



# ACE9435B

## P-Channel Enhancement Mode Field Effect Transistor

### Description

This P-Channel enhancement mode power FETs are produced with high cell density, DMOS trench technology, which is especially used to minimize on-state resistance. This device is particularly suited for low voltage application such as portable equipment, power management and other battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

### Features

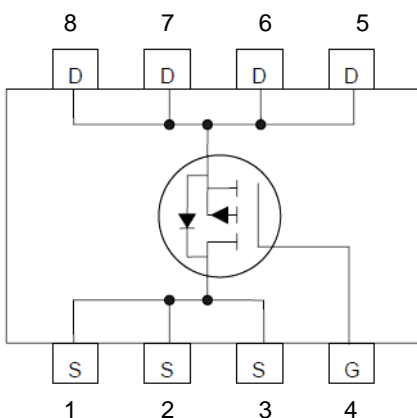
- $V_{DS}(V)=-320V$ ,  $I_D=-5.24.1A$
- $R_{DS(ON)}=51m\Omega$  @  $V_{GS}=-10V$
- $R_{DS(ON)}=68m\Omega$  @  $V_{GS}=-4.5V$
- High density cell design for low  $R_{DS(ON)}$

### Absolute Maximum Ratings

| Parameter                                   |                             | Symbol         | Max        | Unit       |
|---|-----------------------------|----------------|------------|------------|
| Drain-Source Voltage                        |                             | $V_{DSS}$      | -30        | V          |
| Gate-Source Voltage                         |                             | $V_{GSS}$      | $\pm 20$   | V          |
| Drain Current <sup>(Note 1)</sup>           | Continuous $T_A=25^\circ C$ | $I_D$          | -5.2       | A          |
|   | Pulsed <sup>(Note 2)</sup>  |                | -50        |            |
| Total Power Dissipation <sup>(Note 1)</sup> |                             | $P_D$          | 1.5        | W          |
| Operating and Storage Temperature Range     |                             | $T_J, T_{STG}$ | -55 to 150 | $^\circ C$ |

### Packaging Type

SOP-8



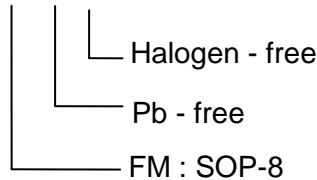


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### Ordering information

ACE9435B XX + H



### Electrical Characteristics

$T_A=25\text{ }^\circ\text{C}$  unless otherwise noted

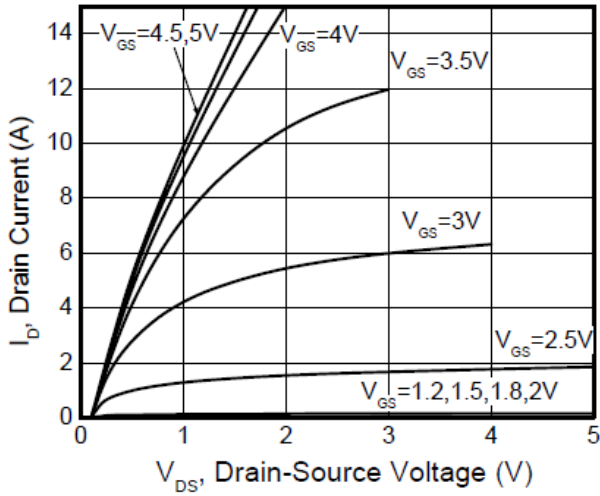
| Parameter  | Symbol        | Conditions   | Min. | Typ.      | Max.      | Unit       |
|--|---------------|--|------|-----------|-----------|------------|
| Off characteristics                                    |               |  |      |           |           |            |
| Drain-Source Breakdown Voltage                         | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$                                     | -30  | -36       |           | V          |
| Zero Gate Voltage Drain Current                        | $I_{DSS}$     | $V_{DS}=-24V, V_{GS}=0V$                                       |      | 0.02      | -1        | $\mu A$    |
| Gate Leakage Current                                   | $I_{GSS}$     | $V_{GS}=\pm 20V, V_{DS}=0V$                                    |      | $\pm 1.5$ | $\pm 100$ | nA         |
| On characteristics                                     |               |  |      |           |           |            |
| Drain-Source On-State Resistance                       | $R_{DS(ON)}$  | $V_{GS}=-10V, I_D=-4.6A$                                       |      | 51        | 60        | m $\Omega$ |
|  |               | $V_{GS}=-4.5V, I_D=-2A$  |      | 68        | 82        |            |
| Gate Threshold Voltage                                 | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=-250\mu A$                                 | -1   | -1.46     | -3        | V          |
| Forward Transconductance                               | $g_{FS}$      | $V_{DS}=-5V, I_D=-6A$  |      | 12        |           | S          |
| Switching  |               |  |      |           |           |            |
| Turn-On Delay Time                                     | $T_{d(on)}$   | $V_{DS}=-15V, R_L=2.5\Omega$<br>$R_{GEN}=3\Omega, V_{GS}=-10V$ |      | 8.6       |           | ns         |
| Turn-Off Delay Time                                    | $t_{d(off)}$  |  |      | 28.2      |           |            |
| Dynamic Characteristics                                |               |  |      |           |           |            |
| Input Capacitance                                      | $C_{iss}$     | $V_{DS}=-15V, V_{GS}=0V$<br>$f=1MHz$                           |      | 550       |           | pF         |
| Output Capacitance                                     | $C_{oss}$     |  |      | 60        |           |            |
| Reverse Transfer Capacitance                           | $C_{rss}$     |  |      | 50        |           |            |
| Drain-source diode characteristics and maximum ratings |               |  |      |           |           |            |
| Diode Forward Voltage                                  | $V_{SD}$      | $V_{GS}=0V, I_S=-1A$   |      | -0.81     |           | V          |

Note: 1. The value of  $P_D$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25\text{ }^\circ\text{C}$ . The value in any given application depends on the user's specific board design. The current rating is based on the DC thermal resistance rating.

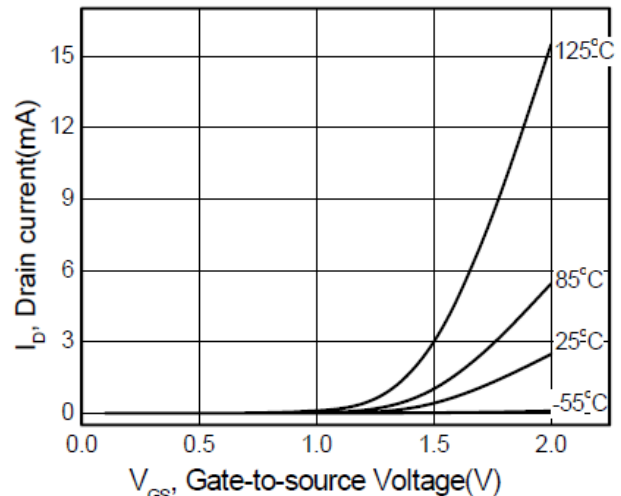
2. Repetitive rating, pulse width limited by junction temperature.



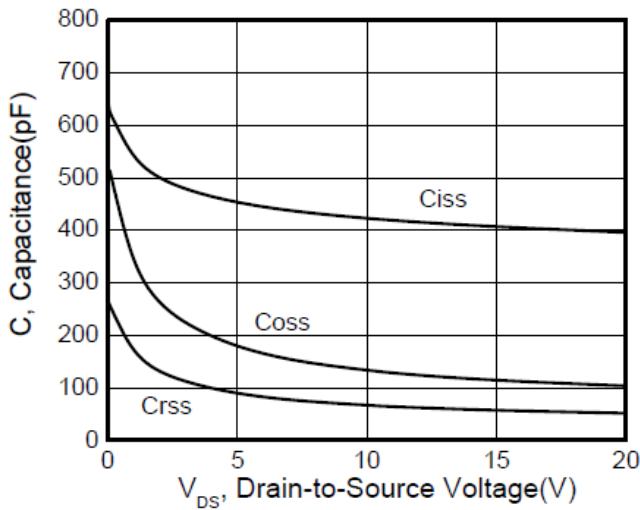
**Typical Performance Characteristics**



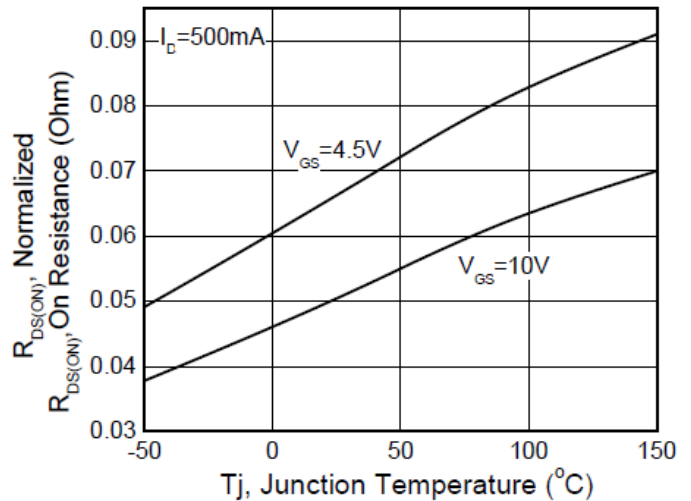
**Figure 1. Output Characteristics**



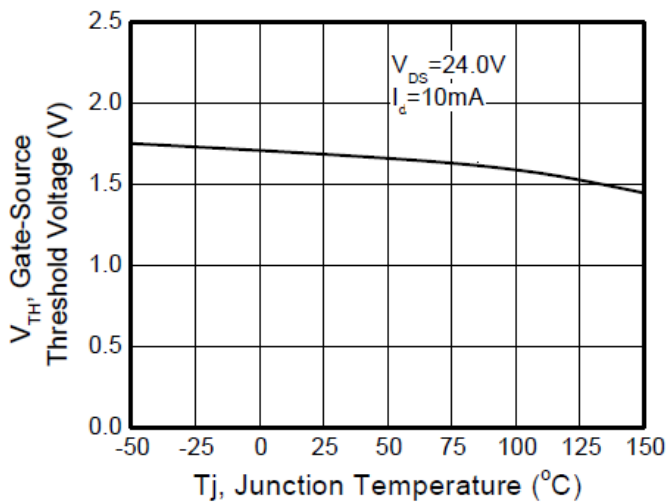
**Figure 2. Transfer Characteristics**



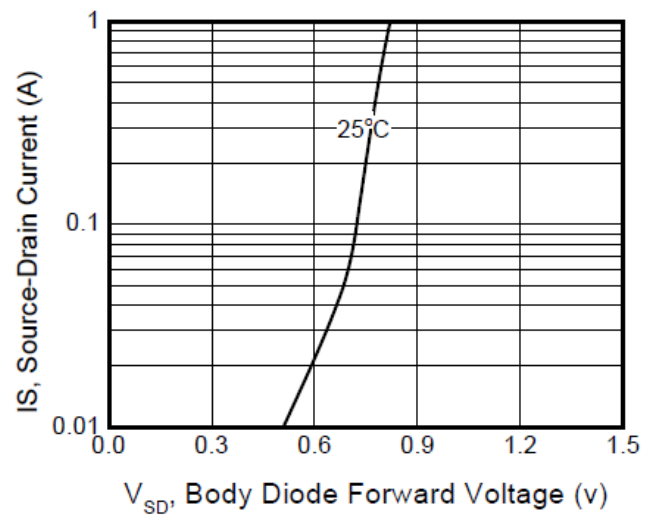
**Figure 3. Capacitance**



**Figure 4. On Resistance Vs. Temperature**



**Figure 5. Gate Threshold Vs. Temperature**



**Figure 6. Body Diode Forward Voltage**

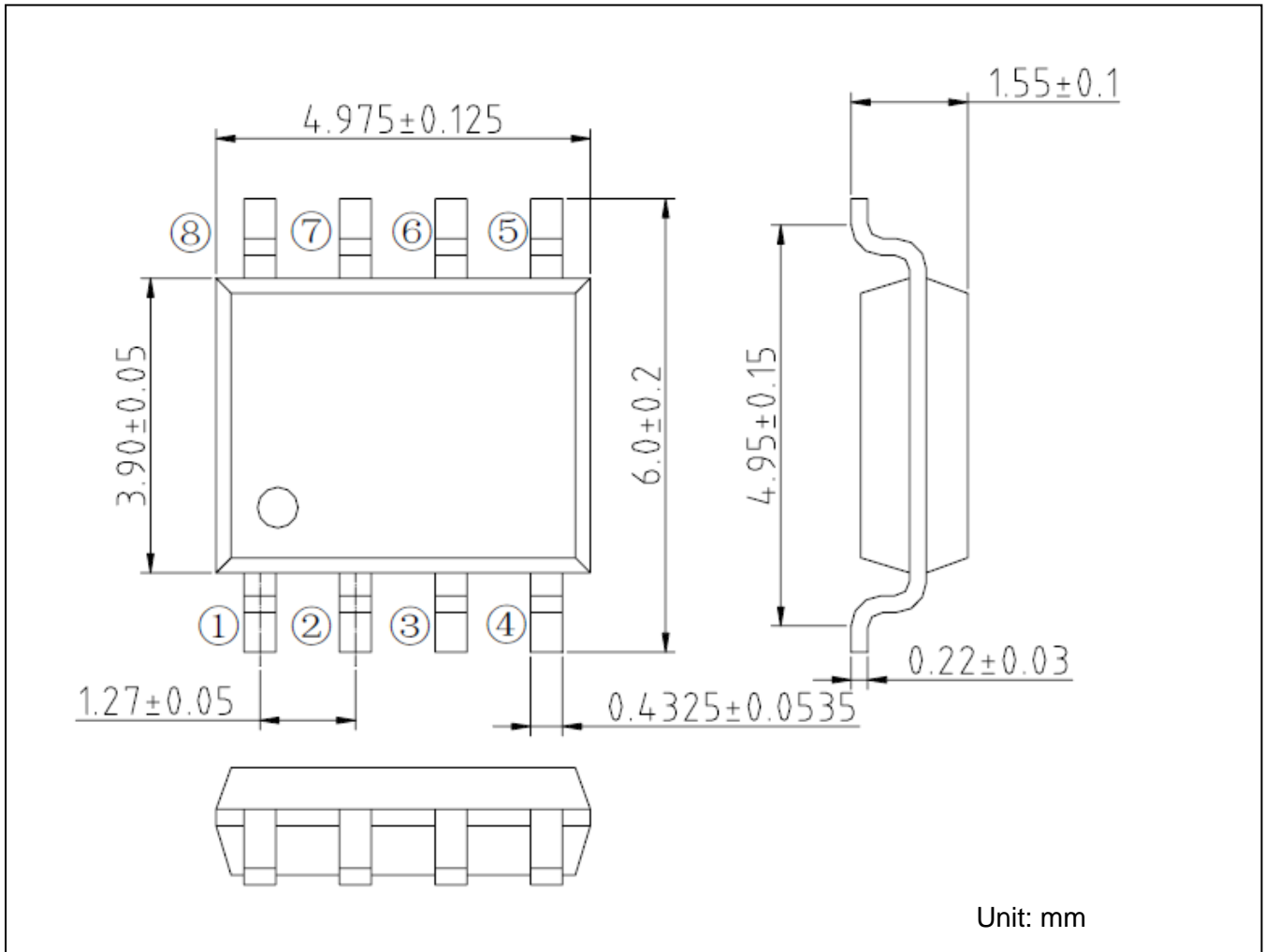


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### Packing Information

#### SOP-8





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### 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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