



ACE7409B

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

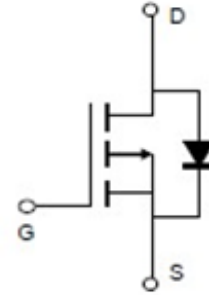
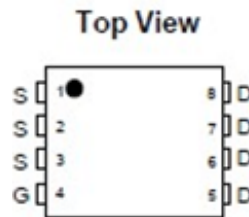
Description

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

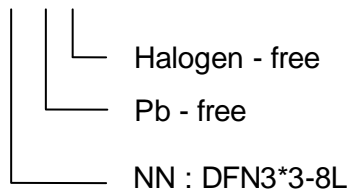
- V_{DS} (V) = -30 V
- I_D = -30A (at $V_{GS} = -10V$)
- $< 14m\Omega$ ($V_{GS} = -10V$)
- $< 20m\Omega$ ($V_{GS} = -4.5V$)

Packaging Type



Ordering information

ACE7333M XX + H



Absolute Maximum Ratings @ $T_A = 25^\circ C$ 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	I_D	$T_A = 25^\circ C$	30
		$T_A = 70^\circ C$	22
Drain Current (Pulse) ^c	I_{DM}	82	A
Power Dissipation ^b	P_D	$T_A = 25^\circ C$	25
		$T_A = 70^\circ C$	16
Operating Temperature/ Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ C$



ACE7409B

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

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 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 _r			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 T_J(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 T_J(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =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 impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_J(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 T_A=25°C



ACE7409B

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

Typical Electrical And Thermal Characteristics

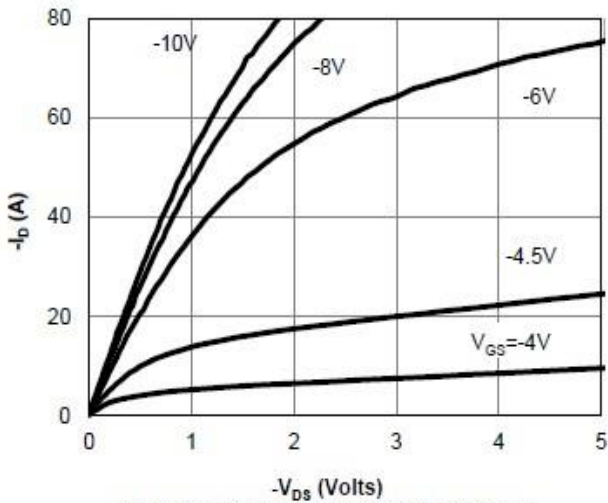


Fig 1: On-Region Characteristics (Note E)

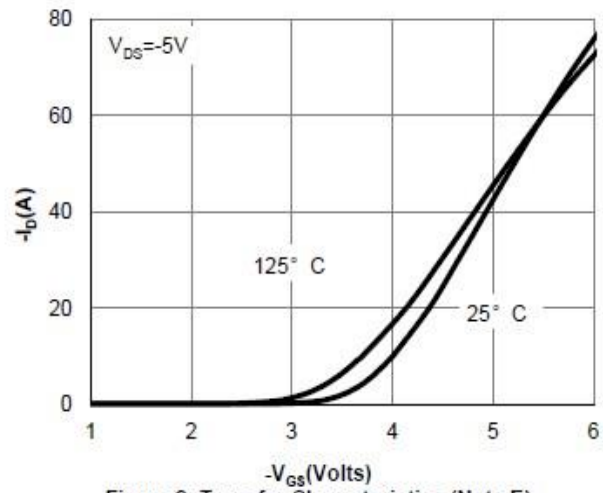


Figure 2: Transfer Characteristics (Note E)

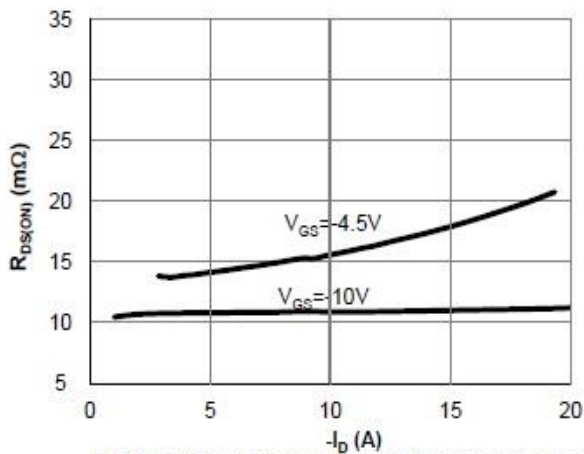


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

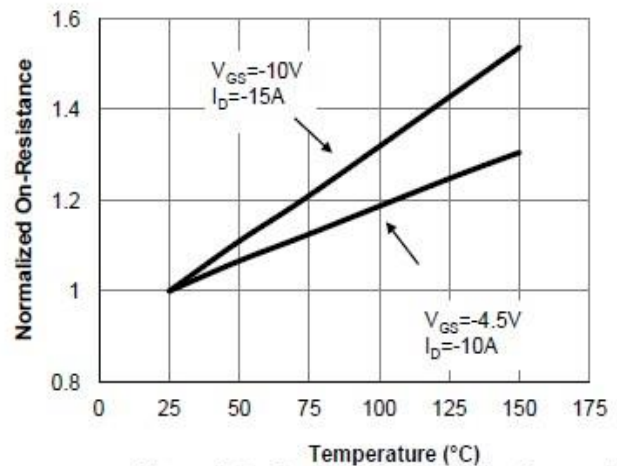


Figure 4: On-Resistance vs. Junction Temperature (Note E)

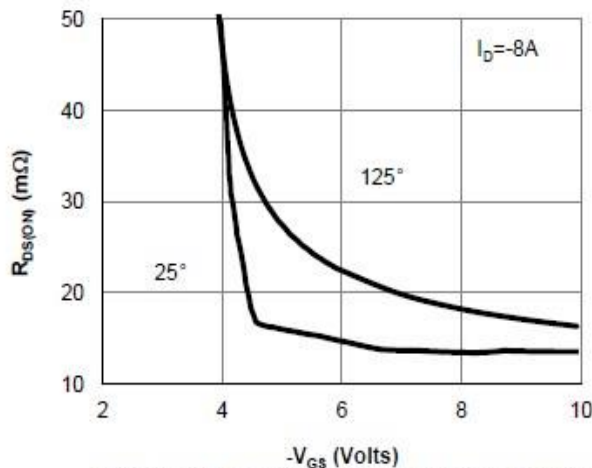


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

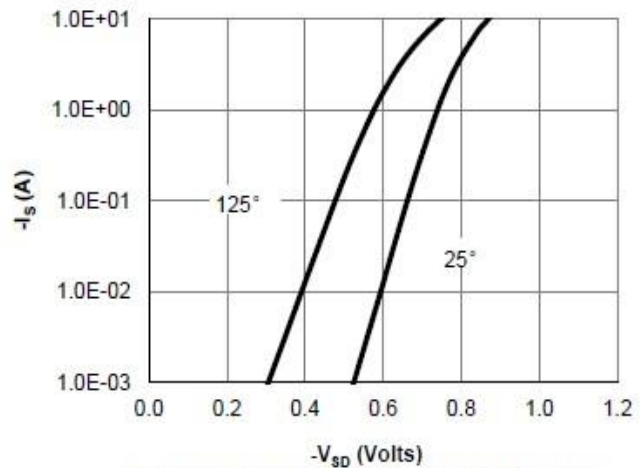


Figure 6: Body-Diode Characteristics (Note E)



ACE7409B

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

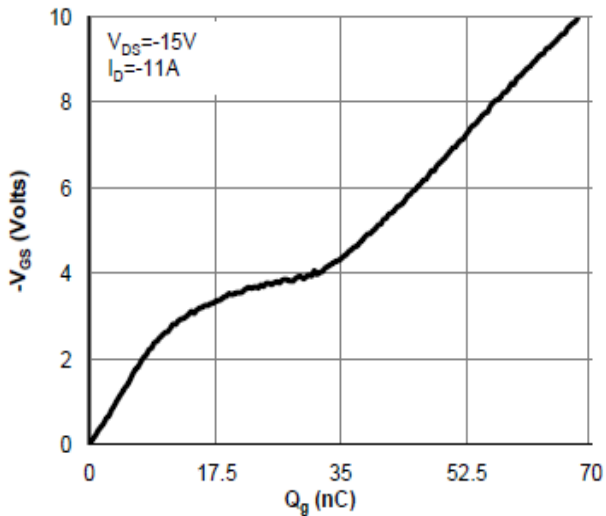


Figure 7: Gate-Charge Characteristics

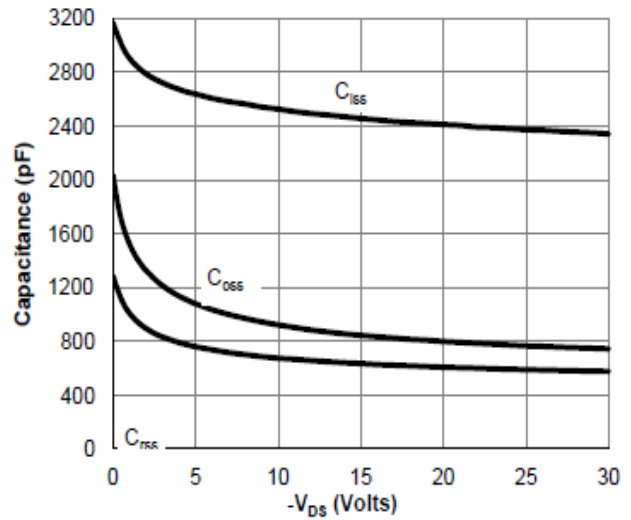


Figure 8: Capacitance Characteristics

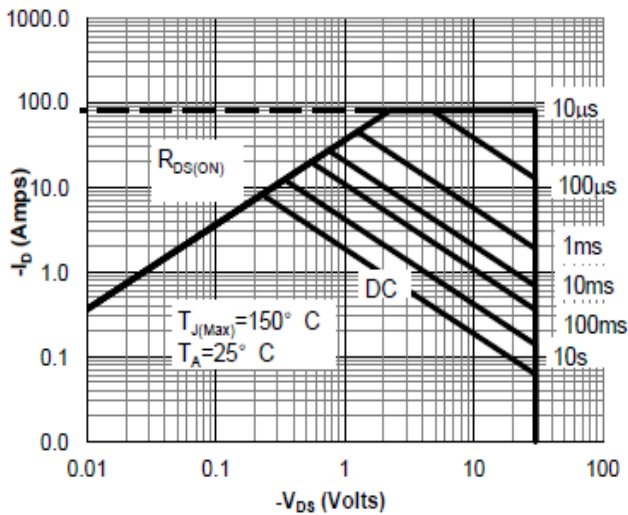


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

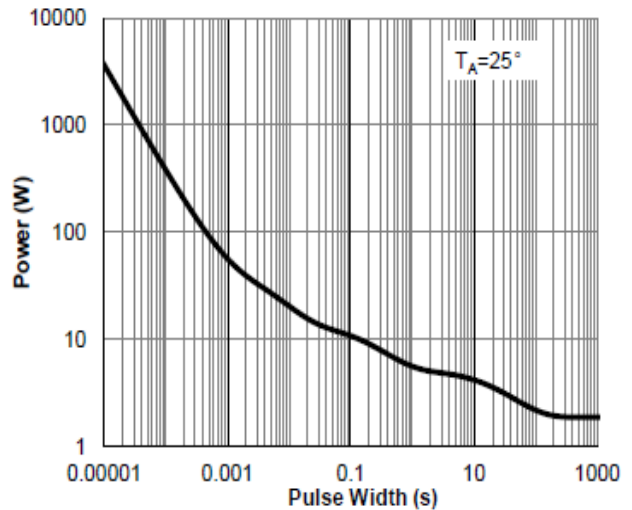


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

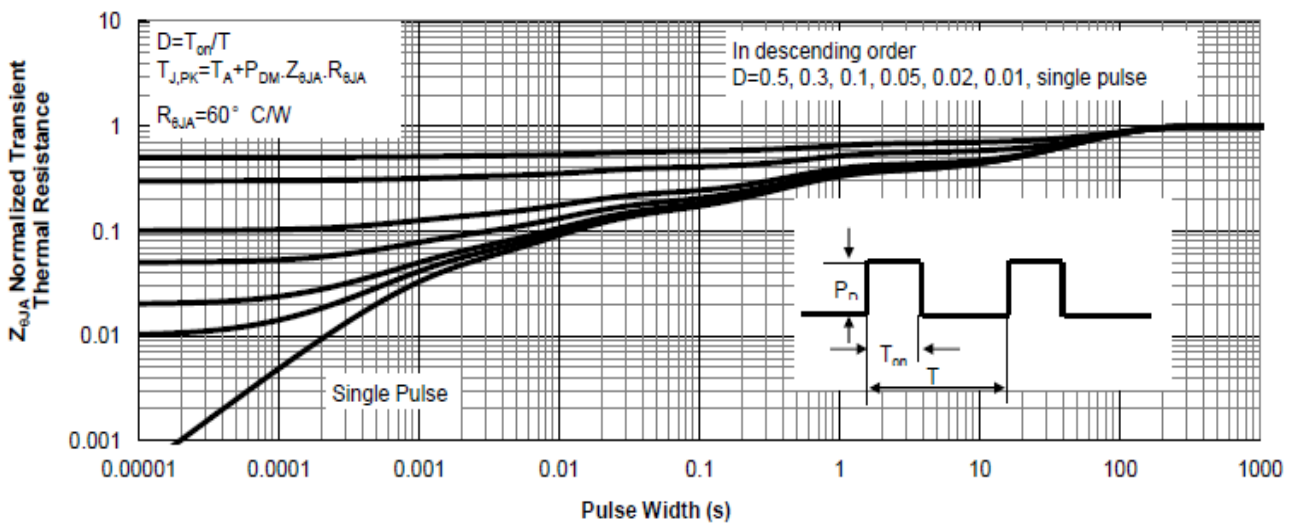


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

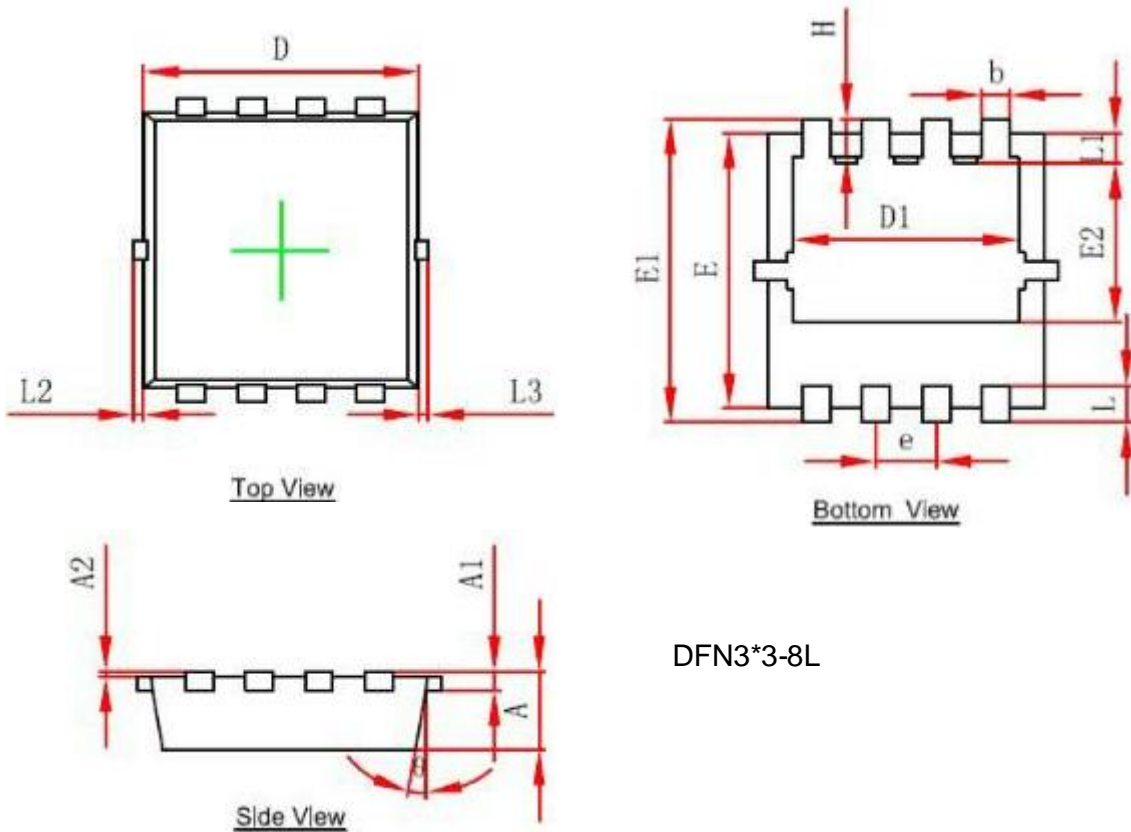


ACE7409B

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

Packing Information

DFN3*3-8L



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°



ACE7409B

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

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.

ACE Technology Co., LTD.
<http://www.ace-ele.com/>