



20V P-Channel MOSFETs

General Description

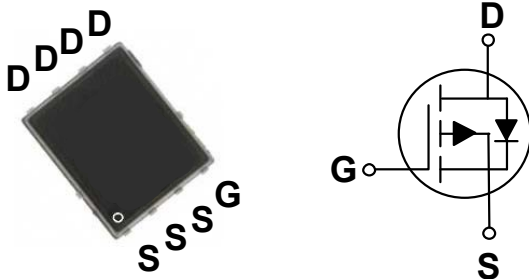
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
-20 V	2.7 m Ω	-100 A

Features

- $R_{DS(ON)} \leq 2.7\text{m}\Omega @ V_{GS} = -10\text{V}$
- Fast Switching
- Green Device Available
- Improved dv/dt Capability

PPAK5X6 Pin Configuration



Applications

- Battery protection
- Load Switch
- Uninterruptible Power Supply

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	-100	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	-340	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	125	mJ
IAS	Avalanche Current	-50	A
P_D	Total Power Dissipation ($T_C=25^\circ\text{C}$)	52.1	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		PB2P7	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	25	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	1.8	$^\circ\text{C/W}$



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	-20	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = -20V , V _{GS} = 0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±12V , V _{DS} = 0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = -4.5V , I _D = -30A	---	---	2.7	mΩ
		V _{GS} = -2.5V , I _D = -20A	---	---	3.8	
		V _{GS} = -1.8V , I _D = -15A	---	---	5.7	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D = -250uA	-0.4	---	-1.0	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} = -10V , V _{GS} = -4.5V , I _D = -20A	---	100	---	nC
Q _{gs}	Gate-Source Charge		---	21	---	
Q _{gd}	Gate-Drain Charge		---	32	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} = -10V , V _{GS} = -4.5V , R _{GEN} = 3Ω , R _L = 0.5Ω	---	20	---	nS
T _r	Rise Time		---	50	---	
T _{d(off)}	Turn-Off Delay Time		---	100	---	
T _f	Fall Time		---	40	---	
C _{iss}	Input Capacitance	V _{DS} = -10V , V _{GS} = 0V , F= 1MHz	---	15	---	pF
C _{oss}	Output Capacitance		---	1600	---	
C _{riss}	Reverse Transfer Capacitance		---	1068	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G = V _D = 0V , Force Current	---	---	-10	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0V , I _S = -30A	---	---	-1.2	V

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=-16V, V_{GS}=-4.5V, L=0.1mH, I_{AS}=-50A.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



Characteristics Curves

FIG. 1 - Drain Current vs. T_c

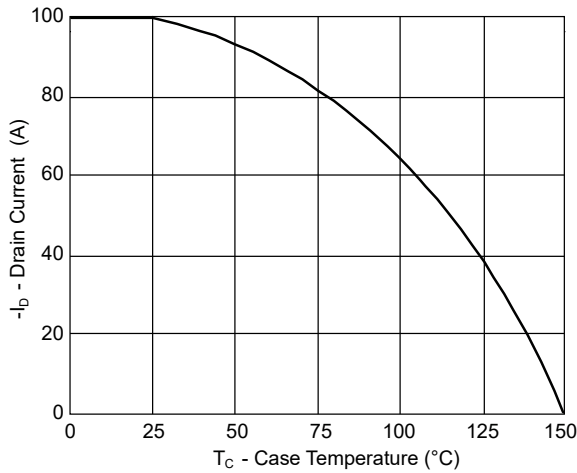


FIG. 2 - Normalized R_{DS(on)} vs. T_J

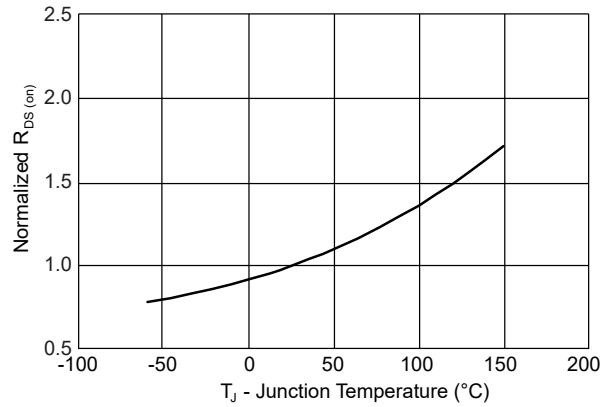


FIG. 3 - Normalized BV_{DSS} vs. T_J

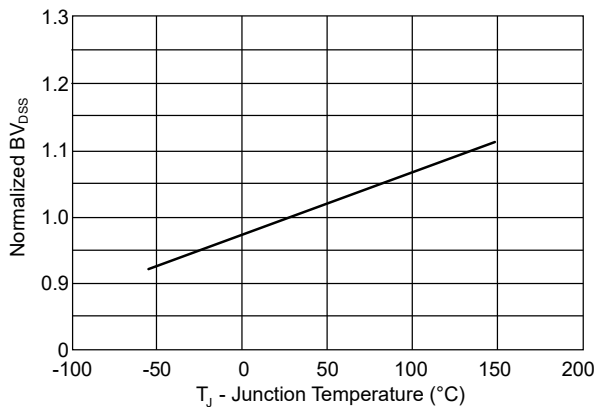


FIG. 4 - Gate Charge Characteristics

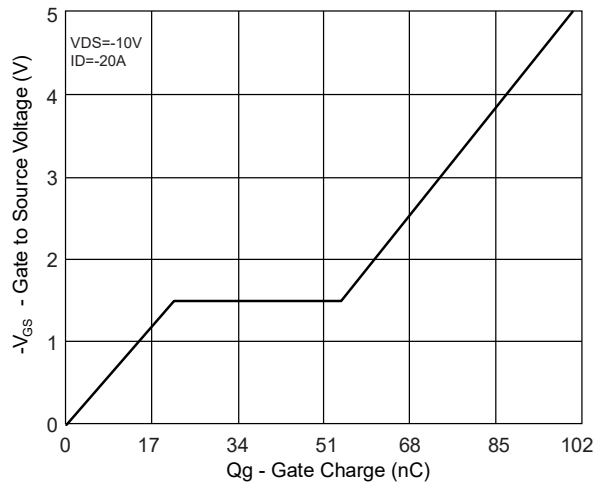


FIG. 5 - Safe Operating Area

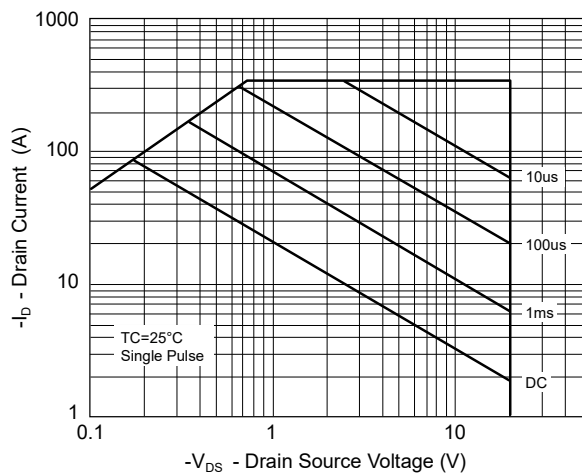
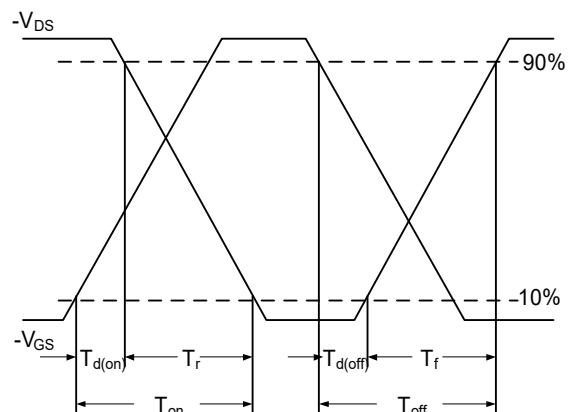
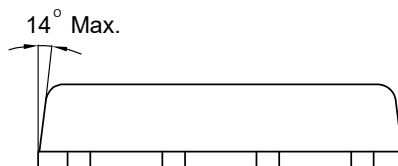
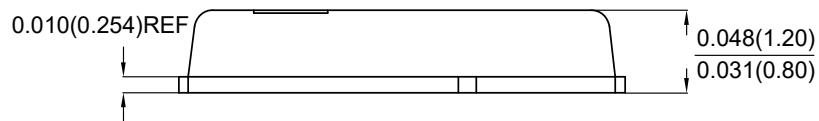
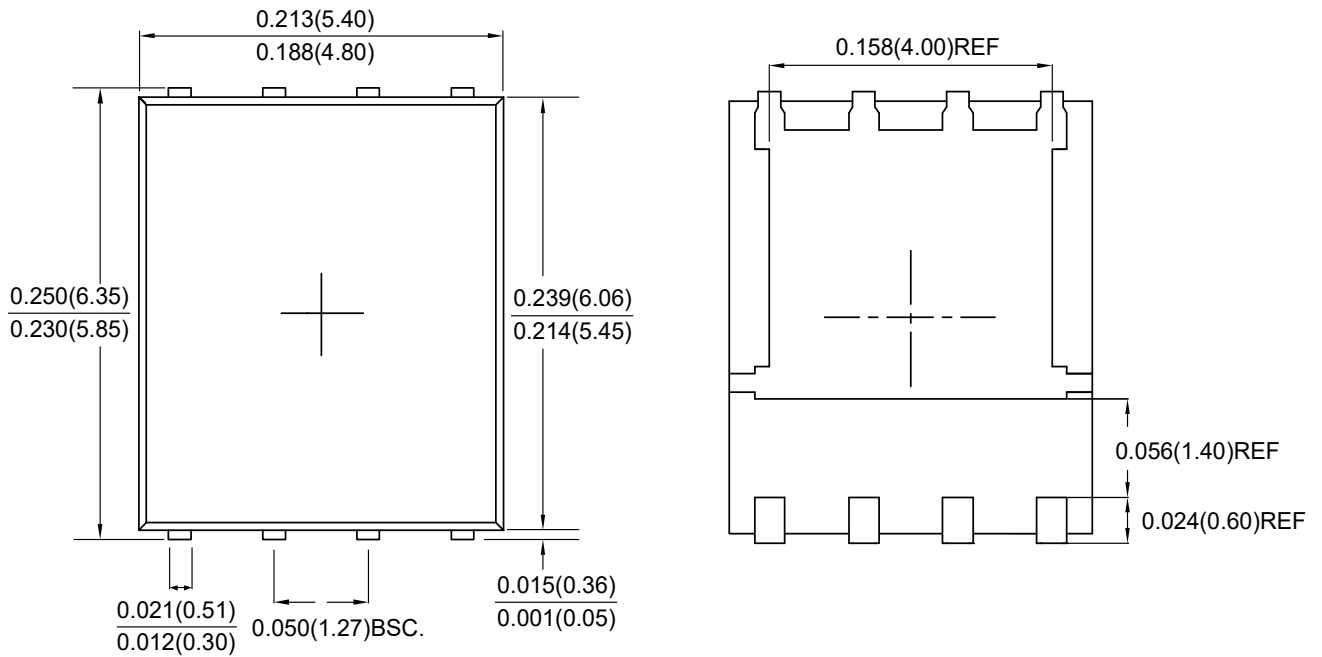


Fig.6 Switching Time Waveform





Package Outline Dimensions



PPAK5X6

Dimensions in inches and (millimeters)



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