

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-60V	45mΩ@-10V	-18A
	59mΩ@-4.5V	

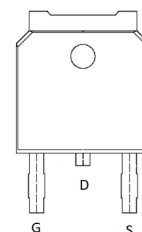
Feature

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

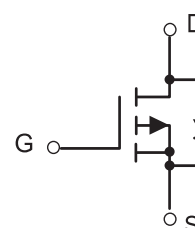
Application

- Power Switching Application

TO-252-2L



Schematic diagram



MARKING:



M650P06L = Device Code
 XX = Date Code
 Solid Dot = Green Indicator

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 ¹	I_D	-18	A
Pulsed Drain Current ²	I_{DM}	-72	A
Single Pulsed Avalanche Current ³	I_{AS}	-22	A
Single Pulsed Avalanche Energy ³	E_{AS}	121	mJ
Power Dissipation ⁵	P_D	40	W
Thermal Resistance from Junction to Ambient ⁶	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

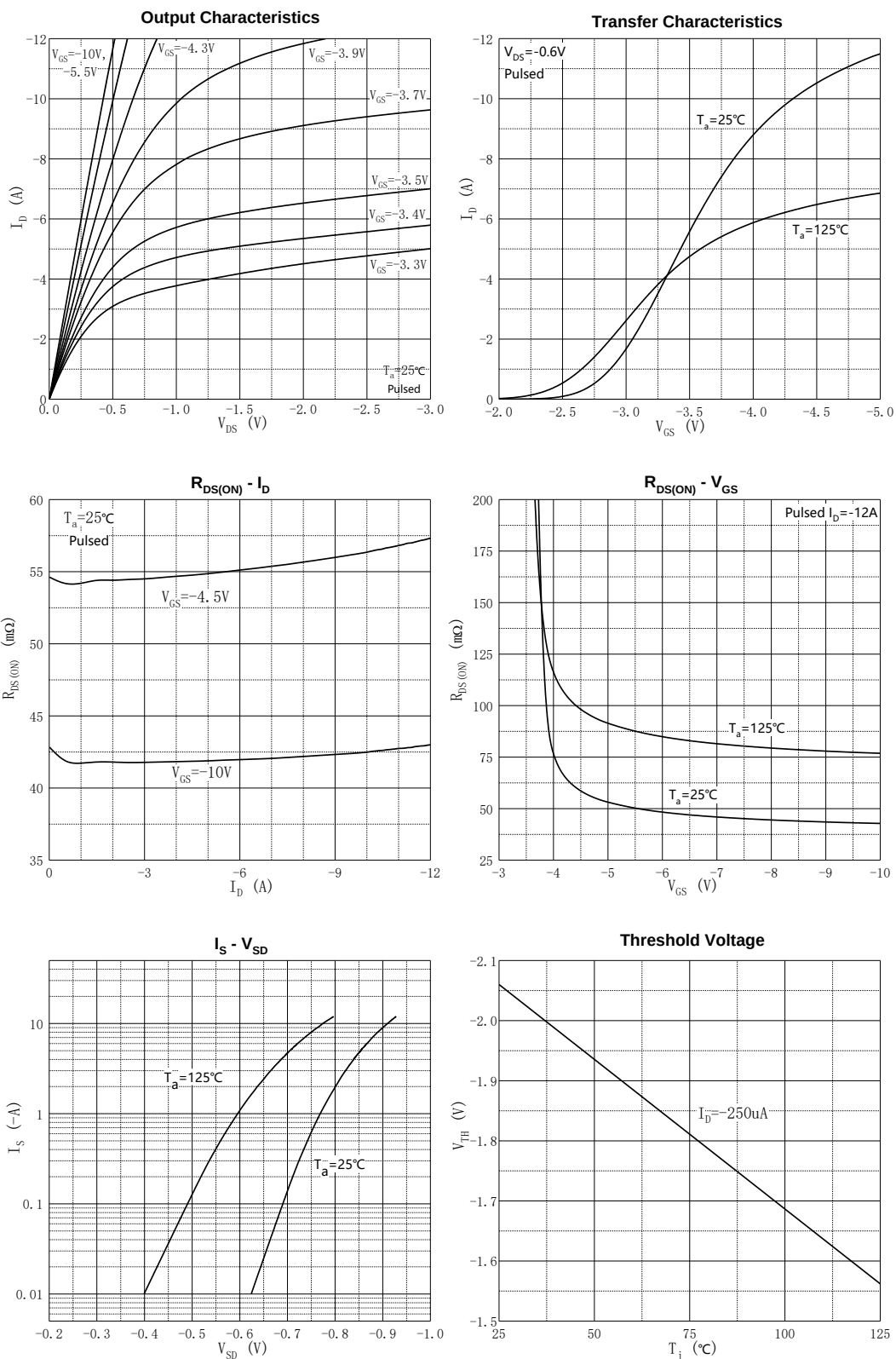
MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

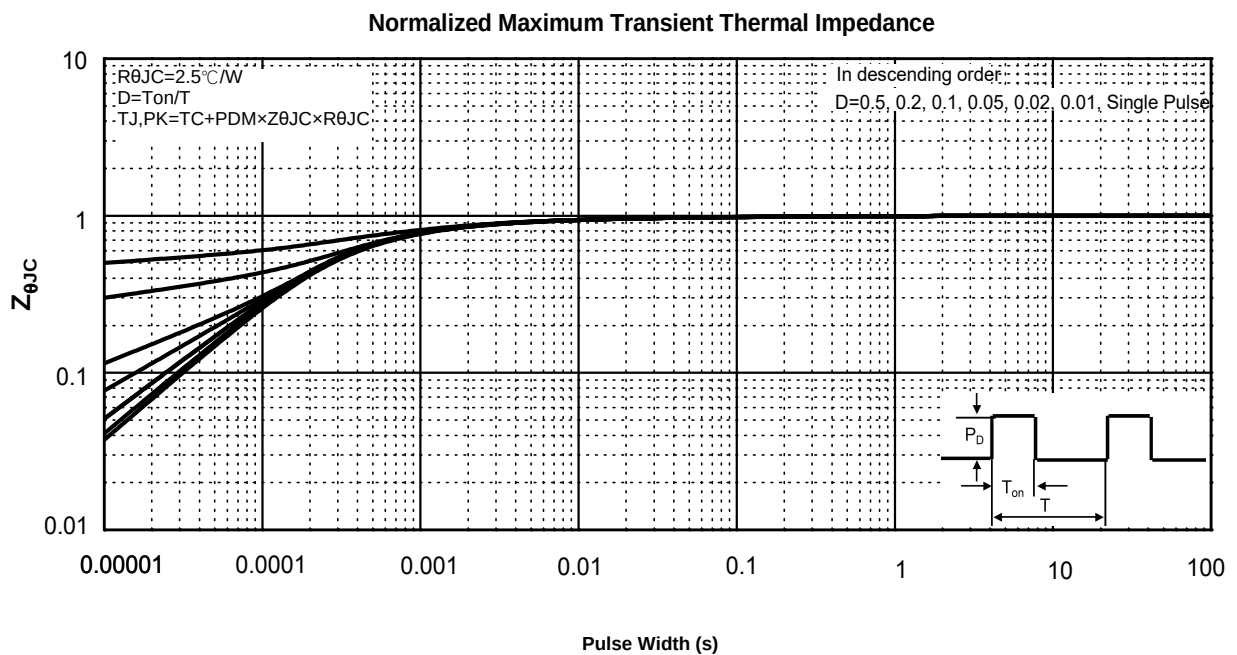
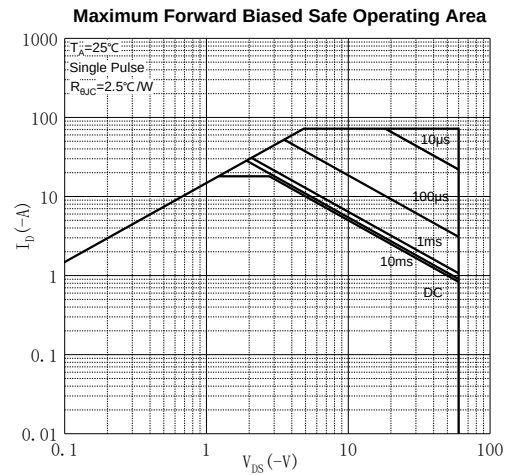
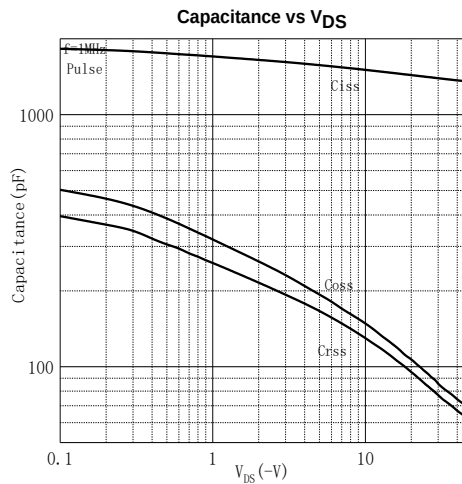
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -60V, V _{GS} = 0V			-1	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics ⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1	-2	-3	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -12A		45	65	mΩ
		V _{GS} = -4.5V, I _D = -8A		59	85	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = -30V, V _{GS} = 0V, f = 1MHz		1389		pF
Output Capacitance	C _{oss}			87		
Reverse Transfer Capacitance	C _{rss}			80		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		4.1		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = -30V, V _{GS} = -10V, I _D = -12A		28		nC
Gate-Source Charge	Q _{gs}			4.2		
Gate-Drain Charge	Q _{gd}			7.1		
Turn-On Delay Time	t _{d(on)}	V _{DD} = -30V, V _{GS} = -10V, R _L = 15Ω, R _G = 2.5Ω		8		ns
Turn-On Rise Time	t _r			6		
Turn-Off Delay Time	t _{d(off)}			30		
Turn-Off Fall Time	t _f			7		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = -12A			-1.2	V

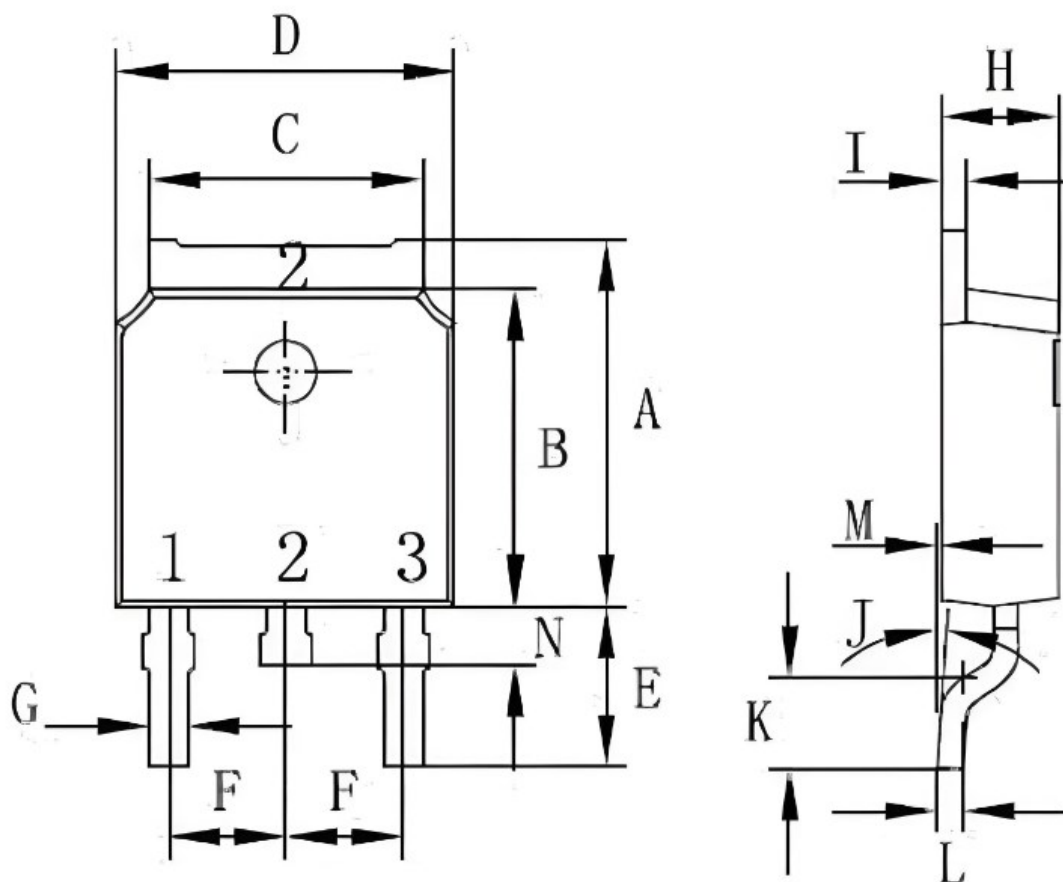
Notes :

- 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.EAS condition: V_{DD} = -30V, 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







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.85	7.45	0.27	0.29
B	5.90	6.35	0.23	0.25
C	5.13	5.53	0.20	0.22
D	6.40	6.80	0.25	0.27
E	2.90	3.30	0.11	0.13
F	2.20	2.40	0.09	0.09
G	0.65	0.95	0.03	0.04
H	2.25	2.45	0.09	0.10
I	0.40	0.60	0.02	0.02
J	0°	8°	0°	8°
K	1.65	2.15	0.06	0.08
L	0.45	0.65	0.02	0.03
M	0.00	0.12	0.00	0.00
N	0.60	1.00	0.02	0.04

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.