

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	80mΩ@-4.5V	-3.3A
	100mΩ@-2.5V	

Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

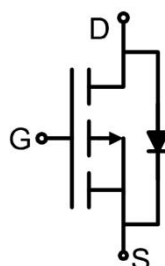
- Battery protection
- Load Switch
- Uninterruptible power supply

Package

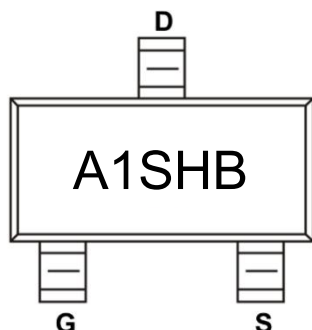


SOT-23

Circuit diagram



Marking



Absolute maximum ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current ¹⁾ (V _{GS} =-4.5V)	I _D	-3.3	A
Continuous Drain Current ¹⁾ (V _{GS} =-4.5V, T _A =70°C)	I _D (70°C)	-2.6	A
Pulsed Drain Current ²⁾	I _{DM}	-13	A
Power Dissipation ³⁾ (T _A =25°C)	P _D	1.4	W
Thermal Resistance Junction to Ambient ¹⁾	R _{θJA}	89.2	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.6	-1	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =-4.5V, I _D =-3A		55	80	mΩ
		V _{GS} =-2.5V, I _D =-2A		75	100	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f =1MHz		677		pF
Output Capacitance	C _{oss}			82		
Reverse Transfer Capacitance	C _{rss}			73		
Total Gate Charge	Q _g	V _{DS} =-15V, V _{GS} =-4.5V I _D =-3A		10.1		nC
Gate-Source Charge	Q _{gs}			1.21		
Gate-Drain Charge	Q _{gd}			2.46		
Turn-on delay time	t _{d(on)}	V _{DS} =-10V, V _{GS} =-4.5V I _D =-3A, R _G =3.3Ω		5.6		nS
Turn-on rise time	t _r			32.2		
Turn-off delay time	t _{d(off)}			45.6		
Turn-off fall time	t _f			29.2		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _G =V _D =0V , Force Current			-3.3	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =-1A			-1	V

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

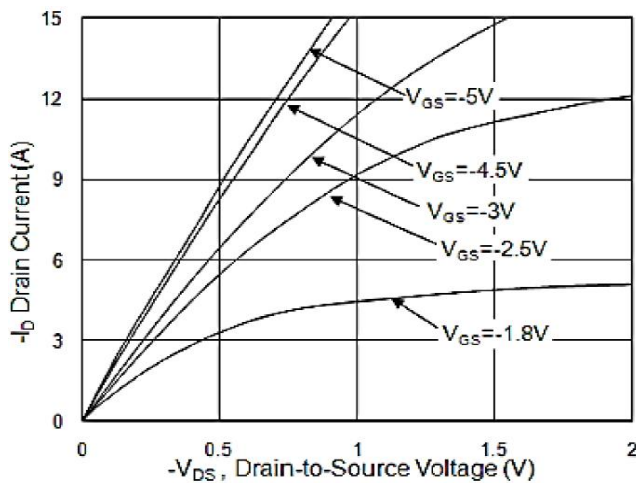


Fig.1 Typical Output Characteristics

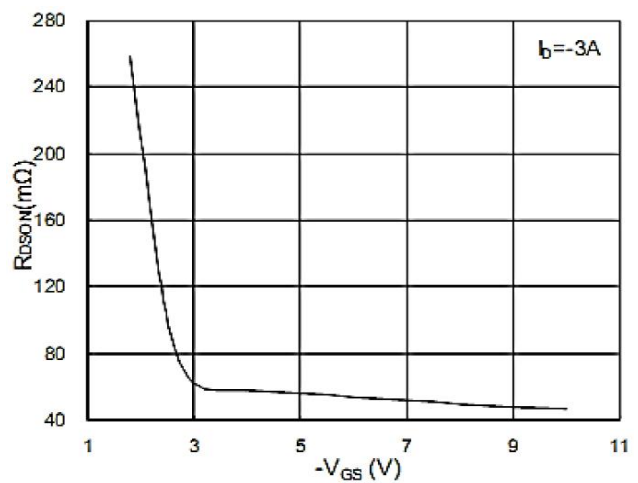


Fig.2 On-Resistance vs. Gate-Source

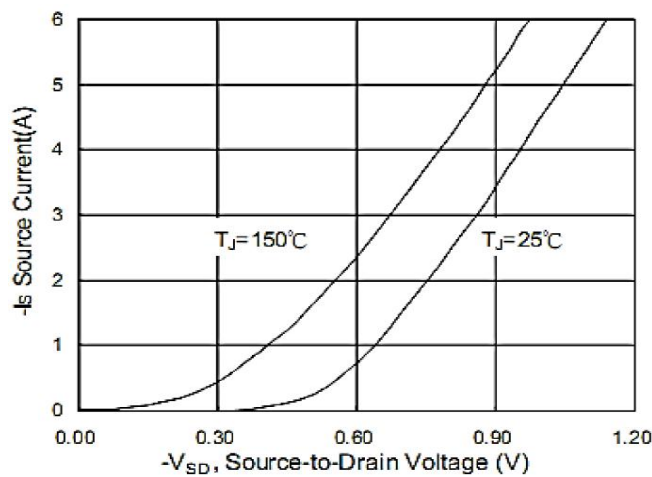


Fig.3 Forward Characteristics Of Reverse

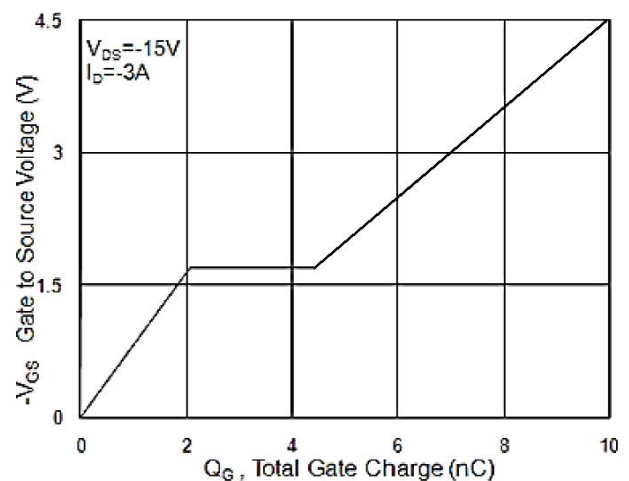


Fig.4 Gate-Charge Characteristics

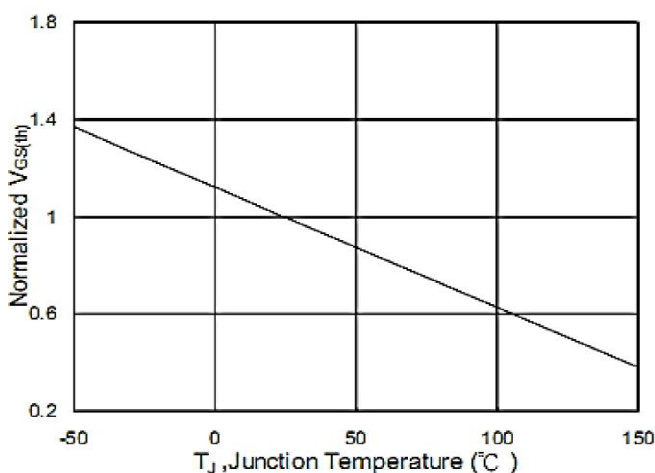


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

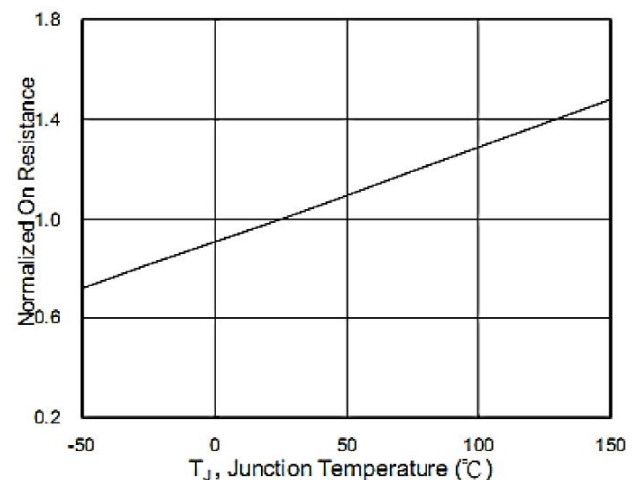


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

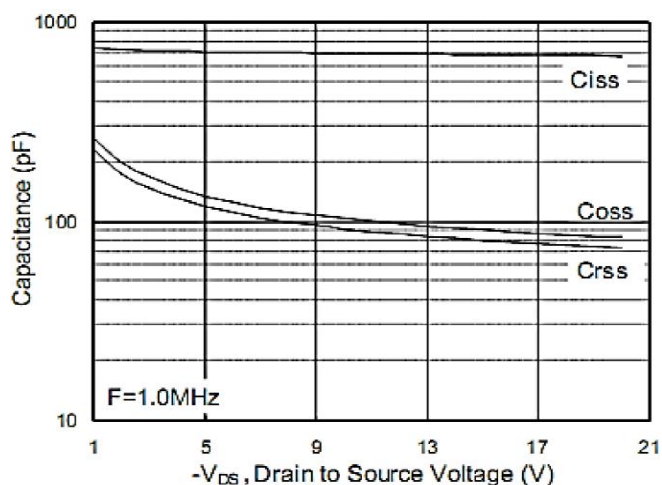


Fig.7 Capacitance

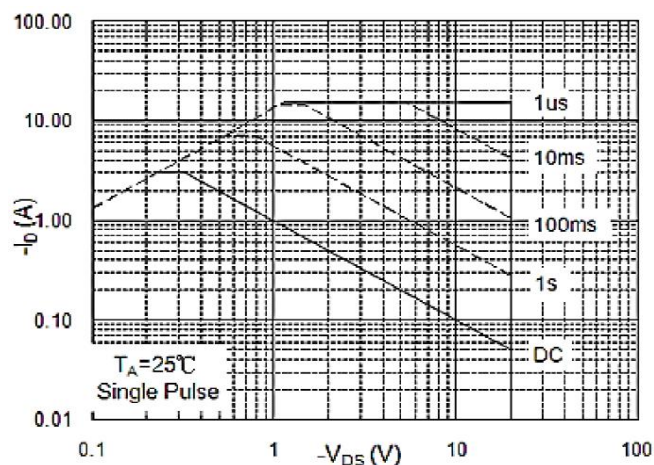


Fig.8 Safe Operating Area

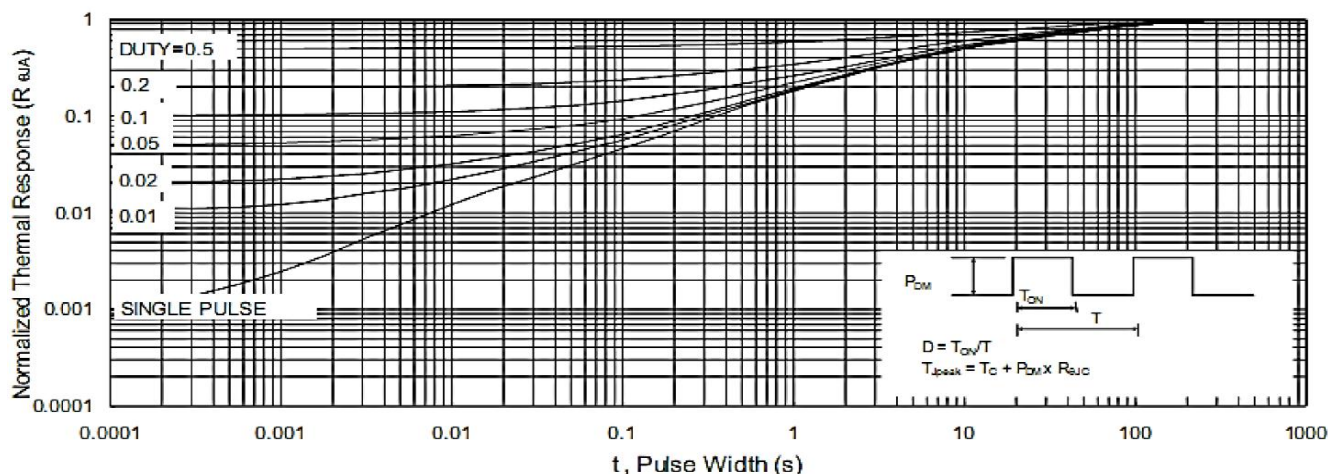


Fig.9 Normalized Maximum Transient Thermal Impedance

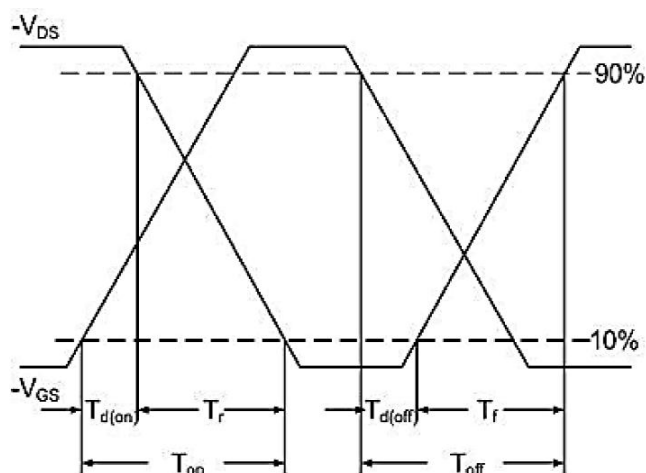


Fig.10 Switching Time Waveform

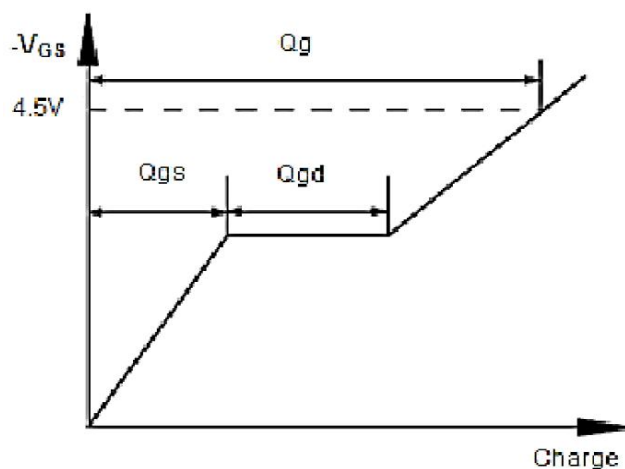
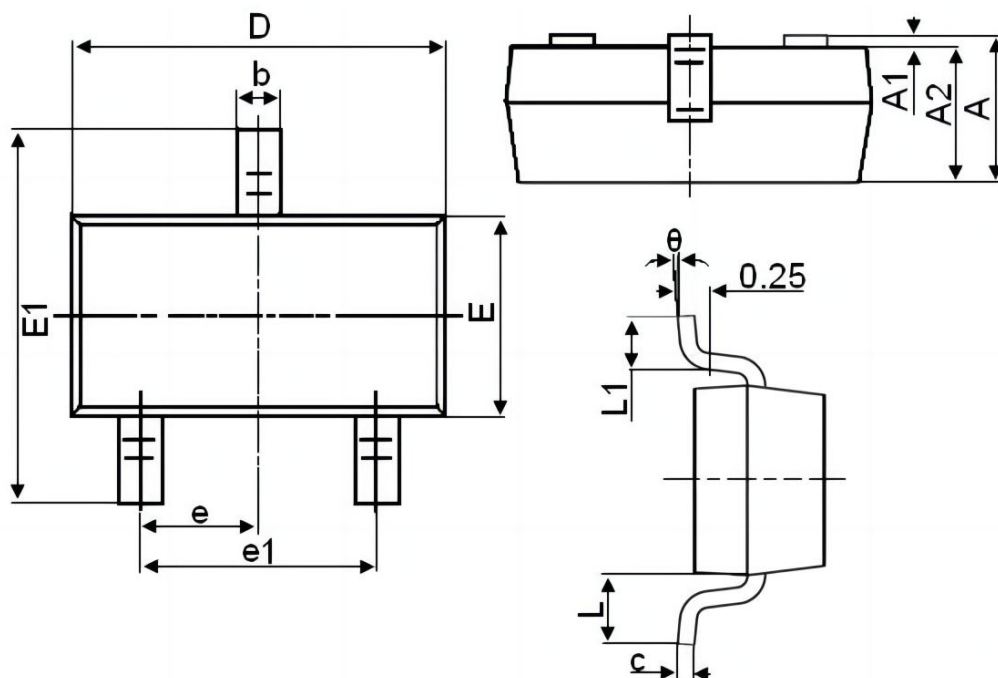


Fig.11 Gate Charge Waveform

SOT-23 Package Information



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°