



## MMBTA29

NPN EPITAXIAL SILICON TRANSISTOR

### DARLINGTON TRANSISTOR

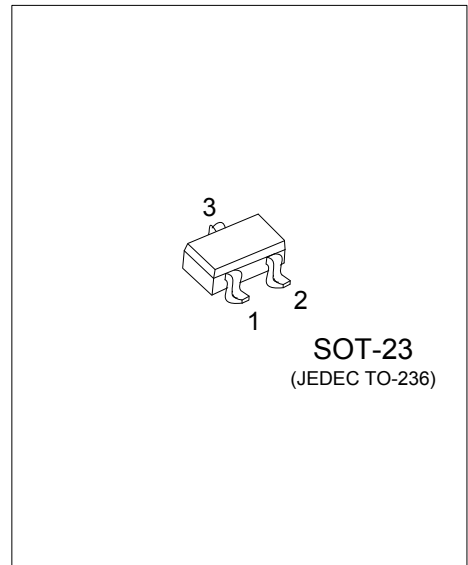
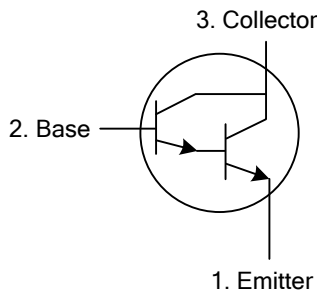
#### DESCRIPTION

The UTC **MMBTA29** is a darlington transistor, it uses UTC's advanced technology to provide customers with high DC current gain, etc.

#### FEATURES

\* High DC current gain

#### EQUIVALENT CIRCUIT



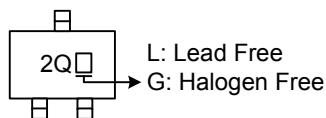
#### ORDERING INFORMATION

| Ordering Number |                | Package | Pin Assignment |   |   | Packing   |
|-----------------|----------------|---------|----------------|---|---|-----------|
| Lead Free       | Halogen Free   |         | 1              | 2 | 3 |           |
| MMBTA29L-AE3-R  | MMBTA29G-AE3-R | SOT-23  | B              | E | C | Tape Reel |

Note: Pin Assignment: B: Base E: Emitter C: Collector

| MMBTA29G-AE3-R |                  |   |
|----------------|------------------|---|
|                | (1)Packing Type  | (1) R: Tape Reel                                |
|                | (2)Package Type  | (2) AE3: SOT-23                                 |
|                | (3)Green Package | (3) G: Halogen Free and Lead Free, L: Lead Free |

#### MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                    | SYMBOL    | RATINGS    | UNIT             |
|------------------------------|-----------|------------|------------------|
| Collector-Base Voltage       | $V_{CBO}$ | 100        | V                |
| Collector-Emitter Voltage    | $V_{CES}$ | 100        | V                |
| Emitter-Base Voltage         | $V_{EBO}$ | 12         | V                |
| Collector Current-Continuous | $I_C$     | 500        | mA               |
| Power Dissipation            | $P_D$     | 350        | mW               |
| Junction Temperature         | $T_J$     | -55 ~ +150 | $^\circ\text{C}$ |
| Storage Temperature          | $T_{STG}$ | -55 ~ +150 | $^\circ\text{C}$ |

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 CHARACTERISTICS

| PARAMETER           | SYMBOL        | RATINGS | UNIT               |
|---------------------|---------------|---------|--------------------|
| Junction to Ambient | $\theta_{JA}$ | 357     | $^\circ\text{C/W}$ |

Note: The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ , unless otherwise noted)

| PARAMETER                            | SYMBOL        | TEST CONDITIONS                           | MIN   | TYP | MAX | UNIT |
|--------------------------------------|---------------|---|-------|-----|-----|------|
| <b>OFF CHARACTERISTICS</b>           |               |   |       |     |     |      |
| Collector-Emitter Breakdown Voltage  | $BV_{CES}$    | $I_C=100\mu\text{A}$ , $V_{BE}=0$         | 100   |     |     | V    |
| Collector-Base Breakdown Voltage     | $BV_{CBO}$    | $I_C=100\mu\text{A}$ , $I_E=0$            | 100   |     |     | V    |
| Emitter-Base Breakdown Voltage       | $BV_{EBO}$    | $I_E=10\mu\text{A}$ , $I_C=0$             | 12    |     |     | V    |
| Collector Cut-Off Current            | $I_{CBO}$     | $V_{CB}=80\text{V}$ , $I_E=0$             |       |     | 100 | nA   |
|                                      | $I_{CES}$     | $V_{CE}=80\text{V}$ , $V_{BE}=0$          |       |     | 500 | nA   |
| Emitter Cut-Off Current              | $I_{EBO}$     | $V_{EB}=10\text{V}$ , $I_C=0$             |       |     | 100 | nA   |
| <b>ON CHARACTERISTICS (Note 1)</b>   |               |   |       |     |     |      |
| DC Current Gain                      | $h_{FE}$      | $V_{CE}=5.0\text{V}$ , $I_C=10\text{mA}$  | 10000 |     |     |      |
|                                      |               | $V_{CE}=5.0\text{V}$ , $I_C=100\text{mA}$ | 10000 |     |     |      |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=10\text{mA}$ , $I_B=0.01\text{mA}$   |       |     | 1.2 | V    |
|                                      |               | $I_C=100\text{mA}$ , $I_B=0.1\text{mA}$   |       |     | 1.5 | V    |
| Base-Emitter On Voltage              | $V_{BE(on)}$  | $I_C=100\text{mA}$ , $V_{CE}=5.0\text{V}$ |       |     | 2.0 | V    |

Note: Pulse Test: Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle $\leq 2.0\%$ .

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