ACE8810B

Common Drain N-Channel Enhancement Mode Field Effect Transistor with ESD Protection

Description

The ACE8810B uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. They offer operation over a wide gate drive range from 1.8V to 8V. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

Features

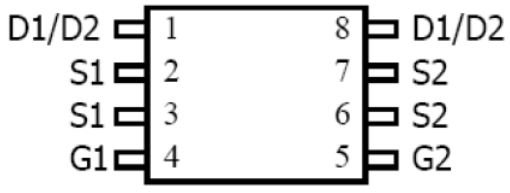
- V_{DS}(V)=20
- I_D=7A (V_{GS}=4.5V)
- $R_{DS(ON)}$＜21Ω (V_{GS}=4.5V)
- $R_{DS(ON)}$＜25Ω (V_{GS}=2.5V)
- $R_{DS(ON)}$＜33Ω (V_{GS}=1.8V)
- ESD Protected: 2,000V

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	7	A
	T_A=70°C		5.6	
Drain Current (Pulse) *B		I_{DM}	30	
Power Dissipation(1)	T_A=25°C	P_D	1.5	W
	T_A=70°C		1	
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

Packaging Type

TSSOP-8



Ordering information

ACE8810B XX + H

- Halogen - free
- Pb - free
- TM : TSSOP-8

Electrical Characteristics T_A=25 °C unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V		±3.5	±10	uA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=8A		14	21	mΩ
		V_{GS}=2.5V, I_D=7A		17	25	
		V_{GS}=1.8V, I_D=6A		22	33	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250uA	0.4	0.5	1	V
Forward Transconductance	g_{FS}	V_{DS}=5V, I_D=6.5A		13		S
Diode Forward Voltage	V_{SD}	I_{SD}=2.5A, V_{GS}=0V		0.79	1.6	V
Maximum Body-Diode Continuous Current	I_S				2.5	A
Switching						
Total Gate Charge	Q_g	V_{DS}=10V, I_D=8A V_{GS}=4.5V		13.8	17.94	nC
Gate-Source Charge	Q_{gs}			4.1	5.33	
Gate-Drain Charge	Q_{gd}			5.6	7.28	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=10V, V_{GS}=5V R_{GEN}=3Ω, R_L=1.5Ω		6.2	12.4	ns
Turn-On Rise Time	t_f			12.7	25.4	
Turn-Off Delay Time	$t_{d(off)}$			51.7	103.4	
Turn-Off Fall Time	t_f			16	32	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V f=1MHz		1160		pF
Output Capacitance	C_{oss}			104		
Reverse Transfer Capacitance	C_{rss}			29		

Note: A. 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.

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

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

Typical Performance Characteristics

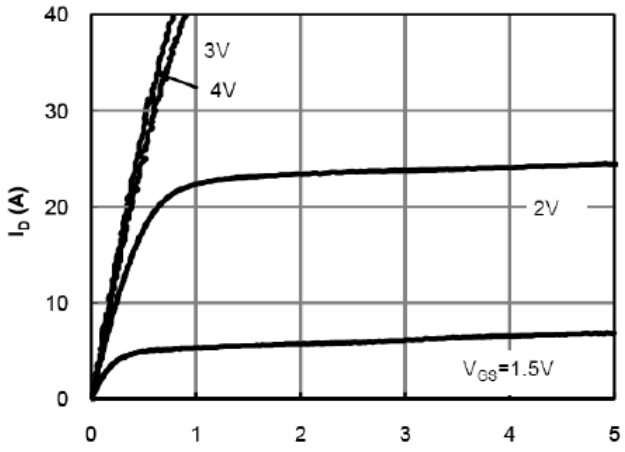


Fig 1: On-Region Characteristics

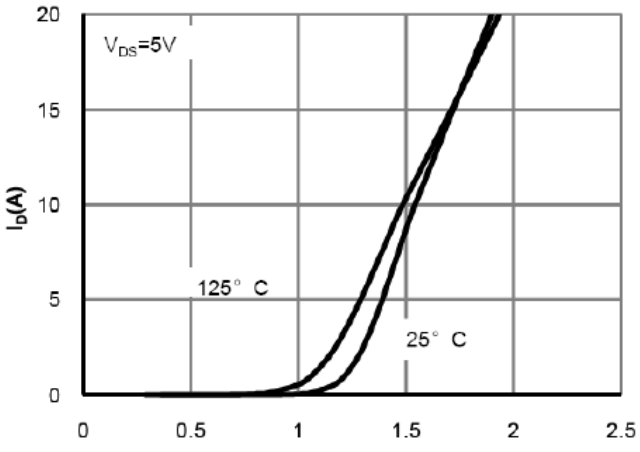


Figure 2: Transfer Characteristics

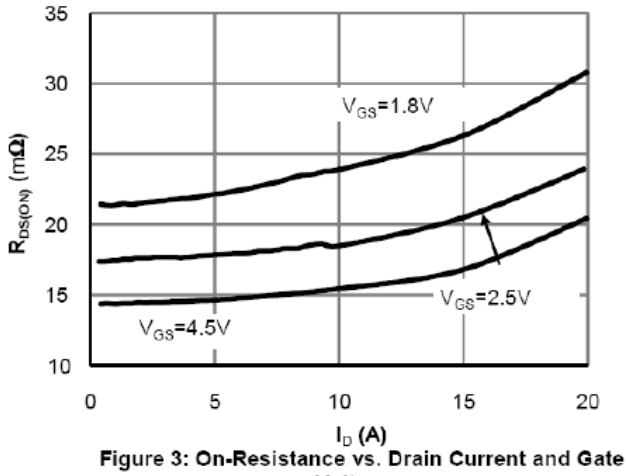


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

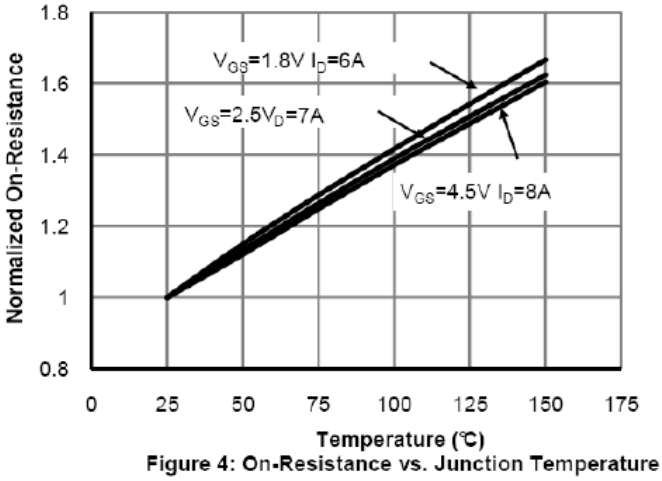


Figure 4: On-Resistance vs. Junction Temperature

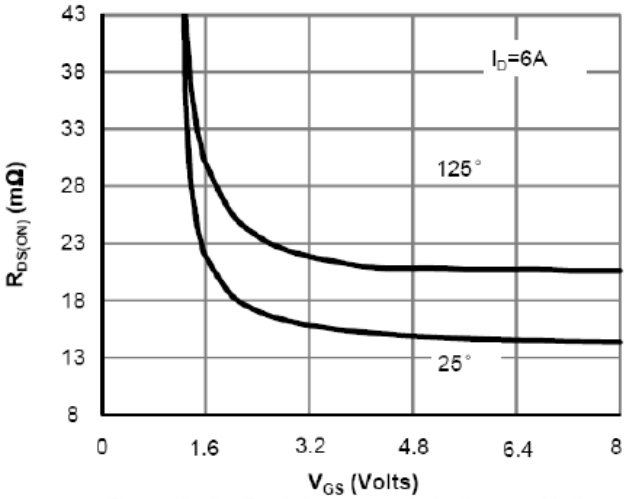


Figure 5: On-Resistance vs. Gate-Source Voltage

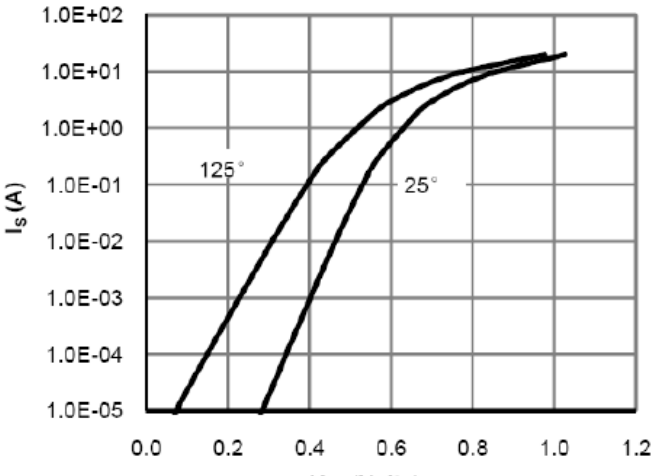


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics

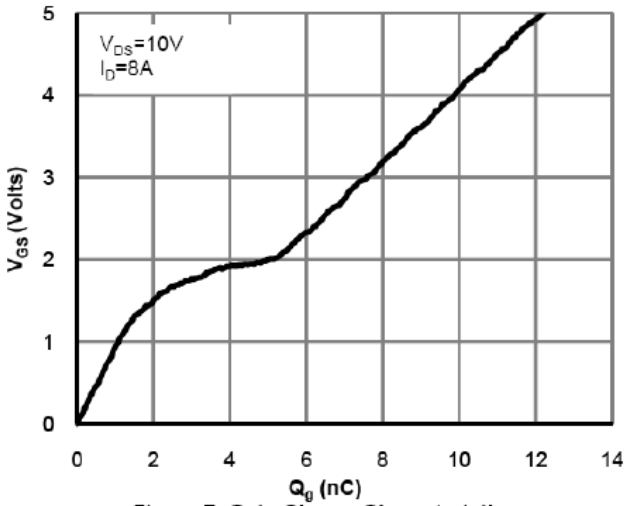


Figure 7: Gate-Charge Characteristics

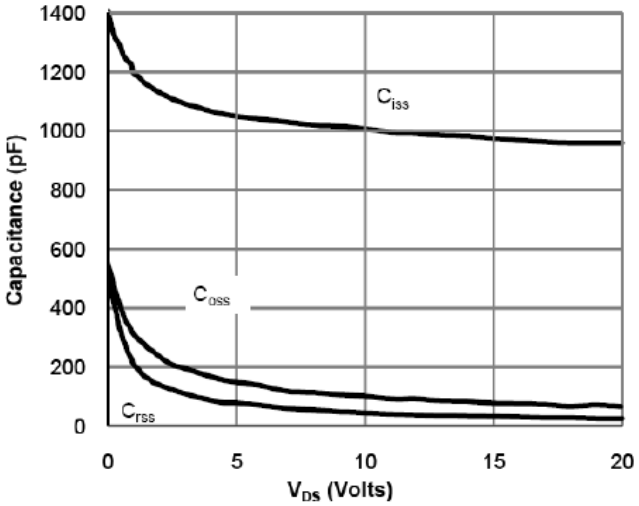


Figure 8: Capacitance Characteristics

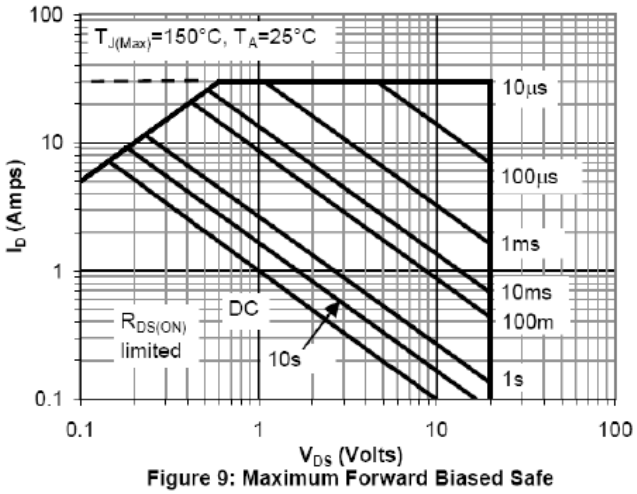


Figure 9: Maximum Forward Biased Safe Operating Area

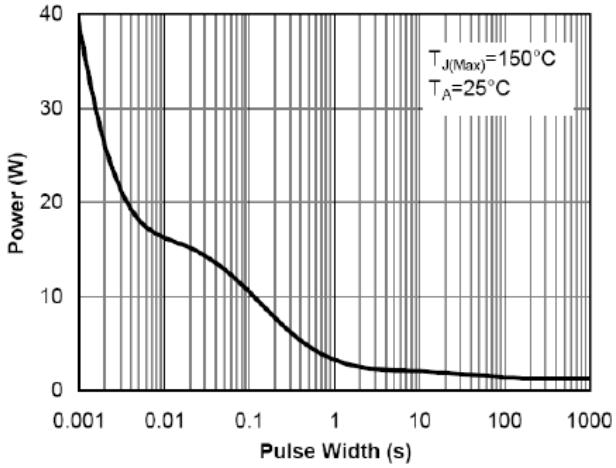


Figure 10: Single Pulse Power Rating Junction-to-Ambient

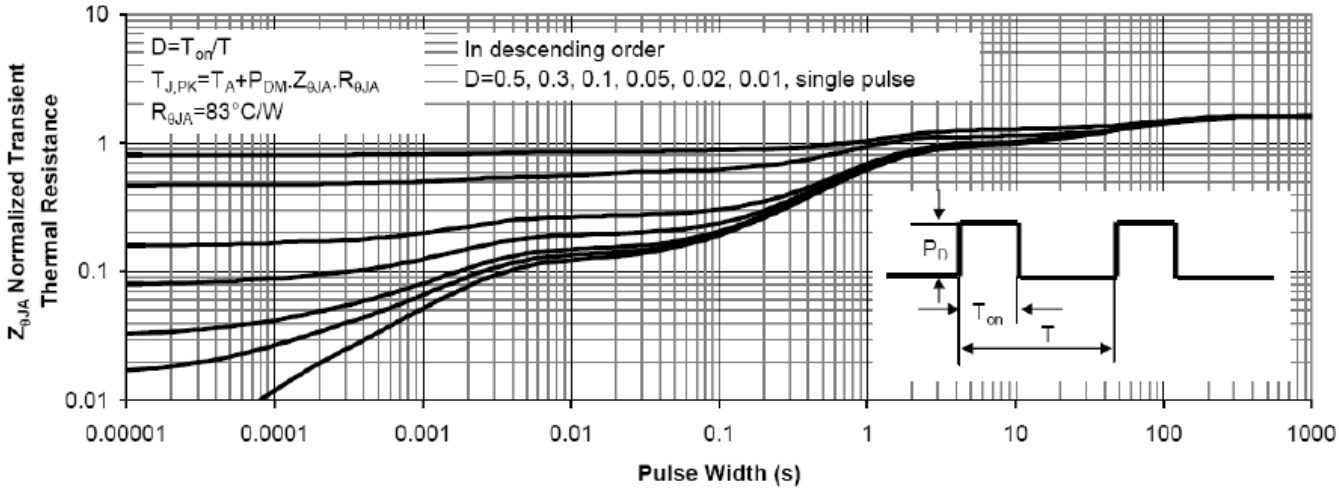
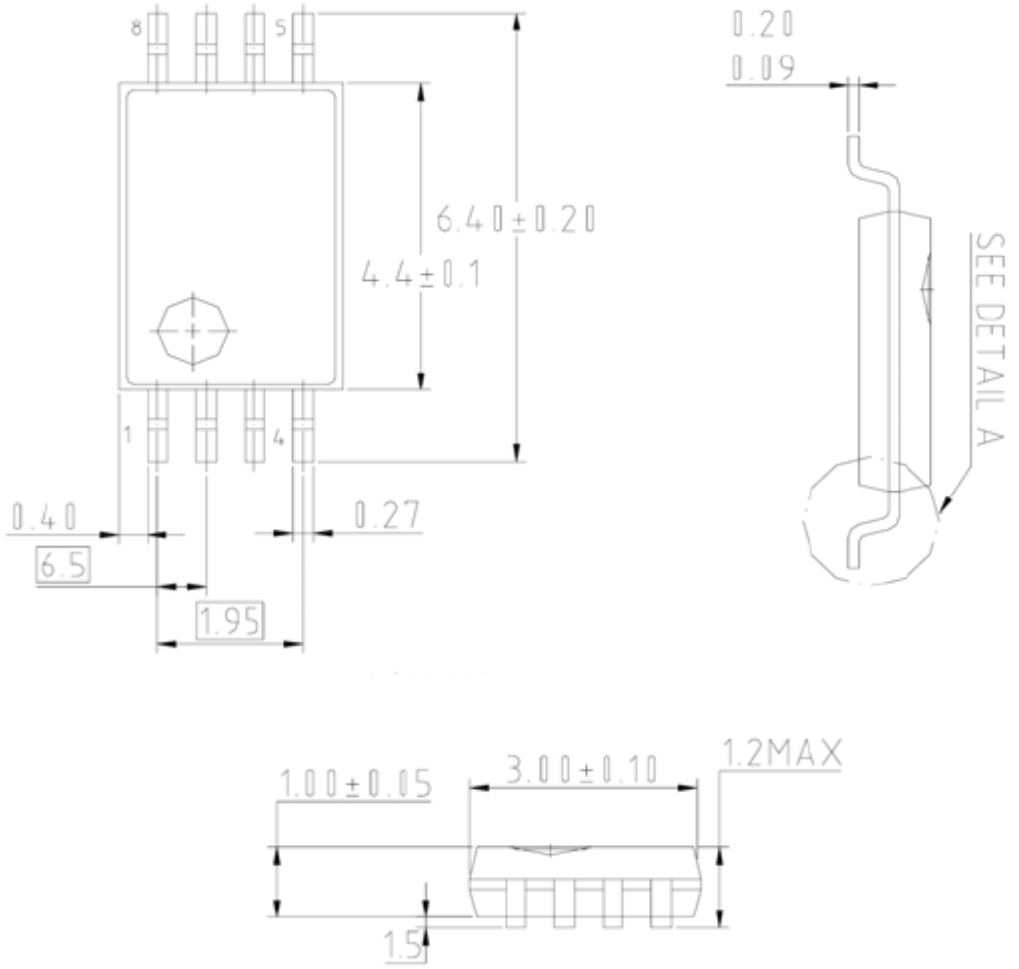


Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

TSSOP-8



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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