GSM1913

20V P-Channel Enhancement Mode MOSFET

Product Description

GSM1913, P-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.

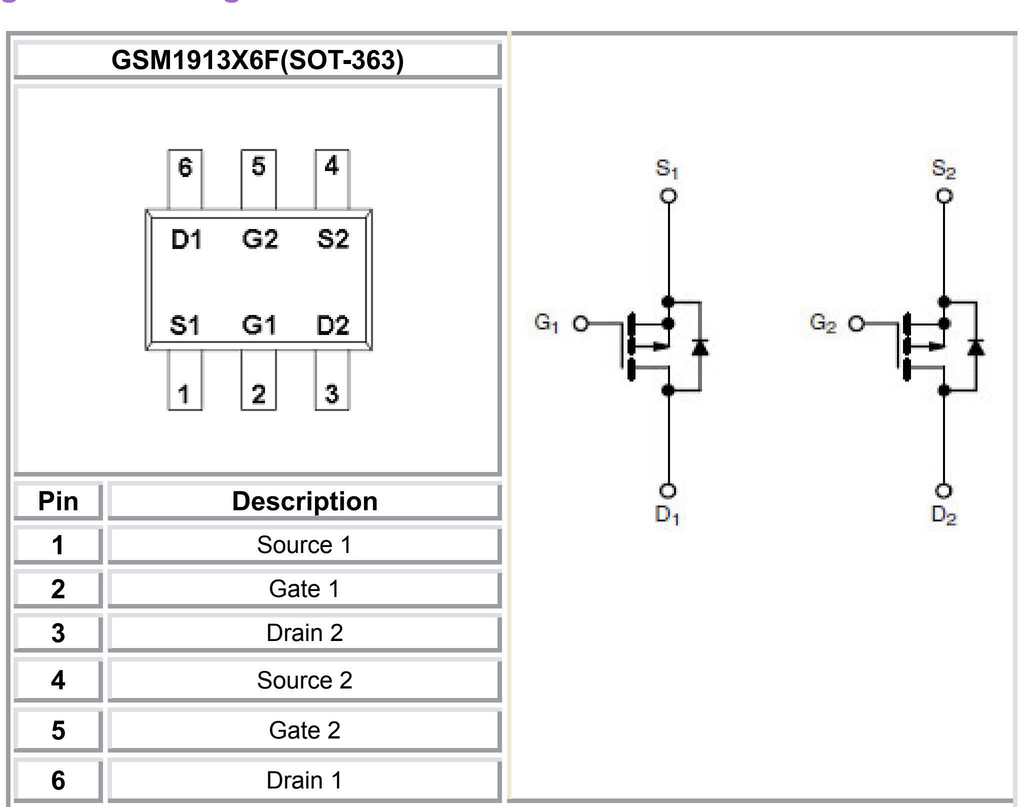
Features

- -20V/-0.6A,$R_{DS(ON)}$=600mΩ@V_{GS}=-4.5V
- -20V/-0.5A,$R_{DS(ON)}$=800mΩ@V_{GS}=-2.5V
- -20V/-0.4A,$R_{DS(ON)}$=1600mΩ@V_{GS}=-1.8V
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation
- SOT-363 package design

Applications

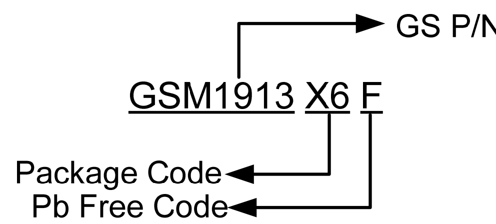
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Load/Power Switching Smart Phones, Pagers
- PA Switch
- Level Switch

Packages & Pin Assignments



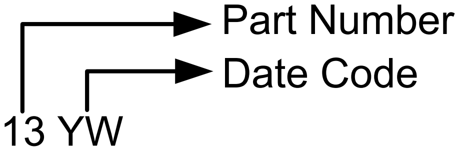
Pin	Description
1	Source 1
2	Gate 1
3	Drain 2
4	Source 2
5	Gate 2
6	Drain 1

Ordering Information



Part Number	Package	Quantity Reel
GSM1913X6F	SOT-363	3000 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25ºC 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℃)	T_A=25ºC	-1.4	A
		T_A=70ºC	-1.0	
I_{DM}	Pulsed Drain Current		-6	A
I_S	Continuous Source Current(Diode Conduction)		-1	A
P_D	Power Dissipation	T_A=25ºC	0.3	W
		T_A=70ºC	0.2	
T_J	Operating Junction Temperature		-55/150	ºC
T_{STG}	Storage Temperature Range		-55/150	ºC

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	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-0.4		-1.0	V
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℃			-5	uA
$I_{D(on)}$	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		460	600	mΩ
		V_{GS} =-2.5V,I_D=-0.5A		680	800	mΩ
		V_{GS} =-1.8V,I_D=-0.4A		1200	1600	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-10V,I_D=-0.4A		1		S
V_{SD}	Diode Forward Voltage	I_S=-0.15A,V_{GS}=0V		-0.65	-1.2	V
Dynamic						
Q_g	Total Gate Charge	V_{DS}=-10V,V_{GS}=-4.5V, I_D=-0.25A		1.0	1.3	nC
Q_{gs}	Gate-Source Charge			0.1		nC
Q_{gd}	Gate-Drain Charge			0.3		nC
C_{iss}	Input Capacitance	V_{DS}=-10V,V_{GS}=0V, f=1MHz		70	100	pF
C_{oss}	Output Capacitance			20		pF
C_{rss}	Reverse Transfer Capacitance			10		pF
$t_{d(on)}$	Turn-On Time	V_{DD}=-10V,R_L=30Ω, I_D=-0.2A,V_{GEN}=-4.5V, R_G=10Ω		10	15	ns
t_r				10	15	ns
$t_{d(off)}$	Turn-Off Time			40	60	ns
t_f				30	50	ns

Typical Performance Characteristics

V_{GS} =-5 V thru-3 V
-2.5 V
-2 V
-1.8 V
$-I_D$ - Drain Current (A)
$-V_{DS}$ - Drain-to-Source Voltage (V)

Output Characteristics

T_J = - 55 °C
25 °C
125 °C
$-I_D$ - Drain Current (mA)
$-V_{GS}$ - Gate-to-Source Voltage (V)

Transfer Characteristics

V_{GS} =-1.8 V
V_{GS} =-2.5 V
V_{GS} =-4.5 V
$R_{DS(on)}$ - On-Resistance (Ω)
$-I_D$ - Drain Current (mA)

On-Resistance vs. Drain Current

V_{GS} =0 V
f = 1 MHz
C_{iss}
C_{oss}
C_{rss}
C - Capacitance (pF)
$-V_{DS}$ - Drain-to-Source Voltage (V)

Capacitance

V_{DS} =-10 V
I_D =-250 mA
$-V_{GS}$ - Gate-to-Source Voltage (V)
Q_g - Total Gate Charge (nC)

Gate Charge

V_{GS} =-4.5 V
I_D =-350 mA
V_{GS} =-1.8 V
I_D =-150 mA
$R_{DS(on)}$ - On-Resistance (Normalized)
T_J - Junction Temperature (°C)

On-Resistance vs. Junction Temperature

Typical Performance Characteristics (continue)

$-I_S$ - Source Current (mA)

T_J = 125 °C

T_J = 25 °C

T_J = - 55 °C

$-V_{SD}$ - Source-to-Drain Voltage (V)

Source-Drain Diode Forward Voltage

$R_{DS(on)}$ - On-Resistance (Ω)

I_D = -350 mA

I_D = -200 mA

$-V_{GS}$ - Gate-to-Source Voltage (V)

On-Resistance vs. Gate-to-Source Voltage

$-V_{GS(th)}$ Variance (V)

I_D = -0.25 mA

T_J - Temperature (°C)

Threshold Voltage Variance vs. Temperature

$-I_{GSS}$ - (μA)

V_{GS} = -4.5 V

T_J - Temperature (°C)

I_{GSS} vs. Temperature

Normalized Effective Transient Thermal Impedance

Duty Cycle = 0.5

0.2

0.1

0.05

0.02

Single Pulse

Notes:

P_{DM}

t_1

t_2

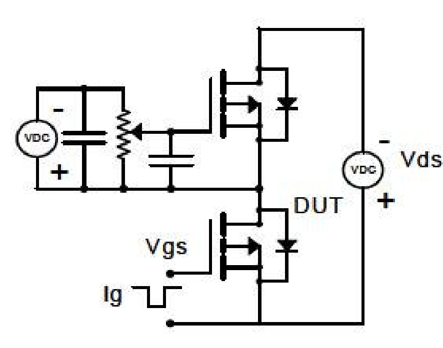
1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 500 °C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}^{(t)}$
4. Surface Mounted

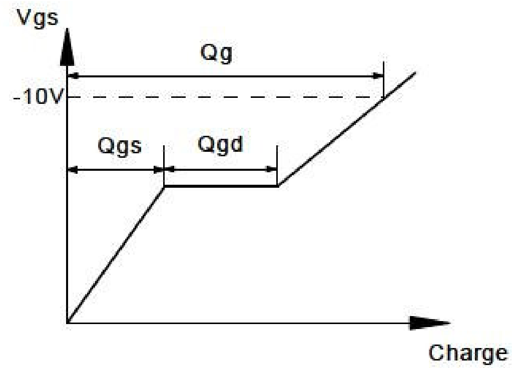
Square Wave Pulse Duration (s)

Normalized Thermal Transient Impedance, Junction-to-Ambient

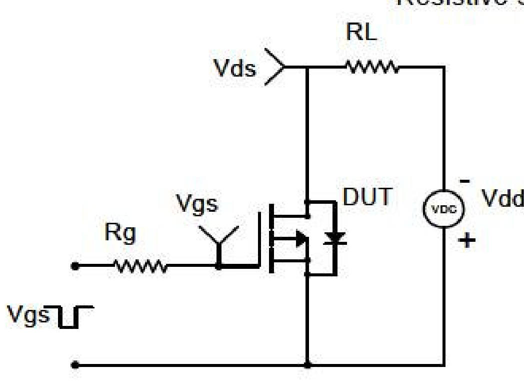
Typical Performance Characteristics **(continue)**

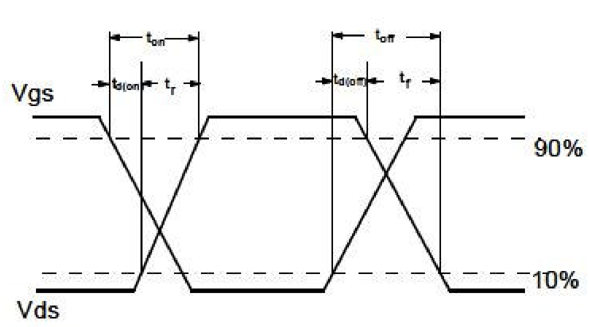
Gate Charge Test Circuit & Waveform



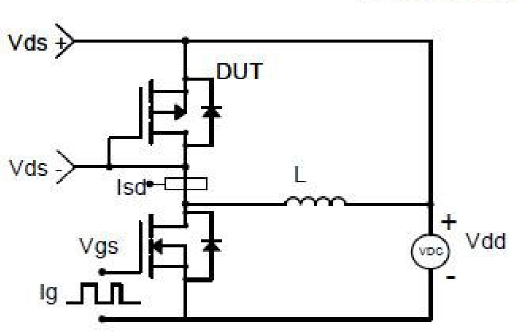


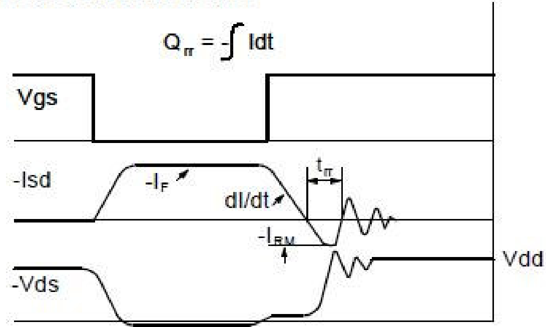
Resistive Switching Test Circuit & Waveforms





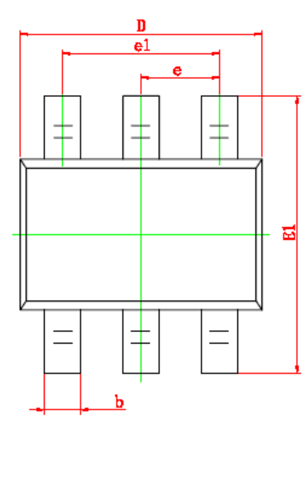
Diode Recovery Test Circuit & Waveforms

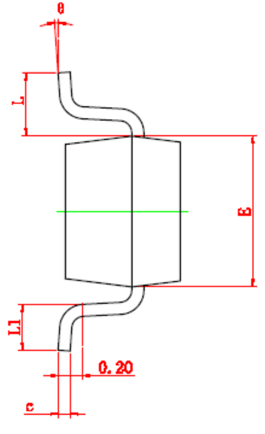


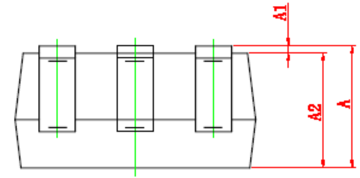


Package Dimension

SOT-363







Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
A1	0.00	0.10	0.000	0.004
A2	0.90	1.00	0.035	0.039
b	0.15	0.35	0.006	0.014
c	0.08	0.15	0.003	0.006
D	2.00	2.20	0.079	0.087
E	1.15	1.35	0.045	0.053
E1	2.15	2.45	0.085	0.096
e	0.650 (TYP)		0.026 (TYP)	
e1	1.20	1.40	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.26	0.46	0.01	0.018
θ	0°	8°	0°	8°

NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

CONTACT US

GS Headquarter	
Address	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
Tel	886-2-2657-9980
Fax	886-2-2657-3630
Email	sales_twn@gs-power.com

Wu-Xi Branch	
Address	No.21 Changjiang Rd., WND, Wuxi, Jiangsu, China (INFO. &. TECH. Science Park Building A 210 Room)
Tel	86-510-85217051
Fax	86-510-85211238
Email	sales_cn@gs-power.com

RD Division	
Address	824 Bolton Drive Milpitas. CA. 95035
Tel	1-408-457-0587