S8MPC016B

30V P-Channel MOSFETs

General Description

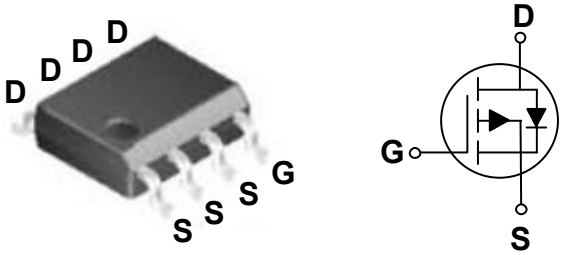
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
-30 V	16 mΩ	-10.5 A

Features

- $R_{DS(ON)} \leqq 16m\Omega @ V_{GS}$= -10V
- Fast Switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

SOP-8 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	±20	V
I_D	Drain Current - Continuous (T_A=25°C)	-10.5	A
	Drain Current - Continuous (T_A=70°C)	-8.6	
I_{DM}	Drain Current - Pulsed (NOTE 1)	-50	A
P_D	Power Dissipation (T_A=25°C)	3.1	W
T_J	Operating Junction Temperature Range	-55 to 150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
Marking Code		PC016B	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	75	°C/W
	Thermal Resistance Junction to Ambient (t≦10s)	40	
$R_{\theta JC}$	Thermal Resistance Junction to Ambient	24	°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	---	---	-1	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	V_{GS}= -10V , I_D= -8A	---	---	16	mΩ
		V_{GS}= -4.5V , I_D= -5A	---	---	24	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D= -250uA	-1.0	---	-2.5	V
gfs	Forward Transconductance	V_{DS}= -5V , I_D= -5A	---	17	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	V_{DS}= -15V , V_{GS}= -4.5V , I_D= -6A	---	30	---	nC
Q_{gs}	Gate-Source Charge		---	6	---	
Q_{gd}	Gate-Drain Charge		---	9	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}= -15V , V_{GS}= -10V , R_G=3.3Ω , I_D= -6A	---	10	---	nS
T_r	Rise Time		---	26	---	
$T_{d(off)}$	Turn-Off Delay Time		---	35	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	V_{DS}= -15V , V_{GS}= 0V , F= 1MHz	---	1800	---	pF
C_{oss}	Output Capacitance		---	305	---	
C_{rss}	Reverse Transfer Capacitance		---	216	---	
R_g	Gate Resistance	V_{DS}= 0V , V_{GS}= 0V , F= 1MHz	---	13	---	Ω

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= -1A , T_J= 25°C	---	---	-1.2	V
t_{rr}	Reverse Recovery Time	I_F= -6A , dI/dt=100A/us	---	16.3	---	nS
Q_{rr}	Reverse Recovery Charge		---	5.9	---	nC

NOTES：

1. Repetitive Rating：Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Characteristics Curves

FIG. 1-Normalized $V_{GS(th)}$ vs. T_J

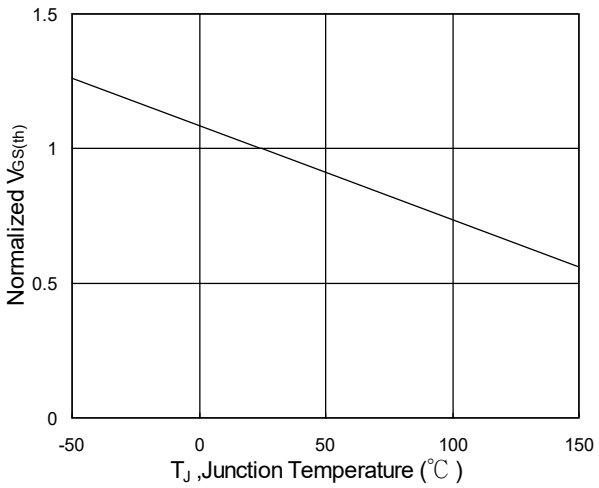


FIG. 2-Normalized R_{DSON} vs. T_J

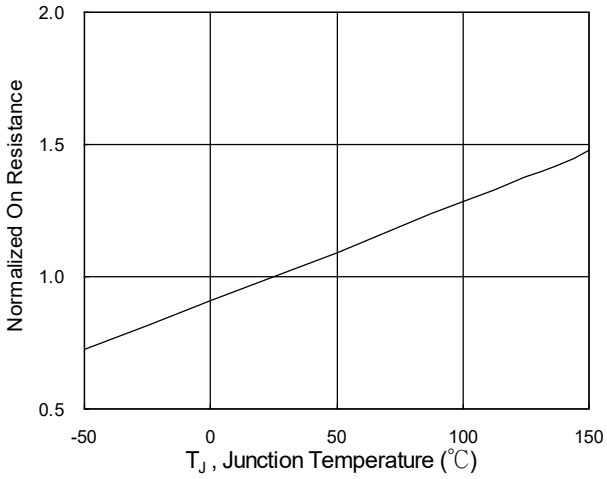


FIG. 3-Diode Forward Characteristics

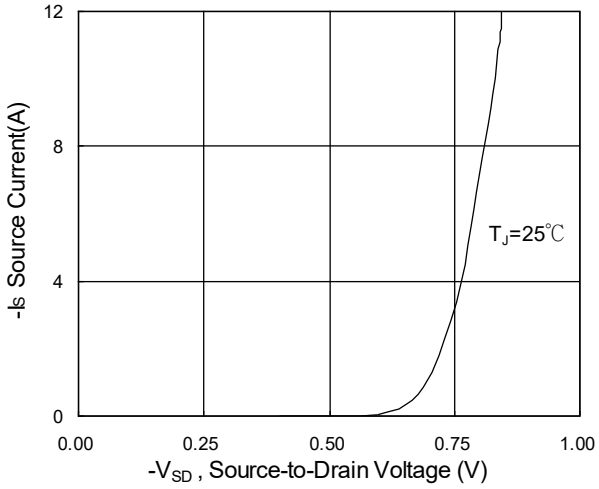


FIG. 4-Safe Operating Area

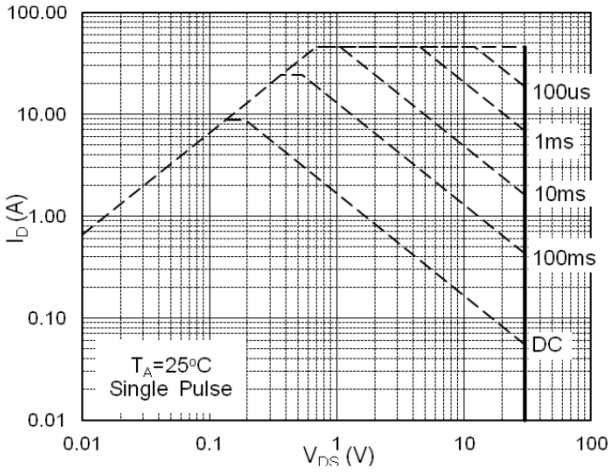
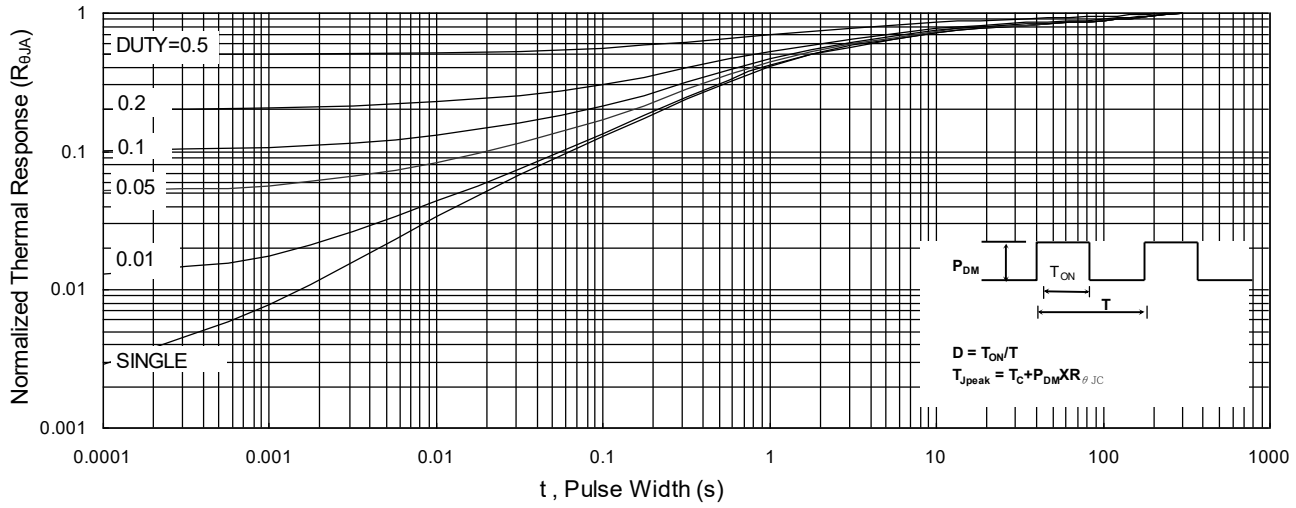
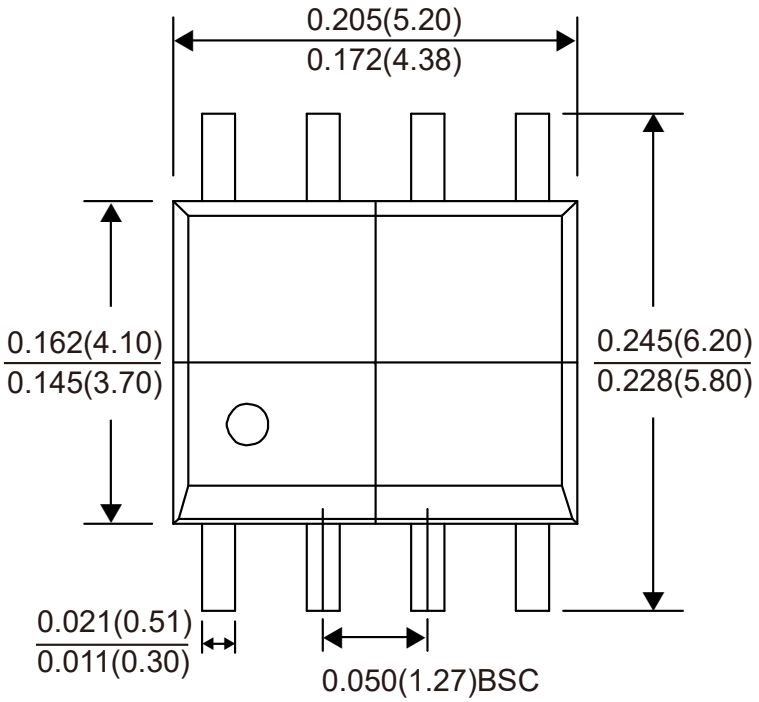
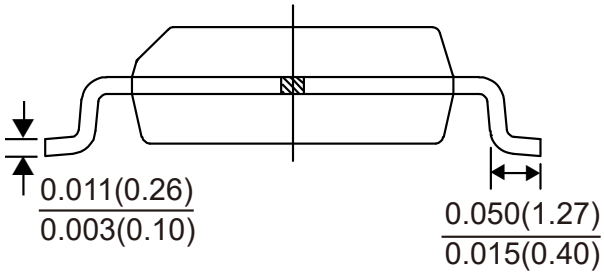


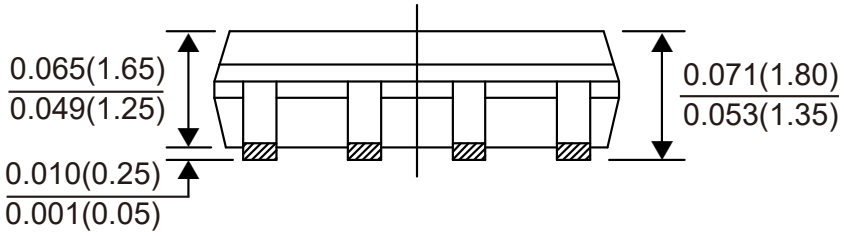
FIG. 5-Normalized Maximum Transient Thermal Impedance



Package Outline Dimensions







SOP-8

Dimensions in inches and (millimeters)

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