

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
-16V	23mΩ@-4.5V	-4A
	31mΩ@-2.5V	



**合肥矽普半导体**

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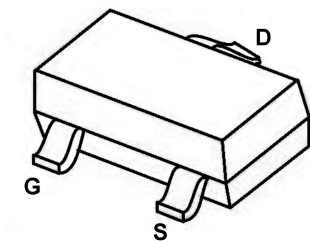
## Feature

- High power and current handling capability
- Surface mount package

## Application

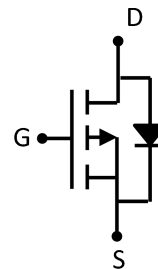
- Battery Switch
- DC/DC Converter

## Package

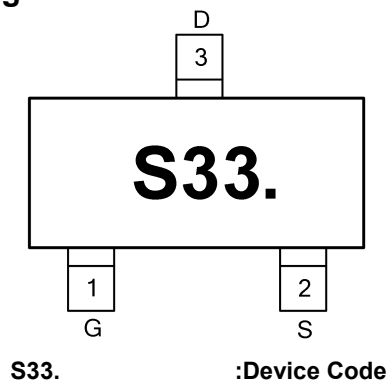


SOT-23-3L

## Circuit diagram



## Marking



## Order Information

Device	Package	Unit/Tape
SP2333BT1	SOT-23-3L	3000

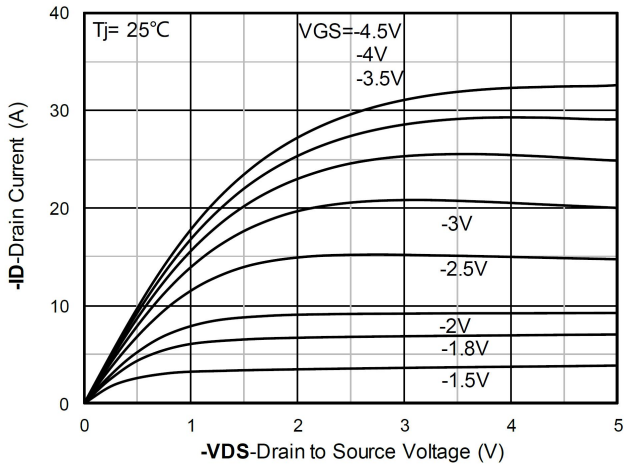
**Absolute maximum ratings (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-16	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current	$I_D$	-4	A
Pulse Drain Current Tested	$I_{DM}$	-16	A
Power Dissipation	$P_D$	1.2	W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	104	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

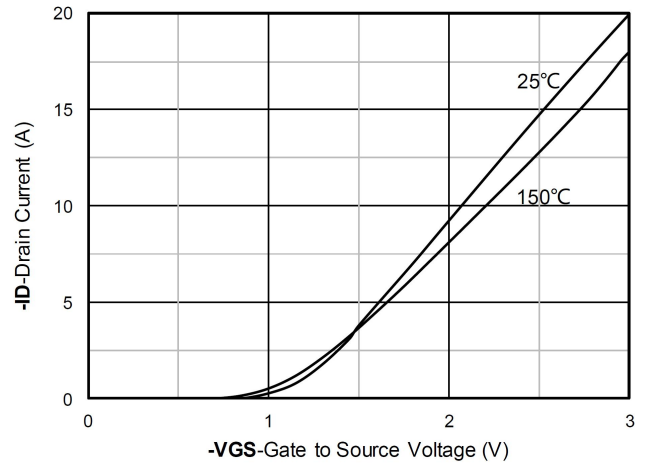
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	VGS=0V , ID=-250μA	-16	-	-	V
Drain-Source Leakage Current	IDSS	VDS=-13V , VGS=0V	-	-	-1	uA
Gate-Source Leakage Current	IGSS	VGS=±10V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS=VGS , ID=-250μA	-0.4	-0.65	-1.0	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=-4.5V , ID=-5A	-	23	29	mΩ
		VGS=-2.5V , ID=-4.3A	-	31	42	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=-4V , VGS=0V , f=1MHz	-	740	-	pF
Output Capacitance	Coss		-	290	-	
Reverse Transfer Capacitance	Crss		-	190	-	
Total Gate Charge	Qg	VDS=-4V , VGS=-2.5V , ID=-4.1A	-	4.5	-	nC
Gate-Source Charge	Qgs		-	1.2	-	
Gate-Drain Charge	Qgd		-	1.6	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD=-4V VGS=-4.5V , RG=1Ω , ID=-3.3A	-	13	-	nS
Turn-On Rise Time	tr		-	35	-	
Turn-Off Delay Time	td(off)		-	32	-	
Turn-Off Fall Time	tr		-	10	-	
Source-Drain Diode characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=-1A , TJ=25℃	-	-	-1.2	V

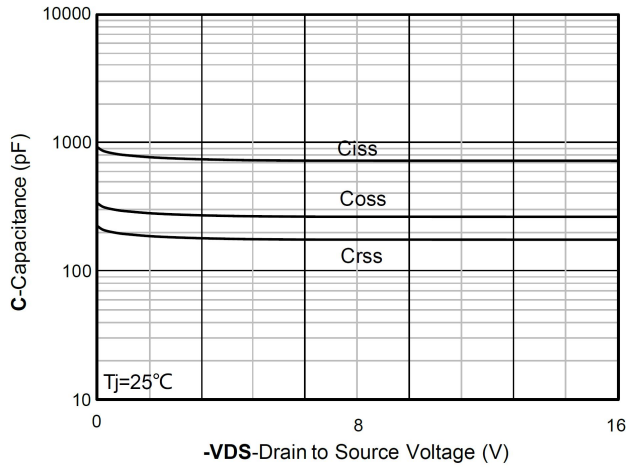
## Typical Characteristics



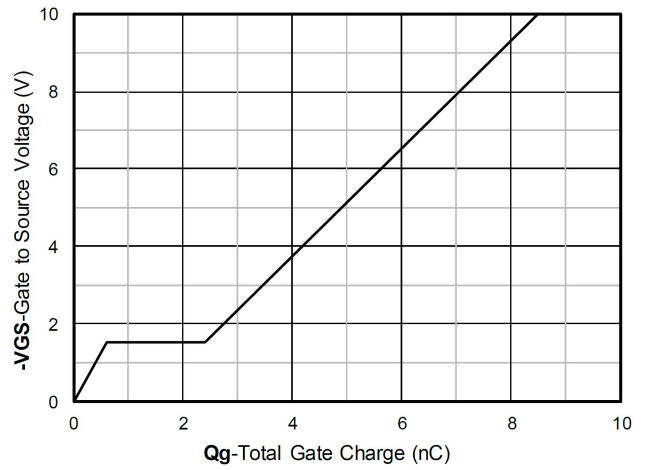
Output Characteristics



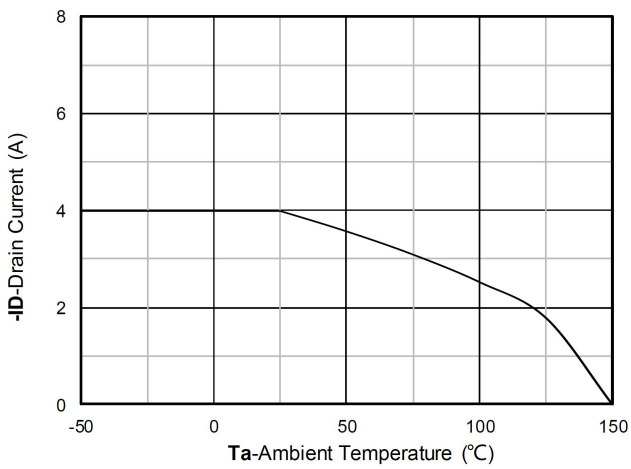
Transfer Characteristics



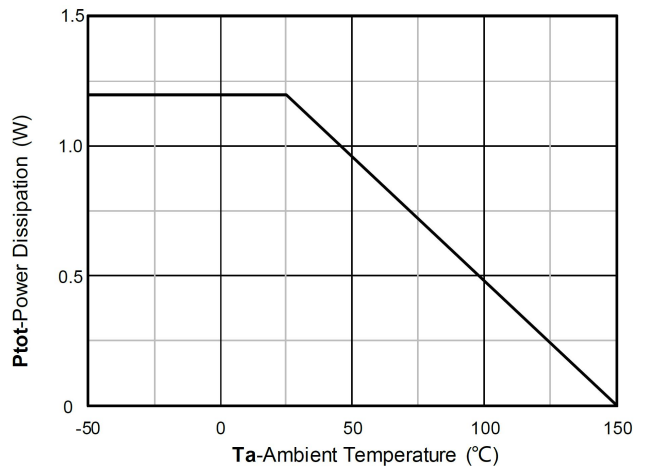
Capacitance Characteristics



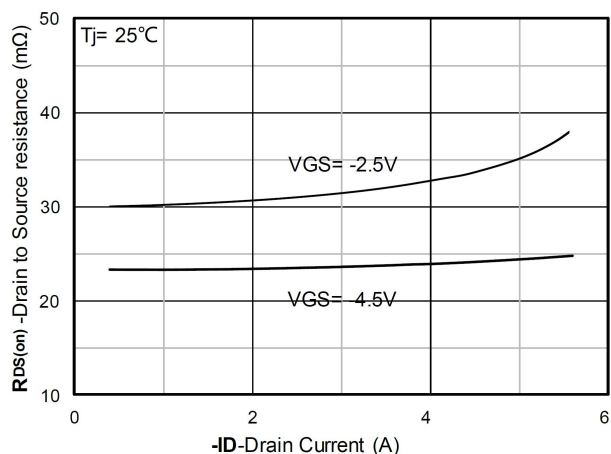
Gate Charge



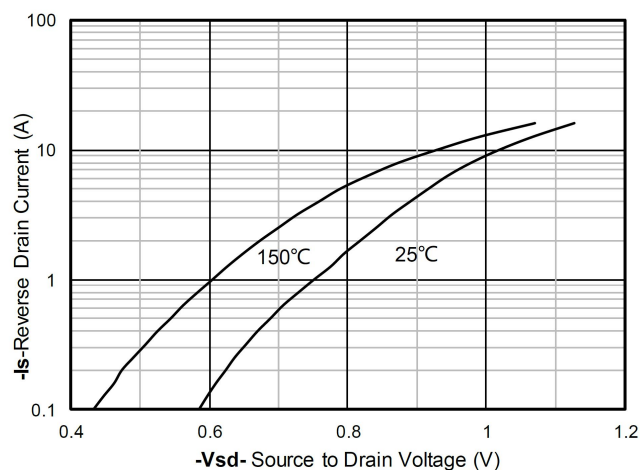
Current dissipation



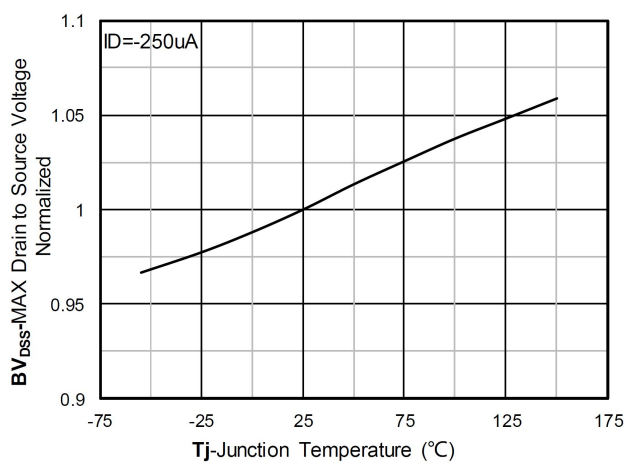
Power dissipation



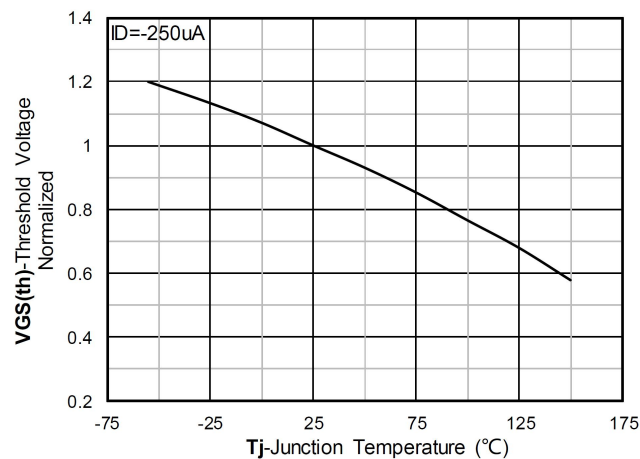
$R_{DS(on)}$  VS Drain Current



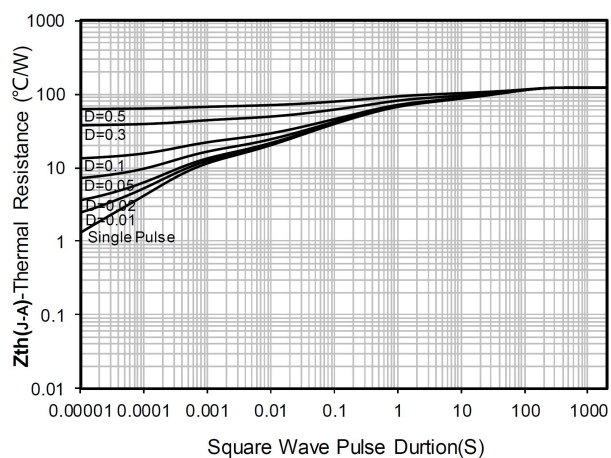
Forward characteristics of reverse diode



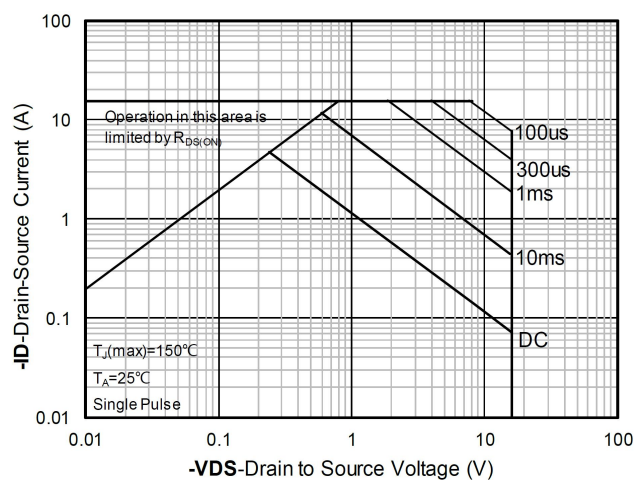
Normalized breakdown voltage



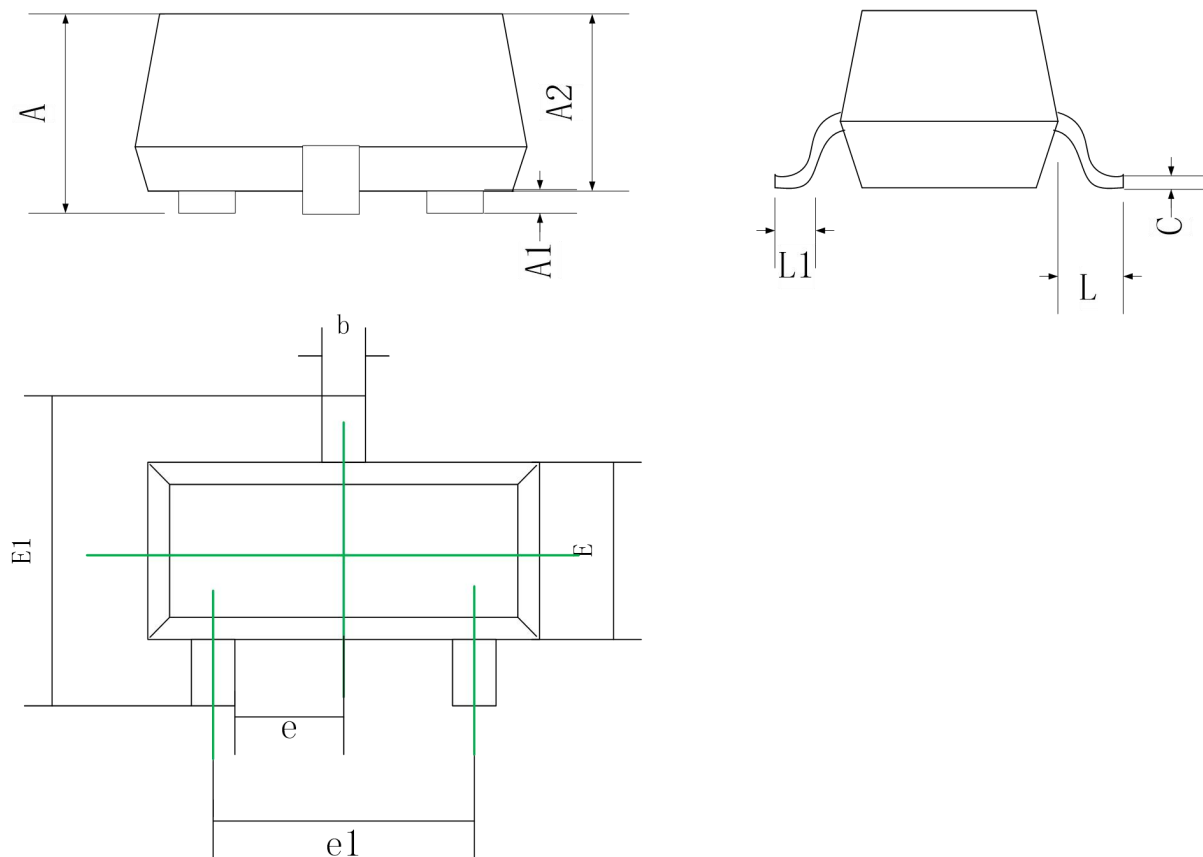
Normalized Threshold voltage



Maximum Transient Thermal Impedance



Safe Operation Area

**SOT-23-3L Package Information**


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	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 Typ.	
e1	1.800	2.000
L	0.300	0.600
$\theta$	0°	8°