



20V P-Channel MOSFETs

General Description

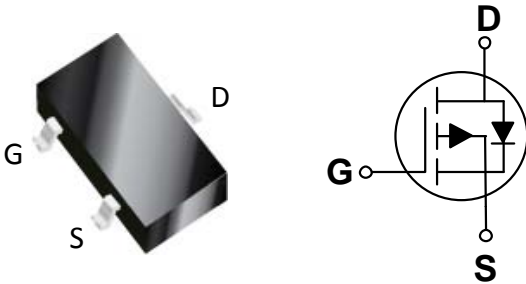
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	R_{DS(ON)}	I_D
-20V	65mΩ	-4.1A

Features

- -20V, -4.1A, R_{DS(ON)}=65mΩ @V_{GS}= -4.5V
- Fast switching
- Improved dv/dt capability
- Green Device Available
- Suit for -1.8V Gate Drive Applications

SOT-23 Pin Configuration



Applications

- Notebook
- Load Switch
- Hand-held Instruments

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±10	V
I _D	Drain Current - Continuous (T _C =25°C)	-4.1	A
	Drain Current - Continuous (T _C =100°C)	-2.6	A
I _{DM}	Drain Current - Pulsed (NOTE 1)	-16.4	A
P _D	Power Dissipation (T _C =25°C)	1.56	W
	Power Dissipation - Derate above 25°C	0.012	W/°C
T _J	Operating Junction Temperature Range	-50 to 150	°C
T _{STG}	Storage Temperature Range	-50 to 150	°C
Marking Code		Q	

Thermal Characteristics

Symbol	Parameter	Typ.	Max	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	80	°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 , T _J =25°C	---	---	-1	uA
		V _{DS} = -16V , V _{GS} = 0V , T _J =125°C	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±10V , 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 = -3A	---	52	65	mΩ
		V _{GS} = -2.5V , I _D = -2A	---	73	85	
		V _{GS} = -1.8V , I _D = -1.5A	---	105	130	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D = -250uA	-0.4	-0.6	-0.8	V
g _{fs}	Forward Transconductance	V _{DS} = -10V , I _S = -3A	---	5.5	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge (NOTE 2、3)	V _{DS} = -10V , V _{GS} = -4.5V , I _D = -3A	---	6.4	9	nC
Q _{gs}	Gate-Source Charge (NOTE 2、3)		---	0.9	1	
Q _{gd}	Gate-Drain Charge (NOTE 2、3)		---	1.6	3	
T _{d(on)}	Turn-On Delay Time (NOTE 2、3)	V _{DD} = -10V , V _{GS} = -4.5V , R _G = 25Ω , I _D = -1A	---	5	9	ns
T _r	Rise Time (NOTE 2、3)		---	17.4	33	
T _{d(off)}	Turn-Off Delay Time (NOTE 2、3)		---	40.7	80	
T _f	Fall Time (NOTE 2、3)		---	11.4	23	
C _{iss}	Input Capacitance	V _{DS} = -10V , V _{GS} = 0V , F= 1MHz	---	515	745	pF
C _{oss}	Output Capacitance		---	55	80	
C _{rss}	Reverse Transfer Capacitance		---	20	30	

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	---	---	-4.1	A
I _{SM}	Pulsed Source Current		---	---	-16.4	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

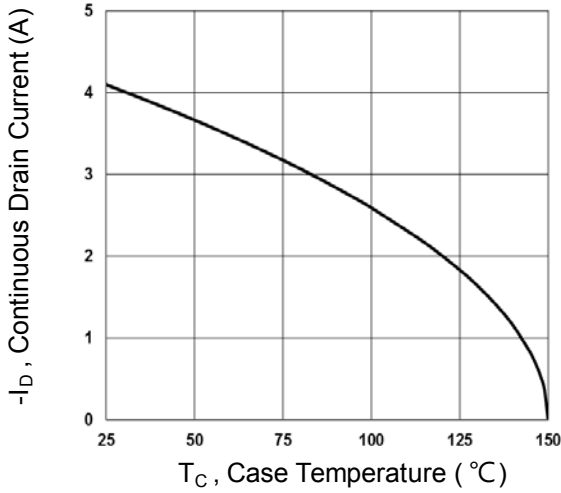


Fig.1 Continuous Drain Current vs. T_C

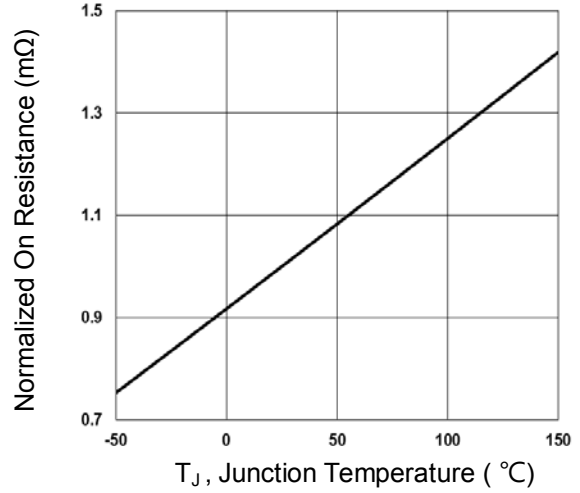


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

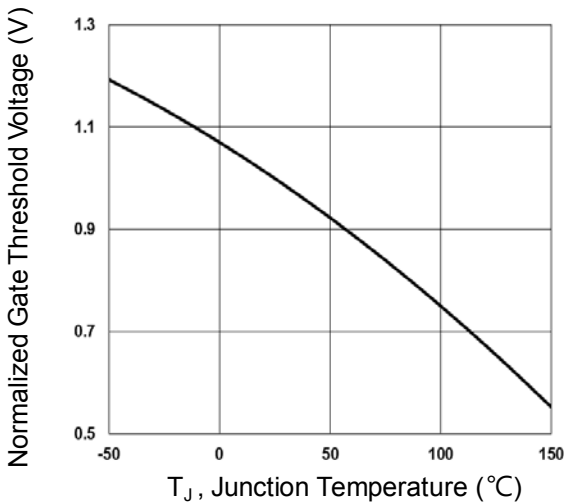


Fig.3 Normalized V_{th} vs. T_J

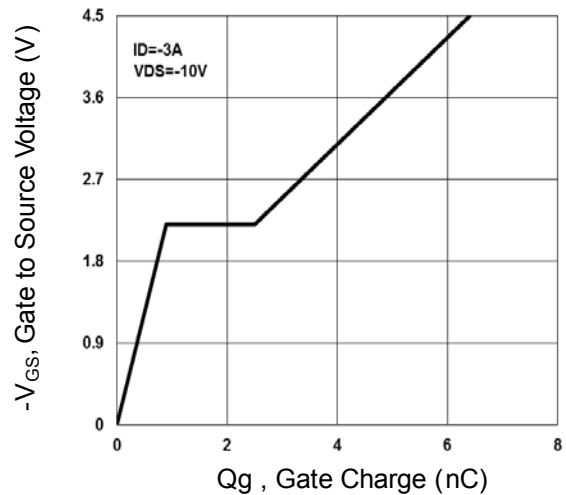


Fig.4 Gate Charge Waveform

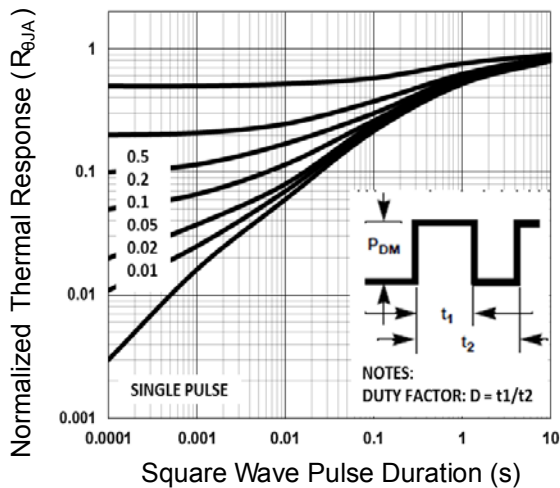


Fig.5 Normalized Transient Impedance

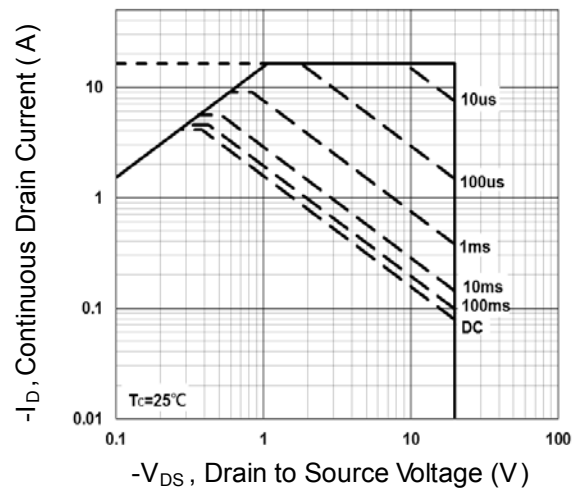


Fig.6 Maximum Safe Operation Area



Characteristics Curves

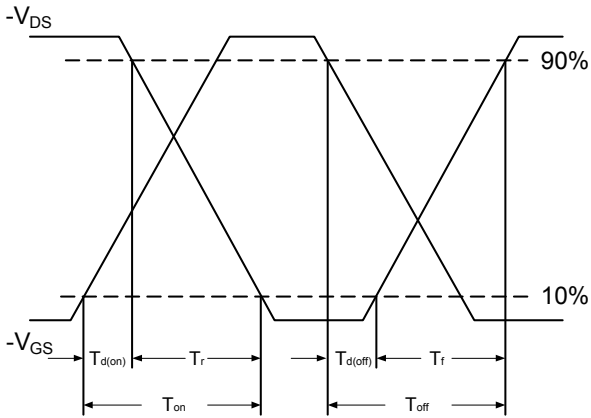


Fig.7 Switching Time Waveform

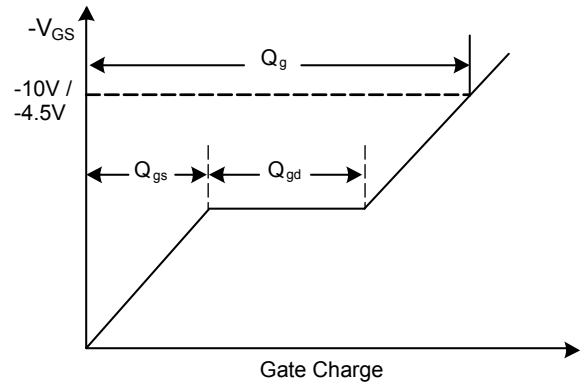
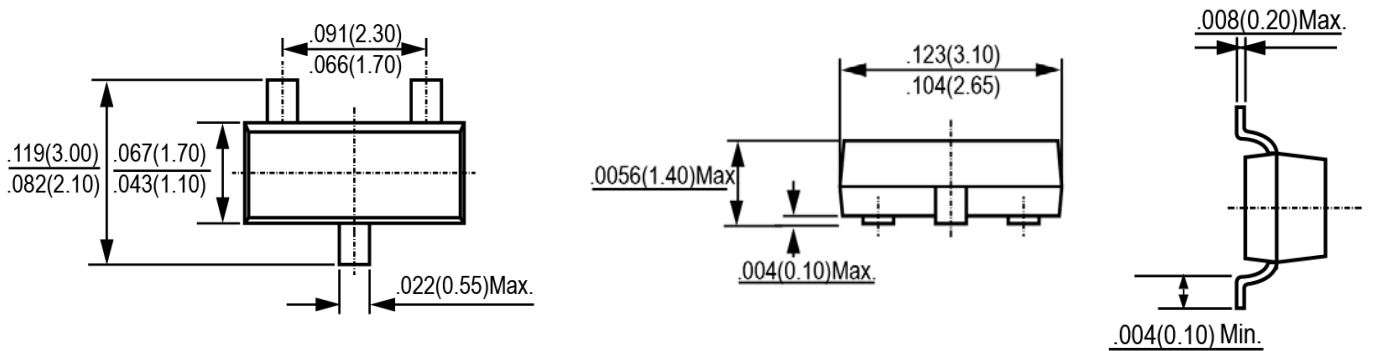


Fig.8 Gate Charge Waveform

Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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