

General Description

The MY009BBNE3 is the highest performance trench N-CH MOSFETS with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the small power switching and load switch applications.

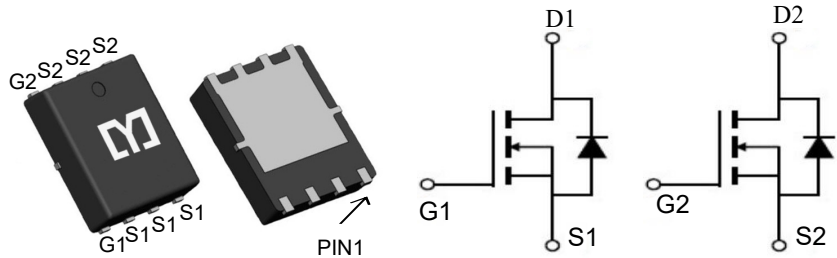


Features

| | | |
|------------------------------------|-------|------------|
| V_{DSS} | 20 | V |
| I_D | 35 | A |
| $R_{DS(ON)}$ (at $V_{GS} = 4.5V$) | <8.8 | m Ω |
| $R_{DS(ON)}$ (at $V_{GS} = 2.5V$) | <10.5 | m Ω |

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|------------|-----------|---------|----------|
| MY009BBNE3 | PDFN3*3-8 | NULL | 5000 |

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|-----------------------|--|------------|--------------|
| V_{DS} | Drain-Source Voltage | 20 | V |
| V_{GS} | Gate-Source Voltage | ± 8 | V |
| $I_D@T_C=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 4.5V^1$ | 35 | A |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, $V_{GS} @ 4.5V^1$ | 32.6 | A |
| $I_D@T_A=25^\circ C$ | Continuous Drain Current, $V_{GS} @ 4.5V^1$ | 19 | A |
| $I_D@T_A=70^\circ C$ | Continuous Drain Current, $V_{GS} @ 4.5V^1$ | 15 | A |
| I_{DM} | Pulsed Drain Current ² | 100 | A |
| $P_D@T_C=25^\circ C$ | Total Power Dissipation ¹ | 31 | W |
| $P_D@T_A=25^\circ C$ | Total Power Dissipation ¹ | 3.6 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient ¹ | 35 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case ¹ | 4 | $^\circ C/W$ |

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|--|--|--|-------|------|------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V , I _D =250uA | 20 | --- | --- | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance ² | V _{GS} =4.5V , I _D =3A | --- | 7.5 | 10.8 | mΩ |
| | | V _{GS} =3.9V , I _D =3A | --- | 10.53 | 16.5 | |
| | | V _{GS} =2.5V , I _D =3A | --- | 18 | 20 | |
| | | V _{GS} =1.8V , I _D =3A | --- | 22 | 24 | |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250uA | 0.4 | --- | 1.0 | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =16V , V _{GS} =0V , T _J =25 °C | --- | --- | 1 | uA |
| | | V _{DS} =16V , V _{GS} =0V , T _J =55°C | --- | --- | 5 | |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±8V , V _{DS} =0V | --- | --- | ±10 | uA |
| g _{fs} | Forward Transconductance | V _{DS} =5V , I _D =3A | --- | 42 | --- | S |
| Q _g | Total Gate Charge (4.5V) | V _{DS} =10V , I _D =3A | --- | 38 | --- | nC |
| | Total Gate Charge (3.9V) | | --- | 33 | --- | |
| Q _{gs} | Gate-Source Charge | | --- | 4.5 | --- | |
| Q _{gd} | Gate-Drain Charge | | --- | 12 | --- | |
| T _{d(on)} | Turn-On Delay Time | | V _{DD} =16V , V _{GS} =4.5V , R _G =6 I _D =3A | --- | 22 | |
| T _r | Rise Time | --- | | 41 | --- | |
| T _{d(off)} | Turn-Off Delay Time | --- | | 77 | --- | |
| T _f | Fall Time | --- | | 21 | --- | |
| C _{iss} | Input Capacitance | V _{DS} =10V , V _{GS} =0V , f=1MHz | --- | 3165 | --- | pF |
| C _{oss} | Output Capacitance | | --- | 380 | --- | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 325 | --- | |
| I _S | Continuous Source Current ¹ | V _G =V _D =0V , Force Current | --- | --- | 30 | A |
| I _{SM} | Pulsed Source Current ² | | --- | --- | 100 | A |
| V _{SD} | Diode Forward Voltage ² | V _{GS} =0V , I _S =3A , T _J =25°C | --- | --- | 1.2 | V |

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, t ≤10s.

2.The data tested by pulsed , pulse width ≤ 10us , duty cycle ≤ 1%

Typical Characteristics

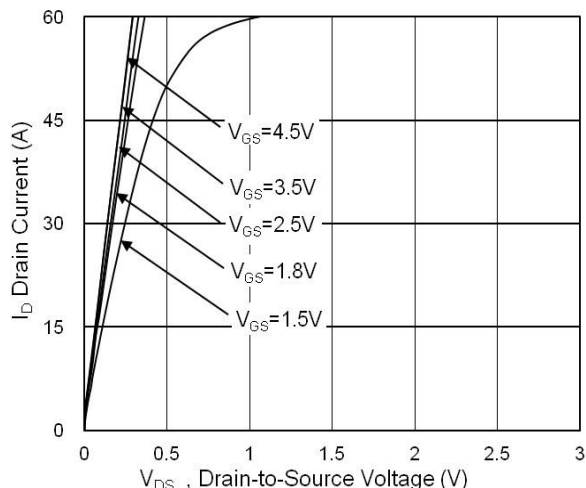


Fig.1 Typical Output Characteristics

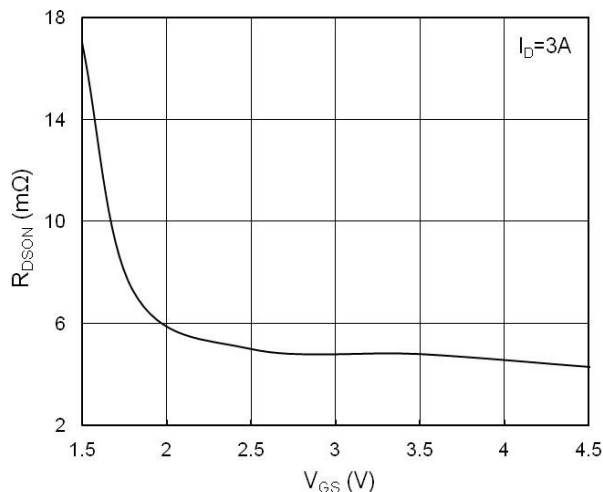


Fig.2 On-Resistance vs. Gate-Source

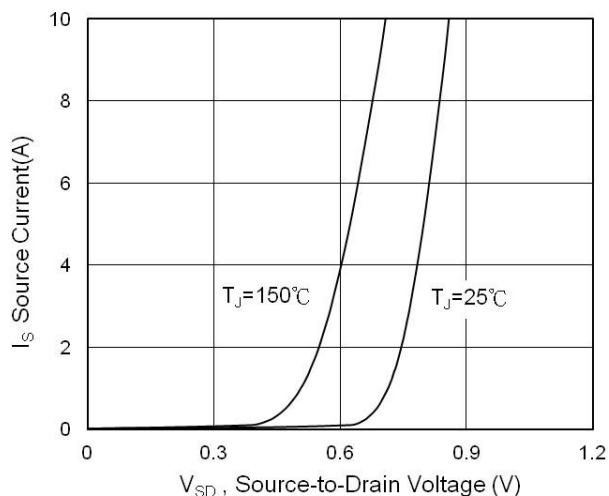


Fig.3 Forward Characteristics Of Reverse

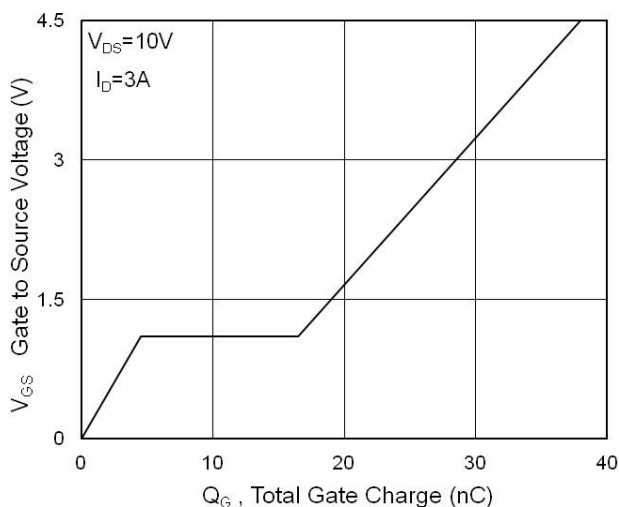


Fig.4 Gate-Charge Characteristics

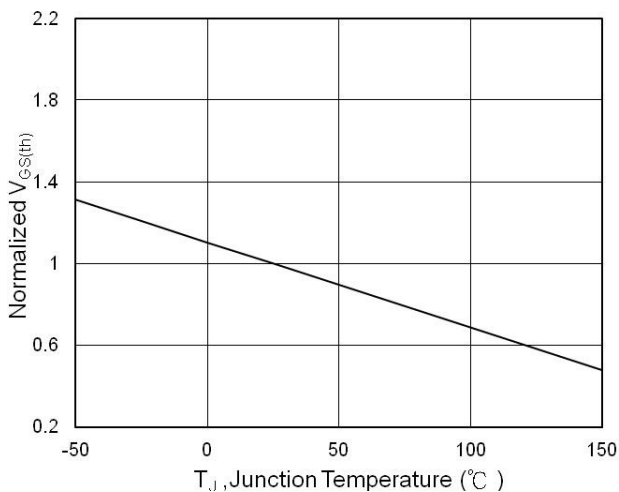


Fig.5 $V_{GS(th)}$ vs. T_J

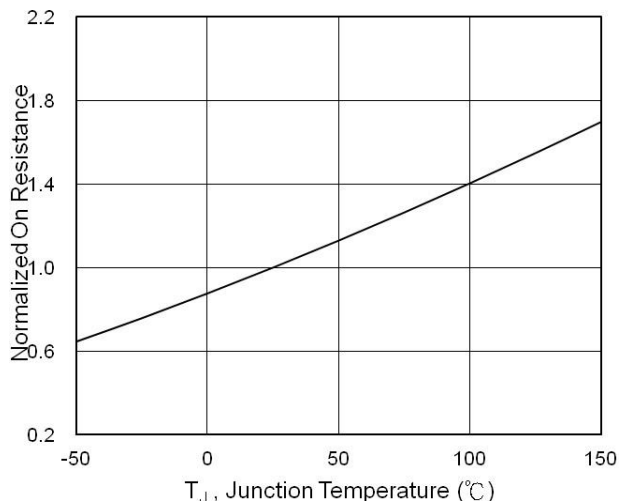


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

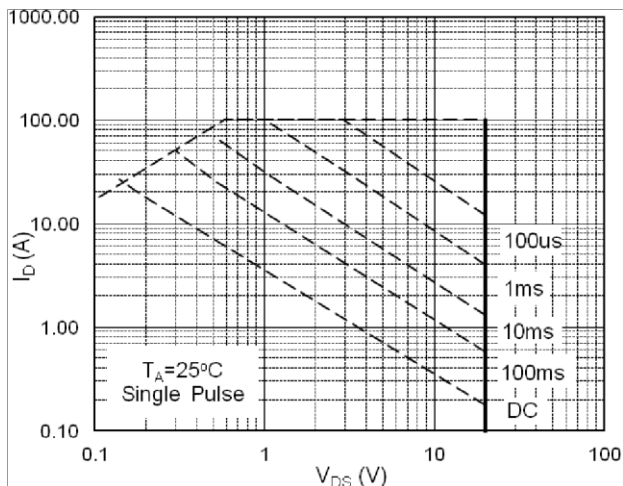


Fig.7 Capacitance

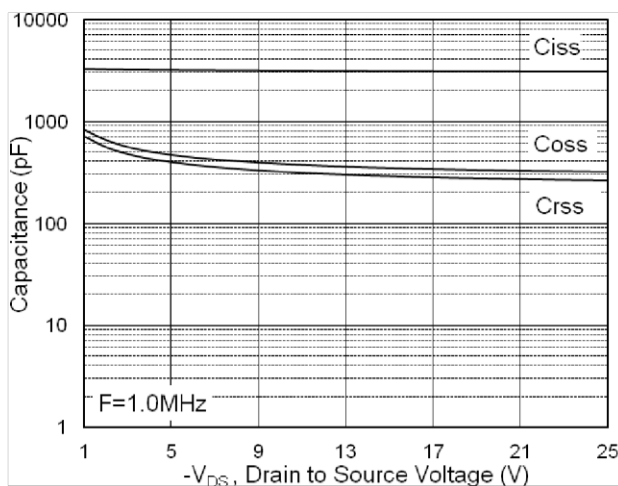


Fig.8 Safe Operating Area

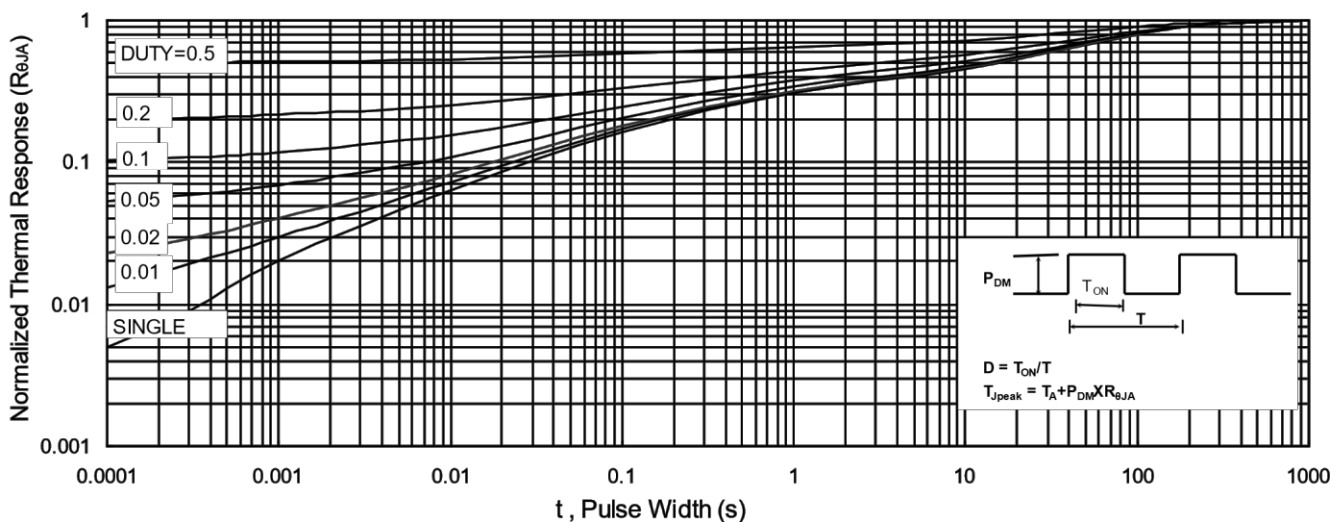


Fig.9 Normalized Maximum Transient Thermal Impedance

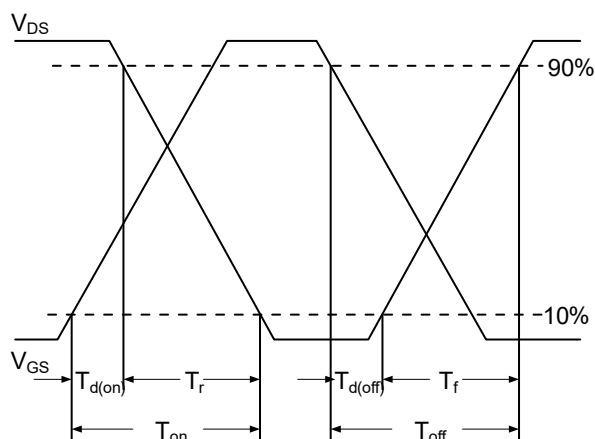


Fig.10 Switching Time Waveform

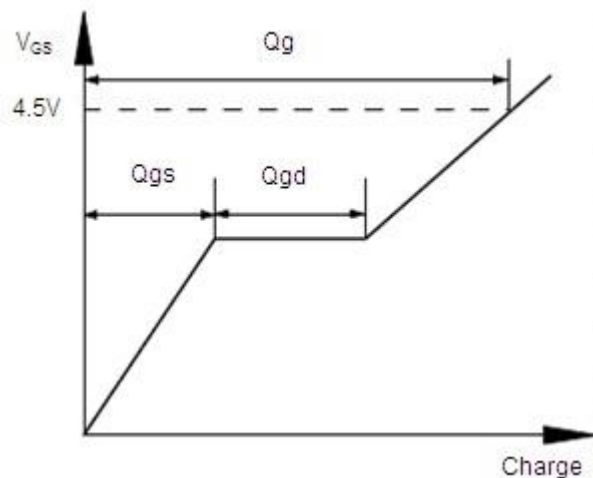
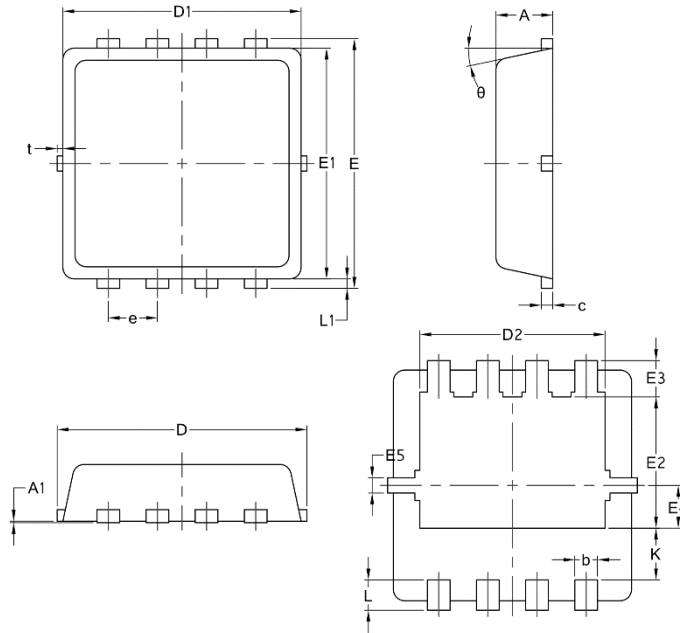


Fig.11 Gate Charge Waveform

Package Mechanical Data-DFN3*3-8L-JQ Single



| Symbol | Common | | |
|--------|--------|-------|------|
| | mm | | |
| | Mim | Nom | Max |
| A | 0.70 | 0.75 | 0.85 |
| A1 | / | / | 0.05 |
| b | 0.20 | 0.30 | 0.40 |
| c | 0.10 | 0.152 | 0.25 |
| D | 3.15 | 3.30 | 3.45 |
| D1 | 3.00 | 3.15 | 3.25 |
| D2 | 2.29 | 2.45 | 2.65 |
| E | 3.15 | 3.30 | 3.45 |
| E1 | 2.90 | 3.05 | 3.20 |
| E2 | 1.54 | 1.74 | 1.94 |
| E3 | 0.28 | 0.48 | 0.65 |
| E4 | 0.37 | 0.57 | 0.77 |
| E5 | 0.10 | 0.20 | 0.30 |
| e | 0.60 | 0.65 | 0.70 |
| K | 0.59 | 0.69 | 0.89 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.06 | 0.125 | 0.20 |
| t | 0 | 0.075 | 0.13 |
| Φ | 10 | 12 | 14 |