

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## FEATURES

- Improved dv/dt Capability
- Fast Switching

## APPLICATION

- Notebook
- Load Switch
- Battery Protection
- Hand-Held Instruments

## MARKING

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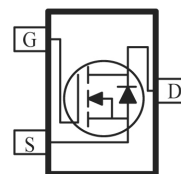
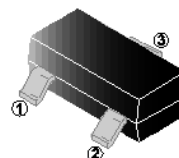
## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-323	3K	7 inch

## ORDER INFORMATION

Part Number	Type
SSF1830-C	Lead (Pb)-free and Halogen-free

SOT-323



## ABSOLUTE MAXIMUM RATINGS ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Drain Current	$I_D$	$T_C=25^\circ\text{C}$	1.8
		$T_C=100^\circ\text{C}$	1.15
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	7.2	A
Total Power Dissipation	$P_D$	275	mW
Thermal Resistance Junction-Ambient @Steady State	$R_{\theta JA}$	450	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-50~150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS** (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250μA
Gate-Threshold Voltage	V <sub>GS(th)</sub>	0.5	0.8	1.2	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Gate-Body Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>DS</sub> =0, V <sub>GS</sub> = ±12V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> =0
		-	-	10		V <sub>DS</sub> =24V, V <sub>GS</sub> =0, T <sub>J</sub> =125°C
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	29	35	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =1A
		-	35	46		V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A
Gate resistance	R <sub>g</sub>	-	1.1	-	Ω	V <sub>DS</sub> =V <sub>GS</sub> =0, f=1MHz
Forward Transconductance	g <sub>fs</sub>	-	2.5	-	S	V <sub>DS</sub> =10V, I <sub>S</sub> =2A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	7.4	-	nC	V <sub>DS</sub> =24V V <sub>GS</sub> =10V I <sub>D</sub> =2A
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>	-	0.9	-		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>	-	1.4	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	2.2	-	nS	V <sub>DS</sub> =24V V <sub>GS</sub> =10V R <sub>G</sub> =3.3Ω I <sub>D</sub> =1A
Rise Time <sup>2</sup>	T <sub>r</sub>	-	6.9	-		
Turn-off Delay Time <sup>2</sup>	T <sub>d(off)</sub>	-	15.2	-		
Fall Time <sup>2</sup>	T <sub>f</sub>	-	4.5	-		
Input Capacitance	C <sub>iss</sub>	-	241	-	pF	V <sub>DS</sub> =25V V <sub>GS</sub> =0 f=1MHz
Output Capacitance	C <sub>oss</sub>	-	33	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	15	-		
<b>Source-Drain Diode</b>						
Continuous Source Current	I <sub>S</sub>	-	-	1.8	A	V <sub>G</sub> =V <sub>D</sub> =0, Force Current
Pulsed Source Current	I <sub>SM</sub>	-	-	3.6	A	
Diode Forward Voltage	V <sub>SD</sub>	-	-	1	V	V <sub>GS</sub> =0, I <sub>S</sub> =0.2A
Reverse Recovery Time	t <sub>rr</sub>	-	87	-	nS	V <sub>GS</sub> =0, I <sub>S</sub> =2A, di/dt=100A/us
Reverse Recovery Charge	Q <sub>rr</sub>	-	390	-	nC	

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%.

**CHARACTERISTIC CURVE**

Fig.1 Continuous Drain Current vs.  $T_C$

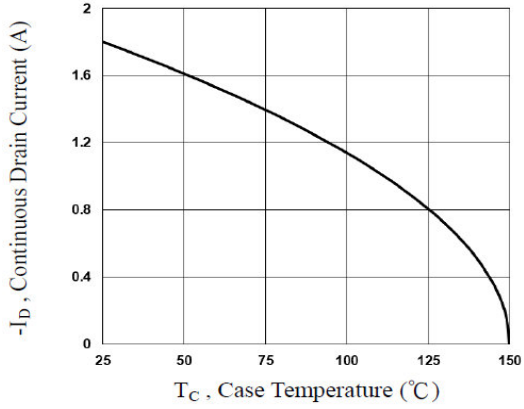


Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>

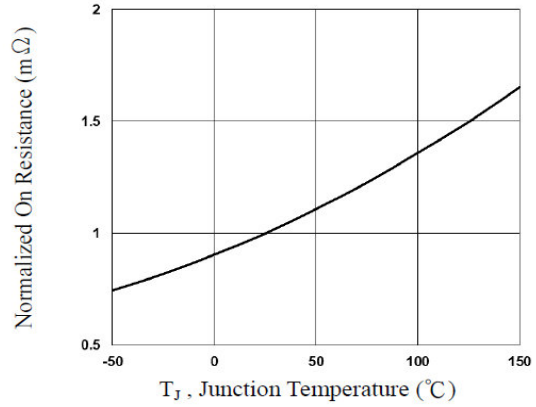


Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>

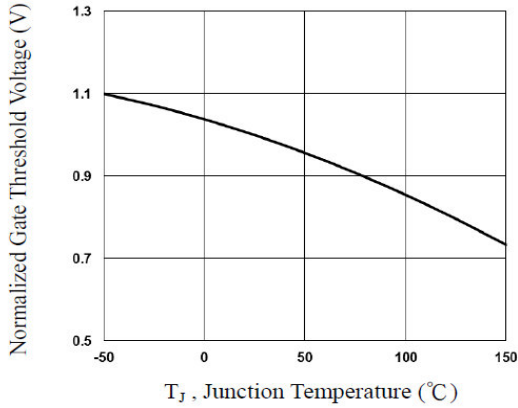


Fig.4 Gate Charge Waveform

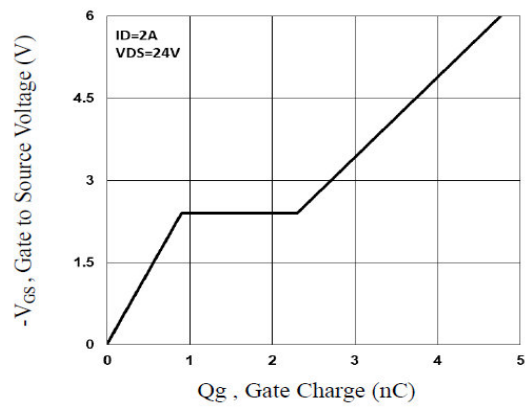


Fig.5 Normalized Transient Response

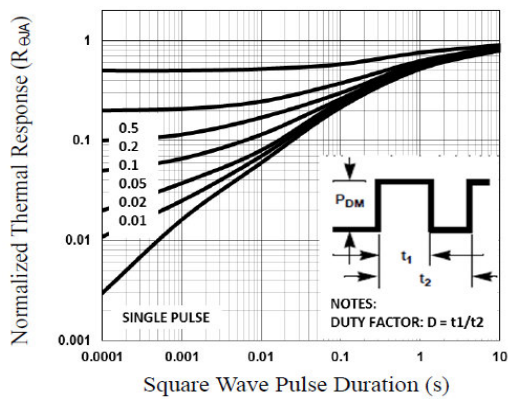


Fig.6 Maximum Safe Operation Area

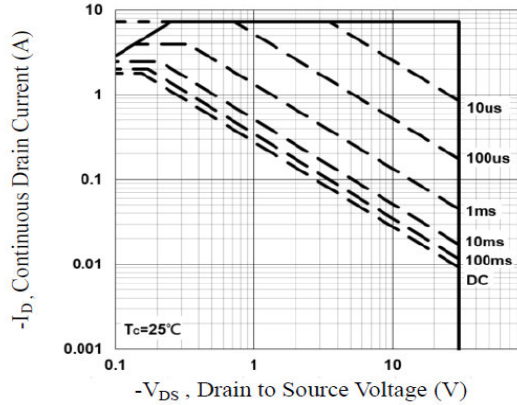


Fig.7 Switching Time Waveform

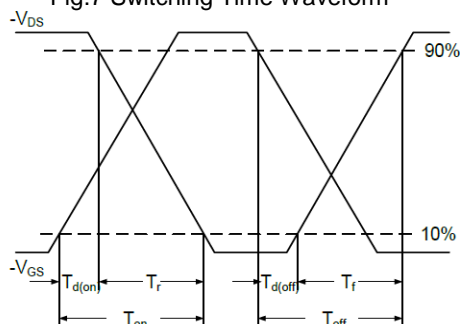
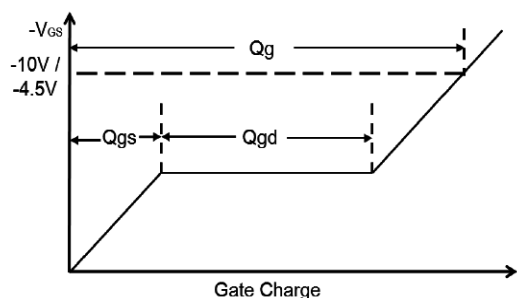
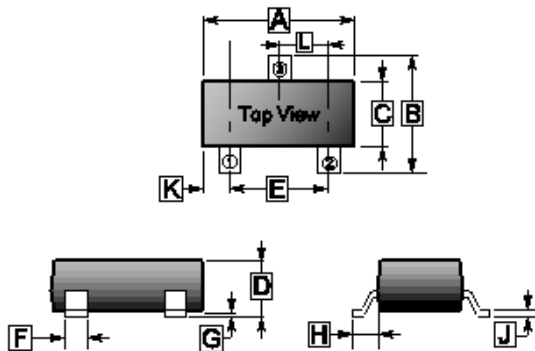


Fig.8 Gate Charge Waveform



**PACKAGE OUTLINE DIMENSIONS**

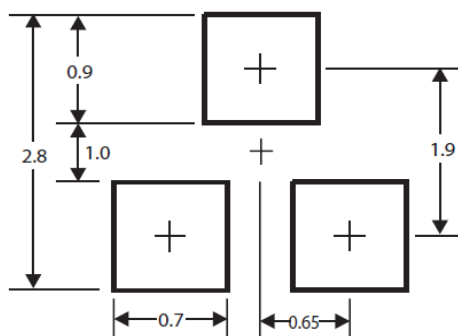
**SOT-323**



REF.	Millimeter	
	Min.	Max.
A	1.80	2.20
B	1.80	2.55
C	1.10	1.40
D	0.80	1.15
E	1.20	2.00
F	0.15	0.50
G	0.10 REF.	
H	0.525 REF.	
J	0.05	0.25
K	0.35 REF.	
L	0.65 TYP.	

**MOUNTING PAD LAYOUT**

**SOT-323**



\*Dimensions in millimeters