

Product Summary

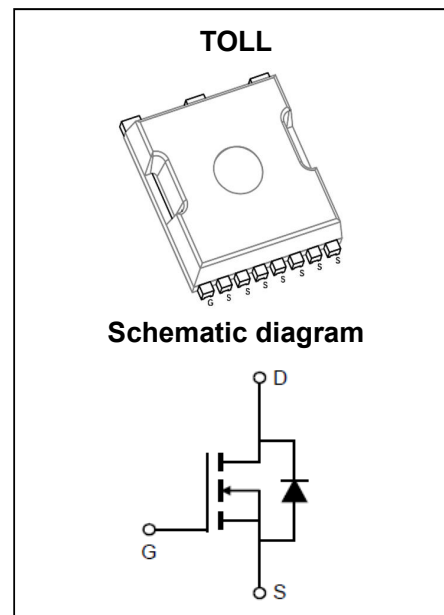
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	2.2m Ω @10V	245A

Feature

- Excellent gate charge x $R_{DS(ON)}$ product(FOM)
- Split Gate Trench Technology
- High Current Capability
- 100% EAS Guaranteed

Application

- DC/DC Converter
- Power Management Switches
- BLDC Motor drive systems
- Battery Management



Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT022N12NTP	TOLL	T022N12N	Reel & Tape	330mm	24mm	2000pcs

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

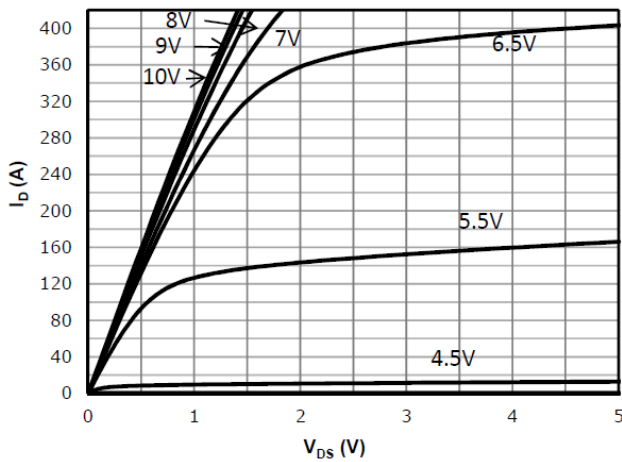
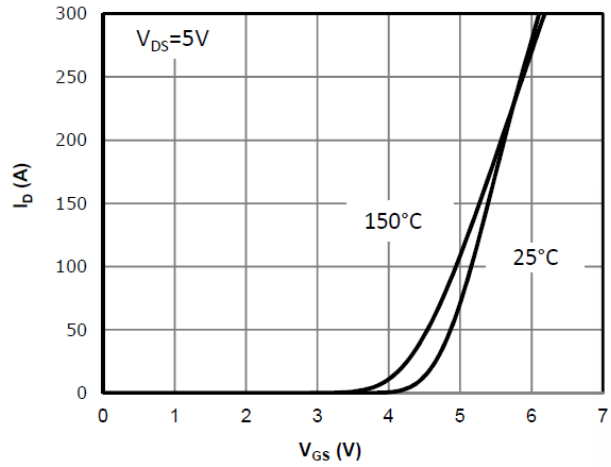
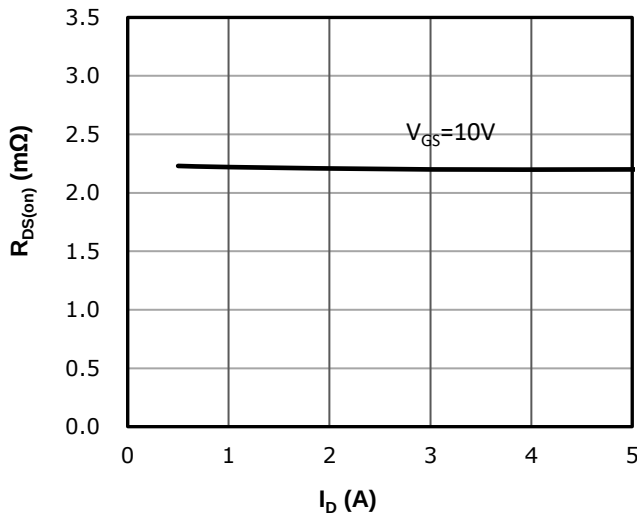
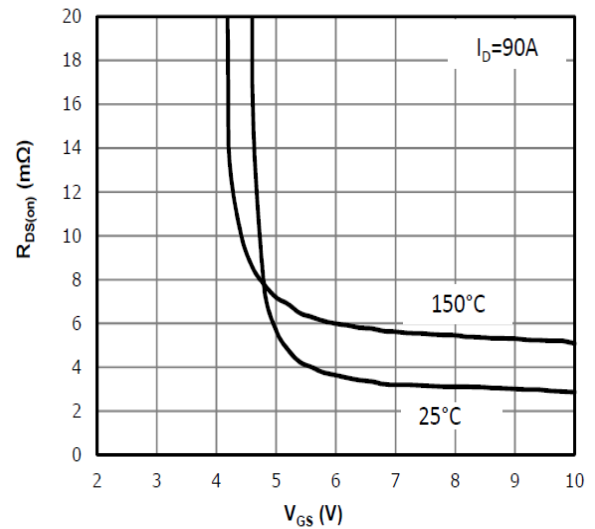
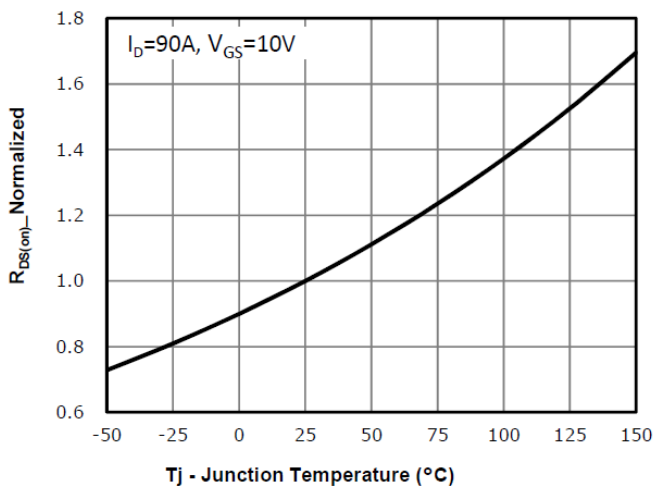
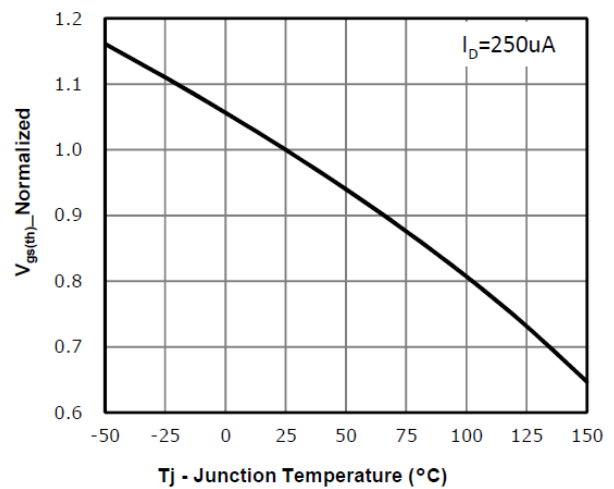
Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	120	V
Gate - Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_C = 25^{\circ}\text{C}$	I_D	245	A
	$T_C = 100^{\circ}\text{C}$		154	
Pulsed Drain Current ²		I_{DM}	820	A
Single Pulsed Avalanche Energy ³		EAS	1892	mJ
Power Dissipation ⁵	$T_C = 25^{\circ}\text{C}$	P_D	300	W
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	42	$^{\circ}\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.41	$^{\circ}\text{C/W}$
Operating Junction And Storage Temperature		T_J, T_{STG}	-55~ +150	$^{\circ}\text{C}$

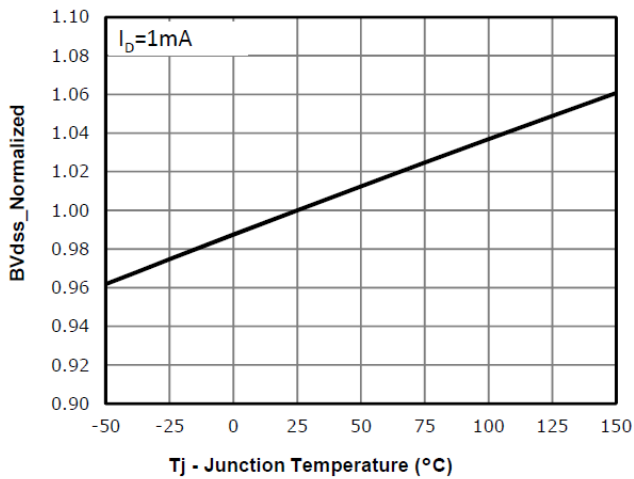
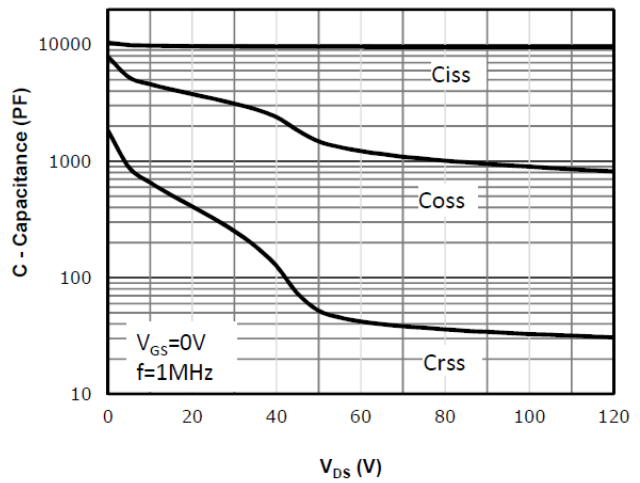
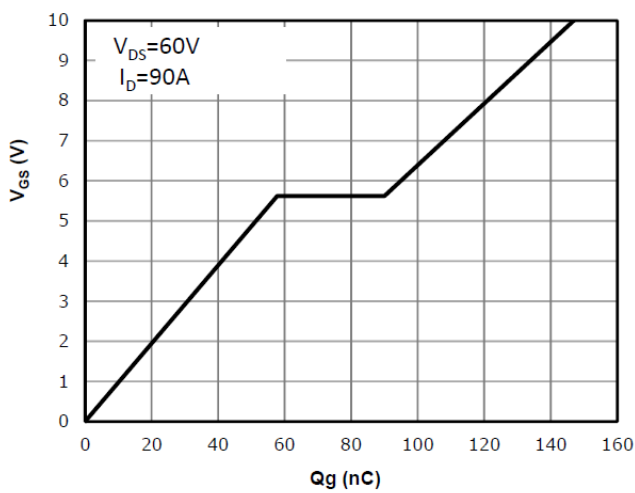
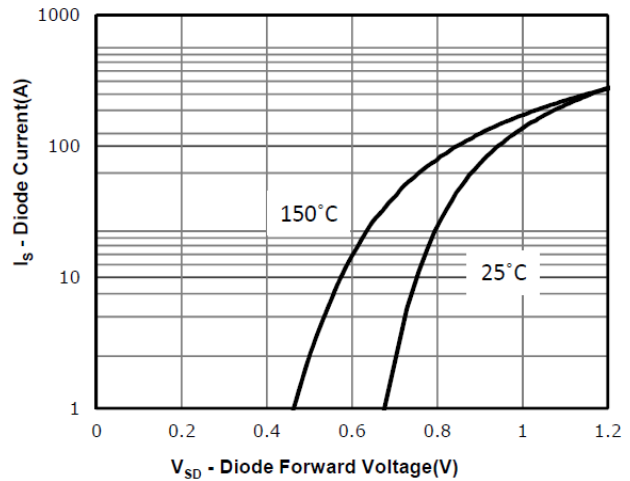
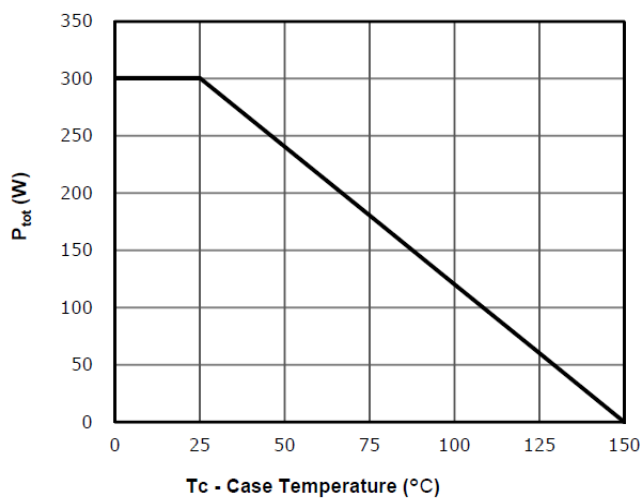
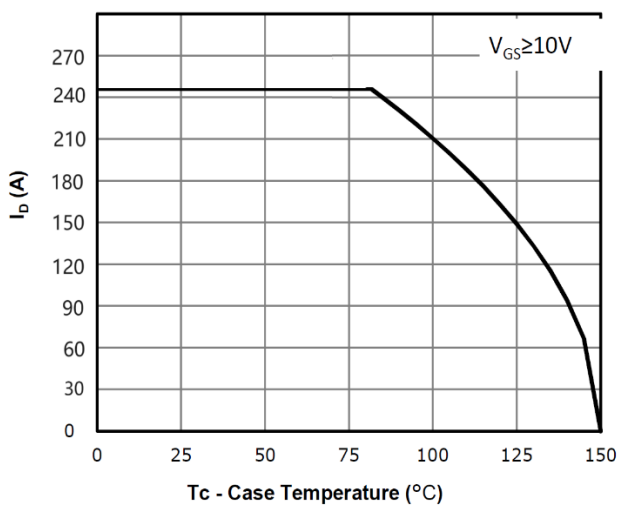
MOSFET ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	120			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 120V, 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	2.0	3.0	4.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 50A		2.2	2.6	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 45V, V _{GS} = 0V, f = 1MHz		10061		pF
Output Capacitance	C _{oss}			1739		
Reverse Transfer Capacitance	C _{rss}			285		
Gate Resistance	R _G	f=1MHz		2.7		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 60V, V _{GS} = 10V, I _D = 50A		136		nC
Gate-Source Charge	Q _{gs}			45		
Gate-Drain Charge	Q _{gd}			30		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 60V, V _{GS} = 10V, I _D = 90A R _G = 2.7Ω		35		ns
Turn-On Rise Time	t _r			83		
Turn-Off Delay Time	t _{d(off)}			76		
Turn-Off Fall Time	t _f			45		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 50A			1.4	V
Reverse Recovery Time	t _{rr}	I _F = 90A,dI _F /dt=100A/us		92		ns
Reverse Recovery Charge	Q _{rr}			243		nC

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.E_{AS} condition: L = 0.5mH, R_G = 25Ω, V_{GS} = 10V, V_{DD} = 60V Starting T_J = 25°C.
- 4.Pulse Test: Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 5.The power dissipation PD 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
Fig 1: Output Characteristics

Fig 2: Transfer Characteristics

Fig 3: Rds(on) Vs Ids Characteristics (Tc=25°C)

Fig 4: Rds(on) vs Gate Voltage

Fig 5: Rds(on) vs. Temperature

Fig 6: Vgs(th) vs. Temperature


Typical Characteristics
Fig 7: BVdss vs. Temperature

Fig 8: Capacitance Characteristics

Fig 9: Gate Charge Characteristics

Fig 10: Body-diode Forward Characteristics

Fig 11: Power Dissipation

Fig 12: Drain Current Derating


Typical Characteristics

Fig 13: Safe Operating Area

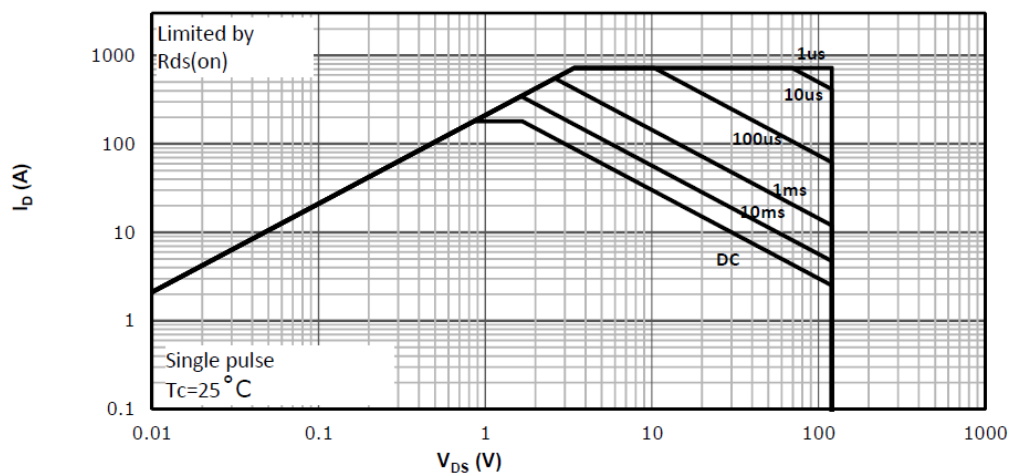
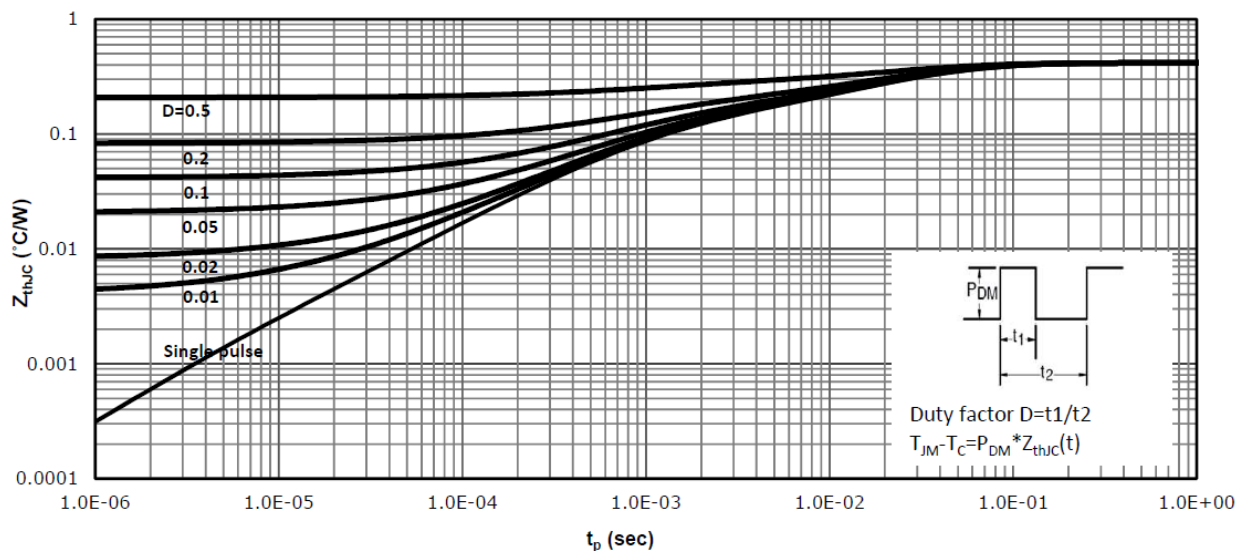
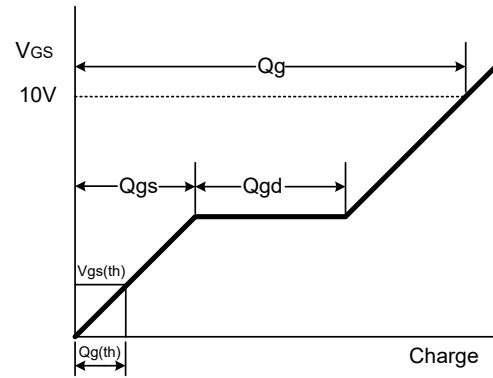
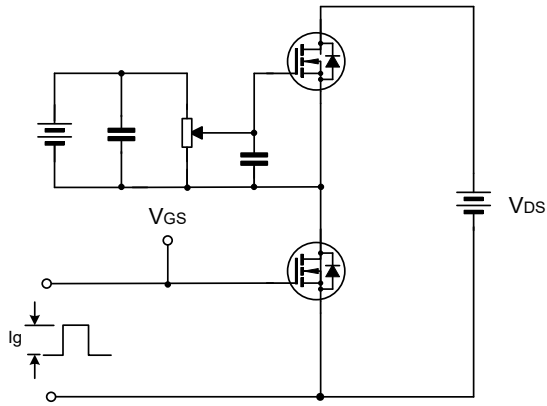


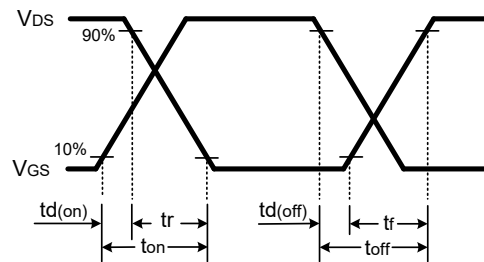
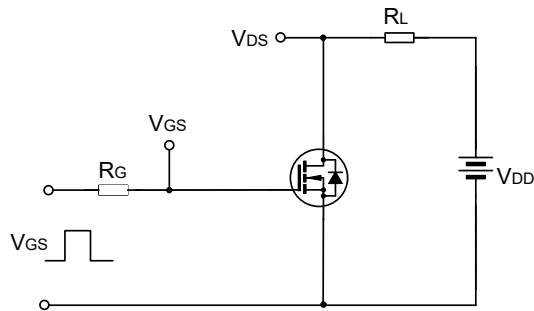
Fig 14: Max. Transient Thermal Impedance



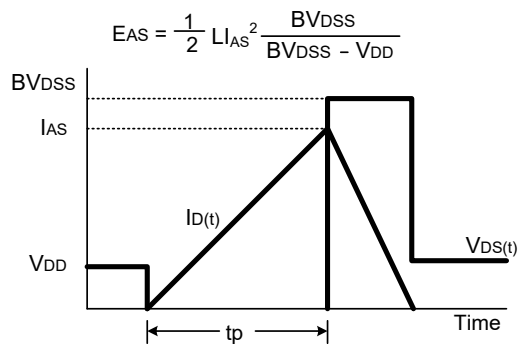
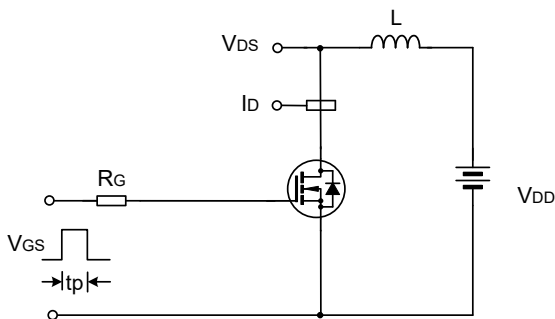
Gate Charge Test Circuit & Waveform

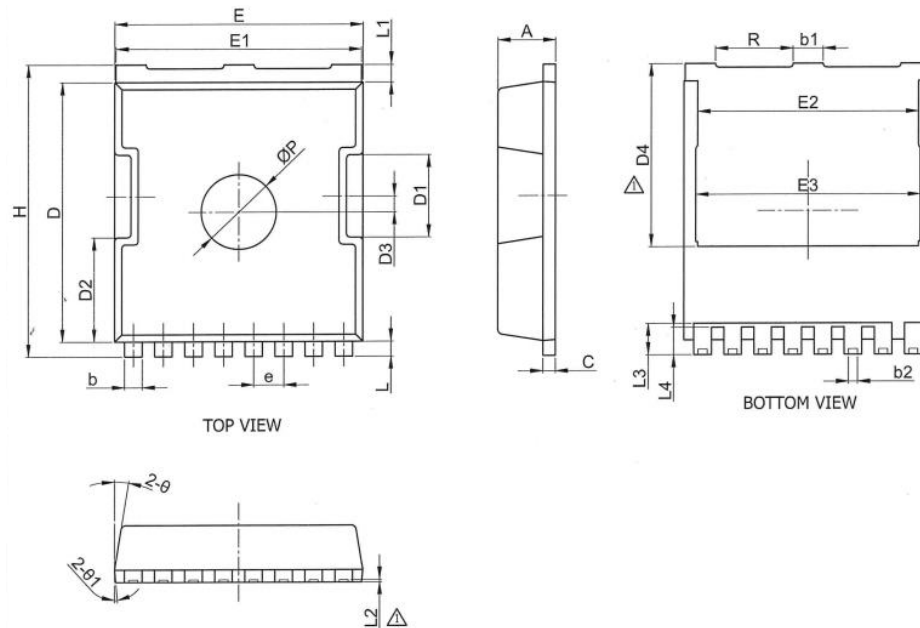


Resistive Switching Test Circuit & Waveform



E_{AS} Test Circuit & Waveform



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°
$\theta 1$	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.