



120V/250A N-Channel Advanced Power MOSFET

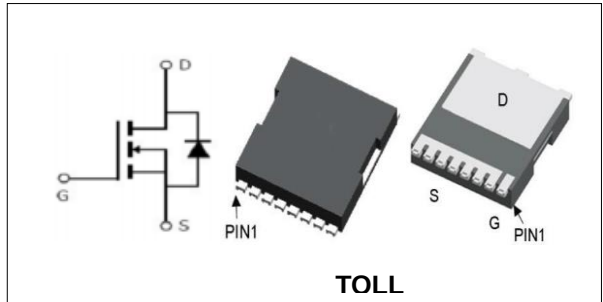
Features

- Maximum Junction Temperature Range (150°C)
- 100% Avalanche Tested

BVDSS	120	V
ID	250	A
RDSON@VGS=10V	2.2	mΩ

Applications

- Battery management system
- Motor control and drive
- Uninterruptible Power Supplies



Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGT12N028H	TOLL	PGT12N028H	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		120	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	TC =25°C	250	A
Mounted on Large Heat Sink				
E _{AS}	Single Pulse Avalanche Energy (Note1)		1468	mJ
I _{DM}	Pulse Drain Current Tested (Note2)	TC =25°C	920	A
I _D	Continuous Drain current	TC =25°C	250	A
P _D	Maximum Power Dissipation	TC =25°C	278	W
R _{θJc}	Thermal Resistance Junction-to-Case		0.45	°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	120	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=120V,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	2	--	4	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=10V, ID=50A	--	2.2	2.8	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS=60V, VGS=0V, F=1MHz	--	11800	--	pF
C _{oss}	Output Capacitance		--	1260	--	pF
C _{rss}	Reverse Transfer Capacitance		--	51	--	pF
Q _g	Total Gate Charge	VDS=60V, ID=50A, VGS=10V	--	149	--	nC
Q _{gs}	Gate-Source Charge		--	61	--	nC
Q _{gd}	Gate-Drain Charge		--	29	--	nC
R _G	Gate Resistance	F=1MHz	--	2.5	--	Ω
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDS=60V, ID=50A, RG=2.7Ω, VGS=10V	--	45	--	nS
t _r	Turn-on Rise Time		--	85	--	nS
t _{d(off)}	Turn-off Delay Time		--	97	--	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=50A,VGS=0V	--	--	1.4	V

Note:

1. Limited by TJmax, starting TJ = 25° C, RG =25Ω, VDS =60V, VGS =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 Performance Characteristics

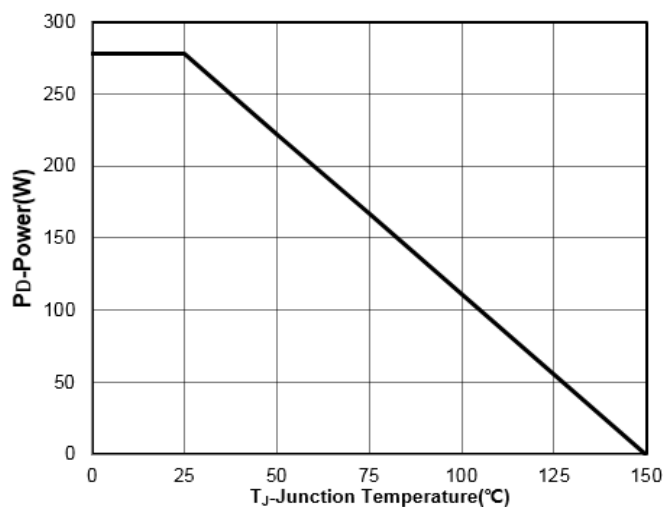


Figure1: Power De-rating

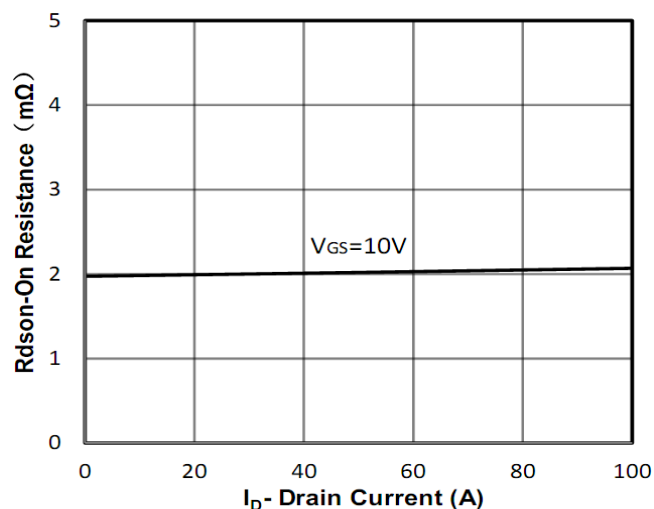


Figure2: Rdson- Drain Current

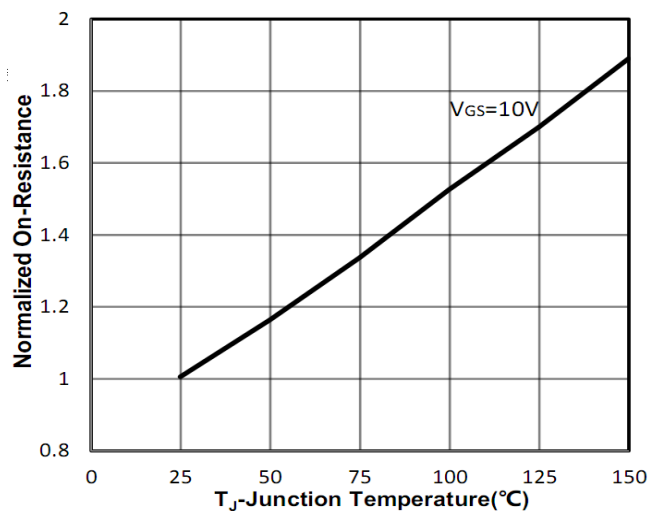


Figure3: Rdson-Junction Temperature

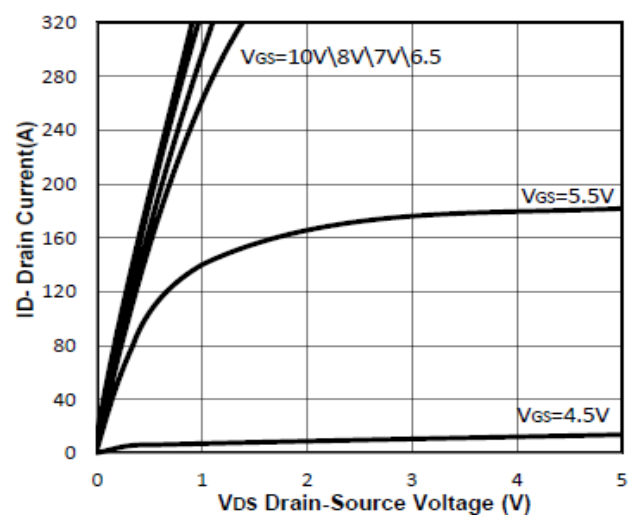


Figure4: Output Characteristics

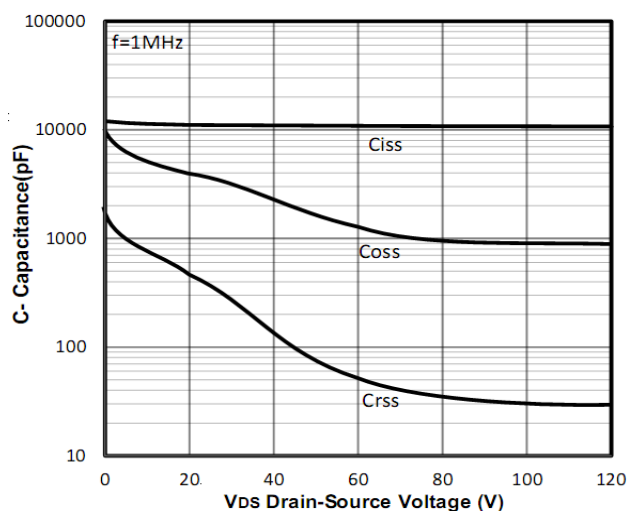


Figure5: Capacitance vs VDS

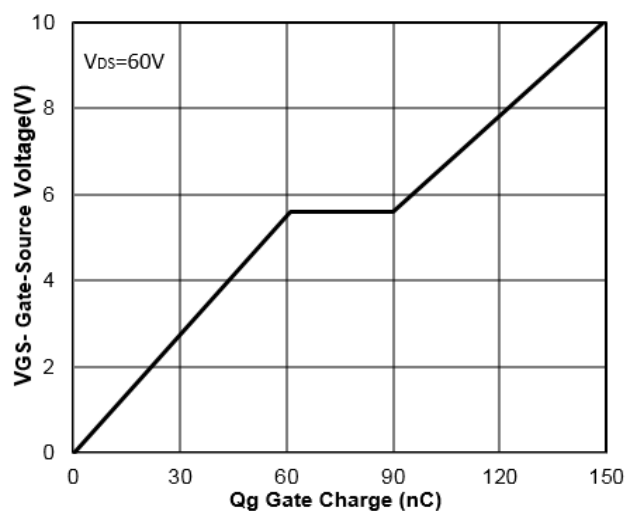


Figure6: Gate Charge



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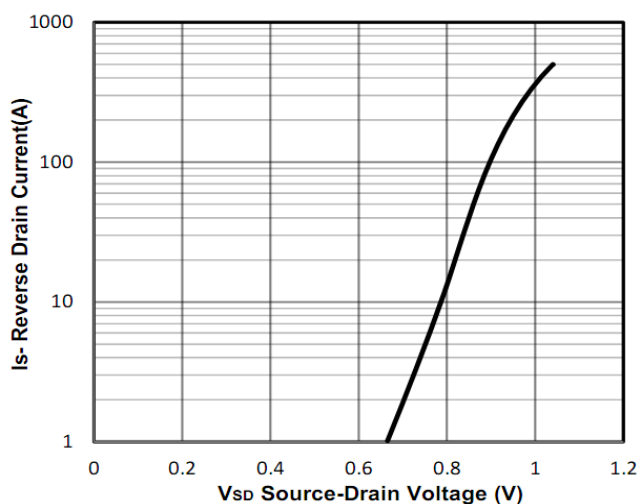


Figure7: Source- Drain Diode Forward

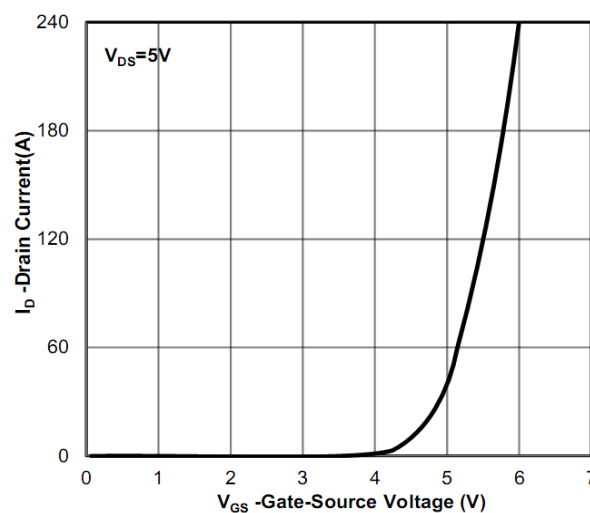


Figure8: Transfer Characteristics

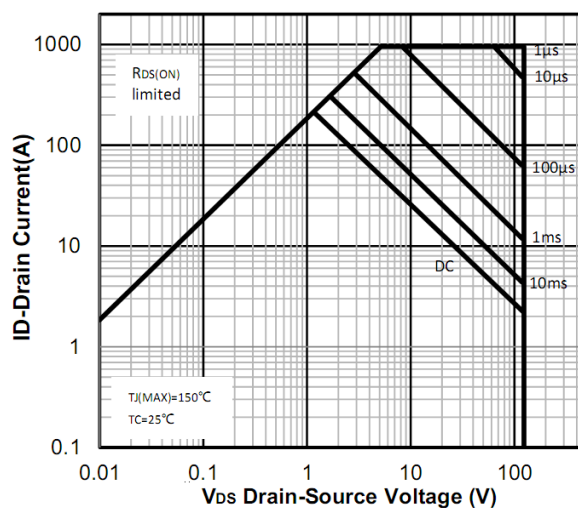


Figure9: Safe Operation Area

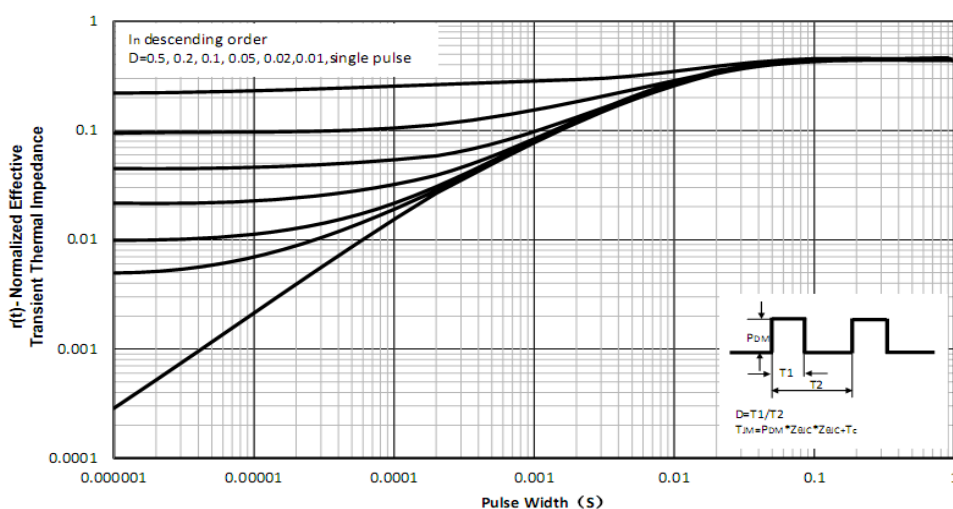


Figure10: Normalized Maximum Transient Thermal Impedance



Test Circuit and Waveform:

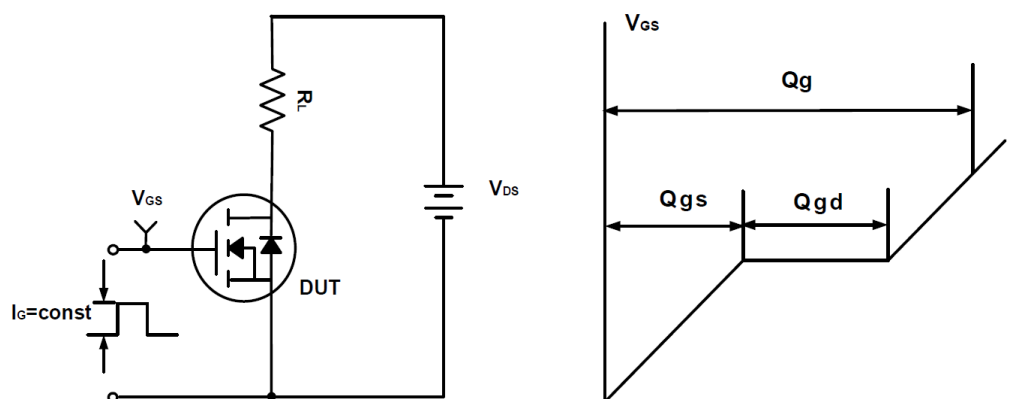


Figure A Gate Charge Test Circuit & Waveforms

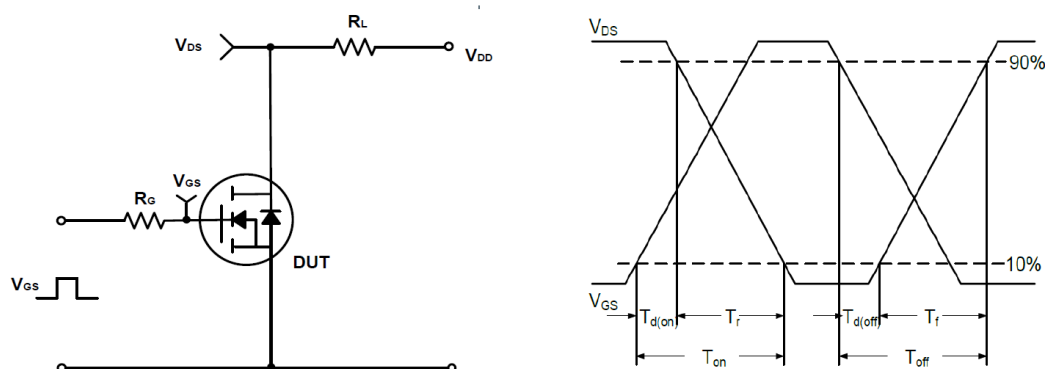


Figure B Switching Test Circuit & Waveforms

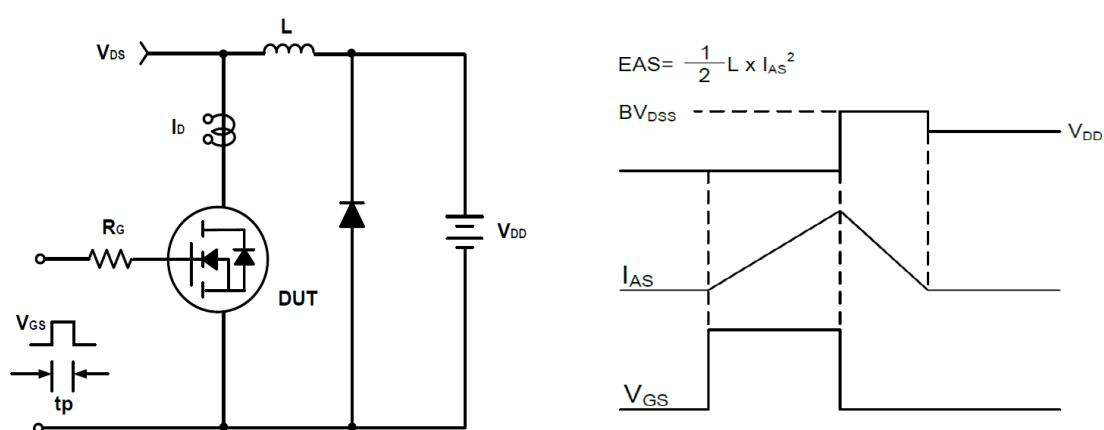
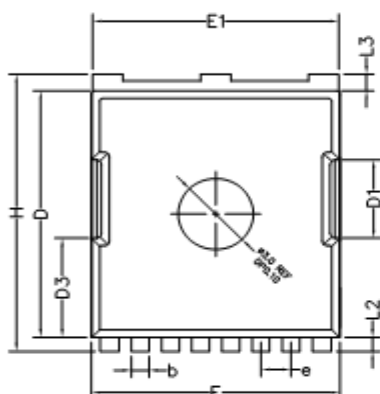


Figure C Unclamped Inductive Switching Circuit & Waveforms

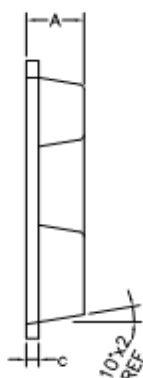


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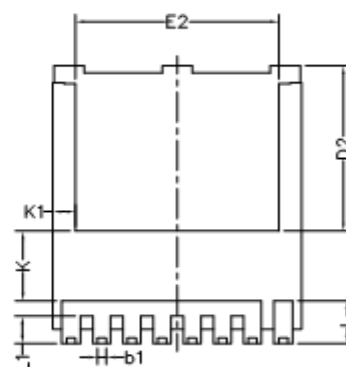
TOLL Package Outline Dimensions (Units: mm)



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		