



20V N-Channel MOSFETs

General Description

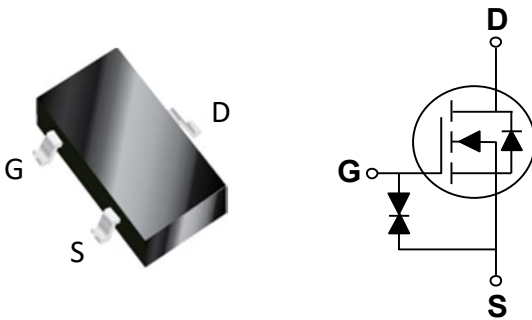
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV _{DSS}	R _{DS(ON)}	I _D
20 V	32 mΩ	4.31 A

Features

- R_{DS(ON)} ≤ 32mΩ@V_{GS}=4.5V
- Improved dv/dt capability
- Fast switching
- Green Device Available
- ESD Protected

TSOT-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	±8	V
I _D	Drain Current - Continuous (T _C =25°C)	4.31	A
I _{DM}	Drain Current - Pulsed (NOTE 1)	16.39	A
P _D	Power Dissipation (T _C =25°C)	1.56	W
T _J	Operating Junction Temperature Range	-50 to 150	°C
T _{STG}	Storage Temperature Range	-50 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	---	80	°C/W



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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} =±8V, V _{DS} =0V	---	---	±10	uA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =1A	---	---	32	mΩ
		V _{GS} =2.5V, I _D =1A	---	---	40	
		V _{GS} =1.8V, I _D =1A	---	---	55	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.4	---	0.9	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =6V, V _{GS} =4.5V, I _D =1.5A	---	5.7	---	nC
Q _{gs}	Gate-Source Charge		---	0.6	---	
Q _{gd}	Gate-Drain Charge		---	1.3	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =6V, V _{GEN} =4.5V, R _G =6Ω, I _D =1A	---	10.6	---	ns
T _r	Rise Time		---	4.5	---	
T _{d(off)}	Turn-Off Delay Time		---	34.3	---	
T _f	Fall Time		---	5.7	---	
C _{iss}	Input Capacitance	V _{DS} =6V, V _{GS} =0V, F=200kHz	---	603.5	---	pF
C _{oss}	Output Capacitance		---	75	---	
C _{riss}	Reverse Transfer Capacitance		---	61.5	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A	---	---	1.5	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

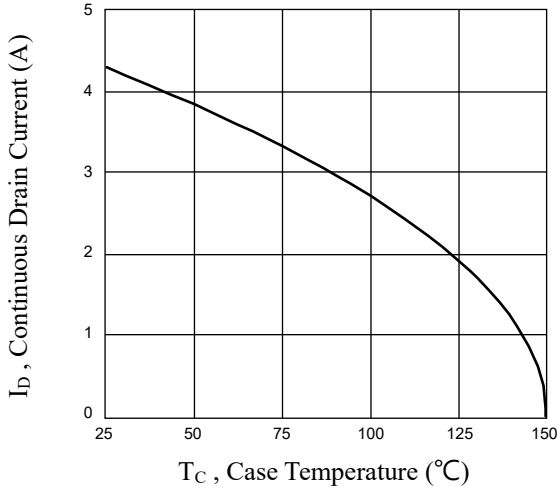


Fig.1 Continuous Drain Current vs. T_C

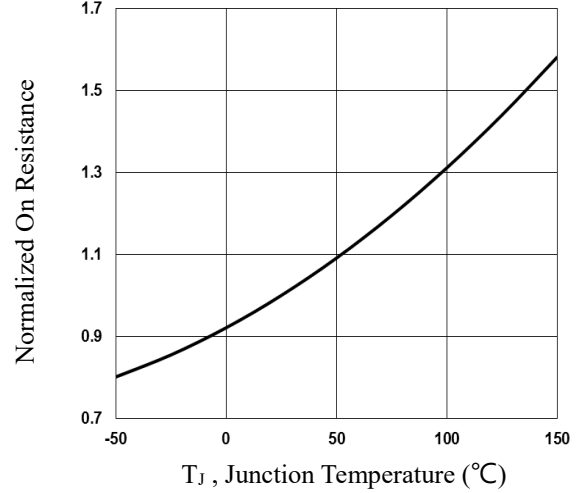


Fig.2 Normalized RDSON vs. T_J

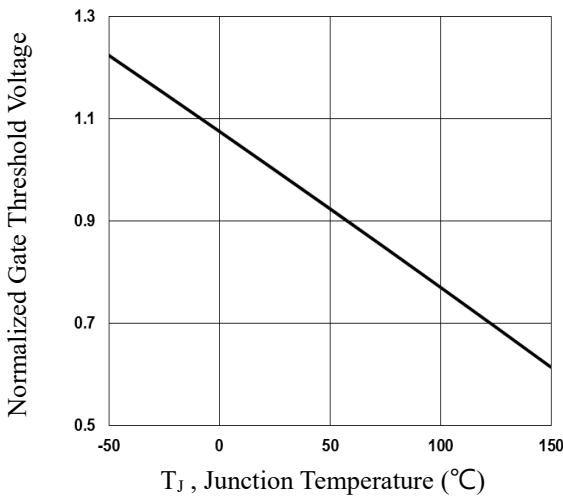


Fig.3 Normalized V_{th} vs. T_J

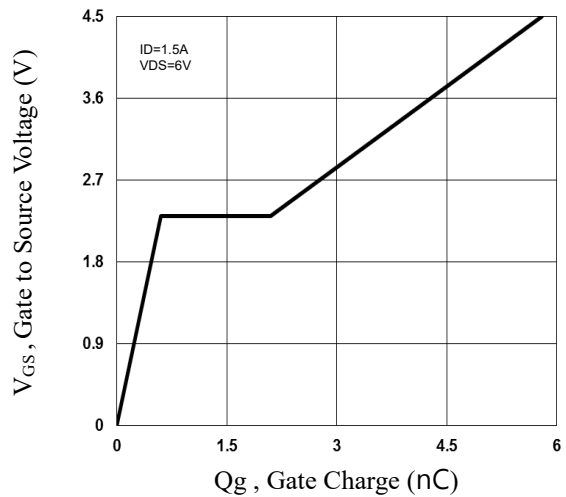


Fig.4 Gate Charge Waveform

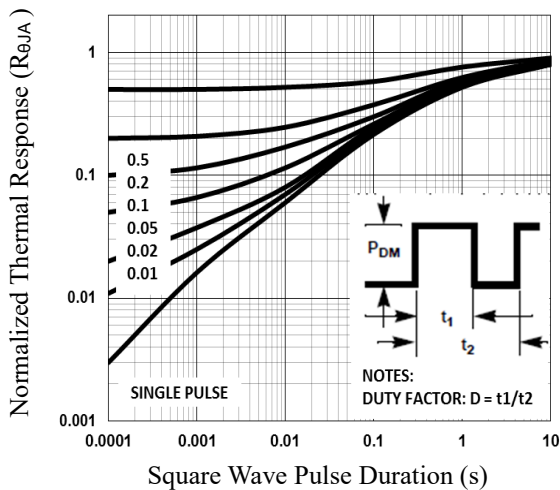


Fig.5 Normalized Transient Impedance

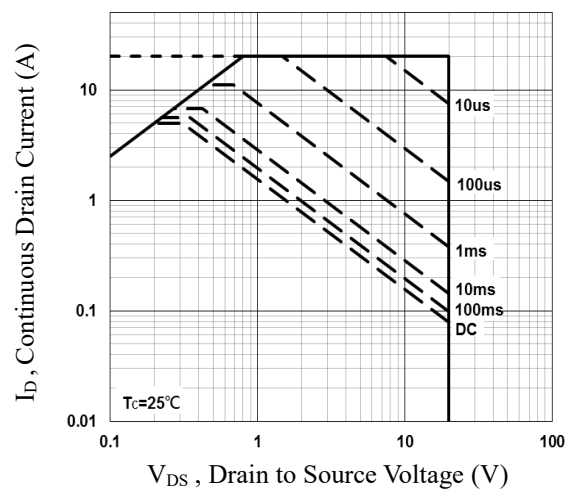


Fig.6 Maximum Safe Operation Area



Characteristics Curves

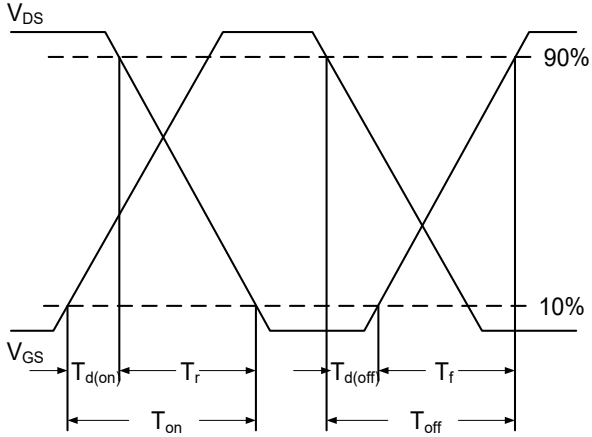


Fig.7 Switching Time Waveform

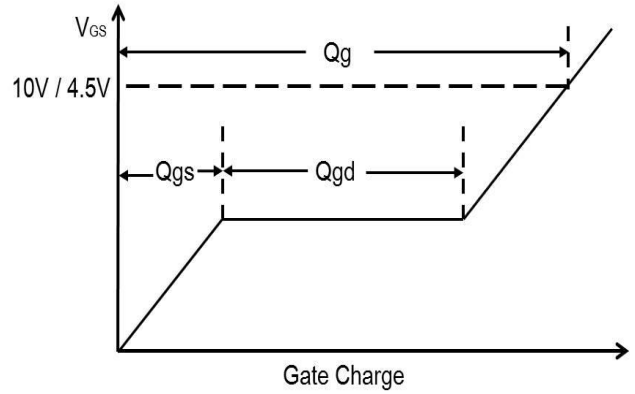
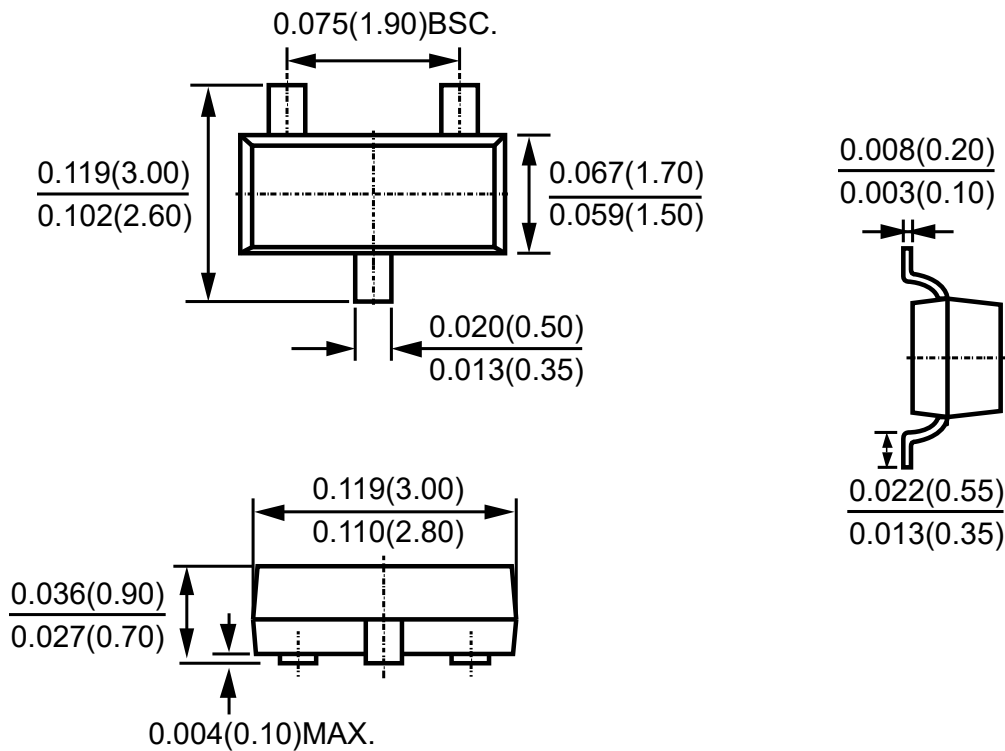


Fig.8 Gate Charge Waveform

Package Outline Dimensions



TSOT-23

Dimensions in inches and (millimeters)



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