ACE5807B

P-Channel Enhancement Mode Field Effect Transistor

Description

The ACE5807B combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.
Standard Product ACE5807B is Pb-free.

Features

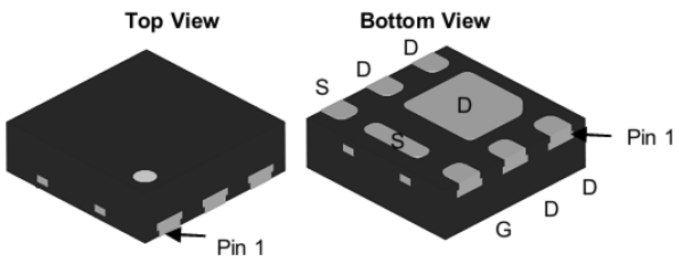
- V_{DS} (V) = -12V
- I_D= -16A
- $R_{DS(ON)}$
  < 18mΩ (V_{GS} = -4.5V)
  < 22mΩ (V_{GS} = -2.5V)
- DFN2x2-6L Package

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	-12	V
Gate-Source Voltage		V_{GSS}	±10	V
Drain Current (Continuous)	T_A=25℃	I_D	-16	A
	T_A=70℃		-13	
Drain Current (Pulsed)		I_{DM}	-65	A
Power Dissipation	T_A=25℃	P_D	18	W
	T_A=70℃		9	
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

Packaging Type

DFN2*2-6L



Ordering information

ACE5807B XX + H

Halogen - free

Pb - free

MN: DFN2*2-6L

Electrical Characteristics

T_A=25℃, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D= -250μA	-12			V
Zero Gate Voltage Drain Current	I_{DSS1}	V_{DS} = -12 V, V_{GS} = 0V			-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS} , I_{DS}= -250μA	-0.4	-0.7	-1	V
Gate Leakage Current	I_{GSS}	V_{GS}= ±8V , V_{DS}=0V			±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = -4.5V , I_D= -6.7A		12	18	mΩ
		V_{GS} = -2.5V , I_D= -6.2A		15	22	mΩ
Forward Trans Conductance	g_{FS}	V_{DS}= -10V , I_D= -6.7A		40		S
Diode Forward Voltage	V_{SD}	I_{SD}= -1.6A , V_{GS}= 0V		-0.6	-1.0	V
Maximum Body-Diode Continuous Current	I_S				-16	A
Switching						
Total Gate Charge	Q_g	V_{DS}= -6V, I_D= -10A, V_{GS}= -4.5V		35	48	nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			10		nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= -10V, R_L=0.75Ω, I_D= -1A, V_{GEN}= -4.5V R_G= 10Ω		11		ns
Turn-on Rise Time	t_r			30		ns
Turn-off Delay Time	$t_{d(off)}$			30		ns
Turn-off Fall Time	t_f			10		ns
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}= -10V, f= 1.0MHz		2700		pF
Output Capacitance	C_{oss}			680		pF
Reverse Transfer Capacitance	C_{rss}			590		pF

Note:

A. The value of $R_{θJA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C.

B. The Power dissipation PD is based on $R_{θJA}$ t ≤ 10s value and the maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

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℃.

D. The $R_{θJA}$ is the sum of the thermal impedance from junction to case $R_{θJC}$ and case 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-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=150℃. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. 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.

Typical Performance Characteristics

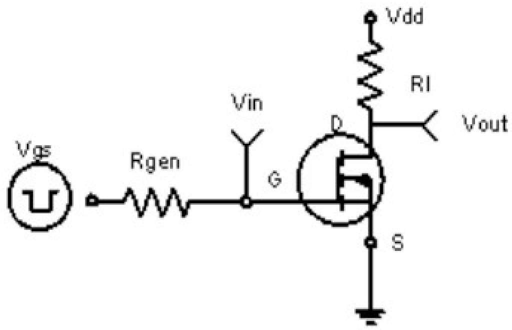


Figure 1:Switching Test Circuit

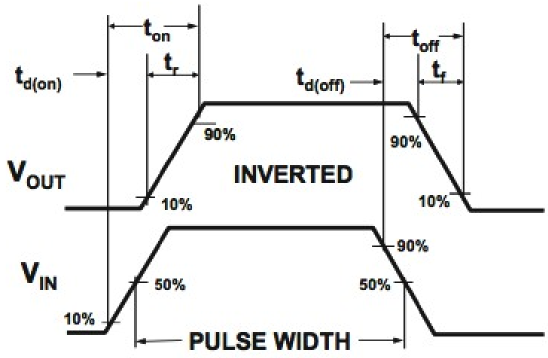


Figure 2:Switching Waveforms

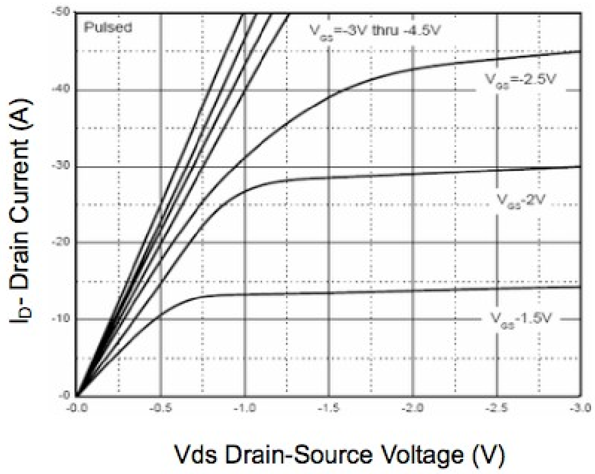


Figure 3 Output Characteristics

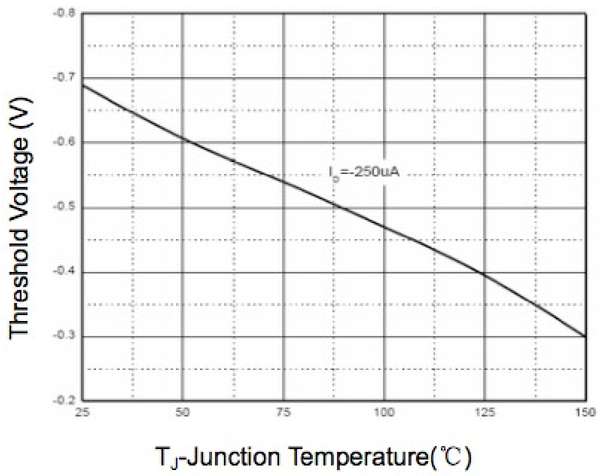


Figure 4 Drain Current

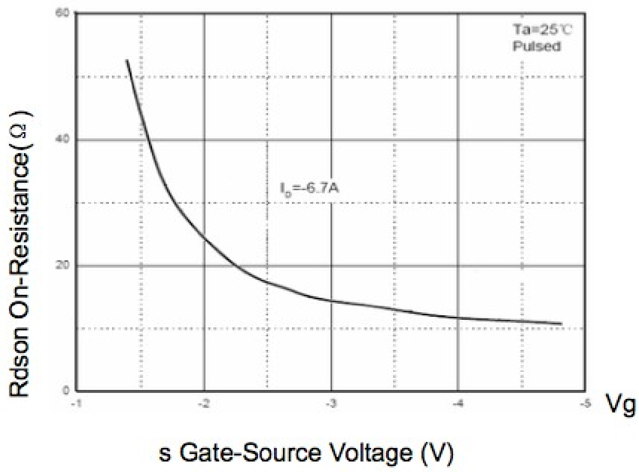


Figure 5 Rdson vs Vgs

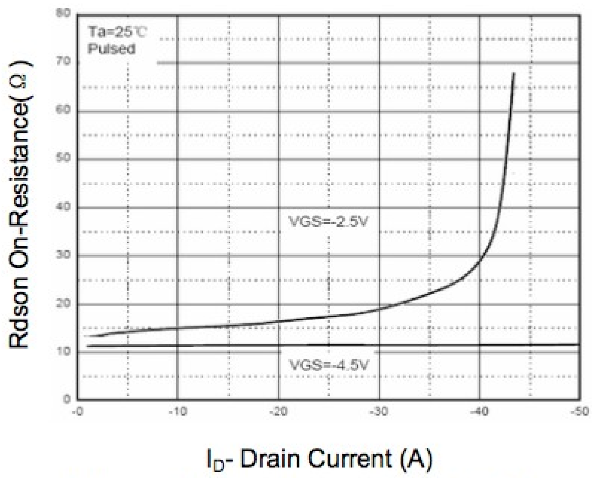


Figure 6 Drain-Source On-Resistance

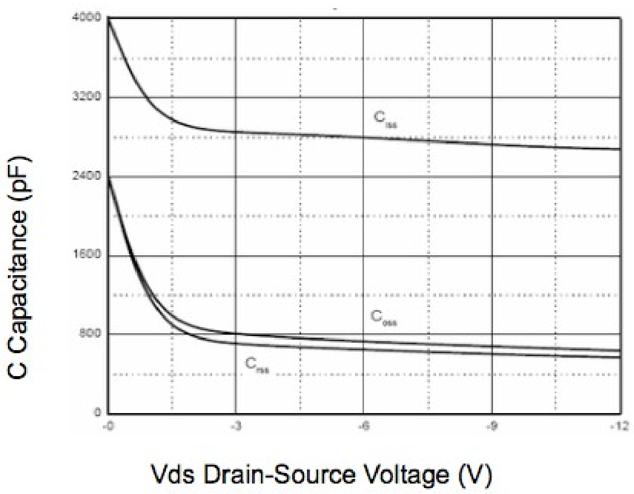


Figure 7 Capacitance vs Vds

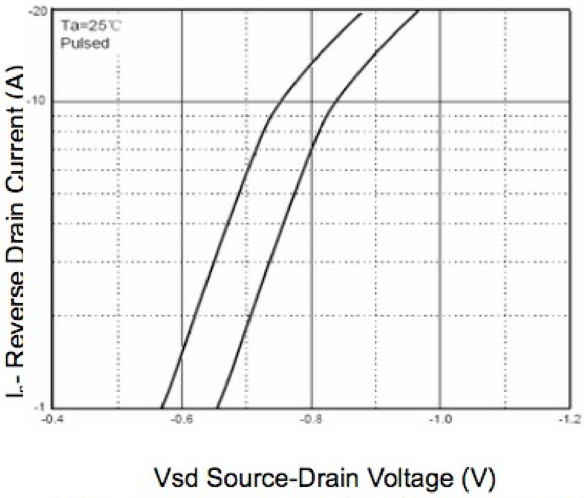
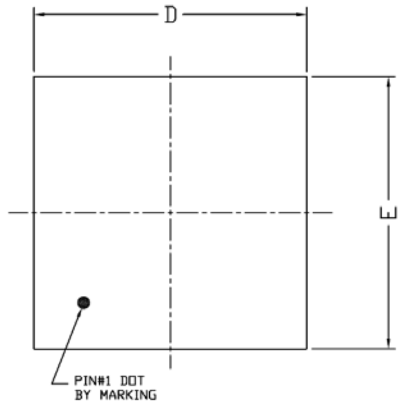
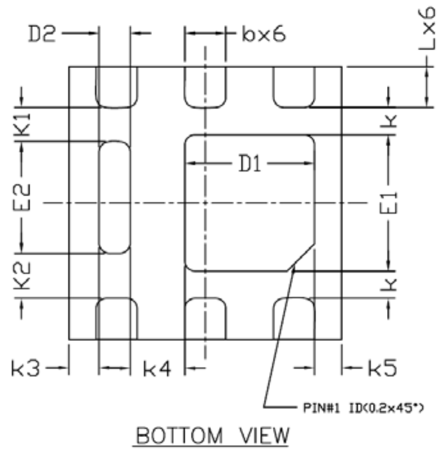


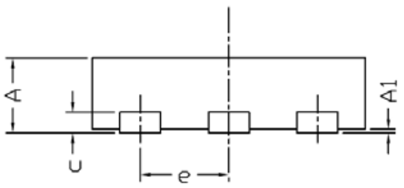
Figure 8 Source- Drain Diode Forward

Packing Information

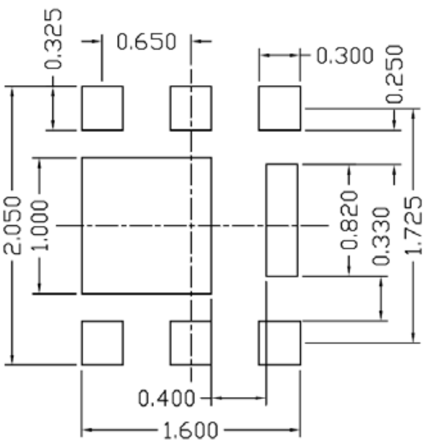
DFN2*2-6







RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.50	0.55	0.60	0.020	0.022	0.024
A1	0.00	——	0.05	0.000	——	0.002
b	0.25	0.30	0.35	0.010	0.012	0.014
c	0.152 REF			0.006 REF		
D	1.90	2.00	2.10	0.075	0.079	0.083
D1	0.85	0.95	1.05	0.033	0.037	0.041
D2	0.13	0.23	0.33	0.005	0.009	0.013
E	1.90	2.00	2.10	0.075	0.079	0.083
E1	0.90	1.00	1.10	0.035	0.039	0.043
E2	0.72	0.82	0.92	0.028	0.032	0.036
e	0.65 BSC			0.026 BSC		
K	0.20 BSC			0.008 BSC		
K1	0.25 BSC			0.010 BSC		
K2	0.33 BSC			0.013 BSC		
K3	0.22 BSC			0.009 BSC		
K4	0.40 BSC			0.016 BSC		
K5	0.20 BSC			0.008 BSC		
L	0.25	0.30	0.35	0.010	0.012	0.014

UNIT: mm

NOTE
1. CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

Notes

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