



PRODUCT DATA SHEET

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Datasheet



Resources



Samples

Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.jg-semi.cn. Please email any questions regarding the system integration to JINGAO_questions@jgsemi.com.

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.

BVDSS	R _{DS(ON)}	I _D
60V	75mΩ	3A

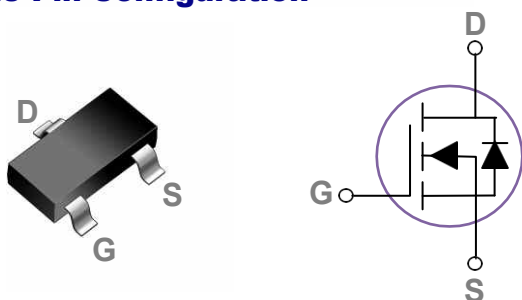
Features

- 60V, 3A, R_{DS(ON)} = 75mΩ @ V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

SOT-23 Pin Configuration



Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (T _C =25°C)	3.0	A
	Drain Current – Continuous (T _C =100°C)	2	A
I _{DM}	Drain Current – Pulsed ¹	12.0	A
P _D	Power Dissipation (T _C =25°C)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/°C
T _{STG}	Storage Temperature Range	-50 to 150	°C
T _J	Operating Junction Temperature Range	-50 to 125	°C

Thermal Characteristics

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

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	60	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.05	---	V/ $^{\circ}\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=48V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=3A$	---	75	95	m Ω
		$V_{GS}=4.5V$, $I_D=2A$	---	85	110	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.0	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5	---	mV/ $^{\circ}\text{C}$
gfs	Forward Transconductance	$V_{DS}=10V$, $I_D=3A$	---	7	---	S

Dynamic and switching Characteristics

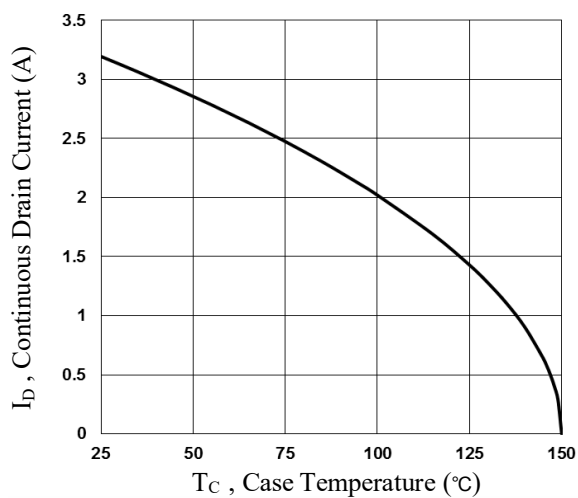
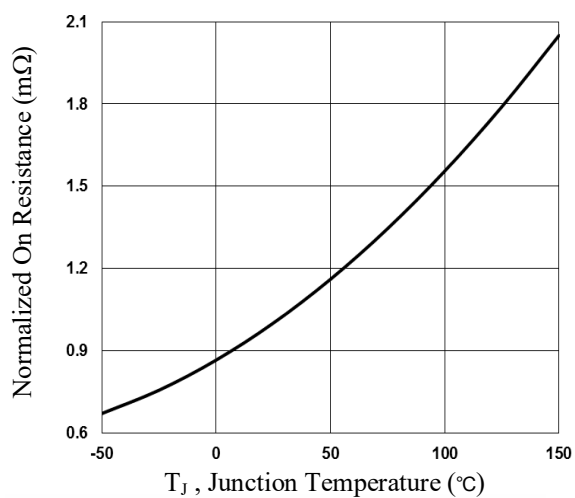
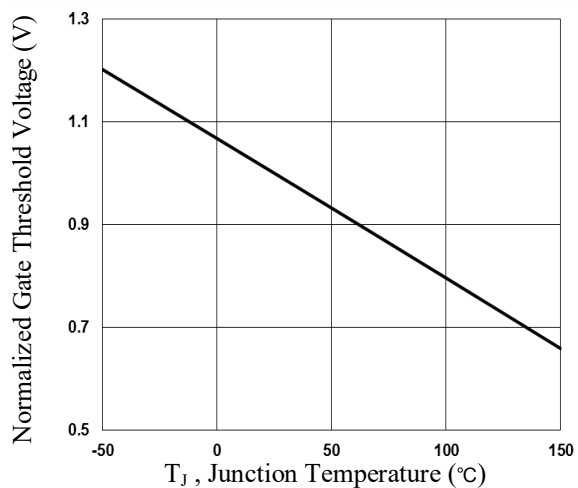
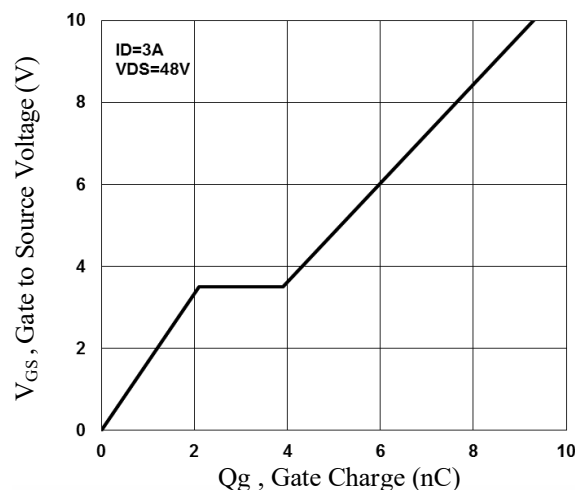
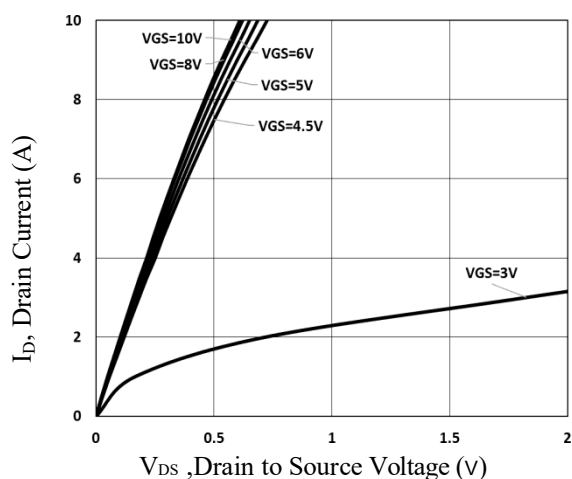
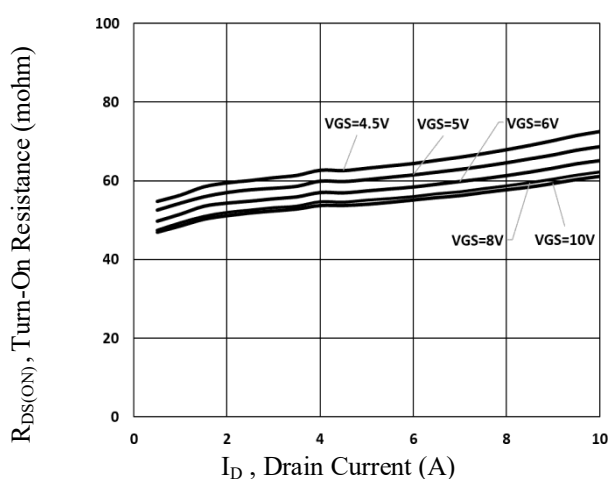
Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=48V$, $V_{GS}=10V$, $I_D=3A$	---	9.3	---	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	2.1	---	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	1.8	---	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=30V$, $V_{GS}=10V$, $R_G=3.3\Omega$ $I_D=1A$	---	2.9	---	ns
T_r	Rise Time ^{2, 3}		---	9.5	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	18.4	---	
T_f	Fall Time ^{2, 3}		---	5.3	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	500	---	pF
C_{oss}	Output Capacitance		---	45	---	
C_{rss}	Reverse Transfer Capacitance		---	16	---	
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1\text{MHz}$	---	2	---	Ω

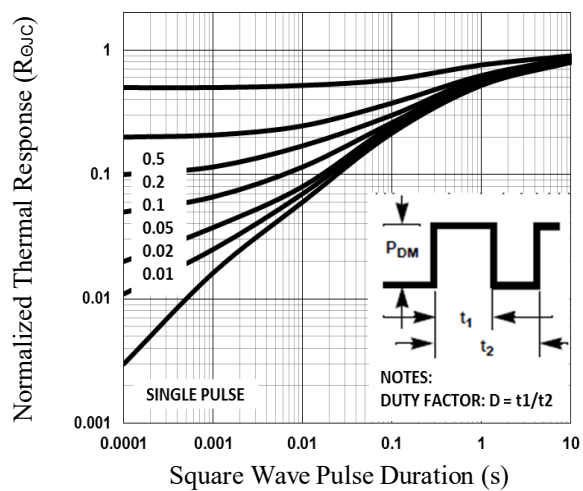
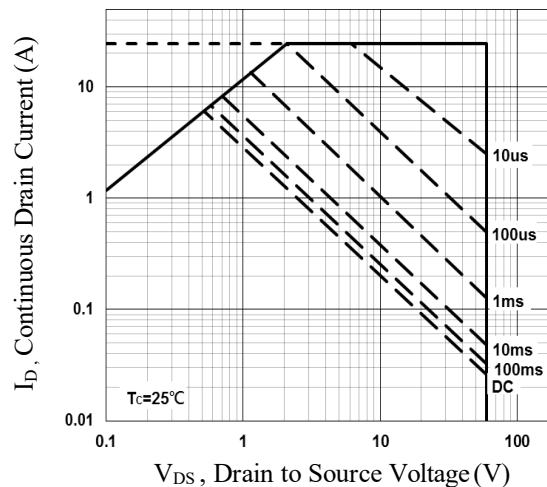
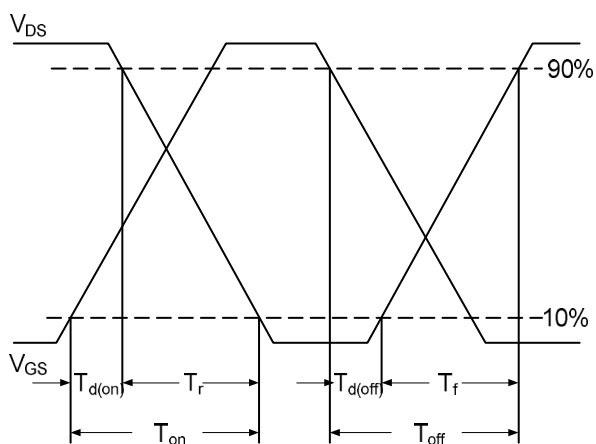
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	3.0	A
I_{SM}	Pulsed Source Current		---	---	6.0	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=1A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V

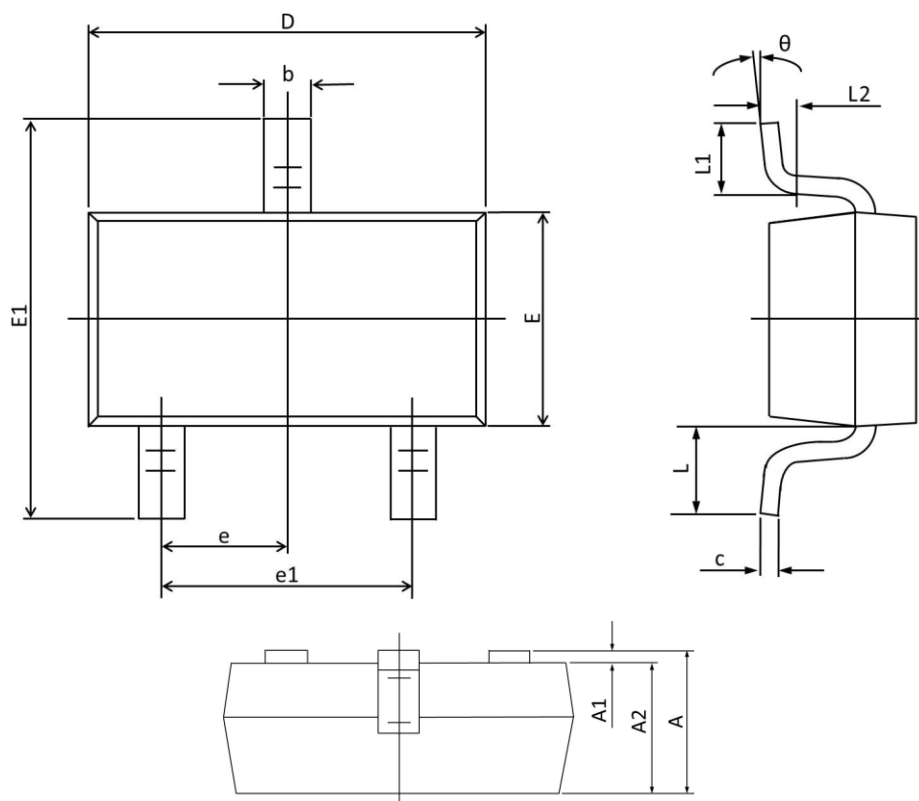
Note :

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. Essentially independent of operating temperature.


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 Typical Output Characteristics

Fig.6 Turn-On Resistance vs. I_D


Fig.7 Normalized Transient Response

Fig.8 Maximum Safe Operation Area

Fig.9 Switching Time Waveform

SOT-23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	1.150	0.900	0.045	0.035
A1	0.100	0.000	0.004	0.000
A2	1.050	0.900	0.041	0.035
b	0.500	0.300	0.020	0.012
c	0.150	0.080	0.006	0.003
D	3.000	2.800	0.118	0.110
E	1.400	1.200	0.055	0.047
E1	2.550	2.250	0.100	0.089
e	0.95 TYP.		0.037 TYP.	
e1	2.000	1.800	0.079	0.071
L	0.55 REF.		0.022 REF.	
L1	0.500	0.300	0.020	0.012
L2	0.25 TYP.		0.01 TYP.	
θ	8°	0°	8°	0°

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