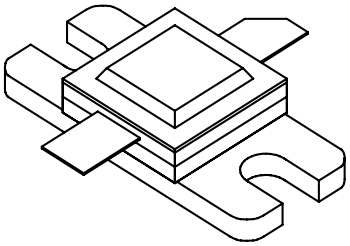
# 1517-110M

**110 Watts, 40 Volts, 200µs, 10%**
**Radar 1480 to 1650 MHz**

## GENERAL DESCRIPTION

The 1517-110M is an internally matched, COMMON BASE transistor capable of providing 110 Watts of pulsed RF output power at 200 microseconds pulse width, 10% duty factor across the band 1480 to 1650 MHz. This hermetically solder-sealed transistor is specifically designed for upper L-Band radar applications. It utilizes gold metallization and diffused emitter ballasting to provide high reliability and supreme ruggedness.

## CASE OUTLINE
**55AW-1**



## ABSOLUTE MAXIMUM RATINGS

**Maximum Power Dissipation**

| | | |
|---|---|---|
| Device Dissipation @25°C[1] | 350 | W |

**Maximum Voltage and Current**

| | | |
|---|---|---|
| Collector to Base Voltage ($BV_{CES}$) | 70 | V |
| Emitter to Base Voltage ($BV_{EBO}$) | 3 | V |
| Collector Current ($I_C$) | 9 | A |

**Maximum Temperatures**

| | | |
|---|---|---|
| Storage Temperature | -65 to +200 | °C |
| Operating Junction Temperature | +200 | °C |

**FUNCTIONAL CHARACTERISTICS @ 25°C**

| SYMBOL | CHARACTERISTICS | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| $P_{out}$ | Power Output | F = 1480-1650 MHz<br>Vcc = 40 Volts<br>Pin = 20.5 W<br>Pulse Width = 200µs<br>Duty Factor = 10% | 110 | 120 | 150 | W |
| $P_g$ | Power Gain | | 7.3 | | 8.6 | dB |
| $\eta_c$ | Collector Efficiency | | 40 | | | % |
| $IR_L$ | Input Return Loss | | 9 | | | dB |
| Pd | Pulse Droop | | | | 0.5 | dB |
| VSWR[1] | Load Mismatch Tolerance | F=1480 MHz, Pin = 20.5 W | | | 3:1 | |

**ELECTRICAL CHARACTERISTICS @ 25°C**

| | | | | | | |
|---|---|---|---|---|---|---|
| $I_{EBO}$ | Emitter cutoff current | $V_{EB}$ = 3 V | | | 10 | mA |
| $BV_{CES}$ | Collector to Emitter Breakdown | $I_C$ = 40 mA | 70 | | | V |
| $h_{FE}$ | DC – Current Gain | $V_{CE}$ = 5V, $I_c$ = 1A | 20 | | | |
| $\theta jc$[1] | Thermal Resistance | | | | 0.5 | °C/W |

NOTES: 1. Pulse condition of 200µsec, 10%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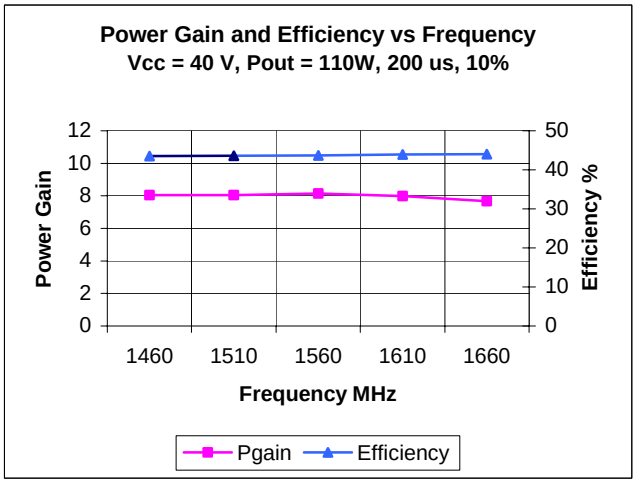
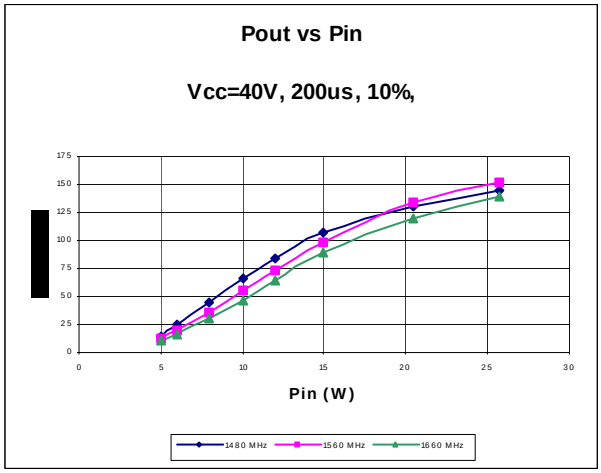
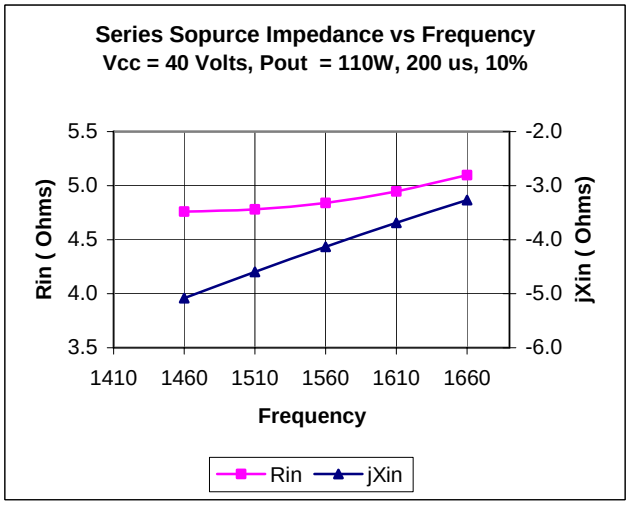
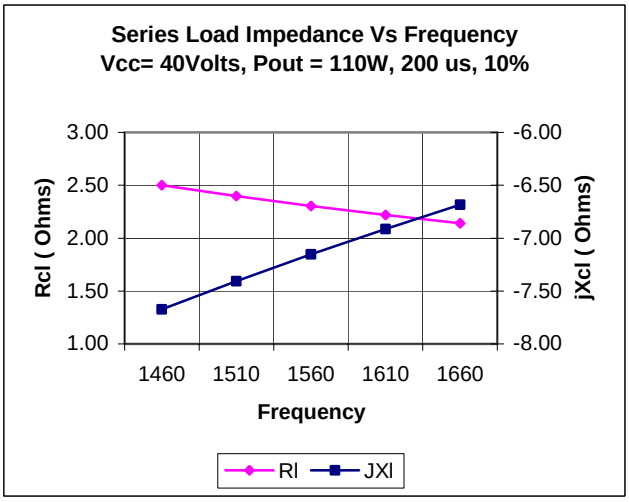
## Performance Curves –



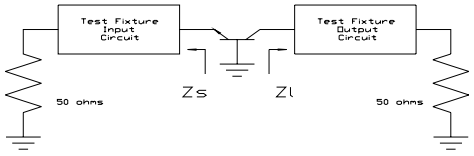




## *Typical Impedances*




| IMPEDANCE | | |
|---|---|---|
| Freq(MHz) | Zs | Zl |
| 1480 | 4.76 – j 5.08 | 2.50 – j 7.67 |
| 1510 | 4.78 – j 4.60 | 2.40 – j 7.40 |
| 1560 | 4.84 – j 4.13 | 2.31 – j 7.15 |
| 1610 | 4.95 – j 3.69 | 2.22 – j 6.91 |
| 1650 | 5.10 – j 3.27 | 2.14 – j 6.68 |



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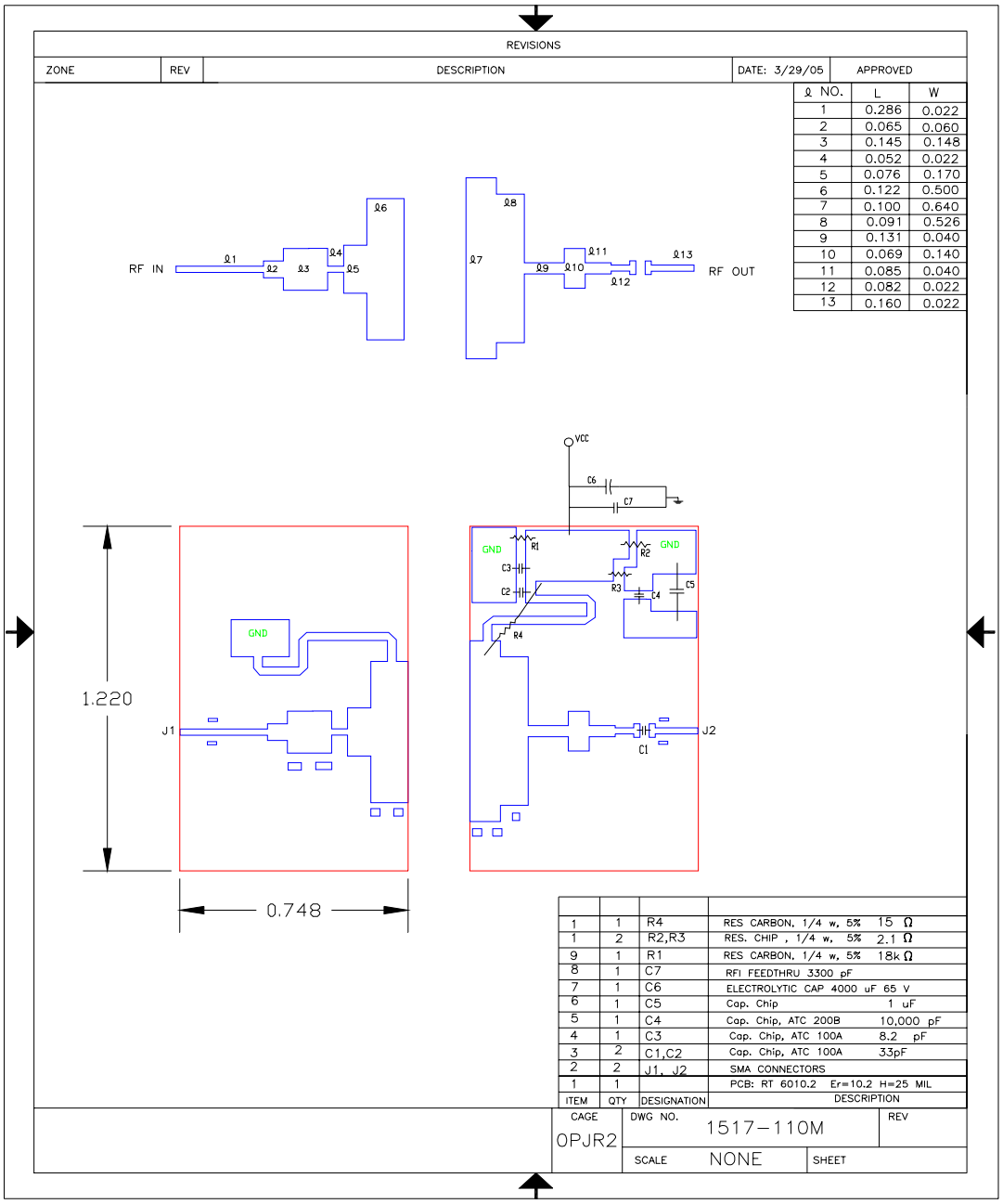
## *BROADBAND TEST CIRCUIT*




| ℓ NO. | L | W |
|---|---|---|
| 1 | 0.286 | 0.022 |
| 2 | 0.065 | 0.060 |
| 3 | 0.145 | 0.148 |
| 4 | 0.052 | 0.022 |
| 5 | 0.076 | 0.170 |
| 6 | 0.122 | 0.500 |
| 7 | 0.100 | 0.640 |
| 8 | 0.091 | 0.526 |
| 9 | 0.131 | 0.040 |
| 10 | 0.069 | 0.140 |
| 11 | 0.085 | 0.040 |
| 12 | 0.082 | 0.022 |
| 13 | 0.160 | 0.022 |

| ITEM | QTY | DESIGNATION | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | R4 | RES CARBON, 1/4 w, 5% 15 Ω |
| 1 | 2 | R2,R3 | RES. CHIP , 1/4 w, 5% 2.1 Ω |
| 9 | 1 | R1 | RES CARBON, 1/4 w, 5% 18k Ω |
| 8 | 1 | C7 | RFI FEEDTHRU 3300 pF |
| 7 | 1 | C6 | ELECTROLYTIC CAP 4000 uF 65 V |
| 6 | 1 | C5 | Cap. Chip 1 uF |
| 5 | 1 | C4 | Cap. Chip, ATC 200B 10,000 pF |
| 4 | 1 | C3 | Cap. Chip, ATC 100A 8.2 pF |
| 3 | 2 | C1,C2 | Cap. Chip, ATC 100A 33pF |
| 2 | 2 | J1, J2 | SMA CONNECTORS |
| 1 | 1 | | PCB: RT 6010.2 Er=10.2 H=25 MIL |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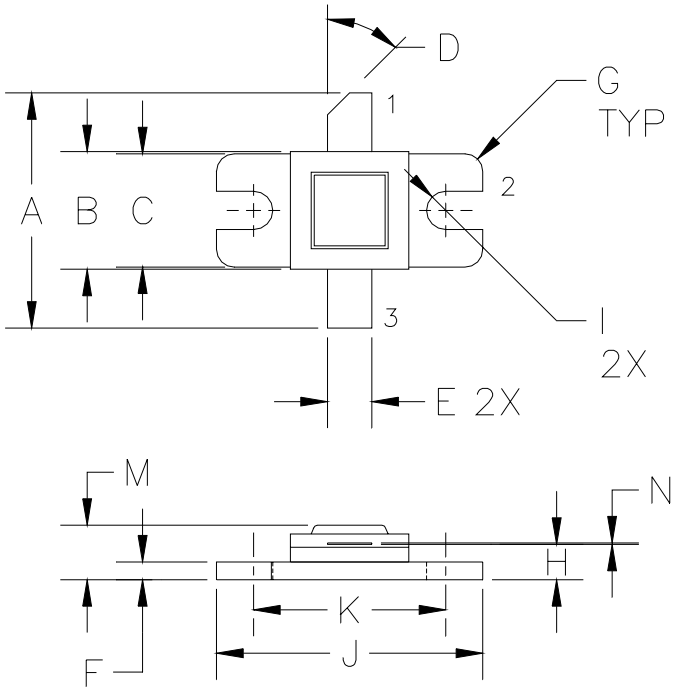
# *Case Outline*

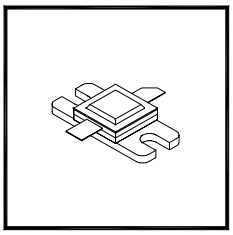
| REVISIONS | | | | |
|---|---|---|---|---|
| ZONE | REV | DESCRIPTION | DATE | APPROVED |




| DIM | MILLIMETER | ±TOL | INCHES | ±TOL |
|---|---|---|---|---|
| A | 20.32 | .76 | .800 | .050 |
| B | 10.16 | .13 | .400 | .005 |
| C | 9.78 | .13 | .385 | .005 |
| D | 45° | 5° | 45° | 5° |
| E | 3.81 | .13 | .150 | .005 |
| F | 1.52 | .13 | .060 | .005 |
| G | 1.52R | .13 | .060R | .005 |
| H | 3.05 | .13 | .120 | .005 |
| I | 3.30 DIA | .13 | .130 DIA | .005 |
| J | 22.86 | .13 | .900 | .005 |
| K | 16.51 | .13 | .650 | .005 |
| M | 4.70 | REF | .185 | REF |
| N | 0.13 | .02 | .005 | .001 |

STYLE 1:
PIN1 = COLLECTOR
2 = BASE
3 = EMITTER

STYLE 2:
PIN1 = COLLECTOR
2 = EMITTER
3 = BASE



| CAGE | DWG NO. | | REV |
|---|---|---|---|
| 0PJR2 | 55AW | | A |
| | SCALE | 2/1 | SHEET |



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