

GSM1012

20V N-Channel Enhancement Mode MOSFET

Product Description

GSM1012, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer, and low in-line power loss are needed in commercial industrial surface mount applications.

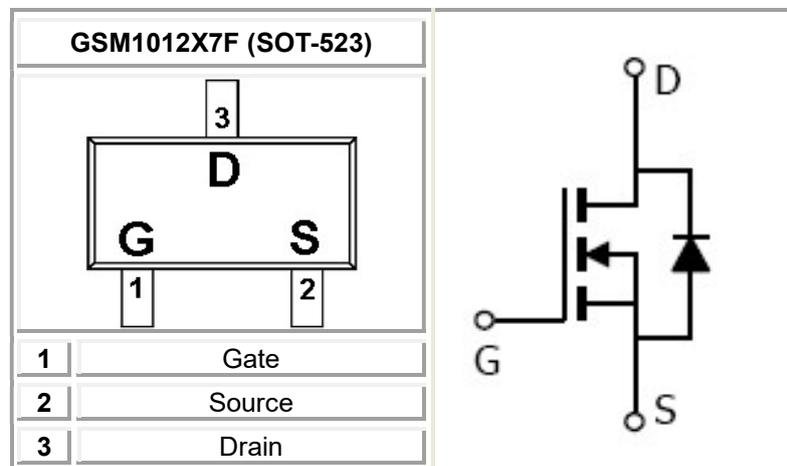
Features

- 20V/0.6A, $R_{DS(ON)}=360m@V_{GS}=4.5V$
- 20V/0.5A, $R_{DS(ON)}=420m@V_{GS}=2.5V$
- 20V/0.4A, $R_{DS(ON)}=560m@V_{GS}=1.8V$
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- SOT-523 package design

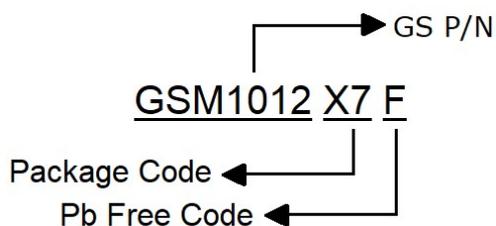
Applications

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Pagers

Packages & Pin Assignments

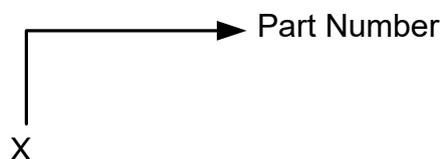


Ordering Information



Part Number	Package	Quantity Reel
GSM1012X7F	SOT-523	3000 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

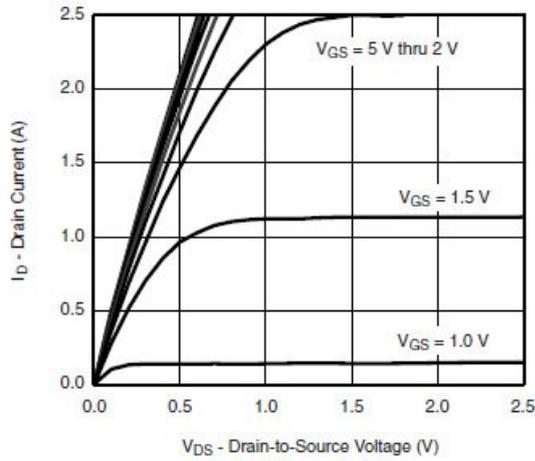
Symbol	Parameter	Typical	Unit
V _{DSS}	Drain-Source Voltage	20	V
V _{GSS}	Gate –Source Voltage	±12	V
I _D	Continuous Drain Current(T _J =150°C)	T _A =25°C	0.7
		T _A =70°C	0.4
I _{DM}	Pulsed Drain Current	1.0	A
I _S	Continuous Source Current(Diode Conduction)	0.3	A
P _D	Power Dissipation	T _A =25°C	0.27
		T _A =70°C	0.16
T _J	Operating Junction Temperature	-55/150	°C
T _{STG}	Storage Temperature Range	-55/150	°C

Electrical Characteristics

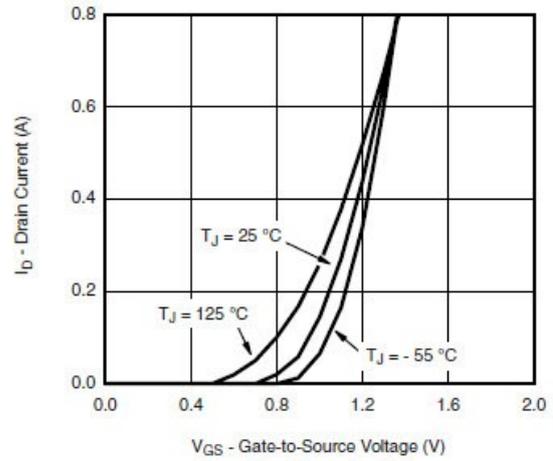
(T_A=25°C Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.4		1.0	
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 20V, V _{GS} =0V			1	uA
		V _{DS} = 20V, V _{GS} =0V, T _J =85°C			5	
I _{D(on)}	On-State Drain Current	V _{DS} ≥5V, V _{GS} =4.5V	0.7			A
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D =0.6A		240	360	mΩ
		V _{GS} =2.5V, I _D =0.5A		300	420	
		V _{GS} =1.8V, I _D =0.4A		420	560	
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =0.4A		1.0		S
V _{SD}	Diode Forward Voltage	I _S =0.15A, V _{GS} =0V		0.65	1.2	V
Dynamic						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz		70		pF
C _{oss}	Output Capacitance			20		
C _{rss}	Reverse Transfer Capacitance			8		
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =0.6A		1.06	1.38	nC
Q _{gs}	Gate-Source Charge			0.18		
Q _{gd}	Gate-Drain Charge			0.32		
t _{d(on)}	Turn-On Time	V _{DD} =10V, R _L =20Ω, I _D =0.5A, V _{GEN} =4.5V, R _G =1Ω		18	26	ns
t _r				20	28	
t _{d(off)}	Turn-Off Time			70	110	
t _f				25	40	

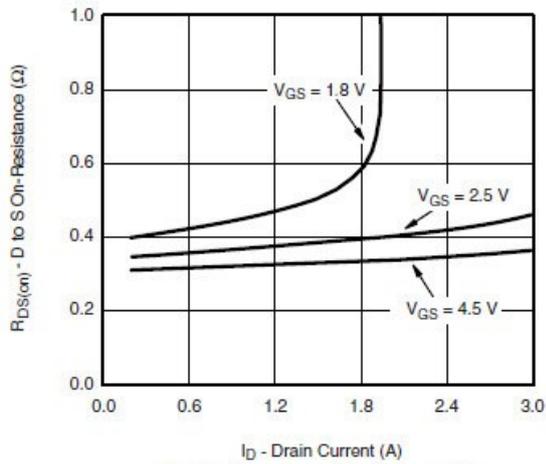
Typical Performance Characteristics



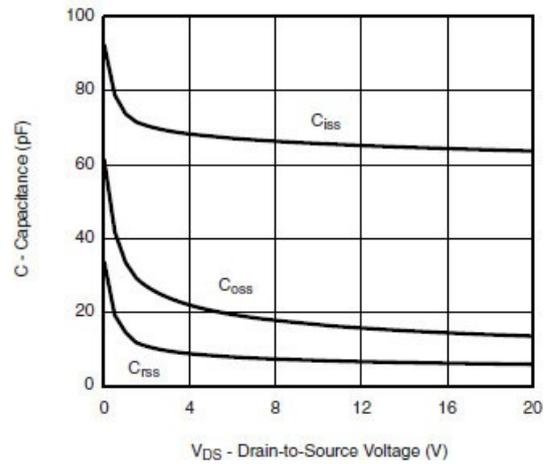
Output Characteristics



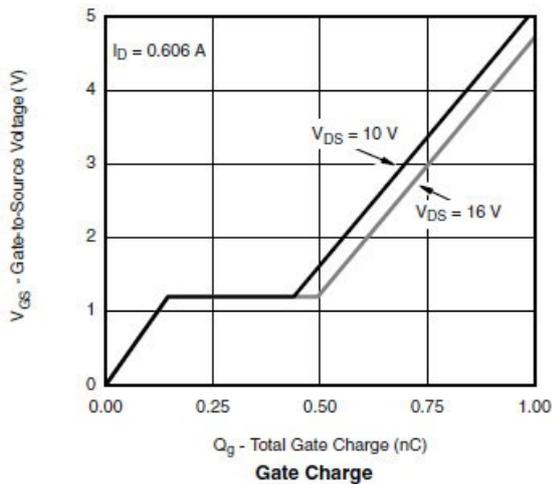
Transfer Characteristics



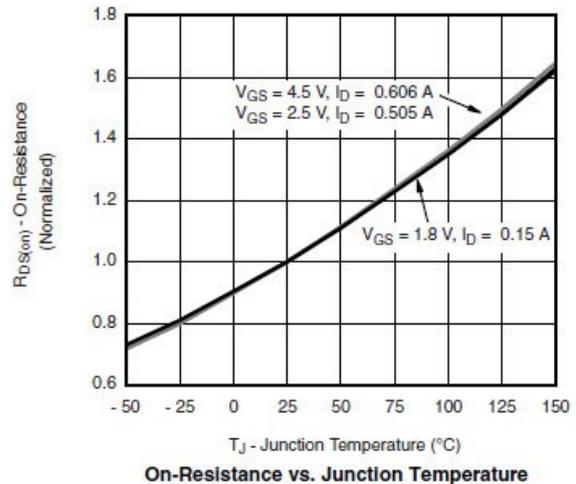
On-Resistance vs. Drain Current



Capacitance

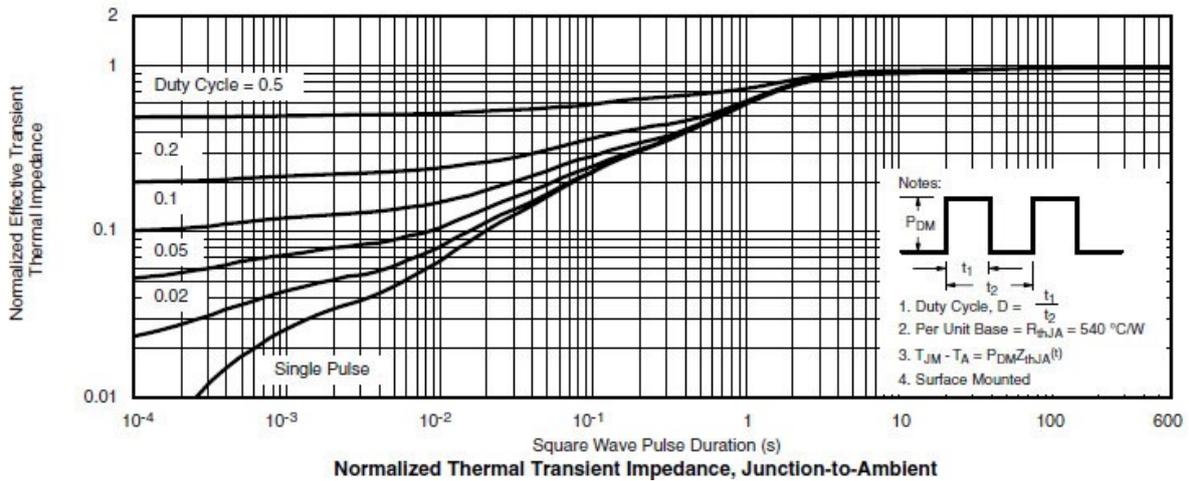
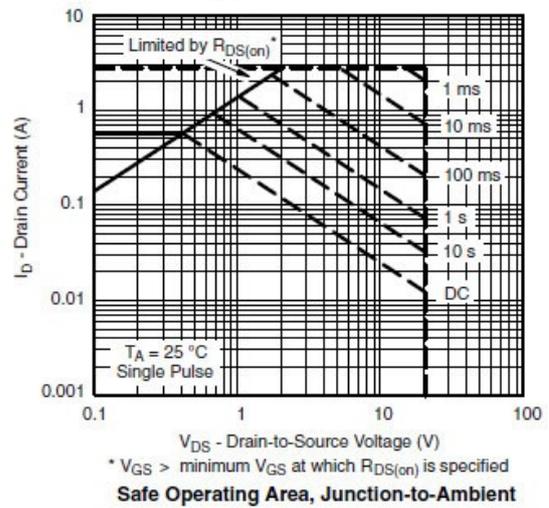
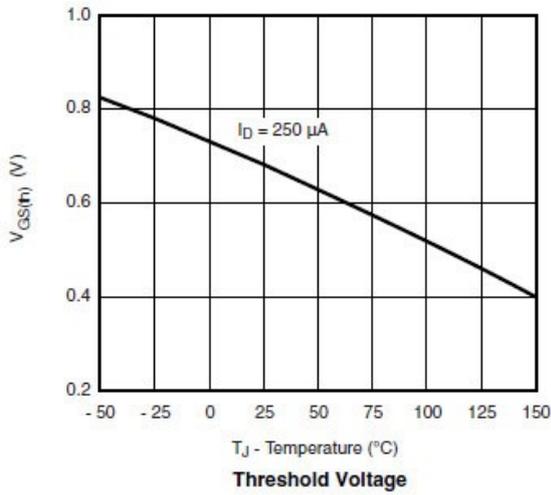
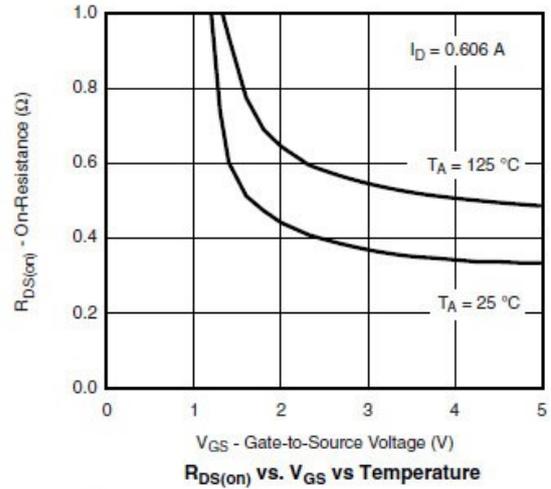
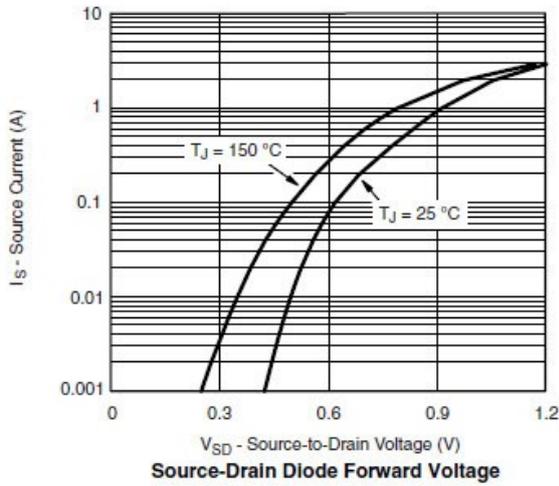


Gate Charge



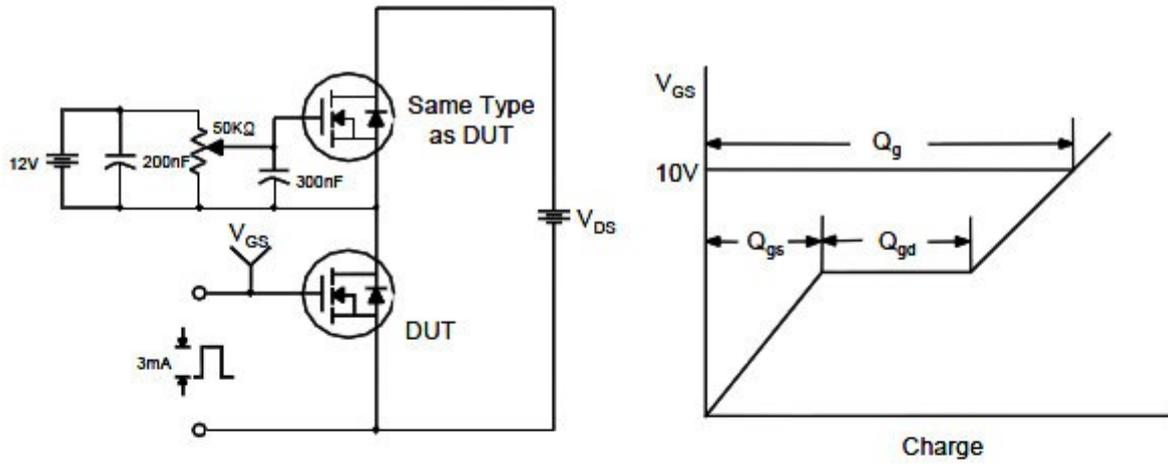
On-Resistance vs. Junction Temperature

Typical Performance Characteristics(continue)

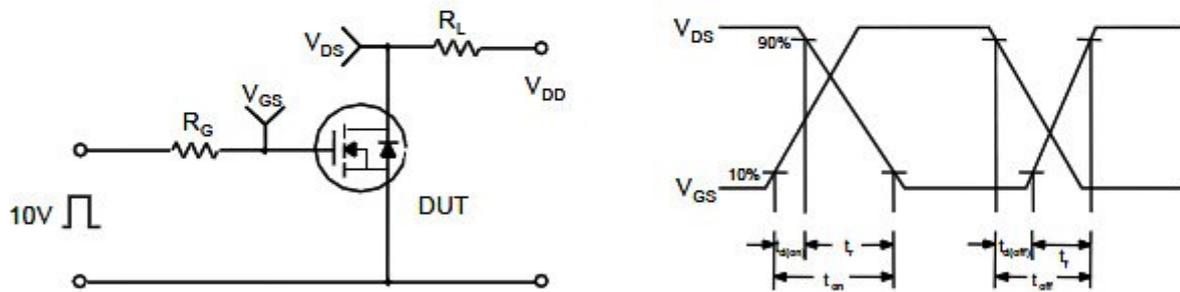


Typical Characteristics

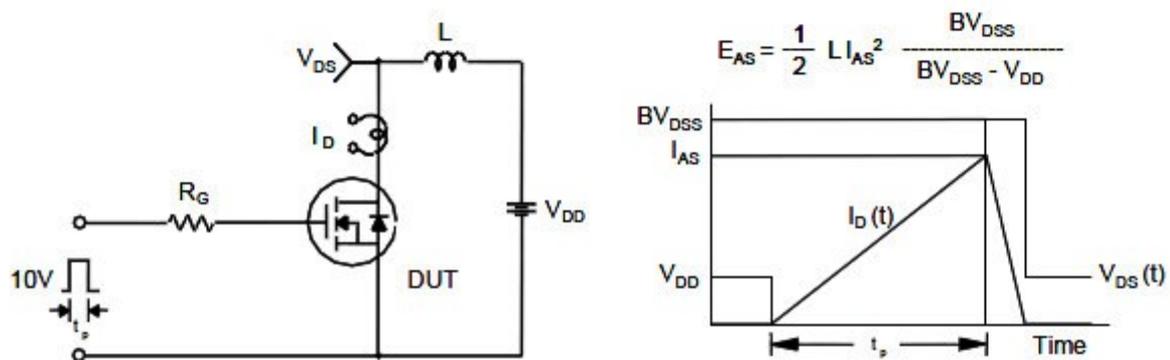
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

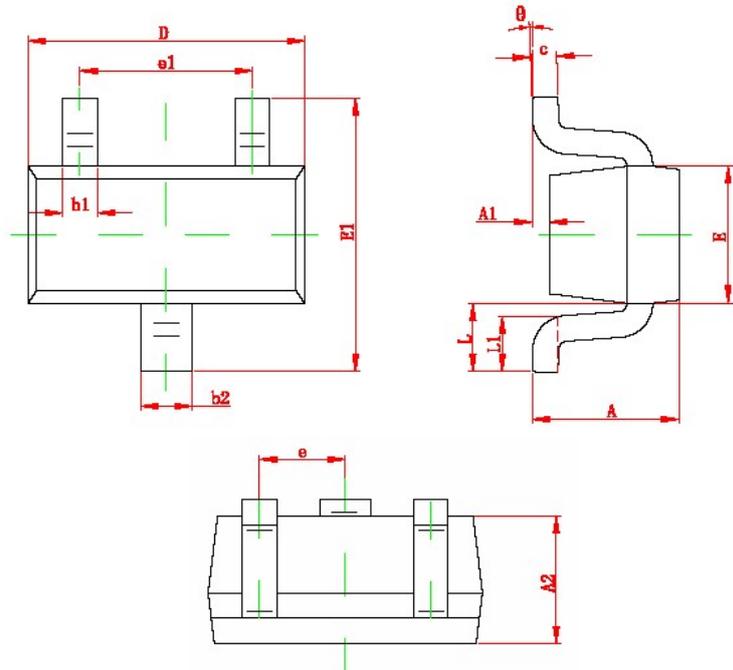


Unclamped Inductive Switching Test Circuit & Waveforms



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	0.325	0.010	0.013
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.750	0.850	0.030	0.033
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	0°	4°	0°	4°

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