

500V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

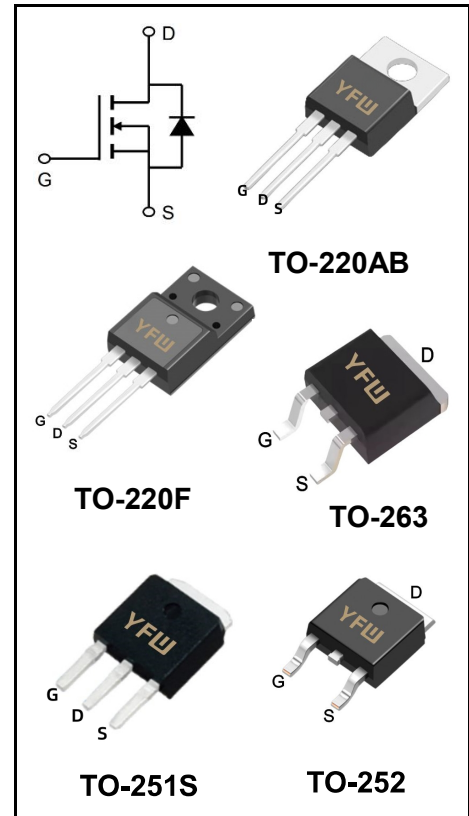
| | |
|--|----------------------------|
| I_D | 5A |
| V_{DSS} | 500V |
| R_{DS(on)}-typ(@V_{GS}=10V) | <1.5Ω (Type:1.39 Ω) |

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 temperature275℃ maximum,10s per JESD22-106



Maximum Ratings at Tc=25°C unless otherwise specified

| Characteristics | Symbols | Value | | | Units |
|---|-----------------|-------------|------|---------|-------|
| | | 220AB/263 | 220F | 251/252 | |
| Drain-Source Voltage | V_{DS} | 500 | | | V |
| Gate-Source Voltage | V_{GS} | ±30 | | | V |
| Continue Drain Current | I_D | 5 | | | A |
| - Continuous(Tc=100°C) | | 3.1 | | | |
| Pulsed Drain Current (Note1) | I_{DM} | 20 | | | A |
| Power Dissipation | P_D | 75 | 33 | 63 | W |
| -Derate above 25°C | | 0.56 | 0.33 | 0.62 | W/°C |
| Single Pulse Avalanche Energy (Note2) | E_{AS} | 195 | | | mJ |
| Avalanche Current (Note 1) | I_{AR} | 5 | | | A |
| Repetitive Avalanche Energy (Note 1) | E_{AR} | 10.1 | | | mJ |
| Operating Temperature Range | T_J | 150 | | | °C |
| Storage Temperature Range | T_{STG} | -55 to +150 | | | °C |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.65 | 3.46 | 2.25 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 62.5 | 62.5 | 62.5 | °C/W |

Maximum Ratings at Tc=25°C unless otherwise specified

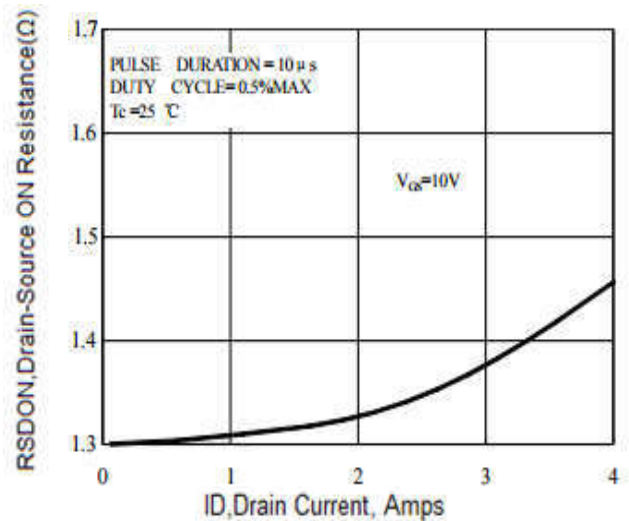
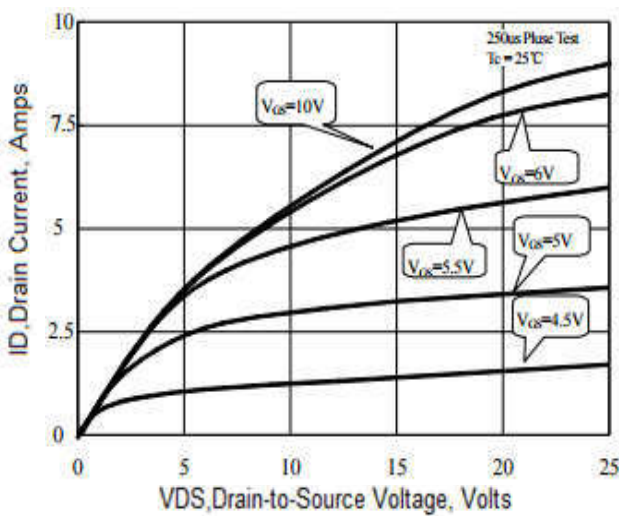
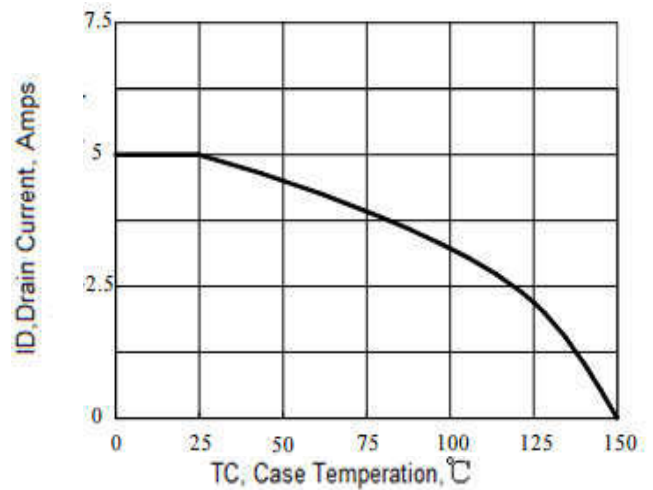
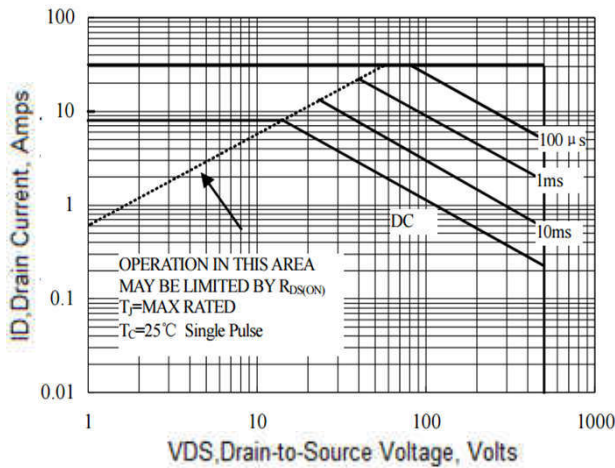
| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|----------------------------------|---|--------------|-----|------|------|-------|
| Drain-Source Breakdown Voltage | $V_{GS} = 0 V, I_D = 250 \mu A$ | BV_{DSS} | 500 | - | - | V |
| Drain-Source Leakage Current | $V_{DS} = 500 V, V_{GS} = 0 V$ | I_{DSS} | - | - | 1 | uA |
| | $V_{DS}=400V, T_C=125^\circ C$ | | - | - | 10 | |
| 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 | $V_{GS} = 10 V, I_D = 2.5 A$ | $R_{DS(on)}$ | - | 1.39 | 1.5 | Ω |
| Forward Transconductance | $V_{DS} = 15 V, I_D = 2.5 A$ | g_{fs} | - | 4 | - | S |
| Input Capacitance | $V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz$ | C_{iss} | - | 545 | - | pF |
| Output Capacitance | | C_{oss} | - | 63 | - | |
| Reverse Transfer Capacitance | | C_{rss} | - | 5.5 | - | |
| Turn-on Delay Time | $I_D = 5 A, V_{DD} = 250 V, R_G = 10 \Omega (Note 3.4)$ | $td(ON)$ | - | 9 | - | nS |
| Rise Time | | tr | - | 11 | - | |
| Turn-Off Delay Time | | $td(OFF)$ | - | 29 | - | |
| Fall Time | | tf | - | 16 | - | |
| Total Gate Charge | $I_D = 5 A, V_{DD} = 400 V, V_{GS} = 10 V (Note 3.4)$ | Q_G | - | 14.5 | - | nC |
| Gate to Source Charge | | Q_{GS} | - | 3.5 | - | |
| Gate to Drain Charge | | Q_{GD} | - | 7 | - | |

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

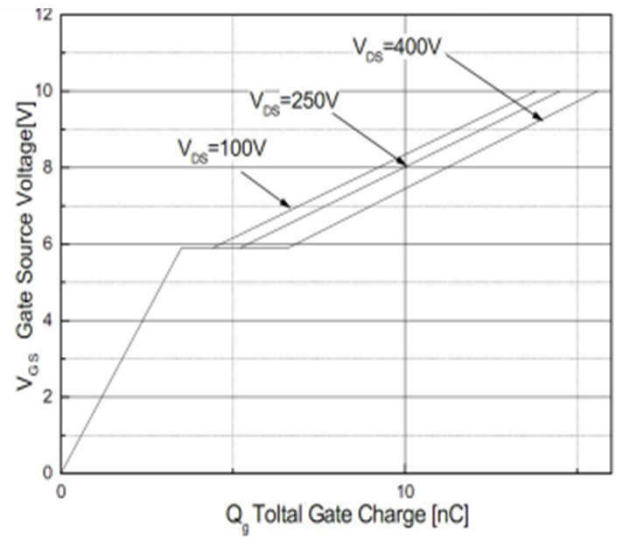
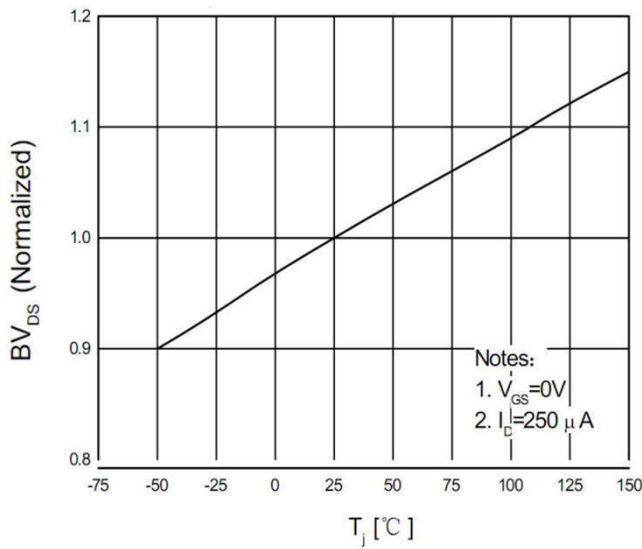
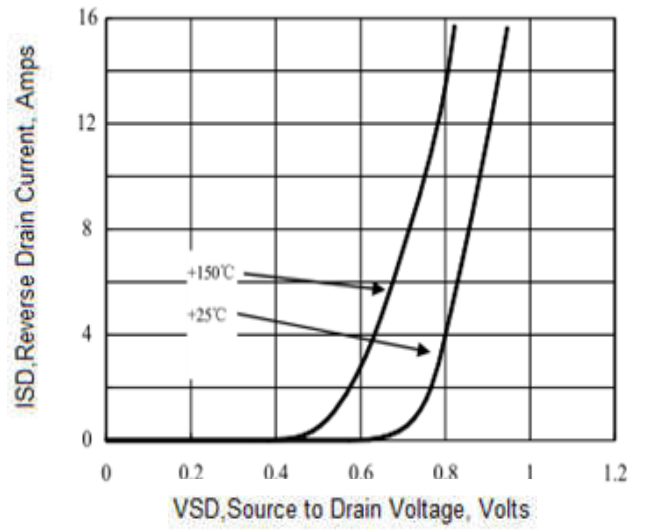
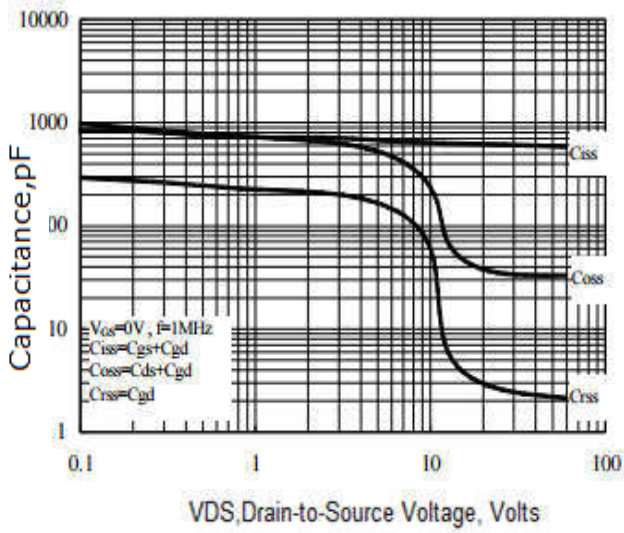
| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|--|--|-----------------------|-----|-----|-----|-----------|
| Maximun Body-Diode Continuous Current | | I_S | - | - | 5 | A |
| Maximun Body-Diode Pulsed Current(Note2) | | I_{SM} | - | - | 20 | A |
| Drain-Source Diode Forward Voltage | I _{SD} = 5 A | V_{SD} | - | - | 1.4 | V |
| Reverse Recovery Time | I _{SD} = 5 A, V _{GS} = 0 V, dI _F / dt = 100 A/μs | trr | - | 391 | - | nS |
| Reverse Recovery Charge | | Qrr | - | 1.7 | - | uC |

- Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 2. IAS = 5 A, VDD = 50 V, L = 16mH, RG = 25Ω, starting TJ = 25°C.
 3. ulse test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
 4. Essentially Independent of Operating Temperature.

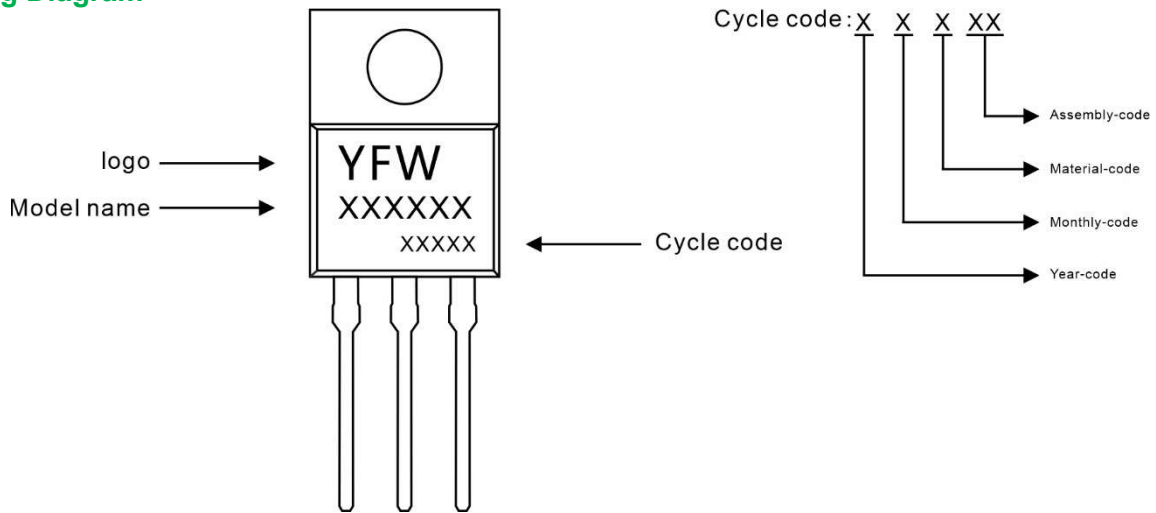
Ratings and Characteristic Curves



Ratings and Characteristic Curves



Marking Diagram



Ordering information

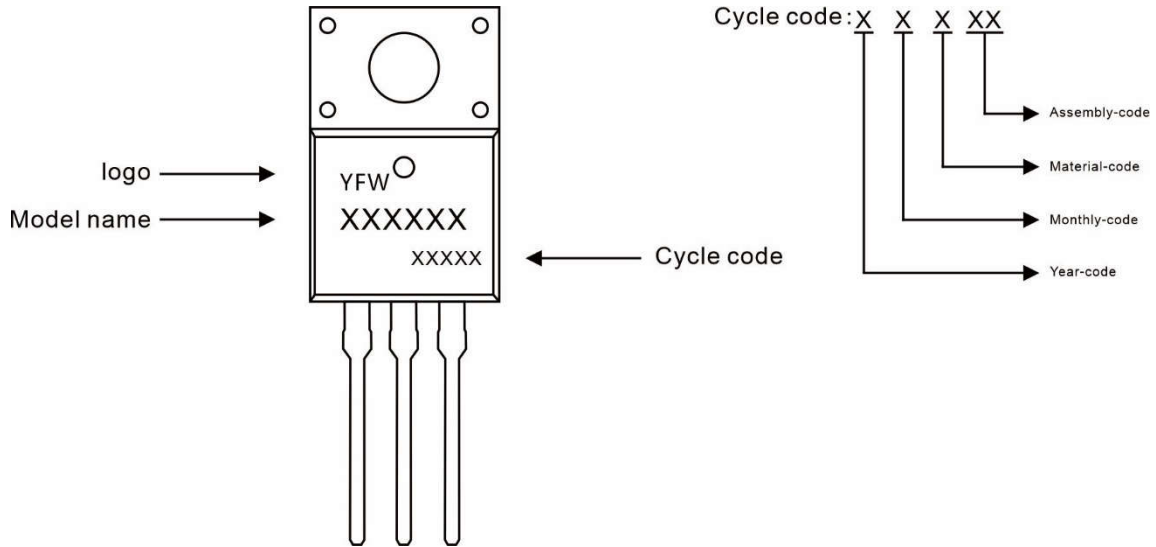
| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|----------|---------------|---------------|----------------------------|
| YFW5N50AT | TO-220AB | 0.07oz(1.96g) | 50pcs/tube | 1000PCS/Box 5000PCS/Carton |

Package Dimensions

TO-220AB

| Symbol | Millimeter | | Inches | |
|--------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.30 | 4.70 | 0.169 | 0.185 |
| A1 | 2.52 | 2.82 | 0.099 | 0.111 |
| b | 0.71 | 0.91 | 0.028 | 0.036 |
| b1 | 1.17 | 1.37 | 0.046 | 0.054 |
| c | 0.30 | 0.50 | 0.012 | 0.020 |
| c1 | 1.17 | 1.37 | 0.046 | 0.054 |
| D | 9.90 | 10.20 | 0.390 | 0.402 |
| E | 8.50 | 8.90 | 0.335 | 0.350 |
| E1 | 12.00 | 12.50 | 0.472 | 0.492 |
| e | 2.44 | 2.64 | 0.096 | 0.104 |
| e1 | 4.88 | 5.28 | 0.192 | 0.208 |
| F | 2.60 | 2.80 | 0.102 | 0.110 |
| L | 13.20 | 13.80 | 0.520 | 0.543 |
| L1 | 3.80 | 4.20 | 0.150 | 0.165 |
| Φ | 3.60 | 3.96 | 0.142 | 0.156 |

Marking Diagram



Ordering information

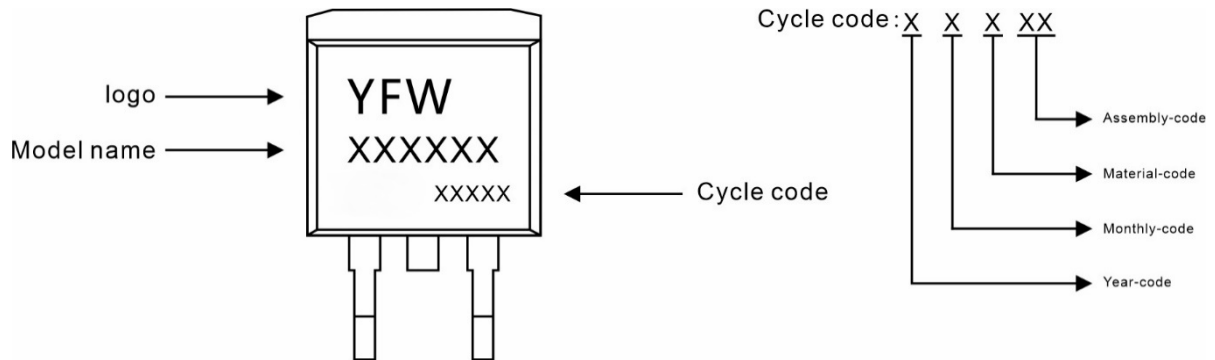
| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|---------------|---------------|----------------------------|
| YFW5N50AF | TO-220F | 0.06oz(1.74g) | 50pcs/tube | 1000PCS/Box 5000PCS/Carton |

Package Dimensions

TO-220F

| Symbol | Millimeter | | Inches | |
|--------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.50 | 4.90 | 0.177 | 0.193 |
| A1 | 2.34 | 2.74 | 0.092 | 0.108 |
| A2 | 2.66 | 2.86 | 0.105 | 0.113 |
| b | 0.75 | 0.85 | 0.030 | 0.033 |
| b1 | 1.24 | 1.44 | 0.049 | 0.057 |
| c | 0.40 | 0.60 | 0.016 | 0.024 |
| D | 10.00 | 10.32 | 0.394 | 0.406 |
| E | 15.75 | 16.05 | 0.620 | 0.632 |
| e | 2.44 | 2.64 | 0.096 | 0.104 |
| e1 | 4.88 | 5.28 | 0.192 | 0.208 |
| F | 3.10 | 3.5 | 0.122 | 0.138 |
| L | 13.50 | 13.90 | 0.531 | 0.547 |
| L1 | 2.90 | 3.30 | 0.114 | 0.130 |
| Φ | 3.10 | 3.30 | 0.122 | 0.130 |

Marking Diagram



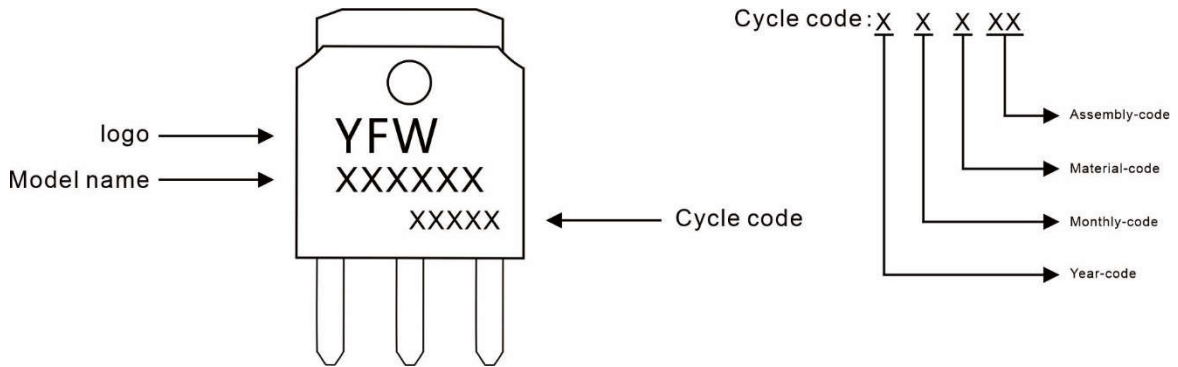
Ordering information

| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|---------------|---------------|----------------------------|
| YFW5N50AS | TO-263 | 0.04oz(1.16g) | 800pcs/reel | 1600pcs/box 8000pcs/Carton |

**Package Dimensions
TO-263**

| Dim | Millimeter | | Inches | |
|-----|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.30 | 4.70 | 0.169 | 0.185 |
| A1 | 0.00 | 0.15 | 0.000 | 0.006 |
| A2 | 4.30 | 4.55 | 0.169 | 0.179 |
| B | 1.10 | 1.50 | 0.043 | 0.059 |
| b | 0.70 | 0.90 | 0.028 | 0.035 |
| b1 | 1.20 | 1.50 | 0.047 | 0.059 |
| c | 0.30 | 0.60 | 0.012 | 0.024 |
| c1 | 1.17 | 1.37 | 0.046 | 0.054 |
| D | 9.90 | 10.20 | 0.390 | 0.402 |
| E | 8.50 | 8.90 | 0.335 | 0.350 |
| e | 2.44 | 2.64 | 0.096 | 0.104 |
| e1 | 4.88 | 5.28 | 0.192 | 0.208 |
| L | 15.00 | 15.30 | 0.591 | 0.602 |
| L1 | 5.20 | 5.40 | 0.205 | 0.213 |
| L2 | 2.40 | 2.60 | 0.094 | 0.102 |
| L3 | 1.60 | 1.80 | 0.063 | 0.071 |

Marking Diagram



Ordering information

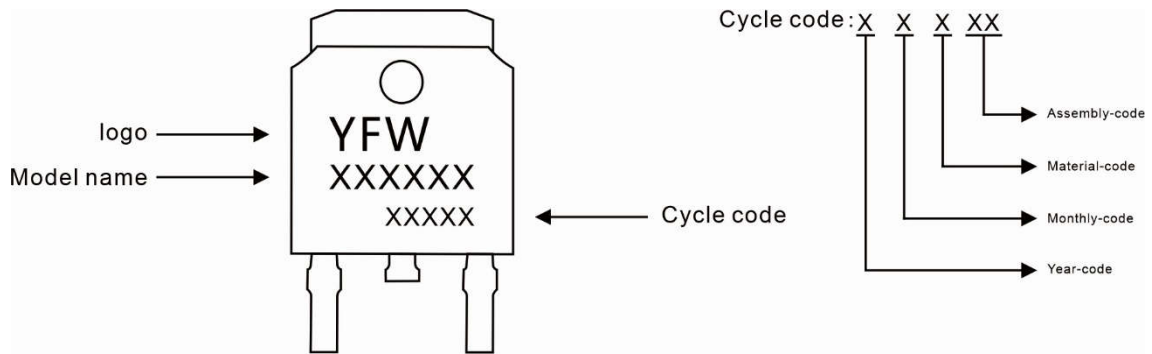
| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|----------------|---------------|-----------------------------|
| YFW5N50AMJ | TO-251S | 0.011oz(0.32g) | 80pcs/tube | 4000pcs/box 24000pcs/Carton |

Package Dimensions

TO-251S

| Dim | Millimeter | | Inches | |
|-----|------------|------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.1 | 2.5 | 0.083 | 0.098 |
| A1 | 6.3 | 6.9 | 0.248 | 0.271 |
| A2 | 0.9 | 1.1 | 0.035 | 0.043 |
| A3 | TYP0.5 | | TYP0.019 | |
| b | 0.6 | 0.8 | 0.024 | 0.031 |
| c | 0.4 | 0.5 | 0.015 | 0.020 |
| D | 5.3 | 5.5 | 0.209 | 0.217 |
| D2 | 3.65 | 4.05 | 0.144 | 0.159 |
| E | 5.8 | 6.4 | 0.228 | 0.252 |
| E2 | 0.9 | 1.4 | 0.035 | 0.055 |
| e | TYP2.29 | | TYP0.090 | |
| e1 | TYP4.58 | | TYP0.180 | |
| L | 3.7 | 4.3 | 0.146 | 0.169 |

Marking Diagram



Ordering information

| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|----------------|---------------|-----------------------------|
| YFW5N50AD | TO-252 | 0.011oz(0.32g) | 2500pcs/reel | 5000pcs/box 25000pcs/Carton |

Package Dimensions

TO-252

| Dim | Millimeter | | Inches | |
|-----|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.20 | 2.50 | 0.087 | 0.098 |
| A1 | 0.00 | 0.12 | 0.000 | 0.005 |
| A2 | 2.20 | 2.40 | 0.087 | 0.094 |
| B | 1.20 | 1.60 | 0.047 | 0.063 |
| b | 0.50 | 0.70 | 0.020 | 0.028 |
| b1 | 0.70 | 0.90 | 0.028 | 0.035 |
| c | 0.40 | 0.60 | 0.016 | 0.024 |
| c1 | 0.40 | 0.60 | 0.016 | 0.024 |
| D | 6.35 | 6.65 | 0.250 | 0.262 |
| D1 | 5.20 | 5.40 | 0.205 | 0.213 |
| E | 5.40 | 5.70 | 0.213 | 0.224 |
| e | 2.20 | 2.40 | 0.087 | 0.094 |
| e1 | 4.40 | 4.80 | 0.173 | 0.189 |
| L | 10.00 | 11.00 | 0.393 | 0.433 |
| L1 | 2.70 | 3.10 | 0.106 | 0.122 |
| L2 | 1.40 | 1.80 | 0.055 | 0.071 |
| L3 | 0.90 | 1.50 | 0.035 | 0.059 |

Disclaimer

The information presented in this document is for reference only. Guangdong Youfeng Microelectronics Co.,Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise. The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), YFW or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale. This publication supersedes & replaces all information previously supplied. For additional information, please visit our website <https://www.yfwdiode.com>, or consult YFW sales office for further assistance.