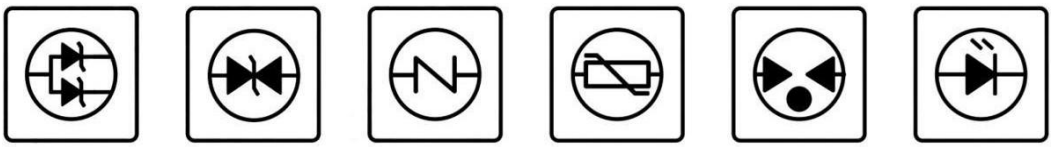
MSKSEMI 美森科
SEMICONDUCTOR



2N7002PW

Product specification

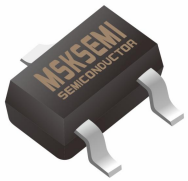
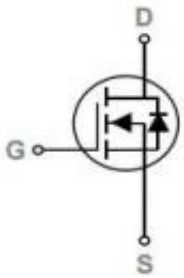
General Features

- 60V,200mA, RDS(ON) =1.7Ω@VGS = 10V
- Fast switching
- Green Device Available

Application

- Notebook
- Smartphone
- Battery Protection
- Hand-held Instruments

Reference News

PACKAGE OUTLINE	P-Channel MOSFET	Marking
 SOT- 323		72 ↄ

Absolute Maximum Ratings (TA=25℃ unless otherwise

Symbol	Parameter	Rating	Units
VDS	Drain- Source Voltage	60	V
VGS	Gate- Source Voltage	±20	V
ID	Drain Current – Continuous (TA=25℃)	200	A
	Drain Current – Continuous (TA=70℃)	160	A
IDM	Drain Current – Pulsed[1]	800	A
PD	Power Dissipation (TA=25℃)	156	W
	Power Dissipation – Derate above 25℃	1.25	mW/ ℃
TSTG	Storage Temperature Range	-55 to 150	℃
TJ	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
RθJA	Thermal Resistance Junction to ambient	---	800	W

Electrical Characteristics (TJ=25℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain- Source Breakdown Voltage	VGS=0V , ID=250uA	60	---	---	V
IDSS	Drain- Source Leakage Current	VDS=60V , VGS=0V , TJ=25℃	---	---	10	A
		VDS=48V , VGS=0V , TJ=125℃	---	---	100	A
IGSS	Gate- Source Leakage Current	VGS= ±20V , VDS=0V	---	---	± 100	A

On Characteristics

RDS(ON)	Static Drain- Source On- Resistance	VGS=10V , ID=0 .3A	---	1.8	2.8	Ω
		VGS=4 .5V , ID=0 .2A	---	2.2	3	Ω
VGS(th)	Gate Threshold Voltage	VGS=VDS , ID =250uA	1	1.6	2.5	V
△VGS(th)	VGS(th) Temperature Coefficient		---	-4	---	mV/ ℃
gfs	Forward Transconductance	VDS=10V , ID=0 . 1A	---	0.24	---	S

Dynamic and switching Characteristics

Qg	Total Gate Charge2 , 3	VDS=30V , VGS=10V , ID=0 .2A	---	1.1		C
Qgs	Gate- Source Charge2 , 3		---	0.1		
Qgd	Gate- Drain Charge2 , 3		---	0 .23		
Td(on)	Turn- On Delay Time2 , 3	VDD=30V , VGS=10V , RG=6 Ω ID=0 .2A	---	3		S
Tr	Rise Time2 , 3		---	5		
Td(off)	Turn- Off Delay Time2 , 3		---	14		
Tf	Fall Time2 , 3		---	9		
Ciss	Input Capacitance	VDS=10V , VGS=0V , F=1MHz	---	30.6		F
Coss	Output Capacitance		---	5.5		
Crss	Reverse Transfer Capacitance		---	4		

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
IS	Continuous Source Current	VG=VD=0V , Force Current	---	---	0.3	A
ISM	Pulsed Source Current		---	---	0.6	A
VSD	Diode Forward Voltage	VGS= 0V , IS=1A , TJ=25C	---	---	1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.

2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

3. Essentially independent of operating temperature.

Typical Performance Characteristics

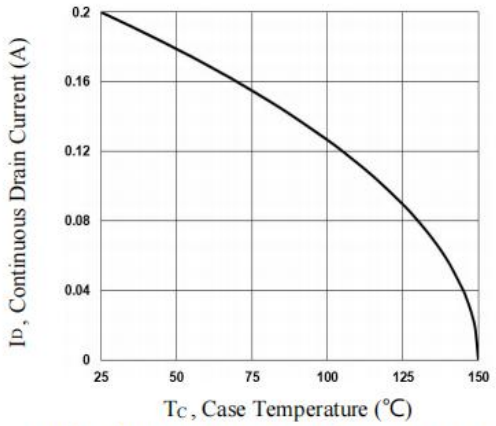


Fig.1 Continuous Drain Current vs. T_C

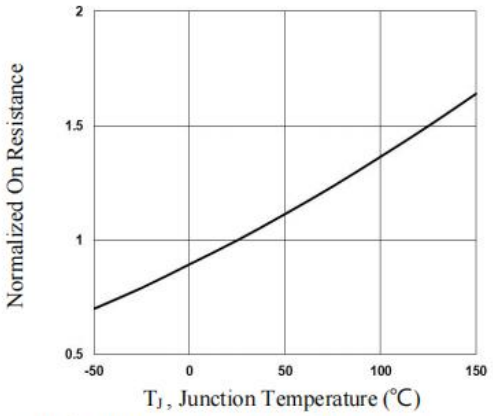


Fig.2 Normalized RDSON vs. T_J

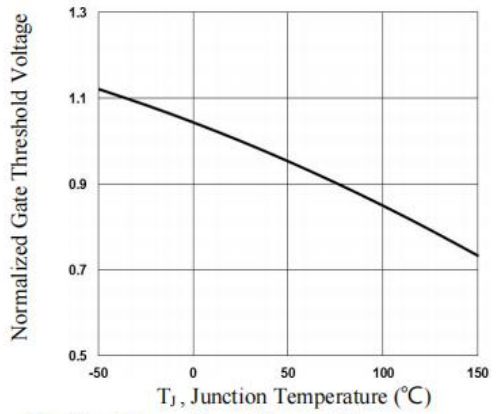


Fig.3 Normalized V_{th} vs. T_J

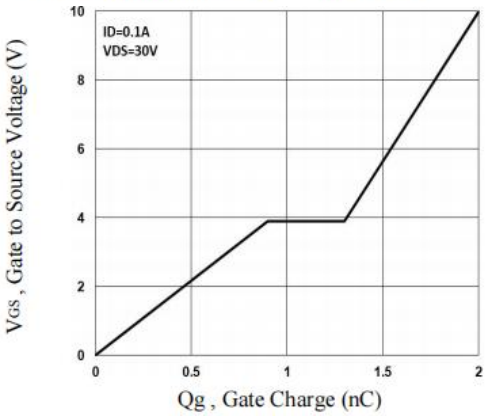


Fig.4 Gate Charge Waveform

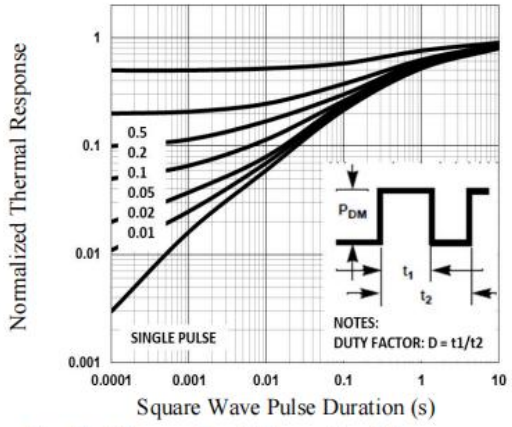


Fig.5 Normalized Transient Response

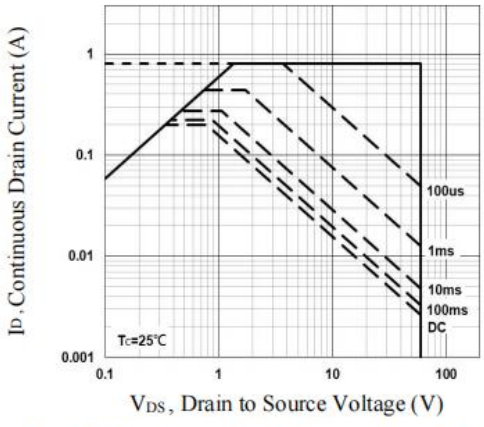


Fig.6 Maximum Safe Operation Area

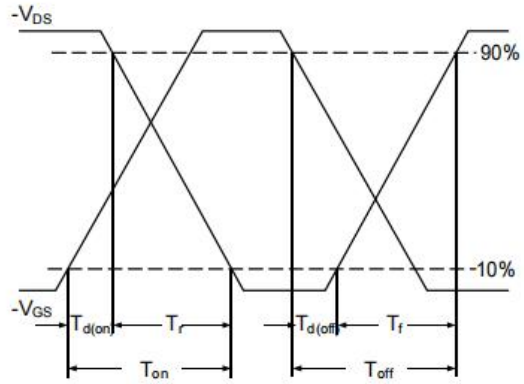


Fig.7 Switching Time Waveform

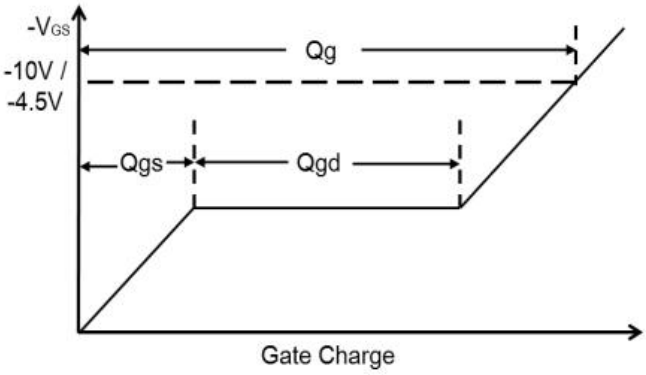
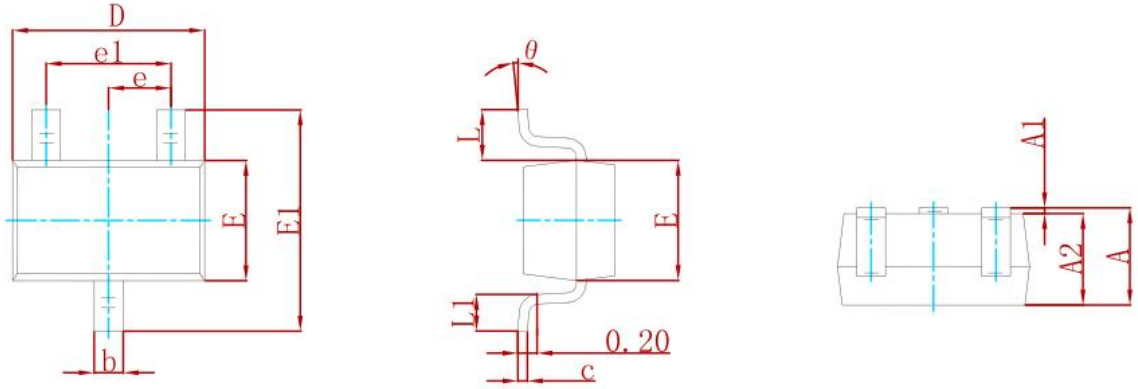


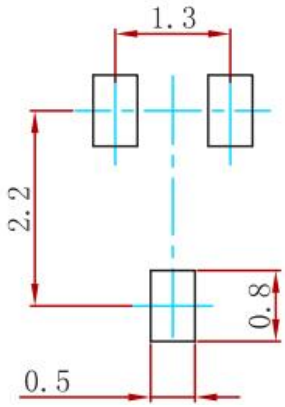
Fig.8 Gate Charge Waveform

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
9	0°	8°	0°	8°

Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
2N7002PW	SOT-323	3000

Attention

■ Any and all MSKSEMI Semiconductor 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, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your MSKSEMI Semiconductor representative nearest you before using any MSKSEMI Semiconductor products described or contained herein in such applications.

■ MSKSEMI Semiconductor 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 specificationsof any andall MSKSEMI Semiconductor products described orcontained herein.

■ Specifications of any and all MSKSEMI Semiconductor products described or contained herein stipulate the performance, characteristics, 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 verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer'sproducts orequipment.

■ MSKSEMI Semiconductor. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with someprobability. It is possiblethat these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits anderror prevention circuitsfor safedesign, redundant design, and structural design.

■ In the event that any or all MSKSEMI Semiconductor 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 without obtaining the export license from theauthorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of MSKSEMI Semiconductor.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. MSKSEMI Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringementsof intellectual property rights or other rightsof third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. Whendesigning equipment, referto the "Delivery Specification" for the MSKSEMI Semiconductor productthat you intend to use.

单击下面可查看定价，库存，交付和生命周期等信息

>>MSKSEMI(美森科)