ACE3401B

P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE3401B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation gate voltages as low as 2.5V. This device is suitable for use as a load switch or other general applications.

Features

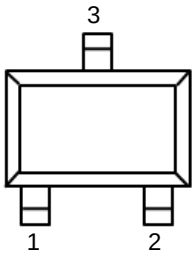
- V_{DS}(V)=-30V, I_D=-4A
- $R_{DS(ON)}$<43mΩ @ V_{GS}=-10V

Absolute Maximum Ratings

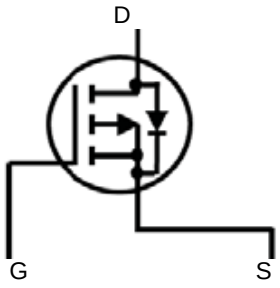
Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous)	T_A=25°C	I_D	-4	A
	T_A=70°C		-3.5	
Drain Current (Pulse)		I_{DM}	-30	A
Power Dissipation	T_A=25°C	P_D	1.4	W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

Packaging Type

SOT-23-3



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



Ordering information

ACE3401B XX + H

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

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	-30	-34		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.2A			43	mΩ
		V_{GS}=-4.5V, I_D=-4A			55	
		V_{GS}=-2.5V, I_D=-1A			110	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250uA	-0.7	-1.0	-1.3	V
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-4A		15		S
Drain Forward Voltage	V_{SD}	I_S=-1A,V_{GS}=0V		-0.78	-1	V
Switching characteristics(3)						
Total Gate Charge	Q_g	V_{DS}=-15V, I_D=-4A V_{GS}=-4.5V		6.4	8.3	nC
Gate-Source Charge	Q_{gs}			1.8	2.3	
Gate-Drain Charge	Q_{gd}			1.4	1.8	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-15V,R_L=3.6Ω I_D=-1A, V_{GEN}=-10V R_G=6Ω		11.4	22.72	ns
Turn-On Rise Time	t_f			2.3	4.6	
Turn-Off Delay Time	$t_{d(off)}$			34.9	69.8	
Turn-Off Fall Time	t_f			3.5	7	
Dynamic characteristics(3)						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V f=1.0MHz		826		pF
Output Capacitance	C_{oss}			90.7		
Reverse Transfer Capacitance	C_{rss}			53.2		

Note:

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while RθCA is determined by the user's board design.
2. Pulse Test: Pulse Width ≤μ300s, Duty Cycle≤ 2.0%

Typical Performance Characteristics

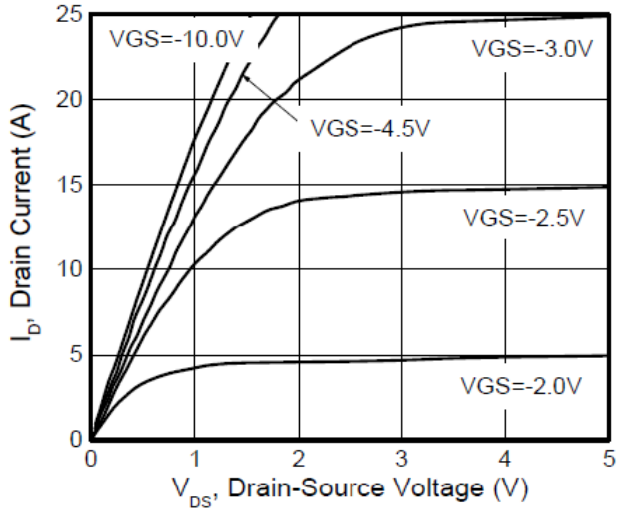


Figure 1. Output Characteristics

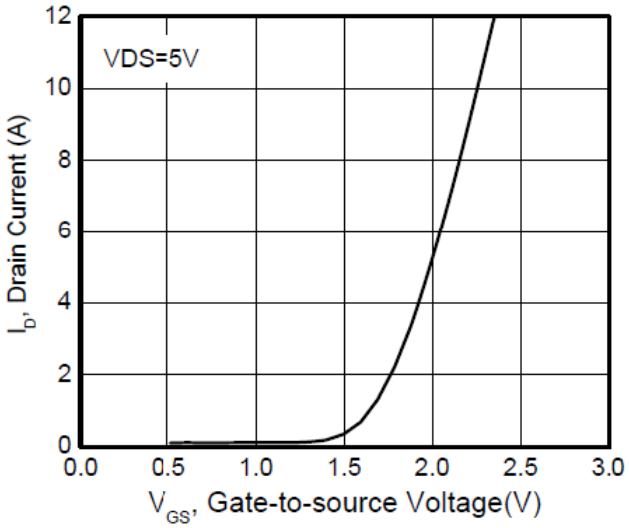


Figure 2. Transfer Characteristics

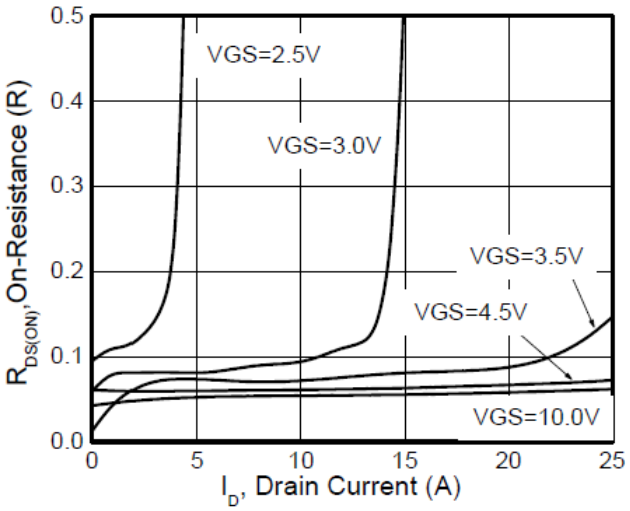


Figure 3. On Resistance VS I_d

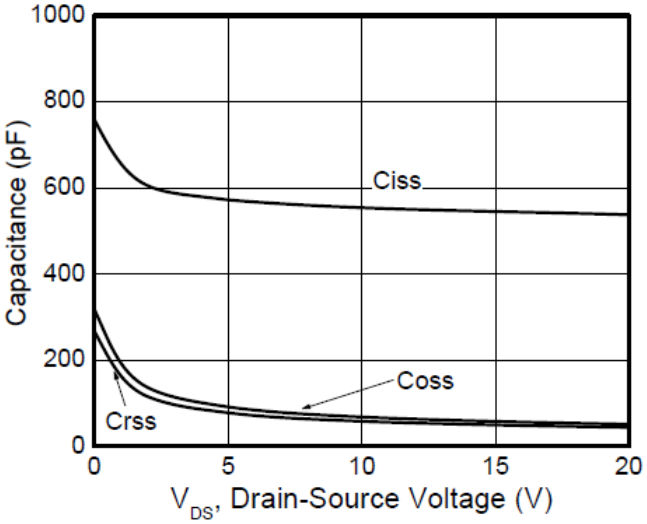


Figure 4. Capacitance

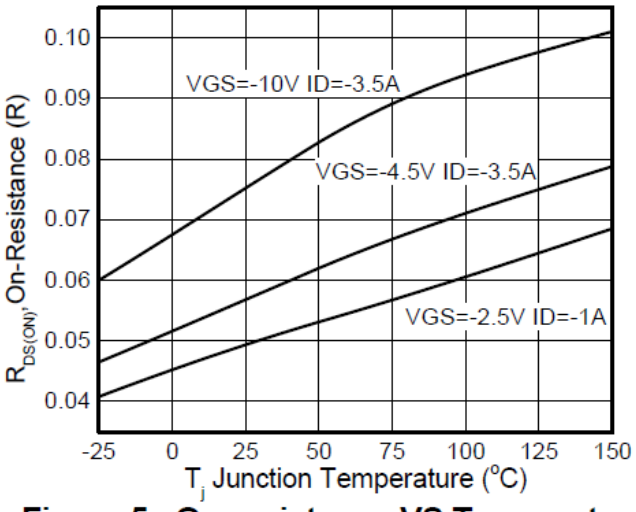


Figure 5 . On-resistance VS Temperature

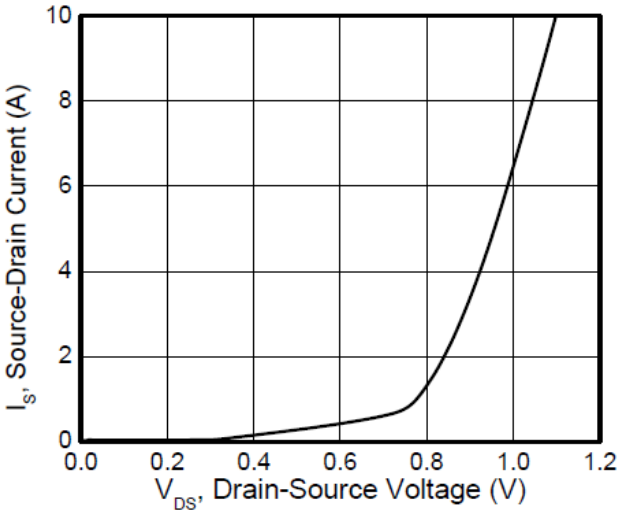


Figure 6. Body Diode Characteristics

Typical Performance Characteristics

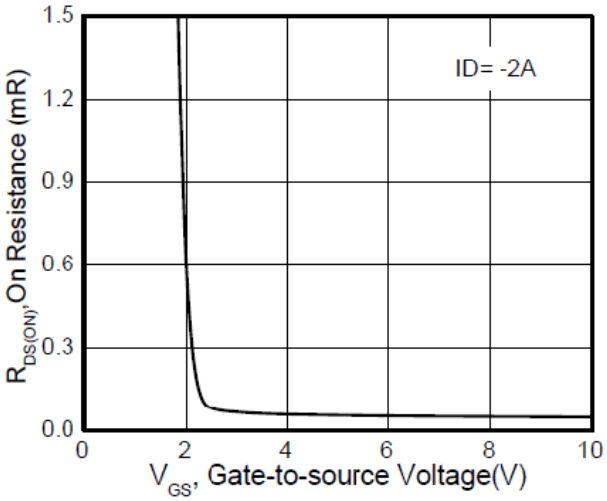


Figure 7. On Resistance VS V_{GS}

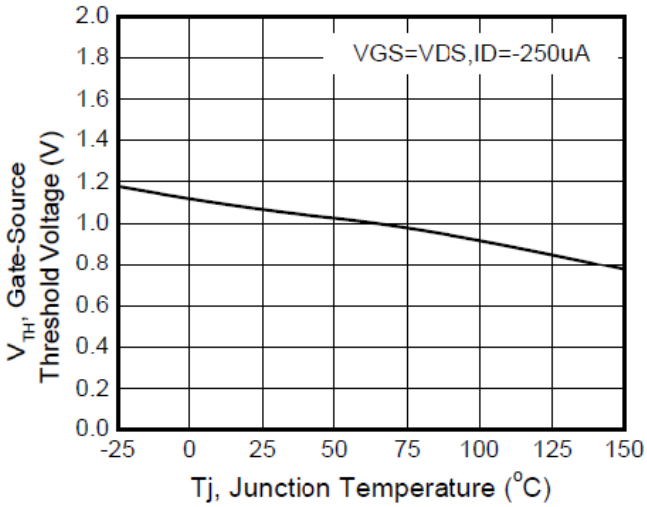
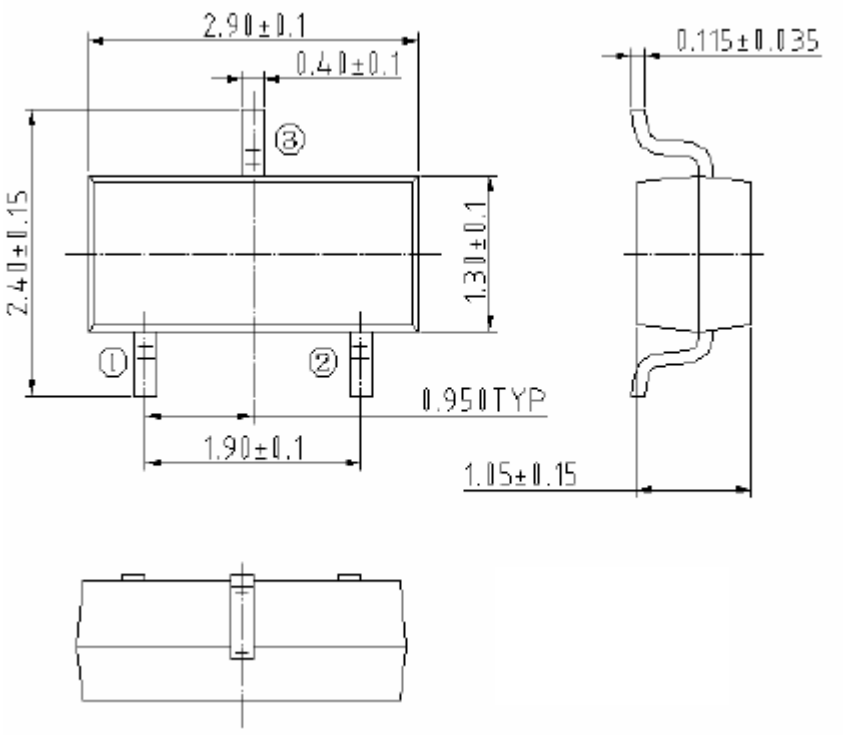


Figure 8. Gate Threshold Vs. Temperature

Packing Information

SOT-23-3



Unit: mm

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 sued 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 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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