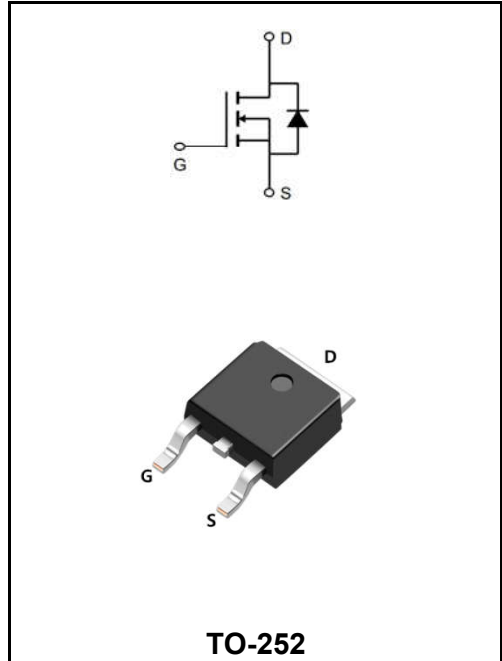


20V N-CHANNEL ENHANCEMENT MODE MOSFET
MAIN CHARACTERISTICS

| | |
|-------------------------------|------------------------------|
| I_D | 20A |
| V_{DSS} | 20V |
| $R_{DS(on)-typ}(@V_{GS}=10V)$ | < 15mΩ (Type:12 mΩ) |


Application

- ◆ Solar road lights
- ◆ Load switch
- ◆ Uninterruptible power supply

Product Specification Classification

| Part Number | Package | Marking | Pack |
|-------------|---------|-------------------|--------------|
| YFW20N02AD | TO-252 | YFW 20N02AD XXXXX | 2500PCS/Tape |

Maximum Ratings at Tc=25°C unless otherwise specified

| Characteristics | Symbols | Value | Units |
|--|-----------------|-------------|-------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate - Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=25^\circ C$ | I_D | 20 | A |
| Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=100^\circ C$ | I_D | 13 | A |
| Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=25^\circ C$ | I_D | 6.3 | A |
| Continuous Drain Current, $V_{GS} @ 10V^1 @ T_A=70^\circ C$ | I_D | 5.8 | A |
| Pulsed Drain Current ² | I_{DM} | 50 | A |
| Single Pulse Avalanche Energy ³ | E_{AS} | 8.1 | mJ |
| Avalanche Current | I_{AS} | 12.7 | A |
| Total Power Dissipation ⁴ @ $T_C=25^\circ C$ | P_D | 20.8 | W |
| Total Power Dissipation ⁴ @ $T_A=25^\circ C$ | P_D | 2 | W |
| Storage Temperature Range | T_{STG} | -55 to +150 | °C |
| Operating Junction Temperature Range | T_J | -55 to +150 | °C |
| Thermal Resistance Junction-Ambient ¹ | $R_{\theta JA}$ | 62 | °C/W |
| Thermal Resistance Junction-Case ¹ | $R_{\theta JC}$ | 6 | °C/W |

Maximum Ratings at Tc=25°C unless otherwise specified

| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|-----------------------------------|--|------------------------------|-----|-------|------|-------|
| Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | BV_{DSS} | 20 | 22 | - | V |
| BVDSS Temperature Coefficient | Reference to 25°C, $I_D=1mA$ | $\Delta BV_{DSS}/\Delta T_J$ | - | 0.018 | - | V/°C |
| Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | $V_{GS(th)}$ | 0.5 | 0.65 | 1.0 | V |
| Static Drain-Source On-Resistance | $V_{GS}=4.5V, I_D=7.6A$ | $R_{DS(on)}$ | - | 12 | 15 | mΩ |
| | $V_{GS}=2.5V, I_D=3.5A$ | | - | 15.5 | 20 | |
| | $V_{GS}=1.8V, I_D=2.5A$ | | - | 20.5 | 35 | |
| Zero Gate Voltage Drain Current | $V_{DS}=20V, V_{GS}=0V$ | I_{DSS} | - | - | 1 | μA |
| Gate - Body Leakage Current | $V_{GS}=\pm 10V, V_{DS}=0V$ | I_{GSS} | - | - | ±100 | nA |
| Input Capacitance | $V_{DS}=10V$ $V_{GS}=0V$ $f=1.0MHz$ | C_{iss} | - | 888 | - | pF |
| Output Capacitance | | C_{oss} | - | 133 | - | |
| Reverse Transfer Capacitance | | C_{rss} | - | 117 | - | |
| Total Gate Charge | $V_{GS}=4.5V$ $V_{DS}=10V$ $I_D=6.8A$ | Q_g | - | 11.05 | - | nC |
| Gate-Source Charge | | Q_{gs} | - | 1.73 | - | |
| Gate-Drain Charge | | Q_{gd} | - | 3.1 | - | |
| Turn-on delay time | $V_{GS}=4.5V$ $V_{DS}=10V$ $I_D=6.8A$ $R_{GEN}=3\Omega$ | $t_{D(on)}$ | - | 7 | - | ns |
| Turn-on Rise Time | | T_r | - | 46 | - | |
| Turn-Off Delay Time | | $t_{d(OFF)}$ | - | 30 | - | |
| Turn- Off Fall Time | | t_f | - | 52 | - | |
| Drain Forward Voltage | $V_{GS}=0V, I_S=7.6A$ | V_{SD} | - | - | 1.2 | V |

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width $\cong 300\mu s$, duty cycle $\cong 2\%$
- 3、 The power dissipation is limited by 150°C junction temperature
- 4、 The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation. Typical Characteristics

Ratings and Characteristic Curves

Typical Characteristics

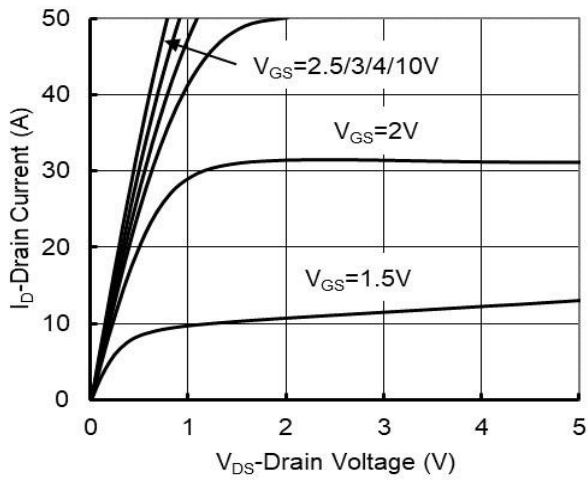


Figure1. Output Characteristics

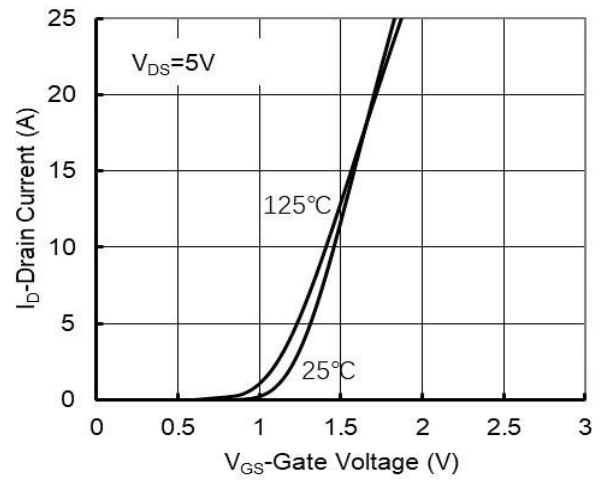


Figure2. Transfer Characteristics

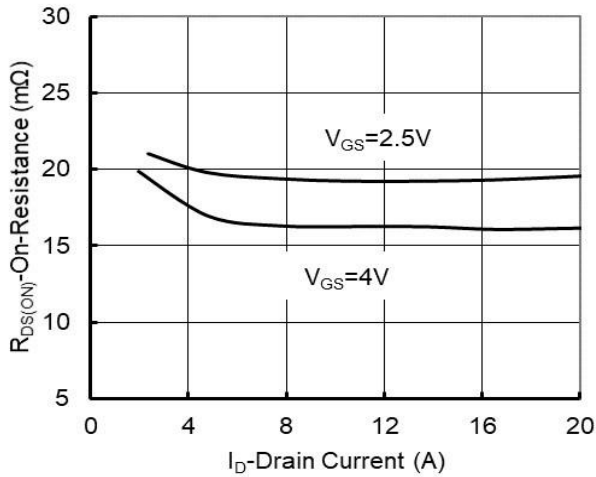


Figure 3: On-Resistance vs. Drain Current

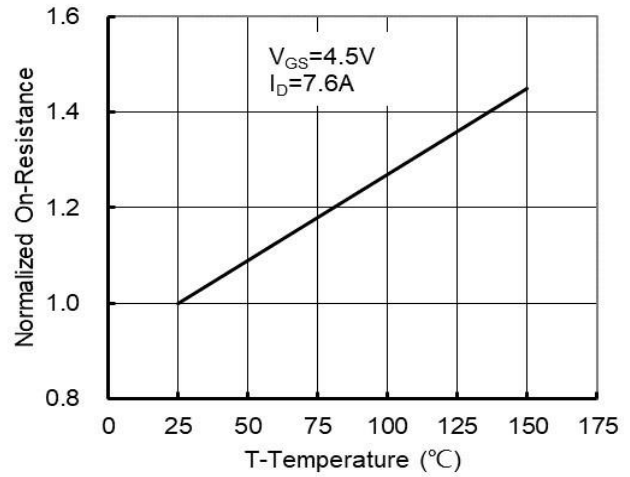


Figure 4: On-Resistance vs. Junction Temperature and Gate Voltage

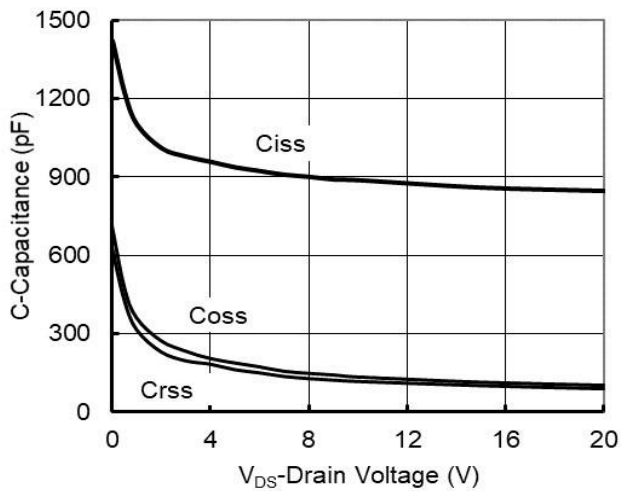


Figure5. Capacitance Characteristics

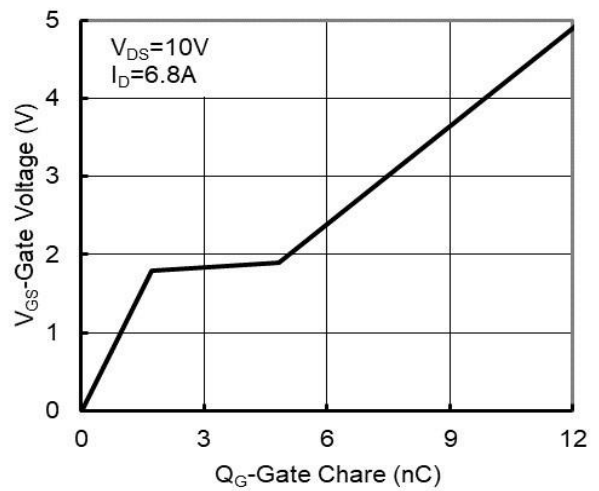


Figure6. Gate Charge

Ratings and Characteristic Curves

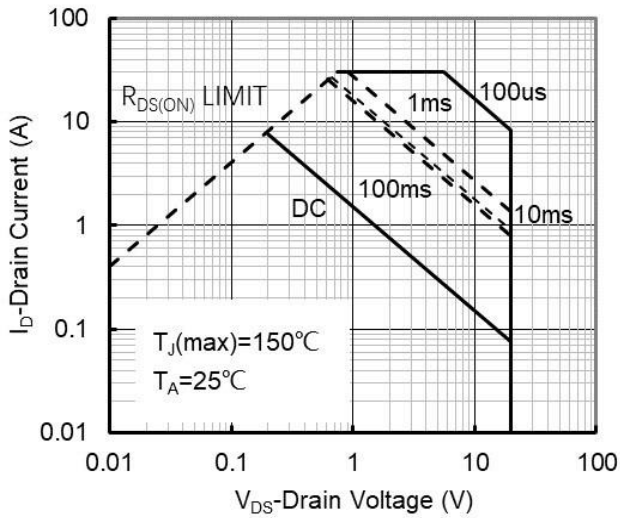


Figure7. Safe Operation Area

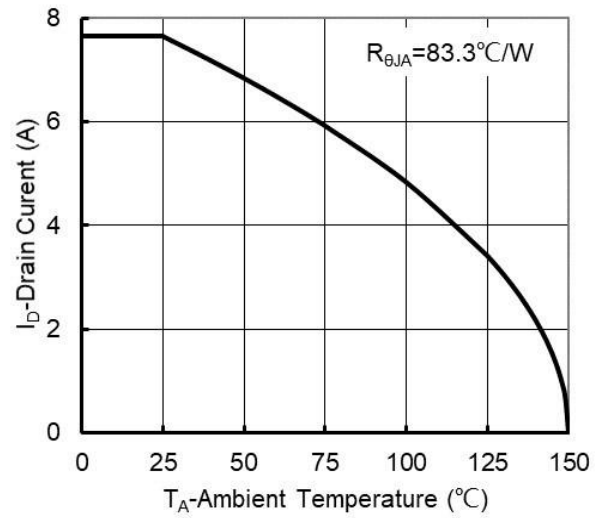


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

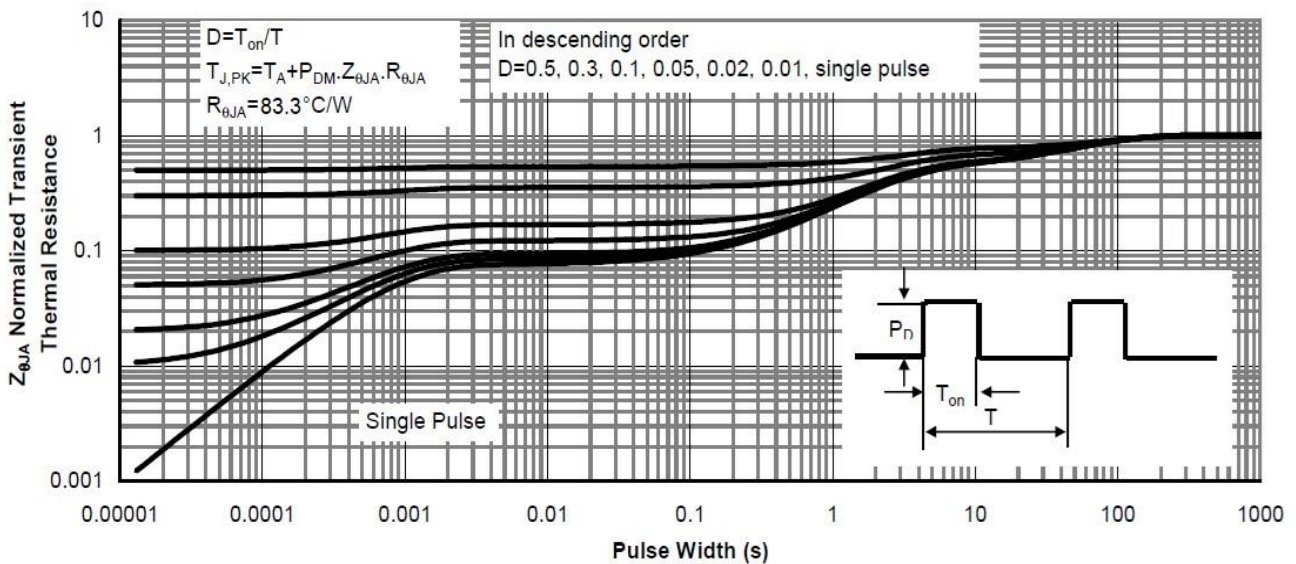


Figure9. Normalized Maximum Transient Thermal Impedance

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 | | | |

