



# 10502

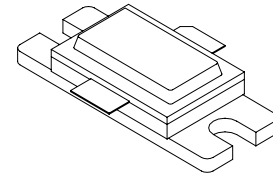
**500 Watts, 50 Volts, Pulsed  
Avionics 1030 / 1090 MHz**

## GENERAL DESCRIPTION

The 10502 is a high power COMMON BASE bipolar transistor. It is designed for pulsed systems in the frequency band 1030/1090 MHz, with the pulse width and duty required for MODE-S & 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.

## CASE OUTLINE

**55SM  
Common Base**



## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C<sup>1</sup> 1458 Watts

### Maximum Voltage and Current

BV<sub>ces</sub> Collector to Emitter Voltage 65 Volts

BV<sub>ebo</sub> Emitter to Base Voltage 3.5 Volts

I<sub>c</sub> Collector Current 40 Amps

### Maximum Temperatures

Storage Temperature - 65 to + 200°C

Operating Junction Temperature + 230°C

## ELECTRICAL CHARACTERISTICS @ 25 °C

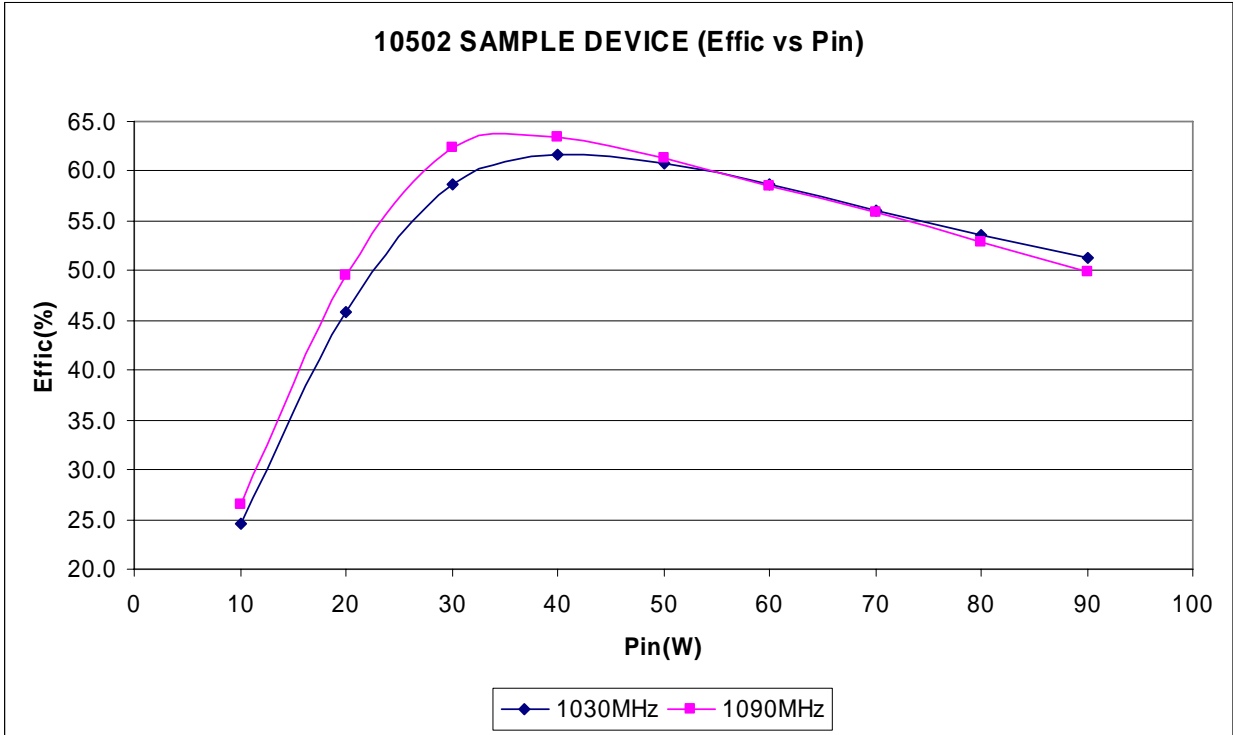
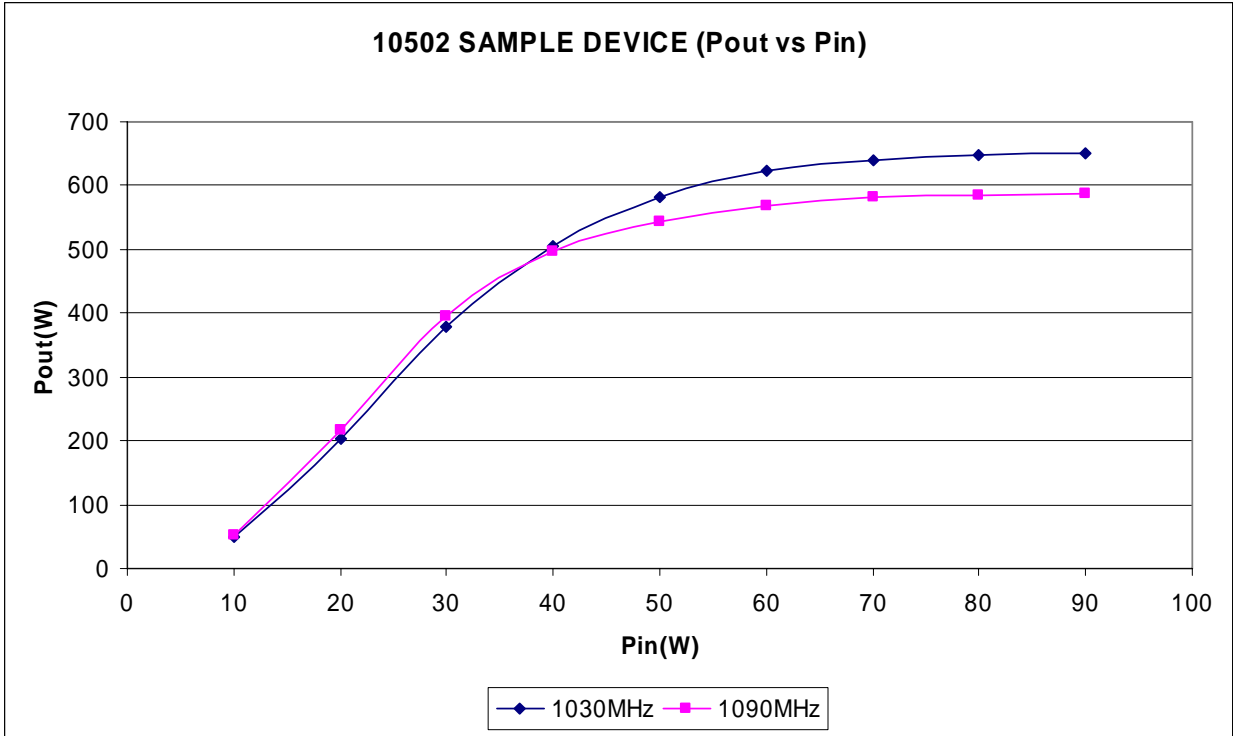
SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
P <sub>OUT</sub>	Output Power	F = 1030/1090 MHz	500			W
P <sub>IN</sub>	Input Power	V <sub>CC</sub> = 50 Volts			70	W
P <sub>G</sub>	Power Gain	PW = 32 μsec, DF = 2%	8.5			dB
η <sub>c</sub>	Collector Efficiency		40			%
RL	Return Loss		10			dB
VSWR	Load Mismatch Tolerance <sup>1</sup>	F = 1090 MHz	10:1			

BV <sub>EBO</sub>	Emitter to Base Breakdown	I <sub>e</sub> = 15 mA	3.5			Volts
BV <sub>CES</sub>	Collector to Emitter Breakdown	I <sub>c</sub> = 60 mA	65			Volts
I <sub>CBO</sub>	Collector to Base Leakage	V <sub>CB</sub> = 36V			25	mA
h <sub>FE</sub>	DC - Current Gain	I <sub>c</sub> = 5 A, V <sub>ce</sub> = 5 V	20			
θ <sub>jc</sub> <sup>1</sup>	Thermal Resistance				0.12	°C/W

Note 1: At rated output power and pulse conditions

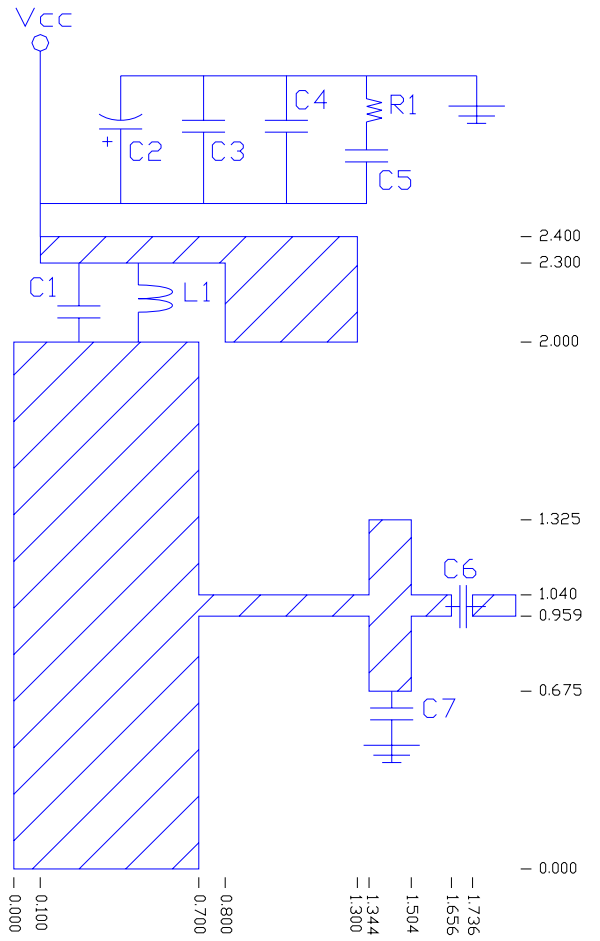
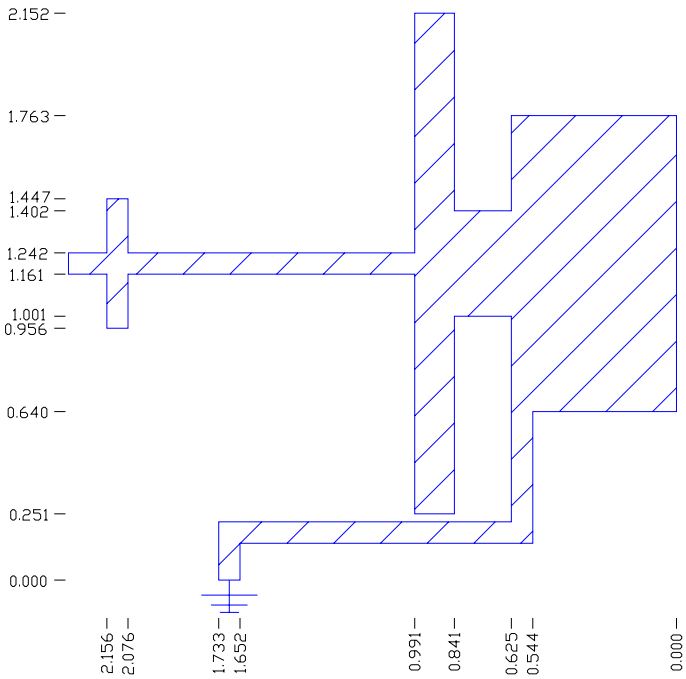
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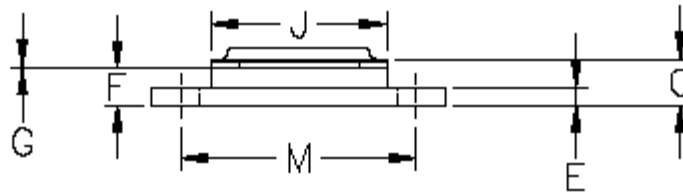
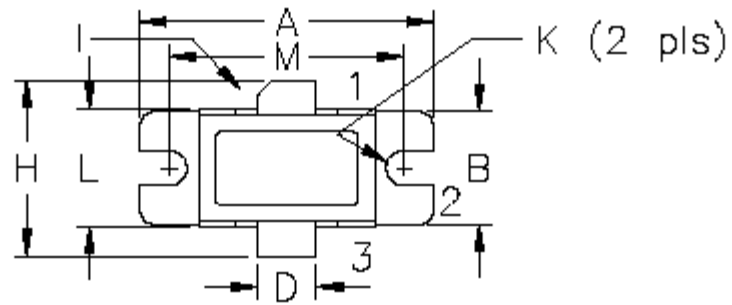
C1=1.5pF ATC Chip Cap; Size B  
 C2=4700uF Electrolytic; 63V  
 C3=47pF ATC Chip Cap; Size B  
 C4=C6=100pF ATC Chip Cap; Size B  
 C5=0.1uF ATC Chip Cap; Size B  
 C7=0.5pF ATC Chip Cap; Size B  
 R1=1ohm Chip Resistor; Size 1206  
 L1=18 AWG; 2 Turns; I.D.=0.1"; L=1.4"  
 Substrate: Er=2.55; H=31mils



DIMENSIONS IN INCHES

 POWER PRODUCTS GROUP	10502 TEST CIRCUIT	Er=2.55; H=31mils
	Casey Tou	7/13/09

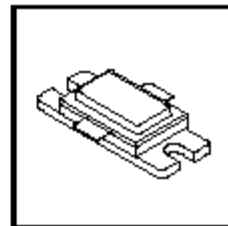
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DIM	MILLIMETER	TOL	INCHES	TOL
A	25.40	.25	1.000	.010
B	9.78	.25	.385	.010
C	4.87	.19	.192	.007
D	5.08	.13	.200	.005
E	1.53	.13	.060	.005
F	3.18	.13	.125	.005
G	0.08	$+.00/-00$	.003	$+.002/-000$
H	19.05	0.51	.750	.020
I	45°	5°	45°	5°
J	15.24	.25	.600	.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



DWG NO.

55SM