DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

# 2N4851-2N4853

## 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** | $P_D$ | 300 | mW |
| **RMS emitter current** | $I_e$ | 50 | mA |
| **Peak-pulse emitter current** | $i_e$ | 1.5 | Amp |
| **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 +200 | °C |

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

| Rating | Part number | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Intrinsic standoff ratio** ($V_{B2B1}$ = 10 V) | 2N4851<br>2N4852, 2N4853 | η | 0.56<br>0.70 | -<br>- | 0.75<br>0.85 | - |
| **Interbase resistance** ($V_{B2B1}$ = 3 V, $I_E$ = 0) | | $R_{BB}$ | 4.7 | - | 9.1 | kΩ |
| **Emitter reverse current** ($V_{B2E}$ = 30 V) | 2N4851, 2N4852<br>2N4853 | $I_{EB2O}$ | -<br>- | -<br>- | <br>100<br>50 | nA |
| **Peak point emitter current** ($V_{B2B1}$ = 25 V) | 2N4851, 2N4852<br>2N4853 | $I_P$ | -<br>- | -<br>- | 2<br>0.4 | µA |
| **Valley point current** ($V_{B2B1}$ = 20 V, $R_{B2}$ = 100Ω) | 2N4851<br>2N4852<br>2N4853 | $I_V$ | 2.0<br>4.0<br>6.0 | -<br>-<br>- | -<br>-<br>- | mA |
| **Base one peak pulse voltage** ($V_1$ = 20V) | 2N4851<br>2N4852<br>2N4853 | $V_{OB1}$ | 3.0<br>5.0<br>6.0 | -<br>-<br>- | -<br>-<br>- | Volts |
| **Maximum frequency of oscillation** | | $f_{(max)}$ | - | 0.25 | - | MHz |

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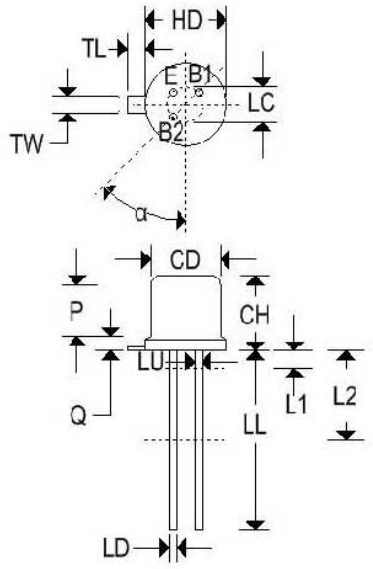
**MECHANICAL CHARACTERISTICS**

| | |
|---|---|
| **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**

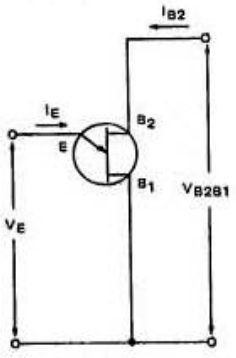



**FIGURE 2 – STATIC EMITTER CHARACTERISTICS CURVES**

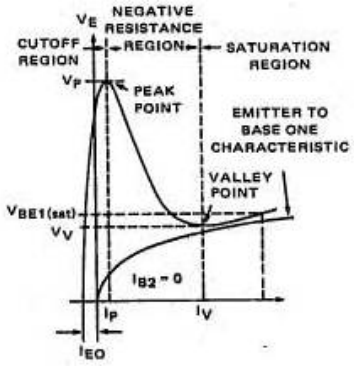


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FIGURE 3 – $V_{OB1}$ TEST CIRCUIT

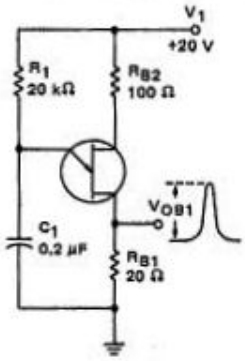
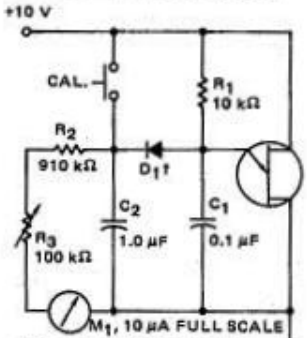



FIGURE 4 – η TEST CIRCUIT




†$D_1$, diode with the following characteristics:

$V_F$ = 0.49 V @ $I_F$ = 10 μA

$I_R$ < 2.0 μA @ $V_R$ = 20 V

FIGURE 5 – $f_{(max)}$ TEST CIRCUIT

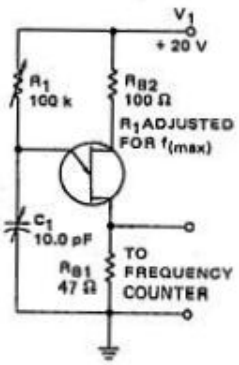
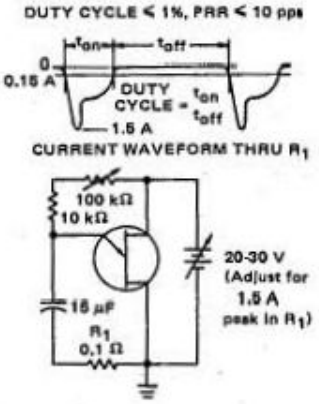



FIGURE 6 – PRR TEST CIRCUIT AND WAVEFORM




## TYPICAL CHARACTERISTICS

FIGURE 7 – EMITTER REVERSE CURRENT

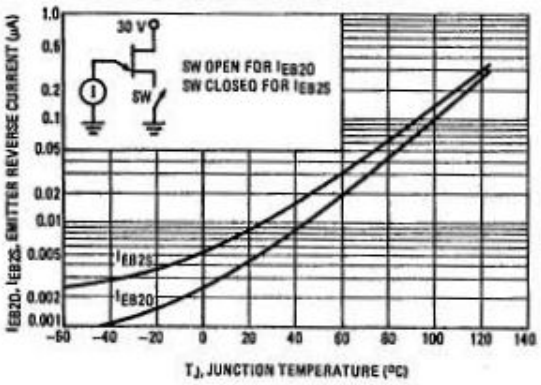
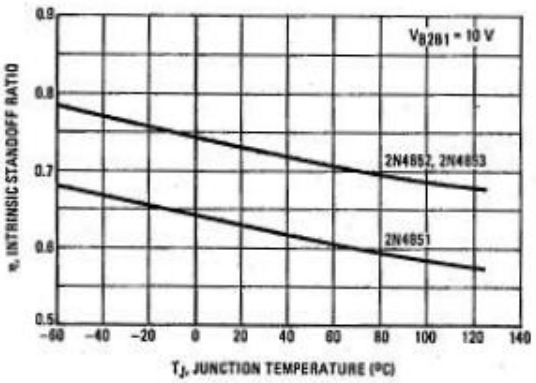



FIGURE 8 – INTRINSIC STANDOFF RATIO



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## PEAK POINT CURRENT

FIGURE 9 – EFFECT OF VOLTAGE

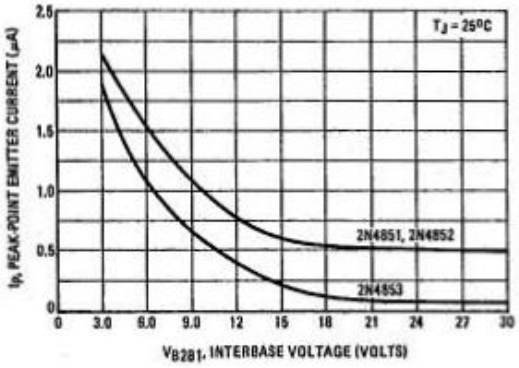
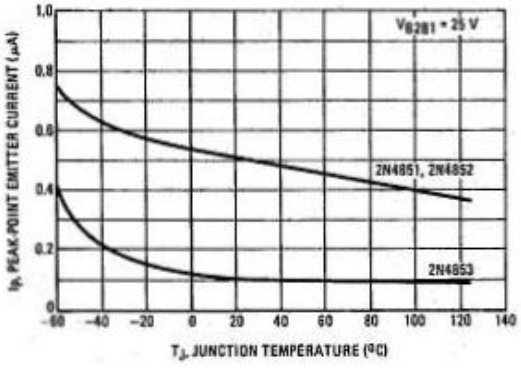



FIGURE 10 – EFFECT OF TEMPERATURE




## INTERBASE RESISTANCE

FIGURE 11 – EFFECT OF VOLTAGE

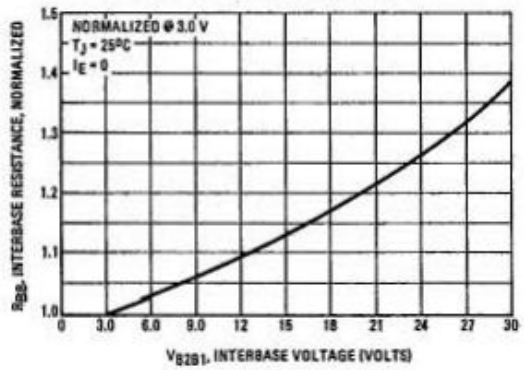
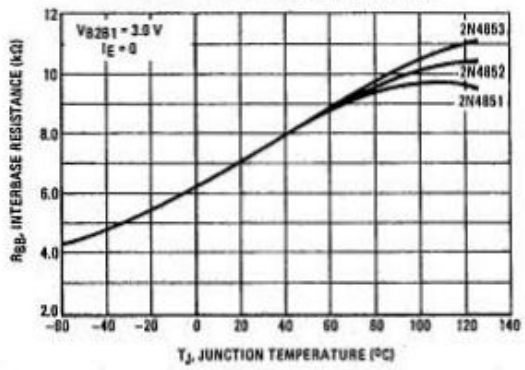



FIGURE 12 – EFFECT OF TEMPERATURE




## TYPICAL CHARACTERISTICS

## VALLEY CURRENT

FIGURE 13 – EFFECT OF VOLTAGE

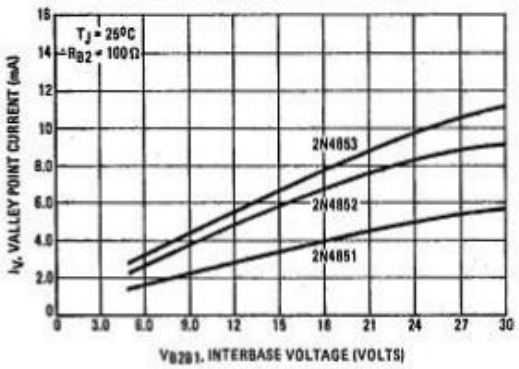
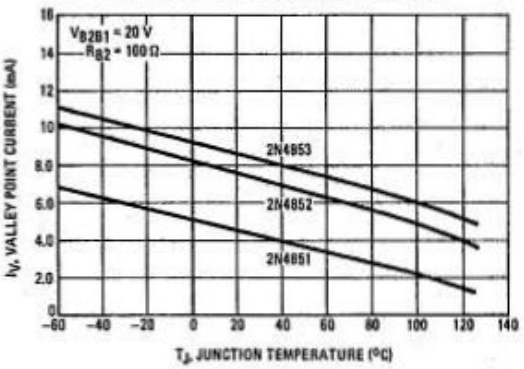



FIGURE 14 – EFFECT OF TEMPERATURE



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## VALLEY VOLTAGE

FIGURE 15 – EFFECT OF VOLTAGE

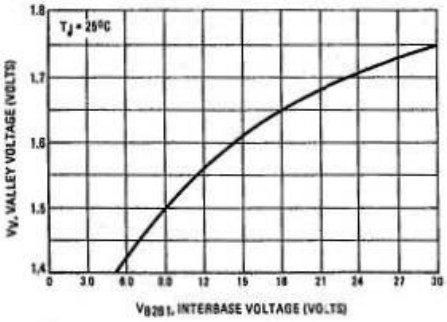


FIGURE 16 – EFFECT OF TEMPERATURE

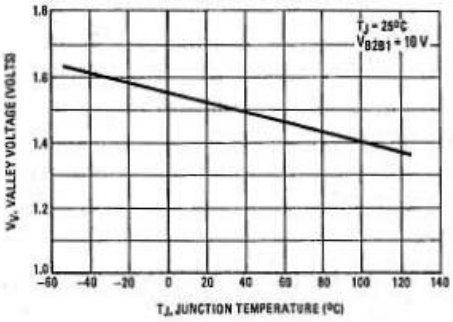


FIGURE 17 – OUTPUT VOLTAGE