



## DESCRIPTION

The AM2342 is the N-Channel logic enhancement mode power field effect transistor is produced using high cell density. Advanced trench technology to provide excellent  $R_{DS(ON)}$ .

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.

AM2342 is available in SOT-23 packages.

## ORDER INFORMATION

| Package Type  | Part Number                         |            |
|---|-------------------------------------|------------|
| SOT-23  | E3                                  | AM2342E3R  |
|   |                                     | AM2342E3VR |
| Note  | V: Green Package<br>R : Tape & Reel |            |
| AiT provides all Pb free products<br>Suffix " V " means Green Package |                                     |            |

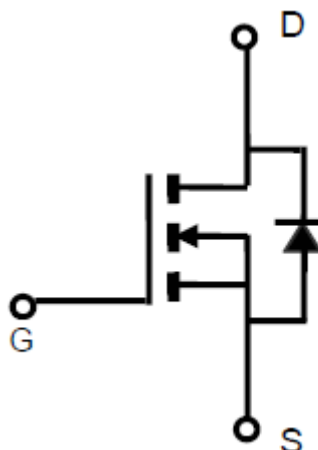
## FEATURES

- 20V/5.0A,  $R_{DS(ON)} = 25m\Omega$ (typ.)@ $V_{GS} = 4.5V$
- 20V/4.5A,  $R_{DS(ON)} = 34m\Omega$ (typ.)@ $V_{GS} = 2.5V$
- 20V/4.0A,  $R_{DS(ON)} = 48m\Omega$ (typ.)@ $V_{GS} = 1.8V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- Available in SOT-23 Package

## APPLICATION

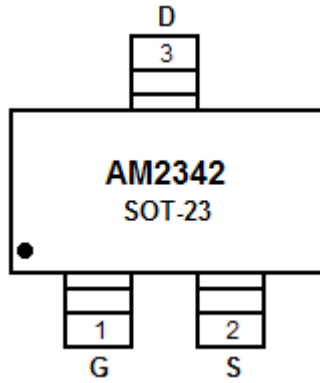
- Power Management in Note book
- Portable Equipment
- DSC
- LCD Display inverter
- Battery Powered System
- DC/DC Converter

## N CHANNEL MOSFET





**PIN DESCRIPTION**



Top View

| Pin # | Symbol | Function |
|-------|--------|----------|
| 1     | G      | Gate     |
| 2     | S      | Source   |
| 3     | D      | Drain    |



## ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$  Unless otherwise specified

|  |                        |                  |
|--|------------------------|------------------|
| $V_{DSS}$ , Drain-Source Voltage                             |                        | 20V              |
| $V_{GSS}$ , Gate-Source Voltage                              |                        | $\pm 12\text{V}$ |
| $I_D$ , Continuous Drain Current ( $T_J=150^\circ\text{C}$ ) | $V_{GS}=4.5\text{V}$   | 5.0A             |
| $I_{DM}$ , Pulsed Drain Current                              |                        | 20A              |
| $I_S$ , Continuous Source Current (Diode Conduction)         |                        | 1.0A             |
| $P_D$ , Power Dissipation                                    |                        |                  |
|  | $T_A=25^\circ\text{C}$ | 1.25W            |
|  | $T_A=70^\circ\text{C}$ | 0.8W             |
| $T_J$ , Operation Junction Temperature                       |                        | 150°C            |
| $T_{STG}$ , Storage Temperature Range                        |                        | -55/150°C        |

Stresses above may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## THERMAL INFORMATION

| Parameter                              | Symbol          | Max | Unit |
|--|-----------------|-----|------|
| Thermal Resistance-Junction to Ambient | $R_{\theta JA}$ | 120 | °C/W |



## ELECTRICAL CHARACTERISTICS

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

| 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> =250μA                        | 20  | -   | -    | V    |
| Gate Threshold Voltage          | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA          | 0.4 | -   | 1.0  | V    |
| Gate Leakage Current            | I <sub>GSS</sub>     | V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V                        | -   | -   | ±100 | nA   |
| Zero Gate Voltage Drain Current | I <sub>DSS</sub>     | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                         | -   | -   | 1    | μA   |
|                                 |                      | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V<br>T <sub>J</sub> =55°C | -   | -   | 10   |      |
| On-State Drain Current          | I <sub>D(ON)</sub>   | V <sub>DS</sub> ≥5V, V <sub>GS</sub> =4.5V                        | 5   | -   | -    | A    |
| Drain-source On-Resistance      | R <sub>DS(ON)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.0A                       | -   | 25  | 28   | mΩ   |
|                                 |                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =4.5A                       | -   | 34  | 38   |      |
|                                 |                      | V <sub>GS</sub> =1.8V, I <sub>D</sub> =4.0A                       | -   | 48  | 60   |      |
| Forward Transconductance        | G <sub>fs</sub>      | V <sub>DS</sub> =15V, I <sub>D</sub> =5.0A                        | -   | 30  | -    | S    |
| <b>Source-Drain Diode</b>       |                      |   |     |     |      |      |
| Diode Forward Voltage           | V <sub>SD</sub>      | I <sub>S</sub> =1.7A, V <sub>GS</sub> =0V                         | -   | 1.0 | 1.3  | V    |
| <b>Dynamic Parameters</b>       |                      |   |     |     |      |      |
| Total Gate Charge               | Q <sub>g</sub>       | V <sub>DS</sub> =10V  | -   | 10  | 12   | nC   |
| Gate-Source Charge              | Q <sub>gs</sub>      | V <sub>GS</sub> =4.5V   | -   | 1.4 | -    |      |
| Gate-Drain Charge               | Q <sub>gd</sub>      | I <sub>D</sub> =5.5A  | -   | 2.2 | -    |      |
| Input Capacitance               | C <sub>iSS</sub>     | V <sub>DS</sub> =10V  | -   | 580 | -    | pF   |
| Output Capacitance              | C <sub>oSS</sub>     | V <sub>GS</sub> =0V   | -   | 120 | -    |      |
| Reverse Transfer Capacitance    | C <sub>rSS</sub>     | f=1MHz  | -   | 98  | -    |      |
| Turn-On Time                    | td(on)               | V <sub>DD</sub> =10V  | -   | 14  | 24   | nS   |
|                                 | tr                   | R <sub>L</sub> =10Ω   | -   | 40  | 60   |      |
| Turn-Off Time                   | td(off)              | I <sub>D</sub> =1.0A  | -   | 45  | 65   |      |
|                                 | tf                   | V <sub>GEN</sub> =4.5V<br>R <sub>G</sub> =6Ω                      | -   | 32  | 42   |      |
|                                 |                      |   |     |     |      |      |

NOTE: 1. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%

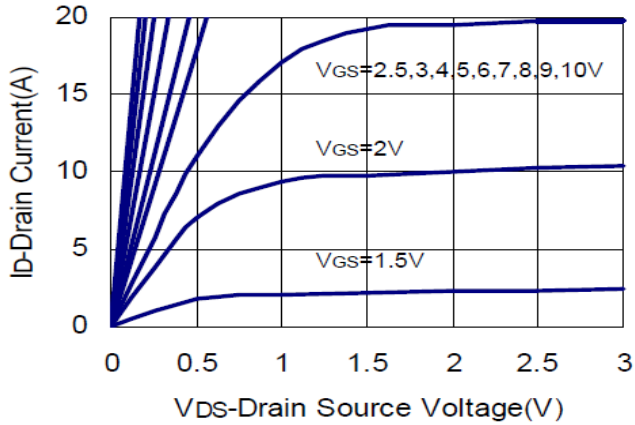
2. Static parameters are based on package level with recommended wire-bonding



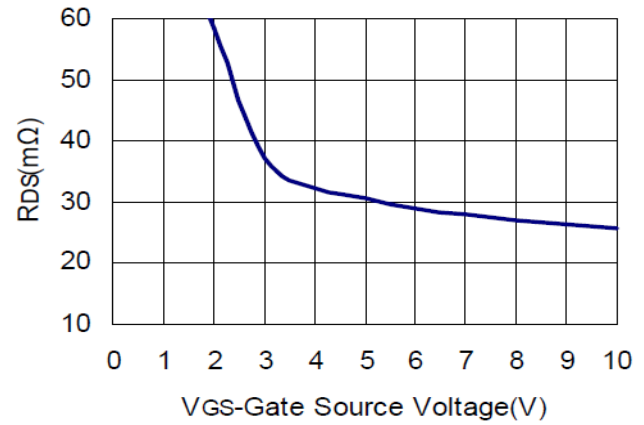
## TYPICAL CHARACTERISTICS

$T_A=25^\circ\text{C}$  Unless specified

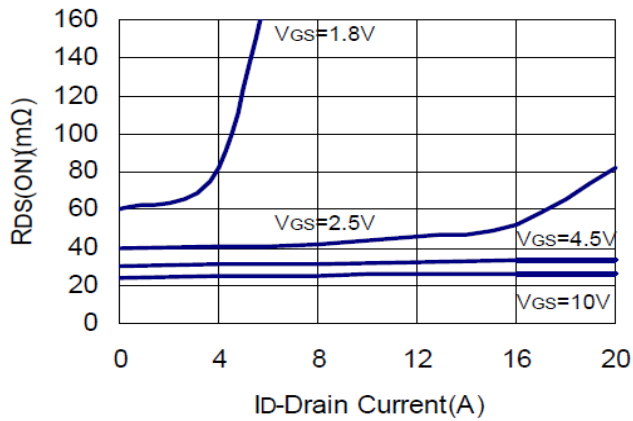
### 1. Output Characteristics



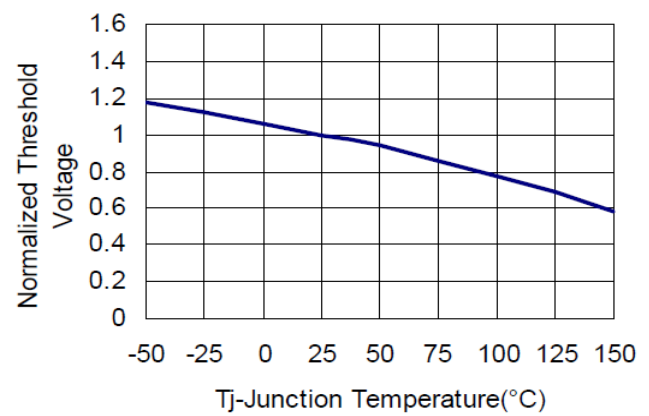
### 2. Drain-Source On Resistance



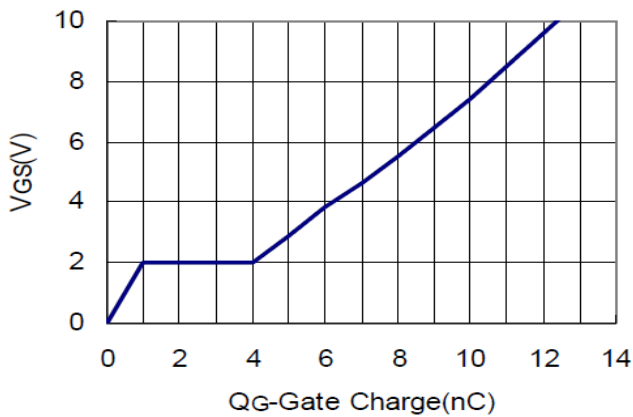
### 3. Drain Source On Resistance



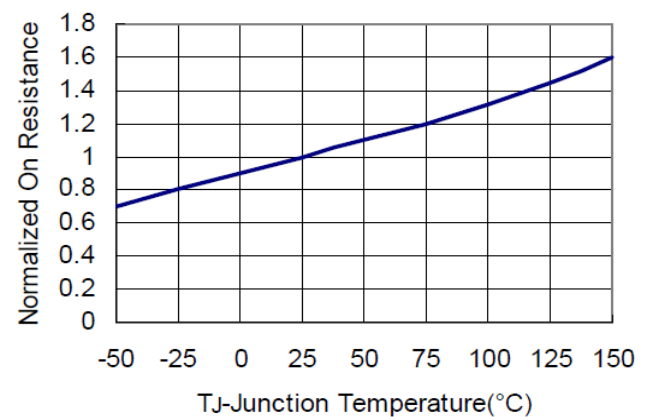
### 4. Gate Threshold Voltage



### 5. Gate Charge

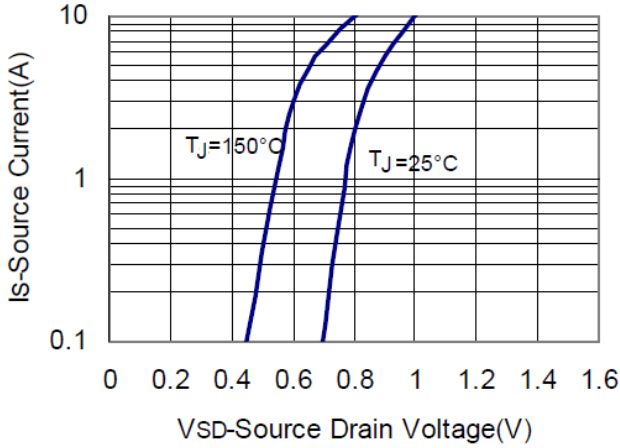


### 6. Drain Source On Resistance

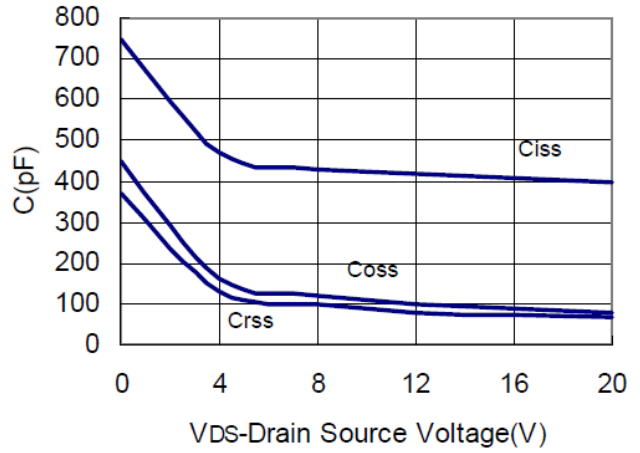




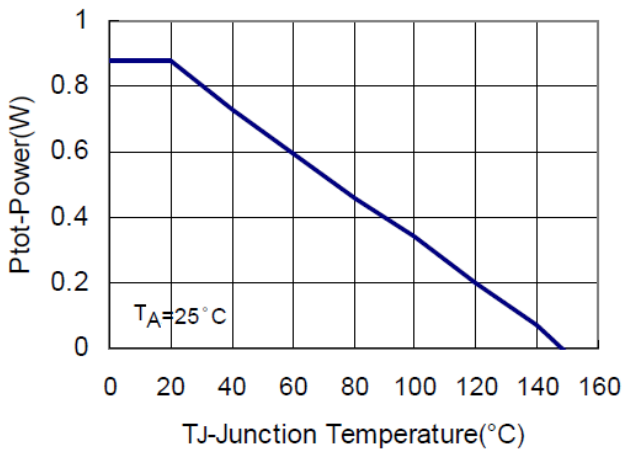
7. Source Drain Diode Forward



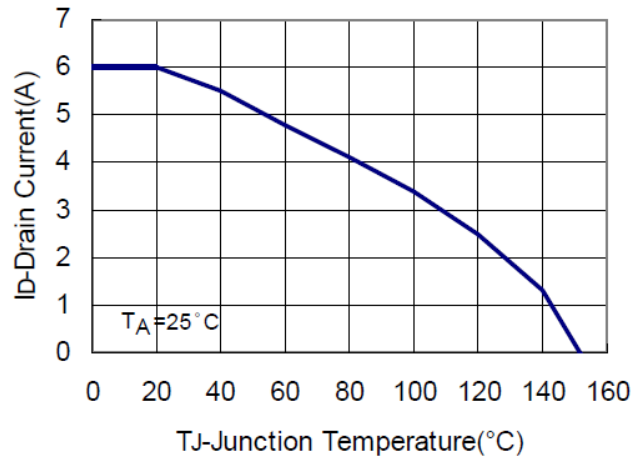
8. Capacitance



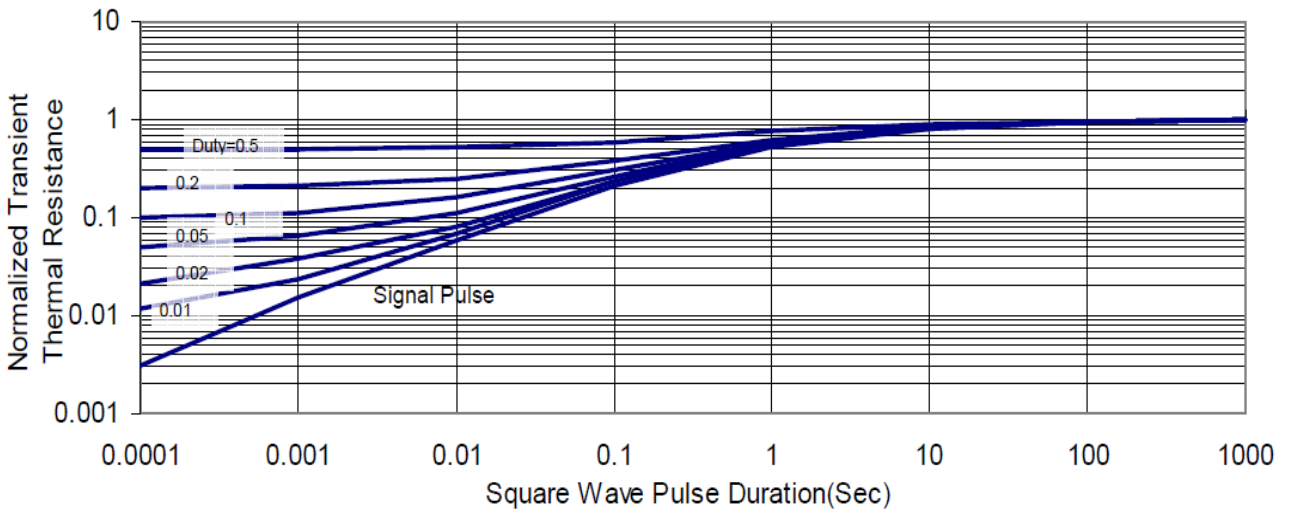
9. Power Dissipation



10. Drain Current



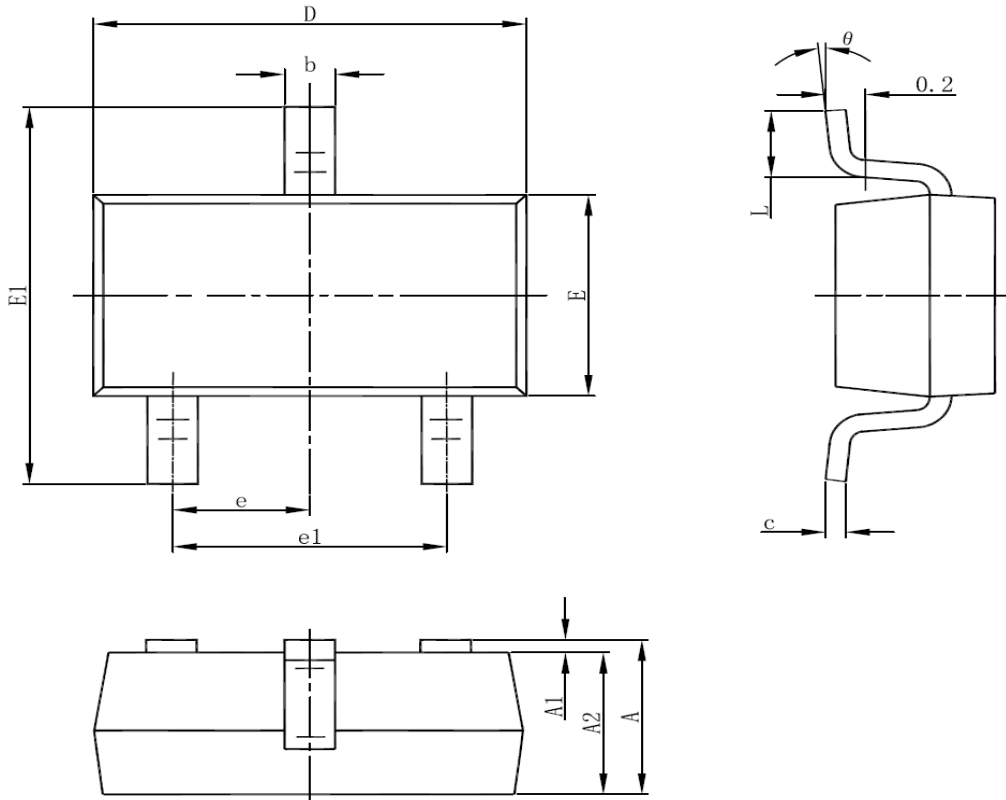
11. Thermal Transient Impedance





**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 |
| θ      | 0°         | 8°    |



## IMPORTANT NOTICE

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