



## PRODUCT DATA SHEET



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Datasheet



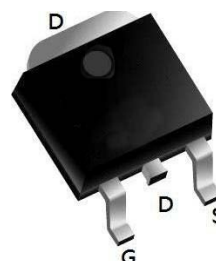
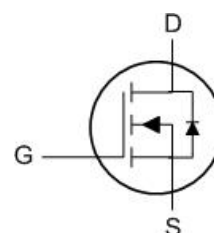
Resources



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).

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent Cdv/dt effect decline
- ★ Advanced high cell density Trench technology


**TO252-3L**


### Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter		Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage		100	V
V <sub>GSS</sub>	Gate-Source Voltage		±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	40	A
		T <sub>C</sub> = 100°C	21	A
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>		120	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>		30	mJ
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	42	W
R <sub>θJC</sub>	Thermal Resistance, Junction to Case		3.6	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range		-55 to +175	°C

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
On Characteristics						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.8	1.2	1.6	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	-	25	32.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	-	26	36	mΩ
Dynamic Characteristics						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	1964	-	pF
C <sub>oss</sub>	Output Capacitance		-	90	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	74	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =80V, I <sub>D</sub> =20A, V <sub>GS</sub> =4.5V	-	20	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	3.1	-	nC
Q <sub>gd</sub>	Gate-Drain(“Miller”) Charge		-	14	-	nC
Switching Characteristics						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =80V, I <sub>D</sub> =20A, R <sub>G</sub> =3.1Ω, V <sub>GS</sub> =4.5V	-	11	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	91	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	40	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	71	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	40	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =20A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =20A, dI/dt=100A/μs	-	64	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	152	-	nC

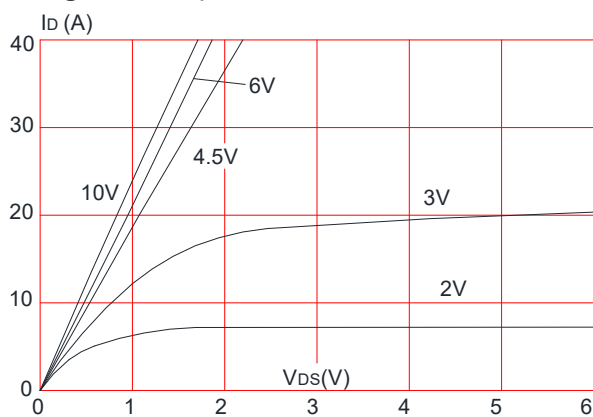
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition :  $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=11A$

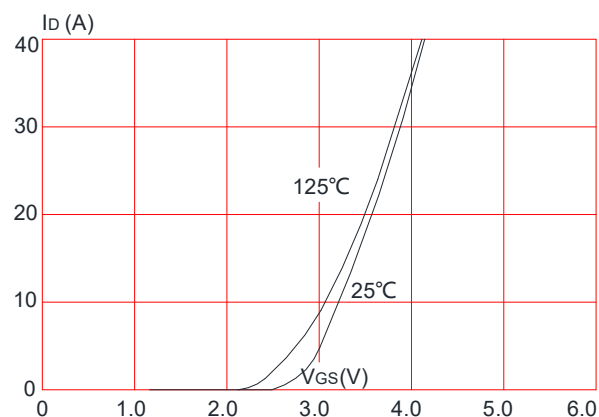
3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

## Typical Performance Characteristics

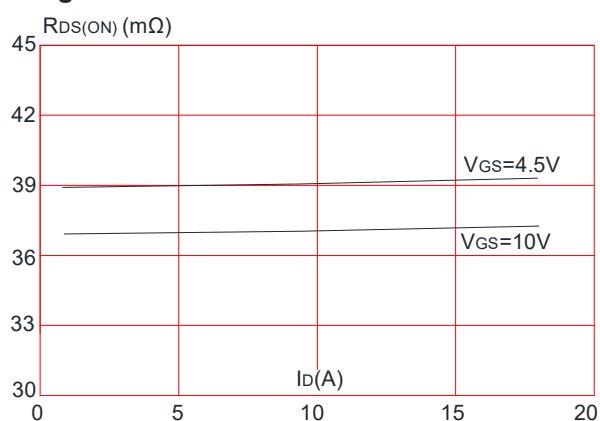
**Figure1: Output Characteristics**



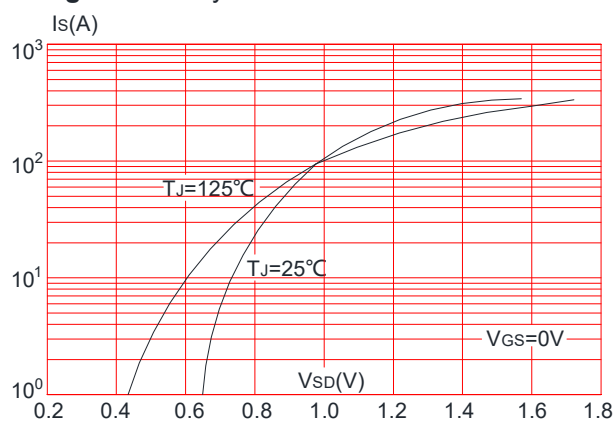
**Figure 2: Typical Transfer Characteristics**



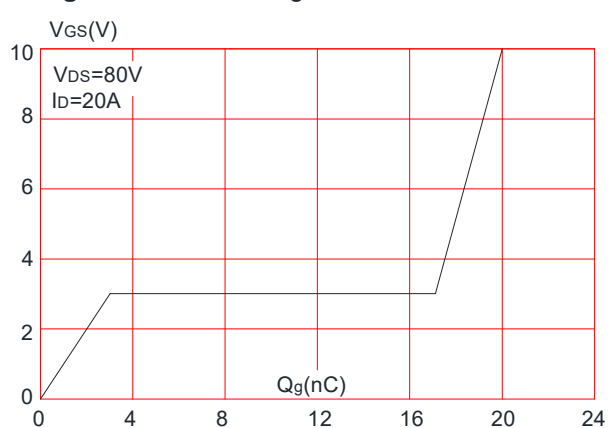
**Figure 3: On-resistance vs. Drain Current**



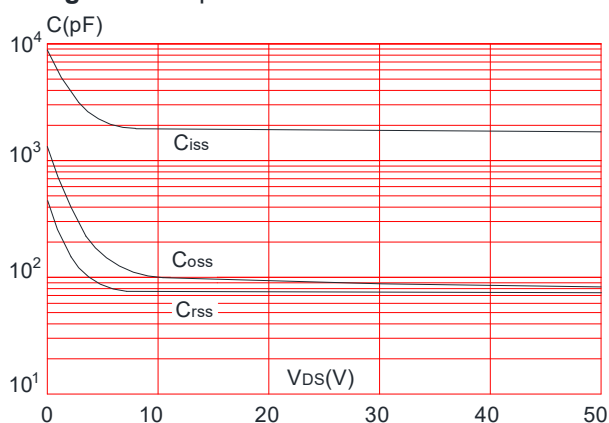
**Figure 4: Body Diode Characteristics**



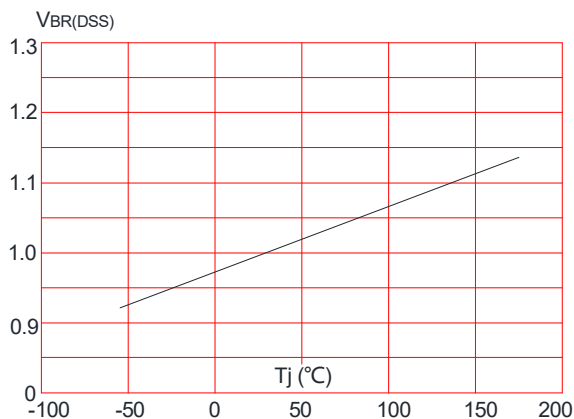
**Figure 5: Gate Charge Characteristics**



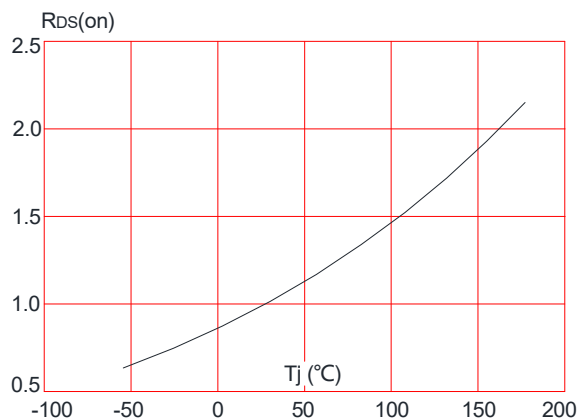
**Figure 6: Capacitance Characteristics**



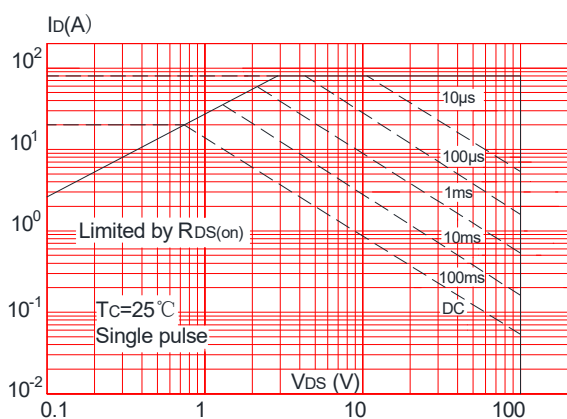
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



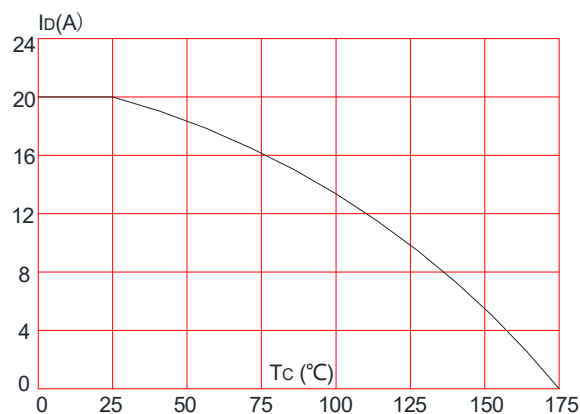
**Figure 8:** Normalized on Resistance vs. Junction Temperature



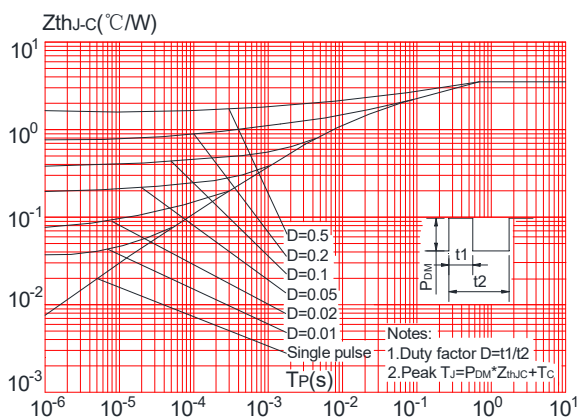
**Figure 9:** Maximum Safe Operating Area



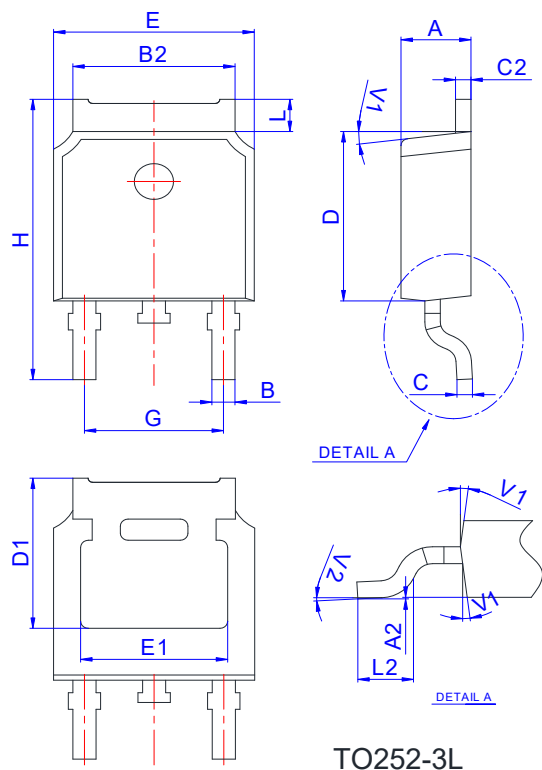
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



## Package Mechanical Data-TO252-3L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

TO252-3L

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