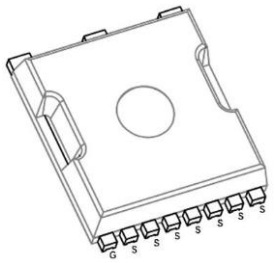
GPT010N08NTP

80V N-Channel MOSFET

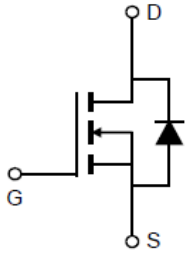
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
80V	1.0mΩ@10V	420A

TOLL



Schematic diagram



Feature

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

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
GPT010N08NTP	TOLL	T010N08N	Tape&Reel	N/A	N/A	2000pcs

ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	80	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25℃	I_D	420	A
	T_C = 100℃		260	
Pulsed Drain Current[1]		I_{DM}	1680	A
Single Pulsed Avalanche Energy[2]		E_{AS}	2065	mJ
Power Dissipation	T_C = 25℃	P_D	357	W
	T_C = 100℃		143	
Thermal Resistance from Junction to Ambient[3]		$R_{\theta JA}$	35	℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.35	℃/W
Operating Junction And Storage Temperature		T_J,T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS (T_A=25℃ 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	80			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 64V,V_{GS} = 0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	2.9	3.8	V
Drain-Source On-Resistance[4]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		1.0	1.3	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 40V, V_{GS} = 0V, f = 1MHz		13653		pF
Output Capacitance	C_{oss}			4421		
Reverse Transfer Capacitance	C_{rss}			110		
Gate Resistance	R_G	f=1MHz		3.2		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 40V, V_{GS} = 0 to 10V, I_D = 20A		200		nC
Gate-Source Charge	Q_{gs}			68		
Gate-Drain Charge	Q_{gd}			41		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 40V, V_{GS} = 10V, I_D = 20A R_G = 3Ω		33		ns
Turn-On Rise Time	t_r			54		
Turn-Off Delay Time	$t_{d(off)}$			138		
Turn-Off Fall Time	t_f			73		
Source-Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 20A			1.2	V
Continuous Source Current	I_S				383	A
Maximum Pulsed Source Current	I_{SM}				1530	A
Reverse Recovery Time	t_{rr}	I_F= 20A,dI/dt=100A/us	82	115	156	ns
Reverse Recovery Charge	Q_{rr}			331		nC

Notes：

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting T_J=25C, V_{DD}=40V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=37.1A, V_{DD}=0V During Time In Avalanche.
3. $R_{\theta JA}$ Is Measured With The Device Mounted On A 1inch^2 Pad of 2oz Copper FR4 PCB.
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Characteristics

Figure 1: Power De-rating

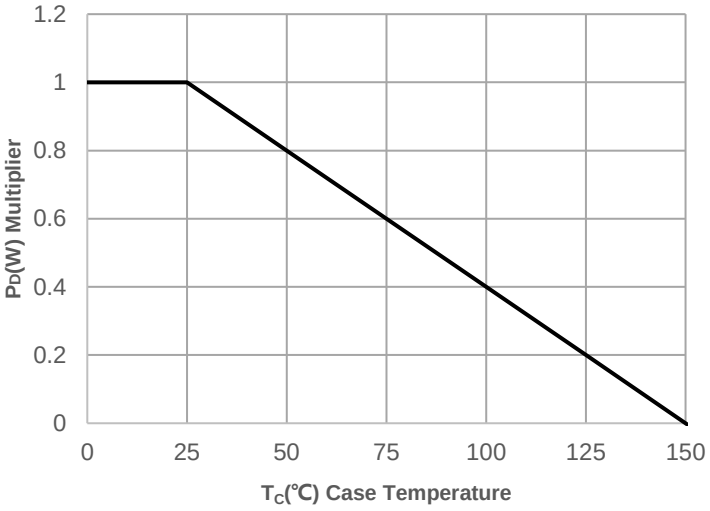


Figure 2: Current De-rating

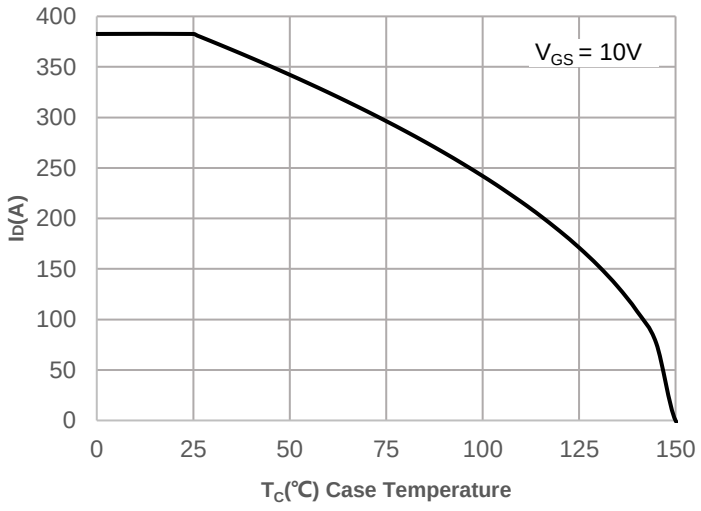


Figure 3: Normalized Maximum Transient Thermal Impedance

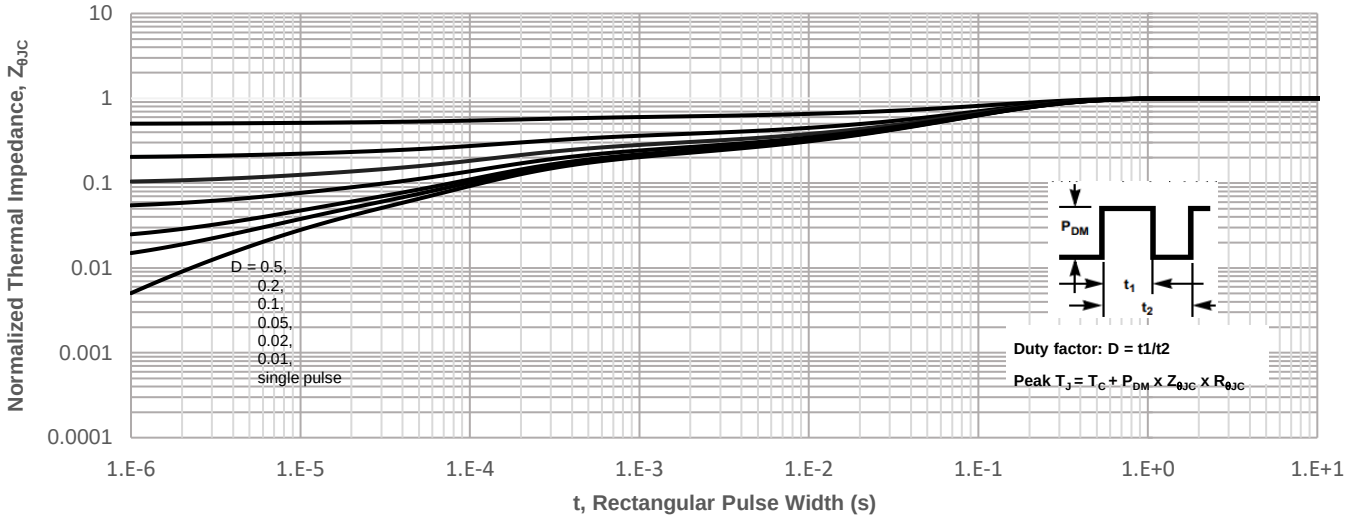
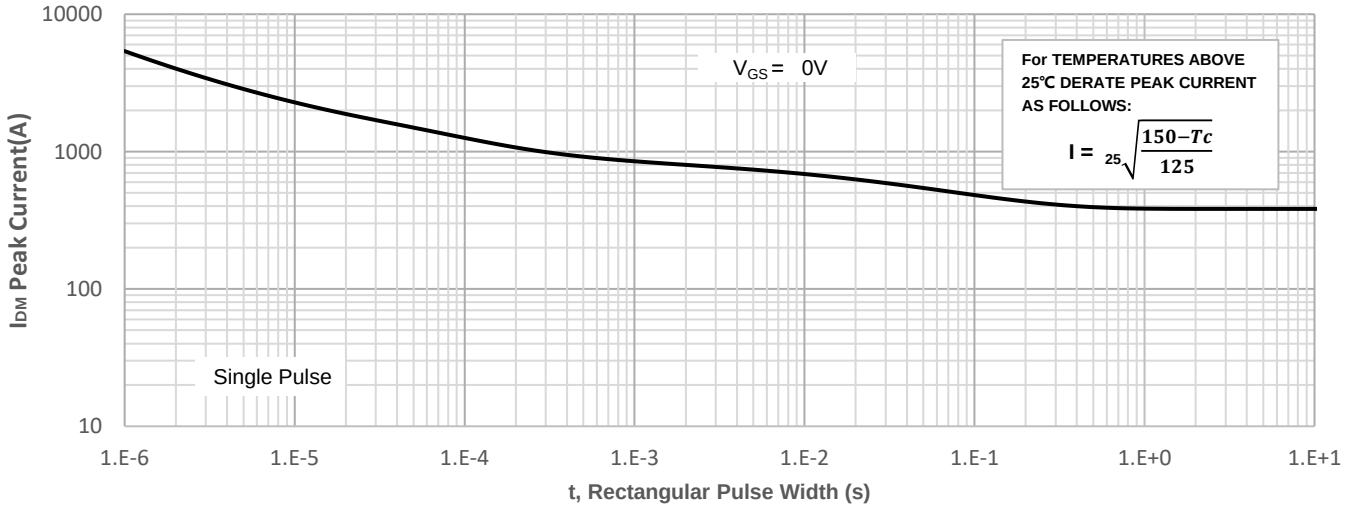


Figure 4: Peak Current Capacity



Typical Characteristics

Figure 5: Output Characteristics

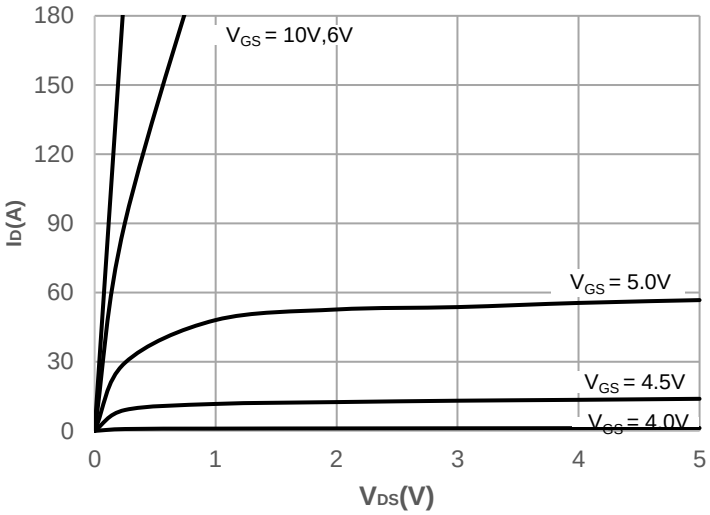


Figure 6: Typical Transfer Characteristics

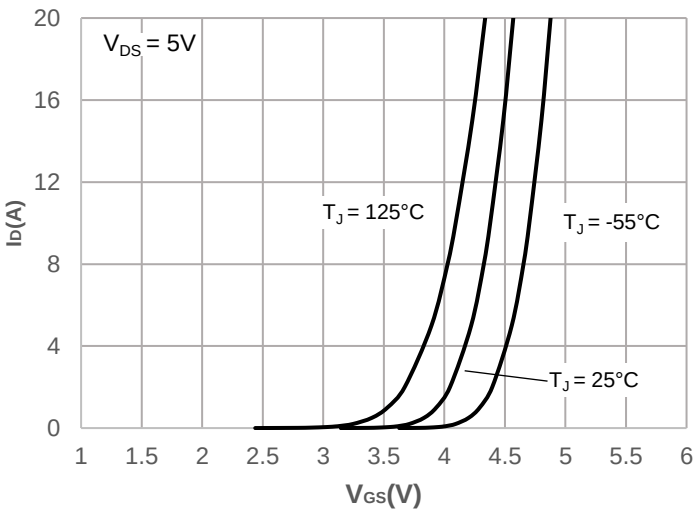


Figure 7: On-resistance vs. Drain Current

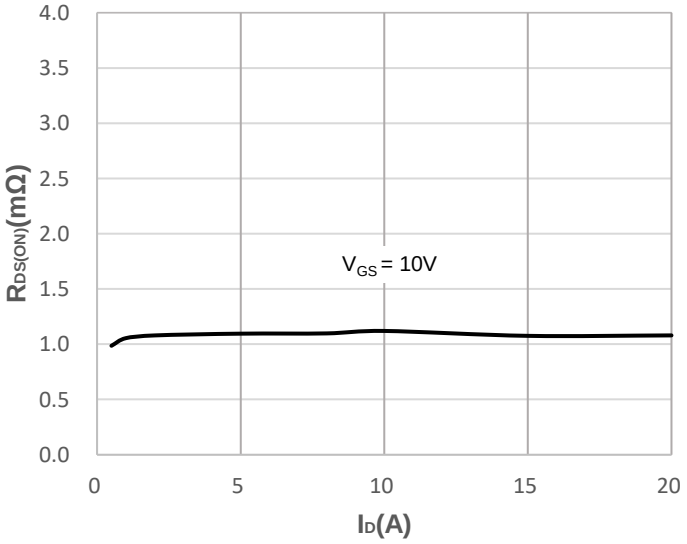


Figure 8: Body Diode Characteristics

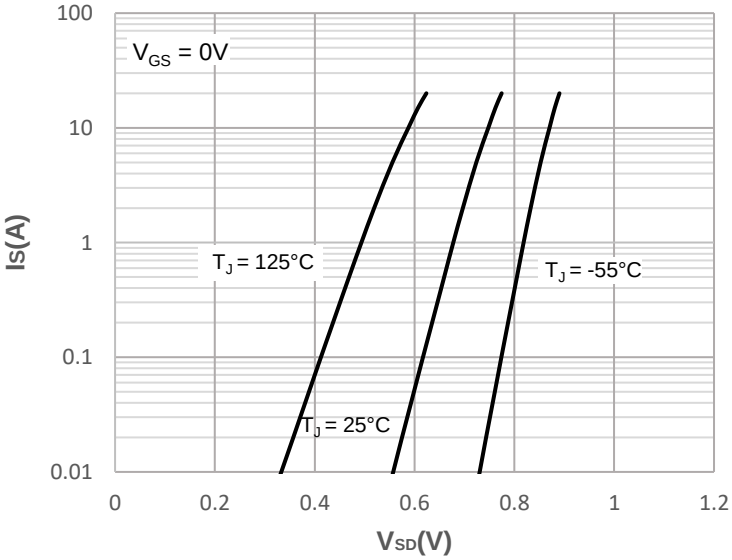


Figure 9: Gate Charge Characteristics

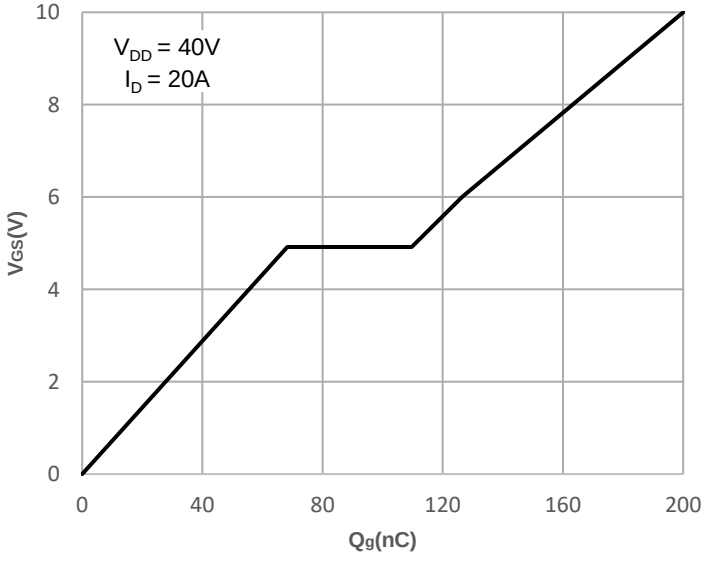
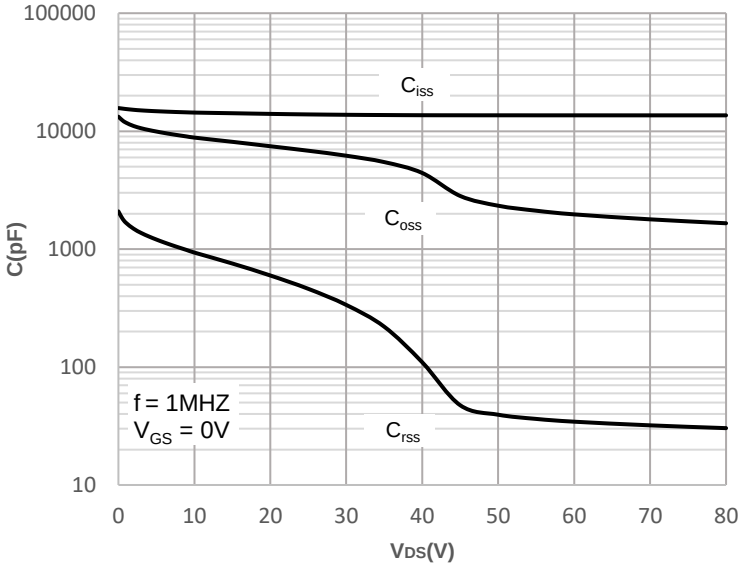


Figure 10: Capacitance Characteristics



Typical Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

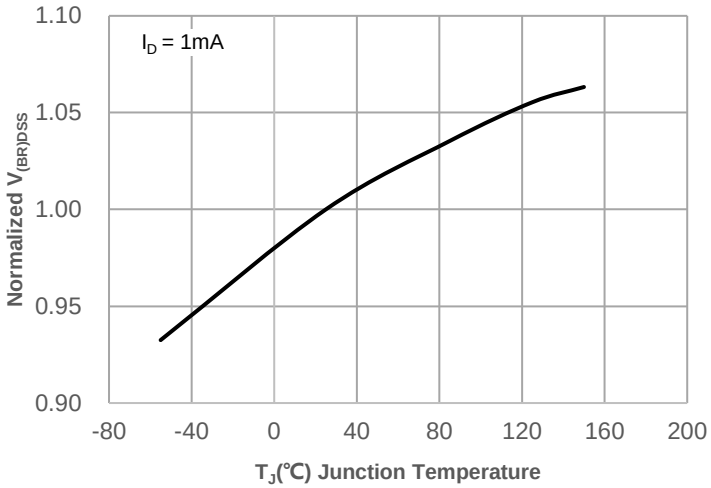


Figure 12: Normalized on Resistance vs. Junction Temperature

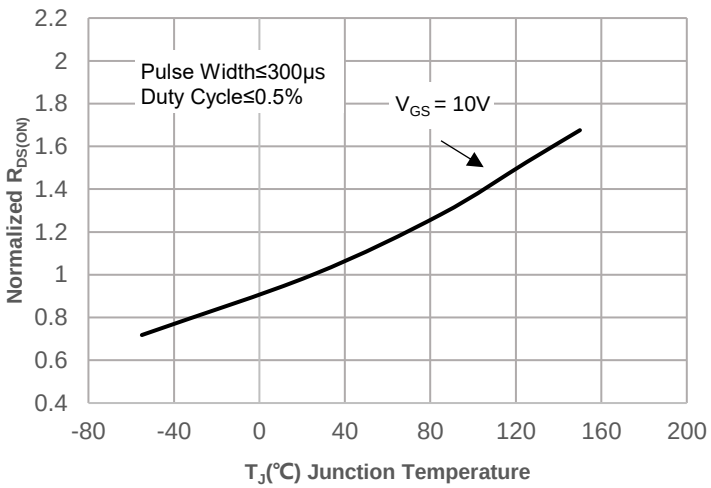


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

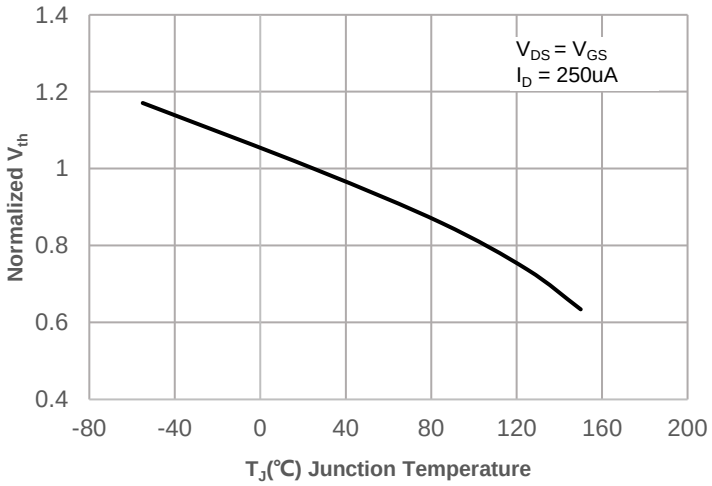


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

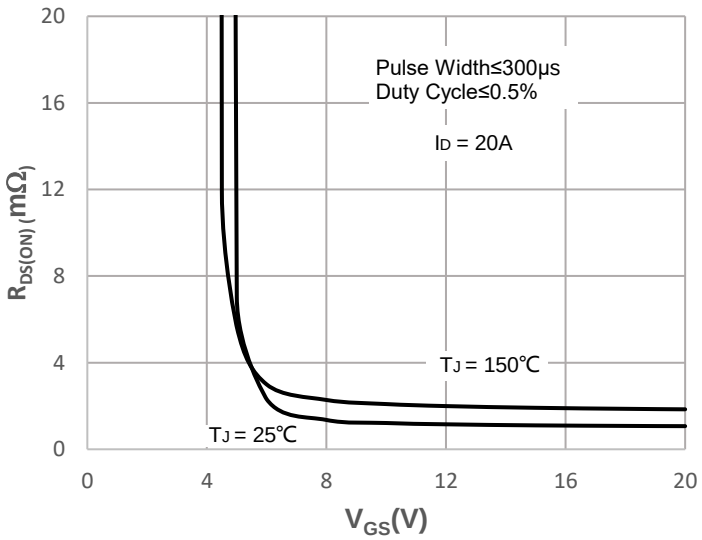
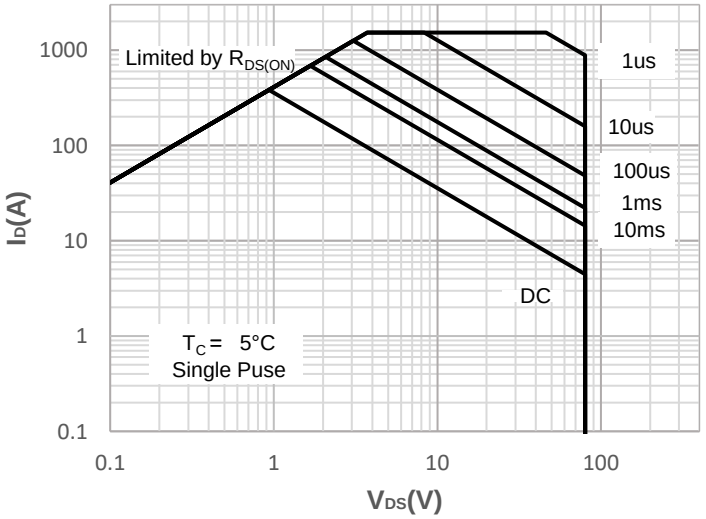
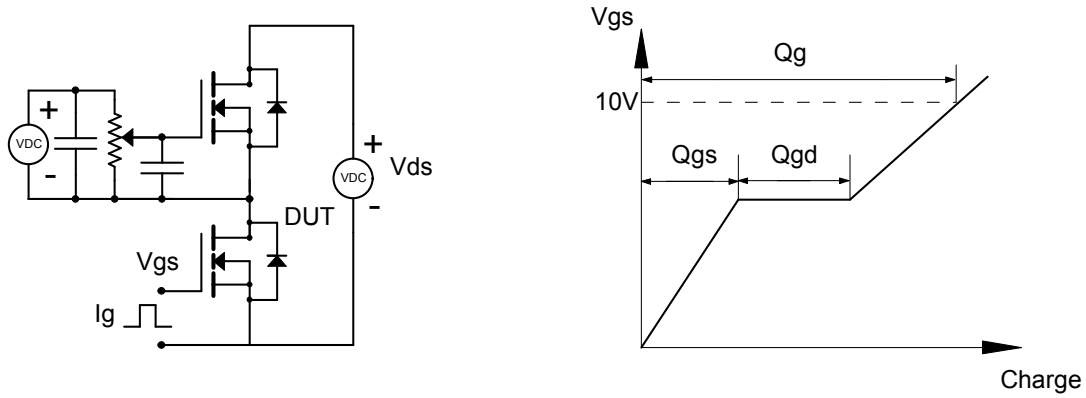


Figure 15: Maximum Safe Operating Area

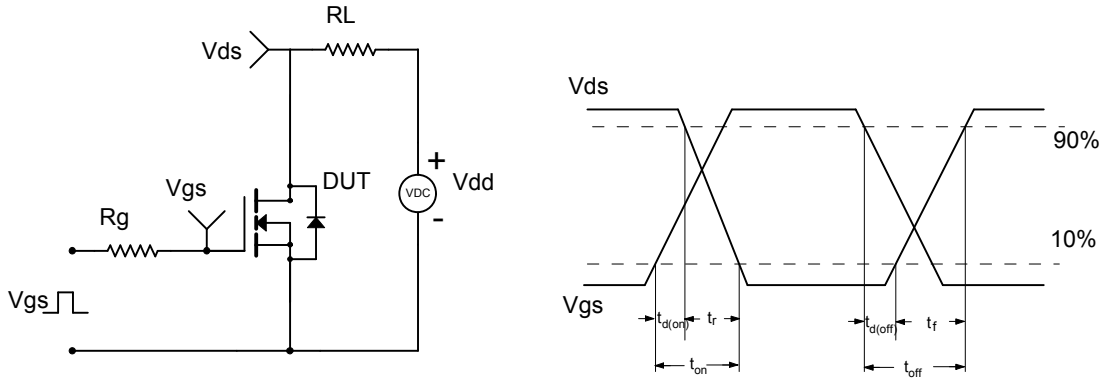


Test Circuit

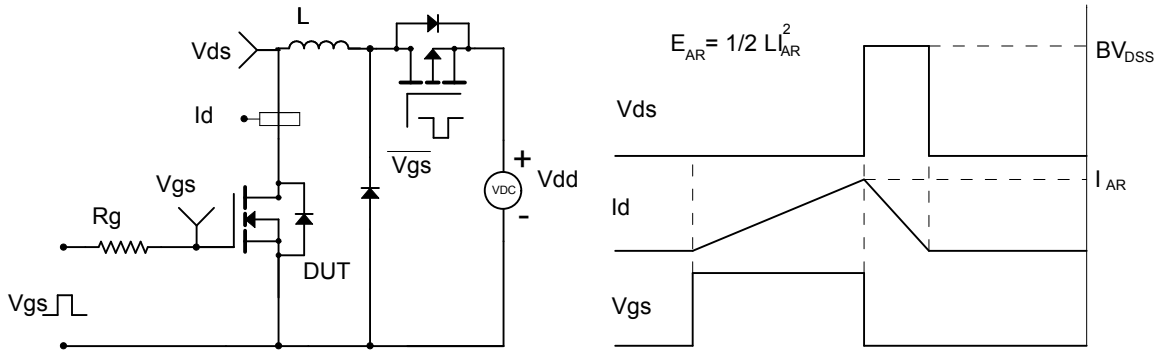
Gate Charge Test Circuit & Waveform



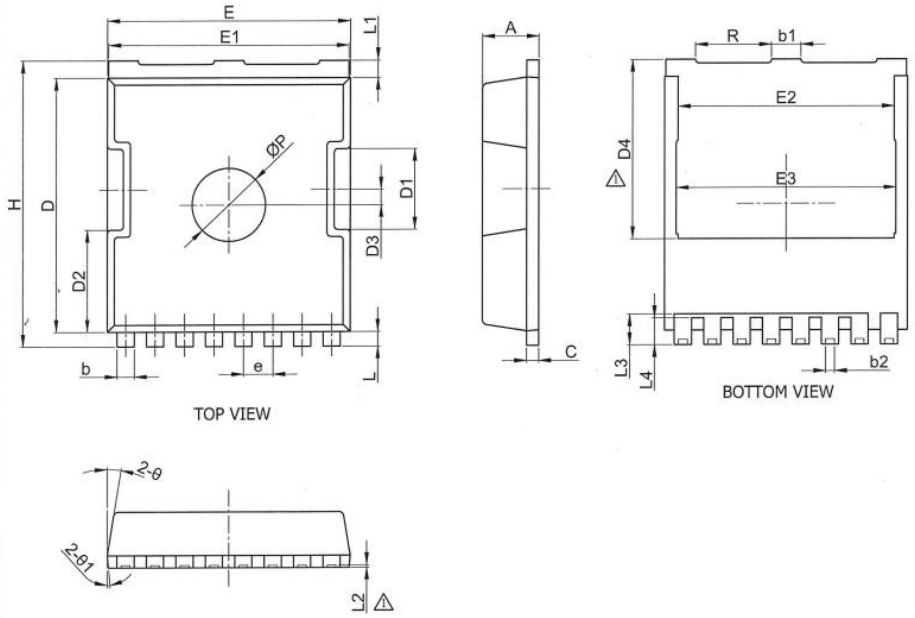
Resistive Switching Test Circuit & Waveform



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°
θ1	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.