# TCS1200

## 1200 Watts, 53 Volts
## Pulsed Avionics at 1030 MHz

## GENERAL DESCRIPTION

The TCS1200 is a high power COMMON BASE bipolar transistor. It is designed for pulsed systems at 1030 MHz, with the pulse width and duty required for TCAS applications. The device has gold thin-film metalization and emitter ballasting for proven highest MTTF. The transistor includes input and output prematch for broadband capability. Low thermal resistance package reduces junction temperature, extends life.
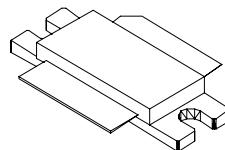
## ABSOLUTE MAXIMUM RATINGS

**Maximum Power Dissipation**

Device Dissipation @ 25°C[1]          2095  W

**Maximum Voltage and Current**

Collector to Base Voltage ($BV_{ces}$)          65  V
Emitter to Base Voltage ($BV_{ebo}$)          3.5  V
Collector Current ($I_c$)          60  A

**Maximum Temperatures**

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

## CASE OUTLINE
## 55TU-1



## ELECTRICAL CHARACTERISTICS @ 25°C

| SYMBOL | CHARACTERISTICS | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|--------|-----------------|-----------------|-----|-----|-----|-------|
| $P_{out}$ | Power Out | Pulse Width = 32µs | 1200 | | | W |
| $P_g$ | Power Gain | Duty Factor = 2% | 10.2 | | | dB |
| $\eta_c$ | Collector Efficiency | F = 1030 MHz, $V_{cc}$ = 53 Volts | 45 | | | % |
| $R_L$ | Return Loss | Pin = 115 Watts | -10 | | | dB |
| Tr | Rise Time | | | | 100 | ns |
| Pd | Pulse Droop | | | | 0.5 | dB |
| VSWR | Load Mismatch Tolerance[1] | | 2.5:1 | | | |

## FUNCTIONAL CHARACTERISTICS @ 25°C

| | | | | | | |
|--------|-----------------|-----------------|-----|-----|-----|-------|
| $BV_{ebo}$ | Emitter to Base Breakdown | Ie = 40 mA | 3.5 | | | V |
| $BV_{ces}$ | Collector to Emitter Breakdown | Ic = 100 mA | 65 | | | V |
| $h_{FE}$ | DC – Current Gain | Vce = 5V, Ic = 1A | 20 | | | |
| $\theta jc$[1] | Thermal Resistance | | | | 0.012 | °C/W |

NOTES:    1.    At rated output power and pulse conditions

              2.    See plots below for Mode S data at 50V as well as the standard 32us,2% data at 53V

**32us,2% (1030MHz, 53V)**



**32us,2% (1030MHz, 53V)**

TCS1200
Test Fixture

L1=wire inductor: length=1155mils; diameter=45mils
R1=1.0ohm chip resistor
C1=6800uF electrolytic cap; 63V
C2=68pF chip cap, size A
C3=C4=0.1uF chip cap, size B
C5=75pF chip cap, size A
C6=82pF chip cap, size A

C7=100pF chip cap, size A

TCS1200

RT6010.2
output

Er = 10.2,  H = 25 mil
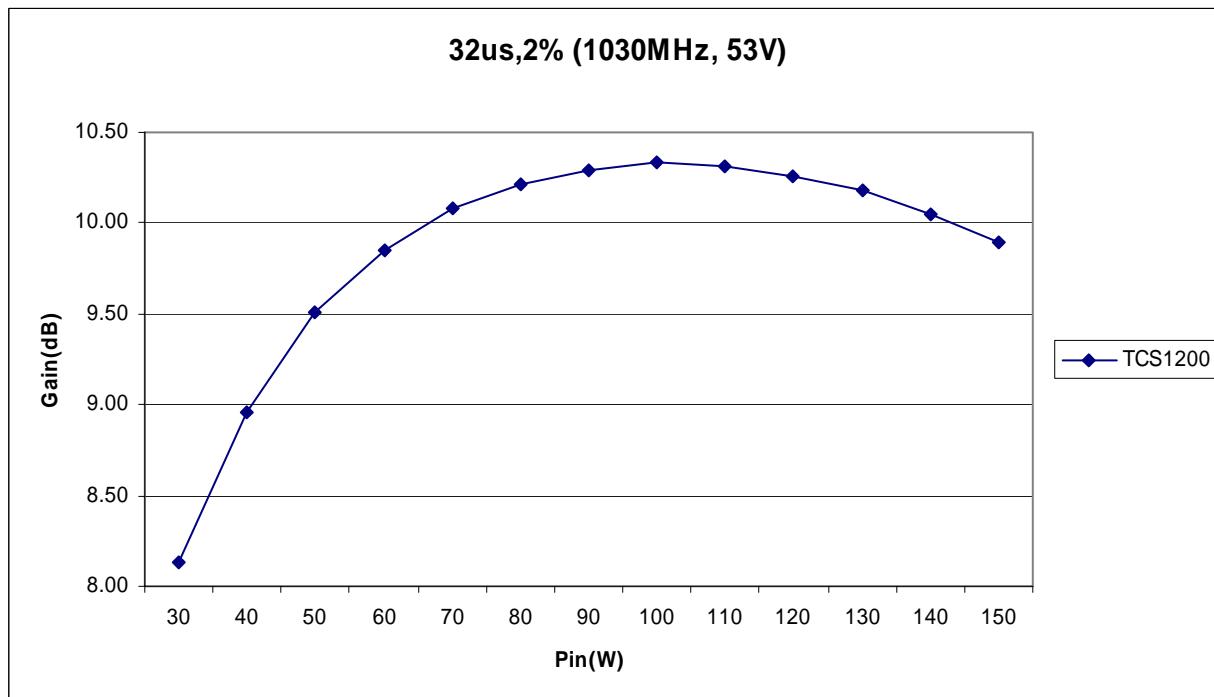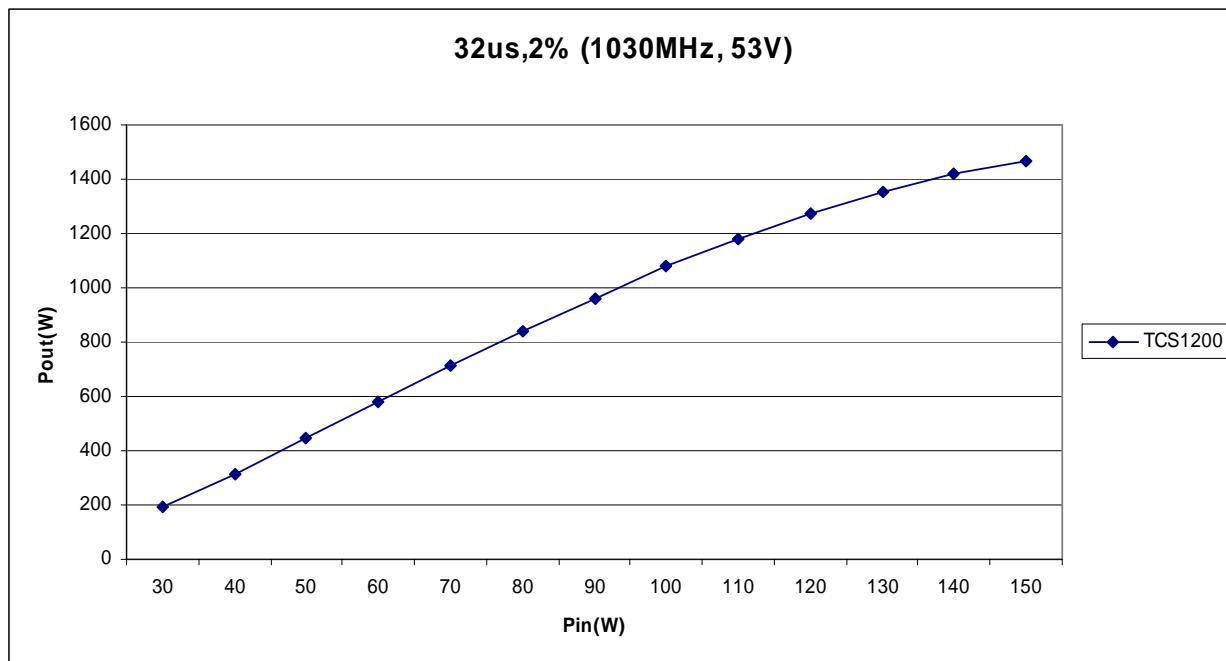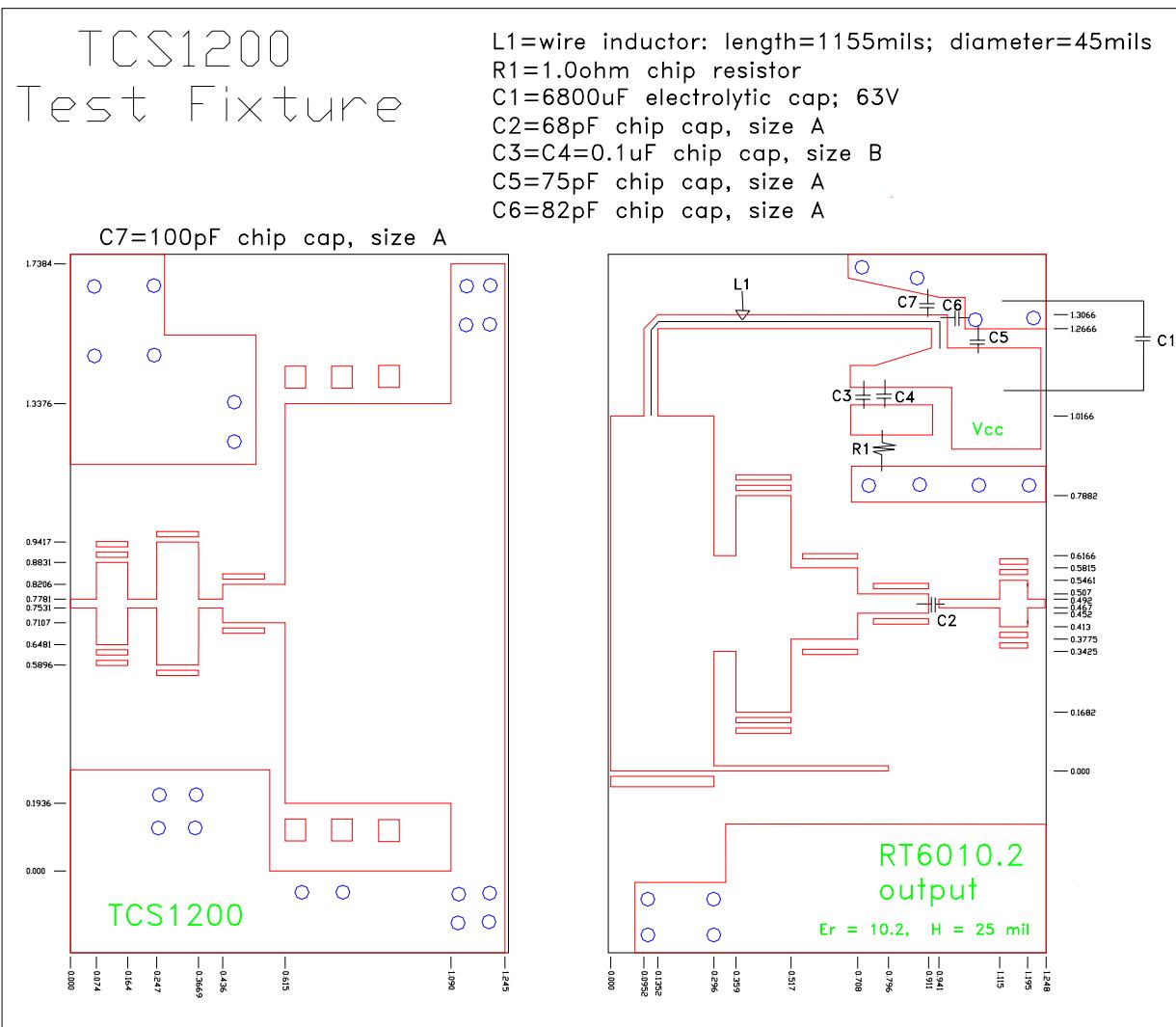
Dimensions in inches

*TCS1200*

| DIM | MILLIMETER | ±TOL | INCHES | ±TOL |
|-----|-----------|------|--------|------|
| A | 20.32 | ±0.25 | .800 | ±.010 |
| B | 16.51 | ±0.25 | .650 | ±.010 |
| C | 25.40 | ±0.25 | 1.000 | ±.010 |
| D | 9.78 | ±0.25 | .385 | ±.010 |
| E | 9.86 | | .388 | |
| F | 10.16 | ±0.25 | .400 | ±.010 |
| G | 3.30 DIA | | .130 DIA | |
| H | 0.25 RAD | | .010 RAD | |
| I | 5.28 | ±0.51 | .208 | ±.020 |
| J | 45° | .0015° | 45° | .0015° |
| K | 1.63 | | .064 | |
| L | 30.48 | ±0.25 | 1.200 | ±.010 |
| M | 2.13 | ±0.13 | .084 | ±.005 |
| N | 0.46 | ±0.03 | .018 | ±.001 |
| O | 0.20 | ±0.03 | .008 | ±.001 |
| P | 2.95 | ±0.03 | .116 | ±.001 |

PIN 1 = COLLECTOR
2 = BASE
3 = EMITTER

**Microsemi**

| CAGE | DWG NO. | | REV |
|------|---------|--|-----|
| 0PJR2 | 55TU−1 | | A |

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