



PRODUCT DATA SHEET

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Datasheet



Resources



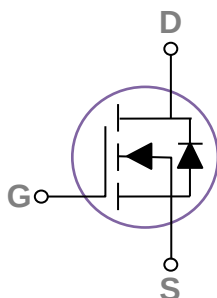
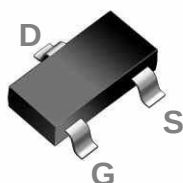
Samples

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.

SOT-23 Pin Configuration



BVDSS	RDS(ON)	ID
30V	26mΩ	5.8A

Features

- 30V, 5.8 A, $R_{DS(ON)} = 26\text{m}\Omega @ V_{GS} = 4.5\text{V}$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- Suit for 2.5V Gate Drive Applications

Applications

- Notebook
- Load Switch
- LED applications

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous ($T_A=25^\circ\text{C}$)	5.8	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	4.2	A
I_{DM}	Drain Current – Pulsed ¹	21.2	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^\circ\text{C/W}$

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	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.06	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=30V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=5A$	---	26	35	m Ω
		$V_{GS}=2.5V$, $I_D=4A$	---	35	50	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.5	0.9	1.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-3	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_S=3A$	---	7	---	S

Dynamic and switching Characteristics

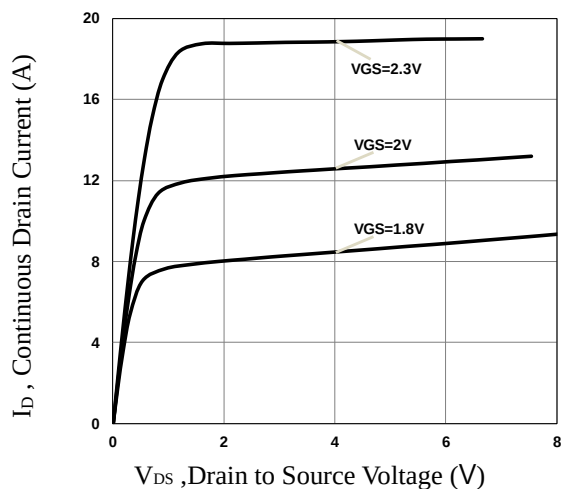
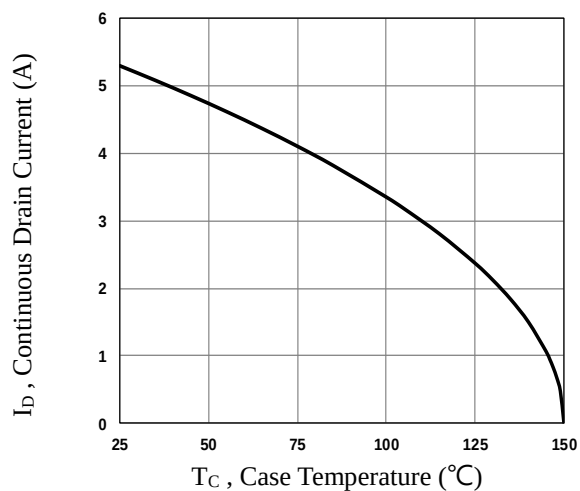
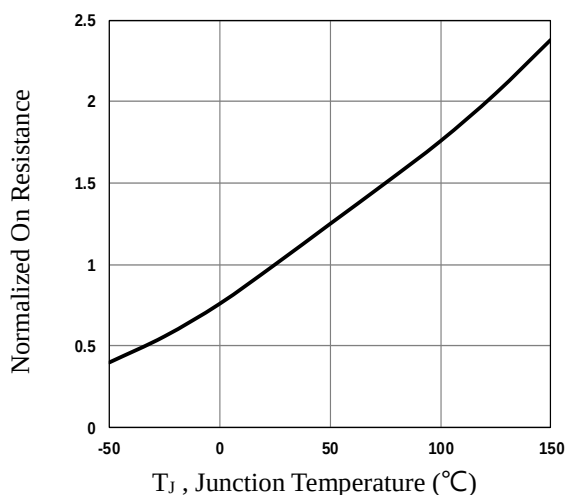
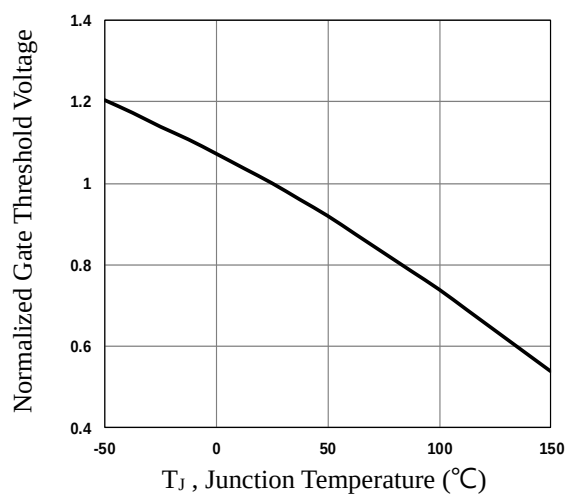
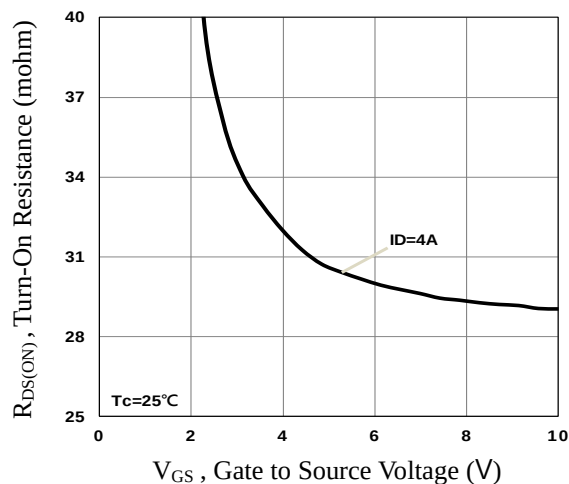
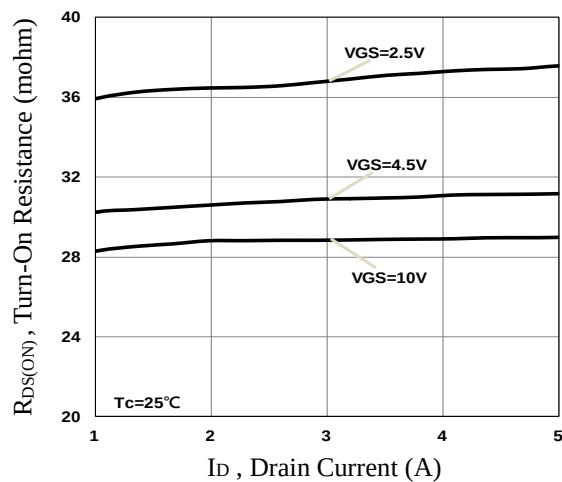
Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=4A$	---	8.4	---	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	1	---	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	2.2	---	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_G=25\Omega$ $I_D=1A$	---	4.5	---	nS
T_r	Rise Time ^{2, 3}		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	27	---	
T_f	Fall Time ^{2, 3}		---	8.3	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $F=1MHz$	---	695	---	pF
C_{oss}	Output Capacitance		---	45	---	
C_{rss}	Reverse Transfer Capacitance		---	36	---	
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1MHz$	---	1.5	---	Ω

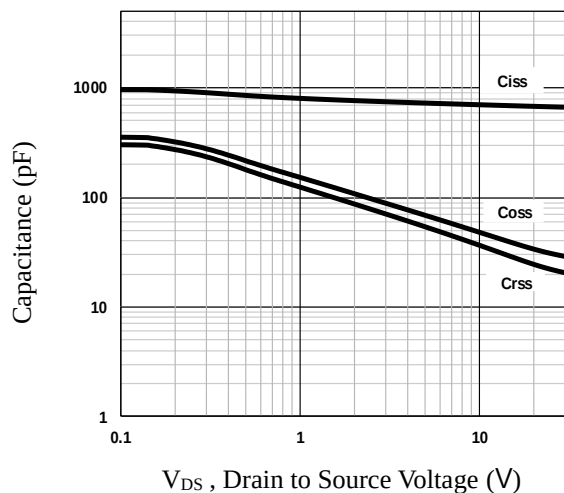
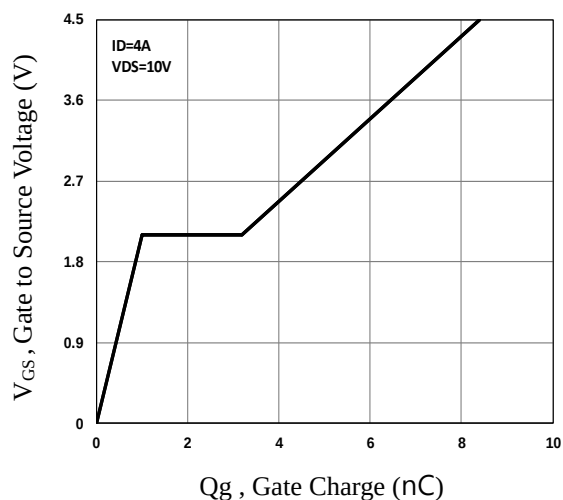
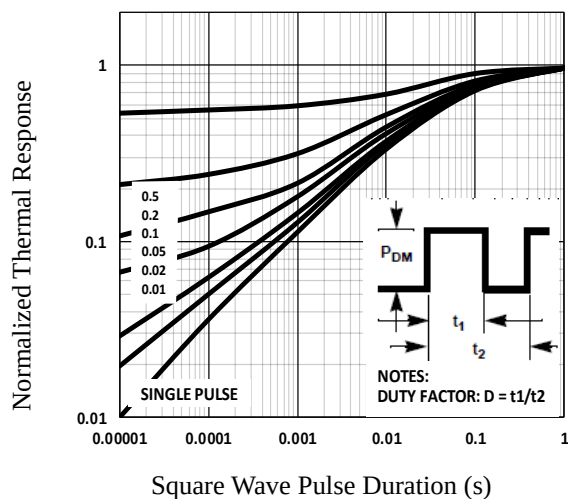
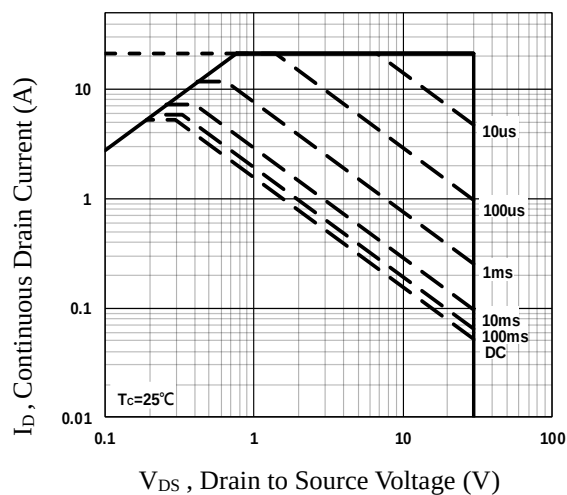
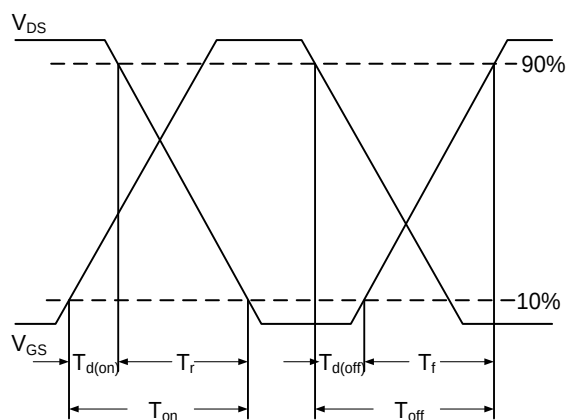
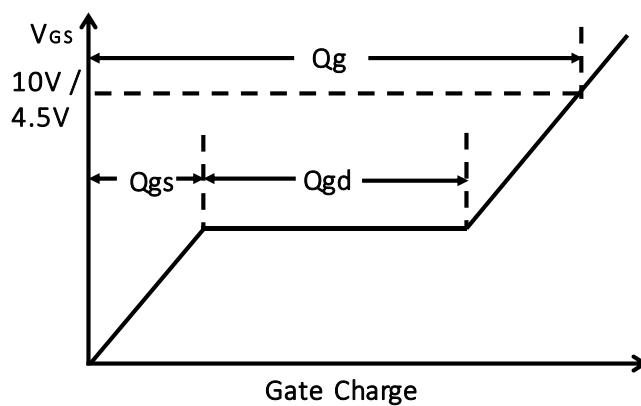
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	5.8	A
I_{SM}	Pulsed Source Current		---	---	21.2	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1.2	V

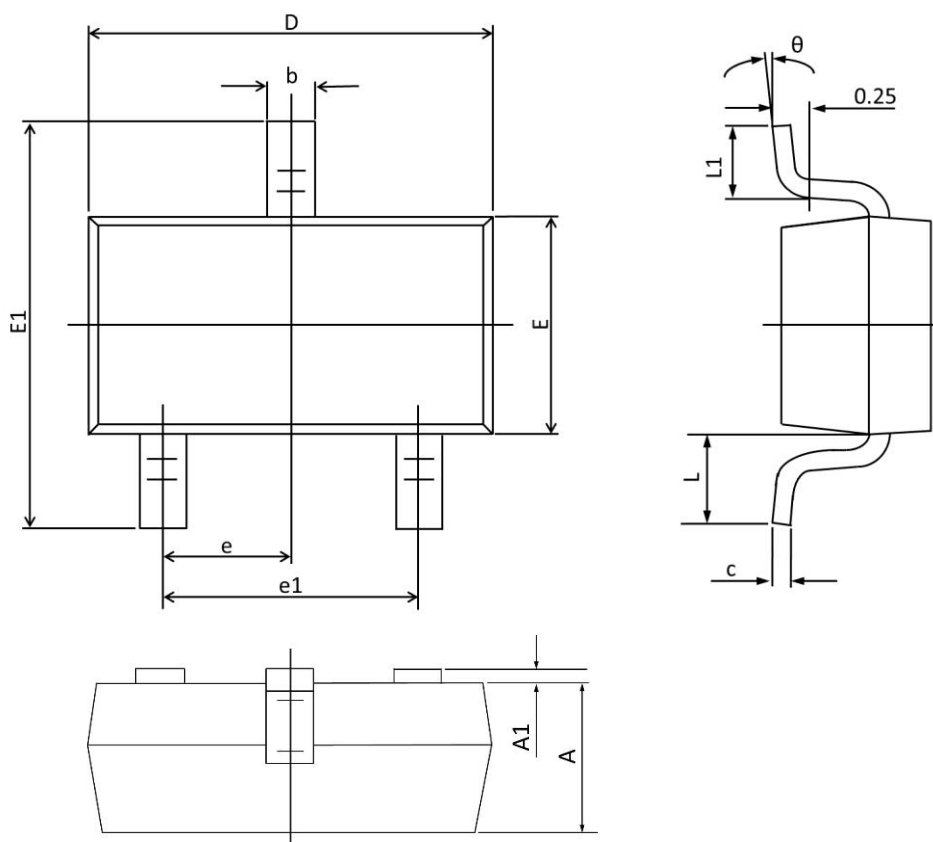
Note :

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 Typical Output Characteristics

Fig.2 Continuous Drain Current vs. T_C

Fig.3 Normalized $R_{DS(on)}$ vs. T_J

Fig.4 Normalized V_{th} vs. T_J

Fig.5 Turn-On Resistance vs. V_{GS}

Fig.6 Turn-On Resistance vs. I_D


Fig.7 Capacitance Characteristics

Fig.8 Gate Charge Characteristics

Fig.9 Normalized Transient Impedance

Fig.10 Maximum Safe Operation Area

Fig.11 Switching Time Waveform

Fig.12 Gate Charge Waveform

SOT-23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.001	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.080	0.180	0.003	0.008
D	2.700	3.100	0.106	0.122
E	1.100	1.500	0.043	0.059
E1	2.100	2.640	0.080	0.104
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.040	0.070	0.080
L	0.550 REF.		0.022 REF.	
L1	0.100	0.500	0.004	0.020
θ	1°	10°	1°	10°

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