

High-reliability discrete products  
and engineering services since 1977

### FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
RMS power dissipation <sup>(1)</sup>	$P_D$	360	mW
RMS emitter current	$I_e$	50	mA
Peak pulse emitter current <sup>(2)</sup>	$I_e$	1.5	Amp
Emitter reverse voltage	$V_{B2E}$	30	Volts
Interbase voltage <sup>(3)</sup>	$V_{B2B1}$	35	Volts
Operating junction temperature range	$T_J$	-65 to +125	°C
Storage temperature range	$T_{stg}$	-65 to +200	°C

- Derate 3 mW/°C increase in ambient temperature.
- Duty cycle  $\leq$  1%, PRR = 10 PPS.
- Based upon power dissipation at  $T_A = 25^\circ\text{C}$ .

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

Characteristic	Symbol	Min	Max	Unit
Intrinsic standoff ratio <sup>(1)</sup> ( $V_{B2B1} = 10\text{V}$ )	$\eta$	0.72	0.80	-
Interbase resistance ( $V_{B2B1} = 3\text{V}$ , $I_E = 0$ )	$R_{BB}$	6	8.5	k $\Omega$
Interbase resistance temperature coefficient ( $V_{B2B1} = 3\text{V}$ , $I_E = 0$ , $T_A = 0$ to $100^\circ\text{C}$ )	$\alpha R_{BB}$	0.4	0.8	%/°C
Emitter saturation voltage <sup>(2)</sup> ( $V_{B2B1} = 10\text{V}$ , $I_E = 50\text{mA}$ )	$V_{EB1(\text{sat})}$	-	3	Volts
Modulated interbase current ( $V_{B2B1} = 10\text{V}$ , $I_E = 50\text{mA}$ )	$I_{B2(\text{mod})}$	5	30	mA
Emitter reverse current ( $V_{B2E} = 30\text{V}$ , $I_{B1} = 0$ )	$I_{EB2O}$	-	10	nA
Peak point emitter current ( $V_{B2B1} = 25\text{V}$ ) ( $V_{B2B1} = 4\text{V}$ )	$I_P$	- -	0.4 4	$\mu\text{A}$
Valley point current <sup>(2)</sup> ( $V_{B2B1} = 20\text{V}$ , $R_{B2} = 100\text{ohms}$ )	$I_V$	2	-	mA
Base one peak pulse voltage ( $V_{BB} = 4\text{V}$ )	$V_{OB1}$	1	-	Volts

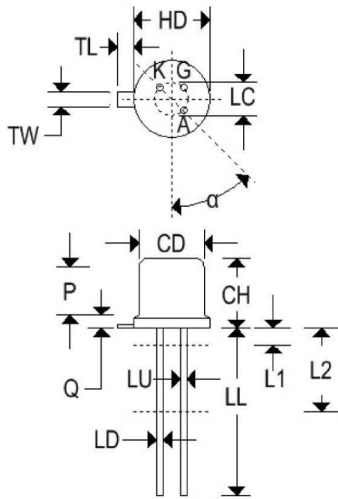
- $\eta$ . Intrinsic standoff ratio is defined in terms of the peak point voltage,  $V_P$ , by means of the equation:  $V_P = \eta V_{B2B1} + V_F$ , where  $V_F$  is about 0.45V at  $25^\circ\text{C}$  @  $I_F = 10\mu\text{A}$  and decreases with temperature at about 2.5 mV/°C. Components  $R_1$ ,  $C_1$  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  $\eta$  is read directly from the meter, if full scale on the meter reads 1.
- PW = 300 $\mu\text{s}$ , duty cycle  $\leq$  2% to avoid internal heating, which may result erroneous readings.

# 2N5431

## PN UNIJUNCTION TRANSISTOR

### MECHANICAL CHARACTERISTICS

Case:	TO-18
Marking:	Body painted, alpha-numeric
Pin out:	See below



Dim	TO-18			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	0.178	0.195	4.520	4.950
CH	0.140	0.210	3.556	5.330
HD	0.209	0.230	5.310	5.840
LC	0.100 TP		2.540 TP	
LD	0.016	0.021	0.410	0.530
LL	0.500	0.750	12.700	19.050
LU	0.016	0.019	0.410	0.480
L <sub>1</sub>	-	0.050	-	1.270
L <sub>2</sub>	0.250	-	6.350	-
P	0.100	-	2.540	-
Q	-	0.040	-	1.020
TL	0.028	0.048	0.710	1.220
TW	0.036	0.046	0.910	1.170
$\alpha$	45°TP		45°TP	

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## PN UNIJUNCTION TRANSISTOR

FIGURE 1 – UNIJUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

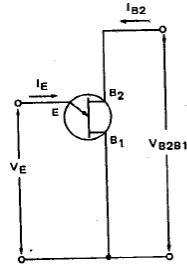


FIGURE 3 –  $V_{OB1}$  TEST CIRCUIT

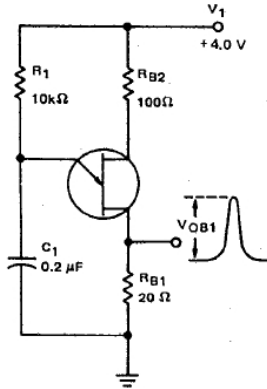


FIGURE 2 – STATIC EMITTER CHARACTERISTICS CURVES

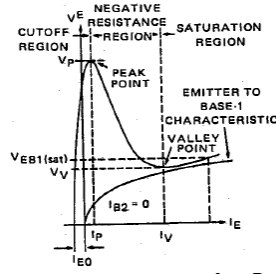


FIGURE 4 –  $\eta$  TEST CIRCUIT

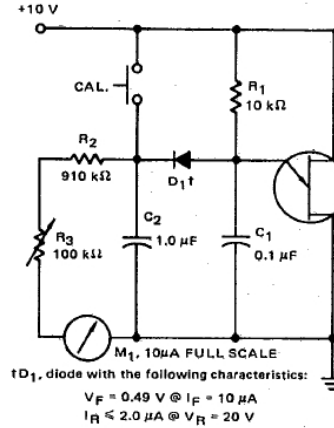


FIGURE 5 – PRR TEST CIRCUIT AND WAVEFORM

DUTY CYCLE  $\leq 1.0\%$ , PRR  $\leq 10$  PPS

