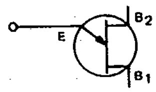
2N2646
2N2647

PN Unijunction Transistors
Silicon PN Unijunction Transistors

. . . designed for use in pulse and timing circuits, sensing circuits and thyristor trigger circuits. These devices feature:

- Low Peak Point Current — 2 μA (Max)
- Low Emitter Reverse Current — 200 nA (Max)
- Passivated Surface for Reliability and Uniformity

PN UJTs



CASE 22A-01
STYLE 1

3

***MAXIMUM RATINGS** (T_A = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Dissipation, Note 1	P_D	300	mW
RMS Emitter Current	$I_{E(RMS)}$	50	mA
Peak Pulse Emitter Current, Note 2	i_E	2	Amps
Emitter Reverse Voltage	V_{B2E}	30	Volts
Interbase Voltage	V_{B2B1}	35	Volts
Operating Junction Temperature Range	T_J	−65 to +125	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

*Indicates JEDEC Registered Data.

Notes: 1. Derate 3 mW/°C increase in ambient temperature. The total power dissipation (available power to Emitter and Base-Two) must be limited by the external circuitry.
2. Capacitor discharge — 10 μF or less, 30 volts or less.

T-37-21

***ELECTRICAL CHARACTERISTICS** (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
Intrinsic Standoff Ratio (V_{B2B1} = 10 V), Note 1	2N2646 2N2647	η	0.56 0.68	— —	0.75 0.82	—
Interbase Resistance (V_{B2B1} = 3 V, I_E = 0)		r_{BB}	4.7	7	9.1	k ohms
Interbase Resistance Temperature Coefficient (V_{B2B1} = 3 V, I_E = 0, T_A = −55°C to +125°C)		α_{rBB}	0.1	—	0.9	%/°C
Emitter Saturation Voltage (V_{B2B1} = 10 V, I_E = 50 mA), Note 2		$V_{EB1(sat)}$	—	3.5	—	Volts
Modulated Interbase Current (V_{B2B1} = 10 V, I_E = 50 mA)		$I_{B2(mod)}$	—	15	—	mA
Emitter Reverse Current (V_{B2E} = 30 V, I_{B1} = 0)	2N2646 2N2647	I_{EB2O}	— —	0.005 0.005	12 0.2	μA
Peak Point Emitter Current (V_{B2B1} = 25 V)	2N2646 2N2647	I_P	— —	1 1	5 2	μA
Valley Point Current (V_{B2B1} = 20 V, R_{B2} = 100 ohms), Note 2	2N2646 2N2647	I_V	4 8	6 10	— 18	mA
Base-One Peak Pulse Voltage (Note 3, Figure 3)	2N2646 2N2647	V_{OB1}	3 6	5 7	— —	Volts

*Indicates JEDEC Registered Data.

Notes:

1. Intrinsic standoff ratio, η, is defined by equation:

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

Where V_P = Peak Point Emitter Voltage
V_{B2B1} = Interbase Voltage
V_F = Emitter to Base-One Junction Diode Drop (≈ 0.45 V @ 10 μA)

2. Use pulse techniques: PW ≈ 300 μs, duty cycle ≤ 2% to avoid internal heating due to interbase modulation which may result in erroneous readings.
3. Base-One Peak Pulse Voltage is measured in circuit of Figure 3. This specification is used to ensure minimum pulse amplitude for applications in SCR firing circuits and other types of pulse circuits.

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FIGURE 1
UNIJUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

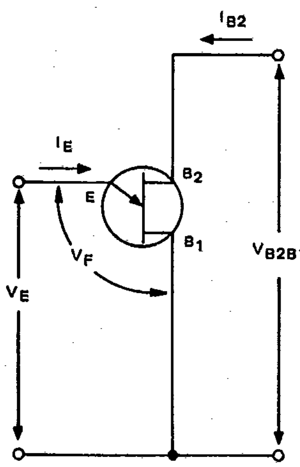

FIGURE 2
STATIC EMITTER CHARACTERISTIC CURVES
(Exaggerated to Show Details)

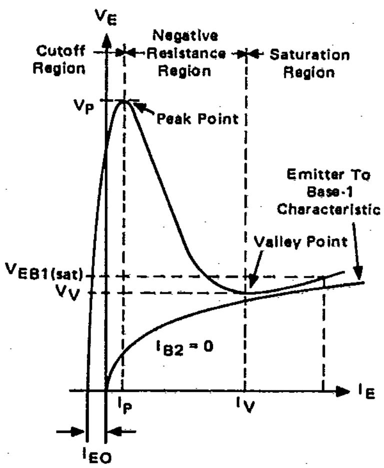

FIGURE 3 — V_{OB1} TEST CIRCUIT
(Typical Relaxation Oscillator)