ACE2302B

N-Channel Enhancement Mode MOSFET

Description

The ACE2302B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating. This device is suitable for use as a uni-directional or bi-directional load switch.

Features

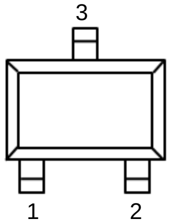
- V_{DS}=20V
- I_D=6A (V_{GS}=10V)
- $R_{DS(ON)}$=26mΩ (typ.) @ V_{GS}=10V
- $R_{DS(ON)}$=28mΩ (typ.) @ V_{GS}=4.5V
- $R_{DS(ON)}$=42mΩ (typ.) @ V_{GS}=2.5V

Absolute Maximum Ratings

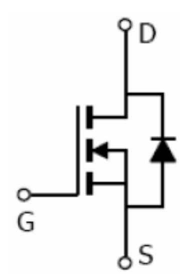
Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous)	T_A=25℃	I_D	6	A
	T_A=70℃		4.8	
Drain Current (Pulsed)		I_{DM}	20	A
Power Dissipation	T_A=25℃	P_D	1.4	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

Packaging Type

SOT-23-3L



SOT-23-3L	Description	Function
1	G	Gate
2	S	Source
3	D	Drain



Ordering information

ACE2302B XX + H

- Halogen - free
- Pb - free
- BM : SOT-23-3L

Electrical Characteristics

T_A=25℃, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20	24		V
Zero gate voltage drain current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_{DS}=250μA	0.6	0.74	1	V
Gate leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6A		19.5	26	mΩ
		V_{GS}=4.5V, I_D=5A		22.6	28	
		V_{GS}=2.5V, I_D=4A		31	42	
Forward transconductance	g_{FS}	V_{DS}=10V, I_D=6A		5		S
Diode forward voltage	V_{SD}	I_{SD}=1.7A, V_{GS}=0V		0.78	1	V
Maximum body-diode continuous current	I_S				1.7	A
Switching						
Total gate charge	Qg	V_{GS}=4.5V, V_{DS}=10V, I_D=6A		6.3	8.1	nC
Gate-source charge	Qgs			1.7	2.2	
Gate-drain charge	Qgd			1.4	1.8	
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V, I_D=1A R_G=6Ω, V_{GS}=4.5V		10.4	20.8	ns
Turn-on rise time	Tr			4.4	8.8	
Turn-off delay time	$t_{d(off)}$			27.4	54.8	
Turn-off fall time	Tf			4.2	8.4	
Dynamic						
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=8V, f=1.0MHz		522.3		pF
Output capacitance	Coss			98.5		
Reverse transfer capacitance	Crss			74.7		

Note :

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.
2. Repetitive rating, pulse width limited by junction temperature.
3. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

Typical Performance Characteristics

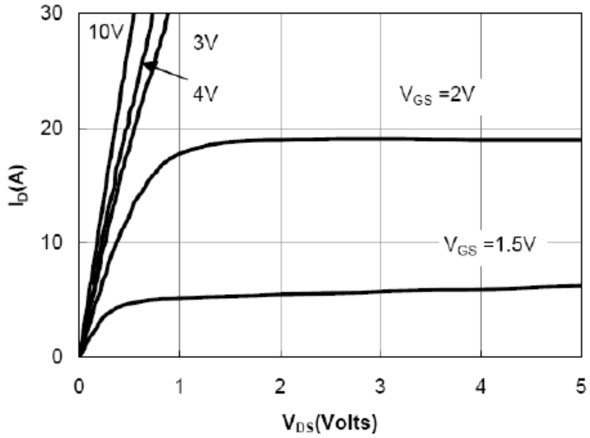


Figure 1: On-Regions Characteristics

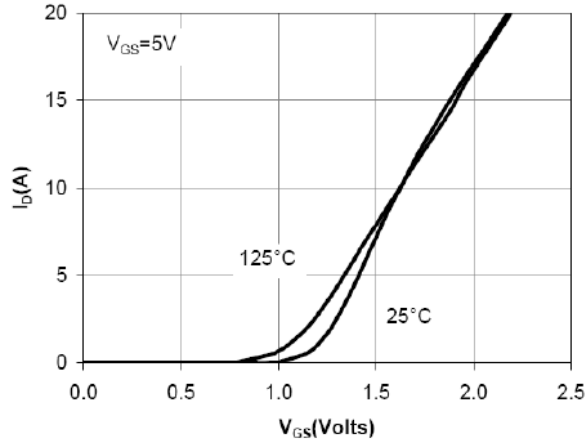


Figure 2: Transfer Characteristics

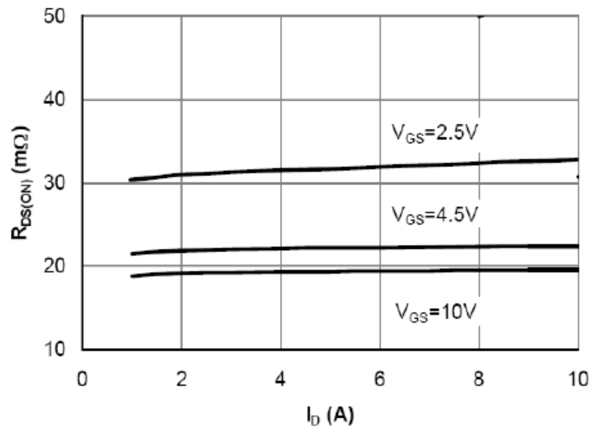


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

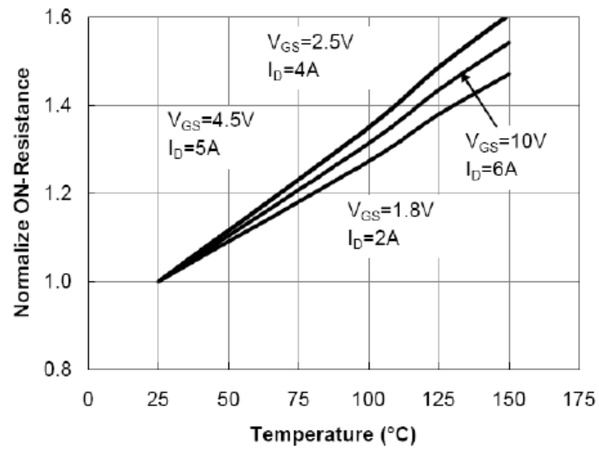


Figure 4: On-Resistance vs. Junction Temperature

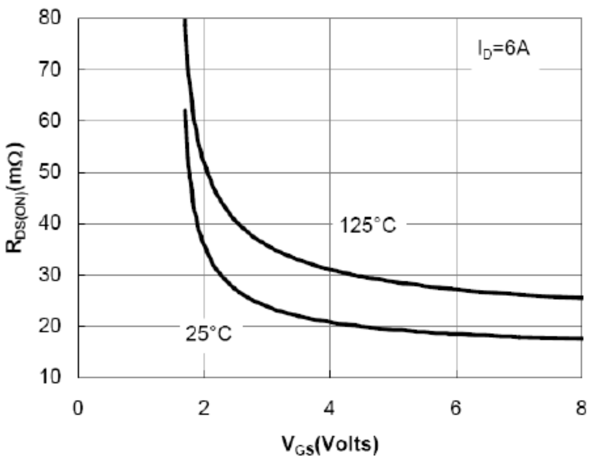


Figure 5: On-Resistance vs. Gate-Source Voltage

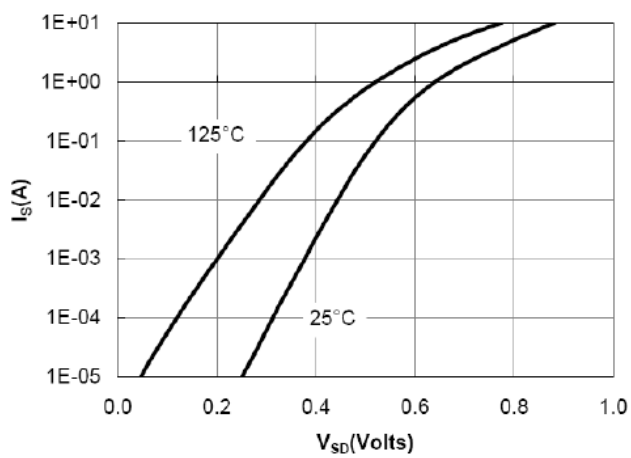


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics

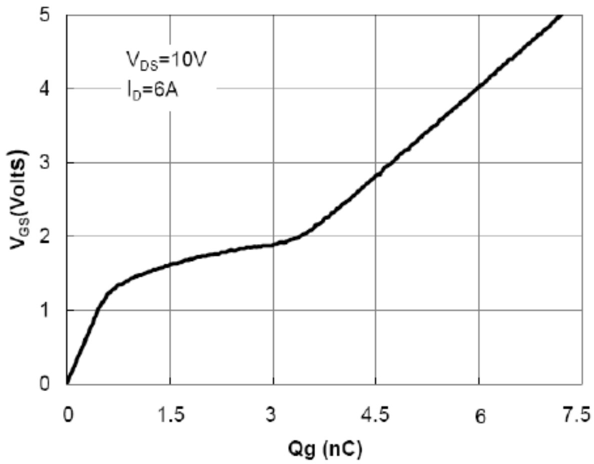


Figure 7: Gate-Charge Characteristics

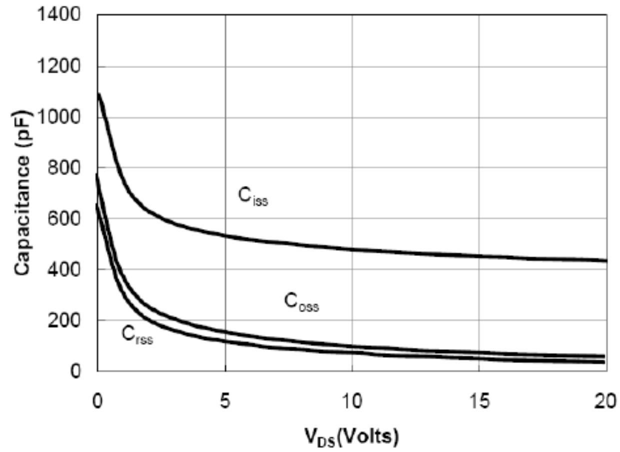


Figure 8: Capacitance Characteristics

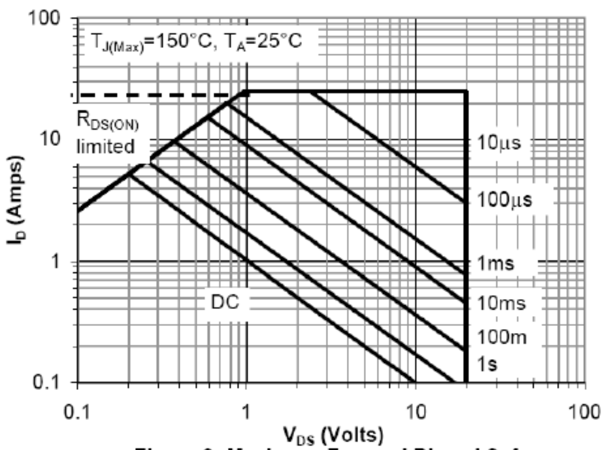


Figure 9: Maximum Forward Biased Safe Operating Area

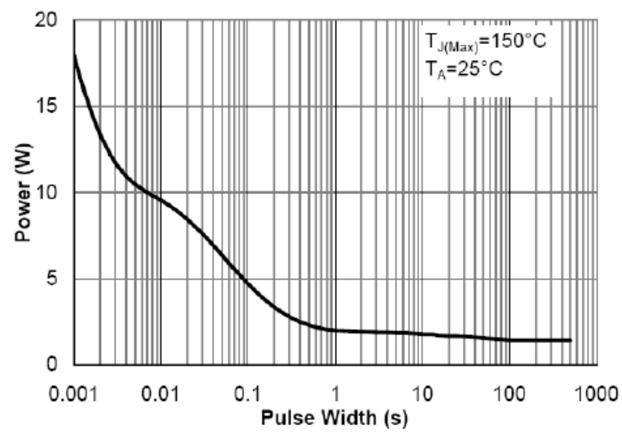


Figure 10: Single Pulse Power Rating Junction-to-Ambient

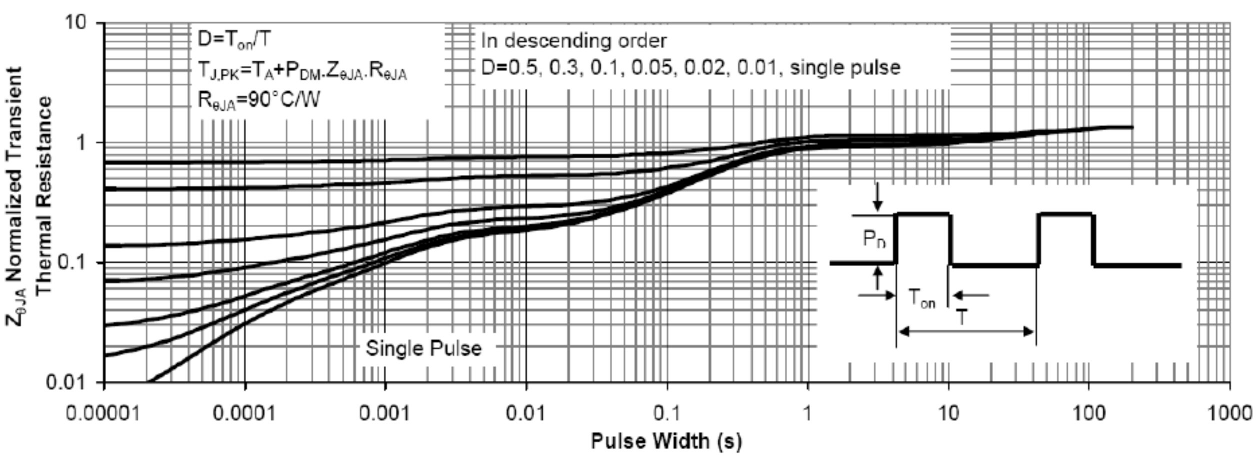
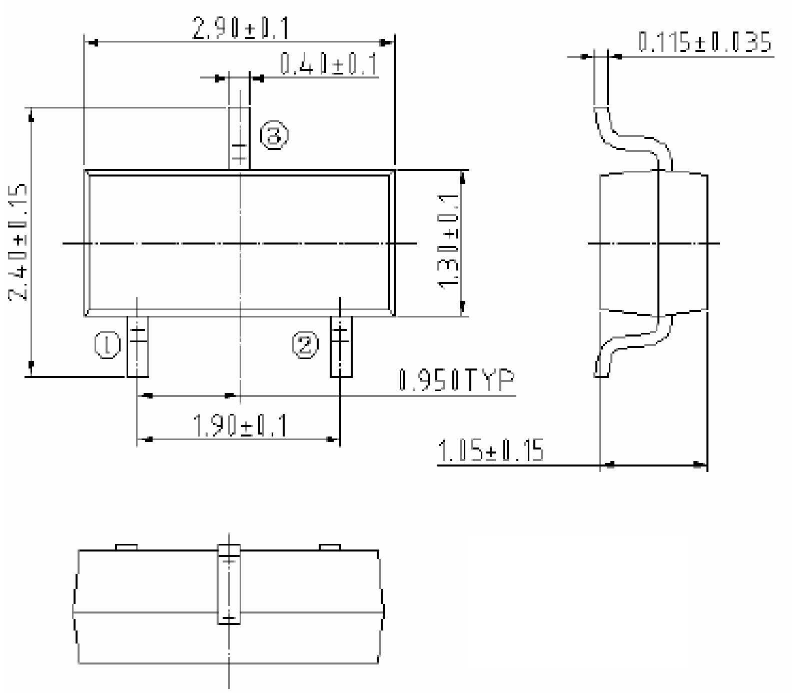


Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

SOT-23-3L



Unit: mm

Notes

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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