

700V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

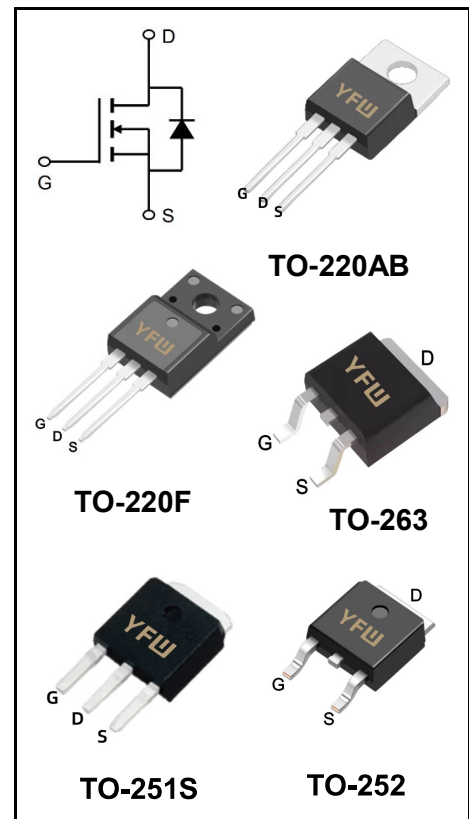
| | |
|-------------------------------|---------------------|
| I_D | 7A |
| V_{DSS} | 700V |
| $R_{DS(on)-typ}(@V_{GS}=10V)$ | <1.4Ω (Type:1.15 Ω) |

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°C 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} | 700 | | | V |
| Gate-Source Voltage | V_{GS} | ±30 | | | V |
| Continue Drain Current-Continuous (TC = 25°C) | I_D | 7 | | | A |
| -Continuous (TC = 100°C) | | 4.5 | | | |
| Pulsed Drain Current (Note1) | I_{DM} | 28 | | | A |
| Power Dissipation | P_D | 89 | 35 | 74 | W |
| -Derate above 25°C | | 0.8 | 0.38 | 1.7 | W/°C |
| Single Pulse Avalanche Energy (Note2) | E_{AS} | 608 | | | mJ |
| Avalanche Current (Note 1) | I_{AR} | 7 | | | A |
| Repetitive Avalanche Energy (Note 1) | E_{AS} | 14 | | | mJ |
| Operating Temperature Range | T_J | 150 | | | °C |
| Storage Temperature Range | T_{STG} | -55 to +150 | | | °C |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 1.4 | 3.5 | 1.7 | °C/W |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 62.5 | 62.5 | 62 | °C/W |

Maximum Ratings at Tc=25°C unless otherwise specified

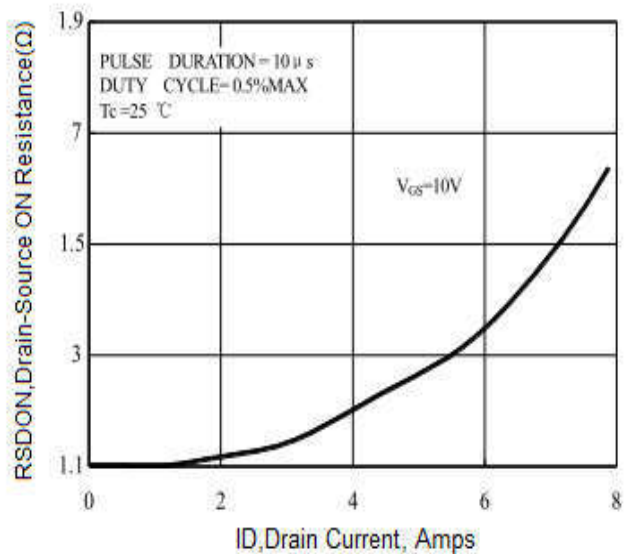
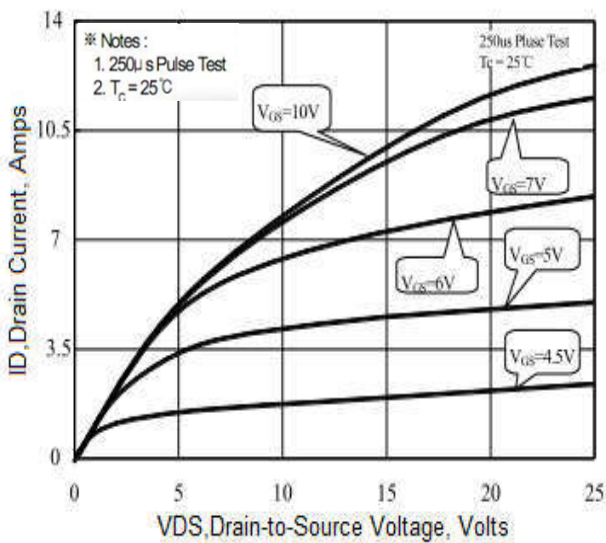
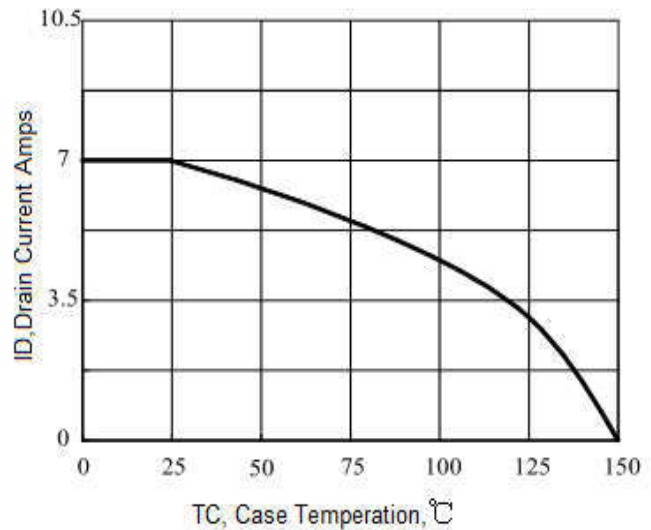
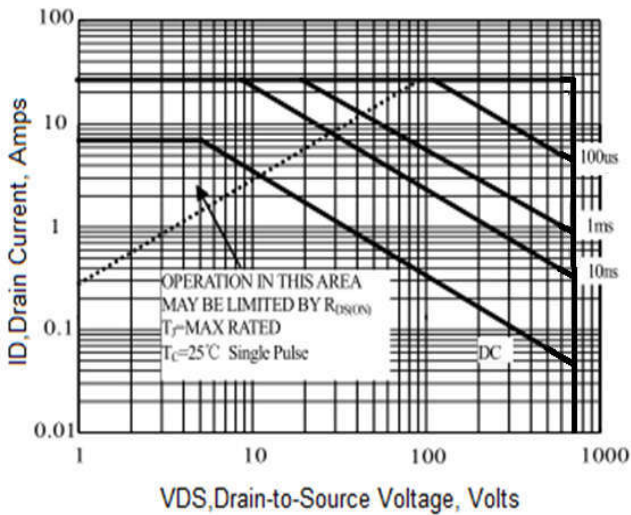
| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|----------------------------------|---|--------------|-----|------|------|-------|
| Drain-Source Breakdown Voltage | $V_{GS} = 0 V, I_D = 250 \mu A$ | BV_{DSS} | 700 | - | - | V |
| Drain-Source Leakage Current | $V_{DS} = 700 V, V_{GS} = 0 V$ | I_{DSS} | - | - | 1 | uA |
| | $V_{DS} = 560 V, T_c = 125^\circ C$ | | - | - | 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 | $V_{GS} = 10 V, I_D = 3.5 A$ | $R_{DS(on)}$ | - | 1.15 | 1.4 | Ω |
| Forward Transconductance(Note3) | $V_{DS} = 40 V, I_D = 3.5 A$ | g_{fs} | - | 6.5 | - | S |
| Input Capacitance | $V_{GS} = 0 V, V_{DS} = 25 V, f = 1MHz$ | C_{iss} | - | 1112 | - | pF |
| Output Capacitance | | C_{oss} | - | 92 | - | |
| Reverse Transfer Capacitance | | C_{rss} | - | 5 | - | |
| Turn-on Delay Time | $I_D = 7 A, V_{DD} = 350 V, R_G = 25\Omega(\text{Note3,4})$ | $td(ON)$ | - | 18 | - | nS |
| Rise Time | | tr | - | 19 | - | |
| Turn-Off Delay Time | | $td(OFF)$ | - | 39 | - | |
| Fall Time | | tf | - | 18 | - | |
| Total Gate Charge | $I_D = 7 A, V_{DD} = 560V, V_{GS} = 10 V(\text{Note3,4})$ | Q_G | - | 22 | - | nC |
| Gate to Source Charge | | Q_{GS} | - | 5 | - | |
| Gate to Drain Charge | | Q_{GD} | - | 9 | - | |

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

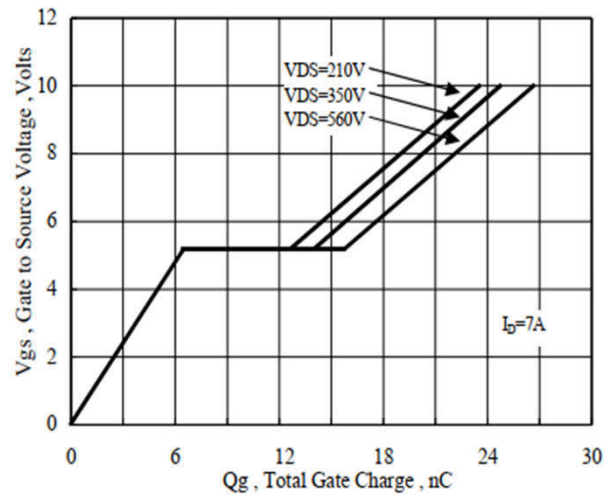
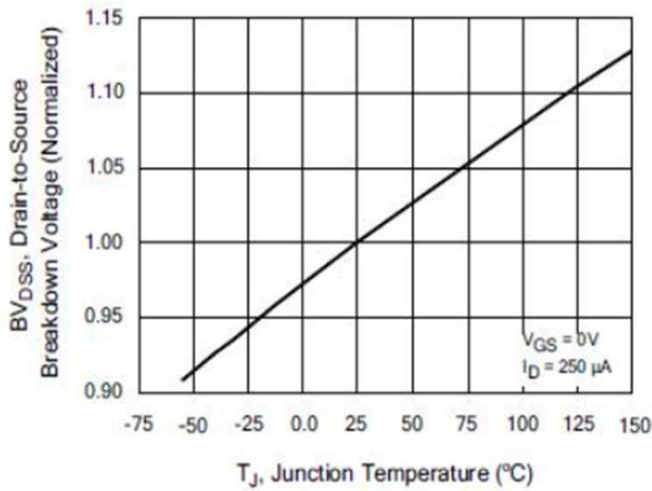
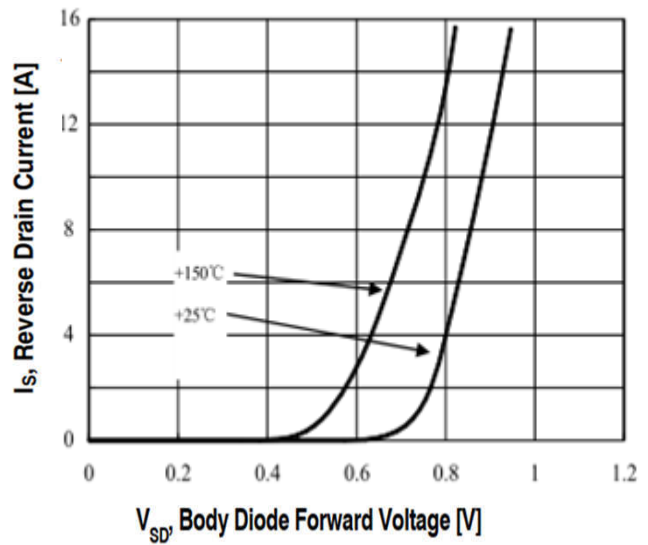
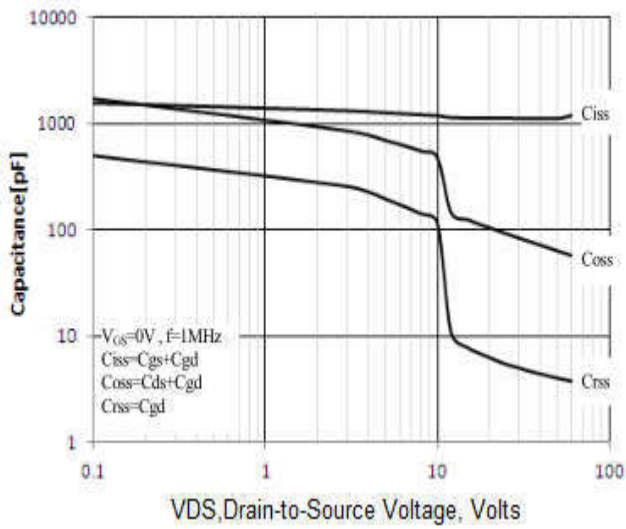
| Characteristics | Test Condition | Symbols | Min | Typ | Max | Units |
|---|---|-----------------------|-----|-----|-----|-----------|
| Maximum Continuous Drain-Source Diode Forward Current | | I_S | - | - | 7 | A |
| Maximum Pulsed Drain-Source Diode Forward Current | | I_{SM} | - | - | 28 | A |
| Drain-Source Diode Forward Voltage | I _{SD} = 7 A | V_{SD} | - | - | 1.4 | V |
| Reverse Recovery Time | I _{SD} = 7 A, V _{GS} = 0 V, | trr | - | 370 | - | nS |
| Reverse Recovery Charge | dI _F / dt = 100 A/μs(Note3) | Q_{rr} | - | 1.9 | - | uC |

- Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 2. IAS = 7 A, VDD = 50 V, L = 26mH, RG = 25Ω, starting TJ = 25°C.
 3. ulse test: Pulse Width ≤ 300 μ s, Duty Cycle ≤ 2%.
 4. Essentially Independent of Operating Temperature.

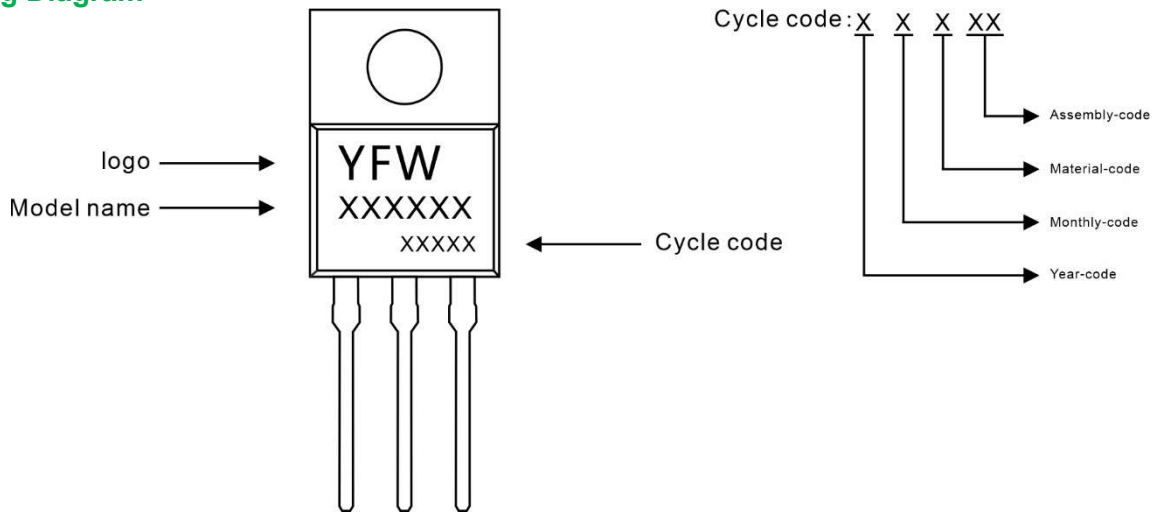
Ratings and Characteristic Curves



Ratings and Characteristic Curves



Marking Diagram



Ordering information

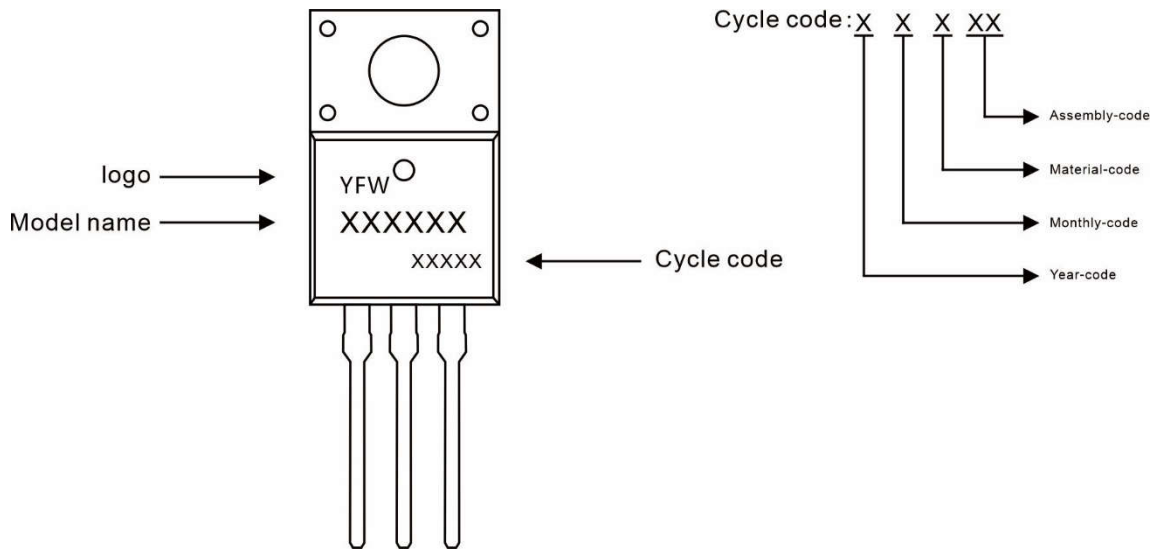
| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|----------|---------------|---------------|----------------------------|
| YFW7N70AT | TO-220AB | 0.07oz(1.96g) | 50pcs/tube | 1000PCS/Box 5000PCS/Carton |

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

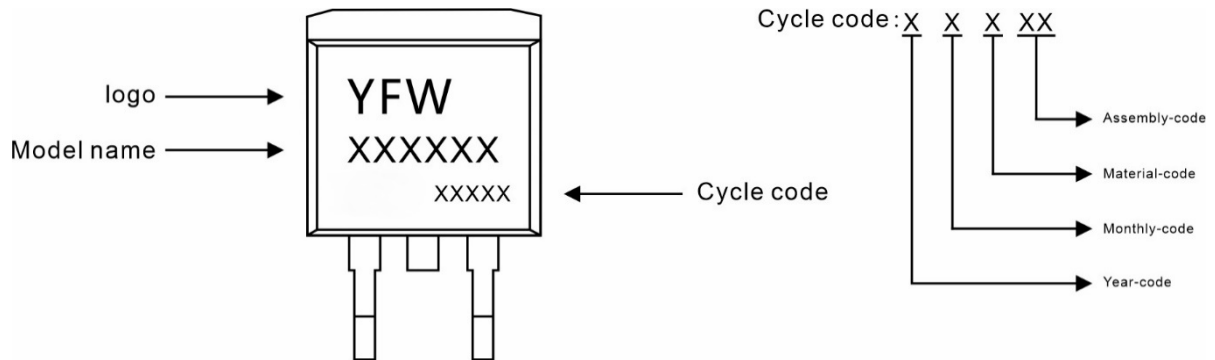
| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|---------------|---------------|----------------------------|
| YFW7N70AF | TO-220F | 0.06oz(1.74g) | 50pcs/tube | 1000PCS/Box 5000PCS/Carton |

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



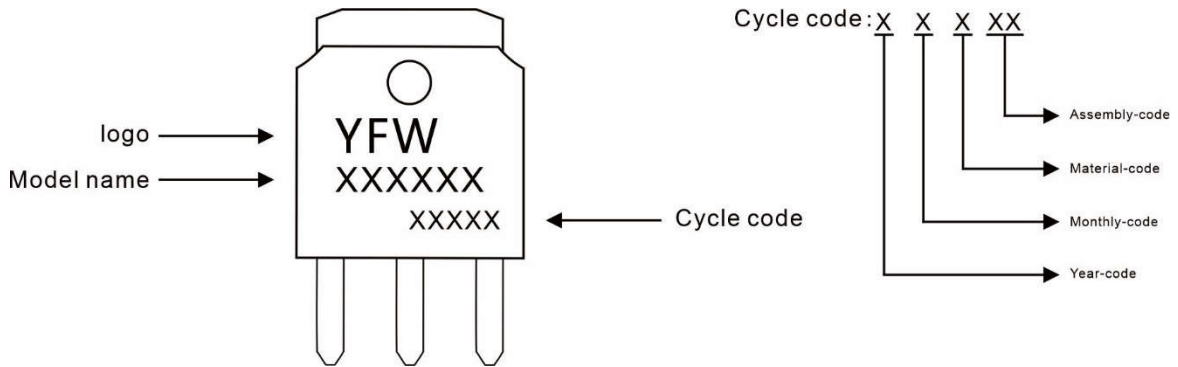
Ordering information

| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|---------------|---------------|----------------------------|
| YFW7N70AS | 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

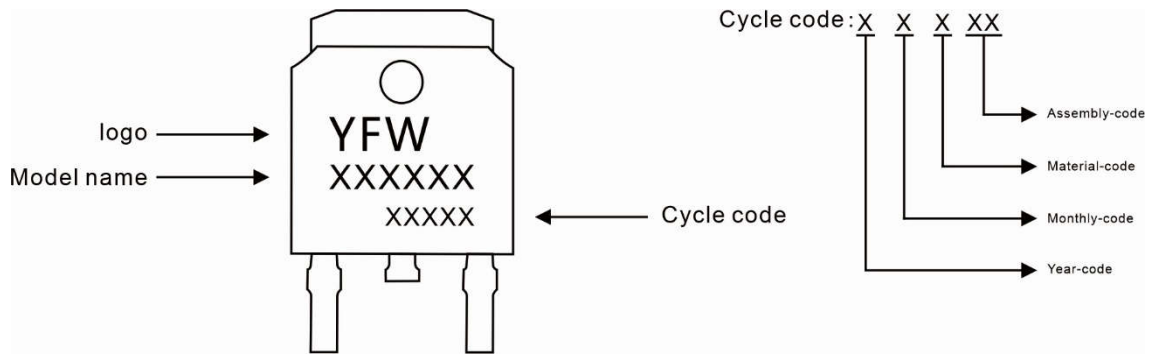
| Model name | Package | Unit Weight | Base Quantity | Packing Quantity |
|------------|---------|----------------|---------------|-----------------------------|
| YFW7N70AMJ | TO-251S | 0.011oz(0.32g) | 80pcs/tube | 4000pcs/box 24000pcs/Carton |

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 |
|------------|---------|----------------|---------------|-----------------------------|
| YFW7N70AD | 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 |

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