P3MPC018

30V P-Channel MOSFETs

General Description

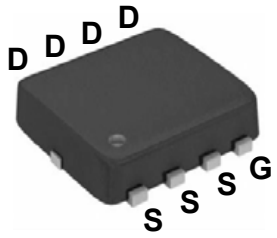
The P3MPC018 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V.
This device is suitable for use as a battery protection or in other Switching application.

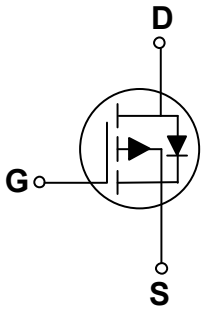
BV_{DSS}	$R_{DS(ON)}$	I_D
-30 V	18 mΩ	-30 A

Features

- $R_{DS(ON)} \leqq 18m\Omega @ V_{GS}$= -10V
- Fast switching
- Green Device Available

PPAK3X3 Pin Configuration





Applications

- Lithium battery protection
- Wireless impact
- Mobile phone fast charging

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±25	V
I_D	Drain Current - Continuous (T_C=25°C)	-32	A
	Drain Current - Continuous (T_C=100°C)	-20	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	-65	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	72.2	mJ
IAS	Avalanche Current	-38	A
P_D	Power Dissipation (T_C=25°C)	29	W
T_J	Operating Junction Temperature Range	-55 to 150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		PC018	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	75	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	4.32	°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	-30	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= -24V , V_{GS}=0V , T_J=25°C	---	---	-1	uA
		V_{DS}= -24V , V_{GS}=0V , T_J=55°C	---	---	-5	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±25V , V_{DS}=0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance (NOTE 1)	V_{GS}= -10V , I_D= -10A	---	15.5	18	mΩ
		V_{GS}= -4.5V , I_D= -5A	---	20.5	28	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-1.0	-1.4	-2.5	V
gfs	Forward Transconductance	V_{DS}= -5V , I_D= -15A	---	19	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge (-4.5V)	V_{DS}= -15V , V_{GS}= -4.5V , I_D= -15A	---	12.5	---	nC
Q_{gs}	Gate-Source Charge		---	5.4	---	
Q_{gd}	Gate-Drain Charge		---	5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}= -15V , V_{GS}= -10V , R_G= 3.3Ω , I_D= -15A	---	4.4	---	nS
T_r	Rise Time		---	11.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	34	---	
T_f	Fall Time		---	18	---	
C_{iss}	Input Capacitance	V_{DS}= -15V , V_{GS}= 0V , F= 1MHz	---	1345	---	pF
C_{oss}	Output Capacitance		---	194	---	
C_{rss}	Reverse Transfer Capacitance		---	158	---	
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0A , f=1MHZ	---	13	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (NOTE 4)	V_G= V_D= 0V , Force Current	---	---	-32	A
I_{SM}	Pulsed Source Current (NOTE 1、4)		---	---	-65	A
V_{SD}	Diode Forward Voltage (NOTE 1)	V_{GS}= 0V , I_S= -1A , T_J=25°C	---	---	-1.2	V
trr	Reverse Recovery Time	I_F= -15A ,di/dt=100A/us , T_J=25°C	---	12.4	---	nS
Qrr	Reverse Recovery Charge		---	5	---	nC

NOTES：

1. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
2. The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH, I_{AS}=-38A.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

Characteristics Curves

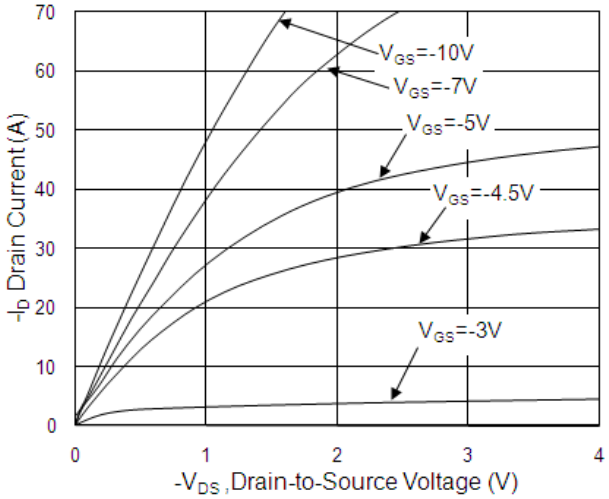


Fig.1 Typical Output Characteristics

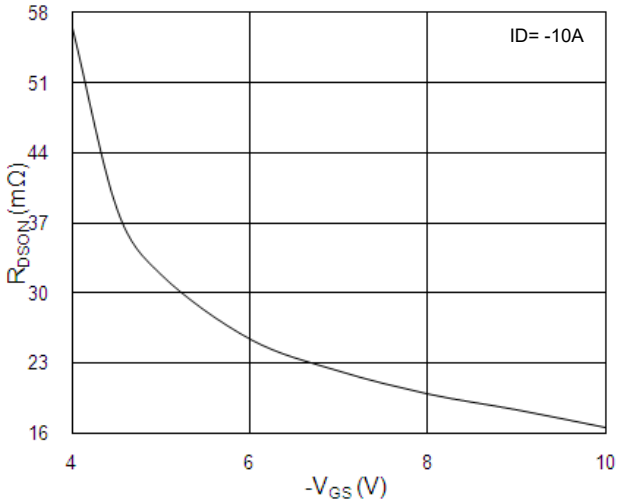


Fig.2 On-Resistance v.s Gate-Source

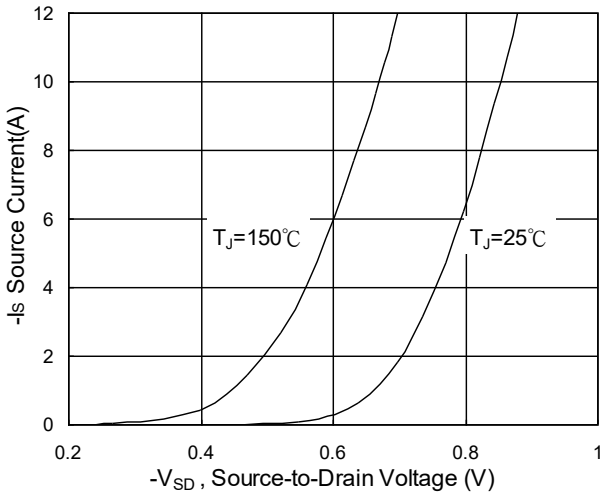


Fig.3 Forward Characteristics of Reverse

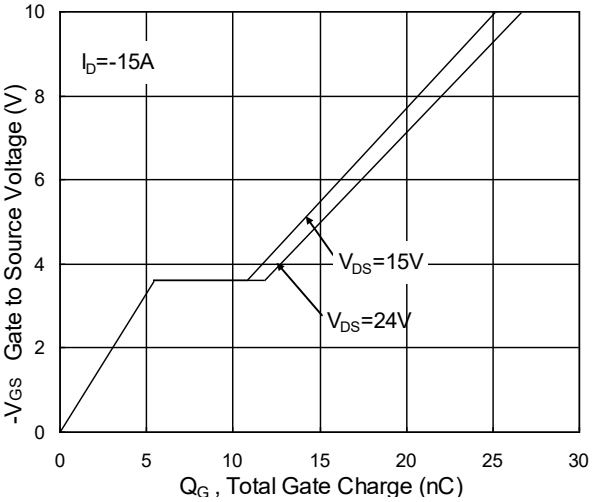


Fig.4 Gate-Charge Characteristics

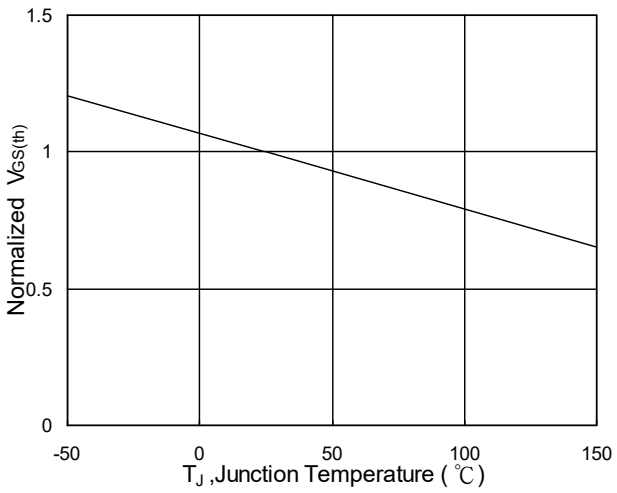


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

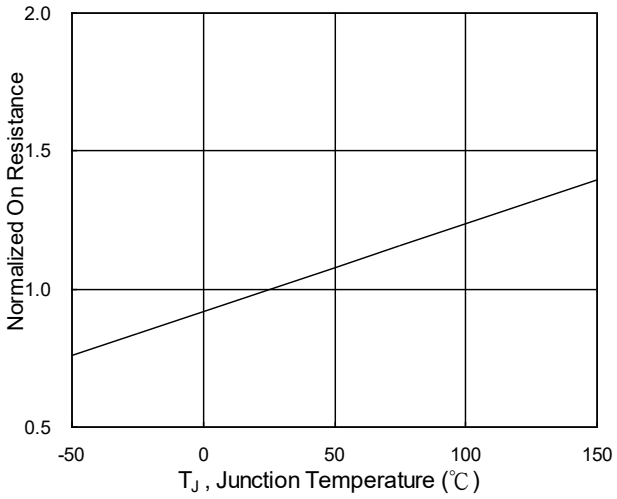


Fig.6 Normalized R_{DSON} vs. T_J

Characteristics Curves

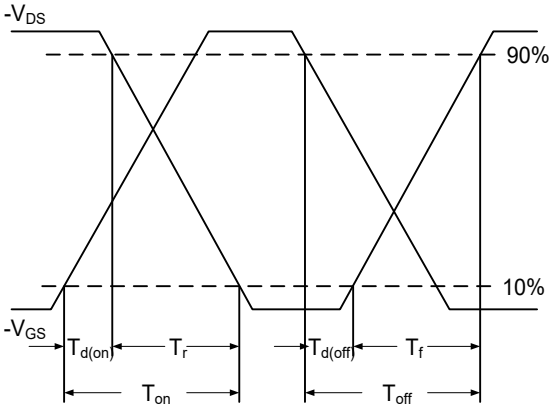
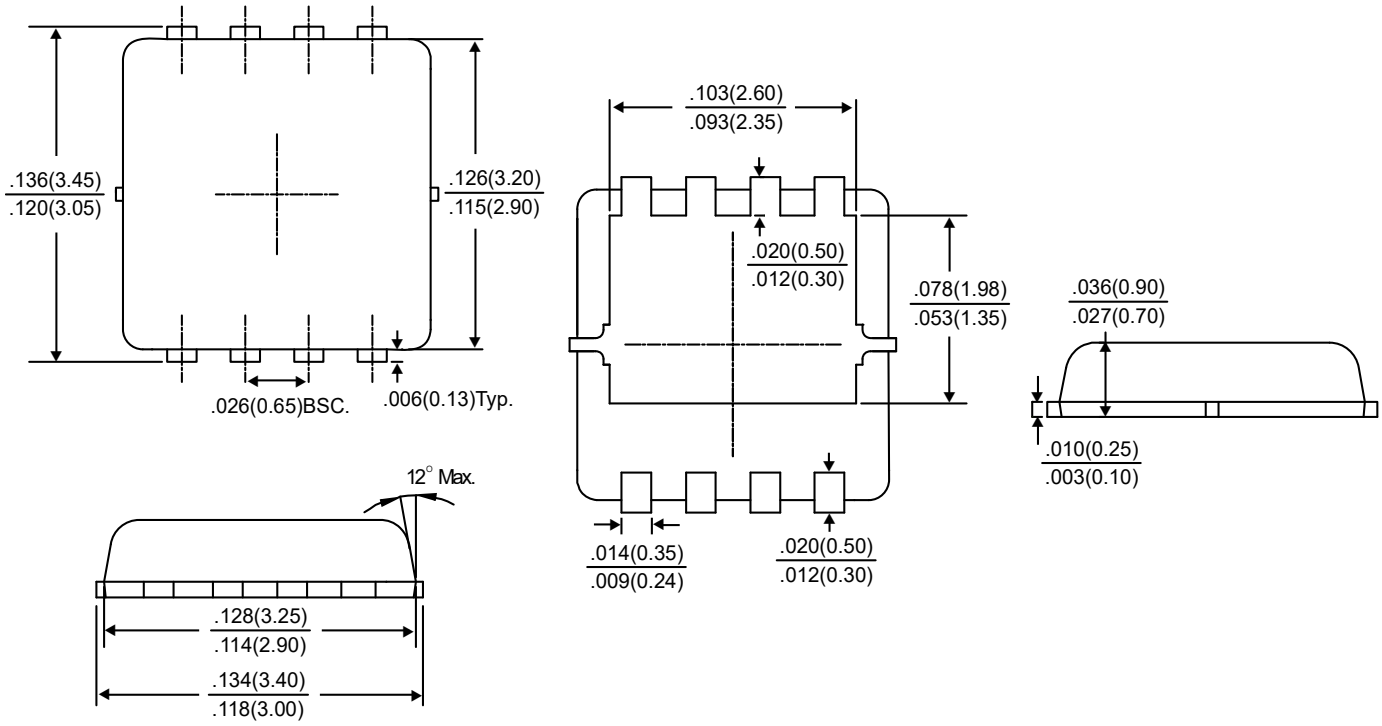


Fig. 7 Switching Time Waveform

Package Outline Dimensions



PPAK3X3

Dimensions in inches and (millimeters)

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