



40V N-Channel MOSFETs

General Description

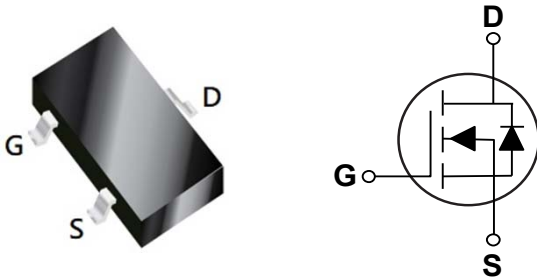
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
40 V	45 m Ω	5 A

Features

- $R_{DS(ON)} \leq 45m\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available

SOT-23 Pin Configuration



Applications

- Notebook
- Load Switch
- Hand-Held Instruments

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous	5	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	19	A
P_D	Power Dissipation (NOTE 1)	1.2	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		40N5	

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	104	$^\circ C/W$

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu\text{A}$	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=5A$	---	---	45	m Ω
		$V_{GS}=4.5V, I_D=3A$	---	---	60	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	1.0	---	2.5	V

Dynamic and switching Characteristics (NOTE 3)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=3.5A$	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	1.4	---	
Q_{gd}	Gate-Drain Charge		---	1.9	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_G=3\Omega, I_D=3.5A$	---	15	---	ns
T_r	Rise Time		---	49.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	19.2	---	
T_f	Fall Time		---	11	---	
C_{iss}	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1\text{MHz}$	---	495	---	pF
C_{oss}	Output Capacitance		---	42	---	
C_{rss}	Reverse Transfer Capacitance		---	33	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	---	---	1.2	V

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. This value is guaranteed by design hence it is not included in the production test.



Characteristics Curves

FIG. 1-Output Characteristics

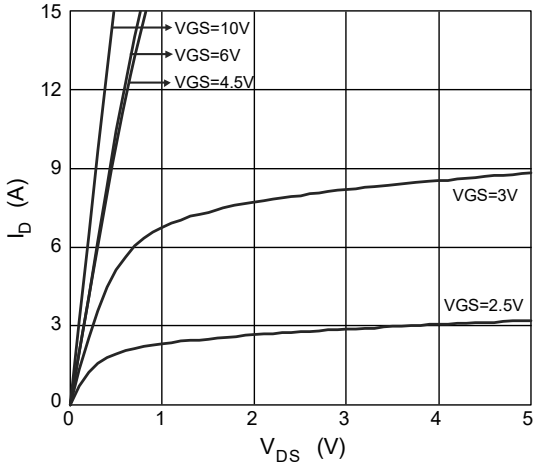


FIG. 2-Transfer Characteristics

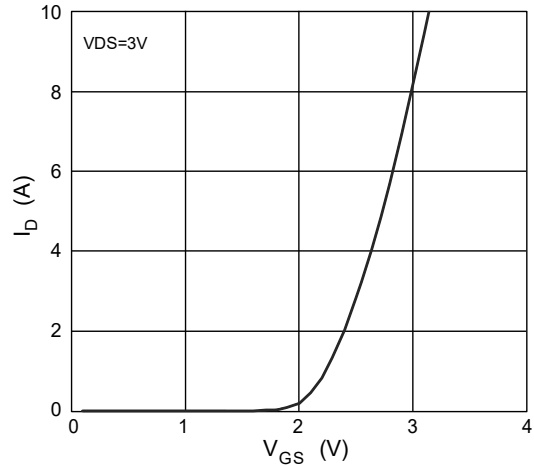


FIG. 3-Diode Forward Characteristics

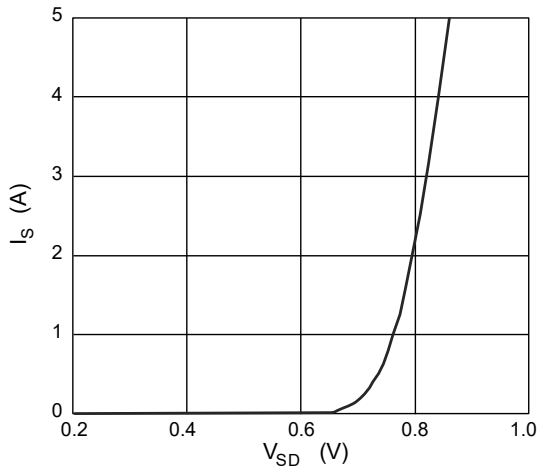


FIG. 4-Gate Charge Characteristics

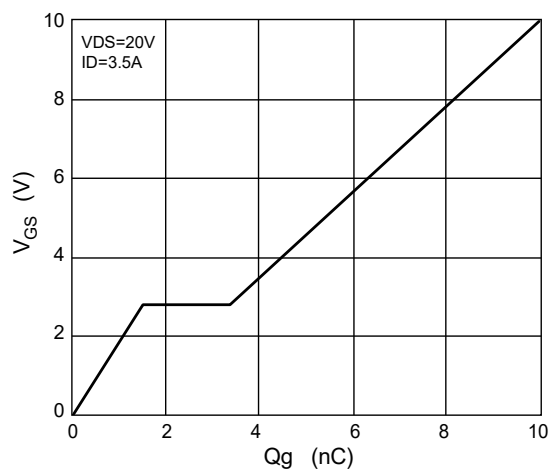


FIG. 5- $R_{DS(ON)}$ vs I_D

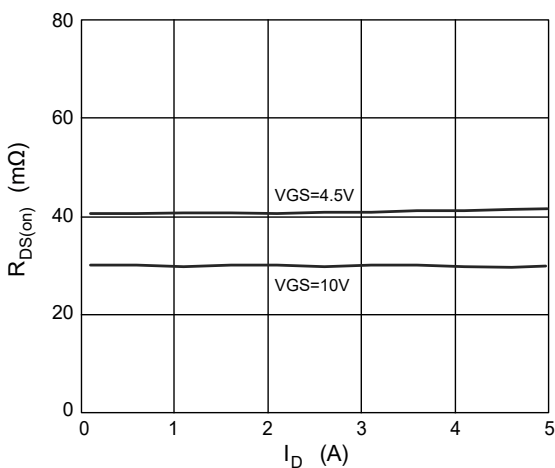
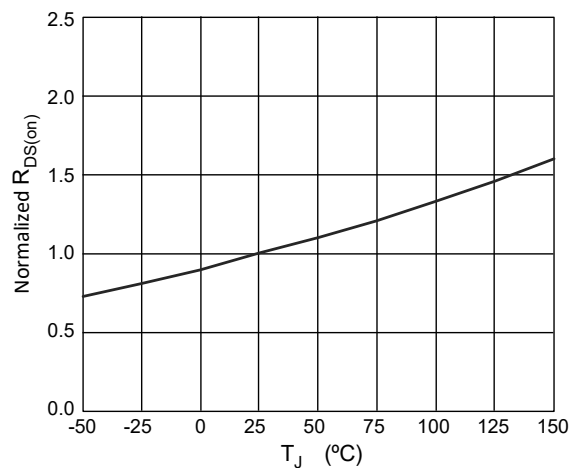
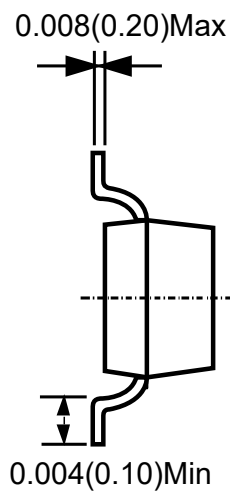
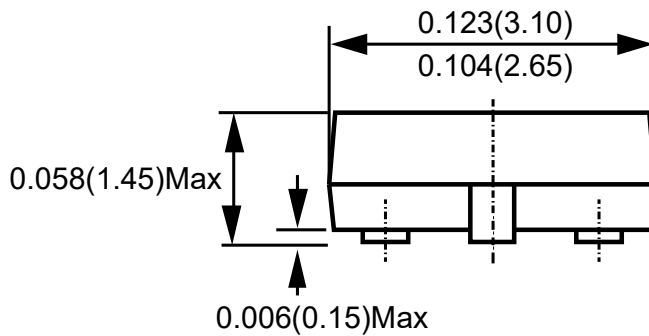
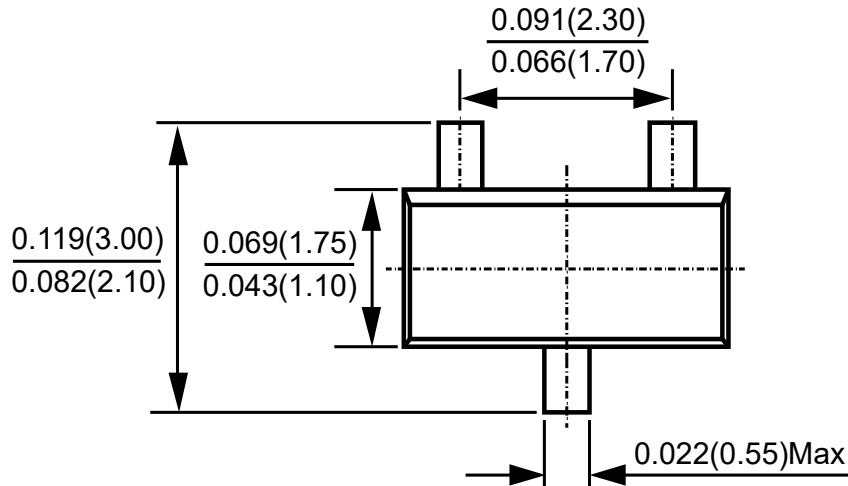


FIG. 6-Normalized $R_{DS(ON)}$ vs T_J





Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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