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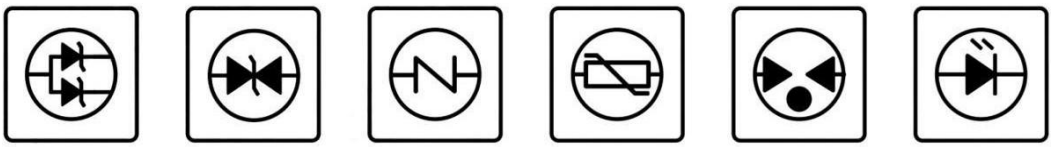
SEMICONDUCTOR



2N7002PW

Product specification

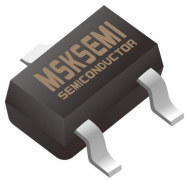
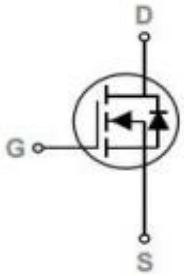
General Features

- 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

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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

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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.

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Typical Performance Characteristics

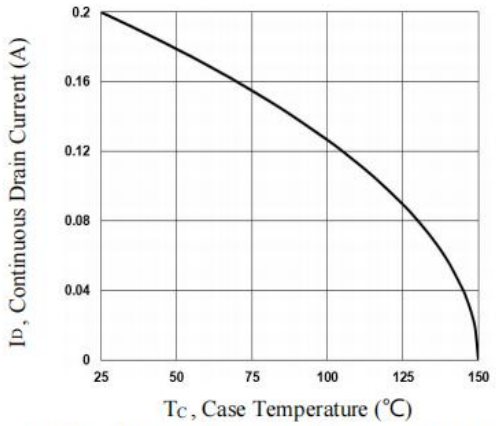

Fig.1 Continuous Drain Current vs. T_C

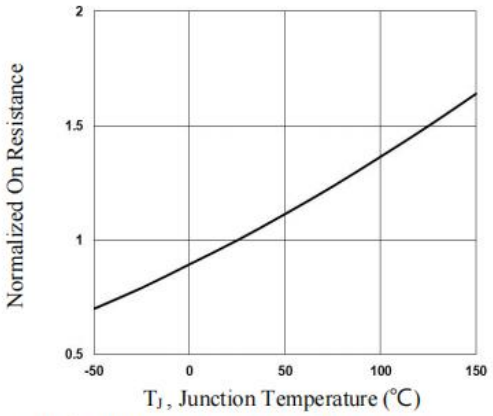

Fig.2 Normalized RDSON vs. T_J

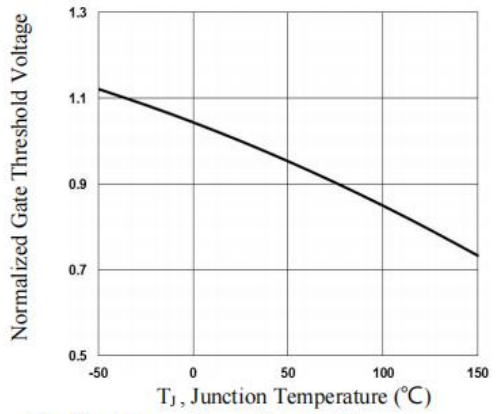

Fig.3 Normalized V_{th} vs. T_J

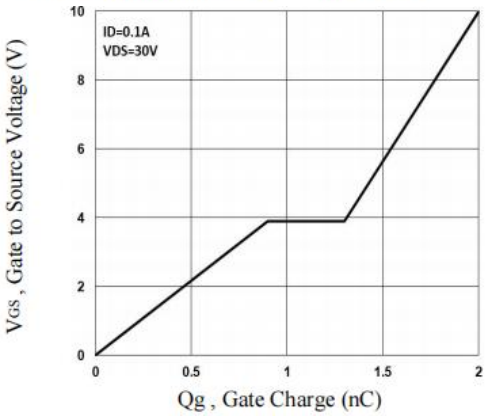

Fig.4 Gate Charge Waveform

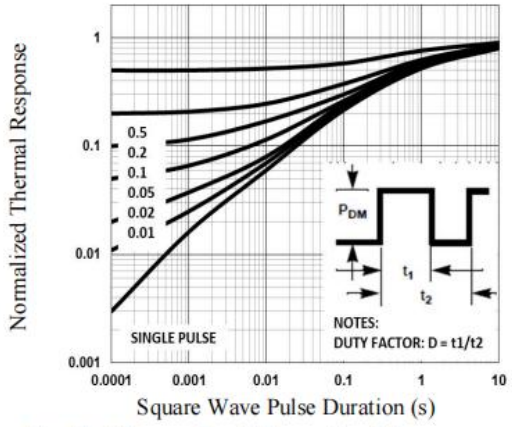

Fig.5 Normalized Transient Response

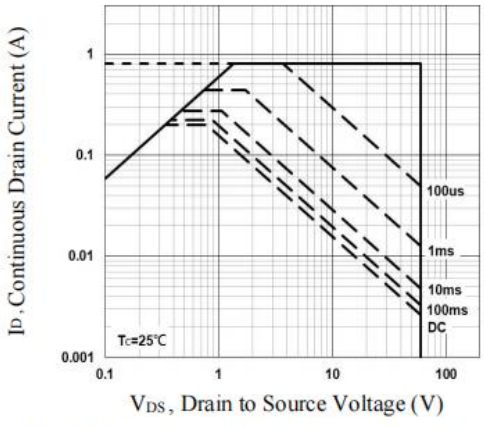

Fig.6 Maximum Safe Operation Area

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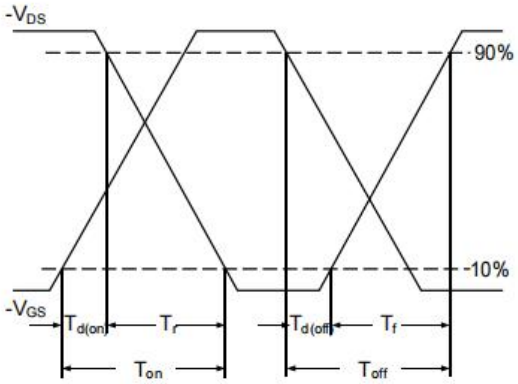

Fig.7 Switching Time Waveform

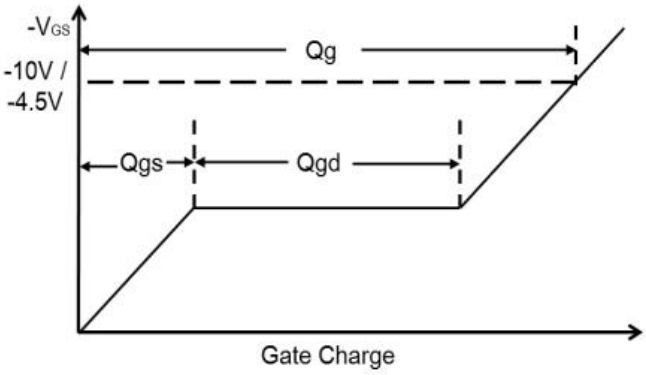

Fig.8 Gate Charge Waveform

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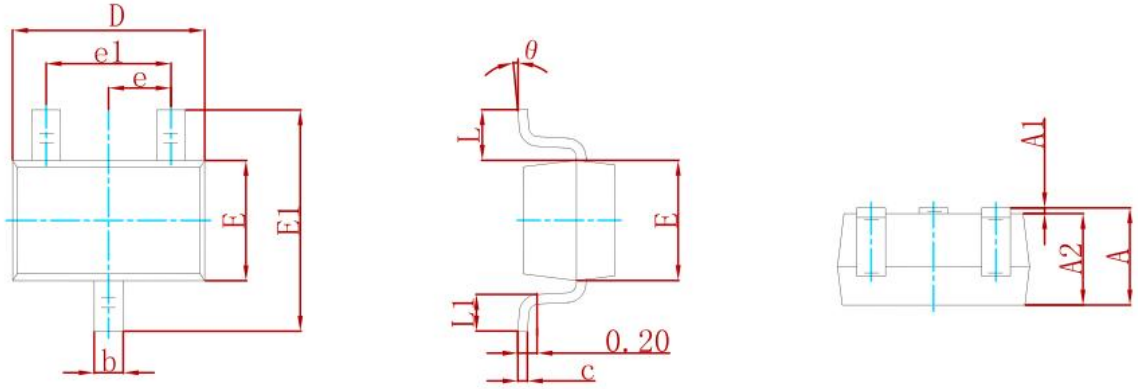
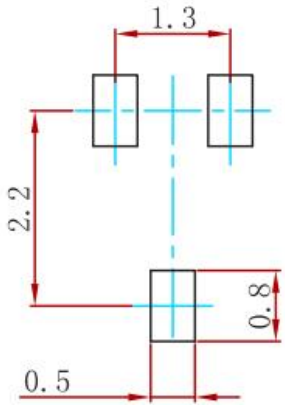
PACKAGE MECHANICAL DATA



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

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