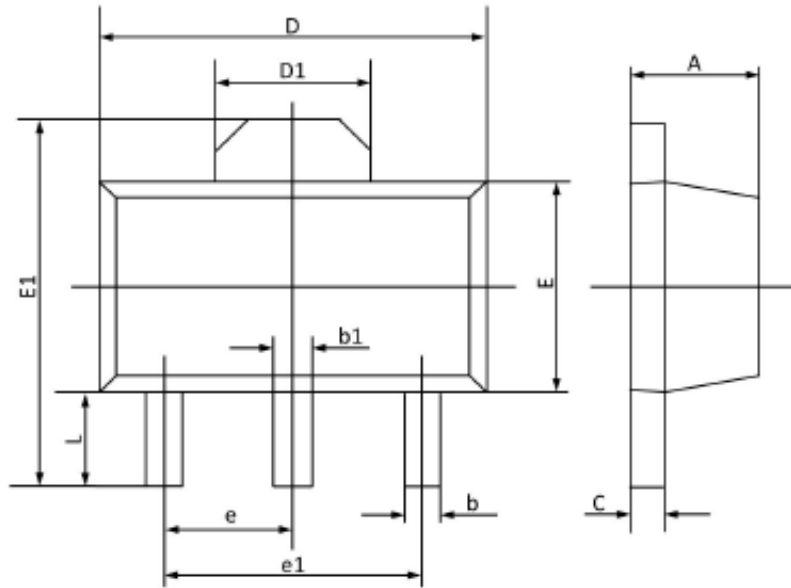


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-89










Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 (REF)		0.061 (REF)	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 (TYP)		0.060 (TYP)	
e1	3.000 (TYP)		0.118 (TYP)	
L	0.900	1.200	0.035	0.047



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