

Product Specification

XBLW SSM3J332R

P-Channel Enhancement Mode MOSFET

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Description

The SSM3J332R uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

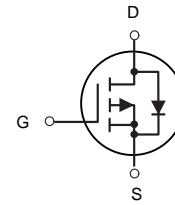
General Features

- VDS = -30V ID =-4.2A
- RDS(ON) < 54mΩ@ VGS=10V
- RDS(ON) < 77mΩ@ VGS=4.5V



Application

- Battery protection
- Load switch
- Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW SSM3J332R	SOT-23-3L	X1KX	Tape	3000Pcs/Reel

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

Symbol	Parameter	Limit	Unit
V _{DS}	Drain-Source Voltage	-30	V
V _{GS}	Gate-Source Voltage	±12	V
I _D	Drain Current-Continuous	-4.2	A
I _{DM}	Drain Current-Pulsed ^(Note 1)	-30	A
P _D	Maximum Power Dissipation	1.2	W
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
R _{θJA}	Thermal Resistance, Junction-to-Ambient ^(Note 2)	104	°C/W

Electrical Characteristics (TA=25°C unless otherwise noted)

Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7	-1	-1.3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.2A$	-	46	54	$m\Omega$
		$V_{GS}=-4.5V, I_D=-4A$	-	58	77	$m\Omega$
		$V_{GS}=-2.5V, I_D=-1A$		74	130	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-4.2A$	-	10	-	S
Dynamic Characteristics ^(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$	-	880	-	PF
Output Capacitance	C_{oss}		-	105	-	PF
Reverse Transfer Capacitance	C_{rss}		-	65	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-4.2A$ $V_{GS}=-10V, R_{GEN}=6\Omega$	-	7	-	nS
Turn-on Rise Time	t_r		-	3	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	12	-	nS
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-4.2A, V_{GS}=-4.5V$	-	8.5	-	nC
Gate-Source Charge	Q_{gs}		-	1.8	-	nC
Gate-Drain Charge	Q_{gd}		-	2.7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-4.2A$	-	-	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

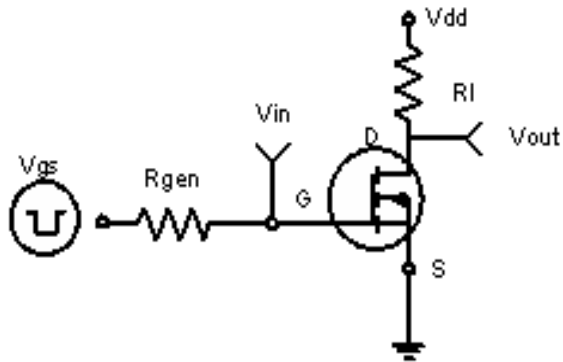


Figure 1: Switching Test Circuit

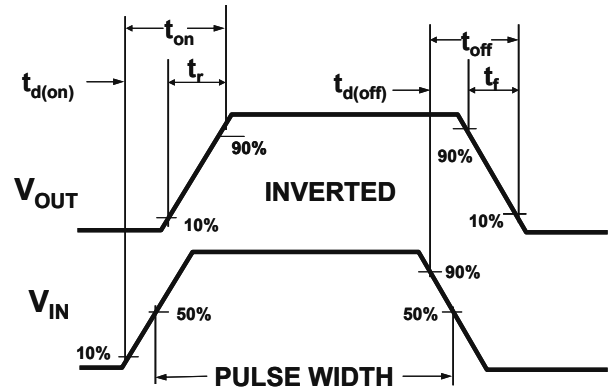
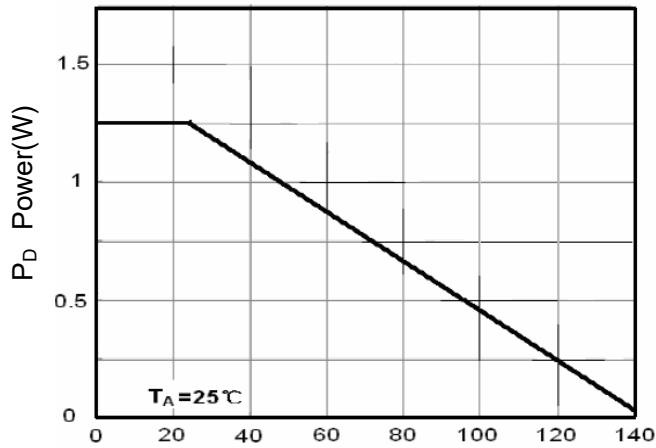
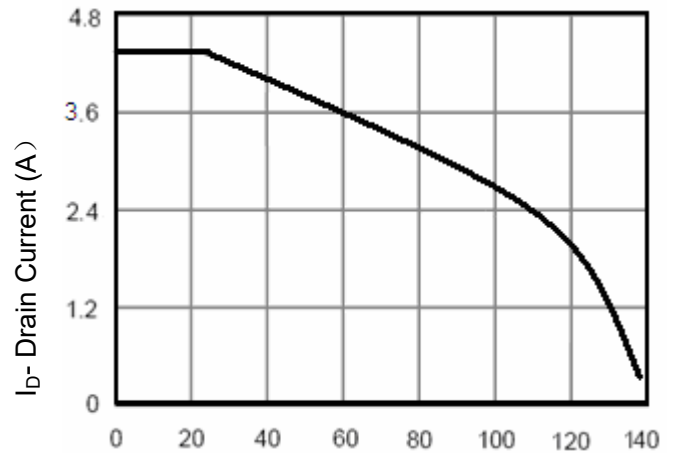


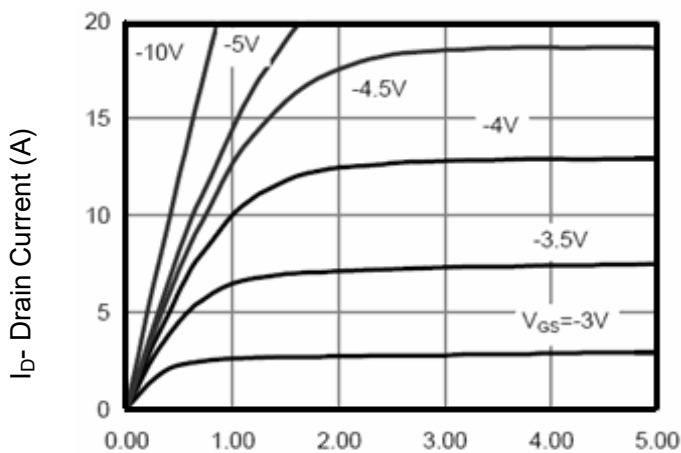
Figure 2: Switching Waveforms



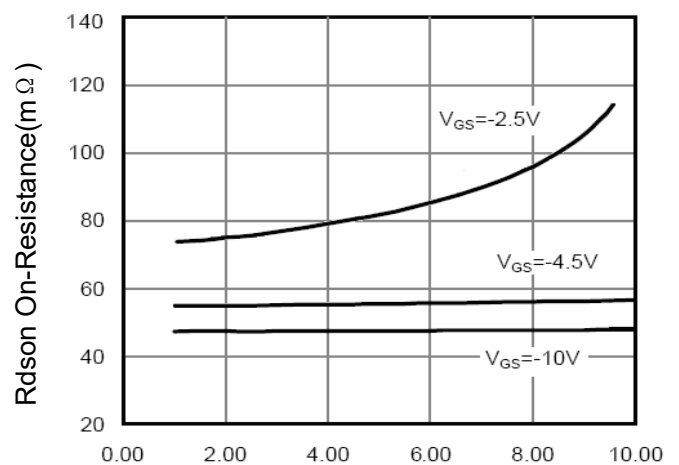
T_J-Junction Temperature(°C)
Figure 3 Power Dissipation



T_J-Junction Temperature(°C)
Figure 4 Drain Current



V_{ds} Drain-Source Voltage (V)
Figure 5 Output Characteristics



I_D- Drain Current (A)
Figure 6 Drain-Source On-Resistance

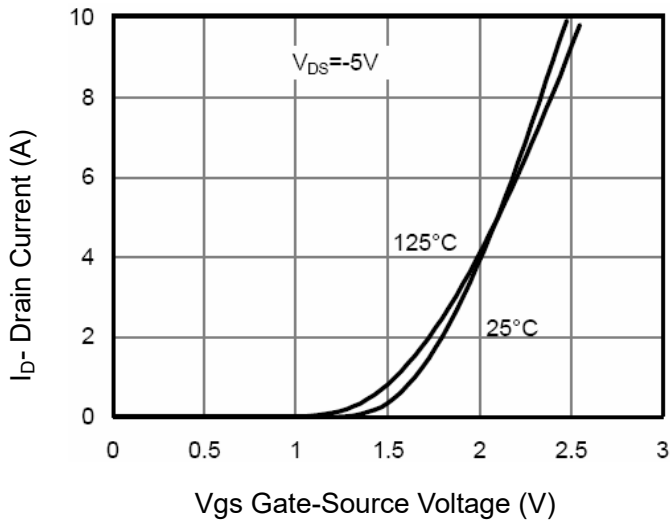


Figure 7 Transfer Characteristics

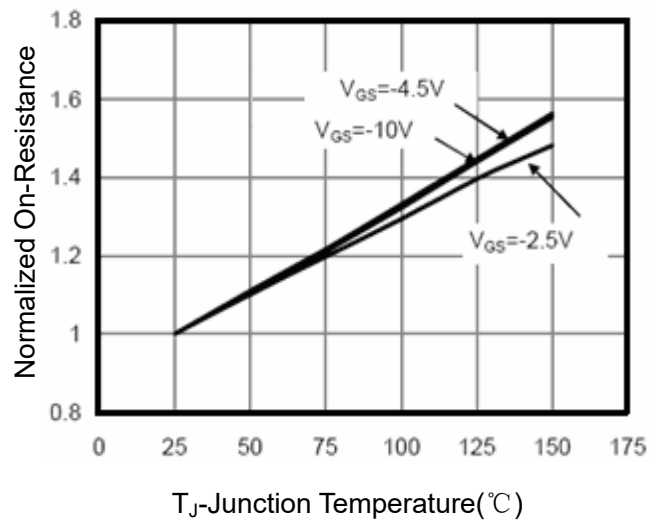


Figure 8 Drain-Source On-Resistance

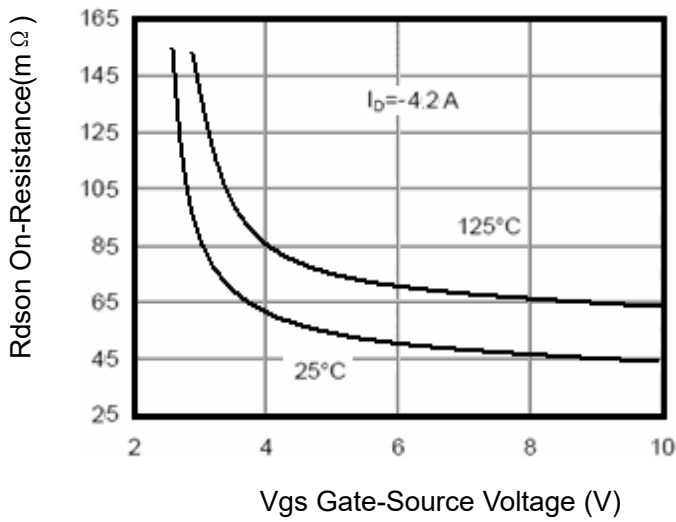


Figure 9 Rdson vs Vgs

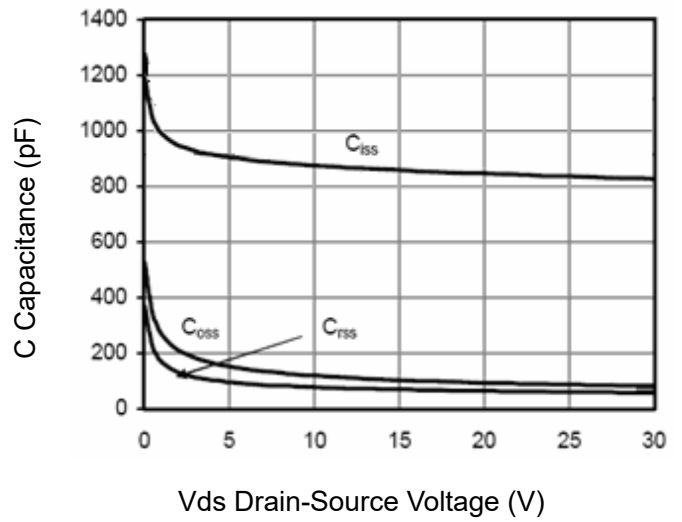


Figure 10 Capacitance vs Vds

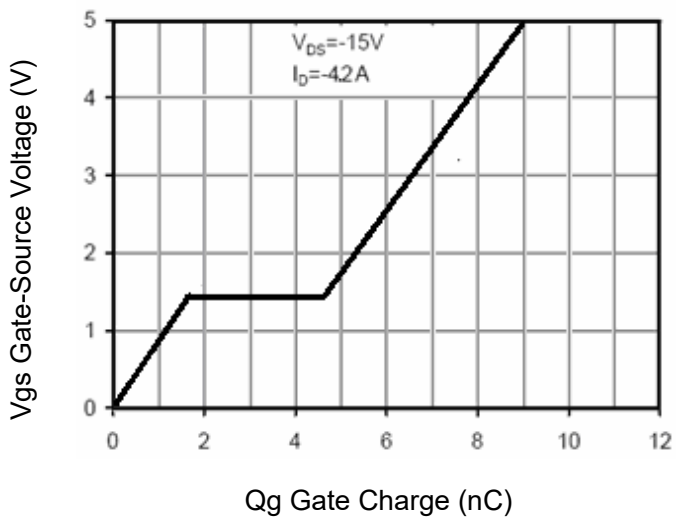


Figure 11 Gate Charge

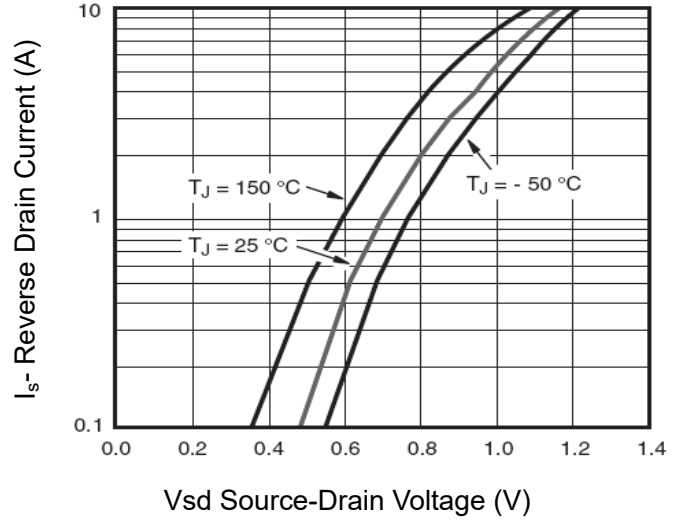
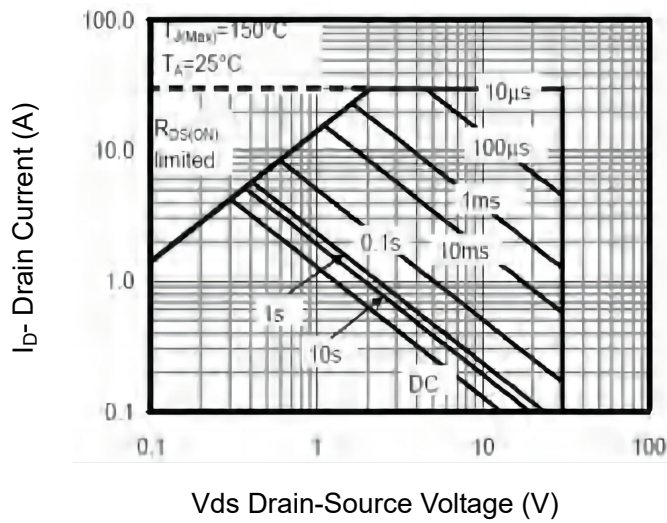
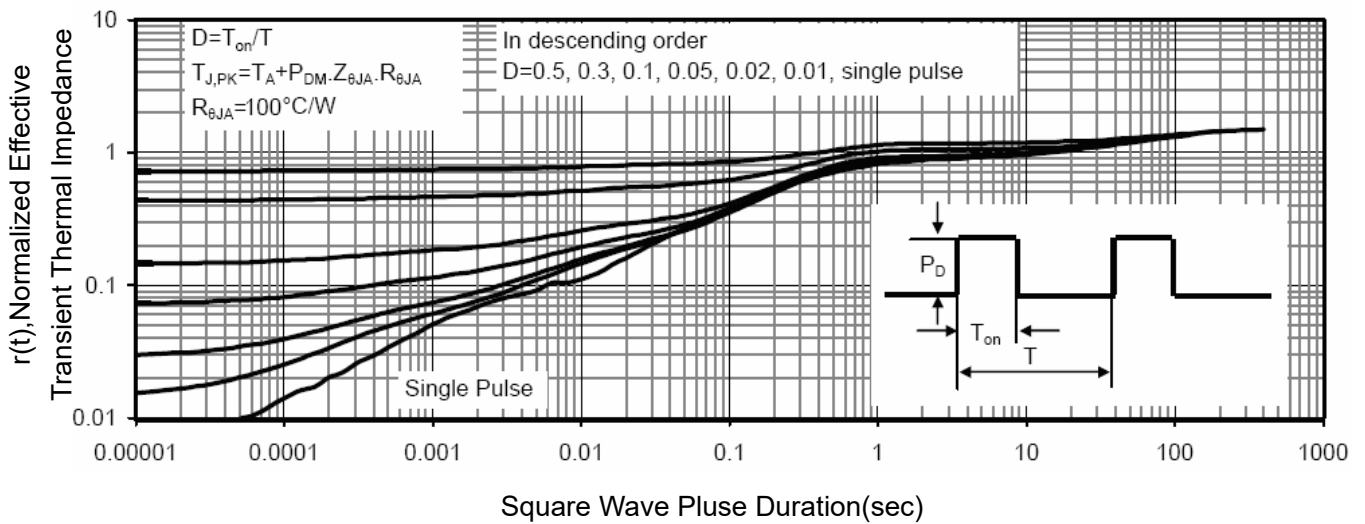


Figure 12 Source-Drain Diode Forward



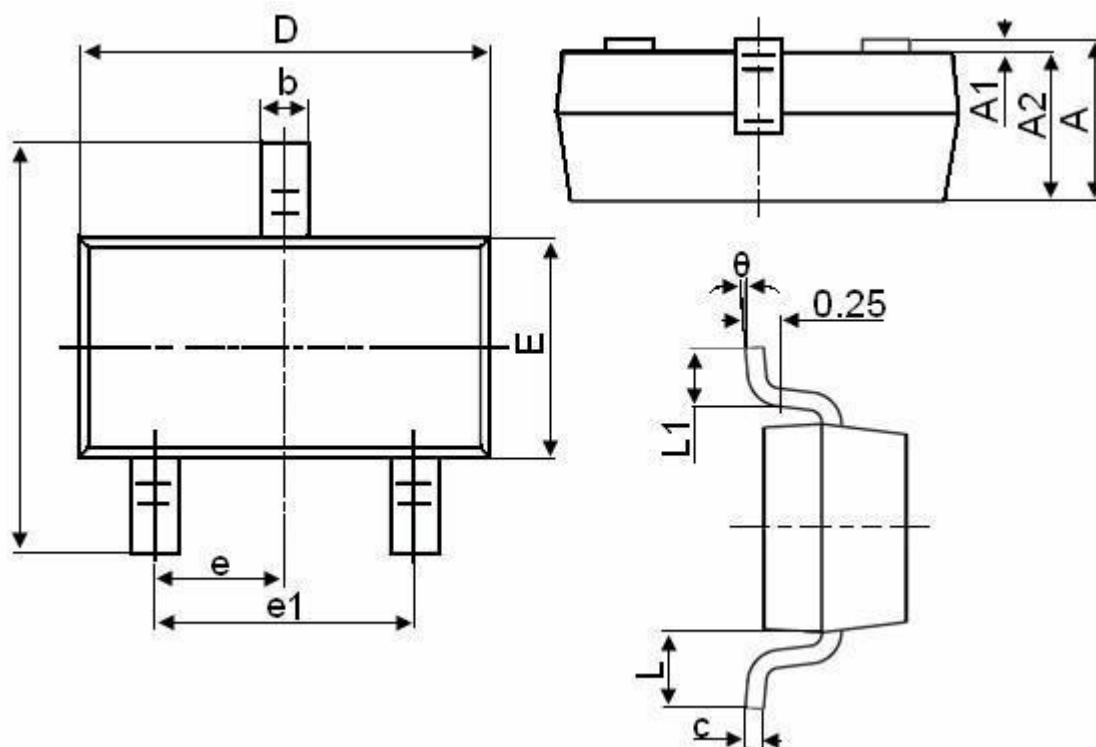
Vds Drain-Source Voltage (V)
Figure 13 Safe Operation Area



Square Wave Pluse Duration(sec)
Figure 14 Normalized Maximum Transient Thermal Impedance

Package Information

SOT23-3L



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.800	3.000
E	1.500	1.700
E1	2.650	2.950
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.600
θ	0°	8°

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