DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N2646, 2N2647

SILICON 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
Power dissipation(1)	P_D	300	mW
RMS emitter current	$I_{E(EMS)}$	50	mA
Peak pulse emitter current (2)	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°C unless otherwise specified)

Parameter		Symbol	Min	Typ	Max	Unit
Intrinsic standoff ration (V_{B2B1} = 10V) (1)	2N2646 2N2647	η	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° to 125°C)		αr_{BB}	0.1	-	0.9	%/°C
Emitter saturation voltage (V_{B2B1} = 10V, I_E = 50mA)(2)		$V_{EB1(sat)}$	-	3.5	-	Volts
Modulated interbase current (V_{B2B1} = 10V, I_E = 50mA)		$I_{B2(mod)}$	-	15	-	mA
Emitter reverse current (V_{B2E} = 30V, I_{B1} = 0)	2N2646 2N2647	I_{EB2O}	- -	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} = 100ohms)(2)	2N2646 2N2647	I_V	4 8	6 10	- 18	mA
Base-one peak pulse voltage(3)	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
(≈ 0.45V @ 10µA).
Note 2: 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 used to ensure minimum pulse amplitude for applications in SCR firing circuits and other types of pulse circuits.

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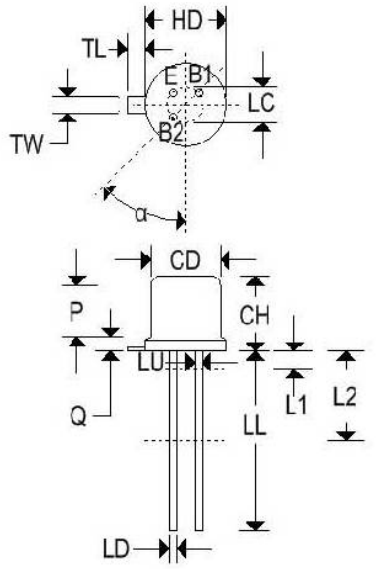
MECHANICAL CHARACTERISTICS

Case	TO-18
Marking	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	0.170	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_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	

FIGURE 1
UNIJUNCTION TRANSISTOR SYMBOL AND NOMENCLATURE

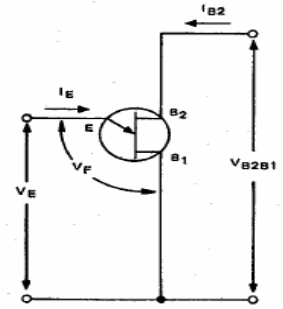


FIGURE 2
STATIC EMITTER CHARACTERISTIC CURVES
(Exaggerated to Show Details)

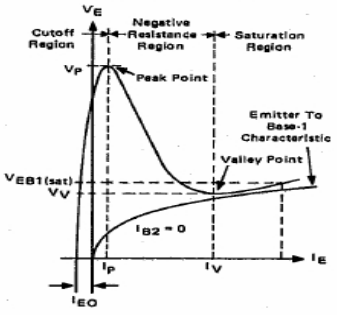


FIGURE 3 – V_{OB1} TEST CIRCUIT
(Typical Relaxation Oscillator)