

Product Summary

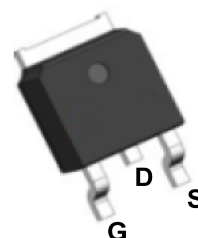
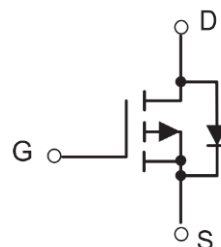
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-60V	-17mΩ@10V	-60A

Feature

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

Application

- Synchronous Rectification
- DC/DC Converter

TO-252-2L

Schematic diagram

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPM170P06LTF	TO-252-2L	M170P06L	Tape&Reel	330mm	16mm	2500pcs

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

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	-60	V
Gate - Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	-60	A
	$T_C = 100^{\circ}\text{C}$		-42	
Pulsed Drain Current ¹		I_{DM}	-240	A
Single Pulsed Avalanche Energy ²		E_{AS}	115.2	mJ
Power Dissipation		P_D	58	W
$T_C = 25^{\circ}\text{C}$				
Thermal Resistance from Junction to Ambient ³		$R_{\theta JA}$	65	$^{\circ}\text{C/W}$
Thermal Resistance from Junction to Case		$R_{\theta JC}$	2.15	$^{\circ}\text{C/W}$
Operating Junction And Storage Temperature		T_J, T_{STG}	-55~ +150	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS (T_J=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		-60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -60V, V _{GS} = 0V	T _J =25°C			-1	μA
			T _J =100°C			-100	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		-1	-1.6	-2.2	V
Drain-Source On-Resistance ⁴	R _{DS(on)}	V _{GS} = -10V, I _D = -10A			17	23	mΩ
		V _{GS} = -4.5V, I _D = -6A			23	32	mΩ
Transconductance ⁴	g _{fs}	V _{DS} = -10V,I _D =-10A			32		S
Dynamic Characteristics ⁵							
Input Capacitance	C _{iSS}	V _{DS} = -30V, V _{GS} = 0V, f = 1MHz			3050		pF
Output Capacitance	C _{oSS}				169		
Reverse Transfer Capacitance	C _{rSS}				143		
Gate Resistance	R _G	f=1MHz			4.8		Ω
Switching Characteristics ⁵							
Total Gate Charge	Q _g	V _{DS} = -30V, V _{GS} = -10V, I _D = -10A			59		nC
Gate-Source Charge	Q _{gs}				5.3		
Gate-Drain Charge	Q _{gd}				8.8		
Turn-On Delay Time	t _{d(on)}	V _{DD} = -30V, V _{GS} = -10V, I _D = -10A R _G = 3Ω			20		ns
Turn-On Rise Time	t _r				23		
Turn-Off Delay Time	t _{d(off)}				82		
Turn-Off Fall Time	t _f				28		
Source - Drain Diode Characteristics							
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = -10A				-1.2	V
Diode Max Current	I _S	T _C = 25° C				-35	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The test condition is V_{DD}= -25V, V_{GS}= -10V, L= 0.4mH, I_{AS}= -24A.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

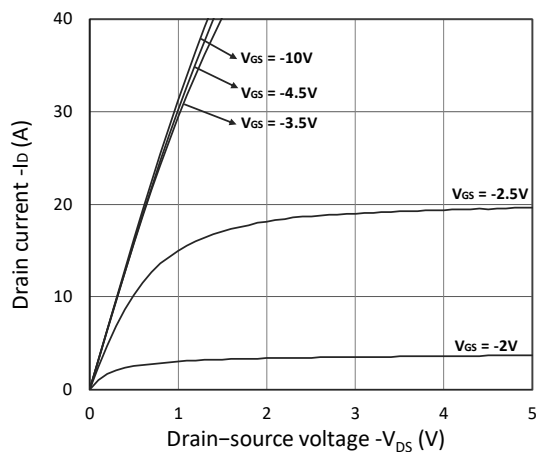
Typical Characteristics


Figure 1. Output Characteristics

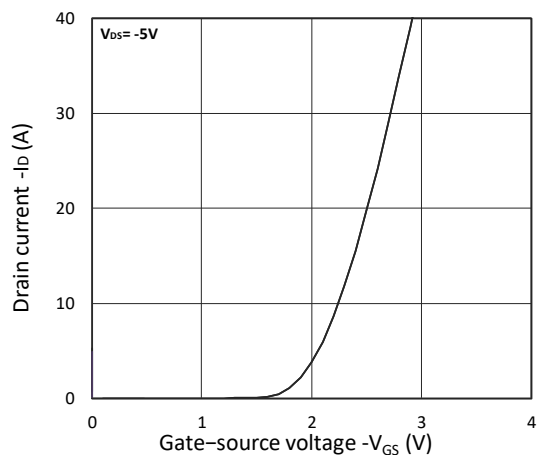


Figure 2. Transfer Characteristics

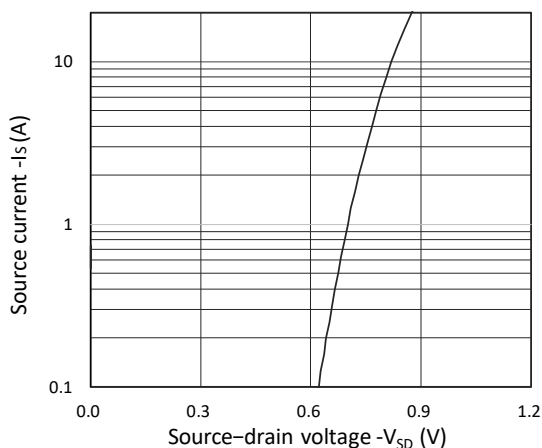
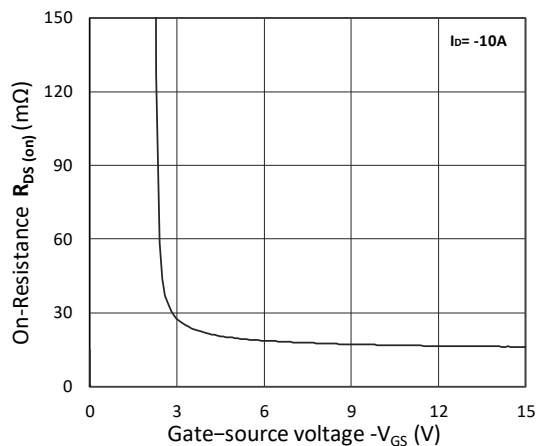
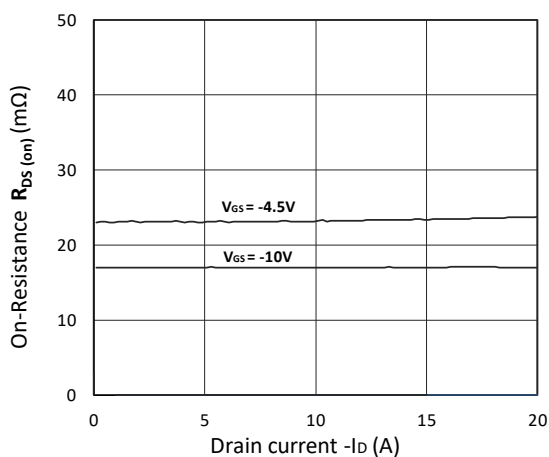
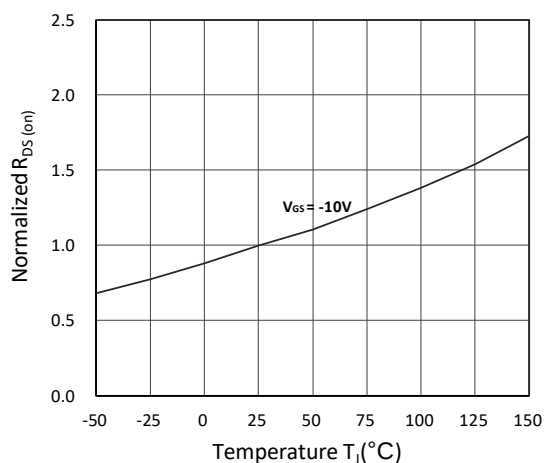


Figure 3. Forward Characteristics of Reverse


 Figure 4. $R_{DS(ON)}$ vs. V_{GS}

 Figure 5. $R_{DS(ON)}$ vs. I_D

 Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

Typical Characteristics

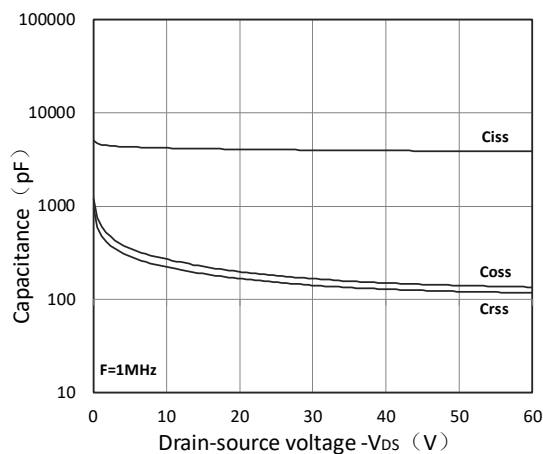


Figure 7. Capacitance Characteristics

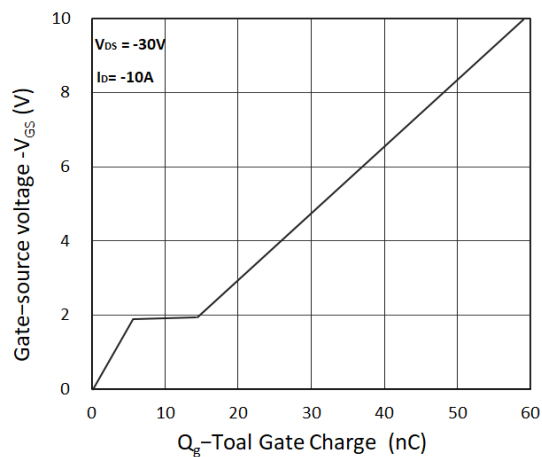


Figure 8. Gate Charge Characteristics

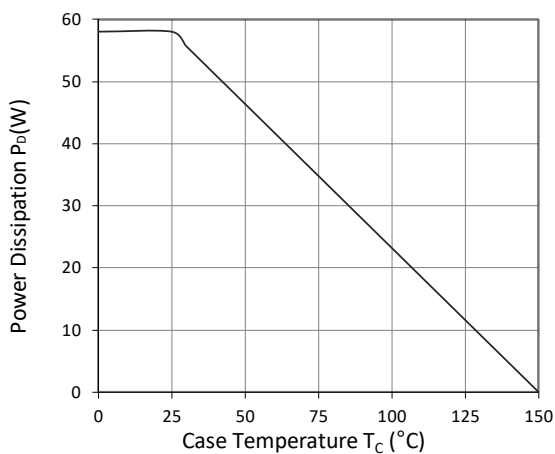


Figure 9. Power Dissipation

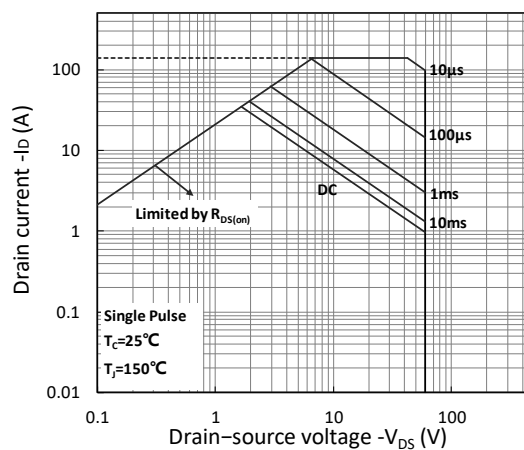


Figure 10. Safe Operating Area

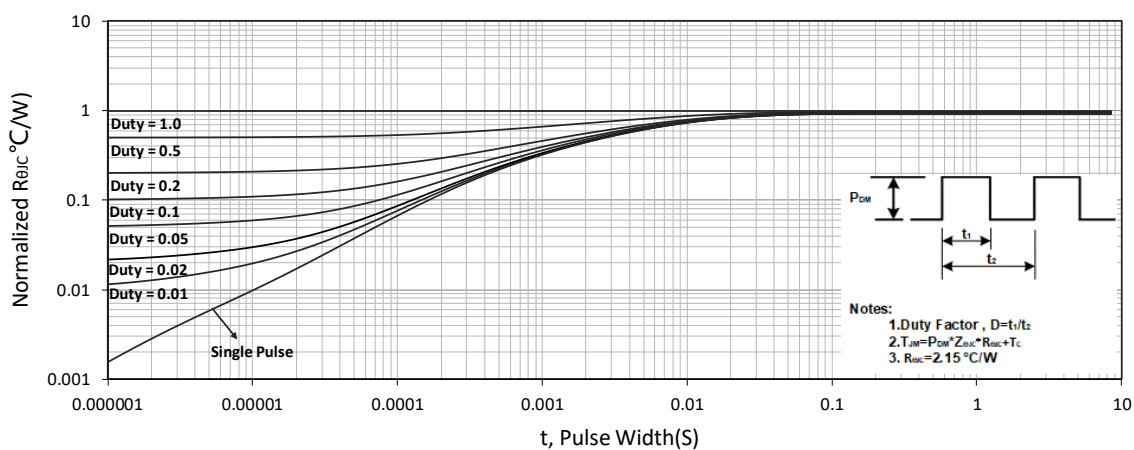
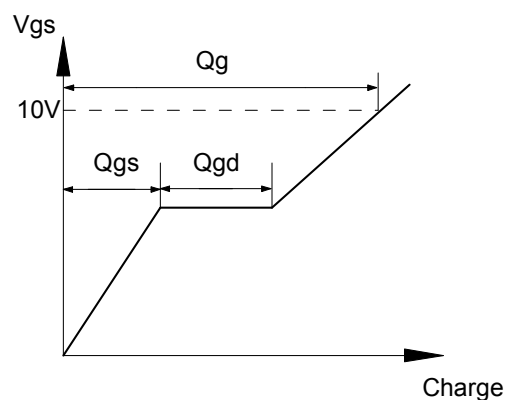
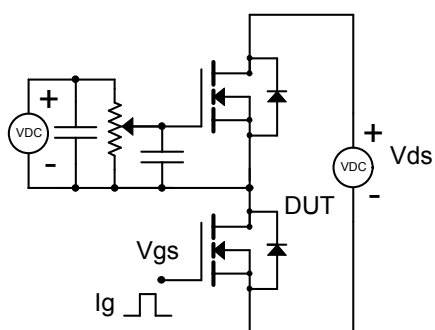
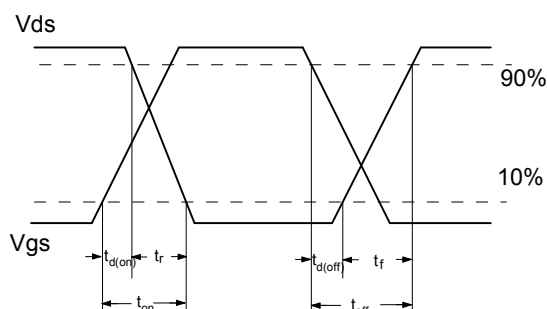
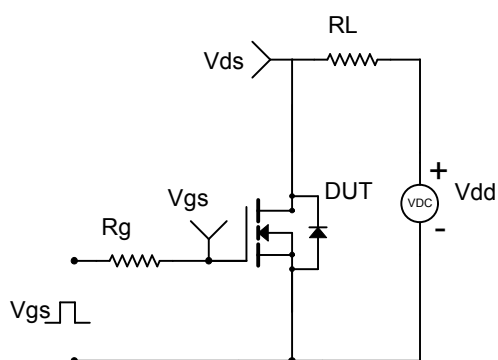
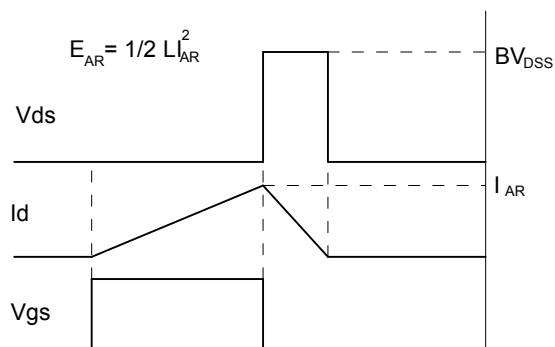
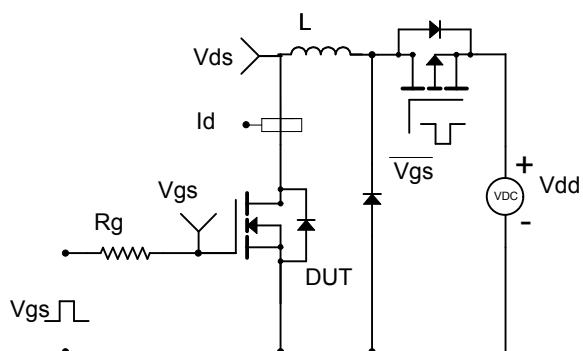
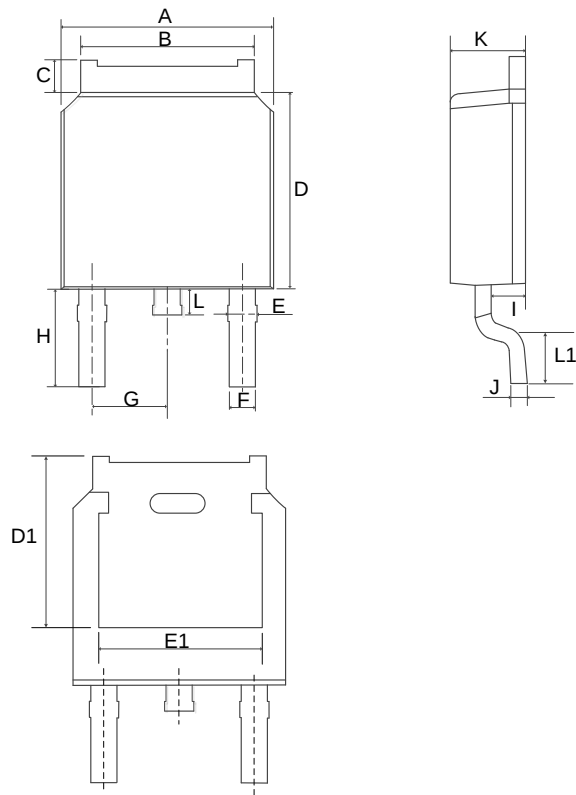


Figure 11. Normalized Maximum Transient Thermal Impedance

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveform

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms


TO-252-2L Package Information


SYMBOL	MM	
	MIN	MAX
A	6.40	6.80
B	5.13	5.50
C	0.88	1.28
D	5.90	6.22
D1	5.35REF	
E	0.68	1.10
E1	4.83REF	
F	0.68	0.91
G	2.29REF	
H	2.90REF	
I	0.85	1.17
J	0.51REF	
K	2.10	2.50
L	0.40	1.00
L1	1.50REF	

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.