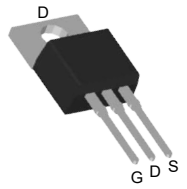
GPT1933NTB

80V N-Channel MOSFET

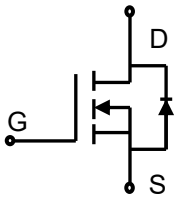
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
80V	4.5mΩ@10V	130A

TO-220-3L-C



Schematic diagram



Feature

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

Application

- Power Switching Application
- Power Management
- BLDC Motor Drive Systems

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPT1933NTB	TO-220-3L-C	GPT1933	Tube	-	-	50pcs

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	80	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25°C	I_D	130	A
	T_C = 100°C	I_D	92	A
Pulsed Drain Current[2]		I_{DM}	520	A
Single Pulsed Avalanche Current[3]		I_{AS}	42	A
Single Pulsed Avalanche Energy[3]		E_{AS}	441	mJ
Power Dissipation[5]	T_C = 25°C	P_D	157	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	55	°C/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.8	°C/W
Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-55~ +150	°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	80			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V, 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	2.6	4	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A		4.5	7.0	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 40V, V_{GS} = 0V, f = 0.1MHz		3449		pF
Output Capacitance	C_{oss}			681		
Reverse Transfer Capacitance	C_{rss}			27		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2.5		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 40V, V_{GS} = 10V, I_D = 20A		50		nC
Gate-source Charge	Q_{gs}			16		
Gate-drain Charge	Q_{gd}			11		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 40V, V_{GS} = 10V, I_D = 20A, R_G = 3Ω		16		ns
Turn-on Rise Time	t_r			13		
Turn-off Delay Time	$t_{d(off)}$			32		
Turn-off Fall Time	t_f			14		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 50A			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.E_{AS} condition: V_{DD} = 80V, 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 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Characteristics

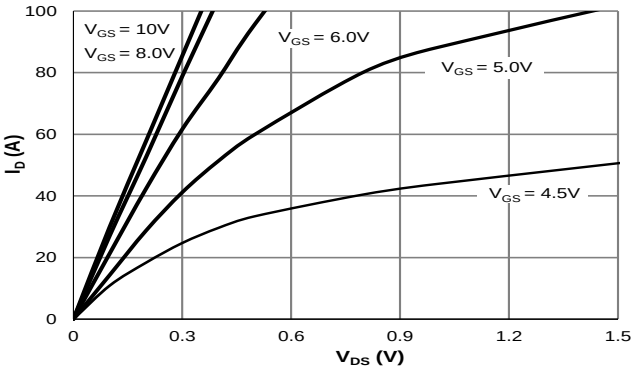


Figure 1: Saturation Characteristics

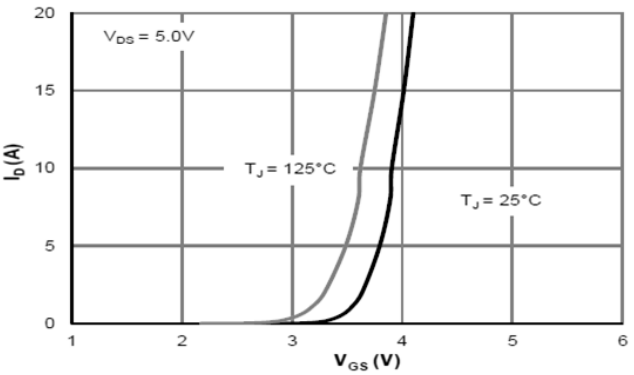


Figure 2: Transfer Characteristics

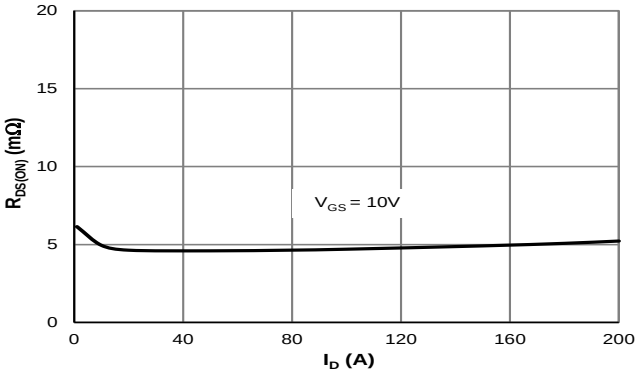


Figure 3: $R_{DS(ON)}$ vs. Drain Current

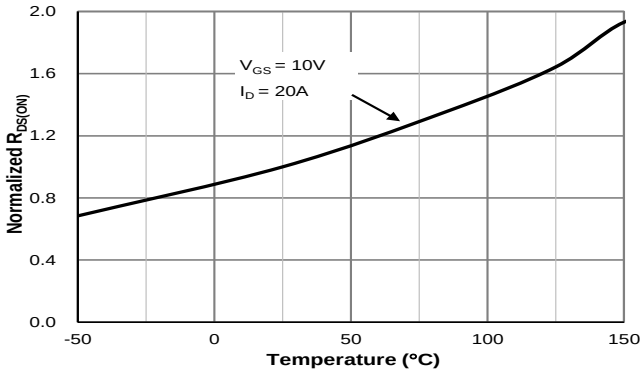


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

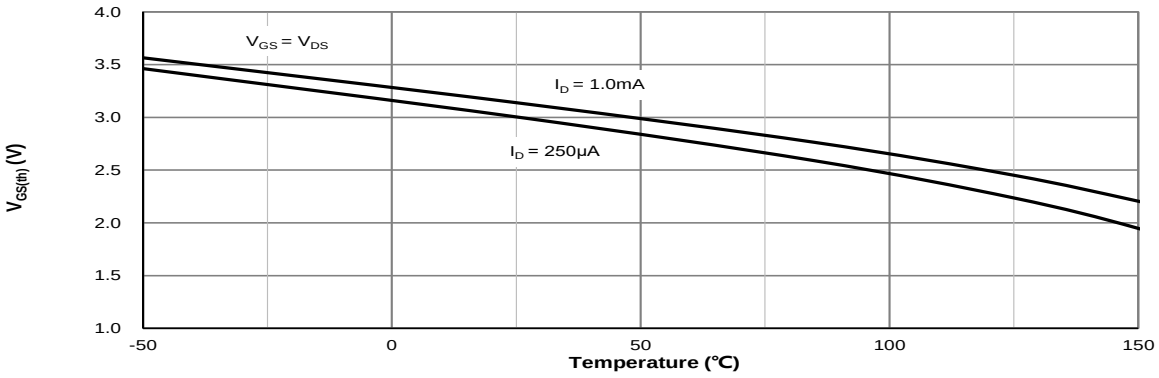


Figure 5: VGS(th) vs. Junction Temperature

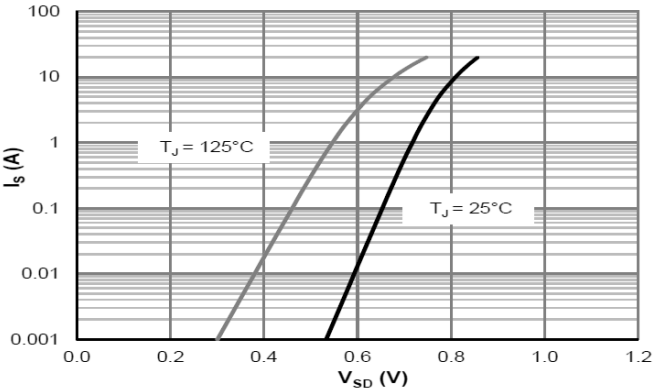


Figure 7: Body-Diode Characteristics

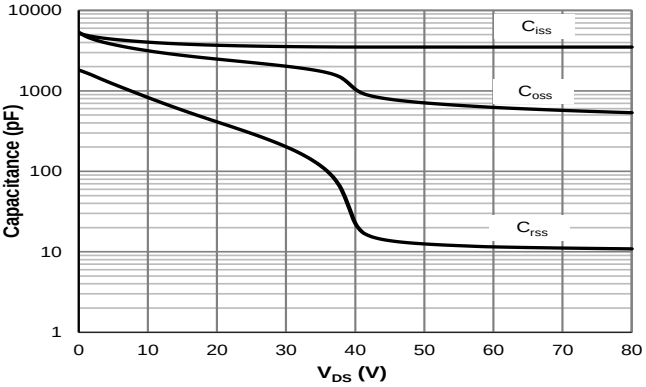


Figure 8: Capacitance Characteristics

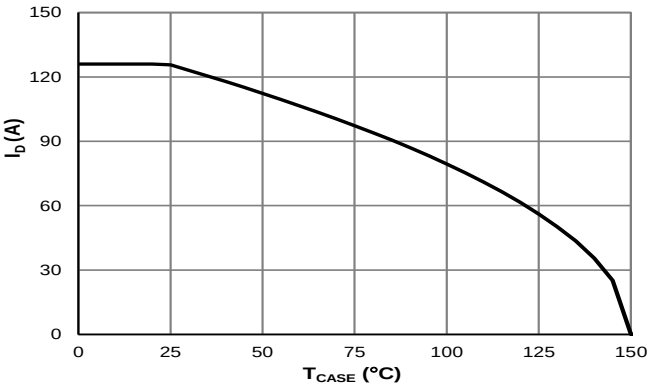


Figure 9: Current De-rating

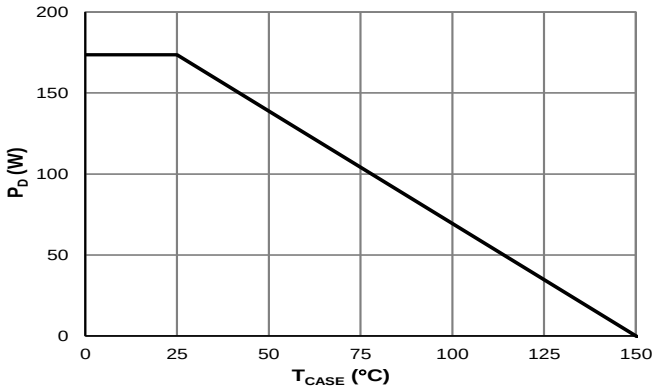


Figure 10: Power De-rating

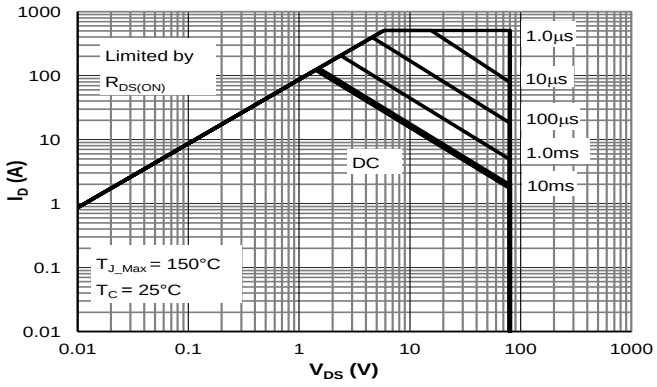


Figure 11: Maximum Safe Operating Area

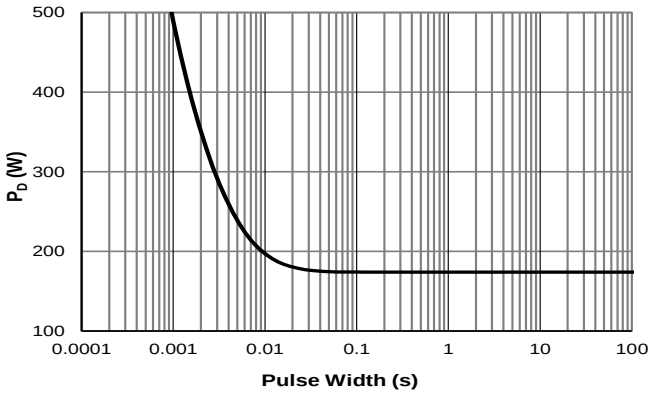


Figure 12: Single Pulse Power Rating, Junction-to-Case

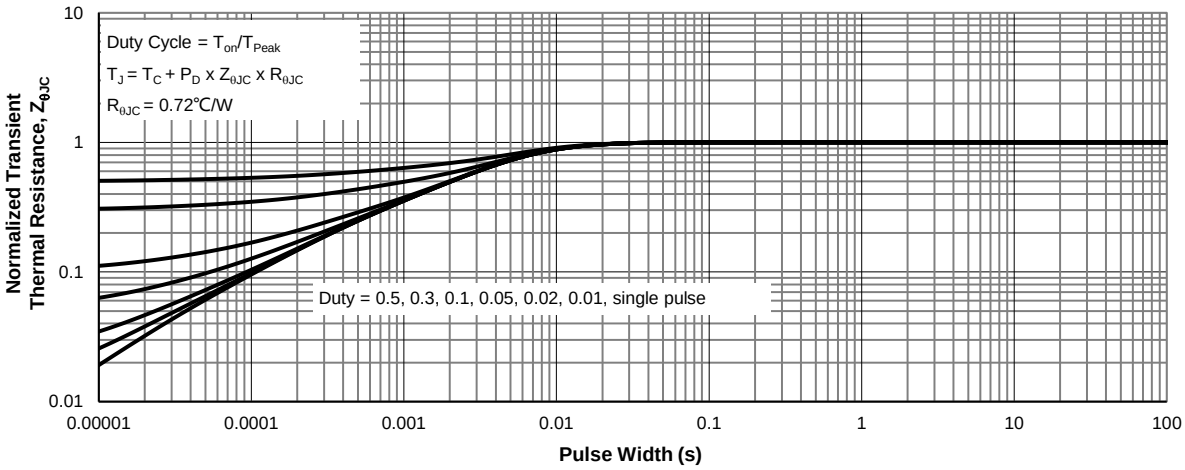
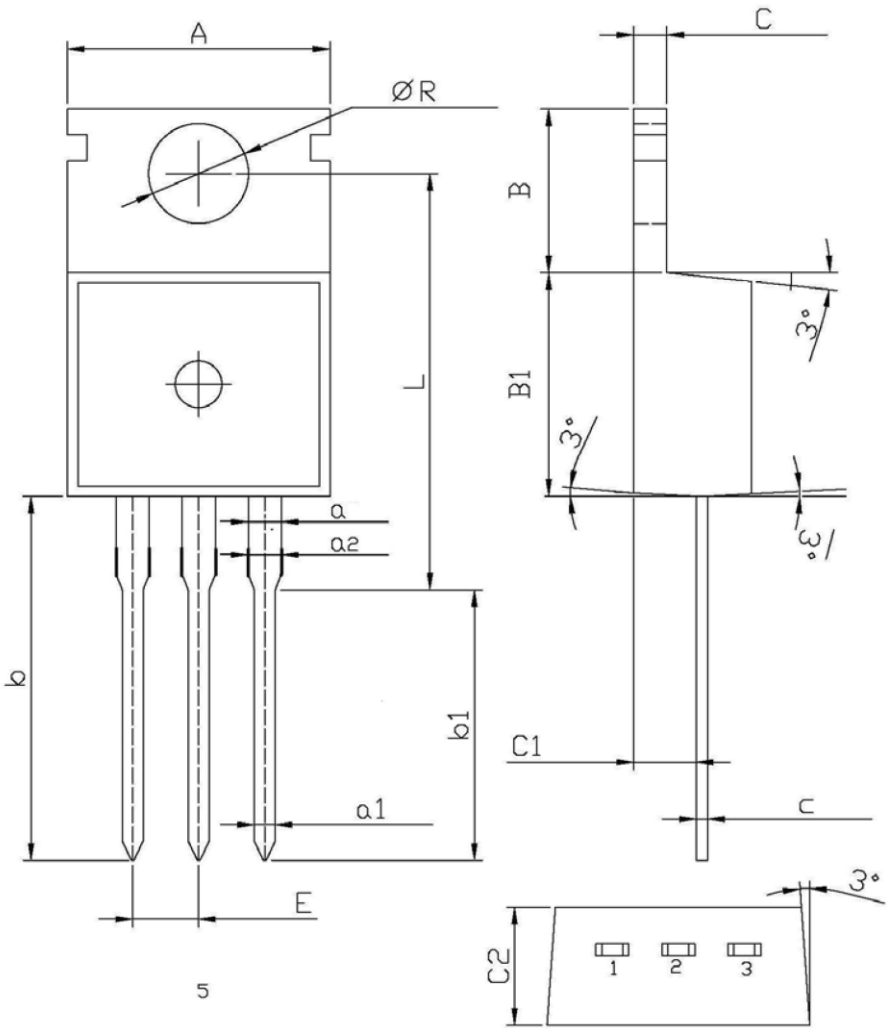


Figure 13: Normalized Maximum Transient Thermal Impedance

TO-220-3L-C Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	9.800	10.200	0.386	0.402
R	3.560	3.640	0.140	0.143
L	15.700	16.100	0.618	0.634
b	12.600	13.600	0.496	0.535
b1	9.600	10.600	0.378	0.417
a	1.220	1.320	0.048	0.052
E	2.340	2.740	0.092	0.108
a2	1.250	1.620	0.049	0.064
C	1.200	1.400	0.047	0.055
B	5.900	6.700	0.232	0.264
B1	9.000	9.400	0.354	0.370
C1	2.200	2.600	0.087	0.102
a1	0.700	0.900	0.028	0.035
c	0.400	0.600	0.016	0.024
C2	4.300	4.700	0.169	0.185

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