



## DTC123E

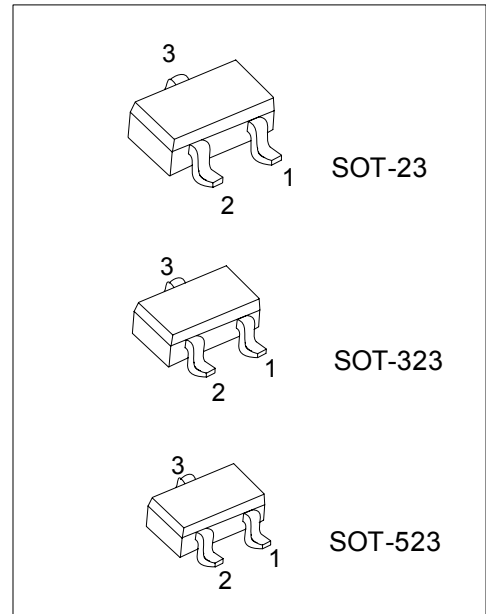
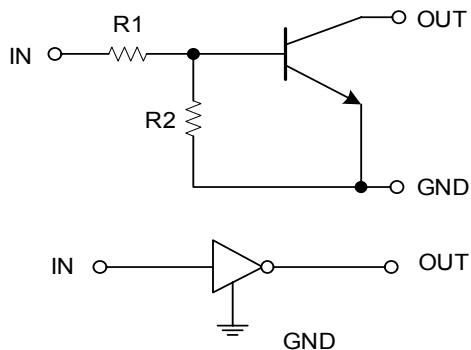
## NPN EPITAXIAL SILICON TRANSISTOR

### DIGITAL TRANSISTORS (BUILT-IN RESISTORS)

#### ■ FEATURES

- \* Built-in bias resistors that implies easy ON/OFF applications.
- \* The bias resistors are thin-film resistors with complete isolation to allow negative input.

#### ■ EQUIVALENT CIRCUIT



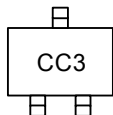
\*Pb-free plating product number:DTC123EL

#### ■ ORDERING INFORMATION

| Order Number    |                   | Package | Pin Assignment |   |   | Packing   |
|-----------------|-------------------|---------|----------------|---|---|-----------|
| Normal          | Lead Free Plating |         | 1              | 2 | 3 |           |
| DTC123E-AE3-6-R | DTC123EL-AE3-6-R  | SOT-23  | G              | I | O | Tape Reel |
| DTC123E-AL3-6-R | DTC123EL-AL3-6-R  | SOT-323 | G              | I | O | Tape Reel |
| DTC123E-AN3-6-R | DTC123EL-AN3-6-R  | SOT-523 | G              | I | O | Tape Reel |

|                                                                                                              |                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>DTC123EL-AE3-6-R</p> <p>(1)Packing Type<br/>(2)Pin Assignment<br/>(3)Package Type<br/>(4)Lead Plating</p> | <p>(1) R: Tape Reel<br/>(2) refer to Pin Assignment<br/>(3) AE3: SOT-23, AL3: SOT-323, AN3: SOT-523<br/>(4) L: Lead Free Plating, Blank: Pb/Sn</p> |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|

#### ■ MARKING



■ **ABSOLUTE MAXIMUM RATINGS** (Ta=25°C)

| PARAMETER            |                | SYMBOL    | RATINGS    | UNIT |
|----------------------|----------------|-----------|------------|------|
| Supply Voltage       |                | $V_{CC}$  | 50         | V    |
| Input Voltage        |                | $V_{IN}$  | -10 ~ +12  | V    |
| Output Current       |                | $I_{OUT}$ | 100        | mA   |
| Power Dissipation    | SOT-523        | $P_D$     | 150        | mW   |
|                      | SOT-23/SOT-323 |           | 200        | mW   |
| Junction Temperature |                | $T_J$     | +150       | °C   |
| Storage Temperature  |                | $T_{STG}$ | -55 ~ +150 | °C   |

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged.

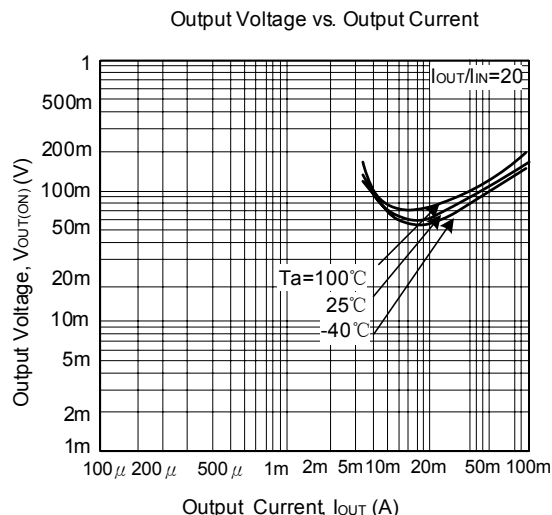
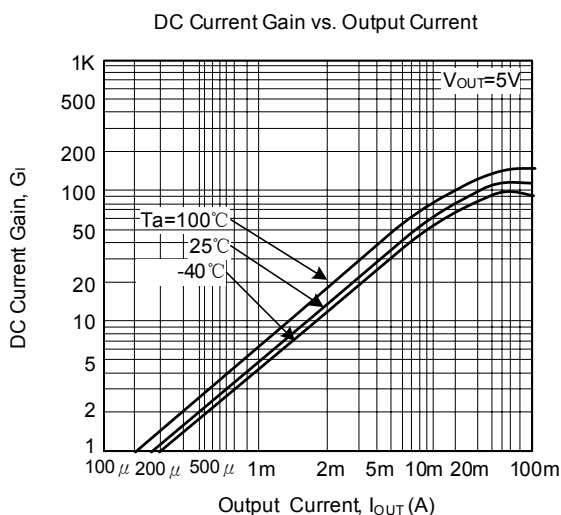
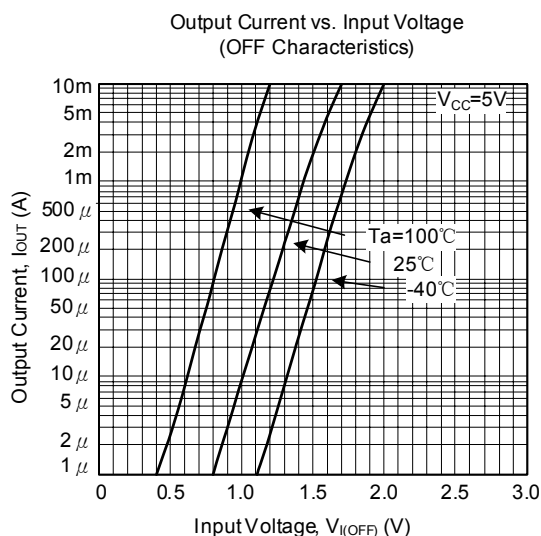
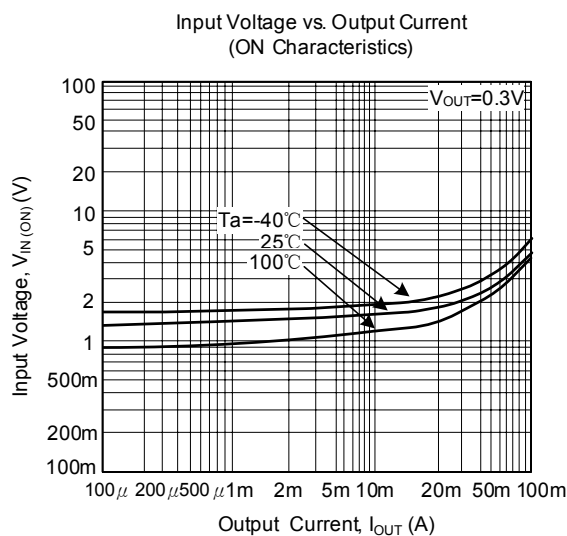
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ **ELECTRICAL SPECIFICATIONS** (Ta=25°C)

| PARAMETER            | SYMBOL         | TEST CONDITIONS                    | MIN  | TYP | MAX  | UNIT       |
|----------------------|----------------|------------------------------------|------|-----|------|------------|
| Input Voltage        | $V_{IN(OFF)}$  | $V_{CC}=5V, I_{OUT}=100\mu A$      |      |     | 0.5  | V          |
|                      | $V_{IN(ON)}$   | $V_{OUT}=0.3V, I_{OUT}=20mA$       | 3    |     |      |            |
| Output Voltage       | $V_{OUT(ON)}$  | $I_{OUT}/I_{IN}=10mA/0.5mA$        |      | 0.1 | 0.3  | V          |
| Input Current        | $I_{IN}$       | $V_{IN}=5V$                        |      |     | 3.8  | mA         |
| Output Current       | $I_{OUT(OFF)}$ | $V_{CC}=50V, V_{IN}=0V$            |      |     | 0.5  | $\mu A$    |
| DC Current Gain      | $G_{IN}$       | $V_{OUT}=5V, I_{OUT}=20mA$         | 20   |     |      |            |
| Input Resistance     | $R_1$          |                                    | 1.54 | 2.2 | 2.86 | K $\Omega$ |
| Resistance Ratio     | $R_2/R_1$      |                                    | 0.8  | 1   | 1.2  |            |
| Transition Frequency | $f_T$          | $V_{CE}=10V, I_E=-5mA, f=100MHz$ * |      | 250 |      | MHz        |

\* Transition frequency of the device

## ■ TYPICAL CHARACTERISTIC



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