

## MS2210

### RF AND MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

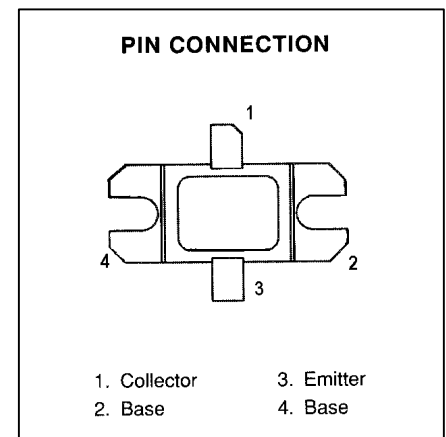
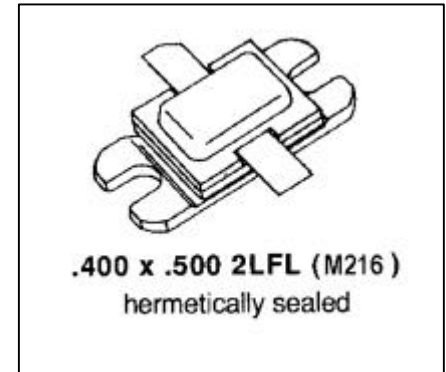
#### Features

- 255 MHz BANDWIDTH
- GOLD METALLIZATION
- EMITTER SITE BALLASTED
- $P_{OUT} = 300W$  MINIMUM
- $G_P = 7.0$  dB
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- 15:1 VSWR CAPABILITY

#### DESCRIPTION:

The MS2210 avionics power transistor is a broadband, high peak pulse power device specifically designed for avionics applications requiring broad bandwidth with moderate duty cycle and pulse width constraints such as ground/ship DME/TACAN.

The MS2210 is also designed for specialized applications where reduced power is provided under pulse formats utilizing short pulse widths and high burst or overall duty cycles. This device is capable of withstanding 15:1 VSWR mismatch load conditions at any phase angle under full rated conditions.



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

Symbol	Parameter	Value	Unit
$P_{DISS}$	Power Dissipation*	940	W
$I_C$	Device Current*	24	A
$V_{CC}$	Collector-Supply Voltage*	50	
$T_J$	Junction Temperature (RF Pulsed Operation)	+200	$^{\circ}C$
$T_{STG}$	Storage Temperature	- 65 to + 200	$^{\circ}C$

#### THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	0.16	$^{\circ}C/W$
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\*Applies only to rated RF amplifier operation

**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> = 50 mA      I<sub>E</sub> = 0 mA</b>	<b>65</b>	<b>----</b>	<b>----</b>	<b>V</b>
<b>BV<sub>EBO</sub></b>	<b>I<sub>E</sub> = 15 mA      I<sub>C</sub> = 0 mA</b>	<b>3.0</b>	<b>----</b>	<b>----</b>	<b>V</b>
<b>BV<sub>CER</sub></b>	<b>I<sub>C</sub> = 50 mA      R<sub>BE</sub> = 10 Ω</b>	<b>65</b>	<b>----</b>	<b>----</b>	<b>V</b>
<b>I<sub>CES</sub></b>	<b>V<sub>CE</sub> = 50 V</b>	<b>----</b>	<b>----</b>	<b>30</b>	<b>mA</b>
<b>h<sub>FE</sub></b>	<b>V<sub>CE</sub> = 5 V      I<sub>C</sub> = 5A</b>	<b>10</b>	<b>----</b>	<b>---</b>	<b>----</b>

**DYNAMIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
<b>P<sub>OUT</sub></b>	<b>f = 960 - 1215 MHz    P<sub>IN</sub> = 60 W    V<sub>CC</sub> = 50 V</b>	<b>300</b>	<b>330</b>	<b>----</b>	<b>W</b>
<b>η<sub>C</sub></b>	<b>f = 960 - 1215 MHz    P<sub>IN</sub> = 60 W    V<sub>CC</sub> = 50 V</b>	<b>38</b>	<b>45</b>	<b>----</b>	<b>%</b>
<b>G<sub>P</sub></b>	<b>f = 960 - 1215 MHz    P<sub>IN</sub> = 60 W    V<sub>CC</sub> = 50 V</b>	<b>7.0</b>	<b>7.4</b>	<b>----</b>	<b>Db</b>

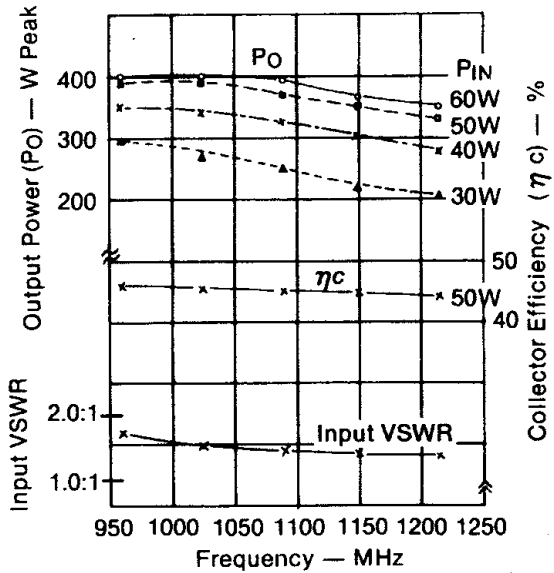
Note:      Pulse Format: 10 μS  
             Duty Cycle: 10%

**IMPEDANCE DATA**

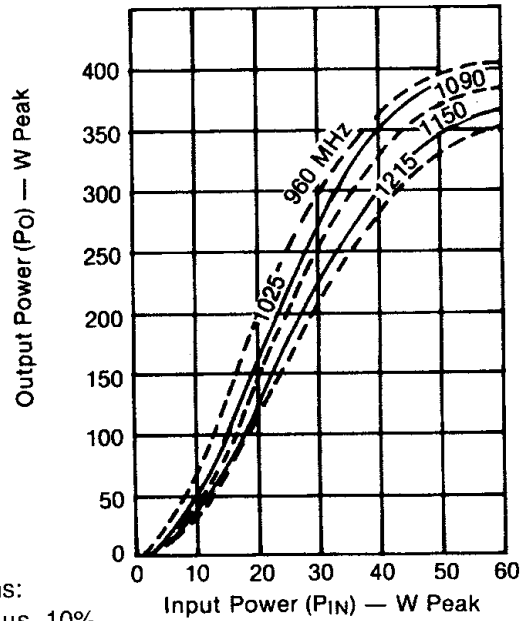
FREQ	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
<b>960 MHz</b>	<b>2.0 + j3.6</b>	<b>1.7 - j2.2</b>
<b>1090 MHz</b>	<b>3.5 + j1.7</b>	<b>2.0 - j1.7</b>
<b>1215 MHz</b>	<b>1.6 + j0.5</b>	<b>1.8 - j2.0</b>

**TYPICAL PERFORMANCE**

**TYPICAL BROADBAND RESPONSE**

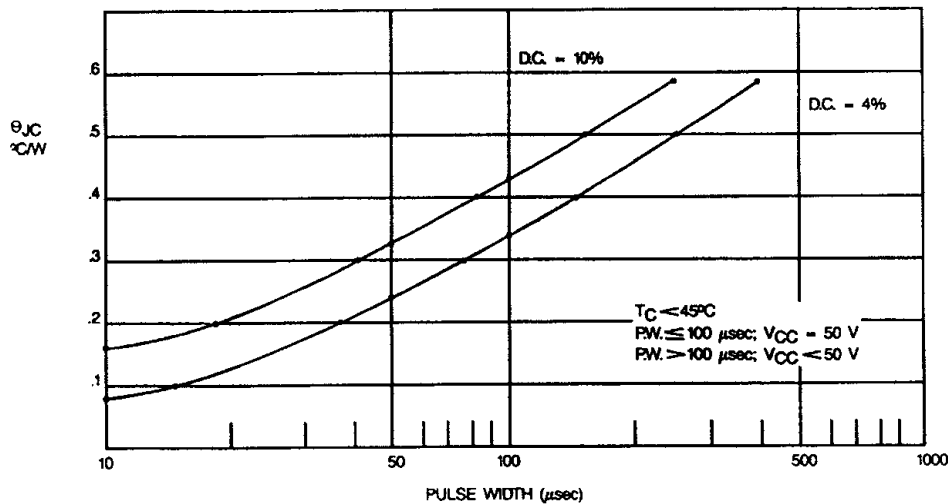


**TYPICAL POWER OUTPUT vs POWER INPUT**



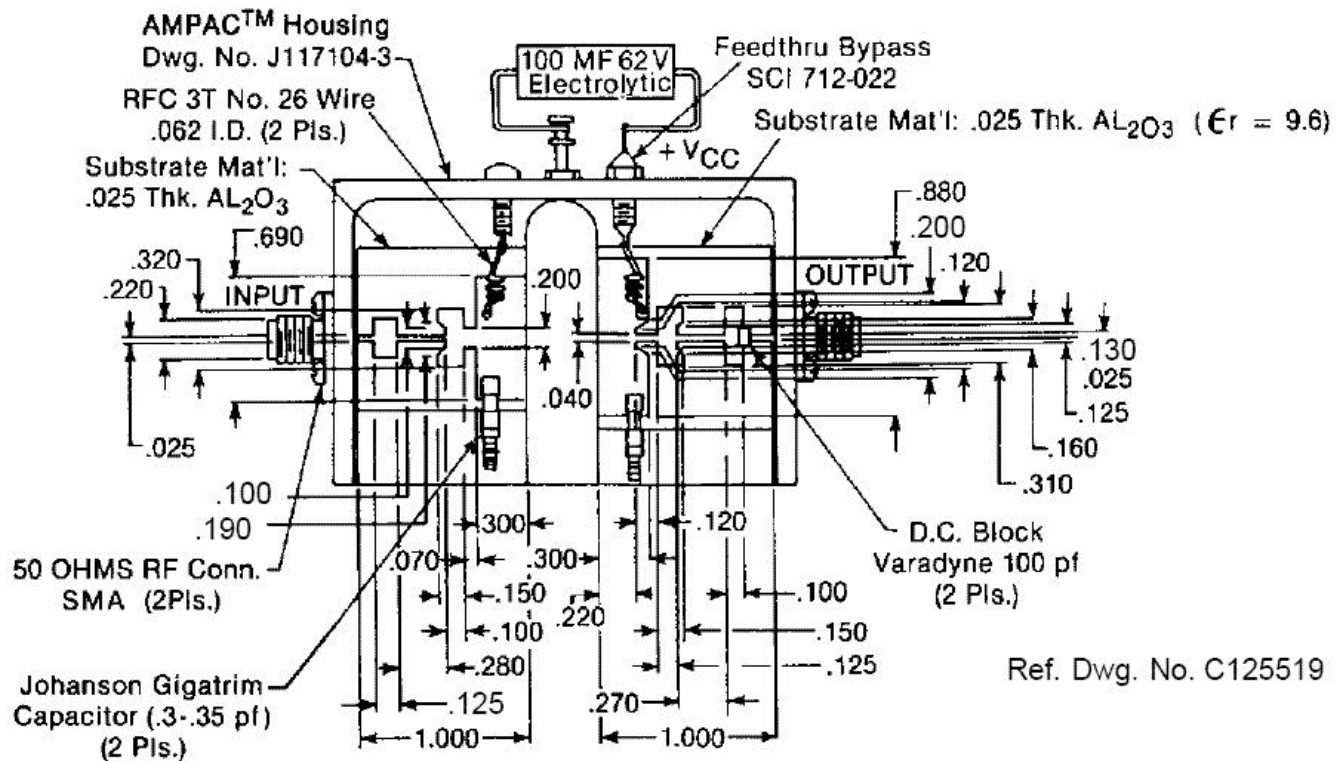
Conditions:  
 PW = 10  $\mu$ s, 10%  
 $V_{CC}$  = 50 V

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



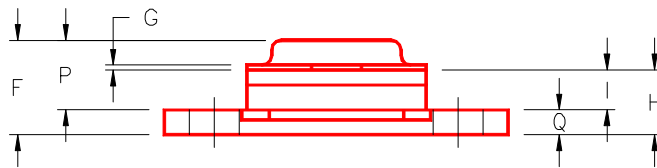
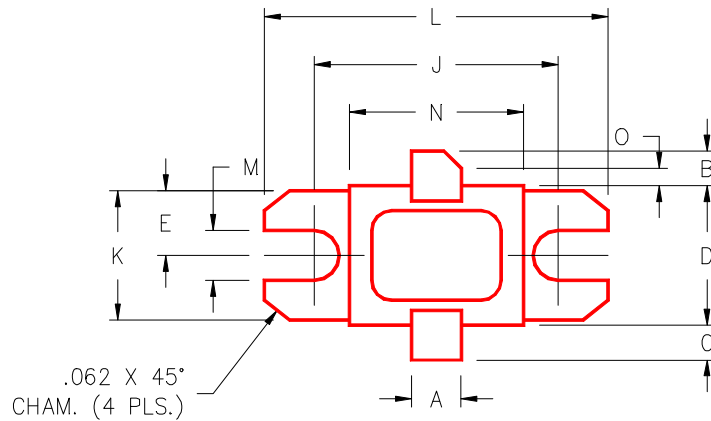
**MS2210**

**TEST CIRCUIT**



**PACKAGE MECHANICAL DATA**

PACKAGE STYLE M216



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.140	3,56	J	.700	17,78
B	.110	2,80	K	.386	9,80
C	.110	2,80	L	.900	22,86
D	.395	10,03	M	.120	3,05
E	.193	4,90	N	.500	12,70
F		.230	O	.050	1,27
G	.003	0,08	P		.170
H	.118	3,00	Q	.062	1,58
I	.063	1,60			