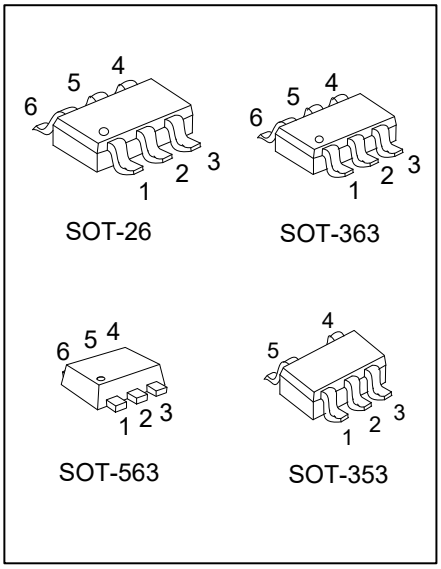
# DUAL NPN DIGITAL TRANSISTOR (BUILT- IN BIAS RESISTORS)



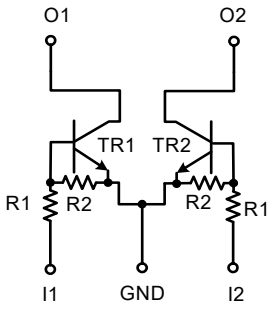

## ■ DESCRIPTION

The UTC **UMH9** is an dual transistor; it uses UTC's advanced technology to provide the customers with low collector -emitter saturation voltage, etc.

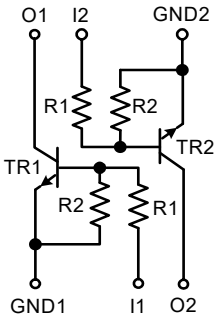
## ■ FEATURES

* NPN silicon transistor (Built-in resistor type)
* 100 mA output current capability
* Built-in bias resistors
* Simplifies circuit design
* Reduces component count
* Reduces pick and place costs

## ■ EQUIVALENT CIRCUIT




SOT-353

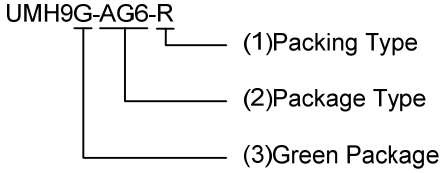



SOT-26 / SOT-363 / SOT-563

## ■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | | | | Packing |
|---|---|---|---|---|---|---|---|---|---|
| Lead Free | Halogen Free | | 1 | 2 | 3 | 4 | 5 | 6 | |
| UMH9L-AG6-R | UMH9G-AG6-R | SOT-26 | G1 | I1 | O2 | G2 | I2 | O1 | Tape Reel |
| UMH9L-AL5-R | UMH9G-AL5-R | SOT-353 | I1 | G | I2 | O2 | O1 | - | Tape Reel |
| UMH9L-AL6-R | UMH9G-AL6-R | SOT-363 | G1 | I1 | O2 | G2 | I2 | O1 | Tape Reel |
| UMH9L-AN6-R | UMH9G-AN6-R | SOT-563 | G1 | I1 | O2 | G2 | I2 | O1 | Tape Reel |

Note: Pin Assignment: G: GND I: IN O: OUT

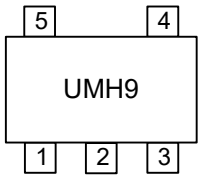
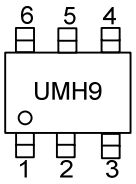



(1) R: Tape Reel

(2) AG6: SOT-26, AL5: SOT-353, AL6: SOT-363
AN6: SOT-563

(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

| SOT-353 | SOT-26 / SOT-363 / SOT-563 |
|---|---|
|  |  |

## ■ ABSOLUTE MAXIMUM RATING ($T_A$=25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Collector-Base Voltage | | $V_{CBO}$ | 50 | V |
| Collector-Emitter Voltage | | $V_{CEO}$ | 50 | V |
| Emitter-Base Voltage | | $V_{EBO}$ | 6 | V |
| Input Voltage | | $V_{IN}$ | -6 ~ +40 | V |
| Output Current | | $I_{OUT}$ | 100 | mA |
| Collector Power dissipation | SOT-26 | $P_C$ | 420 | mW |
| | SOT-353 | | 200 | mW |
| | SOT-363 | | 300 | mW |
| | SOT-563 | | 250 | mW |
| Junction Temperature | | $T_J$ | +150 | °C |
| Ambient Temperature | | $T_A$ | -55 ~ +150 | °C |
| Storage Temperature | | $T_{STG}$ | -55 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ THERMAL DATA

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|---|---|---|---|---|
| Junction to Ambient | SOT-26 | $\theta_{JA}$ | 298 | °C/W |
| | SOT-353 | | 625 | °C/W |
| | SOT-363 | | 417 | °C/W |
| | SOT-563 | | 500 | °C/W |

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

## ■ ELECTRICAL SPECIFICATIONS ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$=100μA, $I_E$=0A | 50 | | | V |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$=2mA, $I_B$=0A | 50 | | | V |
| Collector-Base Cut-Off Current | $I_{CBO}$ | $V_{CB}$=50V, $I_E$=0A | | | 100 | nA |
| Collector-Emitter Cut-Off Current | $I_{CEO}$ | $V_{CE}$=30V, $I_B$=0A | | | 100 | nA |
| Emitter-Base Cut-Off Current | $I_{EBO}$ | $V_{EB}$=5V, $I_C$=0A | | | 150 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=5V, $I_C$=5mA | 100 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C$=5mA, $I_B$=0.25mA | | | 100 | mV |
| Off-State Input Voltage | $V_{I(OFF)}$ | $V_{CE}$=5V, $I_C$=100μA | | | 0.8 | V |
| On-State Input Voltage | $V_{I(ON)}$ | $V_{CE}$=0.3V, $I_C$=1mA | 3 | | | V |
| Input Resistance | R1 | | 7 | 10 | 13 | KΩ |
| Resistor Ratio | R2/R1 | | 3.7 | 4.7 | 5.7 | |
| Transition Frequency | fT | $V_{CE}$=10V, IE =−5mA, f=100MHz | | 250 | | MHz |

Note: Transition frequency of the device.