P5MPM050

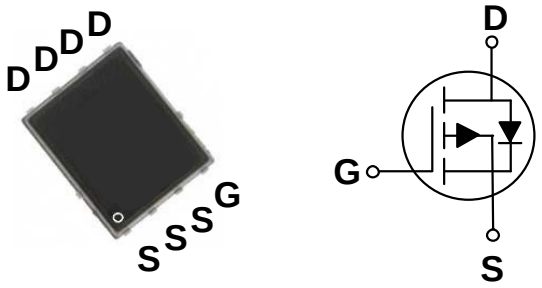
100V P-Channel MOSFETs

General Description

The P5MPM050 uses advanced trench MOSFET technology to provide excellent $R_{DS(ON)}$ and gate charge for use in a wide variety of other applications. The P5MPM050 meets the RoHS and Green Product requirement with full function reliability approved.

BV_{DSS}	$R_{DS(ON)}$	I_D
-100 V	50 mΩ	-8 A

PPAK5X6 Pin Configuration



Features

- -100V, -8A, $R_{DS(ON)}$=50mΩ@V_{GS}= -10V
- Super Low Gate Charge
- Green Device Available
- Excellent CdV/dt effect decline

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current - Continuous, V_{GS}@-10V (NOTE 1) (T_A=25°C)	-8	A
	Drain Current - Continuous, V_{GS}@-10V (NOTE 1) (T_A=100°C)	-6.5	A
I_{DM}	Drain Current - Pulsed (NOTE 2)	-45	A
EAS	Single Pulse Avalanche Energy (NOTE 3)	345	mJ
IAS	Avalanche Current	28	A
P_D	Total Power Dissipation (T_A=25°C) (NOTE 4)	5.5	W
T_J	Operating Junction Temperature Range	-50 to 150	°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		PM050 / A0139	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (NOTE 1)	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case (NOTE 1)	---	1.22	°C/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}= 0V , I_D= -250uA	-100	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= -100V , V_{GS}= 0V , T_J=25°C	---	---	-50	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±20V , V_{DS}= 0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance (NOTE 2)	V_{GS}= -10V , I_D= -8A	---	42	50	mΩ
		V_{GS}= -4.5V , I_D= -6A	---	46	55	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-1.2	-1.8	-2.5	V
gfs	Forward Transconductance	V_{DS}= -10V , I_D= -10A	---	32	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}= -80V , V_{GS}= -10V , I_D= -8A	---	92	---	nC
Q_{gs}	Gate-Source Charge		---	17.5	---	
Q_{gd}	Gate-Drain Charge		---	14	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}= -50V , V_{GS}= -10V , R_G= 3.3Ω , I_D= -1A	---	20.5	---	nS
T_r	Rise Time		---	32.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	123	---	
T_f	Fall Time		---	63.7	---	
C_{iss}	Input Capacitance	V_{DS}= -25V , V_{GS}= 0V , F= 1MHz	---	6516	---	pF
C_{oss}	Output Capacitance		---	223	---	
C_{rss}	Reverse Transfer Capacitance		---	125	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (NOTE1、5)	V_G= V_D= 0V , Force Current	---	---	-30	A
V_{SD}	Diode Forward Voltage (NOTE 2)	V_{GS}= 0V , I_S= -1A , T_J=25°C	---	---	-1.2	V
trr	Reverse Recovery Time	I_F=-14A , di/dt=-100A/μs , T_J=25°C	---	31.2	---	nS
Qrr	Reverse Recovery Charge		---	31.97	---	nC

NOTES：

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. The EAS data shows Max. rating. The test condition is V_{DD}=-25V, V_{GS}=-10V, L=0.88mH, I_{AS}=-28A.
4. The power dissipation is limited by 150°C junction temperature.
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Characteristics Curves

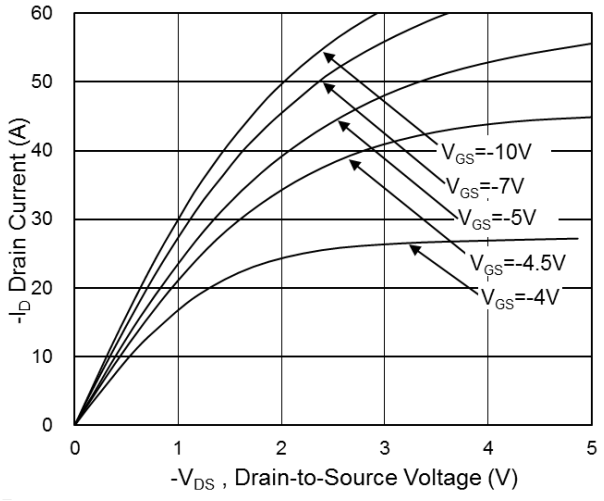


Fig.1 Typical Output Characteristics

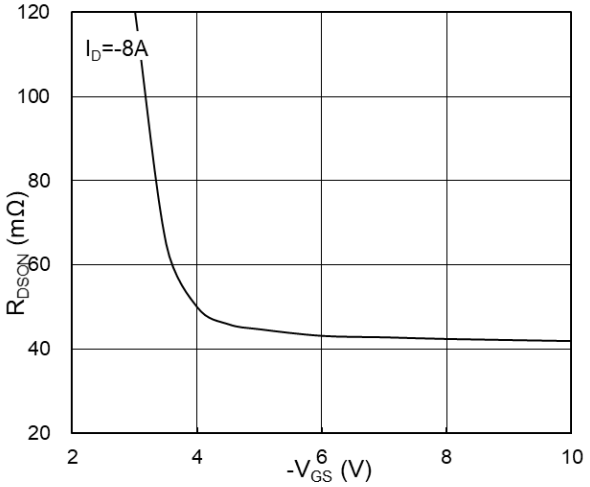


Fig.2 On-Resistance vs G-S Voltage

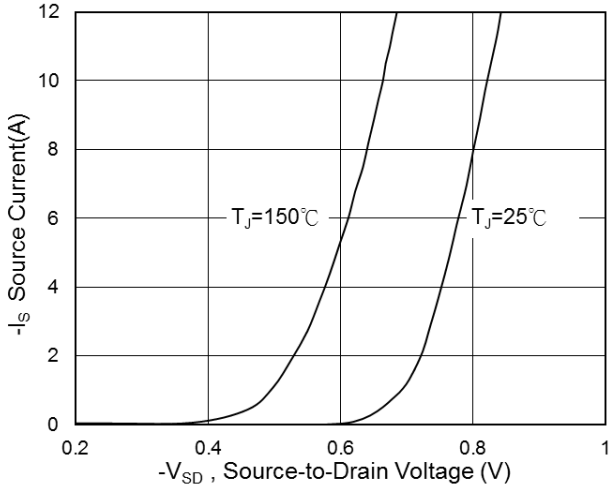


Fig.3 Typical S-D Diode Forward Voltage

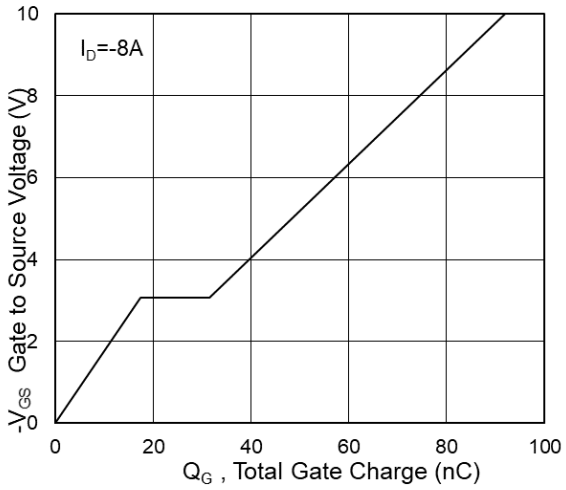


Fig.4 Gate-Charge Characteristics

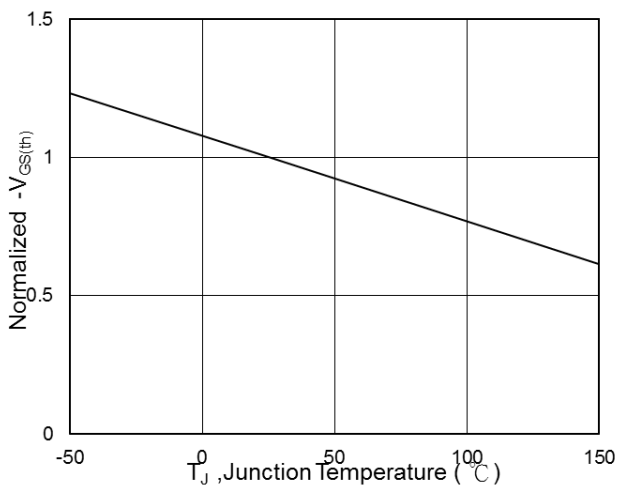


Fig.5 Normalized $V_{GS(th)}$ vs T_J

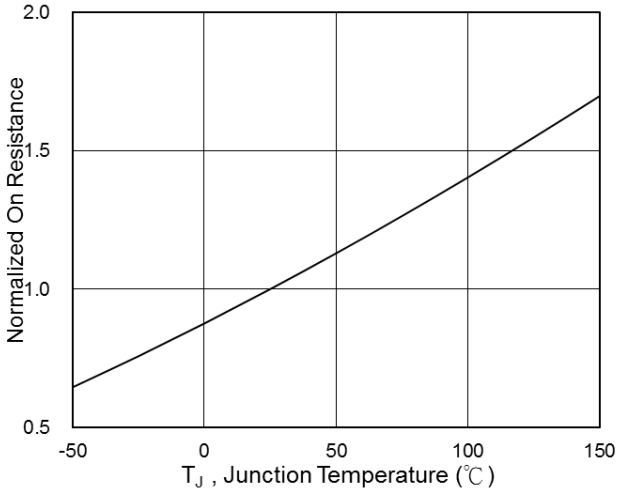


Fig.6 Normalized R_{DSON} vs T_J

Characteristics Curves

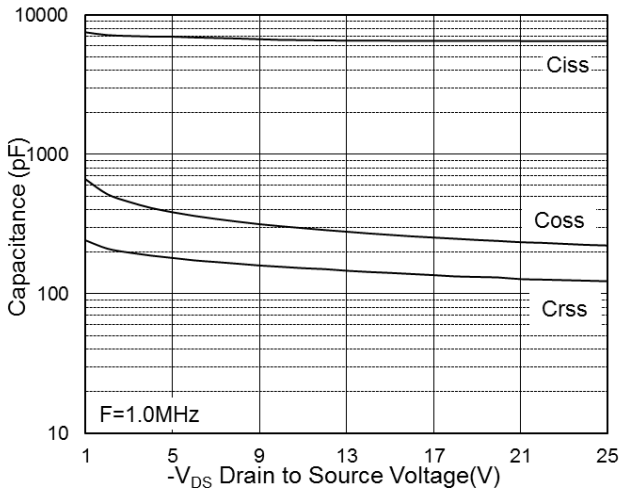


Fig.7 Capacitance

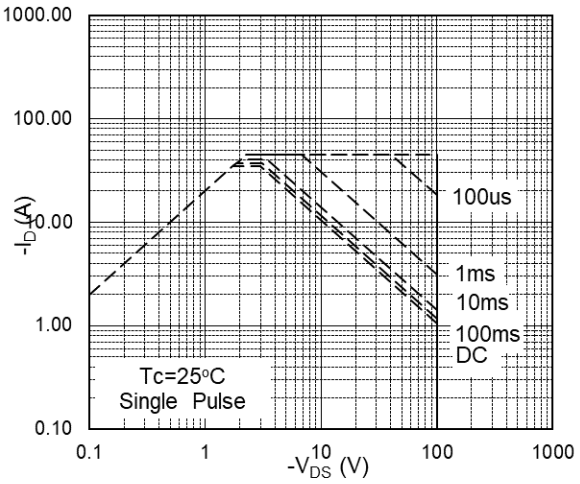


Fig.8 Safe Operating Area

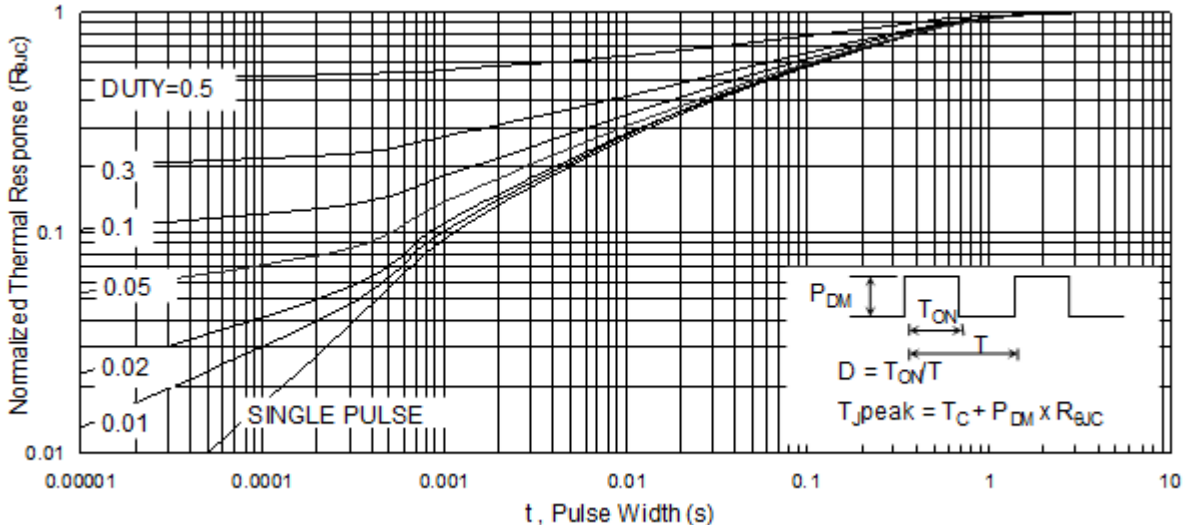


Fig.9 Normalized Maximum Transient Thermal Impedance

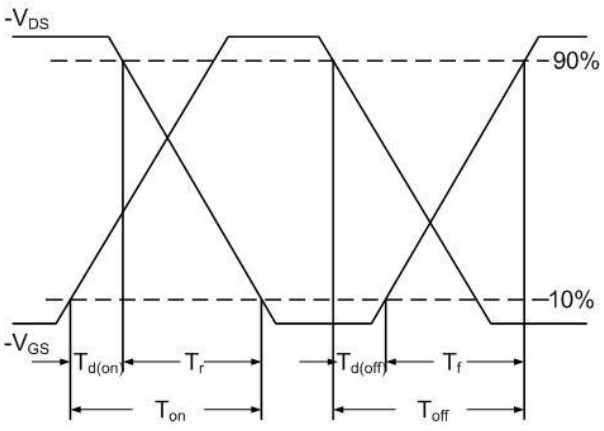


Fig.10 Switching Time Waveform

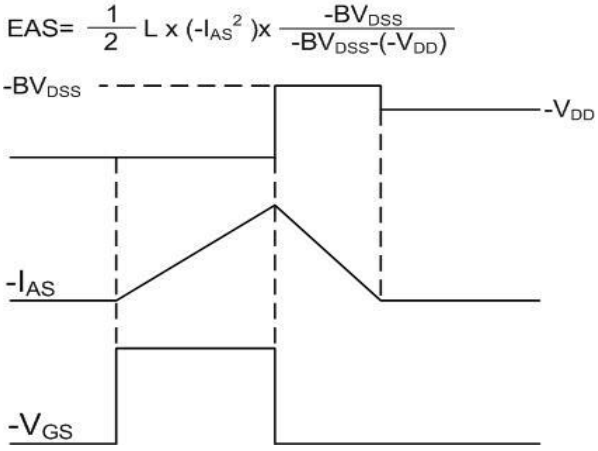
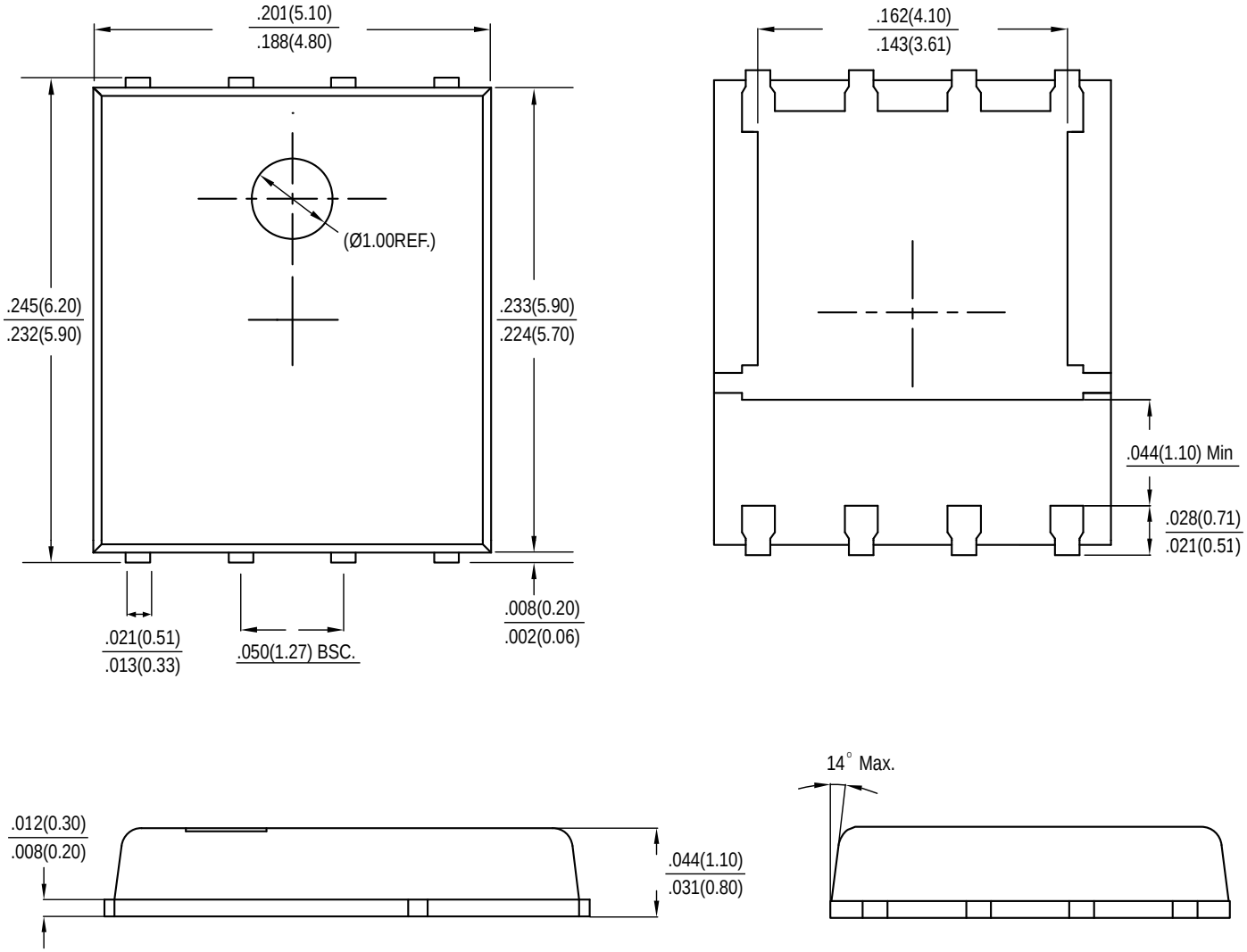


Fig.11 Unclamped Inductive Waveform

Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)

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