

Product Summary

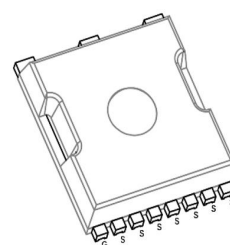
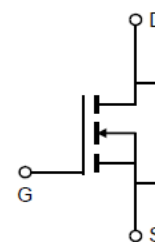
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	1.2m Ω @10V	410A

Feature

- Split Gate Trench Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Application

- Power Switching Application
- Motor Driving

TOLL

Schematic diagram

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT013N10NTP	TOLL	T013N10N	Reel & Tape	330mm	24mm	2000pcs

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	410	A
	$T_C = 100^\circ\text{C}$	I_D	254	A
Pulsed Drain Current ²		I_{DM}	1640	A
Single Pulsed Avalanche Current ³		I_{AS}	95	A
Single Pulsed Avalanche Energy ³		E_{AS}	2256	mJ
Power Dissipation ⁵	$T_C = 25^\circ\text{C}$	P_D	500	W
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	35	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.2	$^\circ\text{C/W}$
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^\circ\text{C}$

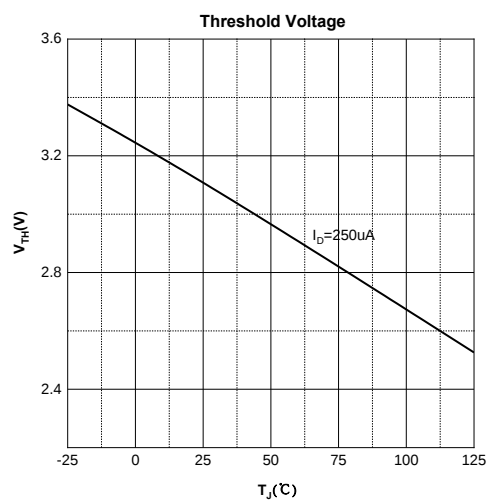
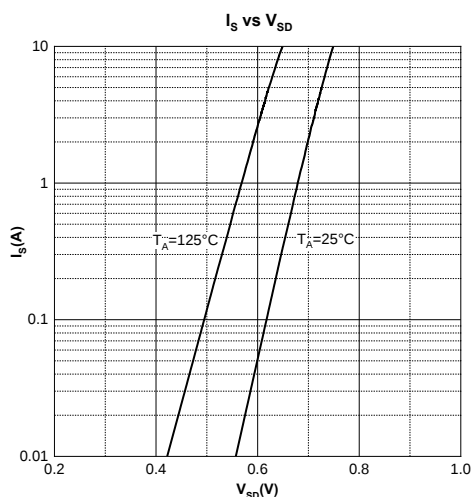
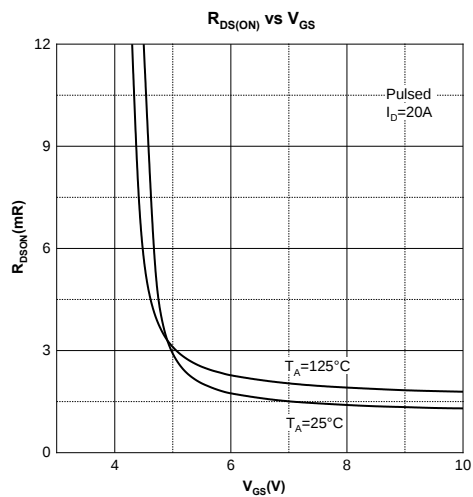
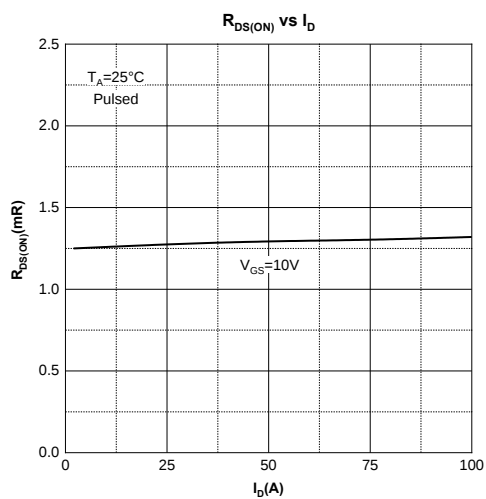
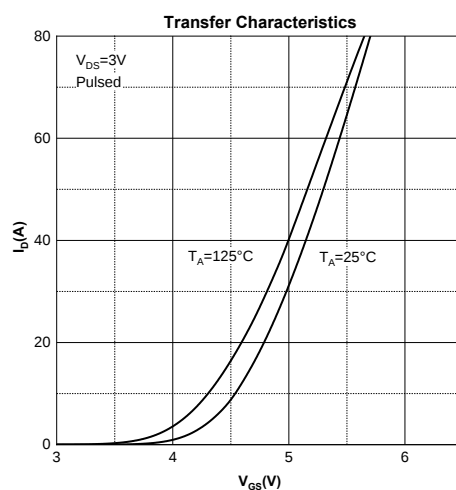
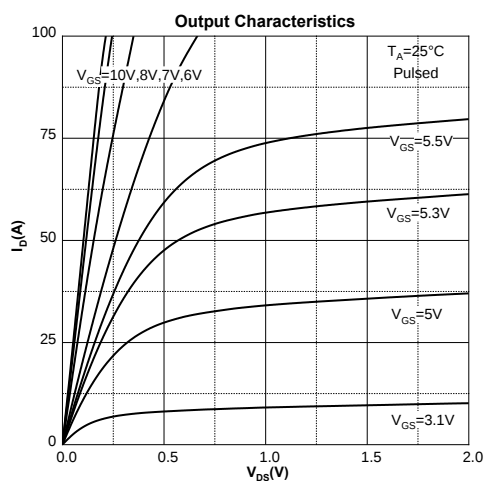
MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

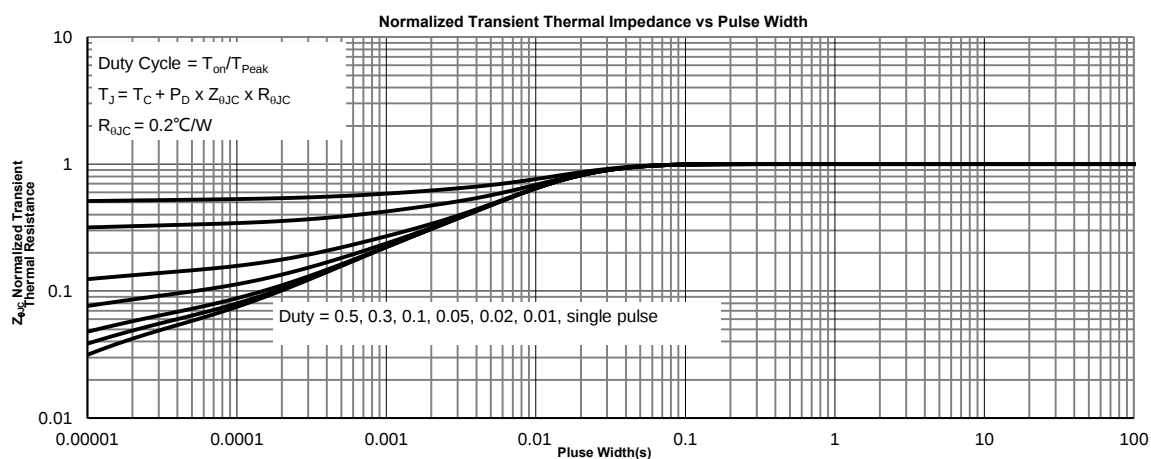
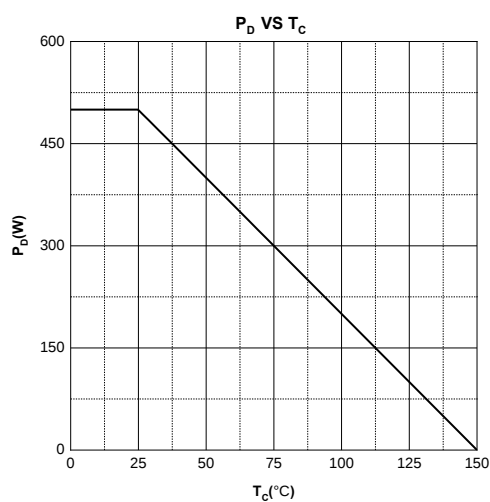
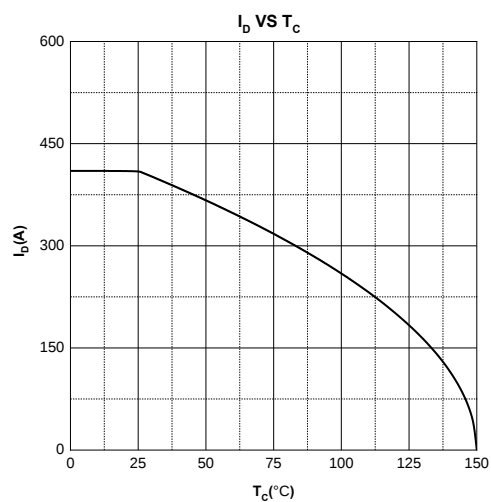
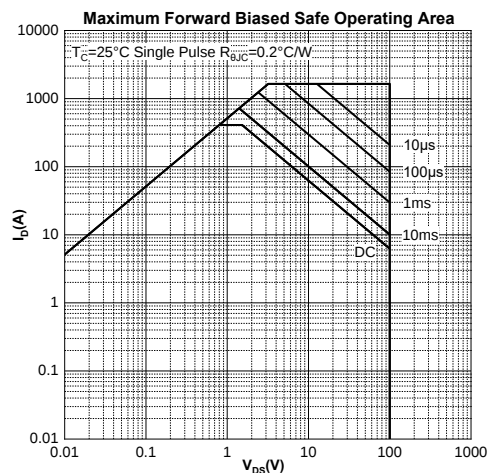
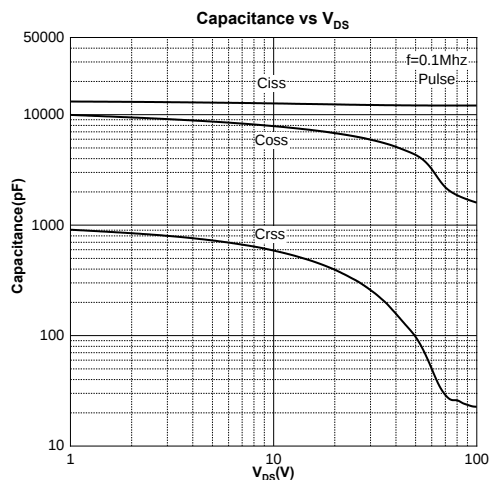
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics ⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3.1	4	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		1.2	1.6	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 50V, V _{GS} = 0V, f = 0.1MHz		12198		pF
Output Capacitance	C _{oss}			4312		
Reverse Transfer Capacitance	C _{rss}			95		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		3.1		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 50V, V _{GS} = 10V, I _D = 20A		163		nC
Gate-Source Charge	Q _{gs}			56		
Gate-Drain Charge	Q _{gd}			27		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 20V, V _{GS} = 10V, R _L = 1Ω, R _G = 3Ω		47		ns
Turn-On Rise Time	t _r			75		
Turn-Off Delay Time	t _{d(off)}			116		
Turn-Off Fall Time	t _f			85		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 20A			1.2	V

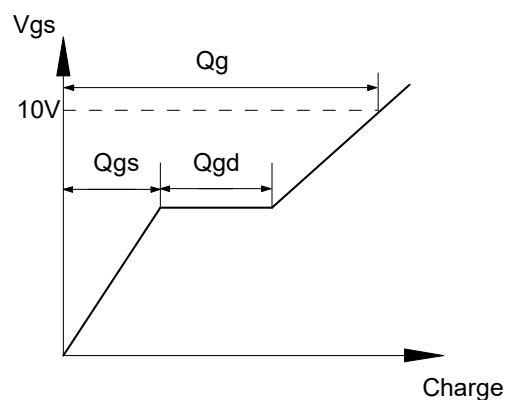
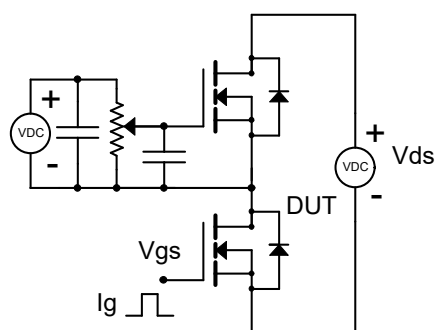
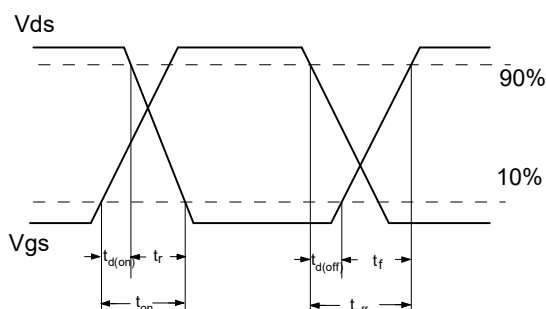
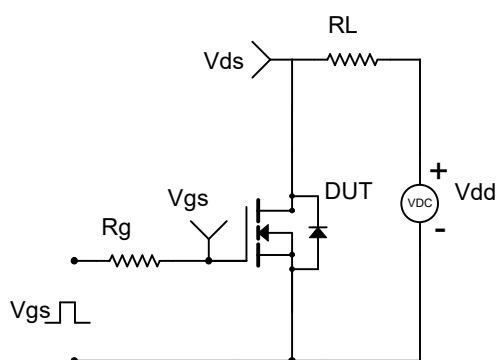
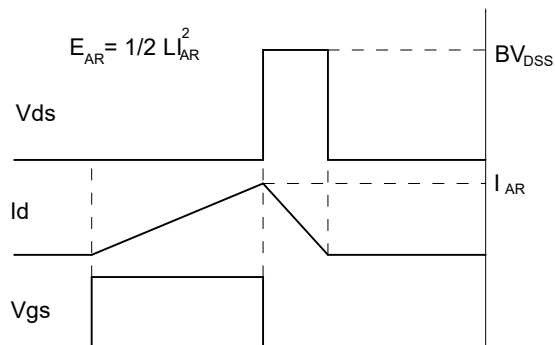
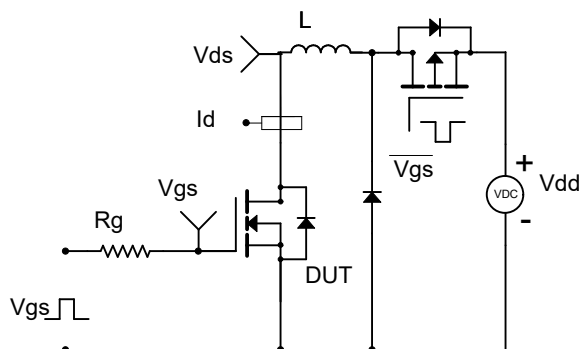
Notes :

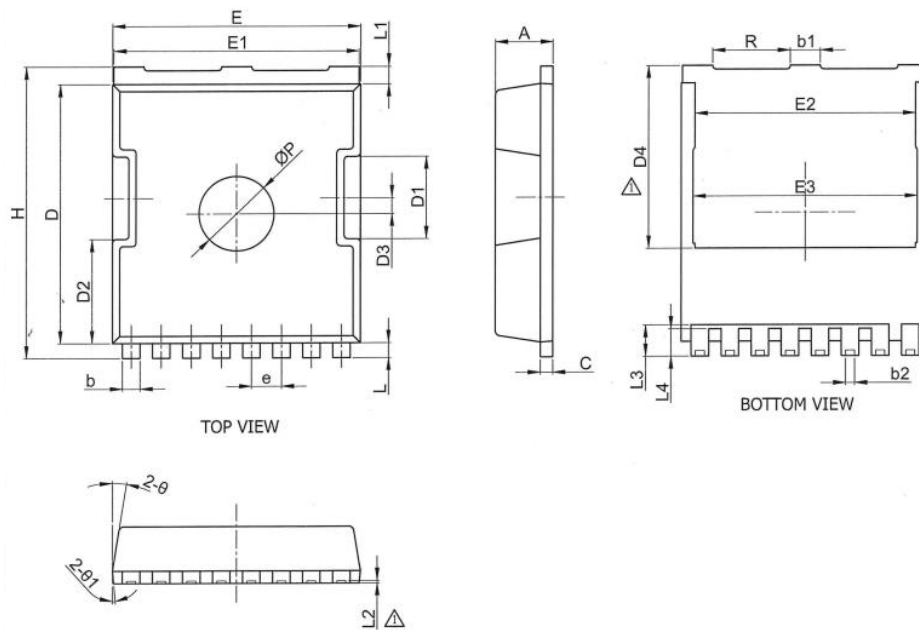
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- 3.EAS condition: V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.
- 4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 5.The power dissipation P_D is limited by T_{J(MAX)} = 150°C.And device mounted on a large heatsink
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

Typical Characteristics





Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveform

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms


TOLL Package Information


SYMBOL	MILLIMETER		Dimensions In Inches	
	MIN.	MAX.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.600	0.900	0.024	0.035
b1	1.100	1.300	0.043	0.051
b2	0.360 REF		0.014 REF	
C	0.400	0.600	0.016	0.024
D	10.300	10.500	0.406	0.413
D1	3.200	3.400	0.126	0.134
D2	4.080	4.280	0.161	0.169
D3	0.530	0.730	0.021	0.029
D4	7.350 REF		0.289 REF	
E	9.800	10.000	0.386	0.394
E1	9.700	9.900	0.382	0.390
E2	8.800 REF		0.346 REF	
E3	8.950 REF		0.352 REF	
e	1.200 BSC		0.047 BSC	
H	11.500	11.900	0.453	0.469
L	0.500	0.700	0.020	0.028
L1	0.600	0.800	0.024	0.031
L2	0.100 REF		0.004 REF	
L3	1.270 REF		0.050 REF	
L4	1.100 REF		0.043 REF	
P	2.000	4.000	0.079	0.157
R	3.000	3.200	0.118	0.126
θ	7°	11°	7°	11°
θ_1	3°	7°	3°	7°

Attention:

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
- GreenPower Electronics products belong to consumer electronics or other civilian electronic products.