

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
200V	21mΩ@10V	90A

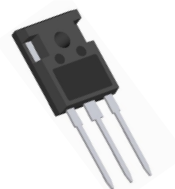
Feature

- Trench Technology Power MOSFET
- Low $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

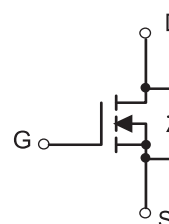
Application

- Power Management Switches
- DC/DC Converter
- Motor Driver

TO-247-3L



Schematic diagram



Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPM210N20NTD	TO-247-3L	M210N20N	Tube	NA	NA	30pcs

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	90	A
	$T_C = 100^\circ\text{C}$		56	
Pulsed Drain Current ²		I_{DM}	360	A
Single Pulsed Avalanche Current ³		I_{AS}	63	A
Single Pulsed Avalanche Energy ³		E_{AS}	992	mJ
Power Dissipation ⁵	$T_C = 25^\circ\text{C}$	P_D	284	W
Thermal Resistance from Junction to Ambient ⁶		$R_{\theta JA}$	55	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.44	$^\circ\text{C/W}$
Junction Temperature		T_J	150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55~ +150	$^\circ\text{C}$

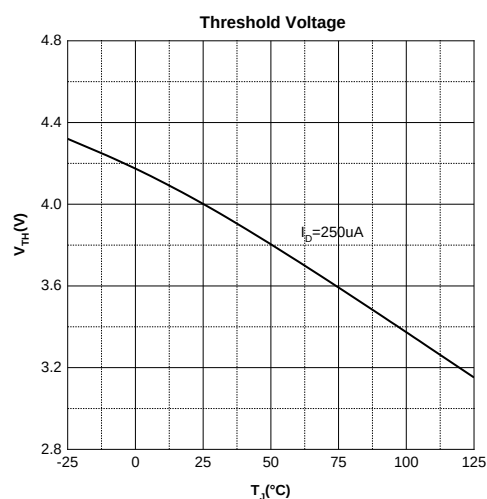
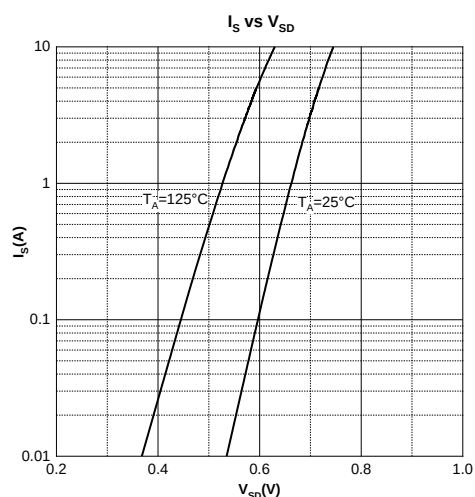
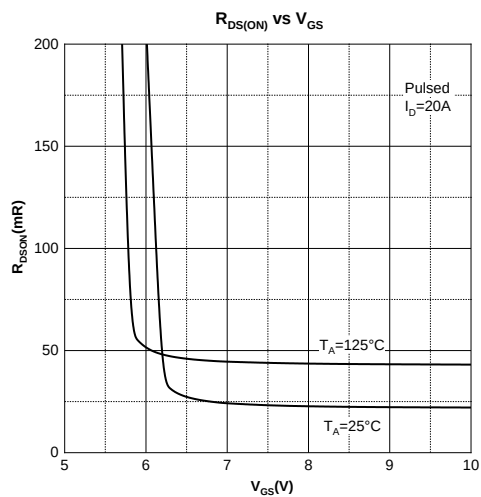
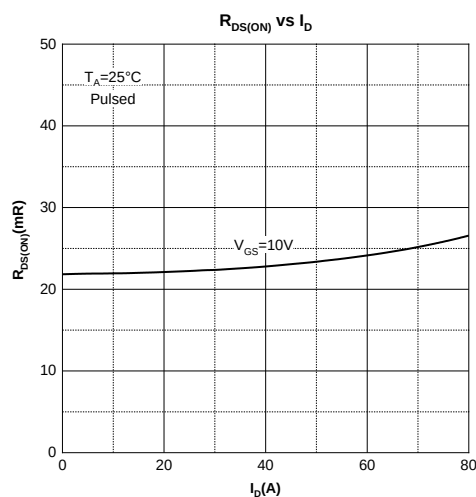
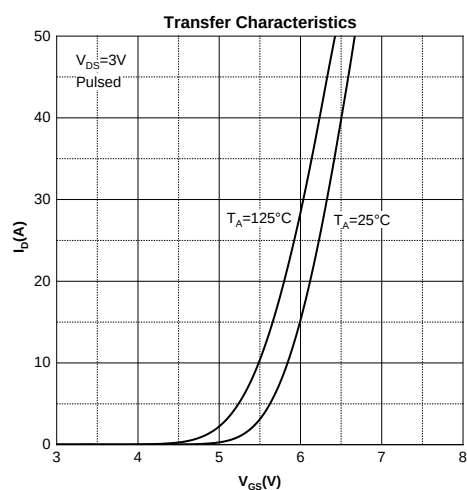
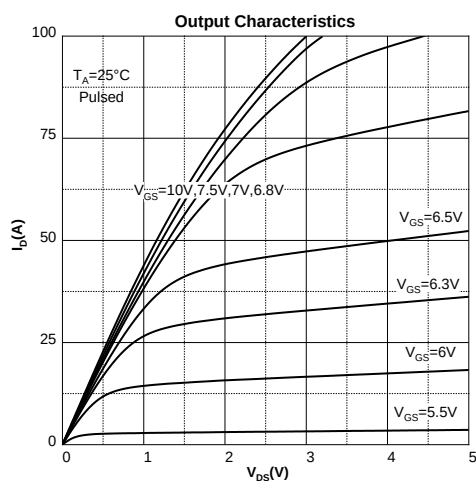
MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

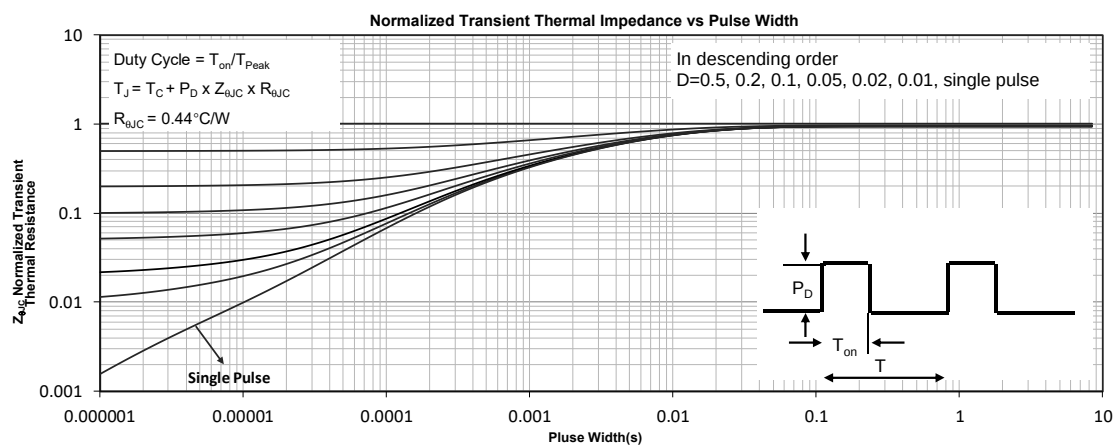
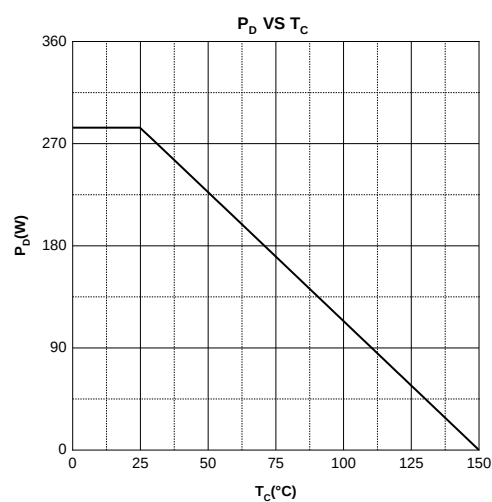
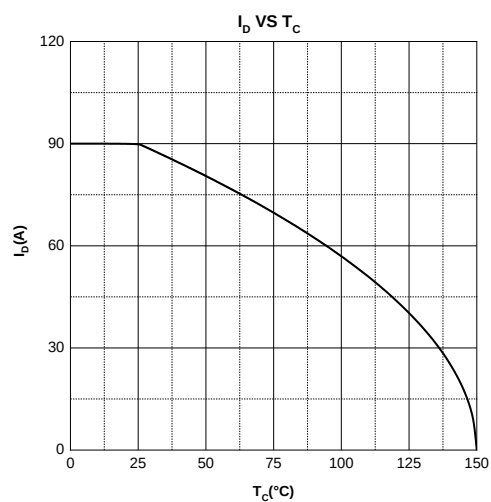
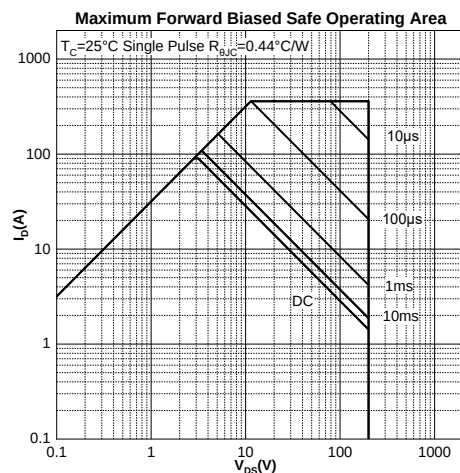
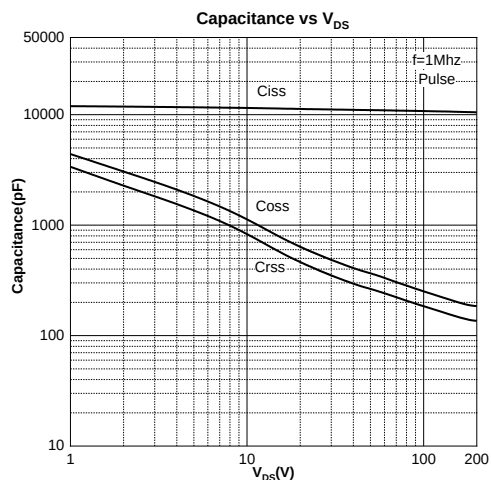
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	200			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 200V, V _{GS} = 0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics ⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	3.5	4.0	4.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		21	26	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{DS} = 100V, V _{GS} = 0V, f = 1MHz		10610		pF
Output Capacitance	C _{oSS}			251		
Reverse Transfer Capacitance	C _{rSS}			183		
Gate Resistance	R _g	f = 1MHz		1.4		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 100V, V _{GS} = 10V, I _D = 20A		236		nC
Gate-Source Charge	Q _{gs}			60		
Gate-Drain Charge	Q _{gd}			98		
Turn-On Delay Time	t _{d(on)}	V _{DD} = 100V, V _{GS} = 10V, R _G = 3Ω, I _D = 20A		33		ns
Turn-On Rise Time	t _r			63		
Turn-Off Delay Time	t _{d(off)}			98		
Turn-Off Fall Time	t _f			30		
Source-Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 20A			1.2	V
Continuous Source Current	I _S				70	A
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, di/dt = 100A/μs		118		ns
Body Diode Reverse Recovery Charge	Q _{rr}			521		nC

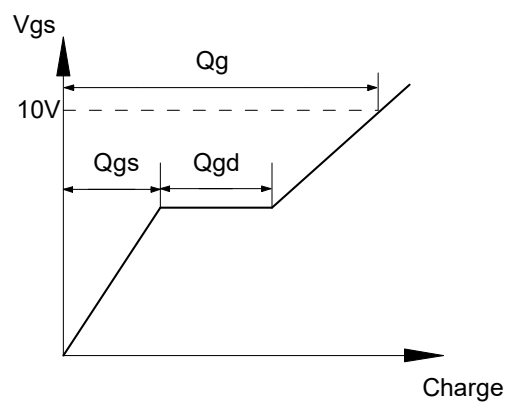
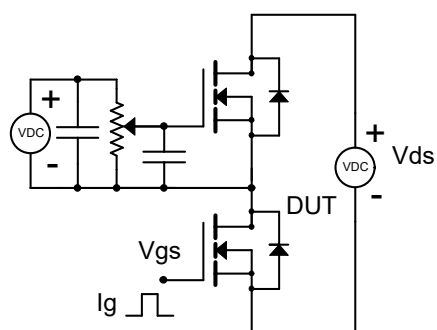
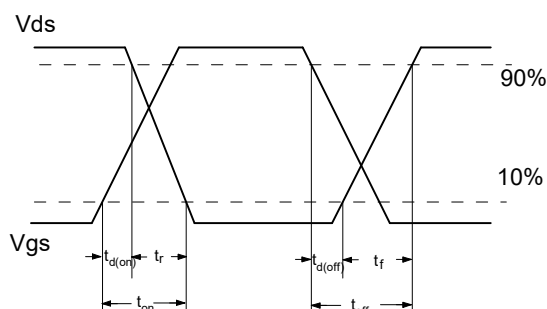
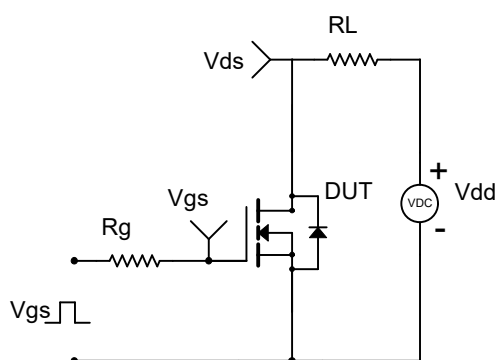
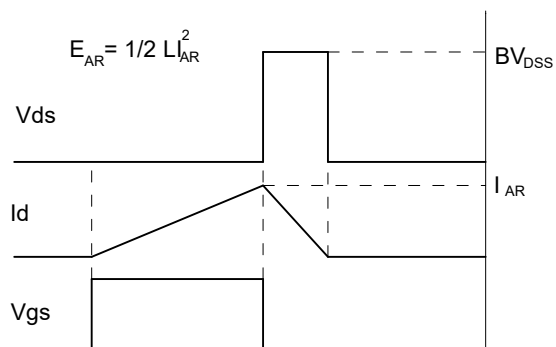
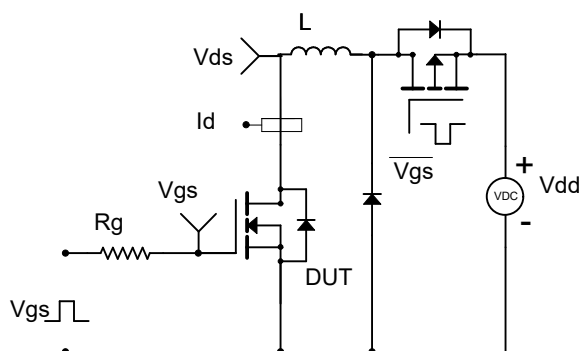
Notes :

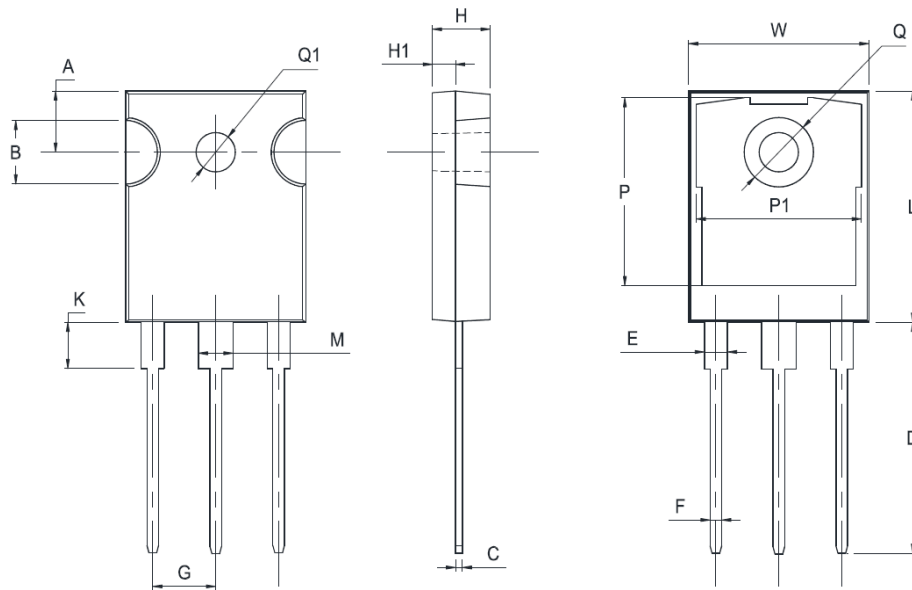
- 1.The maximum current rating is limited by package. And device mounted on a large heatsink.
- 2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- 3.EAS condition: V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.
- 4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 5.The power dissipation P_D is limited by T_{J(MAX)} = 150°C. And device mounted on a large heatsink.
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

Typical Characteristics





Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveform

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms


TO-247-3L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	5.900	6.500	0.232	0.256
B	4.600	5.200	0.181	0.205
C	0.500	0.700	0.020	0.028
D	19.700	20.300	0.776	0.799
E	1.800	2.200	0.071	0.087
F	1.100	1.300	0.043	0.051
G	5.100	5.700	0.201	0.224
W	15.800	16.200	0.622	0.638
H	4.700	5.300	0.185	0.209
H1	2.100	2.500	0.083	0.098
K	4.050	4.450	0.159	0.175
L	20.700	21.300	0.815	0.839
M	2.800	3.200	0.110	0.126
P	16.200	16.600	0.638	0.654
P1	13.800	14.200	0.543	0.559
Q	7.050	7.350	0.278	0.289
Q1	3.600	4.200	0.142	0.165

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.