

Product Summary

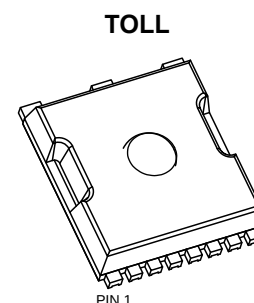
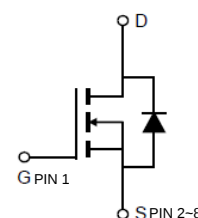
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	0.9m Ω @10V	320A
	1.4m Ω @4.5V	

Feature

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

Application

- Power Switching Application
- Power Management


Schematic diagram

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT009N04LTP	TOLL	T009N04L	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}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	320	A
	$T_C = 100^\circ\text{C}$		203	
Pulsed Drain Current ²		I_{DM}	1280	A
Single Pulsed Avalanche Current ³		I_{AS}	55	A
Single Pulsed Avalanche Energy ³		E_{AS}	1512	mJ
Power Dissipation ⁵		P_D	250	W
$T_C = 25^\circ\text{C}$				
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	45	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.5	$^\circ\text{C/W}$
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^\circ\text{C}$

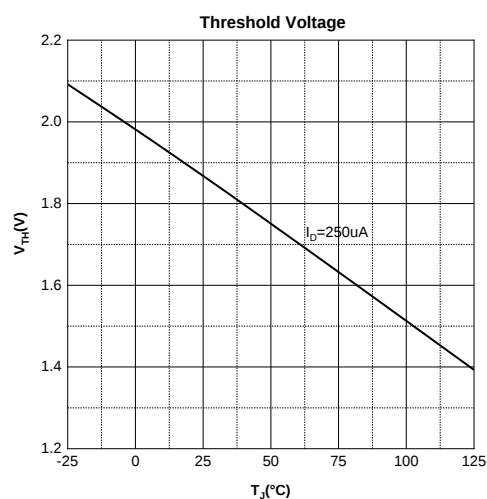
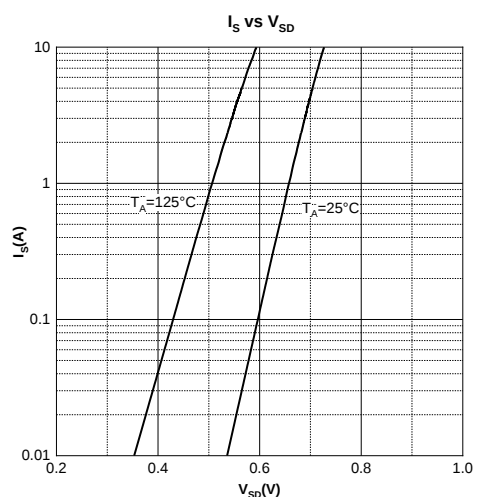
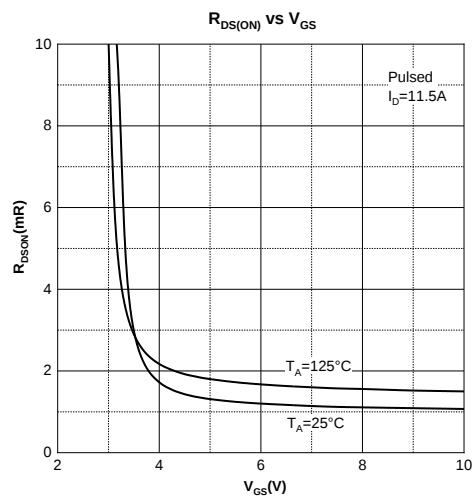
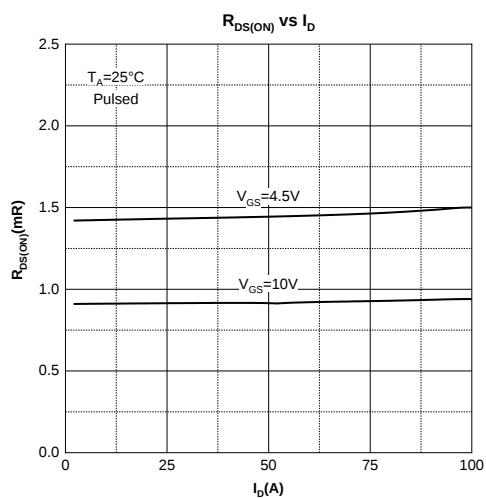
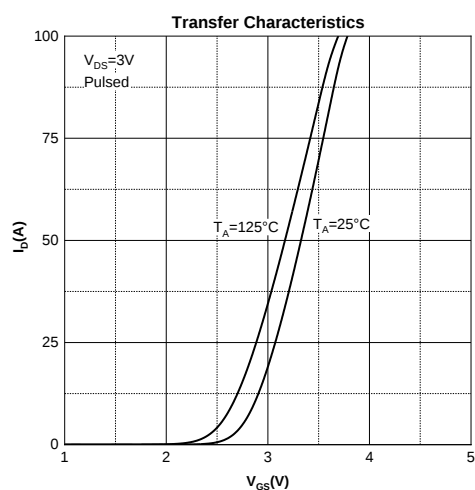
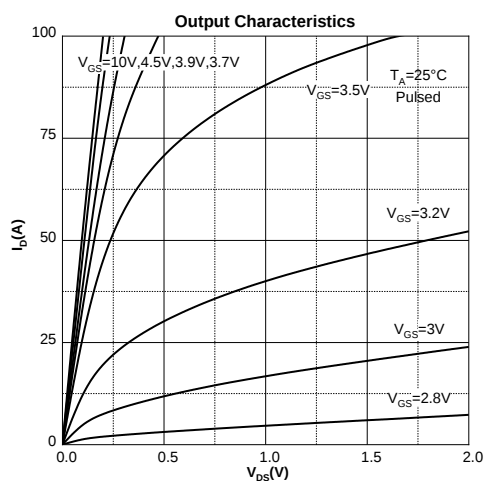
MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

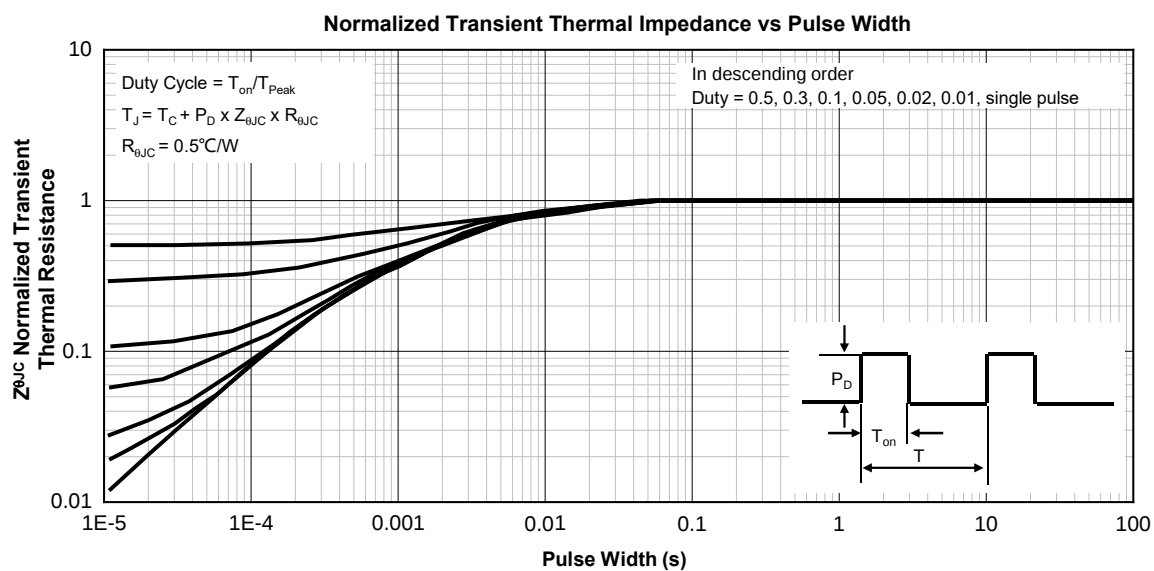
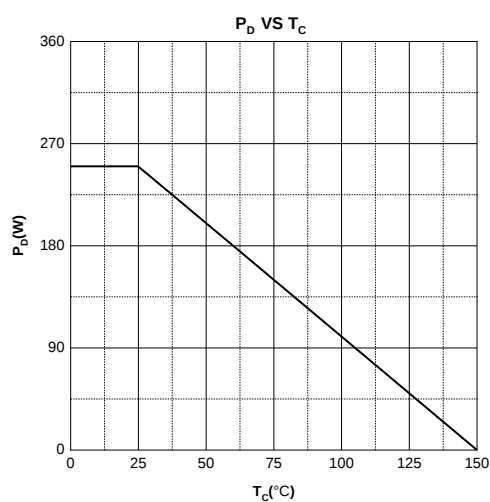
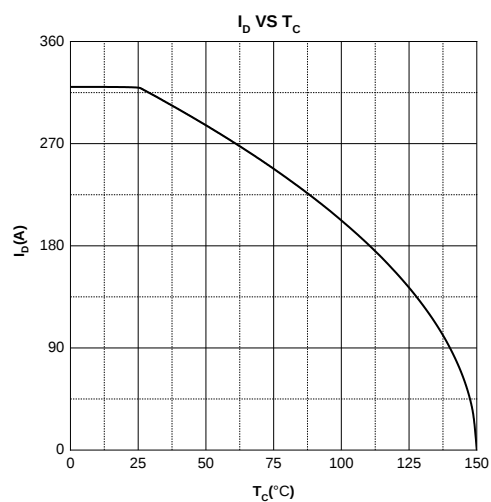
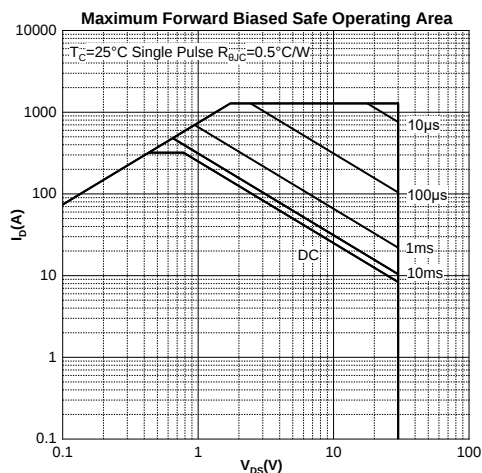
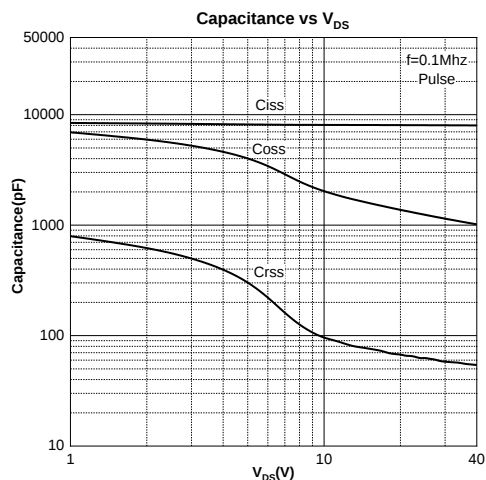
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics ⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.9	3	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		0.9	1.2	m Ω
		$V_{GS} = 4.5V, I_D = 20A$		1.4	1.8	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 0.1MHz$		8156		pF
Output Capacitance	C_{oss}			1388		
Reverse Transfer Capacitance	C_{rss}			70		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		1.2		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 25V, V_{GS} = 10V, I_D = 20A$		104		nC
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			24		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, R_G = 3\Omega, I_D = 20A$		15		ns
Turn-On Rise Time	t_r			14		
Turn-Off Delay Time	$t_{d(off)}$			93		
Turn-Off Fall Time	t_f			42		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 20A$			1.2	V

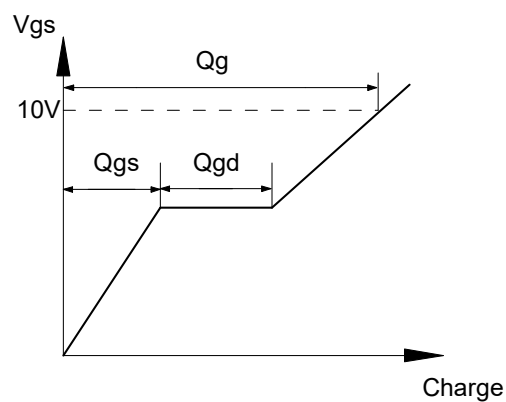
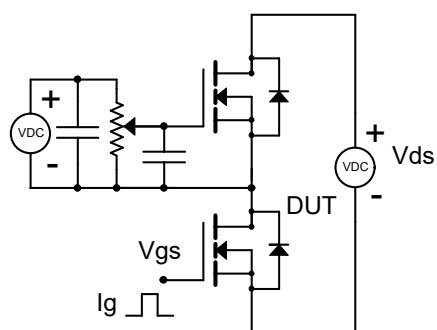
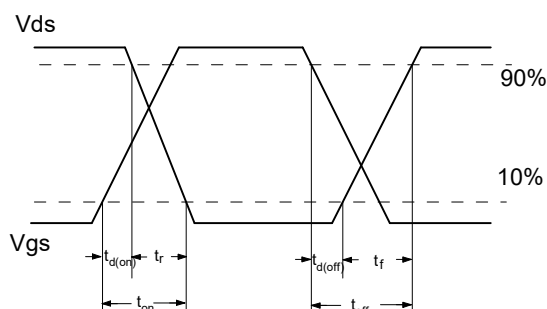
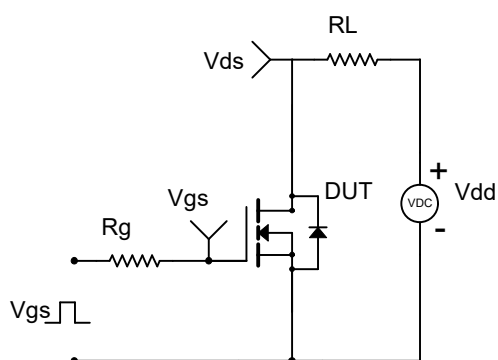
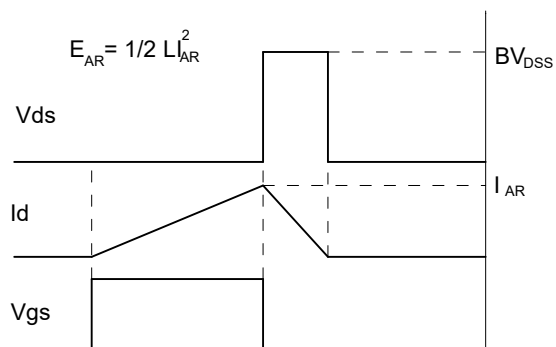
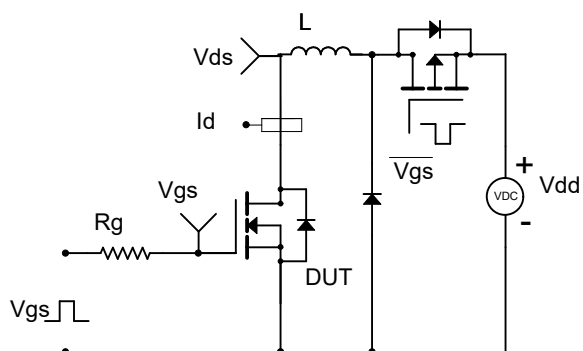
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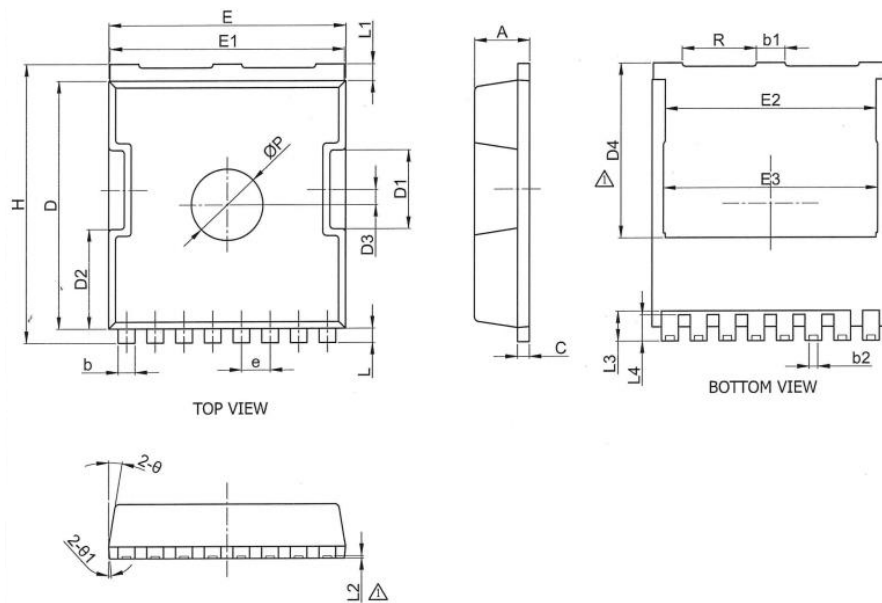
- 1.The maximum current rating is limited by package. And device mounted on a large heatsink.
- 2.Pulse Test: Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = 40V, V_{GS} = 10V, L = 1mH, R_G = 25\Omega$ Starting $T_J = 25^\circ\text{C}$.
- 4.Pulse Test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$. And device mounted on a large heatsink.
- 6.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

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.