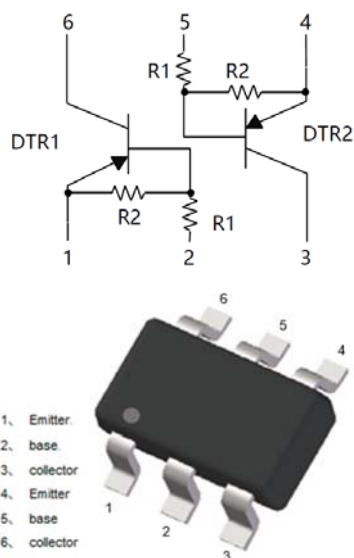


## Dual PNP+PNP Digital Transistors (Built-in Resistors)



### Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic insertion

### Application

- Signal amplification
- Switching circuit

### Mechanical data

- **Package:** SOT-363S
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102

### ■ Maximum Ratings ( $T_a=25^{\circ}\text{C}$ Unless otherwise specified)

| Item                           | Symbol    | Unit               | Conditions | Value       |
|--------------------------------|-----------|--------------------|------------|-------------|
| Device marking code            |           |                    |            | B13         |
| Collector-base voltage         | $V_{CC}$  | V                  |            | -50         |
| Collector-emitter voltage      | $V_{IN}$  | V                  |            | -30 to +5   |
| Collector current              | $I_O$     | mA                 |            | -100        |
| Power dissipation              | $P_D$     | mW                 |            | 150         |
| Operation junction temperature | $T_J$     | $^{\circ}\text{C}$ |            | -55 to +150 |
| Storage temperature            | $T_{STG}$ | $^{\circ}\text{C}$ |            | -55 to +150 |



## UMB13NS

### ■ Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| Item                 | Symbol                         | Unit | Conditions                                           | Min  | Typ | Max  |
|----------------------|--------------------------------|------|------------------------------------------------------|------|-----|------|
| Input voltage        | V <sub>I(off)</sub>            | V    | V <sub>CC</sub> =-5V, I <sub>c</sub> =-100uA         | -0.5 |     |      |
|                      | V <sub>I(on)</sub>             | V    | V <sub>O</sub> =-0.3V, I <sub>c</sub> =-2mA          |      |     | -1.3 |
| Output voltage       | V <sub>O(on)</sub>             | V    | I <sub>o</sub> / I <sub>i</sub> = -5mA/-0.25 mA      |      |     | -0.3 |
| Input current        | I <sub>I</sub>                 | mA   | V <sub>I</sub> =-5V                                  |      |     | -1.8 |
| Output current       | I <sub>O(off)</sub>            | uA   | V <sub>CC</sub> =-50V, V <sub>i</sub> =0             |      |     | -0.5 |
| DC current gain      | G <sub>I</sub>                 |      | V <sub>O</sub> =-5V, I <sub>o</sub> = -10mA          | 80   |     |      |
| Input resistance     | R <sub>1</sub>                 | kΩ   |                                                      | 3.29 | 4.7 | 6.11 |
| Resistance ratio     | R <sub>2</sub> /R <sub>1</sub> |      |                                                      | 8    | 10  | 12   |
| Transition frequency | f <sub>T</sub>                 | MHz  | V <sub>O</sub> =-10V, I <sub>o</sub> =-5mA, f=100MHz |      | 250 |      |

### ■ Thermal Characteristics

| Parameter                               | Symbol                           | Unit | Value |
|-----------------------------------------|----------------------------------|------|-------|
| Thermal resistance, junction-to-ambient | R <sub>θJ-A</sub> <sup>(1)</sup> | °C/W | 834   |
| Thermal resistance, junction-to-case    | R <sub>θJ-C</sub> <sup>(1)</sup> | °C/W | 667   |

Note:

(1) Device mounted on PCB, single-sided copper, with standard footprint

### ■ Ordering Information

| Part Number | Packing code | Unit weight(g)    | Minimum package(pcs) | Inner box quantity(pcs) | Outer carton quantity(pcs) | Delivery mode |
|-------------|--------------|-------------------|----------------------|-------------------------|----------------------------|---------------|
| UMB13NS     | F2           | Approximate 0.009 | 3000                 | 30000                   | 120000                     | 7" reel       |
| UMB13NS     | F3           | Approximate 0.009 | 10000                | /                       | 210000                     | 7" reel       |



## ■Characteristics(Typical)

Fig 1: Input Voltage (On) Characteristics

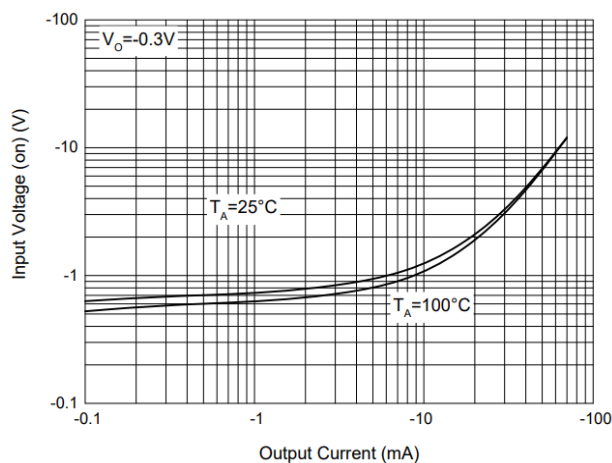


Fig 2: Input Voltage (Off) Characteristic

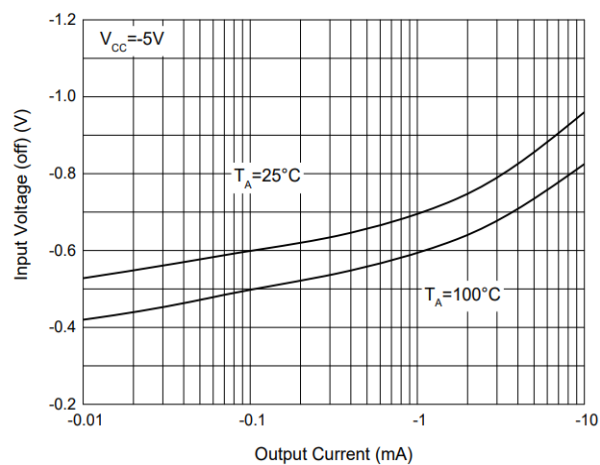


Fig 3: DC Current Gain Characteristics

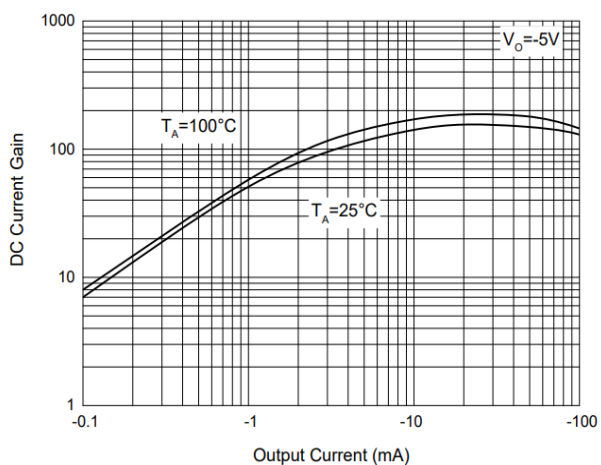


Fig 4: Output Voltage Characteristics

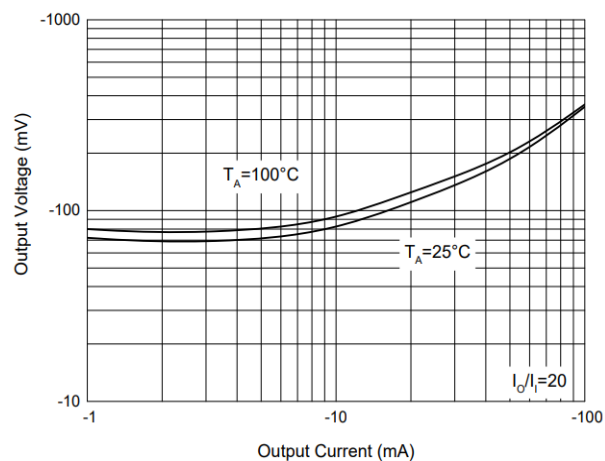
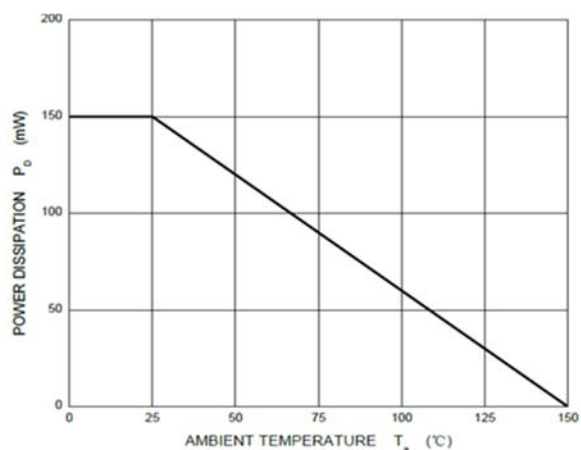


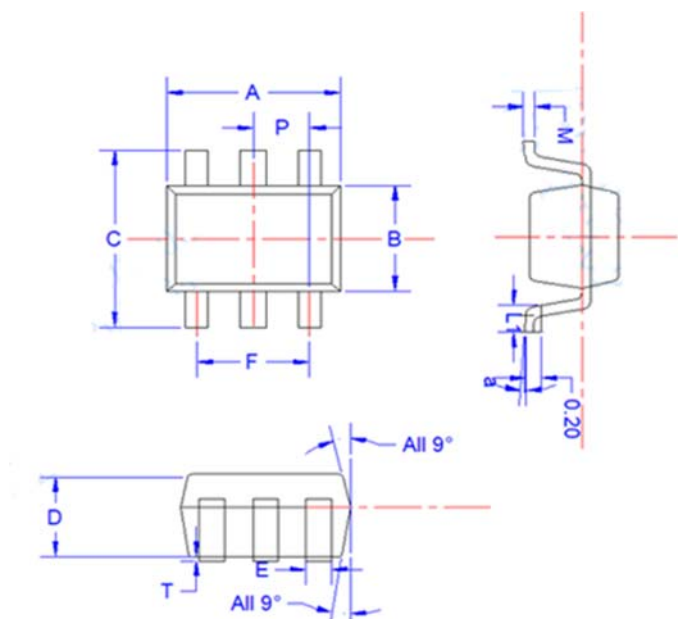
Fig 5: PD-Ta Curve





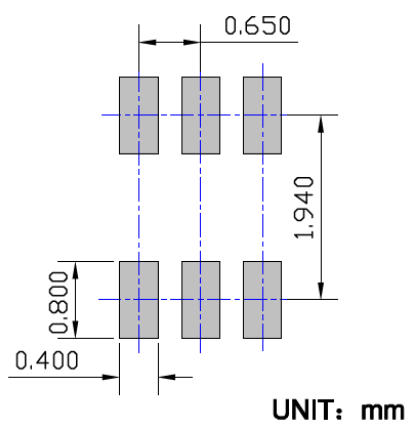
## UMB13NS

### ■ Outline Dimensions



| SYMBOL | MILLIMETER |      |       |
|--------|------------|------|-------|
|        | MIN        | NOM  | MAX   |
| E      | 0.15       | 0.25 | 0.35  |
| B      | 1.15       | 1.25 | 1.35  |
| C      | 2.00       | 2.10 | 2.20  |
| P      | 0.650BSC   |      |       |
| A      | 1.80       | 2.00 | 2.20  |
| T      | 0.00       | 0.05 | 0.100 |
| D      | 0.90       | 0.95 | 1.00  |
| L1     | 0.20       | 0.30 | 0.40  |
| a      | 4°±4°      |      |       |
| M      | 0.10       | 0.15 | 0.25  |

### ■ Suggested Pad Layout





## UMB13NS

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