DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N3980

PN UNIJUNCTION TRANSISTOR

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 (1)	P_D	360	mW
RMS emitter current	I_e	60	mA
Peak pulse emitter current (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

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit
Intrinsic standoff ratio V_{B2B1} = 10V (1)	η	0.68	-	0.82	-
Interbase resistance V_{B2B1} = 3V, I_E = 0	R_{BB}	4	6	8	kΩ
Interbase resistance temperature coefficient V_{B2B1} = 3V, I_E = 0, T_A = -65 to +100°C	αR_{BB}	0.4	-	0.9	%/°C
Emitter saturation voltage V_{B2B1} = 10V, I_E = 50mA (2)	$V_{EB1(sat)}$	-	2.5	3	Volts
Modulated interbase current V_{B2B1} = 10V, I_E = 50mA	$I_{B2(mod)}$	12	15	-	mA
Emitter reverse current V_{B2E} = 30V, I_{B1} = 0 V_{B2E} = 30V, I_{B1} = 0, T_A = 125°C	I_{EB20}	- -	5 -	10 1	nA µA
Peak point emitter current V_{B2B1} = 25V	I_P	-	0.6	2	µA
Valley point current V_{B2B1} = 20V, R_{B2} = 100Ω (2)	I_V	1	4	10	mA
Base one peak pulse voltage(3) Figure 3	V_{OB1}	6	8	-	Volts
Maximum oscillation frequency Figure 4	$f_{(max)}$	-	400	-	kHz

Note 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 (0.45V @ 10µA)

Note 2: Use pulse techniques: PW ≈ 300µs duty cycle ≤ 2% to avoid internal heating due to interbase modulation which may result in erroneous readings.

Note 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 ACR firing circuits and other types of pulse circuits.

MECHANICAL CHARACTERISTICS

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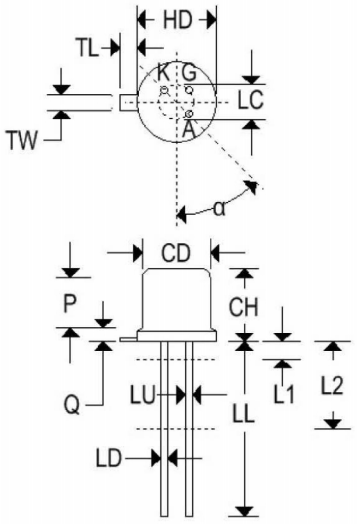
Case:	TO-18
Marking:	Body painted, alpha-numeric
Pin out:	See below



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_1	-	0.050	-	1.270
L_2	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
α	45°TP		45°TP	

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FIGURE 1 – UNIJUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

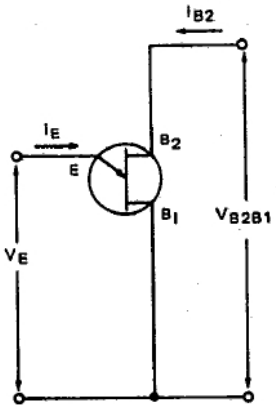

FIGURE 2 – STATIC EMITTER CHARACTERISTICS CURVES
(Exaggerated to Show Details)

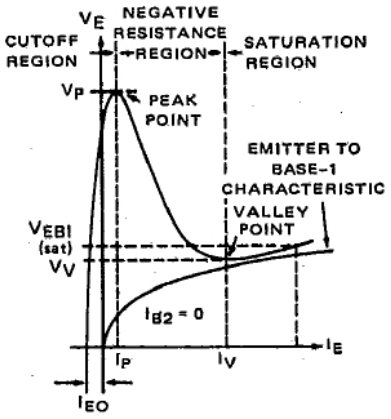

FIGURE 3 – V_{OB1} TEST CIRCUIT
(Typical Relaxation Oscillator)

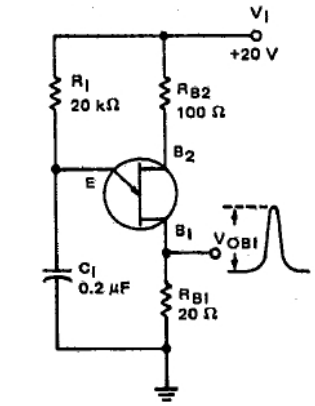

FIGURE 4 – f(max) MAXIMUM FREQUENCY-TEST CIRCUIT