






THE DATASHEET OF ES1JF



SPECIFICATION SHEET

| | |
|--------------------------------|--|
| SPECIFICATION SHEET NO. | N0310-SMAFES1JF0S160 |
| DATE | Mar. 10, 2021 |
| REVISION | A0 |
| DESCRIPTION | <p>SMD Super Fast Recovery Rectifier, SMAF series, ES1JF Type, 2 Pads</p> <p>Reverse recovery Time 35 ns Max.</p> <p>Reverse Voltage 600V Max. Forward Current 1.0A Max.</p> <p>Operating Temp. Range -55°C ~+150°C</p> <p>Package in Tape/Reel, 2000pcs/Reel</p> <p>RoHS/RoHS III compliant</p> |
| CUSTOMER | |
| CUSTOMER PART NUMBER | |
| CROSS REF. PART NUMBER | |
| ORIGINAL PART NUMBER | MDD ES1JF |
| PART CODE | SMAFES1JF0S160 |

| | | | |
|-------------------------|---|--|---|
| VENDOR APPROVE | | | |
| Issued/Checked/Approved |  |  |  |
| DATE: March 10, 2021 | | | |

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|-------------------------|
| CUSTOMER APPROVE |
| |
| DATE: |

SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES

MAIN FEATURE



- The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
- Low reverse leakage
- Built-in strain relief
- High forward surge current capability
- High temperature soldering guaranteed: 250°C/ 10 seconds at terminals
- Glass passivated chip junction

APPLICATION

- For SMD application

RFQ

[Request For Quotation](#)

PART CODE GUIDE

| SMAF | ES1JFO | S | 160 |
|------|--------|---|-----|
| 1 | 2 | 3 | 4 |

- 1) **SMAF**: SMD Super Fast Recovery Rectifier, SMAF series code
- 2) **ES1JFO**: Type code for ES1JF
- 3) **S**: Package code, Tape/reel, 2000pcs/reel.
- 4) **160**: Specification code for Forward Current 1.0A Max. Reverse Voltage 600V Max.

MORE ITEMS AVAILABLE

| | | | | |
|----------------|-----------------------|----------------|----------------|----------------|
| SMAFES1AF0S105 | SMAFES1BF0S110 | SMAFES1CF0S115 | SMAFES1DF0S120 | SMAFES1EF0S130 |
| SMAFES1GF0S140 | SMAFES1JF0S160 | | | |
| SMAFES2AF0S205 | SMAFES2BF0S210 | SMAFES2CF0S215 | SMAFES2DF0S220 | SMAFES2EF0S230 |
| SMAFES2GF0S240 | SMAFES2JF0S260 | | | |
| SMAFES3AF0S305 | SMAFES3BF0S310 | SMAFES3CF0S315 | SMAFES3DF0S320 | SMAFES3EF0S330 |
| SMAFES3GF0S340 | SMAFES3JF0S360 | | | |
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SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES

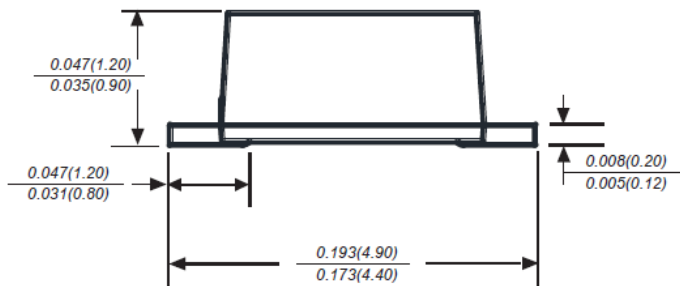
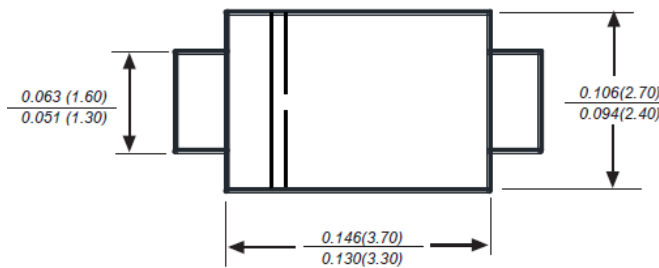
DIMENSION (Unit: Inch/mm)

Image for reference

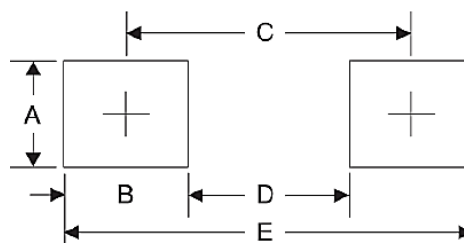


Marking: ES1JF

SMAF



Recommend Pad Layout



| Symbol | Unit (Inch) | Unit (mm) |
|--------|-------------|-----------|
| A | 0.071 | 1.80 |
| B | 0.063 | 1.60 |
| C | 0.150 | 3.80 |
| D | 0.087 | 2.21 |
| E | 0.213 | 5.40 |

SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES
MECHANICAL DATA

| Case | Terminals | Polarity | Mounting Position | Weight per piece |
|--------------------------------|--|--------------------------------|-------------------|----------------------------|
| JEDEC SMAF molded plastic body | Solder plated, Solderable per MIL-STD-750, Method 2026 | Color band denotes cathode end | Any | 0.0018 Ounce, 0.0510 grams |

MAX. RATING & CHARACTERISTICS

| Parameter | SYMBOLS | VALUE | | | UNITS |
|--|------------------|----------|---------|------|-------|
| | | Min. | Typical | Max. | |
| Repetitive peak reverse voltage | V _{RRM} | | | 600 | Volts |
| RMS voltage | V _{RMS} | | | 420 | Volts |
| DC blocking voltage | V _{DC} | | | 600 | Volts |
| Average forward output rectified current at TL= 55°C | I _{AV} | | | 1.0 | A |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) | I _{FSM} | | 30 | | A |
| Instantaneous forward voltage at 1.0A | V _F | | | 1.70 | Volts |
| DC reverse current at rated DC blocking voltage | I _R | TA=25°C | | 5 | μA |
| | | TA=125°C | | 50 | μA |
| Reverse recovery Time (Note 2) | t _{rr} | | | 35 | ns |
| Junction capacitance (NOTE 3) | C _J | | 15 | | pF |
| Thermal resistance (Note 4) | R _{QJA} | | 60 | | °C/W |
| Operating junction temperature range | T _J | -55 | | +150 | °C |
| Storage temperature range | T _{STG} | -55 | | +150 | °C |

Note

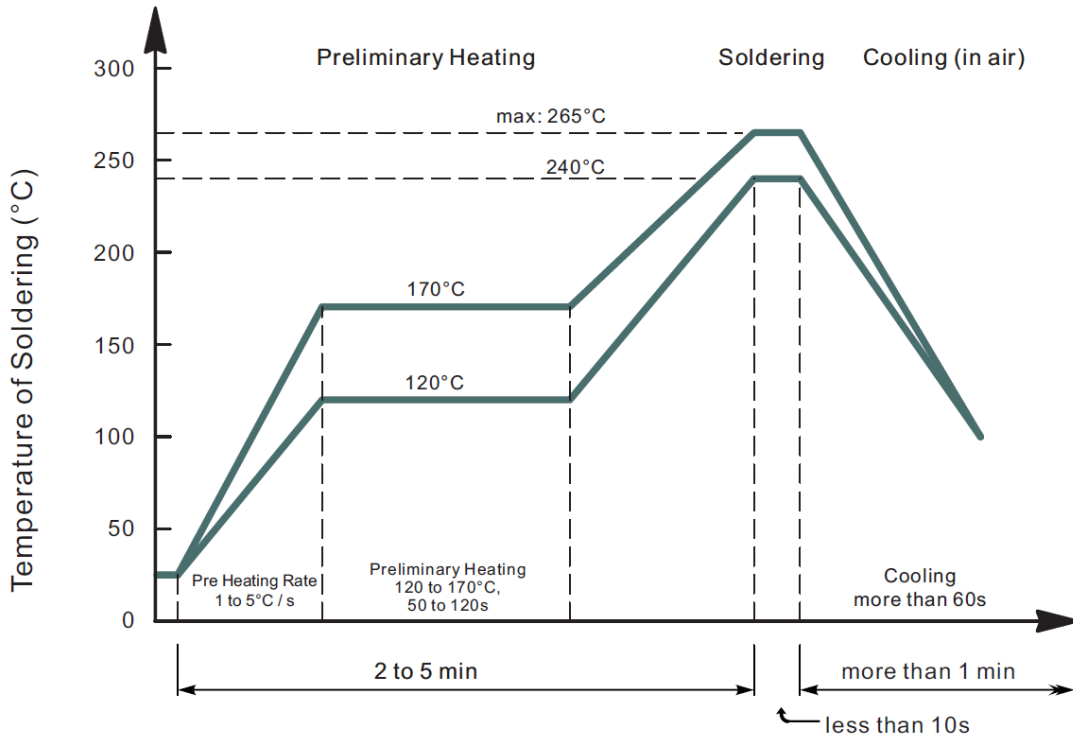
- Ratings at 25 C ambient temperature unless otherwise specified. Single phase half-wave 60Hz, resistive or inductive load, for capacitive load current derate by 20%.
- Reverse recovery condition IF=0.5A,IR=1.0A,Irr=0.25A
- Measured at 1.0MHz and applied reverse voltage of 4.0Voltage
- P.C.B. mounted with 0.2x0.2"(5.0x5.0mm) copper pad areas.

SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES
RELIABILITY

| Number | Experiment Items | Experiment Method And Conditions | Reference Documents |
|--------|------------------------------------|--|---------------------------------|
| 1 | Solder Resistance Test | Test 260°C± 5°C for 10 ± 2 sec. Immerse body into solder 1/16" ± 1/32" | MIL-STD-750D METHOD-2031.2 |
| 2 | Solderability Test | 230°C ±5°C for 5 sec. | MIL-STD-750D METHOD-2026.1 0 |
| 3 | Pull Test | 1 kg in axial lead direction for 10 sec. | MIL-STD-750D METHOD-2036.4 |
| 4 | Bend Test | 0.5Kg Weight Applied To Each Lead, Bending Arcs 90 °C ± 5 °C For 3 Times | MIL-STD-750D METHOD-2036.4 |
| 5 | High Temperature Reverse Bias Test | TA=100°C for 1000 Hours at VR=80% Rated VR | MIL-STD-750D METHOD-1038.4 |
| 6 | Forward Operation Life Test | TA=25°C Rated Average Rectified Current | MIL-STD-750D METHOD-1027.3 |
| 7 | Intermittent Operation Life Test | On state: 5 min with rated IRMS Power Off state: 5 min with Cool Forced Air. On and off for 1000 cycles. | MIL-STD-750D METHOD-1036.3 |
| 8 | Pressure Cooker Test | 15 PSIG, TA=121°C, 4 hours | MIL-S-19500 APPENOIXC |
| 9 | Temperature Cycling Test | -55°C~+125°C; 30 Minutes For Dwelled Time 5 minutes for transferred time. Total: 10 cycles. | MIL-STD-750D METHOD-1051.7 |
| 10 | Thermal Shock Test | 0°C for 5 minutes., 100°C for 5minutes, Total: 10 cycles | MIL-STD-750D METHOD-1056.7 |
| 11 | Forward Surge Test | 8.3ms Single Sale Sine-wave One Surge. | MIL-STD-750D METHOD-4066.4 |
| 12 | Humidity Test | TA=65°C, RH=98% for 1000 hours. | MIL-STD-750D METHOD-1021.3 |
| 13 | High Temperature Storage life Test | 150°C for 1000 Hours | MIL-STD-750D METHOD-1031.5 |

SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES

SUGGESTED REFLOW PROFILE (For Reference Only)



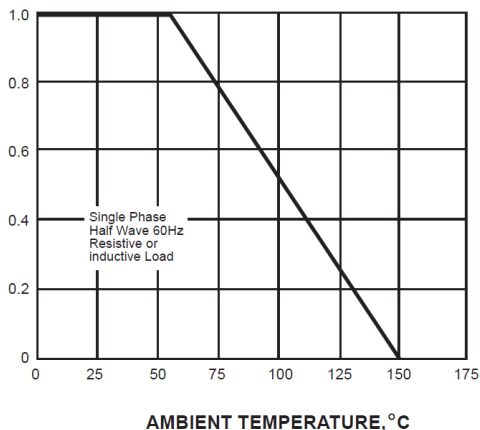
- Recommended peak temperature is over 245°C, If peak temperature is below 245 °C, you may adjust the following parameters; time length of peak temperature (longer), time length of soldering (longer), thickness of solder paste (thicker)
- Welding shall not exceed 2 times
- Remark: lead free solder paste (96.5 sn/3.0 Ag/0.5Cu)

SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES

RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

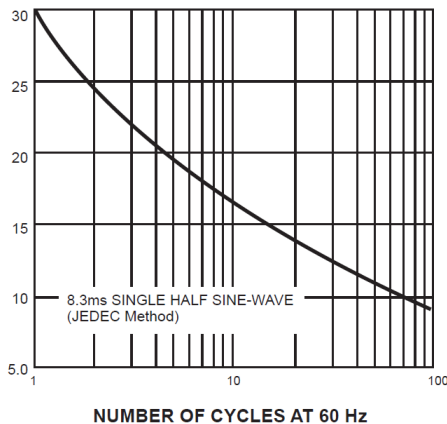
AVERAGE FORWARD RECTIFIED CURRENT, AMPERES

FIG. 1- FORWARD CURRENT DERATING CURVE



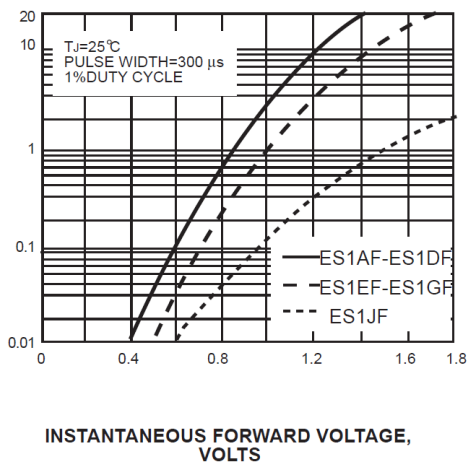
PEAK FORWARD SURGE CURRENT, AMPERES

FIG. 2-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



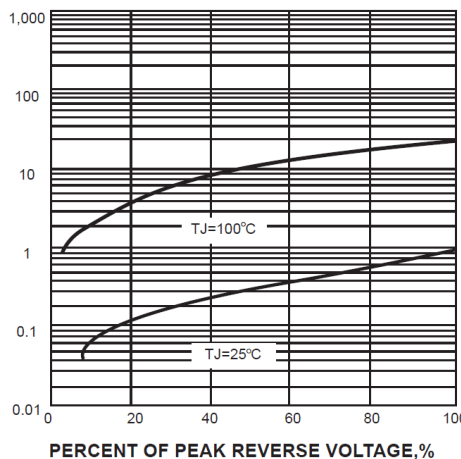
INSTANTANEOUS FORWARD CURRENT, AMPERES

FIG. 3-TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS



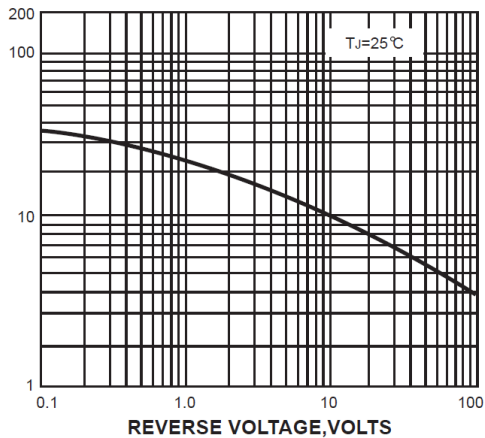
INSTANTANEOUS REVERSE CURRENT, MICROAMPERES

FIG. 4-TYPICAL REVERSE CHARACTERISTICS



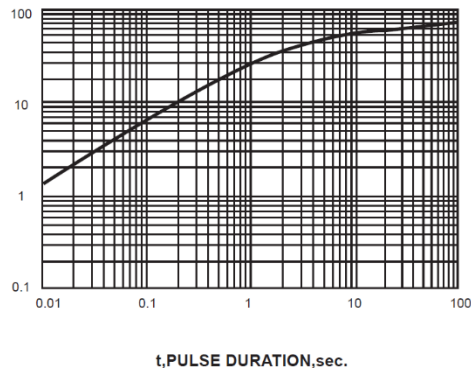
JUNCTION CAPACITANCE, pF

FIG. 5-TYPICAL JUNCTION CAPACITANCE



TRANSIENT THERMAL IMPEDANCE, °C/W

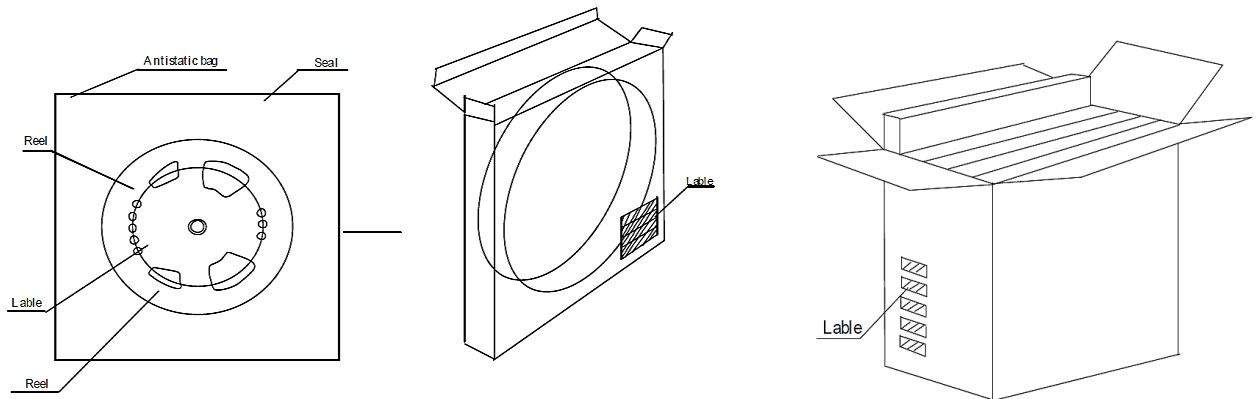
FIG. 6-TYPICAL TRANSIENT THERMAL IMPEDANCE



SMD SUPER FAST RECOVERY RECTIFIER SMAF SERIES

PACKAGE

| Case Code | Reel Size | MPQ (pcs) | Component Spacing (mm) | Qty. Per Box (pcs) | Inner Box L*W*H (mm) | Reel Size (mm) | Carton size L*W*H (mm) | Qty. Per Carton (pcs) | G. W (kg) |
|-----------|-----------|-----------|------------------------|--------------------|----------------------|----------------|------------------------|-----------------------|-----------|
| SMAF | 7" | 3,000 | | 6,000 | 210*208*203 | 178 | 400*400*250 | 120,000 | 10.0 |
| | | | | | | | | | |
| | | | | | | | | | |



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