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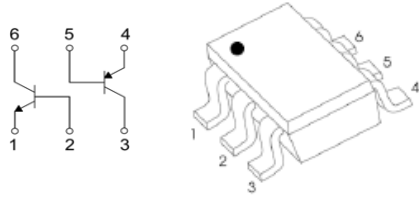
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Product data sheet  
Product data sheet

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**SOT-363**

## Plastic-Encapsulate Transistors

DUAL TRANSISTOR (NPN+PNP)

### FEATURES

- Epitaxial Die Construction
- Two isolated NPN/PNP(BC846W+BC856W) Transistors in one package

**MAKING: BB**

### MAXIMUM RATINGS TR1 (T<sub>a</sub>=25°C unless otherwise noted)

| Symbol           | Parameter                     | Value   | Units |
|------------------|-------------------------------|---------|-------|
| V <sub>CB0</sub> | Collector-Base Voltage        | 80      | V     |
| V <sub>CEO</sub> | Collector-Emitter Voltage     | 65      | V     |
| V <sub>EBO</sub> | Emitter-Base Voltage          | 6       | V     |
| I <sub>C</sub>   | Collector Current –Continuous | 0.1     | A     |
| P <sub>C</sub>   | Collector Power Dissipation   | 200     | mW    |
| T <sub>J</sub>   | Junction Temperature          | 150     | °C    |
| T <sub>stg</sub> | Storage Temperature           | -55-150 | °C    |

### CHARACTERISTICS of TR1 (NPN Transistor) (T<sub>a</sub>=25°C unless otherwise specified)

| Parameter                            | Symbol               | Test conditions   | Min  | Typ | Max  | Unit |
|--------------------------------------|----------------------|---|------|-----|------|------|
| Collector-base breakdown voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> =10μA, I <sub>E</sub> =0   | 80   |     |      | V    |
| Collector-emitter breakdown voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =10mA, I <sub>B</sub> =0   | 65   |     |      | V    |
| Emitter-base breakdown voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =1μA, I <sub>C</sub> =0  | 6    |     |      | V    |
| Collector cut-off current            | I <sub>CB0</sub>     | V <sub>CB</sub> =30V, I <sub>E</sub> =0   |      |     | 15   | nA   |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> =5V, I <sub>C</sub> =0  |      |     | 15   | nA   |
| DC current gain                      | h <sub>FE</sub>      | V <sub>CE</sub> =5V, I <sub>C</sub> =2mA  | 200  |     | 450  |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA                                       |      |     | 0.25 | V    |
|                                      | V <sub>CE(sat)</sub> | I <sub>C</sub> =100mA, I <sub>B</sub> =5mA  |      |     | 0.6  | V    |
| Base-emitter saturation voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA                                       |      | 0.7 |      | V    |
|                                      | V <sub>BE(sat)</sub> | I <sub>C</sub> =100mA, I <sub>B</sub> =5mA  |      | 0.9 |      | V    |
| Base-emitter voltage                 | V <sub>BE(on)</sub>  | V <sub>CE</sub> =5V, I <sub>C</sub> =2mA  | 0.58 |     | 0.7  | V    |
|                                      | V <sub>BE(on)</sub>  | V <sub>CE</sub> =5V, I <sub>C</sub> =10mA   |      |     | 0.72 | V    |
| Collector output capacitance         | C <sub>ob</sub>      | V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz                                   |      |     | 6.0  | pF   |
| Transition frequency                 | f <sub>T</sub>       | V <sub>CE</sub> =5V, I <sub>C</sub> =10mA, f=100MHz                               | 100  |     |      | MHz  |
| Noise figure                         | NF                   | V <sub>CE</sub> =5V, I <sub>C</sub> =0.2mA, f=1kHz, R <sub>g</sub> =2KΩ, Δf=200Hz |      |     | 10   | dB   |

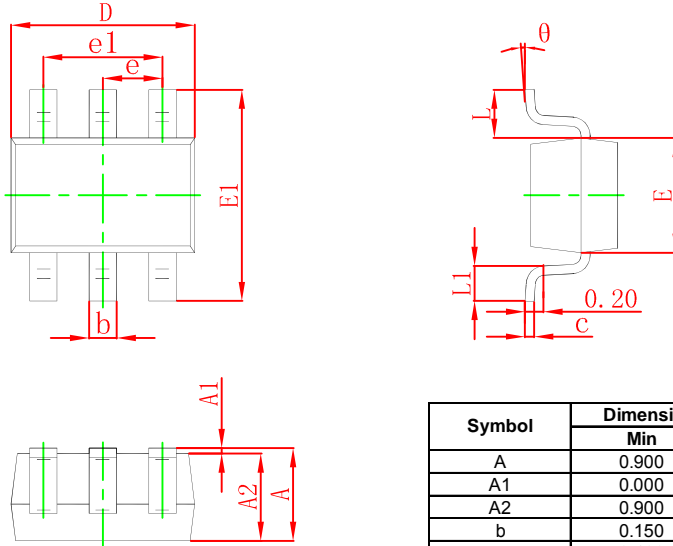
**MAXIMUM RATINGS TR2 (T<sub>a</sub>=25°C unless otherwise noted)**

| Symbol           | Parameter                     | Value   | Units |
|------------------|-------------------------------|---------|-------|
| V <sub>CB0</sub> | Collector-Base Voltage        | -80     | V     |
| V <sub>CEO</sub> | Collector-Emitter Voltage     | -65     | V     |
| V <sub>EBO</sub> | Emitter-Base Voltage          | -5      | V     |
| I <sub>c</sub>   | Collector Current –Continuous | -0.1    | A     |
| P <sub>C*</sub>  | Collector Power Dissipation   | 200     | mW    |
| T <sub>J</sub>   | Junction Temperature          | 150     | °C    |
| T <sub>stg</sub> | Storage Temperature           | -55-150 | °C    |

**CHARACTERISTICS of TR2 (PNP Transistor) (T<sub>a</sub>=25°C unless otherwise specified)**

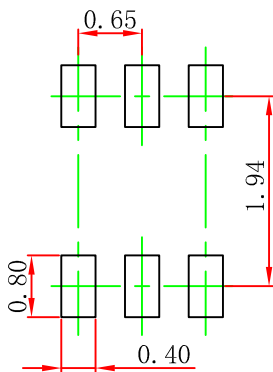
| Parameter                            | Symbol               | Test conditions  | MIN  | TYP  | MAX   | UNIT |
|--------------------------------------|----------------------|--|------|------|-------|------|
| Collector-base breakdown voltage     | V <sub>(BR)CBO</sub> | I <sub>C</sub> =-10μA, I <sub>E</sub> =0   | -80  |      |       | V    |
| Collector-emitter breakdown voltage  | V <sub>(BR)CEO</sub> | I <sub>C</sub> =-10mA, I <sub>B</sub> =0   | -65  |      |       | V    |
| Emitter-base breakdown voltage       | V <sub>(BR)EBO</sub> | I <sub>E</sub> =-1μA, I <sub>C</sub> =0  | -5   |      |       | V    |
| Collector cut-off current            | I <sub>CBO</sub>     | V <sub>CB</sub> =-30V, I <sub>E</sub> =0   |      |      | -15   | nA   |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> =-5V, I <sub>C</sub> =0  |      |      | -15   | nA   |
| DC current gain                      | h <sub>FE1</sub>     | V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA   | 220  |      | 475   |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA  |      |      | -0.3  | V    |
|                                      | V <sub>CE(sat)</sub> | I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA   |      |      | -0.65 | V    |
| Base-emitter saturation voltage      | V <sub>BE(sat)</sub> | I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA  |      | -0.7 |       | V    |
|                                      | V <sub>BE(sat)</sub> | I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA   |      |      | -0.95 | V    |
| Base-emitter voltage                 | V <sub>BE(on)</sub>  | V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA   | -0.6 |      | -0.75 | V    |
|                                      | V <sub>BE(on)</sub>  | V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA  |      |      | -0.82 | V    |
| Collector output capacitance         | C <sub>ob</sub>      | V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=1MHz                                       |      |      | 4.5   | pF   |
| Transition frequency                 | f <sub>T</sub>       | V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA, f=100MHz                                  | 100  |      |       | MHz  |
| Noise figure                         | NF                   | V <sub>CE</sub> =-5V, I <sub>c</sub> =-0.2mA,<br>f=1kHz, R <sub>g</sub> =2KΩ, Δf=200Hz |      |      | 10    | dB   |

**SOT-363 Package Outline Dimensions**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.100 | 0.035                | 0.043 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.000 | 0.035                | 0.039 |
| b      | 0.150                     | 0.350 | 0.006                | 0.014 |
| c      | 0.100                     | 0.150 | 0.004                | 0.006 |
| D      | 2.000                     | 2.200 | 0.079                | 0.087 |
| E      | 1.150                     | 1.350 | 0.045                | 0.053 |
| E1     | 2.150                     | 2.400 | 0.085                | 0.094 |
| e      | 0.650 TYP                 |       | 0.026 TYP            |       |
| e1     | 1.200                     | 1.400 | 0.047                | 0.055 |
| L      | 0.525 REF                 |       | 0.021 REF            |       |
| L1     | 0.260                     | 0.460 | 0.010                | 0.018 |
| theta  | 0°                        | 8°    | 0°                   | 8°    |

**SOT-363 Suggested Pad Layout**



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance: ± 0.05mm.
  3. The pad layout is for reference purposes only.

**REEL SPECIFICATION**

| P/N     | PKG     | QTY  |
|---------|---------|------|
| BC846PN | SOT-363 | 3000 |

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