

MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV

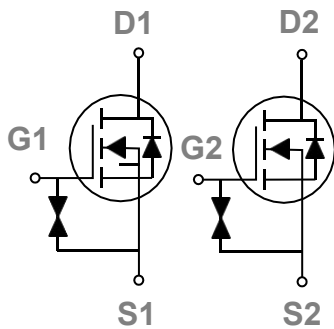
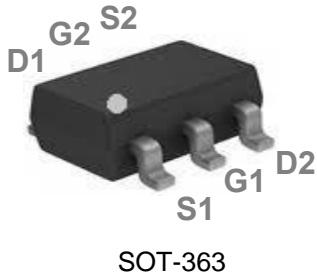


GDT



PLED

Product data sheet



Features

- 60V, 0.3A, $R_{DS(ON)} = 1.8\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- G-S ESD Protection Diode Embedded
- ESD protected up to 2KV

Applications

- Motor Drive
- Power Tools
- LED Lighting

BVDSS	RDSON	ID
60V	1.8Ω	0.3A

Absolute Maximum Ratings $T_c = 25^\circ C$ unless otherwise noted

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

Thermal Characteristics

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

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.04	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =125°C	---	---	100	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±10	uA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =0.3A	---	1.8	2.8	Ω
		V _{GS} =4.5V, I _D =0.2A	---	2.2	3	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =0.1A	---	0.24	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =30V, V _{GS} =10V, I _D =0.2A	---	1.1		nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	0.1		
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	0.23		
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =30V, V _{GS} =10V, R _G =6Ω I _D =0.2A	---	3		ns
T _r	Rise Time ^{2, 3}		---	5		
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	14		
T _f	Fall Time ^{2, 3}		---	9		
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	30.6		pF
C _{oss}	Output Capacitance		---	5.5		
C _{rss}	Reverse Transfer Capacitance		---	4		

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	0.3	A
I _{SM}	Pulsed Source Current		---	---	0.6	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	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.

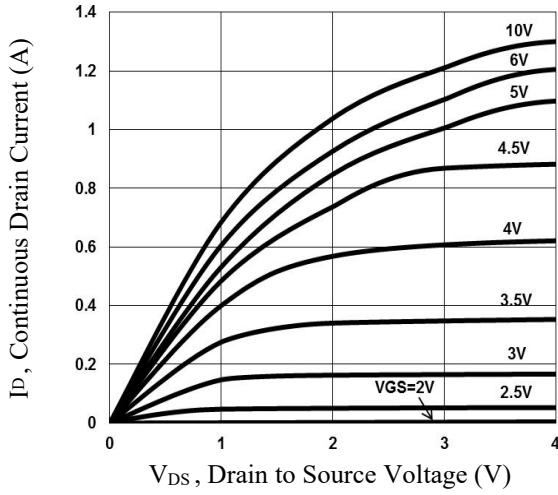


Fig.1 Output Characteristics

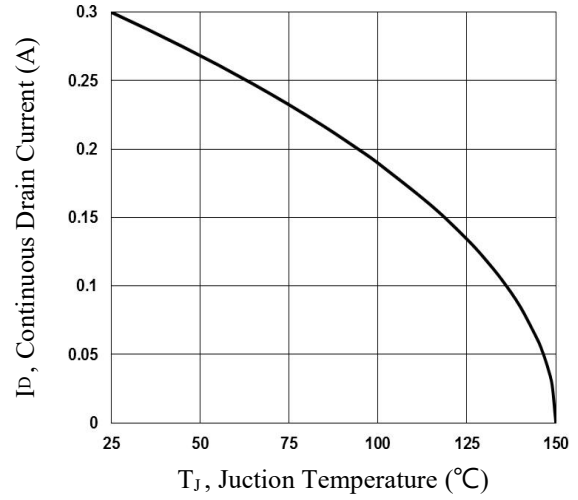


Fig.2 Continuous Drain Current vs. T_J

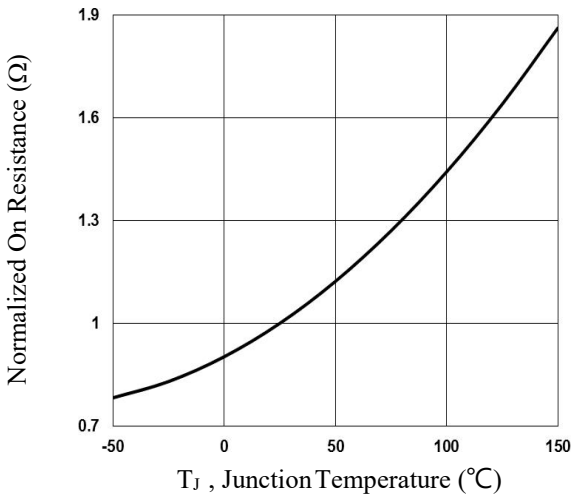


Fig.3 Normalized $R_{DS(on)}$ vs. T_J

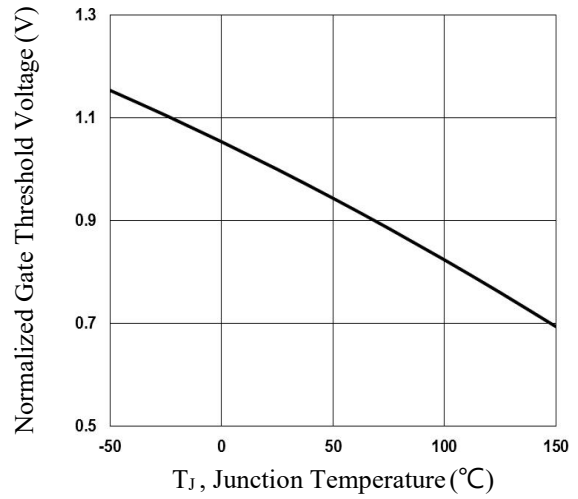


Fig.4 Normalized V_{th} vs. T_J

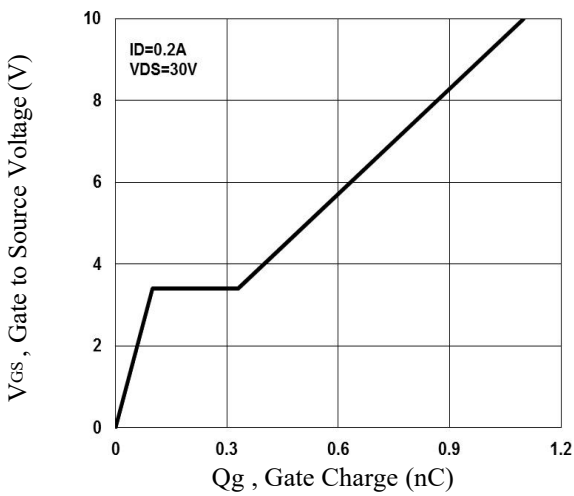


Fig.5 Gate Charge Waveform

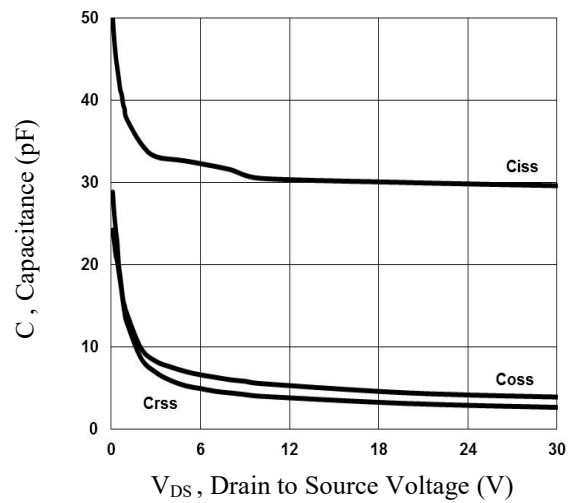


Fig.6 Capacitance Characteristics

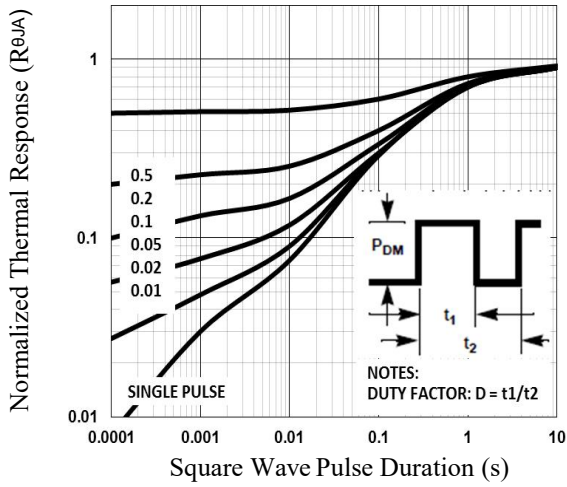


Fig.7 Normalized Transient Impedance

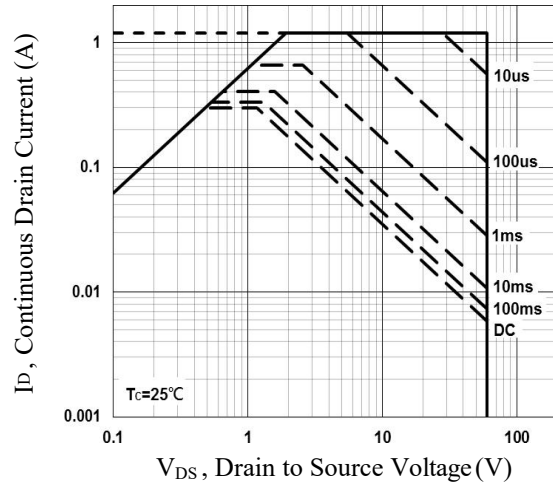


Fig.8 Maximum Safe Operation Area

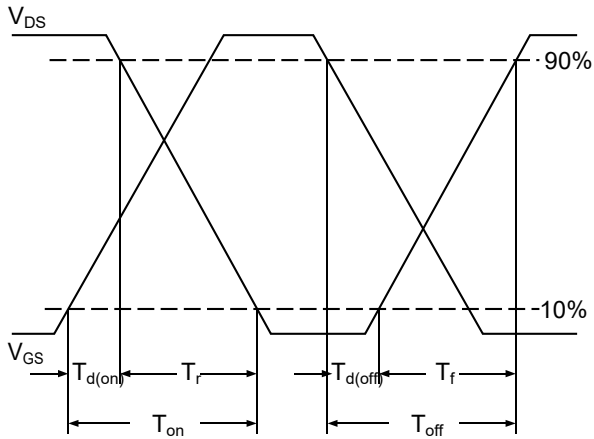
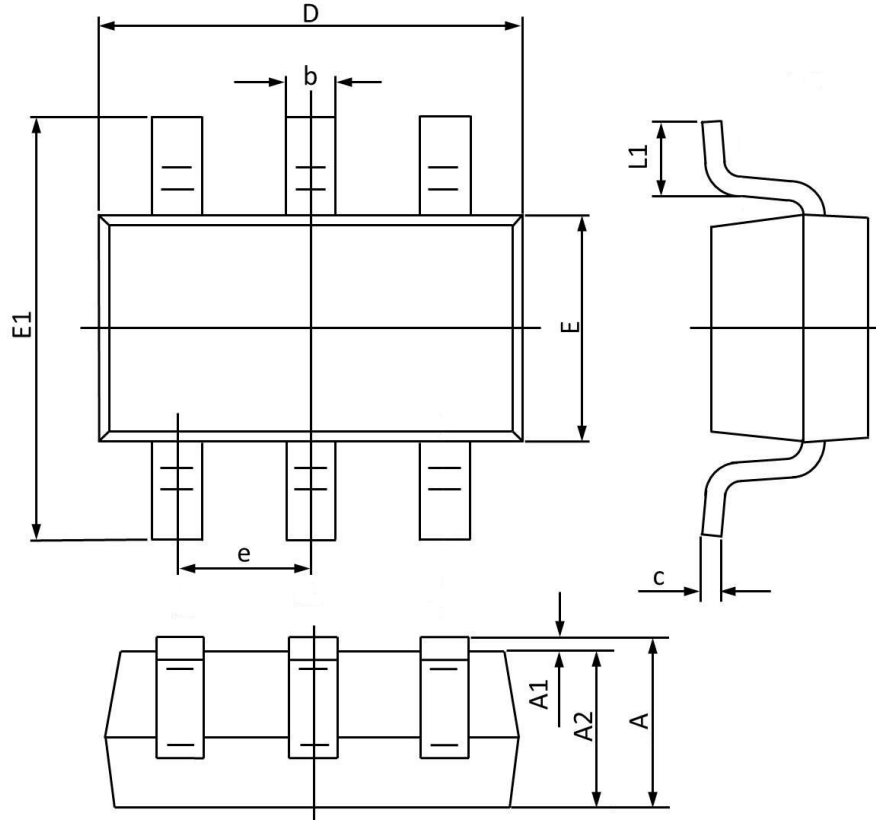


Fig.9 Switching Time Waveform

SOT363 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.330	0.100	0.013	0.004
c	0.250	0.100	0.010	0.004
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.400	1.800	0.094	0.071
e	0.65BSC		0.026BSC	
L1	0.350	0.100	0.014	0.004

REEL SPECIFICATION

P/N	PKG	QTY
2N7002KDW	SOT-363	3000

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