## DESCRIPTION

The AM80R760 is available in TO-252 package.

| BVDSS | RDSON | ID |
|---|---|---|
| 850V | 0.58Ω | 10A |

## FEATURE

- Fast Switching
- 100% avalanche tested
- Improved dv/dt capability

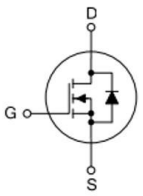
## APPLICATION

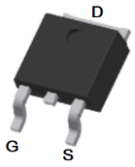
- High frequency switching mode power supply

## ORDERING INFORMATION

| Package Type | Part Number | |
|---|---|---|
| TO-252<br>SPQ: 2,500pcs/Reel | D | AM80R760DVR |
| Note | R: Tape & Reel<br>V: Halogen free Package | |
| AiT provides all RoHS products | | |

## PIN DESCRIPTION




TO-252

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

## ABSOLUTE MAXIMUM RATINGS

$T_C$ = 25°C, unless otherwise specified.

| | | |
|---|---|---|
| $V_{DSS}$, Drain-to-Source Voltage | | 800V |
| $I_D$, Continuous Drain Current | | 10A |
| $I_D$, Continuous Drain Current $T_C$ = 100 °C | | 8A |
| $I_{DM}$, Pulsed Drain Current (1) | | 30A |
| $V_{GS}$, Gate-to-Source Voltage | | ±30V |
| $E_{AS}$, Single Pulse Avalanche Energy (2) | | 82mJ |
| dv/dt, Peak Diode Recovery dv/dt (3) | | 15V/ns |
| $P_D$, Power Dissipation | TO-252 | 52W |
| $P_D$, Derating Factor above 25°C | | 0.416W/℃ |
| $T_J$, Operating Junction Temperature Range | | 150℃ |
| $T_{STG}$, Storage Temperature Range | | -55℃~+150℃ |
| $T_L$, Maximum Temperature for Soldering | | 300℃ |
| $R_{\theta JA}$, Junction-to-Ambient | TO-252 | 62.5℃/W |
| $R_{\theta JC}$, Junction-to-Case | | 2.4℃/W |

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) Pulse width limited by maximum junction temperature

(2) L=20mH, $V_{Ds}$=50V, Start $T_J$=25℃

(3) $I_{SD}$ =5A,di/dt ≤100A/us, $V_{DD}$≤$B_{VDS}$, Start $T_J$=25℃

## ELECTRICAL CHARACTERISTICS

$T_C$ = 25°C, unless otherwise specified.

| Parameter | Symbol | Conditions | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF Characteristics** | | | | | | |
| Drain to Source Breakdown Voltage | $V_{DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 800 | - | - | V |
| $BV_{DSS}$ Temperature Coefficient | $\Delta BV_{DSS}$ / $\Delta T_J$ | $I_D$=250μA Reference 25℃ | - | 0.7 | - | V/℃ |
| Drain to Source Leakage Current | $I_{DSS}$ | $V_{DS}$=800V, $V_{GS}$=0V, $T_J$=25℃ | - | - | 1 | μA |
| | | $V_{DS}$=640V, $V_{GS}$=0V, $T_J$=125℃ | - | - | 100 | |
| Gate to Source Forward Leakage | $I_{GSS(F)}$ | $V_{GS}$=+30V | - | - | 100 | nA |
| Gate to Source Reverse Leakage | $I_{GSS(R)}$ | $V_{GS}$=-30V | - | - | -100 | nA |
| **ON Characteristics** | | | | | | |
| Drain-to-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=5A * | - | 0.58 | 0.76 | Ω |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}$= $V_{GS}$, $I_D$=250μA* | 2.5 | - | 3.5 | V |
| **Dynamic Characteristics** | | | | | | |
| Gate Resistance | $R_g$ | f=1.0MHz | - | 6.8 | - | Ω |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=25V, f=1.0MHz | - | 750 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 331 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 12 | - | |
| **Switching Characteristics** | | | | | | |
| Turn-on Delay Time | $t_{d\ (ON)}$ | $I_D$=5A, $V_{DD}$=350V, $V_{GS}$=10V, $R_G$=50Ω | - | 85 | - | ns |
| Rise Time | $t_r$ | | - | 59.8 | - | |
| Turn-Off Delay Time | $t_{d\ (OFF)}$ | | - | 66.6 | - | |
| Fall Time | $t_f$ | | - | 200.4 | - | |
| Total Gate Charge | $Q_g$ | $I_D$=5A, $V_{DD}$=640V, $V_{GS}$=10V | - | 19.8 | - | nC |
| Gate to Source Charge | $Q_{gs}$ | | - | 5.4 | - | |
| Gate to Drain (“Miller”) Charge | $Q_{gd}$ | | - | 4.8 | - | |
| **Source-Drain Diode Characteristics** | | | | | | |
| Continuous Source Current (Body Diode) | $I_S$ | $T_c$=25℃ | - | - | 10 | A |
| Maximum Pulsed Current (Body Diode) | $I_{SM}$ | | - | - | 30 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=5A , $V_{GS}$=0V * | - | - | 1.2 | V |
| Reverse Recovery Time | $T_{rr}$ | $I_S$=5A, Tj=25℃ dIF/dt =100A/μs | - | 339 | - | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | - | 2.71 | - | nC |
| Reverse Recovery Current | $I_{rrm}$ | | - | 13.6 | - | A |

* Pulse width tp≤300μs, δ≤2%

## TYPICAL PERFORMANCE CHARACTERISTICS

Fig1. Typical Output Characteristics

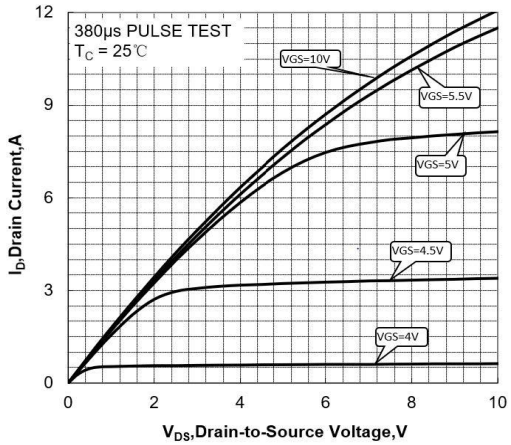



Fig2. Typical Transfer Characteristics

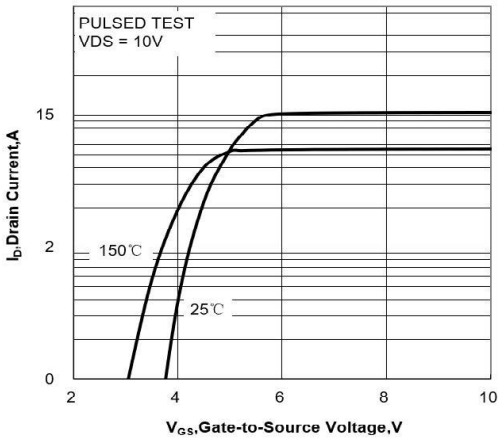



Fig3. Typical Drain to Source ON Resistance vs. Drain Current

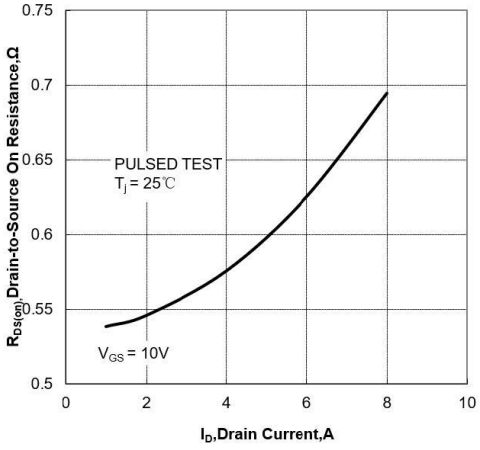



Fig4. Typical Drain to Source on Resistance vs. Junction Temperature

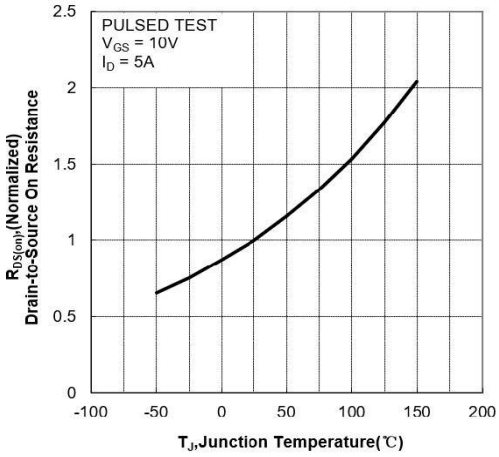



Fig5. Typical Threshold Voltage vs. Junction Temperature

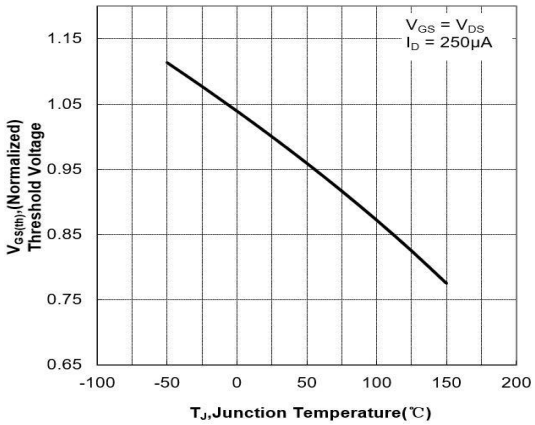



Fig6. Typical Breakdown Voltage vs. Junction Temperature

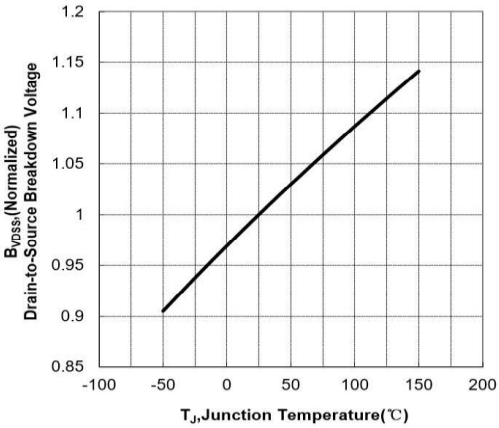


Fig7. Typical Capacitance vs. Drain to Source Voltage

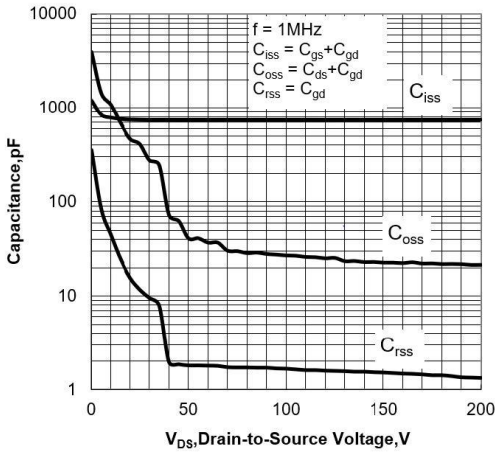



Fig8. Typical Gate Charge vs. Gate to Source Voltage

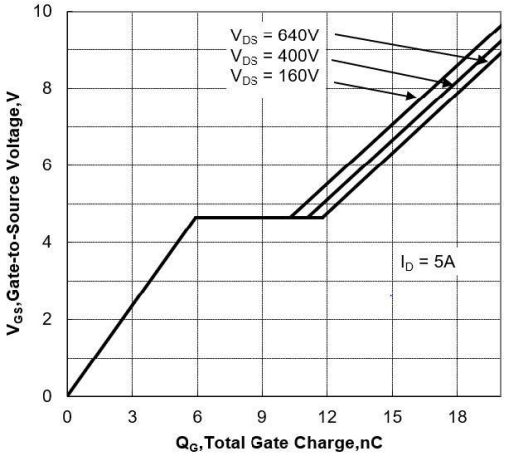



Fig9. Gate Charge Test Circuit

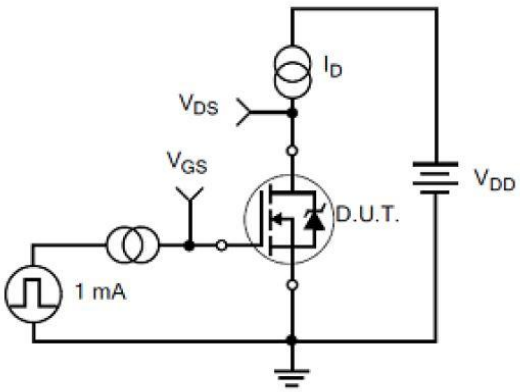



Fig10. Gate Charge Waveforms

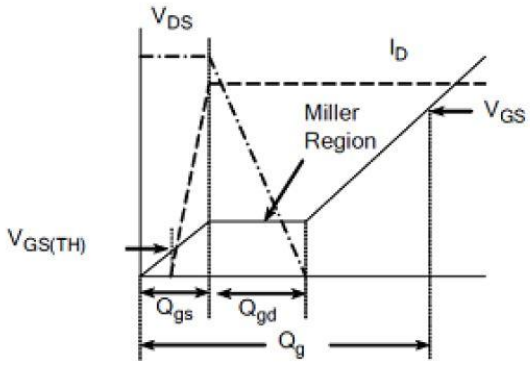



Fig11. Resistive Switching Test Circuit

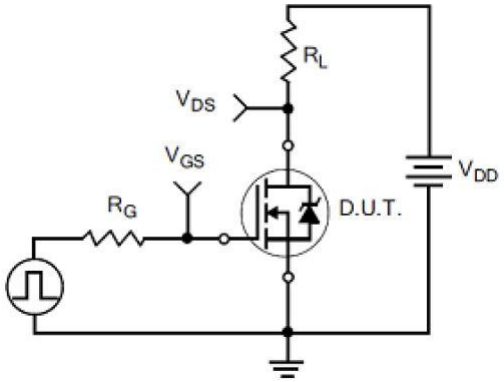



Fig12. Resistive Switching Waveforms

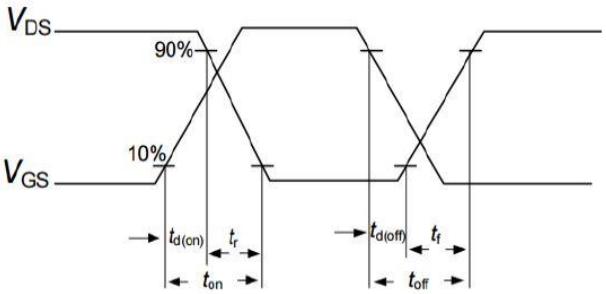


Fig13. Diode Reverse Recovery Test Circuit

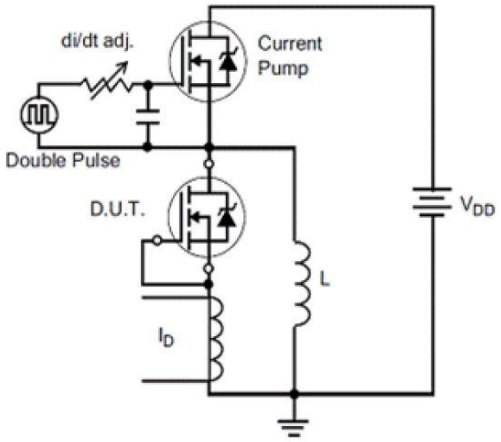



Fig14. Diode Reverse Recovery Waveform

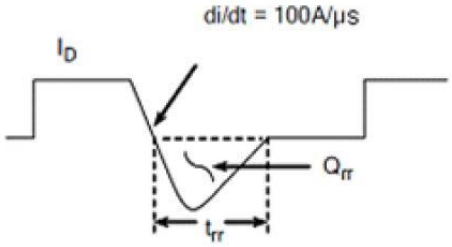



Fig15. Unclamped Inductive Switching Test Circuit

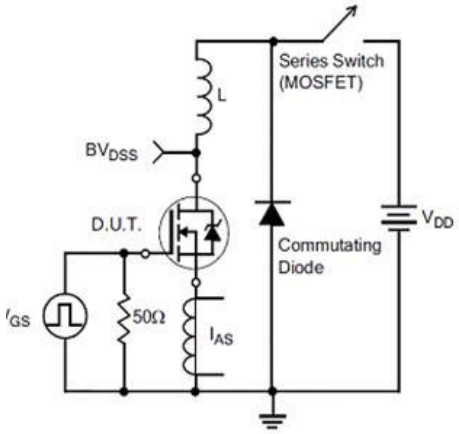
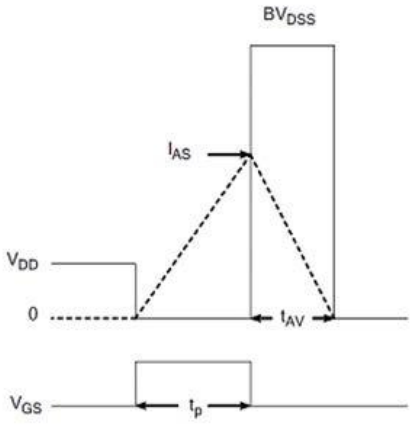
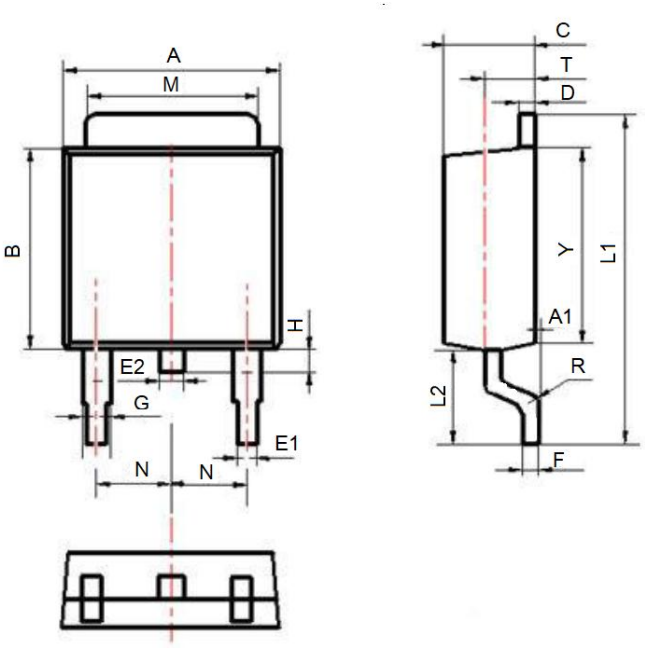



Fig16. Unclamped Inductive Switching Waveform



## PACKAGE INFORMATION

Dimension in TO-252 (Unit: mm)




| Symbol | MILLIMETERS | |
|---|---|---|
| | Min. | Max. |
| A | 6.300 | 6.900 |
| A1 | 0 | 0.130 |
| B | 5.700 | 6.300 |
| C | 2.100 | 2.500 |
| **D** | 0.300 | 0.600 |
| E1 | 0.600 | 0.900 |
| E2 | 0.700 | 1.000 |
| F | 0.300 | 0.600 |
| G | 0.700 | 1.200 |
| L1 | 9.600 | 10.500 |
| L2 | 2.700 | 3.100 |
| H | 0.600 | 1.000 |
| M | 5.100 | 5.500 |
| N | 2.090 | 2.490 |
| R | 0.300 | |
| T | 1.400 | 1.600 |
| Y | 5.100 | 6.300 |

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