# AS12N02FL

N-Channel Enhancement Mode MOSFET

## Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---|---|---|
| 20V | 12mΩ@4.5V | 12A |
| | 18mΩ@2.5V | |

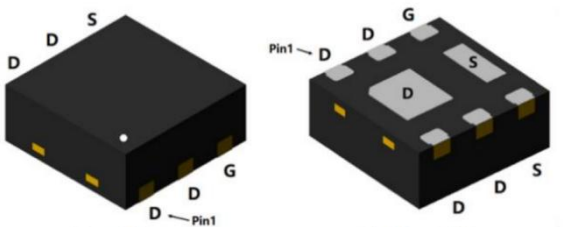
## Feature

- High power and current handing capability
- Ultra low on-resistance with low gate charge

## Application

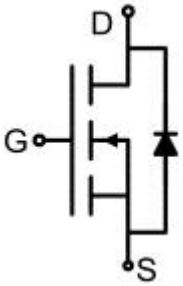
- Motor/Body Load Control
- Load Switch Load Switch
- DC-DC converters
- Relay driver

## Package

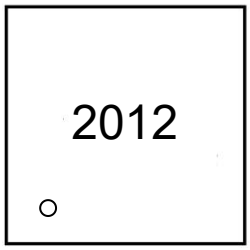



**DFN2*2-6L**

## Circuit diagram




## Marking



## Absolute maximum ratings ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | $I_D$ | 12 | A |
| Pulsed Drain Current[1)] | $I_{DM}$ | 50 | A |
| Power Dissipation | $P_D$ | 2 | W |
| Thermal Resistance,Junction-to-Ambient[2)] | $R_{\theta JA}$ | 57 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55 ~ +150 | ℃ |

## Electrical characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$= 0V, $I_D$ =250μA | 20 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =20V,$V_{GS}$ = 0V | | | 1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$ =±12V, $V_{DS}$ = 0V | | | ±10 | μA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 0.45 | 0.7 | 1.0 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =4.5V, $I_D$ =8A | | 8.5 | 12 | mΩ |
| | | $V_{GS}$ =2.5V, $I_D$ =6A | | 12.5 | 18 | |
| **Dynamic characteristics[3)]** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =10V,$V_{GS}$ =0V,f =1MHz | | 1030 | | pF |
| Output Capacitance | $C_{oss}$ | | | 185 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 174 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =10V,$V_{GS}$ =10V, $I_{DS}$ =6A | | 28.1 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 2.8 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 6.4 | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD}$=10V,$V_{Gen}$=10V, $I_{DS}$ =6A,$R_G$=1.8Ω | | 12 | | nS |
| Turn-on rise time | $t_r$ | | | 32 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 29 | | |
| Turn-off fall time | $t_f$ | | | 17 | | |

Notes:

1) Pulse Test: Pulse Width ≤ 100μs, Duty Cycle ≤ 2%, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$ = 150°C

2) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

3) Guaranteed by design, not subject to production.

## Typical Characteristics

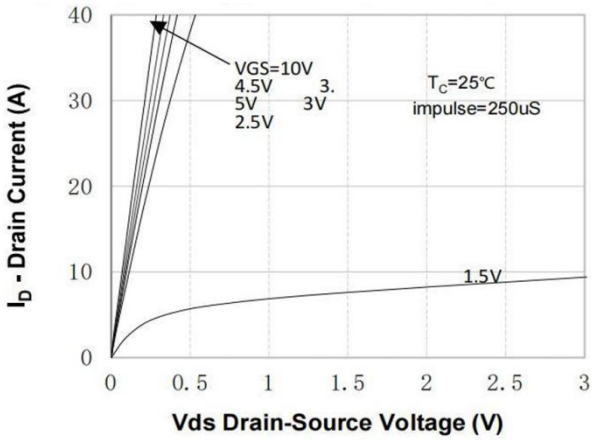



Figure 1. On-Region Characteristics

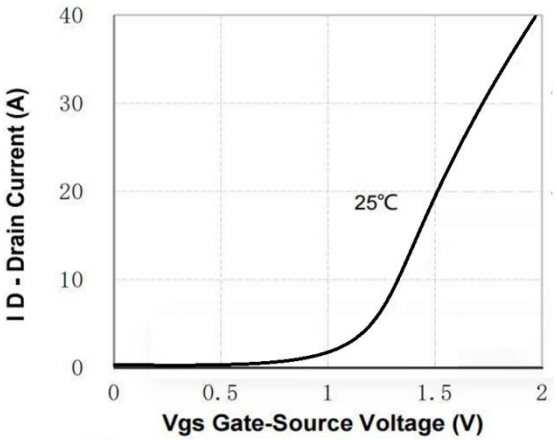



Figure 2. Transfer Characteristics

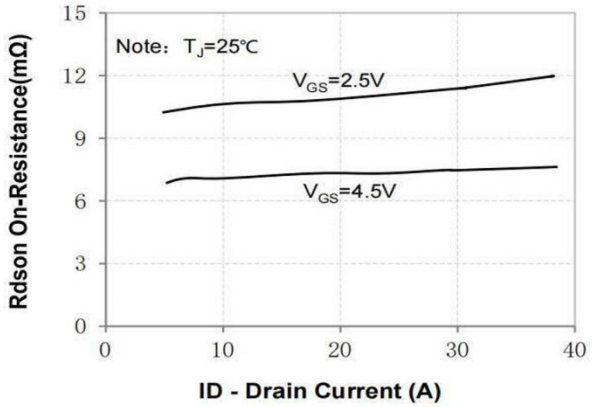



Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

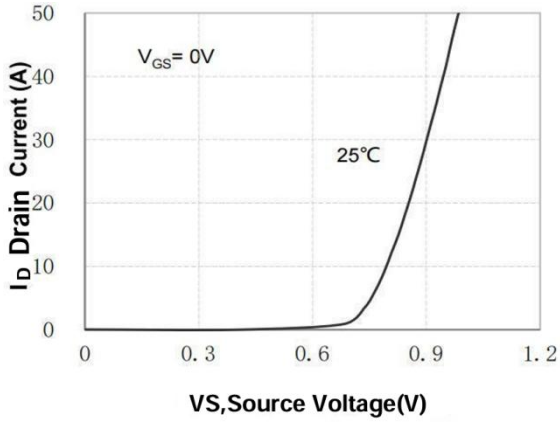



Figure 4. Body Diode Forward Voltage Variation with Source Current

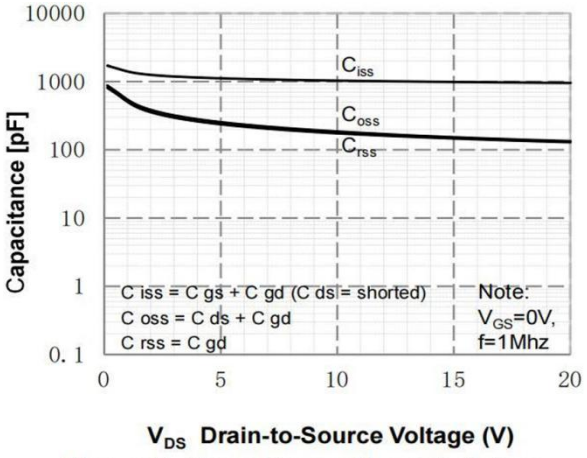



Figure 5. Capacitance Characteristics

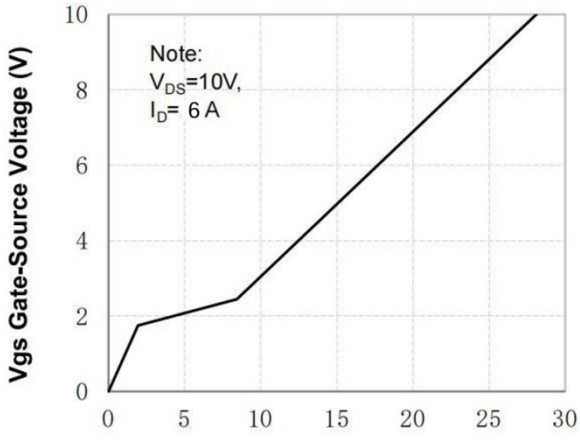



Figure 6. Gate Charge Characteristics

## Typical Characteristics

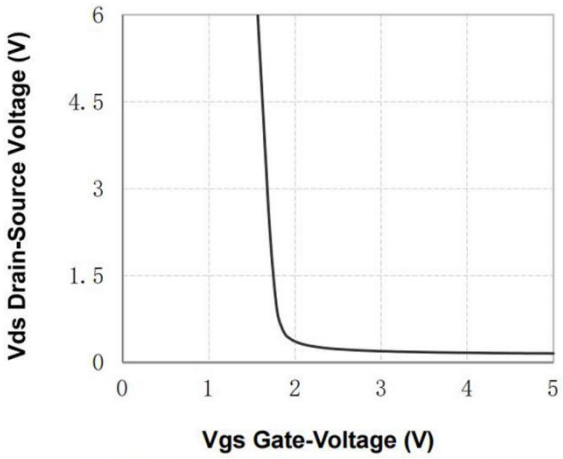



Figure 7. Vds Drain-Source Voltage vs Gate Voltage

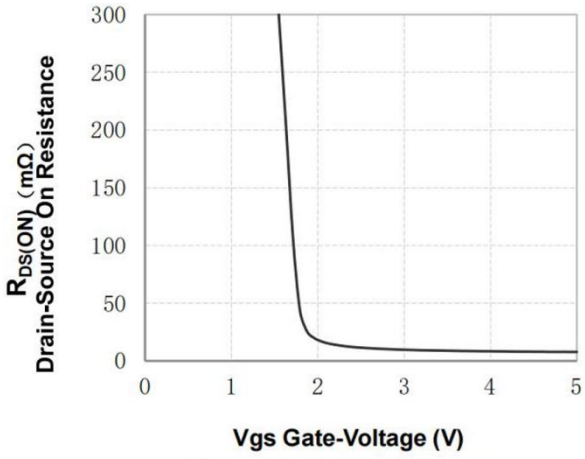



Figure 8. On-Resistance vs Gate Voltage

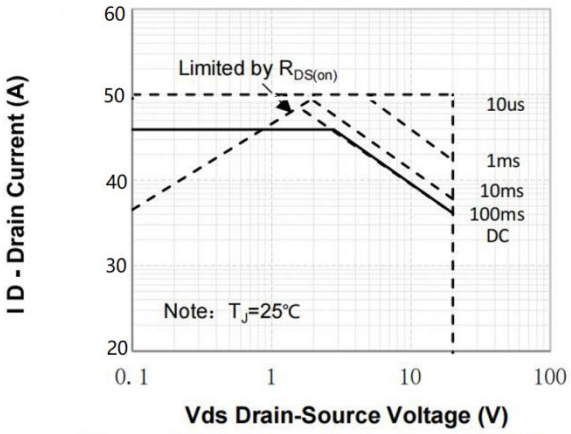



Figure 9. Maximum Safe Operating Area

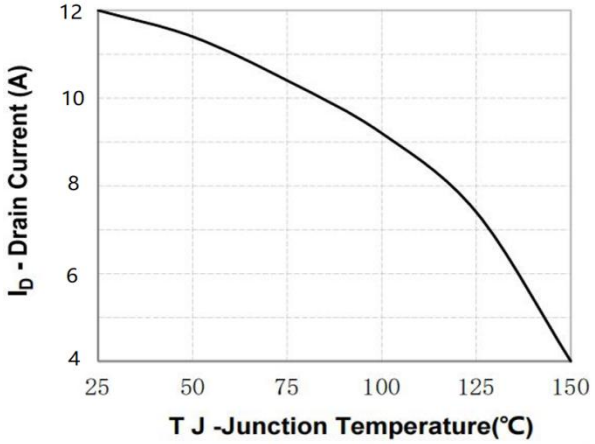
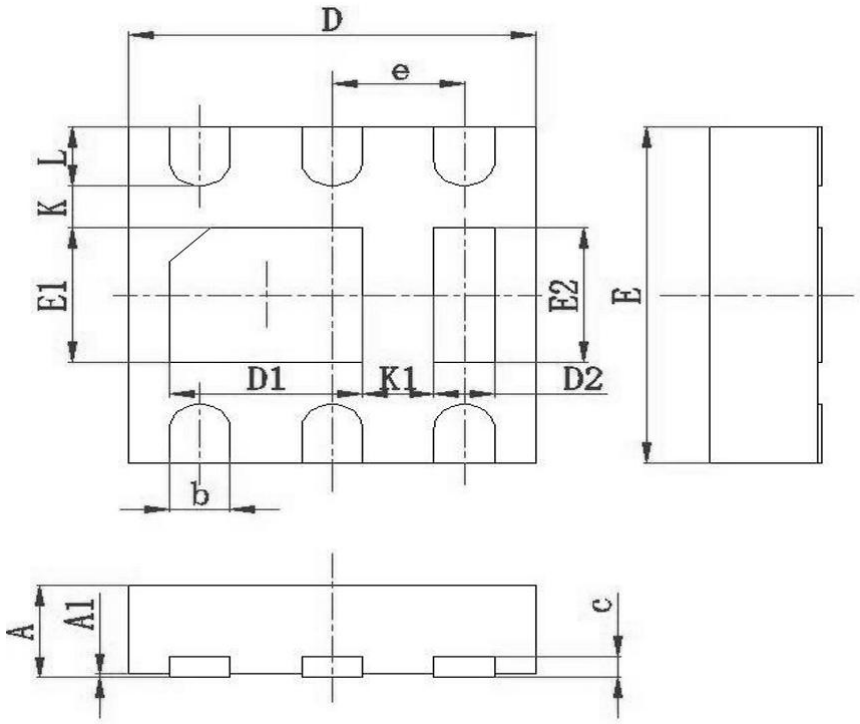



Figure 10. Maximum Continuous Drain Current vs Temperature

## DFN2*2-6L Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.500 | 0.600 | 0.020 | 0.024 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| b | 0.250 | 0.350 | 0.010 | 0.014 |
| c | 0.127 BSC. | | 0.005 BSC. | |
| D | 1.900 | 2.100 | 0.075 | 0.083 |
| D1 | 0.900 | 1.000 | 0.035 | 0.039 |
| D2 | 0.250 | 0.350 | 0.010 | 0.014 |
| e | 0.650 BSC. | | 0.026 BSC | |
| E | 1.900 | 2.100 | 0.075 | 0.083 |
| E1 | 0.750 | 0.850 | 0.030 | 0.033 |
| E2 | 0.750 | 0.850 | 0.030 | 0.033 |
| K | 0.250 BSC. | | 0.010 BSC. | |
| K1 | 0.350 BSC. | | 0.014 BSC. | |
| L | 0.300 | 0.400 | 0.012 | 0.016 |