






THE DATASHEET OF ES3JC



SPECIFICATION SHEET

| | |
|--------------------------------|---|
| SPECIFICATION SHEET NO. | P0319-SMCES3J000S360 |
| DATE | March 19, 2022 |
| REVISION | A0 |
| DESCRIPTION | <p>SMD Super Fast Recovery Rectifier, SMC series, ES3JC Type, 2 Pads</p> <p>Reverse Voltage 600V Max. Forward Current 3.0A Max.</p> <p>Operating Temp. Range -55°C ~+150°C</p> <p>Package in Tape/Reel, 3000pcs/13" Reel</p> <p>RoHS/RoHS III compliant</p> |
| CUSTOMER | |
| CUSTOMER PART NUMBER | |
| CROSS REF. PART NUMBER | |
| ORIGINAL PART NUMBER | MDD ES3JC |
| PART CODE | SMCES3J000S360 |

| | | | |
|-------------------------|---|--|---|
| VENDOR APPROVE | | | |
| Issued/Checked/Approved |  |  |  |
| DATE: March 19, 2022 | | | |

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

3/21/2022

SMD SUPER FAST RECOVERY RECTIFER SMC 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

| SMC | ES3J000 | S | 360 |
|-----|---------|---|-----|
| 1 | 2 | 3 | 4 |

- 1) **SMC**: SMD Super Fast Recovery Rectifier, SMC/DO-214AB series code
- 2) **ES3J000**: Type code for ES3JC
- 3) **S**: Package code, Tape/reel, 3000pcs/13" reel.
- 4) **360**: Specification code for Forward Current 3.0A Max. Reverse Voltage 600V Max.

SMD SUPER FAST RECOVERY RECTIFIER SMC SERIES

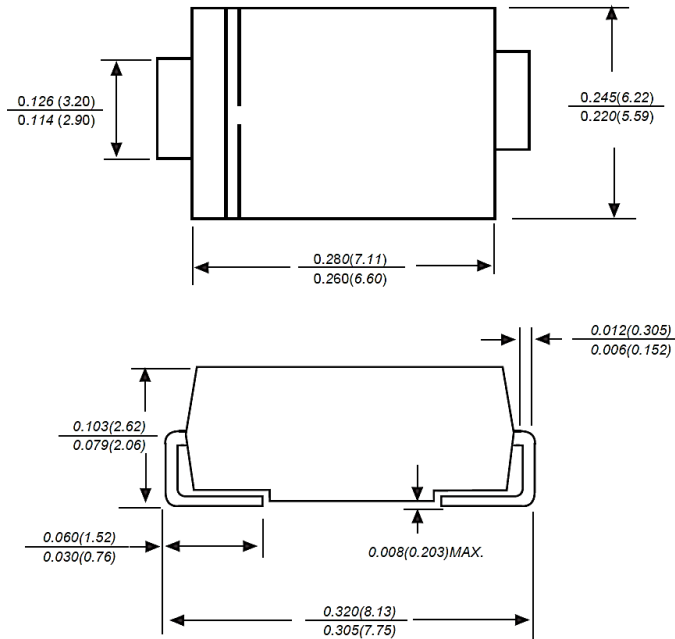
DIMENSION (Unit: Inch/mm)

Image for reference

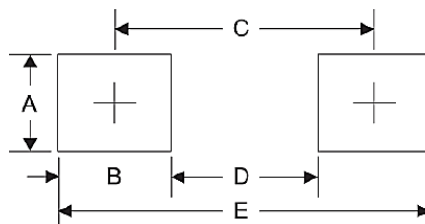


Marking: ES3JC

SMC/DO-214AB



Recommend Pad Layout



| Symbol | Unit (inch) | Unit (mm) |
|--------|-------------|-----------|
| A | 0.170 | 4.30 |
| B | 0.160 | 4.10 |
| C | 0.311 | 7.90 |
| D | 0.150 | 3.80 |
| E | 0.472 | 12.0 |

SMD SUPER FAST RECOVERY RECTIFIER SMC SERIES
MECHANICAL DATA

| Case | Terminals | Polarity | Mounting Position | Weight per piece |
|--|--|---------------------------------|-------------------|----------------------------|
| JEDEC SMC/DO-214AB molded plastic body | Solder plated, Solderable per MIL-STD-750, Method 2026 | Polarity symbol marking on case | Any | 0.0077 Ounce, 0.2200 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= 125°C | I _{AV} | | | 3.0 | A |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) | I _{FSM} | | 90 | | A |
| Instantaneous forward voltage at 3.0A | V _F | | | 1.68 | Volts |
| DC reverse current at rated DC blocking voltage | I _R | TA=25°C | | 5.0 | µA |
| | | TA=125°C | | 100 | µA |
| Reverse recovery Time (Note 2) | t _{rr} | | | 35 | ns |
| Junction capacitance (NOTE 3) | C _J | | 40 | | pF |
| Thermal resistance (Note 4) | R _{θJA} | | 40 | | °C/W |
| | R _{θJC} | | 16 | | |
| Operating junction temperature range | T _J | -55 | | +150 | °C |
| Storage temperature range | T _{STG} | -55 | | +150 | °C |

Note

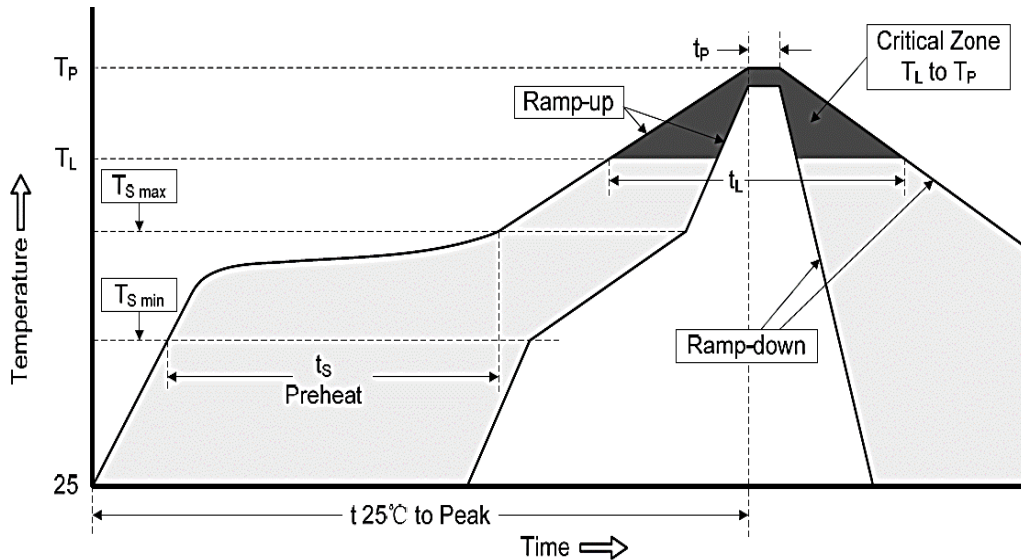
- Ratings at 25 C ambient temperature unless otherwise specified. Single phase half-wave 60Hz, resistive or inductive load, for capacitive load current derate by 20%.
- Reverse recovery condition IF=0.5A,IR=1.0A,Irr=0.25A
- Measured at 1.0MHz and applied reverse voltage of 4.0Voltage
- P.C.B. mounted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

SMD SUPER FAST RECOVERY RECTIFER SMC 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 |

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SUGGESTED REFLOW PROFILE (For Reference Only)

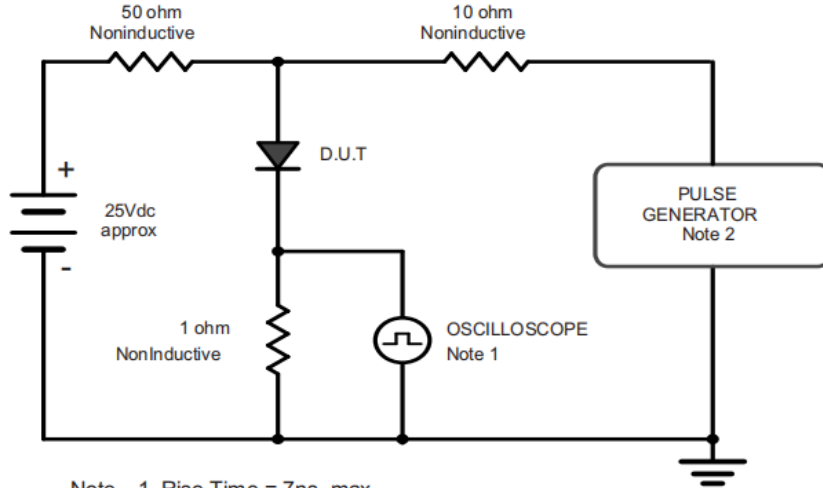


| | | |
|--|----------------------------------|-------------------|
| Profile Feature | | Pb-Free Assembly |
| Average Ramp-up Rate (Ts Max to Tp) | | 3°C/second Max |
| Preheat | Temperature Min (Ts Min.) | 150°C |
| | Temperature Max (Ts Max.) | 200°C |
| | Time (ts Min. to ts Max.) | 60 ~ 180 seconds |
| Time maintained above | Temperature (Tl) | 217°C |
| | Time (ti) | 60 ~ 150 seconds |
| Peak/Classification Temperature (Tp) | | 250 °C |
| Time within 5°C of actual Peak Temperature (tp) | | 3 ~ 10 seconds |
| Ramp-down rate | | 6 °C /Second Max. |
| Time 25 °C to Peak Temperature | | 8 minutes Max. |
| Suggest reflow times | | 3 Times Max. |

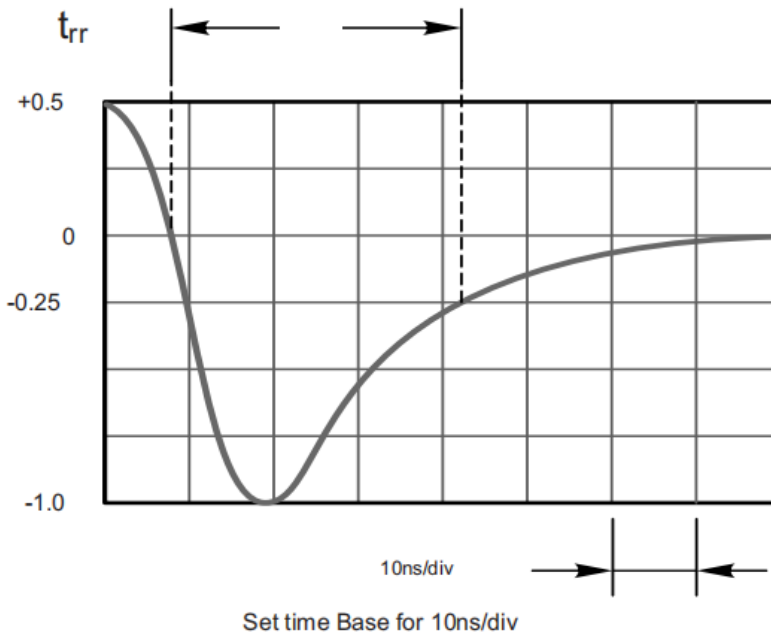
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RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Fig.1 Reverse Recovery Time Characteristic And Test Circuit Diagram



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



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RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Fig.2 Maximum Average Forward Current Rating

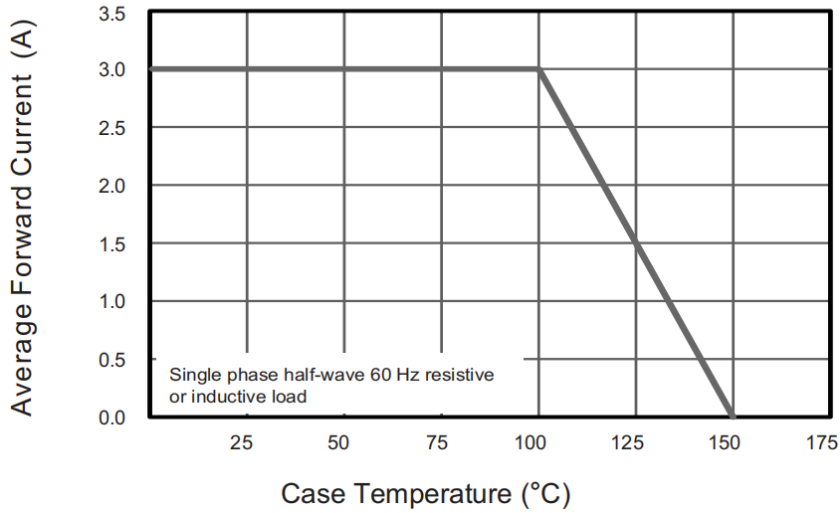
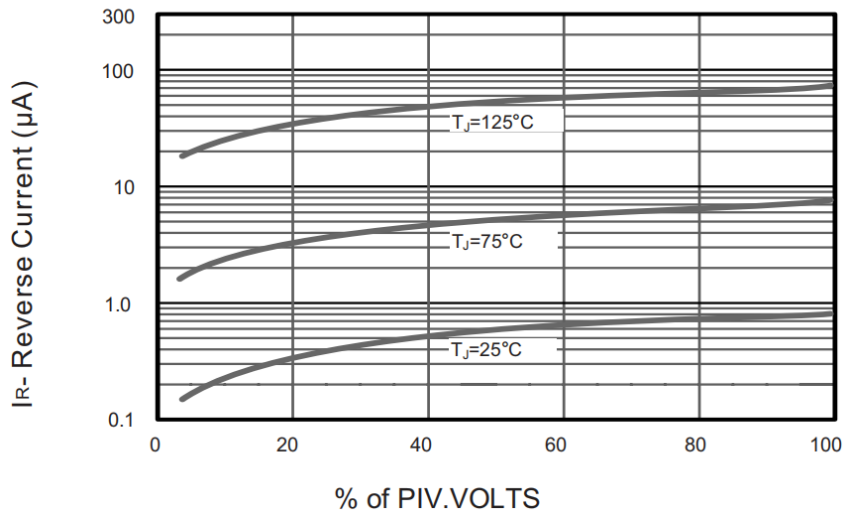


Fig.3 Typical Reverse Characteristics



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RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Fig.4 Typical Forward Characteristics

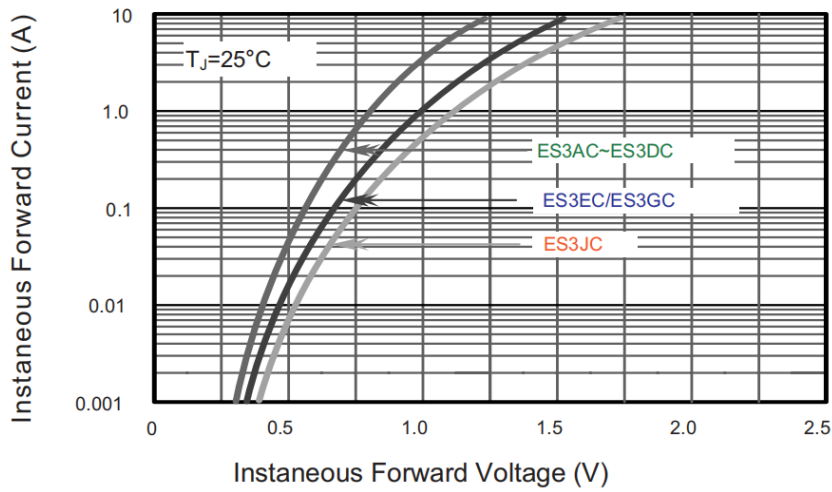
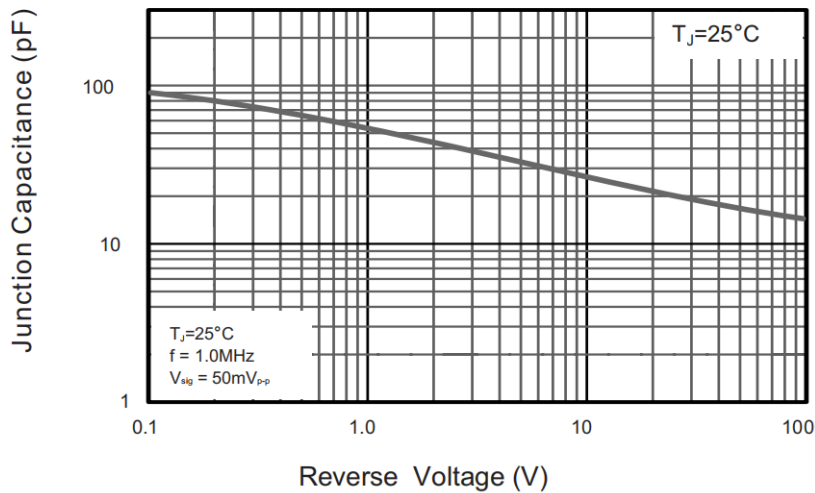


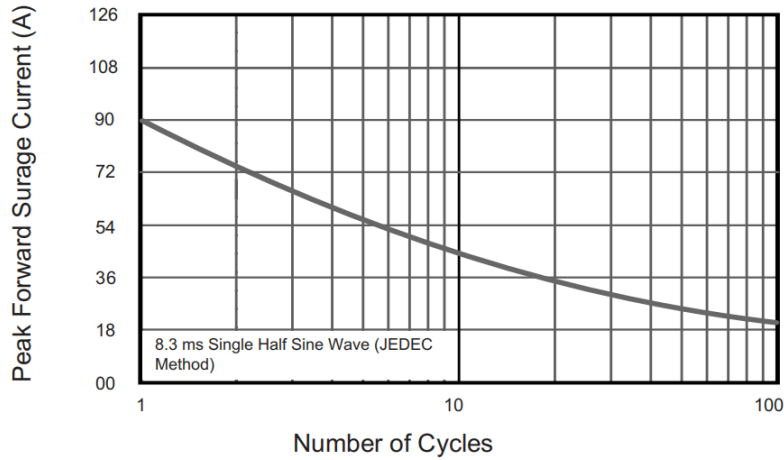
Fig.5 Typical Junction Capacitance



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RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

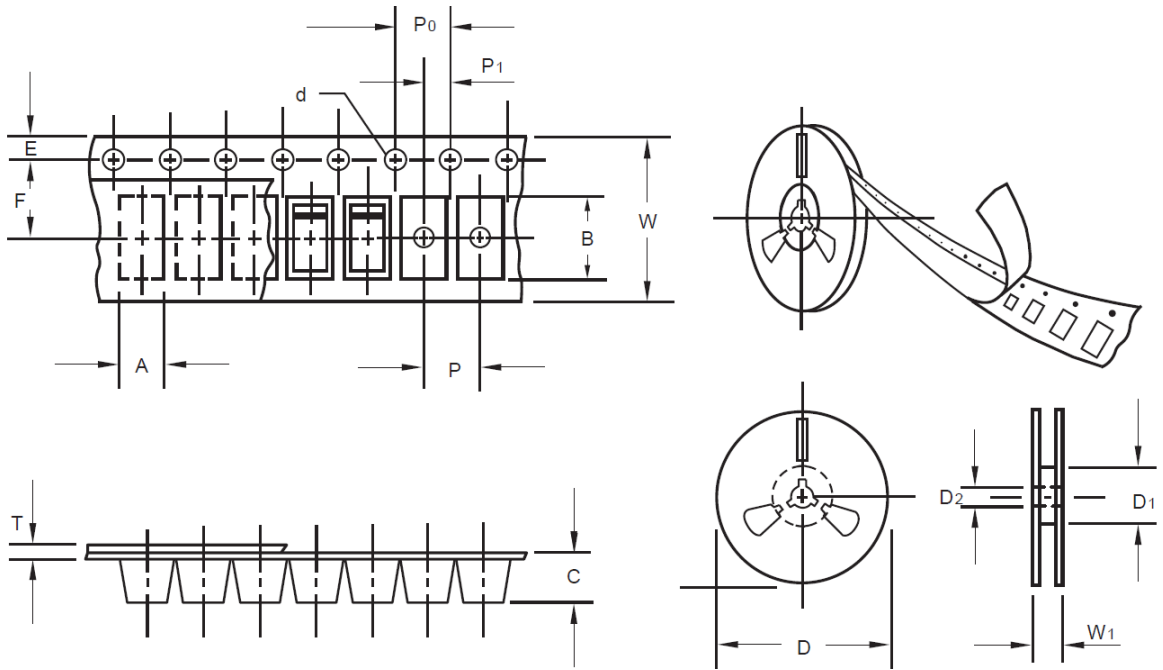
Fig.6 Maximum Non-Repetitive Peak Forward Surge Current



SMD SUPER FAST RECOVERY RECTIFIER SMC SERIES

TAPE/REEL (Unit: mm)

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



| Item | Symbol | Tolerance | SMC/DO-214AB |
|---------------------------|--------|-----------|--------------|
| Carrier width | A | 0.1 | 6.15 |
| Carrier Length | B | 0.1 | 8.41 |
| Carrier Depth | C | 0.1 | 2.42 |
| Sprocket hole | d | 0.05 | 1.50 |
| 13" Reel outside diameter | D | 2.0 | 330.00 |
| 13" Reel inner diameter | D1 | Min. | 50.00 |
| 7" Reel outside diameter | - | - | - |
| 7" Reel inner diameter | - | - | - |
| Feed hole diameter | D2 | 0.5 | 13.00 |
| Sprocket hole position | E | 0.1 | 1.75 |
| Punch hole position | F | 0.1 | 7.50 |
| Punch hole pitch | P | 0.1 | 8.00 |
| Sprocket hole pitch | P0 | 0.1 | 4.00 |
| Embossment center | P1 | 0.1 | 2.00 |
| Overall tape thickness | T | 0.1 | 0.25 |
| Tape width | W | 0.3 | 16.00 |
| Reel width | W1 | 1.0 | 16.50 |

SMD SUPER FAST RECOVERY RECTIFER SMC SERIES

SPQ PACKAGE for Reference



| Item | Unit | Value |
|--------------|------|-------------------|
| Case Code | | SMC/DO-214AB |
| Reel Size | Inch | 13 |
| Reel Size | mm | 330 |
| Tape Space | mm | / |
| SPQ /Reel | pcs | 3000 |
| Weigh /SPQ | LBS | 4.63 |
| Weigh /SPQ | KGs | 2.10 |
| Qty. Per Box | pcs | 6,000 |
| Inner Box | Inch | L13.2*W13.2*H1.95 |

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