GSM0954

100V 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

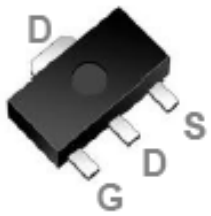
- 100V, 3A, $R_{DS(ON)}$=350mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- Green Device Available
- SOT-89 package design

Applications

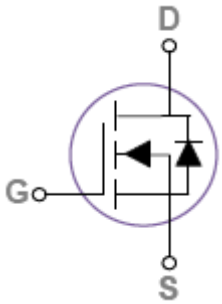
- Networking
- Load Switch
- LED applications

Packages & Pin Assignments

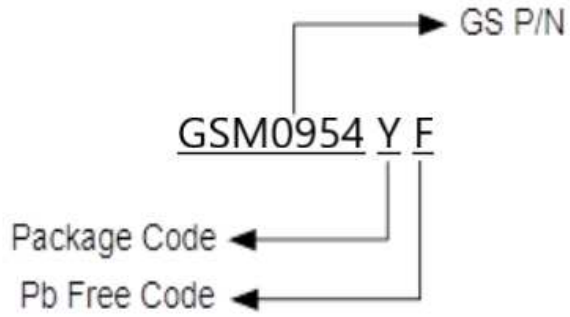
GSM0954YF (SOT-89)



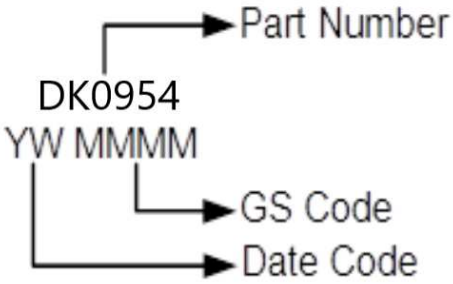
Pin	Description
1	Gate
2	Drain
3	Source



Ordering Information



Marking Information



Part Number	Package	Quantity
GSM0954YF	SOT-89	1000pcs

Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	3	A
		T_C=100℃	1.9	
I_{DM}	Pulsed Drain Current[1]		12	A
EAS	Single Pulse Avalanche Energy[2]		6	mJ
IAS	Single Pulse Avalanche Current[2]		11	A
P_D	Power Dissipation (T_C=25℃)		1.56	W
	Power Dissipation (Derate above 25℃)		0.06	W/℃
T_J	Operating Junction Temperature Range		-50 to +150	℃
T_{STG}	Storage Temperature Range		-50 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		80	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		18	℃/W

Electrical Characteristics

T_J=25℃ Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	100			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		0.09		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	1.8	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-4.4		mV/℃
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V,V_{GS}=±10V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V			1	uA
		V_{DS}=80V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			3	A
I_{SM}	Pulsed Source Current				6	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=2A		280	350	mΩ
		V_{GS}=4.5V,I_D=1A		290	360	
g_{FS}	Forward Transconductance	V_{DS}=10V,I_S=2A		3		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_S=1A , di/dt=100A/μs		70		ns
Qrr	Reverse Recovery Charge			114		nC
Dynamic						
Q_g	Total Gate Charge[3,4]	V_{DS}=50V,V_{GS}=10V, I_D=1A		5.8	11	nC
Q_{gs}	Gate-Source Charge[3,4]			0.7	3	
Q_{gd}	Gate-Drain Charge[3,4]			2.5	5	
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V, f=1MHz		480	960	pF
C_{oss}	Output Capacitance			25	50	
C_{rss}	Reverse Transfer Capacitance			14	28	
$t_{d(on)}$	Turn-On Time[3,4]	V_{DD}=50V,I_D=1A, V_{GS}=10V,R_G=3.3Ω		5.2	10	ns
t_r				6.8	12	
$t_{d(off)}$	Turn-Off Time[3,4]			14.5	28	
t_f				2.1	5	
R_g	Gate resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		2	4	Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V,V_{GS}=10V,L=0.1mH,IAS=11A.,R_G=25Ω,Starting TJ=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics

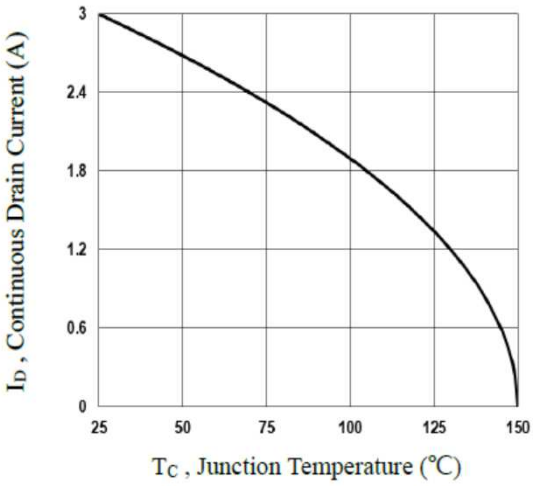


Fig.1 Continuous Drain Current vs. T_C

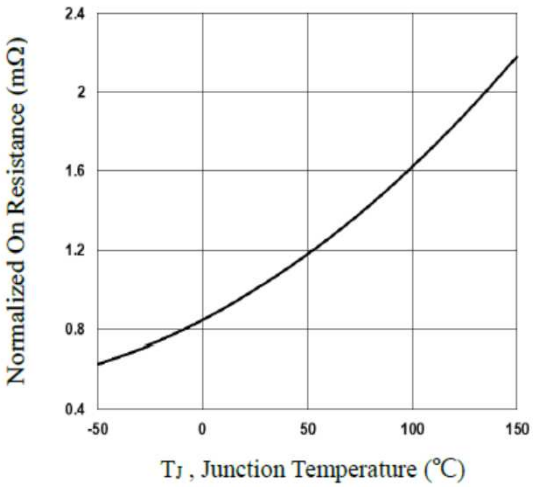


Fig.2 Normalized RDSON vs. T_J

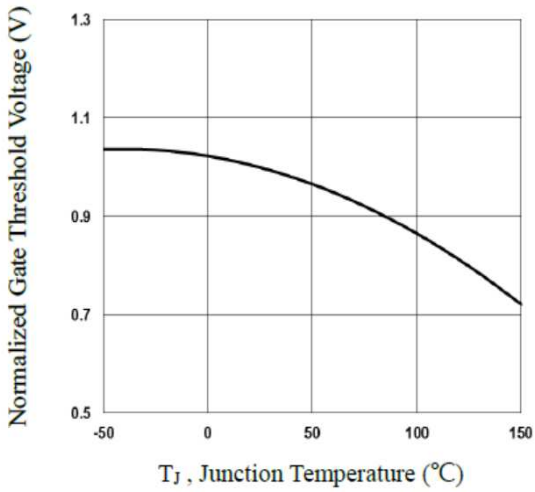


Fig.3 Normalized V_{th} vs. T_J

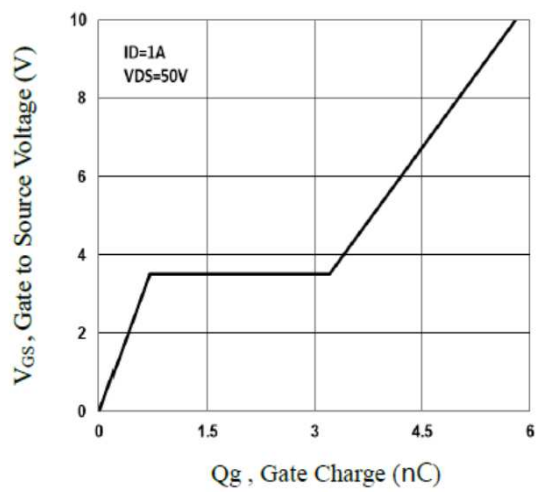


Fig.4 Gate Charge Waveform

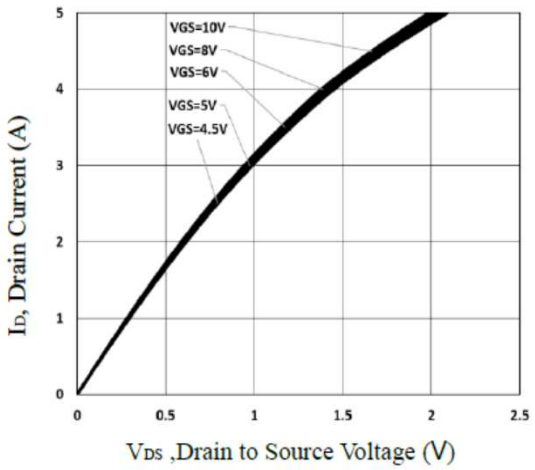


Fig.5 Typical Output Characteristics

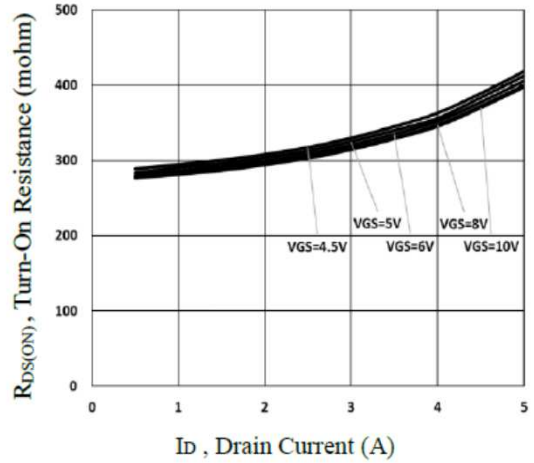


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (Continue)

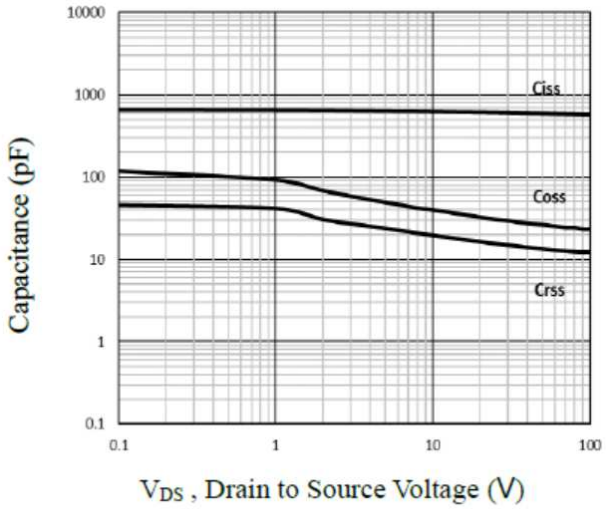


Fig.7 Capacitance Characteristics

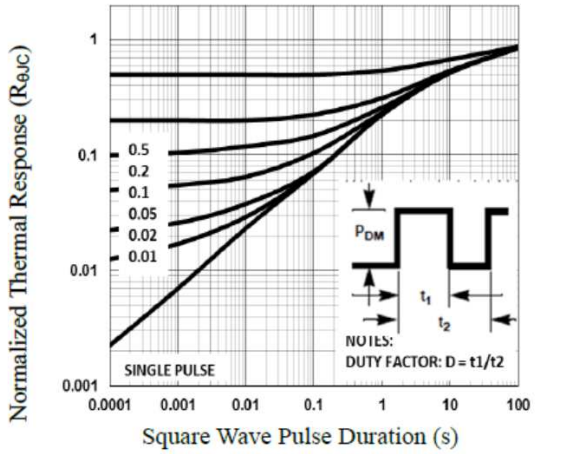


Fig.8 Normalized Transient Impedance

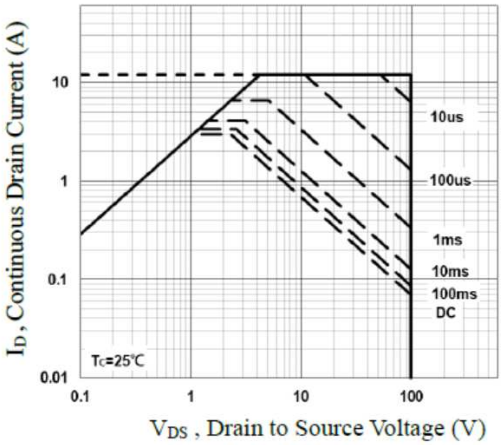


Fig.9 Maximum Safe Operation Area

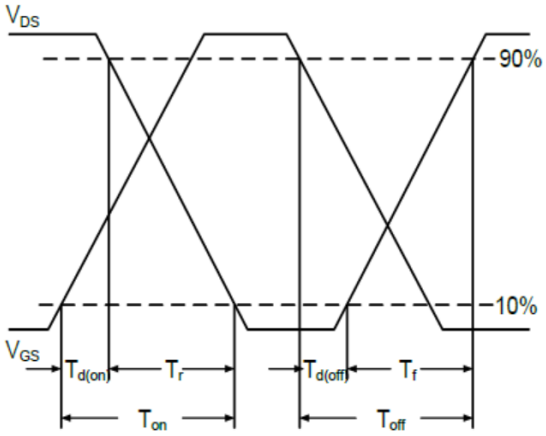


Fig.10 Switching Time Waveform

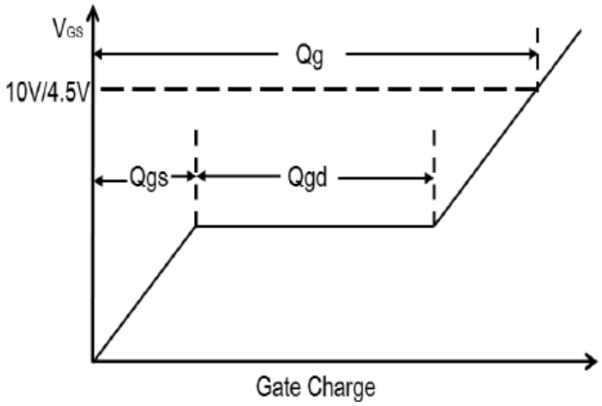
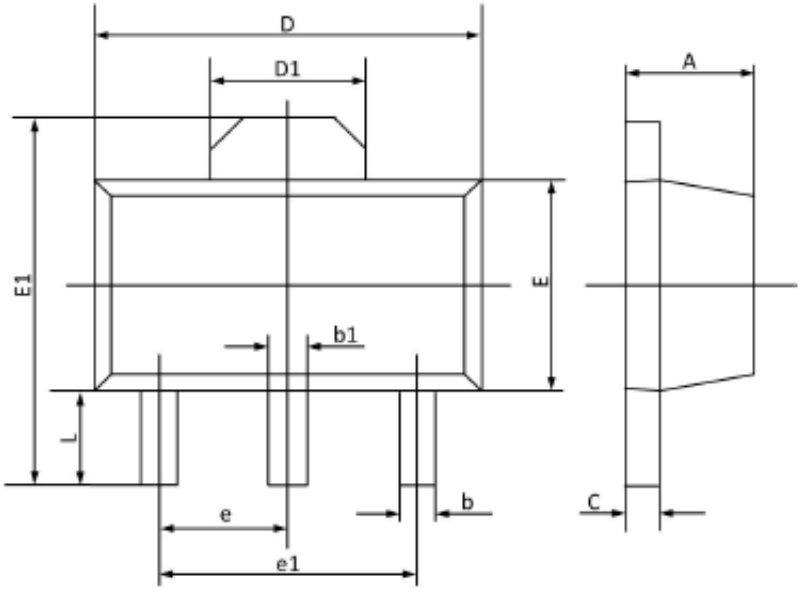


Fig.11 Gate Charge Waveform

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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