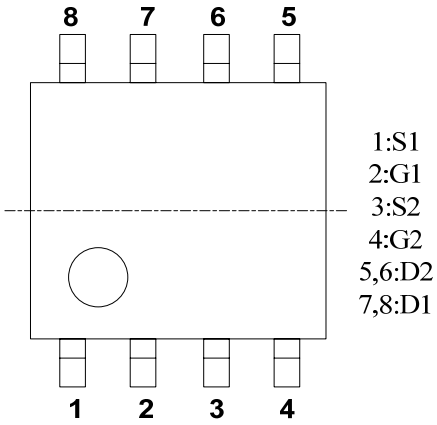
BYD Microelectronics Co., Ltd.

# AM9945N

## Dual N-Channel MOSFET

### General Description

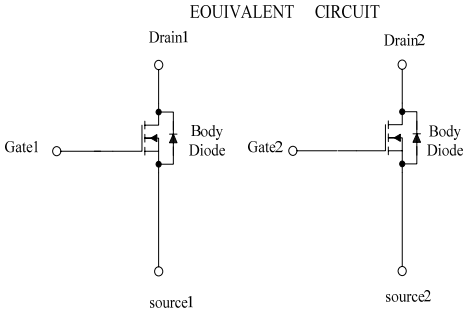
The AM9945N uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge.
This device is suitable for used as DC-DC converters and power managements in portable and battery-powered products.




### Features

- $V_{DS}$ (V) =60V
- Low on-state resistance

  $R_{DS(on)}$ = **89 mΩ** MAX ($V_{GS}$ = 10V, $I_D$ =3.6A)
  $R_{DS(on)}$ = **104 mΩ** MAX ($V_{GS}$ = 4.5V, $I_D$ = 3.4A)
- Fast switching speed




### Absolute Maximum Ratings (Ta = 25℃)

| PARAMETER | | SYMBOL | LIMIT | UNIT |
|---|---|---|---|---|
| Drain to Source Voltage | | $V_{DSS}$ | 60 | V |
| Gate to Source Voltage | | $V_{GSS}$ | ±20 | V |
| Drain Current (DC)[a] | $T_A$=25℃ | $I_{D(DC)}$ | ±3.6 | A |
| | $T_A$=70℃ | | ±3.1 | |
| Drain Current (pulse)[b] | | $I_{D(pulse)}$ | ±25 | A |
| Contnuous Source Current (Diode Conduction)[a] | | $I_S$ | 2 | A |
| Maximun Power Dissipation[a] | $T_A$=25℃ | $P_D$ | 2.1 | W |
| | $T_A$=70℃ | | 1.3 | |
| Channel Temperature | | $T_{ch}$ | 150 | ℃ |

| THERMAL RESISTANCE RATINGS | | | | |
|---|---|---|---|---|
| Parameter | | Symbol | Maximum | Units |
| Maximum Junction-to-Ambient[a] | t<=10sec | $R_{\theta JA}$ | 62.5 | ℃/W |
| | t<=5sec | | 110 | ℃/W |

**Note a.** Mounted on FR4 Board of 1”x1”.
**b**. Pulse width limited by maximum junction temperature

**Caution:** These values must not be exceeded under any conditions.

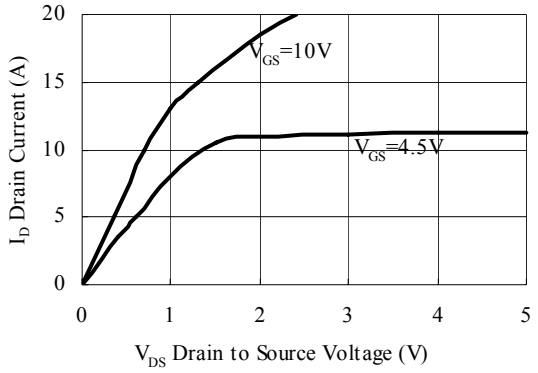
### Ordering Information

- Part Number: AM9945N
- Package: SOIC8

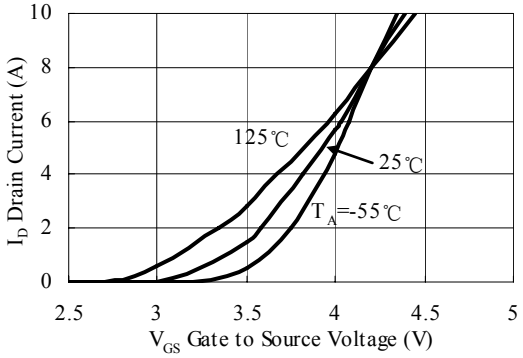
## Electrical Characteristics ($T_A$ = 25℃)

| CHARACTERISTICS | SYMBOL | TEST CONDITION | MIN. | Typ. | MAX | Unit |
|---|---|---|---|---|---|---|
| Zero Gate Votage Drain Current | $I_{DSS}$ | $V_{DS}$=60V,$V_{GS}$=0V, | | | 1 | uA |
| | | $V_{DS}$=60V,$V_{GS}$=0V,$T_J$=55℃ | | | 10 | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=20V | | | ±100 | nA |
| Gate Cut-off Votage | $V_{GSS(off)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250uA | 1 | | | V |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}$=5V,$V_{GS}$=10V | 20 | | | A |
| Drain -Source On-Restance | $R_{DS(on)1}$ | $V_{GS}$=10V,$I_D$=3.6A | | | 89 | mΩ |
| | $R_{DS(on)2}$ | $V_{GS}$=4.5V,$I_D$=3.4A | | | 104 | |
| Forward Transfer Admittance | $\|y_{fs}\|$ | $V_{DS}$=15V,$I_D$=3.6A | | 11 | | S |
| Diode Forward Votage | $V_{SD}$ | $I_S$=2.0A,$V_{GS}$=0A | | 1.1 | | V |
| Pulsed Source Current (Body Diode) | $I_{SM}$ | | | 3.5 | | A |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=30V,$R_L$=30Ω, $I_D$=1A,$V_{GEN}$=10V | | 9 | | nS |
| Rise Time | $t_r$ | | | 10 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 21 | | |
| Fall-Time | $t_f$ | | | 8 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=30V,$V_{GS}$=4.5V,$I_D$=3.6A | | 3.6 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.8 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 1.3 | | |

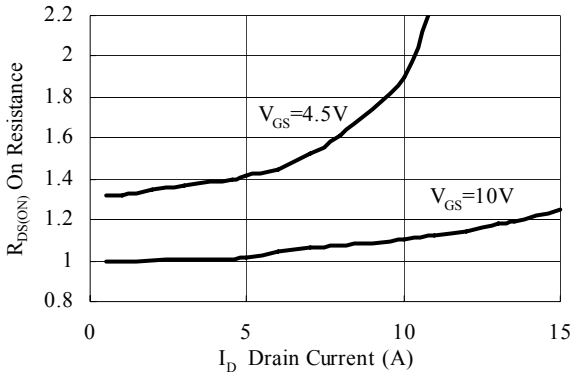
### Typical characteristics (25℃ unless noted)



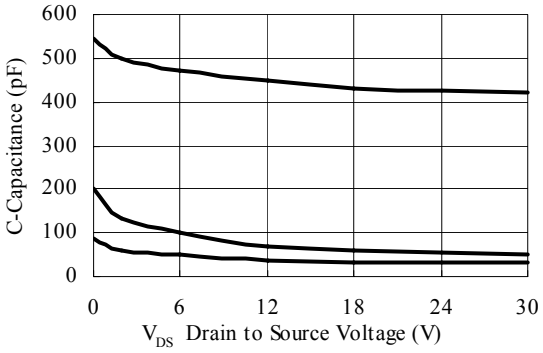

Output Caracteristics



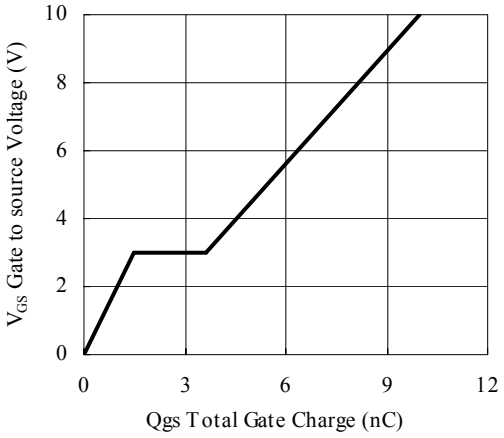

Transfer Characteristics



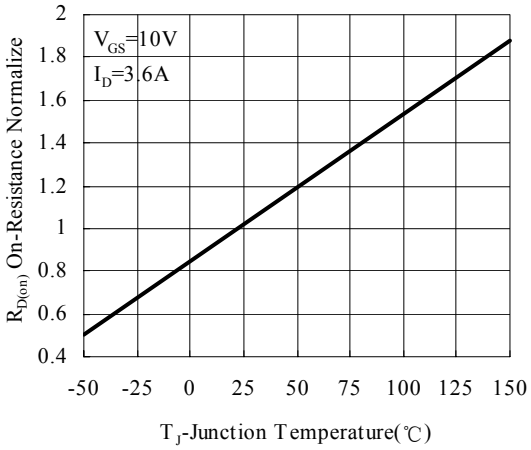

**On Resistance VS Drain Current**



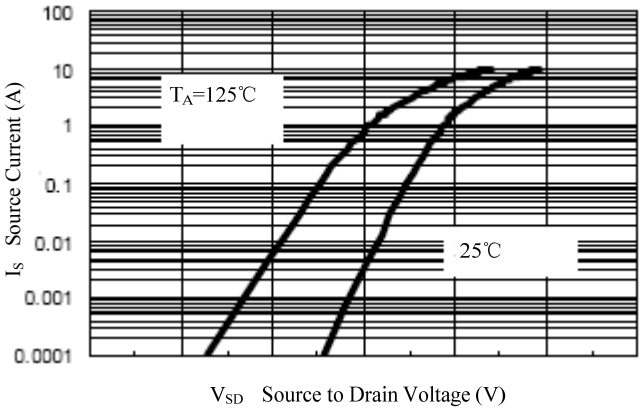

**Capacitance**



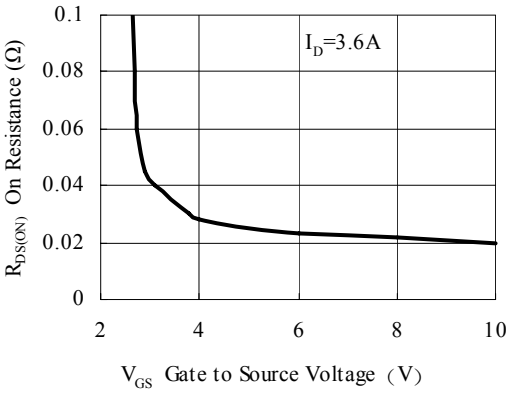

**Gate Charge**



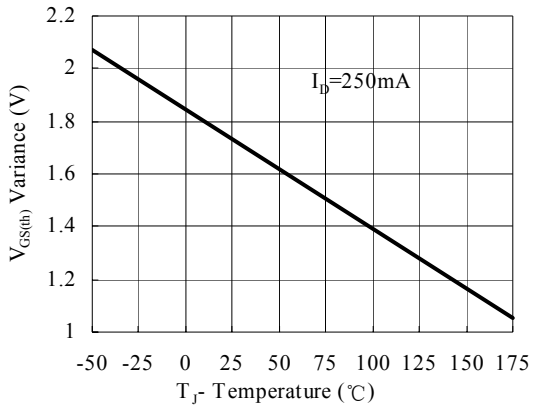

**On-Resistance vs Junction Temperature**



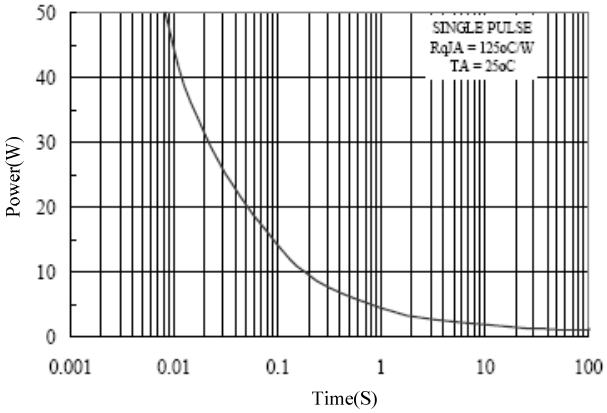

**Source-Drain Diode Forward Voltage**



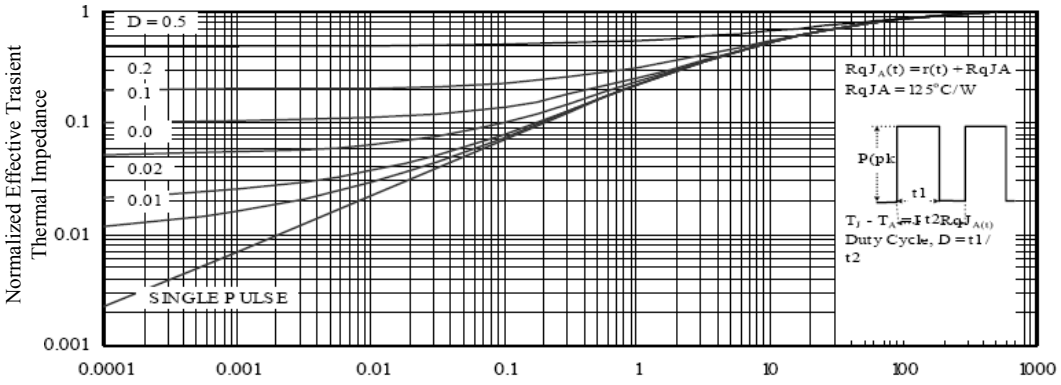

**On-Resistance VS Gate to Source Voltage**



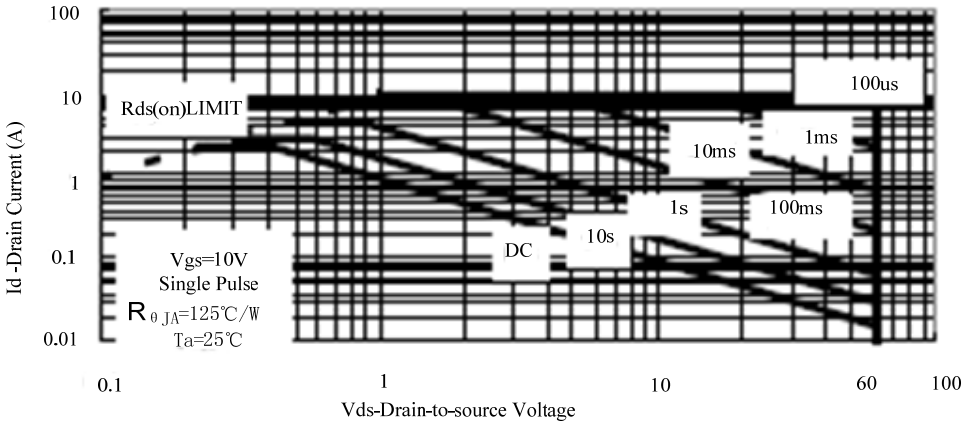

**Threshold Voltage**




Single Pulse Power




Normalized Thermal Transient Impedance,Junction to Ambient

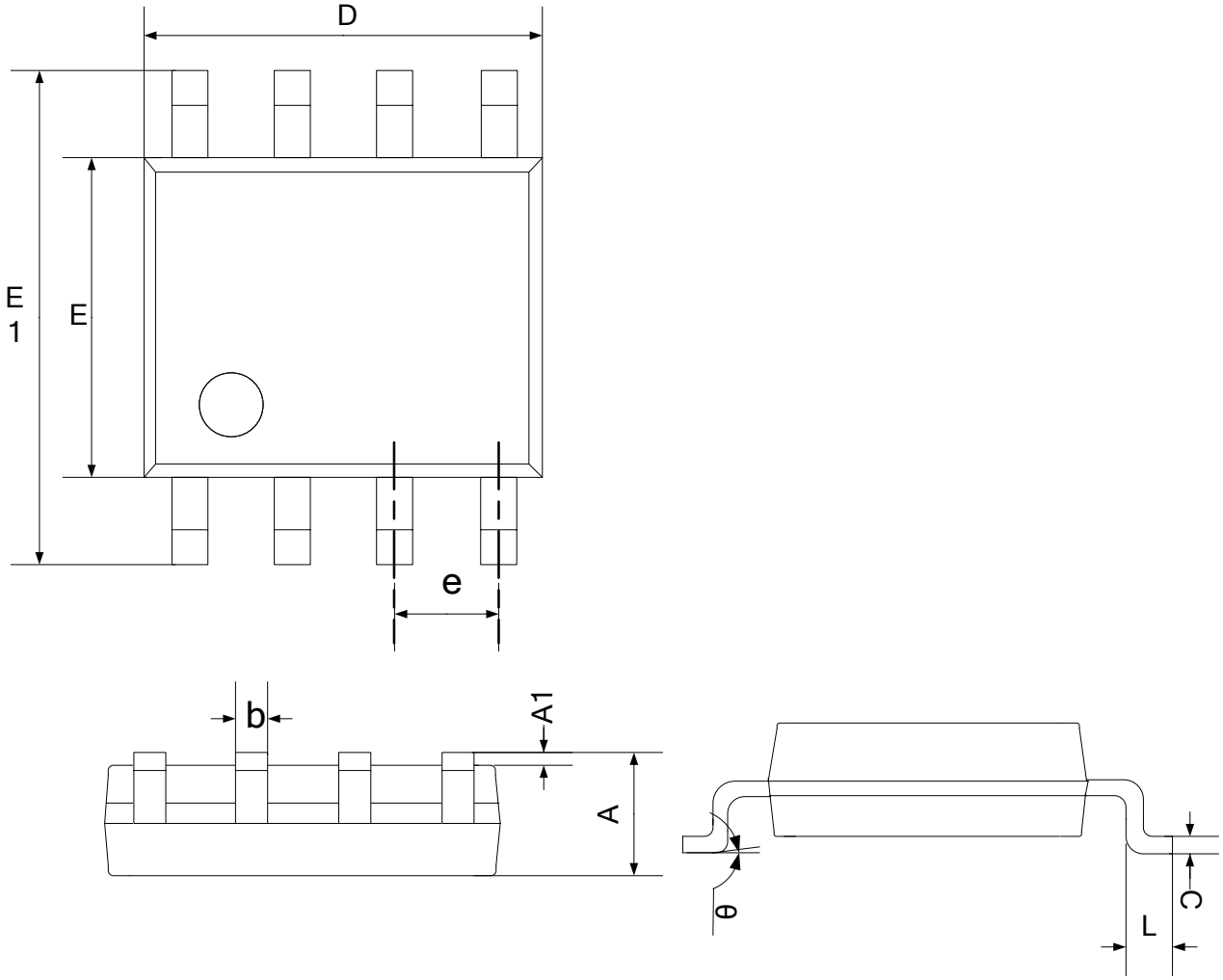



Maximum Safe Operating Area

# Package Drawing

## SOIC8

UNIT (mm)




### Dimensions

| | D | E | A | E1 | A1 | C | L | b | e | θ |
|---|---|---|---|---|---|---|---|---|---|---|
| Min. | 4.80 | 3.80 | 1.35 | 5.80 | 0.100 | 0.19 | 0.500 | 0.380 | 1.27 BSC | 0° |
| Nom. | 4.90 | 3.90 | 1.55 | 6.00 | 0.175 | 0.22 | 0.715 | 0.445 | | 4° |
| Max. | 5.00 | 4.00 | 1.75 | 6.20 | 0.250 | 0.25 | 0.930 | 0.510 | | 8° |