ACE14201B

P-Channel Enhancement Mode Power MOSFET

Description

The ACE14201B uses advanced trench technology and desgin to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features

- V_{DS} (V) =-20V , I_D = -45A
- $R_{DS(ON)}$ @V_{GS} = -4.5V , TYP 5.8mΩ
- $R_{DS(ON)}$ @V_{GS} = -2.5V , TYP 7.2mΩ
- $R_{DS(ON)}$ @V_{GS} = -1.8V , TYP 9mΩ

Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

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℃	I_D	-45	A
	T_A=100℃		-35	
Drain Current (Pulsed)*B		I_{DM}	-200	A
Power Dissipation	T_A=25℃	P_D	80	W
Operating temperature / storage temperature		T_J/T_{STG}	-55~150	℃

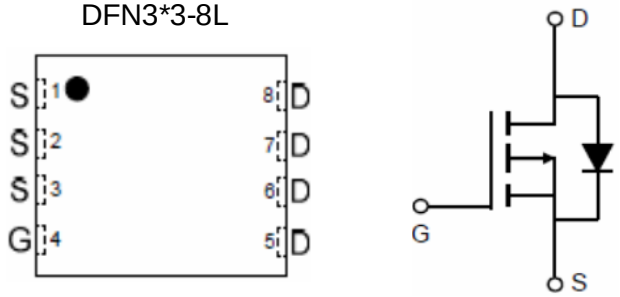
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

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.

Packaging Type

DFN3*3-8L



Ordering information

ACE14201B XX + H

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

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	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_{DS}=-250μA	-0.4	-0.6	-1.0	V
Gate leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-20A		5.8	7	mΩ
		V_{GS}=-2.5V, I_D=-20A		7.2	9	
		V_{GS}=-1.8V, I_D=-20A		9	12	
Forward trans conductance	g_{FS}	V_{DS}=-5V, I_D=-20A	80			S
Diode forward voltage	V_{SD}	I_{SD}=-20A, V_{GS}=0V			1.2	V
Diode Forward Current	I_S				-45	A
Switching						
Total gate charge	Qg	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-20A		55		nC
Gate-source charge	Qgs			10		
Gate-drain charge	Qgd			15		
Turn-on delay time	$t_{d(on)}$	V_{GS}=-4.5V,V_{DD}=-10V, R_L=0.5Ω,R_{GEN} = 3Ω		18		ns
Turn-on rise time	Tr			42		
Turn-off delay time	$t_{d(off)}$			85		
Turn-off fall time	Tf			23		
Dynamic						
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=-10V, f=1.0MHz		3500		pF
Output capacitance	Coss			577		
Reverse transfer capacitance	Crss			445		

Typical Performance Characteristics

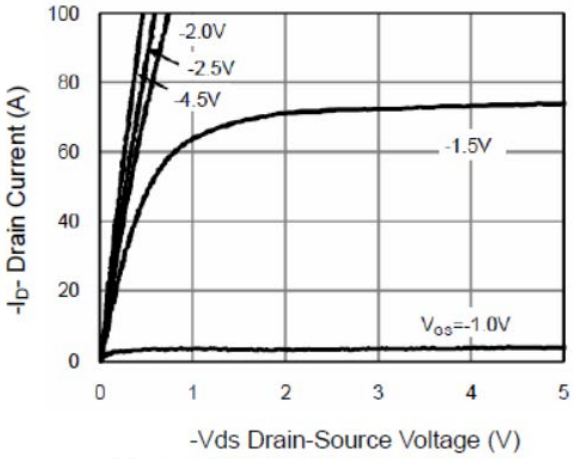


Figure 1 Output Characteristics

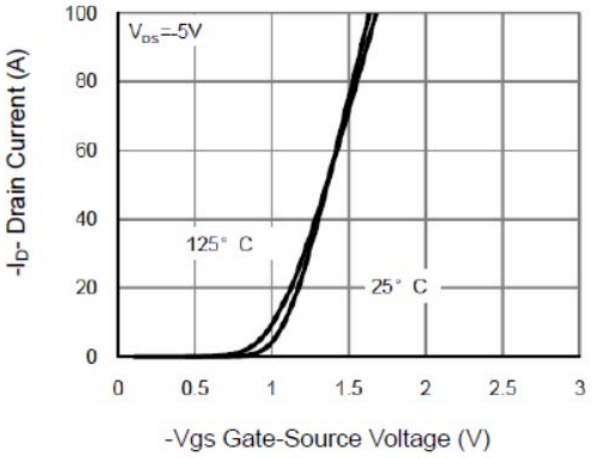


Figure 2 Transfer Characteristics

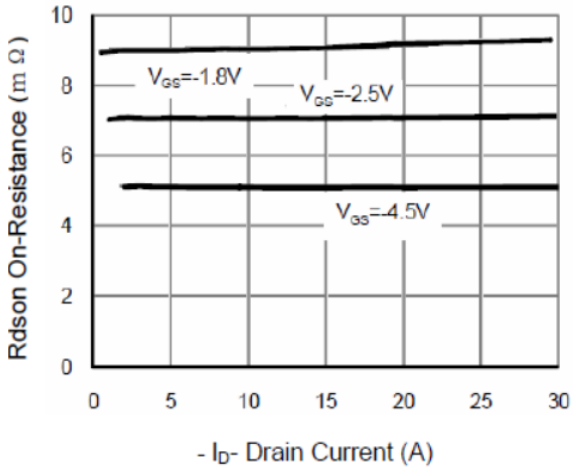


Figure 3 Rdson- Drain Current

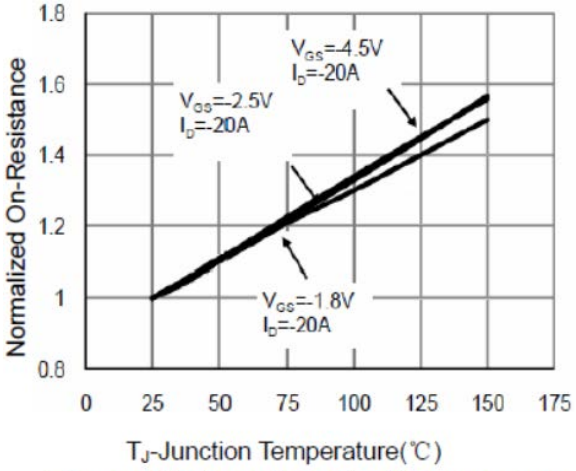


Figure 4 Rdson-Junction Temperature

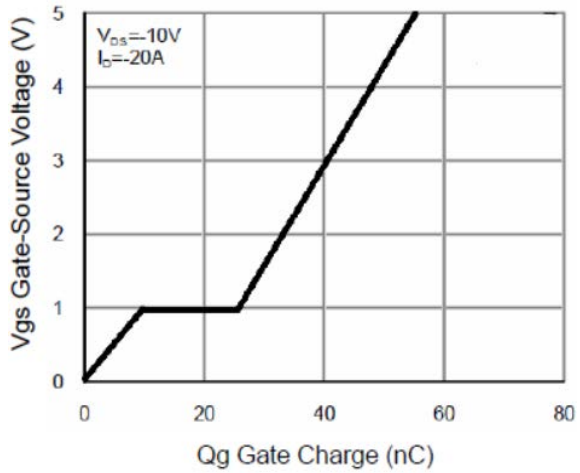


Figure 5 Gate Charge

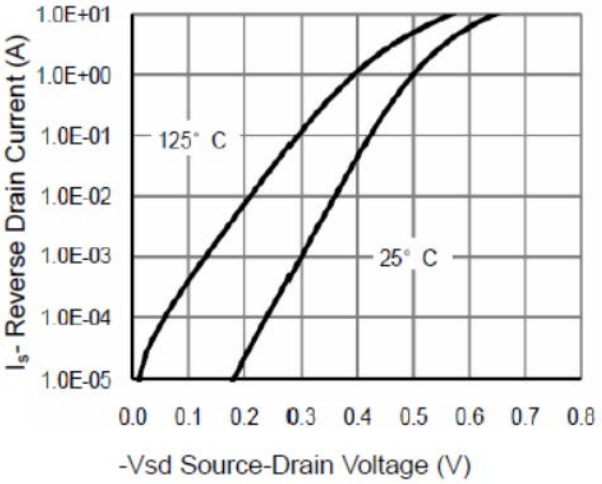


Figure 6 Source- Drain Diode Forward

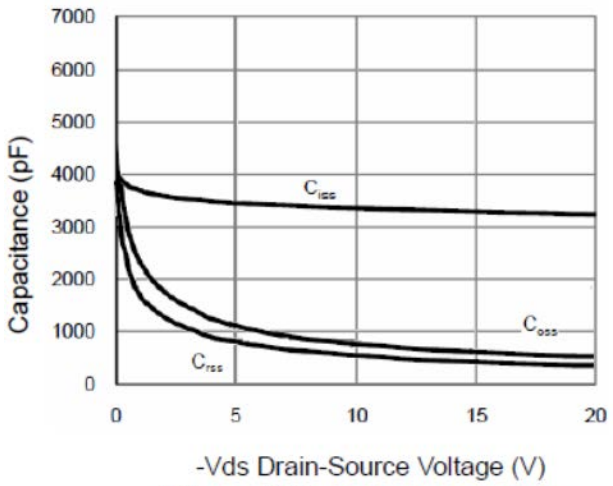


Figure 7 Capacitance vs Vds

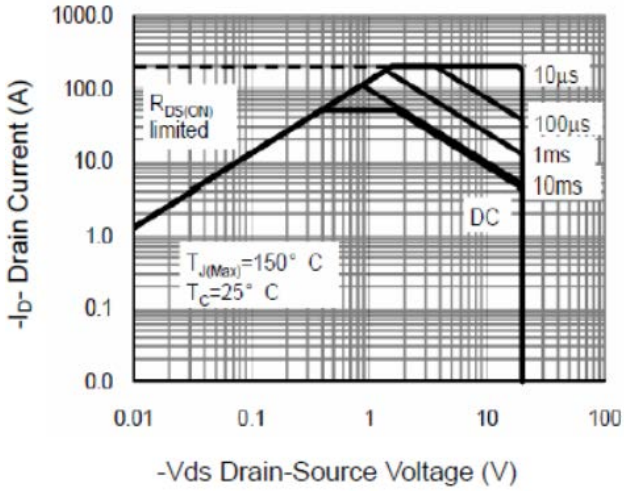


Figure 8 Safe Operation Area

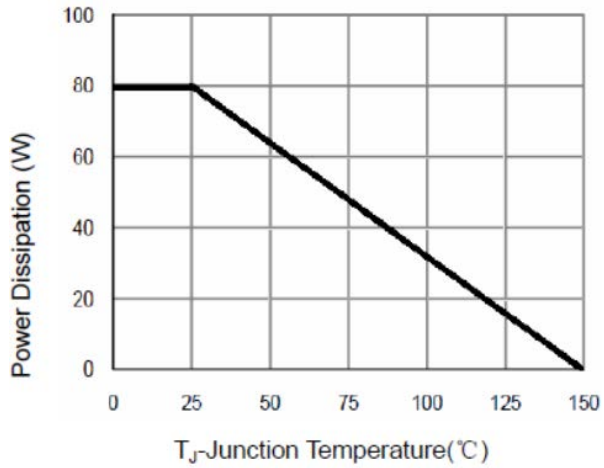


Figure 9 Power De-rating

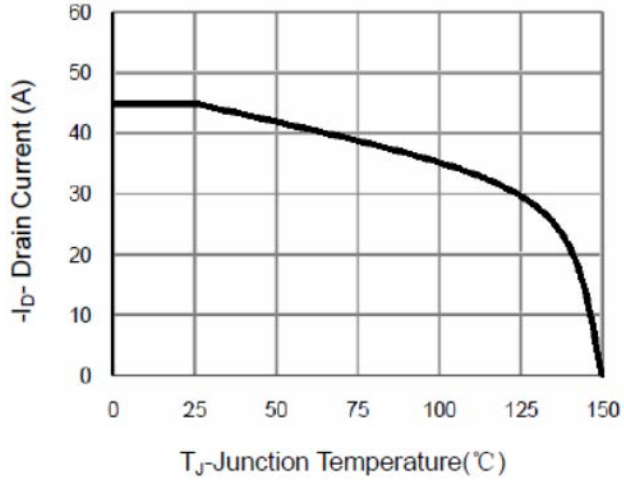


Figure 10 -Current De-rating

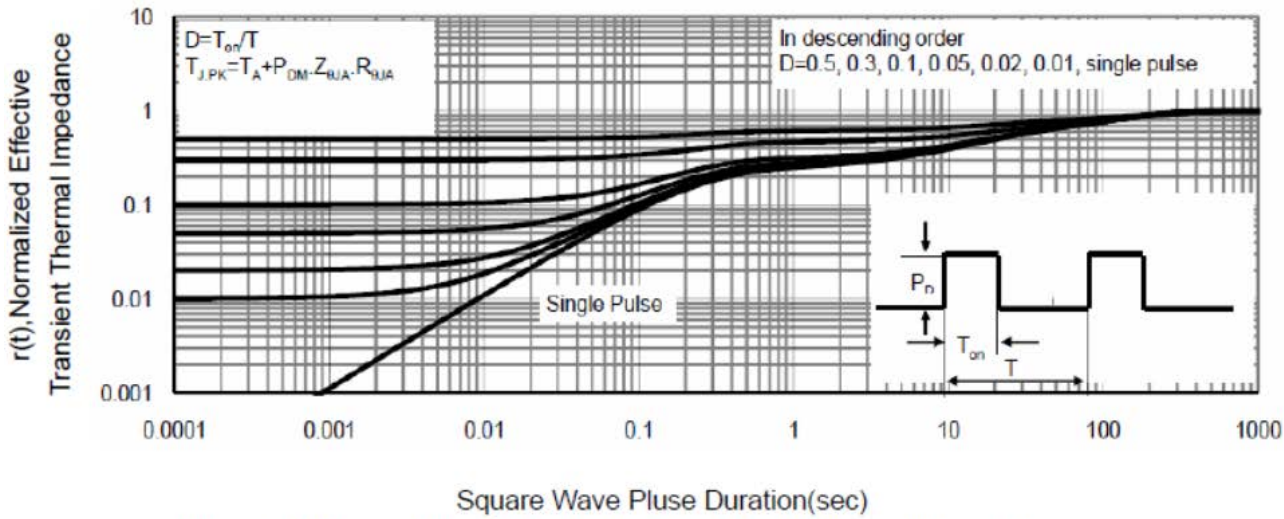
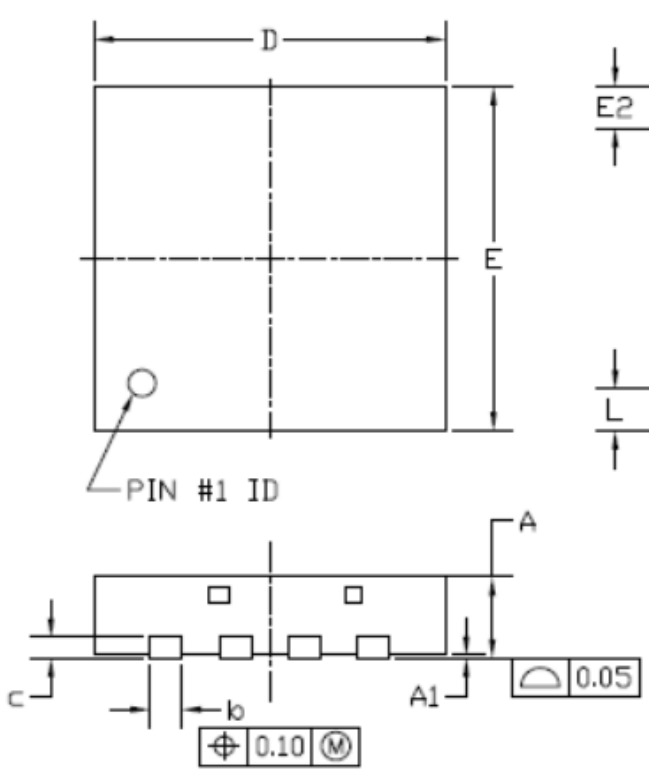
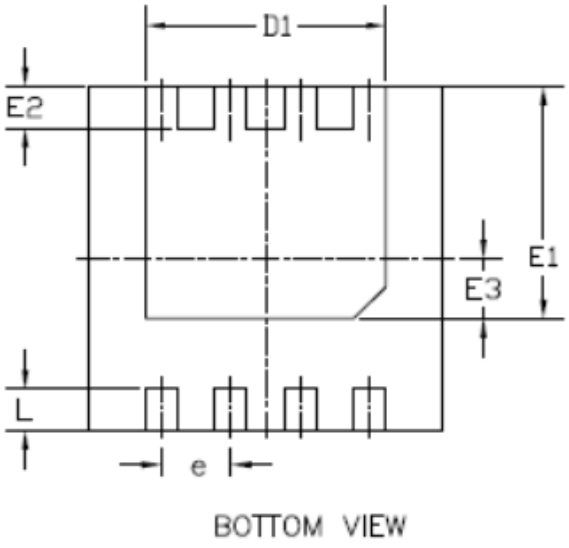


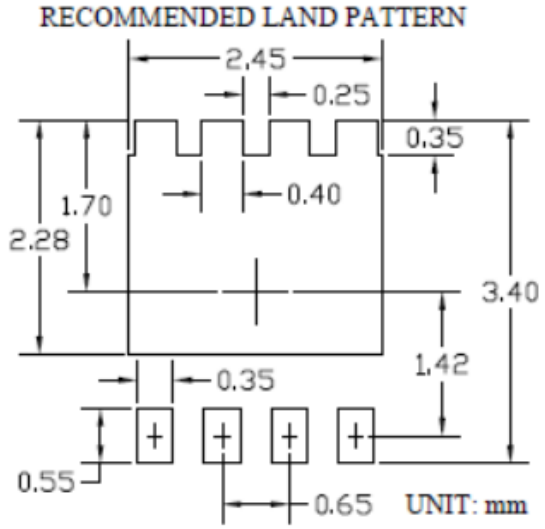
Figure 11 Normalized Maximum Transient Thermal Impedance

Packing Information

DFN3*3-8L







SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	—	—	0.05	—	—	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.15	0.25	0.004	0.006	0.010
D	3.20	3.30	3.40	0.126	0.130	0.134
D1	2.15	2.25	2.35	0.085	0.089	0.093
E	3.20	3.30	3.40	0.126	0.130	0.134
E1	2.13	2.23	2.33	0.084	0.088	0.092
E2	0.30	0.40	0.50	0.012	0.016	0.020
E3	0.48	0.58	0.68	0.019	0.023	0.027
e	0.65 BSC			0.026 BSC		
L	0.30	0.40	0.50	0.012	0.016	0.020

NOTE
1. 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.