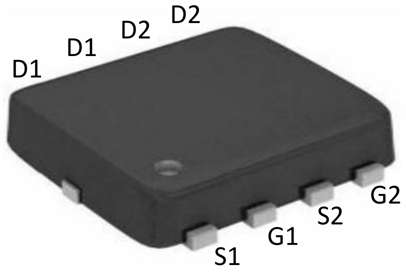
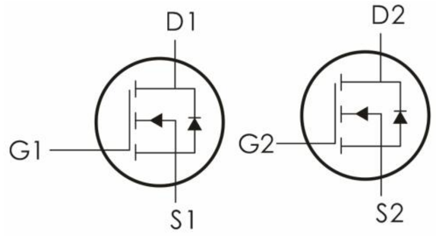
Description：

These Dual 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：

1) V_{DS}=40V,I_D=25A,$R_{DS(ON)}$=13mΩ @V_{GS}=10V
2) Improved dv/dt capability
3) Fast switching
4) 100% EAS Guaranteed
5) Green Device Available.

Absolute Maximum Ratings： (T

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current- (T_C=25℃)	25	A
	Continuous Drain Current-(T_C=100℃)	20.5	
I_{DM}	Drain Current – Pulsed[1]	138	A
E_{AS}	Single Pulse Avalanche Energy[2,6]	45	mJ
I_{AS}	Single Pulse Avalanched Current[2]	23	A
P_D	Power Dissipation (T_C=25℃)	34.7	W
	Power Dissipation – Derate above 25℃	0.28	W/℃
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	3.6	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	

Package Marking and Ordering Information：

Part NO.	Marking	Package
ND013DNG	**D013DN**	DFN5*6-8D

Electrical Characteristics ： (T$_C$=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{GS}=0V, V_{DS}=40V, T_J=25℃	---	---	1	μA
		V_{GS}=0V, V_{DS}=32V, T_J=125℃	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.2	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=15A	---	9.7	13	mΩ
		V_{GS}=4.5V,I_D=12A	---	13	20	
G_{FS}	Forward Transconductance	V_{DS}=10V, I_D=3A	---	6	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	---	1100	2150	pF
C_{oss}	Output Capacitance		---	110	220	
C_{rss}	Reverse Transfer Capacitance		---	80	175	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time[3.4]	V_{DD}=20V , V_{GS}=10V , R_G=6Ω ,I_D=1A	---	8	16	ns
t_r	Rise Time[3.4]		---	3.2	8	ns
$t_{d(off)}$	Turn-Off Delay Time[3.4]		---	26.4	52	ns
t_f	Fall Time[3.4]		---	3.8	8	ns

Q_g	Total Gate Charge[3.4]	V_{DS}=20V , V_{GS}=10V , I_D=10A	---	16.9	32	nC
Q_{gs}	Gate-Source Charge[3.4]		---	2	4	nC
Q_{gd}	Gate-Drain “Miller” Charge[3.4]		---	4.4	9	nC
Rg	Gate resistance	V_{GS}=0V,V_{DS}=0V, F=1MHz	---	2.8	---	Ω
Drain-Source Diode haracteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
Is	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	42	A
I_{SM}	Pulsed Source Current		---	---	84	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=30A.,R_G=25Ω, Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Characteristics： (T$_C$=25℃ unless otherwise noted)

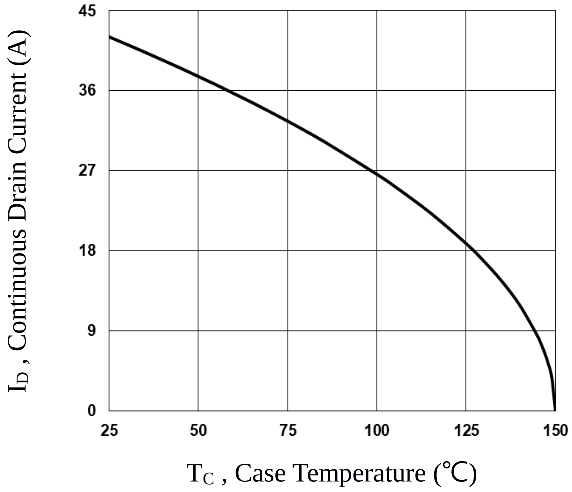


Fig.1 Continuous Drain Current vs. T_C

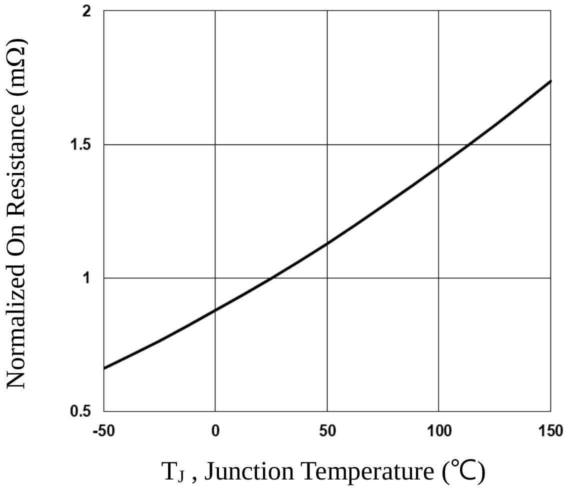


Fig.2 Normalized RDSON vs. T_J

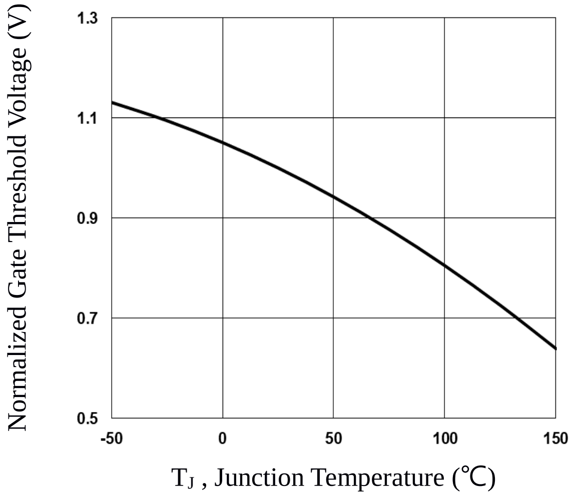


Fig.3 Normalized V_{th} vs. T_J

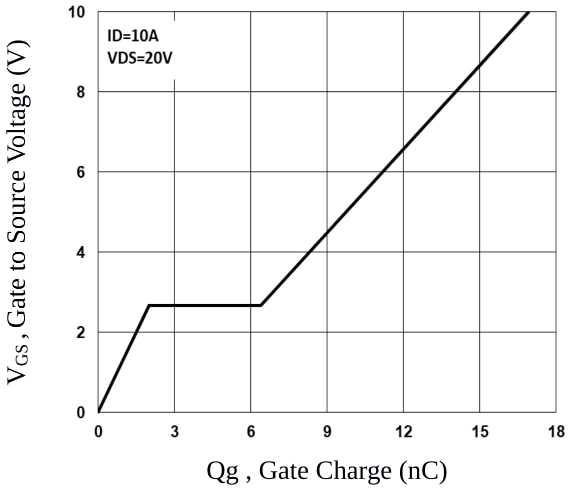


Fig.4 Gate Charge Waveform

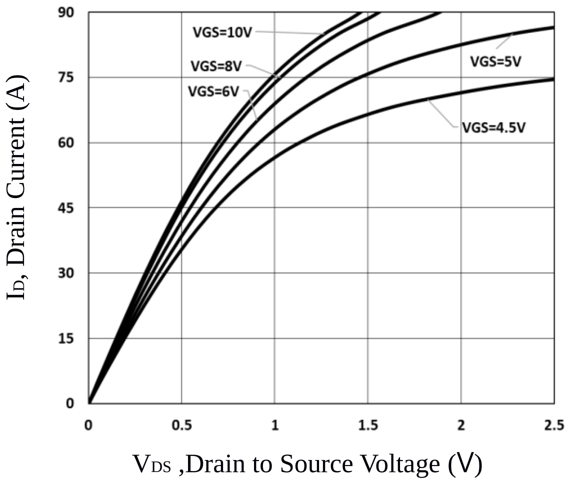


Fig.5 Typical Output Characteristics

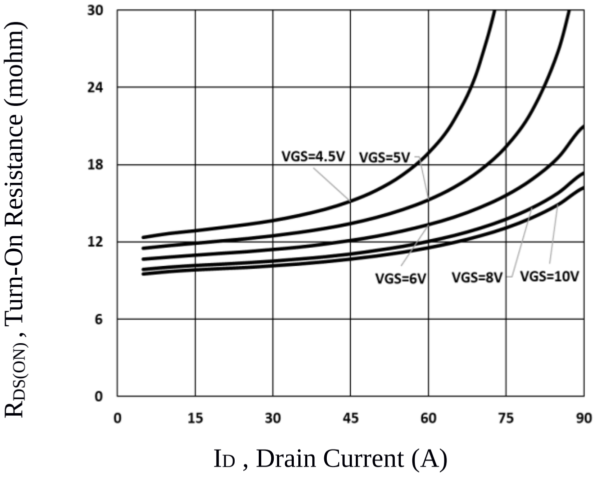


Fig.6 Turn-On Resistance vs. ID

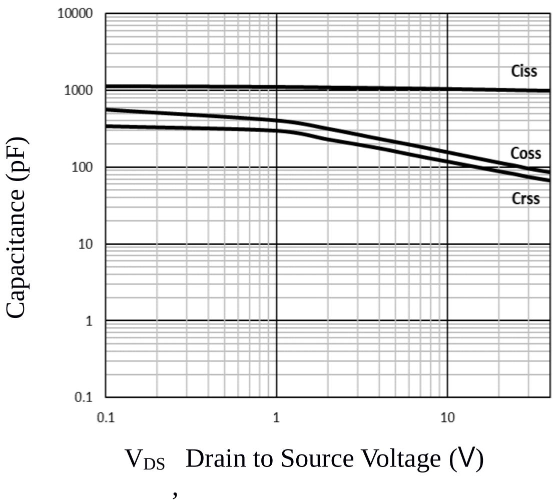


Fig.7 Capacitance Characteristics

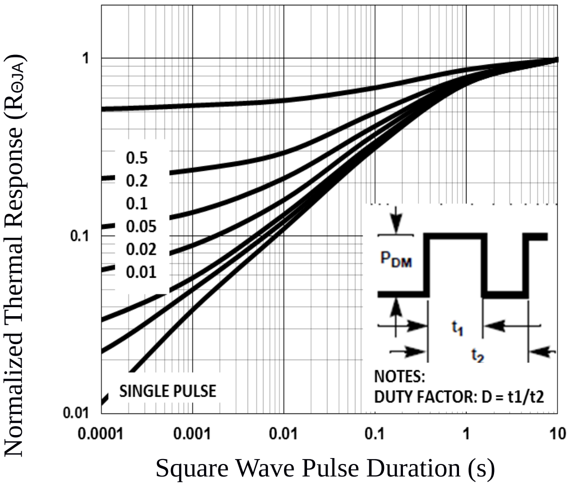


Fig.8 Normalized Transient Response

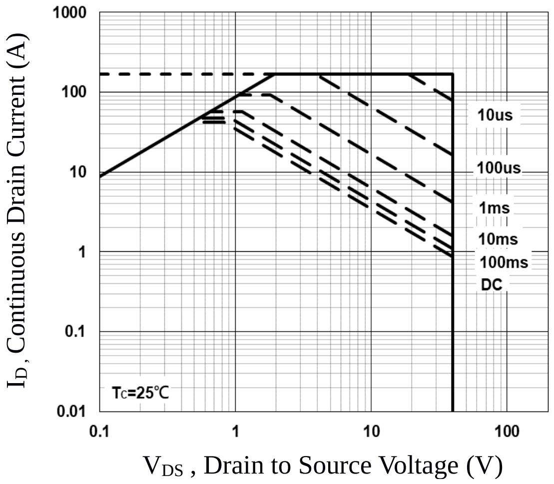


Fig.9 Maximum Safe Operation Area