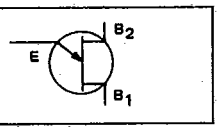
T-37-21

MU10
MU20

PN Unijunction Transistors
Silicon Annular Unijunction Transistors

. . . designed for economical, general purpose use in pulse, timing, oscillator and thyristor trigger circuits.

PN UJTs

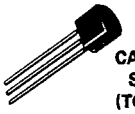


MAXIMUM RATINGS (T_A = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
RMS Power Dissipation, Note 1	P_D	300	mW
RMS Emitter Current	I_e	50	mA
Peak-Pulse Emitter Current, Note 2	i_e	1	Amp
Emitter Reverse Voltage	V_{EB2}	30	Volts
Interbase Voltage Based upon Power Dissipation at T_A = 25°C	V_{B2B1}	35	Volts
Operating Junction Temperature Range	T_J	−65 to +125	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

Notes: 1. Derate 3 mW/°C increase in ambient temperature.
2. Duty Cycle ≤ 1%, PRR = 10 PPS (See Figure 6).

CASE 22A-01
STYLE 1
MU20



CASE 29-04
STYLE 9
(TO-226AA)
MU10

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

Characteristic	Symbol	Min	Typ	Max	Unit
Intrinsic Standoff Ratio (Test Circuit Figure 4), Note 1 (V_{B2B1} = 10 V)	η	0.50	—	0.85	—
Interbase Resistance (V_{B2B1} = 3 V, I_E = 0)	r_{BB}	4	—	10	kΩ
Emitter Saturation Voltage, Note 2 (V_{B2B1} = 10 V, I_E = 50 mA)	$V_{EB1(sat)}$	—	2	—	Volts
Modulated Interbase Current (V_{B2B1} = 10 V, I_E = 50 mA)	$I_{B2(mod)}$	—	—	50	mA
Emitter Reverse Current (V_{EB2} = 30 V, I_{B1} = 0)	I_{EB20}	—	—	1	μA
Peak-Point Emitter Current (V_{B2B1} = 25 V)	I_P	—	—	5	μA
Valley-Point Current** (V_{B2B1} = 20 V, R_{B2} = 100 Ohms)	I_V	1	—	—	mA
Base-One Peak Pulse Voltage (Test Circuit Figure 3)	V_{OB1}	3	—	—	Volts

Notes: 1. η, Intrinsic standoff ratio, is defined in terms of the peak-point voltage, V_P, by means of the equation: $V_P = \eta V_{B2B1} + V_F$, where V_F is about 0.45 volt at 25°C @ I_F = 10 μA and decreases with temperature at about 2.5 mV/°C. The test circuit is shown in Figure 4. 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 "cal" button is pushed, and R_3 is adjusted to make the current meter, M_1, read full scale. When the "cal" button is released, the value of η is read directly from the meter, if full scale on the meter reads 1.
2. Pulse Test: Pulse Width ≈ 300 μs, Duty Cycle ≤ 2% to avoid internal heating, which may result in erroneous readings.

FIGURE 1 – UNIJUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

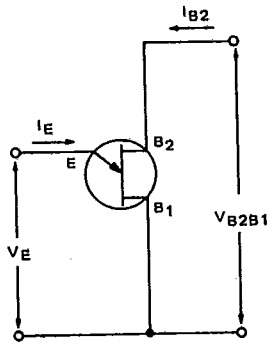


FIGURE 2 – STATIC EMITTER CHARACTERISTICS CURVES

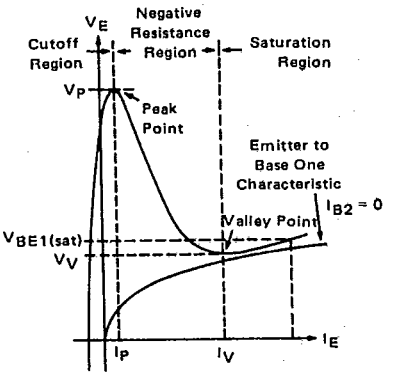


FIGURE 3 – V_{OB1} TEST CIRCUIT

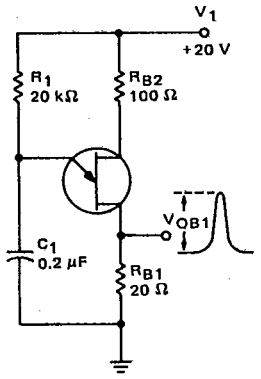
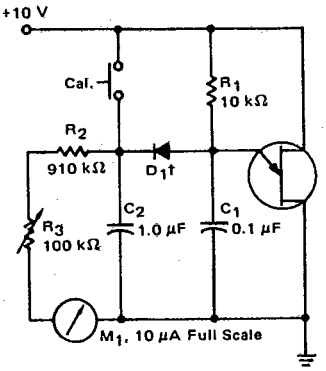
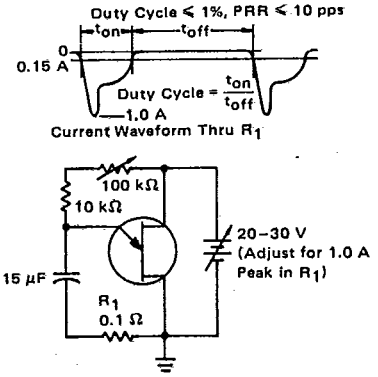


FIGURE 4 – η TEST CIRCUIT



† D_1 diode with the following characteristics:
$V_F = 0.45$ V @ $I_F = 10$ μA
$I_R \leq 2.0$ μA @ $V_R = 20$ V

FIGURE 5 – PRR TEST CIRCUIT AND WAVEFORM



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