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2N4870 Unijunction Transistor (UJT) TO-92 Type Package

Description:

The 2N4870 is a PN unijunction transistor in a TO-92 type package designed for use in pulse and timing circuits, sensing circuits and thyristor trigger circuits.

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless other specified)

| | |
|---|-------------------------------------|
| RMS Power Dissipation, P_D | 300mW |
| Derate Above 25°C | 3.0mW/ $^\circ\text{C}$ |
| RMS Emitter Current, I_E | 50mA |
| Peak-Pulse Emitter Current (Note 1), I_E | 1.5A |
| Emitter Reverse Voltage, V_{B2E} | 30V |
| Interbase Voltage (Note 2), V_{B2B1} | 35V |
| Operating Junction Temperature Range, T_J | -65° to $+125^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -65° to $+150^\circ\text{C}$ |

Note 1. Duty cycle $\leq 1\%$, PRR = 10 PPS

Note 2. Based upon power dissipation at $T_A = +25^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless other specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--|-----------------|---|------|-------|------|---------------------|
| Intrinsic Standoff Ratio | η | $V_{B2B1} = 10\text{V}$, Note 3 | 0.56 | - | 0.76 | |
| Interbase Resistance | R_{BB} | | 4.0 | 6.0 | 9.1 | k Ω |
| Interbase Resistance Temperature Coefficient | αR_{BB} | $V_{B2B1} = 3\text{V}$, $I_E = 0$, $T_A = -65^\circ$ to $+125^\circ\text{C}$ | 0.1 | - | 0.9 | %/ $^\circ\text{C}$ |
| Emitter Saturation Voltage | $V_{BE1(sat)}$ | $V_{B2B1} = 10\text{V}$, $I_E = 50\text{mA}$, Note 4 | - | 2.5 | - | V |
| Modulated Interbase Current | $I_{B2(Mod)}$ | $V_{B2B1} = 10\text{V}$, $I_E = 50\text{mA}$ | - | 15 | - | mA |
| Emitter Reverse Current | I_{EB2O} | $V_{B2E} = 30\text{V}$, $I_{B1} = 0$ | - | 0.005 | 1.0 | μA |
| Peak-Point Emitter Current | I_P | $V_{B2B1} = 25\text{V}$ | - | 1.0 | 5.0 | μA |
| Valley-Point Current | I_V | $V_{B2B1} = 20\text{V}$, $R_{B2} = 100\Omega$, Note 4 | 2.0 | 5.0 | - | mA |
| Base-One Peak Pulse Voltage | V_{OB1} | | 3.0 | 6.0 | - | V |

Note 3. Intrinsic standoff ratio, is defined in terms of peak-point voltage, V_P , by means of the equation: $V_P = \eta V_{B2B1} + V_F$, where V_F is approximately 0.49 volts at $+25^\circ\text{C}$ @ $I_F = 10\mu\text{A}$ and decreases with temperature at approximately 2.5mV/ $^\circ\text{C}$. Components R_1 , C_1 , and the UJT form a relaxation oscillator, the remaining circuitry serves as a peak-voltage detector. The forward drop of Diode D_1 compensates for V_F . To use, the "call" button is pushed, and R_3 is adjusted to make the current meter, M_1 , read full scale. When the "call" button is released, the value of η is read directly from the meter, if full scale on the meter reads 1.0.

Note 4. Use pulse techniques: $PW \sim 300\mu\text{s}$, duty cycle $\leq 2.0\%$ to avoid internal heating, which may result in erroneous readings.

