

1214GN-20V

20 Watts - 50 Volts, 300 μ s, 10%
L-Band Radar 1200 - 1400 MHz

GENERAL DESCRIPTION

The 1214GN-20V is an internally matched, COMMON SOURCE, class AB, GaN on SiC HEMT transistor capable of providing over 16dB gain, over 20 Watts of pulsed RF output power at 300 μ s pulse width, 10% duty factor across the 1200 to 1400 MHz band.

Market Application – 1214GN-20V is designed for L-Band Pulsed Radar

CASE OUTLINE 55-QP Common Source



ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 35 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	Pin=.5W Freq=1200,1300,1400 MHz	20	25		W
Gp	Power Gain	Pin=.5W Freq=1200,1300,1400 MHz	16	17		dB
η_d	Drain Efficiency	Pin=.5W Freq=1200,1300,1400 MHz	45	50		%
Dr	Droop	Pin=.5W Freq=1200,1300,1400 MHz			.5	dB
VSWR-T	Load Mismatch Tolerance	Pout=20W, Freq= 1300MHz			5:1	
θ_{jc}	Thermal Resistance	Pulse Width=300uS, Duty=10%			0.1	°C/W

- Bias Condition: Vdd=+50V, Idq=20mA constant current (V_{gs} = -2.0 ~ -4.5V typical)

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	$V_{gs} = -8V, V_D = 60V$			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

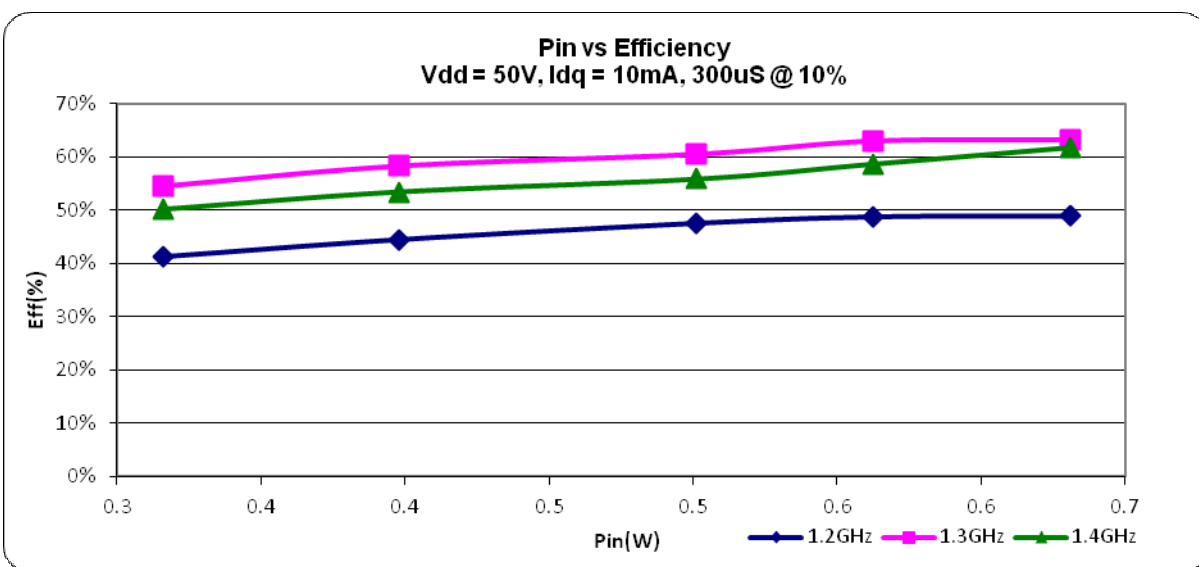
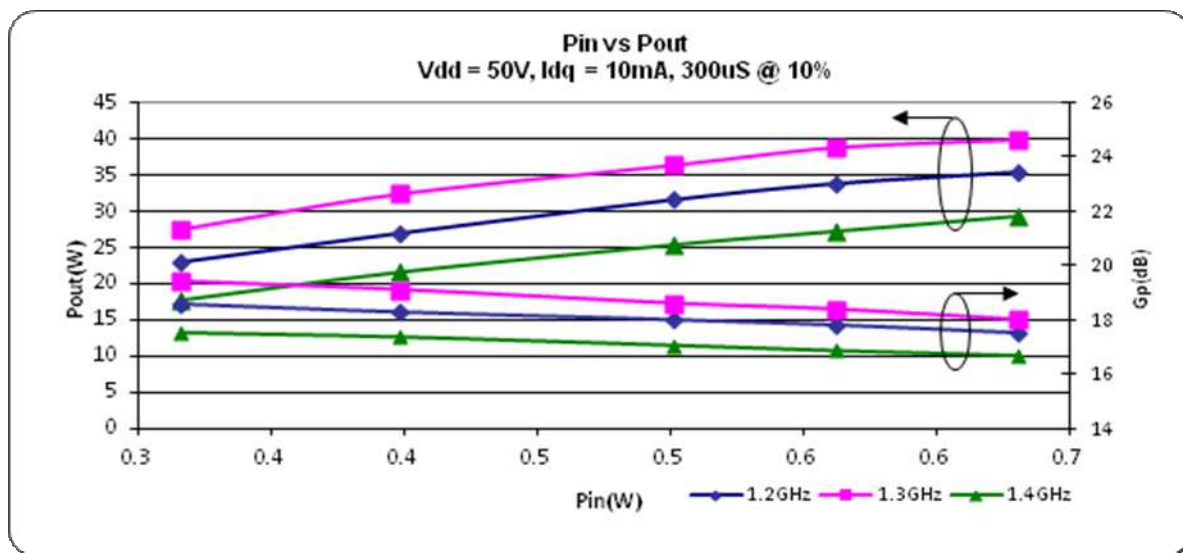
Export Classification: EAR-99

April 2013

For the most current data, consult MICROSEMI's website: www.MICROSEMI.com
Specifications are subject to change, consult the RFIS factory at (408) 986-8031 for the latest information

TYPICAL BROAD BAND PERFORMANCE DATA

Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)	Drop (dB)
1200 MHz	.5	31.6	.14	-9	48	18	0.25
1300 MHz	.5	36.3	.129	-10	61	18.6	0.20
1400 MHz	.5	25.4	.1	-8	56	17.05	0.15

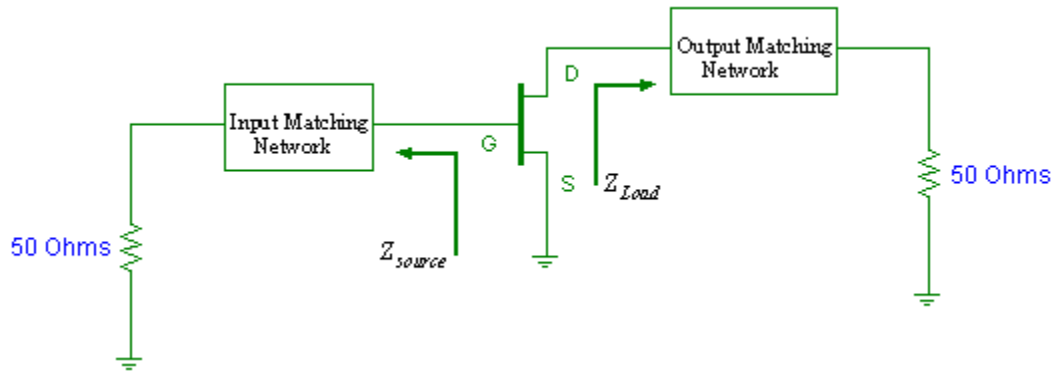


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TRANSISTOR IMPEDANCE INFORMATION



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

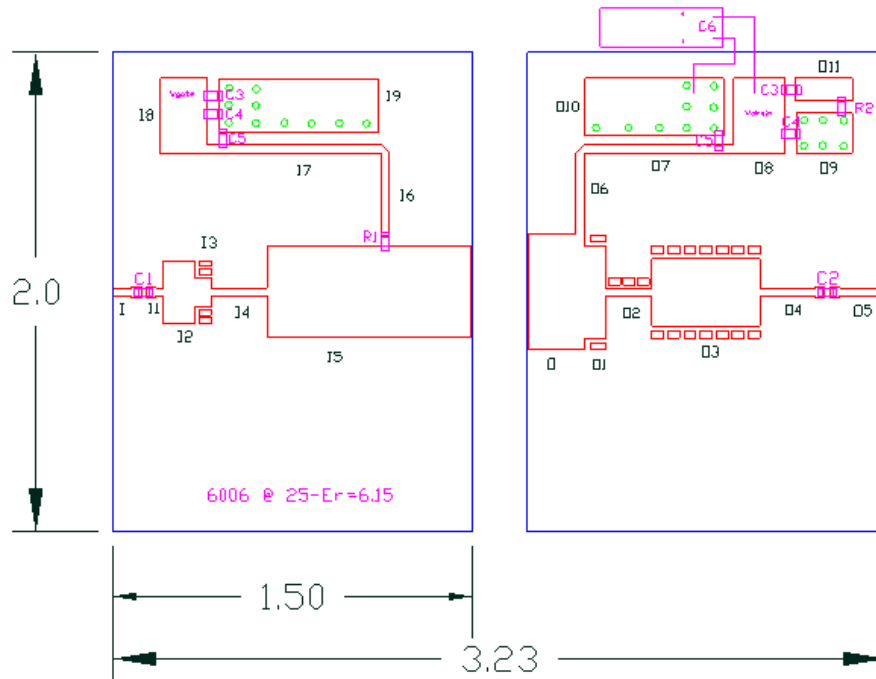
Impedance Data		
Freq (GHz)	Zs	Zl
1.2	3.6 - j1.1	8.5 - j2.95
1.3	4.0 - j.50	12.1 - j5.68
1.4	4.4 - j.14	19.7 - j7.34

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TEST CIRCUIT DIAGRAM



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

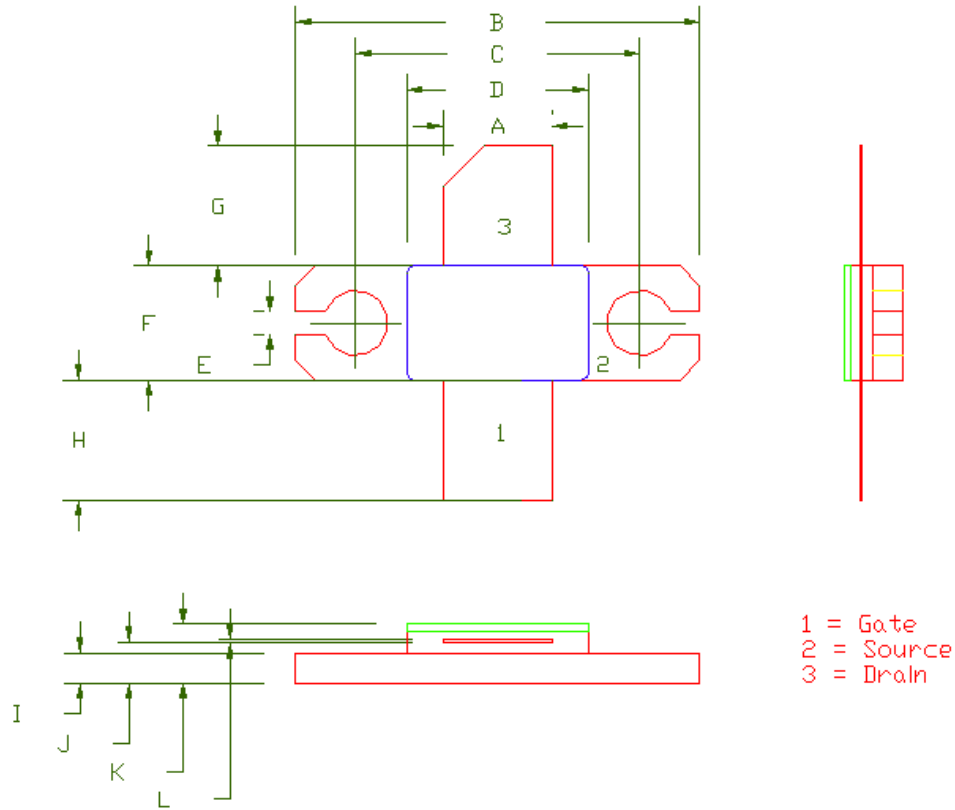
Component List				Input Matching Network			Output Matching Network		
Item	Description		Value	Item	W (Mil)	L (Mil)	Item	W (Mil)	L (Mil)
C1	Chip Cap A size	ATC800A1010JT250XT	100pF	1	35	116	0	480	200
C2	Chip Cap A size	ATC800A680JT250XT	68pF	11	35	70	01	384	90
C3	Chip Cap B size	ATC200B103KW50XT	10,000pF	12	262	134	02	35	190
C4	Chip Cap B size	ATC100B102102KW50XT	1000pF	13	124	65	03	280	450
C5	Chip Cap B size	ATC100B101FW1000XT	100pF	14	35	235	04	35	270
C6	Electrolytic Cap (63V)	ANY	1000uF	15	380	850	05	35	230
R1	Chip Resistor size 0805	ANY	20.5 ohms	16	35	350	06	35	340
R2	Chip Resistor size 0805	ANY	2 ohm	17	35	730	07	35	620
Note:	Need 2x of C3,C4,C5			18	310	194	08	310	210
	Board Material: Roger Duroid 6006 @ 25 mils thick, Er=6.15			19	220	660	09	170	230
							010	240	578
							011	90	230

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55-QP PACKAGE DIMENSION



Dimension	Min (mil)	Min (mm)	Max (mil)	Max (mm)
A	213	5.41	217	5.51
B	798	20.26	802	20.37
C	560	14.22	564	14.32
D	258	6.55	362	9.19
E	43	1.09	47	1.19
F	226	5.74	230	5.84
G	235	5.96	239	6.07
H	235	5.96	239	6.07
I	60	1.52	62	1.57
J	81	2.06	82	2.08
K	116	2.94	118	2.99
L	4	.102	6	.152

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1214GN-20LV

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Revision History

Revision Level / Date	Para. Affected	Description
0.1 / 6 March 2013	-	Initial Preliminary Release

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