



30V P-Channel MOSFETs

General Description

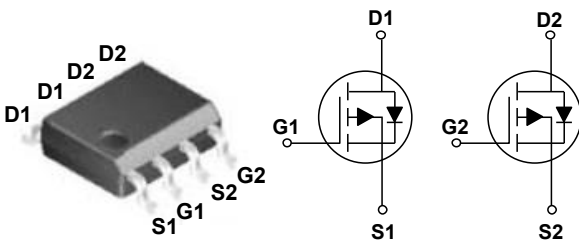
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
-30 V	16 m Ω	-10 A

Features

- -30V, -10A, $R_{DS(ON)} \leq 16m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

SOP-8 Pin Configuration



Applications

- MB / VGA / Vcore
- LED Application
- Load Switch
- POL Applications

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage (base on I_{GSS1} condition)	± 20	V
V_{GS}	Gate-Source Voltage (base on I_{GSS2} condition)	± 25	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	-10	A
	Drain Current - Continuous ($T_C=100^\circ\text{C}$)	-6.3	
I_{DM}	Drain Current - Pulsed (NOTE 1)	-40	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	2.1	W
	Power Dissipation - Derate above 25°C	0.017	W/ $^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
Marking Code		PC016A , DS3805	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	60	$^\circ\text{C}/\text{W}$

**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} = -30V , V _{GS} = 0V , T _J =25°C	---	---	-1	uA
		V _{DS} = -24V , V _{GS} = 0V , T _J =125°C	---	---	-10	uA
I _{GSS1}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} = 0V	---	---	±100	nA
I _{GSS2}	Gate-Source Leakage Current	V _{GS} = ±25V , V _{DS} = 0V	---	---	±1	mA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} = -10V , I _D = -8A	---	12	16	mΩ
		V _{GS} = -4.5V , I _D = -6A	---	18	26	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D = -250uA	-1.2	-1.6	-2.5	V
gfs	Forward Transconductance	V _{DS} = -10V , I _D = -8A	---	10.5	---	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 = -8A (NOTE 2、3)	---	14.6	21	nC
Q _{gs}	Gate-Source Charge		---	4.1	6	
Q _{gd}	Gate-Drain Charge		---	6.3	9	
T _{d(on)}	Turn-On Delay Time	V _{DD} = -15V , V _{GS} = -10V , R _G =6Ω , I _D = -1A (NOTE 2、3)	---	9	17	nS
T _r	Rise Time		---	21.8	41	
T _{d(off)}	Turn-Off Delay Time		---	59.8	114	
T _f	Fall Time		---	14.4	27	
C _{iss}	Input Capacitance	V _{DS} = -15V , V _{GS} = 0V , F= 1MHz	---	1730	2510	pF
C _{oss}	Output Capacitance		---	180	260	
C _{rss}	Reverse Transfer Capacitance		---	125	180	

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	---	---	-7	A
I _{SM}	Pulsed Source Current		---	---	-14	A
V _{SD}	Diode Forward Voltage	V _{GS} = 0V , I _S = -1A , T _J = 25°C	---	---	-1	V

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

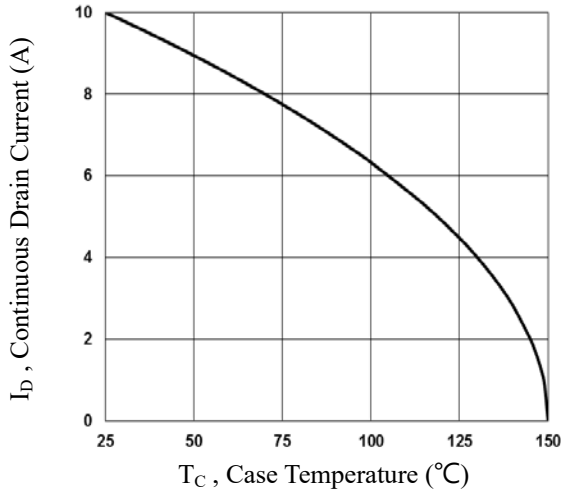


Fig.1 Continuous Drain Current vs. T_c

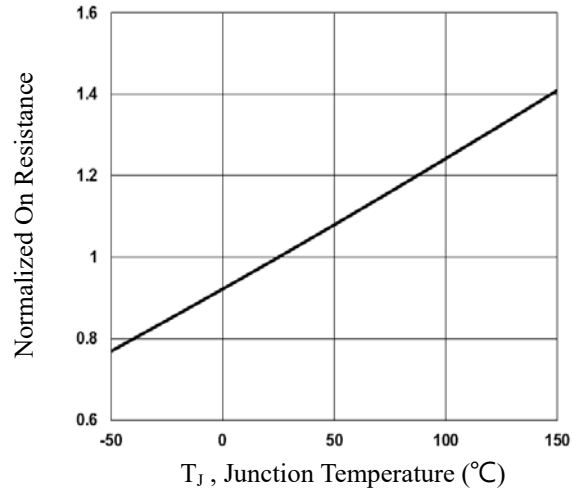


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

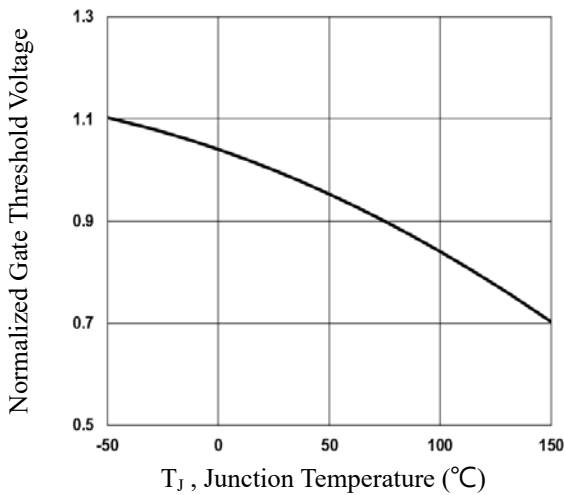


Fig.3 Normalized V_{th} vs. T_j

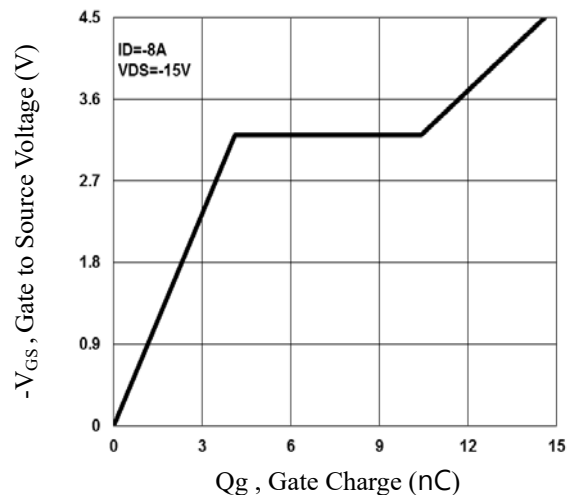


Fig.4 Gate Charge Waveform

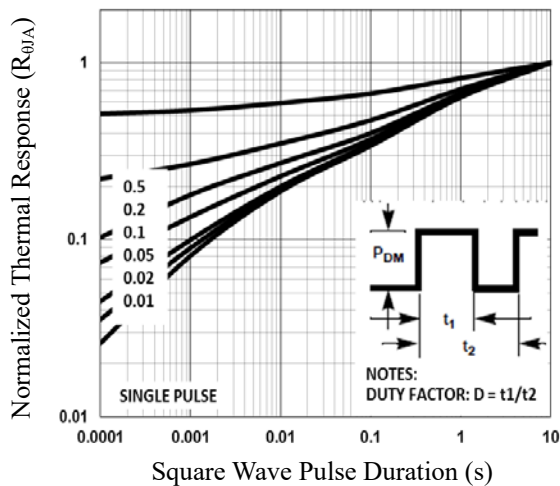


Fig.5 Normalized Transient Impedance

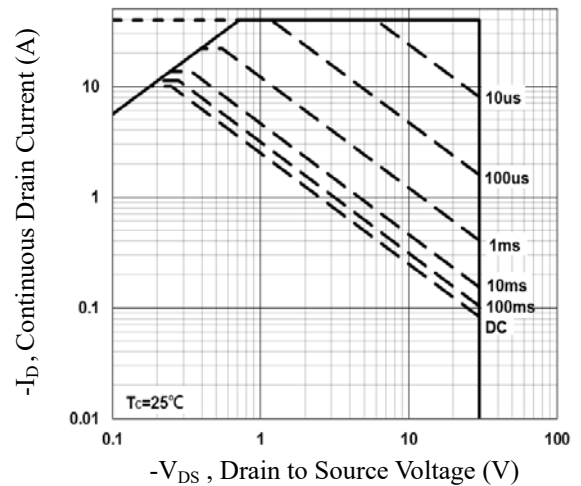


Fig.6 Maximum Safe Operation Area



Characteristics Curves

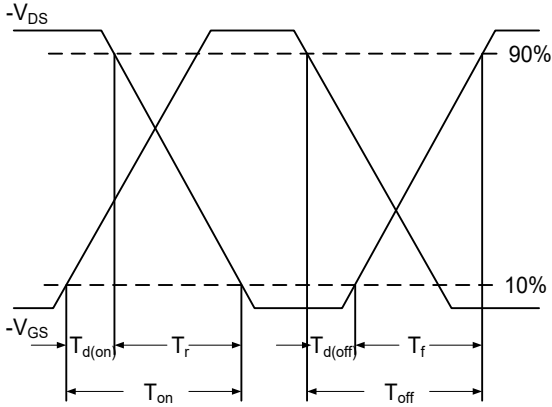


Fig.7 Switching Time Waveform

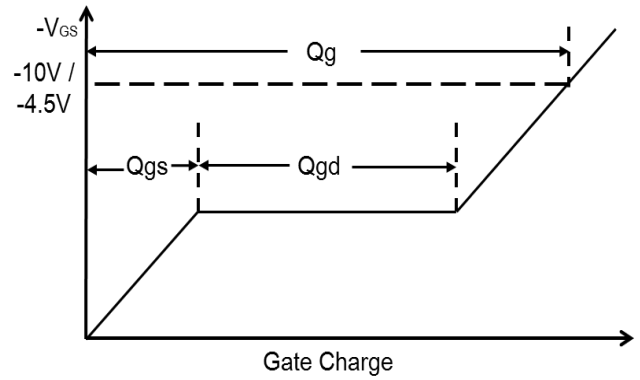
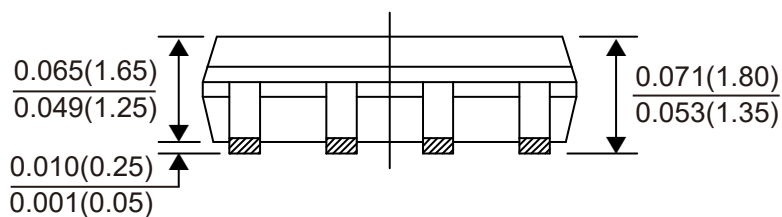
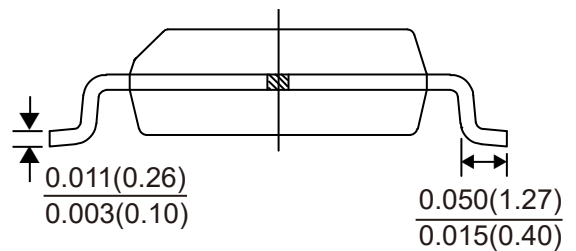
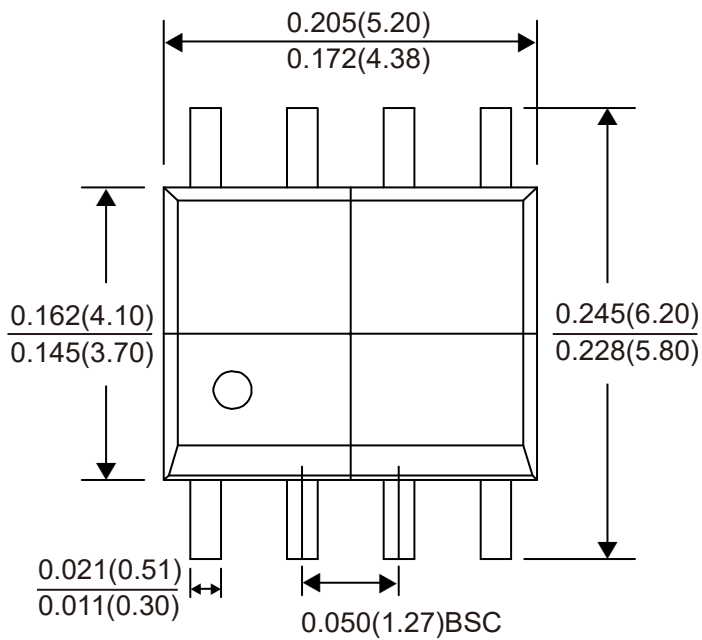


Fig.8 Gate Charge Waveform

Package Outline Dimensions



SOP-8

Dimensions in inches and (millimeters)



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