

**Features**

- Built-In Bias Resistors Enable the Configuration of an Inverter Circuit Without Connecting External Input Resistors
- 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
- Halogen Free. "Green" Device (Note 1)
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

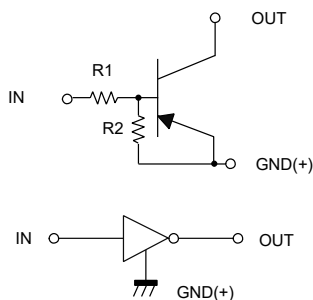
**Maximum Ratings @ 25°C Unless Otherwise Noted**

| Parameter            | Symbol       | Min | Typ  | Max | Unit |
|----------------------|--------------|-----|------|-----|------|
| Supply Voltage       | $V_{CC}$     | --- | -50  | --- | V    |
| Input Voltage        | $V_{IN}$     | -30 | ---  | 5.0 | V    |
| Output Current       | $I_O$        | --- | -100 | --- | mA   |
|                      | $I_{C(Max)}$ | --- | -100 | --- | mA   |
| Power Dissipation    | $P_D$        | --- | 200  | --- | mW   |
| Junction Temperature | $T_J$        | --- | ---  | 150 | °C   |
| Storage Temperature  | $T_{stg}$    | -55 | ---  | 150 | °C   |

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

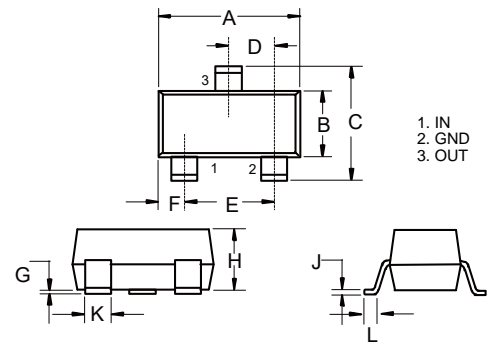
**Device Marking: 113**

**Internal Structure**



**PNP  
Digital Transistor**

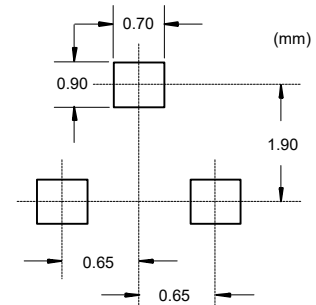
**SOT-323**



**DIMENSIONS**

| DIM | INCHES |       | MM   |      | NOTE |
|-----|--------|-------|------|------|------|
|     | MIN    | MAX   | MIN  | MAX  |      |
| A   | 0.071  | 0.087 | 1.80 | 2.20 |      |
| B   | 0.045  | 0.053 | 1.15 | 1.35 |      |
| C   | 0.083  | 0.096 | 2.10 | 2.45 |      |
| D   | 0.026  |       | 0.65 |      | TYP. |
| E   | 0.047  | 0.055 | 1.20 | 1.40 |      |
| F   | 0.012  | 0.016 | 0.30 | 0.40 |      |
| G   | 0.000  | 0.004 | 0.00 | 0.10 |      |
| H   | 0.035  | 0.044 | 0.90 | 1.10 |      |
| J   | 0.002  | 0.010 | 0.05 | 0.25 |      |
| K   | 0.006  | 0.016 | 0.15 | 0.40 |      |
| L   | 0.010  | 0.018 | 0.26 | 0.46 |      |

**Suggested Solder Pad Layout**



**Electrical Characteristics @ 25°C Unless Otherwise Specified**

| Parameter            | Symbol       | Min  | Typ | Max  | Unit       | Conditions                       |
|----------------------|--------------|------|-----|------|------------|----------------------------------|
| Input Voltage        | $V_{I(off)}$ | -0.5 | --- | ---  | V          | $V_{CC}=-5V, I_O=-100\mu A$      |
|                      | $V_{I(on)}$  | ---  | --- | -1.3 | V          | $V_O=-0.3V, I_O=-5mA$            |
| Output Voltage       | $V_{O(on)}$  | ---  | --- | -0.3 | V          | $I_O=-5mA, I_I=-0.25mA$          |
| Input Current        | $I_I$        | ---  | --- | -1.8 | mA         | $V_I=-5V$                        |
| Output Current       | $I_{O(off)}$ | ---  | --- | -0.5 | $\mu A$    | $V_{CC}=-50V, V_I=0$             |
| DC Current Gain      | $G_1$        | 80   | --- | ---  |            | $V_O=-5V, I_O=-10mA$             |
| Input Resistance     | $R_1$        | 3.29 | 4.7 | 6.11 | K $\Omega$ |                                  |
| Resistance Ratio     | $R_2/R_1$    | 8.0  | 10  | 12   |            |                                  |
| Transition Frequency | $f_T$        | ---  | 250 | ---  | MHz        | $V_{CE}=-10V, I_E=5mA, f=100MHz$ |

Curve Characteristics

Fig. 1 - DC Current Gain Characteristics

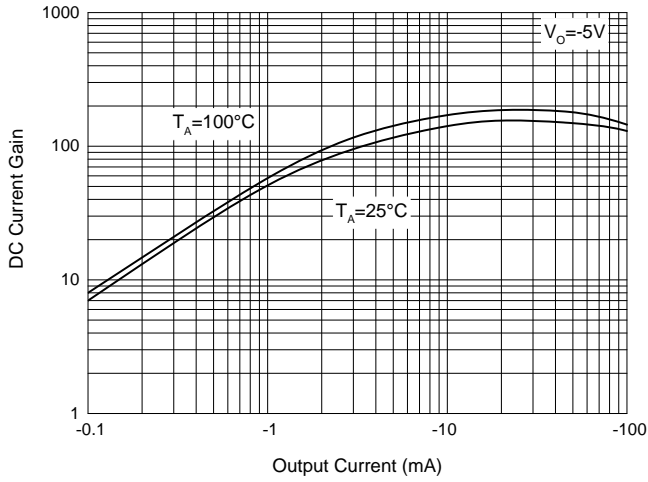


Fig. 2 - Input Voltage (on) Characteristics

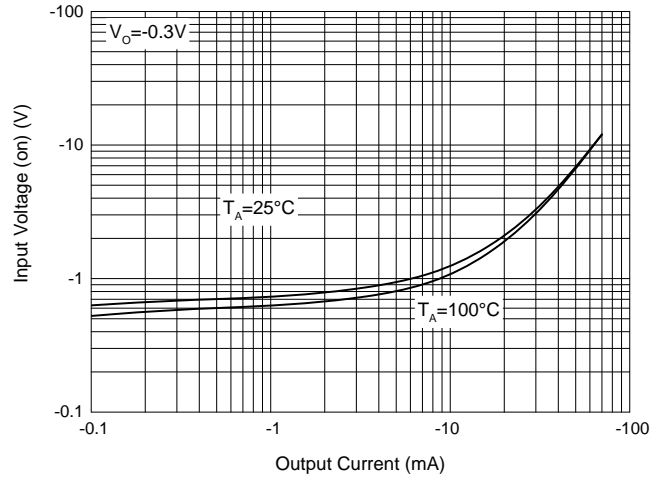


Fig. 3 - Input Voltage (off) Characteristics

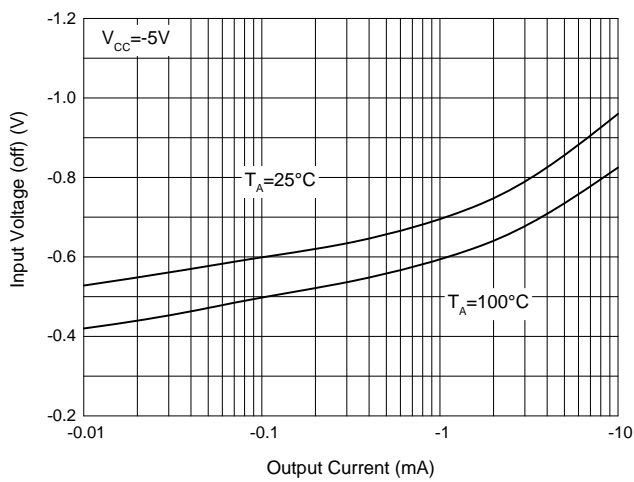


Fig. 4 - Output Voltage Characteristics

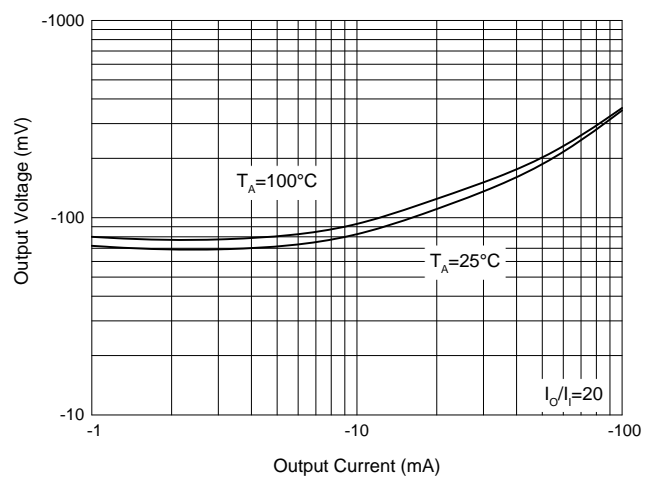
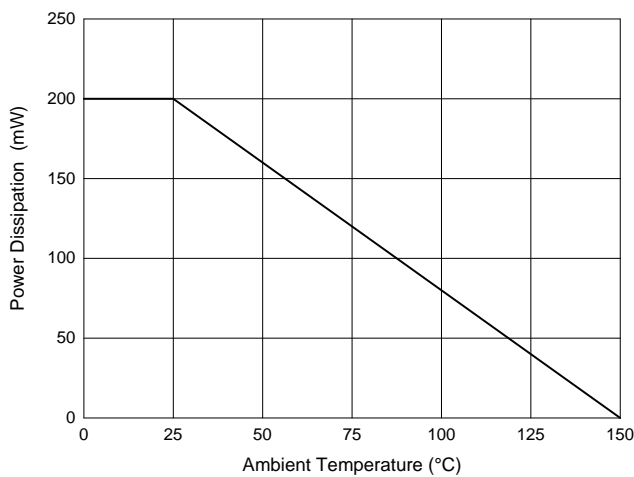


Fig. 5 - Power Derating Curve



## Ordering Information

| Device         | Packing              |
|----------------|----------------------|
| Part Number-TP | Tape&Reel:3Kpcs/Reel |

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