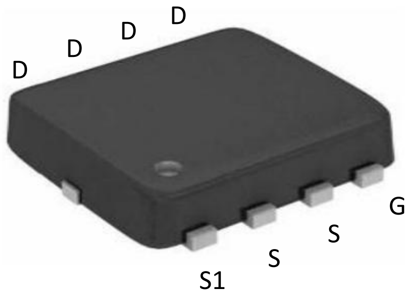
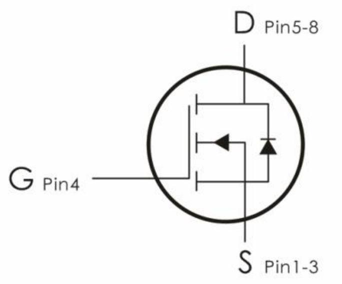
Description：

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.





Features：

1) V_{DS}=40V,I_D=22A,$R_{DS(ON)}$<22mΩ @V_{GS}=10V
2) Improved dv/dt capability
3) Fast switching
4) 100% EAS Guaranteed
5) Green Device Available.

Absolute Maximum Ratings：

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℃	22	A
	Continuous Drain Current-Continuous-T_C=100℃	14	
I_{DM}	Drain Current – Pulsed^{note1}	65	A
EAS	Single Pulse Avalanche Energy^{note2}	16	mJ
P_D	Power Dissipation -T_C=25℃^{4}	15.6	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{θJC}$	Thermal Resistance,Junction to Case	6.9	℃/W

Package Marking and Ordering Information：

Part NO.	Marking	Package
ZD020NG	**D020N**	DFN3*3-8

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	---	---	1.0	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	1.5	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance②	V_{GS}=10V,I_D=8A	---	17	22	mΩ
		V_{GS}=4.5V,I_D=5A	---	25	35	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	---	523	---	pF
C_{oss}	Output Capacitance		---	62	---	
C_{rss}	Reverse Transfer Capacitance		---	53	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=20V ,R_L=2.5Ω V_{GS}=10V , R_{REN}=3Ω	---	4	---	ns
t_r	Rise Time		---	3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	15	---	ns
t_f	Fall Time		---	2	---	ns
Q_g	Total Gate Charge	V_{DS}=20V , V_{GS}=10V , I_D=8A	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	3.2	---	nC

Q_{gd}	Gate-Drain “Miller” Charge		---	3.1	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Source Current1,5	VG=VD=0V , Force Current	---	---	8	A
I_{SM}	Pulsed Source Current2,5		---	---	32	A
V_{SD}	Forward on voltage②	I_{SD}=1A,T_J=25℃,V_{GS}=0V	---	---	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25℃,V_{DD}=20V,V_G=10V,L=0.5mH,Rg=25Ω,I_{AS}=7.2A
   T_J=25℃,V_{DD}=-20V,V_G= -10V,L=0.5mH,Rg=25Ω,I_{AS}=-8.4A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

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

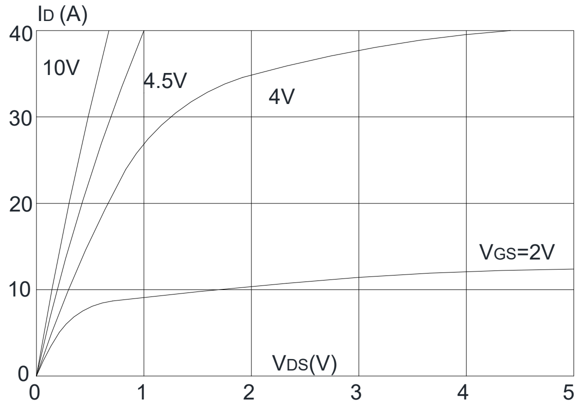


Figure1: Output Characteristics

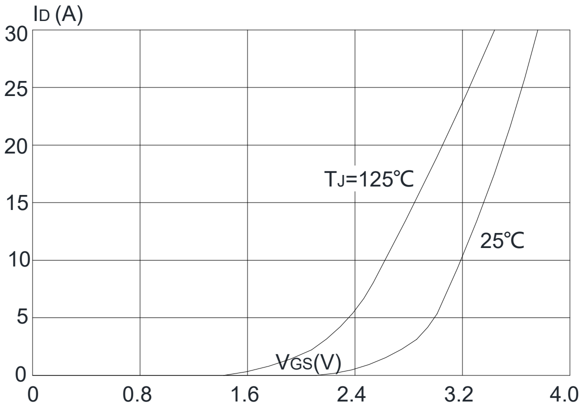


Figure 2: Typical Transfer Characteristics

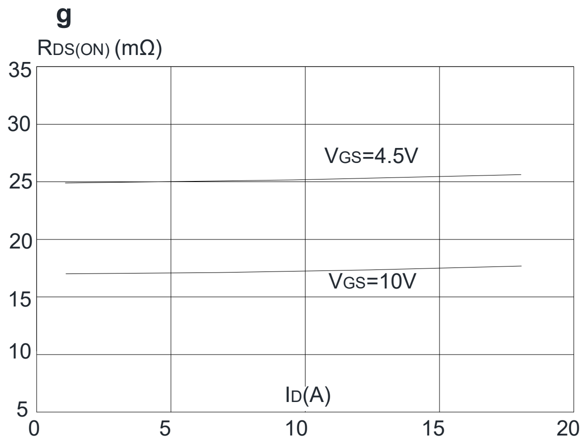


Figure 3: On-resistance vs. Drain Current

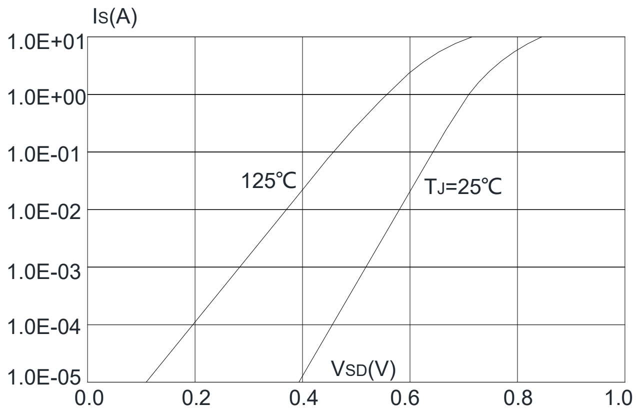


Figure 4: Body Diode Characteristics

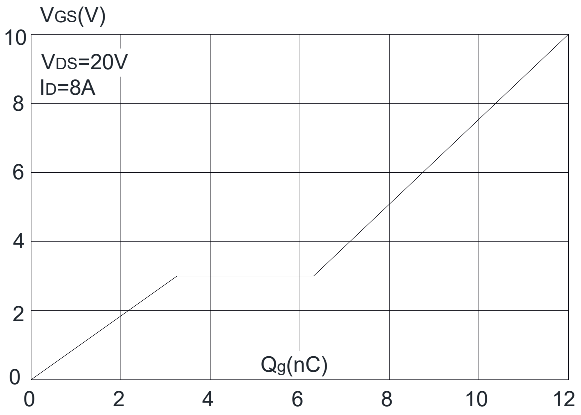


Figure 5: Gate Charge Characteristics

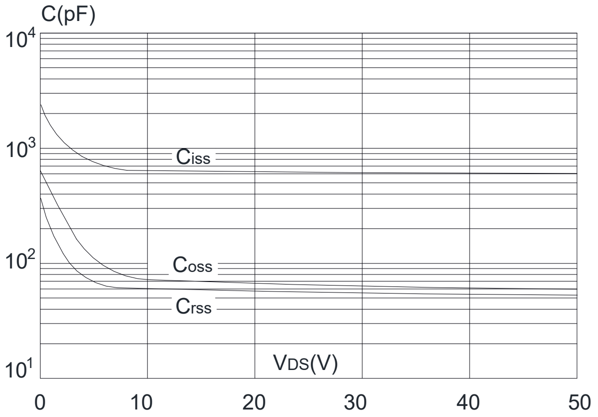


Figure 6: Capacitance Characteristics

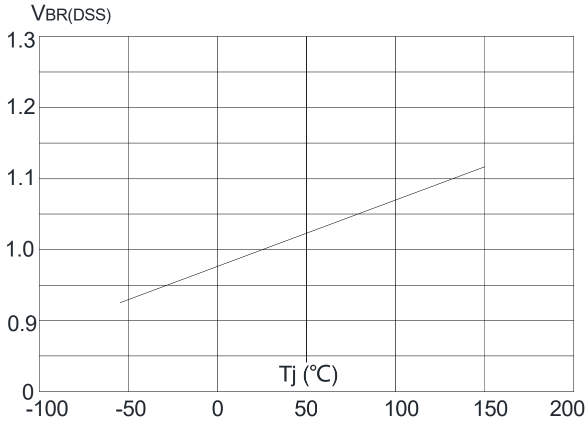


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

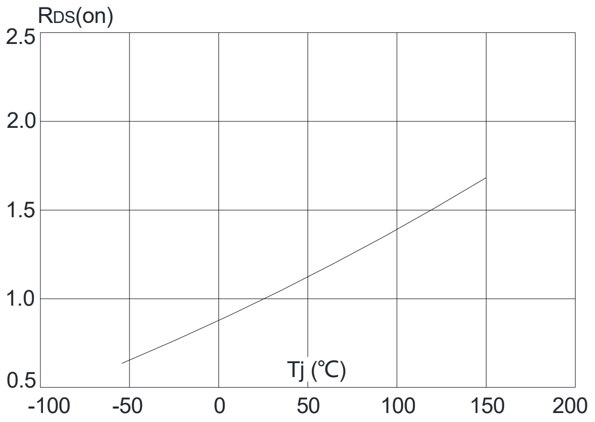


Figure 8: Normalized on Resistance vs. Junction Temperature

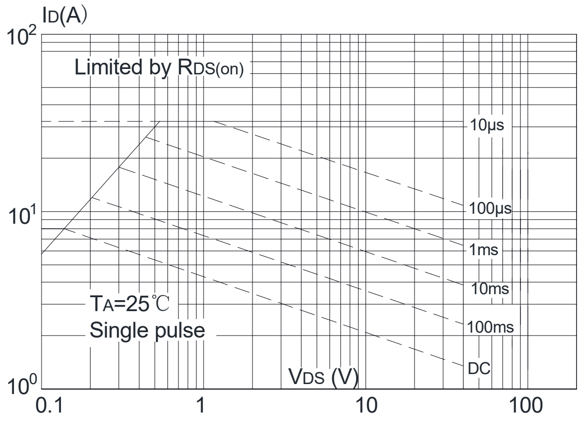


Figure 9: Maximum Safe Operating Area

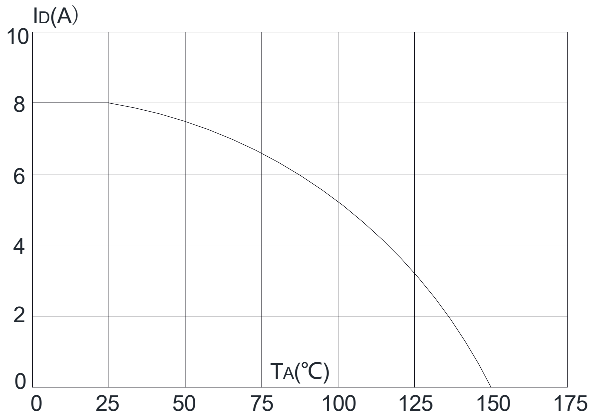


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

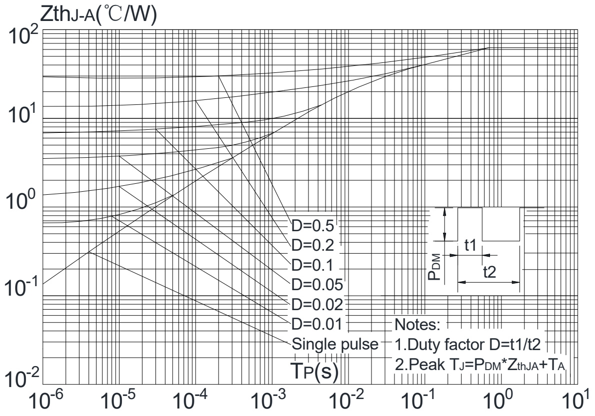


Figure.11: Maximum Effective
Transient Thermal Impedance, Junction-to-Ambient