ACE1820B

N-Channel Enhancement Mode Power MOSFET

Description

ACE1820B uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ gate charge. It can be used in a wide variety of applications

Features

- V_{DS}=200V, I_D=18A
- $R_{DS(ON)1}$@V_{GS}=10V, MAX 170mΩ
- $R_{DS(ON)1}$@V_{GS}=4.5V, MAX 180mΩ

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	200	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous)*AC	T_A=25℃	I_D	18	A
	T_A=100℃		11.7	
Single Pulse Avalanche Energy3		EAS	15	mJ
Drain Current (Pulsed)*B		I_{DM}	40	A
Power Dissipation	T_A=25℃	P_D	83	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

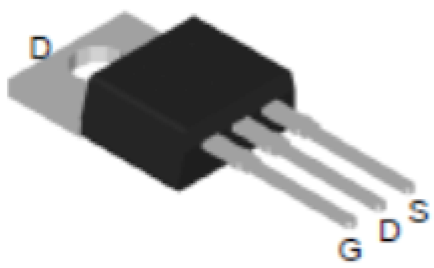
A: The value of $R_{\theta JA}$ is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

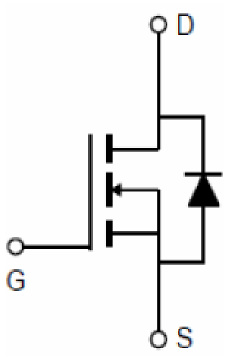
B: Repetitive rating, pulse width limited by junction temperature.

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

Packaging Type

TO-220





Ordering information

ACE1820B XX + H

- Halogen - free
- Pb - free
- ZM: TO-220

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	200			V
Zero Gate Voltage Drain Current	I_{DSS1}	V_{DS} = 160V, V_{GS} = 0V			1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS} , I_{DS}= 250μA	1.2	1.6	2.5	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= 9A			170	mΩ
		V_{GS} = 4.5V , I_D= 9A			180	
Forward Trans Conductance	g_{FS}	V_{DS}= 25V , I_D= 57A		22		S
Diode Forward Voltage	V_{SD}	I_{SD}= 40A , V_{GS}= 0V			1.2	V
Diode Forward Current	I_S				18	A
Switching						
Total Gate Charge	Q_g	V_{DS}= 80V, I_D= 9A, V_{GS}= 10V		45		nC
Gate-Source Charge	Q_{gs}			9		nC
Gate-Drain Charge	Q_{gd}			10.5		nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V,I_D= 9A, V_{GS}= 10V,R_{GEN}= 3.3Ω		13		ns
Turn-on Rise Time	t_r			8.2		ns
Turn-off Delay Time	$t_{d(off)}$			25		ns
Turn-off Fall Time	t_f			11		ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}= 0V, f= 1.0MHz		2.47		pF
Output Capacitance	C_{oss}			109		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
Gate resistance	Rg	V_{GS}=0V, V_{DS}=0V, F=1MHz		2		Ω

Typical Performance Characteristics

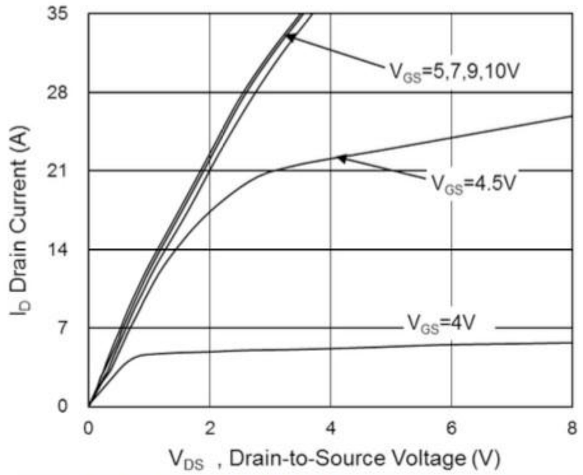


Fig.1 Typical Output Characteristics

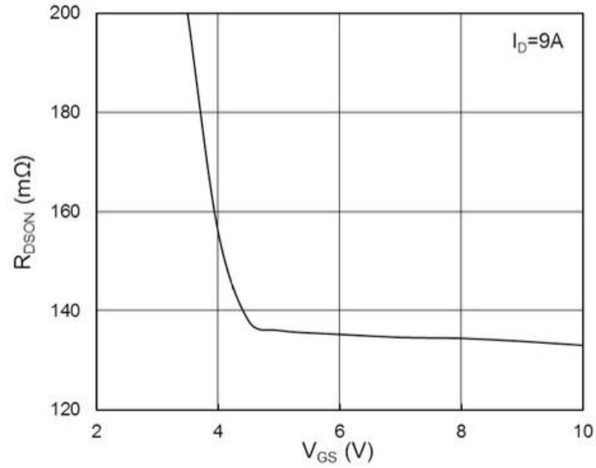


Fig.2 On-Resistance vs. Gate-Source

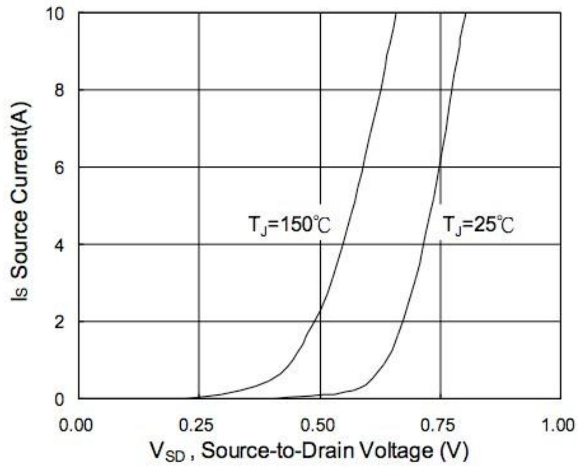


Fig.3 Forward Characteristics Of Reverse

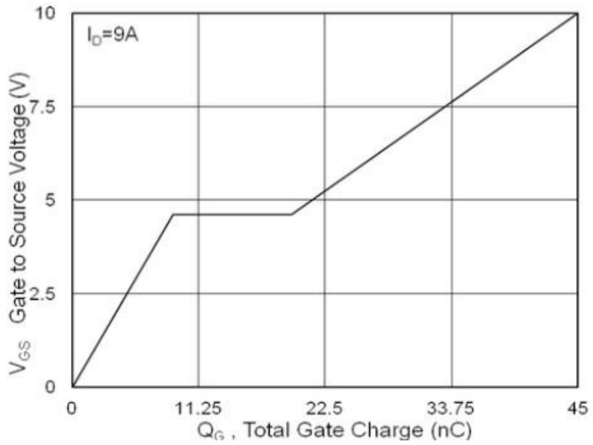


Fig.4 Gate-Charge Characteristics

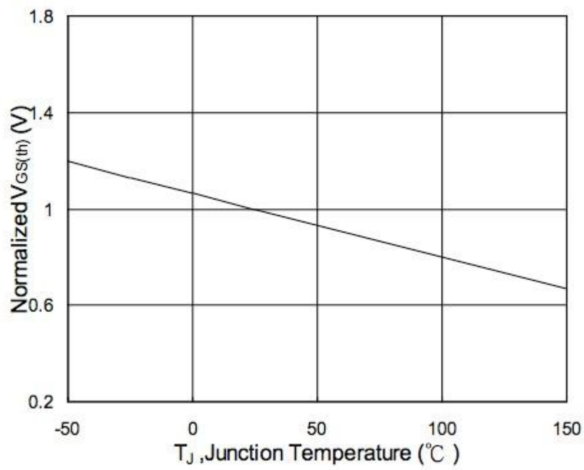


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

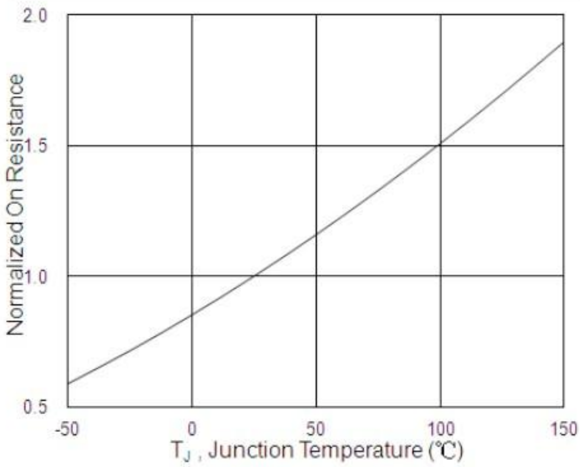


Fig.6 Normalized R_{DSON} vs. T_J

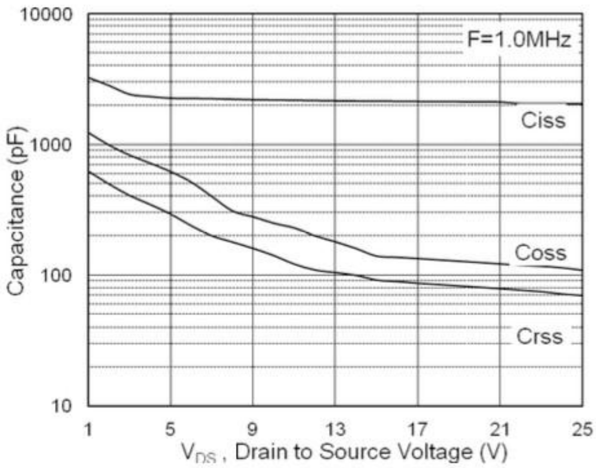


Fig.7 Capacitance

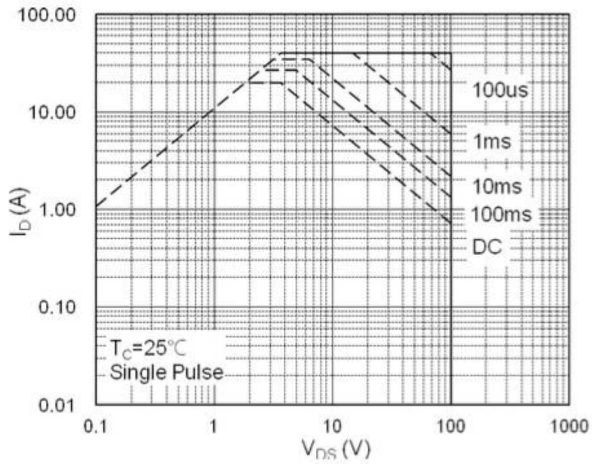


Fig.8 Safe Operating Area

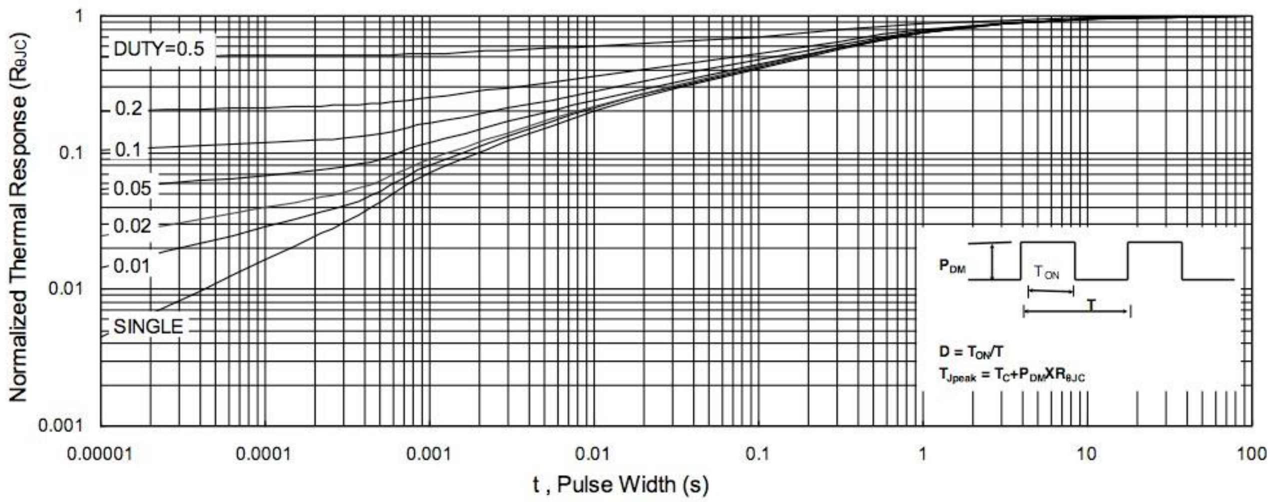


Fig.9 Normalized Maximum Transient Thermal Impedance

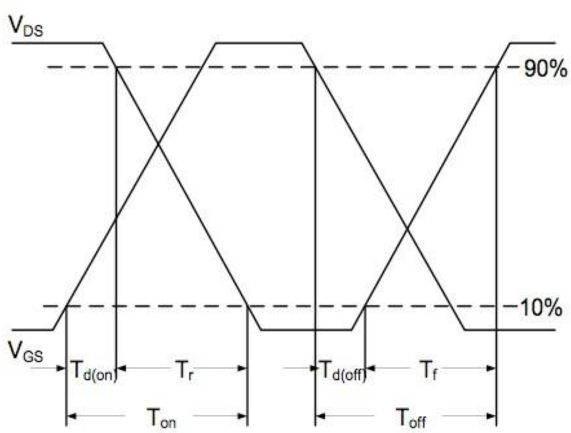


Fig.10 Switching Time Waveform

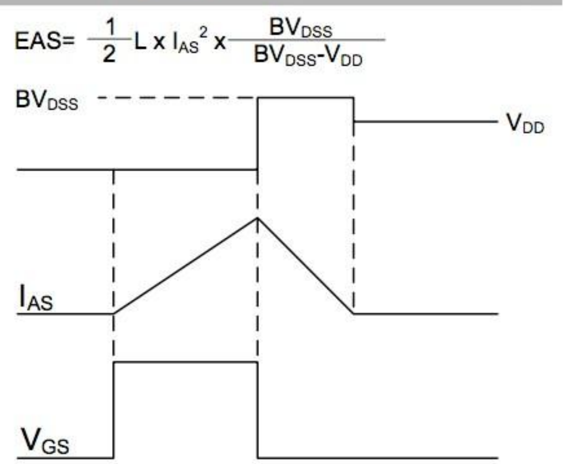
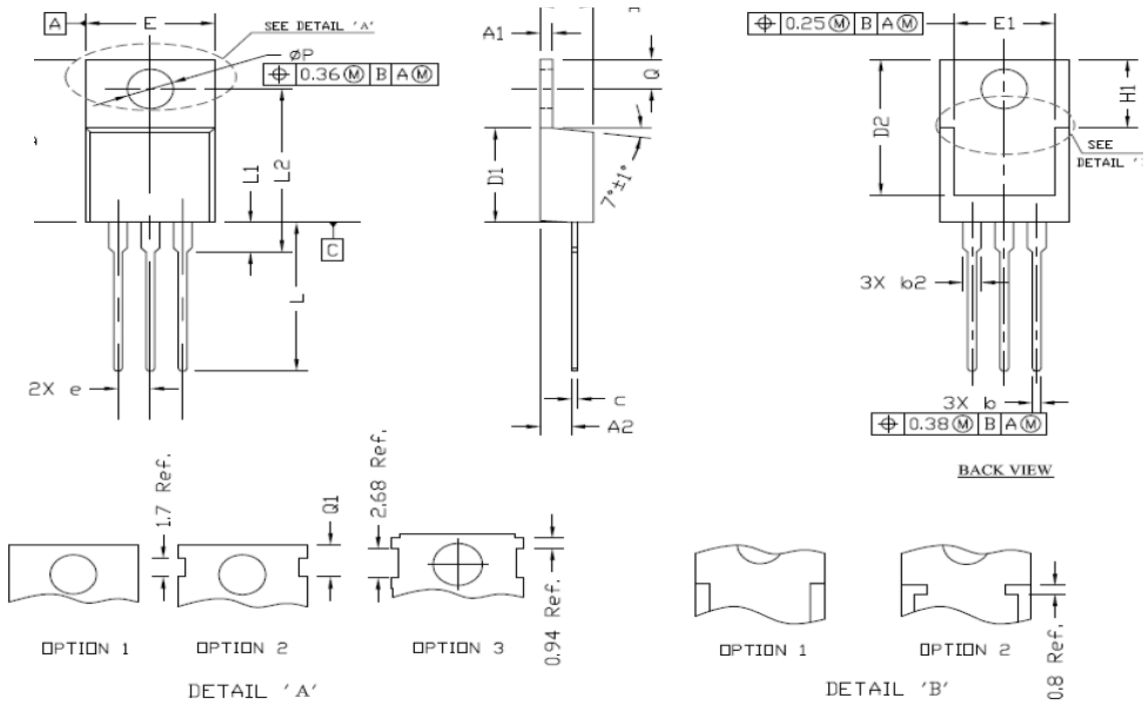


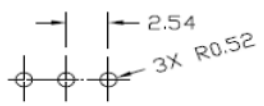
Fig.11 Unclamped Inductive Switching Waveform

Packing Information

TO-220



RECOMMENDATION OF HOLE PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4,30	4,45	4,72	0,169	0,175	0,186
A1	1.15	1.27	1.40	0.045	0.050	0.055
A2	2.20	2.67	2.90	0.087	0.105	0.114
b	0.69	0.81	0.95	0.027	0.032	0.037
b2	1,17	1,37	1,45	0,046	0,050	0,068
c	0,36	0,38	0,60	0,014	0,015	0,024
D	14.50	15.44	15.80	0.571	0.608	0.622
D1	8.59	9.14	9.65	0.338	0.360	0.380
D2	11.43	11.73	12.48	0.450	0.462	0.491
e	2.54 BSC			0.100 BSC.		
E	9,66	10,03	10,54	0,380	0,395	0,415
E1	6.22	---	---	0.245	---	---
H1	6.10	6.30	6.50	0.240	0.248	0.256
L	12.27	12.82	14.27	0.483	0.505	0.562
L1	2.47	---	3.90	0.097	---	0.154
L2	---	---	16.70	---	---	0.657
Q	2,59	2,74	2,89	0,102	0,108	0,114
ØP	3,50	3,84	3,89	0,138	0,151	0,153
Q1	2,70	---	2,90	0,106	---	0,114

NOTE
1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH SHOULD BE LESS THAN 6 MIL.
2. TOLERANCE 0.100 MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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.

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