



## 0405-1000M

1000 Watts - 40 Volts, 300 $\mu$ s, 10%  
UHF Pulsed Radar 400 - 450 MHz

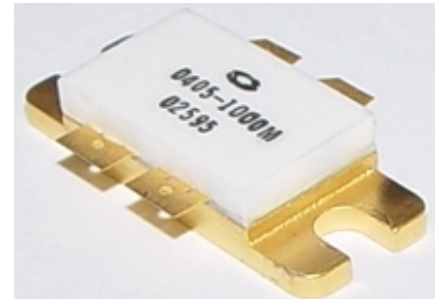
### GENERAL DESCRIPTION

The 0405-1000M is an internally matched, COMMON EMITTER transistor capable of providing 1000 Watts of pulsed RF output power in a push-pull configuration at three hundreds microsecond pulse width ten percent duty factor across the frequency band 400-450 MHz. This hermetically sealed transistor is specifically designed for medium pulse radar applications. It utilizes gold metallization and diffused emitter ballasting to provide high reliability and supreme ruggedness.

### ABSOLUTE MAXIMUM RATINGS

|   |                 |
|---|-----------------|
| Maximum Power Dissipation @ 25°C <sup>1</sup> | 1400 Watts      |
| <b>Maximum Voltage and Current</b>            |                 |
| BVces Collector to Emitter Voltage            | 85 Volts        |
| BVebo Emitter to Base Voltage                 | 3.5 Volts       |
| Ic Collector Current                          | 70 Amps         |
| <b>Maximum Temperatures</b>                   |                 |
| Storage Temperature                           | - 65 to + 200°C |
| Operating Junction Temperature                | + 200°C         |

### CASE OUTLINE 55SL, STYLE 2



### ELECTRICAL CHARACTERISTICS @ 25 °C

| SYMBOL            | CHARACTERISTICS           | TEST CONDITIONS           | MIN  | TYP | MAX | UNITS |
|-------------------|---------------------------|---------------------------|------|-----|-----|-------|
| Pout              | Power Out (Note 2) Pulsed | F = 400, 425, 450 MHz     | 1000 |     |     | Watts |
| Pin               | Power Input, Pulsed       | Vcc = 40 Volts,           |      |     | 112 | Watts |
| Pg                | Power Gain                | Pulse Width = 300 $\mu$ s | 9.5  | 10  |     | dB    |
| $\eta_c$          | Collector Efficiency      | Duty = 10 %               | 45   |     |     | %     |
| Pd                | Pulse Amplitude Droop     | As above                  |      |     | 0.7 | dB    |
| VSWR <sup>1</sup> | Load Mismatch Tolerance   | F = 425MHz, Po = 1000W    |      |     | 2:1 |       |

### FUNCTIONAL CHARACTERISTICS @ 25 °C

|                            |                                 |                        |    |  |      |       |
|----------------------------|---------------------------------|------------------------|----|--|------|-------|
| Bvces                      | Collector to Emitter Breakdown  | Ic = 50 mA             | 75 |  |      | Volts |
| Ices                       | Collector to Emitter Leakage    | Vce = 50 Volts         |    |  | 30   | mA    |
| Iebo                       | Emitter to Base Leakage Current | Veb = 3.0 Volts        |    |  | 25   | mA    |
| Hfe                        | DC Current Gain                 | Vce = 5 V, Ic = 1000mA | 10 |  |      |       |
| $\theta_{jc}$ <sup>1</sup> | Thermal Resistance              | Rated Pulse Condition  |    |  | 0.08 | °C/W  |

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Note 1: Pulse width = 300  $\mu$ s, duty = 10%

Note 2: Power Input = 112 Watts max Peak Pulsed

Note 3: This part is tested at fixed Pout=1000W.

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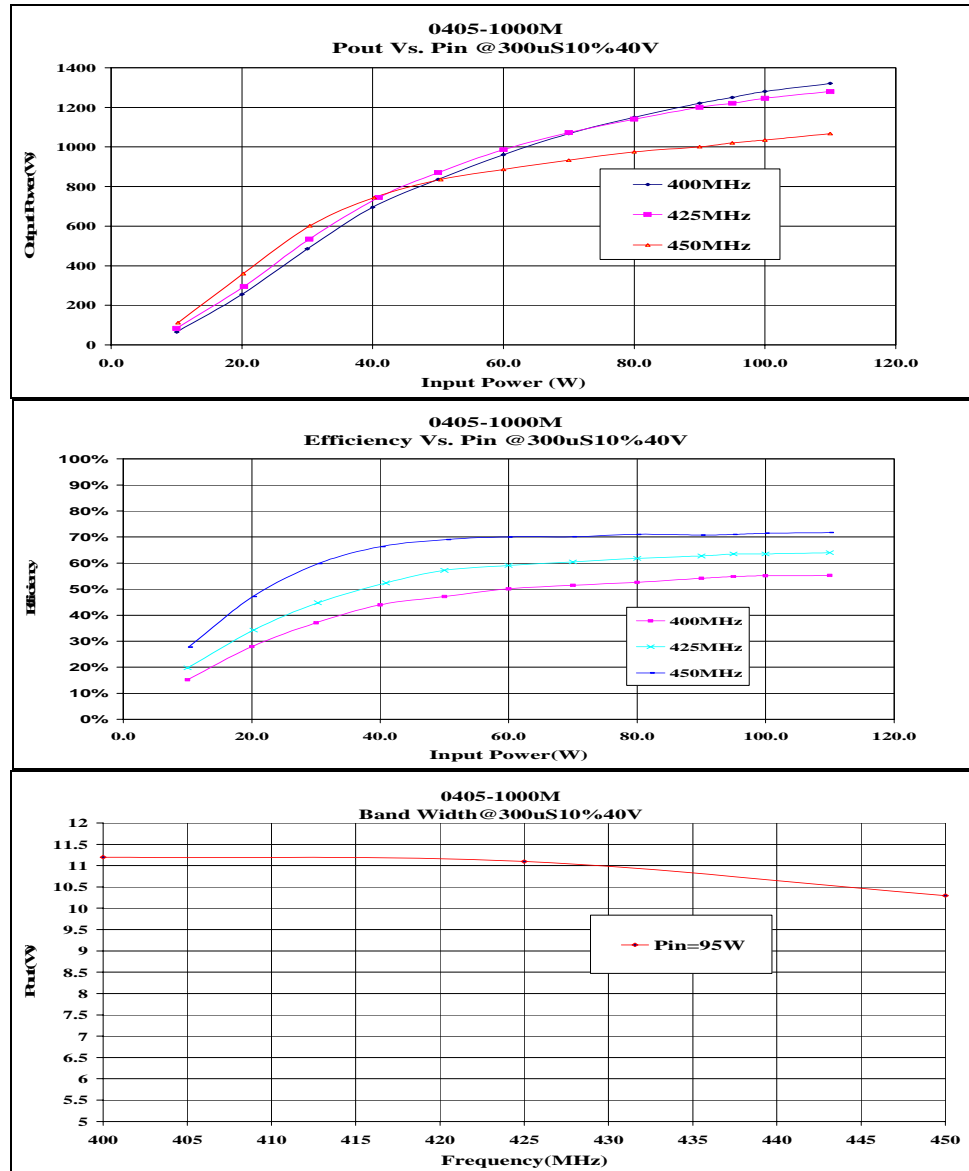
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Microsemi Corp. 3000 Oakmead Village Drive, Santa Clara, CA 95051-0808 TEL. 408-986-8031 FAX 408-869-2324



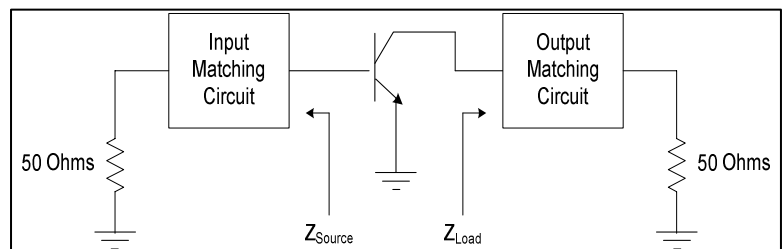
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### Performance Curves



### Single-Ended Impedance Information

| Single-Ended Impedance |            |            |
|------------------------|------------|------------|
| Freq                   | Zs         | Zl         |
| 400                    | 1.39-j2.9  | 0.79-j2.41 |
| 425                    | 1.94-j2.93 | 0.86-j2.55 |
| 450                    | 2.21-j3.07 | 0.91-j2.95 |



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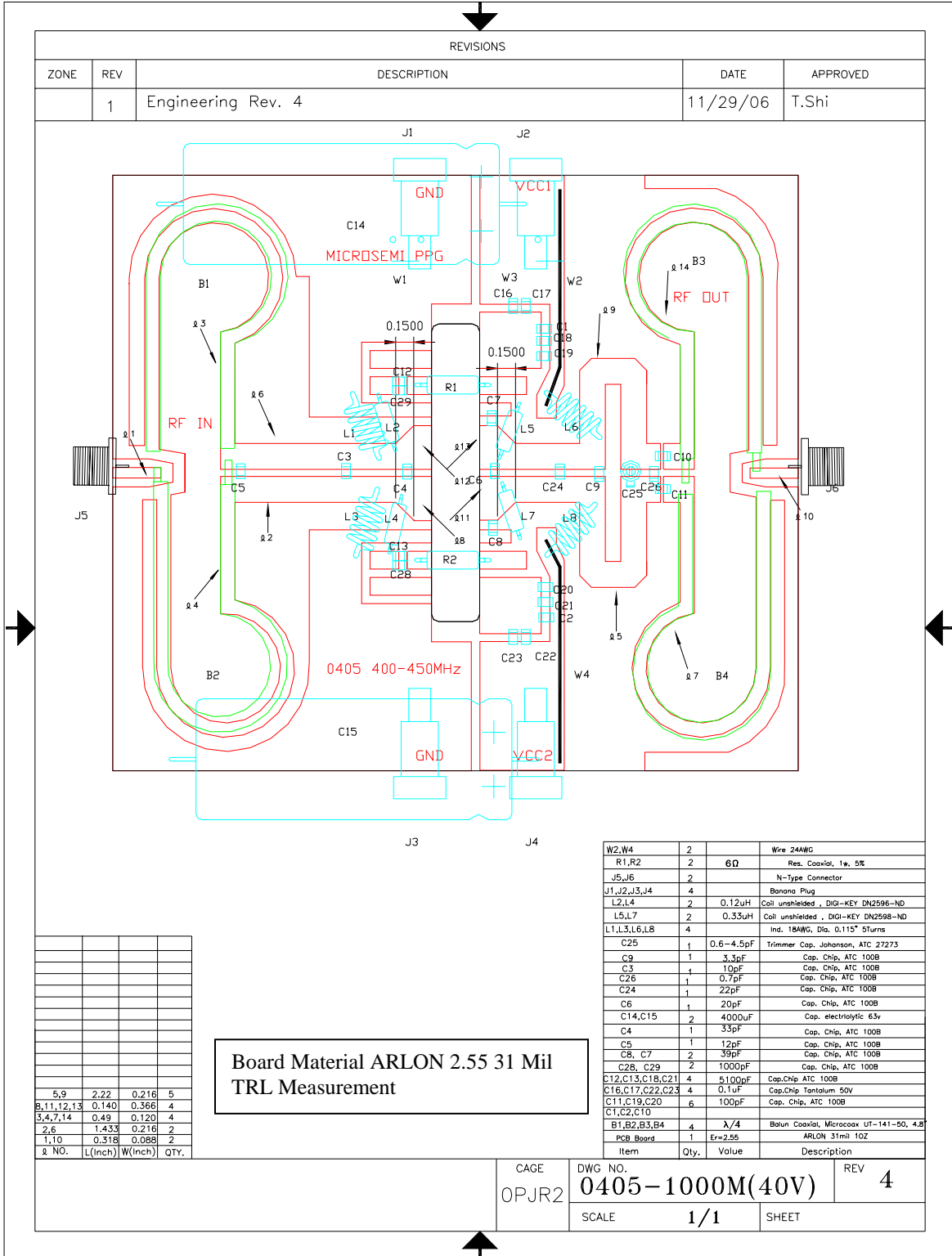
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## Broadband Test Fixture



| REVISIONS |     |                    |          |          |
|-----------|-----|--------------------|----------|----------|
| ZONE      | REV | DESCRIPTION        | DATE     | APPROVED |
|           | 1   | Engineering Rev. 4 | 11/29/06 | T.Shi    |

|                 |      |           |   |
|-----------------|------|-----------|---|
| W2,W4           | 2    |           | Wire 24AWG                              |
| R1,R2           | 2    | 6Ω        | Res. Coaxial, 1w, 5%                    |
| J5,J6           | 2    |           | N-Type Connector                        |
| J1,J2,J3,J4     | 4    |           | Banana Plug                             |
| L2,L4           | 2    | 0.12uH    | Coil unshielded , DIGI-KEY DN2596-ND    |
| L5,L7           | 2    | 0.33uH    | Coil unshielded , DIGI-KEY DN2598-ND    |
| L1,L3,L6,L8     | 4    |           | Ind. 18AWG, Dia. 0.115" 5Turns          |
| C25             | 1    | 0.6-4.5pF | Trimmer Cap. Johanson, ATC 27273        |
| C9              | 1    | 3.3pF     | Cap. Chip, ATC 100B                     |
| C3              | 1    | 10pF      | Cap. Chip, ATC 100B                     |
| C26             | 1    | 0.1pF     | Cap. Chip, ATC 100B                     |
| C24             | 1    | 22pF      | Cap. Chip, ATC 100B                     |
| C6              | 1    | 20pF      | Cap. Chip, ATC 100B                     |
| C14,C15         | 2    | 4000uF    | Cap. electrolytic 63v                   |
| C4              | 1    | 33pF      | Cap. Chip, ATC 100B                     |
| C5              | 1    | 12pF      | Cap. Chip, ATC 100B                     |
| C8, C7          | 2    | 39pF      | Cap. Chip, ATC 100B                     |
| C28, C29        | 2    | 1000pF    | Cap. Chip, ATC 100B                     |
| C12,C13,C18,C21 | 4    | 5100pF    | Cap. Chip ATC 100B                      |
| C16,C17,C22,C23 | 4    | 0.1uF     | Cap. Chip Tantalum 50V                  |
| C11,C19,C20     | 6    | 100pF     | Cap. Chip, ATC 100B                     |
| C1,C2,C10       |      |           |   |
| B1,B2,B3,B4     | 4    | λ/4       | Balon Coaxial, Microcosm UT-141-50, 4.8 |
| PCB Board       | 1    | Er=2.55   | ARLON 31mil 10Z                         |
| Item            | Qty. | Value     | Description                             |

| Ø NO.      | L(Inch) | W(Inch) | QTY. |
|------------|---------|---------|------|
| 5,9        | 2.22    | 0.216   | 5    |
| 8,11,12,13 | 0.140   | 0.366   | 4    |
| 3,4,7,14   | 0.49    | 0.120   | 4    |
| 2,6        | 1.433   | 0.216   | 2    |
| 1,10       | 0.318   | 0.088   | 2    |

Board Material ARLON 2.55 31 Mil  
TRL Measurement

|       |                 |     |
|-------|-----------------|-----|
| CAGE  | DWG NO.         | REV |
| OPJR2 | 0405-1000M(40V) | 4   |
| SCALE | SHEET           |     |
| 1/1   |                 |     |

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## Case Outline

