JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD

# Digital Transistors (Built-in Resistors)

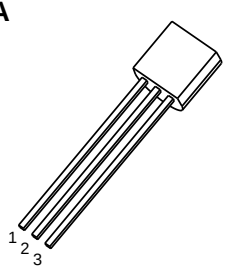
## DTC113ZVA DIGITAL TRANSISTOR (NPN)

### FEATURE

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors(see equivalent circuit)
- The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input.They also have the advantage of almost completely eliminating parasitic effects
- Only the on/off conditions need to be set for operation, making device design easy

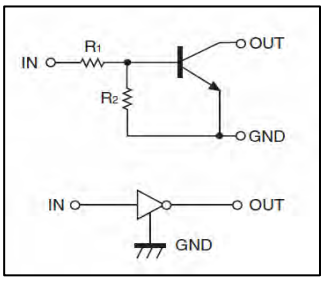
### PIN CONNENCTIONS and EQUIVALENT CIRCUIT

**DTC113ZVA** **TO-92**




1. GND
2. OUT
3. IN

**Equivalent Circuit**




### MAXIMUM RATINGS(Ta=25℃ unless otherwise noted)

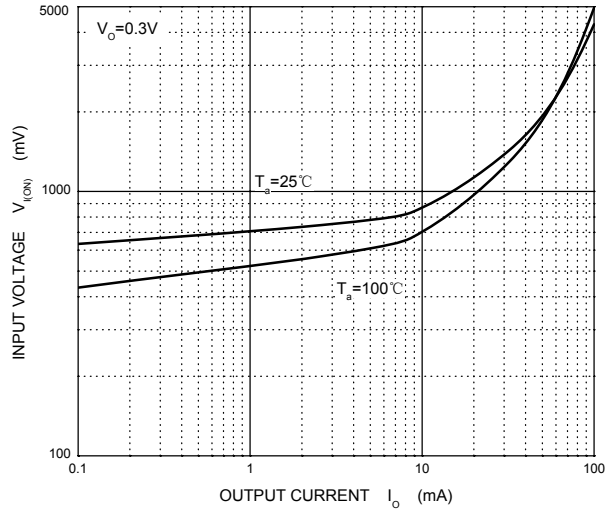
| Symbol | Parameter | Limit | Unit |
|---|---|---|---|
| $V_{CC}$ | Supply Voltage | 50 | V |
| $V_{IN}$ | Input Voltage | -5～+10 | V |
| $I_O$ | Output Current | 100 | mA |
| $P_D$ | Power Dissipation | 625 | mW |
| $T_j$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -55～+150 | ℃ |

### ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)

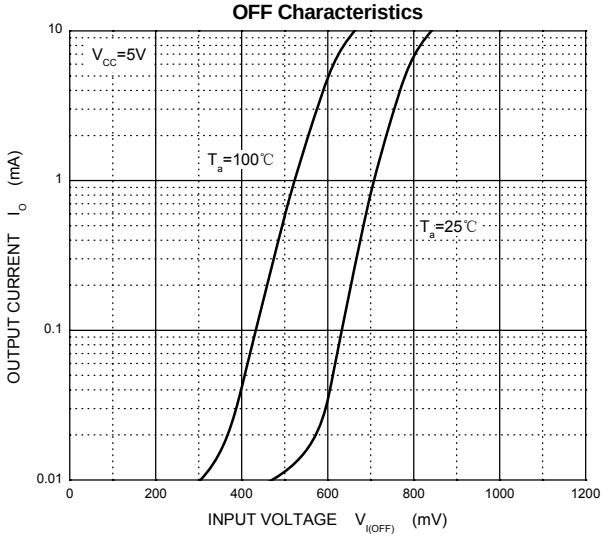
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Input voltage** | $V_{I(off)}$ | $V_{CC}$=5V,$I_O$=100μA | 0.3 | | | V |
| | $V_{I(on)}$ | $V_O$=0.3V,$I_O$=20mA | | | 3 | V |
| **Output voltage** | $V_{O(on)}$ | $I_O/I_I$=10mA/0.5mA | | | 0.3 | V |
| **Input current** | $I_I$ | $V_I$=5V | | | 7.2 | mA |
| **Output current** | $I_{O(off)}$ | $V_{CC}$=50V,$V_I$=0 | | | 0.5 | μA |
| **DC current gain** | $G_I$ | $V_O$=5V,$I_O$=5mA | 33 | | | |
| **Input resistance** | $R_1$ | | 0.7 | 1 | 1.3 | kΩ |
| **Resistance ratio** | $R_2/R_1$ | | 8 | 10 | 12 | |
| **Transition frequency** | $f_T$ | $V_O$=10V ,$I_O$=5mA,f=100MHz | | 250 | | MHz |

# Typical Characteristics

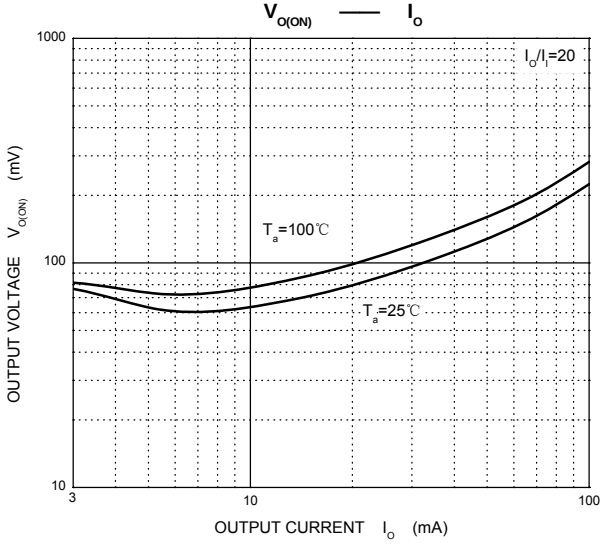
**ON Characteristics**



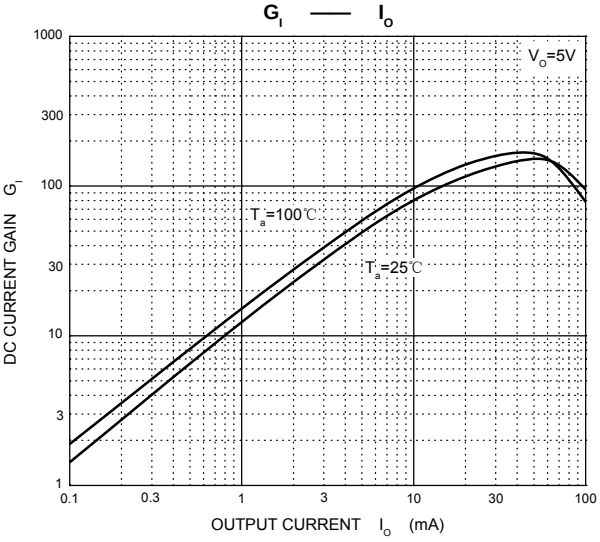

**OFF Characteristics**



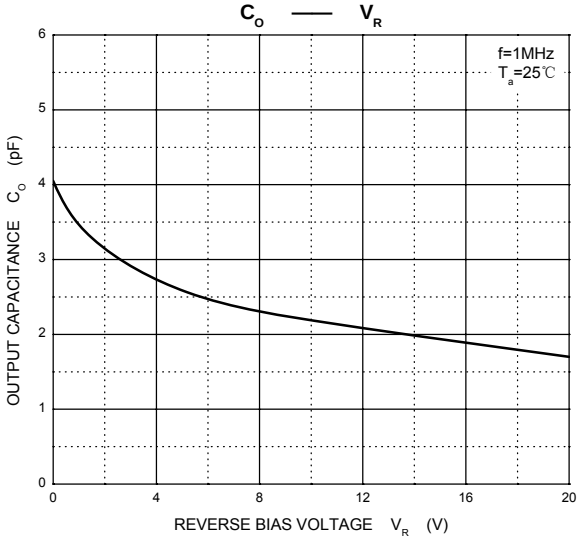

**$V_{O(ON)}$ —— $I_O$**



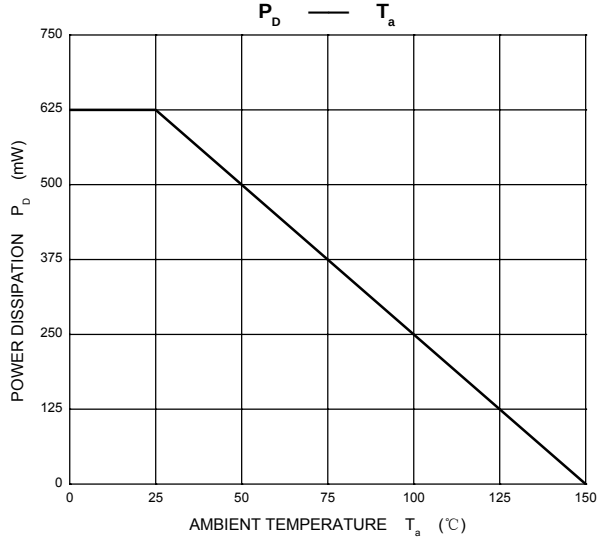

**$G_I$ —— $I_O$**



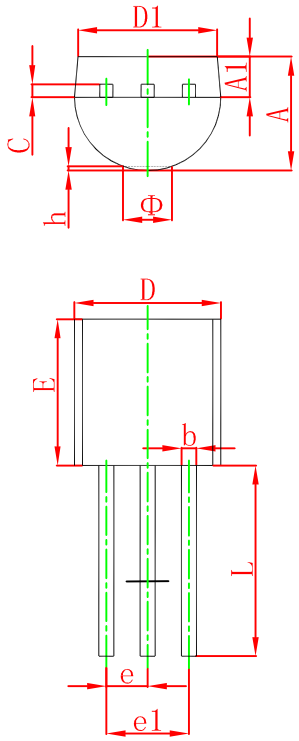

**$C_O$ —— $V_R$**




**$P_D$ —— $T_a$**

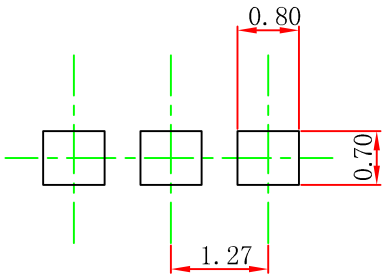


## TO-92 Package Outline Dimensions



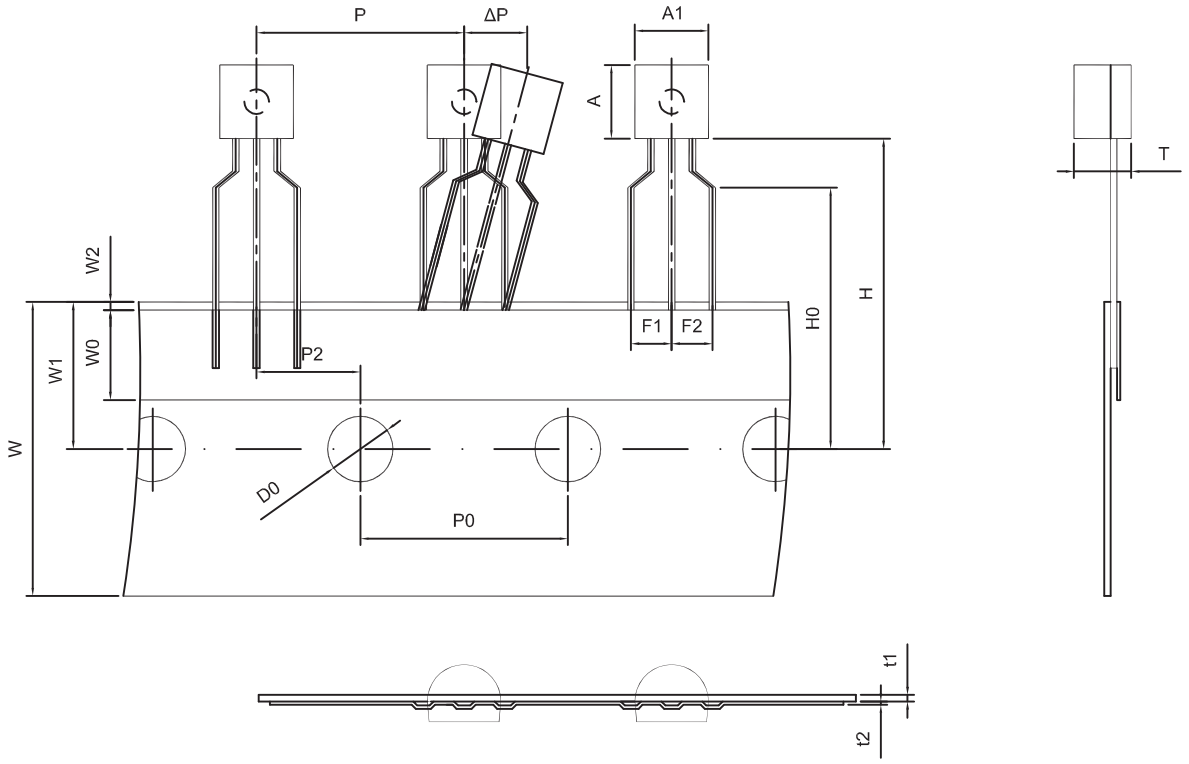

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 3.300 | 3.700 | 0.130 | 0.146 |
| A1 | 1.100 | 1.400 | 0.043 | 0.055 |
| b | 0.380 | 0.550 | 0.015 | 0.022 |
| c | 0.360 | 0.510 | 0.014 | 0.020 |
| D | 4.300 | 4.700 | 0.169 | 0.185 |
| D1 | 3.430 | | 0.135 | |
| E | 4.300 | 4.700 | 0.169 | 0.185 |
| e | 1.270 TYP | | 0.050 TYP | |
| e1 | 2.440 | 2.640 | 0.096 | 0.104 |
| L | 14.100 | 14.500 | 0.555 | 0.571 |
| Φ | | 1.600 | | 0.063 |
| h | 0.000 | 0.380 | 0.000 | 0.015 |

## TO-92 Suggested Pad Layout

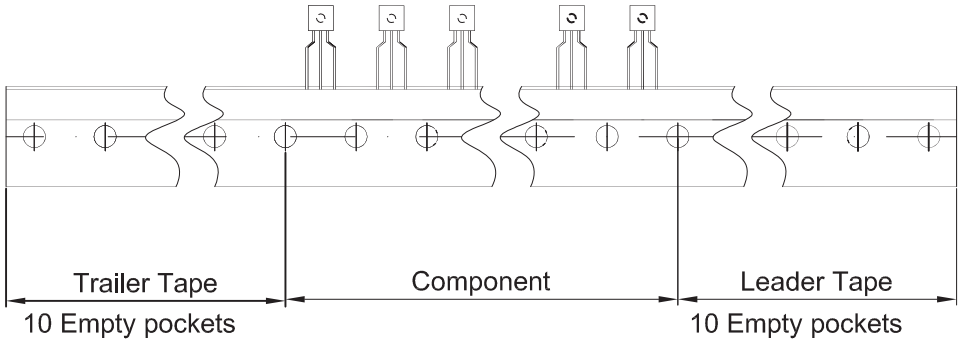



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

## TO-92 PACKAGE TAPEING DIMENSION




| Dimiensions are in millimeter | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| A1 | A | T | P | P0 | P2 | F1 | F2 | W |
| 4.5 | 4.5 | 3.5 | 12.7 | 12.7 | 6.35 | 2.5 | 2.5 | 18.0 |
| W0 | W1 | W2 | H | H0 | D0 | t1 | t2 | ΔP |
| 6.0 | 9.0 | 1.0 MAX. | 19.0 | 16.0 | 4.0 | 0.4 | 0.2 | 0 |




| Package | Box | Box Size(mm) | Carton | Carton Size(mm) |
|---|---|---|---|---|
| TO-92 | 2000 pcs | 333×162×43 | 20,000 pcs | 350×340×250 |