



TAN500

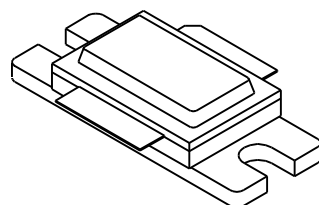
500 Watts, 50 Volts

Pulsed Avionics 960 to 1215 MHz

GENERAL DESCRIPTION

The **TAN 500** is a high power COMMON BASE bipolar transistor. It is designed for pulsed systems in the frequency band 960-1215 MHz. The device has gold thin-film metallization and diffused ballasting for proven highest MTTF. The transistor includes input and output prematch for broadband capability. Low thermal resistance package reduces junction temperature, extends life.

CASE OUTLINE 55ST Style 1 (Common Base)



ABSOLUTE MAXIMUM RATINGS

Power Dissipation

Device Dissipation @25°C (P_d) 2500 W (At rated pulse condition)

Voltage and Current

Collector to Base Voltage (BV_{ces}) 65 V

Emitter to Base Voltage (BV_{ebo}) 3.0 V

Collector Current (I_c) 50 A

Temperatures

Storage Temperature -65 to +200 °C

Operating Junction Temperature +200 °C

ELECTRICAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
BV_{ebo}	Emitter to Base Breakdown	$I_e = 30 \text{ mA}$	3.0			V
BV_{ces}	Collector to Emitter Breakdown	$I_c = 50 \text{ mA}$	75			V
h_{FE}	DC – Current Gain	$I_c = 1 \text{ A}, V_{ce} = 5 \text{ V}$	20			-
$\theta_{jc}^{1,2}$	Thermal Resistance			0.07		°C/W

FUNCTIONAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
P_{out}	Power Out	F = 960/1090/1215 MHz VCC = 50V PW = 10µs, DF = 10% $P_{in} = 63 \text{ W}$	500			W
P_{in}	Power Input				63	W
G_p	Power Gain		9.0			dB
η_c	Collector Efficiency		40			%
P_d	Pulse Droop				0.5	dB
T_r^1	Rise Time			110		ns
ρ_a	Load Mismatch				3:1	-

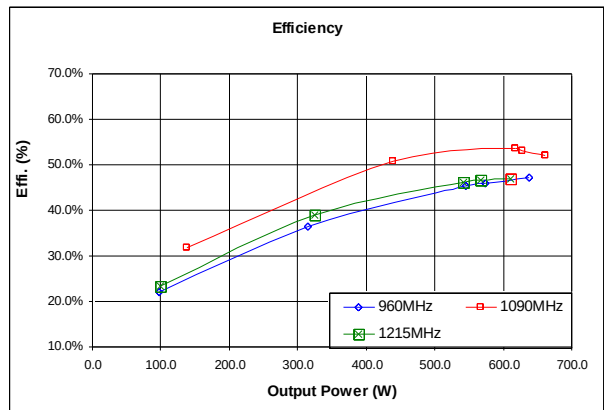
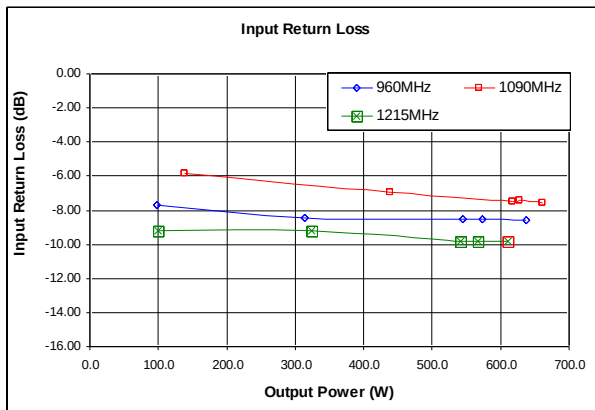
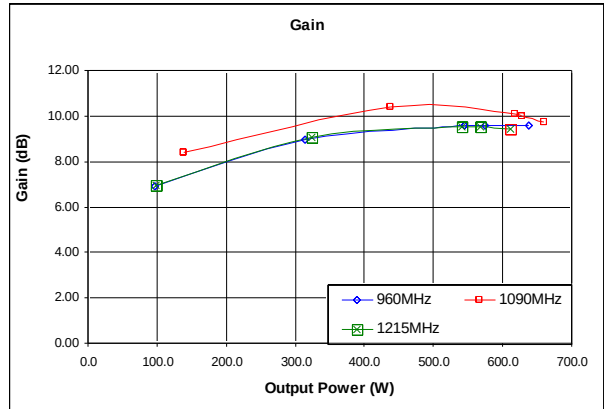
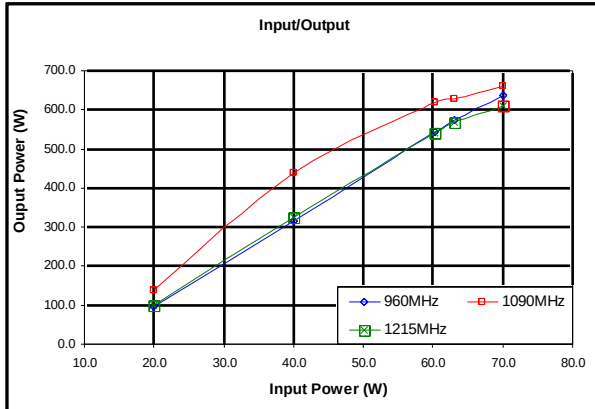
NOTES: 1. At rated output power, pulse conditions and MSC fixture

2. Pulse Format: PW=10µs, DF=10%

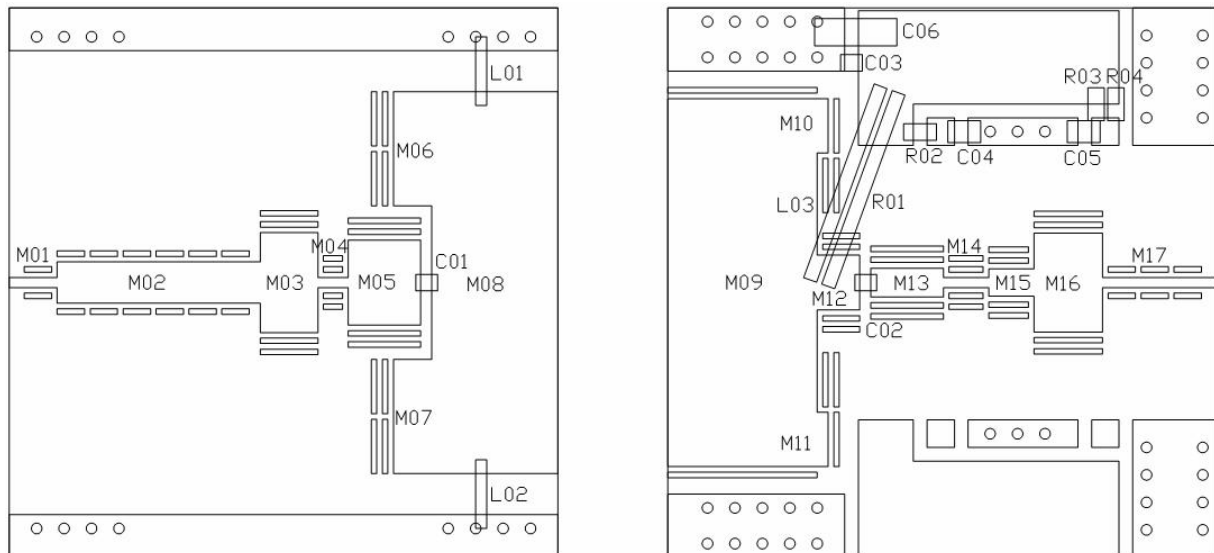
Rev. B – May. 2008

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Visit our web site at www.microsemi.com or contact our factory direct.

Typical Performance (960/1090/1215 MHz)

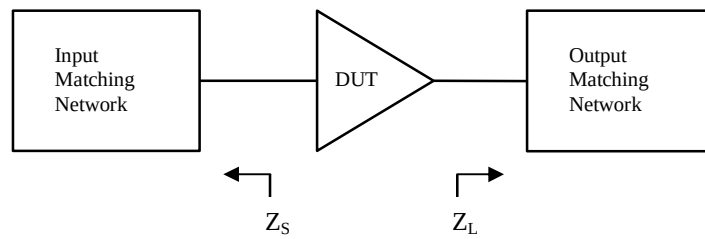


TAN500 Test Circuit Layout



TAN500 Test Circuit Component Designations and Values

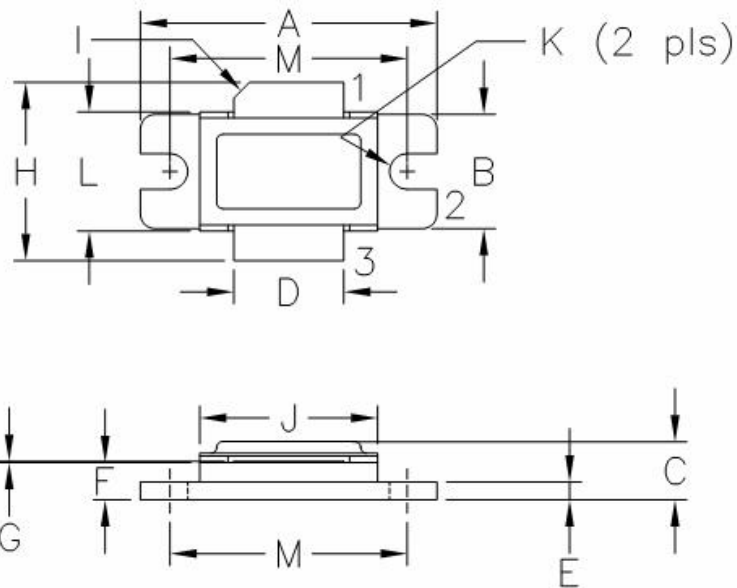
Part	Description	Part	Description
C01	9.1pF Chip Capacitor (ATC 600F)	C04	100nF Chip Capacitor (ATC 200B)
C02	10pF Chip Capacitor (ATC 600F)	C05	1000pF Chip Capacitor (ATC 200B)
C03	43pF Chip Capacitor (ATC 600F)	C06	2200uF, 63V Electrolytic Capacitor
L01, L02	18 AWG, Length: 0.42?l	L03	18 AWG, Length: 0.85?l
R01	2.4? , 1/4W Radial Resistor, Length: 0.85?b	R02	2.4? , 1/4W Chip Resistor
R03, R04	1.5?V, 1/4W Chip Resistor	PCB	Rogers RT6006, e ² =6.15, 25mils, 1oz
M01	36 x 175 mils (W x L)	M02	150 x 740 mils (W x L)
M03	364 x 210 mils (W x L)	M04	36 x 110 mils (W x L)
M05	310 x 265 mils (W x L)	M06, M07	415 x 140 mils (W x L)
M08	1390 x 460 mils (W x L)	M09	1340 x 545 mils (W x L)
M10, M11	198 x 40 mils (W x L)	M12	200 x 155 mils (W x L)
M13	106 x 265 mils (W x L)	M14	36 x 165 mils (W x L)
M15	100 x 165 mils (W x L)	M16	360 x 250 mils (W x L)
M17	36 x 415 mils (W x L)		

Typical Impedance Values


Frequency (MHz)	Z_S (Ω)	Z_L (Ω)
960	$0.67 - j2.14$	$0.96 - j1.54$
1030	$0.90 - j1.51$	$1.53 - j1.33$
1090	$1.21 - j1.14$	$1.58 - j1.46$
1150	$1.47 - j1.11$	$1.33 - j1.67$
1215	$1.32 - j1.23$	$1.87 - j1.47$

* $V_{CC} = 50V$, $P_{IN} = 63$ $P_{OUT} > 500W$

* Pulse Format: PW = 10 μ s, DF = 10%



DIM	MILLIMETER	±TOL	INCHES	±TOL
A	25.40	.25	1.000	.010
B	9.78	.25	.385	.010
C	4.00	.19	.142	.007
D	9.40	.13	.370	.005
E	1.53	.13	.060	.005
F	3.18	.13	.125	.005
G	0.08	+05/- .00	.003	+.002/- .000
H	19.05	0.51	.750	.020
I	45°	5°	45°	5°
J	15.24	.25	.600	.010
K	3.05 DIA	.13	.120 DIA	.005
L	10.15	.13	.400	.005
M	20.32	.25	.800	.010

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

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

