



ACE4953B

Dual P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE4953B uses advanced trench technology to provide excellent $R_{DS(ON)}$, and ultra-low low gate charge. This device is suitable for use as a load switch or in PWM applications.

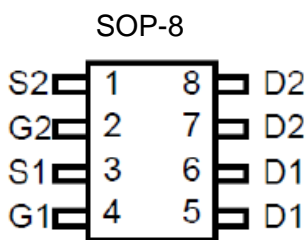
Features

- $V_{DS}(V)=-20V$
- $I_D=-5.5A$ ($V_{GS}=-10V$)
- $R_{DS(ON)}<55m\Omega$ ($V_{GS}=-10V$)
- $R_{DS(ON)}<58m\Omega$ ($V_{GS}=-4.5V$)
- $R_{DS(ON)}<80m\Omega$ ($V_{GS}=-2.5V$)

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Drain Current (Continuous) * AC	I_D	$T_A=25^\circ C$	-5.5
		$T_A=70^\circ C$	-4.4
Drain Current (Pulse) * B	I_{DM}	-25	A
Power Dissipation	P_D	$T_A=25^\circ C$	2
		$T_A=70^\circ C$	1.5
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

Packaging Type



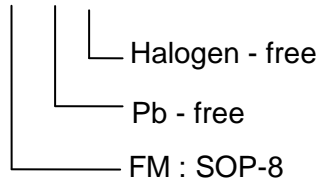


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Ordering information

ACE4953B XX + H



Electrical Characteristics

$T_A=25\text{ }^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
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 Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			100	nA
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-6A$		45	55	m Ω
		$V_{GS}=-4.5V, I_D=-4.7A$		51	58	
		$V_{GS}=-2.5V, I_D=-1A$		65	80	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.6	-0.8	-1.4	V
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-5.5A$		13		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=-1.7A$		-0.8	-1.1	V
Maximum Body-Diode Continuous Current	I_S				1.7	A
Switching						
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-4.5A$		8.92	11.6	nC
Gate-Source Charge	Q_{gs}			1.8	2.34	
Gate-Drain Charge	Q_{gd}			2.04	2.65	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-4.5V, V_{DS}=-10V, R_L=10\Omega, R_{GEN}=6\Omega, I_D=-1A$		16.08	32.16	ns
Turn-On Rise Time	t_r			5.28	10.56	
Turn-Off Delay Time	$t_{d(off)}$			37.6	75.2	
Turn- Off Rise Time	t_f			7.28	14.5	
Dynamic						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$		800	960	pF
Output Capacitance	C_{oss}			131		
Reverse Transfer Capacitance	C_{rss}			103		

Note: A. The value of $R_{\theta JA}$ is measured with the device mounted on 1*1in FR-4 board with 2oz Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

B. Repetitive rating, pulse width limited by junction temperature.

C. The current rating is based on the $t \leq 10s$ junction to ambient thermal resistance rating.



Typical Performance Characteristics

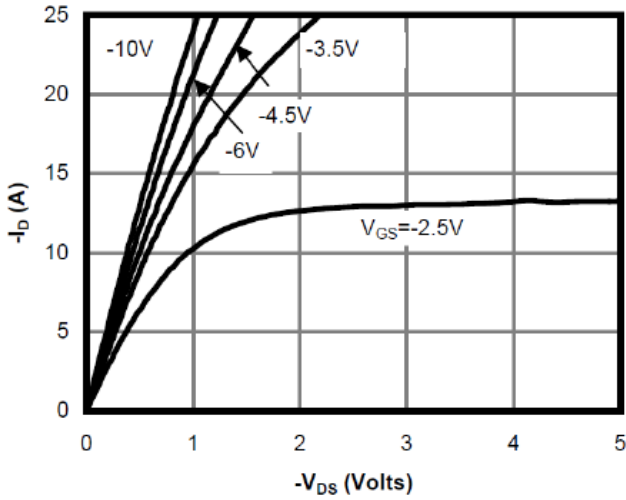


Fig 1: On-Region Characteristics

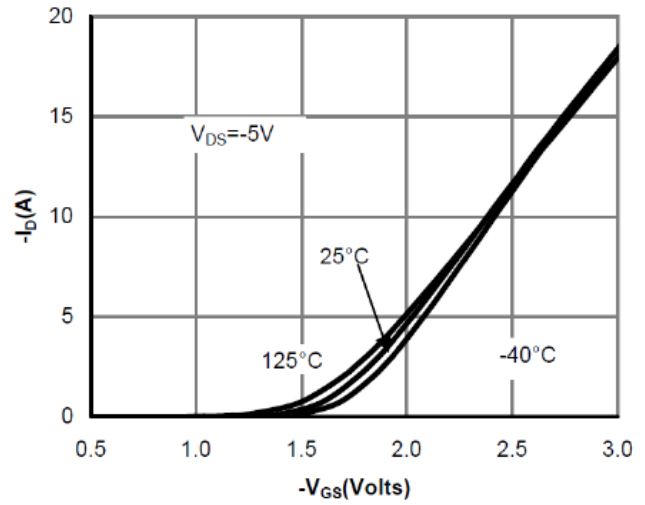


Figure 2: Transfer Characteristics

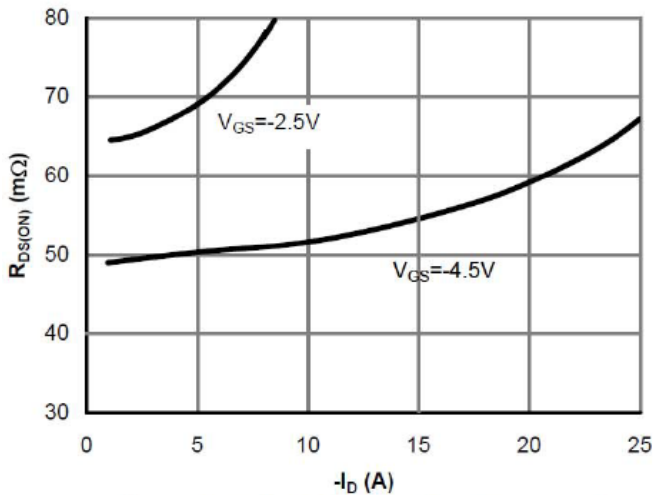


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

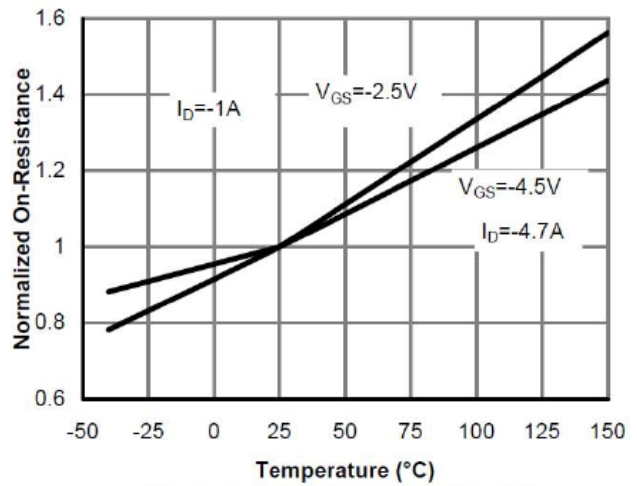


Figure 4: On-Resistance vs. Junction Temperature

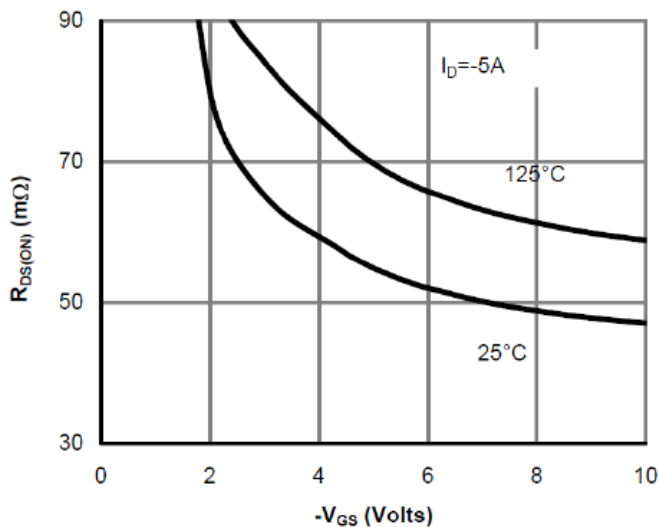


Figure 5: On-Resistance vs. Gate-Source Voltage

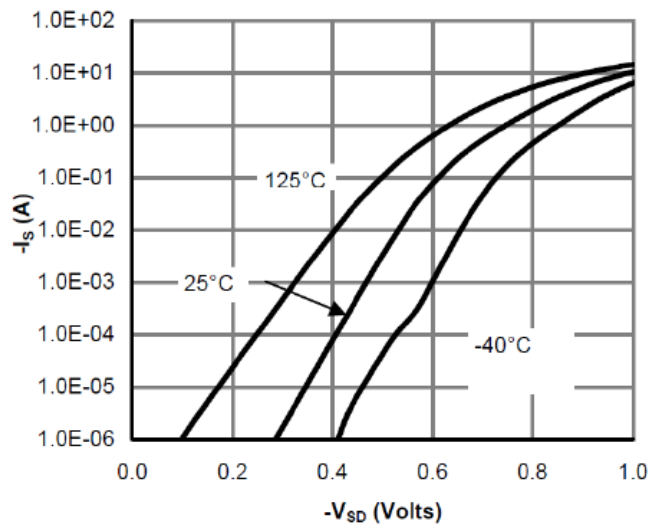


Figure 6: Body-Diode Characteristics



Typical Performance Characteristics

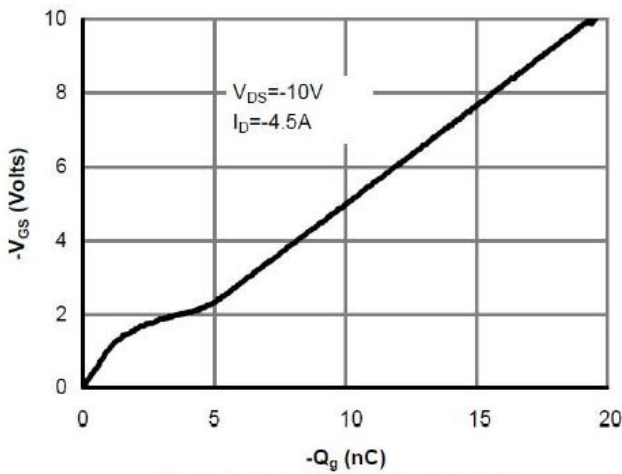


Figure 7: Gate-Charge Characteristics

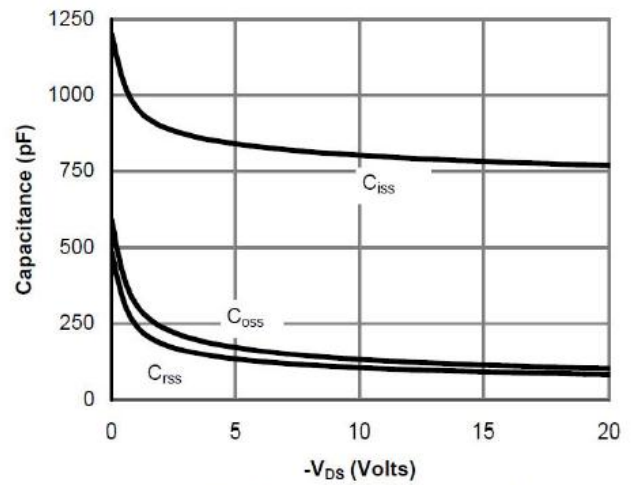


Figure 8: Capacitance Characteristics

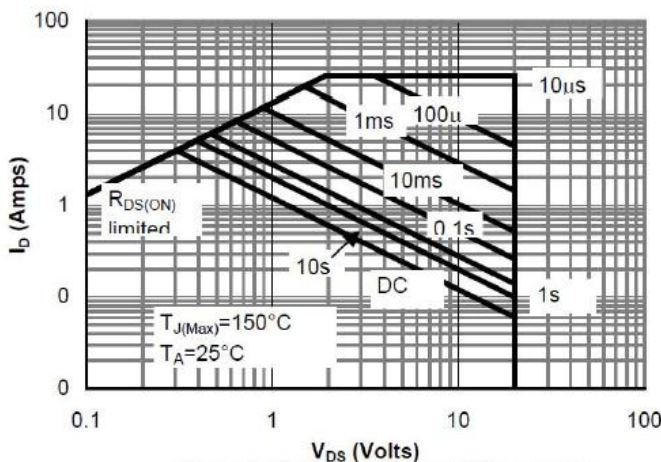


Figure 9: Maximum Forward Biased Safe Operating Area

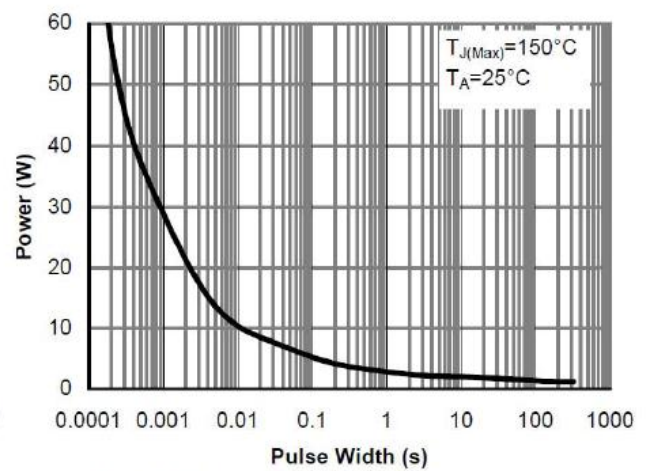


Figure 10: Single Pulse Power Rating Junction-to-Ambient

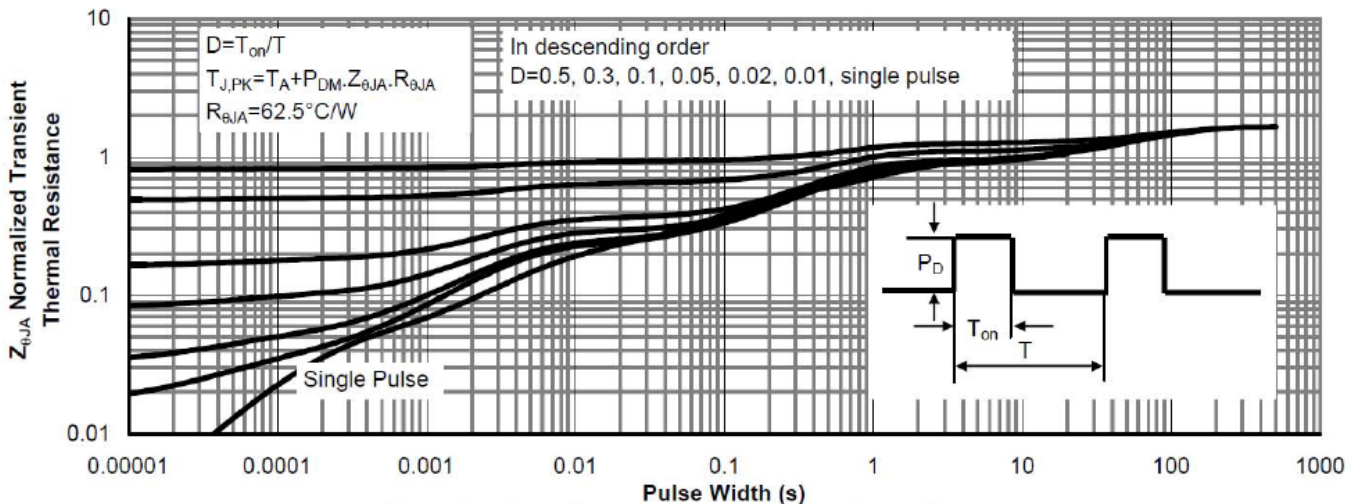


Figure 11: Normalized Maximum Transient Thermal Impedance

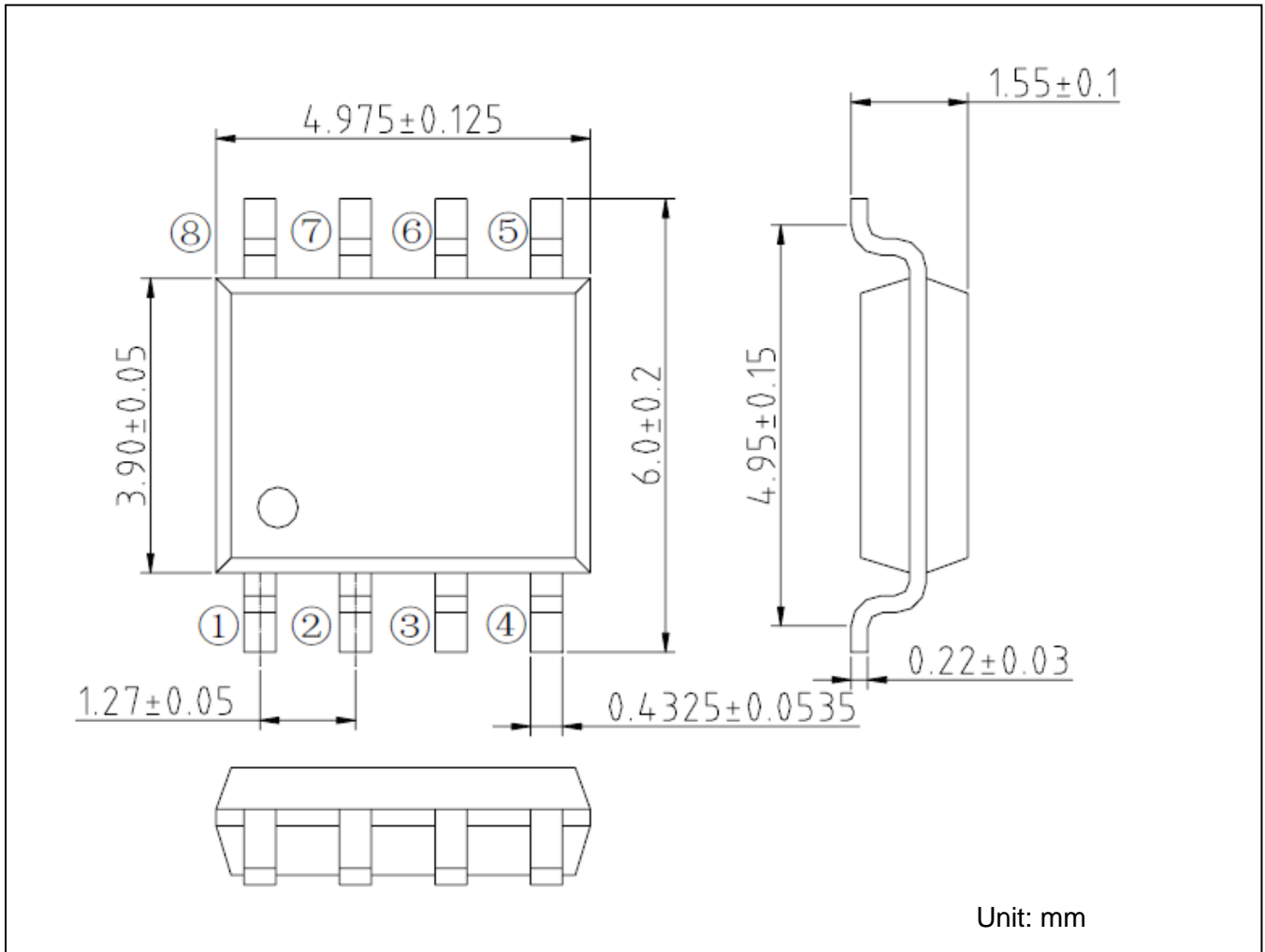


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Packing Information

SOP-8





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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 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.

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