

650V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

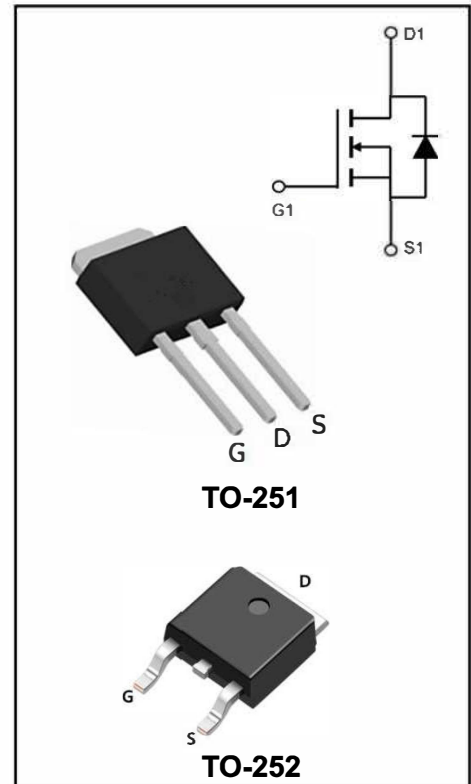
| | |
|-------------------------------|-------------------|
| I_D | 2A |
| V_{DSS} | 650V |
| $R_{DS(on)-typ}(@V_{GS}=10V)$ | <4.8Ω (Type: 4 Ω) |

Features

- ◆Fast Switching
- ◆Low ON Resistance
- ◆Low Gate Charge
- ◆100% Single Pulse avalanche energy Test
- ◆LeadfreeincomplywithEURoHS2011/65/EUdirectives

Mechanical Data

- ◆Case: Molded plastic
- ◆Mounting Position: Any
- ◆Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆Solder bath temperature 275°C maximum, 10s per JESD22-106



Product Specification Classification

| Part Number | Package | Marking | Pack |
|-------------|---------|-------------------|--------------|
| YFW2N65AMJ | TO-251 | YFW 2N65AMJ XXXXX | 80PCS/Tube |
| YFW2N65AD | TO-252 | YFW 2N65AD XXXXX | 2500PCS/Tape |

Maximum Ratings at Tc=25°C unless otherwise specified

| Characteristics | Symbols | Value | Units |
|---|-----------------|-------------|-------|
| | | 251/252 | |
| Drain-Source Voltage | V_{DS} | 650 | V |
| Gate-Source Voltage | V_{GS} | ±30 | V |
| Continue Drain Current | I_D | 2 | A |
| - Continuous(Tc=100°C) | | 1.3 | |
| Pulsed Drain Current (Note1) | I_{DM} | 8 | A |
| Power Dissipation | P_D | 35 | W |
| -Derate above 25°C | | 0.35 | |
| Single Pulse Avalanche Energy (Note2) | E_{AS} | 65 | mJ |
| Avalanche Current (Note 1) | I_{AR} | 2 | A |
| Repetitive Avalanche Energy (Note 1) | E_{AR} | 2.3 | mJ |
| Operating Temperature Range | T_J | 150 | °C |
| Storage Temperature Range | T_{STG} | -55 to +150 | °C |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 3.57 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 62.5 | °C/W |

Maximum Ratings at Tc=25°C unless otherwise specified

| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|---|--|--------------------------------------|-----|------|------|-------|
| Drain-Source Breakdown Voltage | $V_{GS} = 0 V, I_D = 250 \mu A$ | BV_{DSS} | 650 | 693 | - | V |
| Breakdown Voltage Temperature Coefficient | $I_D = 250 \mu A$ (Referenced to 25°C) | $\frac{\Delta BV_{DSS}}{\Delta T_J}$ | - | 0.5 | - | V/°C |
| Drain-Source Leakage Current | $V_{DS} = 650 V, V_{GS} = 0 V$ | I_{DSS} | - | - | 1 | uA |
| | $V_{DS} = 520 V, T_C = 125^\circ C$ | | - | - | 10 | uA |
| Gate Leakage Current | $V_{GS} = \pm 30 V, V_{DS} = 0 V$ | I_{GSS} | - | - | ±100 | nA |
| Gate-Source Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250 \mu A$ | $V_{GS(th)}$ | 2 | - | 4 | V |
| Drain-Source On-State Resistance | $V_{GS} = 10 V, I_D = 1 A$ | $R_{DS(on)}$ | - | 4 | 4.8 | Ω |
| Forward Transconductance | $V_{DS} = 15 V, I_D = 2 A$ | g_{fs} | - | 2.5 | - | S |
| Input Capacitance | $V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$ | C_{iss} | - | 295 | - | pF |
| Output Capacitance | | C_{oss} | - | 32 | - | |
| Reverse Transfer Capacitance | | C_{rss} | - | 6 | - | |
| Turn-on Delay Time | $I_D = 2 A, V_{DD} = 325 V, R_G = 10 \Omega$ (Note3,4) | $td(ON)$ | - | 8 | - | nS |
| Rise Time | | tr | - | 6 | - | |
| Turn-Off Delay Time | | $td(OFF)$ | - | 30 | - | |
| Fall Time | | tf | - | 11 | - | |
| Total Gate Charge | $I_D = 2 A, V_{DD} = 520 V, V_{GS} = 10 V$ (Note3,4) | Q_G | - | 10.8 | - | nC |
| Gate to Source Charge | | Q_{GS} | - | 1.5 | - | |
| Gate to Drain Charge | | Q_{GD} | - | 4 | - | |

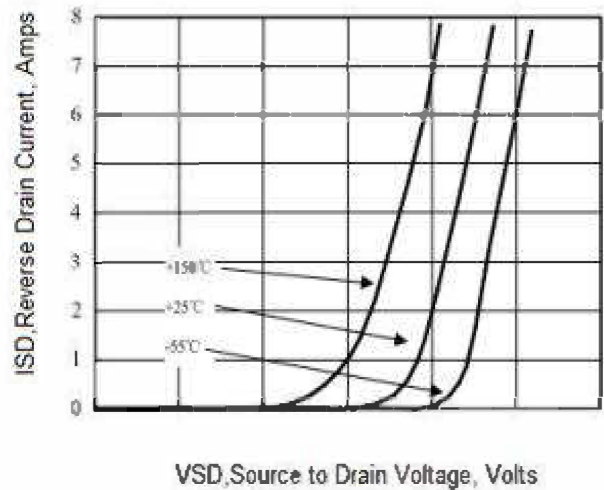
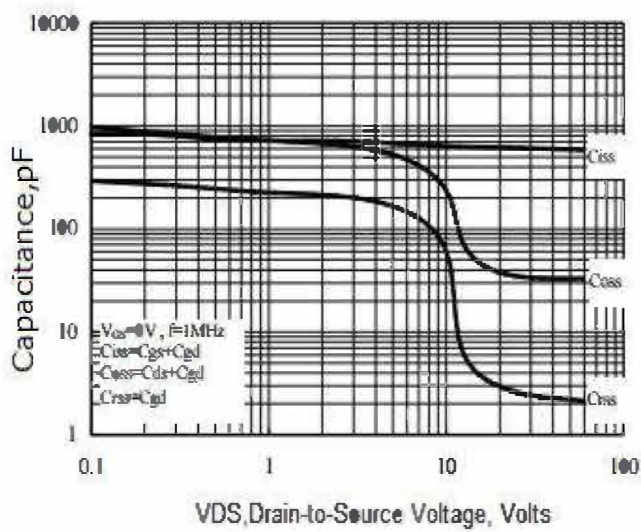
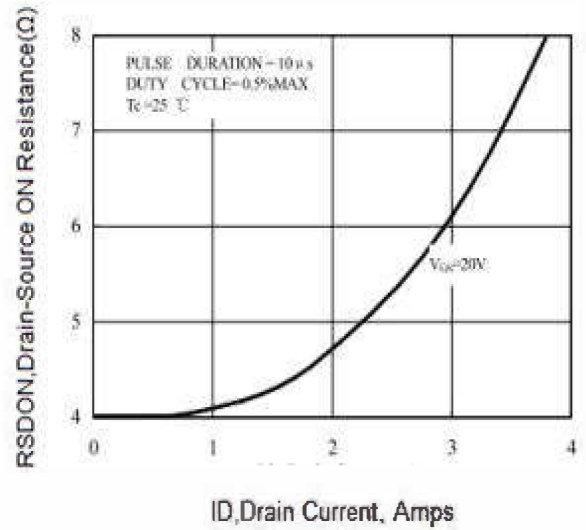
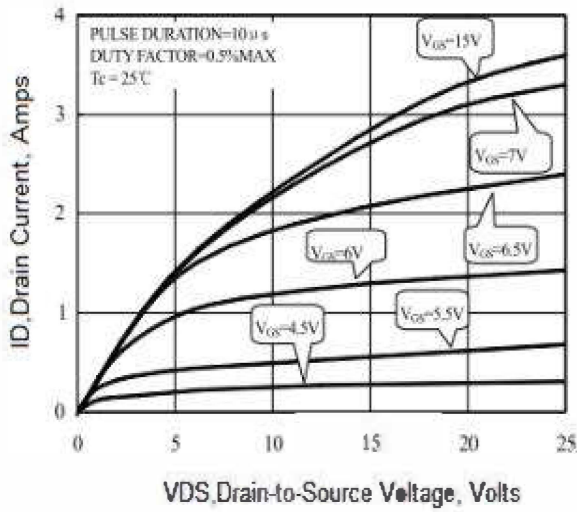
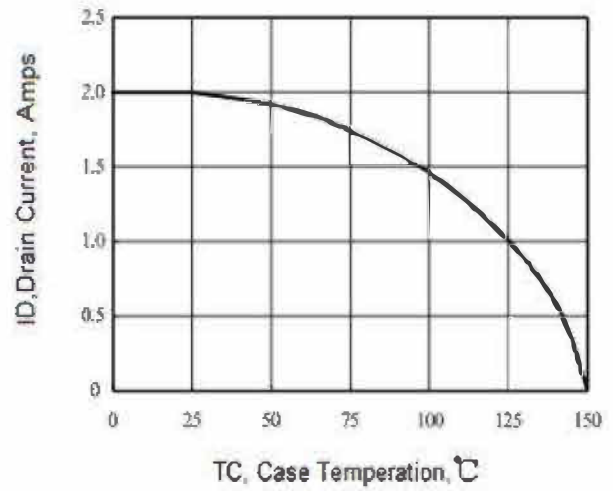
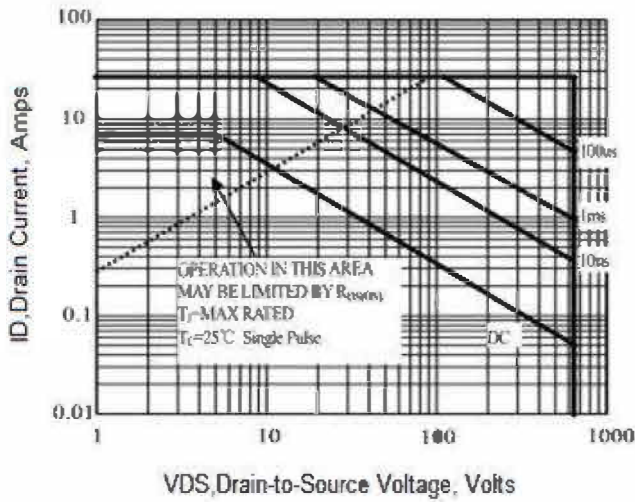
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|---------------------------------------|--|----------|-----|-----|-----|-------|
| Maximun Body-Diode Continuous Current | | I_S | - | - | 2 | A |
| Maximun Body-Diode Pulsed Current | | I_{SM} | - | - | 8 | A |
| Drain-Source Diode Forward Voltage | $I_{SD} = 2 \text{ A}$ | V_{SD} | - | - | 1.4 | V |
| Reverse Recovery Time | $I_{SD} = 2 \text{ A}, V_{GS} = 0 \text{ V},$ $di_F / dt = 100 \text{ A}/\mu\text{s}$ | t_{rr} | - | 430 | - | nS |
| Reverse Recovery Charge | | Q_{rr} | - | 1.1 | - | uC |

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. IAS = 2 A, VDD = 50 V, L = 33mH, RG = 25Ω, starting TJ = 25°C.
3. ulse test: Pulse Width ≤ 300 μ s, Duty Cycle ≤ 2%.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves



Package Outline Dimensions millimeters

TO-252

| | | | | |
|------------------------------|------|---------|------|-------|
| | Dim. | Min. | Typ. | Max. |
| | A | 2.10 | - | 2.50 |
| | A2 | 0 | - | 0.10 |
| | B | 0.66 | - | 0.86 |
| | B2 | 5.18 | - | 5.48 |
| | C | 0.40 | - | 0.60 |
| | C2 | 0.44 | - | 0.58 |
| | D | 5.90 | - | 6.30 |
| | D1 | 5.30REF | | |
| | E | 6.40 | - | 6.80 |
| | E1 | 4.63 | - | - |
| | G | 4.47 | - | 4.67 |
| | H | 9.50 | - | 10.70 |
| | L | 1.09 | - | 1.21 |
| | L2 | 1.35 | - | 1.65 |
| | V1 | - | 7° | - |
| V2 | 0° | - | 6° | |
| All Dimensions in millimeter | | | | |

TO-251

| | | | |
|------------------------------|------|---------|------|
| | Dim. | Min. | Max. |
| | A | 2.2 | 2.4 |
| | A2 | 0.95 | 1.15 |
| | A3 | 0.45 | 0.65 |
| | B | 0.65 | 0.85 |
| | C | 0.45 | 0.55 |
| | D | 6.45 | 6.75 |
| | D2 | 5.2 | 5.4 |
| | E | 5.8 | 6 |
| | E2 | 0.95 | 1.25 |
| | E | Typ 2.3 | |
| | E1 | Typ 4.6 | |
| | L | 4 | 4.2 |
| L1 | 1.2 | 1.5 | |
| All Dimensions in millimeter | | | |