




SPECIFICATION SHEET

| | | |
|---|--|-------------------------------|
| SPECIFICATION SHEET NO. | R0510- ES1DA00000S200 | |
| DATE | May 10, 2024 | |
| REVISION | A1 | Updated With Most Recent Data |
| DESCRIPTION AND MAIN PARAMETRICS | <p>SMD Super Fast Recovery Rectifier, 2 Pads, Case DO-214AC/SMA, ES1 Series, Repetitive Peak Reverse Voltage 200V Max.</p> <p>Average Forward Rectified Current 1.0A Max.</p> <p>Operating Temp. Range -55°C ~+150°C</p> <p>Package in Tape/Reel, 5000pcs/Reel</p> <p>RoHS III/REACH Compliant and Halogen Free (HF)</p> | |
| CUSTOMER | | |
| CUSTOMER PART NO. | | |
| CROSS REF. PART NO. | | |
| ORIGINAL MFG/PART NO. | MDD Diodes/ES1D | |
| PART CODE | ES1DA00000S200 | |

| | | |
|-------------------------|---|---|
| VENDOR APPROVE | | |
| Issued/Checked/Approved |  |  |
| | |  |
| DATE: May 10, 2024 | | |

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

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA

MAIN FEATURE

- The Plastic Package Carries Underwriters Laboratory Flammability Classification 94V-0
- Low Reverse Leakage
- Glass Passivated Chip Junction
- Built-in Strain Relief, Ideal For Automated Placement
- High Forward Surge Current Capability
- High Temperature Soldering Guaranteed: 250°C/10 Seconds At Terminals
- Surface Mount Package Ideally Suited for Automatic Insertion
- REACH/RoHS III Complaint and Halogen Free
- Cross Main Competitor Parts in Market



APPLICATION

- For SMD application

ELECTRICAL CHARACTERISTICS

- See Page 5~ Page 6 For Different Part Code

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA

HOW TO ORDER

- Please follow up Part Code Guide and indicate pat code when you order or RFQ For Custom Specification .

PART CODE GUIDE

RFQ
Request For Quotation

| CODE | NAME | KEY SPECIFICATION OPTION |
|-------|--------------------------------------|--|
| ES1 | Product Series Code | Super Fast Recovery Rectifier, Forward Current 1.0A |
| D | Repetitive Peak Reverse Voltage Code | A: 50V Max. ; B: 100V Max. ; C: 150V Max.; D: 200V Max.; E: 300V Max.; G: 400V Max.; J: 600V Max |
| A0 | Case Code | A0: Case DO-214AC/SMA; B0: Case DO-214AA/SMB; BF: Case SMBF; C0: Case SMC/DO-214AB ; F0: Case SMAF ; W0: Case SMF/SOD-123FL |
| 0000S | Internal Control Code | Custom letter A~Z, a-z or Digits (0-9) |
| 200 | DC Blocking Voltage Code | 050: 50V Max.; 100: 100V Max.; 150: 150V Max.; 200: 200V Max. 300: 300V Max.; 400: 400V Max.; 600: 600V Max. |

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA

DIMENSION (Unit: Inch/mm)

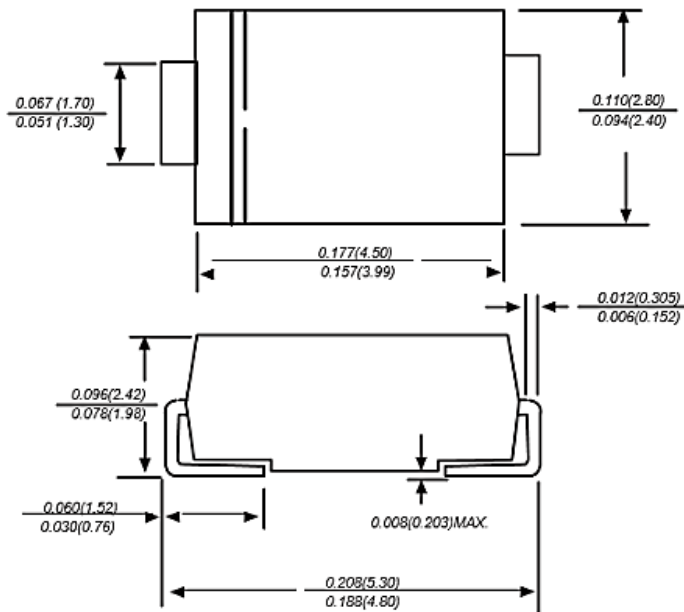
Image for reference



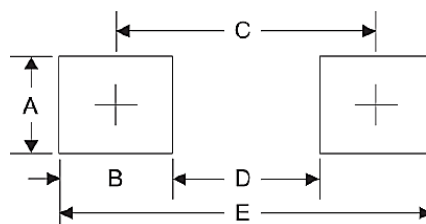
Marking:

See Page -6 Marking List
For different Part code

SMA/DO-214AC



Recommend Pad Layout



| Symbol | Unit (Inch) | Unit (mm) |
|--------|-------------|-----------|
| A | 0.066 | 1.680 |
| B | 0.060 | 1.520 |
| C | 0.154 | 3.900 |
| D | 0.095 | 2.410 |
| E | 0.215 | 5.450 |

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA
MECHANICAL DATA

| CASE | TERMINALS | POLARITY | MOUNTING POSITION | WEIGHT PER PIECE |
|---|--|---------------------------------------|-------------------|------------------------------|
| JEDEC DO-214AC/SMA Molded Plastic Body | Solder plated, Solderable per MIL-STD-750, Method 2026 | Polarity Symbol Marking On Case | Any | 0.0019 Ounce, 0.055 Grams |

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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%.

| PARAMETER | | SYMBOLS | VALUE | UNITS |
|--|-----------------------|-----------------------------------|-------------|-------|
| Maximum Average Forward Rectified Current | | 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 |
| Maximum DC Reverse Current At Rated DC Blocking Voltage | T _A =25°C | I _R | 5 | μA |
| | T _A =125°C | | 100 | |
| Maximum Reverse Recovery Time (NOTE 1) | | t _{rr} | 35 | ns |
| Typical Junction Capacitance (NOTE 2) | | C _J | 15 | pF |
| Typical Thermal Resistance (NOTE 3) | | R _{θJA} | 75 | °C/W |
| Operating Junction And Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

Note:

- Reverse Recovery Condition I_F=0.5A, I_R=1.0A, I_{rr}=0.25A
- Measured at 1MHz and Applied Reverse Voltage of 4.0V D.C.
- P.C.B. mounted with 0.2"x 0.2"(5.08 x 5.08mm) Copper Pad Areas

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS FOR DIFFERENT PART CODE

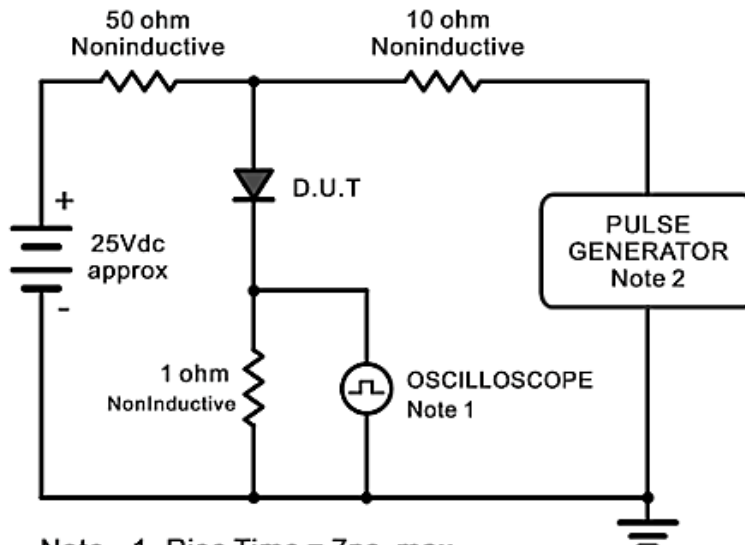
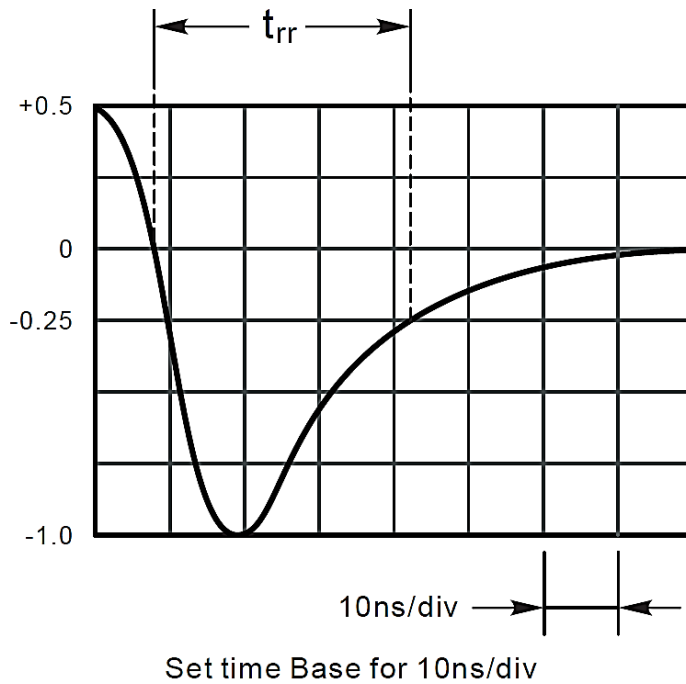
Ratings at 25 °C ambient temperature unless otherwise specified. Single phase half-wave 60Hz, resistive or inductive load, for capacitive load current derate by 20%.

| PART CODE | Max. Repetitive Peak Reverse Voltage | Max. RMS Voltage | Max. DC Blocking Voltage | Max. Instantaneous Forward Voltage @1A | Marking List |
|-----------------------|--------------------------------------|------------------|--------------------------|--|--------------|
| | V _{RRM} | V _{RMS} | V _{DC} | V _F | |
| | V | | | | |
| ES1AA00000S050 | 50 | 35 | 50 | 1 | ES1A |
| ES1BA00000S100 | 100 | 70 | 100 | 1 | ES1B |
| ES1CA00000S150 | 150 | 105 | 150 | 1 | ES1C |
| ES1DA00000S200 | 200 | 140 | 200 | 1 | ES1D |
| ES1EA00000S300 | 300 | 210 | 300 | 1.25 | ES1E |
| ES1GA00000S400 | 400 | 280 | 400 | 1.25 | ES1G |
| ES1JA00000S600 | 600 | 420 | 600 | 1.7 | ES1J |

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA

RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 1. Reverse Recovery Time Characteristic And Test Circuit Diagram



- Note: 1. Rise Time = 7ns, max.
Input Impedance = 1megohm, 22pF.
2. Rises Time = 10ns, max.
Source Impedance = 50 ohms.

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RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 2. Maximum Average Forward Current Rating

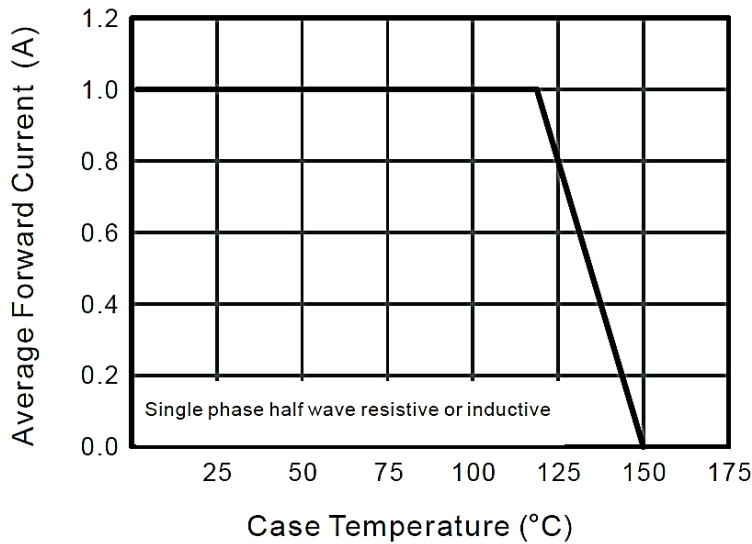
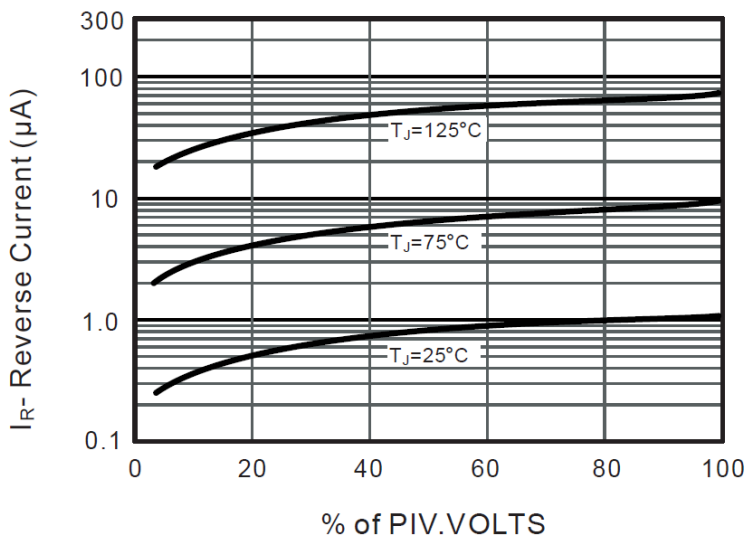


Figure 3. Typical Reverse Characteristics



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RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 4. Typical Forward Characteristics

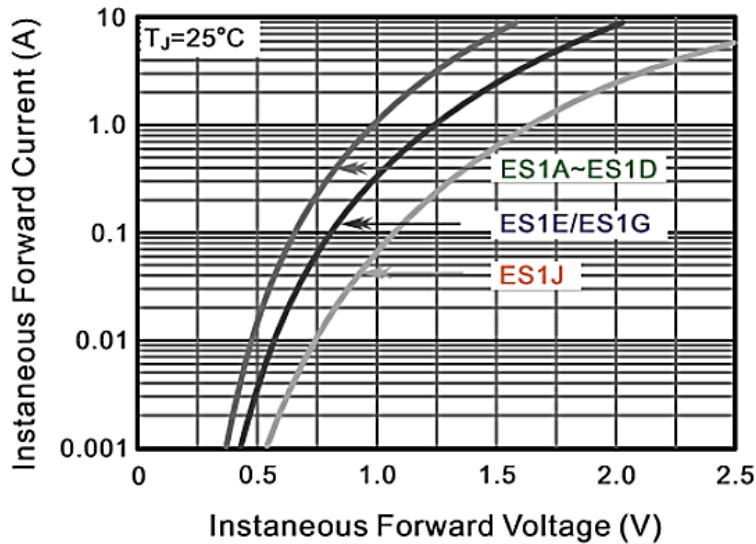
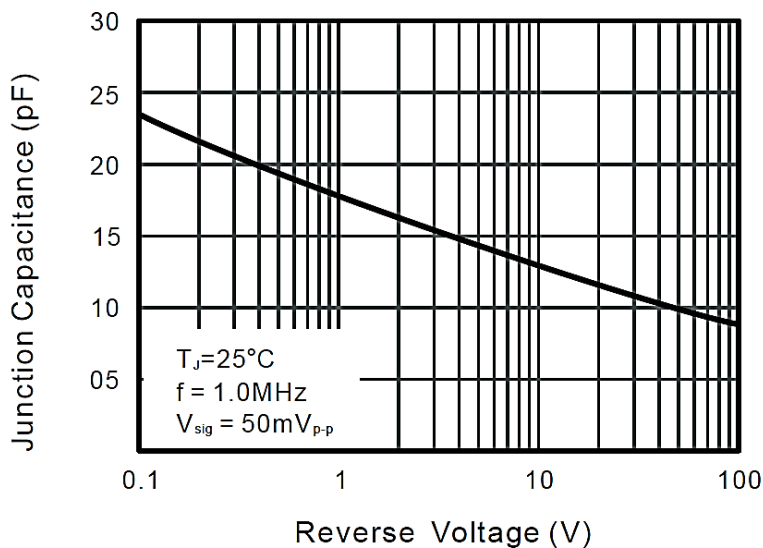


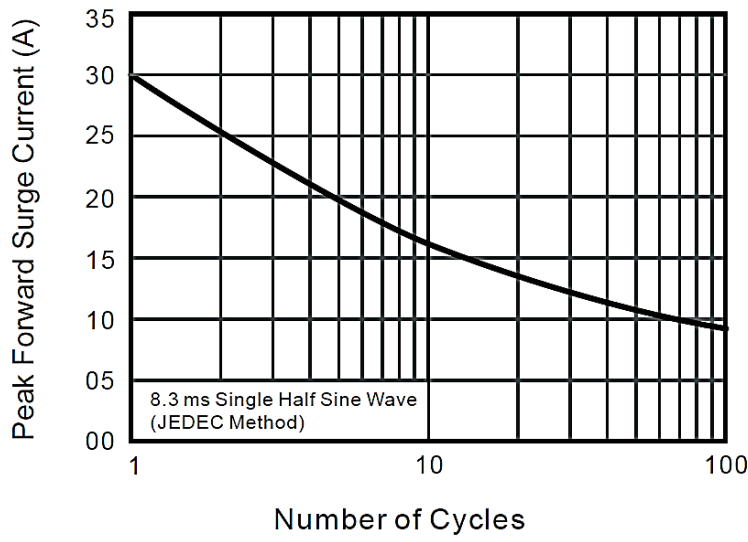
Figure 5. Typical Junction Capacitance



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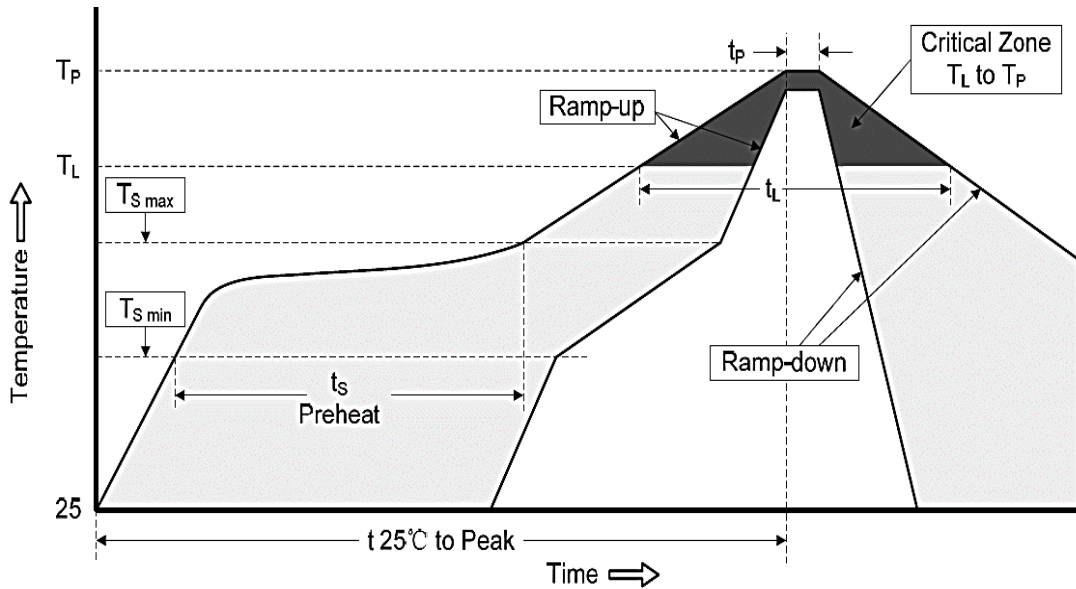
RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Figure 6. Maximum Non-Repetitive Peak Forward Surge Current



SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA
RELIABILITY

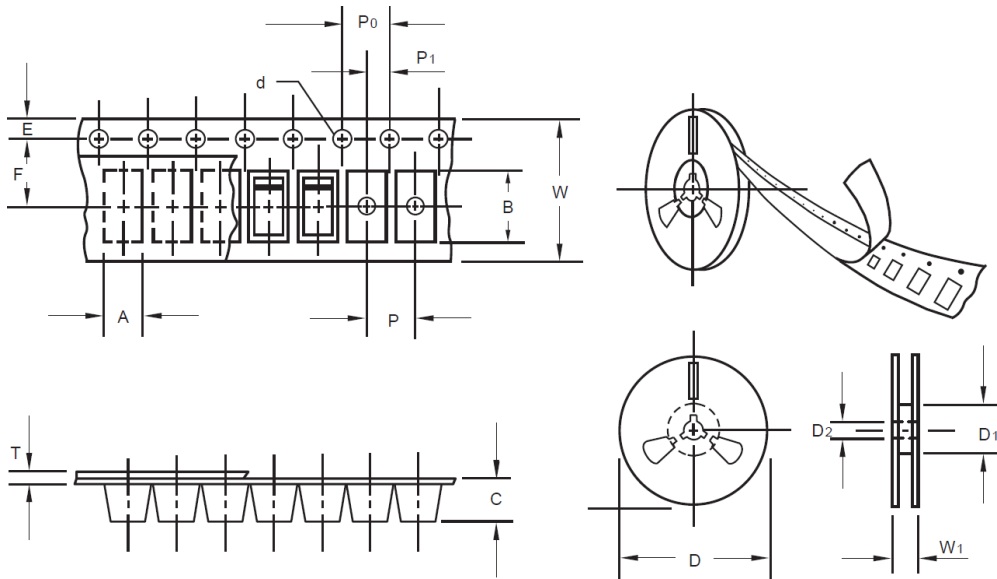
| NUMBER | EXPERIMENT ITEMS | EXPERIMENT METHOD AND CONDITIONS | REFERENCE DOCUMENTS |
|--------|------------------------------------|--|---------------------------------|
| 1 | Solder Resistance Test | Test 260°C± 5°C for 10 ± 2 sec. Immerse body into solder 1/16" ± 1/32" | MIL-STD-750D METHOD-2031.2 |
| 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 ES1 SERIES CASE SMA
SUGGESTED REFLOW PROFILE - For Reference Only


| PROFILE FEATURE | | PB-FREE ASSEMBLY |
|---|---------------------------|-------------------|
| Average Ramp-up Rate (Ts Max to Tp) | | 3°C/second Max |
| Preheat | Temperature Min (Ts Min.) | 150°C |
| | Temperature Max (Ts Max.) | 200°C |
| | Time (ts Min. to ts Max.) | 60 ~ 180 seconds |
| Time maintained above | Temperature (Tl) | 217°C |
| | Time (tl) | 60 ~ 150 seconds |
| Peak/Classification Temperature (Tp) | | 260 °C |
| Time within 5°C of actual Peak Temperature (tp) | | 20 ~ 40 seconds |
| Ramp-down rate | | 6 °C /Second Max. |
| Time 25 °C to Peak Temperature | | 8 minutes Max. |
| Suggest reflow times | | 3 Times Max. |

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA
TAPE/REEL (Unit: mm)

All Devices are packed in accordance with EIA standard RS-481-A and specifications.



| ITEM | SYMBOL | TOLERANCE | SMA/DO-214AC |
|---------------------------|--------------|-----------|--------------|
| Carrier width | A | 0.1 | 2.8 |
| Carrier Length | B | 0.1 | 5.33 |
| Carrier Depth | C | 0.1 | 2.36 |
| Sprocket hole | d | 0.05 | 1.50 |
| 13" Reel outside diameter | D | 2.0 | 330.00 |
| 13" Reel inner diameter | D1 | Min. | 50.00 |
| Feed hole diameter | D2 | 0.5 | 13.00 |
| Sprocket hole position | E | 0.1 | 1.75 |
| Punch hole position | F | 0.1 | 5.50 |
| Punch hole pitch | P | 0.1 | 4.00 |
| Sprocket hole pitch | P0 | 0.1 | 4.00 |
| Embossment center | P1 | 0.1 | 2.0 |
| Overall tape thickness | T | 0.1 | 0.28 |
| Tape width | W | 0.3 | 12.00 |
| Reel width | W1 | 1.0 | 18.0 |
| MPQ/Reel | 5000pcs/Reel | | |

SMD SUPER FAST RECOVERY RECTIFIER ES1 SERIES CASE SMA

IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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