

# 10500

500 Watts, 50 Volts, Pulsed  
Avionics 1030 / 1090 MHz

## GENERAL DESCRIPTION

The 10500 is a high power COMMON BASE BiPolar transistor. It is designed for pulsed systems in the frequency band 1025 - 1150 MHz, with the pulse width and duty required for MODE-S, TACAN & TCAS applications. 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.

## ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation @ 25°C<sup>2</sup> 1700 Watts

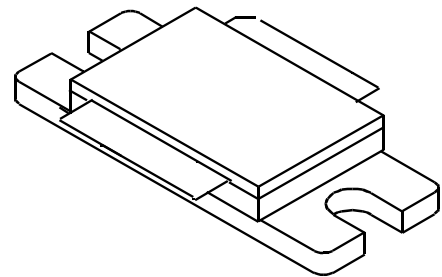
### Maximum Voltage and Current

BVces Collector to Base Voltage 65 Volts  
BVebo Emitter to Base Voltage 3.5 Volts  
Ic Collector Current 40 Amps

### Maximum Temperatures

Storage Temperature - 65 to + 200°C  
Operating Junction Temperature + 230°C

## CASE OUTLINE 55ST Style 1



## ELECTRICAL CHARACTERISTICS @ 25 °C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>P<sub>out</sub></b>	Power Out	F = 1090 MHz	500			Watts
<b>P<sub>in</sub></b>	Power Input	V <sub>cc</sub> = 50 Volts			70	Watts
<b>P<sub>g</sub></b>	Power Gain	PW = 32 μsec	8.5			dB
<b>η<sub>c</sub></b>	Collector Efficiency	DF = 2%		50		%
<b>P<sub>d</sub></b>	Pulse Droop	F = 1090 MHz		0.5		dB
<b>VSWR</b>	Load Mismatch Tolerance				4:1	

<b>BVebo*</b>	Emitter to Base Breakdown	I <sub>e</sub> = 50 mA	3.5			Volts
<b>BVces</b>	Collector to Emitter Breakdown	I <sub>c</sub> = 100 mA	65			Volts
<b>h<sub>FE</sub>*</b>	DC - Current Gain	I <sub>c</sub> = 5 A, V <sub>ce</sub> = 5 V	20			
<b>θ<sub>jc</sub><sup>1</sup></b>	Thermal Resistance				0.12	°C/W

Note 1: At rated output power and pulse conditions

\*: Not measurable due to internal EB returns

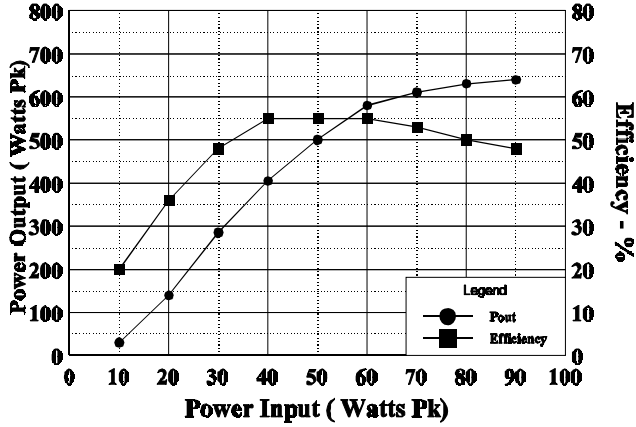
Issue C, November 3, 1997

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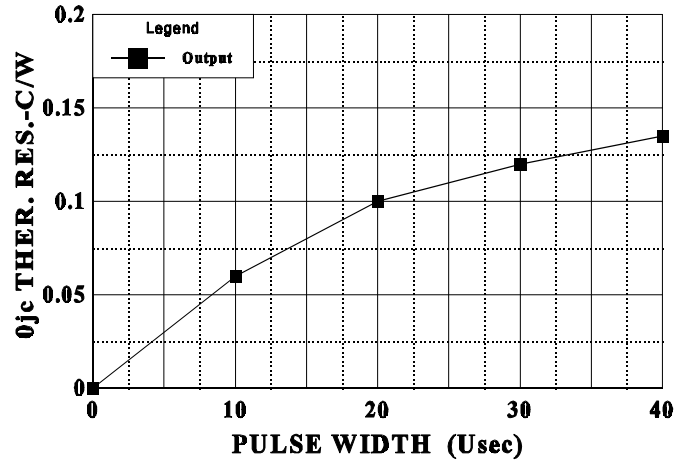
**Power Output & Efficiency vs Pin**

1090 MHz, 50 V, PW 0.5us, 50%, 128 us,



**THERMAL RESISTANCE VS PULSE WIDTH**

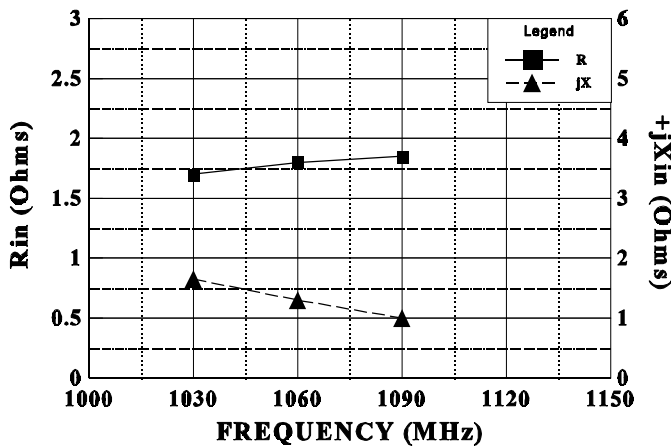
Vcc = 50 V, Tf = 30 C



Burst Width = 128 μs, L.T.D. = 1%

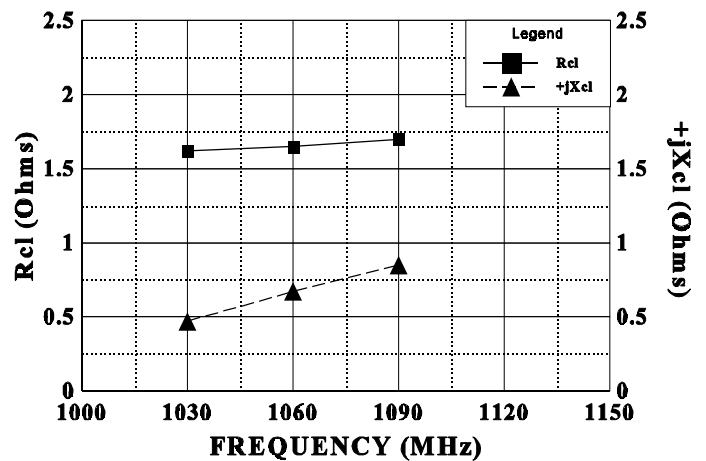
**SERIES INPUT IMPEDANCE VS FREQUENCY**

Vcc = 50 V, Pi = 65W, 32 us, 2%



**SERIES LOAD IMPEDANCE VS FREQUENCY**

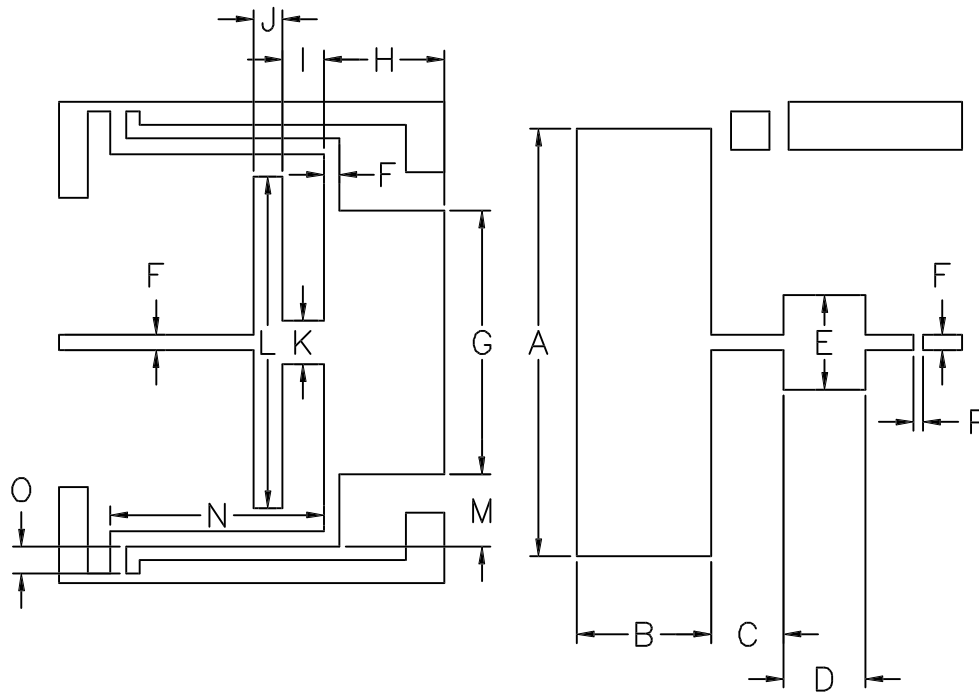
Vcc = 50 V, Pin = 65 W, 32 us, 2%



November 3, 1997

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
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DIM	INCHES
A	2.220
B	.700
C	.375
D	.425
E	.490
F	.081
G	1.370
H	.625
I	.216
J	.150
K	.225
L	1.720
M	.375
N	1.108
O	.140
P	.050

MATERIAL = TEFLON FIBRE GLASS  
 DIELECTRIC THICKNESS = 0.030"  
 Er = 2.55



CAGE  
 0PJR2

DWG NO.

10500

REV C

SCALE

1/1

SHEET