

-20V P-Channel Advanced Power MOSFET

BVDSS	-20.0	V
ID	-6	A
R _{DS(ON)} @V _{GS} =-4.5V typ	27	mΩ
R _{DS(ON)} @V _{GS} =-2.5V typ	34	mΩ

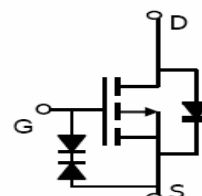
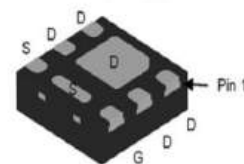
General Description

- High density cell design for Low R_{DS(ON)}
- High Speed switching

Applications

- Battery protection
- Load switch
- Power management

DFN2x2-6L



Order Information

Product	Package	Marking	Packing
M02P06P	DFN2x2-6L	PTM2106	3000PCS/Reel

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter	Rating	Unit	
Common Ratings (T _c =25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage	±10	V	
V _{(BR)DSS}	Drain-Source Breakdown Voltage	-20	V	
T _J	Maximum Junction Temperature	150	°C	
T _{STG}	Storage Temperature Range	-55 to 150	°C	
Mounted on Large Heat Sink note B				
I _{DM}	Pulse Drain Current Tested (Sillicon Limit)	T _C =25°C	-15	A
I _D	Continuous Drain current @V _{GS} =10V	T _C =25°C	-6	A
P _D	Maximum Power Dissipation	T _A =25°C	1.3	W
R _{θJA}	Thermal Resistance <i>Junction-to-Ambient</i> – Steady State (Note 1)	96	°C/W	

Note :

1. Surface-mounted on FR4 board using 1 in sq. pad size (Cu area = 1.127 in sq. [2 oz] including traces).

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Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain current(Tc=25°C)	VDS=-20V,VGS=0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±10V,VDS=0V	--	--	±10	uA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.4	-0.62	-1.0	V
R _{DS(ON)'}	Drain-Source On-State Resistance note A	VGS=-4.5V, ID=-4A		27	35	mΩ
R _{DS(ON)%}	Drain-Source On-State Resistance note A	VGS=-2.5V, ID=-3A		34	50	mΩ
R _{DS(ON)K}	Drain-Source On-State Resistance note A	VGS=-1.8V, ID=-1A		50	100	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated) note B						
C _{iss}	Input Capacitance	VDS=-10V,VGS=0V, f=1MHz	--	902	--	pF
C _{oss}	Output Capacitance		--	156	--	pF
C _{rss}	Reverse Transfer Capacitance		--	114	--	pF
Q _g	Total Gate Charge	VDS=-10V,ID=-4A, VGS=-4.5V	--	9	--	nC
Q _{gs}	Gate-Source Charge		--	1.2	--	nC
Q _{gd}	Gate-Drain Charge		--	1.0	--	nC
Switching Characteristics note B						
t _{d(on)}	Turn-on Delay Time	VDD=-10V, I _D =-4A RG=2.5Ω VGS=-4.5V	--	7	--	nS
t _r	Turn-on Rise Time		--	15	--	nS
t _{d(off)}	Turn-Off Delay Time		--	35	--	nS
t _f	Turn-Off Fall Time		--	18	--	nS
Source- Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
I _S	Source-drain current(Body Diode)	Tc=25°C	--	--	-6	A
V _{SD}	Forward on voltage	IS=-4A,VGS=0V	--	-0.80	-1.2	V

Note:

A: Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%

B:Guranteed by design, not subject to production testing.

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Typical Performance Characteristics

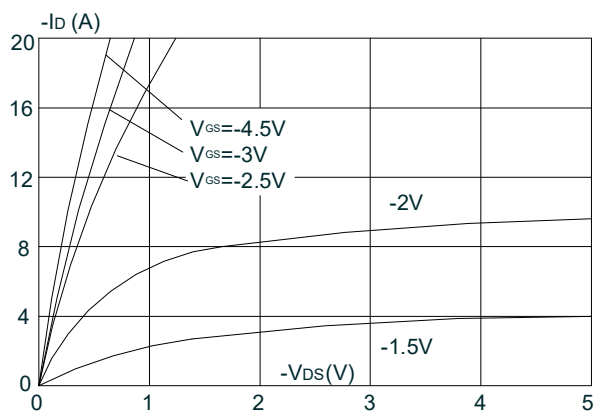


Figure 1: Output Characteristics

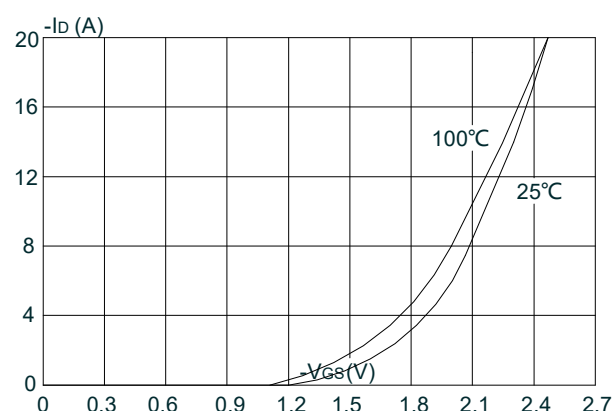


Figure 2: Typical Transfer Characteristics

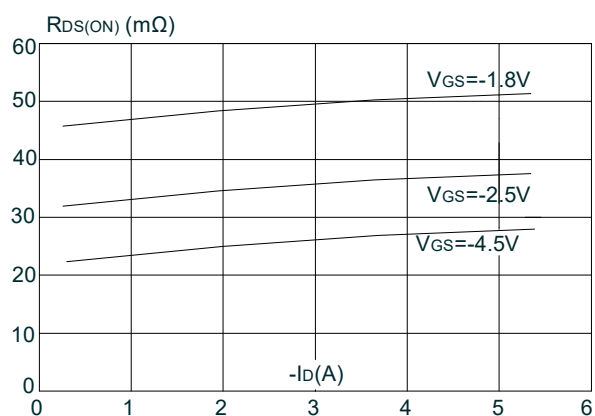


Figure 3: On-resistance vs. Drain Current

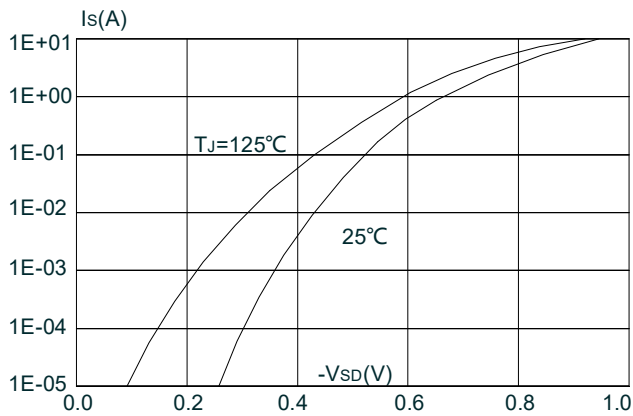


Figure 4: Body Diode Characteristics

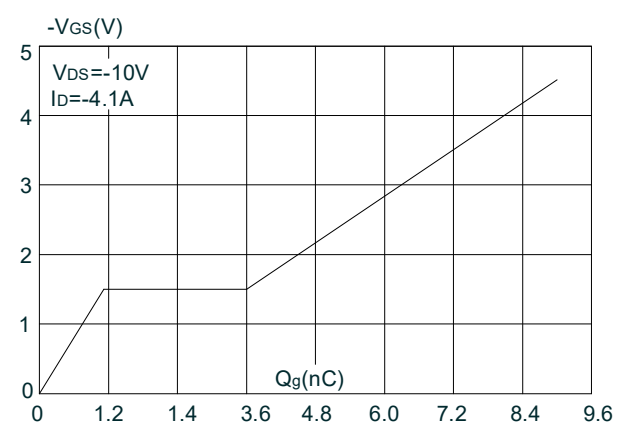


Figure 5: Gate Charge Characteristics

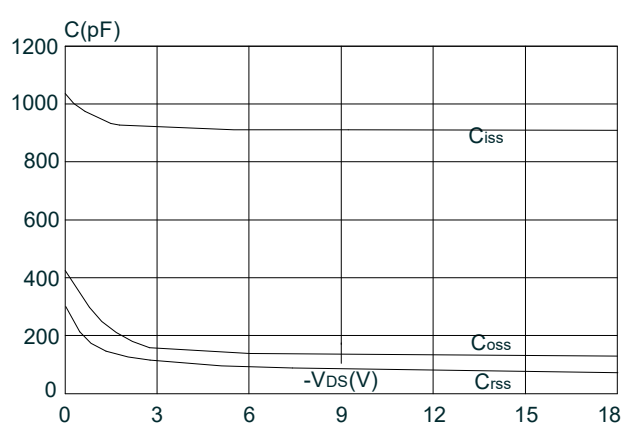


Figure 6: Capacitance Characteristics

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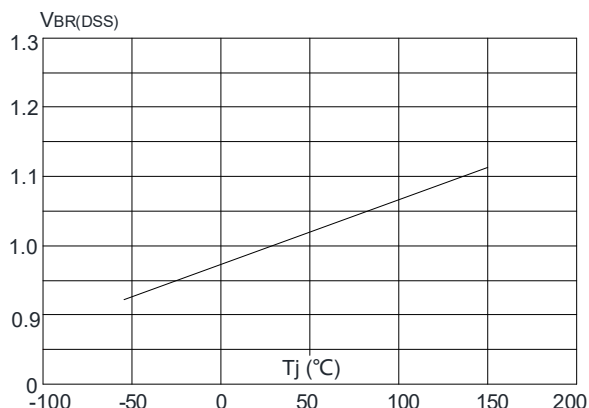


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

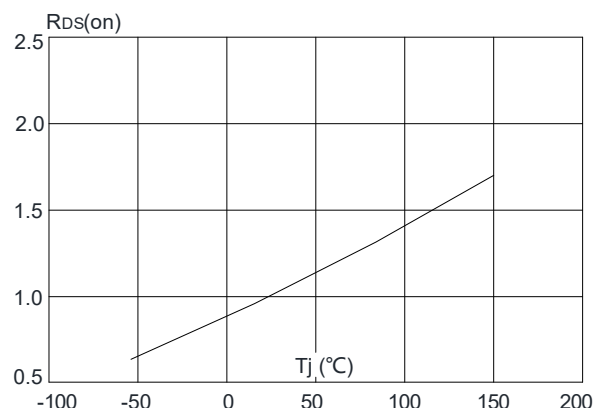


Figure 8: Normalized on Resistance vs. Junction Temperature

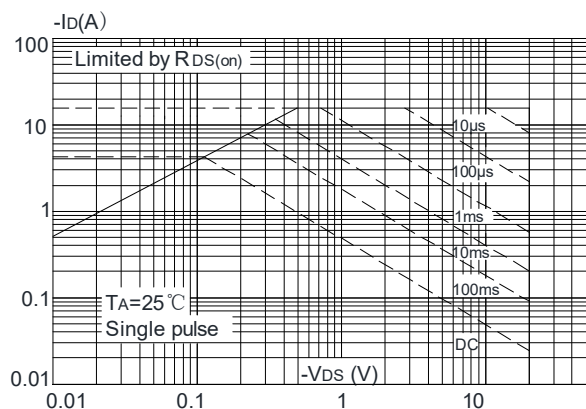


Figure 9: Maximum Safe Operating Area

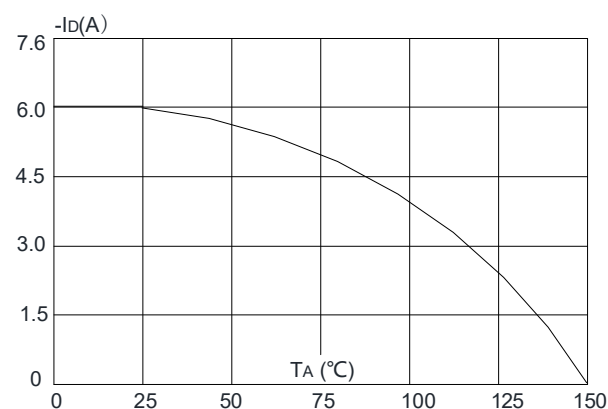


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

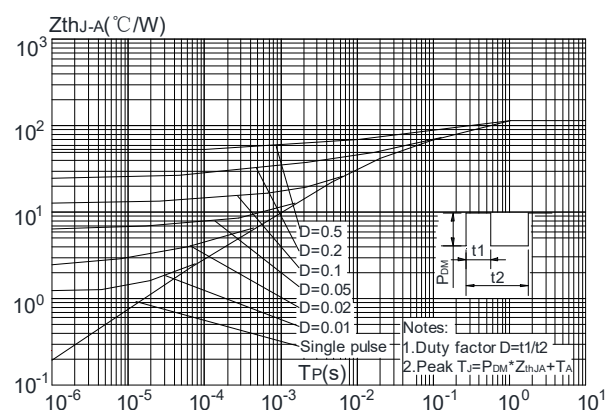
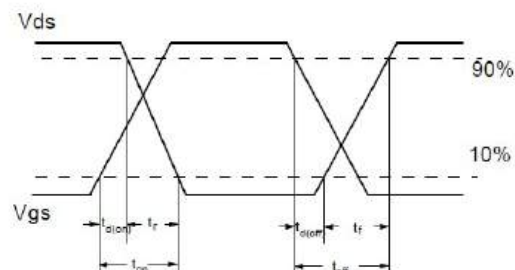
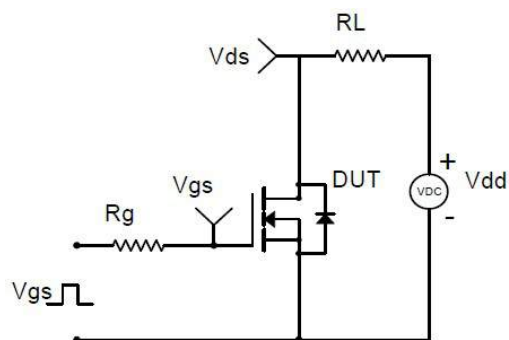
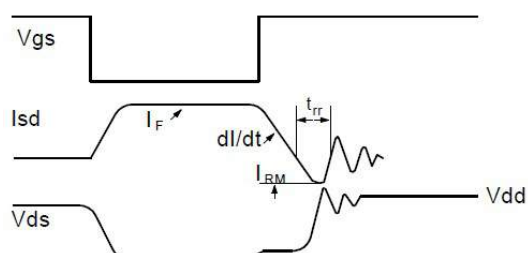
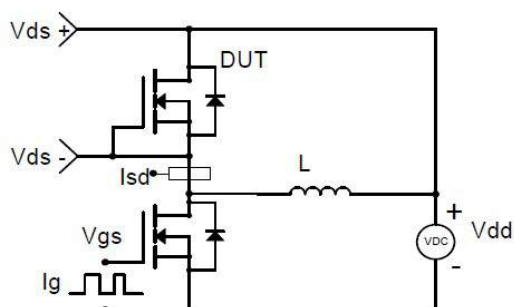


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

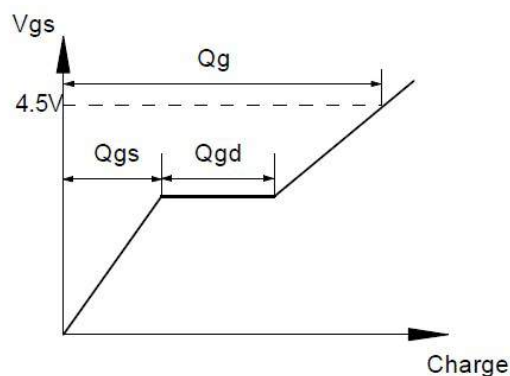
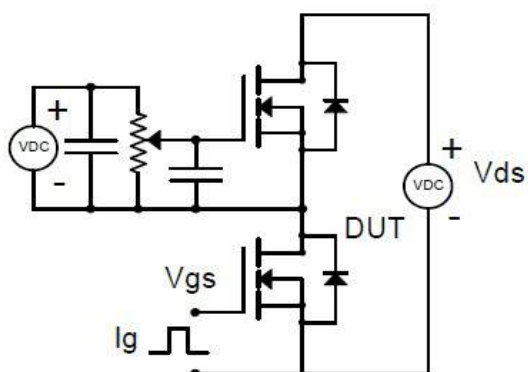
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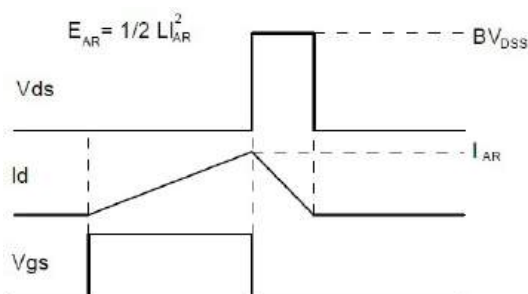
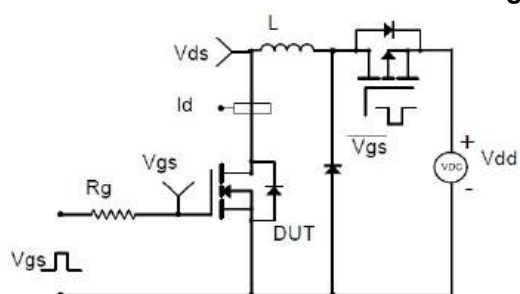
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



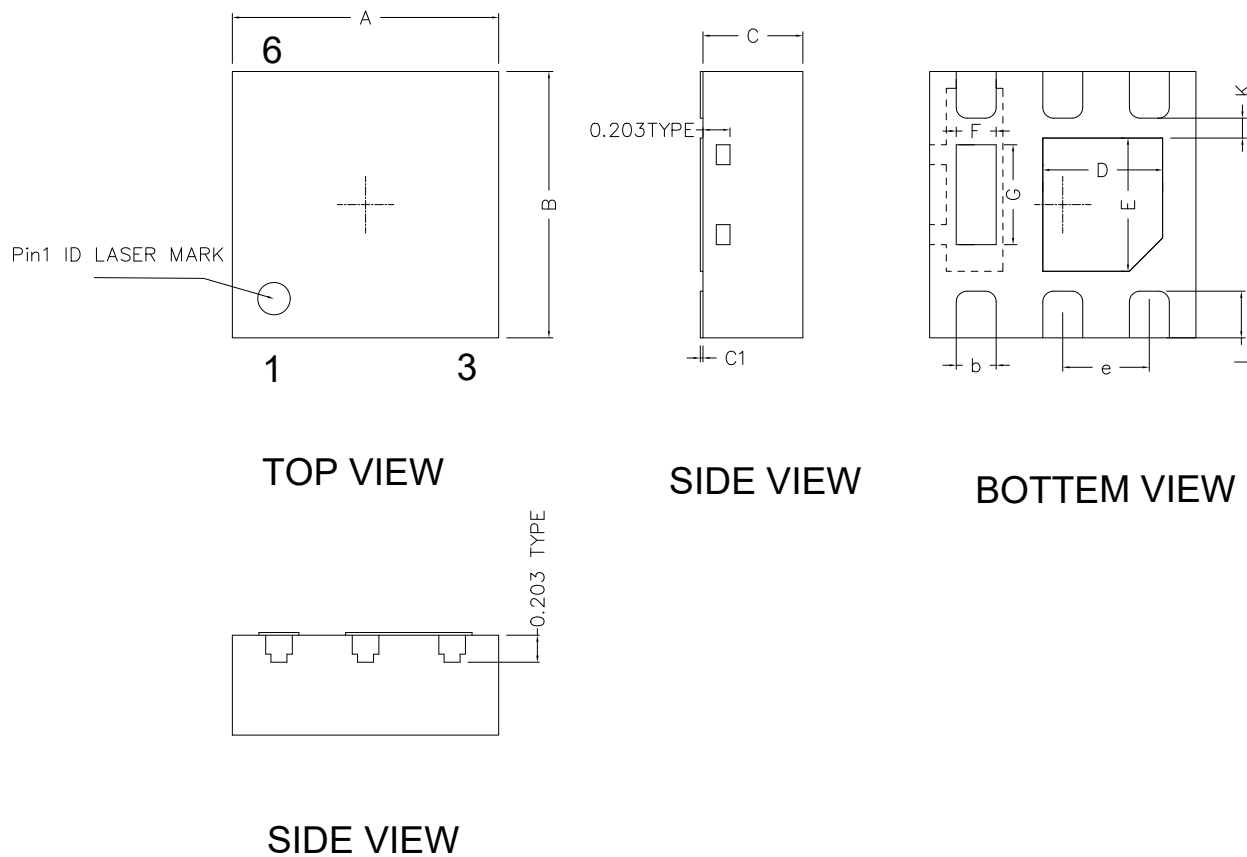
Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

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DFN2X2-6L Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	1.900	2.000	2.100
B	1.900	2.000	2.100
C	0.700	0.750	0.800
C1	0.005	—	0.020
D	0.850	0.900	0.950
E	0.950	1.000	1.050
F	0.250	0.300	0.350
G	0.700	0.750	0.800
L	0.300	0.350	0.400
b	0.250	0.300	0.350
K	0.150 TYPE		
e	0.650 TYPE		