

## Features

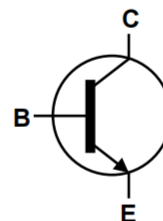
- $BV_{CEO} > 45V, 60V \text{ \& } 80V$
- $I_C = 1A$  High Continuous Collector Current
- $I_{CM} = 2A$  Peak Pulse Current
- 2W Power Dissipation
- Low Saturation Voltage  $V_{CE(sat)} < 500mV @ 0.5A$
- Gain Groups 10 and 16

## Mechanical Data

- Case: SOT-23
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 <sup>(e3)</sup>
- Weight: 0.112 grams (Approximate)



SOT-23



Device Symbol

## Applications

- Medium Power Switching or Amplification Applications
- AF Driver and Output Stages

## Absolute Maximum Ratings (@ $T_A = +25^{\circ}C$ , unless otherwise specified.)

| Characteristic                              | Symbol    | PBSS8110T,215-JSM | Unit |
|---------------------------------------------|-----------|-------------------|------|
| Collector-Base Voltage                      | $V_{CBO}$ | 100               | V    |
| Collector-Emitter Voltage                   | $V_{CEO}$ | 80                | V    |
| Emitter-Base Voltage                        | $V_{EBO}$ | 5                 | V    |
| Continuous Collector Current                | $I_C$     | 1                 | A    |
| Peak Pulse Collector Current (Single pulse) | $I_{CM}$  | 2                 |      |
| Continuous Base Current                     | $I_B$     | 100               | mA   |
| Peak Pulse Base Current (Single pulse)      | $I_{BM}$  | 200               |      |

## Thermal Characteristics (@ $T_A = +25^{\circ}C$ , unless otherwise specified.)

| Characteristic                          | Symbol                   | Value       | Unit          |
|-----------------------------------------|--------------------------|-------------|---------------|
| Power Dissipation                       | (Note 5) $P_D$           | 2           | W             |
| Thermal Resistance, Junction to Ambient | (Note 5) $R_{\theta JA}$ | 62          | $^{\circ}C/W$ |
| Thermal Resistance, Junction to Leads   | (Note 6) $R_{\theta JL}$ | 19.4        | $^{\circ}C/W$ |
| Operating and Storage Temperature Range | $T_J, T_{STG}$           | -55 to +150 | $^{\circ}C$   |

## ESD Ratings (Note 7)

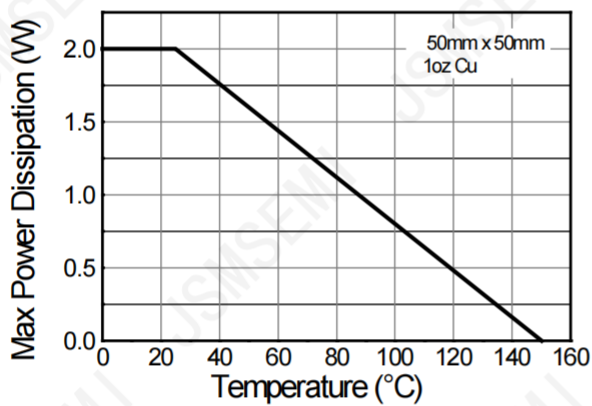
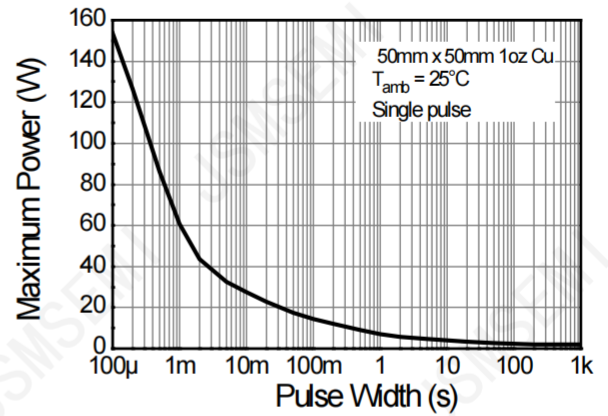
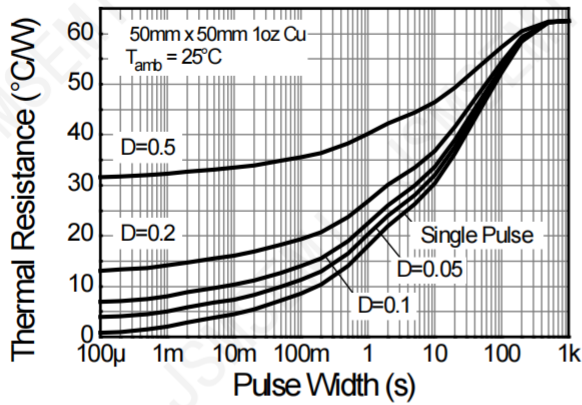
| Characteristic                             | Symbol  | Value | Unit | JEDEC Class |
|--------------------------------------------|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V    | 3A          |
| Electrostatic Discharge - Machine Model    | ESD MM  | 400   | V    | C           |

Notes: 5. For a device mounted with the collector lead on 50mm x 50mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.

6. Thermal resistance from junction to solder-point (at the end of the collector lead).

7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

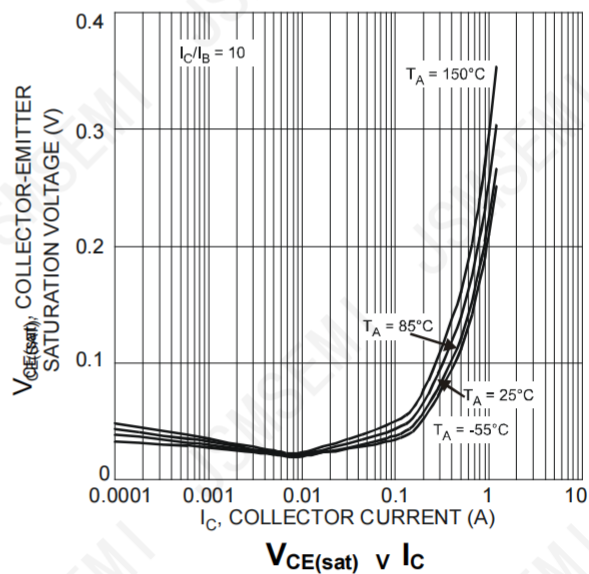
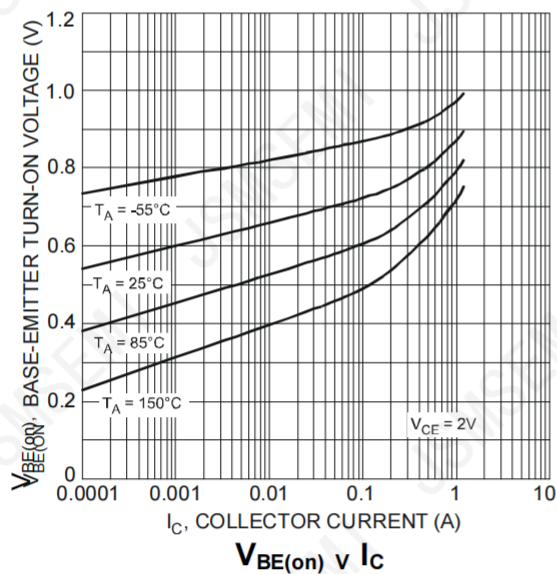
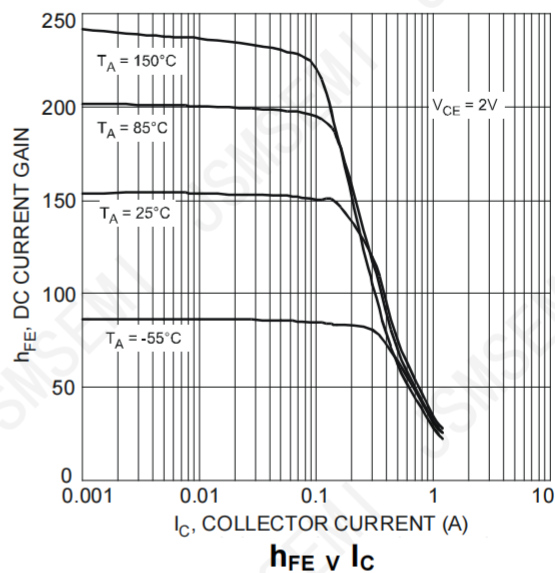
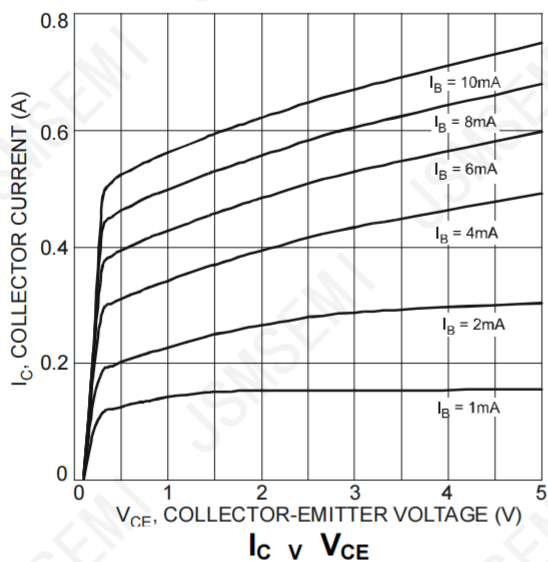
### Thermal Characteristics and Derating Information



**Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic                                |              | Symbol        | Min | Typ | Max       | Unit          | Test Condition                                                           |
|-----------------------------------------------|--------------|---------------|-----|-----|-----------|---------------|--------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage              |              | $BV_{CBO}$    | 100 | -   | -         | V             | $I_C = 100\mu\text{A}$                                                   |
| Collector-Emitter Breakdown Voltage (Note 8)  |              | $BV_{CEO}$    | 80  | -   | -         | V             | $I_C = 10\text{mA}$                                                      |
| Emitter-Base Breakdown Voltage                |              | $BV_{EBO}$    | 5   | -   | -         | V             | $I_E = 10\mu\text{A}$                                                    |
| Collector Cut-Off Current                     |              | $I_{CBO}$     | -   | -   | 0.1<br>20 | $\mu\text{A}$ | $V_{CB} = 30\text{V}$<br>$V_{CB} = 30\text{V}, T_A = +150^\circ\text{C}$ |
| Emitter Cut-Off Current                       |              | $I_{EBO}$     | -   | -   | 20        | nA            | $V_{EB} = 4\text{V}$                                                     |
| DC Current Gain (Note 8)                      | All versions | $h_{FE}$      | 25  | -   | -         | -             | $I_C = 5\text{mA}, V_{CE} = 2\text{V}$                                   |
|                                               |              |               | 40  | -   | 250       |               | $I_C = 150\text{mA}, V_{CE} = 2\text{V}$                                 |
|                                               |              |               | 25  | -   | -         |               | $I_C = 500\text{mA}, V_{CE} = 2\text{V}$                                 |
|                                               |              |               |     | -   | -         |               |                                                                          |
|                                               | 10 gain grp  |               | 63  | -   | 160       |               | $I_C = 150\text{mA}, V_{CE} = 2\text{V}$                                 |
|                                               | 16 gain grp  |               | 100 | -   | 250       |               | $I_C = 150\text{mA}, V_{CE} = 2\text{V}$                                 |
| Collector-Emitter Saturation Voltage (Note 8) |              | $V_{CE(sat)}$ | -   | -   | 0.5       | V             | $I_C = 500\text{mA}, I_B = 50\text{mA}$                                  |
| Base-Emitter Turn-On Voltage (Note 8)         |              | $V_{BE(on)}$  | -   | -   | 1.0       | V             | $I_C = 500\text{mA}, V_{CE} = 2\text{V}$                                 |
| Transition frequency                          |              | $f_T$         | 150 | -   | -         | MHz           | $I_C = 50\text{mA}, V_{CE} = 10\text{V}$<br>$f = 100\text{MHz}$          |
| Output Capacitance                            |              | $C_{obo}$     | -   | -   | 25        | pF            | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                                   |

 Note: 8. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)


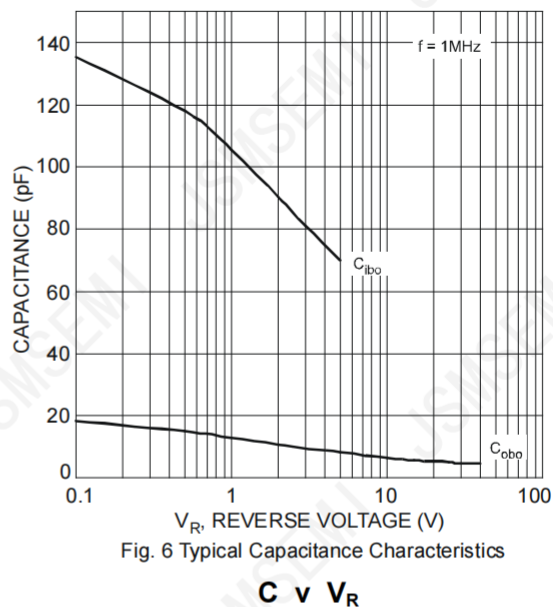
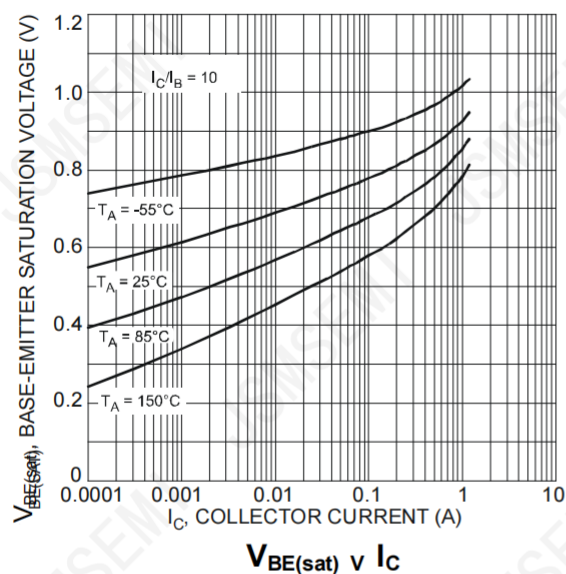
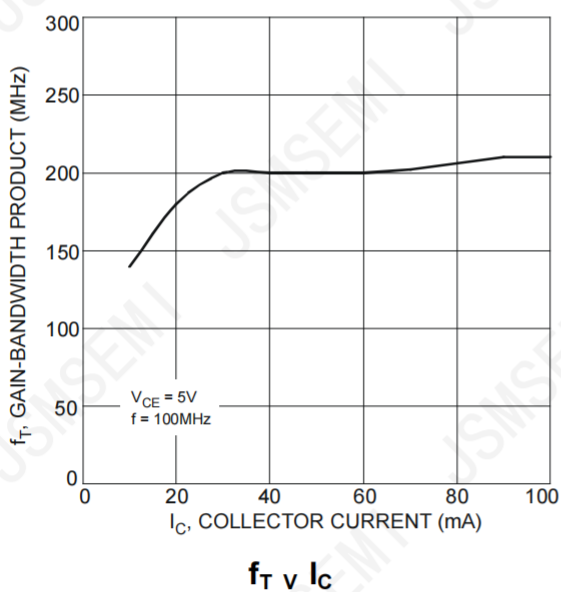
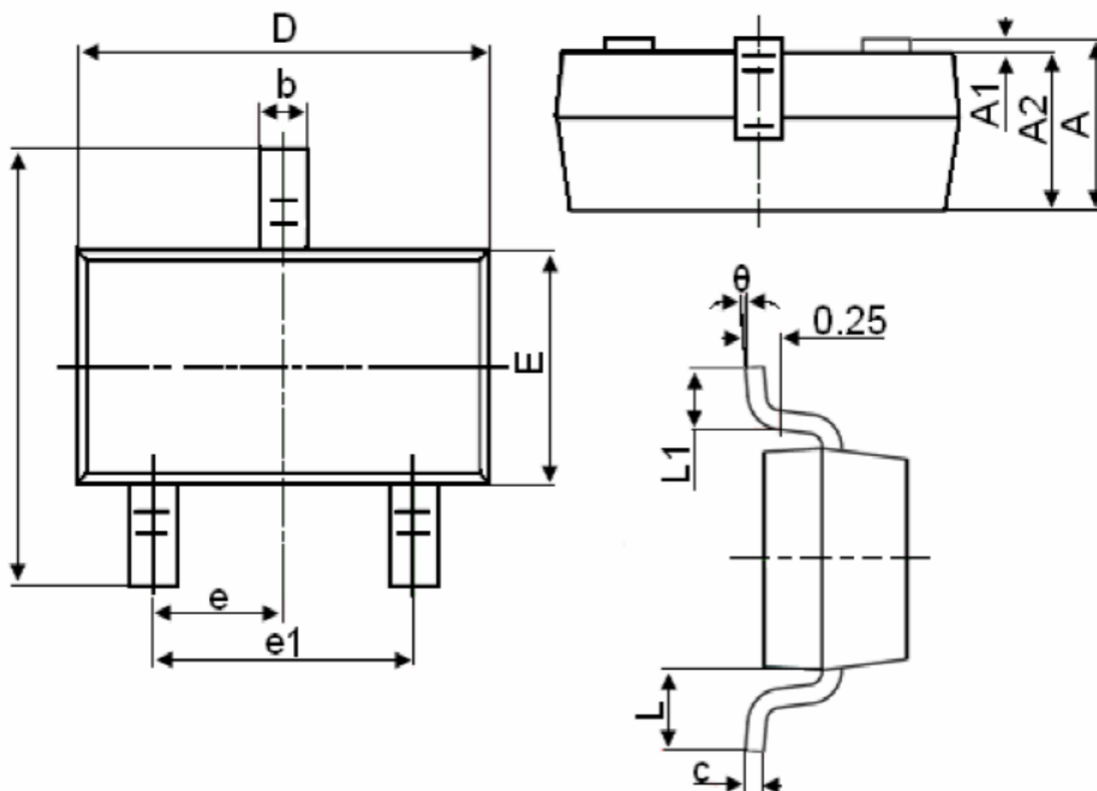
**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)


Fig. 6 Typical Capacitance Characteristics



## Package Outline Dimensions

### SOT-23



| Symbol   | Dimensions in Millimeters(mm) |       | Dimensions In Inches |       |
|----------|-------------------------------|-------|----------------------|-------|
|          | Min                           | Max   | Min                  | Max   |
| A        | 0.900                         | 1.150 | 0.035                | 0.045 |
| A1       | 0.000                         | 0.100 | 0.000                | 0.004 |
| A2       | 0.900                         | 1.050 | 0.035                | 0.041 |
| b        | 0.300                         | 0.500 | 0.012                | 0.020 |
| c        | 0.080                         | 0.150 | 0.003                | 0.006 |
| D        | 2.800                         | 3.000 | 0.110                | 0.118 |
| E        | 1.200                         | 1.400 | 0.047                | 0.055 |
| E1       | 2.250                         | 2.550 | 0.089                | 0.100 |
| e        | 0.950TYP                      |       | 0.037TYP             |       |
| e1       | 1.800                         | 2.000 | 0.071                | 0.079 |
| L        | 0.550REF                      |       | 0.022REF             |       |
| L1       | 0.300                         | 0.500 | 0.012                | 0.020 |
| $\theta$ | 0°                            | 8°    | 0°                   | 8°    |

## Revision History

| Rev. | Change          | Date      |
|------|-----------------|-----------|
| V1.0 | Initial version | 2/23/2024 |
|      |                 |           |

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