

## Features

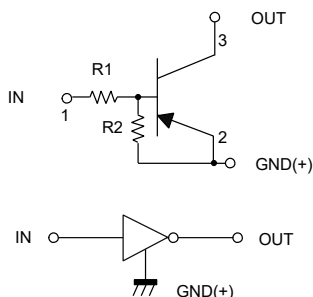
- Built-In Bias Resistors Enable the Configuration of an Inverter Circuit Without Connecting External Input Resistors
- The Bias Resistors Consist of Thin-Film Resistors With Complete Isolation to Allow Negative Biasing of the Input. They Also Have the Advantage of Almost Completely Eliminating Parasitic Effects
- Only the On/Off Conditions Need to Be Set For Operation, Making Device Design Easy
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- 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 Specified

| Parameter            | Symbol       | Min | Typ  | Max | Unit |
|----------------------|--------------|-----|------|-----|------|
| Supply Voltage       | $V_{CC}$     | --- | -50  | --- | V    |
| Input Voltage        | $V_{IN}$     | -30 | ---  | 10  | V    |
| Output Current       | $I_O$        | --- | -100 | --- | mA   |
|                      | $I_{C(Max)}$ | --- | -100 | --- | mA   |
| Power Dissipation    | $P_D$        | --- | 150  | --- | mW   |
| Junction Temperature | $T_J$        | --- | 150  | --- | °C   |
| Storage Temperature  | $T_{stg}$    | -55 | ---  | 150 | °C   |

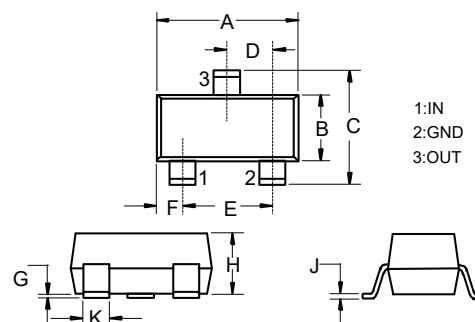
## Device Marking: 13

### Internal Structure



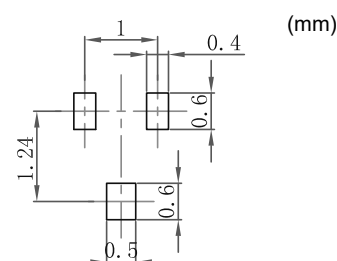
## PNP Digital Transistor

### SOT-523



| DIMENSIONS |        |       |      |      |      |
|------------|--------|-------|------|------|------|
| DIM        | INCHES |       | MM   |      | NOTE |
|            | MIN    | MAX   | MIN  | MAX  |      |
| A          | 0.059  | 0.067 | 1.50 | 1.70 |      |
| B          | 0.030  | 0.033 | 0.75 | 0.85 |      |
| C          | 0.057  | 0.069 | 1.45 | 1.75 |      |
| D          | 0.020  |       | 0.50 |      | TYP. |
| E          | 0.035  | 0.043 | 0.90 | 1.10 |      |
| G          | 0.000  | 0.004 | 0.00 | 0.10 |      |
| H          | 0.028  | 0.031 | 0.70 | 0.80 |      |
| J          | 0.004  | 0.008 | 0.10 | 0.20 |      |
| K          | 0.006  | 0.014 | 0.15 | 0.35 |      |

### 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          | $V_{CC}=-5V, I_O=-100\mu A$      |
|                      | $V_{I(on)}$  | ---  | --- | -3.0 | V          | $V_O=-0.3V, I_O=-20mA$           |
| Output Voltage       | $V_{O(on)}$  | ---  | --- | -0.3 | V          | $I_O=-10mA, I_I=-0.5mA$          |
| 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      | $G_I$        | 30   | --- | ---  |            | $V_O=-5V, I_O=-10mA$             |
| Input Resistance     | $R_I$        | 3.29 | 4.7 | 6.11 | K $\Omega$ |                                  |
| Resistance Ratio     | $R_2/R_1$    | 0.8  | 1.0 | 1.2  |            |                                  |
| Transition Frequency | $f_T$        | ---  | 250 | ---  | MHz        | $V_{CE}=-10V, I_E=5mA, f=100MHz$ |

## Curve Characteristics

Fig. 1 - DC Current Gain Characteristics

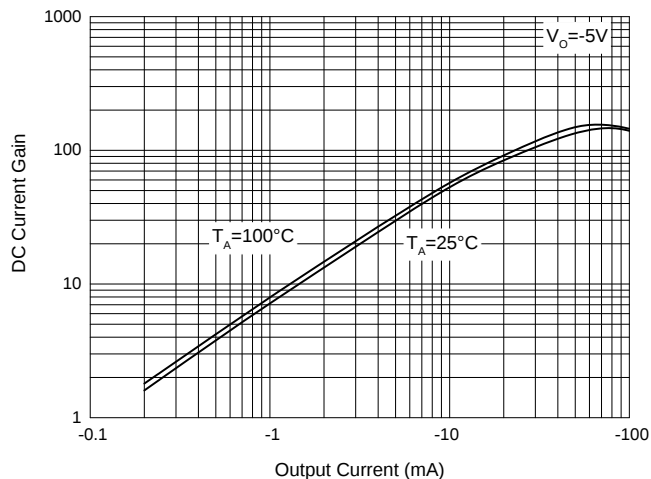


Fig. 2 - Input Voltage (on) Characteristics

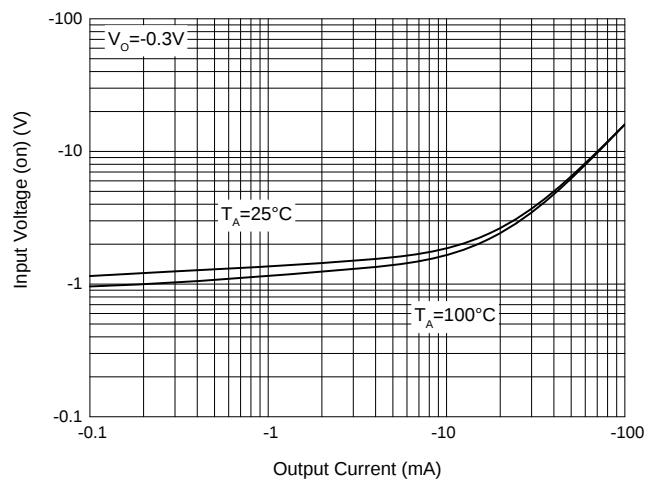


Fig. 3 - Input Voltage (off) Characteristics

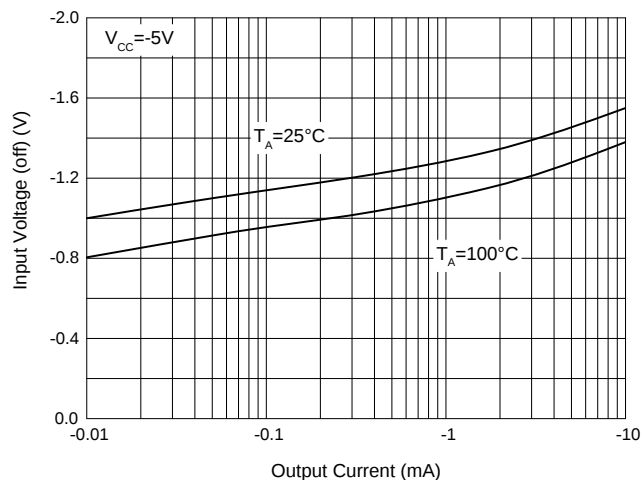


Fig. 4 - Output Voltage Characteristics

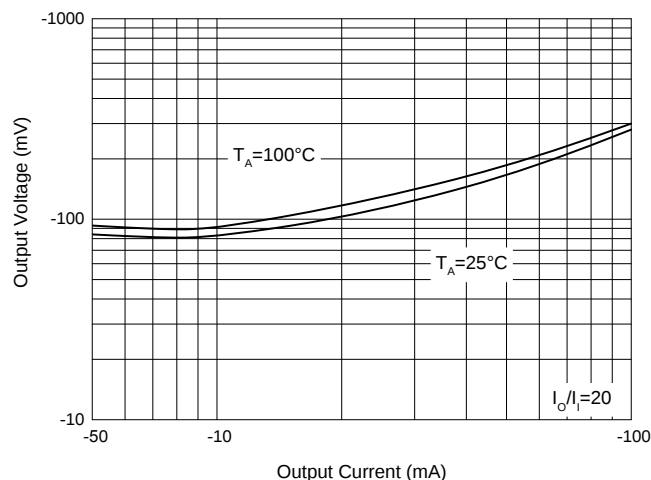
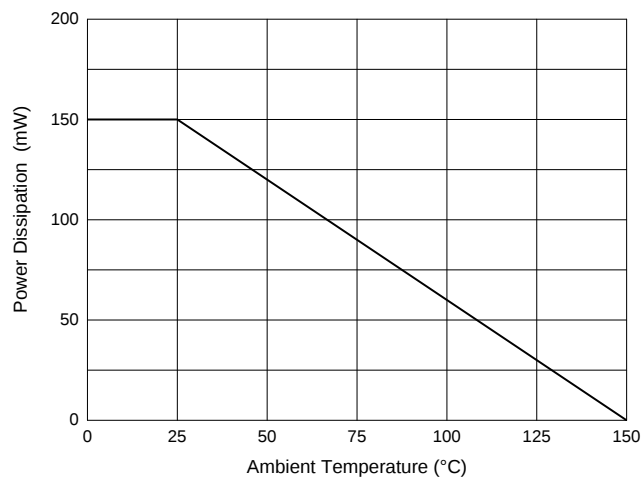


Fig. 5 - Power Derating Curve



## Ordering Information

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

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331