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## 2N2646 Unijunction Transistor TO-18 Package

**Description:**

The 2N2646 is designed for use in pulse and timing circuits, sensing circuits and thyristor trigger circuits.

**Features:**

- Low Peak Point Current: 5μA (Max)
- Low Emitter Reverse Current: .005μA (Typ)
- Passivated Surface for Reliability & Uniformity

**Absolute Maximum Ratings:** (T<sub>A</sub> = +25°C unless otherwise specified)

Power Dissipation (Note 1), P <sub>D</sub> .....	300mW
RMS Emitter Current, I <sub>E(RMS)</sub> .....	50mA
Peak Pulse Emitter Current (Note 2), i <sub>E</sub> .....	2A
Emitter Reverse Voltage, V <sub>B2E</sub> .....	30V
Interbase Voltage, V <sub>B2B1</sub> .....	35V
Operating Junction Temperature Range, T <sub>J</sub> .....	-65° to 125°C
Storage Temperature Range, T <sub>stg</sub> .....	-65° to +150°C

Note 1 Derate 3mW/°C increase in ambient temperature. The total power dissipation (available power to Emitter and Base-Two) must be limited by the external circuitry.

Note 2 Capacitor discharge – 10μF or less, 30 volts or less

**Electrical Characteristics:** (T<sub>A</sub> = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Intrinsic Standoff Ratio	η	V <sub>B2B1</sub> = 10V, Note 3	0.56	–	0.75	–
Interbase Resistance	r <sub>BB</sub>	V <sub>B2B1</sub> = 3V, I <sub>E</sub> = 0	4.7	7.0	9.1	kΩ
Interbase Resistance Temperature Coefficient	α <sub>rBB</sub>		0.1	–	0.9	%/°C

Note 3. Intrinsic standoff ratio, η is defined by equation:

$$\eta = \frac{V_P - V_F}{V_{B2B1}}$$

where V<sub>P</sub> = Peak Point Emitter Voltage  
 V<sub>B2B1</sub> = Interbase Voltage  
 V<sub>F</sub> = Emitter to Base-One Junction Diode Drop (~ 0.45V @ 10μA)

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Emitter Saturation Voltage	$V_{EB1(sat)}$	$V_{B2B1} = 10\text{V}, I_E = 50\text{mA}$ , Note 4	-	3.5	-	V
Modulated Interbase Current	$I_{B2(mod)}$	$V_{B2B1} = 10\text{V}, I_E = 50\text{mA}$	-	15	-	mA
Emitter Reverse Current	$I_{EB20}$	$V_{B2E} = 30\text{V}, I_{B1} = 0$	-	0.005	12	$\mu\text{A}$
Peak Point Emitter Current	$I_P$	$V_{B2B1} = 25\text{V}$	-	1	5	$\mu\text{A}$
Valley Point Current	$I_V$	$V_{B2B1} = 20\text{V}, R_{B2} = 100\Omega$	4	6	-	mA
Base-One Peak Pulse Voltage	$V_{OB1}$		3	5	-	V

Note 4. Use pulse techniques: Pulse Width  $\sim 300\mu\text{s}$ , duty cycle  $\leq 2\%$  to avoid internal heating due to interbase modulation which may result in erroneous readings.

