



20V N-Channel MOSFETs

General Description

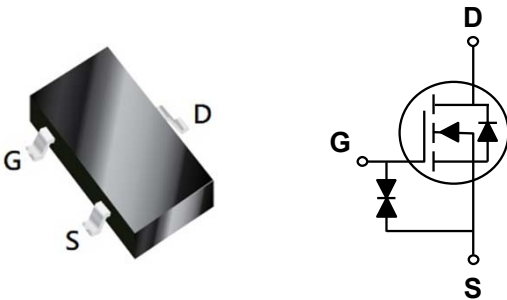
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
20 V	250 mΩ	0.8 A

Features

- $R_{DS(ON)} \leq 250m\Omega @ V_{GS}=4.5V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available
- ESD Protection

SOT-323 Pin Configuration



Applications

- Power Management in DC/DC Converters
- Power Load Switch
- Notebook Battery Management

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current - Continuous ($T_A=25^\circ\text{C}$)	0.8	A
I_{DM}	Drain Current - Pulsed ($T_A=25^\circ\text{C}$) (NOTE 1)	1.8	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	0.26	W
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		0	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	480	$^\circ\text{C/W}$



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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} =16V, V _{GS} =0V	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±12V, 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 =0.4A	---	---	250	mΩ
		V _{GS} =2.5V, I _D =0.25A	---	---	360	
		V _{GS} =1.8V, I _D =0.15A	---	---	580	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	0.5	---	1.0	V
g _{fs}	Forward Transconductance	V _{DS} =3V, I _{DS} =0.2A	---	0.9	---	S

Dynamic and switching Characteristics (NOTE 3)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =1A	---	1	---	nC
Q _{gs}	Gate-Source Charge		---	0.3	---	
Q _{gd}	Gate-Drain Charge		---	0.1	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =10V, V _{GS} =4.5V, R _{GEN} =6Ω, I _D =2A	---	1.2	---	nS
T _r	Rise Time		---	24.6	---	
T _{d(off)}	Turn-Off Delay Time		---	13.6	---	
T _f	Fall Time		---	14.6	---	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	40	---	pF
C _{oss}	Output Capacitance		---	17	---	
C _{rss}	Reverse Transfer Capacitance		---	10	---	
R _g	Gate Resistance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	195	---	Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =0.2A	---	---	1.1	V
t _{rr}	Reverse Recovery Time	I _F =1A, V _R =10V,	---	9.2	---	nS
Q _{rr}	Reverse Recovery Charge	di _F /dt=100A/us	---	0.8	---	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. Guaranteed by design, not subject to production testing



Characteristics Curves

FIG. 1-Drain Current

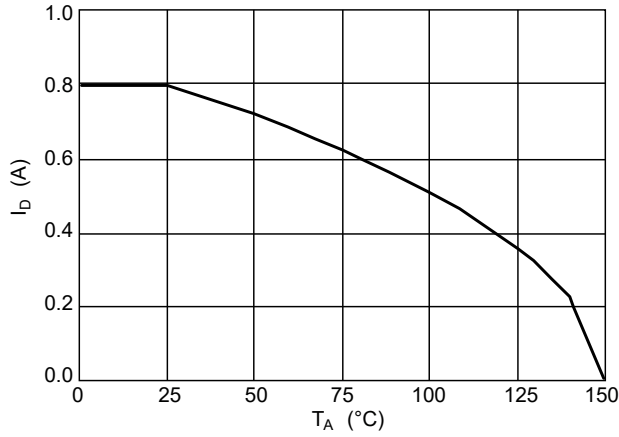


FIG. 2-Normalized $V_{GS(th)}$ vs T_J

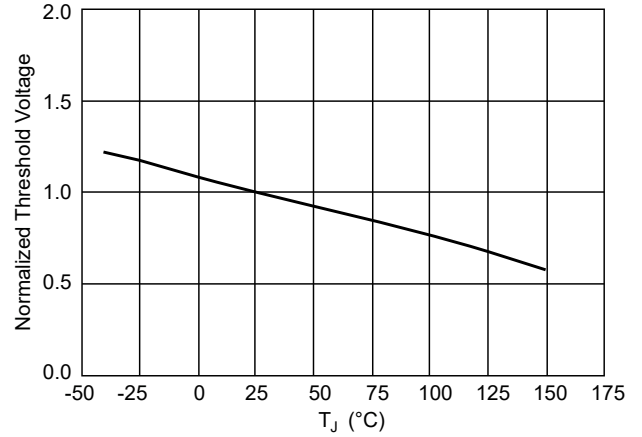


FIG. 2-Normalized $R_{DS(on)}$ vs T_J

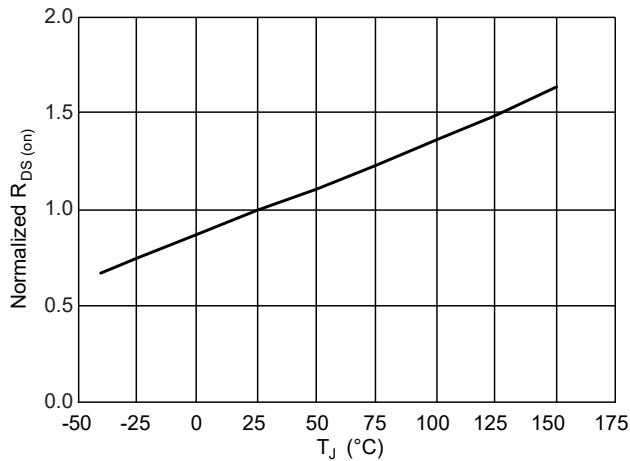


FIG. 4-Gate Charge Characteristics

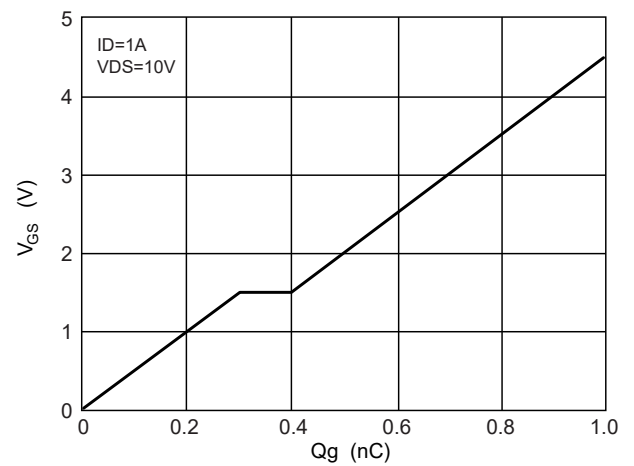


FIG. 5-Safe Operating Area

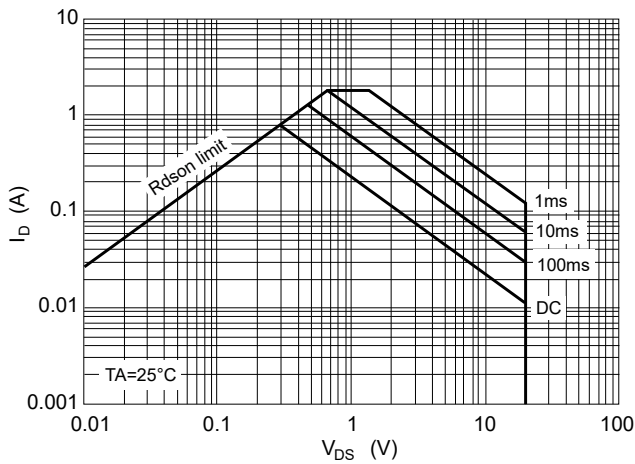
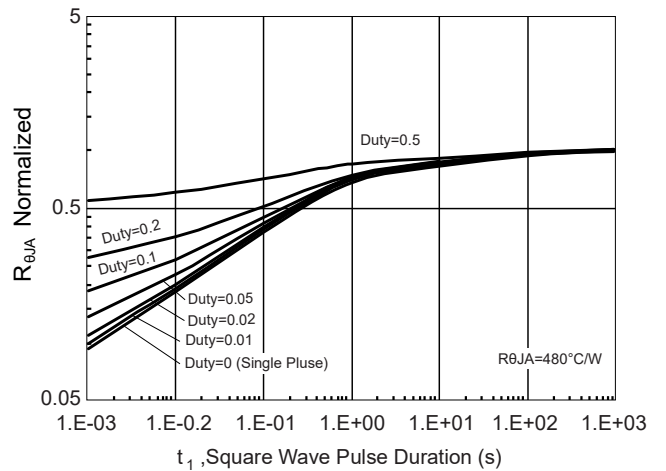
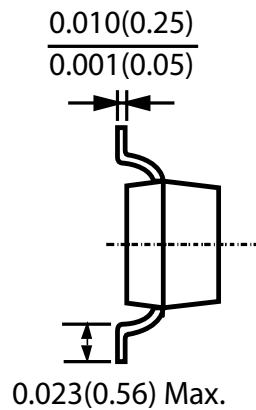
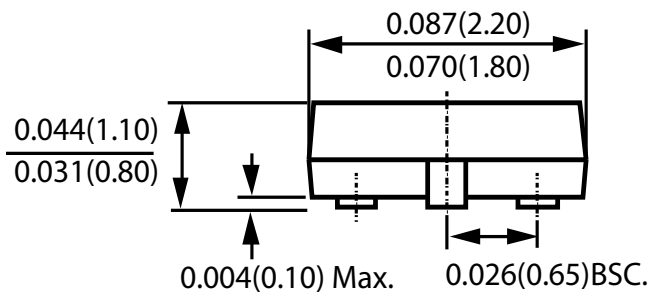
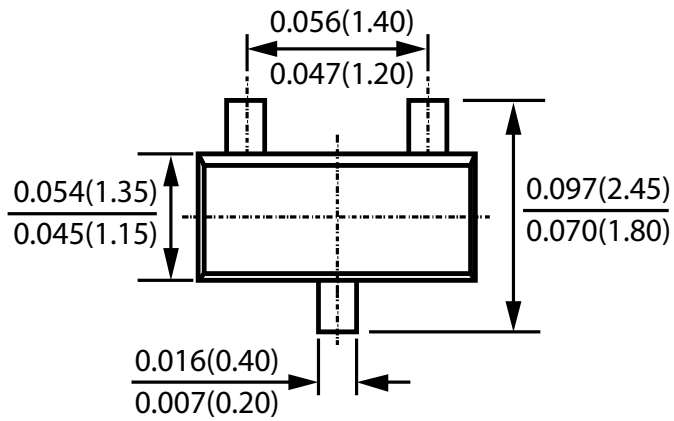


FIG. 6-Transient Thermal Impedance





Package Outline Dimensions



SOT-323

Dimensions in inches and (millimeters)



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