

GSMDC2305Z

20V P-Channel MOSFETs

Product Description

These P-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.

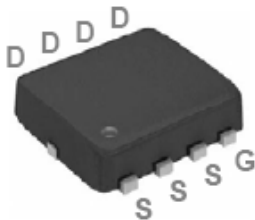
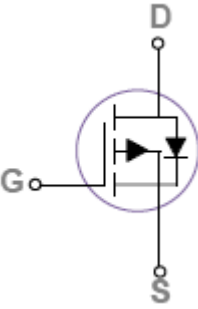
Features

- -20V, -26A, $R_{DS(ON)}=15m\Omega@V_{GS}=-4.5V$
- Improved dv/dt capability
- Fast switching
- Suit for -1.8V Gate Drive Applications
- Green Device Available
- DFN3X3-8L package design

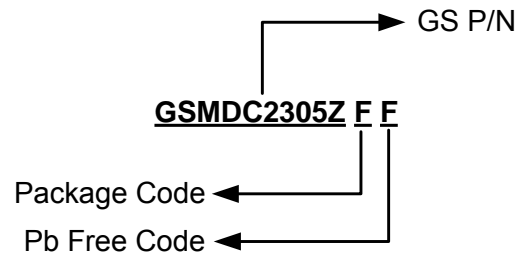
Applications

- Notebook
- Load Switch
- Networking
- Hand-Held Instruments

Packages & Pin Assignments

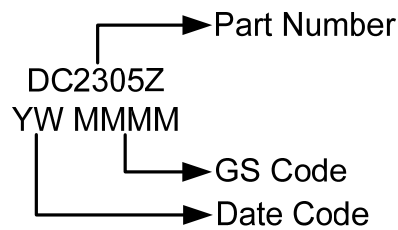
GSMDC2305ZFF (DFN3X3-8L)	
 <p>Top View</p>	
	
Pin	Description
1	Source
2	Source
3	Source
4	Gate
5	Drain
6	Drain
7	Drain
8	Drain

Ordering Information



Part Number	Package	Quantity Reel
GSMDC2305ZFF	DFN3X3-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^\circ\text{C}$ Unless otherwise noted

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	-26
		$T_C=100^\circ\text{C}$	-14
I_{DM}	Pulsed Drain Current	-104	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	2.5	W
	Power Dissipation ($T_C=25^\circ\text{C}$)	44	W
	Power Dissipation (Derate above 25°C)	0.36	W/ $^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.8	$^\circ\text{C}/\text{W}$

Note 1: Repetitive Rating : Pulsed width limited by maximum junction temperature.

Electrical Characteristics

T_J=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
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA		-0.01		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.3	-0.6	-1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			3		mV/°C
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±10V			±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°C			-10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			-11	A
I _{SM}	Pulsed Source Current				-44	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-6A		12	15	mΩ
		V _{GS} =-2.5V, I _D =-4A		15	20	
		V _{GS} =-1.8V, I _D =-3A		20	26	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-6A		20		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 =-6A		27	40	nC
Q _{gs}	Gate-Source Charge			2.4	4.8	
Q _{gd}	Gate-Drain Charge			5.3	8	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		2320	3370	pF
C _{oss}	Output Capacitance			280	410	
C _{rss}	Reverse Transfer Capacitance			175	260	
t _{d(on)}	Turn-On Time	V _{DD} =-10V, I _D =-1A, V _{GS} =-4.5V, R _G =25Ω		16.2	31	ns
t _r				43.5	83	
t _{d(off)}	Turn-Off Time			114	217	
t _f				28.8	55	

Note 2: The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.

Note 3: Essentially independent of operating temperature.

Typical Performance Characteristics

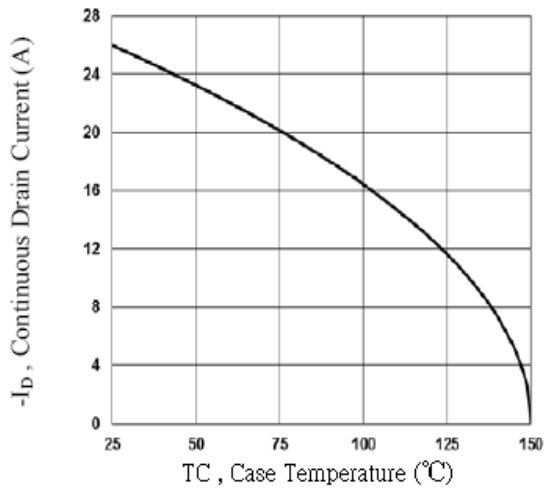


Fig.1 Continuous Drain Current vs. T_c

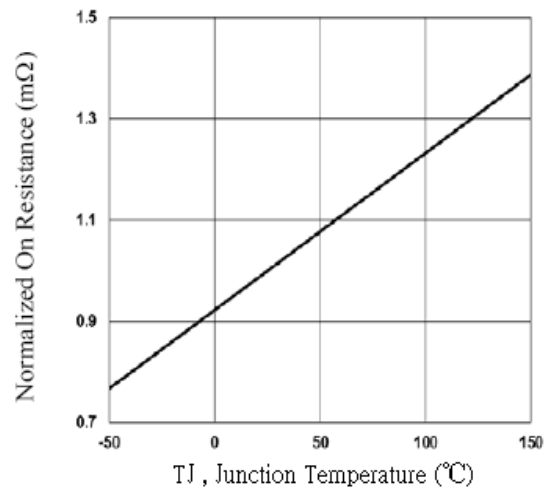


Fig.2 Normalized R_{DSON} vs. T_j

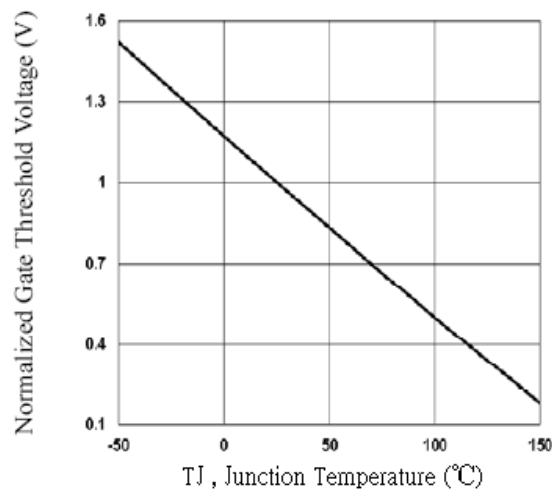


Fig.3 Normalized V_{th} vs. T_j

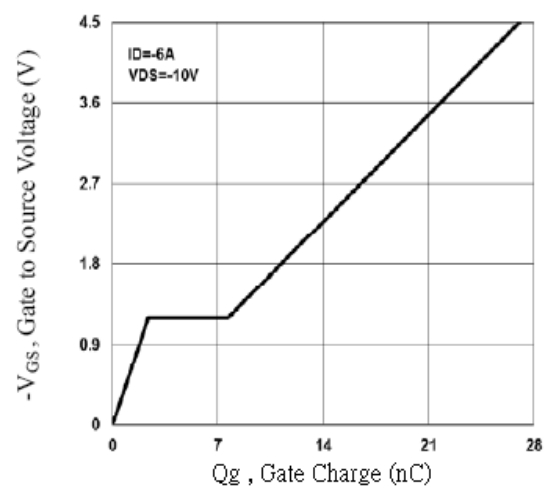


Fig.4 Gate Charge Waveform

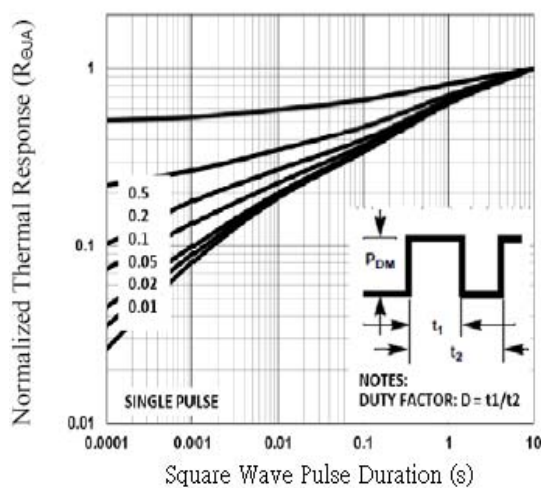


Fig.5 Normalized Transient Response

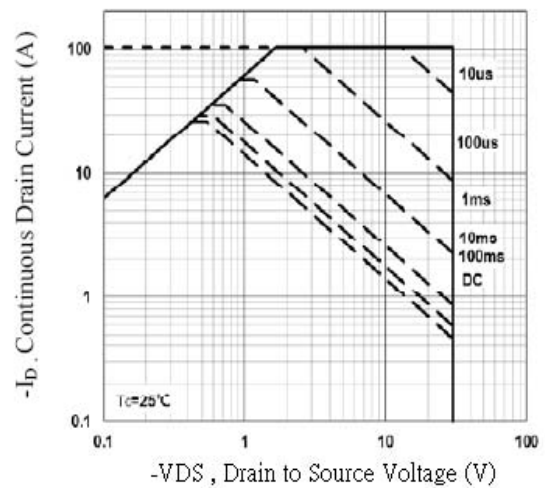
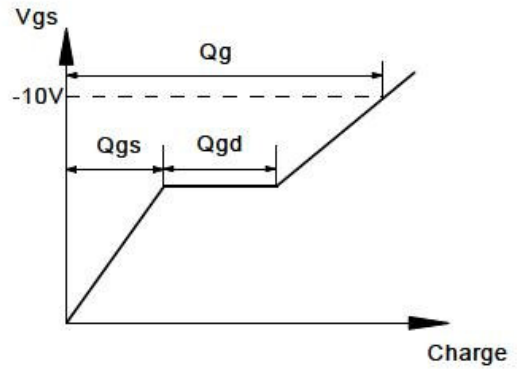
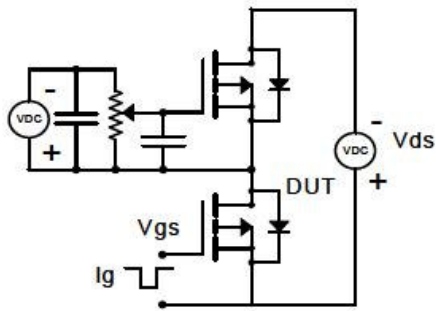


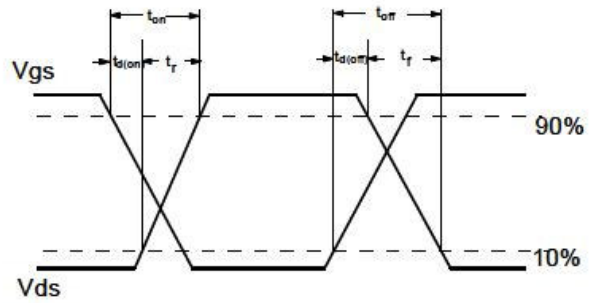
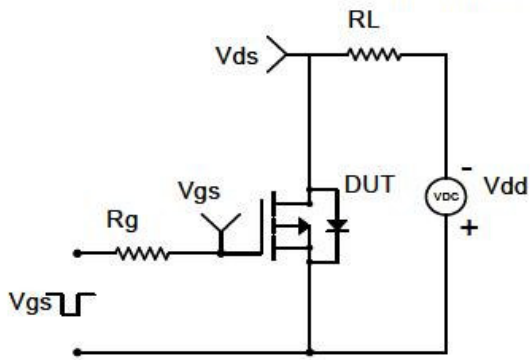
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

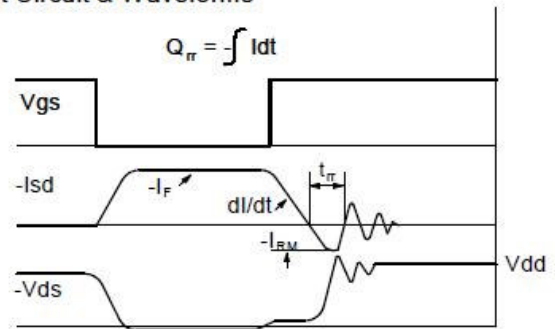
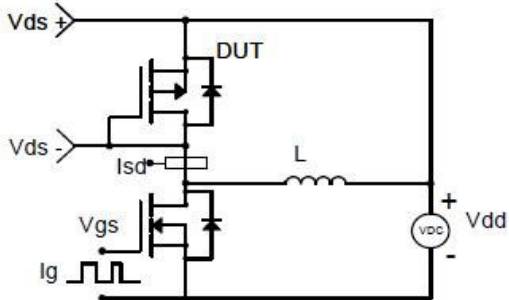
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

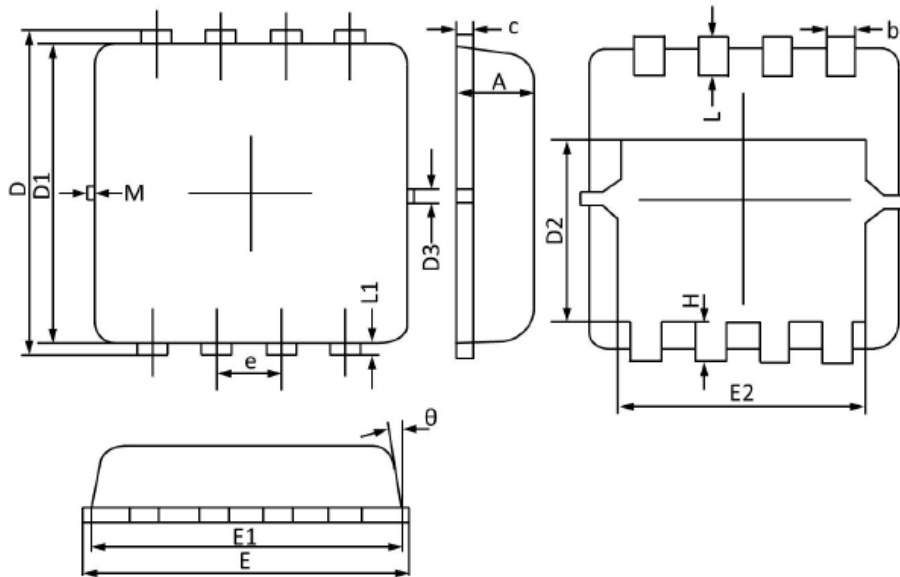


Diode Recovery Test Circuit & Waveforms



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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