



## PRODUCT DATA SHEET



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Datasheet



Resources



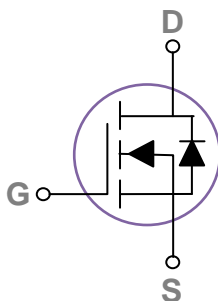
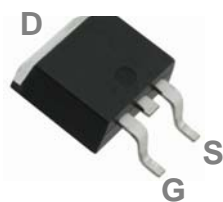
Samples

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](http://www.jg-semi.cn). Please email any questions regarding the system integration to [JINGAO\\_questions@jgsemi.com](mailto: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.

## TO252 Pin Configuration



BVDSS	RDSON	ID
100V	90mΩ	15A

## Features

- 100V, 15A,  $R_{DS(ON)} = 90\text{m}\Omega @ V_{GS} = 10\text{V}$
- Improved  $dv/dt$  capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

## Applications

- Networking
- 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	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ )	15	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ )	9.5	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	60	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	50	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.4	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	2.5	$^\circ\text{C}/\text{W}$

## 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	$V_{GS}=0V$ , $I_D=250\mu A$	100	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=1mA$	---	0.05	---	$V/^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=100V$ , $V_{GS}=0V$ , $T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=80V$ , $V_{GS}=0V$ , $T_J=125^\circ\text{C}$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V$ , $V_{DS}=0V$	---	---	$\pm 100$	nA

### On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$ , $I_D=5A$	---	72	90	$m\Omega$
		$V_{GS}=4.5V$ , $I_D=3A$	---	75	100	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=250\mu A$	1.2	1.6	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5	---	$mV/^\circ\text{C}$
$g_{fs}$	Forward Transconductance	$V_{DS}=10V$ , $I_D=3A$	---	8.7	---	S

### Dynamic and switching Characteristics

$Q_g$	Total Gate Charge <sup>2, 3</sup>	$V_{DS}=48V$ , $V_{GS}=10V$ , $I_D=5A$	---	9.3	13	nC
$Q_{gs}$	Gate-Source Charge <sup>2, 3</sup>		---	2.1	4.2	
$Q_{gd}$	Gate-Drain Charge <sup>2, 3</sup>		---	1.8	4	
$T_{d(on)}$	Turn-On Delay Time <sup>2, 3</sup>	$V_{DD}=30V$ , $V_{GS}=10V$ , $R_G=3.3\Omega$ $I_D=1A$	---	2.9	6	ns
$T_r$	Rise Time <sup>2, 3</sup>		---	9.5	18	
$T_{d(off)}$	Turn-Off Delay Time <sup>2, 3</sup>		---	18.4	35	
$T_f$	Fall Time <sup>2, 3</sup>		---	5.3	10	
$C_{iss}$	Input Capacitance	$V_{DS}=50V$ , $V_{GS}=0V$ , $F=1MHz$	---	1480	2150	pF
$C_{oss}$	Output Capacitance		---	480	700	
$C_{rss}$	Reverse Transfer Capacitance		---	35	55	
$R_g$	Gate resistance	$V_{GS}=0V$ , $V_{DS}=0V$ , $F=1MHz$	---	1.3	2.6	$\Omega$

### 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	---	---	15	A
$I_{SM}$	Pulsed Source Current		---	---	60	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V$ , $I_S=1A$ , $T_J=25^\circ\text{C}$	---	---	1	V
$t_{rr}$	Reverse Recovery Time <sup>2</sup>	$V_{GS}=30V$ , $I_S=1A$ , $dI/dt=100A/\mu s$ $T_J=25^\circ\text{C}$	---	---	---	ns
$Q_{rr}$	Reverse Recovery Charge <sup>2</sup>		---	---	---	nC

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.

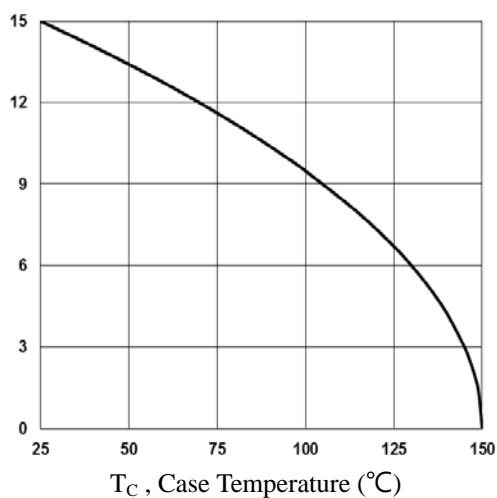


Fig.1 Continuous Drain Current vs. TC

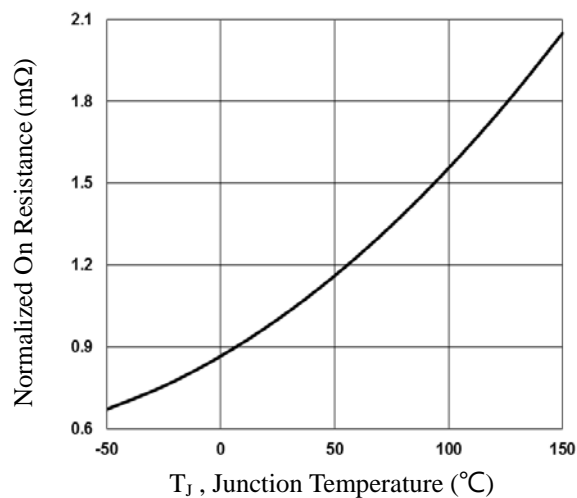


Fig.2 Normalized RDSON vs.  $T_J$

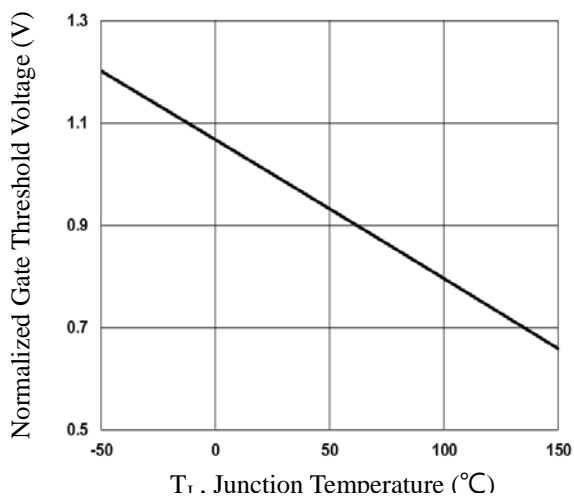


Fig.3 Normalized  $V_{th}$  vs.  $T_J$

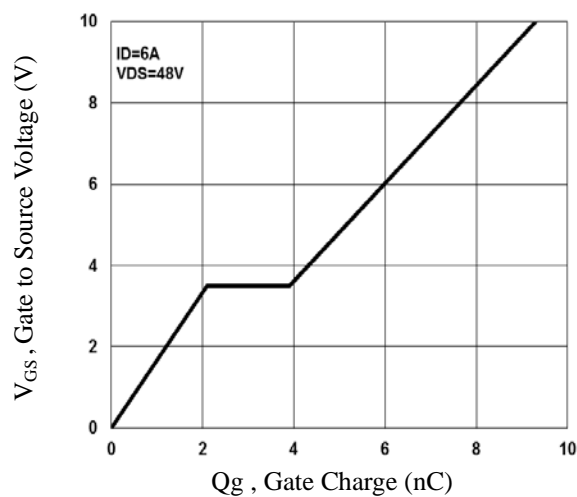


Fig.4 Gate Charge Characteristics

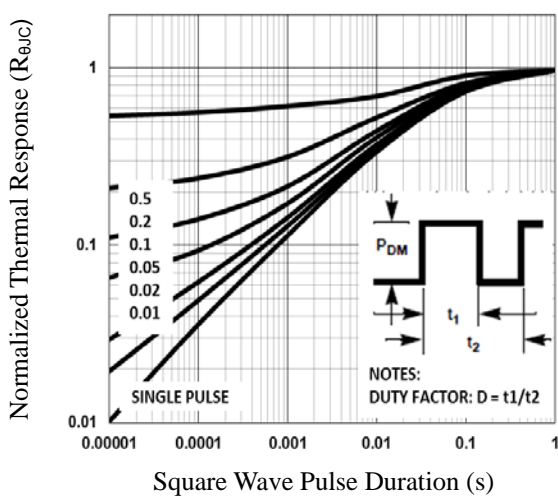


Fig.5 Normalized Transient Impedance

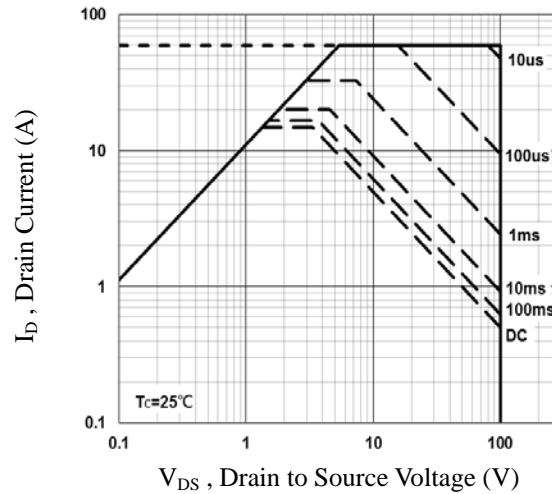


Fig.6 Maximum Safe Operation Area

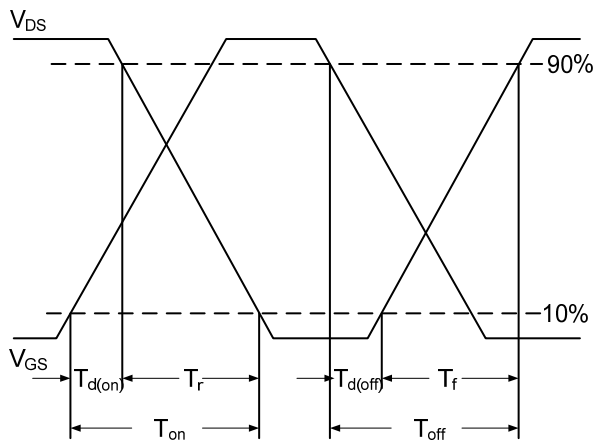


Fig.7 Switching Time Waveform

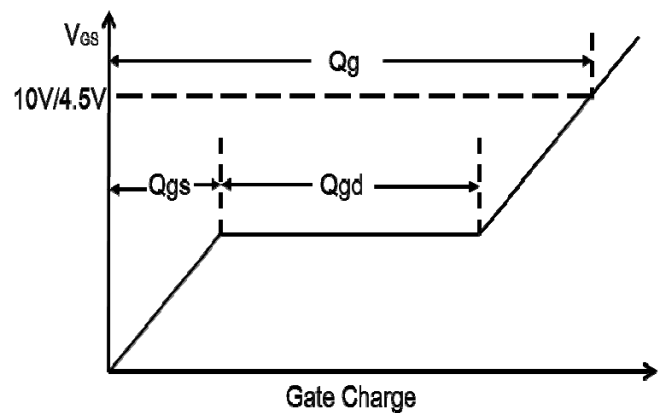
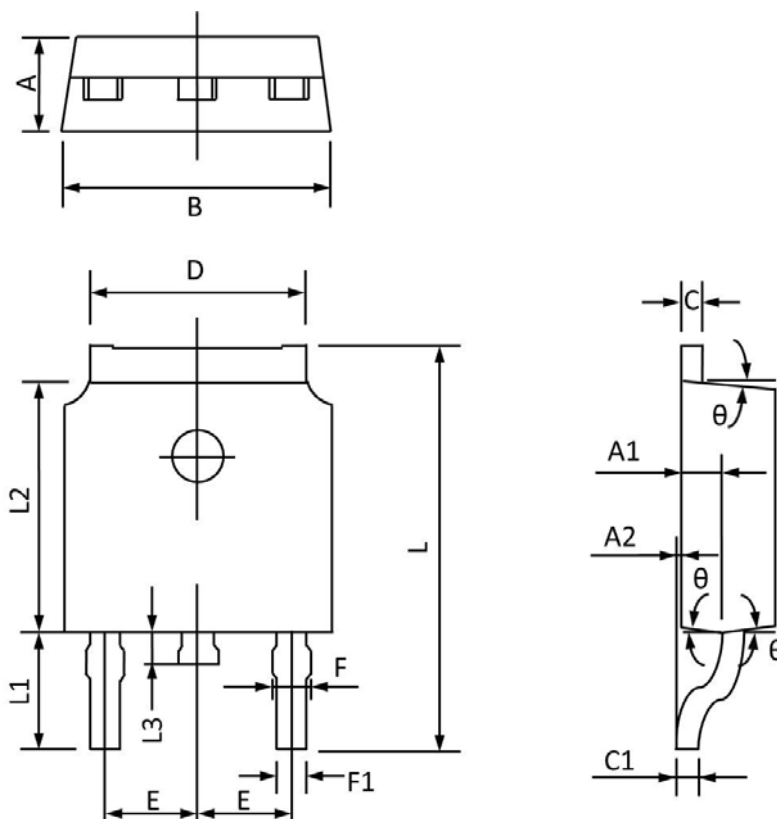


Fig.8 Gate Charge Waveform

## TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°

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