GSM6320TF

60V N-Channel MOSFET

Product Description

The N-Channel enhancement mode power field effect transistor is 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.

The device is well suited for high efficiency fast switching applications.

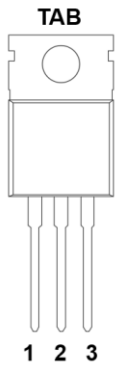
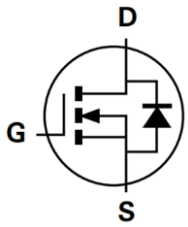
Features

- $R_{DS(ON)}$ = 2.8mΩ @ V_{GS}=10V
- $R_{DS(ON)}$ = 4mΩ @ V_{GS}=4.5V
- TO-220-3L Package
- RoHS Compliant and Halogen Free

Applications

- MB / VGA / Vcore
- POL Applications
- SMPS

Packages & Pin Assignments

TO-220-3L	Equivalent Circuit
	

Pin	Symbol	Description	Pin	Symbol	Description
1	G	Gate	2	D	Drain
3	S	Source	TAB	D	Drain

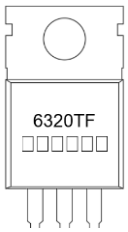
Ordering and Marking Information

Ordering Information			
Part Number	**Package**	**Part Marking**	**Quantity / Tube**
GSM6320TF	TO-220-3L	6320TF □□□□□□	50 PCS

GSM6320 1 2

- **Product Code:** GSM6320
- **Package Code:** 1 is **T** for TO-220-3L
- **Green Level:** 2 is **F** for RoHS Compliant and Halogen Free

Marking Information



- **Product Code:** 6320TF
- **GS Code:** □□□□□□

Absolute Maximum Ratings (T_A = 25ºC unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current (Silicon Limited)	T_C=25ºC	178	A
		T_C=100ºC	112	
	Continuous Drain Current (Package Limited)		120	
I_{DM}	Pulsed Drain Current [1]		400	A
I_{AS}	Single Pulse Avalanche Current, L = 0.5mH [1]		25	A
E_{AS}	Single Pulse Avalanche Energy, L = 0.5mH [1]		312	mJ
P_D	Power Dissipation	T_C=25ºC	178	W
		T_C=100ºC	71	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.7	ºC/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient [2]		62	ºC/W
T_J	Operating Junction Temperature Range		-55 to +150	ºC
T_{STG}	Storage Temperature Range		-55 to +150	ºC

NOTE:
1. Single pulse width is limited by max junction temperature.
2. The device mounted on 1in^2 FR-4 board with 2oz. Copper

Electrical Characteristics (T_J = 25ºC unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	-	-	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.2	-	2.5	V
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	-	2.4	2.8	mΩ
		V_{GS}=4.5V, I_D=10A	-	3.2	4	
gfs	Forward Transconductance	V_{DS}=5V, I_D=20A	-	54	-	S
Dynamic Characteristics						
Rg	Gate Resistance	f=1MHz		1.8		Ω
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz	-	4947	-	pF
C_{oss}	Output Capacitance		-	2850	-	
C_{rss}	Reverse Transfer Capacitance		-	26	-	
Q_g	Total Gate Charge	V_{DS}=30V, I_D=50A V_{GS}=10V	-	98	-	nC
Q_{gs}	Gate-Source Charge		-	18	-	
Q_{gd}	Gate-Drain Charge		-	24	-	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, I_D=50A V_{GS}=10V, Rg=6Ω	-	25	-	ns
t_r	Turn-On Rise Time		-	45	-	
$t_{d(off)}$	Turn-Off Delay Time		-	53	-	
t_f	Turn-Off Fall Time		-	34	-	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A	-	-	1	V
t_{rr}	Reverse Recovery Time	I_F=10A , dI/dt=100A/μs	-	52	-	ns
Q_{rr}	Reverse Recovery Charge		-	90	-	nC

Typical Performance Characteristics

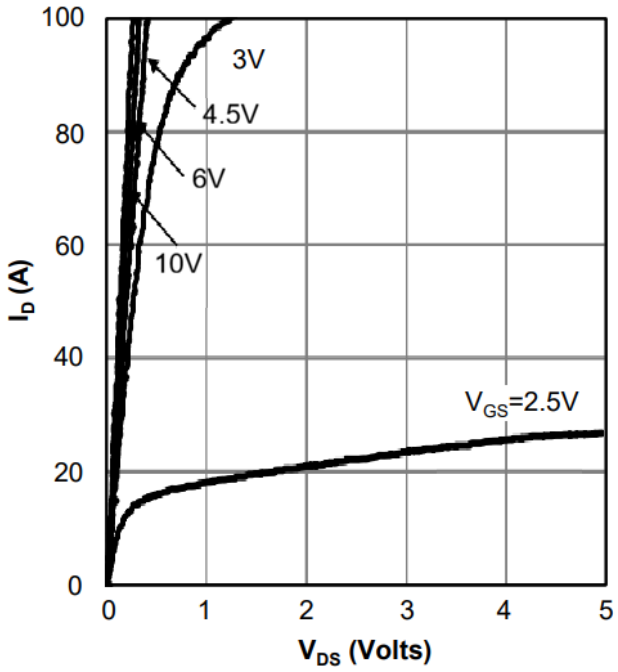


FIG.1 Output Characteristics

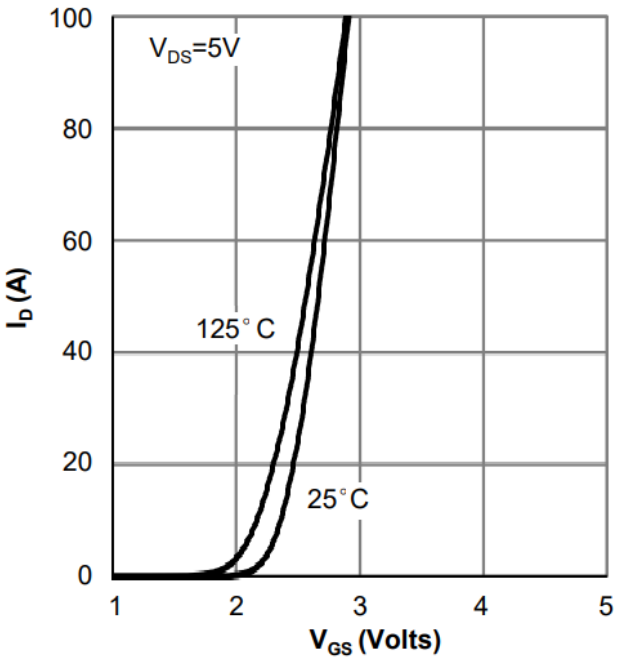


FIG.2 Transfer Characteristics

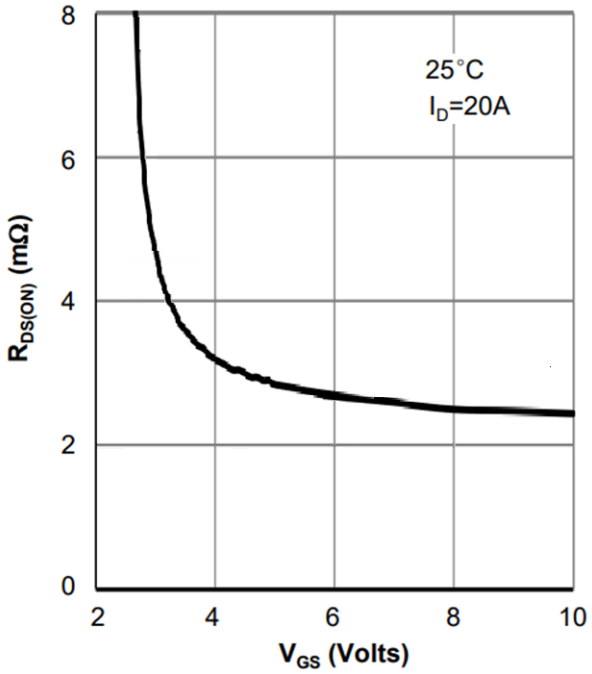


FIG.3 On-Resistance vs. Gate Voltage

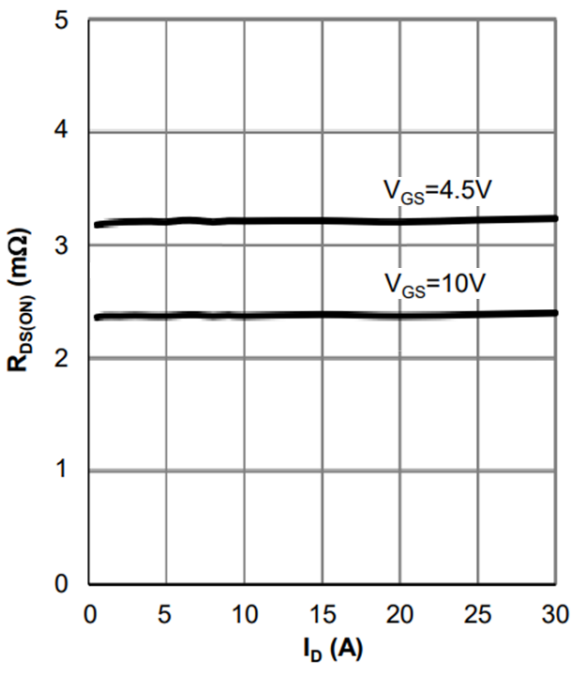


FIG.4 On-Resistance vs. Drain Current

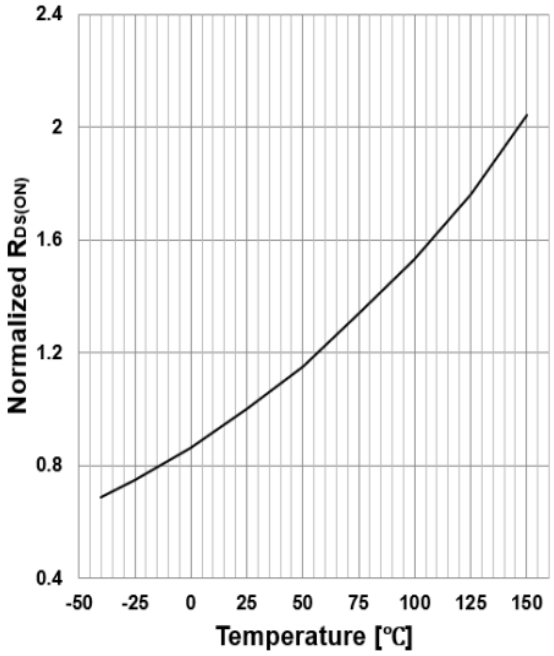


FIG.5 Normalized On-Resistance vs. T_J

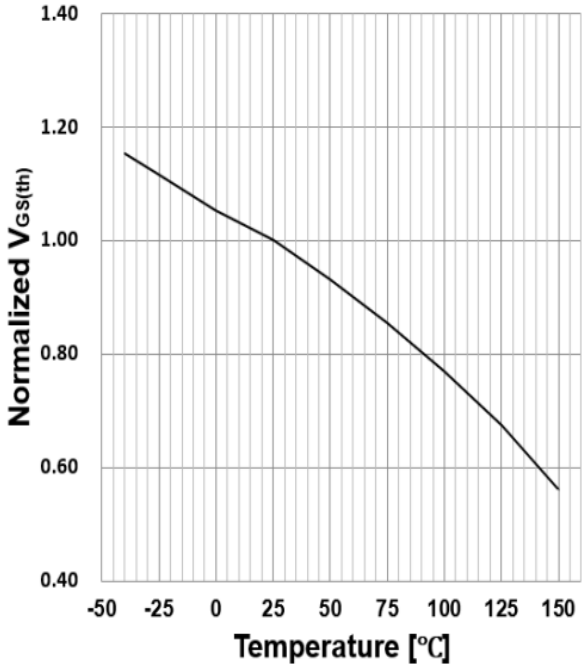


FIG.6 Normalized $V_{GS(th)}$ vs. T_J

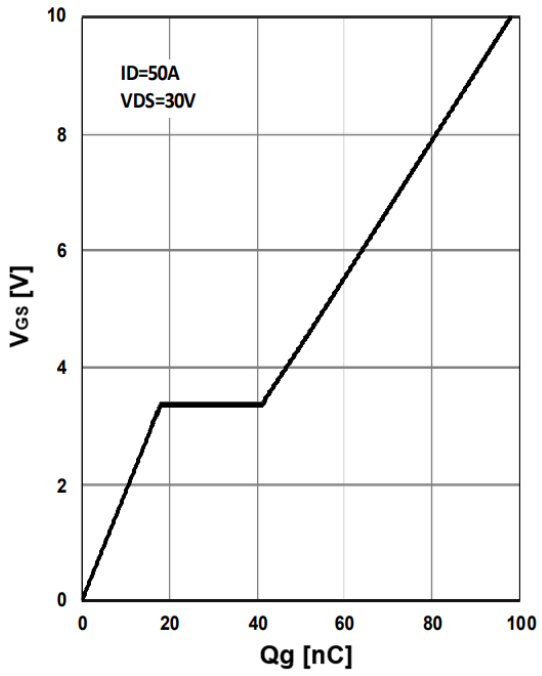


FIG.7 Gate Charge Characteristics

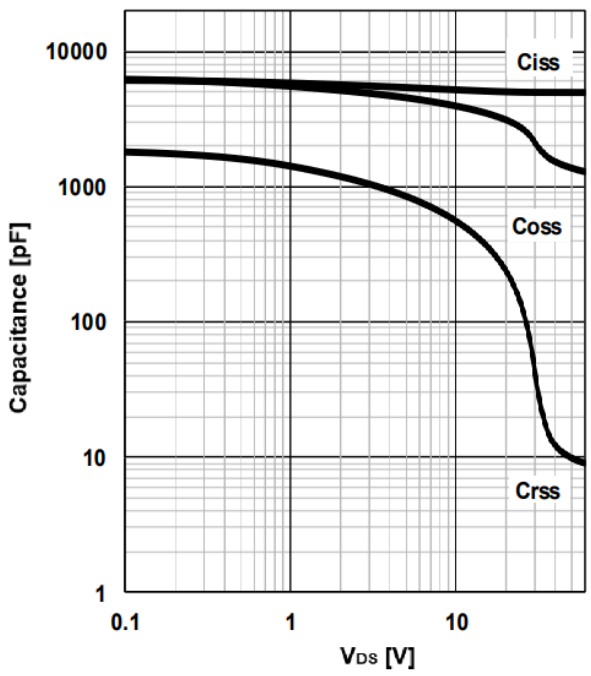


FIG.8 Capacitance Characteristics

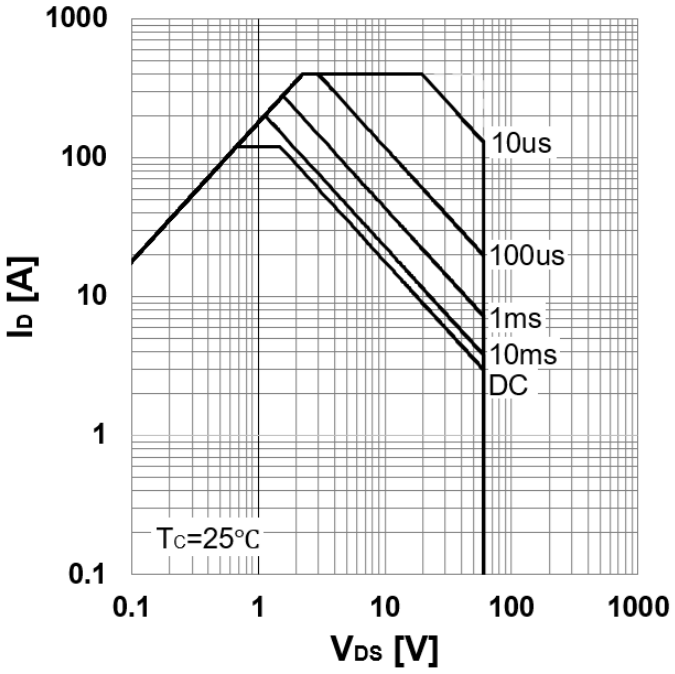


FIG.9 Maximum Safe Operation Area

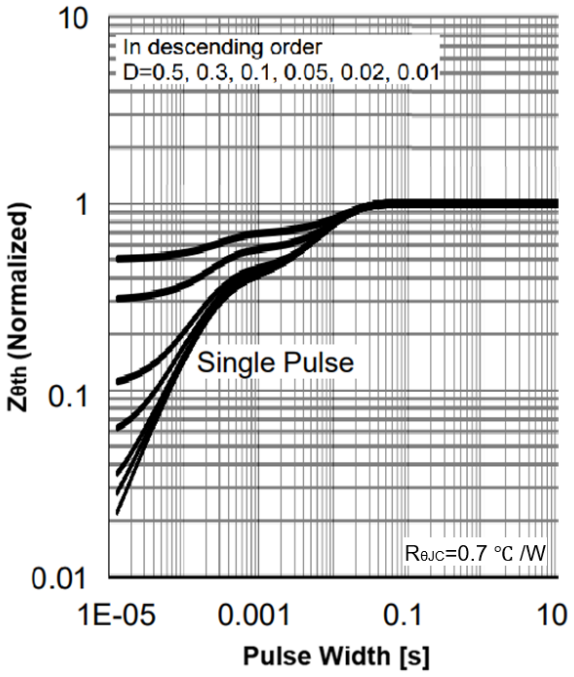


FIG.10 Transient Thermal Impedance (Normalized)

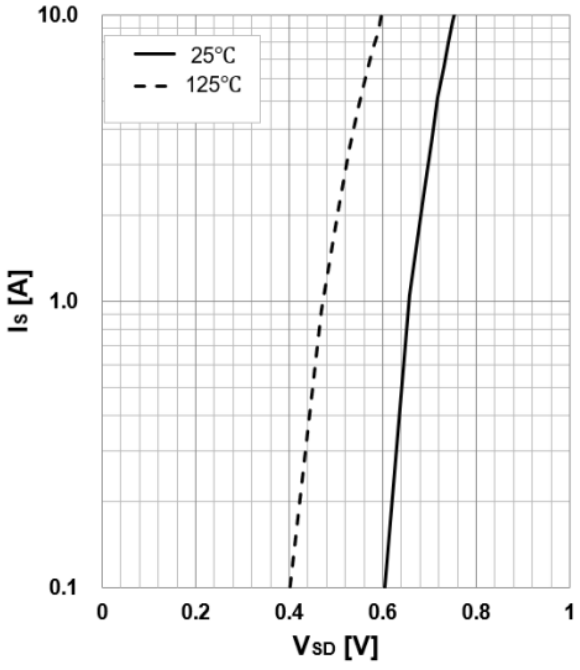
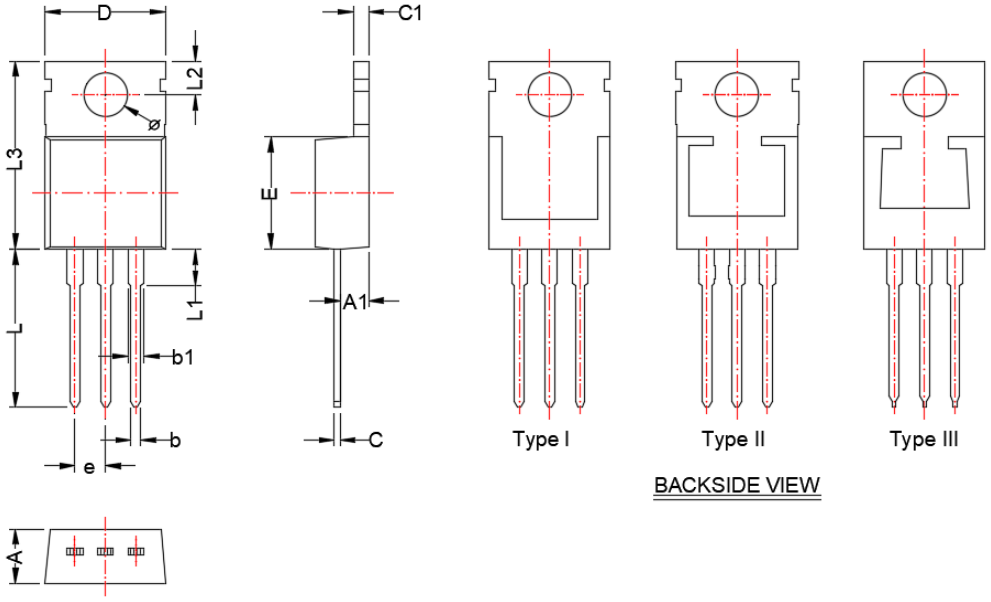


FIG.11 Body-Diode Characteristics

TO-220-3L

Package Dimension



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.56	4.82	0.140	0.190
A1	2.03	2.92	0.080	0.115
b	0.38	1.14	0.015	0.045
b1	1.00	1.78	0.039	0.070
c	0.30	1.14	0.012	0.045
c1	0.51	1.50	0.020	0.059
D	9.50	10.67	0.374	0.420
E	8.38	9.42	0.330	0.371
e	2.54 BSC		0.100 BSC	
L	12.00	14.73	0.472	0.250
L1	---	7.00	---	0.250
L2	2.54	3.43	0.100	0.135
L3	14.22	16.51	0.560	0.650
ø	3.40	4.09	0.134	0.161

NOTE:
Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

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