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SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

BSS84AK-MS

Product specification

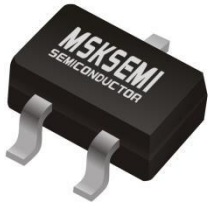
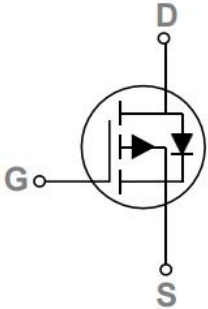

General Features

- -55 V,-0.3A, $R_{DS(ON)} = 4.0\Omega @ V_{GS} = -10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- ESD protected up to 2KV

Application

- Notebook
- Load Switch
- Battery Protection

Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
		
<p>SOT-23</p>		

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-55	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (TA=25°C)	-0.3	A
	Drain Current – Continuous (TA=70°C)	-0.2	A
I _{DM}	Drain Current – Pulsed ¹	-1.2	A
P _D	Power Dissipation (TA=25°C)	1.0	W
	Power Dissipation – Derate above 25°C	12.5	mW/°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 _{θJA}	Thermal Resistance Junction to ambient	---	80	°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	-55	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-55V , 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	---	---	±20	uA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V , I _D =-0.3A	---	4.0	5	Ω
		V _{GS} =-4.5V , I _D =-0.2A	---	3.5	6.0	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	- 1.7	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} =-10V , I _D =-0.3A	---	0.4	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=-30V, V_{GS}=-10V, I_D=-0.3A$	---	2.8	---	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.96	---	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	0.6	---	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=-30V, V_{GS}=-10V, R_G=6\Omega$ $I_D=-0.3A$	---	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	$V_{DS}=-30V, V_{GS}=0V, F=1MHz$	---	30.5	---	pF
C_{oss}	Output Capacitance		---	15.1	---	
C_{rss}	Reverse Transfer Capacitance		---	7	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{ Force Current}$	---	---	-0.3	A
I_{SM}	Pulsed Source Current		---	---	-0.6	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-0.2A, T_J=25^\circ C$	---	---	-1.2	V
T_{rr}	Reverse Recovery Time	$V_R=-50V, I_S=-0.3A$ $di/dt=100A/ps, T_J=25^\circ C$	---	13.5	---	nS
Q_{rr}	Reverse Recovery Charge		---	3	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Essentially independent of operating temperature.

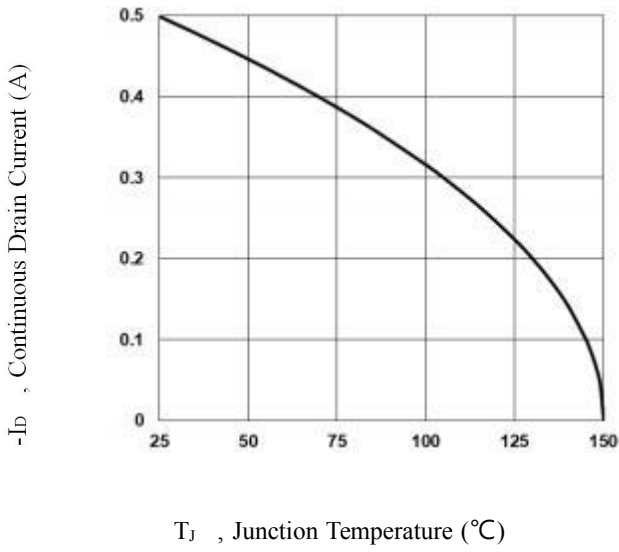


Fig.1 Continuous Drain Current vs. T_J

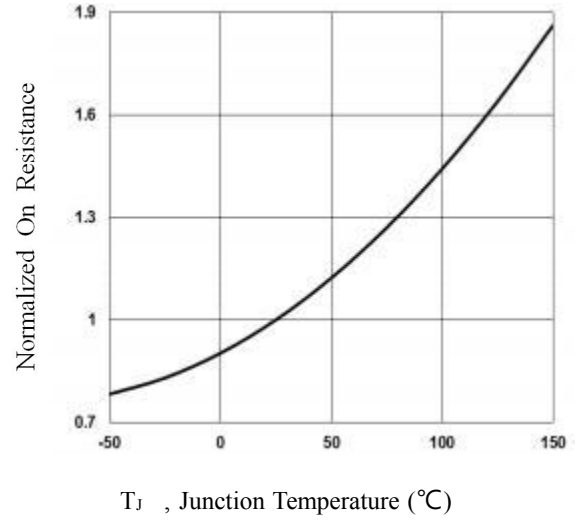


Fig.2 Normalized R_{DS(on)} vs. T_J

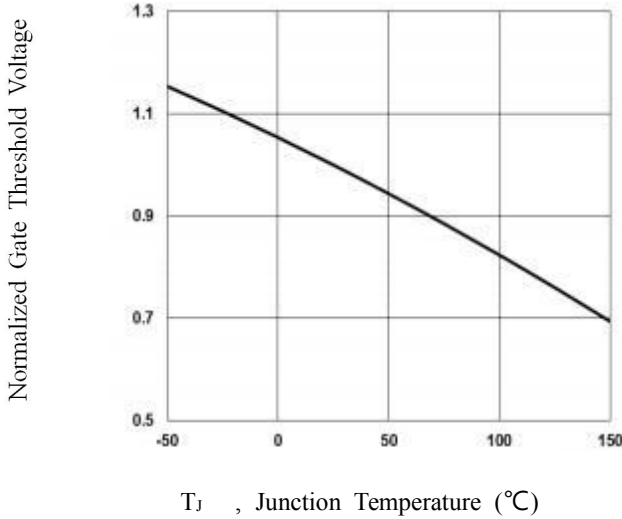


Fig.3 Normalized V_{th} vs. T_J

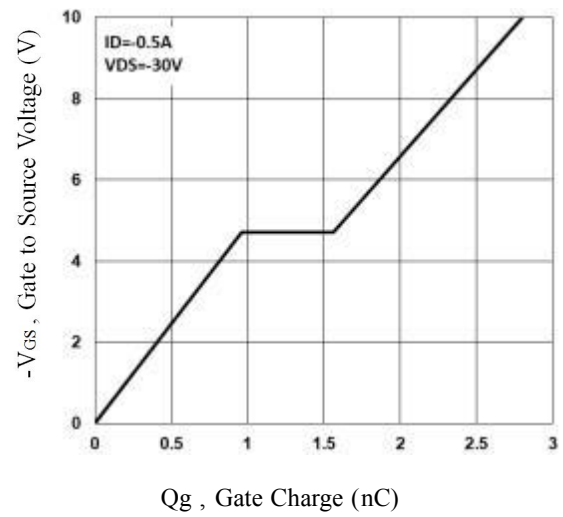


Fig.4 Gate Charge Waveform

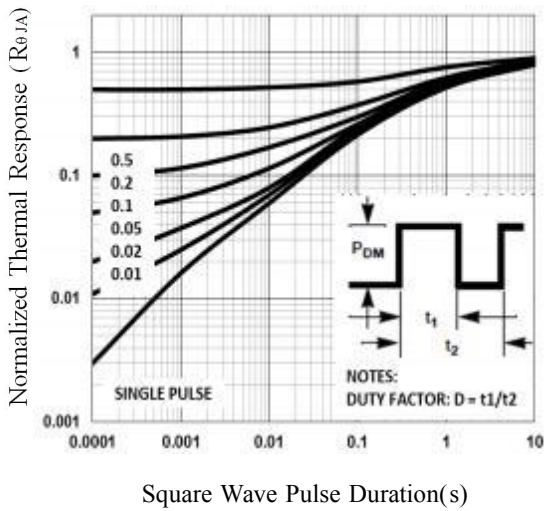


Fig.5 Normalized Transient Impedance

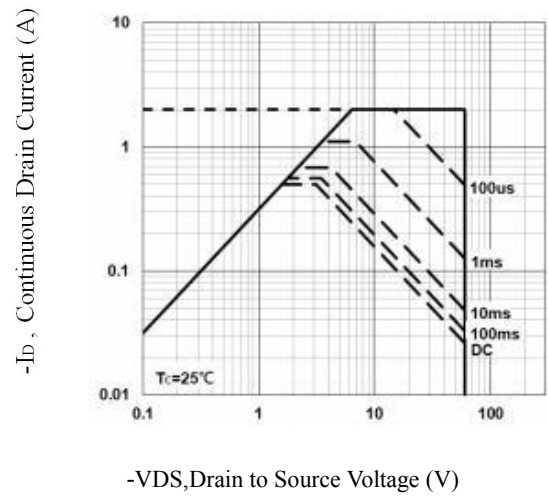


Fig.6 Maximum Safe Operation Area

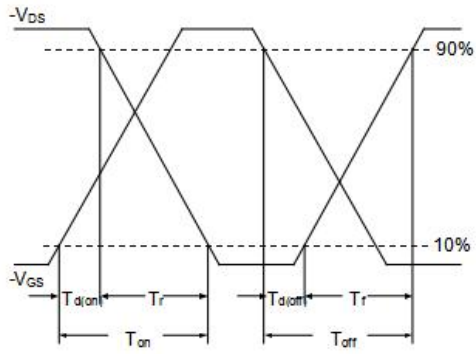


Fig. 7 Switching Time Waveform

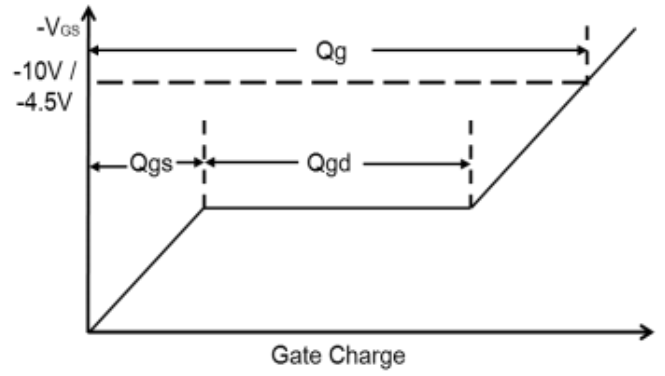
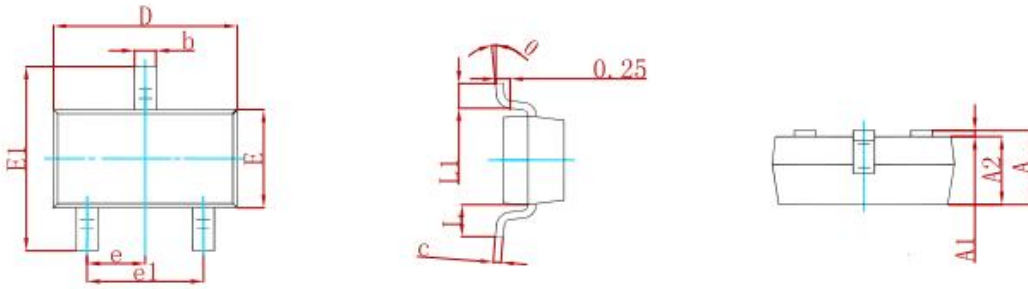


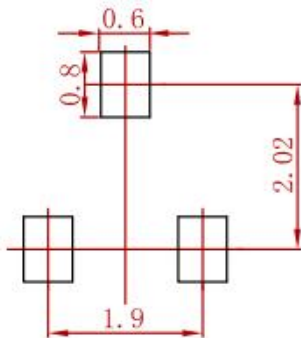
Fig. 8 Gate Charge Waveform

PACKAGE MECHANICAL DATA



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
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
BSS84AK-MS	SOT-23	3000

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