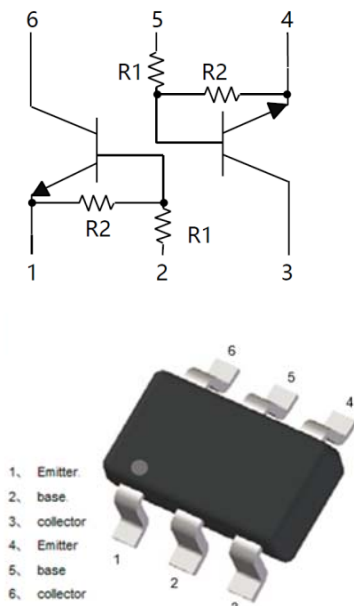


## Dual NPN Digital Transistors (Built-in Resistors)



### 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       |           |                    |            | H16         |
| Collector-base voltage    | $V_{CC}$  | V                  |            | 50          |
| Collector-emitter voltage | $V_{IN}$  | V                  |            | -10 to +40  |
| Collector current         | $I_O$     | mA                 |            | 100         |
| Power dissipation         | $P_D$     | mW                 |            | 150         |
| Junction temperature      | $T_J$     | $^{\circ}\text{C}$ |            | -55 to +150 |
| Storage temperature       | $T_{STG}$ | $^{\circ}\text{C}$ |            | -55 to +150 |



## UMH16NS

### ■ 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         | 0.4  |     |      |
|                      | V <sub>I(on)</sub>             | V    | V <sub>O</sub> =0.3V, I <sub>c</sub> =2mA          |      |     | 2.5  |
| Output voltage       | V <sub>O(on)</sub>             | V    | I <sub>O</sub> / I <sub>I</sub> =10mA/0.5 mA       |      |     | 0.3  |
| Input current        | I <sub>I</sub>                 | uA   | V <sub>I</sub> =5V                                 |      |     | 120  |
| Output current       | I <sub>O(off)</sub>            | uA   | V <sub>CC</sub> =50V, V <sub>I</sub> =0            |      |     | 0.1  |
| DC current gain      | G <sub>I</sub>                 |      | V <sub>O</sub> =5V, I <sub>O</sub> =5mA            | 68   |     |      |
| Input resistance     | R <sub>1</sub>                 | kΩ   |                                                    | 15.4 | 22  | 28.6 |
| Resistance ratio     | R <sub>2</sub> /R <sub>1</sub> |      |                                                    | 1.7  | 2.1 | 2.6  |
| 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

| Preferred P/N | Package code | Unit weight(g)    | Minimum package(pcs) | Inner box quantity(pcs) | Outer carton quantity(pcs) | Delivery mode |
|---------------|--------------|-------------------|----------------------|-------------------------|----------------------------|---------------|
| UMH16NS       | F2           | Approximate 0.009 | 3000                 | 30000                   | 120000                     | 7" reel       |
| UMH16NS       | F3           | Approximate 0.009 | 10000                | /                       | 210000                     | 7" reel       |



## ■Characteristics(Typical)

Fig 1: DC Current Gain Characteristics

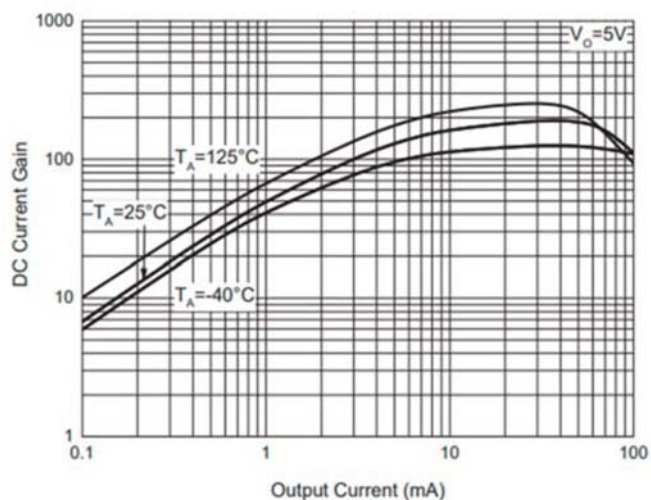


Fig 2: Input Voltage (On) Characteristics

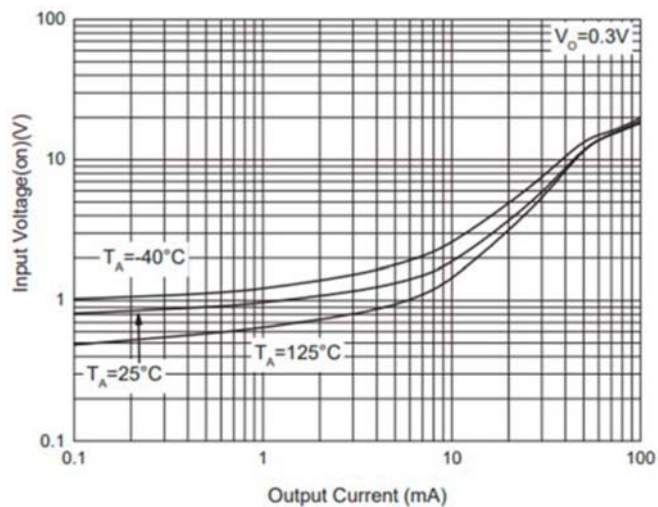


Fig 3: Input Voltage (Off) Characteristic

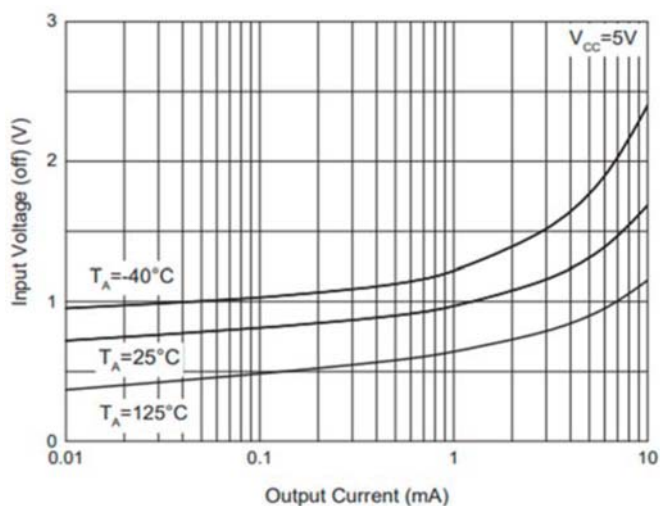


Fig 4: Output Voltage Characteristics

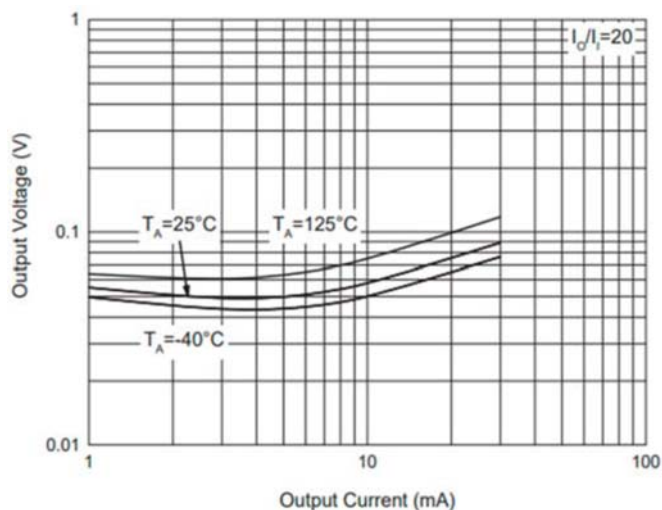
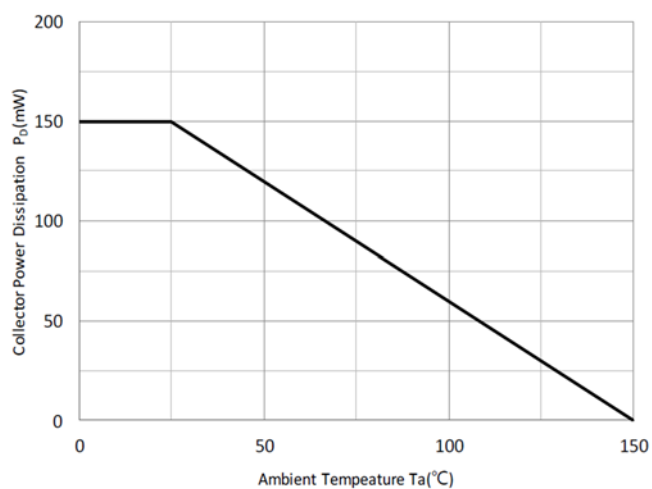


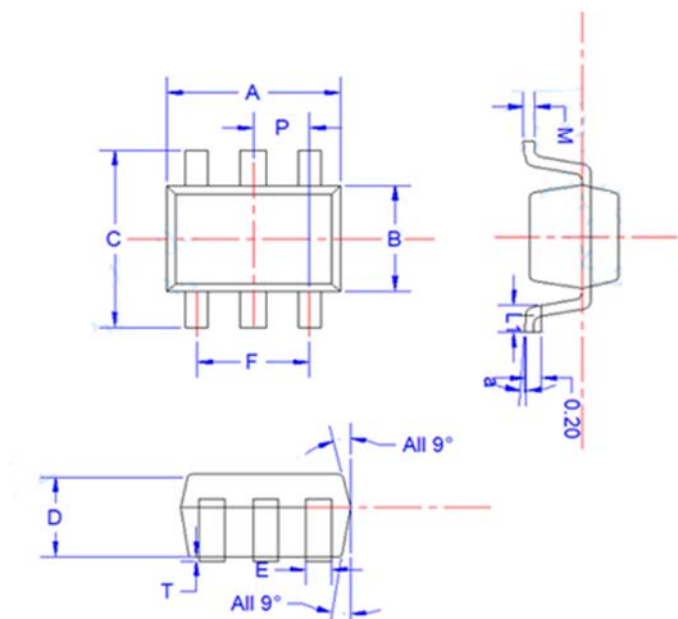
Fig 5: PD-Ta Curve





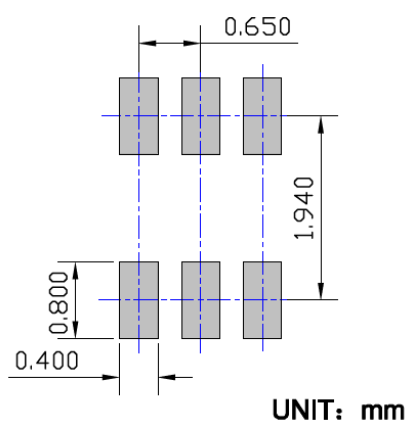
## UMH16NS

### ■ 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





## UMH16NS

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