

PNP TIP115-116-117

SILICON DARLINGTON POWER TRANSISTORS

PNP epitaxial-base transistors in a monolithic Darlington circuit and housed in a TO-220 envelope. They are designed for general purpose amplifier and low-speed switching applications.

NPN complements are TIP110-111-112

Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

| Symbol | Ratings | | Value | Unit |
|-----------|---------------------------|--------------------|-------------|------------------|
| V_{CBO} | Collector-Base Voltage | TIP110 | -60 | V |
| | | TIP111 | -80 | |
| | | TIP112 | -100 | |
| V_{CEO} | Collector-Emitter Voltage | TIP110 | -60 | V |
| | | TIP111 | -80 | |
| | | TIP112 | -100 | |
| V_{EBO} | Emitter-Base Voltage | TIP110 | -5 | V |
| | | TIP111 | | |
| | | TIP112 | | |
| I_C | Collector Current | TIP110 | -2 | A |
| | | TIP111 | | |
| | | TIP112 | | |
| I_{CM} | Collector Peak Current | TIP110 | -4 | A |
| | | TIP111 | | |
| | | TIP112 | | |
| I_B | Base Current | TIP110 | 50 | mA |
| | | TIP111 | | |
| | | TIP112 | | |
| P_T | Power Dissipation | @ $T_c < 25^\circ$ | 50 | Watts |
| | | TIP110 | | |
| | | TIP111 | | |
| | | @ $T_a < 25^\circ$ | 2 | |
| | | TIP110 | | |
| | | TIP111 | | |
| T_J | Junction Temperature | TIP110 | 150 | $^\circ\text{C}$ |
| | | TIP111 | | |
| | | TIP112 | | |
| T_s | Storage Temperature range | TIP110 | -65 to +150 | $^\circ\text{C}$ |
| | | TIP111 | | |
| | | TIP112 | | |

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THERMAL CHARACTERISTICS

| Symbol | Ratings | Value | Unit | |
|----------------|-----------------------|--------|------|------|
| $R_{thJ-case}$ | From junction-case | TIP110 | 2.5 | °C/W |
| | | TIP111 | | |
| | | TIP112 | | |
| $R_{thJ-amb}$ | From junction-ambient | TIP110 | 62.5 | °C/W |
| | | TIP111 | | |
| | | TIP112 | | |

ELECTRICAL CHARACTERISTICS

$T_C=25^{\circ}\text{C}$ unless otherwise noted

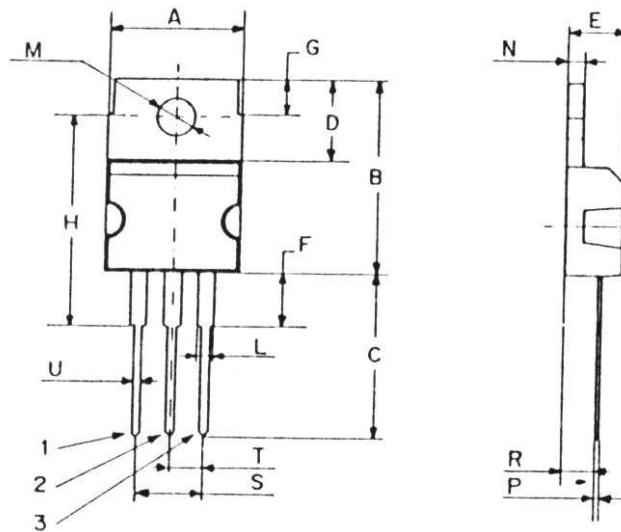
| Symbol | Ratings | Test Condition(s) | Min | Typ | Max | Unit | |
|---------------|------------------------------------------|----------------------------------------------------------|--------|------|-----|------|----|
| I_{CBO} | Collector Cutoff Current | $I_E=0, V_{CB} = -V_{CBOmax}$ | TIP110 | - | - | -1 | mA |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| I_{CEO} | Collector Cutoff Current | $I_E=0,$ $V_{CE} = -1/2 V_{CEOmax}$ | TIP110 | - | - | -2 | mA |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| I_{EBO} | Emitter Cutoff Current | $V_{EB} = -5\text{ V}, I_C = 0$ | TIP110 | - | - | -2 | mA |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| V_{CEO} | Collector-Emitter Breakdown Voltage (*) | $I_C = -30\text{ mA}, I_B = 0$ | TIP110 | -60 | - | - | V |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| $V_{CE(SAT)}$ | Collector-Emitter saturation Voltage (*) | $I_C = -2\text{ A}, I_B = -8\text{ mA}$ | TIP110 | - | - | -2.5 | V |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| $V_{BE(on)}$ | Base-Emitter Voltage (*) | $I_C = -2\text{ A}, V_{CE} = -4\text{ V}$ | TIP110 | - | - | -2.8 | V |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| h_{FE} | DC Current Gain (*) | $V_{CE} = -4\text{ V}, I_C = -1\text{ A}$ | TIP110 | 1000 | - | - | - |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| | | $V_{CE} = -4\text{ V}, I_C = -2\text{ A}$ | TIP110 | 500 | - | - | |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |
| C_{OB} | Output Capacitance | $I_E = 0, V_{CB} = -10\text{ V}$ $f = 0.1\text{ MHz}$ | TIP110 | - | - | 200 | pF |
| | | | TIP111 | | | | |
| | | | TIP112 | | | | |

(*) Pulse Width $\approx 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$

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MECHANICAL DATA CASE TO-220

| DIMENSIONS (mm) | | |
|-----------------|-------|-------|
| | Min. | Max. |
| A | 9,90 | 10,30 |
| B | 15,65 | 15,90 |
| C | 13,20 | 13,40 |
| D | 6,45 | 6,65 |
| E | 4,30 | 4,50 |
| F | 2,70 | 3,15 |
| G | 2,60 | 3,00 |
| H | 15,75 | 17,15 |
| L | 1,15 | 1,40 |
| M | 3,50 | 3,70 |
| N | - | 1,37 |
| P | 0,46 | 0,55 |
| R | 2,50 | 2,70 |
| S | 4,98 | 5,08 |
| T | 2,49 | 2,54 |
| U | 0,70 | 0,90 |



| | |
|---------|-----------|
| Pin 1 : | Base |
| Pin 2 : | Collector |
| Pin 3 : | Emitter |
| Package | Collector |

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