# 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 | ℃ |

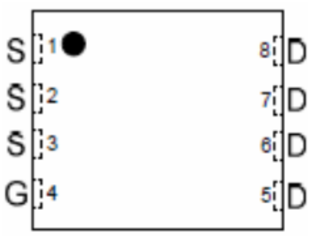
A: The value of $R_{θJA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C. The value in any given application depends on the user's specific board design.

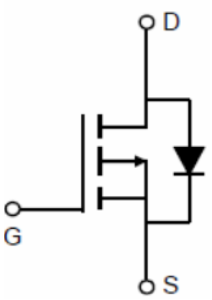
B: Repetitive rating, pulse width limited by junction temperature.

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

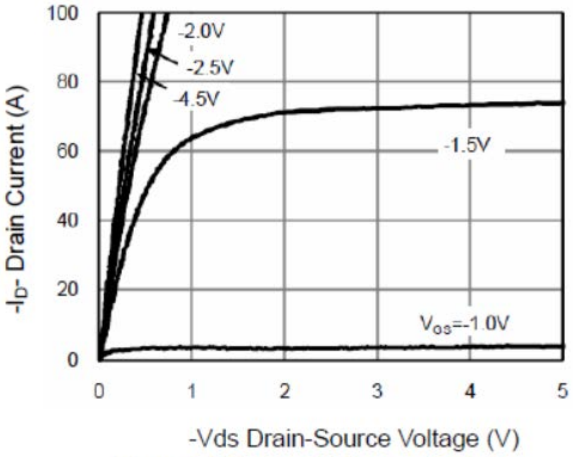



**Figure 1 Output Characteristics**

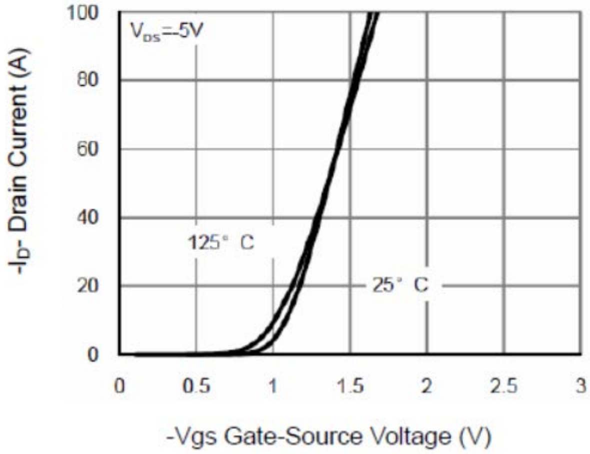



**Figure 2 Transfer Characteristics**

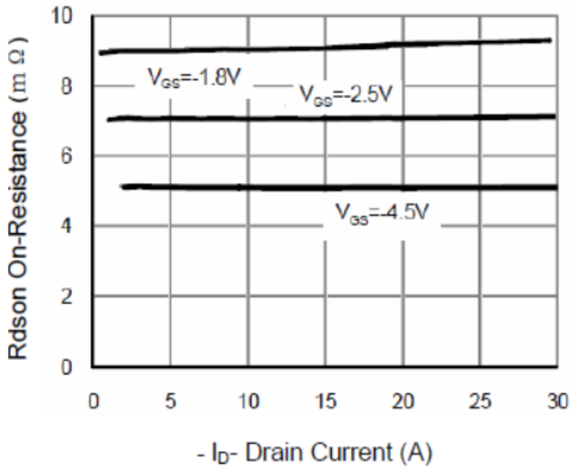



**Figure 3 Rdson- Drain Current**

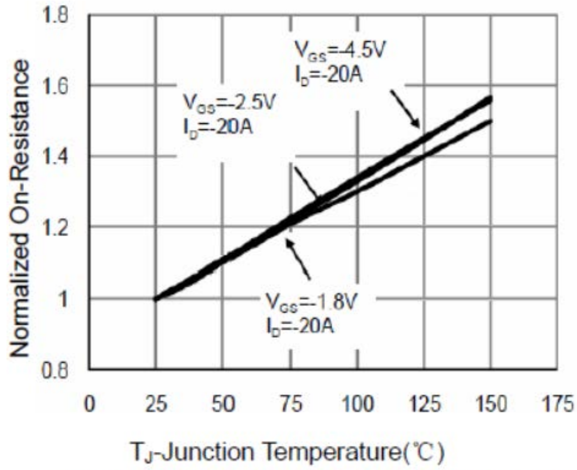



**Figure 4 Rdson-Junction Temperature**

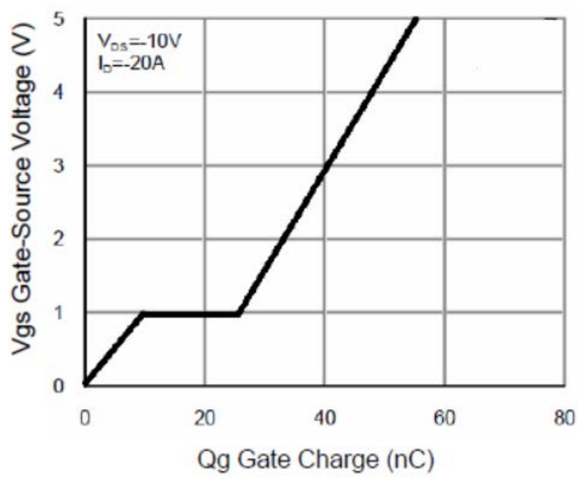



**Figure 5 Gate Charge**

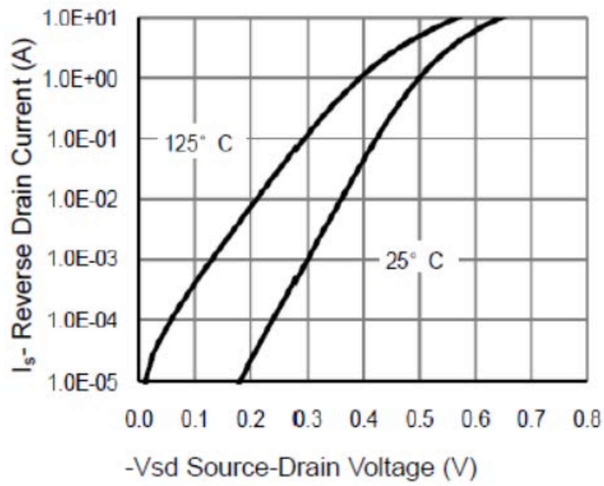



**Figure 6 Source- Drain Diode Forward**

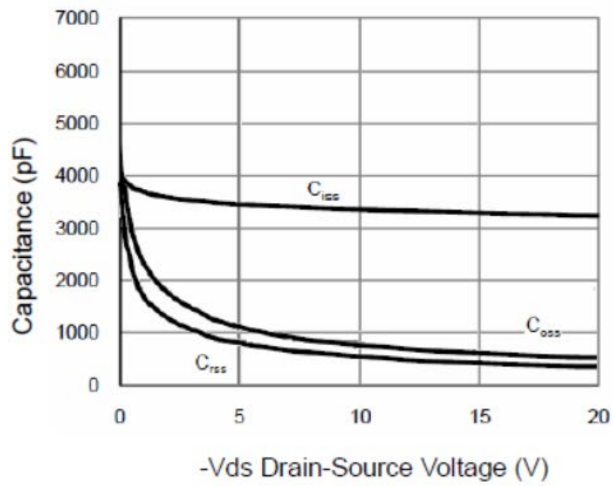



**Figure 7 Capacitance vs Vds**

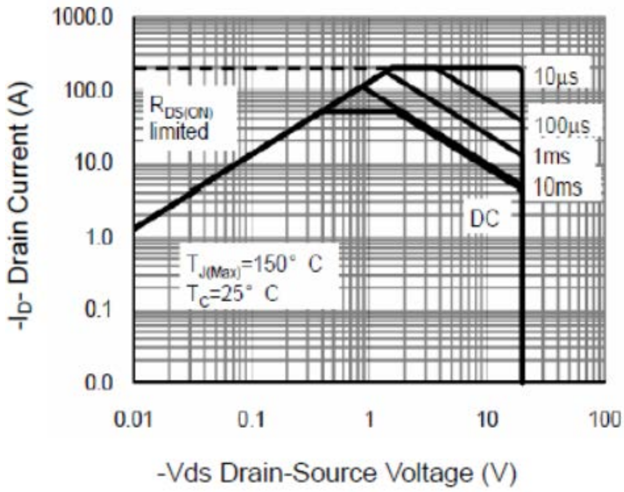



**Figure 8 Safe Operation Area**

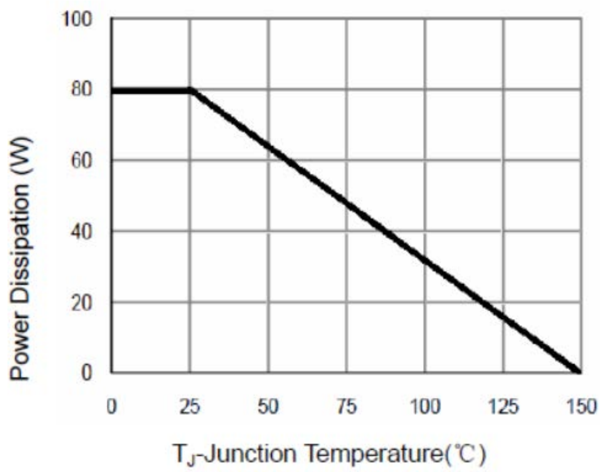



**Figure 9 Power De-rating**

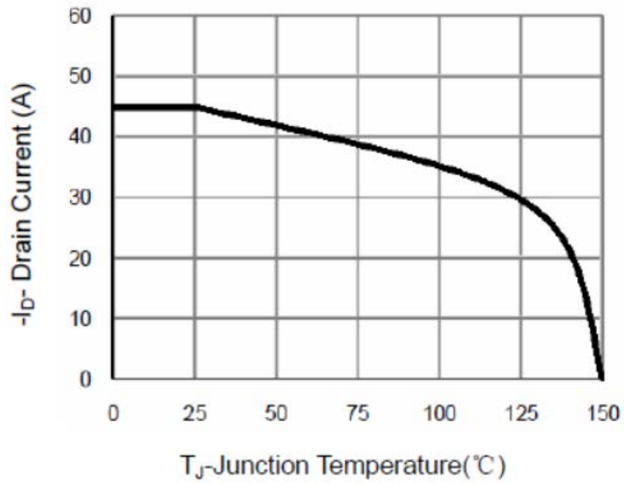



**Figure 10 -Current De-rating**

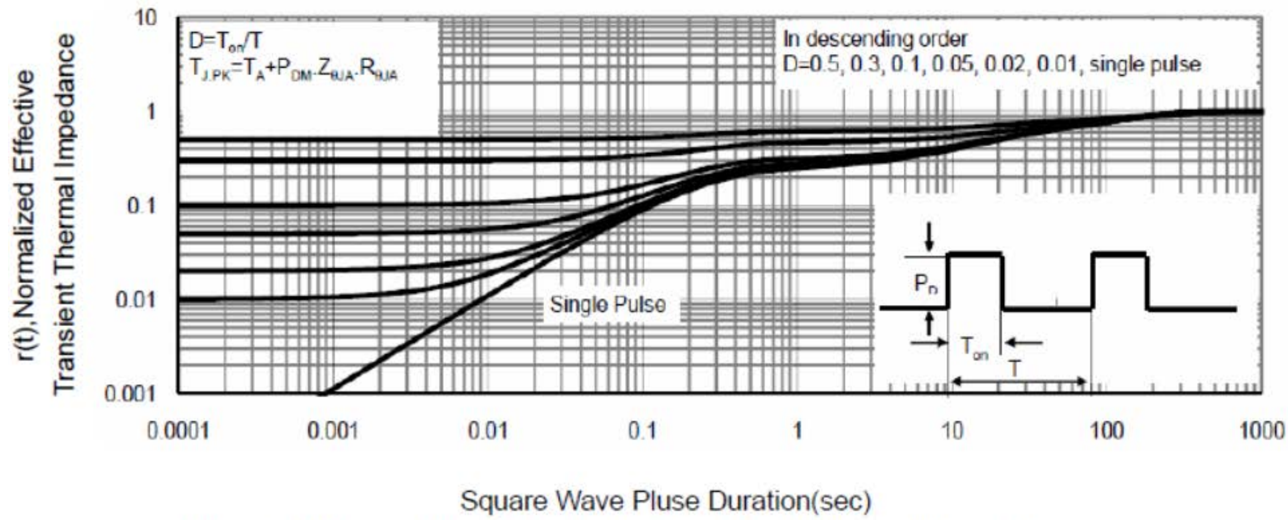
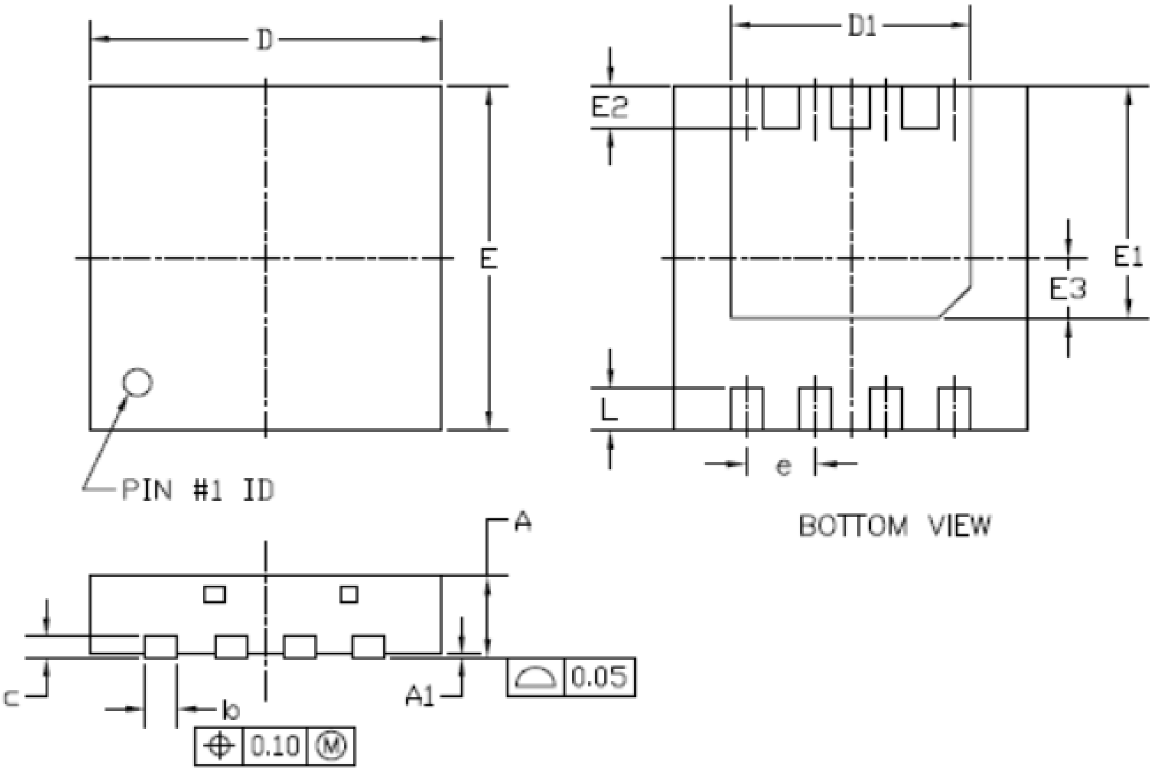


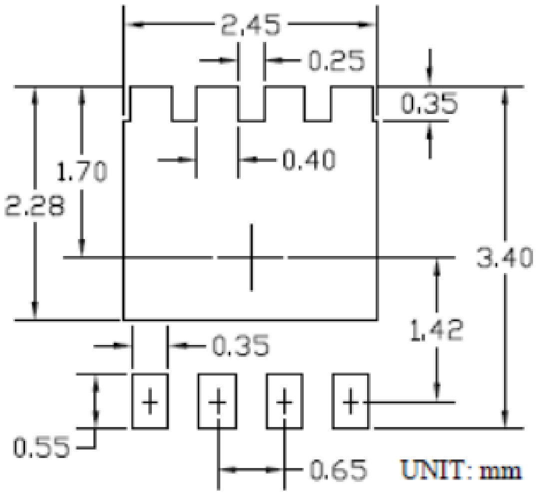

**Figure 11 Normalized Maximum Transient Thermal Impedance**

## Packing Information

### DFN3*3-8L




RECOMMENDED LAND PATTERN




| 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

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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.

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