ACE7409B

P-Channel 30-V (D-S) MOSFET

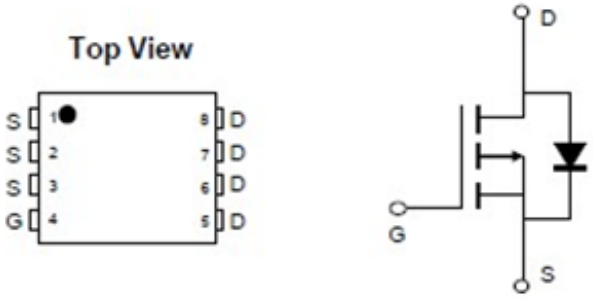
Description

The ACE7409B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. This device is suitable for use as a high side switch in SMPS and general purpose applications.

Features

- V_{DS} (V) = -30 V
- I_D =-30A (at V_{GS}=-10V)
- < 14mΩ (V_{GS}=-10V)
- < 20mΩ (V_{GS}=-4.5V)

Packaging Type



Ordering information

ACE7333M XX + H

- Halogen - free
- Pb - free
- NN : DFN3*3-8L

Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous)[a]	T_A=25°C	I_D	30	A
	T_A=70°C		22	
Drain Current (Pulse)[c]		I_{DM}	82	
Power Dissipation [b]	T_A=25°C	P_D	25	W
	T_A=70°C		16	
Operating Temperature/ Storage Temperature		T_J,T_{STG}	-55 to 150	°C

Electrical Characteristics @T_A=25℃ 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 Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = -250μ A	-1	-1.3	-3	V
Gate Leakage Current	I_{GSS}	V_{GS} =±20V,V_{DS} = 0V			±100	nA
Drain-Source On-state Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-15A		11	14	mΩ
		V_{GS}=-4.5V,I_D=-10A		13	20	
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-8A		20		S
Diode Forward Voltage	V_{SD}	I_S=-2.1A ,V_{GS}=0V		-0.8	-1.3	V
Switching						
Total Gate Charge	Q_g	V_{GS}=-10V,V_{DS}=-15V I_D=-11A		68.12		nC
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			10.12		
Turn-On Delay Time	$t_{d(on)}$	V_{GEN}=-10V,V_{DS}=-15V R_L=15Ω, R_{GEN}=6Ω, I_D=-1A		20.4		ns
Turn-On Rise Time	t_f			8.96		
Turn-Off Delay Time	$t_{d(off)}$			131.8		
Turn-Off Fall Time	t_f			47.2		
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V ,V_{DS}=8V f=1MHz		3204.2		pF
Output Capacitance	C_{oss}			492		
Reverse Transfer Capacitance	C_{rss}			415		

Note:

A. The maximum current rating is package limited.

B. The power dissipation PD is based on TJ(MAX)=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial TJ =25°C.

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

E. These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of TJ(MAX)=150°C. The SOA curve provides a single pulse rating.

F. The maximum current rating is package limited.

G. These tests are performed with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with TA=25°C

Typical Electrical And Thermal Characteristics

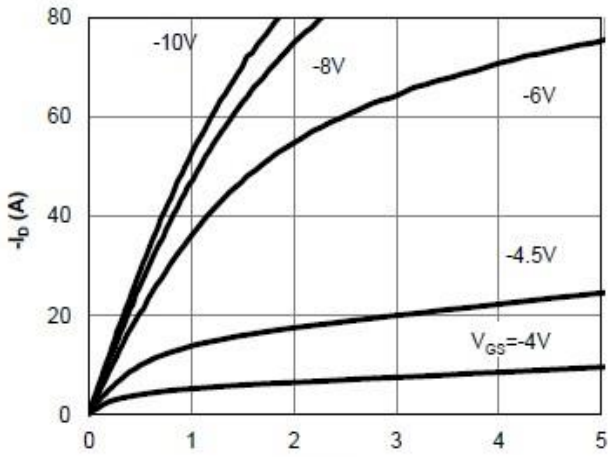


Fig 1: On-Region Characteristics (Note E)

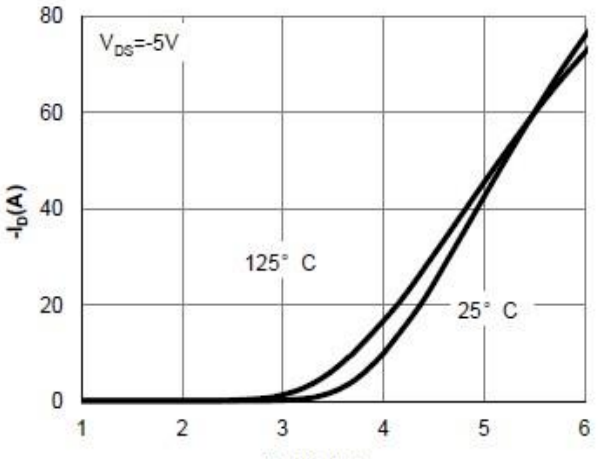


Figure 2: Transfer Characteristics (Note E)

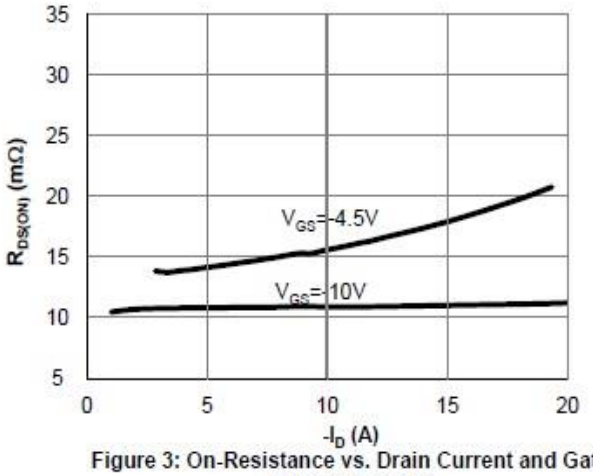


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

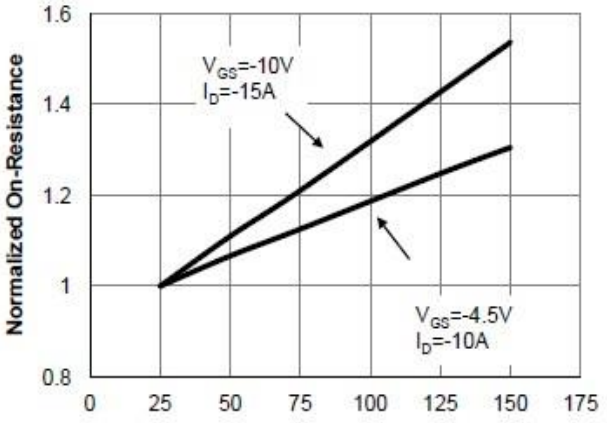


Figure 4: On-Resistance vs. Junction Temperature (Note E)

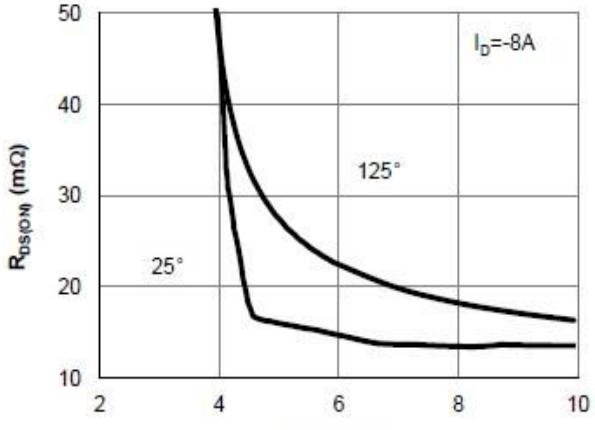


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

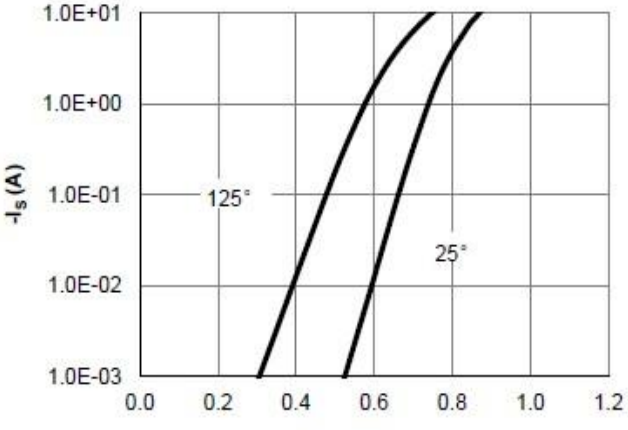


Figure 6: Body-Diode Characteristics (Note E)

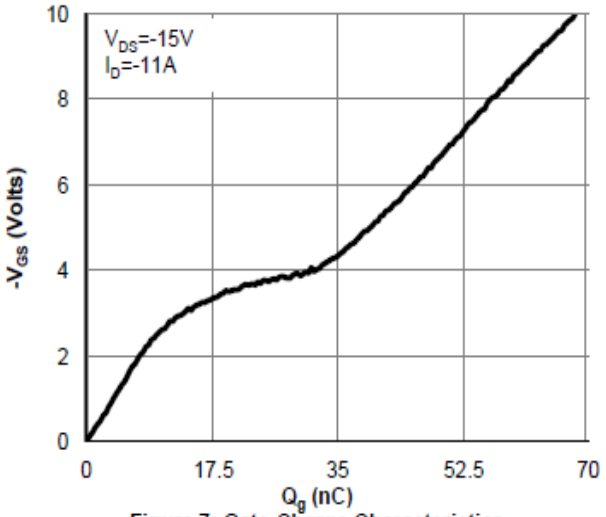


Figure 7: Gate-Charge Characteristics

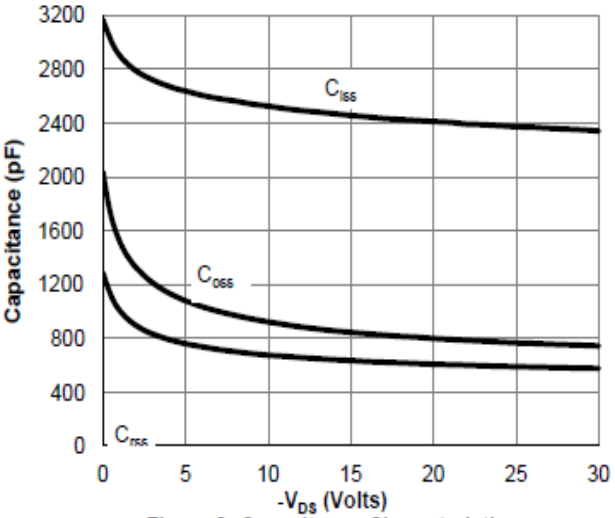


Figure 8: Capacitance Characteristics

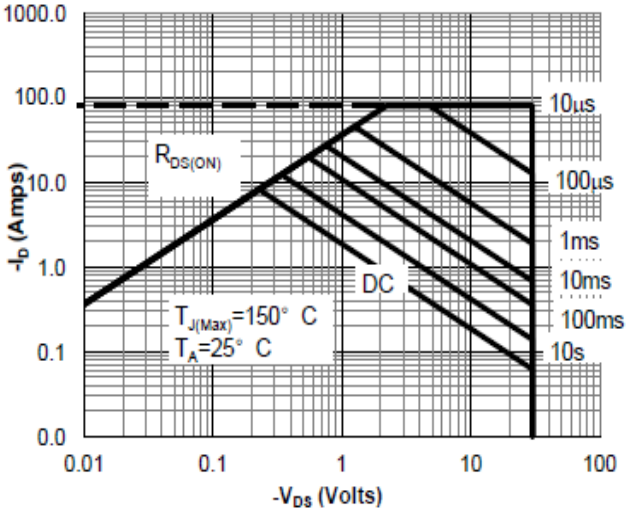


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

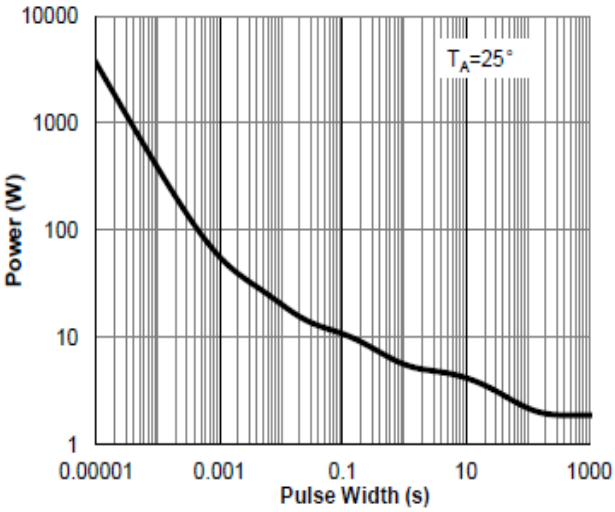


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

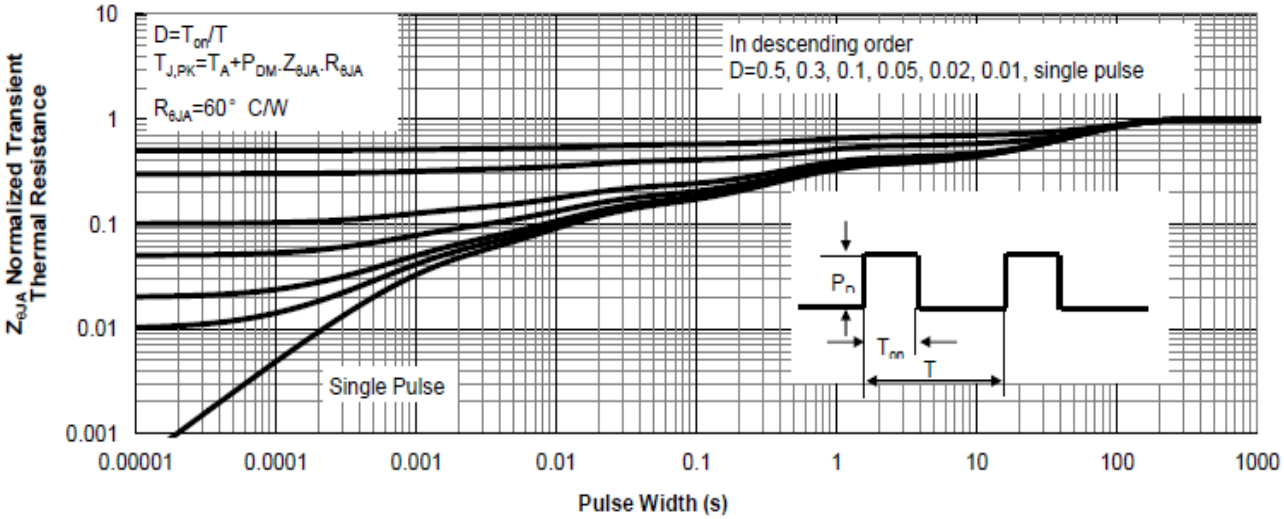
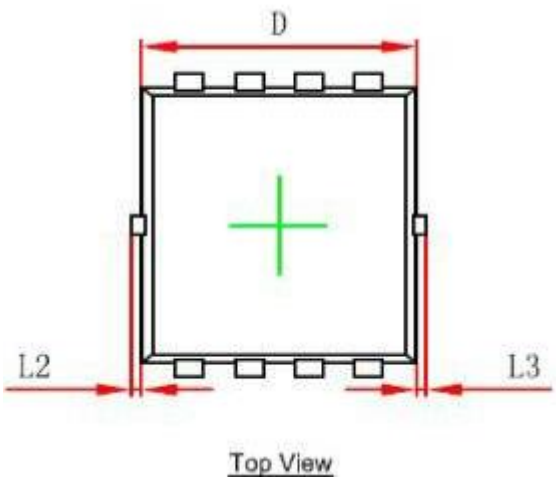


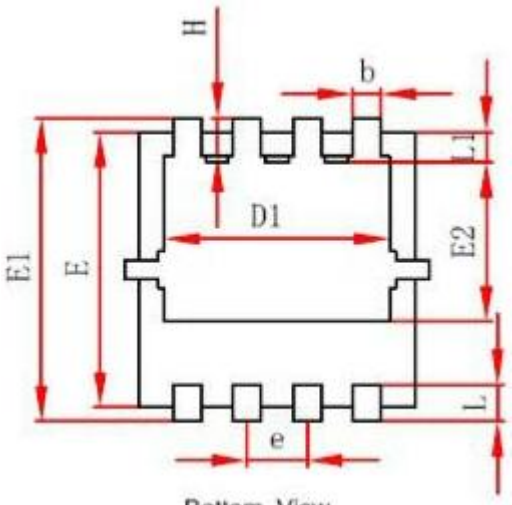
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Packing Information

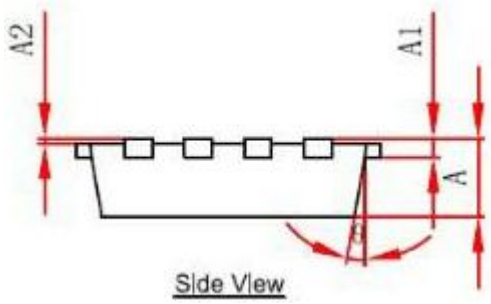
DFN3*3-8L



Top View



Bottom View



Side View

DFN3*3-8L

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.650	0.850	0.026	0.033
A1	0.152REF		0.006REF	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.09	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.50	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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.