

## MS2422

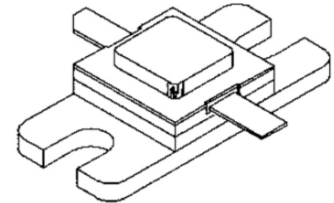
### RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

#### Features

- DESIGNED FOR HIGH POWER PULSED IFF, DME, AND TACAN APPLICATIONS
- 350 W (typ.) IFF 1030 – 1090 MHz
- 300 W (min.) DME 1025 – 1150 MHz
- 290 W (typ.) TACAN 960 – 1215 MHz
- 960 – 1215 MHz
- GOLD METALLIZATION
- $P_{OUT} = 300W$  MINIMUM
- $G_P = 6.3$  dB MINIMUM
- INFINITE VSWR CAPABILITY @ RATED CONDITIONS
- EMITTER BALLASTED
- COMMON BASE

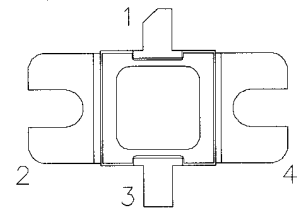
#### DESCRIPTION

The MS2422 is a gold metallized silicon, NPN power transistor designed for applications requiring high peak power and low duty cycles such as IFF, DME, and TACAN. The MS2422 is designed with internal input/output matching resulting in improved broadband performance and low thermal resistance.



**.400 SQ. 2LFL (M138)**  
hermetically sealed

#### PIN CONNECTION



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

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

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	65	V
$V_{CES}$	Collector-Emitter Voltage	65	V
$V_{EBO}$	Emitter-Base Voltage	3.5	V
$I_C$	Device Current	22	A
$P_{DISS}$	Power Dissipation	875	W
$T_J$	Junction Temperature	200	$^{\circ}C$
$T_{STG}$	Storage Temperature	-65 to +150	$^{\circ}C$

#### Thermal Data

$R_{TH(J-C)}$	Junction-case Thermal Resistance	0.20	$^{\circ}C/W$
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**ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)**
**STATIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
<b>BV<sub>CBO</sub></b>	<b>I<sub>C</sub> = 10 mA      I<sub>E</sub> = 0 mA</b>	<b>65</b>	---	---	<b>V</b>
<b>BV<sub>CES</sub></b>	<b>I<sub>C</sub> = 25 mA      V<sub>BE</sub> = 0 V</b>	<b>65</b>	---	---	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 5.0 mA      I<sub>C</sub> = 0 mA</b>	<b>3.5</b>	---	---	<b>V</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 50 V      I<sub>E</sub> = 0 mA</b>	---	---	<b>25</b>	<b>mA</b>
<b>h<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V      I<sub>C</sub> = 1 A</b>	<b>10</b>	---	---	<b>mA</b>

**DYNAMIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 1025 - 1150 MHz    P<sub>IN</sub> = 70W    V<sub>CE</sub> = 50V</b>	<b>300</b>	---	---	<b>W</b>
<b>G<sub>p</sub></b>	<b>f = 1025 - 1150 MHz    P<sub>IN</sub> = 70W    V<sub>CE</sub> = 50V</b>	<b>6.3</b>	---	---	<b>dB</b>
<b>η<sub>C</sub></b>	<b>f = 1025 - 1150 MHz    P<sub>IN</sub> = 70W    V<sub>CE</sub> = 50V</b>	<b>35</b>	---	---	<b>%</b>
<b>Conditions</b>	<b>Pulse Width = 10 μs    Duty Cycle = 1%</b>				

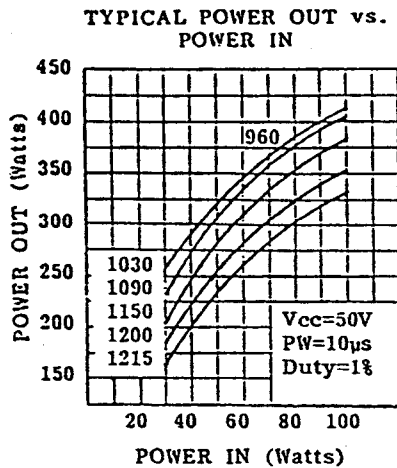
**IMPEDANCE DATA**

FREQ	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
<b>960 MHz</b>	<b>5.1 + j1.0</b>	<b>2.2 – j3.5</b>
<b>1090 MHz</b>	<b>4.2 + j0.5</b>	<b>2.5 – j3.5</b>
<b>1215 MHz</b>	<b>7.5 + j1.5</b>	<b>2.3 – j1.5</b>

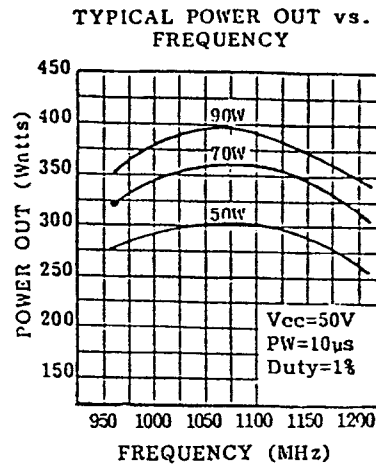
**P<sub>in</sub> = 70W    V<sub>ce</sub> = 50V**

## TYPICAL PERFORMANCE

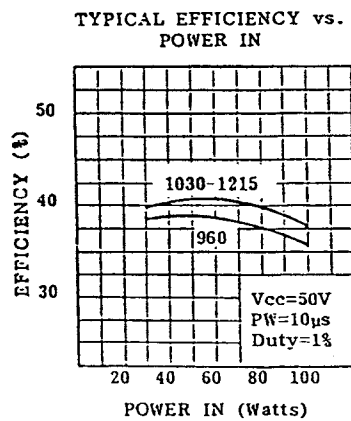
**POWER OUTPUT vs POWER INPUT**



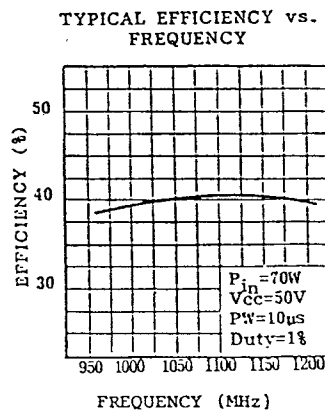
**POWER OUTPUT vs FREQUENCY**



**EFFICIENCY vs POWER INPUT**

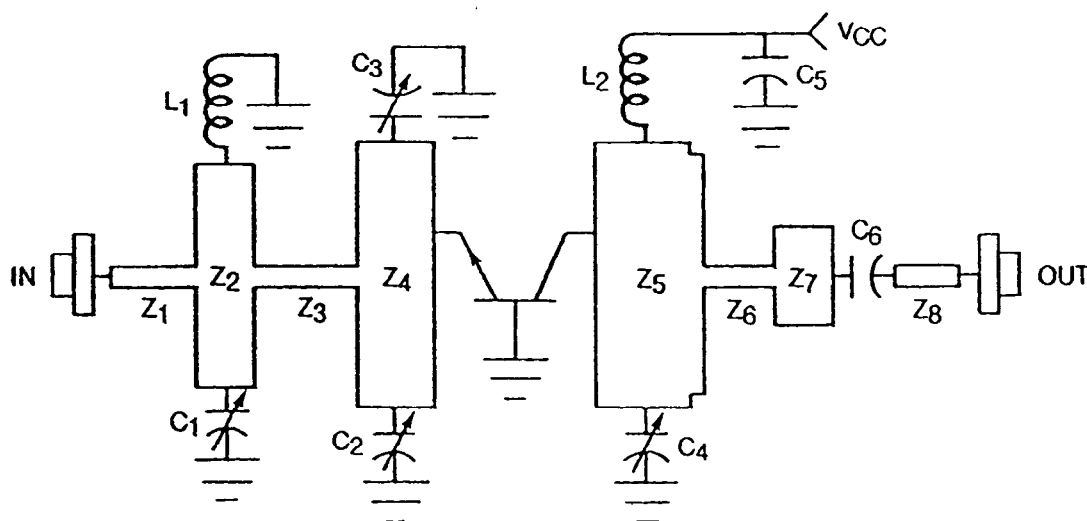


**EFFICIENCY vs FREQUENCY**



## TEST CIRCUIT

Teflon Fiberglass  $\epsilon_r = 2.5$  THK .031

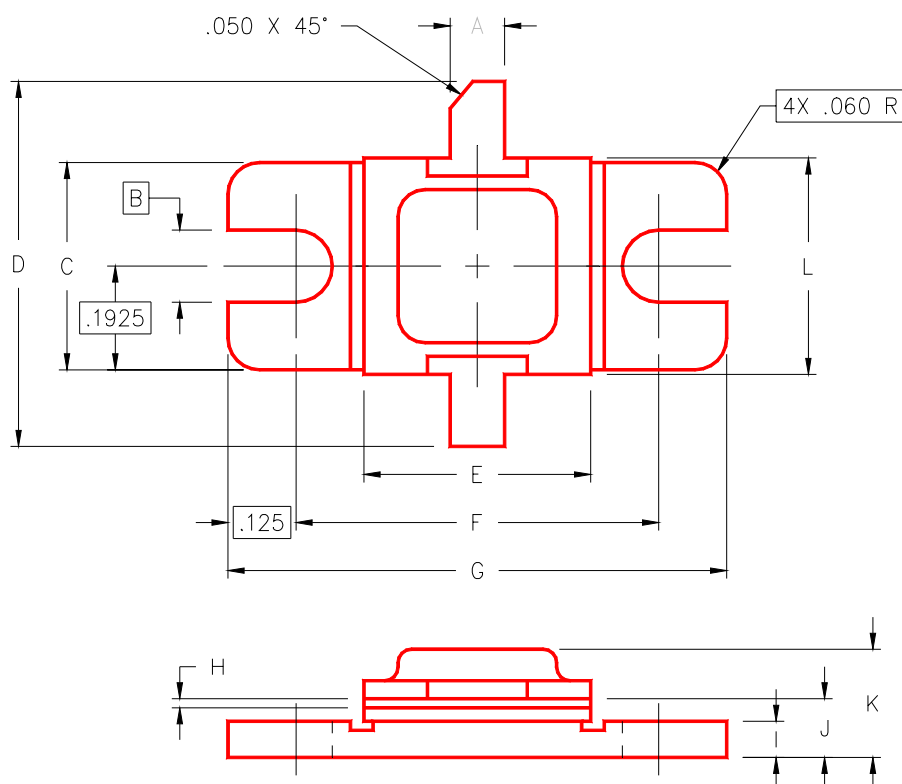


All Dimension are in Inches

C1, C2:		Z1	: .404 x .075
C3, C4 :	.6 - 4.5pF JOHANSON Gigatrim	Z2	: .263 x .995
C5	: 1000 $\mu$ F, 63V, Electrolytic	Z3	: .483 x .077
C6	: 100pF Chip Capacitor Across .090 Gap	Z4	: .350 x 1.203
L1	: 2 Turns #24 .12 I.D., Spaced Wire Diameter	Z5	: .505 x 1.200 with Two Notches .05 Long By .068 Wide
L2	: 4 Turns #24, .07 I.D., Spaced Wire Diameter	Z6	: .335 x .076
		Z7	: .260 x .442
		Z8	: .310 x .082

**PACKAGE MECHANICAL DATA**

**PACKAGE STYLE M138**



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.095/2,41	.105/2,67	I	.055/1,40	.065/1,65
B	.125/3,18		J	.105/2,67	.125/3,18
C	.380/9,65	.390/9,91	K		.230/5,84
D	.790/20,07		L	.392/9,96	.402/10,21
E	.392/9,96	.402/10,21			
F	.645/16,38	.655/16,64			
G	.895/22,73	.905/22,99			
H	.002/0,05	.006/0,15			