PGT04N013

40V/180A N-Channel Advanced Power MOSFET

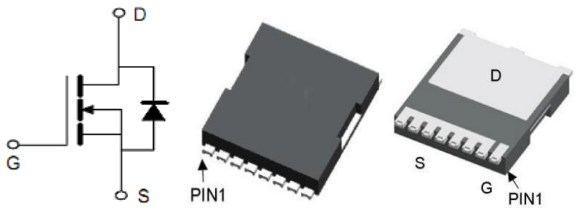
Features

- Fast switching capability
- Robust design wish better EAS performance
- EMI Improved

BVDSS	40	V
ID	180	A
RDSON@VGS=10V	1.3	mΩ
RDSON@VGS=4.5V	2.2	mΩ

Applications

- Server/Telecom
- High Power Supply
- E-Tools
- Motor Driver
- BMS



TOLL

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGT04N013	TOLL	PGT04N013	13inch	1500PCS	12000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TC=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	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
I_S	Diode Continuous Forward Current	TC =25°C	180	A
Mounted on Large Heat Sink				
E_{AS}	Single Pulse Avalanche Energy (Note1)		182	mJ
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note2)	TC =25°C	540	A
I_D	Continuous Drain current	TC =25°C	180	A
P_D	Maximum Power Dissipation	TC =25°C	205	W
$R_{\theta Jc}$	Thermal Resistance Junction-to-Case (Note3)		0.61	° C/W

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=40V,VGS=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.2	1.6	2.4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note4)	VGS=10V, ID=30A	--	1.3	1.8	mΩ
		VGS=4.5V, ID=20A	--	2.2	2.7	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note5)						
C_{iss}	Input Capacitance	VDS=20V, VGS=0V, F=1MHz	--	4067	--	pF
C_{oss}	Output Capacitance		--	1134	--	pF
C_{rss}	Reverse Transfer Capacitance		--	110	--	pF
Q_g	Total Gate Charge	VDS=20V, ID=40A, VGS=10V	--	79	--	nC
Q_{gs}	Gate-Source Charge		--	10	--	nC
Q_{gd}	Gate-Drain Charge		--	13	--	nC
Switching Characteristics (Note5)						
$t_{d(on)}$	Turn-on Delay Time	VDS=20V, ID=40A, RG=1.6Ω, VGS=10V	--	22	--	nS
t_r	Turn-on Rise Time		--	11	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	95	--	nS
t_f	Turn-off Fall Time		--	48	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	IS=20A,VGS=0V	--	--	1.2	V

Note:

1. Limited by TJmax, starting TJ = 25° C, RG =25Ω, VDS =30V, VGS =10V. Part not recommended for use above this value.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Surface Mounted on FR4 Board, t ≤ 10 sec.
4. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
5. Guranteed by design, not subject to production testing.

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Typical Performance Characteristics

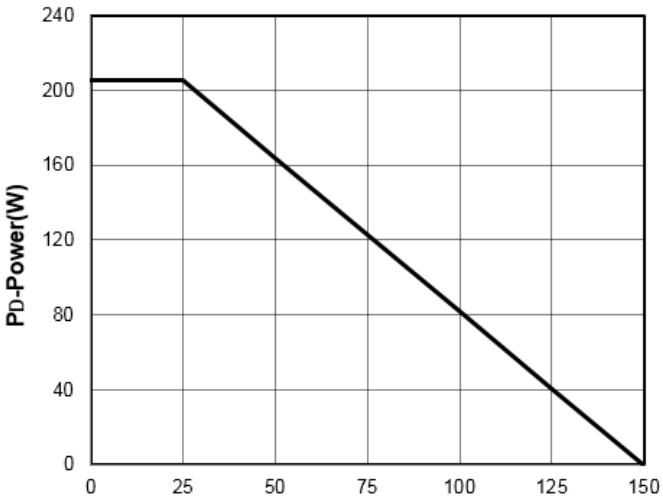

Figure1：T_J -Junction Temperature（°C）

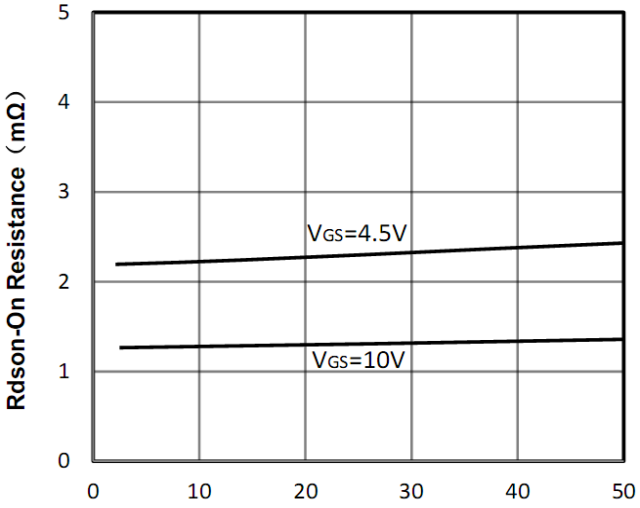

Figure2：I_D -Drain Current（A）

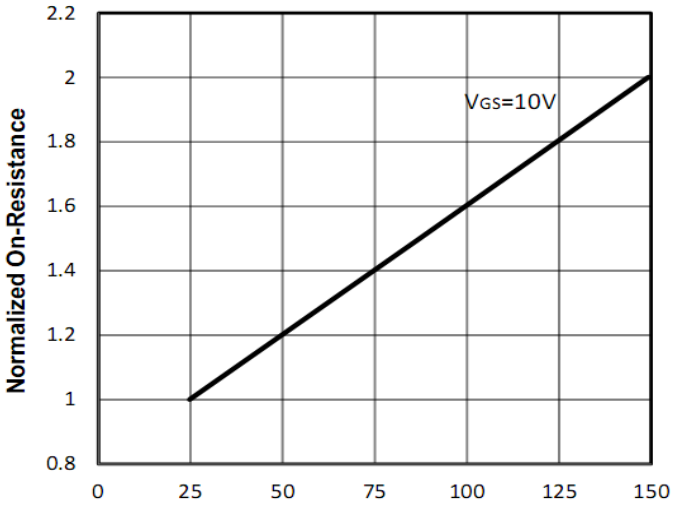

Figure3：T_J -Junction Temperature（°C）

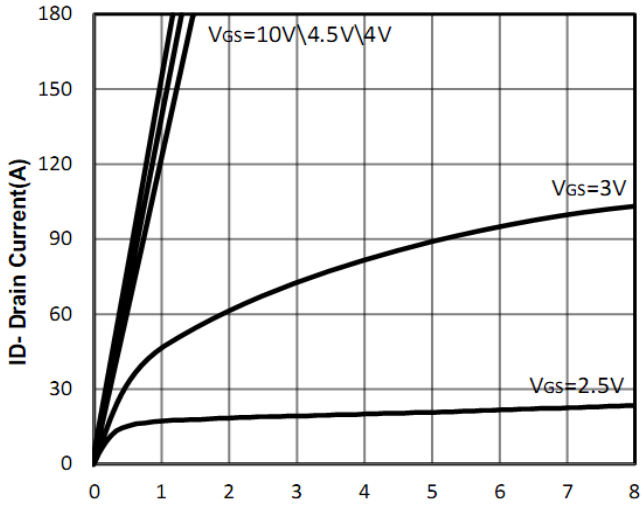

Figure4：V_{DS} –Drain Source Voltage（V）

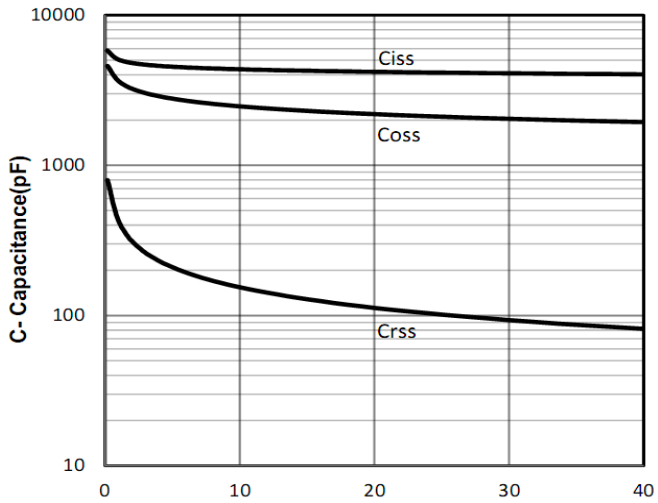

Figure5：V_{DS} -Drain Source Voltage（V）

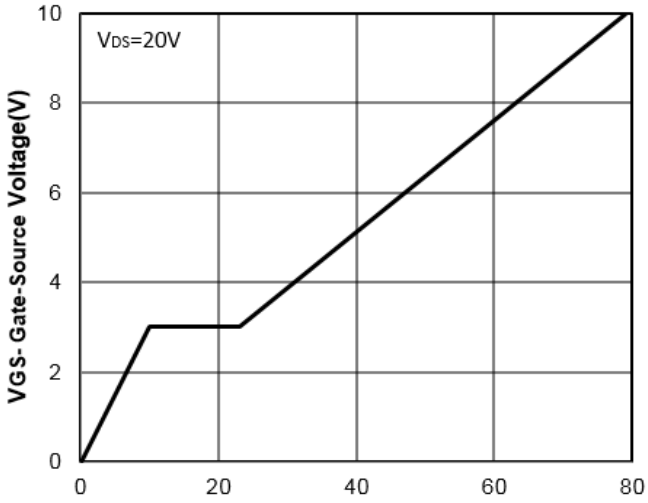

Figure6：Qg -Gate Charge（nC）

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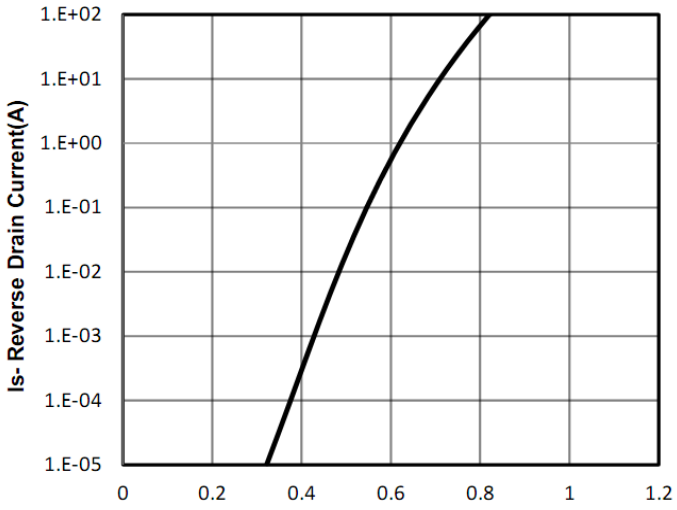

Figure7：Vsd –Source Drain Voltage（V）

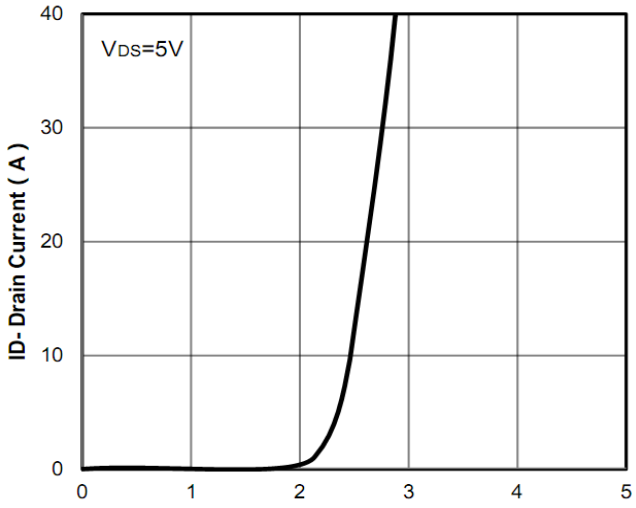

Figure8：VGS –Gate Source Voltage（V）

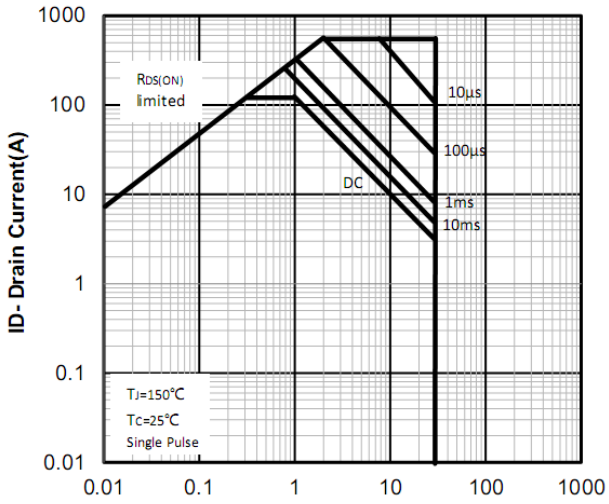

Figure9：VDS -Drain Source Voltage（V）

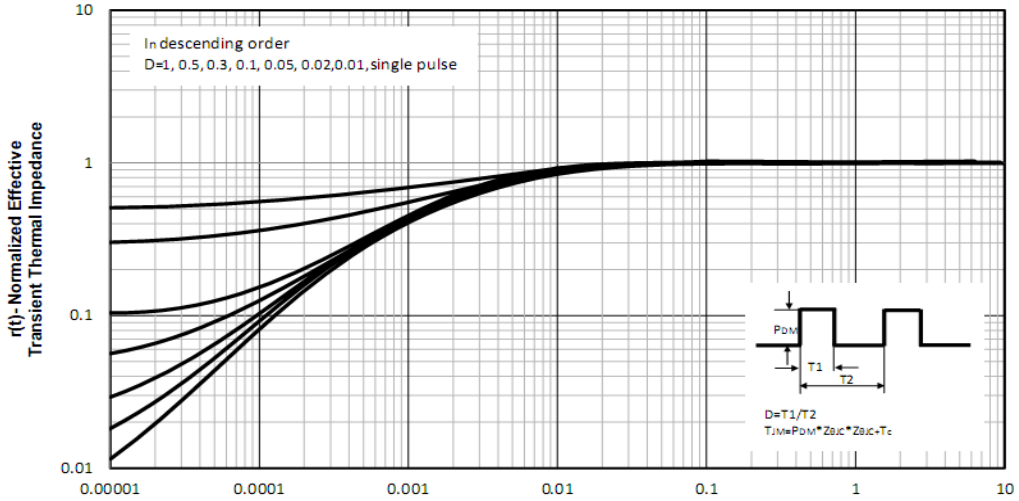

Figure10：Square Wave Pulse Duration（sec）

Test Circuit and Waveform:

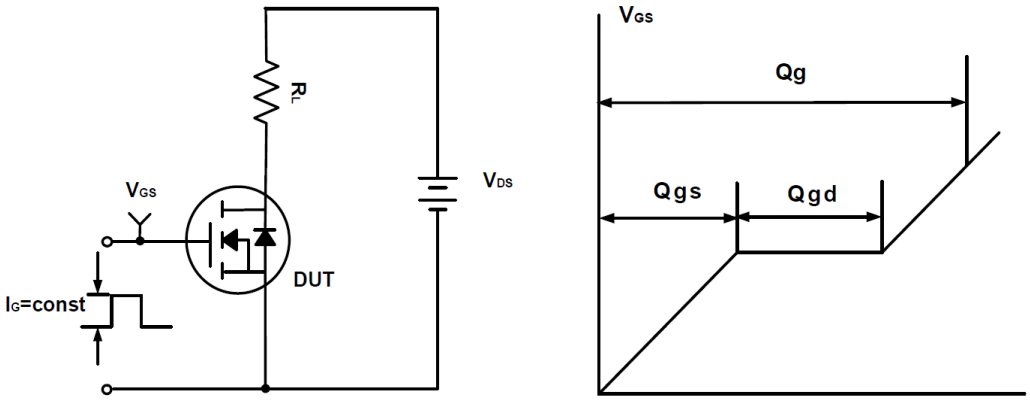

Figure A Gate Charge Test Circuit &Waveforms

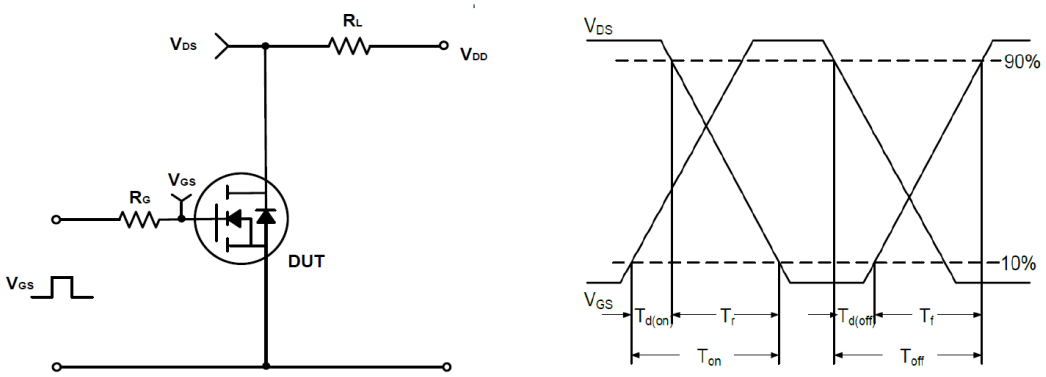

Figure B Switching Test Circuit & Waveforms

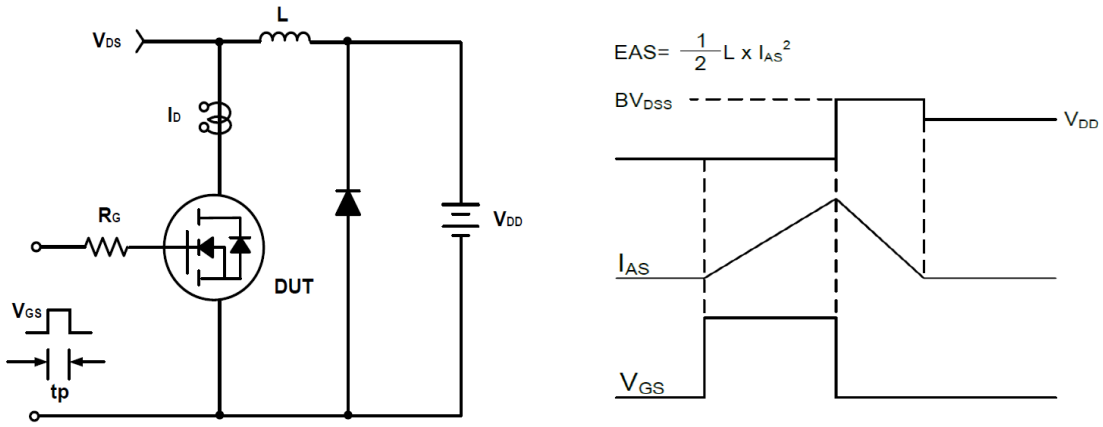

Figure C Unclamped Inductive Switching Circuit & Waveforms

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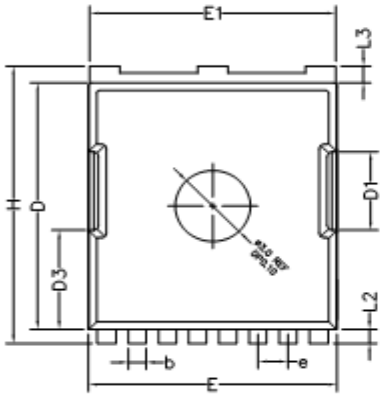
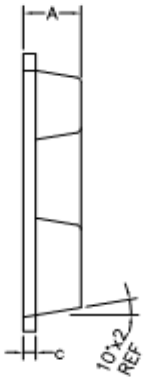
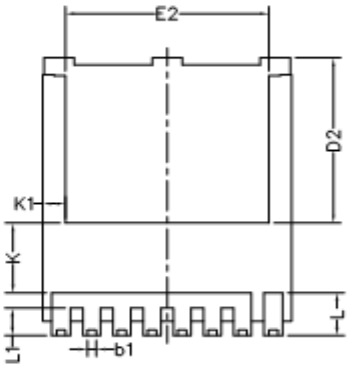
TOLL Package Outline Dimensions (Units: mm)



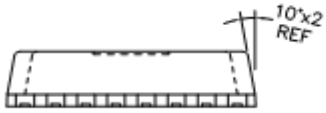
TOP VIEW



SIDE VIEW



BOTTEM VIEW



SIDE VIEW

COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.200	2.300	2.400
b	0.600	0.700	0.900
b1	0.300	–	0.500
c	0.400	0.500	0.600
D	10.280	10.380	10.480
D1	3.200	3.300	3.400
D2	6.850	6.950	7.050
D3		4.18REF	
E	9.800	9.900	10.000
E1	9.700	9.800	9.900
E2	8.000	8.100	8.200
e		1.200BSC	
H	11.480	11.680	11.880
L	1.600	1.800	2.100
L1	1.000	1.150	1.300
L2		0.600 TYPE	
L3		0.600 TYPE	
K		2.900 TYPE	
K1		0.900 TYPE	