



DTD123Y

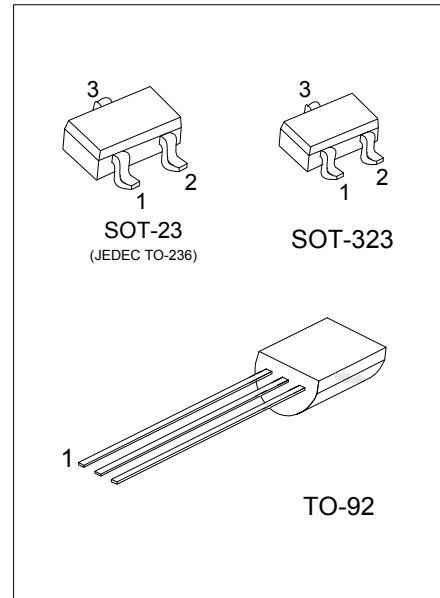
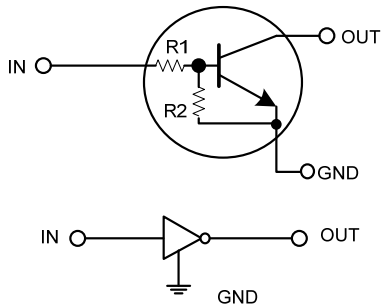
NPN SILICON TRANSISTOR

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



■ ORDERING INFORMATION

| Ordering Number | | Package | Pin Assignment | | | Packing |
|-----------------|----------------|---------|----------------|---|---|-----------|
| Lead Free | Halogen Free | | 1 | 2 | 3 | |
| DTD123YL-AE3-R | DTD123YG-AE3-R | SOT-23 | I | G | O | Tape Reel |
| DTD123YL-AL3-R | DTD123YG-AL3-R | SOT-323 | I | G | O | Tape Reel |
| DTD123YL-T92-B | DTD123YG-T92-B | TO-92 | G | O | I | Tape Box |
| DTD123YL-T92-K | DTD123YG-T92-K | TO-92 | G | O | I | Bulk |

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

| | |
|-----------------------|---|
| <p>DTD123YG-AE3-R</p> | <p>(1) B: Tape Box, K: Bluk, R: Tape Reel</p> <p>(2) AE3: SOT-23, AL3: SOT-323, T92: TO-92</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|-----------------------|---|

■ MARKING

| SOT-23 / SOT-323 | TO-92 |
|------------------|-------|
| | |

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

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|----------------------|----------------|-----------|------------|--------------------|
| Supply voltage | | V_{CC} | 50 | V |
| Input voltage | | V_{IN} | -5 ~ +12 | V |
| Output current | | I_C | 500 | mA |
| Power dissipation | SOT-23/SOT-323 | P_D | 200 | mW |
| | TO-92 | | 625 | mW |
| Junction Temperature | | T_J | +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.

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

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|----------------------|---------------|--|------|-----|------|------------|
| Input Voltage | $V_{IN(OFF)}$ | $V_{CC}=5V, I_{OUT}=100\mu A$ | | | 0.3 | V |
| | $V_{IN(ON)}$ | $V_{OUT}=0.3V, I_{OUT}=20mA$ | 2 | | | |
| Output Voltage | $V_{OUT(ON)}$ | $I_O/I_I=50mA/2.5mA$ | | 0.1 | 0.3 | V |
| Input Current | I_{IN} | $V_{IN}=5V$ | | | 3.6 | mA |
| Output Current | $I_{O(OFF)}$ | $V_{CC}=50V, V_{IN}=0V$ | | | 0.5 | μA |
| DC Current Gain | h_{FE} | $V_{OUT}=5V, I_{OUT}=50mA$ | 56 | | | |
| Input Resistance | R_1 | | 1.54 | 2.2 | 2.86 | K Ω |
| Resistance Ratio | R_2/R_1 | | 3.6 | 4.5 | 5.5 | |
| Transition Frequency | f_T | $V_{CE}=10V, I_E=-50mA, f=100MHz$ (Note) | | 200 | | MHz |

Note: Transition frequency of the device.

TYPICAL CHARACTERISTICS

Fig.1 Input Voltage vs. Output Current (ON Characteristics)

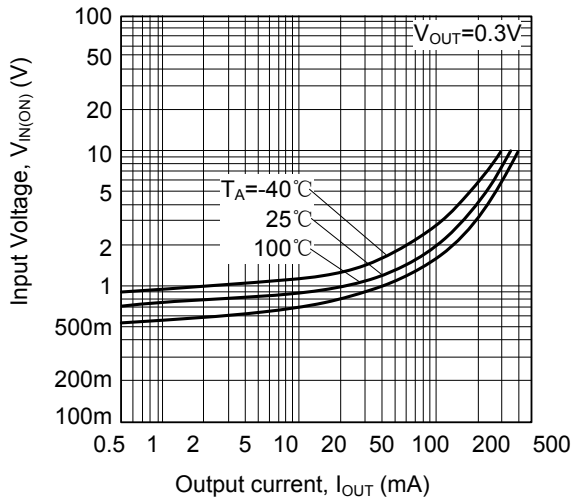


Fig.2 Output Current vs. Input Voltage (OFF Characteristics)

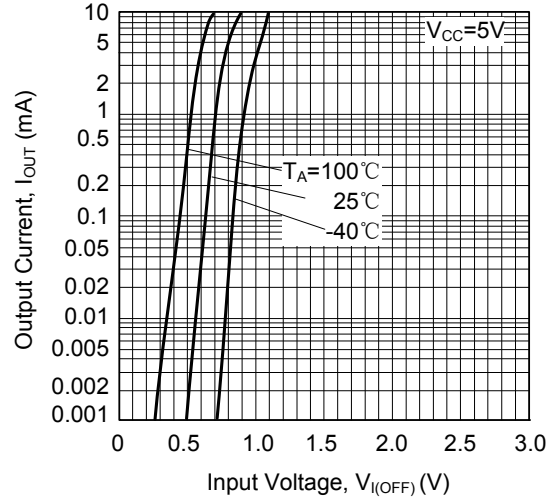


Fig.3 DC Current Gain vs. Output Current

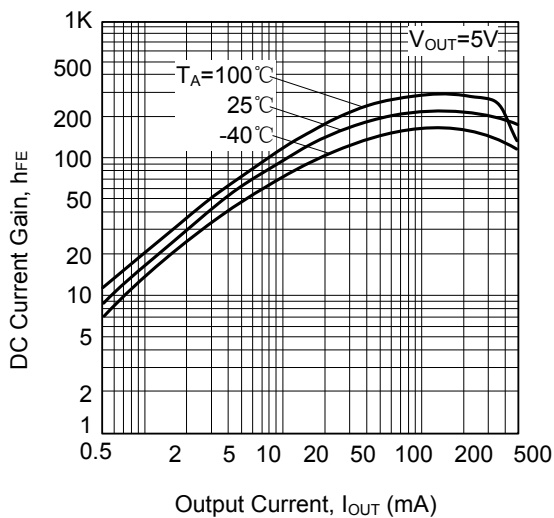
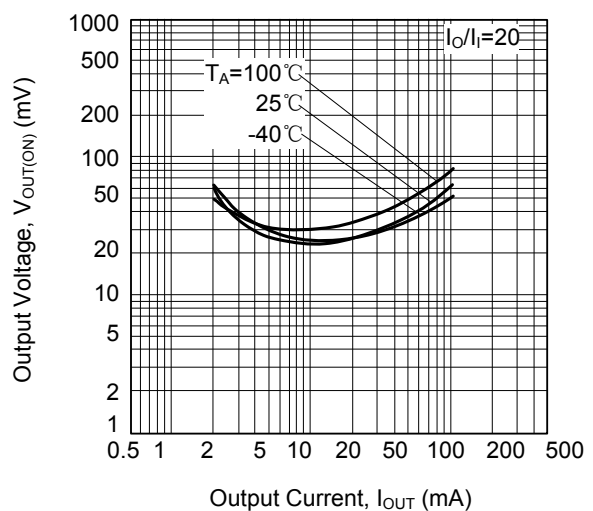


Fig.4 Output Voltage vs. Output Current



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