# ACE2341B

**P-Channel Enhancement Mode Field Effect Transistor**

## Description

The ACE2341B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation gate voltages as low as 1.8V. This device is suitable for use as a load switch or other general applications.

## Features

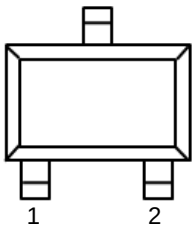
- $V_{DS}$=-20V, $I_D$=-4.1A
- $R_{DS(ON)}$<65mΩ @ $V_{GS}$=-4.5V
- $R_{DS(ON)}$<85mΩ @ $V_{GS}$=-2.5V
- $R_{DS(ON)}$<125mΩ @ $V_{GS}$=-1.8V

## Absolute Maximum Ratings

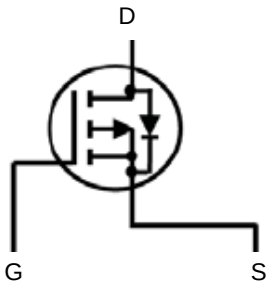
| Parameter | | Symbol | Max | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | V |
| Drain Current (Continuous) | $T_A$=25°C | $I_D$ | -4.1 | A |
| | $T_A$=70°C | | -3.2 | |
| Drain Current (Pulse) | | $I_{DM}$ | -30 | A |
| Power Dissipation | $T_A$=25°C | $P_D$ | 1.4 | W |
| Operating and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to 150 | °C |

## Packaging Type

SOT-23-3L




| SOT-23-3L | Description |
|---|---|
| 1 | Gate |
| 2 | Source |
| 3 | Drain |




## Ordering information

ACE2341B XX + H

- Halogen - free
- Pb - free
- BM : SOT-23-3L

## Electrical Characteristics

$T_A$=25 °C unless otherwise noted

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| State | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=-250uA | -20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-16V, $V_{GS}$=0V | | | -1 | uA |
| Gate Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V, $V_{DS}$=0V | | | ±100 | nA |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-4.3A | | 55 | 65 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-2.5A | | 70 | 85 | |
| | | $V_{GS}$=-1.8V, $I_D$=-2A | | 112 | 125 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250uA | -0.6 | -0.81 | -1.4 | V |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-5V, $I_D$=-4A | | 15 | | S |
| Drain Forward Voltage | $V_{SD}$ | $I_S$=-1.7A,$V_{GS}$=0V | | -0.85 | -1 | V |
| Switching | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-10V, $I_D$=-4.5A $V_{GS}$=-4.5V | | 8.92 | 11.6 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.8 | 2.34 | |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.04 | 2.65 | |
| Turn-On Delay Time | $T_{d(on)}$ | $V_{DS}$=-10V,$R_L$=10Ω $I_D$=-1A, $R_{GEN}$=6Ω $V_{GS}$=-4.5V | | 16.08 | 32.16 | ns |
| Turn-On Rise Time | $t_f$ | | | 5.28 | 10.56 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 37.6 | 75.2 | |
| Turn-Off Fall Time | $t_f$ | | | 7.28 | 14.5 | |
| Dynamic | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-10V, $V_{GS}$=0V f=1MHz | | 800 | 960 | pF |
| Output Capacitance | $C_{oss}$ | | | 131 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 103 | | |

Note: 1. 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.

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

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

## Typical Performance Characteristics

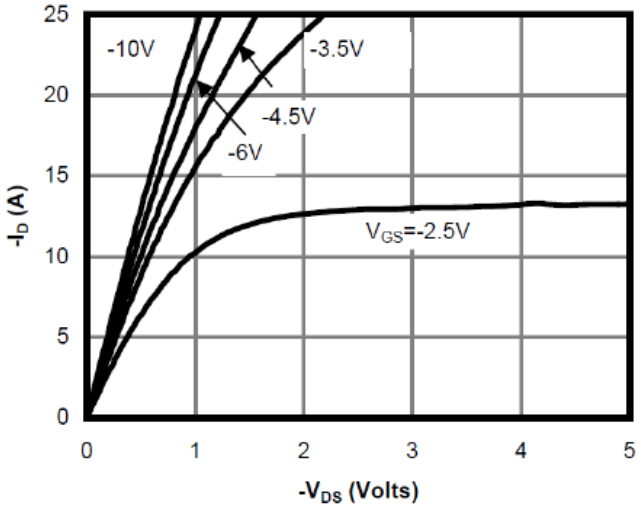



Fig 1: On-Region Characteristics

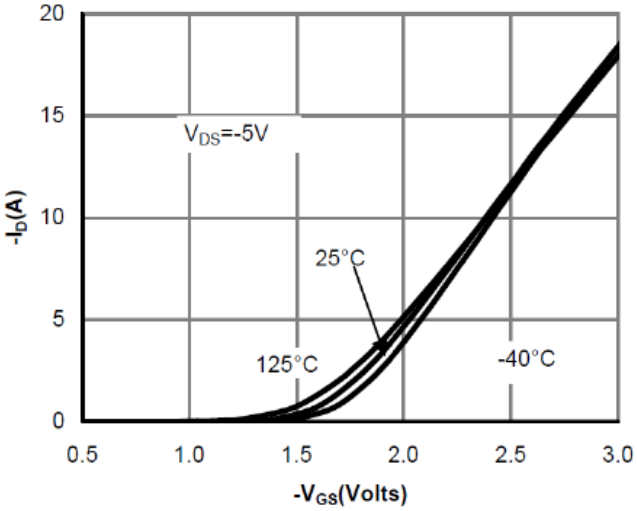



Figure 2: Transfer Characteristics

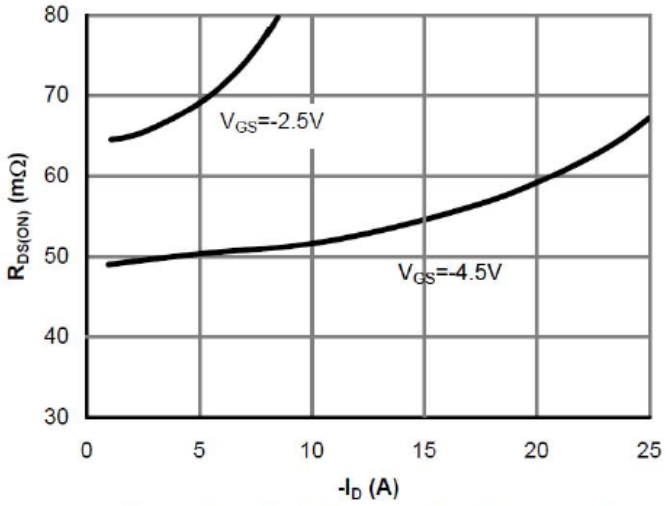



Figure 3: On-Resistance vs. Drain Current and

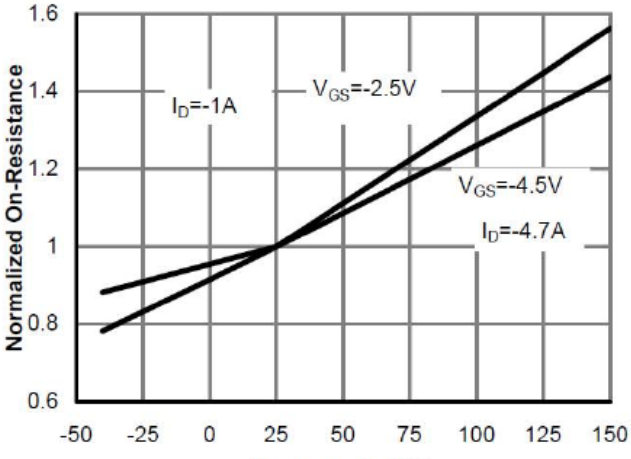



Figure 4: On-Resistance vs. Junction

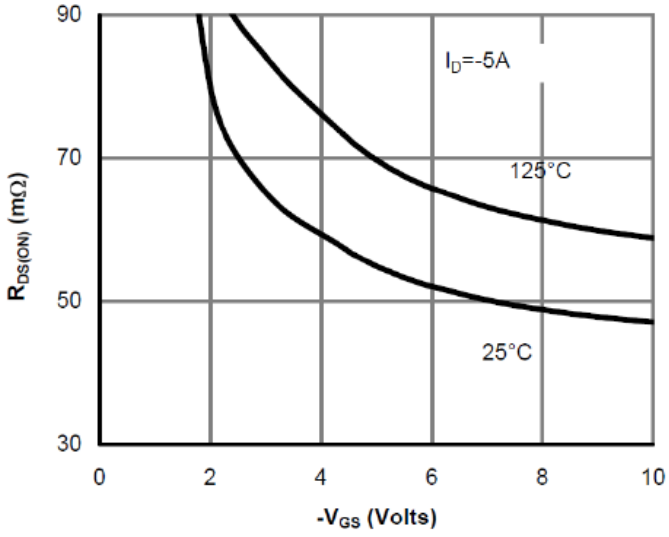



Figure 5: On-Resistance vs. Gate-Source Voltage

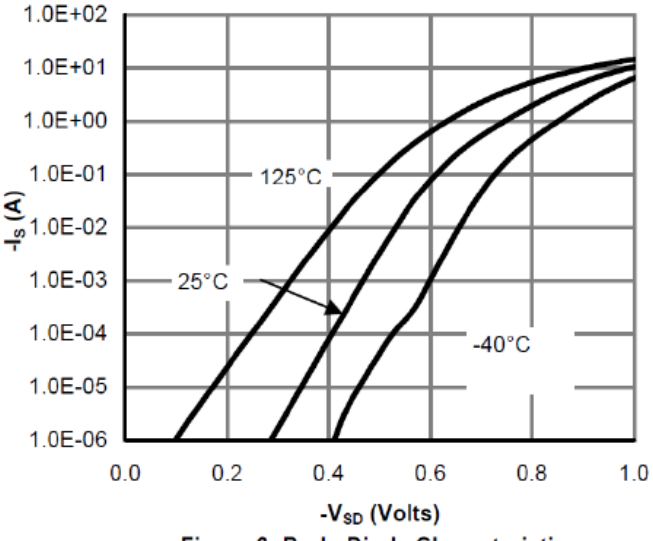



Figure 6: Body-Diode Characteristics

## Typical Performance Characteristics

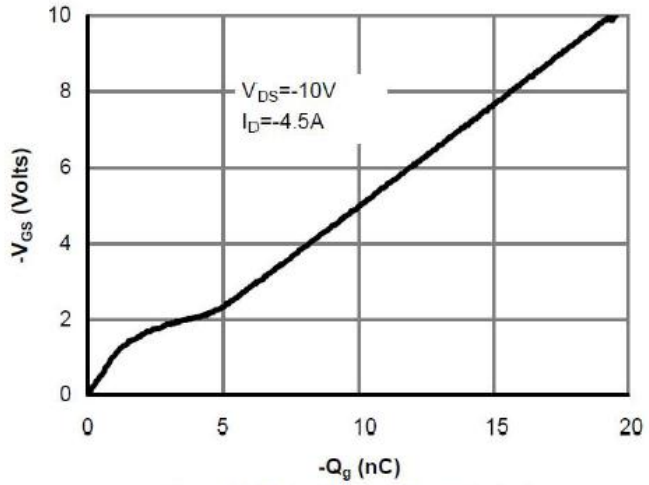



Figure 7: Gate-Charge Characteristics

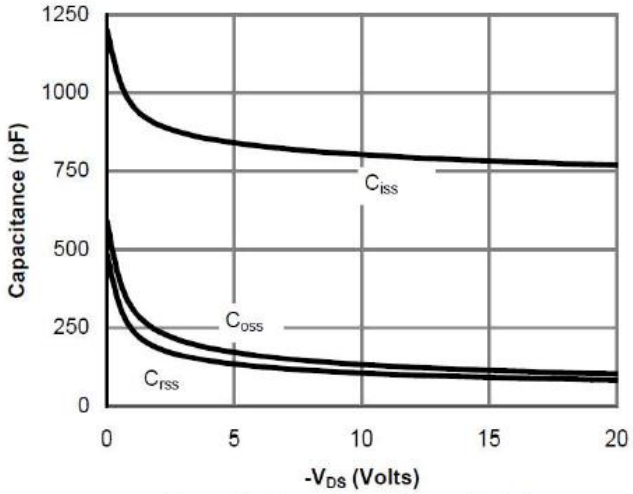



Figure 8: Capacitance Characteristics

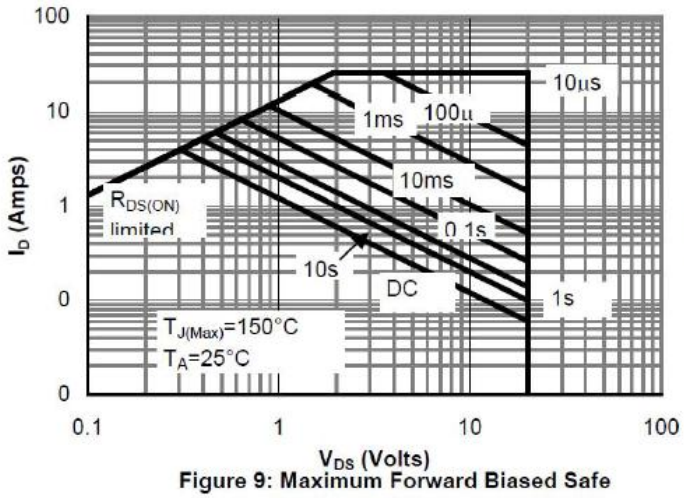



Figure 9: Maximum Forward Biased Safe Operating Area

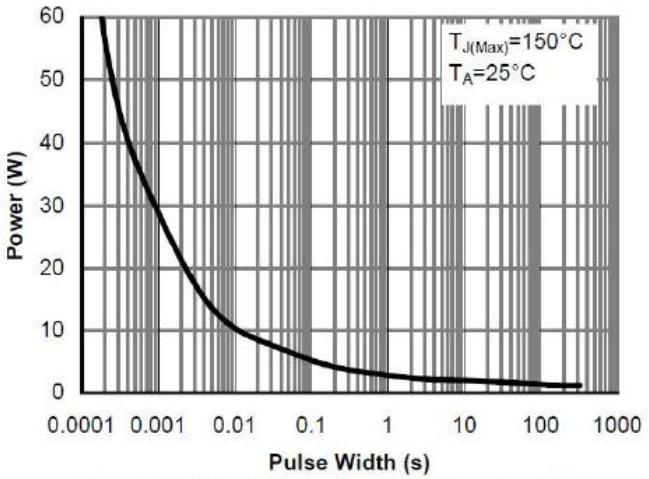



Figure 10: Single Pulse Power Rating Junction-to-Ambient

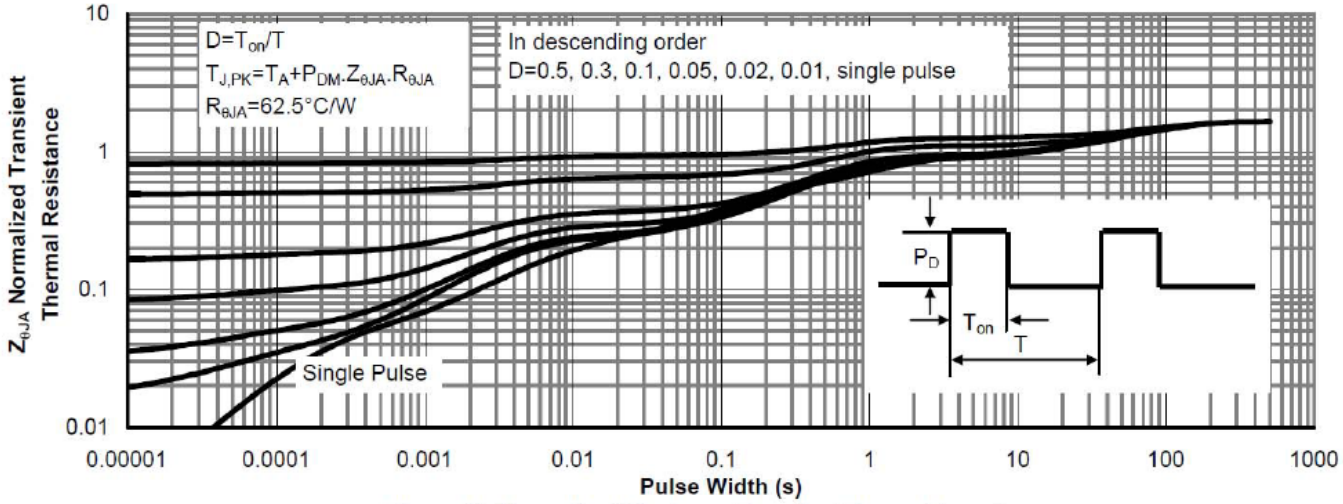
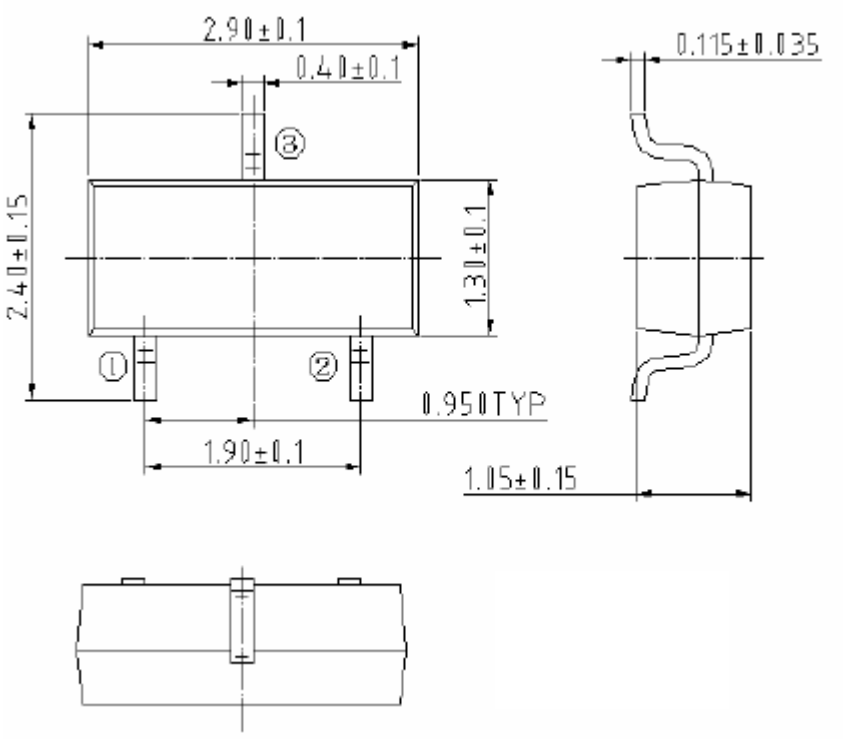



Figure 11: Normalized Maximum Transient Thermal Impedance

## Packing Information

### SOT-23-3L




Unit: mm

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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