

NOT RECOMMENDED FOR NEW DESIGNS

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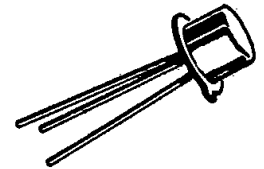
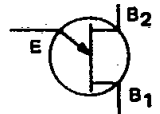
PN Unijunction Transistors Silicon Unijunction Transistors

**2N4851
thru
2N4853**

... designed for pulse and timing circuits, sensing circuits, and thyristor trigger circuits.

PN UJT's

- Low Peak-Point Current — $I_p = 0.4 \mu\text{A Max}$
- Low Emitter Reverse Current — $I_{EO} = 50 \text{ nA Max}$
- Fast Switching



CASE 22A-01
STYLE 1

***MAXIMUM RATINGS** ($T_A = 25^\circ\text{C}$ 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	1.5	Amp
Emitter Reverse Voltage	V_{B2E}	30	Volts
Interbase Voltage, Note 3	V_{B2B1}	35	Volts
Operating Junction Temperature Range	T_J	-65 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +200	$^\circ\text{C}$

*Indicates JEDEC Registered Data.

Notes: 1. Derate 3 mW/ $^\circ\text{C}$ increase in ambient temperature.

2. Duty cycle $\leq 1\%$, PRR = (see Figure 6).

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

2N4851 thru 2N4853

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

Rating	Fig. No.	Symbol	Min	Typ	Max	Unit
*Intrinsic Standoff Ratio, Note 1 ($V_{B2B1} = 10\text{ V}$)	4, 8	η	0.56 0.70	— —	0.75 0.85	—
*Interbase Resistance ($V_{B2B1} = 3\text{ V}, I_E = 0$)	11, 12	r_{BB}	4.7	—	9.1	k ohms
*Interbase Resistance Temperature Coefficient ($V_{B2B1} = 3\text{ V}, I_E = 0, T_A = -65\text{ to }+125^\circ\text{C}$)	12	α_{BB}	0.2	—	0.8	%/°C
Emitter Saturation Voltage, Note 2 ($V_{B2B1} = 10\text{ V}, I_E = 50\text{ mA}$)		$V_{EB1}(\text{sat})$	—	2.5	—	Volts
Modulated Interbase Current ($V_{B2B1} = 10\text{ V}, I_E = 50\text{ mA}$)		$I_{B2}(\text{mod})$	—	15	—	mA
*Emitter Reverse Current ($V_{B2E} = 30\text{ V}, I_{B1} = 0$)	7	I_{EB20}	— —	— —	0.1 0.05	μA
*Peak-Point Emitter Current ($V_{B2B1} = 25\text{ V}$)	9, 10	I_P	— —	— —	2 0.4	μA
*Valley-Point Current, Note 2 ($V_{B2B1} = 20\text{ V}, R_{B2} = 100\text{ ohms}$)	13, 14	I_V	2 4 6	— — —	— — —	mA
*Base-One Peak Pulse Voltage	3, 17	V_{OB1}	3 5 6	— — —	— — —	Volts
*Maximum Frequency of Oscillation	5	$f(\text{max})$	—	0.25	—	MHz

*Indicates JEDEC Registered Data.

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 0.49 volt at 25°C @ $I_F = 10\ \mu\text{A}$ and decreases with temperature at about $2.5\ \text{mV}/^\circ\text{C}$. 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. Use pulse techniques: $PW \approx 300\ \mu\text{s}$, duty cycle $\leq 2\%$ to avoid internal heating, which may result in erroneous readings.

FIGURE 1 — UNIJUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

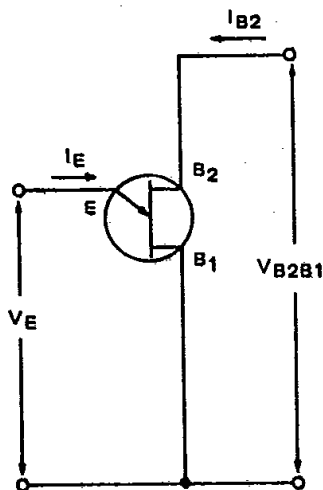
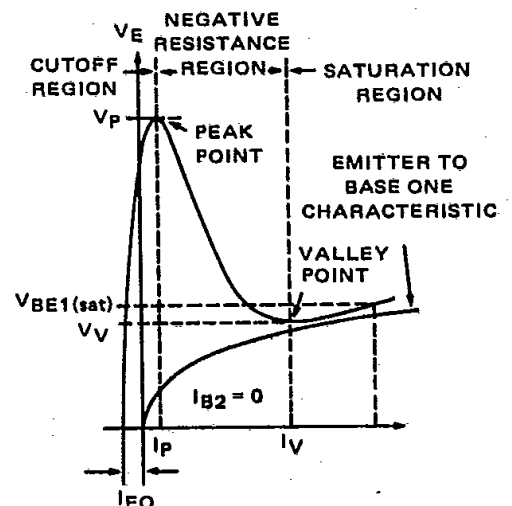


FIGURE 2 — STATIC EMITTER CHARACTERISTICS CURVES



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FIGURE 3 - V_{OB1} TEST CIRCUIT

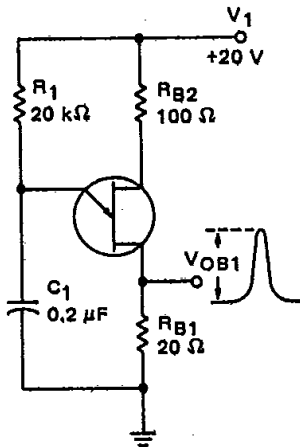


FIGURE 5 - $f_{(max)}$ TEST CIRCUIT

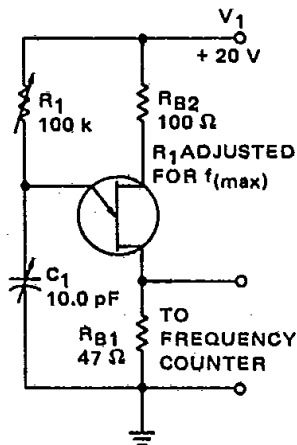


FIGURE 4 - η TEST CIRCUIT

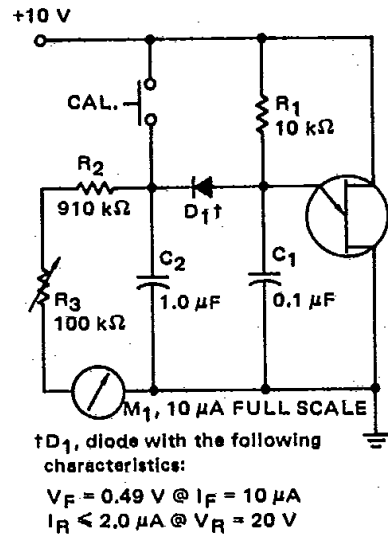
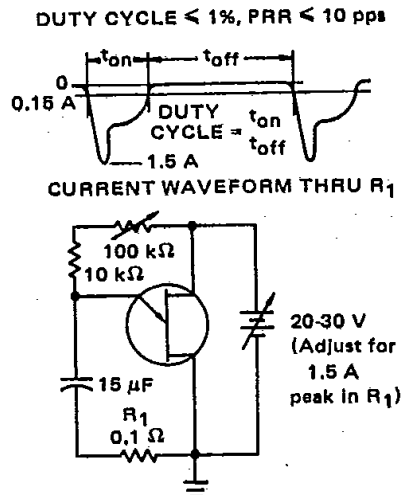


FIGURE 6 - PRR TEST CIRCUIT AND WAVEFORM



TYPICAL CHARACTERISTICS

FIGURE 7 - EMITTER REVERSE CURRENT

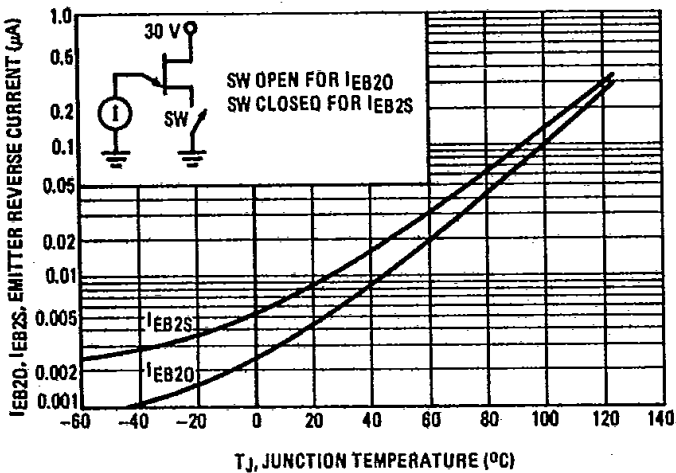
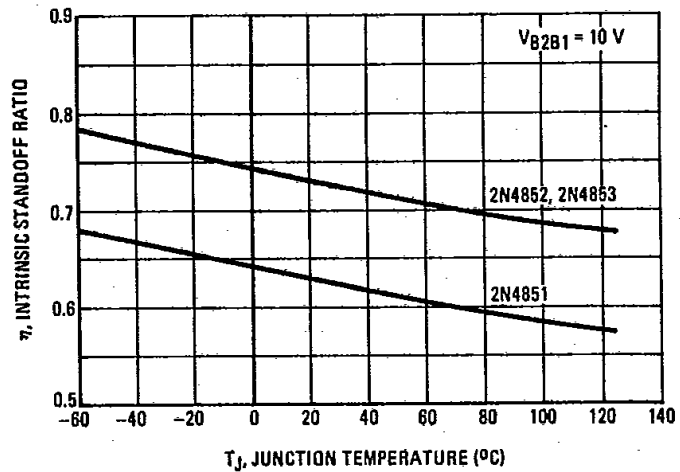


FIGURE 8 - INTRINSIC STANDOFF RATIO



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PEAK POINT CURRENT

FIGURE 9 – EFFECT OF VOLTAGE

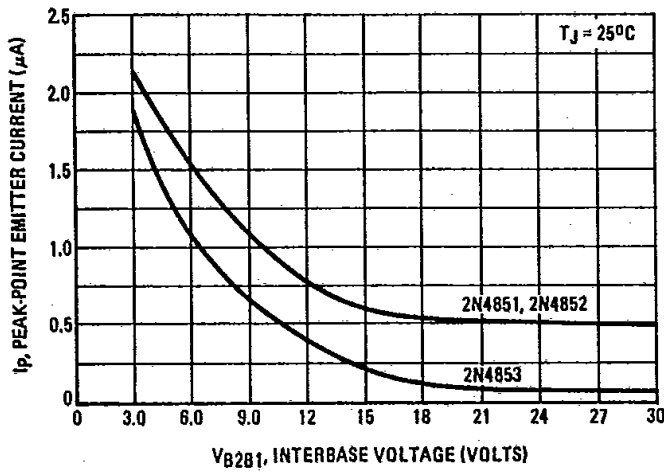
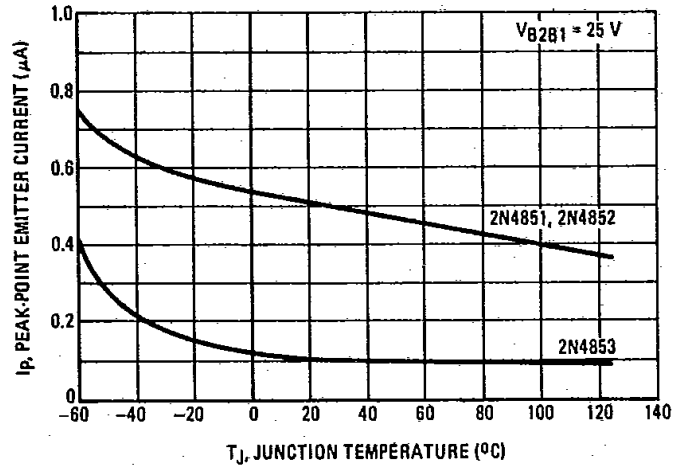


FIGURE 10 – EFFECT OF TEMPERATURE



INTERBASE RESISTANCE

FIGURE 11 – EFFECT OF VOLTAGE

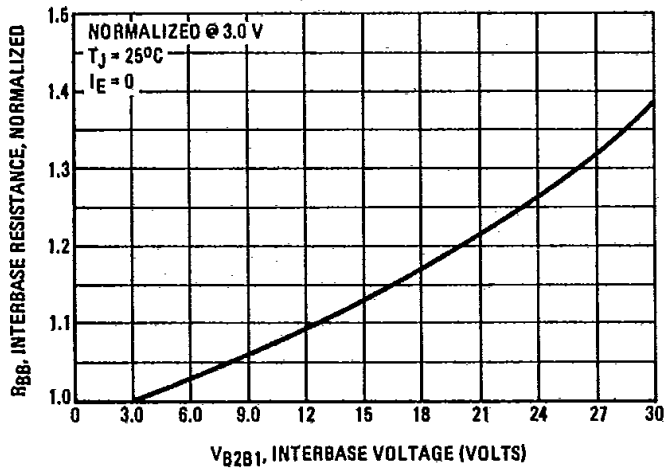
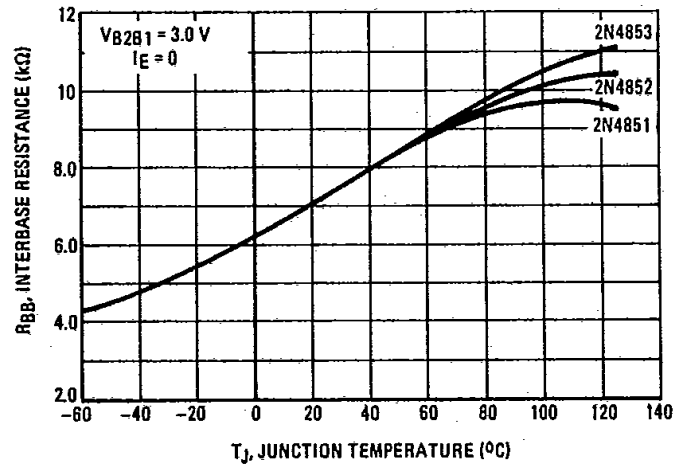


FIGURE 12 – EFFECT OF TEMPERATURE



TYPICAL CHARACTERISTICS

VALLEY CURRENT

FIGURE 13 – EFFECT OF VOLTAGE

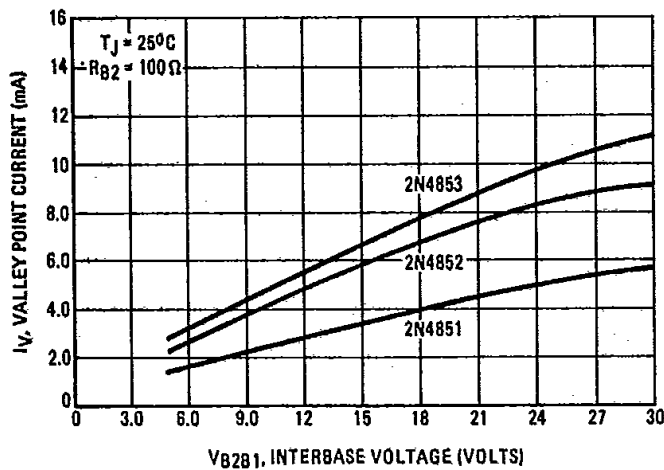
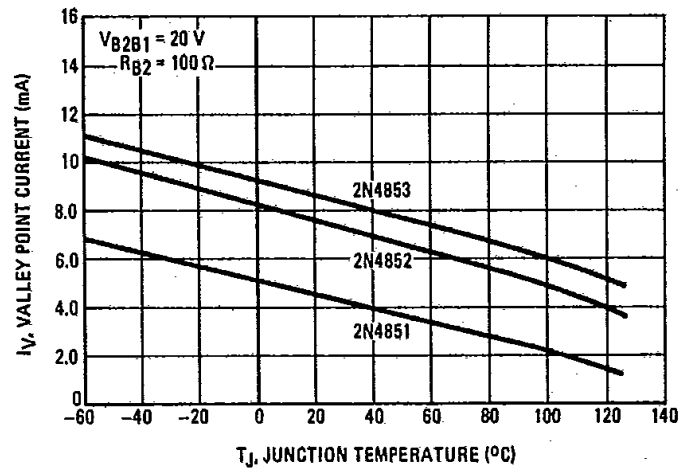


FIGURE 14 – EFFECT OF TEMPERATURE



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VALLEY VOLTAGE

FIGURE 15 – EFFECT OF VOLTAGE

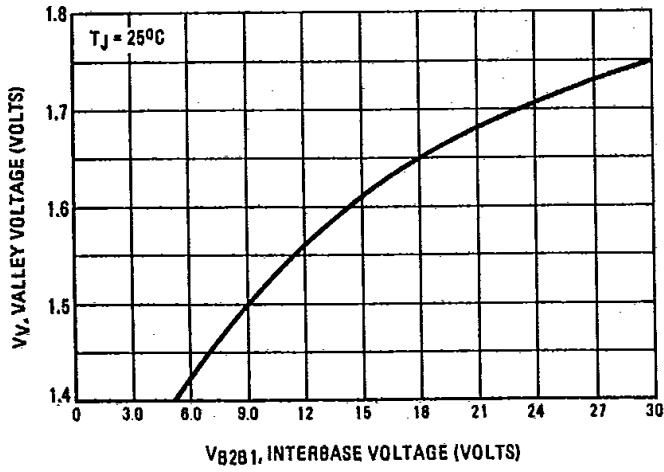


FIGURE 16 – EFFECT OF TEMPERATURE

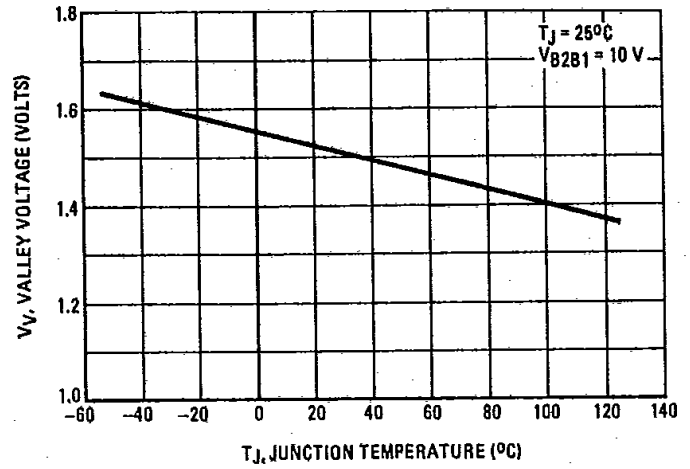


FIGURE 17 – OUTPUT VOLTAGE

