



## DESCRIPTION

The AM2317 is the P-Channel logic enhancement mode power field effect transistor is produced using high cell density advanced trench technology.

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, and low in-line power loss are needed in a very small outline surface mount package.

The AM2317 is available in SOT-23 package.

## ORDERING INFORMATION

| Package Type  | Part Number                               |            |
|---|---|------------|
| SOT-23  | E3  | AM2317E3R  |
|   |   | AM2317E3VR |
| Note  | V: Halogen free Package<br>R: Tape & Reel |            |
| AiT provides all RoHS products<br>Suffix " V " means Halogen free Package |   |            |

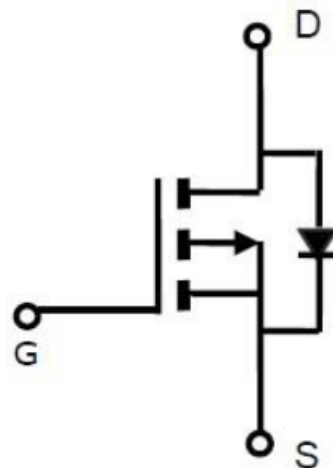
## FEATURES

- -20V/-4.6A,  $R_{DS(ON)}=35m\Omega(\text{typ.})@V_{GS}=-4.5V$
- -20V/-4.1A,  $R_{DS(ON)}=45m\Omega(\text{typ.})@V_{GS}=-2.5V$
- -20V/-3.6A,  $R_{DS(ON)}=53m\Omega(\text{typ.})@V_{GS}=-1.8V$
- Super high design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- Full RoHS compliance
- Available in SOT-23 Package

## APPLICATION

- Power Management
- Portable Equipment
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

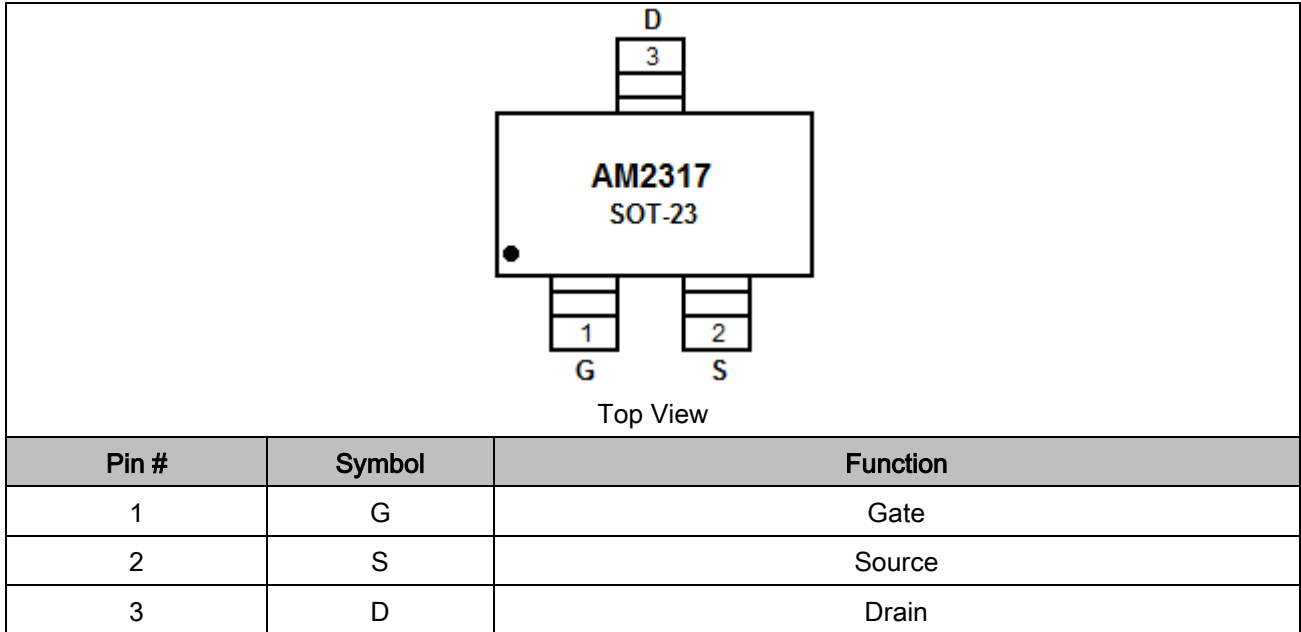
## TYPICAL APPLICATION



P-Channel



## PIN DESCRIPTION





## ABSOLUTE MAXIMUM RATINGS

T<sub>A</sub>= 25°C, Unless otherwise noted

|   |  |              |
|---|--|--------------|
| V <sub>DSS</sub> , Drain-Source Voltage                       |  | -20V         |
| V <sub>GSS</sub> , Gate-Source Voltage                        |  | ±8V          |
| I <sub>D</sub> , Continuous Drain Current                     | T <sub>C</sub> =25°C, V <sub>GS</sub> =10V | -6A          |
|   | T <sub>C</sub> =75°C, V <sub>GS</sub> =10V | -5.2A        |
| I <sub>DM</sub> , Pulsed Drain Current                        |  | -20A         |
| I <sub>S</sub> , Continuous Source Current (Diode Conduction) |  | -2.0A        |
| P <sub>D</sub> , Power Dissipation                            | T <sub>A</sub> =25°C                       | 1.25W        |
|   | T <sub>A</sub> =75°C                       | 0.8W         |
| T <sub>J</sub> , Operation Junction Temperature               |  | 150°C        |
| T <sub>STG</sub> , Storage Temperature Range                  |  | -55°C~+150°C |
| R <sub>θJA</sub> , Thermal Resistance Junction to Ambient     |  | 120°C/W      |

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



## ELECTRICAL CHARACTERISTICS

T<sub>A</sub>=25°C, Unless otherwise noted

| Parameter                       | Symbol               | Conditions   | Min. | Typ. | Max. | Unit |
|---------------------------------|----------------------|--|------|------|------|------|
| <b>Static Parameters</b>        |                      |  |      |      |      |      |
| Drain-Source Breakdown Voltage  | V <sub>(BR)DSS</sub> | V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA                              | -20  |      |      | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA                | -0.5 |      | -1.0 | V    |
| Gate Leakage Current            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V                                |      |      | ±100 | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =-12V, V <sub>GS</sub> =0                                |      |      | -1   | uA   |
|                                 |                      | V <sub>DS</sub> =-12V, V <sub>GS</sub> =0 T <sub>J</sub> =55°C           |      |      | -5   |      |
| Drain-Source On-Resistance      | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =-45V, I <sub>D</sub> =-4.6A                             |      | 35   | 40   | mΩ   |
|                                 |                      | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4.1A                            |      | 45   | 50   |      |
|                                 |                      | V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-3.6A                            |      | 53   | 63   |      |
| Forward Transconductance        | G <sub>fs</sub>      | V <sub>DS</sub> =-5V, I <sub>D</sub> =-4.6A                              |      | 2.0  |      | S    |
| <b>Source-Drain Diode</b>       |                      |  |      |      |      |      |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V                               |      | -0.6 | -1.2 | V    |
| <b>Dynamic Parameters</b>       |                      |  |      |      |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =-10V<br>V <sub>GS</sub> =-4.5V<br>I <sub>D</sub> =-4.6A |      | 6.5  |      | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      |  |      | 2.8  |      |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      |  |      | 3.2  |      |      |
| Input Capacitance               | C <sub>iss</sub>     | V <sub>DS</sub> =-10V<br>V <sub>GS</sub> =0V<br>f=1MHz                   |      | 680  |      | pF   |
| Output Capacitance              | C <sub>oss</sub>     |  |      | 290  |      |      |
| Reverse Transfer Capacitance    | C <sub>rss</sub>     |  |      | 108  |      |      |
| Turn-On Time                    | T <sub>d(on)</sub>   | V <sub>DS</sub> =-10V<br>I <sub>D</sub> =-3.7A                           |      | 10   |      | nS   |
|                                 | T <sub>r</sub>       |  |      | 16.8 |      |      |
| Turn-Off Time                   | T <sub>d(off)</sub>  | V <sub>GEN</sub> =-4.5V<br>R <sub>G</sub> =1Ω                            |      | 21   |      |      |
|                                 | T <sub>f</sub>       |  |      | 15   |      |      |

NOTE1: Pulse test: pulse width≤300uS, duty cycle≤2%

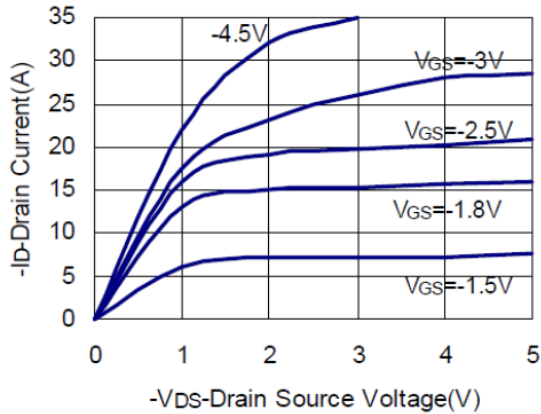
NOTE1: Static parameters are based on package level with recommended wire bonding



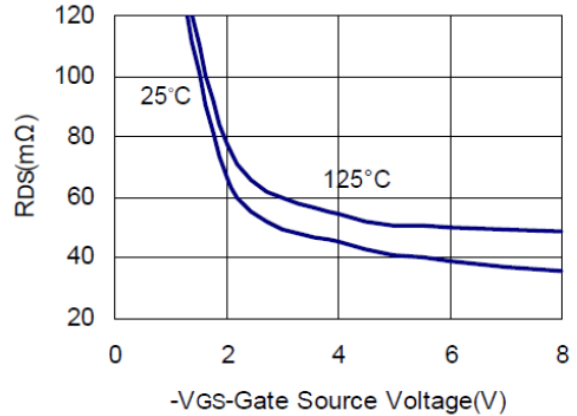
## TYPICAL PERFORMANCE CHARACTERISTICS

25°C, Unless Note

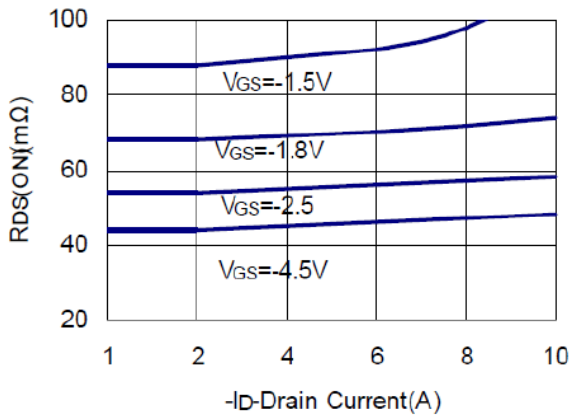
### 1. Output Characteristics



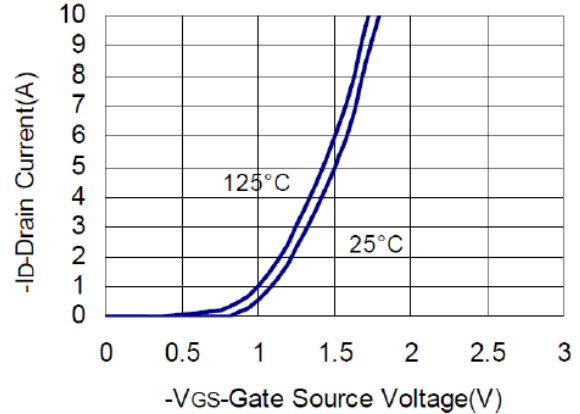
### 2. Drain-Source On Resistance



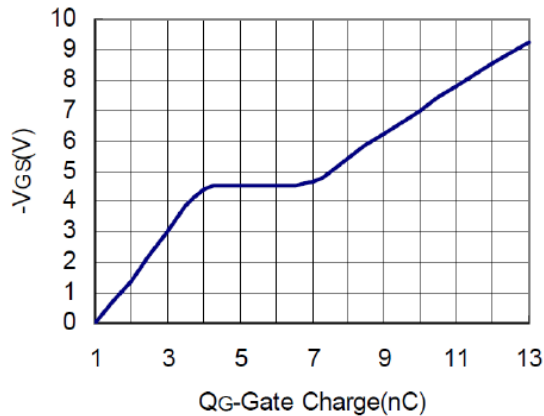
### 3. Drain Source On Resistance



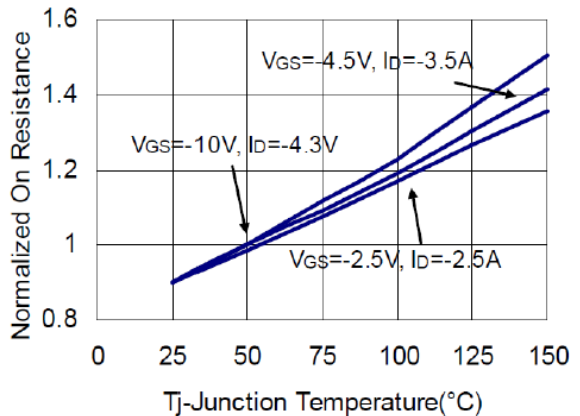
### 4. Transfer Characteristics



### 5. Gate Charge

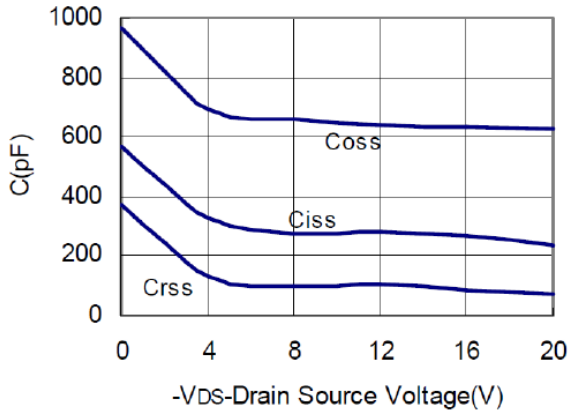


### 6. Drain Source Resistance

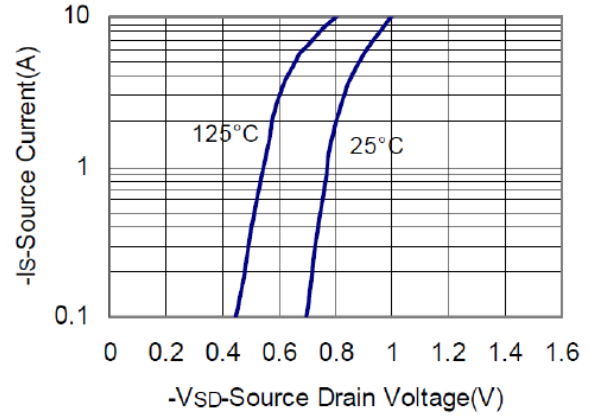




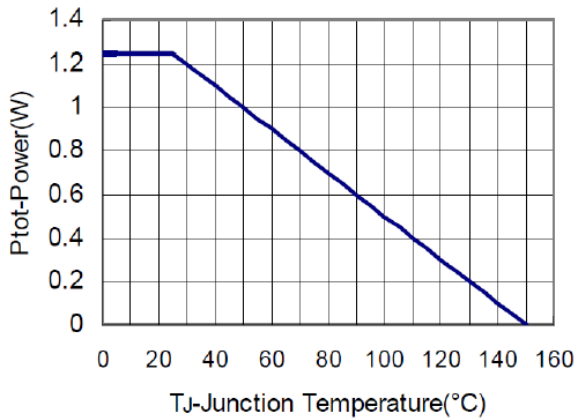
7. Capacitance



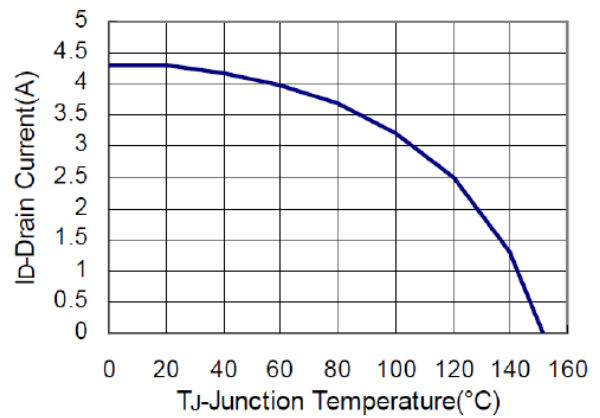
8. Source Drain Diode Forward



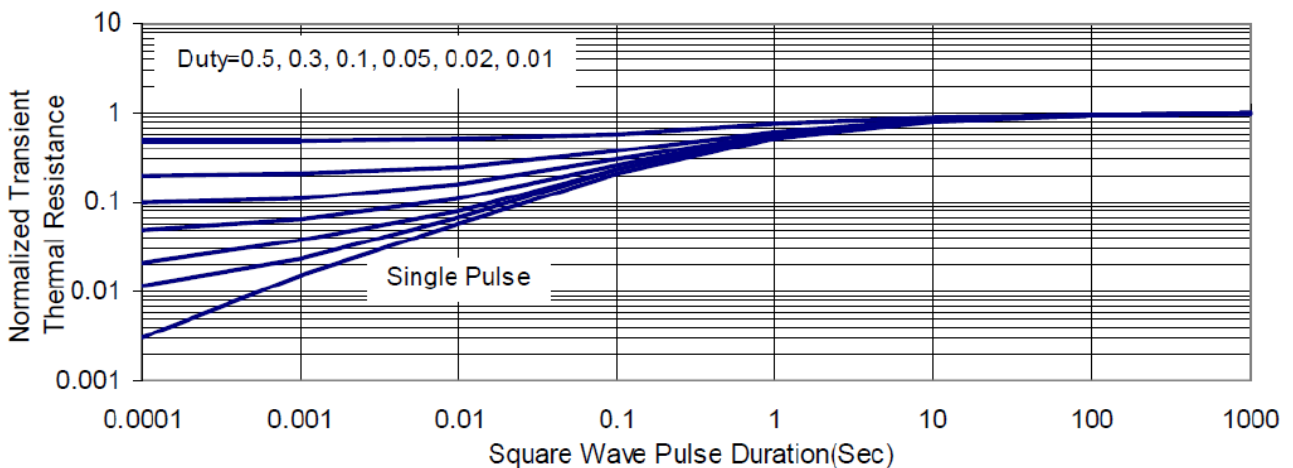
9. Power Dissipation



10. Drain Current



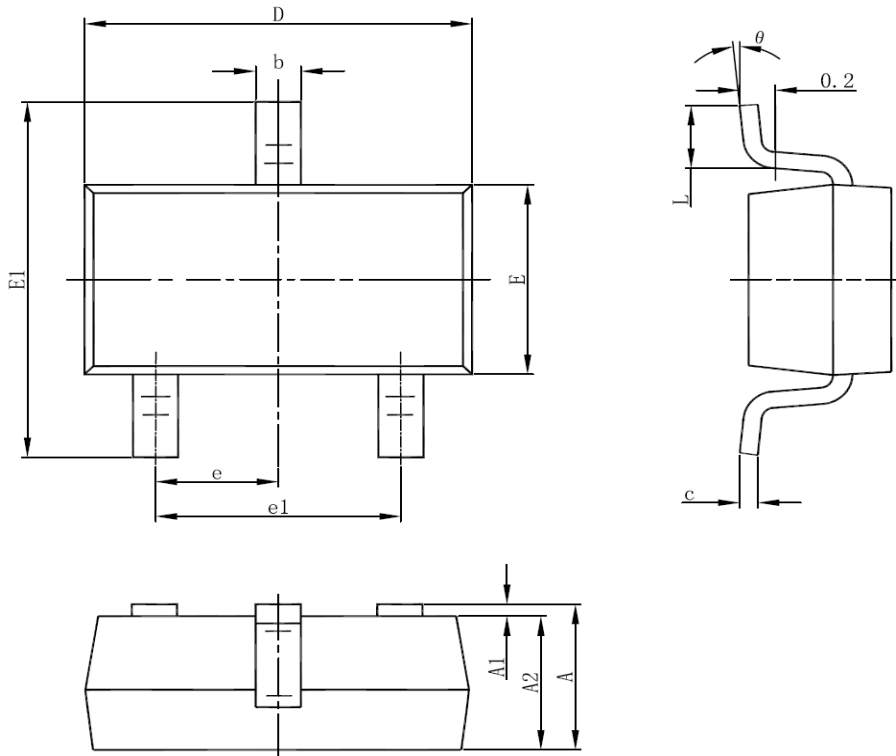
11. Thermal Transient Impedance





## PACKAGE INFORMATION

Dimension in SOT-23 Package (Unit: mm)



| SYMBOL | MIN        | MAX   |
|--------|------------|-------|
| A      | 1.050      | 1.250 |
| A1     | 0.000      | 0.100 |
| A2     | 1.050      | 1.150 |
| b      | 0.300      | 0.500 |
| c      | 0.100      | 0.200 |
| D      | 2.820      | 3.020 |
| E      | 1.500      | 1.700 |
| E1     | 2.650      | 2.950 |
| e      | 0.950(BSC) |       |
| e1     | 1.800      | 2.000 |
| L      | 0.300      | 0.600 |
| theta  | 0°         | 8°    |



## IMPORTANT NOTICE

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