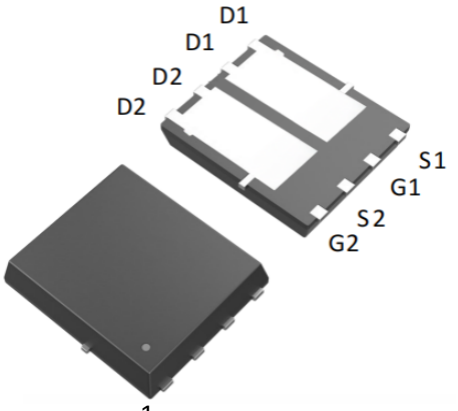
Description：

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.



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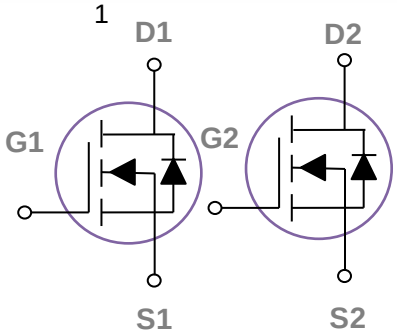

Features：

1) V_{DS}=60V,I_D=40A,$R_{DS(ON)}$<17m Ω @V_{GS}=10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-T_C=25℃	40	A
	Continuous Drain Current-T_C=100℃	29	A
I_{DM}	Pulsed Drain Current[3]	190	A
P_D	Power Dissipation	56	W
E_{AS}	Single pulse avalanche energy[1]	98	mJ
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	2.23	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	℃/W

Package Marking and Ordering Information：

Part NO.	Marking	Package
DON40DN06	40DN06	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	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V	---	---	1	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	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistanc	V_{GS}=10V, I_D=20A	---	13.5	17	mΩ
		V_{GS}=4.5V, I_D=20A	---	18	23	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz	---	1899	---	pF
C_{oss}	Output Capacitance		---	113	---	
C_{rss}	Reverse Transfer Capacitance		---	92	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	VDD=30V, V_{GS}=10V R_{GEN}=3Ω， I_D=20A	---	13	---	ns
t_r	Rise Time		---	25	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	60	---	ns
t_f	Fall Time		---	9	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=20A	---	40	---	nC
Q_{gs}	Gate-Source Charge		---	7.8	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	8.3	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Source Current	VG=VD=0V	---	---	40	A
Ism	Pulsed Source Current	VG=VD=0V	---	---	190	A

V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_D=20A ,V_{GS}=0V	---	---	1.2	V
Trr	Reverse Recovery Time	IF=20A , dI/dt=100A/μs ,	---	29	---	ns
Qrr	Reverse Recovery Charge		---	21	---	nC

Notes:

1) L=0.5mH, V_{DD}=30V, Start T_J=25℃.

2) Limited by maximum junction temperature.

3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics:

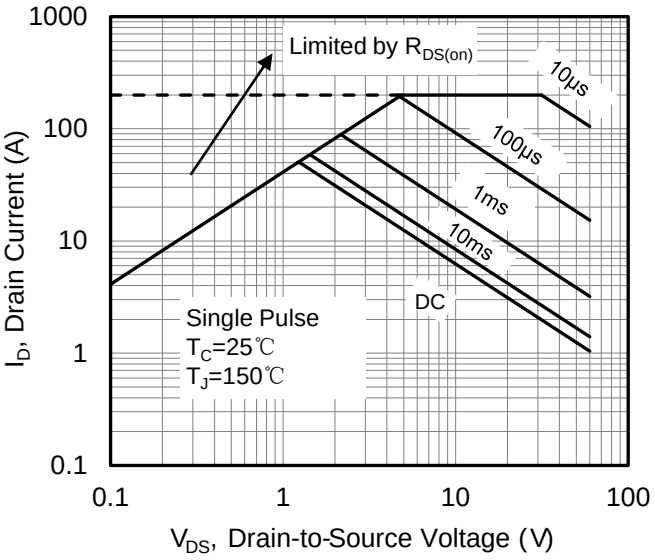

Figure 1. Maximum Safe Operating Area

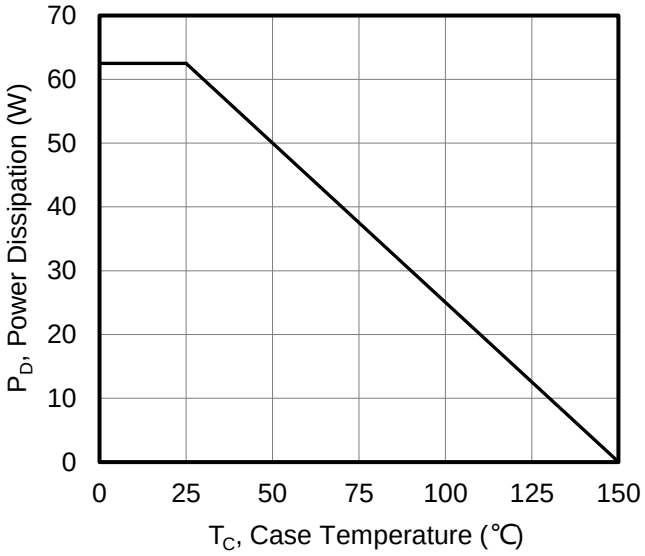

Figure 2. Maximum Power Dissipation vs Case Temperature

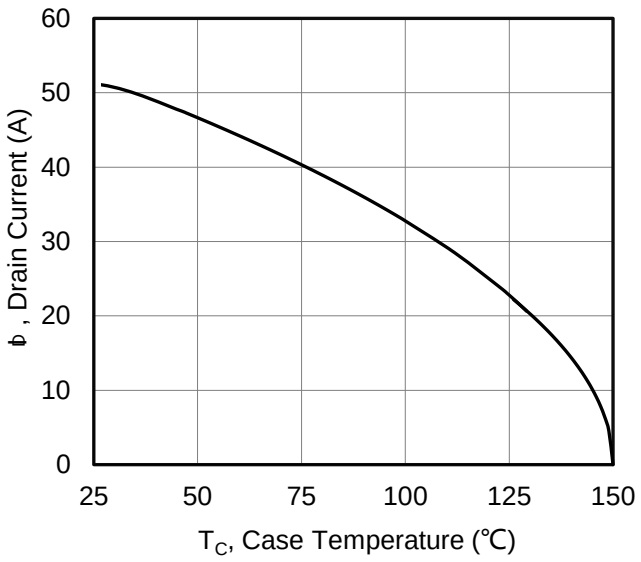

Figure 3. Maximum Continuous Drain Current vs Case Temperature

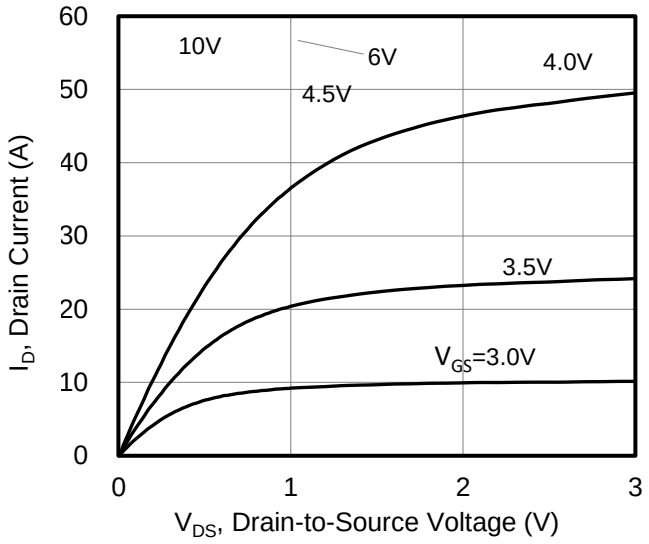

Figure 4. Typical output Characteristics

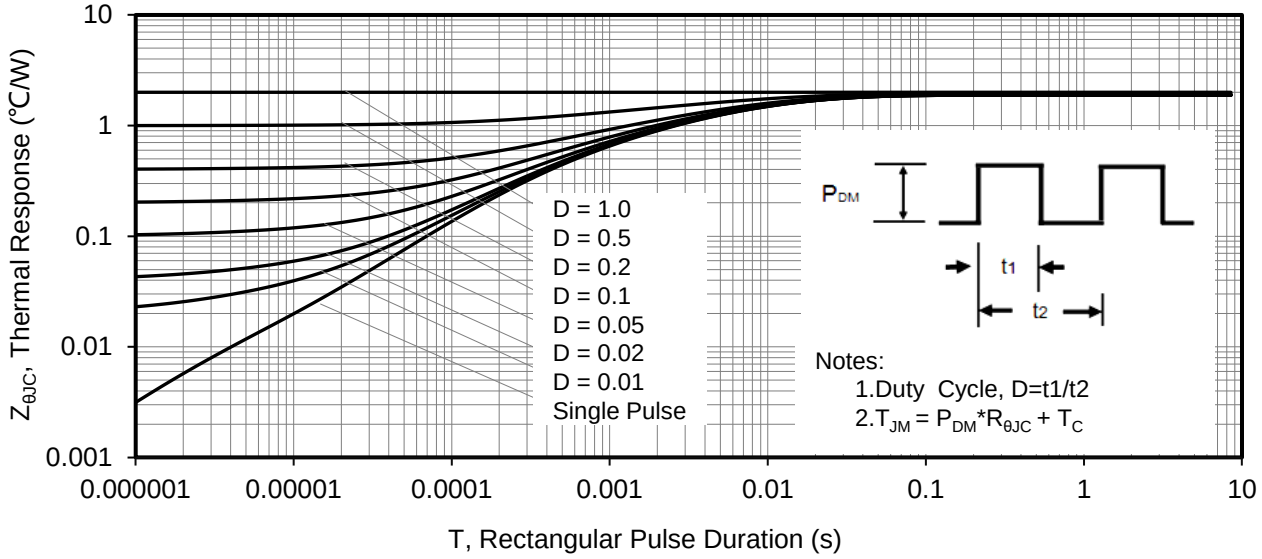

Figure 5. Maximum Effective Thermal Impedance, Junction to Case

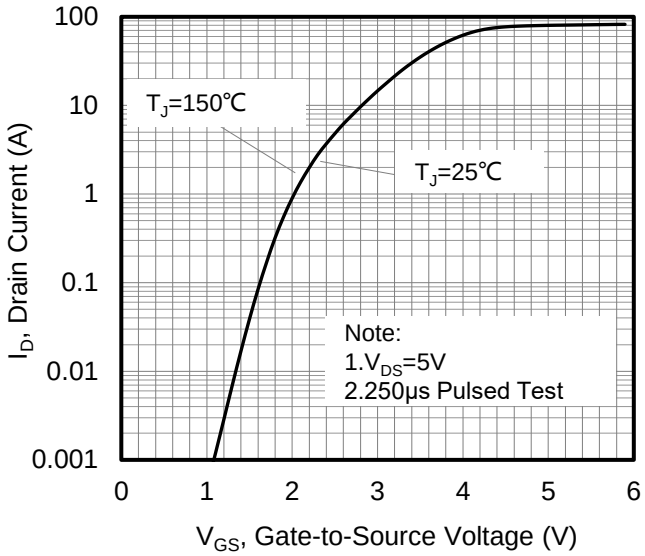

Figure 6. Typical Transfer Characteristics

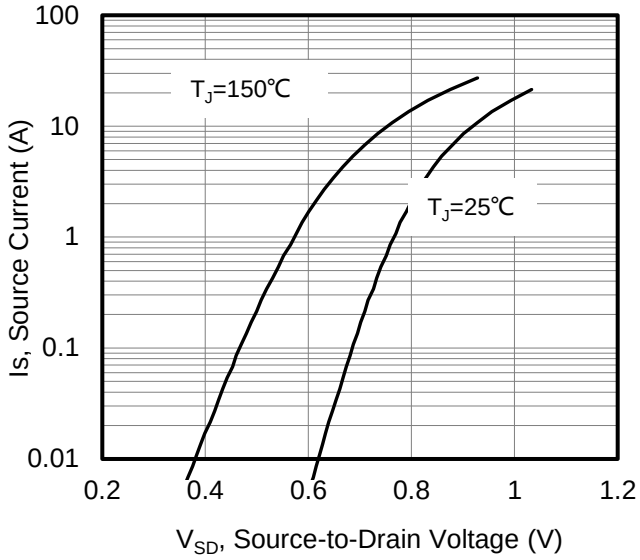

Figure 7. Typical Body Diode Transfer Characteristics

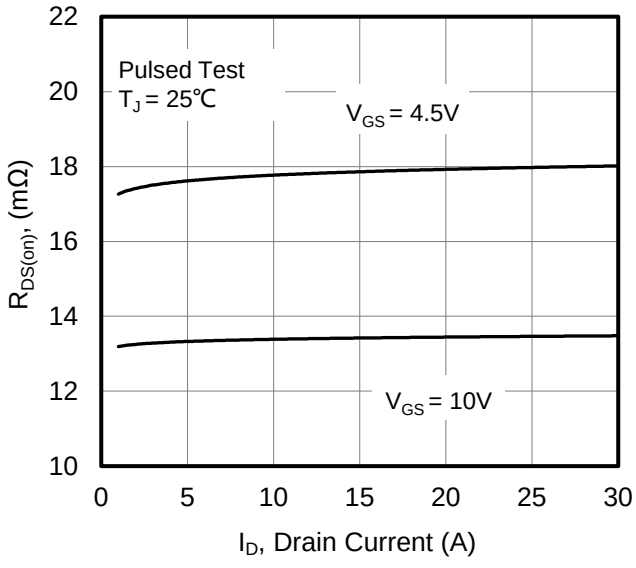

Figure 8. Drain-to-Source On Resistance vs Drain Current

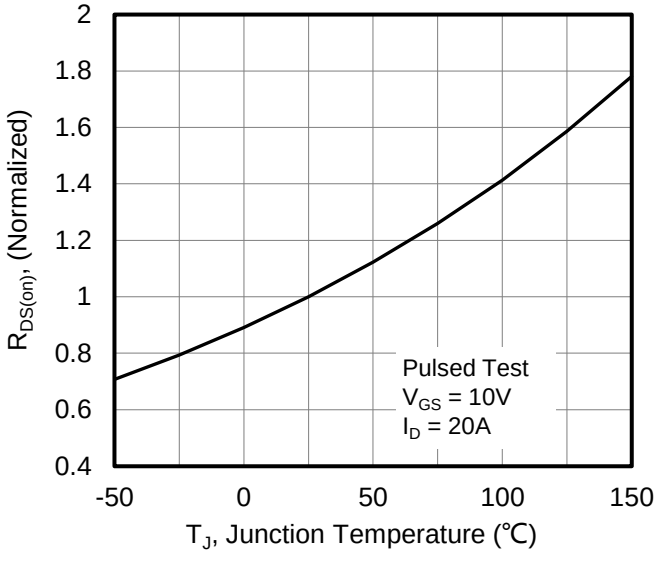

Figure 9. Normalized On Resistance vs Junction Temperature

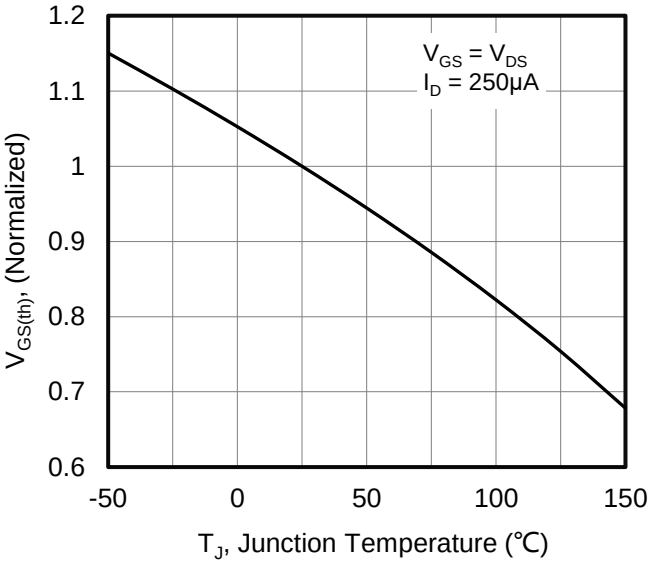

Figure 10. Normalized Threshold Voltage vs Junction Temperature

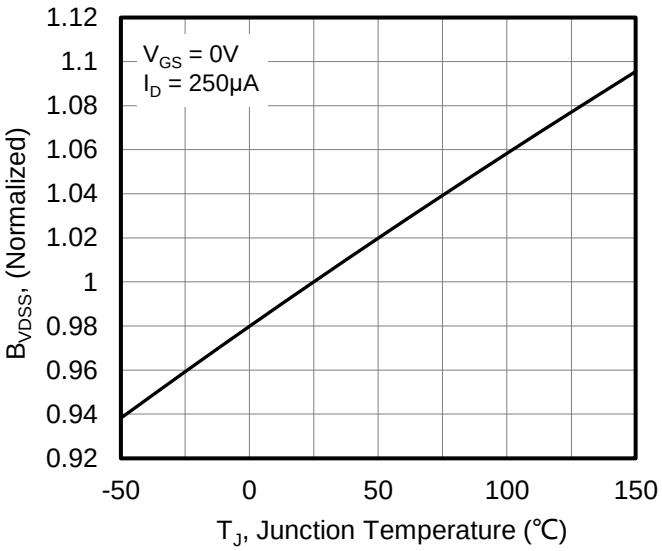

Figure 11. Normalized Breakdown Voltage vs Junction Temperature

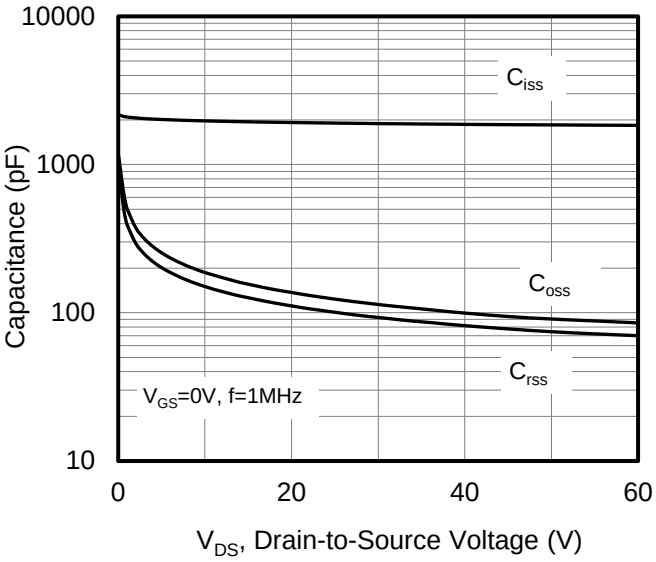

Figure 12. Capacitance Characteristics

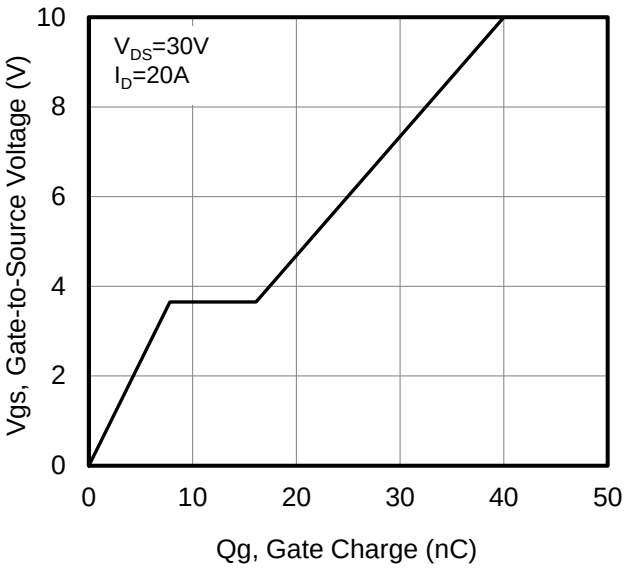

Figure 13. Typical Gate Charge vs Gate to Source Voltage