

### 7.5 Volts Transistor



Island Labs

The latest in the TRW RF transistor, this device has been specifically designed and characterized for 7.5 V operation. It is ideally suited for use in pocketphones where low battery voltage is used.

400 - 512 MHz  
0.2 Watts  
13 dB Gain

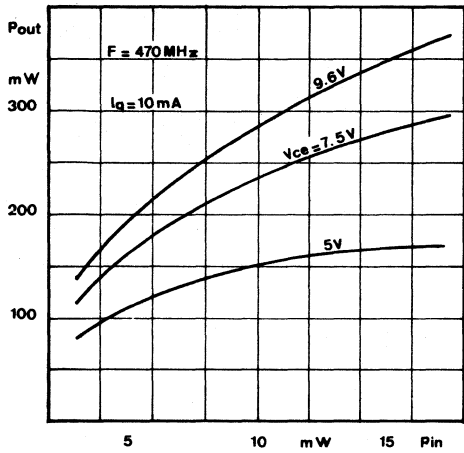


200 SOE STUDLESS

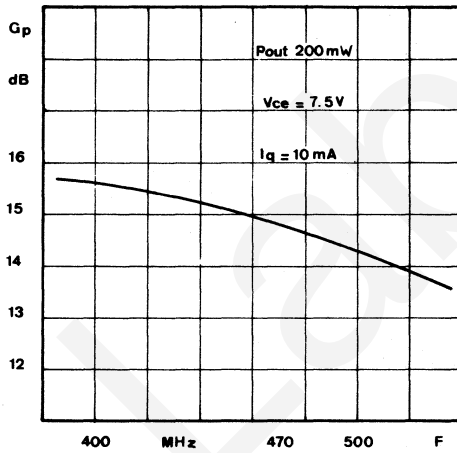
#### PRELIMINARY

|           | SYMBOL            | CHARACTERISTICS                              | TEST CONDITIONS   | MIN.           | TYP.           | MAX. | UNIT |
|-----------|-------------------|--|---|----------------|----------------|------|------|
| DC Test   | BV <sub>EBO</sub> | Emitter - Base Breakdown Voltage             | I <sub>E</sub> = 1 mA    I <sub>C</sub> = 0   | 4              |                |      | V    |
|           | BV <sub>CEO</sub> | Collector - Emitter Breakdown Voltage        | I <sub>C</sub> = 5 mA    I <sub>B</sub> = 0   | 18             |                |      | V    |
|           | BV <sub>CBO</sub> | Collector - Base Breakdown Voltage           | I <sub>C</sub> = 2 mA    I <sub>E</sub> = 0   | 40             |                |      | V    |
|           | I <sub>CBO</sub>  | Collector Cutoff Current                     | V <sub>CB</sub> = 15 V    I <sub>E</sub> = 0  |                |                | 0.5  | mA   |
|           | H <sub>FE</sub>   | D.C Current Gain                             | V <sub>CE</sub> = 5 V    I <sub>C</sub> = 50 mA   | 20             |                |      | —    |
| RF Test   | P <sub>GAIN</sub> | Power Gain                                   | F = 470 MHz    I <sub>q</sub> = 10 mA<br>V <sub>CE</sub> = 7.5 V    P <sub>in</sub> = 10 mW<br>V <sub>CE</sub> = 9.6 V    P <sub>in</sub> = 10 mW | 0.175<br>0.200 | 0.230<br>0.290 |      | W    |
|           | η                 | Efficiency                                   | F = 470 MHz    I <sub>q</sub> = 10 mA<br>V <sub>CE</sub> = 7.5 V    Rated Output Power  | 35             | 40             |      | %    |
|           | Z <sub>in</sub>   | Common Emitter Amplifier Input Impedance     | F = 470 MHz    AB Class<br>V <sub>CE</sub> = 7.5 V    P <sub>in</sub> = 10 mW   |                | 5 + j 0.5      |      | Ω    |
|           | Z <sub>Load</sub> | Common Emitter Amplifier Load Impedance      | F = 470 MHz    AB Class<br>V <sub>CE</sub> = 7.5 V    P <sub>out</sub> = 0.2 W  |                | 47 + j 45      |      | Ω    |
|           | C <sub>OB</sub>   | Collector - Base Capacitance                 | V <sub>CB</sub> = 10 V    F = 1 MHz   |                | 1.6            | 2.5  | pF   |
| Operating | I <sub>C</sub>    | Continuous Collector Current                 |   |                |                | 0.2  | A    |
|           | θ <sub>j-c</sub>  | Thermal Resistance                           | T <sub>C</sub> = 25 °C  |                |                | 175  | °C/W |
|           | T <sub>STG</sub>  | Storage Temperature and Junction Temperature |   | — 65°          |                | 200° | °C   |
|           | P <sub>D</sub>    | Power Dissipation                            | T <sub>C</sub> = 25 °C  |                |                | 1    | W    |

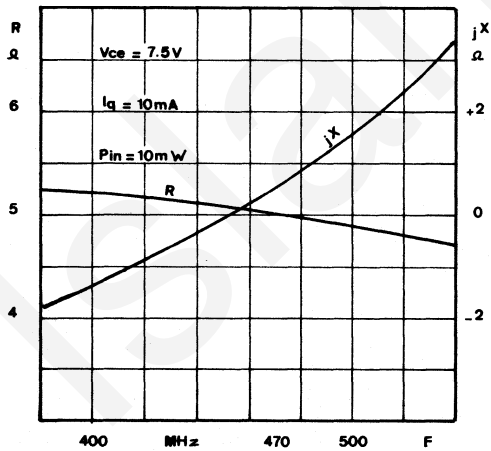
Output Power vs Input Power and  $V_{CE}$



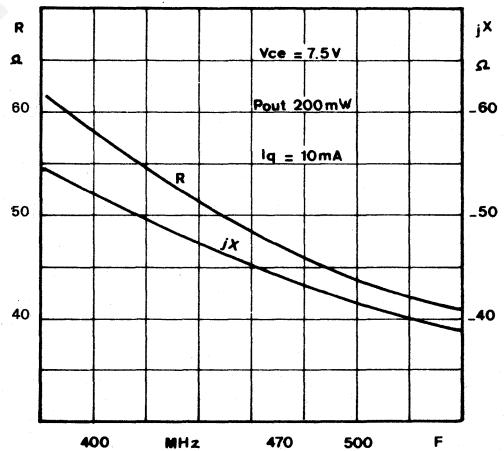
Power Gain vs Frequency



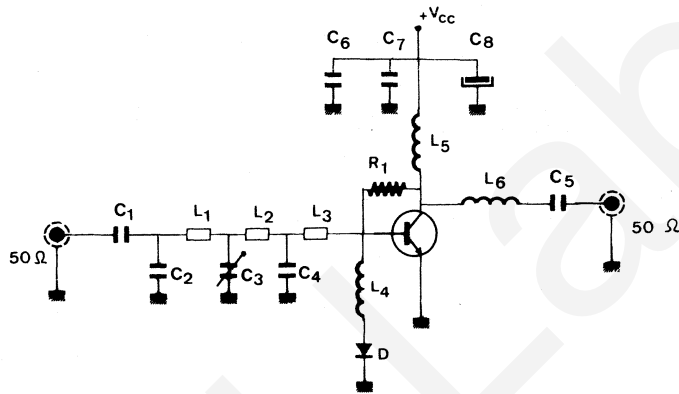
Input Impedance vs Frequency



Output Impedance vs Frequency



400-512 MHz TEST CIRCUIT



- C<sub>1</sub> = 27 pF Ceramic 632 RTC
  - C<sub>2</sub> = 8.2 pF Ceramic 632 RTC
  - C<sub>3</sub> = 3-20 pF Trimmer Capacitor
  - C<sub>4</sub> = 22 pF Ceramic 632 RTC
  - C<sub>5</sub> = C<sub>6</sub> = 1000 pF Ceramic 629 RTC
  - C<sub>7</sub> = 10 nF Ceramic 629 RTC
  - C<sub>8</sub> = 10 μF/25 V Electrolytic
  - L<sub>1</sub> = Stripline Z<sub>0</sub> = 70 ohms l = 0.061 λ
  - L<sub>2</sub> = Stripline Z<sub>0</sub> = 70 ohms l = 0.026 λ
  - L<sub>3</sub> = Stripline Z<sub>0</sub> = 50 ohms l = 0.031 λ
- } F<sub>REF</sub> = 480 MHz
- L<sub>4</sub> = L<sub>5</sub> = 0.15 μH Molded Coil
  - L<sub>6</sub> = 3 turns - Silvered Wire 6/10 mm - 4 mm I.D - 8 mm length
  - R<sub>1</sub> = 5 10 Ω Carbon Composition 1/4 W

# PACKAGE .200 SOE STUDLESS

