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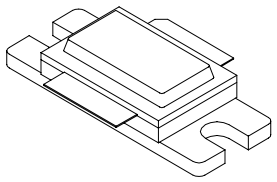
# *MDS500L*

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

## GENERAL DESCRIPTION

The MDS500L is a high power COMMON BASE bipolar transistor. It is designed for MODE-S ELM systems in the 1030 - 1090 MHz frequency band. The transistor includes input and output prematch for broadband performance. The device has gold thin-film metallization and diffused ballasting in a hermetically sealed package for proven highest MTTF.

## CASE OUTLINE
**55ST Style 1**



## ABSOLUTE MAXIMUM RATINGS

**Maximum Power Dissipation**

| | |
|---|---|
| Device Dissipation @25°C[1] | 833 W |

**Maximum Voltage and Current**

| | |
|---|---|
| Collector to Emitter Voltage ($BV_{ces}$) | 70 V |
| Emitter to Base Voltage ($BV_{ebo}$) | 3.5 V |
| Peak Collector Current ($I_c$) | 24 A |

**Maximum Temperatures**

| | |
|---|---|
| Storage Temperature | -65 to +150 °C |
| Operating Junction Temperature | +200 °C |

**ELECTRICAL CHARACTERISTICS @ 25°C**

| SYMBOL | CHARACTERISTICS | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| $P_{out}$ | Power Out | F = 1030, 1090 MHz | 500 | | | W |
| $P_{in}$ | Power Input | Vcc = 50 Volts | | | 60 | W |
| $P_g$ | Power Gain | PW = Note 2 | 9.2 | | | dB |
| $\eta_c$ | Collector Efficiency | DF = Note 2 | | 50 | | % |
| VSWR | Load Mismatch Tolerance | | | | 2:1 | |
| Pd[1] | Pulse Droop | | | | 0.8 | dB |
| Trise[1] | Rise Time | | | | 100 | nSec |

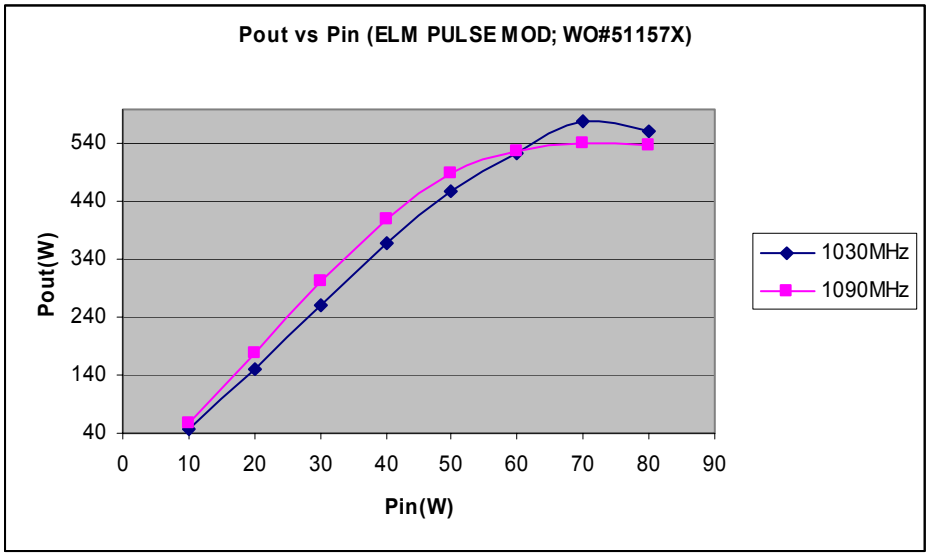
**FUNCTIONAL CHARACTERISTICS @ 25°C**

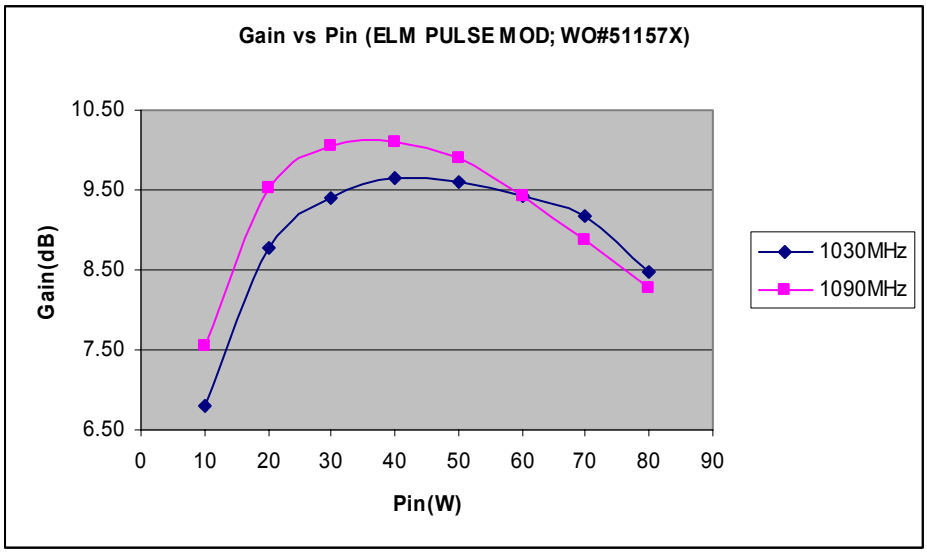
| | | | | | | |
|---|---|---|---|---|---|---|
| $BV_{ebo}$ | Emitter to Base Breakdown | Ie = 15 mA | 3.0 | | | V |
| $BV_{ces}$ | Collector to Emitter Breakdown | Ic = 50 mA | 70 | | | V |
| $BV_{cbo}$ | Collector to Base Breakdown | Ic = 50 mA | 70 | | | V |
| Ices | Collector to Emitter Leakage | Vce = 50V | | | 15 | mA |
| $h_{FE}$ | DC – Current Gain | Vce = 5V, Ic = 1.0 A | 20 | | | |
| $\theta jc$[1] | Thermal Resistance | | | | 0.08 | °C/W |

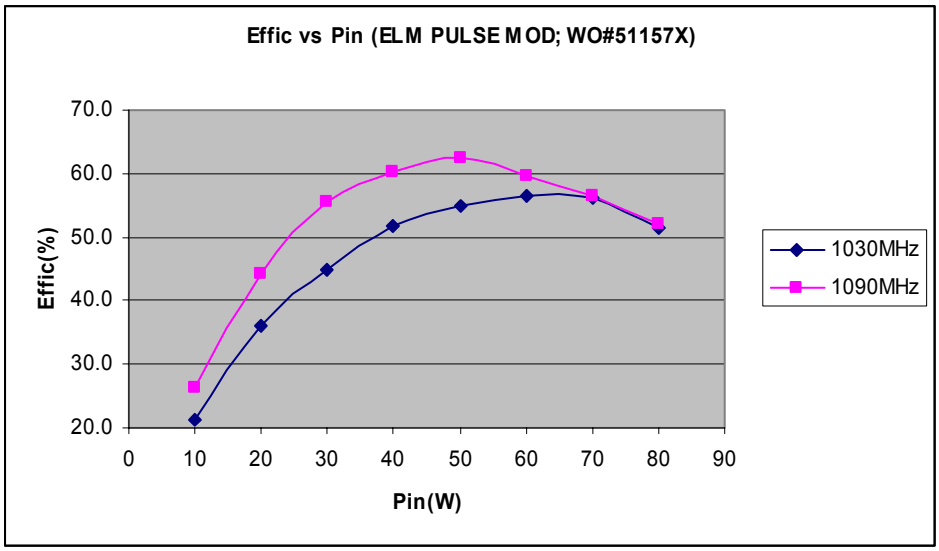
NOTE 1: AT RATED OUTPUT POWER AND PULSE CONDITIONS
NOTE 2: ELM Burst: 32µSec ON/ 18µSec OFF x 48, repeated at 23mSec

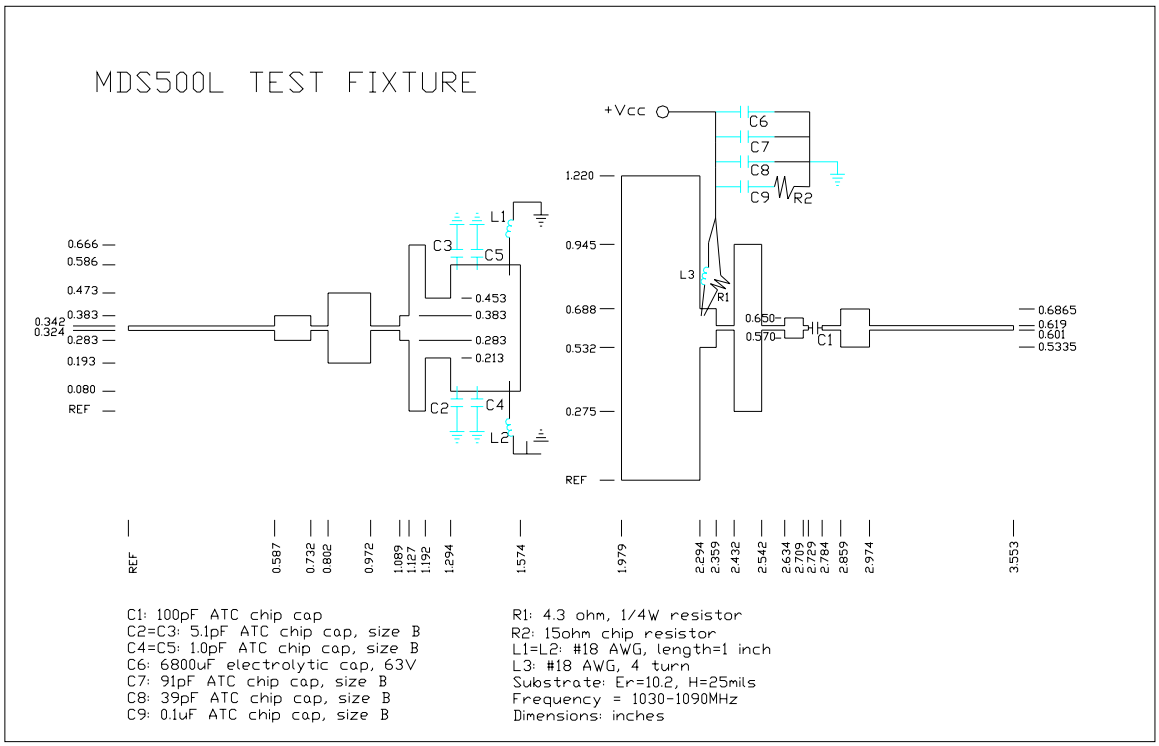
REV C – March 2008

**MDS500L SAMPLE RF DATA (SN#7-23; WO#51157X)**



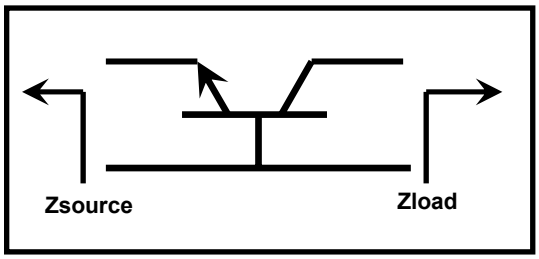



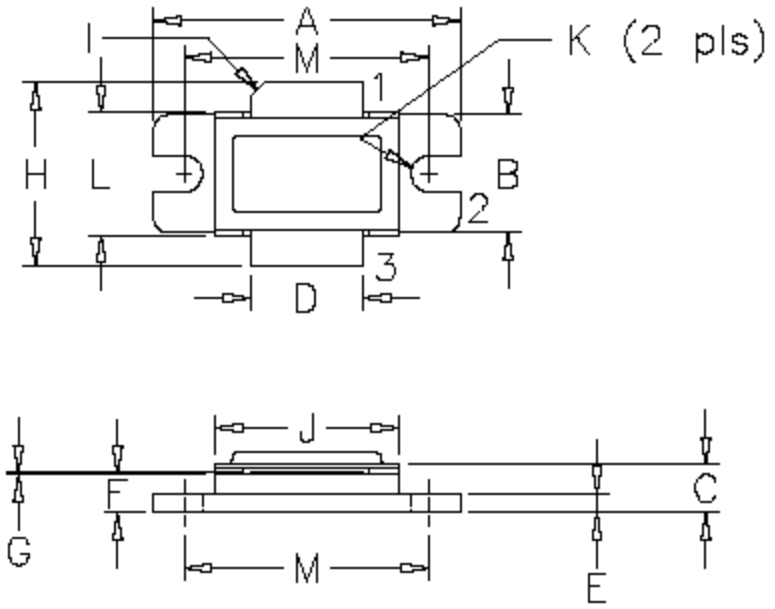



**IMPEDANCE DATA**

| FREQUENCY | $Z_{source}$ (ohms) | $Z_{load}$ (ohms) |
|---|---|---|
| 1030 | 1.90 – j1.60 | 1.79 – j1.51 |
| 1090 | 2.10 – j1.61 | 2.05 – j1.76 |
| 1150 | 2.26 – j1.82 | 2.21 – j2.21 |



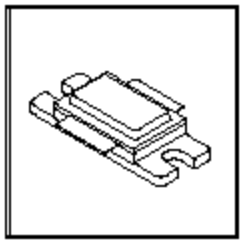
# MDS500L




| 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 | +.08/-.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.

**55ST**