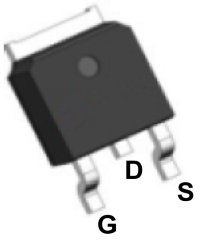
GPM170P06LTF

60V P-Channel MOSFET

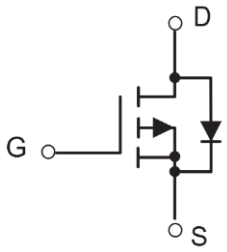
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-60V	-17mΩ@10V	-35A

TO-252-2L



Schematic diagram



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

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℃ 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℃	I_D	-35	A
	T_C = 100℃		-22	
Pulsed Drain Current[1]		I_{DM}	-140	A
Single Pulsed Avalanche Energy[2]		E_{AS}	115.2	mJ
Power Dissipation	T_C = 25℃	P_D	58	W
Thermal Resistance from Junction to Ambient[3]		$R_{\theta JA}$	65	℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	2.15	℃/W
Operating Junction And Storage Temperature		T_J,T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS (T_J=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		-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]	gfs	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

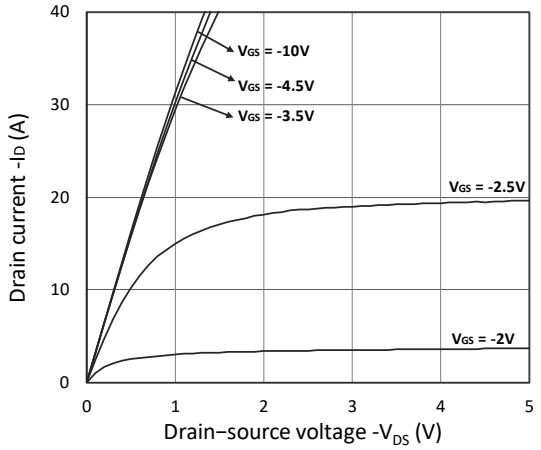


Figure 1. Output Characteristics

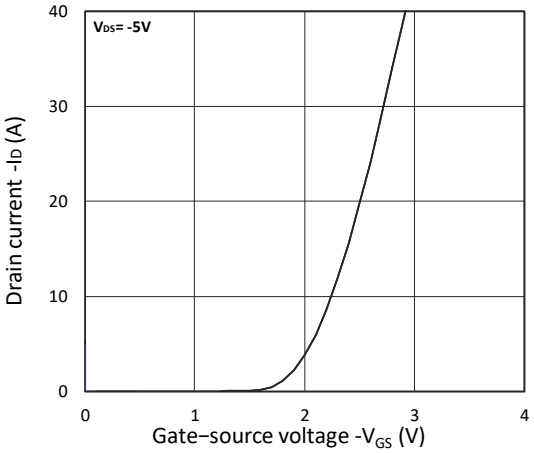


Figure 2. Transfer Characteristics

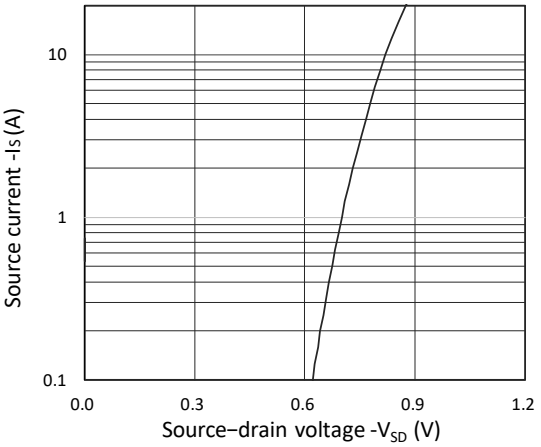


Figure 3. Forward Characteristics of Reverse

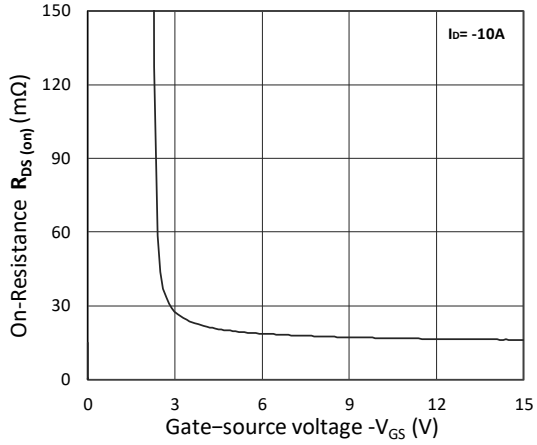


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

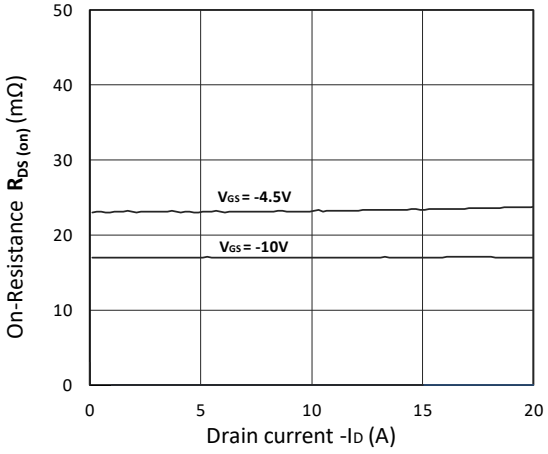


Figure 5. $R_{DS(ON)}$ vs. I_D

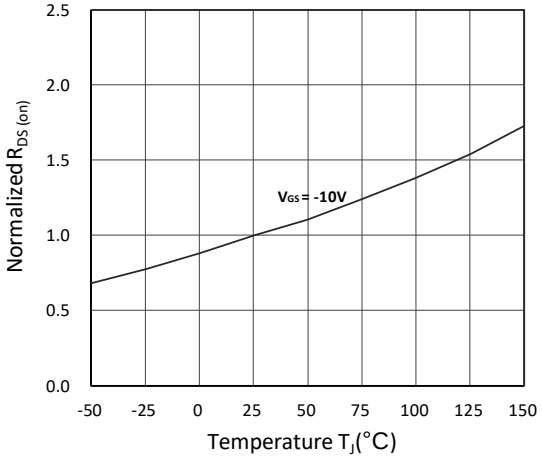


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics

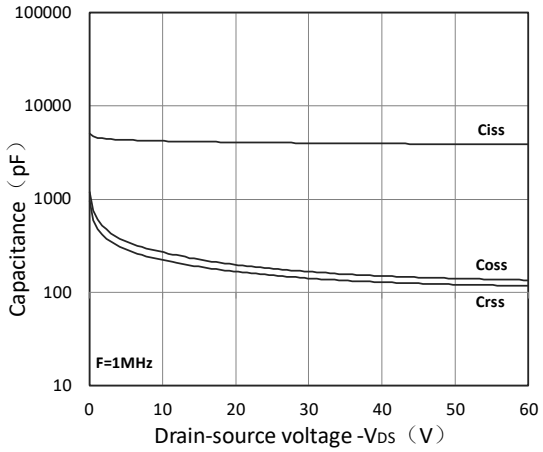


Figure 7. Capacitance Characteristics

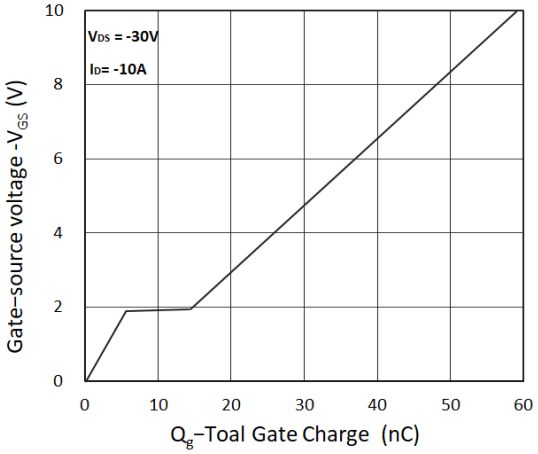


Figure 8. Gate Charge Characteristics

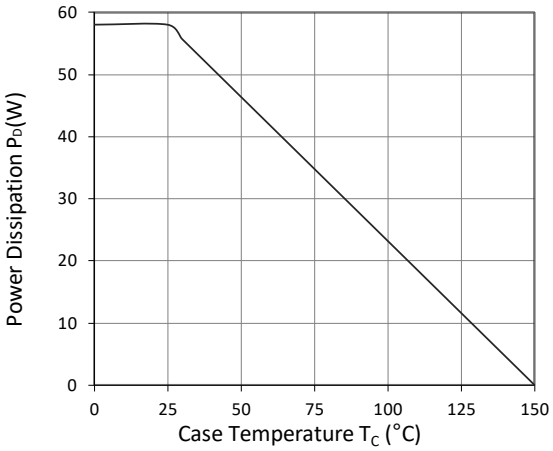


Figure 9. Power Dissipation

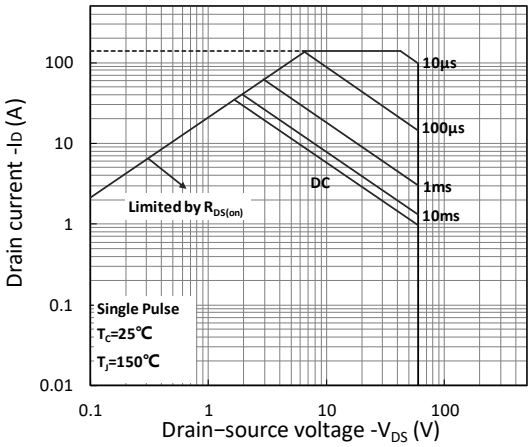


Figure10. Safe Operating Area

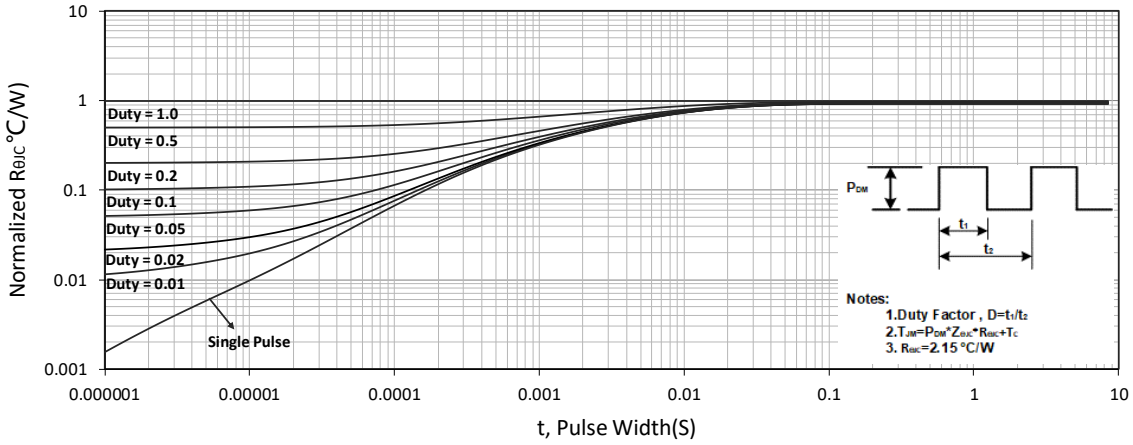
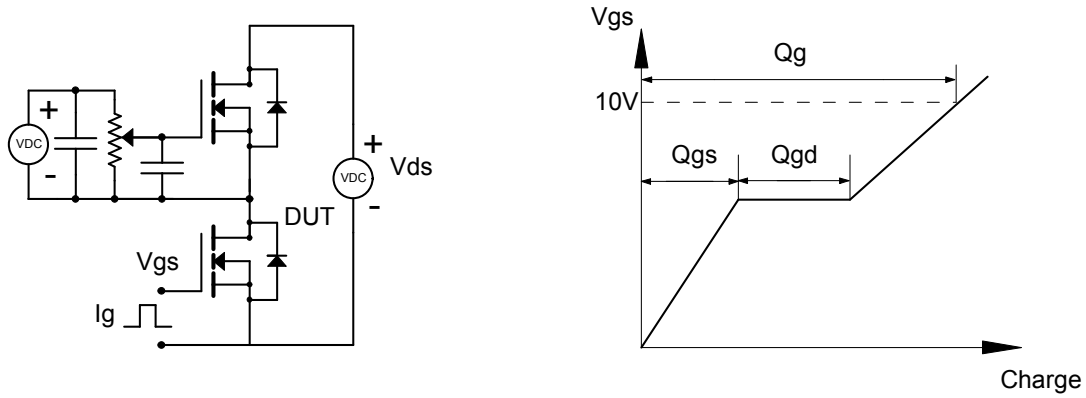


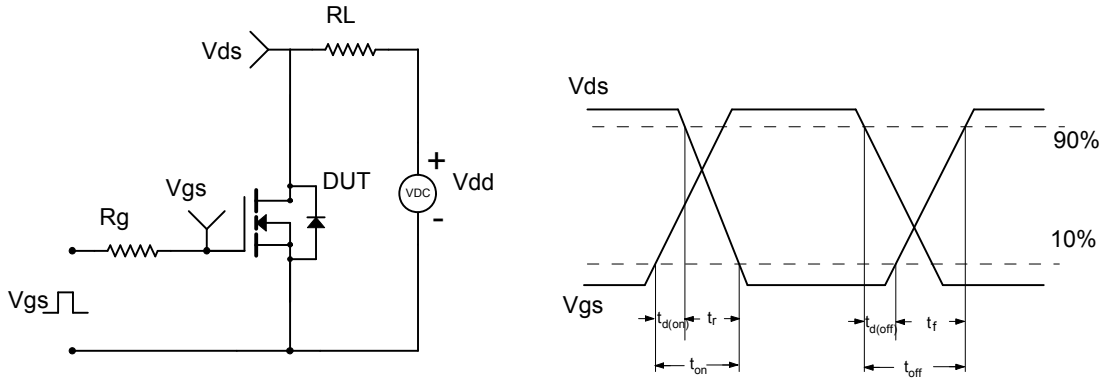
Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

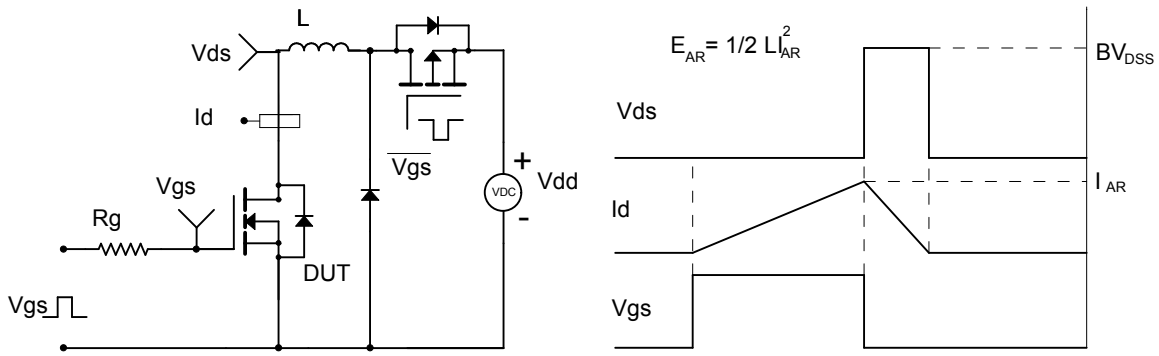
Gate Charge Test Circuit & Waveform



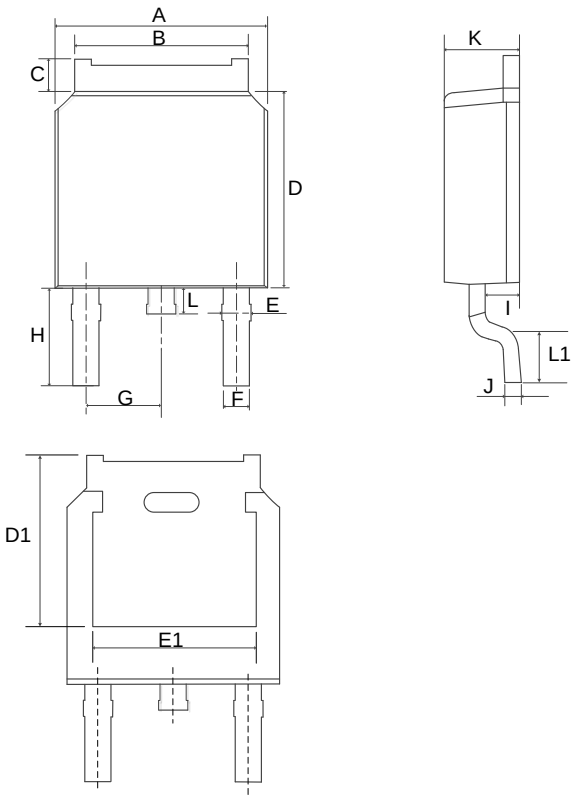
Resistive Switching Test Circuit & Waveform



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.
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