PGD04N030

40V/100A N-Channel Advanced Power MOSFET

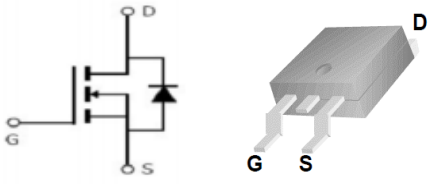
Features

- Ultra Low Gate Charge cause lower driving requirements
- 100% Avalanche Tested

V_{DS}	40	V
I_D	100	A
$R_{DS(on),Typ}$ @V_{GS}=10V	2.6	mΩ
$R_{DS(on),Typ}$ @V_{GS}=4.5V	3.5	mΩ

Applications

- Power Supply
- DC-DC Converters
- Motor Drive



TO-252

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGD04N030	TO-252	PGD04N030	13inch	2500PCS	50000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		40	V
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C =25°C	100	A
Mounted on Large Heat Sink				
E_{AS}	Single Pulse Avalanche Energy (Note1)		182	mJ
I_{DM}	Pulse Drain Current Tested (Note2)	T_C =25°C	400	A
I_D	Continuous Drain current	T_C =25°C	100	A
P_D	Maximum Power Dissipation	T_C =25°C	78	W
$R_{\theta Jc}$	Thermal Resistance Junction−to−Case		1.6	°C/W

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j= 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	V_{GS}=0V I_D=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	V_{DS}=40V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1	--	2.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note3)	V_{GS}=10V, I_D=30A	--	2.6	3.1	mΩ
		V_{GS}=4.5V, I_D=20A	--	3.5	4.5	mΩ
Dynamic Electrical Characteristics @ T_j= 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	--	2070	--	pF
C_{oss}	Output Capacitance		--	1132	--	pF
C_{rss}	Reverse Transfer Capacitance		--	45	--	pF
Q_g	Total Gate Charge	V_{DS}=20V, I_D=30A, V_{GS}=10V	--	35	--	nC
Q_{gs}	Gate-Source Charge		--	6.5	--	nC
Q_{gd}	Gate-Drain Charge		--	5.8	--	nC
R_g	Gate Resistance	f=1MHz	--	1.9	--	Ω
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=20V, I_D=30A, RG=5Ω, V_{GS}=10V	--	15	--	ns
t_r	Turn-on Rise Time		--	5.2	--	ns
$t_{d(off)}$	Turn-off Delay Time		--	44	--	ns
t_f	Turn-off Fall Time		--	10	--	ns
Source- Drain Diode Characteristics @ T_j= 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=30A,V_{GS}=0V	--	--	1.2	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_D=30A, di/dt=100A/us	--	65	--	ns
Q_{rr}	Reverse Recovery Charge		--	13	--	nC

Note:

1. Limited by TJmax, starting T_j = 25° C, R_G = 25Ω, V_{DS} =20V, V_{GS} =10V. Part not recommended for use above this value.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guranteed by design, not subject to production testing.

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Typical Characteristics

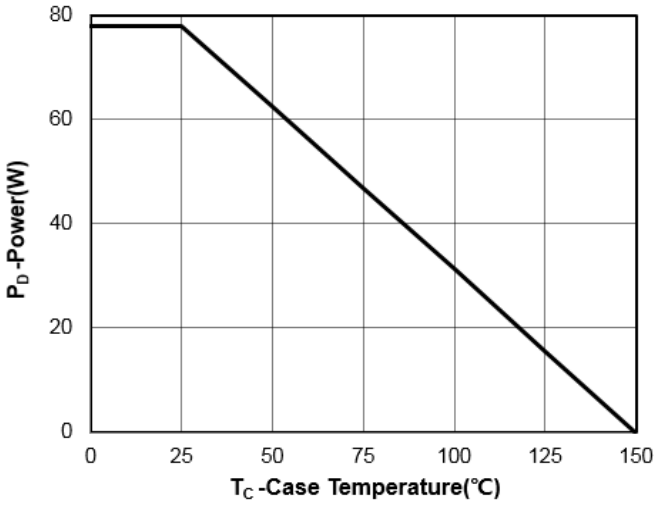


Figure1：Power De-rating

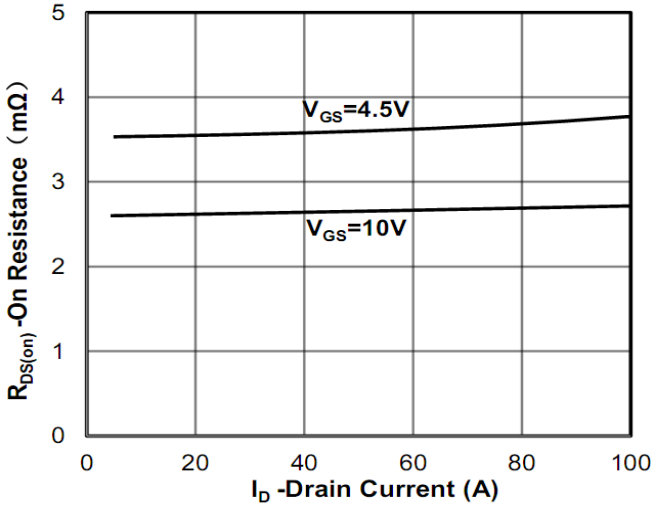


Figure2：$R_{DS(on)}$ -Drain Current

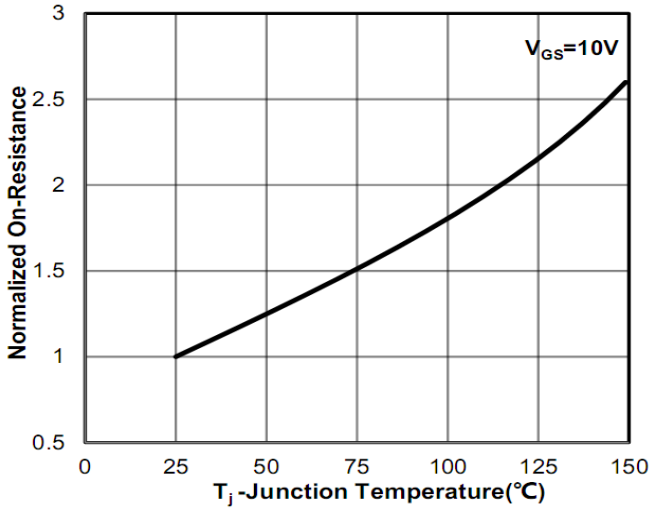


Figure3：$R_{DS(on)}$ -Junction Temperature

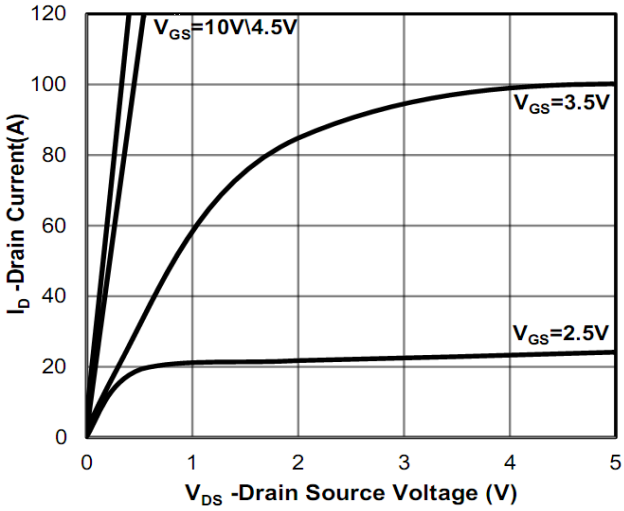


Figure4：Output Characteristics

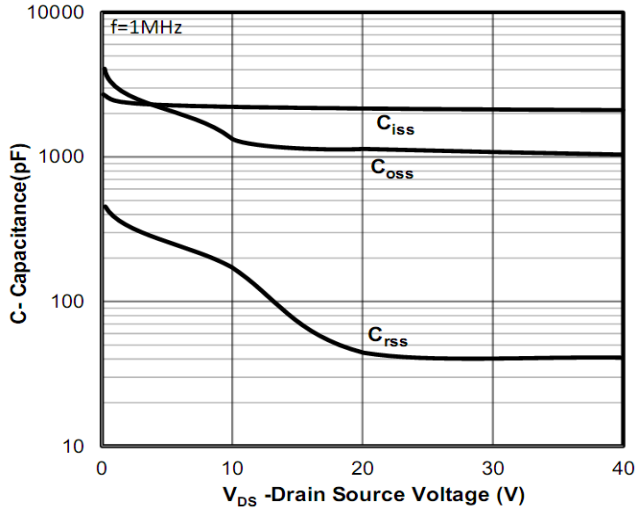


Figure5：Capacitance -V_{DS}

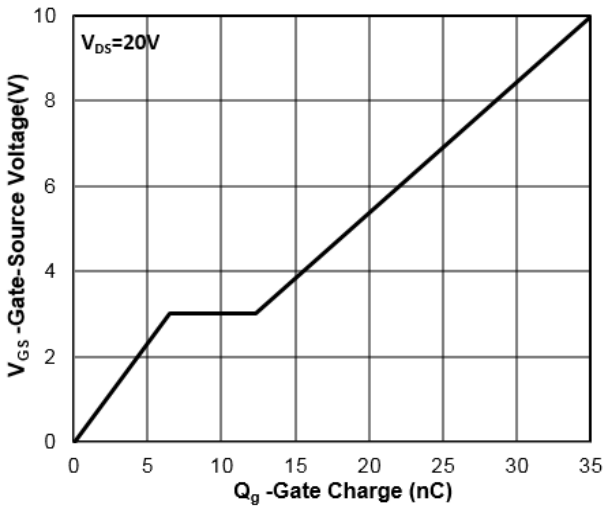


Figure6：Gate Charge

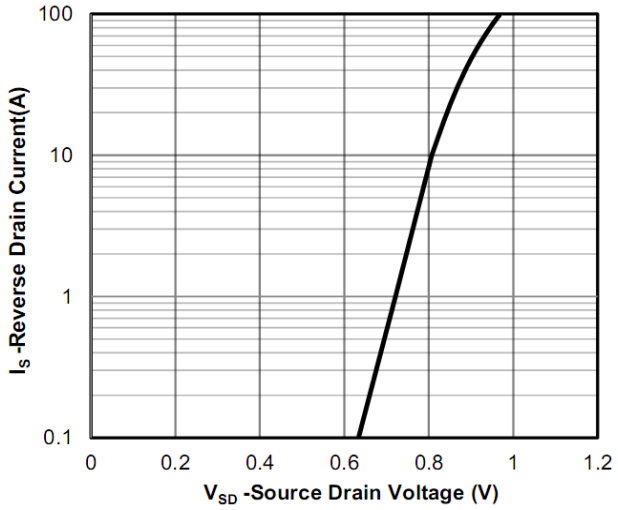


Figure7：Typical Source-Drain Diode Forward Voltage

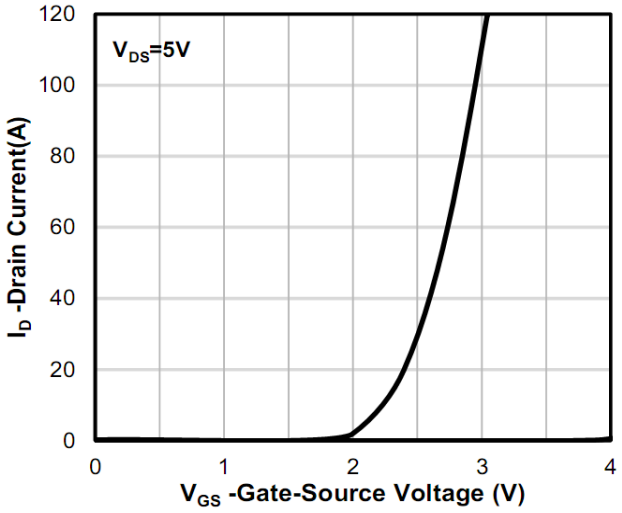


Figure8：Transfer Characteristics

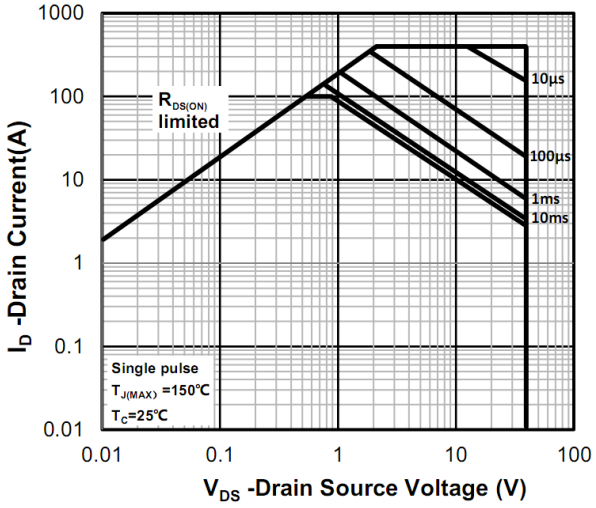


Figure9：Safe Operation Area

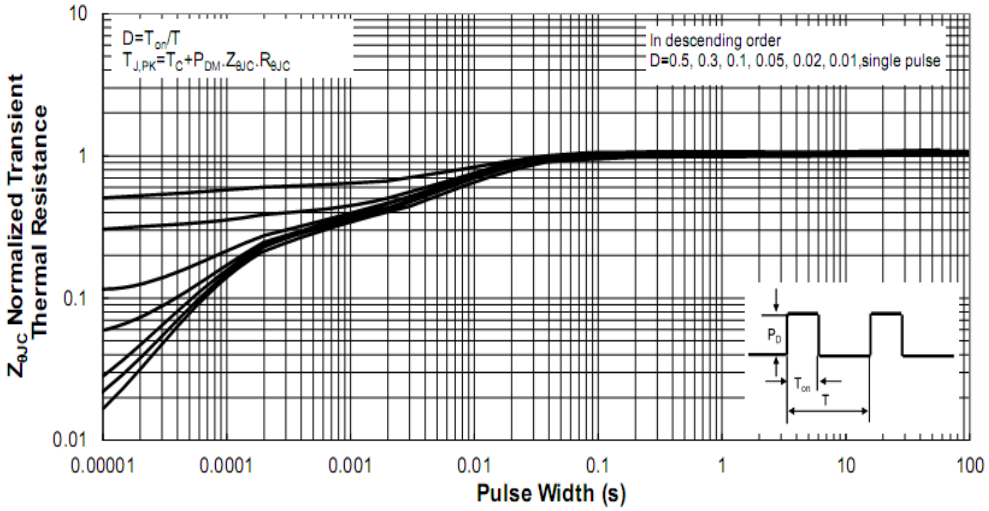


Figure10：Normalized Maximum Transient Thermal Impedance

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Test Circuit and Waveform:

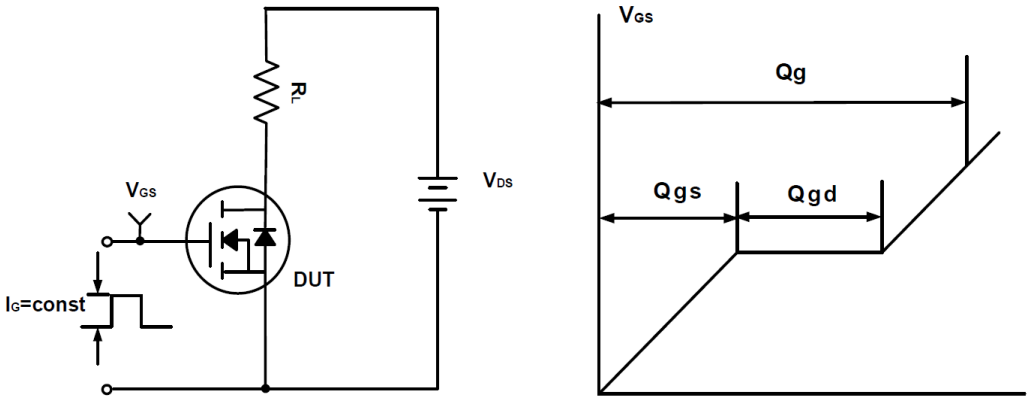


Figure A Gate Charge Test Circuit &Waveforms

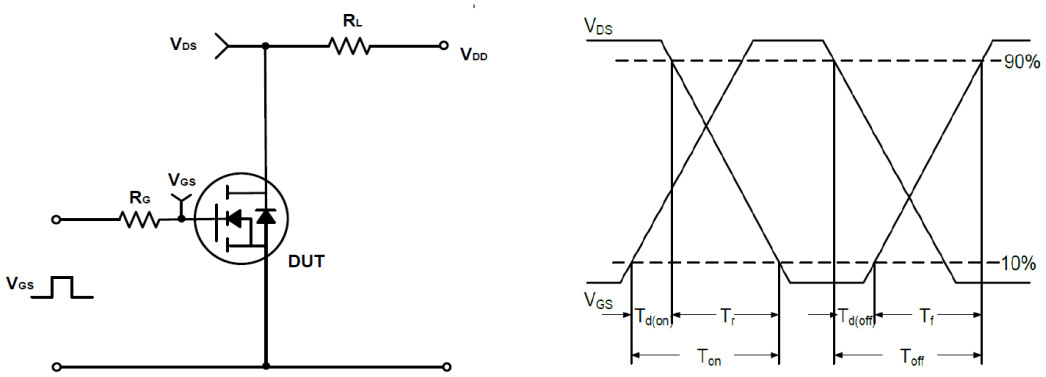


Figure B Switching Test Circuit & Waveforms

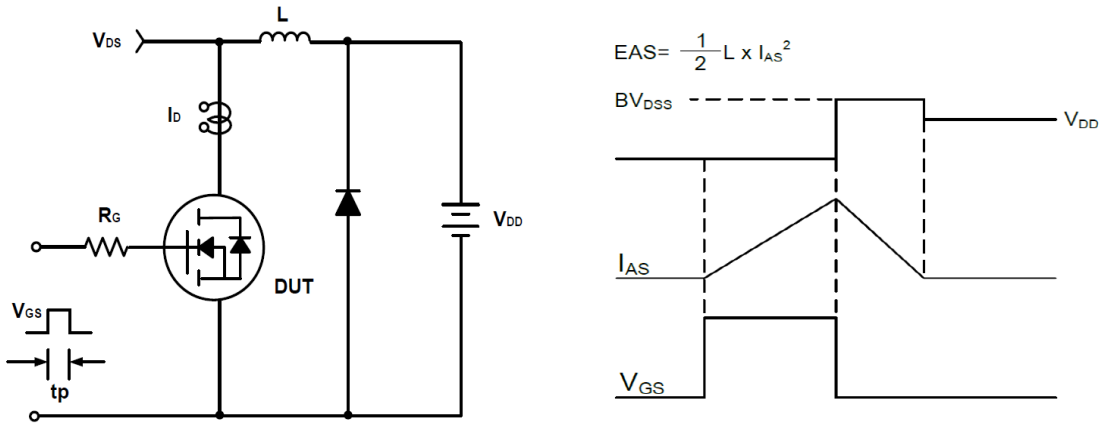
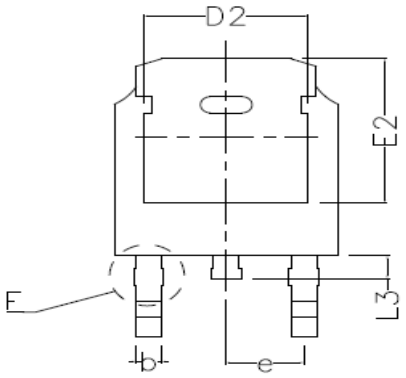


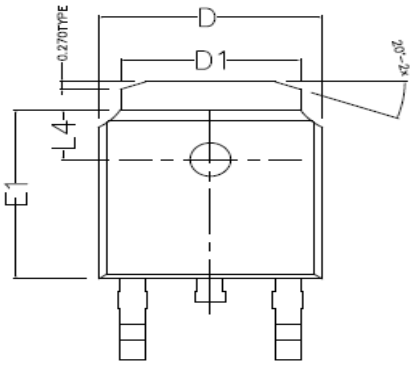
Figure C Unclamped Inductive Switching Circuit & Waveforms

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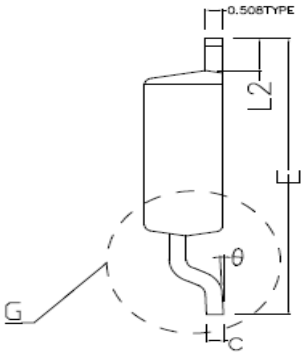
TO-252 Package Outline Dimensions (Units: mm)



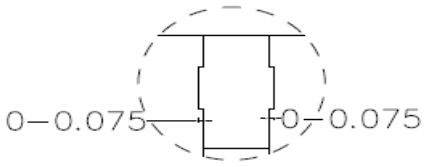
BOTTOM VIEW



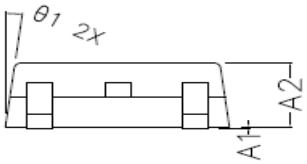
TOP VIEW



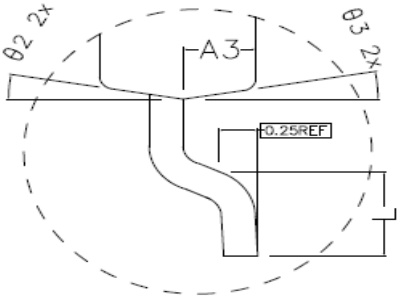
SIDE VIEW



DETAIL F



SIDE VIEW



DETAIL G

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A1	0.030	0.080	0.130
A2	2.200	2.300	2.400
A3	0.960	1.010	1.060
b	0.640	0.690	0.740
c	0.460	0.508	0.550
D	6.500	6.600	6.700
D1		5.334REF	
D2		4.830REF	
E	9.770	9.97	10.170
E1	6.000	6.100	6.200
E2		5.142REF	
e		2.286TYPE	
L	1.400	1.500	1.600
L2		1.00REF	
L3		0.80REF	
L4		1.80REF	
θ		0~6°	
θ1		7° TYPE	
θ2		7° TYPE	
θ3		7° TYPE	