



GSX6010T

MOSFET

Metal Oxide Semiconductor Field Effect Transistor

Trench MOSFET

60V Normal Power Transistor

GSX6010T

Data Sheet

Ver 2

2019-5-24

60V 10A Power MOSFET

■ Description

GroupSemiconductor(GS) has series Trench power MOSFET platforms for voltage up 20V to 200 volts, both with design service and manufacturing capability, including cell, termination design and simulation.

The GS 60V 10A power MOSFET is a Low voltage N channel Trench power MOSFET sample with advanced technology to have better characteristics, such as fast switching time, low Ciss and Crss, low on resistance and excellent avalanche characteristics, making it especially suitable for applications which require superior power density and outstanding efficiency.

■ Features

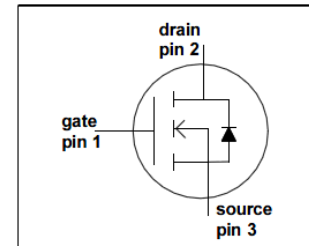
$R_{DS(ON)} = 70m\ \Omega$ @ $V_{GS} = 10V$

$V_{DS} = 60V$

I_D (@ $V_{GS} = 10V$) = 10A

■ PKG

GSS6010T	GSD6010T	GSA6010T	GSP6010T	GSB6010T
TO-251	TO-252	TO-220Fullpak	TO-220	TO-263



■ Absolute Maximum Ratings (TC = 25° C, unless otherwise specified)

Symbol	Parameter	Maximum	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 25	V
$I_D^{(1)}$	Continuous Drain Current (TC=25° C)	10	A
	Continuous Drain Current (TC=100° C)	8	
$I_{DM}^{(2)}$	Pulsed Drain Current	40	A

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EAR ^{(2),(3)}	Repetitive avalanche energy	15	mJ
EAS ⁽⁴⁾	Single pulsed avalanche energy (1mH)	58	mJ
dv/dt	Peak diode recovery dv/dt	5	V/ns
PD ⁽¹⁾	Power Dissipation (TC=25° C) TO-220	10	W
	Derating above 25° C	1.5	W/ ° C
TJ	Max. operating junction temperature	150	° C
TSTG	Storage temperature	-55 to +150	° C

■ Thermal Characteristics

Symbol	Parameter	Value (TO220)	Unit
R _{θJA} ⁽⁶⁾	Maximum Junction-to-Ambient	82	C/W
R _{θCS} ⁽⁶⁾	Maximum Case-to-sink	0.6	C/W
R _{θJC} ^{(7),(8)}	Maximum Junction-to-Case θ	4.1	C/W

1. The power dissipation PD is based on TJ(MAX)=150° C in a TO-251 package, using junction-to-case thermal resistance.
2. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150° C.
3. L=1mH, Starting TJ=25° C.
4. L = 10mH, starting TJ = 25° C.
5. L=60mH, starting TJ = 25° C.
6. The tests are performed with the device with T A =25° C.
7. The R _{θJA} is the sum of the thermal impedance from junction to case R _{θJC} and case to ambient.
8. These curves are based on the junction-to-case thermal impedance, assuming a maximum junction temperature of TJ(MAX)=150° C.

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■ Electrical Characteristics (T_J=25° C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Off Characteristics						
BVDSS	Drain-Source Breakdown Voltage	ID=250uA, VGS=0V, T _J =25° C	60			V
BVDSS /ΔTJ	Zero Gate Voltage Drain Current	ID=250uA, VGS=0V		0.72		V/° C
IDSS	Zero Gate Voltage Drain Current	VDS=60V, VGS=0V			1	uA
		VDS=60V, T _J =125° C	10			
IGSS	Gate-Body leakage current	VDS=0V, VGS=20V			100	nA
		VDS=0V, VGS=-20V	-100			
On Characteristics						
VGS(th)	Gate Threshold Voltage	VDS=Vgs, ID=250uA	1.2		2.5	V
RDS(ON)	Static Drain-Source On-Resistance	VGS=10V, ID=5A		0.06	0.08	Ω
gFS	Forward Transconductance	VDS = 10 V, ID = 5A		8		S
Source Drain Diode Characteristics						
VSD	Diode Forward Voltage	IS=5A, VGS=0V		0.82	1.2	V
ISD	Continuous source-drain Current			8		A
trr	Reverse Recovery Time	IF=5A, dI/dt=100A/us		18		ns
Qrr	Reverse Recovery Charge	IF=5A, dI/dt=100A/us		20		nC
Dynamic Characteristics						
Ciss	Input Capacitance	VGS=0V, VDS=15V, f=1MHz		490		pF
Coss	Output Capacitance	VGS=0V, VDS=15V, f=1MHz		124		pF
Crss	Reverse Transfer Capacitance	VGS=0V, VDS=15V, f=1MHz		52		pF
Qg	Total Gate Charge	VDS=10V, ID=5A		7		nC
Qgs	Gate Source Charge	VDS=10V, ID=5A		1.5		nC
Qgd	Gate Drain Charge	VDS=10V, ID=5A		2.1		nC
Switching Characteristics						
t _d (on)	Turn-On DelayTime	VGS=10V, VDS=10V, ID=5A, RG=2.5 Ω		8		ns
tr	Turn-On Rise Time			9		ns
t _d (off)	Turn-Off DelayTime			11		ns
tf	Turn-Off Fall Time			6		ns

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

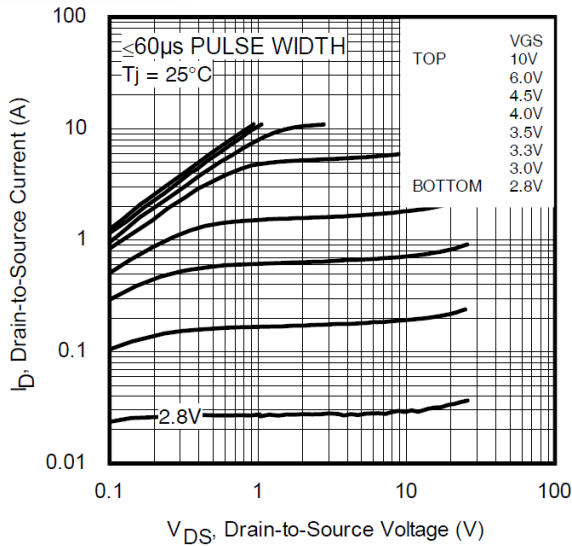


Fig. 1 Typical Output Characteristics

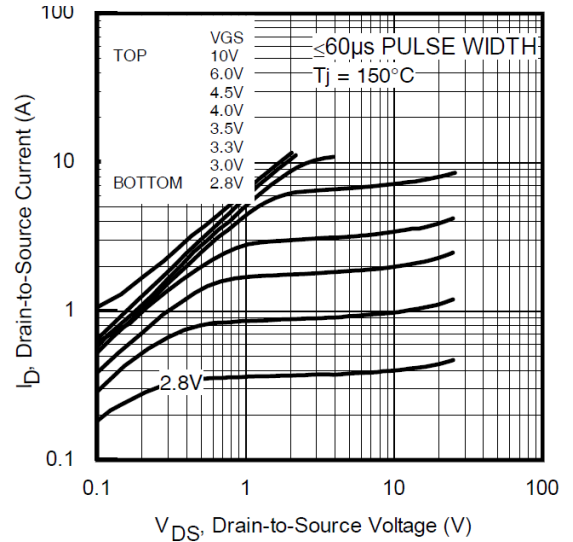


Fig. 2 Typical Output Characteristics

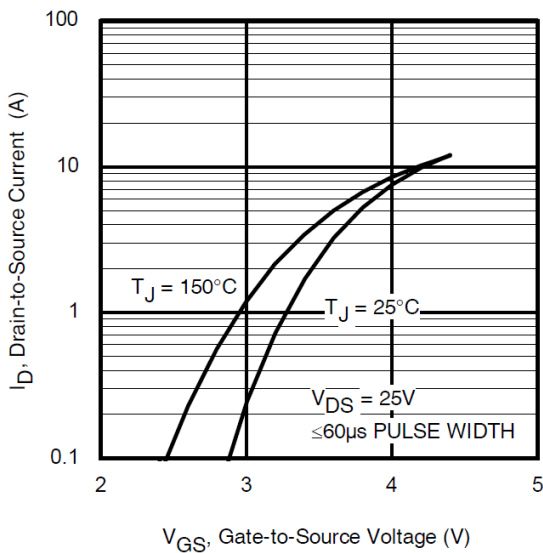


Fig. 3 Typical Transfer Characteristics

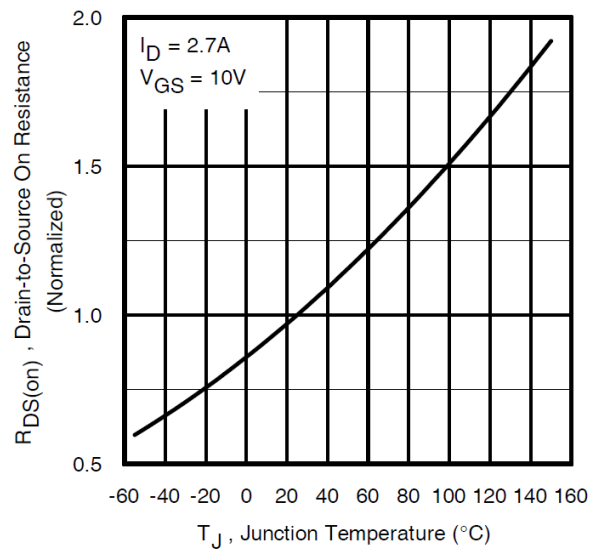


Fig. 4 Normalized On-Resistance vs. Temperature

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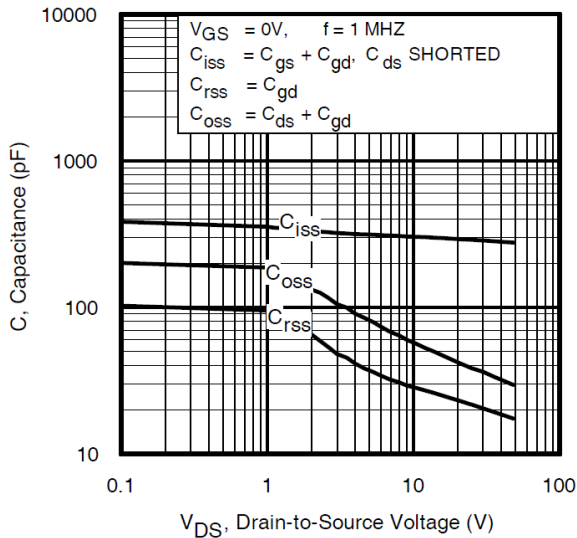


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

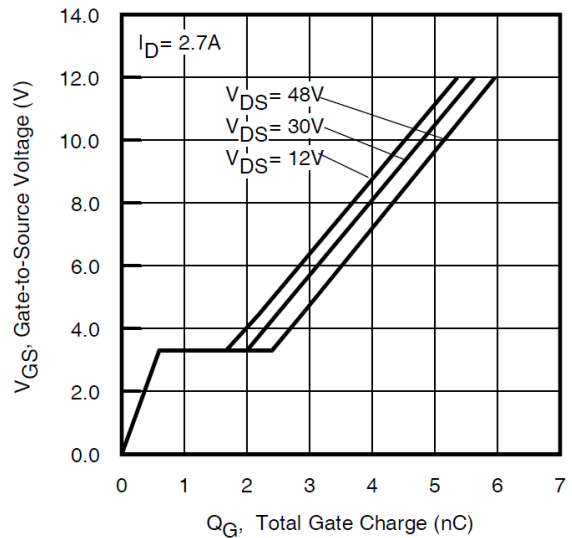


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

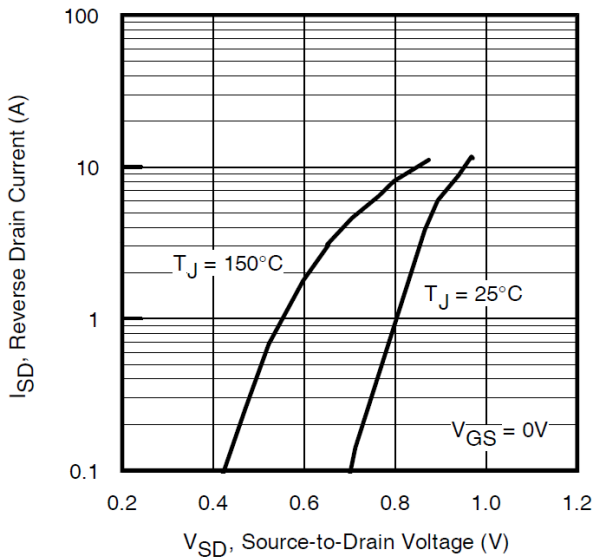


Fig. 7 Typical Source-to-Drain Diode Forward Voltage

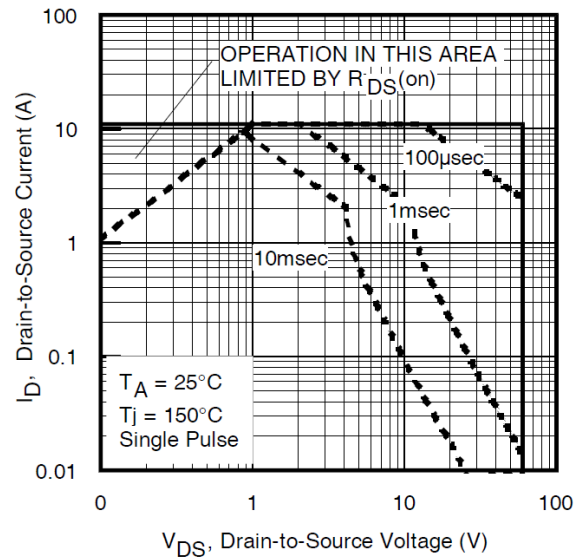


Fig 8. Maximum Safe Operating Area

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

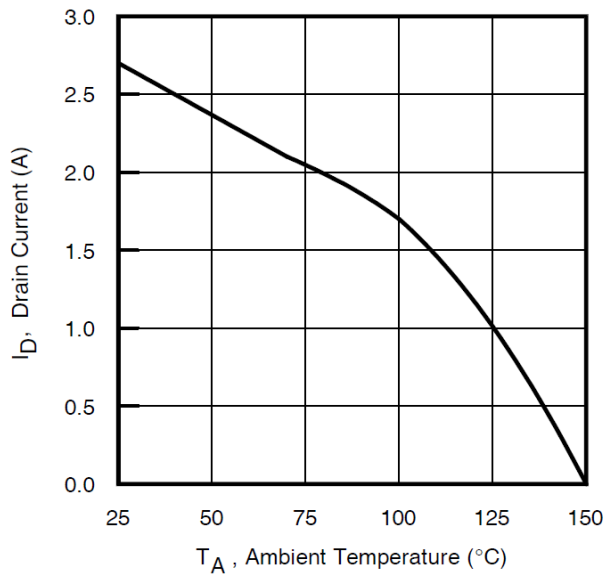


Fig 9. Maximum Drain Current vs. Case Temperature

