# General Purpose PNP Transistor

## FEATURES

- Low $V_{CE(SAT)}$ -0.4 @ $I_C$ / $I_B$ = -150mA / -15mA
- PNP Silicon Transistor
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

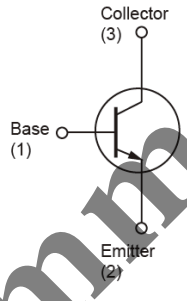
## APPLICATION

- Consumer electronics
- General purpose amplification

| KEY PERFORMANCE PARAMETERS | | | |
|---|---|---|---|
| **PARAMETER** | | **VALUE** | **UNIT** |
| $BV_{CBO}$ | | -60 | V |
| $BV_{CEO}$ | | -60 | V |
| $I_C$ | | -0.6 | A |
| $V_{CE(SAT)}$ | $I_C$=-150mA, $I_B$=-15mA | -0.4 | V |

Pb-Free RoHS COMPLIANT HALOGEN FREE

**SOT-23**


**Notes:** MSL 1 (Moisture Sensitivity Level) per J-STD-020

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **LIMIT** | **UNIT** |
| Collector-Base Voltage | $V_{CBO}$ | -60 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | -60 | V |
| Emitter-Base Voltage | $V_{EBO}$ | -5 | V |
| Collector Current | $I_C$ | -0.6 | A |
| Collector Power Dissipation | $P_D$ | 225 | mW |
| Operating Junction Temperature | $T_J$ | +150 | °C |
| Operating Junction and Storage Temperature Range | $T_{STG}$ | - 55 to +150 | °C |

**Note:** Single pulse, Pw ≤ 380μs, Duty ≤ 2%

| THERMAL PERFORMANCE | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **LIMIT** | **UNIT** |
| Junction to Ambient Thermal Resistance | $R_{\Theta JA}$ | 556 | °C/W |

| ELECTRICAL SPECIFICATIONS ($T_A$ = 25°C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **CONDITIONS** | **SYMBOL** | **MIN** | **TYP** | **MAX** | **UNIT** |
| **Static** (Note 1) | | | | | | |
| Collector-Base Breakdown Voltage | $I_C$=-10μA, $I_E$=0 | $BV_{CBO}$ | -60 | -- | -- | V |
| Collector-Emitter Breakdown Voltage | $I_C$=-10mA, $I_B$=0 | $BV_{CEO}$ | -60 | -- | -- | V |
| Emitter-Base Breakdown Voltage | $I_E$=-10μA, $I_C$=0 | $BV_{EBO}$ | -5 | -- | -- | V |
| Collector Cutoff Current | $V_{CB}$=-50V, $I_E$=0 | $I_{CBO}$ | -- | -- | -10 | nA |
| Emitter Cutoff Current | $V_{EB}$=-0.5V, $V_{CE}$=-30V | $I_{EBO}$ | -- | -- | -50 | nA |
| Collector-Emitter Saturation Voltage | $I_C/I_B$ =-150mA /-15mA | *$V_{CE(SAT)}$ | -- | -- | -0.4 | V |
| Base-Emitter Saturation Voltage | $I_C/I_B$ =-500mA /-50mA | *$V_{BE(SAT)}$ | -- | -- | -1.3 | V |
| DC Current Transfer Ratio | $V_{CE}$ =-10V, $I_C$=-0.1A | *$h_{FE}$ 1 | 75 | -- | -- | |
| | $V_{CE}$ =-10V, $I_C$=-150mA | *$h_{FE}$ 2 | 100 | -- | 300 | |
| Transition Frequency | $V_{CE}$ =-5V, $I_C$=-50mA, f=100MHz | $f_T$ | 200 | -- | -- | MHz |
| Output Capacitance | $V_{CB}$ = -10V, f=1MHz | Cob | -- | -- | 8 | pF |

**Note:** Pulse test: ≤ 380μs, duty cycle ≤ 2%

## ORDERING INFORMATION

| ORDERING CODE | PACKAGE | PACKING |
|---|---|---|
| TSA1036CX RFG | SOT-23 | 3,000pcs / 7” Reel |

## ELECTRICAL CHARACTERICS CURVES ($T_A$=25°C, unless otherwise noted)

**Figure 1. DC Current Gain**

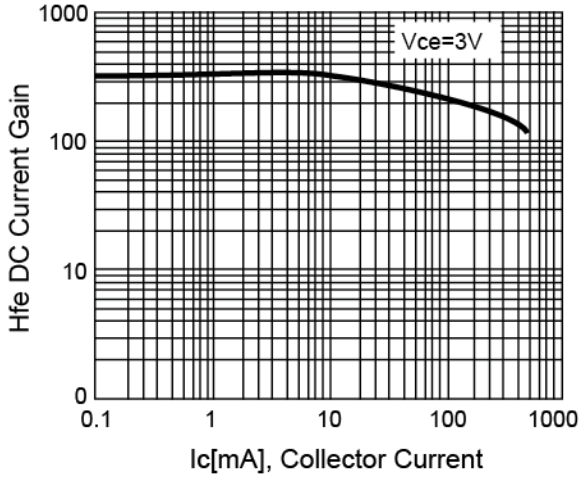



**Figure 2. $V_{CE(SAT)}$ v.s. Ic**

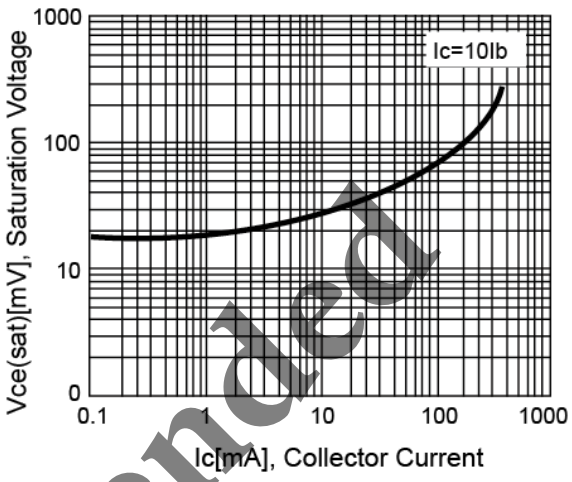



**Figure 3. $V_{BE(SAT)}$ v.s. Ic**

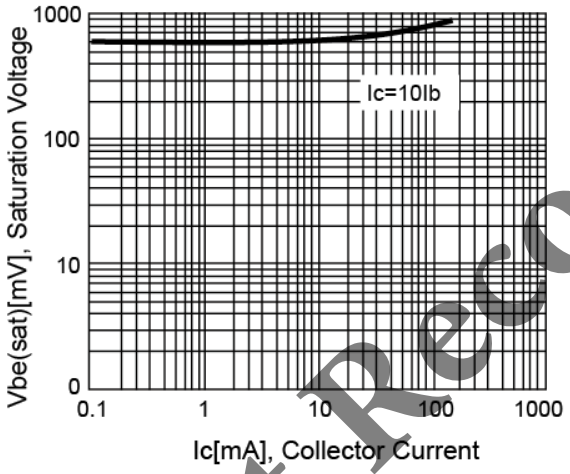



**Figure 4. Cutoff Frequency vs. Ic**

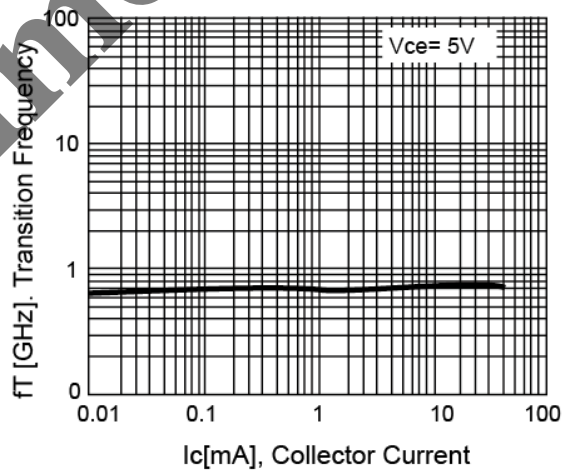
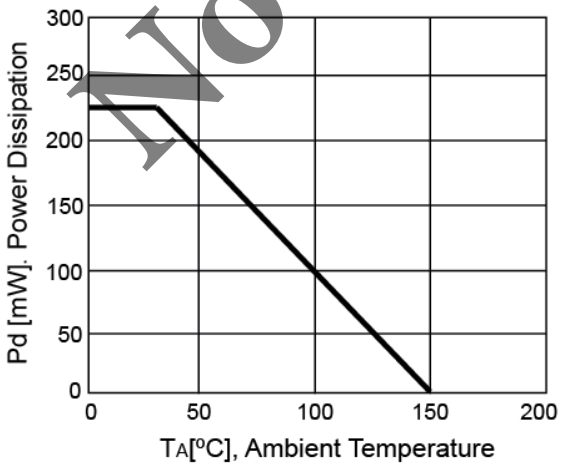
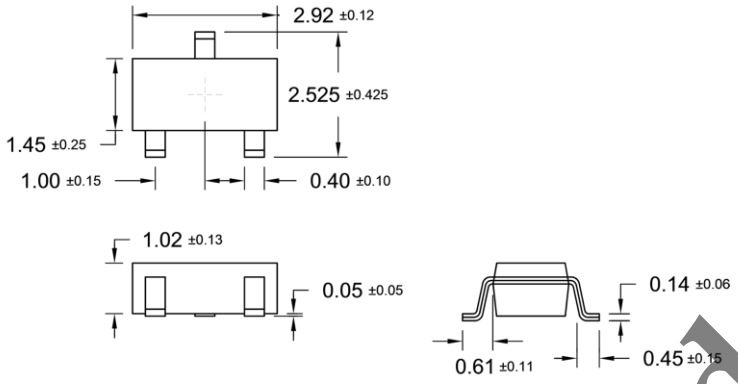



**Figure 5. Power Derating Curve**

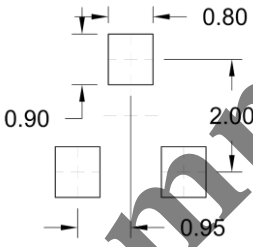


## PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

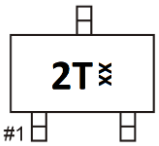
**SOT-23**




## SUGGESTED PAD LAYOUT (Unit: Millimeters)




## MARKING DIAGRAM




**2T** = Device Code
**xx** = Year Code + Month Code
Year Code: 7=2017, 8=2018
Month Code:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1** | =Jan | **2** | =Feb | **3** | =Mar | **4** | =Apr |
| **5** | =May | **6** | =Jun | **7** | =Jul | **8** | =Aug |
| **9** | =Sep | **A** | =Oct | **B** | =Nov | **C** | =Dec |

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