



# 2731-100M

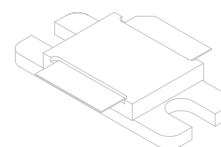
100 Watts, 36 Volts, 200 $\mu$ s, 10%  
Radar 2700-3100 MHz

## GENERAL DESCRIPTION

The 2731-100M is an internally matched, COMMON BASE bipolar transistor capable of providing 100 Watts of pulsed RF output power at 200 $\mu$ s pulse width, 10% duty factor across the 2700 to 3100 MHz band. The transistor prematch and test fixture has been optimized through the use of 10 Ohm TRL Analysis. This ceramic sealed transistor is specifically designed for S-band radar applications. It utilizes gold metallization and emitter ballasting to provide high reliability and supreme ruggedness.

## CASE OUTLINE

**55KS-1**  
**Common Base**



## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C<sup>1</sup> 575 W

### Maximum Voltage and Current

Collector to Base Voltage (BV<sub>ces</sub>) 65 V

Emitter to Base Voltage (BV<sub>ebo</sub>) 3.0 V

Collector Current (I<sub>c</sub>) 15.0 A

### Maximum Temperatures

Storage Temperature -65 to +200 °C

Operating Junction Temperature +200 °C

## ELECTRICAL CHARACTERISTICS @ 25°C

| SYMBOL           | CHARACTERISTICS         | TEST CONDITIONS           | MIN | TYP | MAX | UNITS |
|------------------|-------------------------|---------------------------|-----|-----|-----|-------|
| P <sub>out</sub> | Power Output            | F=2700-3100 MHz           | 100 | 115 | 140 | W     |
| P <sub>g</sub>   | Power Gain              | Pulse Width = 200 $\mu$ s | 8.0 | 8.5 | 9.4 | dB    |
| $\eta_c$         | Collector Efficiency    | Duty Factor = 10 %        | 40  |     |     | %     |
| R <sub>l</sub>   | Return Loss             | Power Input = 16W         | -7  |     |     | dB    |
| P <sub>d</sub>   | Pulse Droop             | V <sub>cc</sub> = +36V    |     |     | 0.6 | dB    |
| VSWR-T           | Load Mismatch Tolerance | F = 2700, 2900, 3100 MHz  |     |     | 2:1 |       |

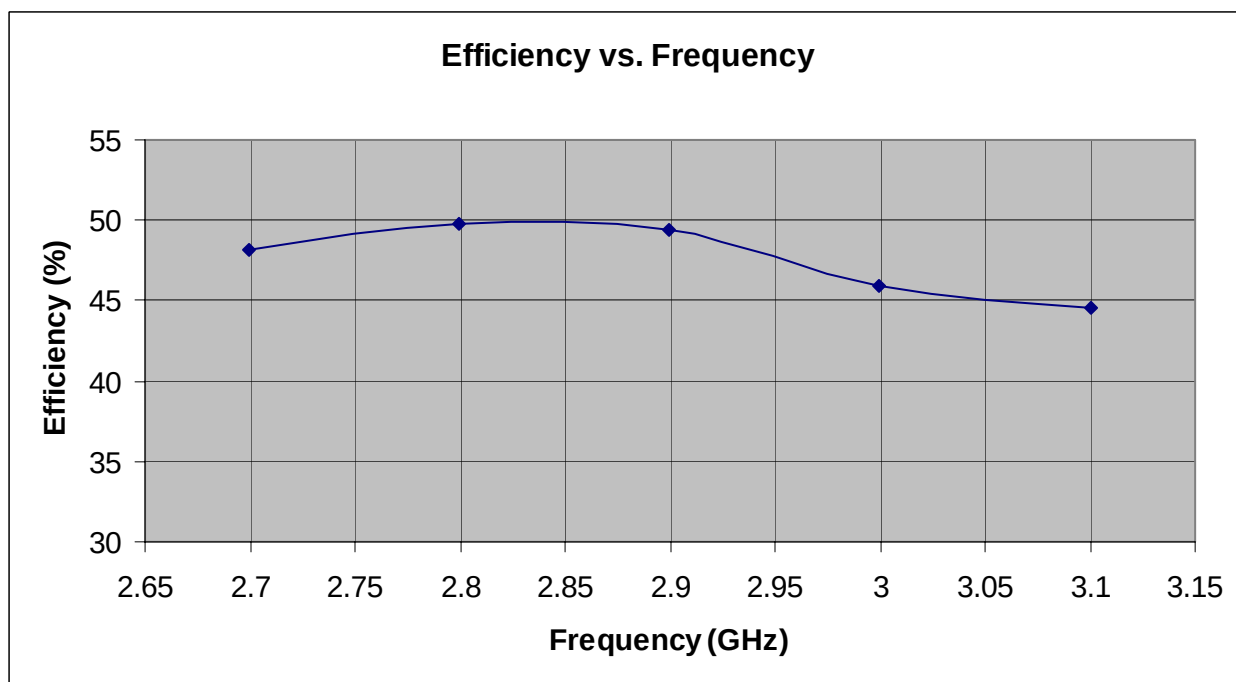
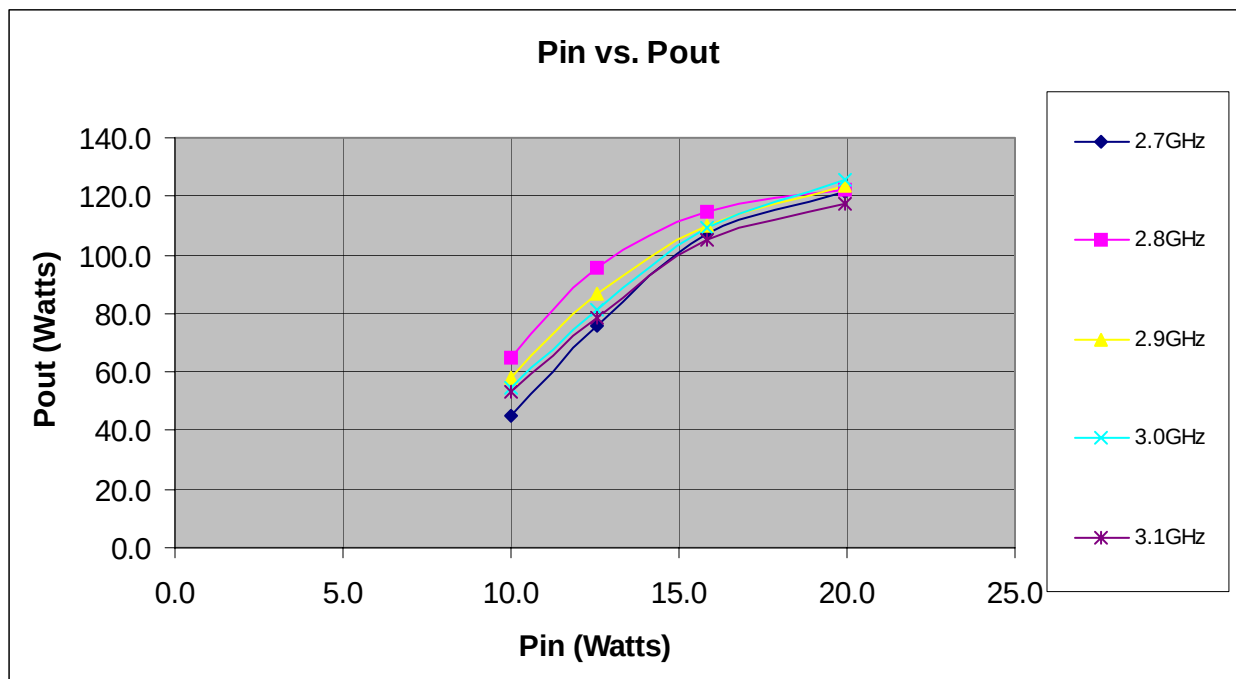
## FUNCTIONAL CHARACTERISTICS @ 25°C

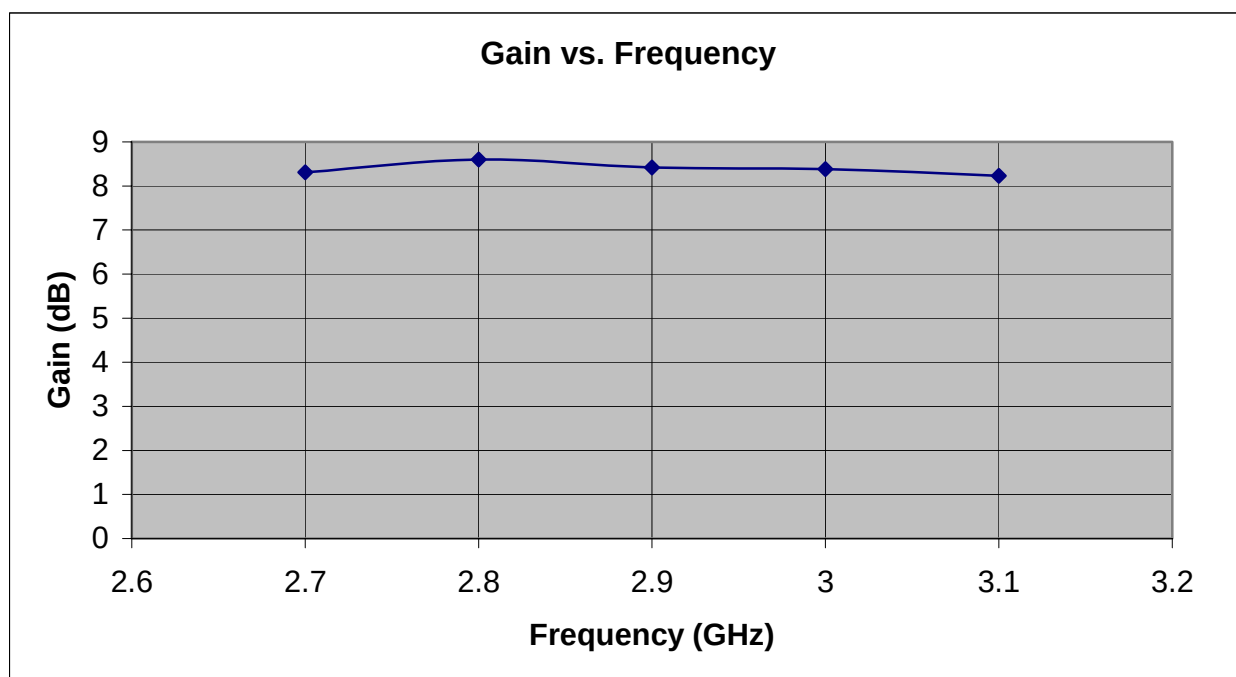
|                   |                                |                                               |     |    |      |      |
|-------------------|--------------------------------|-----------------------------------------------|-----|----|------|------|
| BV <sub>ebo</sub> | Emitter to Base Breakdown      | I <sub>e</sub> = 30 mA                        | 3.0 |    |      | V    |
| BV <sub>ces</sub> | Collector to Emitter Breakdown | I <sub>c</sub> = 120 mA                       | 65  |    |      | V    |
| h <sub>FE</sub>   | DC – Current Gain              | V <sub>ce</sub> = 5V, I <sub>c</sub> = 600 mA |     | 15 |      |      |
| $\theta_{jc}^1$   | Thermal Resistance             |                                               |     |    | 0.43 | °C/W |

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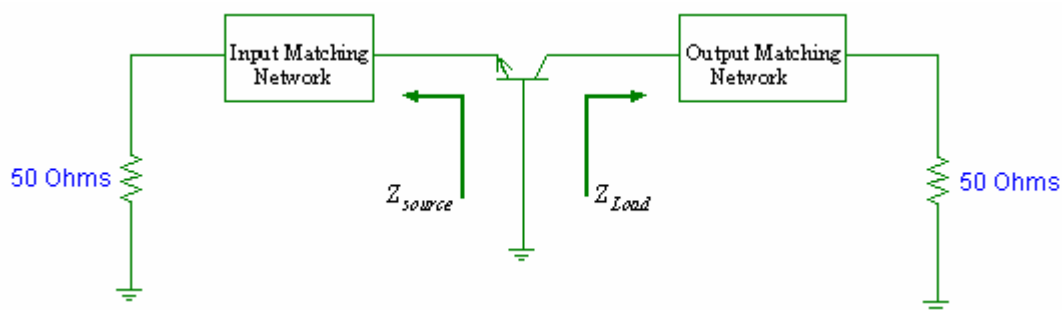
**2731-100M**

**V<sub>cc</sub> = 36 Volts, Pulse Width = 200μs, Duty = 10 %**

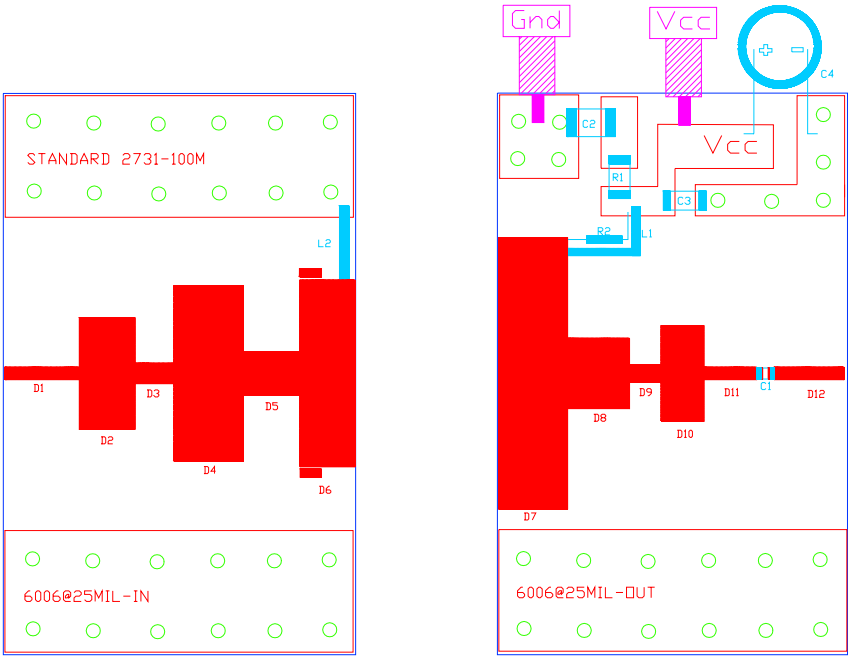




*Impedance curves will be added at the completion of the characterization.*

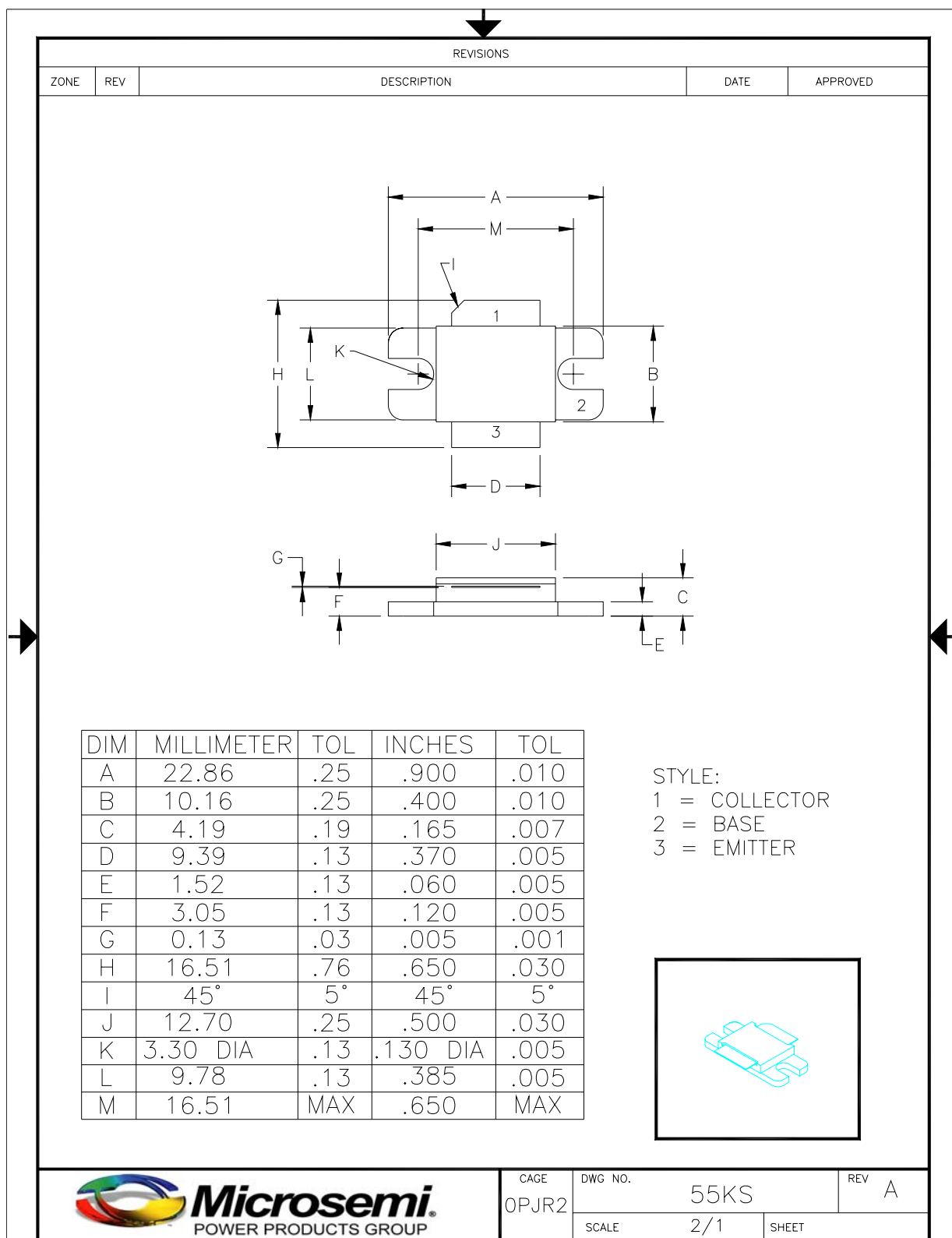


| Impedance Data |             |            |
|----------------|-------------|------------|
| Freq (GHz)     | Zs          | Zl         |
| 2.7            | 8.87-j12.64 | 4.33-j4.67 |
| 2.8            | 8.24-j10.26 | 3.95-j4.94 |
| 2.9            | 8.54-j8.06  | 3.47-j5.08 |
| 3.0            | 9.85-j6.05  | 2.96-j5.06 |
| 3.1            | 10.26-j4.88 | 2.48-j4.92 |



| Circuit Component |                  |                               |
|-------------------|------------------|-------------------------------|
| Item              | Description      | Value                         |
| C1                | Chip Cap A size  | 9.1pF                         |
| C2                | Chip Cap B size  | 10,000pF                      |
| C3                | Chip Cap B size  | 100pF                         |
| C4                | Electrolytic Cap | 2200uF                        |
| R1                | Chip resistor    | 20 ohms                       |
| R2                | Fix resistor     | 1.5 ohms                      |
| L1                | Silver ribbon    | L=870 Mil, W=70 Mil.          |
| L2                | Copper wire      | 21 AWG, 560 Mil               |
| Material          | Roger-Duroid     | 6006 @ 25Mil, Er=6.15, 1Oz Cu |
|                   |                  |                               |

| Physical Circuit Dimension |         |         |
|----------------------------|---------|---------|
| Item                       | W (Mil) | L (Mil) |
| D1                         | 35      | 210     |
| D2                         | 318     | 158     |
| D3                         | 58      | 114     |
| D4                         | 500     | 195     |
| D5                         | 124     | 161     |
| D6                         | 530     | 156     |
| D7                         | 770     | 196     |
| D8                         | 200     | 176     |
| D9                         | 48      | 92      |
| D10                        | 272     | 119     |
| D11                        | 35      | 150     |
| D12                        | 35      | 200     |

**2731-100M**

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