

# DIGITRON SEMICONDUCTORS

2N2646, 2N2647

SILICON UNIJUNCTION TRANSISTOR

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power dissipation <sup>(1)</sup>	$P_D$	300	mW
RMS emitter current	$I_{E(EMS)}$	50	mA
Peak pulse emitter current <sup>(2)</sup>	$I_E$	2	Amps
Emitter reverse voltage	$V_{B2E}$	30	Volts
Interbase voltage	$V_{B2B1}$	35	Volts
Operating junction temperature range	$T_J$	-65 to 125	°C
Storage temperature range	$T_{stg}$	-65 to 150	°C

Note 1: Derate 3mW/°C increase in ambient temperature. The total power dissipation must be limited by the external circuitry.

Note 2: Capacitor discharge - 10µF or less, 30 volts or less.

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

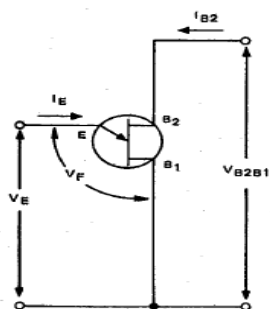
Parameter		Symbol	Min	Typ	Max	Unit
Intrinsic standoff ration ( $V_{B2B1} = 10V$ ) <sup>(1)</sup>	2N2646 2N2647	$\eta$	0.56 0.68	- -	0.75 0.82	-
Interbase resistance ( $V_{B2B1} = 3V, I_E = 0$ )		$r_{BB}$	4.7	7	9.1	kohms
Interbase resistance temperature coefficient ( $V_{B2B1} = 3V, I_E = 0, T_A = -55^\circ\text{ to } 125^\circ\text{C}$ )		$\alpha r_{BB}$	0.1	-	0.9	%/°C
Emitter saturation voltage ( $V_{B2B1} = 10V, I_E = 50\text{mA}$ ) <sup>(2)</sup>		$V_{EB1(sat)}$	-	3.5	-	Volts
Modulated interbase current ( $V_{B2B1} = 10V, I_E = 50\text{mA}$ )		$I_{B2(mod)}$	-	15	-	mA
Emitter reverse current ( $V_{B2E} = 30V, I_{B1} = 0$ )	2N2646 2N2647	$I_{EB20}$	- -	0.005 0.005	12 0.2	µA
Peak point emitter current ( $V_{B2B1} = 25V$ )	2N2646 2N2647	$I_P$	- -	1 1	5 2	µA
Valley point current ( $V_{B2B1} = 20V, R_{B2} = 100\text{ohms}$ ) <sup>(2)</sup>	2N2646 2N2647	$I_V$	4 8	6 10	- 18	mA
Base-one peak pulse voltage <sup>(3)</sup>	2N2646 2N2647	$V_{OB1}$	3 6	5 7	- -	volts

Note 1: Intrinsic standoff voltage:  $\eta = V_P - V_F / V_{B2B1}$ , where  $V_P$  = peak point emitter voltage,  $V_{B2B1}$  = interbase voltage,  $V_F$  = emitter to base one junction diode drop ( $\approx 0.45V$  @  $10\mu A$ ).

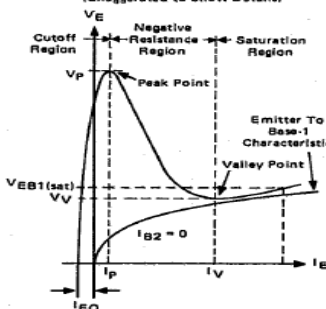
Note 2: PW  $\approx 300\mu s$ , duty cycle  $\leq 2\%$  to avoid internal heating due to interbase modulation which may result in erroneous readings

Note 3: Base one peak pulse voltage is used to ensure minimum pulse amplitude for applications in SCR firing circuits and other types of pulse circuits.

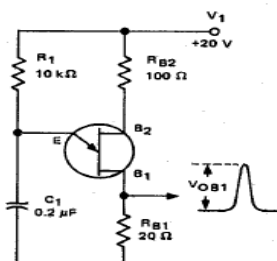
**FIGURE 1**  
UNIUNION TRANSISTOR SYMBOL  
AND NOMENCLATURE



**FIGURE 2**  
STATIC EMITTER CHARACTERISTIC  
CURVES  
(Exaggerated to Show Details)



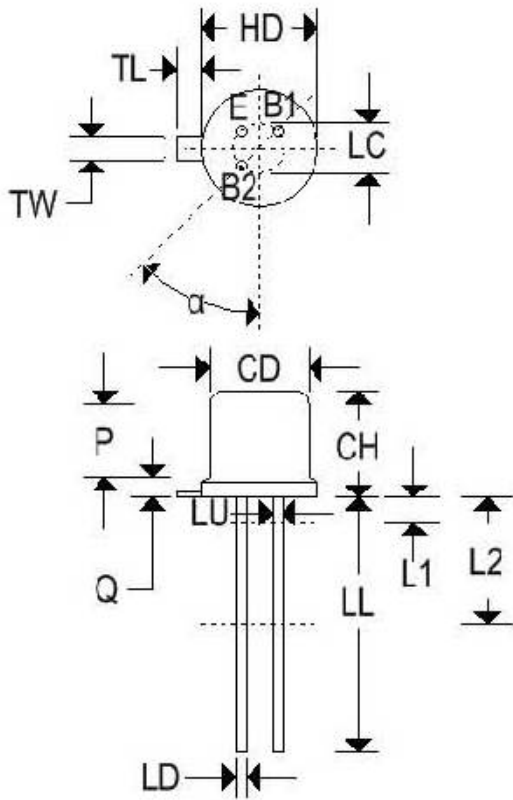
**FIGURE 3 -  $V_{OB1}$  TEST CIRCUIT**  
(Typical Relaxation Oscillator)



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Dim	TO-18			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	0.178	0.195	4.520	4.950
CH	0.170	0.210	4.320	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	

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.