ACE18812B

Common Drain N-Channel Enhancement Mode Power MOSFET with ESD Protection

Description

- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- ESD Protection

Features

- V_{DS} (V) = 20V ,I_D = 7A
- $R_{DS(ON)}$@V_{GS} = 4.5V, TYP 13.5mΩ
- $R_{DS(ON)}$@V_{GS} = 4.0V, TYP 14.0mΩ
- $R_{DS(ON)}$@V_{GS} = 3.1V, TYP15.2mΩ
- $R_{DS(ON)}$@V_{GS} = 2.5V, TYP17.5mΩ

Absolute Maximum Ratings

Parameter		Symbol	Max	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	7	A
	T_A=70°C		5.5	
Drain Current (Pulse)*B		I_{DM}	30	
Power Dissipation	T_A=25°C	P_D	1.5	W
Operating and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

A. The value of $R_{\theta JA}$ 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.

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

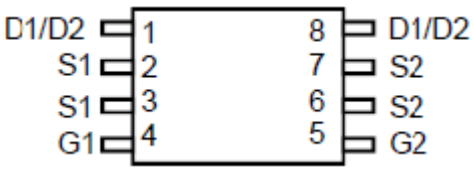
C. The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

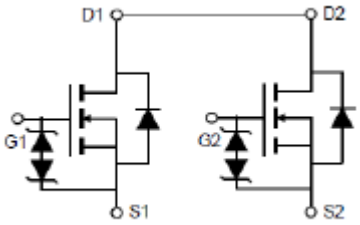
Thermal Resistance Ratings

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient	t ≤ 10 s	R_{thJA}	100	°C/W

Packaging Type

TSSOP-8





Ordering information

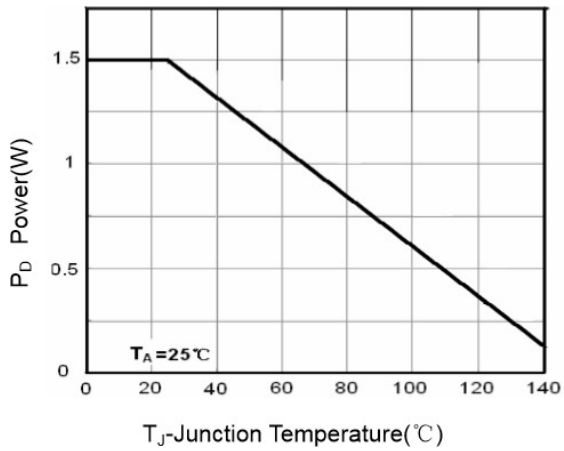
ACE18812B XX + H

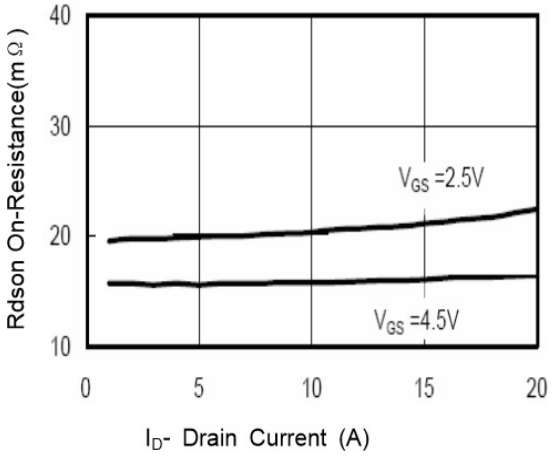
- Halogen - free
- Pb - free
- TM: TSSOP-8

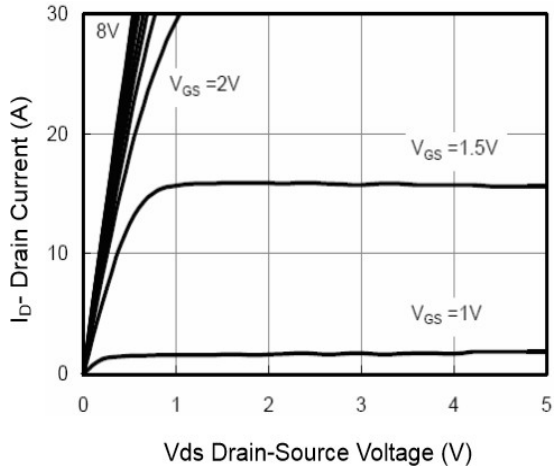
Electrical Characteristics T_A=25 °C unless otherwise noted

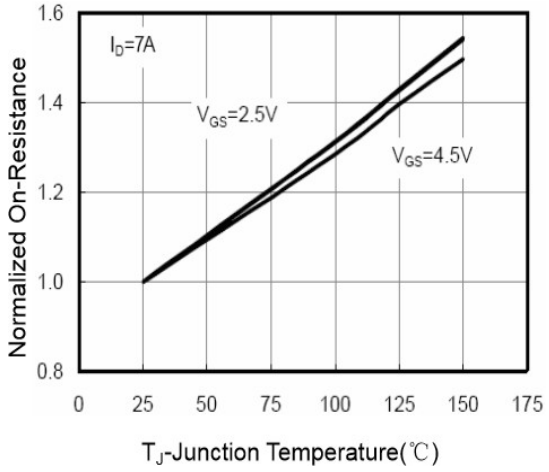
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V			1	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250uA	0.4	0.65	1	V
Gate Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=7A		13.5	17	mΩ
		V_{GS}=4.0V, I_D=7A		14	18	
		V_{GS}=3.1V, I_D=6.5A		15.2	19	
		V_{GS}=2.5V, I_D=5.5A		17.5	23	
Diode Forward Voltage	V_{SD}	I_{SD}=2.5A, V_{GS}=0V		0.76	1	V
Diode Forward Current*AC	I_S	T_A=25 °C			2	A
Switching						
Total Gate Charge	Q_g	V_{DS}=10V, I_D=7A V_{GS}=4.5V		15		nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			3.2		
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=10V, V_{GS}=5V R_{GEN}=3Ω, RL=1.35Ω		6		ns
Turn-On Rise Time	t_f			13		
Turn-Off Delay Time	$t_{d(off)}$			52		
Turn-Off Fall Time	t_f			16		
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V f=1.0MHz		1150		pF
Output Capacitance	C_{oss}			185		
Reverse Transfer Capacitance	C_{rss}			145		

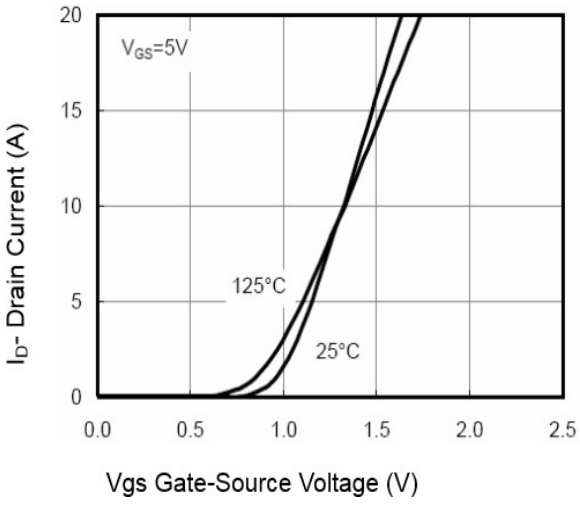
Typical Performance Characteristics

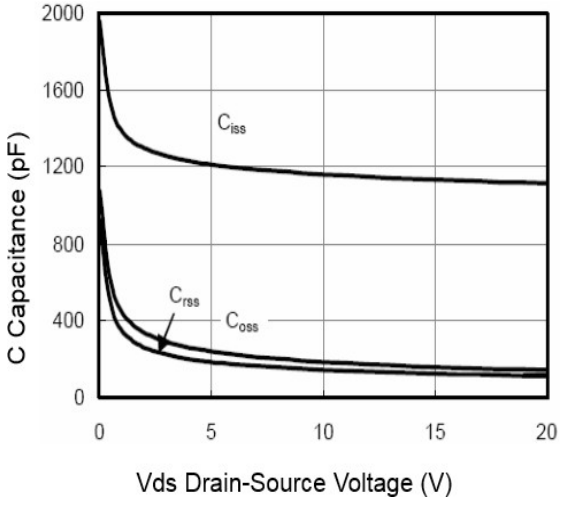


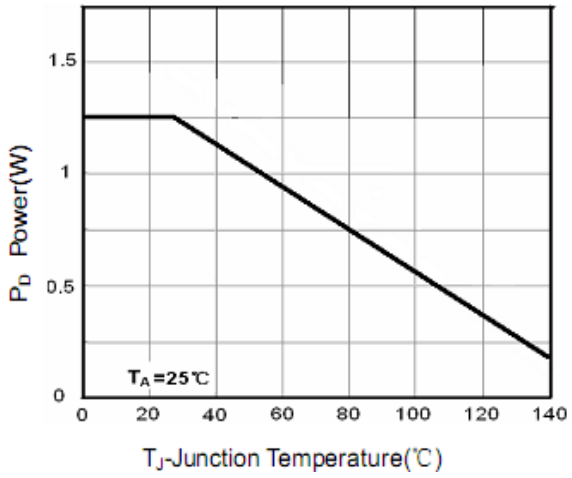


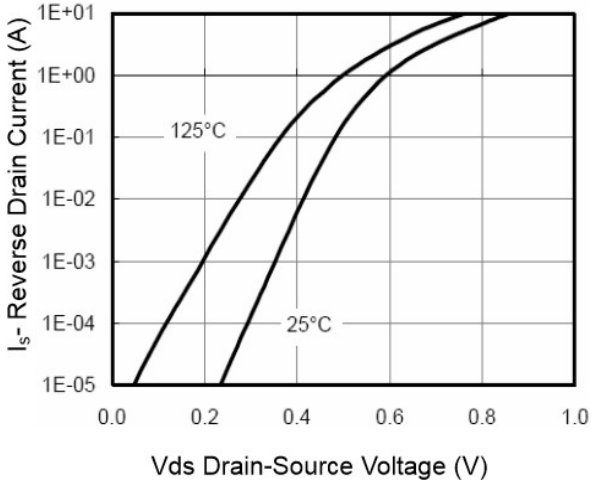


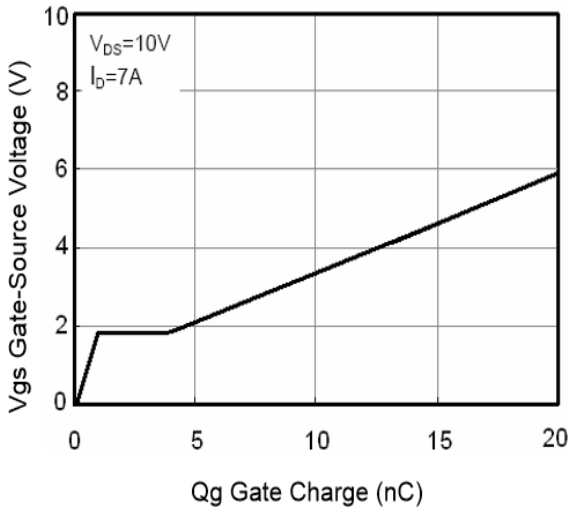


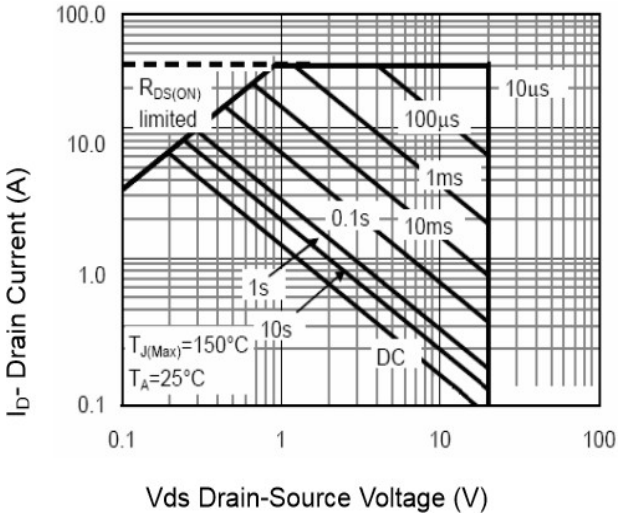


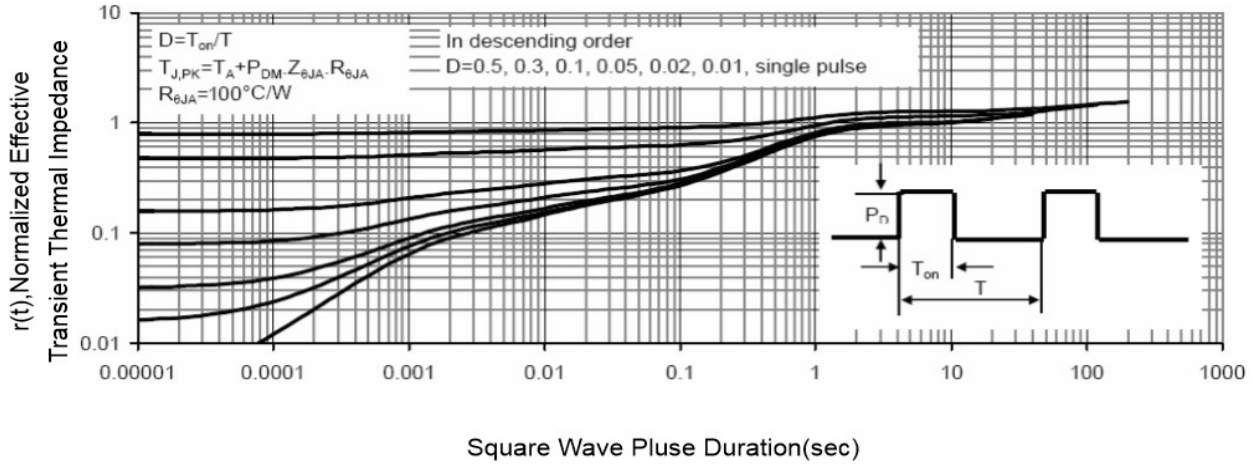



P_D Power(W)
1.5
1
0.5
0
T_A=25℃
0
20
40
60
80
100
120
140
T_J-Junction Temperature(℃)


I_S- Reverse Drain Current (A)
1E+01
1E+00
1E-01
1E-02
1E-03
1E-04
1E-05
125°C
25°C
0.0
0.2
0.4
0.6
0.8
1.0
Vds Drain-Source Voltage (V)

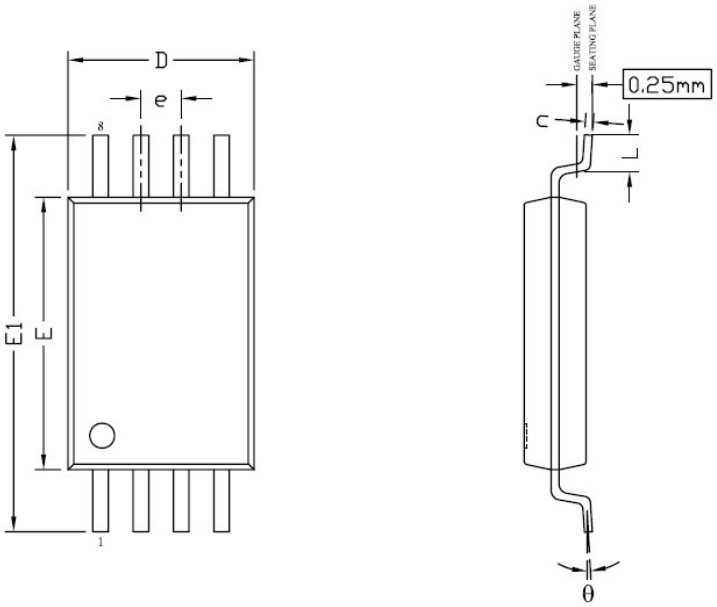

Vgs Gate-Source Voltage (V)
V_DS=10V
I_D=7A
10
8
6
4
2
0
0
5
10
15
20
Qg Gate Charge (nC)


I_D- Drain Current (A)
100.0
10.0
1.0
0.1
R_DS(ON) limited
10μs
100μs
1ms
0.1s
10ms
1s
10s
DC
T_J(Max)=150°C
T_A=25°C
0.1
1
10
100
Vds Drain-Source Voltage (V)

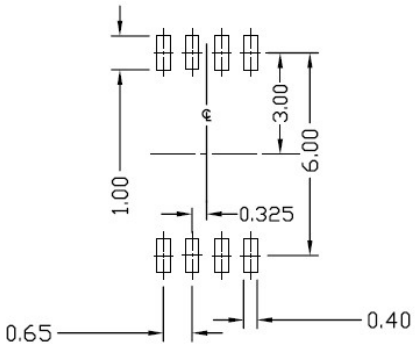

r(t),Normalized Effective Transient Thermal Impedance
10
1
0.1
0.01
D=T_on/T
T_J,PK=T_A+P_DM·Z_θJA·R_θJA
R_θJA=100°C/W
In descending order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse
P_D
T_on
T
0.00001
0.0001
0.001
0.01
0.1
1
10
100
1000
Square Wave Pluse Duration(sec)

Packing Information

TSSOP-8



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	—	—	1.20	—	—	0.047
A1	0.05	—	0.15	0.002	—	0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19	—	0.30	0.007	—	0.012
c	0.09	—	0.20	0.004	—	0.008
D	2.90	3.00	3.10	0.114	0.118	0.122
E1	6.40 BSC			0.252 BSC		
E	4.30	4.40	4.50	0.169	0.173	0.177
e	0.65 BSC			0.026 BSC		
L	0.45	0.60	0.75	0.018	0.024	0.030
θ	0°	—	8°	0°	—	8°

UNIT: mm

NOTE
1. ALL DIMENSIONS ARE IN MILLMETERS.
2. DIMENSIONS ARE INCLUSIVE OF PLATING.
3. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
   MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
4. DIMENSION L IS MEASURED IN GAUGE PLANE.
5. CONTROLLING DIMENSION IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
6. REFER TO JEDEC MO-153(AA)

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.