

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	80mΩ@-4.5V	-2.3A
	100mΩ@-2.5V	

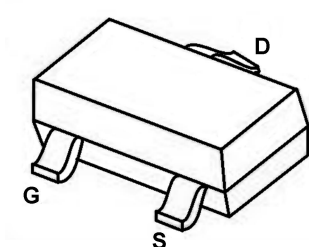
Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low Gate Charge

Application

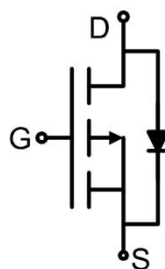
- Battery protection
- Load switch
- Uninterruptible power supply

Package

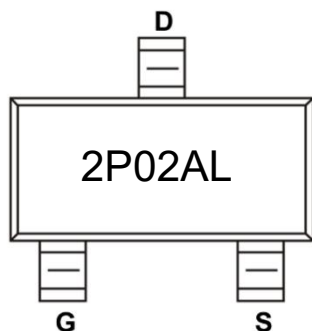


SOT-323

Circuit diagram



Marking



Absolute maximum ratings ($T_c=25^\circ\text{C}$ 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⁾ ($V_{GS}=-4.5\text{V}, T_A=25^\circ\text{C}$)	I_D	-2.3	A
Continuous Drain Current ¹⁾ ($V_{GS}=-4.5\text{V}, T_A=70^\circ\text{C}$)	$I_D(70^\circ\text{C})$	-1.9	A
Pulsed Drain Current ²⁾	I_{DM}	-6.9	A
Power Dissipation ³⁾ ($T_A=25^\circ\text{C}$)	P_D	1.4	W
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	90	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45	-0.6	-1.0	V
Drain-source on-resistance ²⁾	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3A$		55	80	m Ω
		$V_{GS} = -2.5V, I_D = -2A$		75	100	
Dynamic characteristics ⁵⁾						
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	$t_{d(on)}$	$V_{GS} = -4.5V, V_{DD} = -10V, I_D = -3A, R_G = 3.3\Omega$		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 ^{1,4)}	I_S	$V_G = V_D = 0V$, Force Current			-2.3	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 2OZ copper.
- 2) The data tested by pulsed, pulse width $\Delta 300\mu\text{s}$, duty cycle $\Delta 2\%$
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.
- 5) Guaranteed by design, not subject to production.

Typical Characteristics

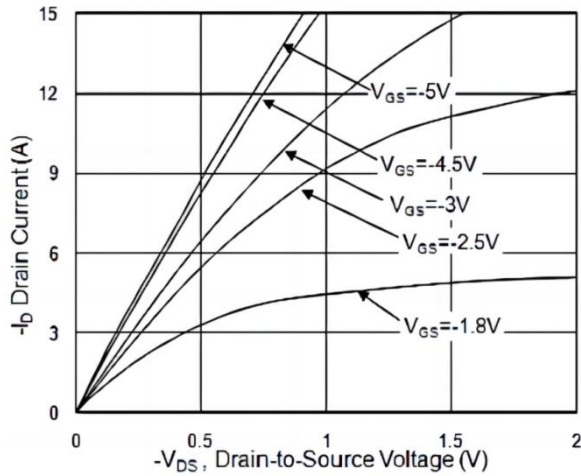


Fig.1 Typical Output Characteristics

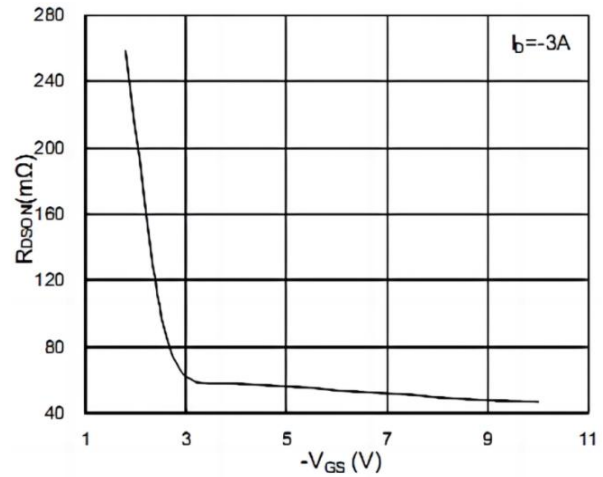


Fig.2 On-Resistance vs. Gate-Source

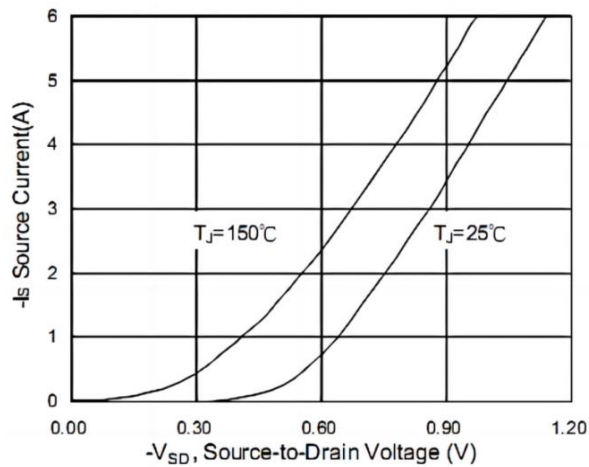


Fig.3 Forward Characteristics Of Reverse

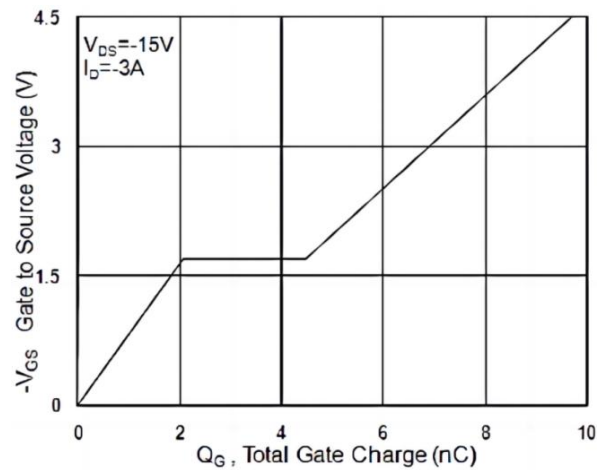


Fig.4 Gate-Charge Characteristics

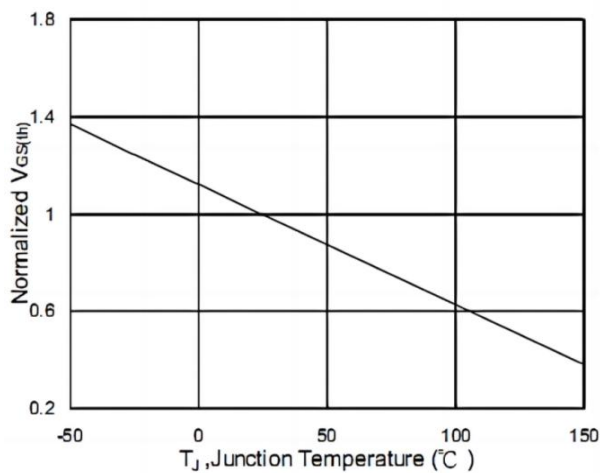


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

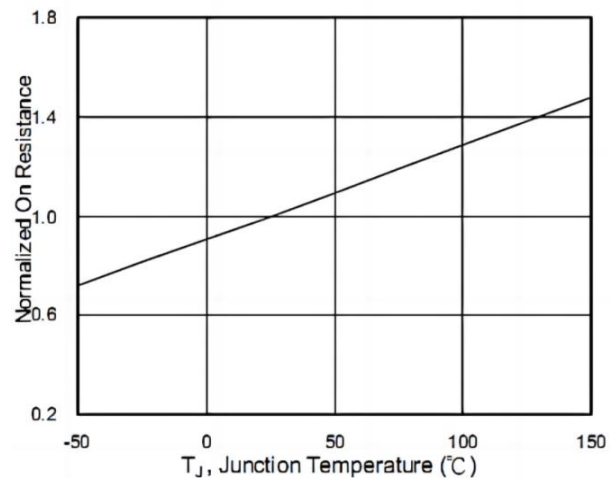


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

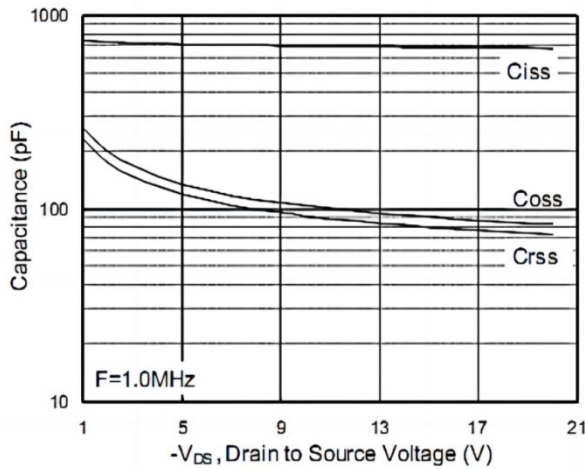


Fig.7 Capacitance

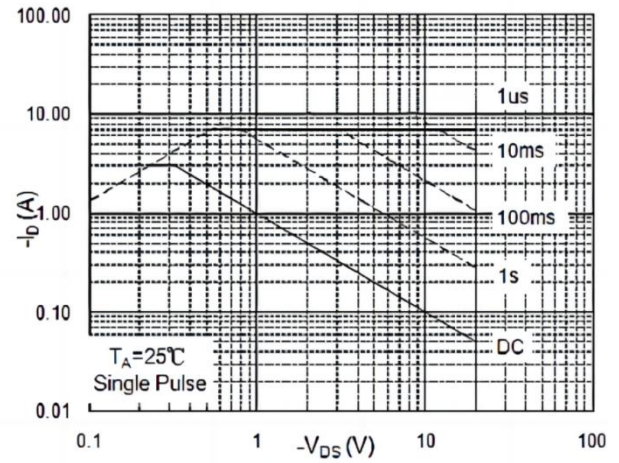


Fig.8 Safe Operating Area

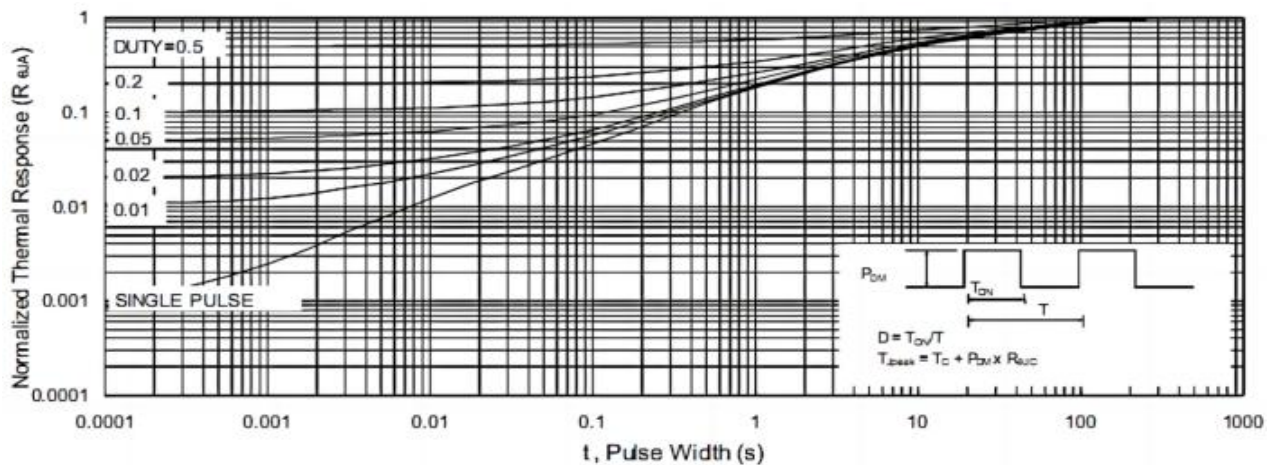


Fig.9 Normalized Maximum Transient Thermal Impedance

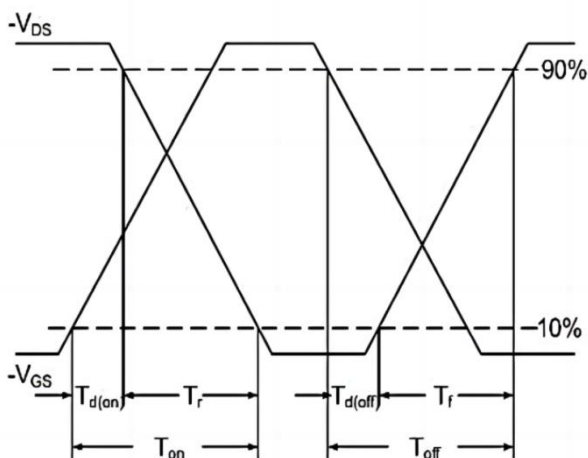


Fig.10 Switching Time Waveform

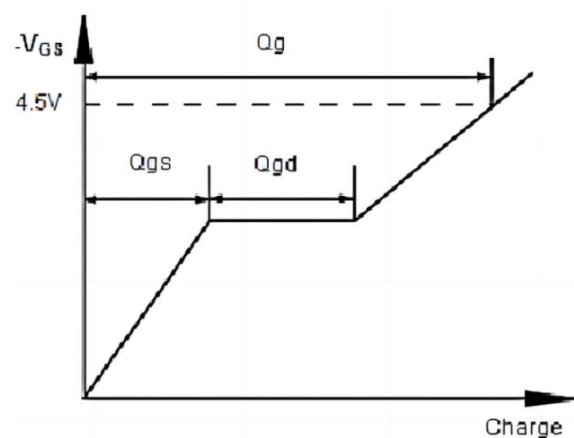
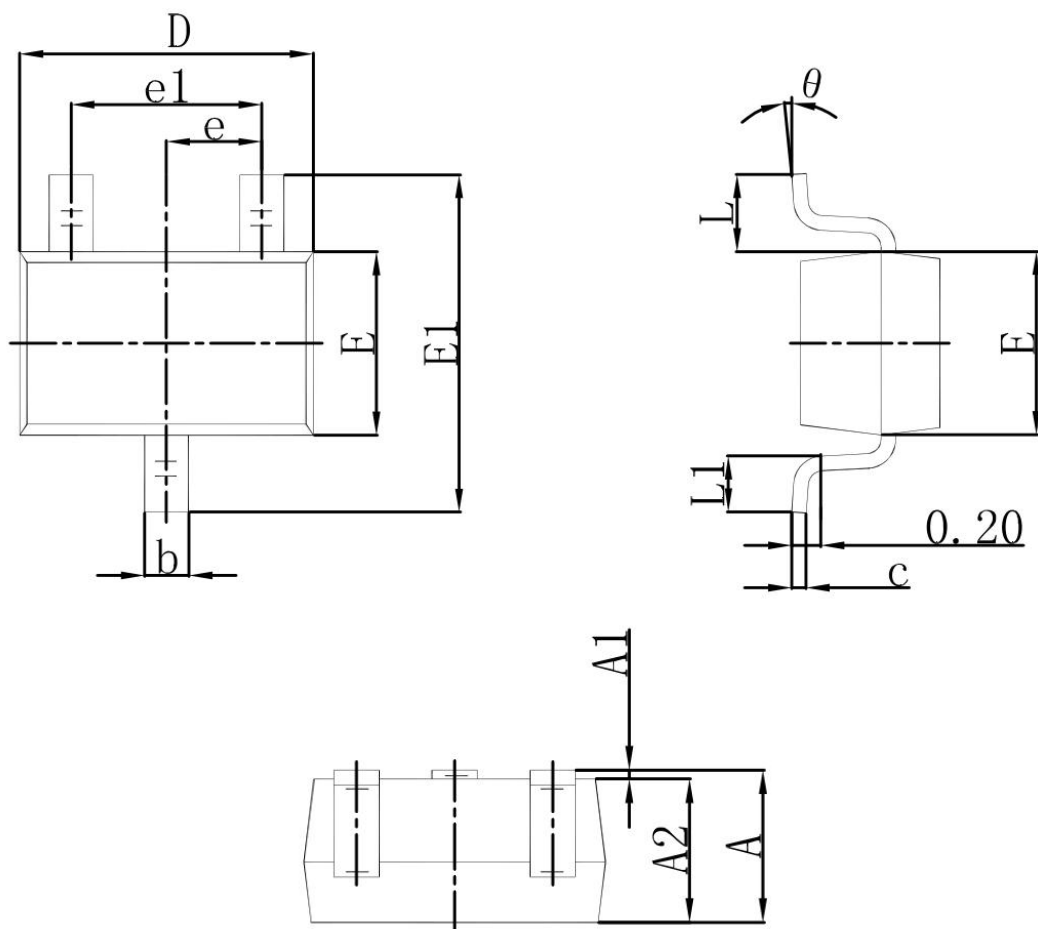


Fig.11 Gate Charge Waveform

SOT-323 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.400	0.006	0.016
c	0.080	0.250	0.003	0.016
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.250	0.460	0.010	0.018
θ	0°	8°	0°	8°