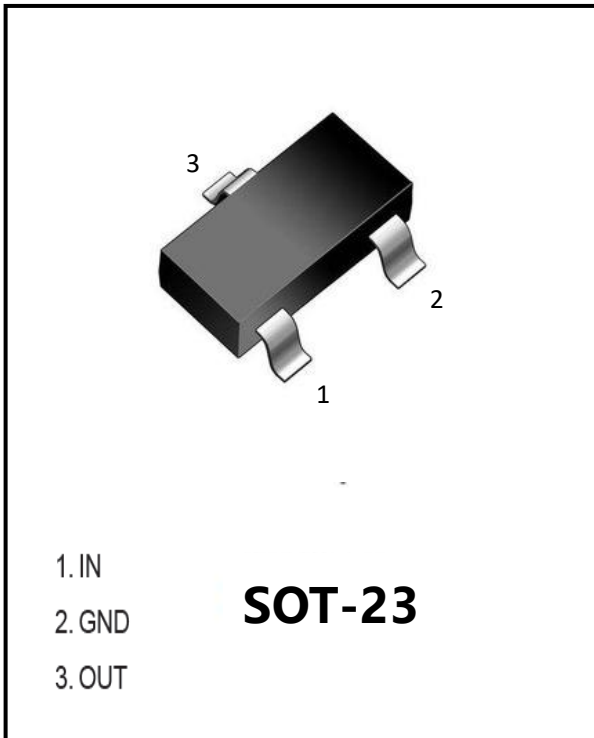


NPN Digital Transistors (Built-in Resistors)



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

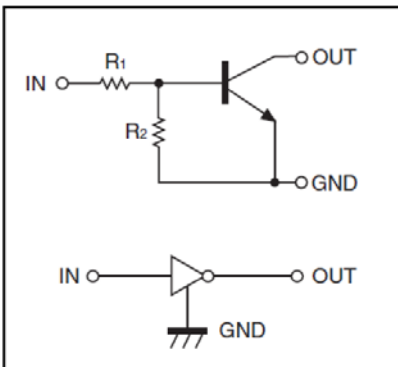
Application

- Control of IC inputs、Switching loads、Digital system

Mechanical Data

- **Package:** SOT-23
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** 64

■Equivalent circuit





DTC114YCAQ

■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 | 6 |
| Supply Voltage | V_{CC} | V | 50 |
| Input Voltage | V_{IN} | V | -6 to +40 |
| Collector Current | I_C | mA | 100 |
| Power Dissipation (*) | P_D | mW | 200 |
| Thermal Resistance From Junction to Ambient (*) | $R_{\theta JA}$ | °C/W | 625 |
| 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 | $V_{CC}=5V, I_o=100\mu A$ | 0.3 | | |
| | $V_{I(on)}$ | V | $V_o=0.3V, I_o=1mA$ | | | 1.4 |
| Output voltage | $V_{O(on)}$ | V | $I_o=5mA, I_i=0.25mA$ | | | 0.3 |
| Input current | I_i | mA | $V_i=5V$ | | | 0.88 |
| Output current | $I_{O(off)}$ | μA | $V_{CC}=50V, V_i=0$ | | | 0.5 |
| DC current gain | G_i | | $V_o=5V, I_o=20mA$ | 68 | | |
| Input resistance | R_1 | k Ω | | 7 | 10 | 13 |
| Resistance ratio | R_2/R_1 | | | 3.7 | 4.7 | 5.7 |
| 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 |
|---------------|--------------|------------------|----------------------|-------------------------|----------------------------|---------------|
| DTC114YCAQ | F2 | Approximate 0.01 | 3000 | 30000 | 120000 | 7" reel |



■ Characteristics (Typical)

Fig.1 - ON Characteristics

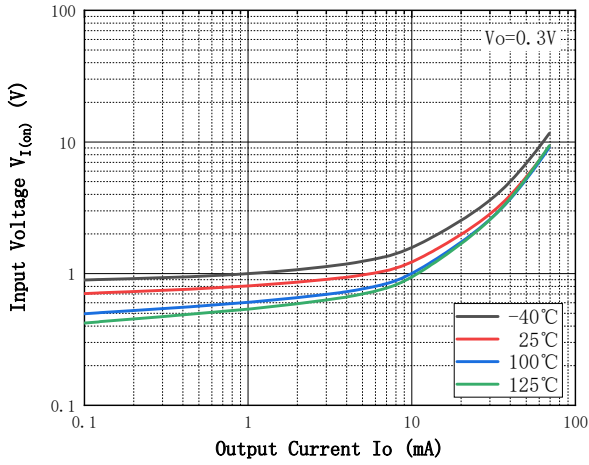


Fig.2 - OFF Characteristics

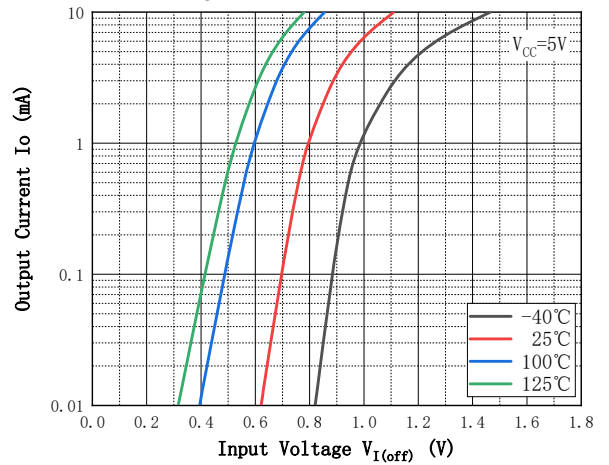


Fig.3 - Output Voltage Characteristics

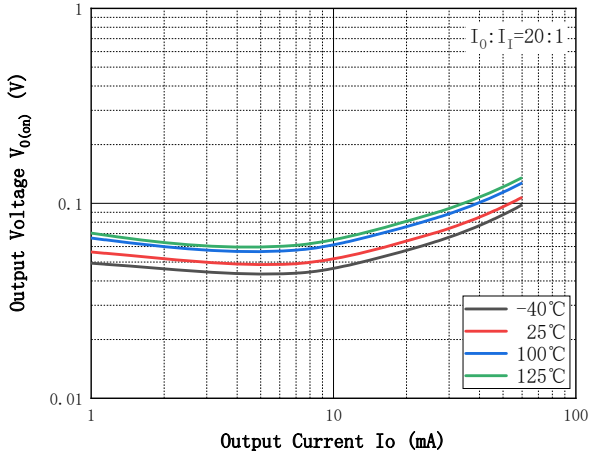


Fig.4 - DC Current Gian Characteristics

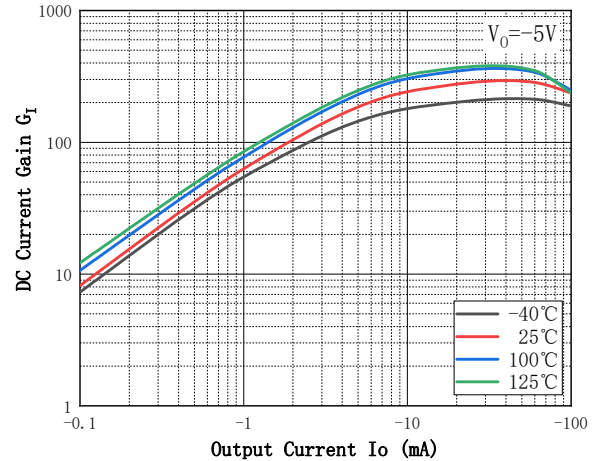


Fig.5 - $C_o - V_{CB}$

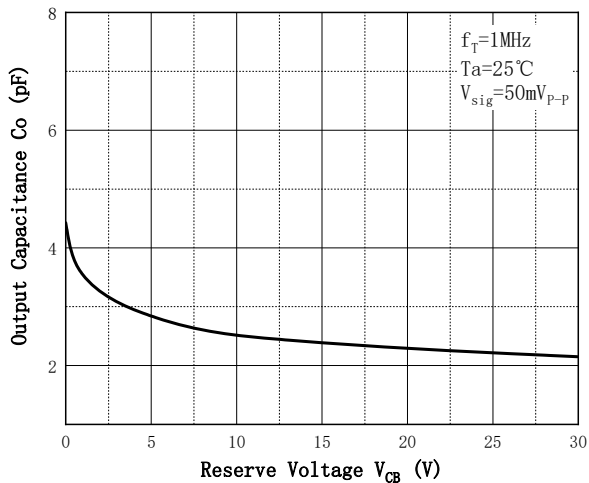
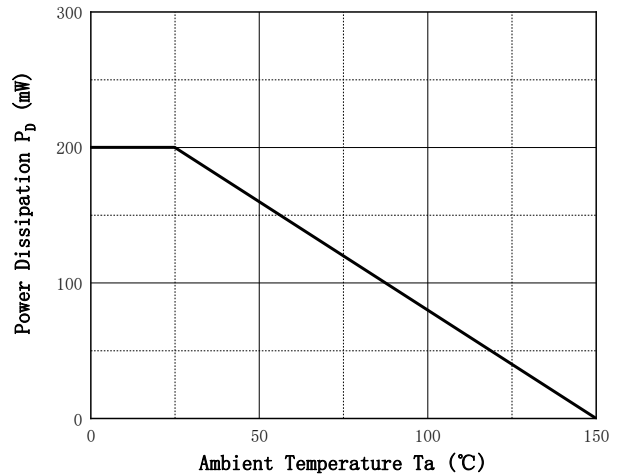


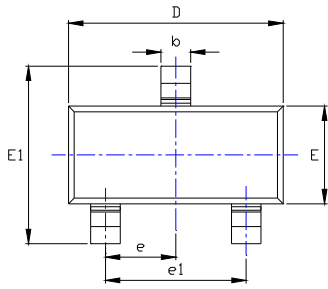
Fig.6 - Power Derating Curve



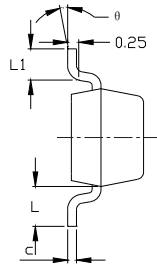


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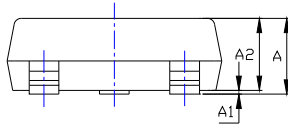
■SOT-23 Package Outline Dimensions & Suggested Pad Layout



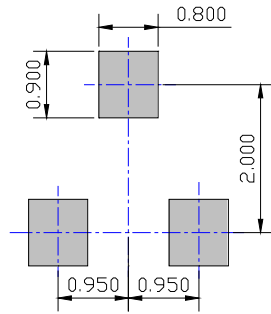
TOP VIEW



SIDE VIEW



SIDE VIEW



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

| SYMBOL | DIMENSIONS | | | |
|--------|------------|-------|------------|-------|
| | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.035 | 0.045 | 0.900 | 1.150 |
| A1 | 0.000 | 0.004 | 0.000 | 0.100 |
| A2 | 0.035 | 0.041 | 0.900 | 1.050 |
| b | 0.012 | 0.020 | 0.300 | 0.500 |
| c | 0.004 | 0.008 | 0.100 | 0.200 |
| D | 0.110 | 0.118 | 2.800 | 3.000 |
| E | 0.047 | 0.055 | 1.200 | 1.400 |
| E1 | 0.089 | 0.100 | 2.250 | 2.550 |
| e | 0.037 TYP | | 0.950 TYP | |
| e1 | 0.071 | 0.079 | 1.800 | 2.000 |
| L | 0.022 REF | | 0.550 REF | |
| L1 | 0.012 | 0.020 | 0.300 | 0.500 |
| 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.



DTC114YCAQ

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