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SEMICONDUCTOR



ESD



TVS



TSS



MOV



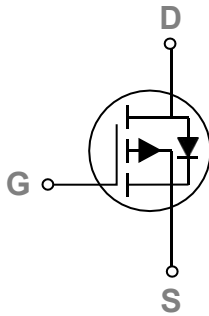
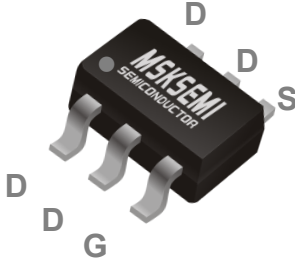
GDT



PLED

Product data sheet

SOT23-6 Pin Configuration



Features

- -60V, -3.3A, $R_{DS(ON)} = 70m\Omega @ V_{GS} = -10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

BVDSS	RDSON	ID
-60V	70mΩ	-3.3A

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 ($T_A=25^\circ C$)	-3.3	A
	Drain Current – Continuous ($T_A=70^\circ C$)	-2.6	A
I_{DM}	Drain Current – Pulsed ¹	-13.2	A
P_D	Power Dissipation ($T_A=25^\circ C$)	2	W
	Power Dissipation – Derate above 25°C	0.016	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62.5	°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
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	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-2A	---	70	105	mΩ
		V _{GS} =-4.5V, I _D =-1A	---	80	130	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	-1.6	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-1A	---	3	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =-30V, V _{GS} =-10V, I _D =-1A	---	10		nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	1.6		
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	3		
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =-30V, V _{GS} =-10V, R _G =6Ω I _D =-1A	---	8		ns
T _r	Rise Time ^{3, 4}		---	15.4		
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	42.8		
T _f	Fall Time ^{3, 4}		---	8.4		
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, F=1MHz	---	720		pF
C _{oss}	Output Capacitance		---	42		
C _{rss}	Reverse Transfer Capacitance		---	32		
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	22		Ω

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	---	---	-3.3	A
I _{SM}	Pulsed Source Current		---	---	-6.6	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1	V
t _{rr}	Reverse Recovery Time	V _R =-50V, I _S =-1A	---	30	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs, T _J =25°C	---	15	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-18A., R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

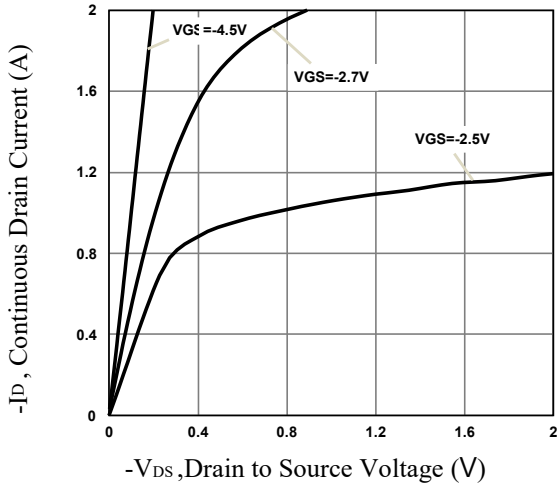


Fig.1 Typical Output Characteristics

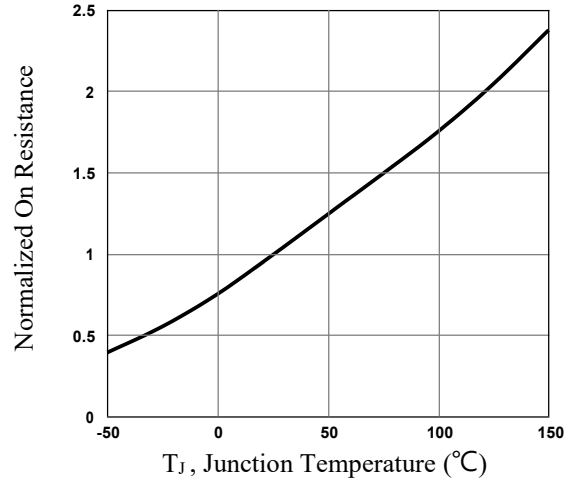


Fig.2 Normalized RDS(on) vs. TJ

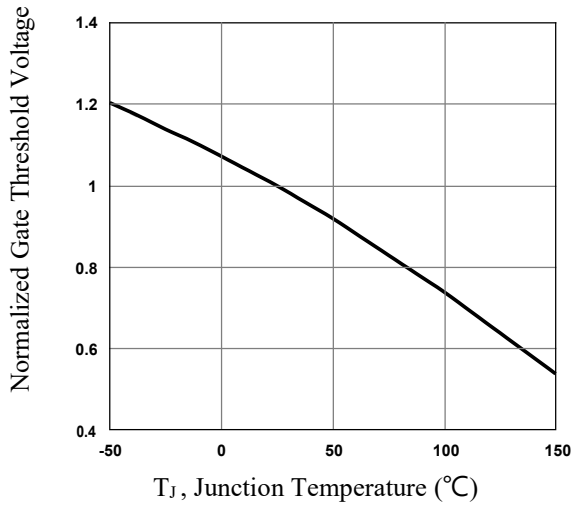


Fig.3 Normalized V_{th} vs. TJ

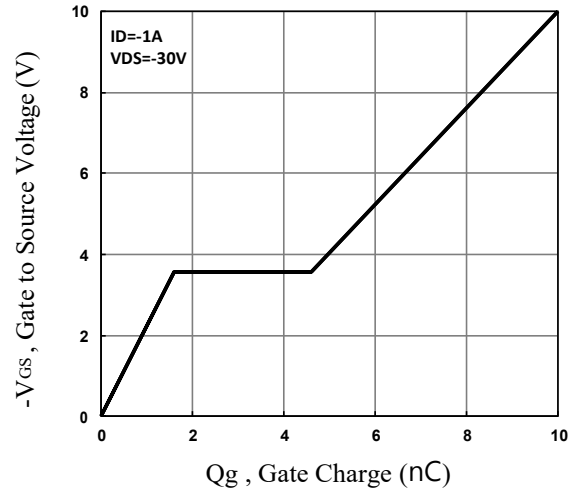


Fig.4 Gate Charge Waveform

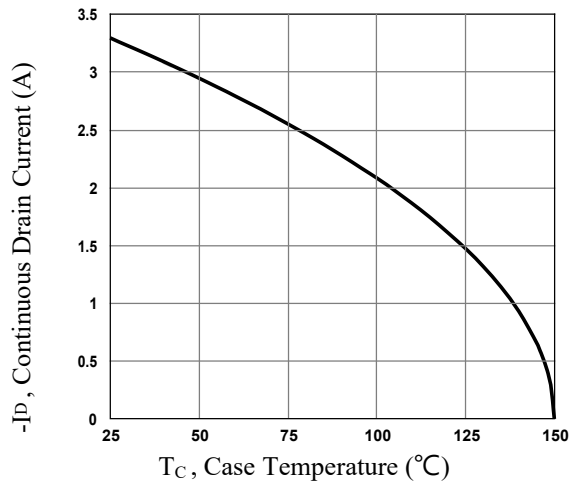


Fig.5 Continuous Drain Current vs. TC

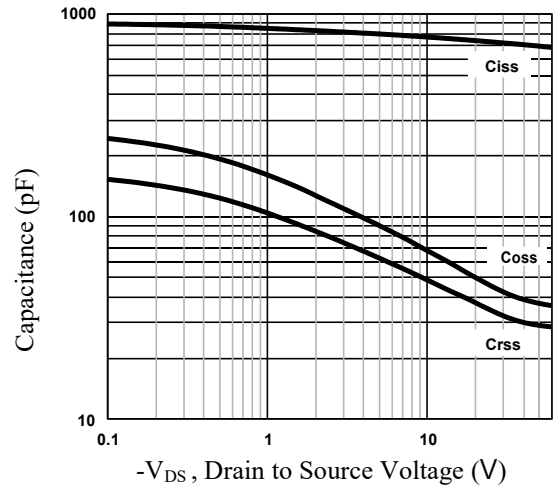


Fig.6 Capacitance Characteristics

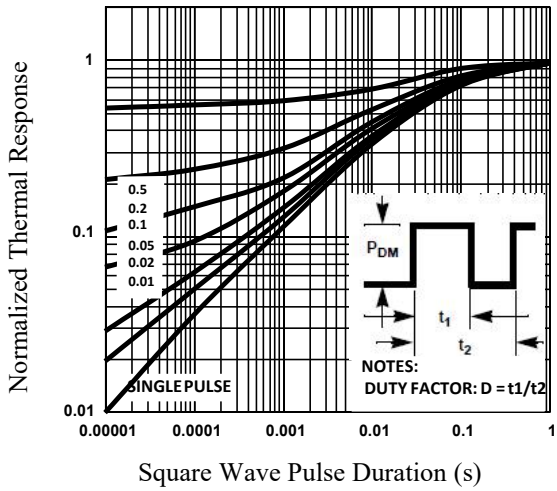


Fig.7 Normalized Transient Impedance

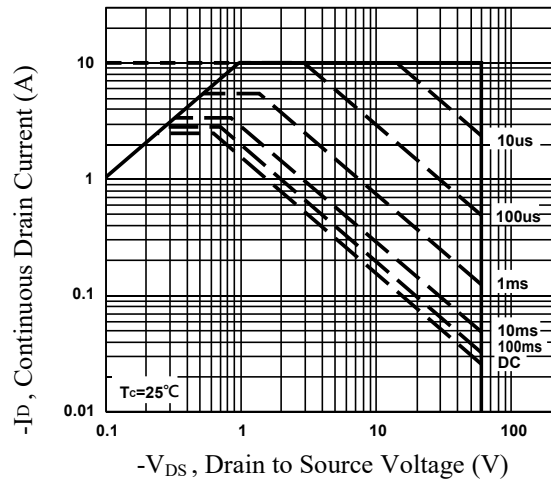


Fig.8 Maximum Safe Operation Area

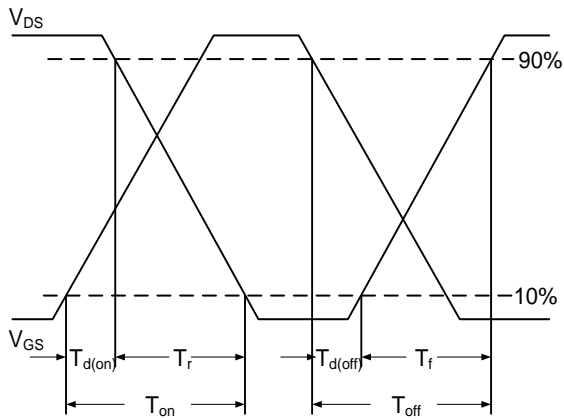
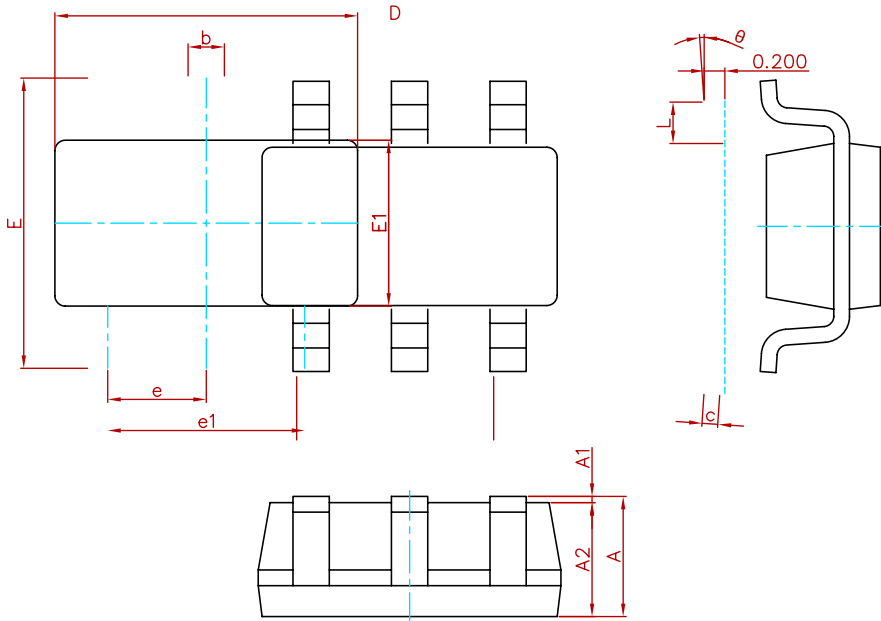


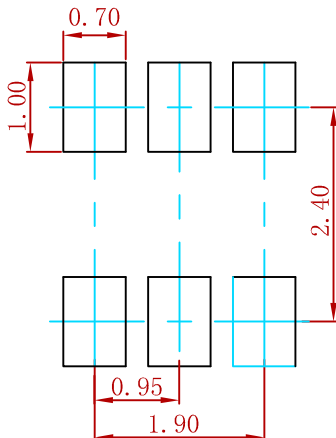
Fig.9 Switching Time Waveform

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
FDC5614P	SOT-23-6	3000

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