GSMDC2604Z

20V 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

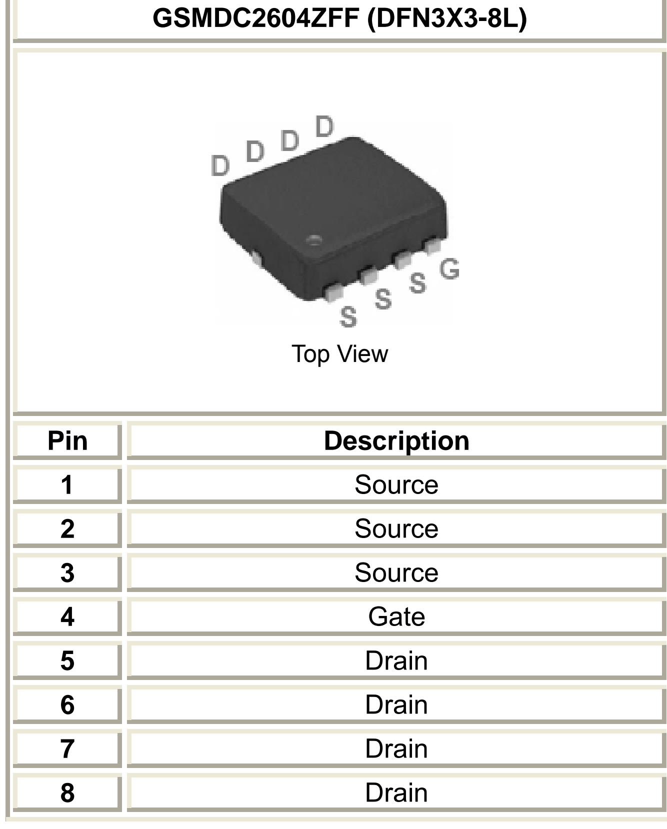
- 20V, 80A, $R_{DS(ON)}$=3.5mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- DFN3X3-8L package design

Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

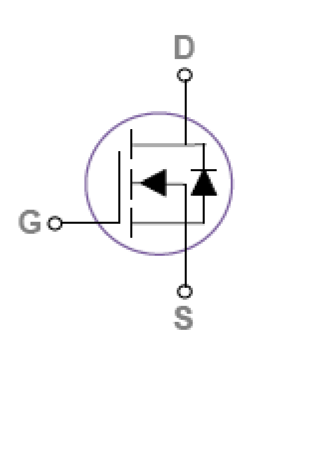
Packages & Pin Assignments

GSMDC2604ZFF (DFN3X3-8L)

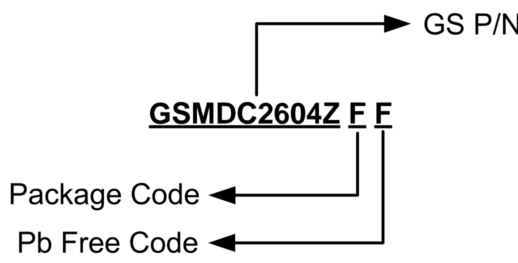


Top View

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

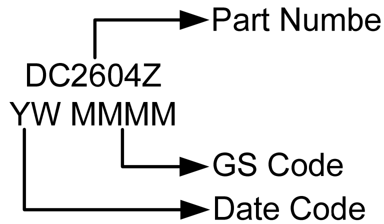


Ordering Information



Part Number	Package	Quantity
GSMDC2604ZFF	DFN3X3-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current (Chip Limitation)	T_C=25℃	80	A
		T_C=100℃	51	
I_{DM}	Pulsed Drain Current		320	A
P_D	Power Dissipation (T_C=25℃)		66	W
	Power Dissipation (Derate above 25℃)		0.53	W/℃
T_J	Operating Junction Temperature Range		-55 to +175	℃
T_{STG}	Storage Temperature Range		-55 to +175	℃
$R_{θJA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{θJC}$	Thermal Resistance-Junction to Case		2	℃/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	20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	0.3	0.65	1	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}=16V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			80	A
I_{SM}	Pulsed Source Current				160	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V,I_D=15A		2.8	3.5	mΩ
		V_{GS}=2.5V,I_D=10A		3.5	4.5	
		V_{GS}=1.8V,I_D=6A		5	7	
g_{FS}	Forward Transconductance	V_{DS}=5V,I_D=5A		35		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
Dynamic						
Q_g	Total Gate Charge	V_{DS}=10V,V_{GS}=4.5V, I_D=5A		52	100	nC
Q_{gs}	Gate-Source Charge			6.6	12	
Q_{gd}	Gate-Drain Charge			13.8	28	
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, f=1MHz		3870	5500	pF
C_{oss}	Output Capacitance			580	850	
C_{rss}	Reverse Transfer Capacitance			340	600	
$t_{d(on)}$	Turn-On Time	V_{DD}=10V,I_D=1A, V_{GS}=4.5V,R_G=3.3Ω		20.2	40	ns
t_r				31.2	60	
$t_{d(off)}$	Turn-Off Time			68.5	120	
t_f				21.2	42	
R_g	Gate Resistance	V_{GS}=0V,V_{DS}=0V, f=1MHz		1.3	2.6	Ω

Note 1: Repetitive Rating : Pulsed width limited by maximum junction temperature.
Note 2: The data tested by pulsed , pulse width≦300us, duty cycle≦2%.
Note 3: Essentially independent of operating temperature.

Typical Performance Characteristics

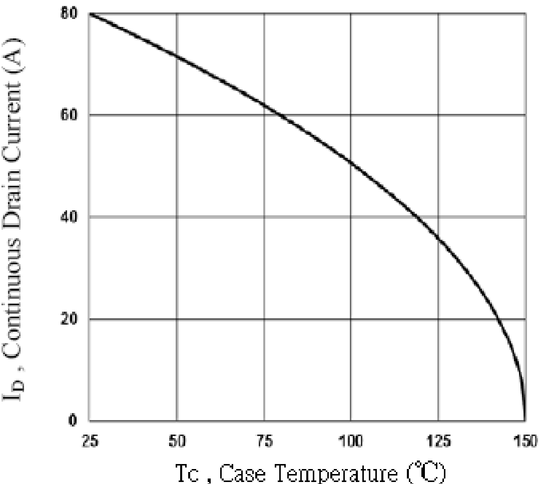


Fig.1 Continuous Drain Current vs. T_c

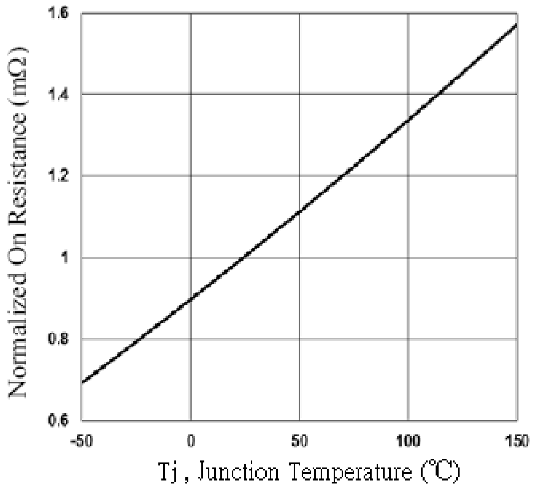


Fig.2 Normalized RDSON vs. T_J

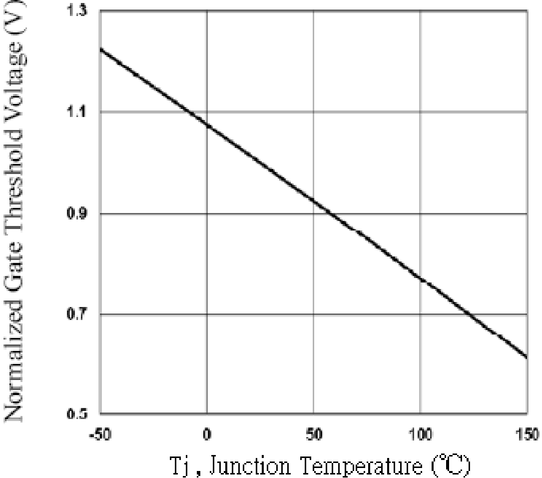


Fig.3 Normalized V_{th} vs. T_J

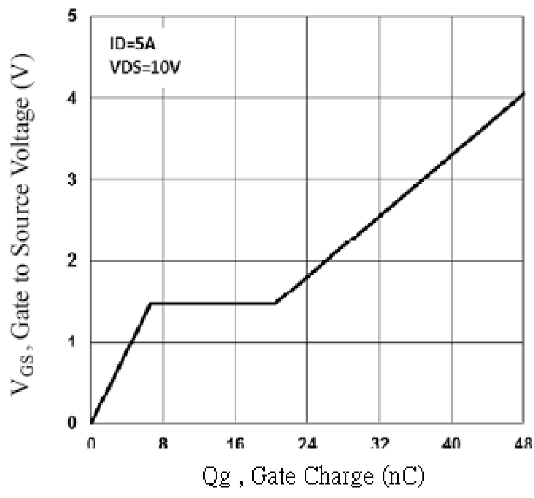


Fig.4 Gate Charge Waveform

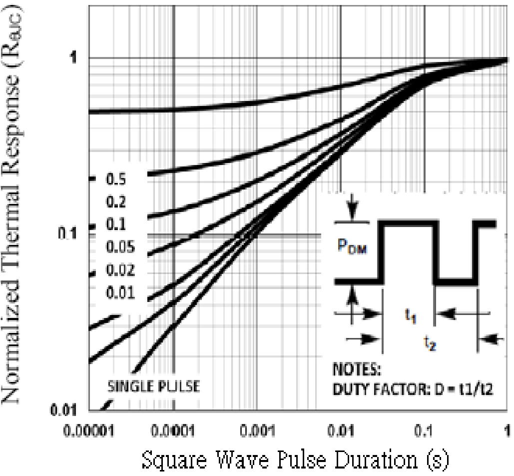


Fig.5 Normalized Transient Impedance

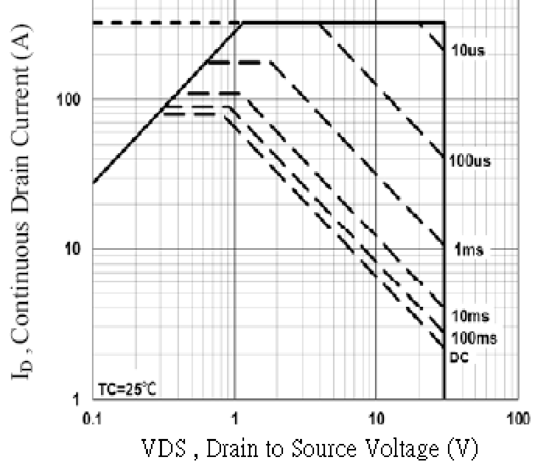
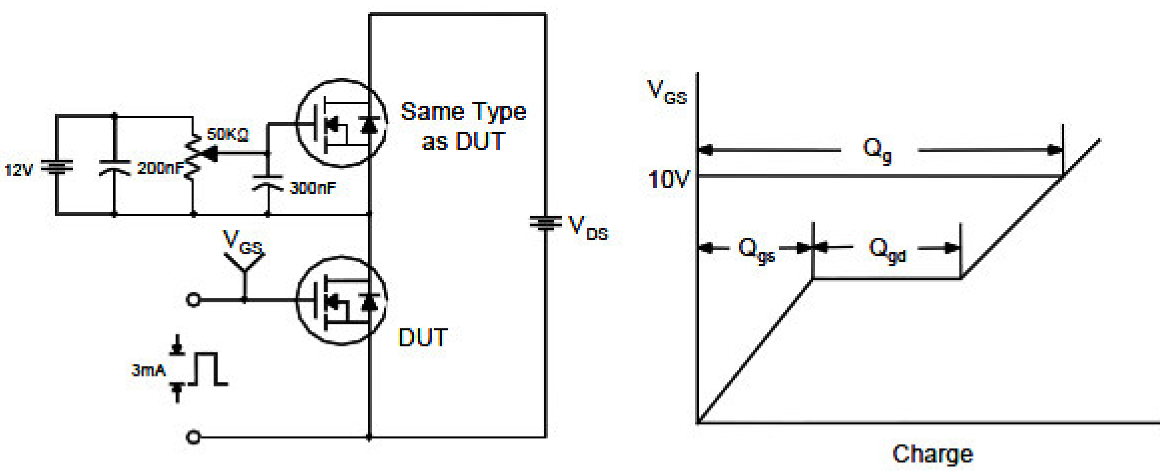


Fig.6 Maximum Safe Operation Area

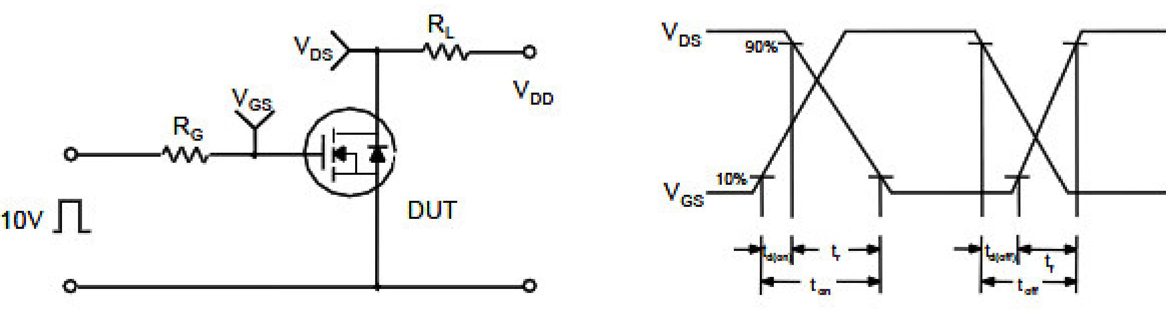
GSMDC2604Z

Typical Performance Characteristics (Continue)

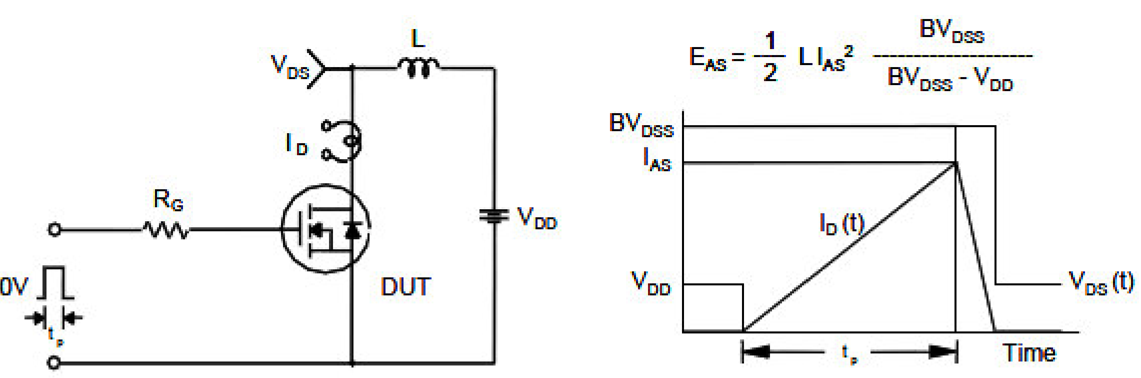
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

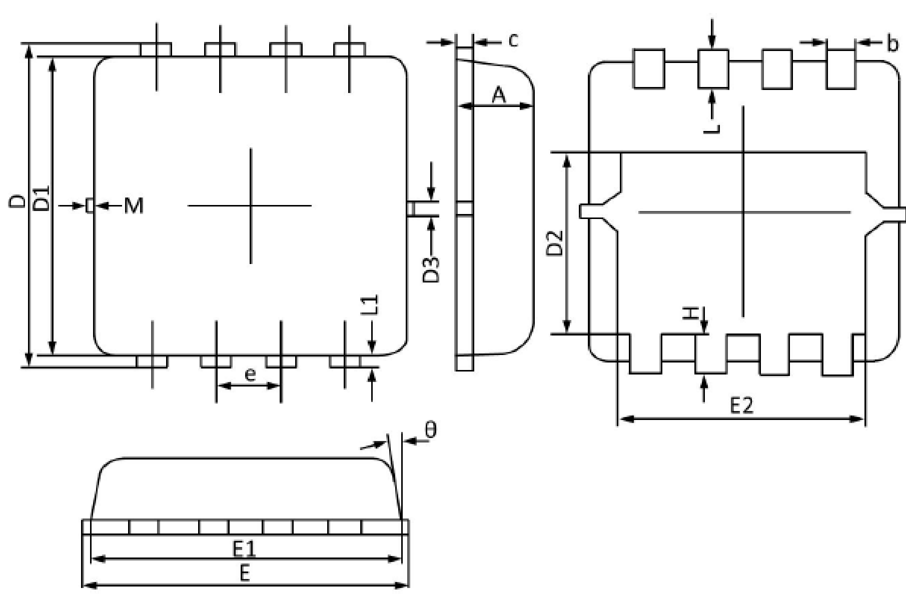


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

DFN3X3-8L



Dimensions				
Symbol	**Millimeters**		**Inches**	
	Min	**Max**	**Min**	**Max**
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 (REF)		0.005 (REF)	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 (BSC)		0.026 (BSC)	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 (REF)		0.005 (REF)	
θ	0°	12°	0°	12°
M	0.150 (REF)		0.006 (REF)	

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