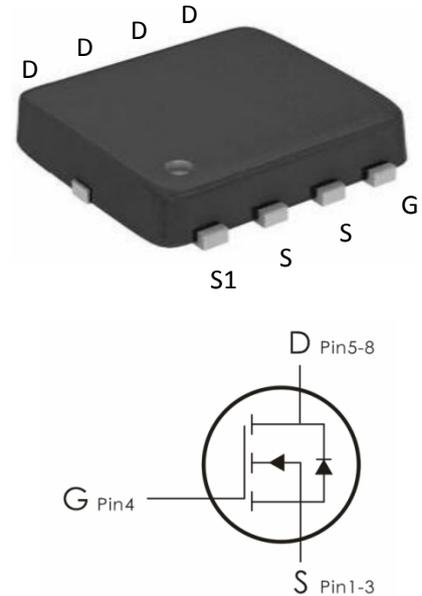


Description:

This N-Channel MOSFET uses advanced trench technology 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:

- 1) $V_{DS}=40V, I_D=35A, R_{DS(ON)}=10m\ \Omega @V_{GS}=10V$
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-Continuous- $T_C=25^\circ C$	35	A
	Continuous Drain Current- $T_C=100^\circ C$	22.1	
I_{DM}	Drain Current – Pulsed ¹	140	A
P_D	Power Dissipation- $T_C=25^\circ C$	44	W
	Power Dissipation-Derate above $25^\circ C$	0.36	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.8	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
ZD010NG	D010N	DFN3*3-8

Electrical Characteristics: ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{GS}=0V, V_{DS}=40V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{GS}=0V, V_{DS}=32V, T_J=85^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1.2	1.8	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=8A$	---	7.4	10	m Ω
		$V_{GS}=4.5V, I_D=4A$	---	10.6	13.5	
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=2A$	---	13	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	1205	2180	pF
C_{oss}	Output Capacitance		---	128	245	
C_{rss}	Reverse Transfer Capacitance		---	52	106	
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2.2	---	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=15V, V_{GS}=10V$ $R_G=3.3\ \Omega, I_D=1A$	---	13.2	25	ns
t_r	Rise Time ^{2,3}		---	2.2	5	ns
$t_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	72	130	ns
t_f	Fall Time ^{2,3}		---	4.5	10	ns
Q_g	Total Gate Charge ^{2,3}	$V_{DS}=20V, V_{GS}=10V, I_D=8A$	---	19.7	30	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	2.8	4.2	nC
Q_{gd}	Gate-Drain "Miller" Charge ^{2,3}		---	5.1	7.6	nC

Drain-Source Diode Characteristics						
I_S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	35	A
I_{SM}	Pulsed Source Current		---	---	70	A
V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t_{rr}	Reverse Recovery Time ³	I _S =1A, di/dt=100A/μs, T _J =25°C, V _{GS} =0V	---	17	---	nS
Q_{rr}	Reverse Recovery Charge ³		---	2.8	---	nC

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Characteristics: (T_C=25°C unless otherwise noted)

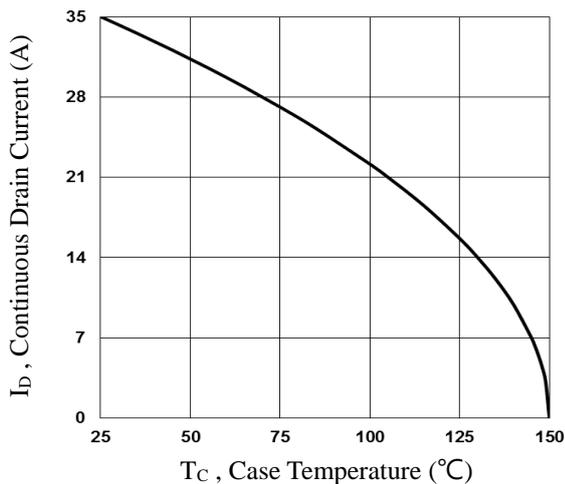


Fig.1 Continuous Drain Current vs. T_C

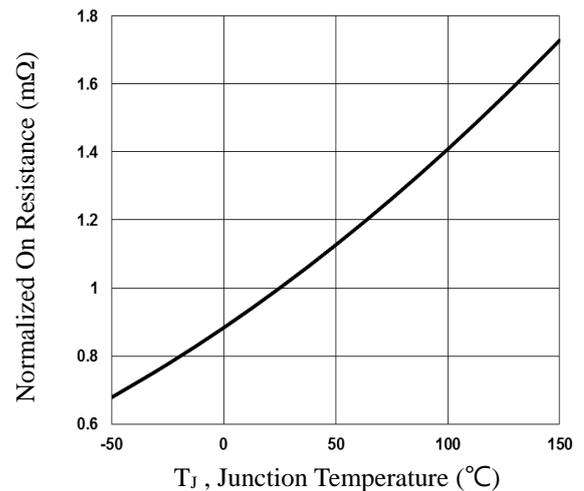


Fig.2 Normalized R_{DSon} vs. T_J

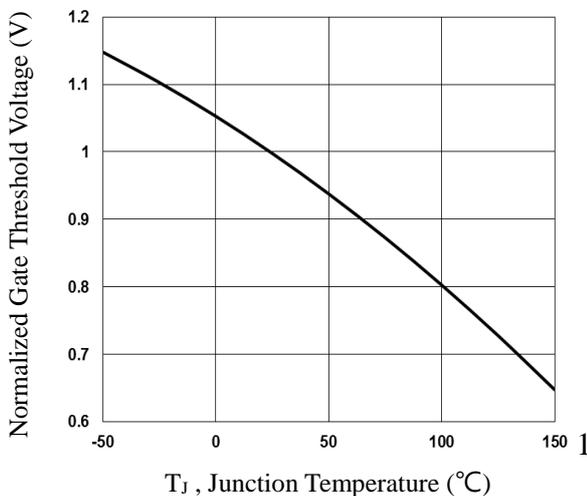


Fig.3 Normalized V_{th} vs. T_J

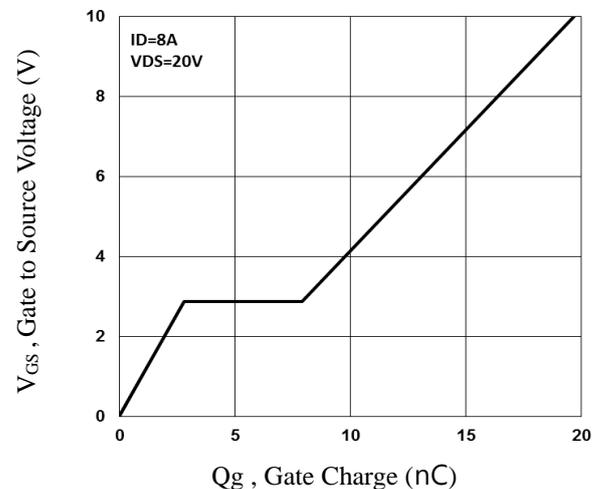


Fig.4 Gate Charge Waveform

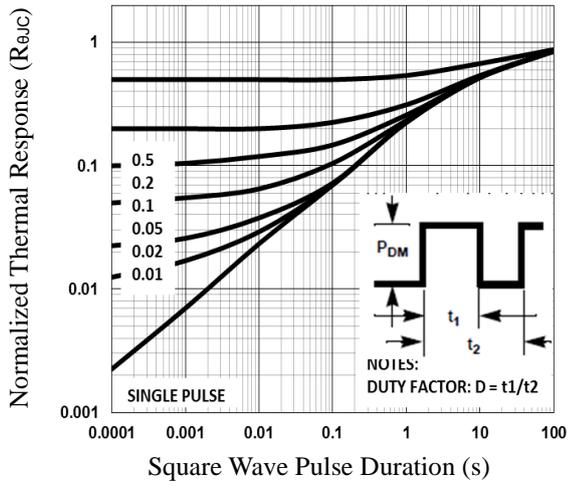


Fig.5 Normalized Transient Impedance

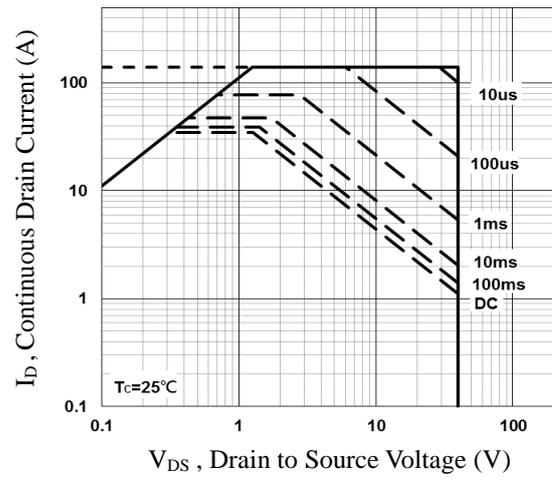


Fig.6 Maximum Safe Operation Area