



60V/422A N-Channel Power MOSFET

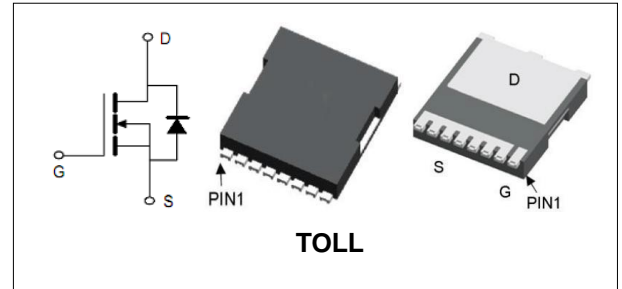
Features

- New technology for high voltage device.
- Low on-resistance and low conduction losses
- Ultra Low Gate Charge cause lower driving requirements
- 100% Avalanche Tested

Applications

- DC/DC Converter
- Motor control and drives
- Battery management

BVDSS	60	V
ID	422	A
RDSON@VGS=10V	0.67	mΩ
RDSON@VGS=6V	0.92	mΩ



Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PGT06N009	TOLL	PGT06N009	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	60	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	422	A
Mounted on Large Heat Sink				
E_{AS}	Single Pulse Avalanche Energy (Note1)	1149	mJ	
I_{DM}	Pulse Drain Current Tested (Silicon Limit) (Note2)	TC =25°C	900	A
I_D	Continuous Drain current	TC =25°C	422	A
P_D	Maximum Power Dissipation	TC =25°C	284	W
$R_{θJc}$	Thermal Resistance Junction-to-Case (Note3)	0.44	°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	VGS=0V ID=250μA	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=60V,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	2.4	4	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note4)	VGS=10V, ID=80A	--	0.67	0.9	mΩ
		VGS=6V, ID=56A	--	0.92	1.4	mΩ
g _{fs}	Transconductance	VDS=5V, ID=80A	--	290	--	S
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note5)						
C _{iss}	Input Capacitance	VDS=30V, VGS=0V, F=10kHz	--	9950	--	pF
C _{oss}	Output Capacitance		--	3100	--	pF
C _{rss}	Reverse Transfer Capacitance		--	160	--	pF
Q _g	Total Gate Charge	VDS=30V, ID=80A, VGS=10V	--	123	--	nC
Q _{gs}	Gate-Source Charge		--	28	--	nC
Q _{gd}	Gate-Drain Charge		--	27	--	nC
Switching Characteristics (Note5)						
t _{d(on)}	Turn-on Delay Time	VDD=30V, ID=80A RL=6Ω, VGS=10V	--	28	--	nS
t _r	Turn-on Rise Time		--	46	--	nS
t _{d(off)}	Turn-off Delay Time		--	97	--	nS
t _f	Turn-off Fall Time		--	83	--	nS
R _G	Gate resistance	F=1MHz	--	0.7	--	Ω
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	ISD=80A,VGS=0V	--	--	1.2	V
t _{rr}	Reverse Recovery Time	IS=56A,VGS=0V di/dt=100A/μs	--	120	--	nS
Q _{rr}	Reverse Recovery Charge		--	322	--	nC

Note:

- Limited by T_{Jmax}, starting T_J = 25° C, R_G = 25Ω, V_D = 30V, V_{GS} = 10V. Part not recommended for use above this value.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.



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Typical Characteristics

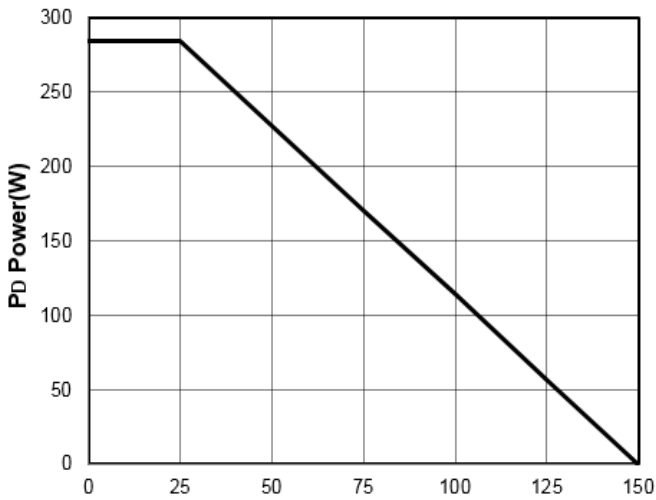


Figure1: T_j Junction Temperature (°C)

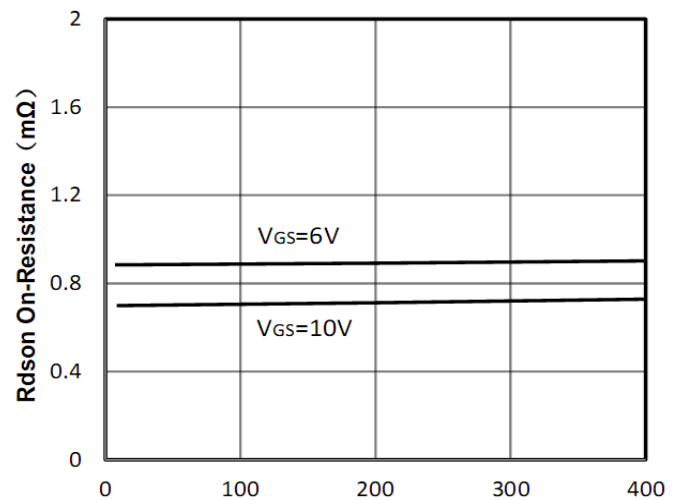


Figure2: I_d Drain Current (A)

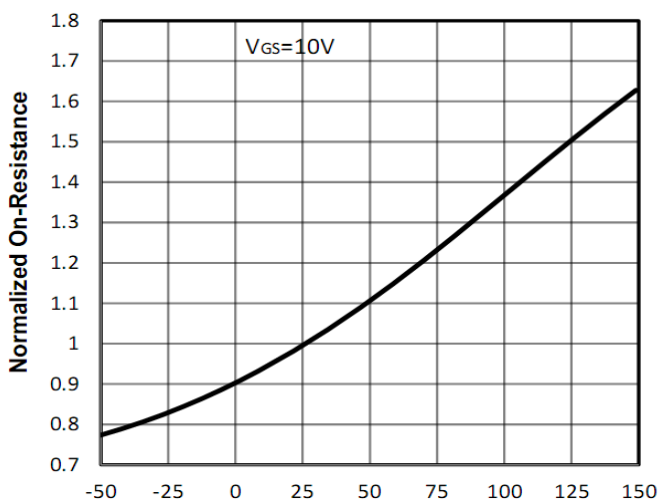


Figure3: T_j Junction Temperature (°C)

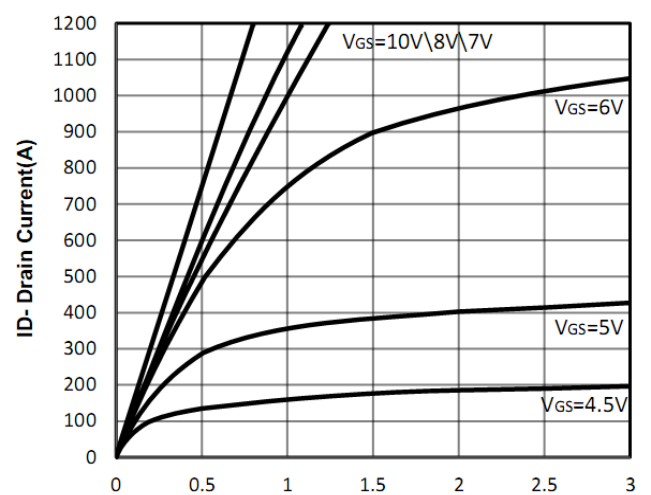


Figure4: V_{ds} Drain-Source Voltage (V)

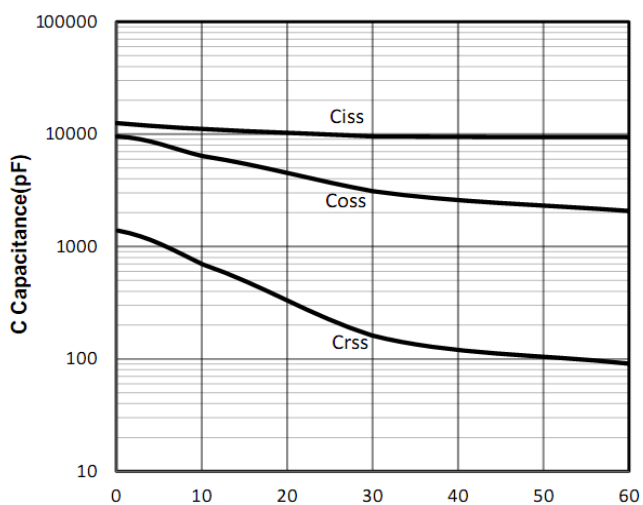


Figure5: V_{ds} Drain Source Voltage (V)

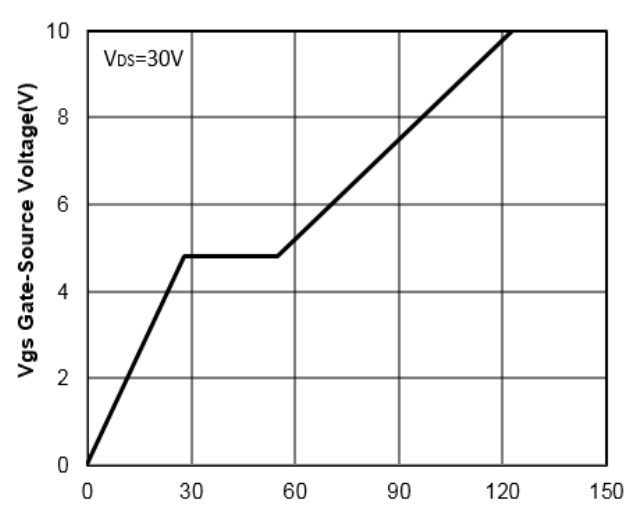


Figure6: Q_g Gate Charge (nC)



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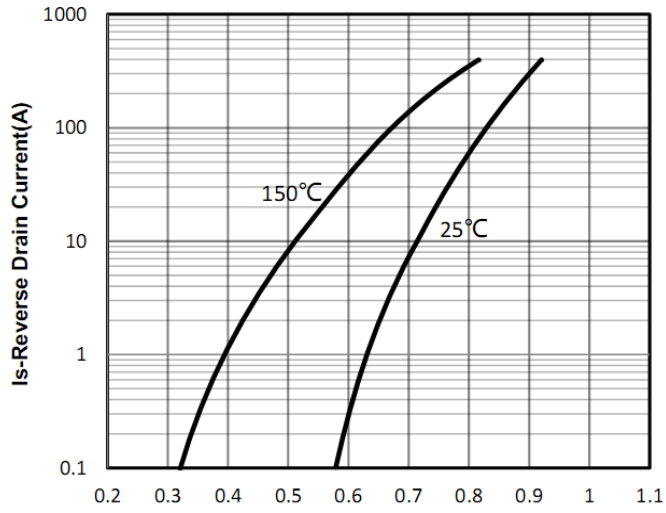


Figure7: Vsd Source-Drain Voltage (V)

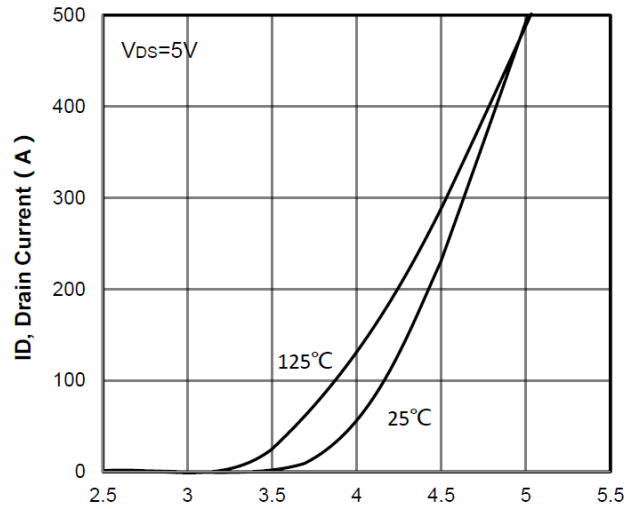


Figure8: Vgs Gate-Source Voltage (V)

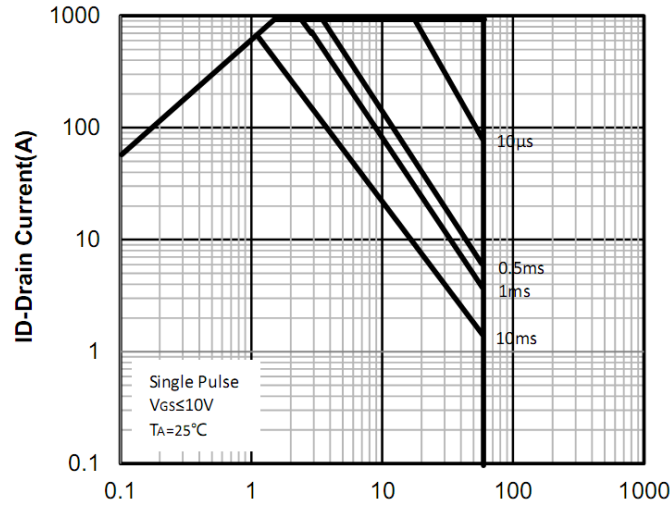


Figure9: Vds Drain -Source Voltage (V)

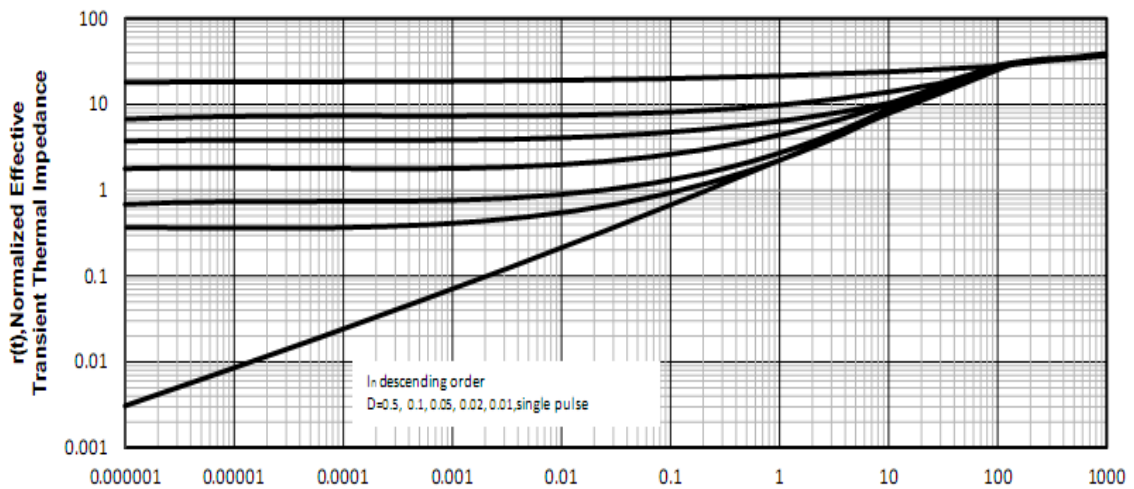
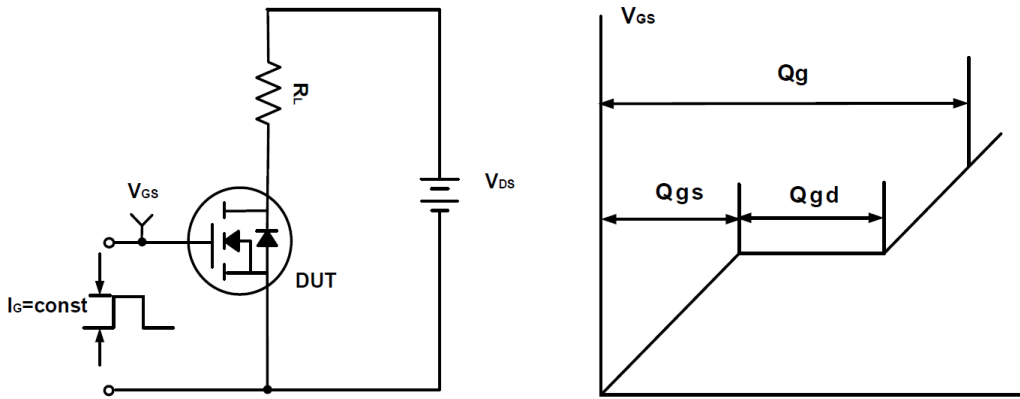
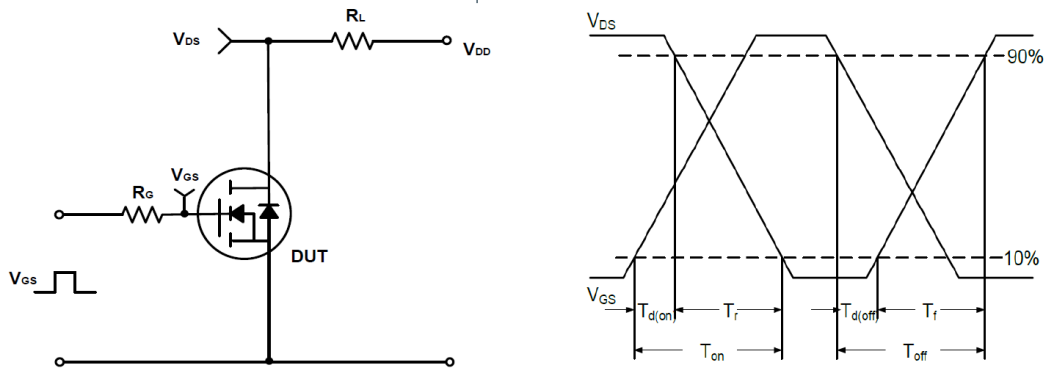
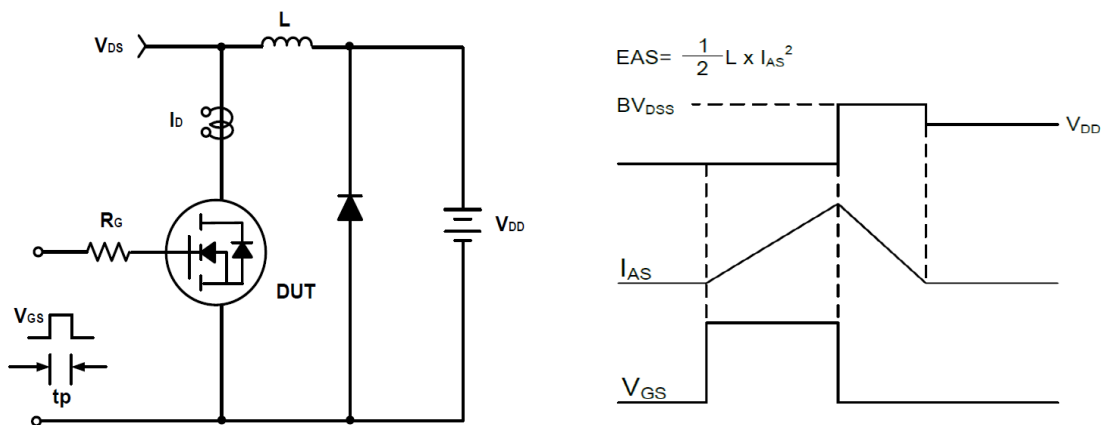


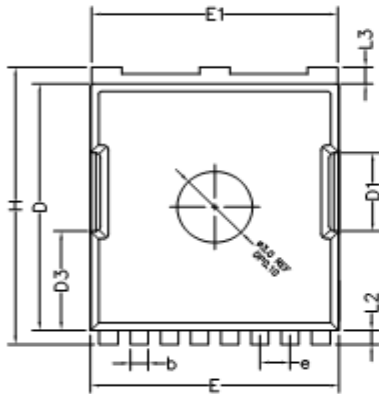
Figure10: Square Wave Pulse Duration (sec)

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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

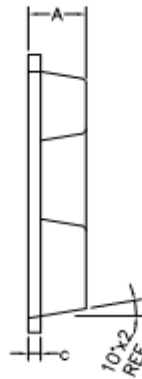


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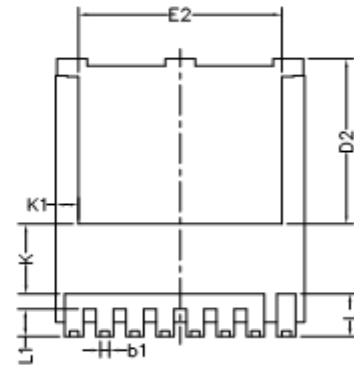
TOLL Package Outline Dimensions (Units: mm)



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		