ACE11H1PB

Dual P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE11H1PB uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

Features

- V_{DS} (V) = -20V
- I_D (V_{GS} = -4.5V)= -3A
- $R_{DS(ON)}$<85mΩ @ V_{GS}= -4.5V
- $R_{DS(ON)}$<115mΩ @ V_{GS}= -2.5V
- $R_{DS(ON)}$<150mΩ @ V_{GS}= -1.8V
- SOT23-6 Package

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 °C	I_D	-3	A
	T_A=70 °C		-2.4	
Drain Current (Pulse) [C]		I_{DM}	-13	
Power Dissipation [B]	T_A=25 °C	P_D	1.15	W
	T_A=70 °C		0.73	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

A. The value of $R_{θJA}$ is measured with the device mounted on $1in^2$ 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. The power dissipation PD is based on $T_{J(MAX)}$=150℃, using≤10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.

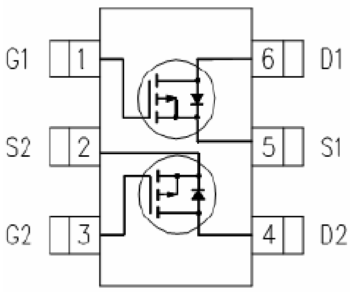
D. The $R_{θJA}$ is the sum of the thermal impedence from junction to lead $R_{θJL}$ and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300µs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedence which is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.

Packaging Type

SOT23-6



Ordering information

ACE11H1PB XX + H

Halogen - free

Pb - free

GM: SOT23-6

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= -250μA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20 V , V_{GS} = 0V			-1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS} , I_{DS}= -250μA	-0.5	-0.6	-1	V
Gate Leakage Current	I_{GSS}	V_{GS}= ±12V , V_{DS}=0V			±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = -4.5V , I_D= -2.8A		80	85	mΩ
		V_{GS} = -2.5V , I_D= -2A		95	115	
		V_{GS} = -1.8V , I_D= -2A		119	150	
Forward Transconductance	g_{FS}	V_{DS}= -5V , I_D= -2.5A		13		S
Diode Forward Voltage	V_{SD}	I_{SD}= -1.6A , V_{GS}= 0V		-0.81	-1.0	V
Maximum Body-Diode Continuous Current	I_S				-1.6	A
Switching						
Total Gate Charge	Q_g	V_{DS} = -6V, I_D = -2.8A V_{GS} = -4.5V		6.6	8.6	nC
Gate-Source Charge	Q_{gs}			0.3	0.4	
Gate-Drain Charge	Q_{gd}			1.3	1.7	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}= -6V, R_L=6Ω I_D= -1A, V_{GEN} = -4.5V R_G= 6Ω		9.7	19.4	ns
Turn-On Rise Time	t_r			3.6	7.1	
Turn-Off Delay Time	$t_{d(off)}$			33.3	66.6	
Turn-Off Fall Time	t_f			4.5	9	
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}= -6V f= 1.0MHz		589		pF
Output Capacitance	C_{oss}			91.2		
Reverse Transfer Capacitance	C_{rss}			67.2		

Typical Performance Characteristics

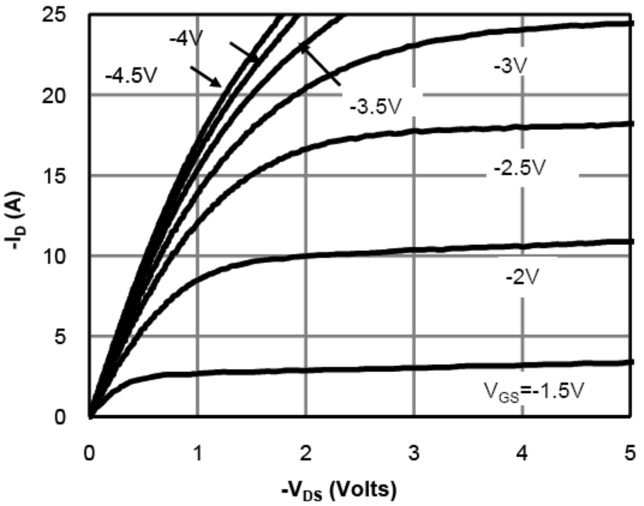


Figure 1: On-Region Characteristics

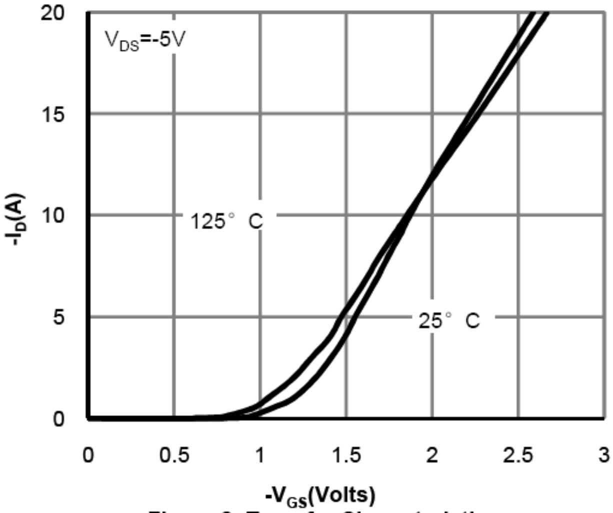


Figure 2: Transfer Characteristics

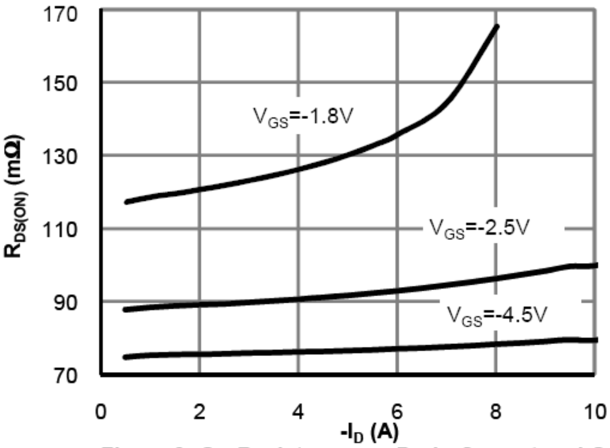


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

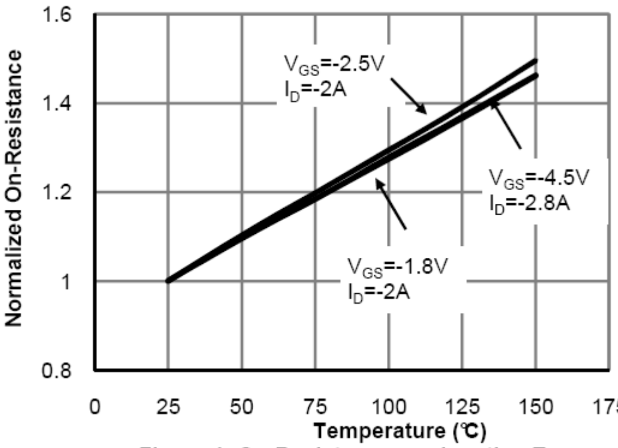


Figure 4: On-Resistance vs. Junction Temperature

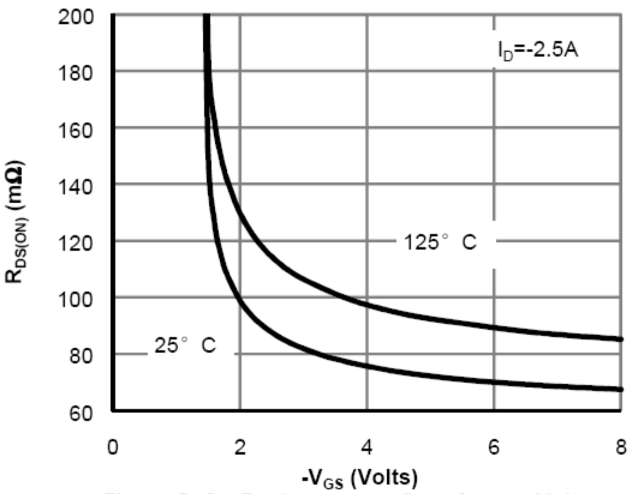


Figure 5: On-Resistance vs. Gate-Source Voltage

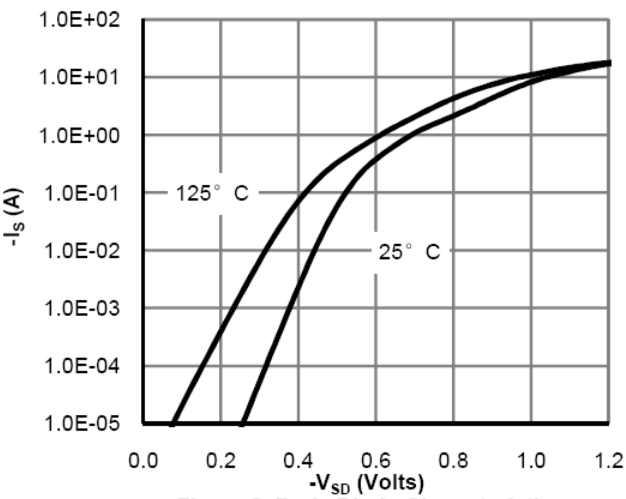


Figure 6: Body-Diode Characteristics

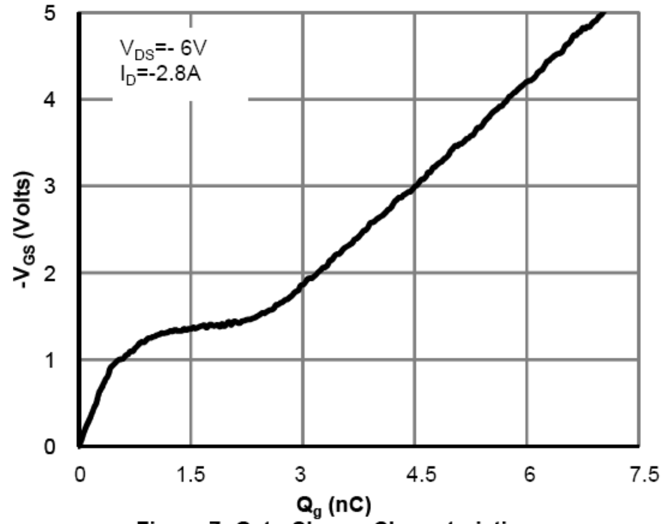


Figure 7: Gate-Charge Characteristics

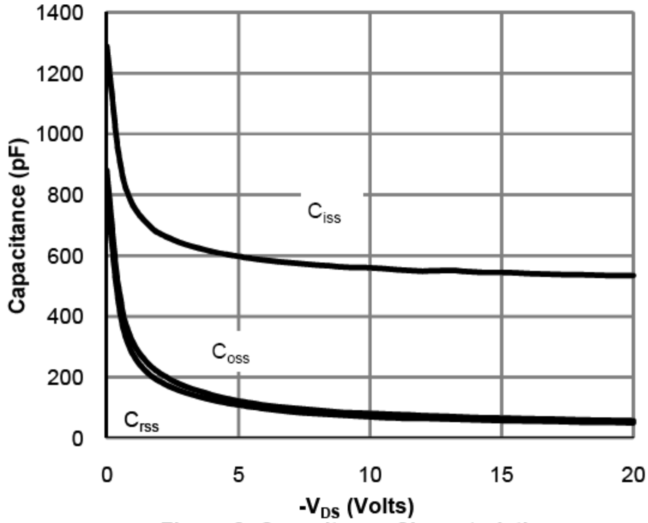


Figure 8: Capacitance Characteristics

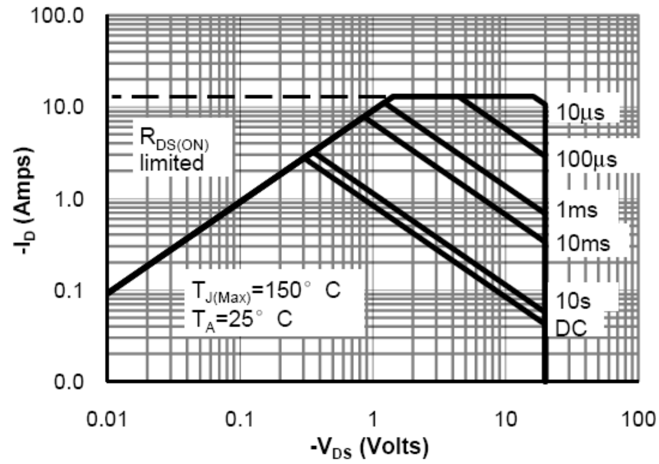


Figure 9: Maximum Forward Biased Safe Operating Area

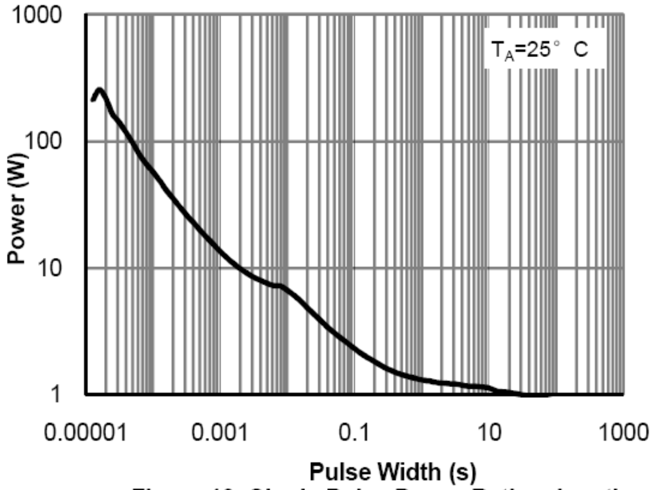


Figure 10: Single Pulse Power Rating Junction-to-Ambient

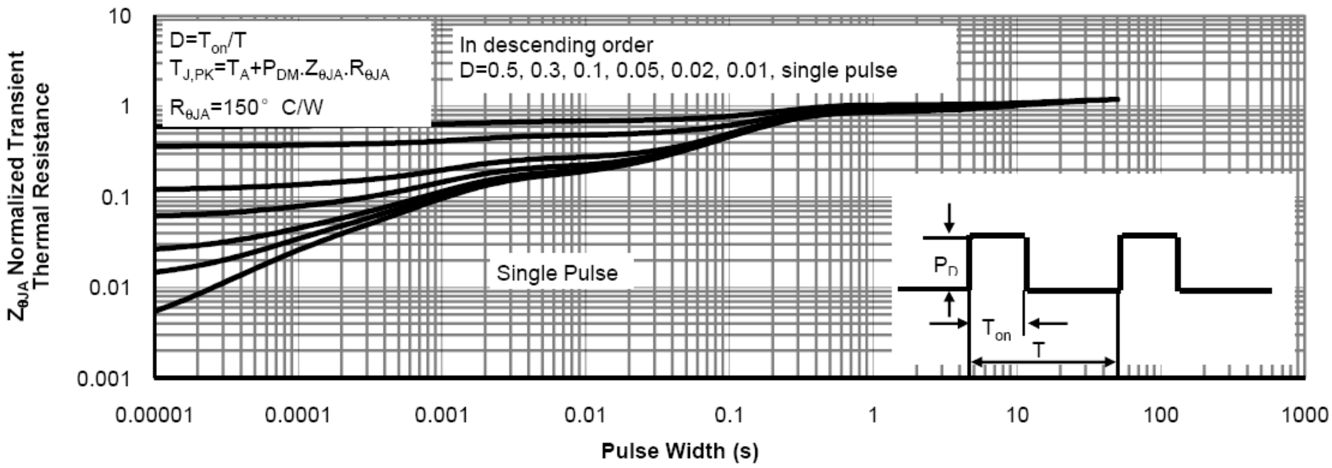
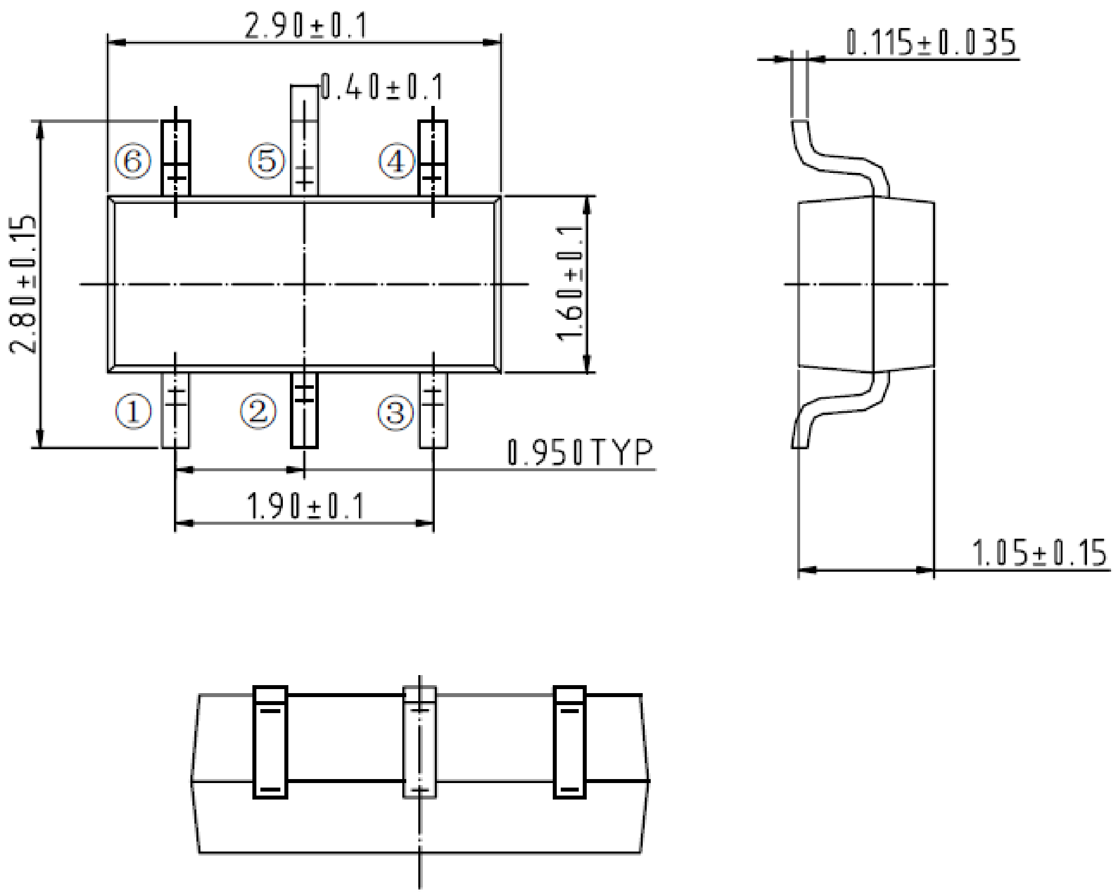


Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

SOT23-6



Notes

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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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