

**DESCRIPTION**

The AM14P06D is available in TO-252 Package.

| VDSS | RDS(ON) | ID   |
|------|---------|------|
| -60V | 80mΩ    | -14A |

**APPLICATIONS**

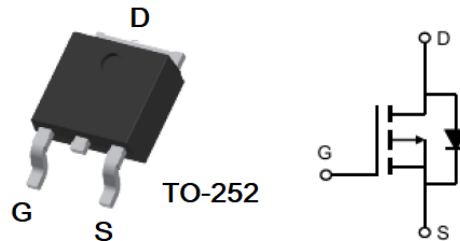
- Load Switch
- PWM Application
- Power Management

**ORDERING INFORMATION**

| Package Type                   | Part Number    |           |
|--------------------------------|----------------|-----------|
| TO-252<br>SPQ: 2,500pcs/Reel   | D              | AM14P06DR |
| Note                           | R: Tape & Reel |           |
| AiT provides all RoHS products |                |           |

**FEATURE**

- -60V, -14A
- $R_{DS(ON)}$  Typ.= 80mΩ @  $V_{GS} = -10V$
- $R_{DS(ON)}$  Typ.= 100mΩ @  $V_{GS} = -4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge

**PIN DESCRIPTION**

| Pin # | Symbol | Function |
|-------|--------|----------|
| 1     | G      | Gate     |
| 2,4   | D      | Drain    |
| 3     | S      | Source   |

**ABSOLUTE MAXIMUM RATINGS**

$T_J = 25^\circ\text{C}$ , unless otherwise specified.

|                                                          |                           |                |
|----------------------------------------------------------|---------------------------|----------------|
| $V_{DS}$ , Drain-to-Source Voltage                       |                           | -60V           |
| $V_{GS}$ , Gate-to-Source Voltage                        |                           | $\pm 20V$      |
| $I_D$ , Continuous Drain Current                         | $T_C = 25^\circ\text{C}$  | -14A           |
|                                                          | $T_C = 100^\circ\text{C}$ | -8.4A          |
| $I_{DM}$ , Pulsed Drain Current <sup>(1)</sup>           |                           | -56A           |
| $E_{AS}$ , Single Pulsed Avalanche Energy <sup>(2)</sup> |                           | 18mJ           |
| $P_D$ , Power Dissipation                                | $T_C = 25^\circ\text{C}$  | 36W            |
| $R_{\theta JC}$ , Thermal Resistance, Junction-to-Case   |                           | 3.5°C/W        |
| $T_{STG}$ , Storage Temperature Range                    |                           | -55°C ~ +150°C |
| $T_J$ , Junction Temperature Range                       |                           | -55°C ~ +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 are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

(2)  $E_{AS}$  condition: Starting  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = -30V$ ,  $V_G = -10V$ ,  $R_G = 25\Omega$ ,  $L = 0.5mH$ ,  $I_{AS} = -8.5A$

**ELECTRICAL CHARACTERISTICS**T<sub>J</sub> = 25°C, unless otherwise specified.

| Parameter                                                | Symbol               | Conditions                                                                                   | Min  | Typ. | Max  | Unit |
|----------------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------|------|------|------|------|
| Off Characteristics                                      |                      |                                                                                              |      |      |      |      |
| Drain-Source Breakdown Voltage                           | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                | -60  | -    | -    | V    |
| Zero Gate Voltage Drain Current                          | I <sub>DSS</sub>     | V <sub>DS</sub> = -60V, V <sub>GS</sub> =0V                                                  | -    | -    | -1   | μA   |
| Gate-Body Leakage Current                                | I <sub>GSS</sub>     | V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V                                                  | -    | -    | ±100 | nA   |
| On Characteristics                                       |                      |                                                                                              |      |      |      |      |
| Gate Threshold Voltage                                   | V <sub>GS(TH)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                  | -1.1 | -1.7 | -2.4 | V    |
| Static Drain-Source ON-Resistance *                      | R <sub>DS(ON)</sub>  | V <sub>GS</sub> = -10V, I <sub>D</sub> = -2.5A                                               | -    | 80   | 104  | mΩ   |
|                                                          |                      | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2A                                                | -    | 100  | 130  |      |
| Dynamic Characteristics                                  |                      |                                                                                              |      |      |      |      |
| Input Capacitance                                        | C <sub>iSS</sub>     | V <sub>DS</sub> = -25V, V <sub>GS</sub> =0V,<br>f=1.0MHZ                                     | -    | 978  | -    | pF   |
| Output Capacitance                                       | C <sub>oSS</sub>     |                                                                                              | -    | 51   | -    |      |
| Reverse Transfer Capacitance                             | C <sub>rSS</sub>     |                                                                                              | -    | 39   | -    |      |
| Total Gate Charge                                        | Q <sub>g</sub>       | V <sub>DS</sub> = -30V , I <sub>D</sub> = -5A<br>V <sub>GS</sub> =0V ~ -10V                  | -    | 18   | -    | nC   |
| Gate-Source Charge                                       | Q <sub>gs</sub>      |                                                                                              | -    | 4    | -    |      |
| Gate-Drain(“Miller”) Charge                              | Q <sub>gd</sub>      |                                                                                              | -    | 5.2  | -    |      |
| Switching Characteristics                                |                      |                                                                                              |      |      |      |      |
| Turn-On Delay Time                                       | t <sub>d(on)</sub>   | V <sub>DD</sub> = -30V, I <sub>D</sub> = -5A<br>R <sub>GEN</sub> =3Ω, V <sub>GS</sub> = -10V | -    | 9    | -    | ns   |
| Turn-On Rise Time                                        | t <sub>r</sub>       |                                                                                              | -    | 15   | -    |      |
| Turn-Off Delay Time                                      | t <sub>d(off)</sub>  |                                                                                              | -    | 33   | -    |      |
| Turn-Off Fall Time                                       | t <sub>f</sub>       |                                                                                              | -    | 12   | -    |      |
| Drain-Source Diode Characteristics and Max Ratings       |                      |                                                                                              |      |      |      |      |
| Maximum Continuous Drain to Source Diode Forward Current | I <sub>S</sub>       | -                                                                                            | -    | -    | -14  | A    |
| Maximum Pulsed Drain to Source Diode Forward Current     | I <sub>SM</sub>      | -                                                                                            | -    | -    | -56  | A    |
| Drain to Source Diode Forward Voltage                    | V <sub>SD</sub>      | V <sub>GS</sub> =0V, I <sub>S</sub> = -2.5A                                                  | -    | -    | -1.2 | V    |
| Body Diode Reverse Recovery Time                         | t <sub>rr</sub>      | I <sub>F</sub> = -4A,                                                                        | -    | 35   | -    | ns   |
| Body Diode Reverse Recovery Charge                       | Q <sub>rr</sub>      | di/dt = 100A/μs                                                                              | -    | 40   | -    | nC   |

\* Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Gate Charge Test Circuit & Waveform

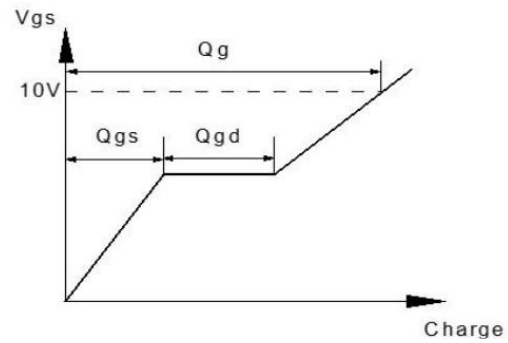
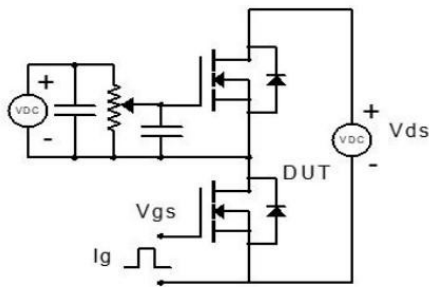


Fig 2. Resistive Switching Test Circuit & Waveform

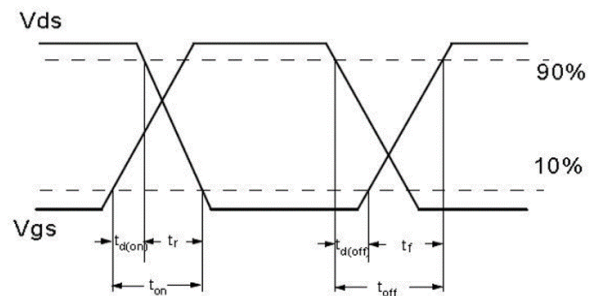
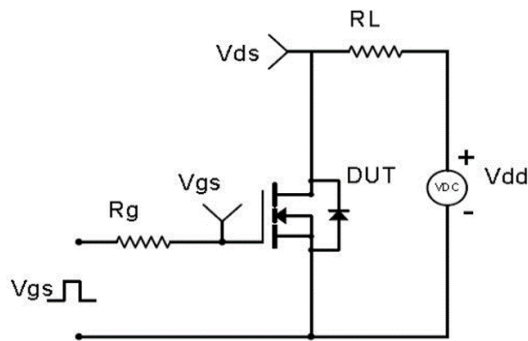


Fig 3. Unclamped Inductive Switching Test Circuit & Waveform

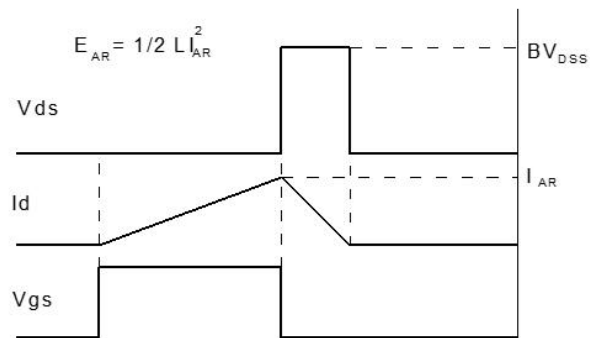
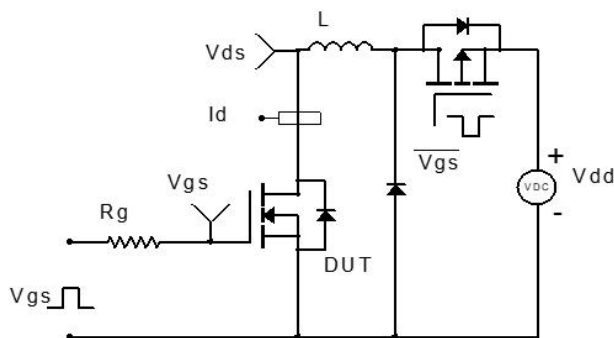
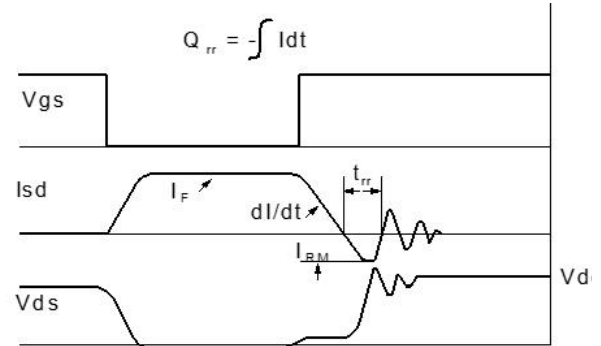
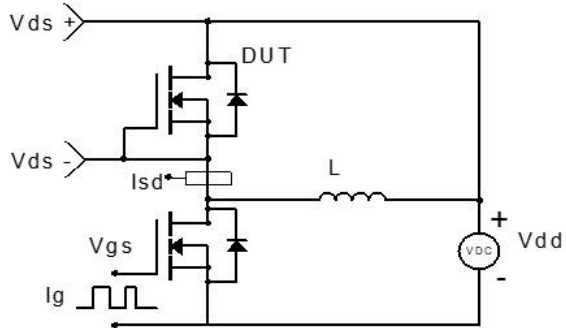


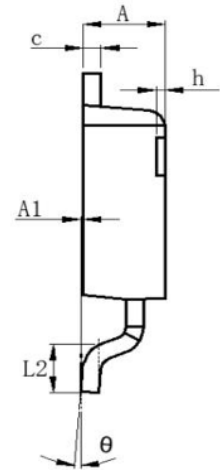
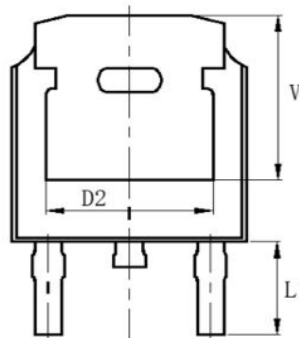
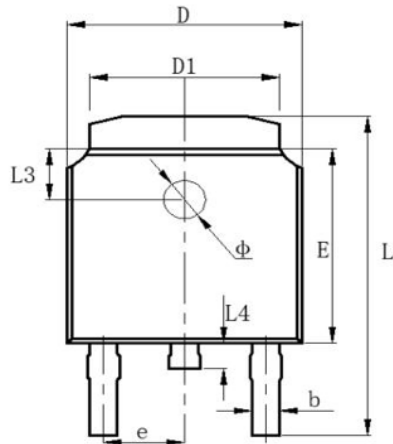


Fig 4. Diode Recovery Test Circuit & Waveform



**PACKAGE INFORMATION**

Dimension in TO-252 (Unit: mm)



| Symbol | Millimeters |        |
|--------|-------------|--------|
|        | Min.        | Max.   |
| A      | 2.200       | 2.400  |
| A1     | 0.000       | 0.127  |
| b      | 0.600       | 0.860  |
| c      | 0.460       | 0.580  |
| D      | 6.500       | 6.700  |
| D1     | 5.100       | 5.460  |
| D2     | 4.830 REF.  |        |
| E      | 6.000       | 6.300  |
| e      | 2.186       | 2.386  |
| L      | 9.712       | 10.312 |
| L1     | 2.900 REF.  |        |
| L2     | 1.400       | 1.700  |
| L3     | 1.600 REF.  |        |
| L4     | 0.600       | 1.000  |
| h      | 0.000       | 0.300  |
| Φ      | 1.100       | 1.300  |
| V      | 5.250 REF.  |        |
| θ      | 0°          | 8°     |



## IMPORTANT NOTICE

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