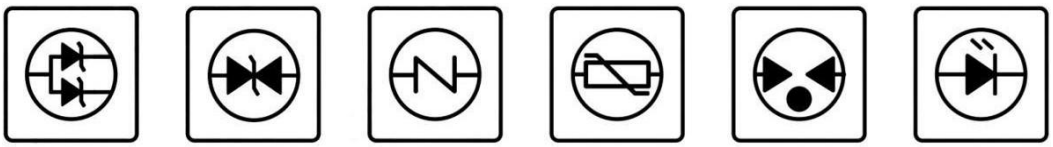
MSKSEMI 美森科
SEMICONDUCTOR



2N7002DW

Product specification

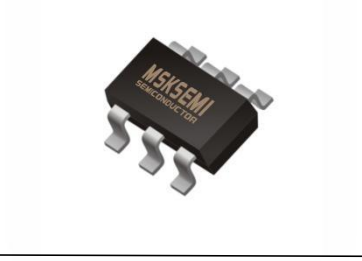
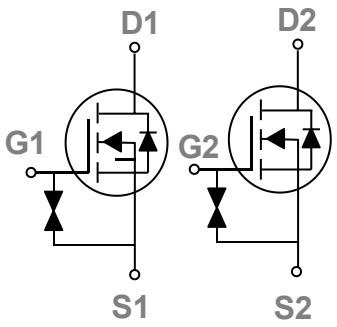
General Features

- 60V,0.3A,RDS(ON)=1.8Ω@VGS=10V
  Improved dv/dt capability
- Fast switching
- Green Device Available
- G-S ESD Protection Diode Embedded

Application

- Motor Drive
- Power Tools
- LED Lighting

Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
 SOT-363		

Absolute Maximum Ratings (TA=25℃ unless otherwise

Symbol	Parameter	Rating	Units
V_{DS}	Drain- Source Voltage	60	V
V_{GS}	Gate- Source Voltage	±20	V
I_D	Drain Current – Continuous (T_A=25℃)	0.3	A
	Drain Current – Continuous (T_A=70℃)	0.24	A
I_{DM}	Drain Current – Pulsed[1]	1.2	A
P_D	Power Dissipation (T_A=25℃)	0.28	W
	Power Dissipation – Derate above 25℃	0.002	W/℃
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	450	℃/W

ElectricalCharacteristics(TJ=25℃,unlessotherwise noted) Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain- Source Breakdown Voltage	VGS=0V , ID=250uA	60	---	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , ID=1mA	---	0.04	---	V/℃
IDSS	Drain- Source Leakage Current	VDS=60V , VGS=0V , TJ=25℃	---	---	1	A
		VDS=48V , VGS=0V , TJ=125℃	---	---	100	A
IGSS	Gate- Source Leakage Current	VGS= ±20V , VDS=0V	---	---	±10	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 Charge[2,3]	VDS=30V , VGS=10V , ID=0.2A	---	1.1		nC
Qgs	Gate-Source Charge[2,3]		---	0.1		
Qgd	Gate-Drain Charge[2,3]		---	0.23		
Td(on)	Turn-On Delay Time[2,3]	VDD=30V , VGS=10V , RG=6Ω ID=0.2A	---	3		nS
Tr	Rise Time[2,3]		---	5		
Td(off)	Turn-Off Delay Time[2,3]		---	14		
Tf	Fall Time[2,3]		---	9		
Ciss	Input Capacitance	VDS=10V , VGS=0V , F=1MHz	---	30.6		pF
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.

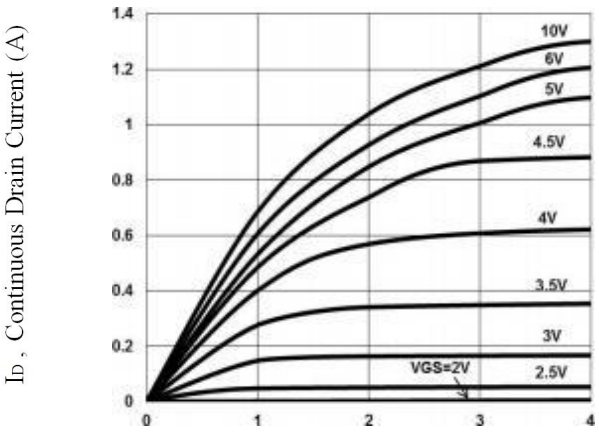


Fig. 1 Output Characteristics

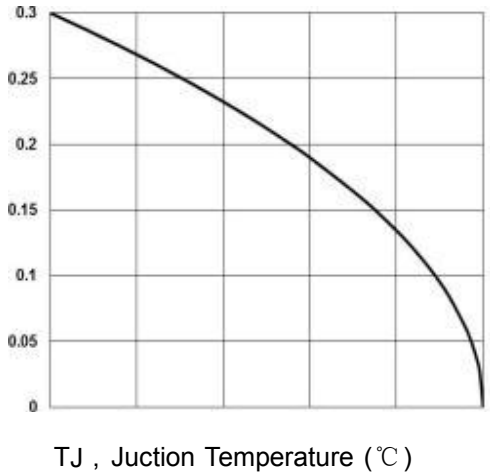


Fig. 2 Continuous Drain Current vs. TJ

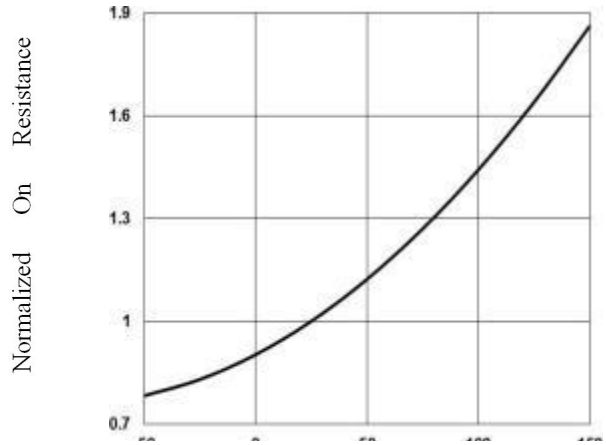


Fig. 3 Normalized RDSON vs. TJ

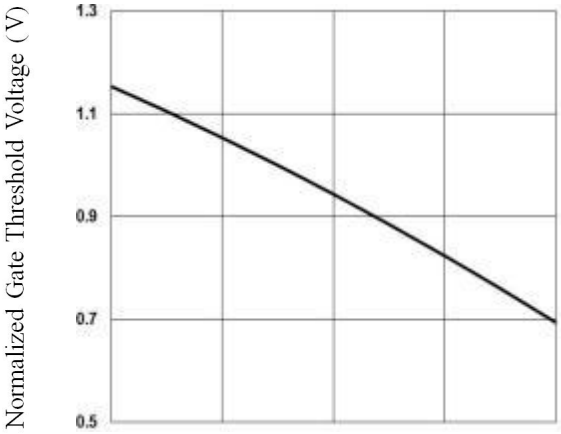


Fig. 4 Normalized Vth vs. TJ

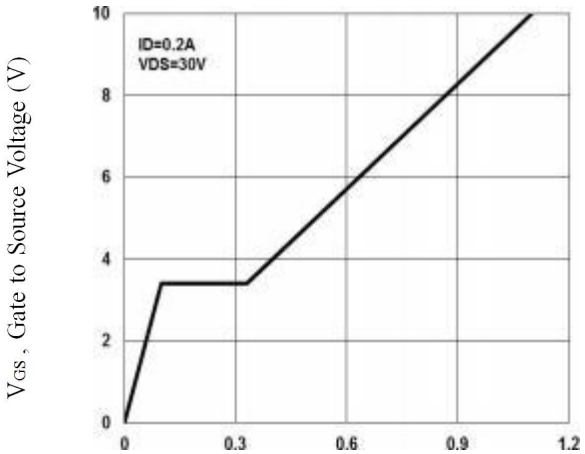


Fig. 5 Gate Charge Waveform

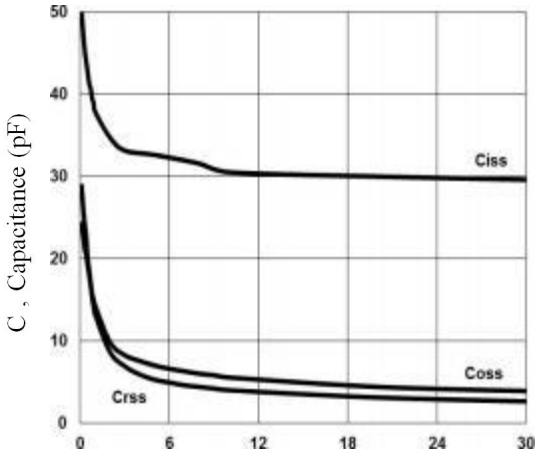


Fig. 6 Capacitance Characteristics

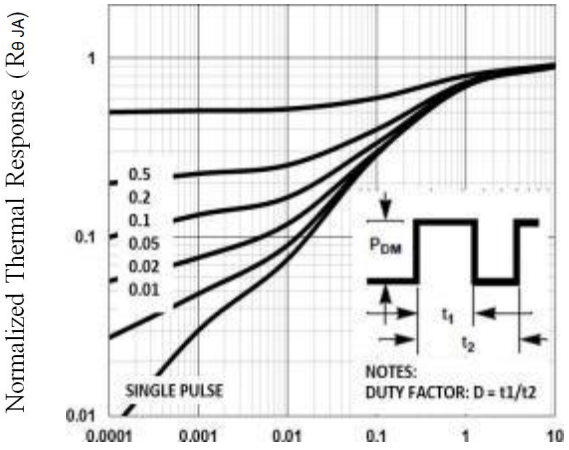


Fig. 7 Normalized Transient Impedance

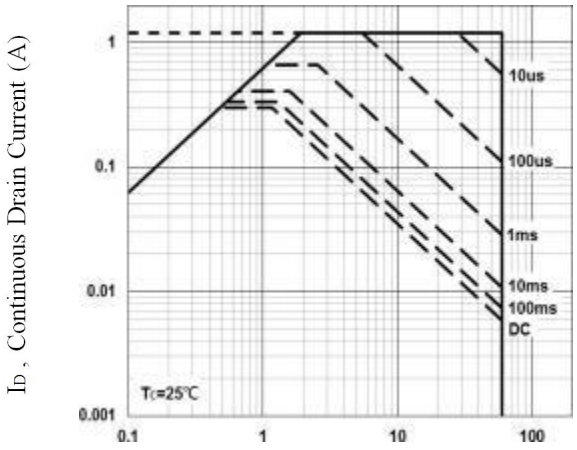


Fig. 8 Maximum Safe Operation Area

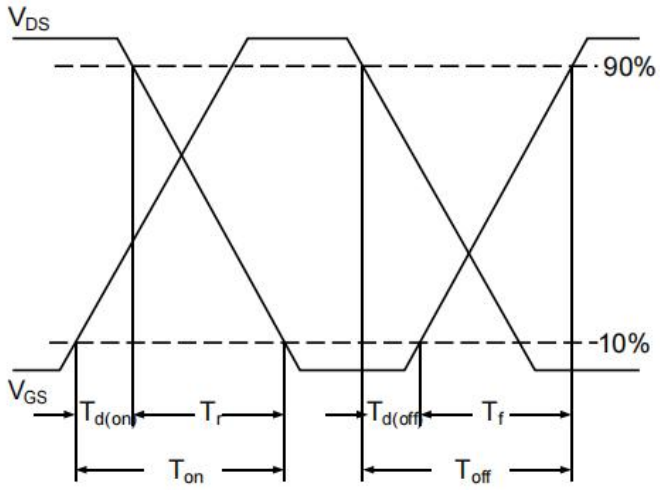
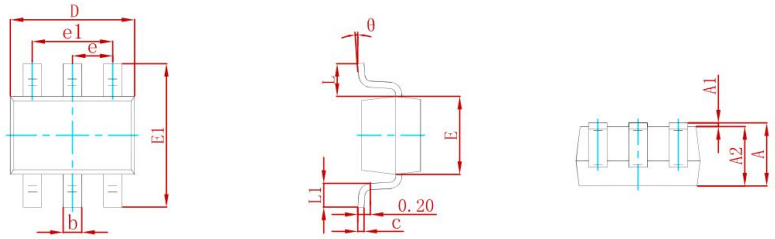


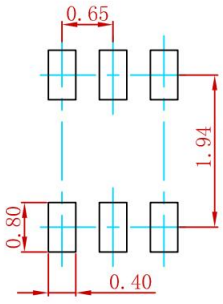
Fig.9 Switching Time Waveform

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	0.150	0.350	0.006	0.014
c	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
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
θ	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

P/N	PKG	QTY
2N7002DW	SOT-363	3000

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