

**SPECIFICATION SHEET**

|   |   |                               |
|---|---|-------------------------------|
| <b>SPECIFICATION SHEET NO.</b>          | R0608- 2SC1623S20S0L5   |                               |
| <b>DATE</b>                             | June 8, 2024  |                               |
| <b>REVISION</b>                         | A2  | Updated With Most Recent Data |
| <b>DESCRIPTION AND MAIN PARAMETRICS</b> | <p>SMD Plastic-Encapsulate Transistors, 3 Pads, Case SOT-23</p> <p>2SC Series, Transistor Type NPN,</p> <p>hFE Rank Range (L5) 135~270</p> <p>Collector-Base Voltage 60V Max. Collector Current 100mA Max.</p> <p>Operating Temp. Range -55°C ~+150°C</p> <p>Package in Tape/Reel, 3000pcs/Reel</p> <p>RoHS III/REACH Compliant and Halogen Free (HF)</p> |                               |
| <b>CUSTOMER</b>                         |   |                               |
| <b>CUSTOMER PART NO.</b>                |   |                               |
| <b>CROSS REF. PART NO.</b>              |   |                               |
| <b>ORIGINAL MFG/PART NO.</b>            | MDD Diodes/2SC1623-L5   |                               |
| <b>PART CODE</b>                        | 2SC1623S20S0L5  |                               |

**VENDOR APPROVE**

Issued/Checked/Approved



DATE: June 8, 2024

**CUSTOMER APPROVE**

DATE:

**SMD TRANSISTORS 2SC SERIES CASE SOT-23**

**MAIN FEATURE**

- Epoxy Meets UL-94 V-0 Flammability Rating
- DC Current Gain:  $h_{FE}=90\sim600$  @ $V_{CE}=6V$ ,  $I_C=1mA$
- High Voltage  $V_{CEO}=50V$
- 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 4~ Page 5 For Different Part Code

**HOW TO ORDER**

- Please Follow Up Part Code Guide And Indicate Pat Code When You Order Or RFQ For Custom Specification

**PART CODE GUIDE**

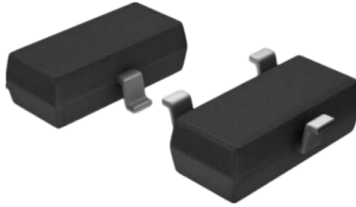
**RFQ**  
Request For Quotation

| CODE | NAME                  | KEY SPECIFICATION OPTION                          |
|------|-----------------------|---|
| 2SC  | Product Series Code   | SMD Plastic-Encapsulate Transistors 2SC series    |
| 1623 | Specification Code    | For Original Part Number 2SC1623                  |
| S2   | Case Code             | S2: Case SOT-23                                   |
| 0S0  | Internal Control Code | Custom letter A~Z, a-z or Digits (0-9)            |
| L5   | hFE Rank Range Code   | L4: 90~180; L5: 135~270; L6: 200~400; L7: 300~600 |

**SMD TRANSISTORS 2SC SERIES CASE SOT-23**

**DIMENSION** (Unit: Inch/mm)

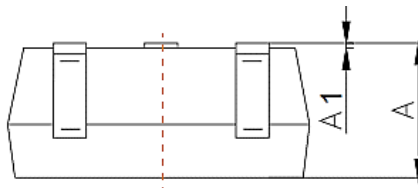
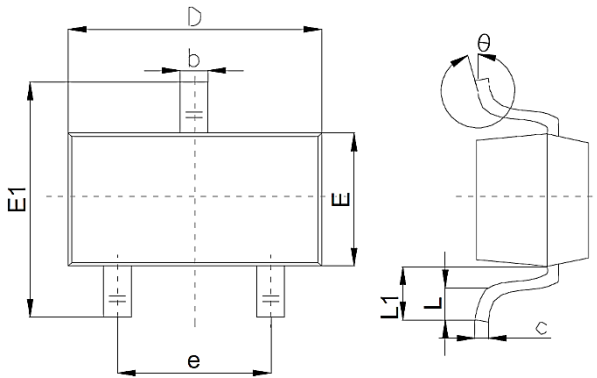
Image for reference



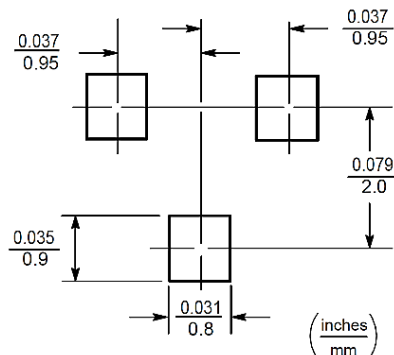
**Marking:**

See Page -4 Marking List  
For different Part code

SOT-23

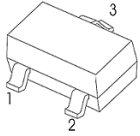


Recommend Pad Layout



| Symbol | Value ( mm ) |      |      |
|--------|--------------|------|------|
|        | Min.         | Typ. | Max. |
| A      | 0.9          |      | 1.4  |
| A1     |              |      | 0.10 |
| b      | 0.30         |      | 0.50 |
| c      | 0.08         |      | 0.20 |
| D      | 2.80         | 2.90 | 3.10 |
| E      | 1.20         |      | 1.60 |
| E1     | 2.25         |      | 2.80 |
| e      | 1.8          | 1.9  | 2.00 |
| L      | 0.10         |      | 0.50 |
| L1     | 0.40         |      |      |
| θ      | 0°           |      | 10°  |

**SMD TRANSISTORS 2SC SERIES CASE SOT-23**
**CLASSIFICATION OF hFE – For Different Part Code**

| PART CODE      | RANK CODE | RANK RANG | MARKING | PIN FUNCTION   |
|----------------|-----------|-----------|---------|--|
| 2SC1623S20S0L4 | L4        | 90~ 180   | L4      |  <p>1. Base<br/>2. Emitter<br/>3. Collector</p> |
| 2SC1623S20S0L5 | L5        | 135~ 270  | L5      |  |
| 2SC1623S20S0L6 | L6        | 200~ 400  | L6      |  |
| 2SC1623S20S0L7 | L7        | 300~ 600  | L7      |  |

**MECHANICAL DATA**

| CASE                                   | TERMINALS  | POLARITY                           | MOUNTING POSITION | WEIGHT PER PIECE               |
|--|--|------------------------------------|-------------------|--------------------------------|
| JEDEC SOT-23<br>Molded Plastic<br>Body | Solder Plated, Solderable<br>Per MIL-STD-750,<br>Method 2026 | Polarity Symbol<br>Marking On Case | Any               | 0.00019 Ounce,<br>0.0055 grams |

**MAXIMUM RATINGS - @ 25 °C**

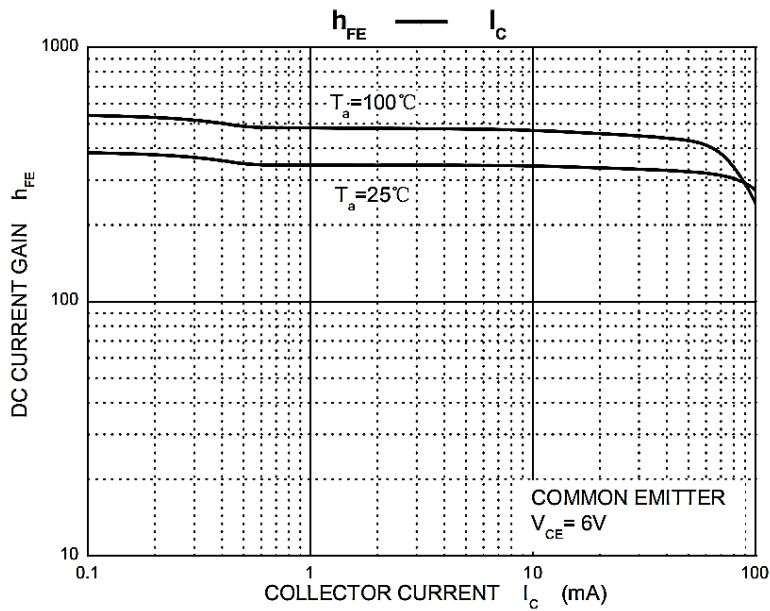
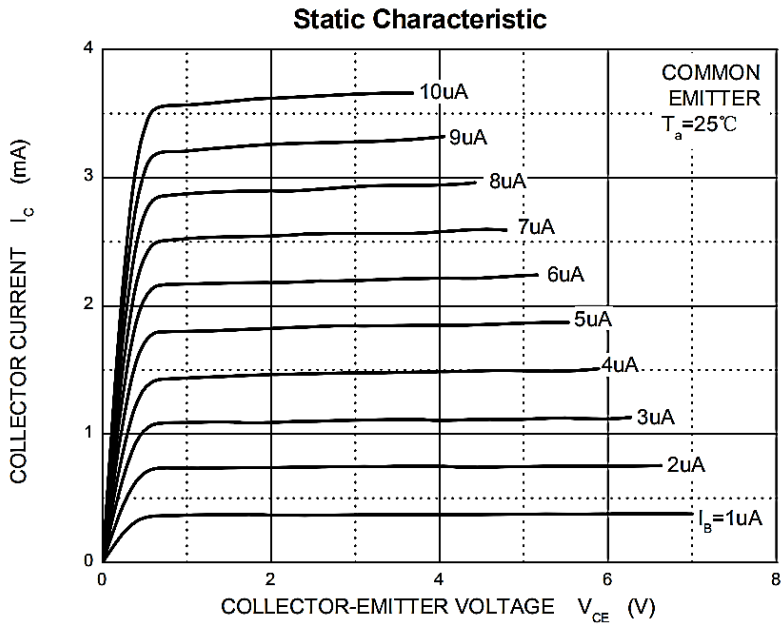
| PARAMETER                              | SYMBOLS          | VALUE      | UNITS |
|--|------------------|------------|-------|
|  |                  | LIMIT      |       |
| Collector-base Voltage                 | V <sub>CB0</sub> | 60         | Volts |
| Collector-emitter Voltage              | V <sub>CEO</sub> | 50         | Volts |
| Emitter-base Voltage                   | V <sub>EBO</sub> | 5          | Volts |
| Collector Current -Continuous          | I <sub>C</sub>   | 100        | mA    |
| Collector Power Dissipation            | P <sub>C</sub>   | 200        | mW    |
| Thermal Resistance Junction To Ambient | R <sub>θJA</sub> | 625        | °C/W  |
| Junction Temperature                   | T <sub>J</sub>   | +150       | °C    |
| Storage Temperature Range              | T <sub>STG</sub> | -55 ~ +150 | °C    |

**SMD TRANSISTORS 2SC SERIES CASE SOT-23**
**ELECTRICAL MAXIMUM RATINGS - @ 25 °C**

| PARAMETER                            |                | SYMBOLS              | VALUE |      |     | UNIT | TEST CONDITION                              |
|--------------------------------------|----------------|----------------------|-------|------|-----|------|---|
|                                      |                |                      | MIN.  | TYP. | MAX |      |   |
| Collector-base Breakdown Voltage     |                | V(BR)CBO             | 60    |      |     | V    | I <sub>c</sub> = 100μA, I <sub>E</sub> =0   |
| Collector-emitter Breakdown Voltage  |                | V(BR)CEO             | 50    |      |     | V    | I <sub>c</sub> = 1mA, I <sub>B</sub> =0     |
| Emitter-base Breakdown Voltage       |                | V(BR)EBO             | 5     |      |     | V    | I <sub>E</sub> = 100μA, I <sub>C</sub> =0   |
| Collector Cut-off Current            |                | I <sub>CBO</sub>     |       |      | 0.1 | μA   | V <sub>CB</sub> =60V, I <sub>E</sub> =0     |
| Emitter Cut-off Current              |                | I <sub>EBO</sub>     |       |      | 0.1 | μA   | V <sub>EB</sub> = 5V, I <sub>C</sub> =0     |
| DC Current Gain                      | 2SC1623S20S0L4 | h <sub>FE</sub>      | 90    |      | 180 |      | V <sub>CE</sub> =6V, I <sub>C</sub> =1mA    |
|                                      | 2SC1623S20S0L5 |                      | 135   |      | 270 |      |   |
|                                      | 2SC1623S20S0L6 |                      | 200   |      | 400 |      |   |
|                                      | 2SC1623S20S0L7 |                      | 300   |      | 600 |      |   |
| Collector-emitter Saturation Voltage |                | V <sub>CE(sat)</sub> |       |      | 0.3 | V    | I <sub>C</sub> =100mA, I <sub>B</sub> =10mA |
| Base-emitter Saturation Voltage      |                | V <sub>BE(sat)</sub> |       |      | 1   | V    | I <sub>C</sub> =100mA, I <sub>B</sub> =10mA |
| Transition Frequency                 |                | f <sub>T</sub>       |       | 250  |     | MHz  | V <sub>CE</sub> =6V, I <sub>C</sub> =10mA   |

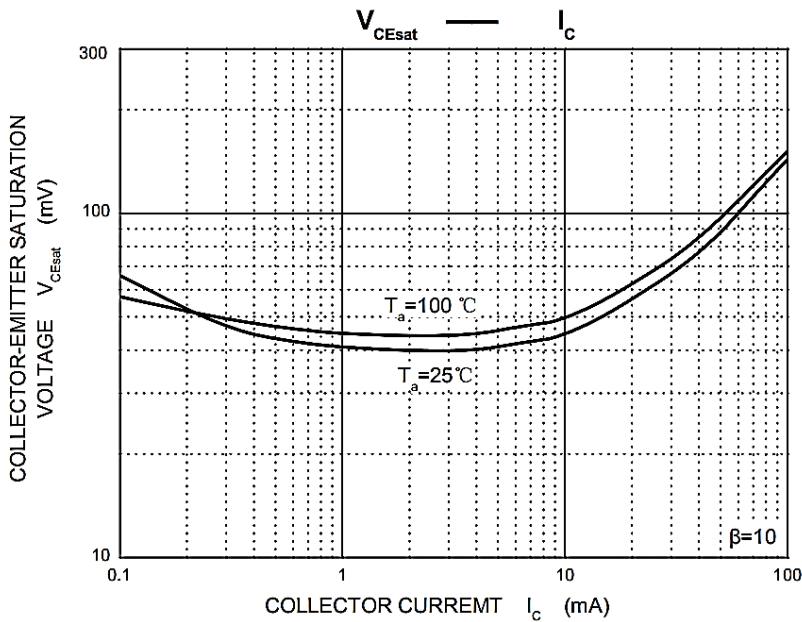
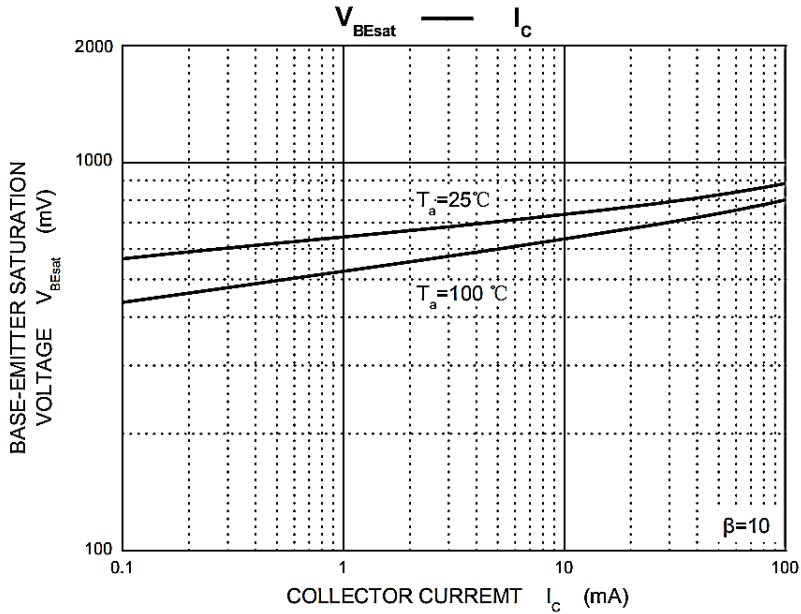
**SMD TRANSISTORS 2SC SERIES CASE SOT-23**

TYPICAL CHARACTERISTIC CURVES - For Reference Only



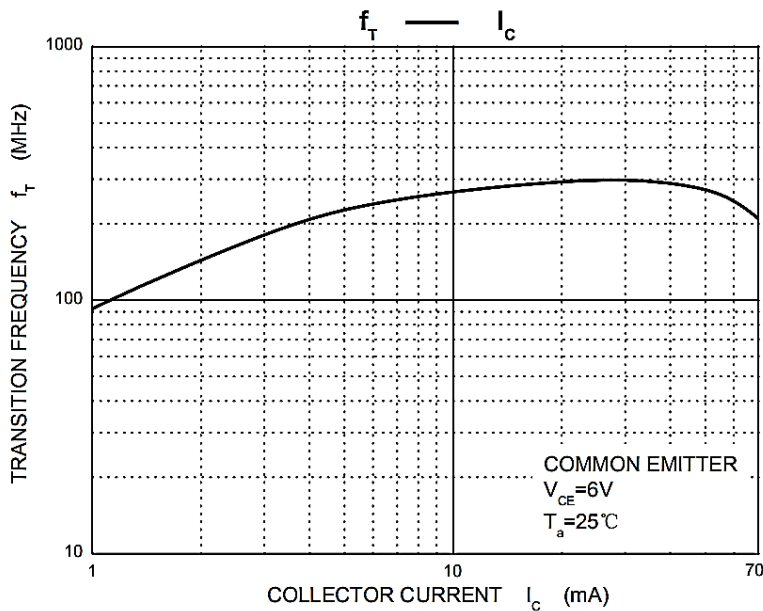
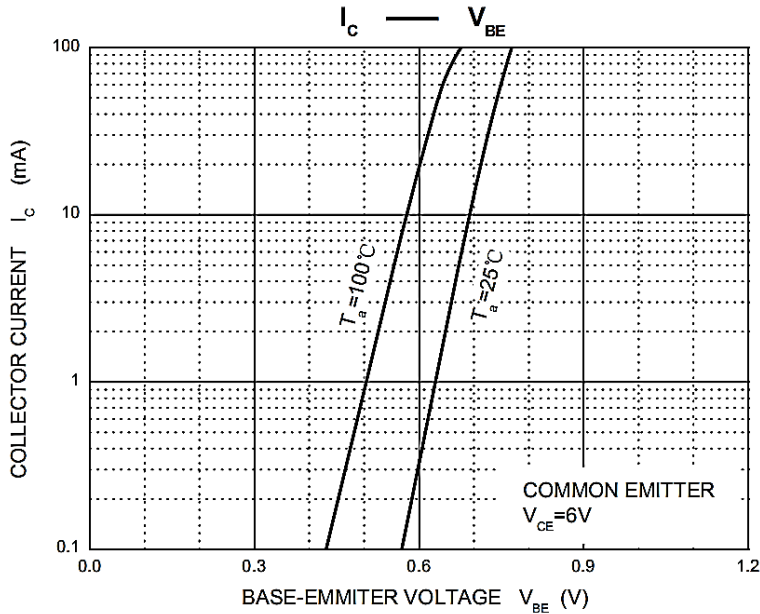
**SMD TRANSISTORS 2SC SERIES CASE SOT-23**

**TYPICAL CHARACTERISTIC CURVES - For Reference Only**



**SMD TRANSISTORS 2SC SERIES CASE SOT-23**

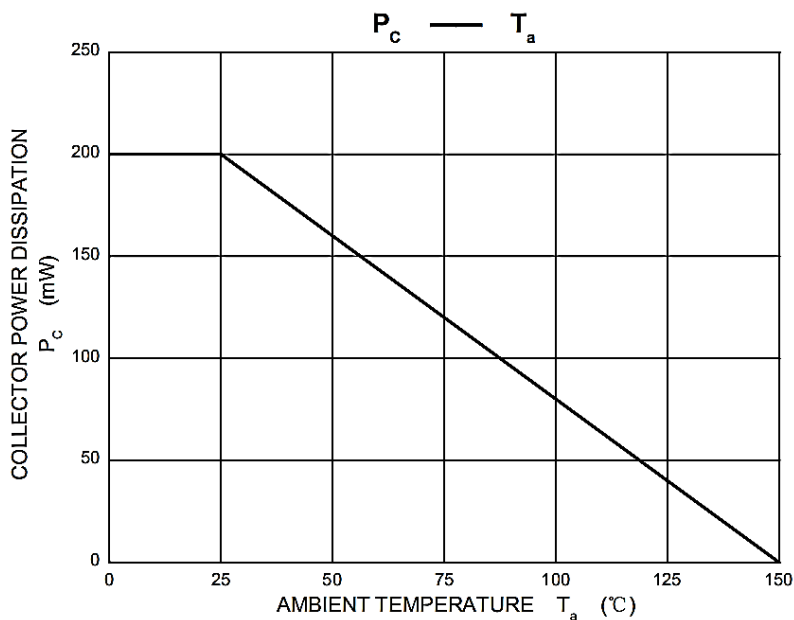
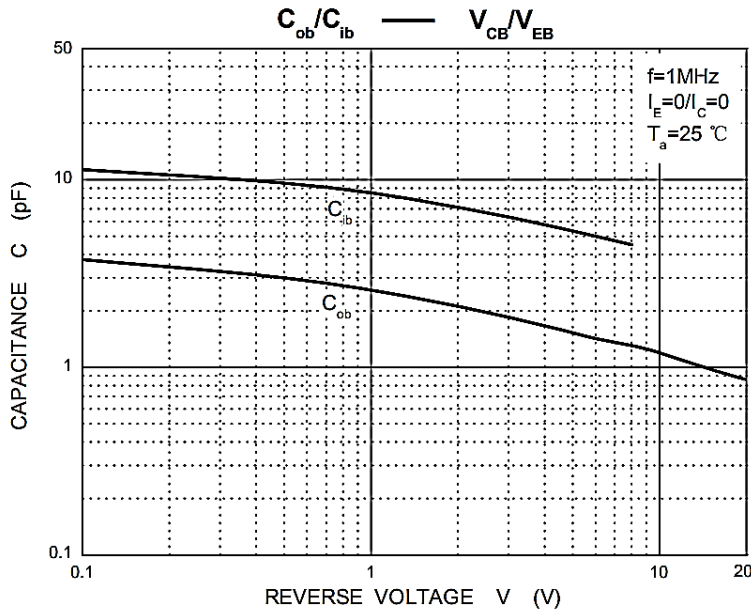
**TYPICAL CHARACTERISTIC CURVES - For Reference Only**





**SMD TRANSISTORS 2SC SERIES CASE SOT-23**

**TYPICAL CHARACTERISTIC CURVES - For Reference Only**



**SMD TRANSISTORS 2SC SERIES CASE SOT-23**
**RELIABILITY**

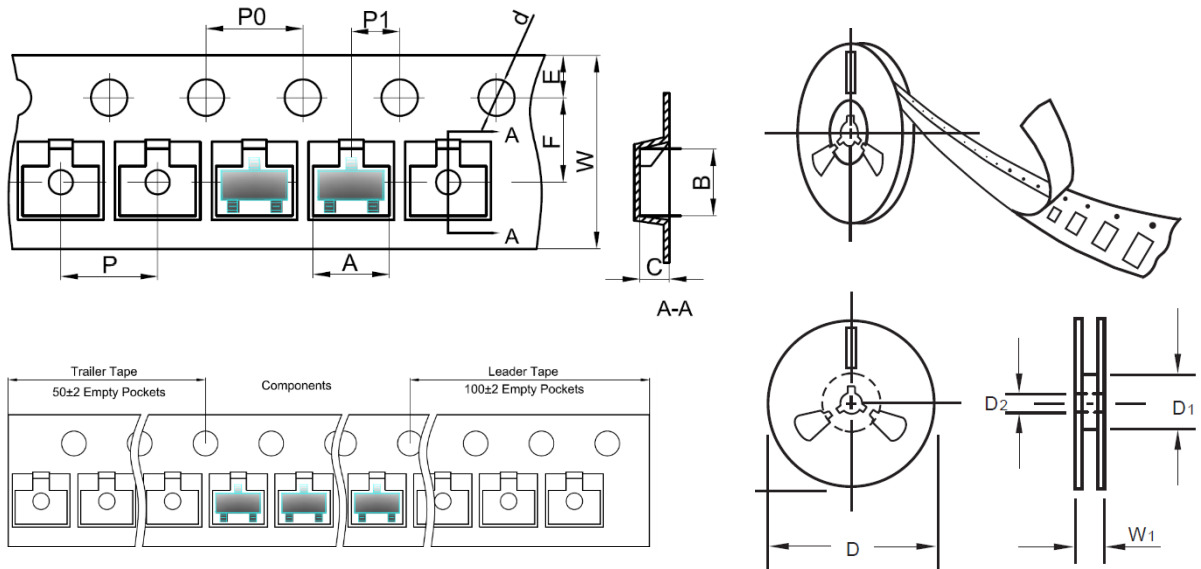
| Number | Experiment Items                   | Experiment Method And Conditions   | Reference Documents             |
|--------|------------------------------------|--|---------------------------------|
| 1      | Solder Resistance Test             | Test 260°C± 5°C for 10 ± 2 sec.<br>Immerse body into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

**SMD TRANSISTORS 2SC SERIES CASE SOT-23**
**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 TRANSISTORS 2SC SERIES CASE SOT-23**
**TAPE/REEL - Unit: mm**

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



| ITEM                     | SYMBOL       | TOLERANCE | SOT-23 |
|--------------------------|--------------|-----------|--------|
| Carrier width            | A            | 0.1       | 3.15   |
| Carrier Length           | B            | 0.1       | 2.77   |
| Carrier Depth            | C            | 0.1       | 1.22   |
| Sprocket hole            | d            | 0.05      | 1.55   |
| 7" Reel outside diameter | D            | 2.0       | 178.00 |
| 7" Reel inner diameter   | D1           | Min.      | 54.4   |
| Feed hole diameter       | D2           | 0.5       | 13.00  |
| Sprocket hole position   | E            | 0.1       | 1.75   |
| Punch hole position      | F            | 0.1       | 3.50   |
| Punch hole pitch         | P            | 0.1       | 4.00   |
| 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       | 8.00   |
| Reel width               | W1           | 1.0       | 19.50  |
| MPQ/Reel                 | 3000pcs/Reel |           |        |

## SMD TRANSISTORS 2SC SERIES CASE SOT-23

### 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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