



ACE2305B

P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE2305B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

Features

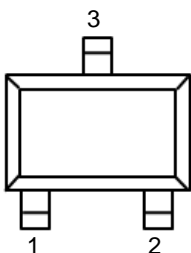
- $V_{DS}=-20V$, $I_D=-4A$
- $R_{DS(ON)}<55m\Omega$ @ $V_{GS}=-4.5V$
- $R_{DS(ON)}<63m\Omega$ @ $V_{GS}=-2.5V$
- $R_{DS(ON)}<83m\Omega$ @ $V_{GS}=-1.8V$
- ESD Protected: 3000V HBM

Absolute Maximum Ratings

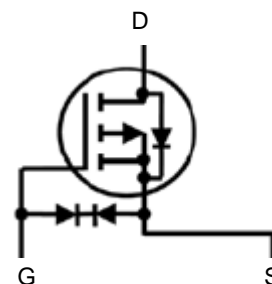
Parameter	Symbol	Max	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current (Continuous)	I_D	$T_A=25^\circ C$	-4
		$T_A=70^\circ C$	-3.2
Drain Current (Pulse)	I_{DM}	-30	A
Power Dissipation	$T_A=25^\circ C$	P_D	1.4
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Packaging Type

SOT-23-3L

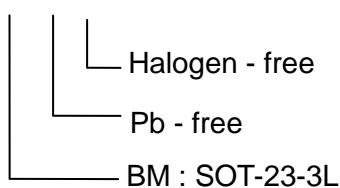


SOT-23-3L	Description
1	Gate
2	Source
3	Drain



Ordering information

ACE2305B XX + H





Electrical Characteristics

T_A=25 °C unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250uA	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-16V, V _{GS} =0V			-1	uA
Gate Leakage Current	I _{GSS}	V _{GS} =+8V, V _{DS} =0V			±10	nA
Gate Threshold Voltage	I _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-0.3	-0.65	-1	nA
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4A		50	55	mΩ
		V _{GS} =-2.5V, I _D =-4A		59	63	
		V _{GS} =-1.8V, I _D =-2A		74	83	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-1	-1.6	-2.0	V
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-4A	8	16		S
Maximum Body-Diode Continuous Current	I _S				-2.2	A
Drain Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V		-0.8	-1	V
Switching characteristics ⁽³⁾						
Total Gate Charge	Q _g	V _{DS} =-10V, I _D =-4A V _{GS} =-4.5V		4.59	5.97	nC
Gate-Source Charge	Q _{gs}			2.14	2.78	
Gate-Drain Charge	Q _{gd}			2.51	3.26	
Turn-On Delay Time	T _{d(on)}	V _{DD} =-10V, R _L =2.5Ω I _D =-4A, V _{GEN} =-4.5V R _G =3Ω		965.2	1930.4	ns
Turn-On Rise Time	t _r			1604	3208	
Turn-Off Delay Time	t _{d(off)}			7716	15432	
Turn-Off Fall Time	t _f			3452	6904	
Dynamic characteristics ⁽³⁾						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V f=1.0MHz		36.45		pF
Output Capacitance	C _{oss}			128.57		
Reverse Transfer Capacitance	C _{rss}			15.17		

Note: 1. Pulse width limited by maximum junction temperature

2. Pulse test: PW ≤ 300us, duty cycle ≤ 2%

3. For design AID only, not subject to production testing.

4. Switching time is essentially independent of operating temperature.



Typical Performance Characteristics

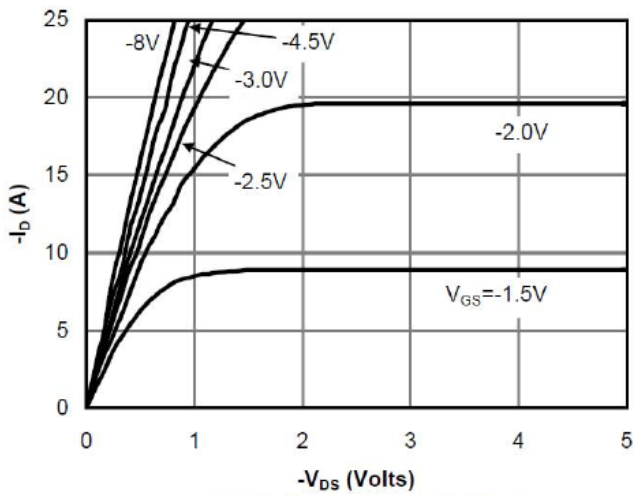


Fig 1: On-Region Characteristics

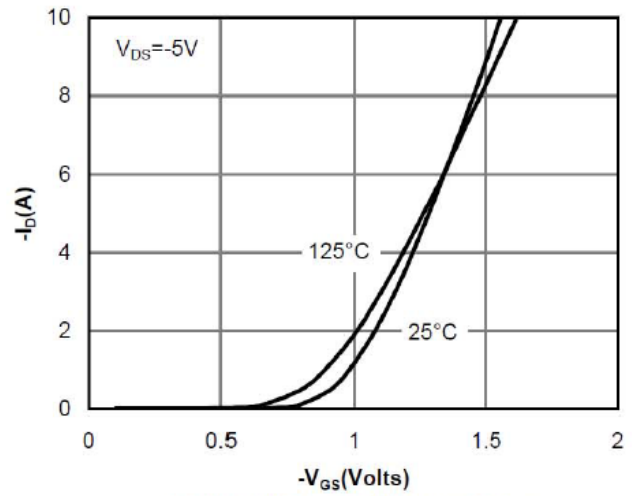


Figure 2: Transfer Characteristics

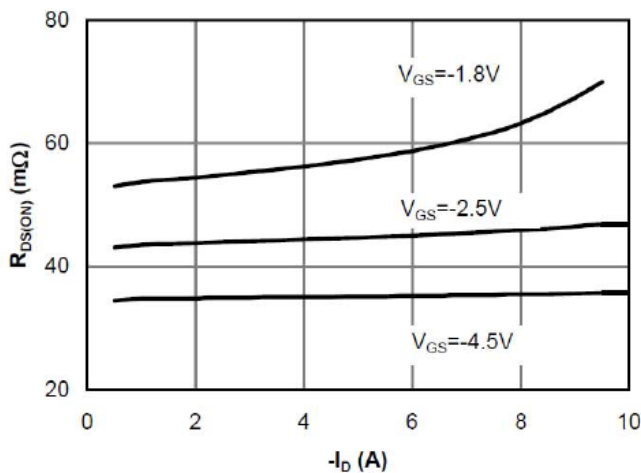


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

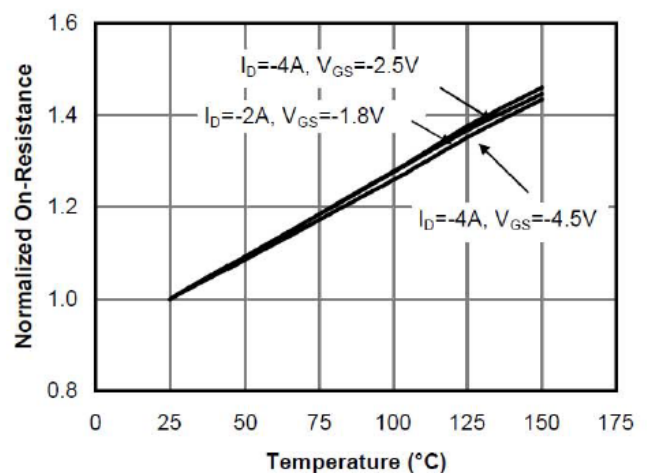


Figure 4: On-Resistance vs. Junction Temperature

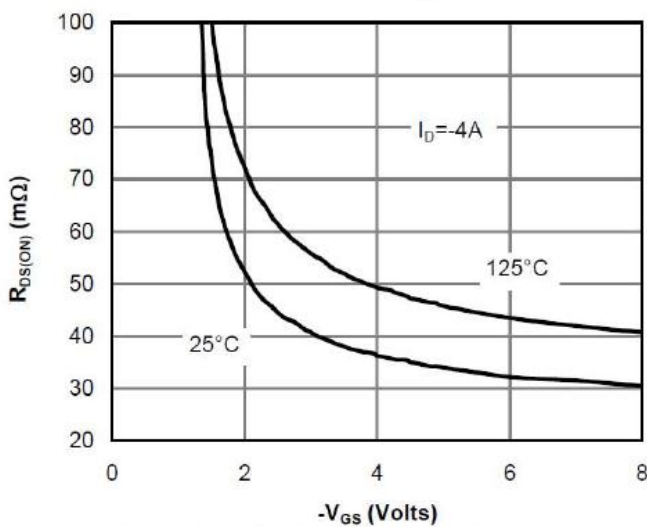


Figure 5: On-Resistance vs. Gate-Source Voltage

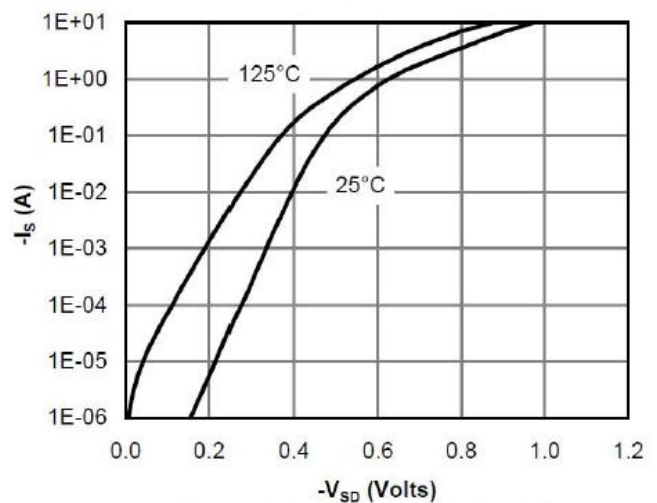


Figure 6: Body-Diode Characteristics



Typical Performance Characteristics

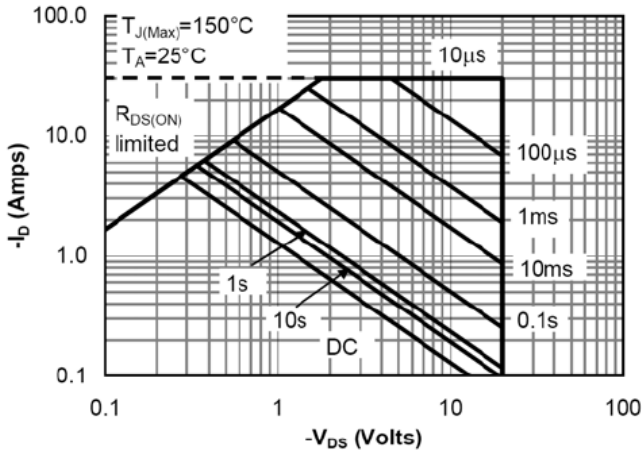


Figure 7: Maximum Forward Biased Safe Operating Area

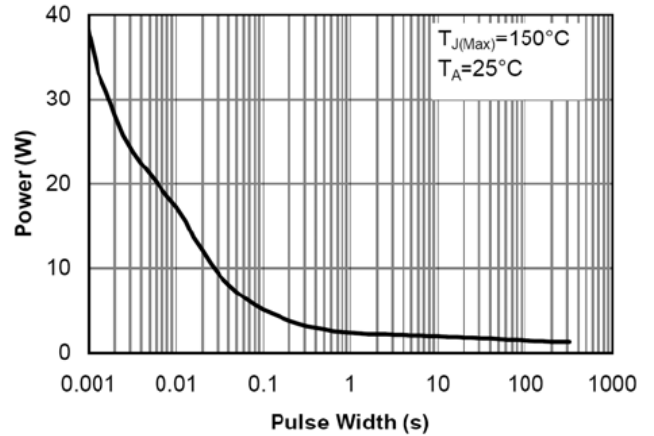


Figure 8: Single Pulse Power Rating Junction-to-Ambient

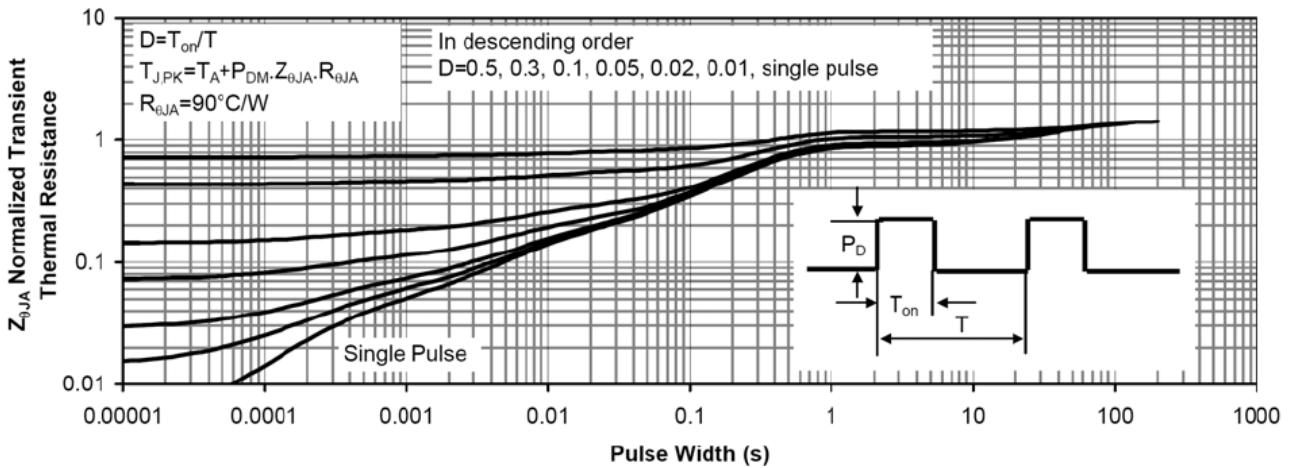


Figure 9: Normalized Maximum Transient Thermal Impedance

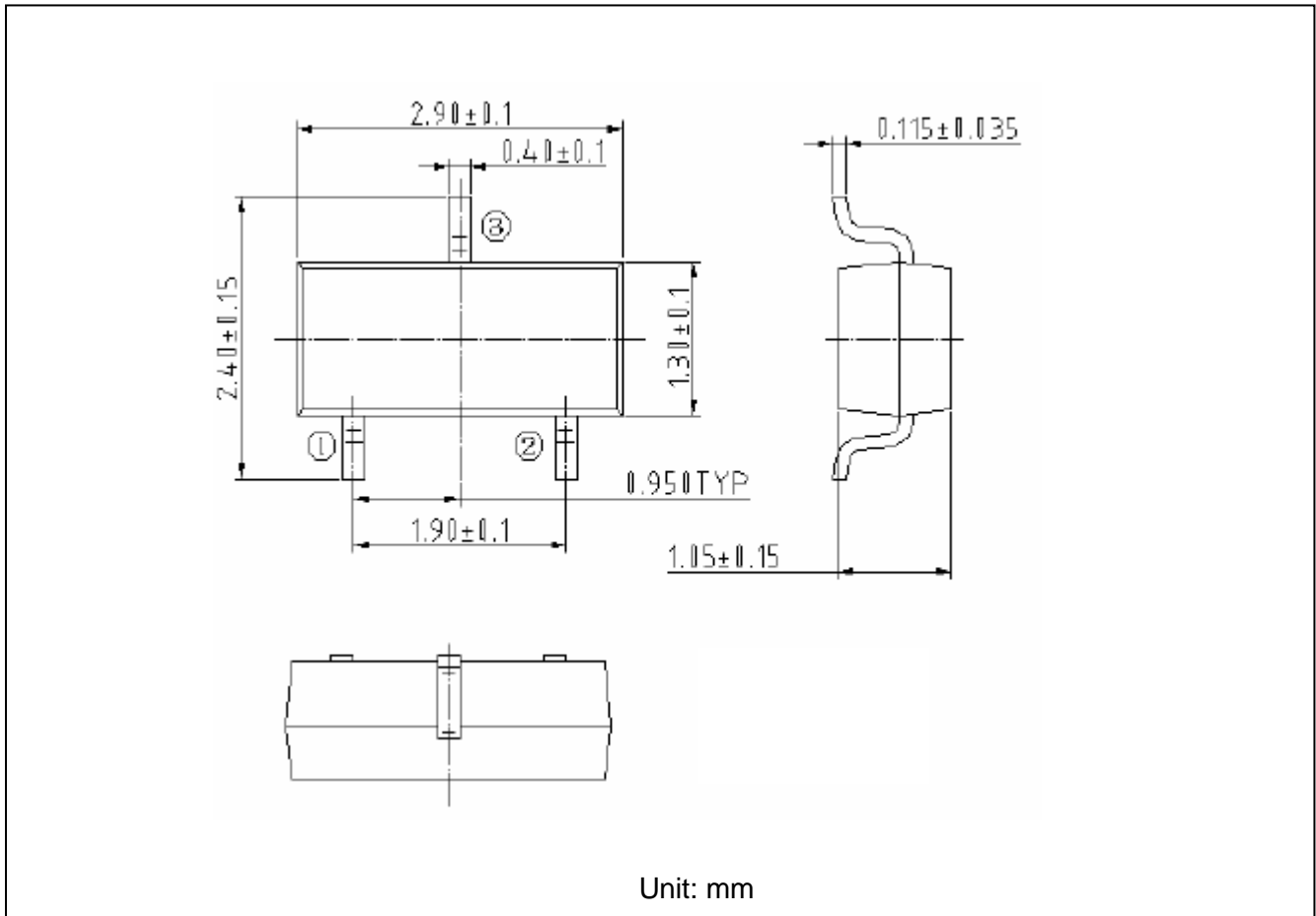


ACE2305B

P-Channel Enhancement Mode Field Effect Transistor

Packing Information

SOT-23-3L





ACE2305B

P-Channel Enhancement Mode Field Effect Transistor

Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As used herein:

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 whose 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.

ACE Technology Co., LTD.
<http://www.ace-ele.com/>