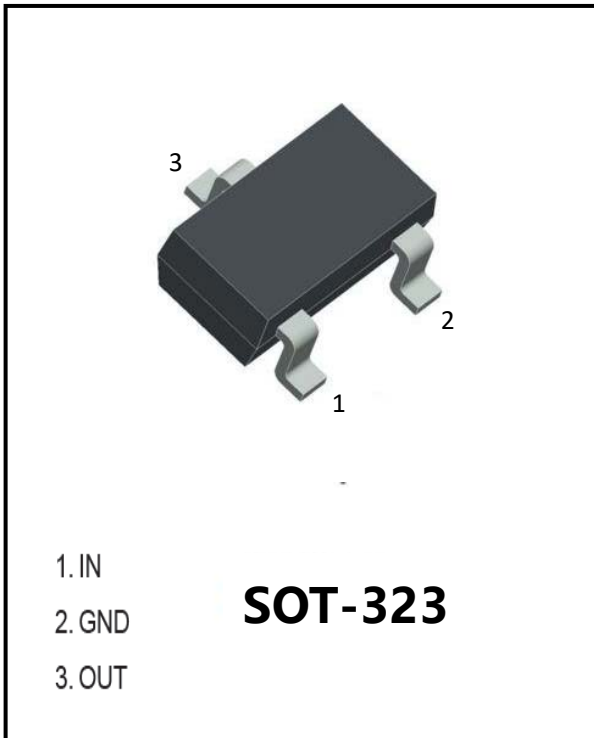


NPN Digital Transistors (Built-in Resistors)



Features

- Epoxy meets UL-94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors
- Only the on/off conditions need to be set for operation, making the circuit design easy
- Simplifies Circuit Design、Reduces Board Space、Reduces Component Count
- Part no. with suffix "Q" means AEC-Q101 qualified

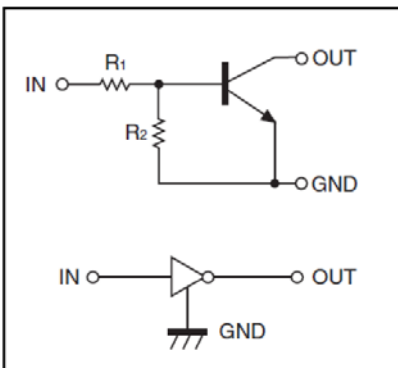
Application

- Control of IC inputs、Switching loads、Digital system

Mechanical Data

- **Package:** SOT-323
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** 24

■Equivalent circuit





DTC114EUAQ

■Maximum Ratings (Ta=25°C Unless otherwise specified)

| Item | Symbol | Unit | Value |
|---------------------------|-----------|------|-------------|
| Collector-Emitter Voltage | V_{CEO} | V | 50 |
| Collector-Base Voltage | V_{CBO} | V | 50 |
| Emitter-Base Voltage | V_{EBO} | V | 10 |
| Supply Voltage | V_{CC} | V | 50 |
| Input Voltage | V_{IN} | V | -10 to +40 |
| Collector Current | I_C | mA | 100 |
| Power Dissipation (*) | P_D | mW | 200 |
| Junction Temperature | T_J | °C | -55 to +150 |
| Storage Temperature | T_{STG} | °C | -55 to +150 |

(*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch

■Electrical Characteristics (Ta=25°C unless otherwise specified)

| Item | Symbol | Unit | Conditions | Min | Typ | Max |
|----------------------|--------------|------------|---------------------------------|-----|-----|-----|
| Input voltage | $V_{I(off)}$ | V | $V_{CC}=5V, I_O=100\mu A$ | 0.5 | | |
| | $V_{I(on)}$ | V | $V_O=0.3V, I_O=10mA$ | | | 3 |
| Output voltage | $V_{O(on)}$ | V | $I_O=10mA, I_I=0.5mA$ | | | 0.3 |
| Output current | $I_{O(off)}$ | μA | $V_{CC}=50V, V_I=0$ | | | 0.1 |
| DC current gain | G_I | | $V_O=5V, I_O=5mA$ | 33 | | |
| Input resistance | R_1 | k Ω | | 7 | 10 | 13 |
| Resistance ratio | R_2/R_1 | | | 0.8 | 1 | 1.2 |
| Transition frequency | f_T | MHz | $V_{CE}=10V, I_C=5mA, f=100MHz$ | | 250 | |

■ Ordering Information (Example)

| Preferred P/N | Packing Code | Unit Weight(G) | Minimum Package(Pcs) | Inner Box Quantity(Pcs) | Outer Carton Quantity(Pcs) | Delivery Mode |
|---------------|--------------|-------------------|----------------------|-------------------------|----------------------------|---------------|
| DTC114EUAQ | F2 | Approximate 0.005 | 3000 | 30000 | 120000 | 7" reel |



■ Characteristics (Typical)

Fig.1 - ON Characteristics

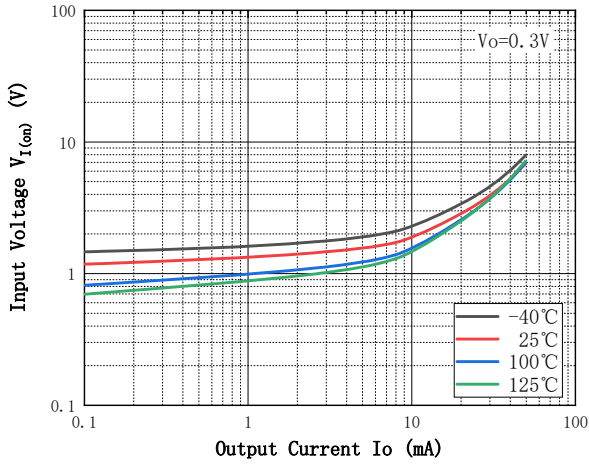


Fig.2 - OFF Characteristics

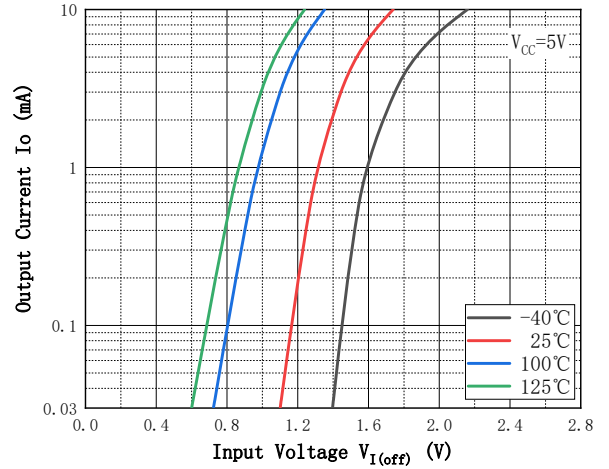


Fig.3 - Output Voltage Characteristics

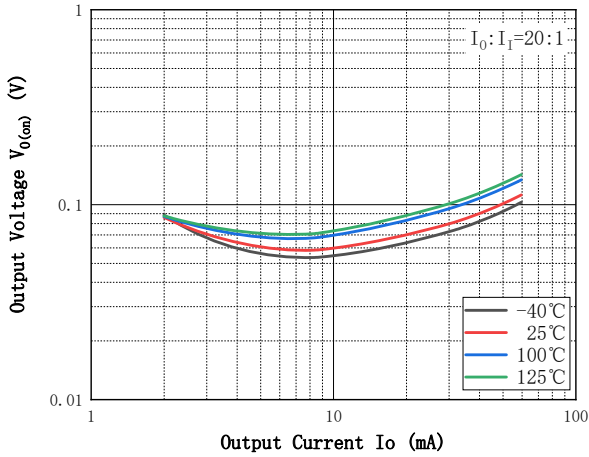


Fig.4 - DC Current Gain Characteristics

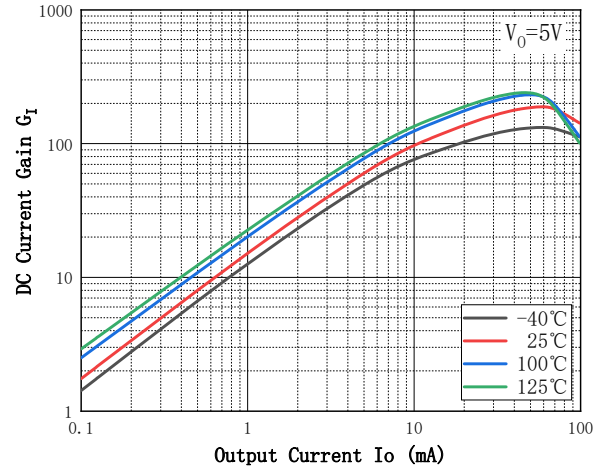
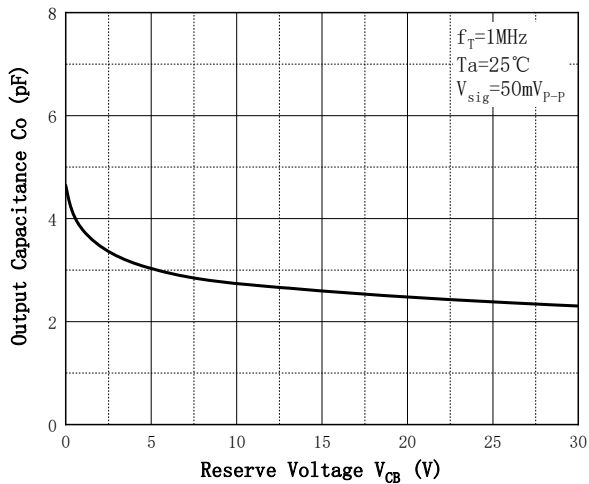


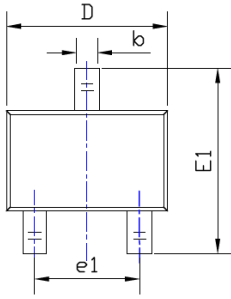
Fig.5 - C_o — V_{CB}



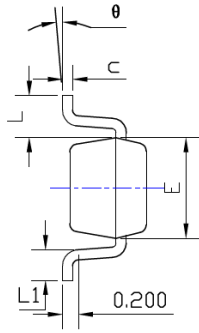


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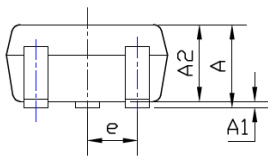
■ SOT-323 Package Outline Dimensions & Suggested Pad Layout



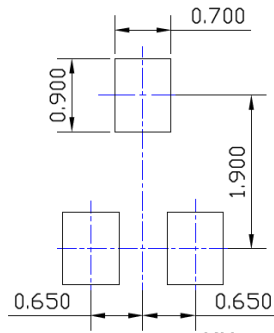
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

| SYMBOL | DIMENSIONS | | | |
|--------|------------|-------|------------|-------|
| | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.035 | 0.043 | 0.900 | 1.100 |
| A1 | 0.000 | 0.004 | 0.000 | 0.100 |
| A2 | 0.035 | 0.039 | 0.900 | 1.000 |
| b | 0.006 | 0.016 | 0.150 | 0.400 |
| c | 0.004 | 0.010 | 0.100 | 0.250 |
| D | 0.071 | 0.087 | 1.800 | 2.200 |
| E | 0.045 | 0.053 | 1.150 | 1.350 |
| E1 | 0.085 | 0.096 | 2.150 | 2.450 |
| e | 0.026TYP | | 0.650TYP | |
| e1 | 0.047 | 0.055 | 1.200 | 1.400 |
| L | 0.021REF | | 0.525REF | |
| L1 | 0.010 | 0.018 | 0.260 | 0.460 |
| θ | 0° | 8° | 0° | 8° |

NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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