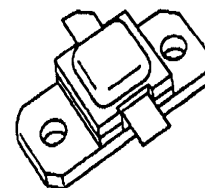


MS2228

RF & MICROWAVE TRANSISTORS L-BAND RADAR APPLICATIONS

Features

- 1090 MHz
- 50 VOLTS
- $P_{OUT} = 75$ WATTS
- $G_P = 9.2$ dB MINIMUM
- 10:1 VSWR CAPABILITY
- COMMON BASE CONFIGURATION



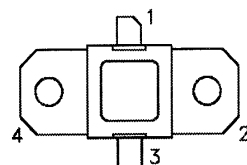
.400 x .400 2LFL M214
hermetically sealed

DESCRIPTION

The MS2228 device is a high power Class C transistor specifically designed for L-Band Avionics transponder/interrogator pulsed output and driver applications.

This device is capable of operation over a wide range of pulse widths, duty cycles, and is capable of withstanding 10:1 output VSWR at rated RF conditions. Internal input and output matching provide optimum performance and product consistency.

PIN CONNECTION



1. Collector 3. Emitter
2. Base 4. Base

ABSOLUTE MAXIMUM RATINGS ($T_{case} = 25^{\circ}\text{C}$)

| Symbol | Parameter | Value | Unit |
|------------|--------------------------|-------------|--------------------|
| P_{DISS} | Power Dissipation | 175 | W |
| I_C | Device Current | 5.4 | A |
| V_{CC} | Collector-Supply Voltage | 55 | V |
| T_J | Junction Temperature | 200 | $^{\circ}\text{C}$ |
| T_{STG} | Storage Temperature | -65 to +200 | $^{\circ}\text{C}$ |

Thermal Data

| | | | |
|---------------|-----------------------------------|------|----------------------|
| $R_{TH(J-C)}$ | Thermal Resistance Junction-case* | 0.86 | $^{\circ}\text{C/W}$ |
|---------------|-----------------------------------|------|----------------------|

Revision A, October 2009

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)
STATIC

| Symbol | Test Conditions | Value | | | Unit |
|-------------------------|--|------------|------|----------|-----------|
| | | Min. | Typ. | Max. | |
| BV_{CBO} | I_C = 10 mA I_E = 0 mA | 65 | --- | --- | V |
| BV_{EBO} | I_E = 4 mA I_C = 0 mA | 3.5 | --- | --- | V |
| BV_{CER} | I_C = 20 mA R_{BE} = 10Ω | 65 | --- | --- | V |
| I_{CES} | V_{CE} = 50 V | --- | --- | 6 | mA |
| HFE | V_{CE} = 5 V I_C = 1 A | 10 | --- | --- | --- |

DYNAMIC

| Symbol | Test Conditions | Value | | | Unit |
|------------------------|--|------------|------|------|-----------|
| | | Min. | Typ. | Max. | |
| P_{OUT} | f = 1090 MHz P_{IN} = 9W V_{CC} = 50V | 75 | --- | --- | W |
| G_P | f = 1090 MHz P_{IN} = 9W V_{CC} = 50V | 9.2 | --- | --- | dB |
| η_C | f = 1090 MHz P_{IN} = 9W V_{CC} = 50V | 48 | --- | --- | % |

Conditions: Pulse Width = 32 μsec Duty Cycle = 2%

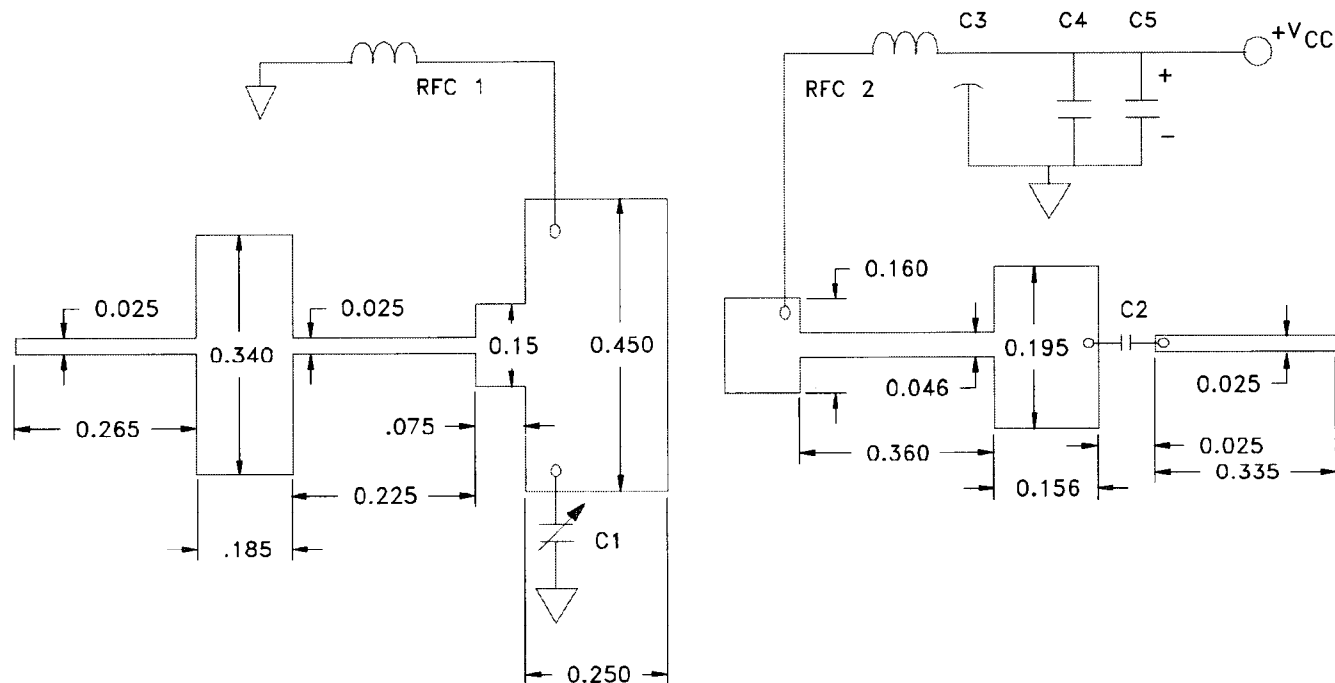
IMPEDANCE DATA

| FREQ | $Z_{IN}(\Omega)$ | $Z_{CC}(\Omega)$ |
|----------|------------------|------------------|
| 1030 MHz | $7.0 + j3.0$ | $12.5 - j4.5$ |
| 1090 MHz | $11.0 + j1.5$ | $13.0 - j3.0$ |

$P_{IN} = 9.0W$

$V_{CC} = 50V$

TEST CIRCUIT



All dimensions are in inches.

Substrate material: .025 thick Al_2O_3

C1 : 0.8—8.0 pF Johanson Gigatrim Capacitor

C2 : 100 pF Chip Capacitor

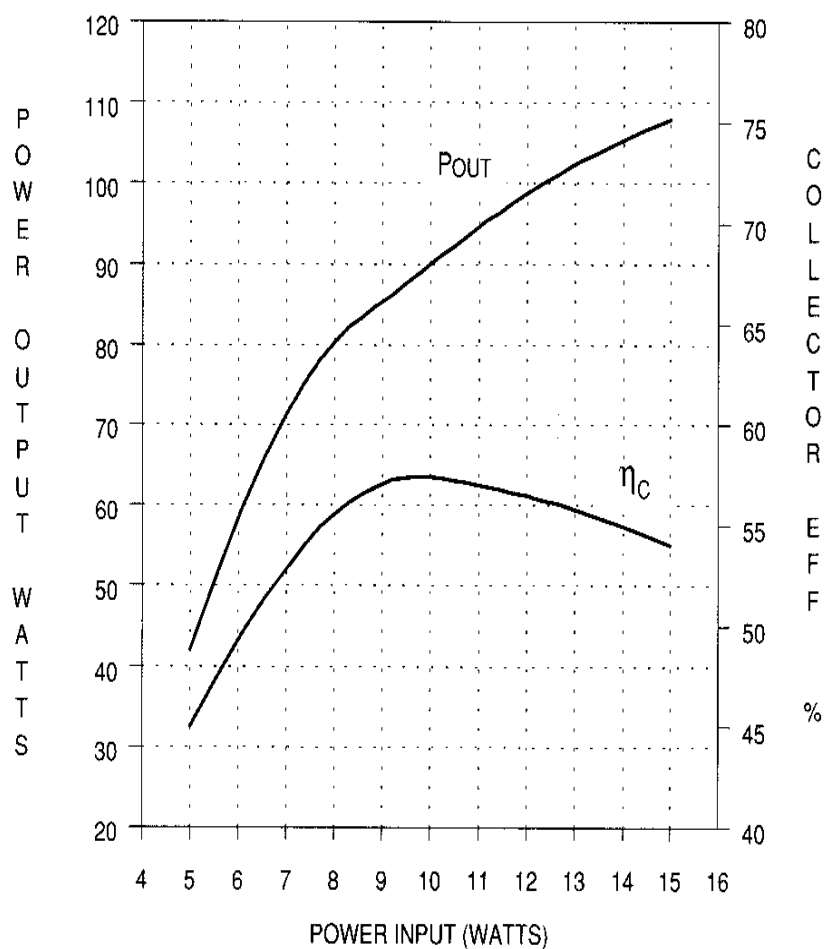
C3 : 1500 pF Filtercon Feedthru

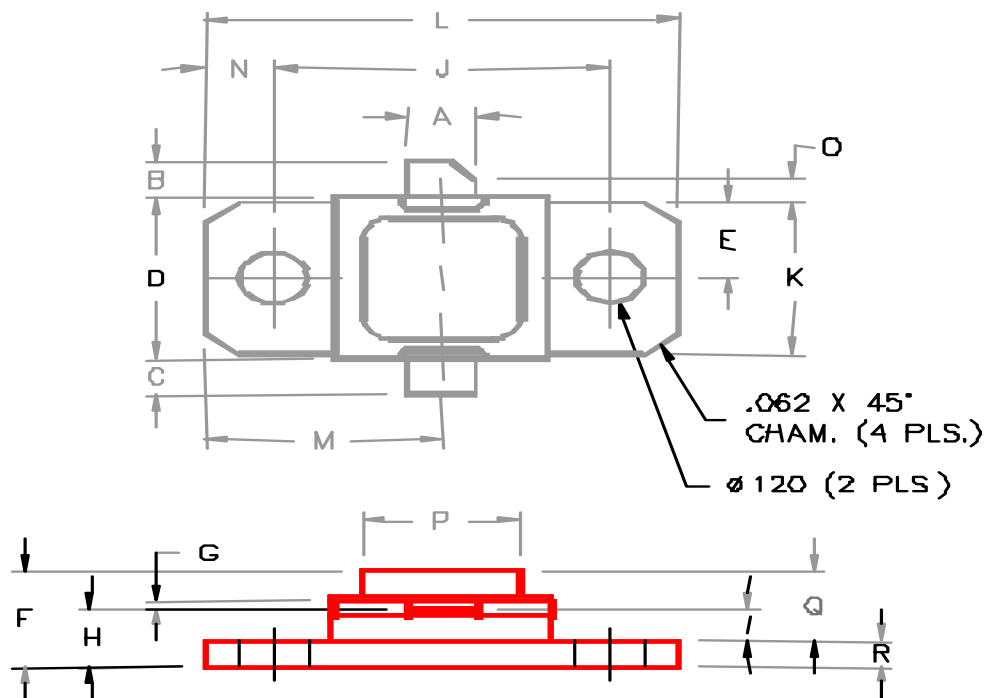
C4 : 1 μF , Ceramic Capacitor

C5 : 100 μF , Electrolytic Capacitor

RFC 1: Au Plated Ni Strap
0.280 Long x 0.035 Wide x 0.005 Thick

RFC 2: #26 Wire, 4 Turn 1/16 I.D.

TYPICAL PERFORMANCE**TYPICAL POWER OUTPUT &
COLLECTOR EFFICIENCY vs
POWER INPUT**

PACKAGE MECHANICAL DATA
PACKAGE STYLE M214


| | MINIMUM INCHES/MM | MAXIMUM INCHES/MM | | MINIMUM INCHES/MM | MAXIMUM INCHES/MM |
|---|----------------------|----------------------|---|----------------------|----------------------|
| A | .140/3,56 | | J | .650/16,51 | |
| B | .110/2,80 | | K | .386/9,80 | |
| C | .110/2,80 | | L | .900/22,86 | |
| D | .395/10,03 | .407/10,34 | M | .450/11,43 | |
| E | .193/4,90 | | N | .125/3,18 | |
| F | | .230/5,84 | O | .050/1,27 | |
| G | .003/0,08 | .006/0,15 | P | .405/10,29 | |
| H | .118/3,00 | .131/3,33 | Q | .170/4,32 | |
| I | .063/1,60 | | R | .062/1,58 | |