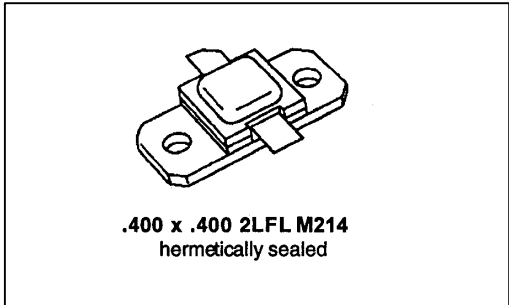


# MS2213

## RF & MICROWAVE TRANSISTORS AVIONICS/JTIDS APPLICATIONS

### Features

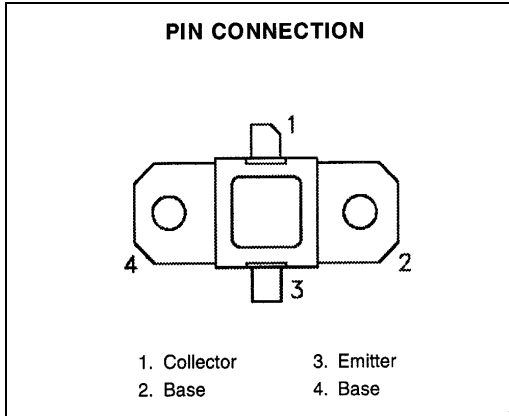
- 960-1215 MHz
- COMMON BASE
- GOLD METALLIZATION
- HERMETIC PACKAGE
- CLASS C OPERATION
- POUT = 30 W MIN. WITH 7.8 dB GAIN



### DESCRIPTION:

The MS2213 is a silicon NPN bipolar device specifically designed for JTIDS pulsed power applications from 960-1215 MHz.

Gold metallization and emitter ballasting assure high reliability under Class C amplifier operation. This device operates over a wide range of pulse widths, duty cycles and temperatures, and can withstand a 15:1 VSWR mismatch under load.



### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Collector-Supply Voltage	40	V
I <sub>C</sub>	Device Current	3.5	A
P <sub>DISS</sub>	Power Dissipation	75	W
T <sub>J</sub>	Junction Temperature (RF Pulsed Operation)	+250	°C
T <sub>STG</sub>	Storage Temperature	-65 to +200	°C

### Thermal Data

R <sub>TH(J-C)</sub>	Junction-case Thermal Resistance	2.2	°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> = 10mA</b>	<b>55</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 1mA</b>	<b>3.5</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>BV<sub>CER</sub></b>	<b>I<sub>C</sub> = 20mA</b> <b>R<sub>BE</sub> = 10Ω</b>	<b>55</b>	<b>---</b>	<b>---</b>	<b>V</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CB</sub> = 35 V</b>	<b>-----</b>	<b>---</b>	<b>5.0</b>	<b>mA</b>
<b>h<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V</b> <b>I<sub>C</sub> = 1A</b>	<b>15</b>	<b>---</b>	<b>150</b>	<b>---</b>

**DYNAMIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 960-1215 MHz</b> <b>V<sub>CC</sub> = 35V</b> <b>P<sub>IN</sub> = 5.0W</b>	<b>30</b>	<b>---</b>	<b>---</b>	<b>W</b>
<b>G<sub>P</sub></b>	<b>f = 960-1215 MHz</b> <b>V<sub>CC</sub> = 35V</b> <b>P<sub>IN</sub> = 5.0W</b>	<b>7.8</b>	<b>---</b>	<b>---</b>	<b>dB</b>
<b>η<sub>C</sub></b>	<b>f = 960-1215 MHz</b> <b>V<sub>CC</sub> = 35V</b> <b>P<sub>IN</sub> = 5.0W</b>	<b>40</b>	<b>---</b>		<b>%</b>

Pulse format: 6.4 us on 6.6 us off, repeat for 3.3ms, then off for 4.5125 ms.

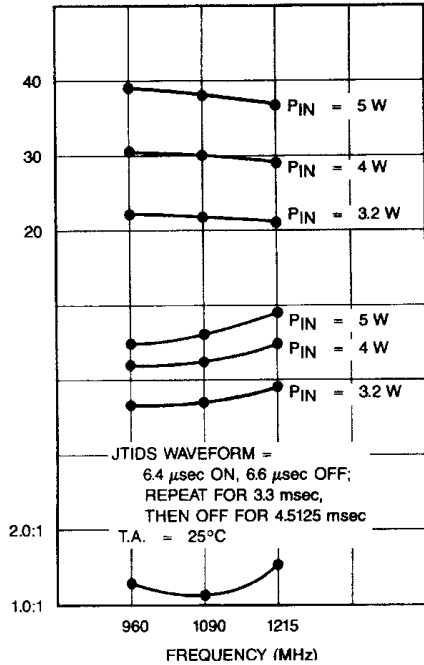
Duty Cycle: Burst 49.2%, overall 20.8%.

**IMPEDANCE DATA**

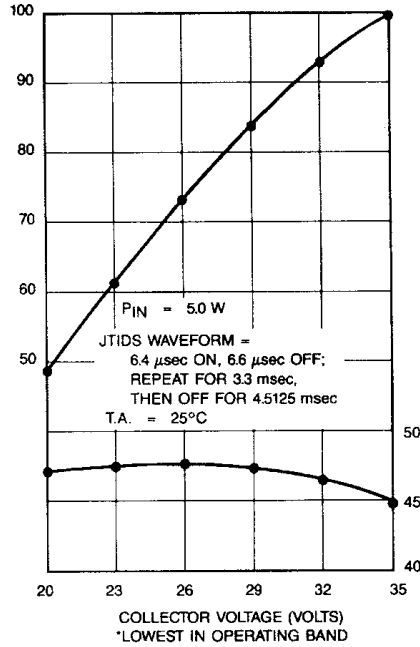
Freq. (MHz)	Z <sub>IN</sub> (Ω)	Z <sub>OUT</sub> (Ω)
<b>960</b>	<b>4.5 + j 6.0</b>	<b>11.0 + j 0.5</b>
<b>1090</b>	<b>5.5 + j 6.3</b>	<b>12.0 - j 2.0</b>
<b>1215</b>	<b>5.0 + j 5.0</b>	<b>12.5 - j 5.0</b>

**TYPICAL PERFORMANCE**

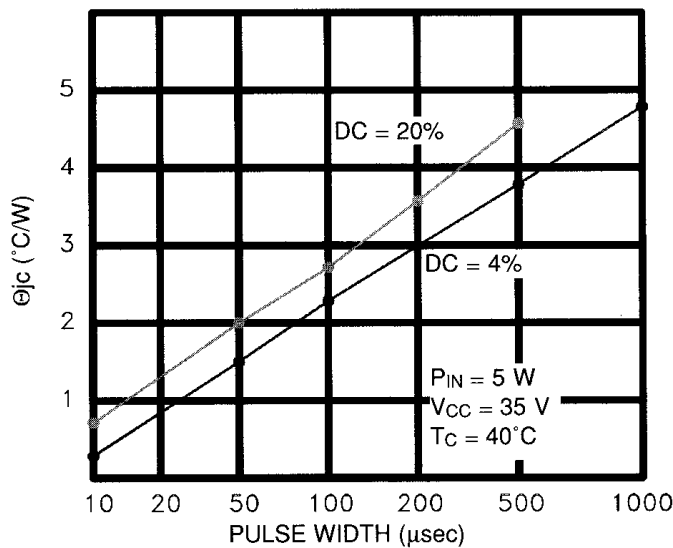
**TYPICAL BROADBAND  
POWER AMPLIFIER**



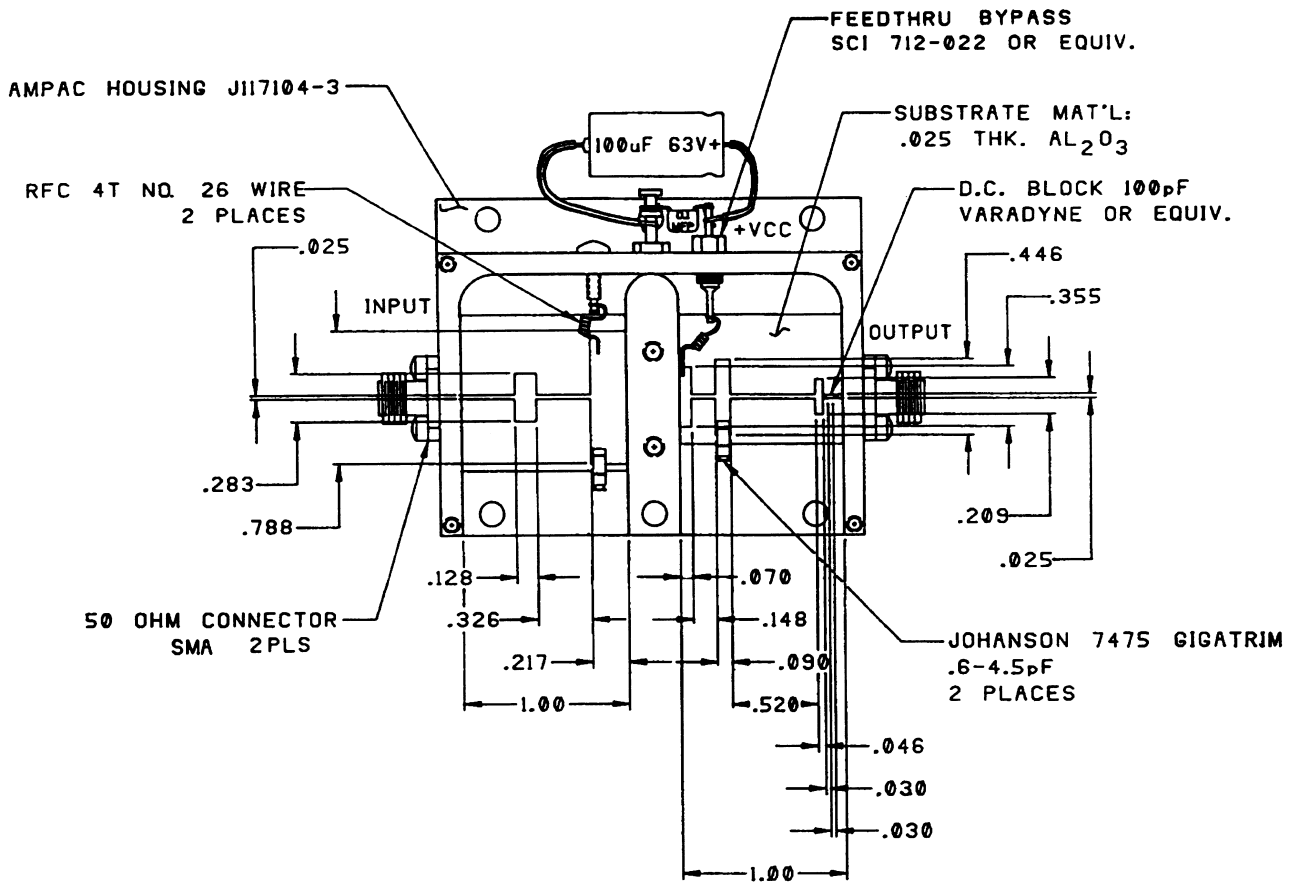
**TYPICAL RELATIVE POWER  
OUTPUT & COLLECTOR  
EFFICIENCY\* vs COLLECTOR  
VOLTAGE**



**MAXIMUM THERMAL RESISTANCE vs PULSE  
WIDTH & DUTY CYCLE**

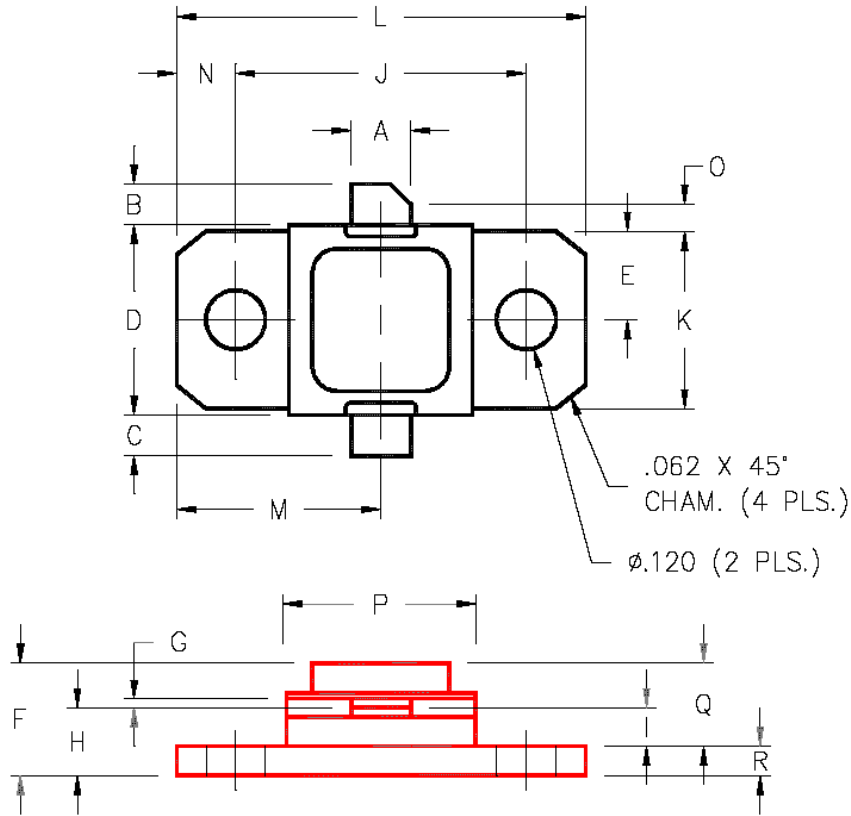


**TEST CIRCUIT**



**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	