ACE4409B

P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE4409B 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

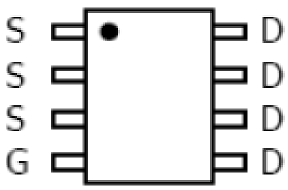
- V_{DS}(V)=-30V
- I_D=-14A (V_{GS}=-10V)
- $R_{DS(ON)}$ < 11mΩ (V_{GS}=-10V)
- $R_{DS(ON)}$ < 13mΩ (V_{GS}=-4.5V)

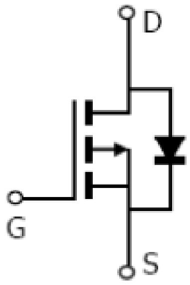
Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current (Continuous) * AC	T_A=25°C	I_D	-14	A
	T_A=70°C		-11	
Drain Current (Pulse) * B		I_{DM}	-70	
Power Dissipation	T_A=25°C	P_D	3	W
	T_A=70°C		2.1	
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

Packaging Type

SOP-8





Ordering information

ACE4409B XX + H

Halogen - free

Pb - free

FM : SOP-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	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V			-1	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-15A		8	11	mΩ
		V_{GS}=-4.5V, I_D=-10A		10	13	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-1	-1.3	-2	V
Forward Transconductance	g_{FS}	V_{GS}=-5V, I_D=-15A		50		S
Diode Forward Voltage	V_{SD}	I_{SD}=-1A, V_{GS}=0V		-0.71	-1	V
Maximum Body-Diode Continuous Current	I_S				-2.7	A
Switching						
Total Gate Charge	Q_g	V_{DS}=-15V, I_D=-15A V_{GS}=-10V		37.08	48.2	nC
Gate-Source Charge	Q_{gs}			10.12	13.16	
Gate-Drain Charge	Q_{gd}			11.24	14.61	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=-15V, R_L=15Ω, V_{GS}=-10V, R_{GEN}=6Ω		19.52	39.04	ns
Turn-On Rise Time	t_r			10.12	20.34	
Turn-Off Delay Time	$t_{d(off)}$			137.6	275.2	
Turn-Off Fall Time	t_f			55.32	110.64	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V f=1MHz		3887.7		pF
Output Capacitance	C_{oss}			577.33		
Reverse Transfer Capacitance	C_{rss}			42.72		

Note: 1. The value of R θ_{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.

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

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

Typical Performance Characteristics

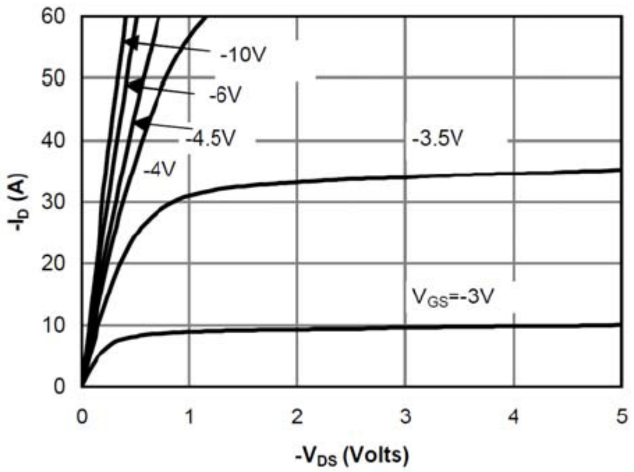


Fig 1: On-Region Characteristics

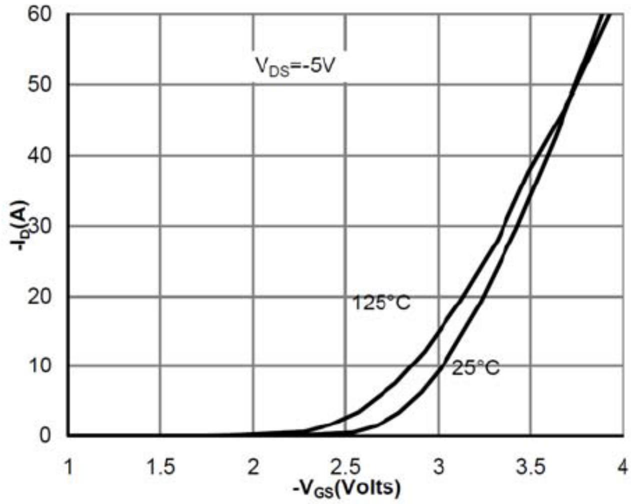


Figure 2: Transfer Characteristics

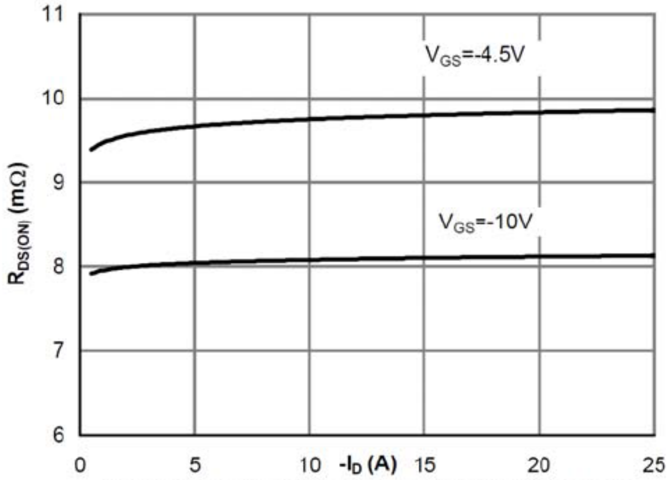


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

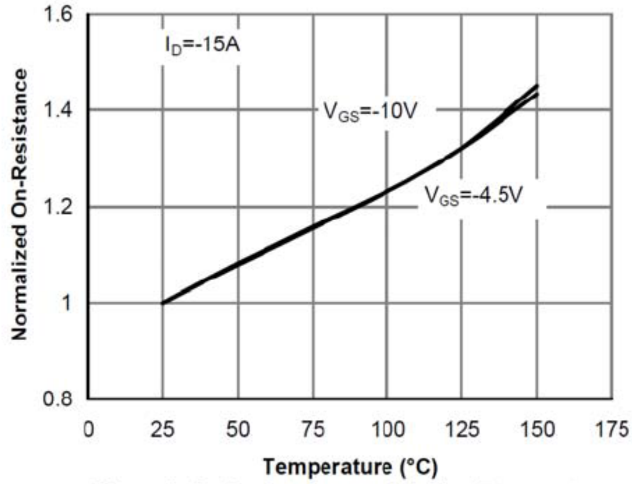


Figure 4: On-Resistance vs. Junction Temperature

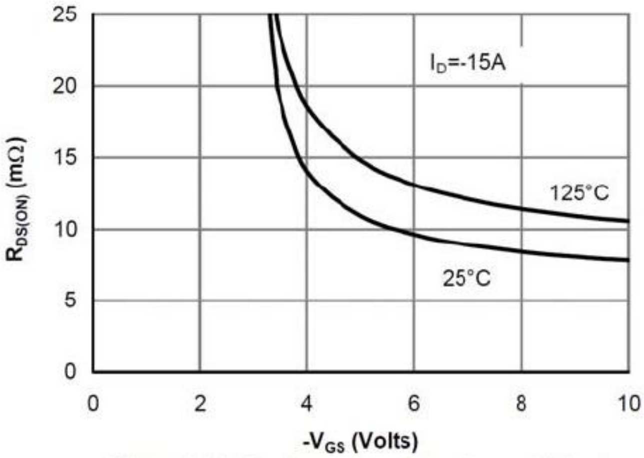


Figure 5: On-Resistance vs. Gate-Source Voltage

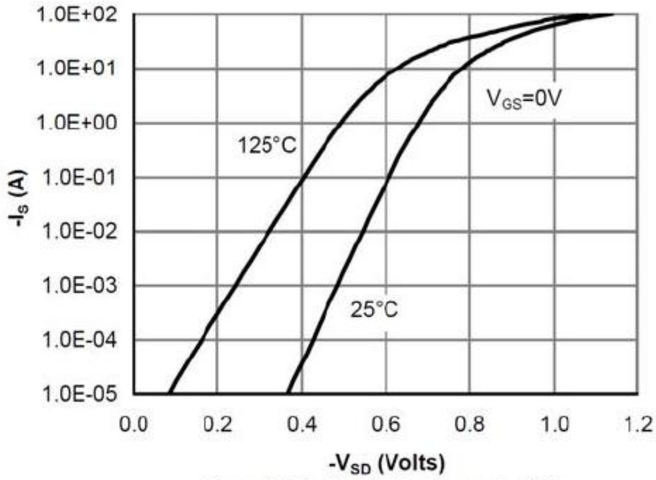


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics

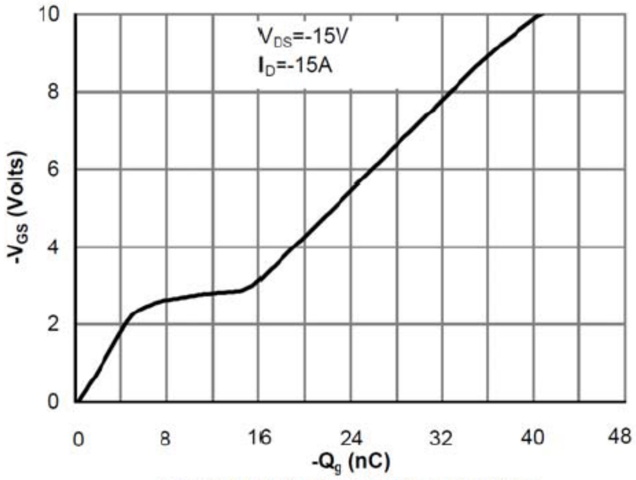


Figure 7: Gate-Charge Characteristics

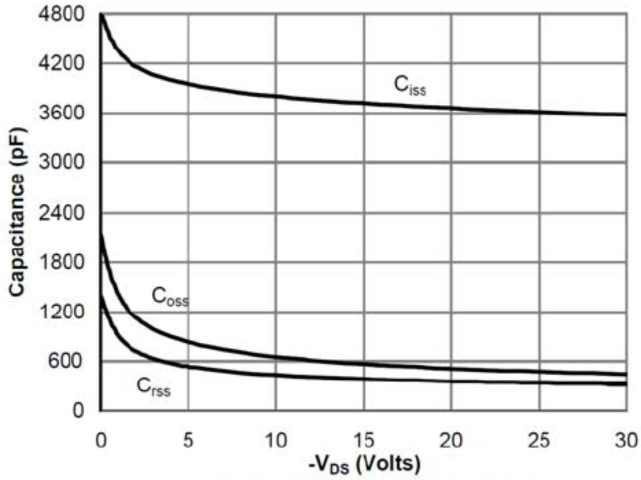


Figure 8: Capacitance Characteristics

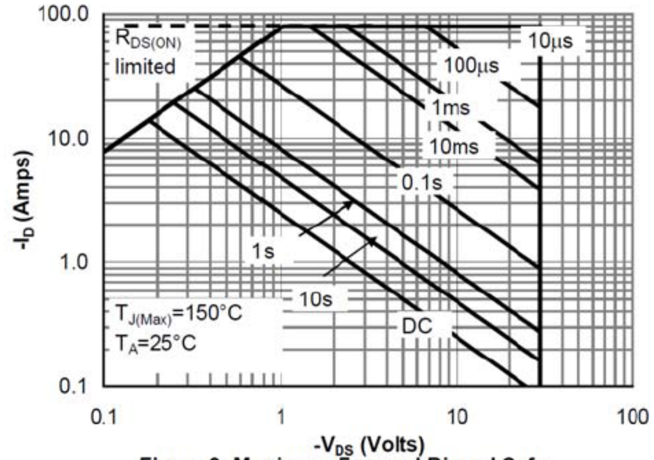


Figure 9: Maximum Forward Biased Safe Operating Area

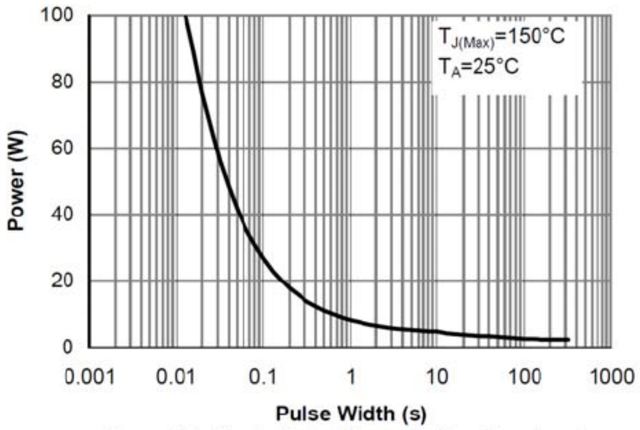


Figure 10: Single Pulse Power Rating Junction-to-Ambient

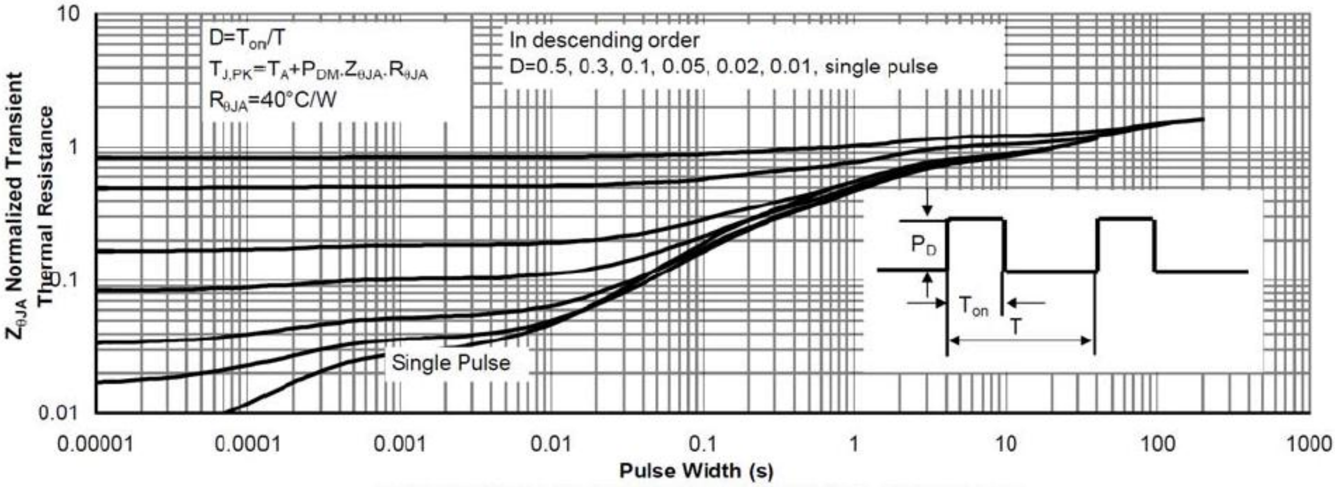
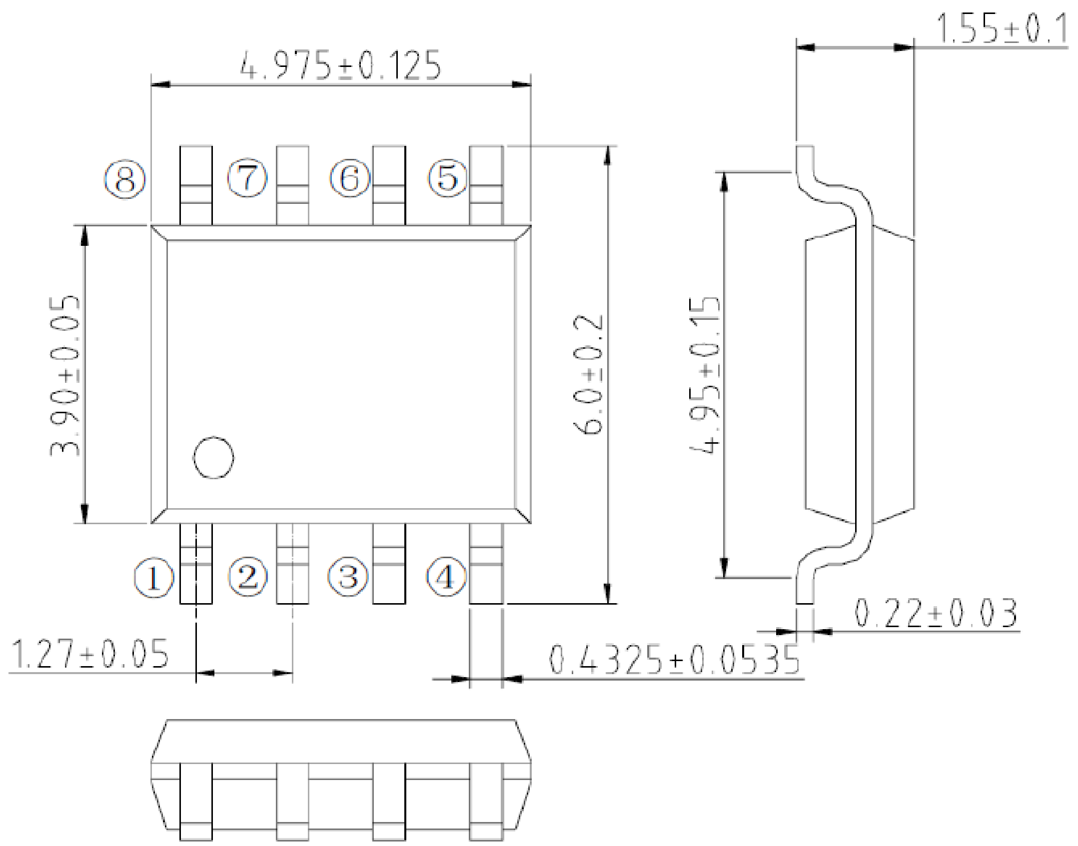


Figure 11: Normalized Maximum Transient Thermal Impedance

Packing Information

SOP-8



Unit: mm

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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