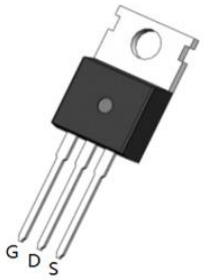
GPT081N15NTB

150V N-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
150V	8.1mΩ@10V	84A

TO-220-3L-C



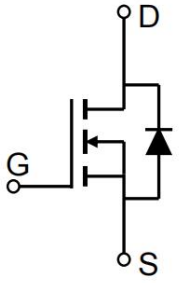
Feature

- Low $R_{DS(ON)}$
- 100% EAS Guaranteed
- High Speed Power Switching

Application

- Load Switch
- PWM Application
- Power Management

Schematic diagram



Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Qty
GPT081N15NTB	TO-220-3L-C	T081N15N	Tube	N/A	50pcs

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

Parameter		Symbol	Value	Unit
Drain - source Voltage		V_{DS}	150	V
Gate - source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25℃	I_D	84	A
	T_C = 100℃		59	
Pulsed Drain Current[1]		I_{DM}	336	A
Single Pulse Avalanche Energy[2]		E_{AS}	536	mJ
Power Dissipation	T_C = 25℃	P_D	170	W
Thermal Resistance from Junction to Ambient[3]		$R_{\theta JA}$	28	℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.7	℃/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	150			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						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.2	3.2	4.1	V
Drain-source On-resistance[4]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		8.1	10.6	mΩ
Dynamic Characteristics[5]						
Input Capacitance	C_{iss}	V_{DS} = 75V, V_{GS} = 0V, f = 1MHz		3569		pF
Output Capacitance	C_{oss}			323		
Reverse Transfer Capacitance	C_{rss}			14		
Gate Resistance	R_G	f=1MHz		3.7		Ω
Switching Characteristics[5]						
Total Gate Charge	Q_g	V_{DS} = 75V, I_D = 20A V_{GS} = 0 to 10V		53		nC
Gate-source Charge	Q_{gs}			19		
Gate-drain Charge	Q_{gd}			12		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 75V, V_{GS} = 10V, I_D = 20A R_G = 3Ω		16		ns
Turn-on Rise Time	t_r			29		
Turn-off Delay Time	$t_{d(off)}$			39		
Turn-off Fall Time	t_f			16		
Source - Drain Diode Characteristics						
Diode Continuous curent	I_S				84	A
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 20A			1.2	V
Reverse Recovery Time	t_{rr}	I_F= 15A,dI/dt=100A/us		85		ns
Reverse Recovery Charge	Q_{rr}			253		nC

Notes：

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting T_J=25°C, V_{DD}=75V, V_G=10V, R_G=25ohm, L=3mH, I_{AS}=18.9A, V_{DD}=0V during time in avalanche.
3. RθJA is measured with the device mounted on a 1inch2 pad of 2oz copper FR4 PCB.
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

Figure 1: Output Characteristics

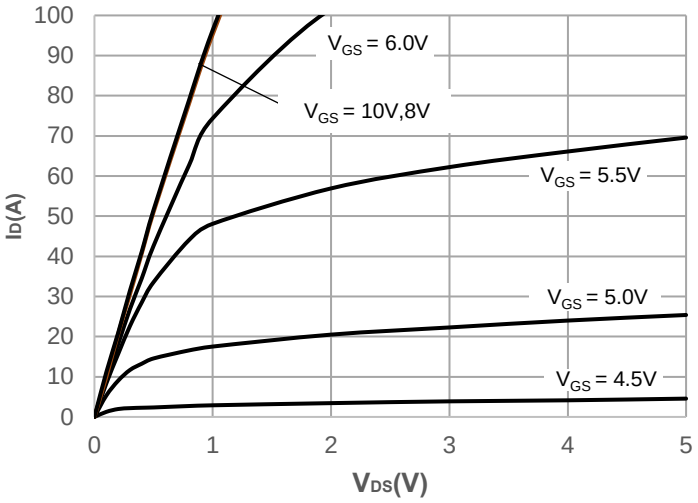


Figure 2: Typical Transfer Characteristics

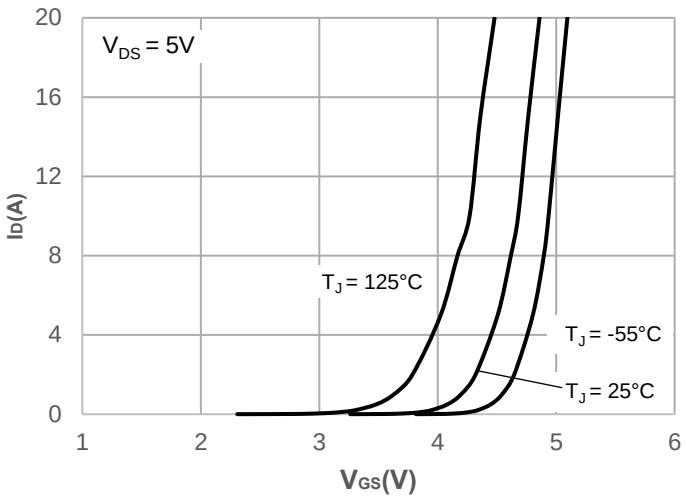


Figure 3: On-resistance vs. Drain Current

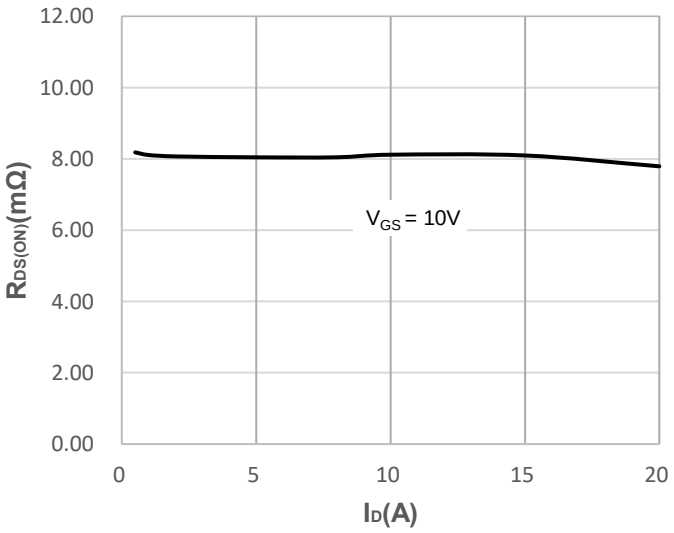


Figure 4: Body Diode Characteristics

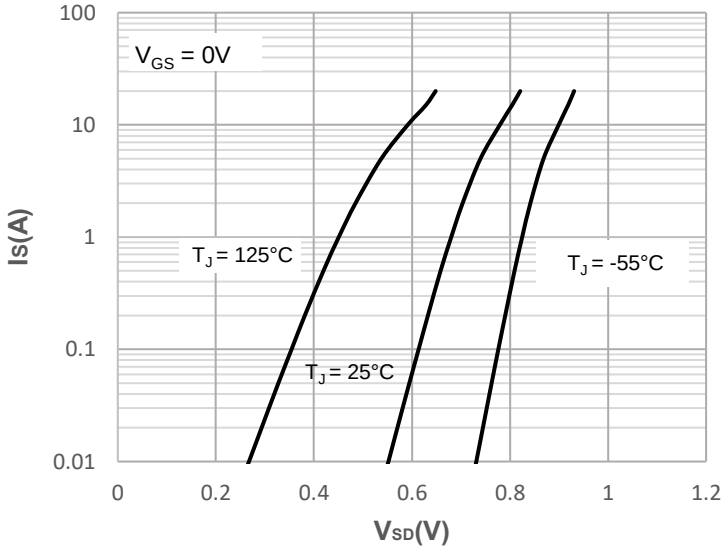


Figure 5: Gate Charge Characteristics

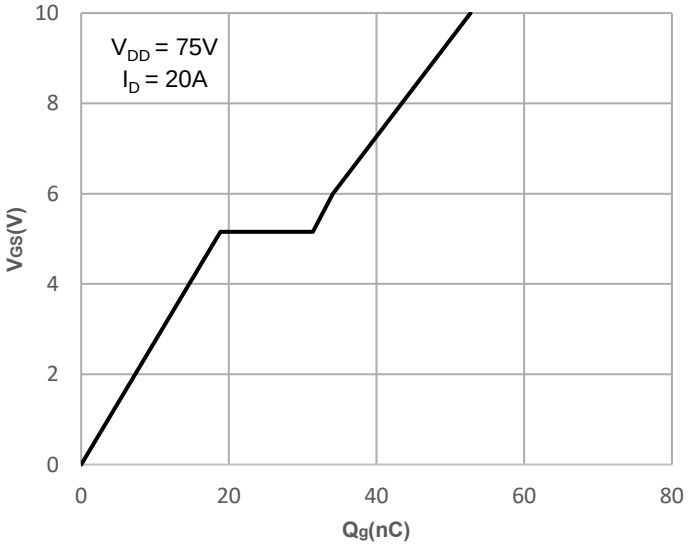
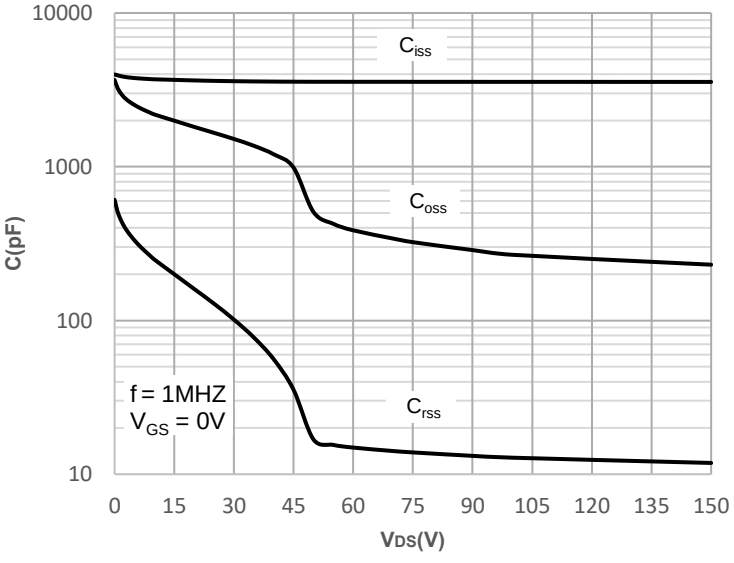


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

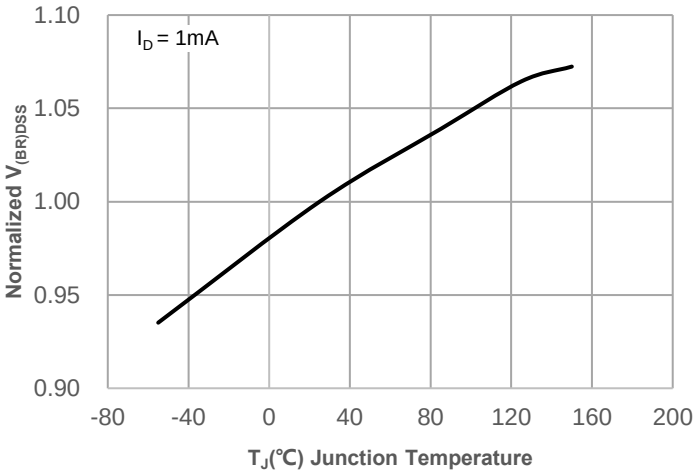


Figure 8: Normalized on Resistance vs. Junction Temperature

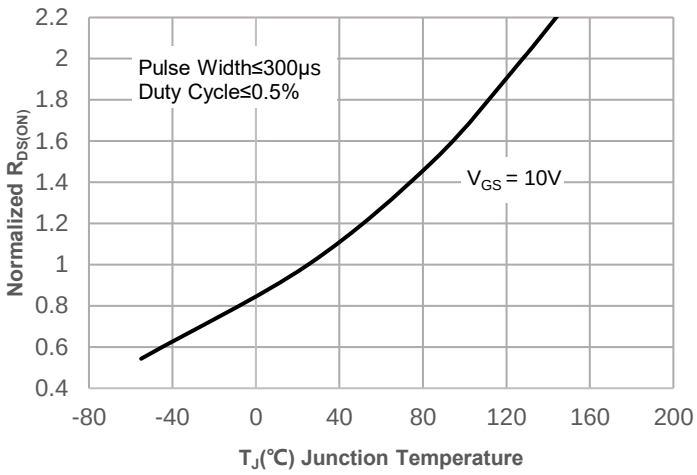


Figure 9: Normalized Threshold Voltage vs. Junction Temperature

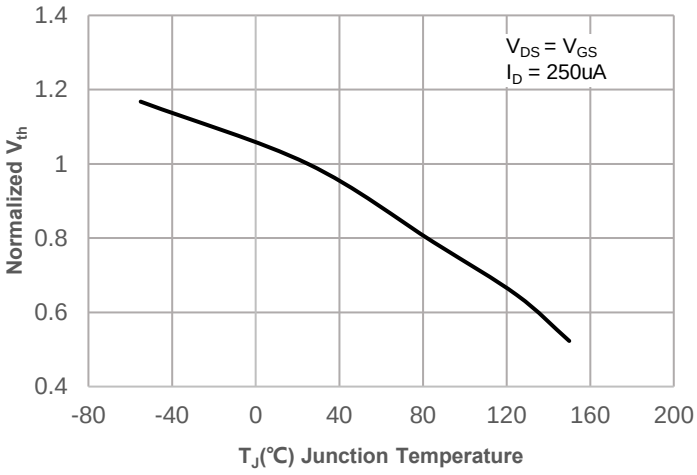


Figure 10: $R_{DS(ON)}$ vs. V_{GS}

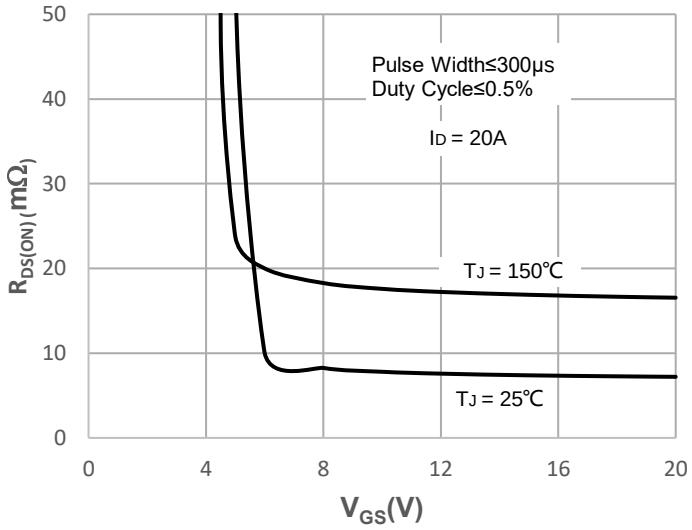
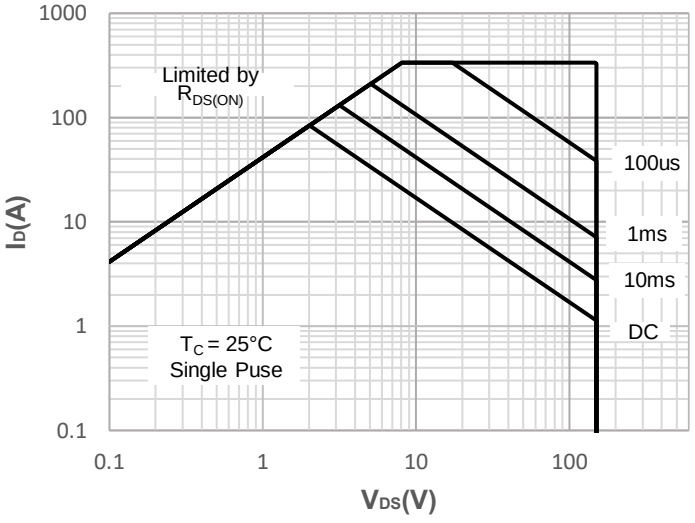


Figure 11: Maximum Safe Operating Area



Typical Characteristics

Figure 12: Power De-rating

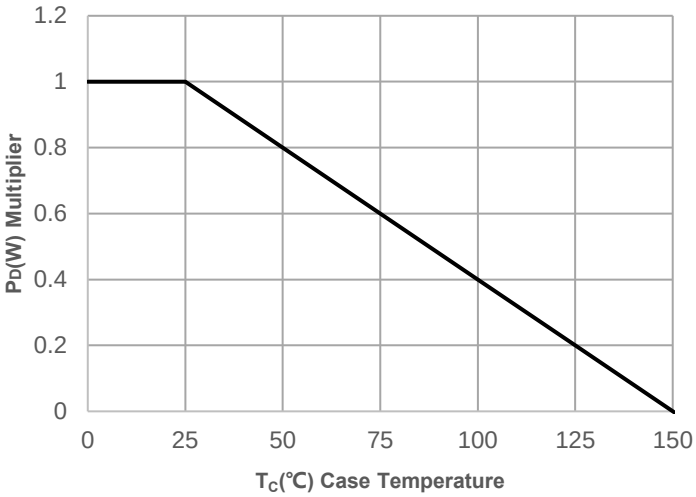


Figure 13: Current De-rating

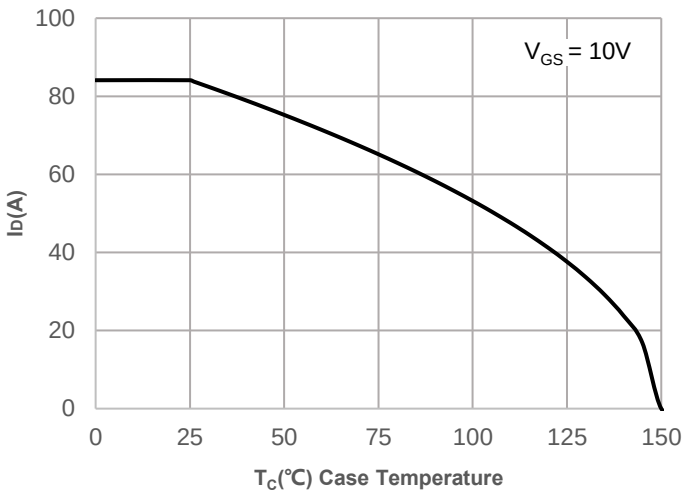


Figure 14: Normalized Maximum Transient Thermal Impedance

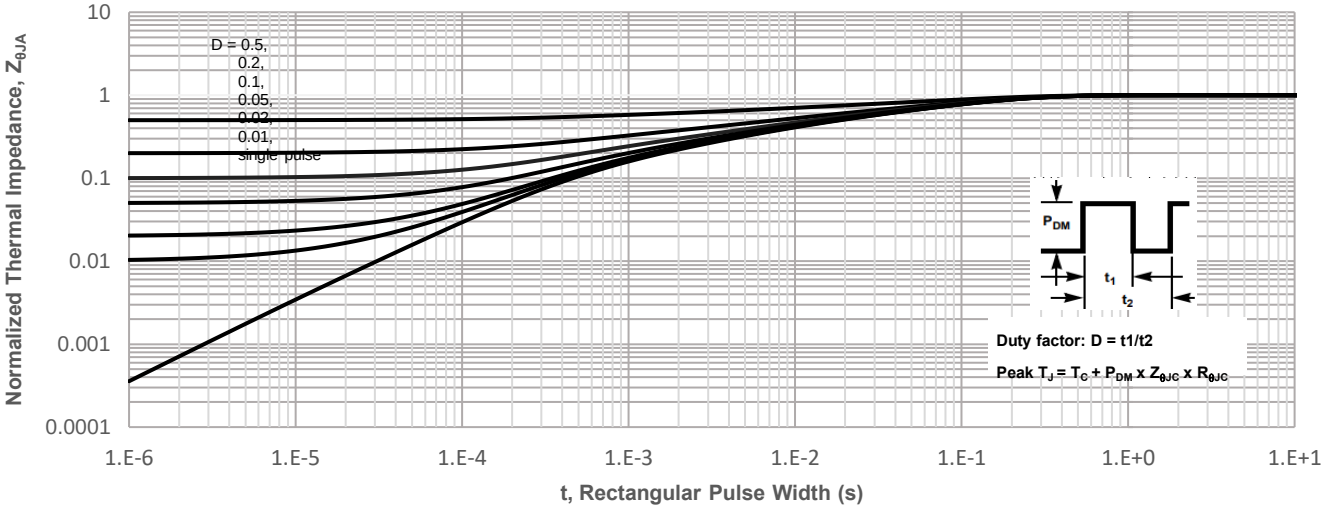
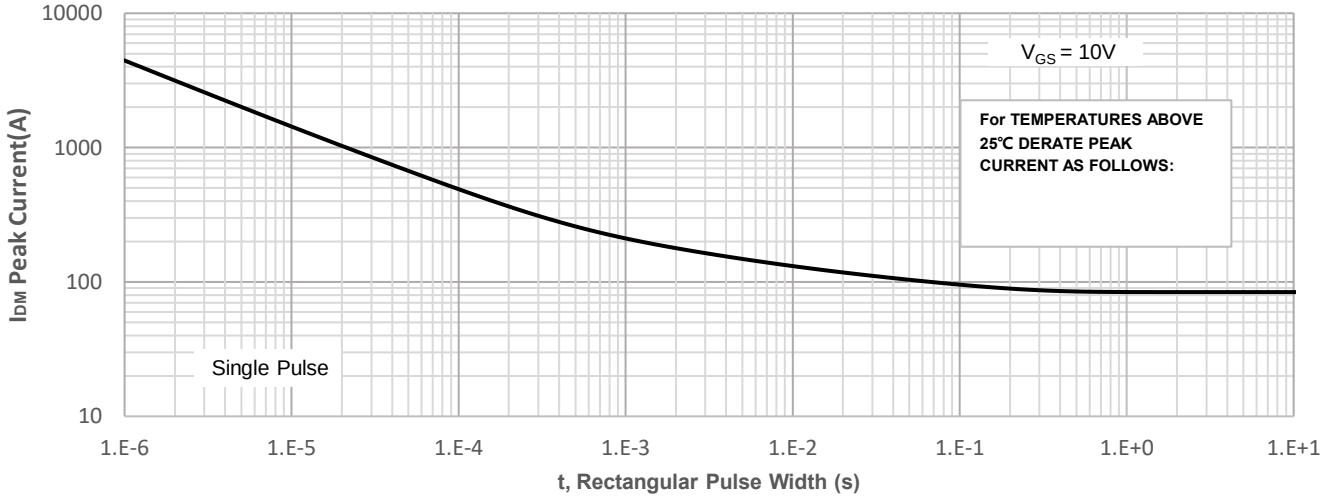
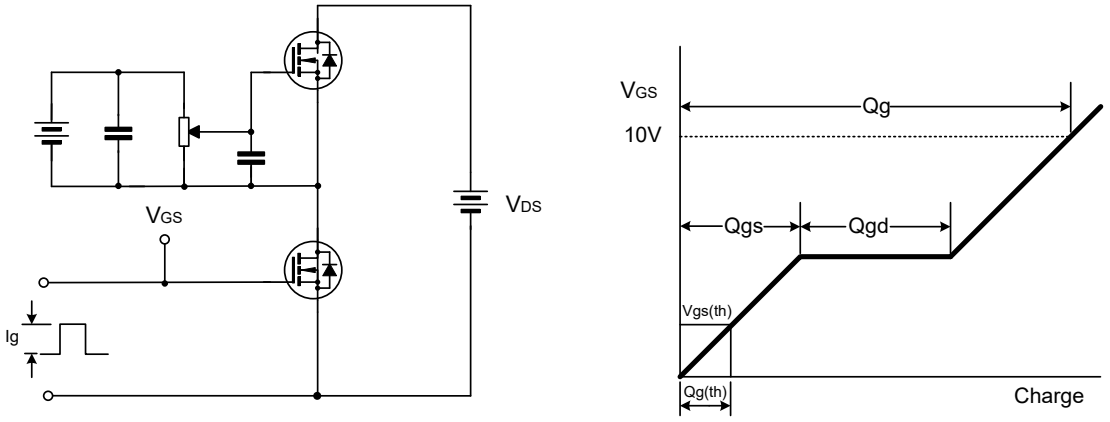


Figure 15: Peak Current Capacity

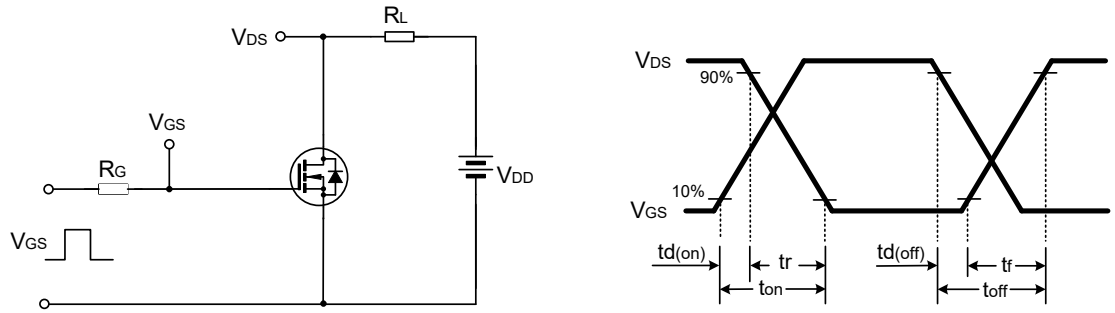


Test Circuit

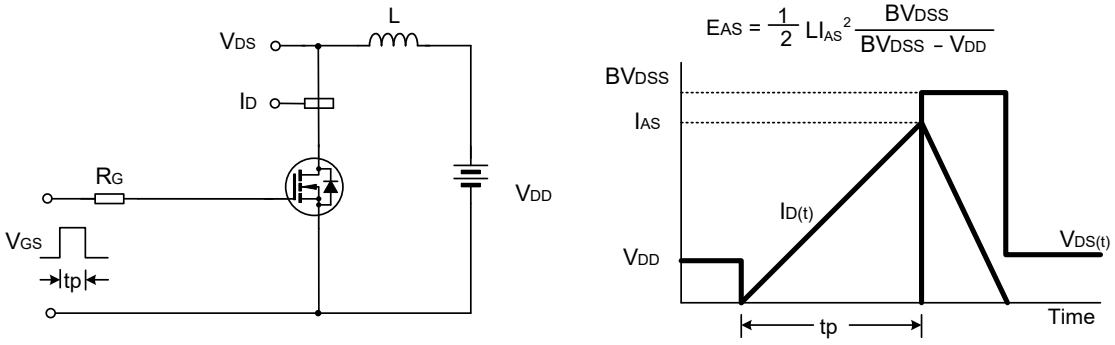
Gate Charge Test Circuit & Waveform



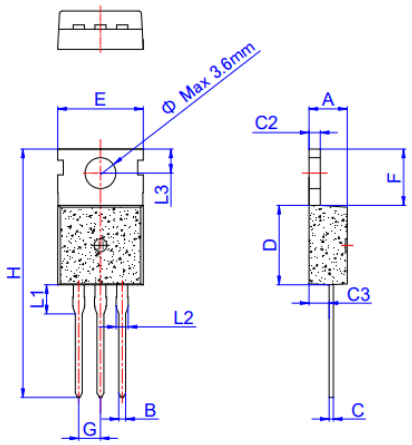
Resistive Switching Test Circuit & Waveform



E_{AS} Test Circuit & Waveform



TO-220-3L-C Package Information



TO-220C

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

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.