



20V N-Channel MOSFETs

General Description

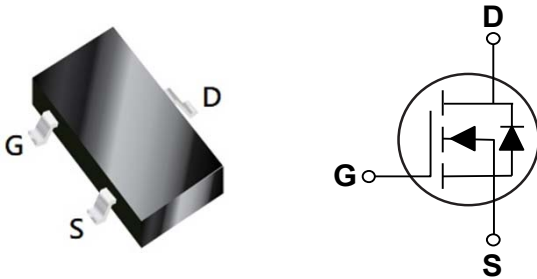
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
20 V	27 m Ω	5 A

Features

- $R_{DS(ON)} \leq 27m\Omega @ V_{GS}=4.5V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available
- Suit for 1.8V Gate Drive Applications

SOT-23 Pin Configuration



Applications

- Notebook
- Load Switch
- Hand-Held Instruments

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

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current - Continuous	5	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	20	A
P_D	Power Dissipation (NOTE 1)	1.25	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		R20	

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	100	$^\circ\text{C/W}$



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Electrical Characteristics ($T_a=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=5A$	---	---	27	m Ω
		$V_{GS}=2.5V, I_D=4.7A$	---	---	35	
		$V_{GS}=1.8V, I_D=4.3A$	---	---	57	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.4	0.7	1.0	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=10V, V_{GEN}=5V, R_{GEN}=1\Omega, I_D=4A$ (NOTE 3)	---	10	---	ns
T_r	Rise Time		---	20	---	
$T_{d(off)}$	Turn-Off Delay Time		---	32	---	
T_f	Fall Time		---	12	---	
C_{ISS}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1MHz$	---	700	---	pF
C_{OSS}	Output Capacitance		---	120	---	
C_{RSS}	Reverse Transfer Capacitance		---	105	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=4A$	---	---	1.2	V

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Guaranteed by design, not subject to product.



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Characteristics Curves

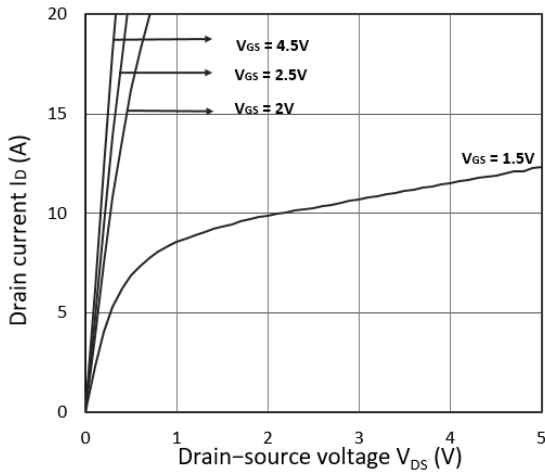


Fig.1 Output Characteristics

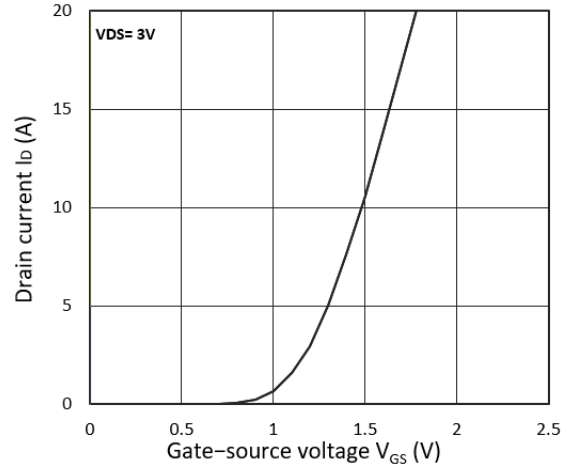


Fig.2 Transfer Characteristics

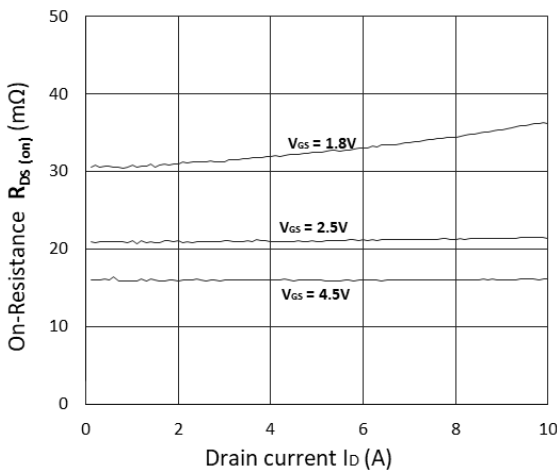


Fig.3 $R_{DS(on)}$ VS. I_D

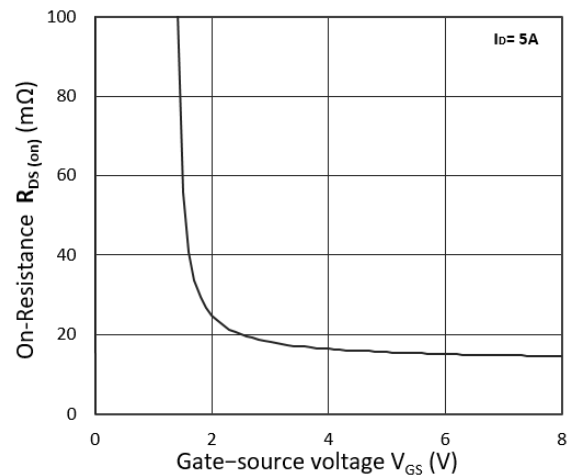


Fig.4 $R_{DS(on)}$ VS. V_{GS}

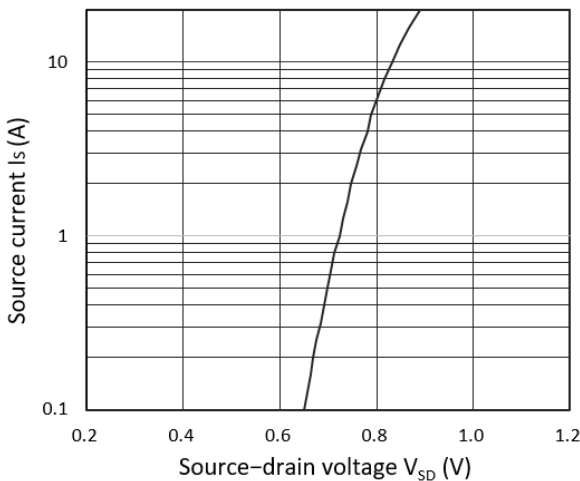


Fig.5 I_S VS. V_{SD}

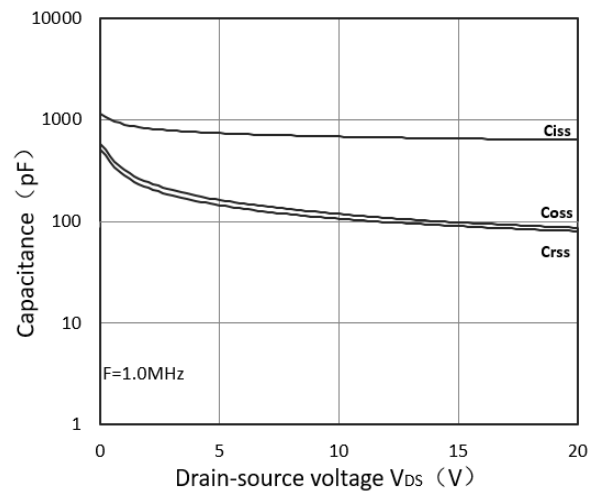


Fig.6 Capacitance Characteristics



Characteristics Curves

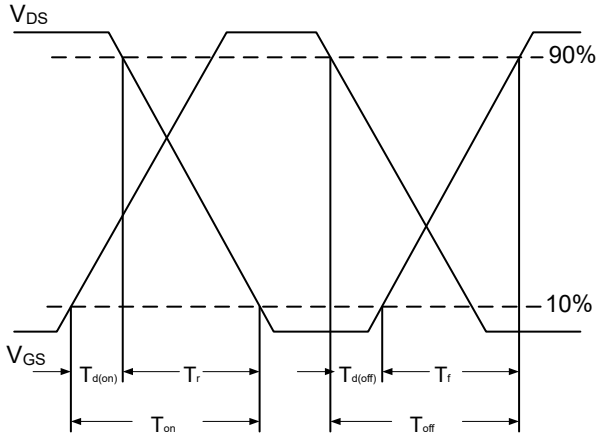
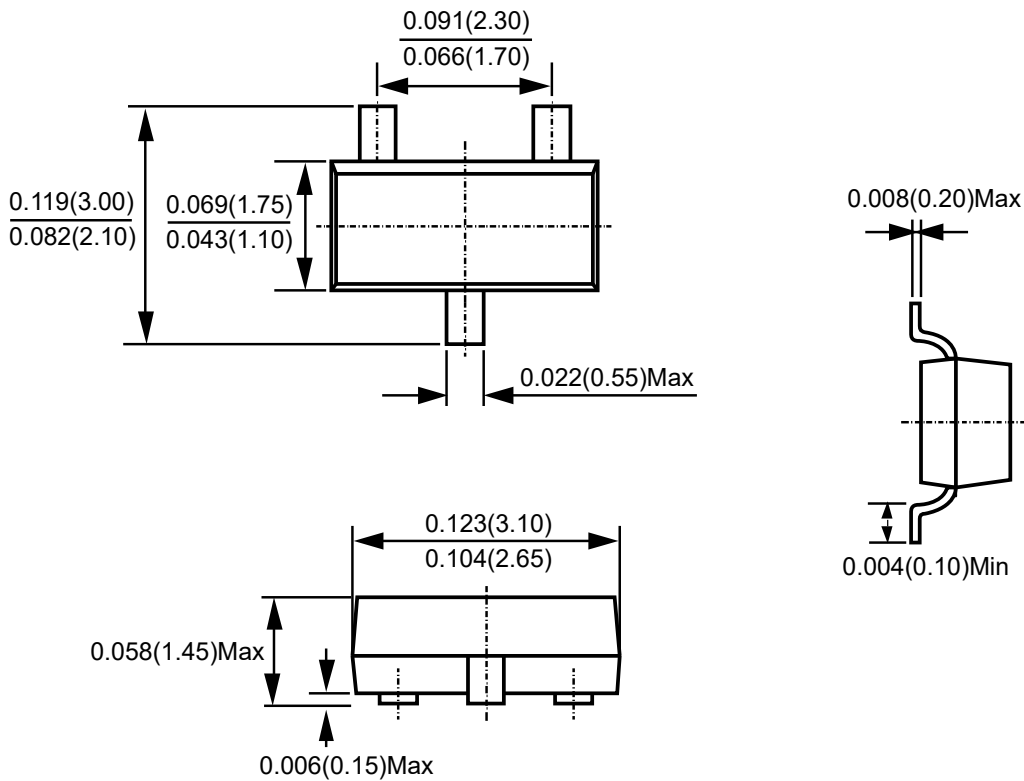


Fig.7 Switching Time Waveform

Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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