PRODUCT DATA SHEET

To learn more about JGSEMI, please visit our website at

Datasheet Resources Samples

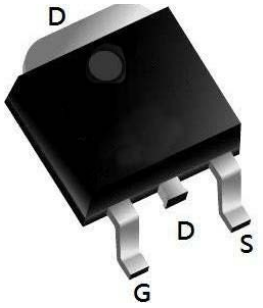
Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.jg-semi.cn. Please email any questions regarding the system integration to JINGAO_questions@jgsemi.com.

PDD6904

N-Ch 60V Fast Switching MOSFETs

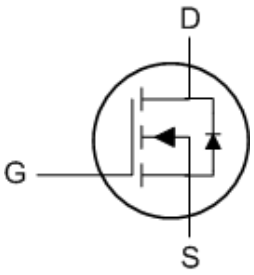
Product Summary

BVDSS	RDSON	ID
60V	6.8mΩ	65A



TO252 Pin Configuration

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology



Abs olute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	60	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
$I_{D\ (DC)}$	Drain Current (DC) at Tc=25℃	65	A
$I_{D\ (DC)}$	Drain Current (DC) at Tc=100℃	45	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed **(Note 1)**	260	A
dv/dt	Peak Diode Recovery Voltage	8	V/ns
P_D	Maximum Power Dissipation(Tc=25℃)	75	W
	Derating Factor	0.5	W/℃
E_{AS}	Single Pulse Avalanche Energy **(Note 2)**	300	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	℃

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.E_{AS} condition:T_J=25℃,V_{DD}=33V,V_G=10V

Thermal Characteristic

Symbol	Parameter	Value	Max	Unit
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	---	2.0	℃/W

Electrical Characteristics (TA=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=64V,V_{GS}=0V	---	---	1	μA
I_{DSS}	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=64V,V_{GS}=0V	---	---	10	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	---	---	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2	---	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=40A	---	6.8	8.2	mΩ
Dynamic Characteristics						
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=15A	15	---	---	S
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1.0MHz	---	2873	---	pF
C_{oss}	Output Capacitance		---	252	---	pF
C_{rss}	Reverse Transfer Capacitance		---	205	---	pF
Q_g	Total Gate Charge	V_{DS}=50V,I_D=40A, V_{GS}=10V	---	56	---	nC
Q_{gs}	Gate-Source Charge		---	10	---	nC
Q_{gd}	Gate-Drain Charge		---	16	---	nC
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V,I_D=2A,R_L=15Ω V_{GS}=10V,R_G=2.5Ω	---	14.5	---	nS
t_r	Turn-on Rise Time		---	24	---	nS
$t_{d(off)}$	Turn-Off Delay Time		---	45	---	nS
t_f	Turn-Off Fall Time		---	22	---	nS
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)		---	65	---	A
I_{SDM}	Pulsed Source-Drain Current(Body Diode)		---	260	---	A
V_{SD}	Forward On Voltage(Note 1)	T_J=25℃,I_{SD}=40A,V_{GS}=0V	---	0.89	0.99	V
t_{rr}	Reverse Recovery Time(Note 1)	T_J=25℃,I_F=75A di/dt=100A/μs	---	22	---	nS
Q_{rr}	Reverse Recovery Charge(Note 1)		---	27	---	nC
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

Notes 1.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%, R_G=25Ω, Starting T_J=25℃

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Output Characteristics

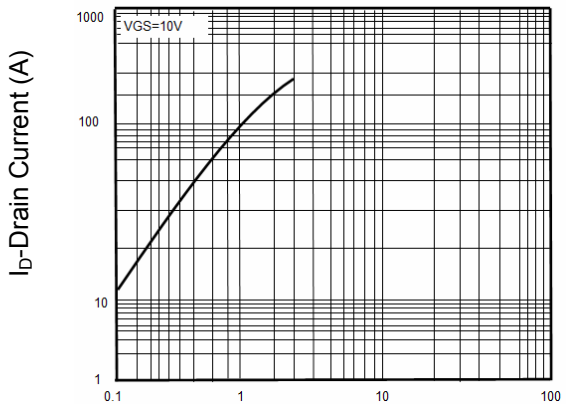


Figure2. Transfer Characteristics

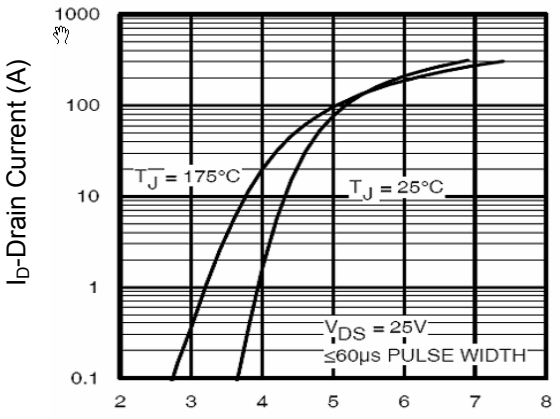


Figure3. BVDSS vs Junction Temperature

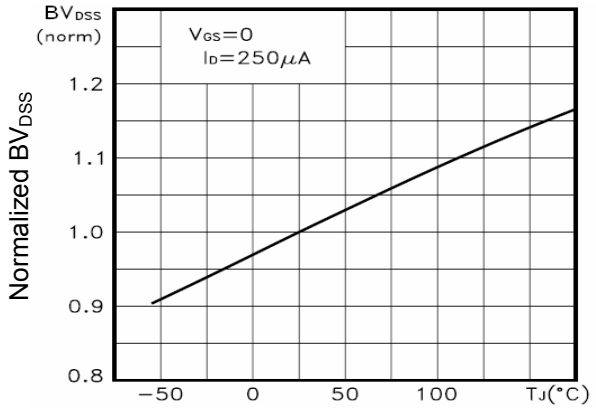


Figure4. ID vs Junction Temperature

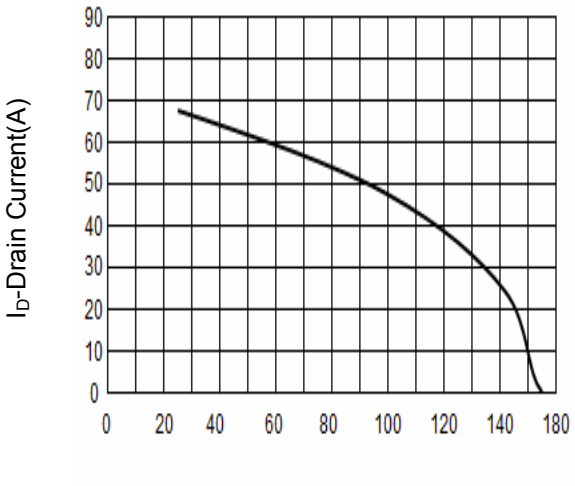


Figure5. VGS(th) vs Junction Temperature

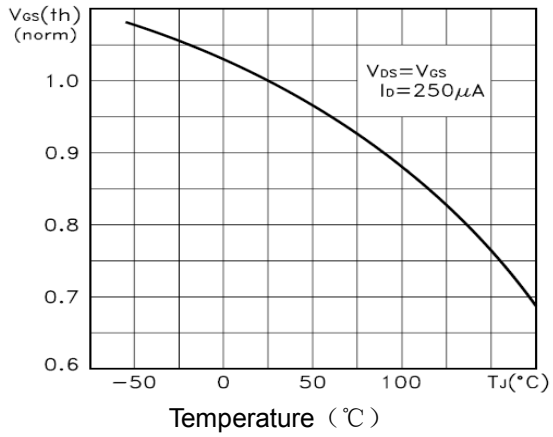


Figure6. Rdson Vs Junction Temperature

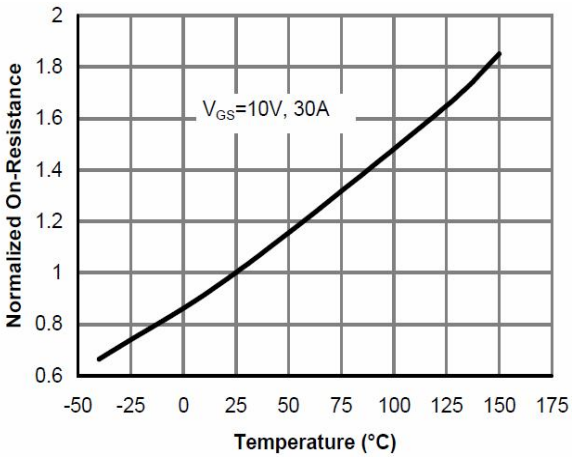


Figure7. Gate Charge

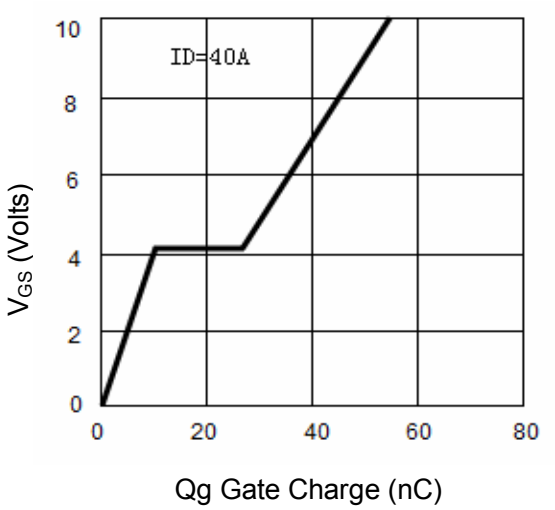


Figure8. Capacitance vs Vds

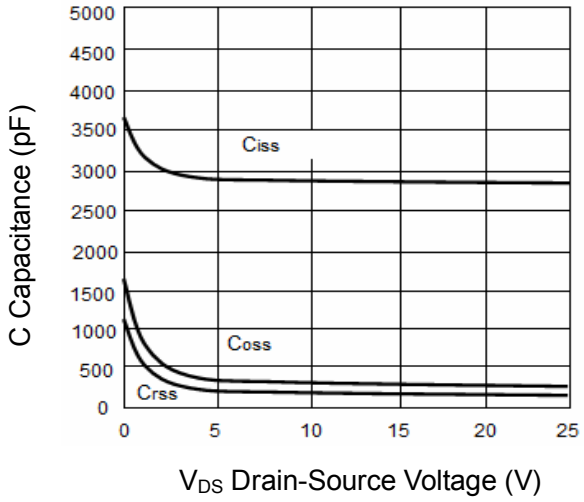


Figure9. Source- Drain Diode Forward

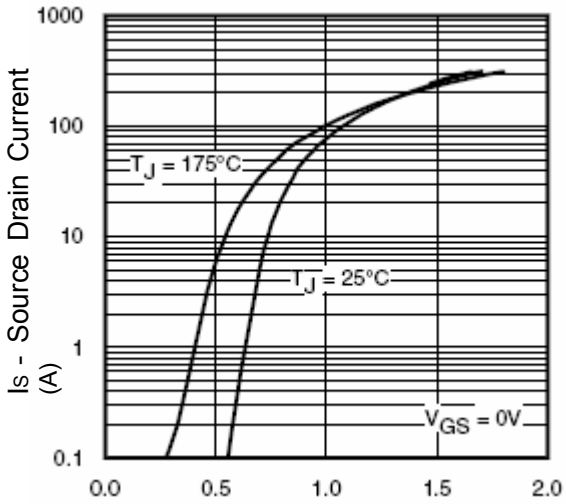


Figure10. Safe Operation Area

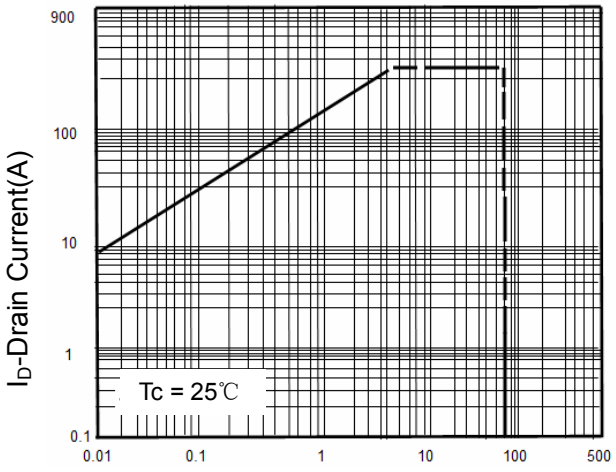
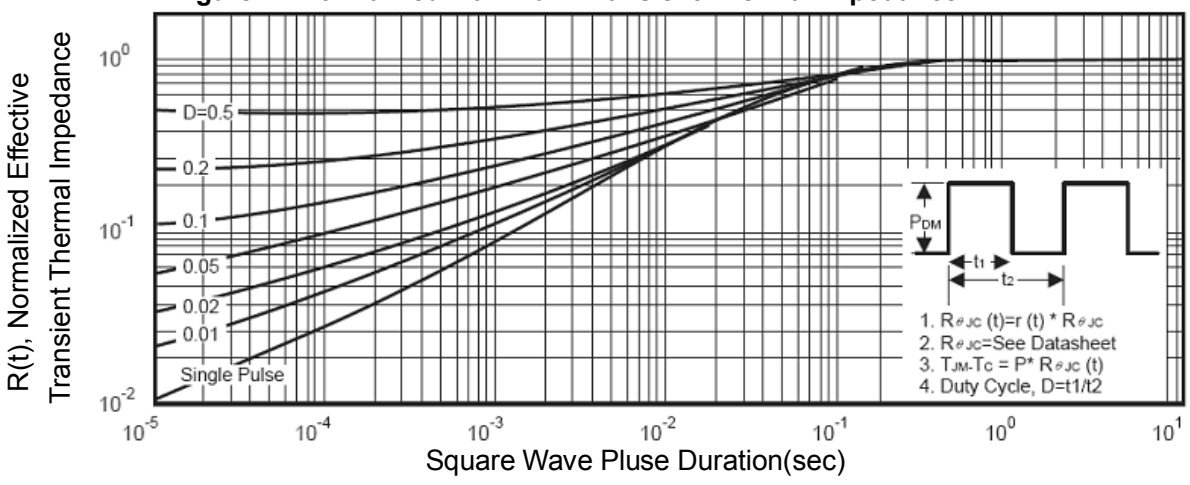
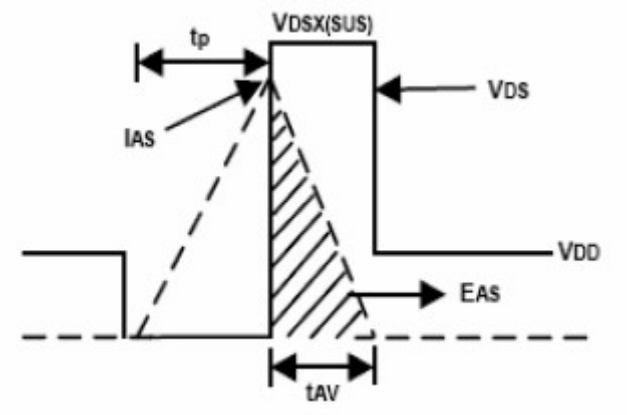


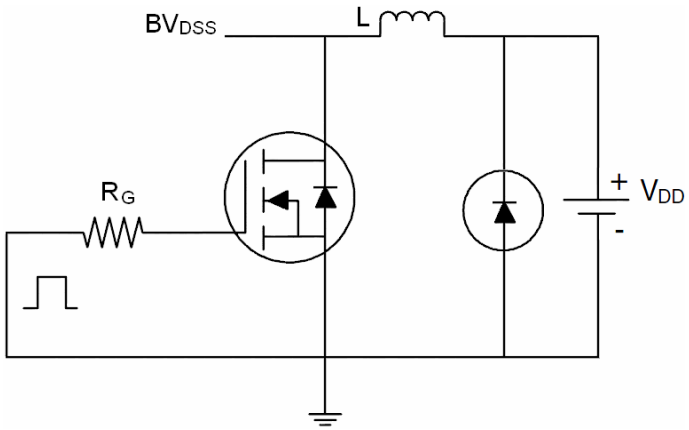
Figure11. Normalized Maximum Transient Thermal Impedance



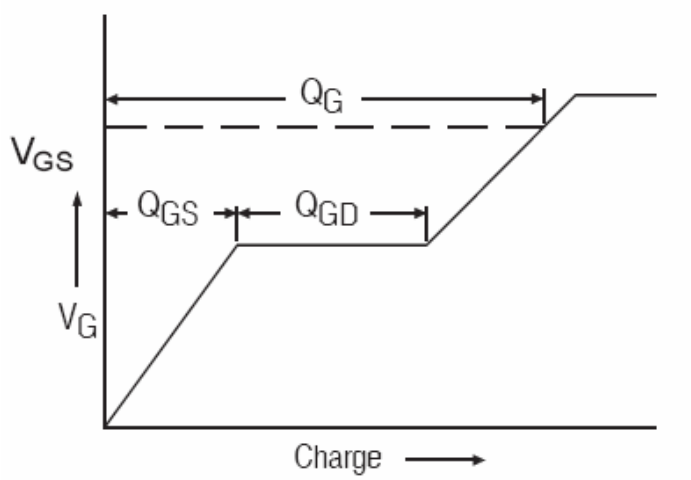
Test Circuit

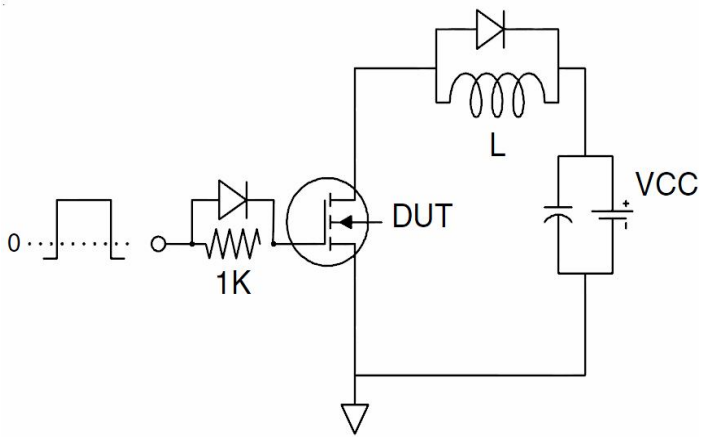
1）E_{AS} Test Circuits



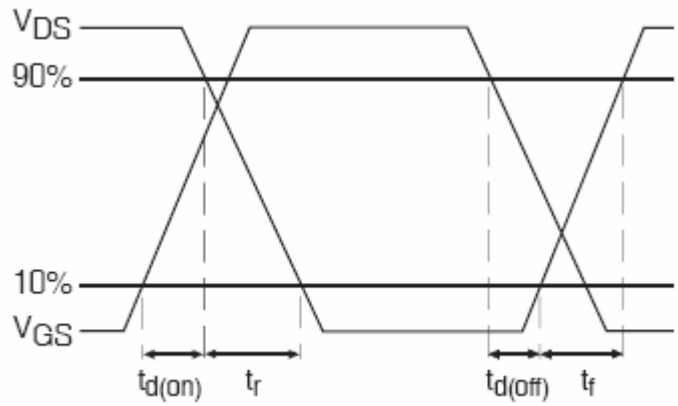


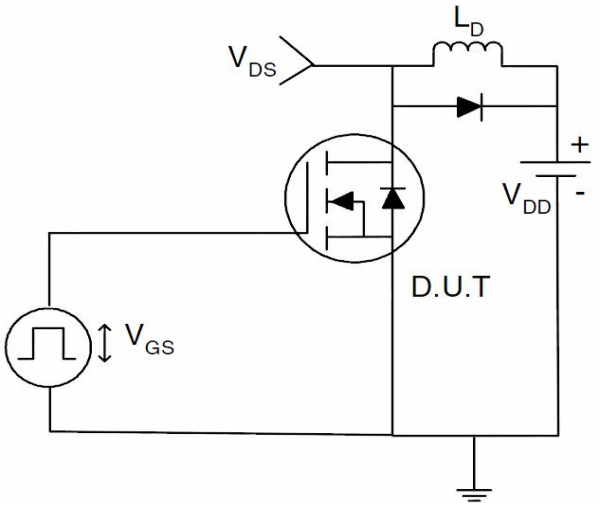
2）Gate Charge Test Circuit:



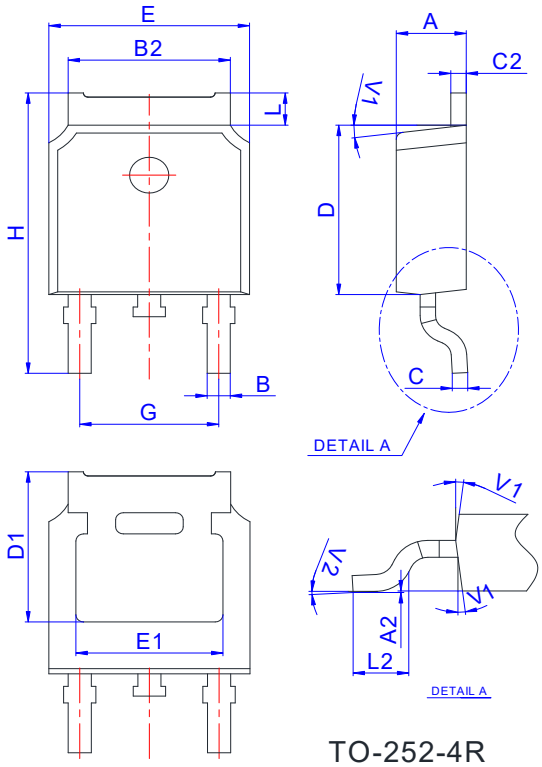


3）Switch Time Test Circuit：





Package Mechanical Data-TO-252-4R



TO-252-4R

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°

Attention

1, Any and all JGSEMI products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, orother applic ations whose failure can be reasonably expected to result in serious physical or material damage. Consult with your JGSEMI representative nearest you before using any JGSEMI products described or contained herein in such applicati ons.

2,JGSEMI assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all JGSEMI products described or contained herein.

3, Specifications of any and all JGSEMI products described or contained herein stipulate the performance, characteri stics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer’s products or equipment. To ver ify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate an d test devices mounted in the customer’s products or equipment.

4,In the event that any or all JGSEMI products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported wit hout obtaining the export license from the authorities concerned in accordance with the above law.

6, Any and all information described or contained herein are subject to change without notice due to product technology improvement,etc. When designing equipment, refer to the "Delivery Specification" for the JGSEMI produ ct that you Intend to use.