

# 1214GN-500

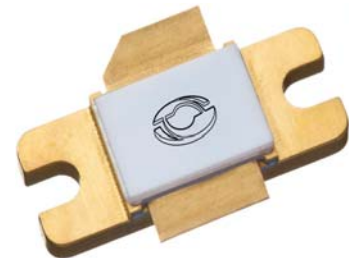
500 Watts - 60 Volts, 300  $\mu$ s, 10%  
L-Band Radar 1200 - 1400 MHz

## GENERAL DESCRIPTION

The 1214GN-500 is an internally matched, COMMON SOURCE, class AB, GaN on SiC HEMT transistor capable of providing over 18dB gain, 500 Watts of pulsed RF output power at 300 $\mu$ s pulse width, 10% duty factor across the 1200 to 1400 MHz band.

Market Application – 1214GN-500 is designed for L-Band Pulsed Radar

## CASE OUTLINE 55-KR Common Source



## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C 1000 W

### Maximum Voltage and Current

Drain-Source Voltage ( $V_{DSS}$ ) 150 V

Gate-Source Voltage ( $V_{GS}$ ) -8 to +0 V

### Maximum Temperatures

Storage Temperature ( $T_{STG}$ ) -55 to +125° C

Operating Junction Temperature +250 °C

## ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
Pout	Output Power	Pout=500W, Freq=1200,1300,1400 MHz	500	550		W
Gp	Power Gain	Pout=500W, Freq=1200,1300,1400 MHz	17	18.5		dB
$\eta_d$	Drain Efficiency	Pout=500W, Freq=1200,1300,1400 MHz	48	55		%
Dr	Droop	Pout=500W, Freq=1200,1300,1400 MHz			1.0	dB
VSWR-T	Load Mismatch Tolerance	Pout=500W, Freq= 1300MHz			3:1	
$\theta_{jc}$	Thermal Resistance	Pulse Width=300uS, Duty=10%			0.16	°C/W

- Bias Condition: Vdd=+60V, Idq=100mA average current (Vgs= -2.0 ~ -4.5V typical)

## FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	$V_{gs} = -8V, V_D = 65V$			10	mA
$I_{G(Off)}$	Gate leakage current	$V_{gs} = -8V, V_D = 0V$			8	mA
$BV_{DSS}$	Drain-source breakdown voltage	$V_{gs} = -8V, I_D = 10mA$	250			V

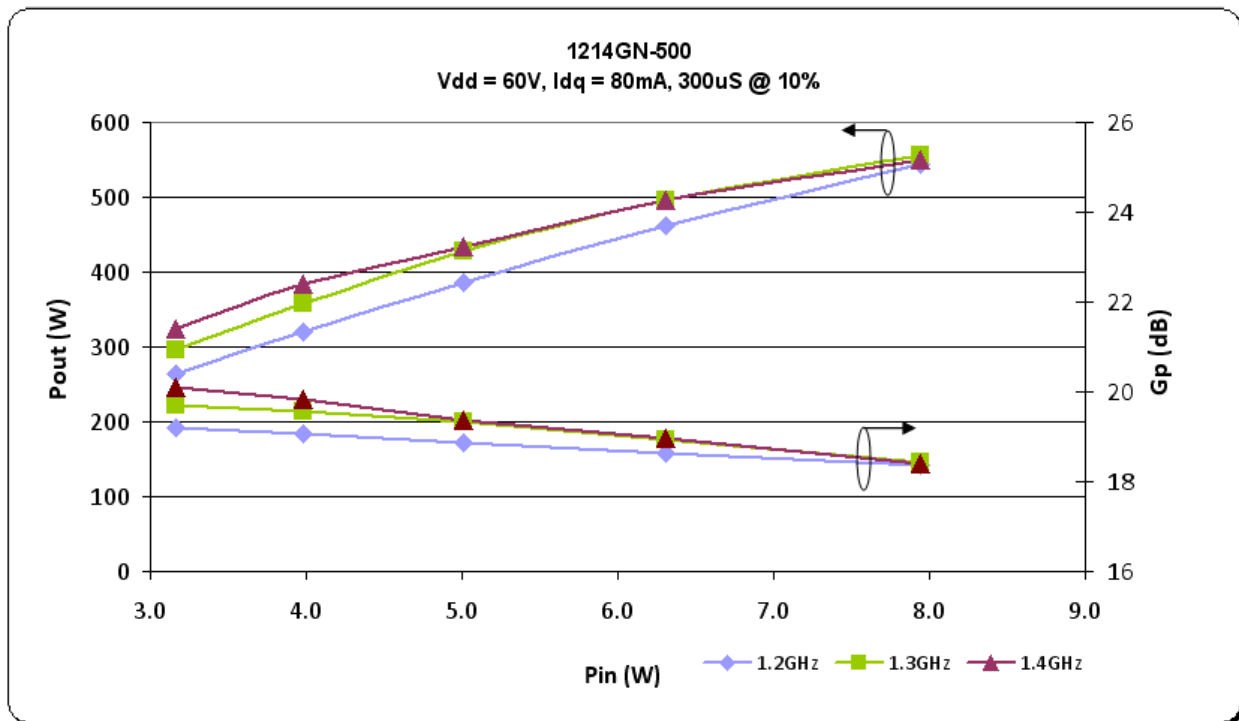
*Export Classification: EAR-99*

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## TYPICAL BROAD BAND PERFORMANCE DATA

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)	Drop (dB)
1200 MHz	8	544	1.86	-16	52	18.36	0.6
1300 MHz	8	556	1.76	-13	55	18.45	0.5
1400 MHz	8	550	1.58	-13	61	18.4	0.4



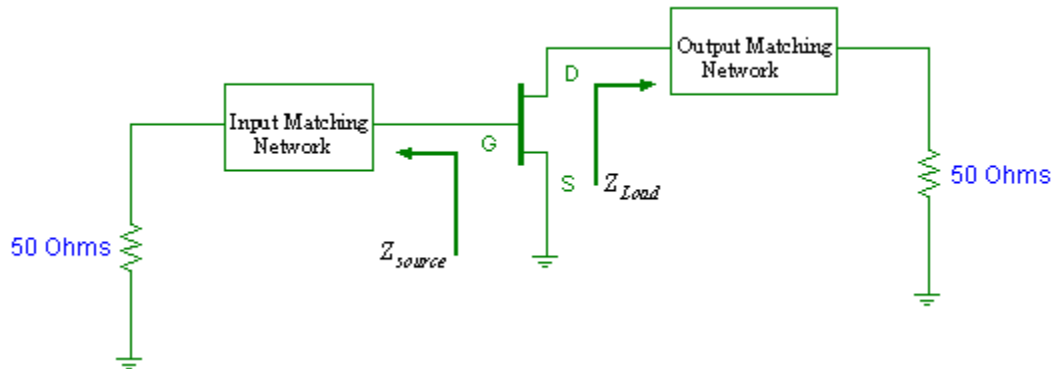
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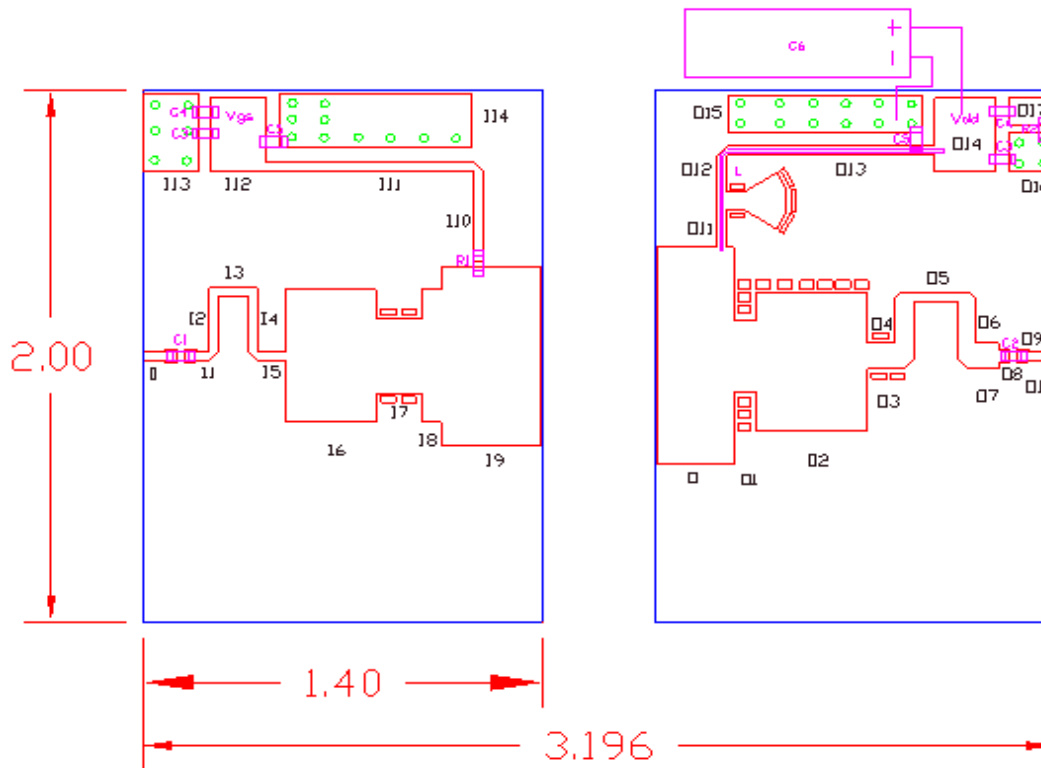
## TRANSISTOR IMPEDANCE INFORMATION



Note:  $Z_{source}$  is looking into the input circuit;  
 $Z_{Load}$  is looking into the output circuit.

Impedance Data		
Freq (GHz)	Zs	ZI
1.2	1.17 - j 1.16	2.08 - j 2.14
1.3	1.20 - j .91	2.07 - j 1.67
1.4	1.26 - j .15	2.04 - j 1.18

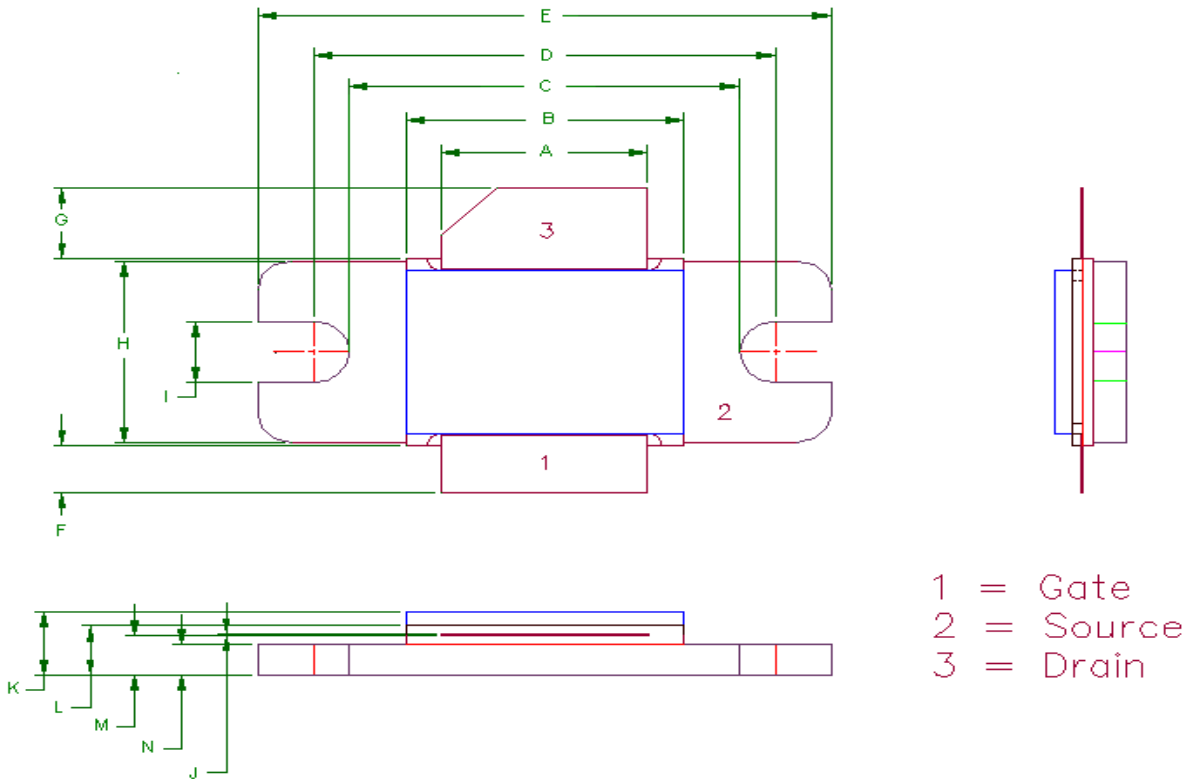
## TEST CIRCUIT DIAGRAM



**Board Material: Roger Duriod 6006 @ 25 Mil Thickness, Er=6.15**

Component List				Input Physical Circuit Layout			Output Physical Circuit Layout		
Item	Description		Value	Item	W (mil)	L (mil)	Item	W (mil)	L (mil)
C1	Chip Cap A size	ATC800A1010JT250XT	100pF	I	35	116	O	820	270
C2	Chip Cap A size	ATC800A680JT250XT	68pF	I1	35	84	O1	270	80
C3	Chip Cap B size	ATC200B103KW50XT	10,000pF	I2	35	230	O2	520	390
C4	Chip Cap B size	ATC100B102102KW50XT	1000pF	I3	35	100	O3	95	95
C5	Chip Cap B size	ATC100B101FW1000XT	100pF	I4	35	230	O4	70	160
C6	Electrolytic Cap (63V)	ANY	4700uF	I5	35	100	O5	35	150
R1	Chip Resistor size 0805	ANY	20.5 ohms	I6	500	315	O6	70	160
R2	Chip Resistor size 0805	ANY	2 ohm	I7	280	160	O7	95	80
L	RF Choke 20 AWG Copper wire			I8	500	70	O8	47	40
	L=1350 mil solder on top of the output choke			I9	670	350	O9	47	40
				I10	35	355	O10	35	85
				I11	35	745	O11	35	180
				I12	275	200	O12	35	180
				I13	280	190	O13	35	730
				I14	200	670	O14	270	200
							O15	138	680
							O16	150	150
							O17	98	150

## 55-KR PACKAGE DIMENSION



Dimension	Min (mil)	Min (mm)	Max (mil)	Max (mm)
A	370	9.40	372	9.44
B	498	12.65	500	12.7
C	700	17.78	702	17.83
D	830	21.08	832	21.13
E	1030	26.16	1032	26.21
F	101	2.56	102	2.59
G	151	3.84	152	3.86
H	385	9.78	387	9.83
I	130	3.30	132	3.35
J	003	.076	004	0.10
K	135	3.43	137	3.48
L	105	2.67	107	2.72
M	085	2.16	86	2.18
N	065	1.65	66	1.68



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#### Revision History

Revision Level / Date	Para. Affected	Description
0.1 / 18 January 2013	-	Initial Preliminary Release

For the most current data, consult MICROSEMI's website: [www.MICROSEMI.com](http://www.MICROSEMI.com)  
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