

NOT RECOMMENDED FOR NEW DESIGNS

PN Unijunction Transistor Silicon Annular PN Unijunction Transistor

2N3980

... designed for military and industrial use in pulse, timing, sensing, and oscillator circuits. These devices feature:

- Low Peak Point Current — 2 μ A max
- Fast Switching — to 1 MHz
- Low Emitter Reverse Current — 10 nA max
- Passivated Surface for Reliability and Uniformity

PN UJT's



CASE 22A-01
STYLE 1

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

Rating	Symbol	Value	Unit
RMS Power Dissipation, Note 1	P _D	360	mW
RMS Emitter Current	I _e	50	mA
Peak Pulse Emitter Current, Note 2	i _e	1	Amp
Emitter Reverse Voltage	V _{B2E}	30	Volts
Interbase Voltage	V _{B2B1}	35	Volts
Storage Temperature Range	T _{stg}	-65 to +200	°C

Notes: 1. Derate 2.4 mW/°C increase in ambient temperature. Total power dissipation (available power to Emitter and Base-Two) must be limited by the external circuitry.

2. Capacitance discharge current must fall to 0.37 Amp within 3 ms and PRR \leq 10 PPS.

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

Characteristic	Symbol	Min	Typ	Max	Unit
Intrinsic Standoff Ratio (V _{B2B1} = 10 V) Note 1	η	0.68	—	0.82	—
Interbase Resistance (V _{B2B1} = 3 V, I _E = 0)	R _{BB}	4	6	8	k ohms
Interbase Resistance Temperature Coefficient (V _{B2B1} = 3 V, I _E = 0, T _A = -65°C to +100°C)	α R _{BB}	0.4	—	0.9	%/°C
Emitter Saturation Voltage (V _{B2B1} = 10 V, I _E = 50 mA) Note 2	V _{EB1(sat)}	—	2.5	3	Volts
Modulated Interbase Current (V _{B2B1} = 10 V, I _E = 50 mA)	I _{B2(mod)}	12	15	—	mA
Emitter Reverse Current (V _{B2E} = 30 V, I _{B1} = 0) (V _{B2E} = 30 V, I _{B1} = 0, T _A = 125°C)	I _{EB20}	—	5	10	nA μ A
Peak Point Emitter Current (V _{B2B1} = 25 V)	I _p	—	0.6	2	μ A

(cont.)

Notes:

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

$$\eta = \frac{V_p - (V_{EB1})}{V_{B2B1}}$$

Where V_p = Peak Point Emitter Voltage

V_{B2B1} = Interbase Voltage

V_f = Emitter to Base-One Junction Diode Drop
(0.45 V @ 10 μ A)

2. Use pulse techniques: PW \approx 300 μ s duty cycle \leq 2% to avoid internal heating due to interbase modulation which may result in erroneous readings.



T-37-21

ELECTRICAL CHARACTERISTICS — continued ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Valley Point Current ($V_{B2B1} = 20\text{ V}$, $R_{B2} = 100\text{ ohms}$) Note 2	I_V	1	4	10	mA
Base-One Peak Pulse Voltage (Note 1, Figure 3)	V_{OB1}	6	8	—	Volts
Maximum Oscillation Frequency (Figure 4)	$f(\text{max})$	—	400	—	kHz

Notes:

1. Base-One Peak Pulse Voltage is measured in circuit of Figure 3. This specification is used to ensure minimum pulse amplitude for applications in ACR firing circuits and other types of pulse circuits.

2. Use pulse techniques; $PW \sim 300\ \mu\text{s}$ duty cycle $\leq 2\%$ to avoid internal heating due to interbase modulation which may result in erroneous readings.

FIGURE 1 — UNI-JUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

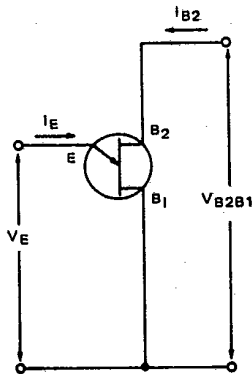


FIGURE 2 — STATIC EMITTER CHARACTERISTICS CURVES
(Exaggerated to Show Details)

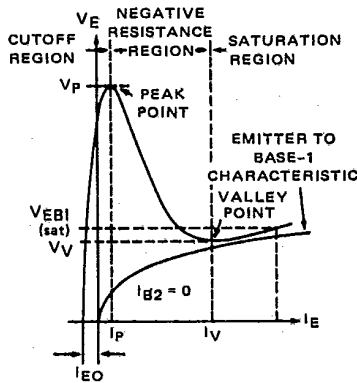


FIGURE 3 — V_{OB1} TEST CIRCUIT
(Typical Relaxation Oscillator)

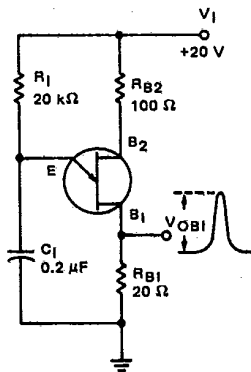


FIGURE 4 — $f(\text{max})$ MAXIMUM FREQUENCY-TEST CIRCUIT

