

# 1214GN-280

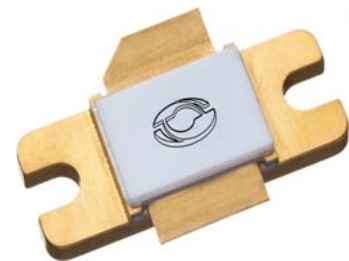
280 Watts - 60 Volts, 300  $\mu$ s, 10%  
L-Band Radar 1200 - 1400 MHz

## GENERAL DESCRIPTION

The 1214GN-280 is an internally matched, COMMON SOURCE, class AB, GaN on SiC HEMT transistor capable of providing over 17dB gain, 280 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-280 is designed for L-Band Pulsed Radar

## CASE OUTLINE 55-KR Common Source



## ABSOLUTE MAXIMUM RATINGS

### Maximum Power Dissipation

Device Dissipation @ 25°C 600 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=280W, Freq=1200,1300,1400 MHz	280	300		W
Gp	Power Gain	Pout=280W, Freq=1200,1300,1400 MHz	17	17.3		dB
$\eta_d$	Drain Efficiency	Pout=280W, Freq=1200,1300,1400 MHz	47	55		%
Dr	Droop	Pout=280W, Freq=1200,1300,1400 MHz			1.0	dB
VSWR-T	Load Mismatch Tolerance	Pout=280W, Freq= 1300MHz			3:1	
$\Theta_{jc}$	Thermal Resistance	Pulse Width=300uS, Duty=10%			0.3	°C/W

- Bias Condition: Vdd=+60V, Idq=50mA average current (Vgs= -2.0 ~ -4.5V typical)
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## 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

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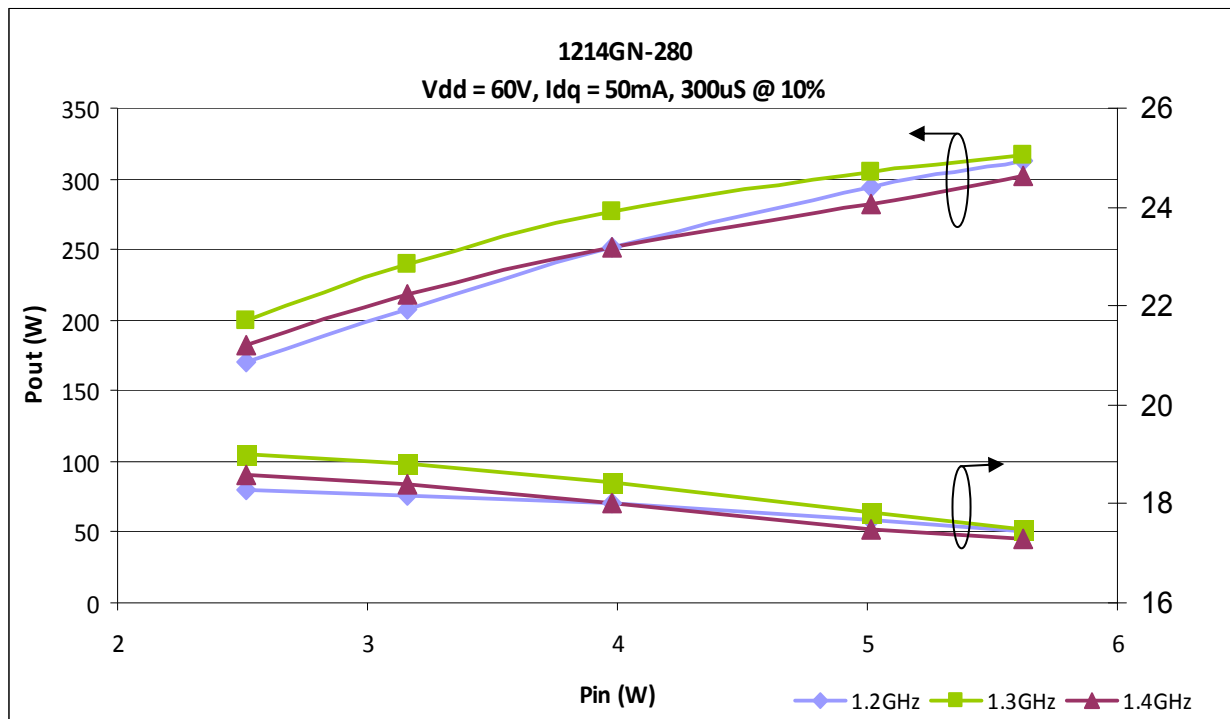
**Export Classification: EAR-99**

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## TYPICAL BROAD BAND PERFORMANCE DATA

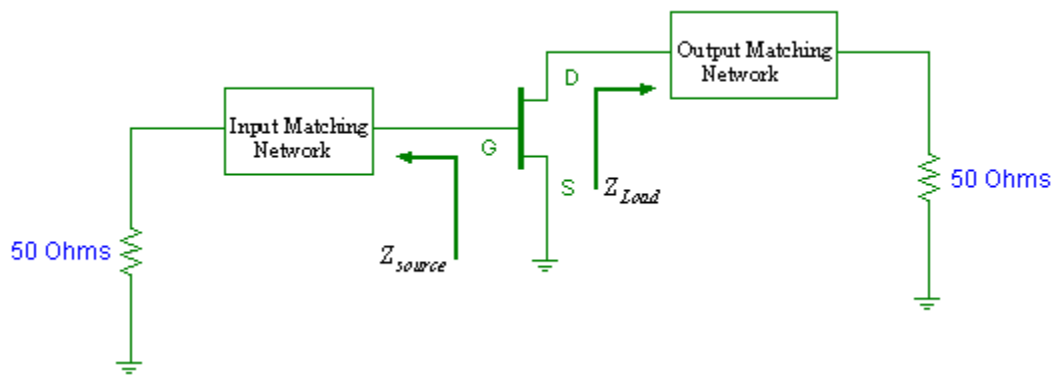
Frequency	Pin (W)	Pout (W)	Id (A)	RL (dB)	Nd (%)	G (dB)	Droop (dB)
1200 MHz	5.6	312	1.0	-9	53	17.45	0.5
1300 MHz	5.6	316	.96	-15	57	17.5	0.3
1400 MHz	5.6	302	.9	-17	58	17.2	0.2



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## TRANSISTOR IMPEDANCE INFORMATION



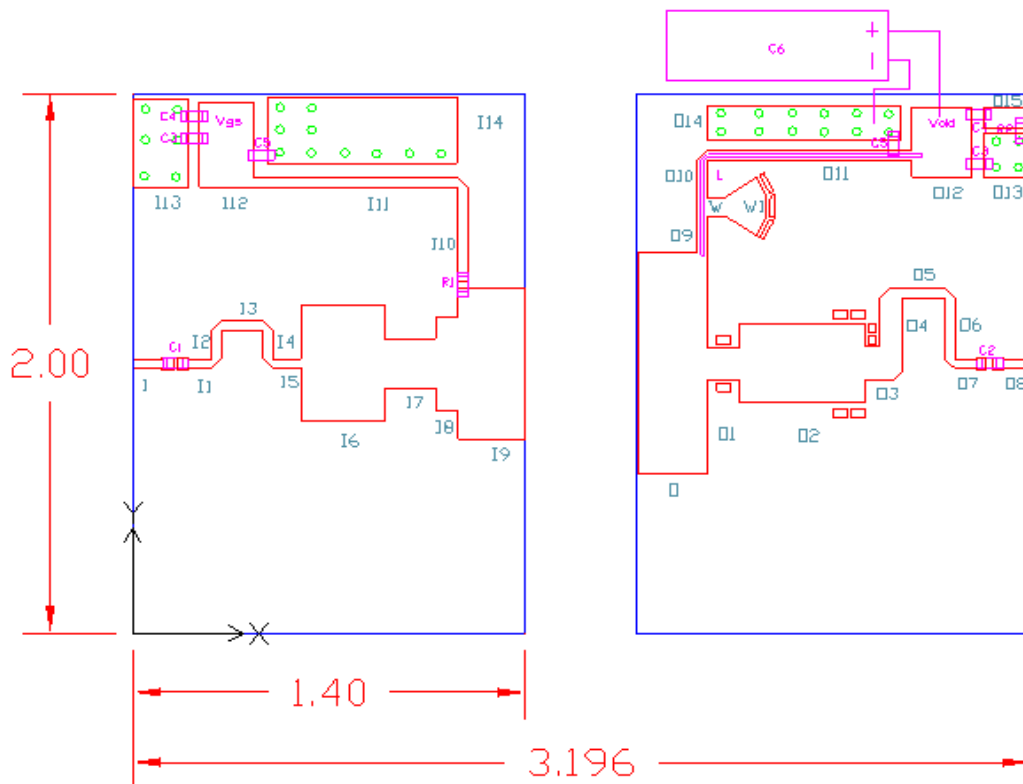
Note:  $Z_{source}$  is looking into the input circuit;  
 $Z_{Load}$  is looking into the output circuit.

Impedance Data		
Freq (GHz)	Zs	Zl
1.2	2.29 - j2.52	3.18 - j2.32
1.3	2.32 - j1.47	3.61 - j1.43
1.4	2.44 - j.40	4.29 - j.56

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## TEST CIRCUIT DIAGRAM



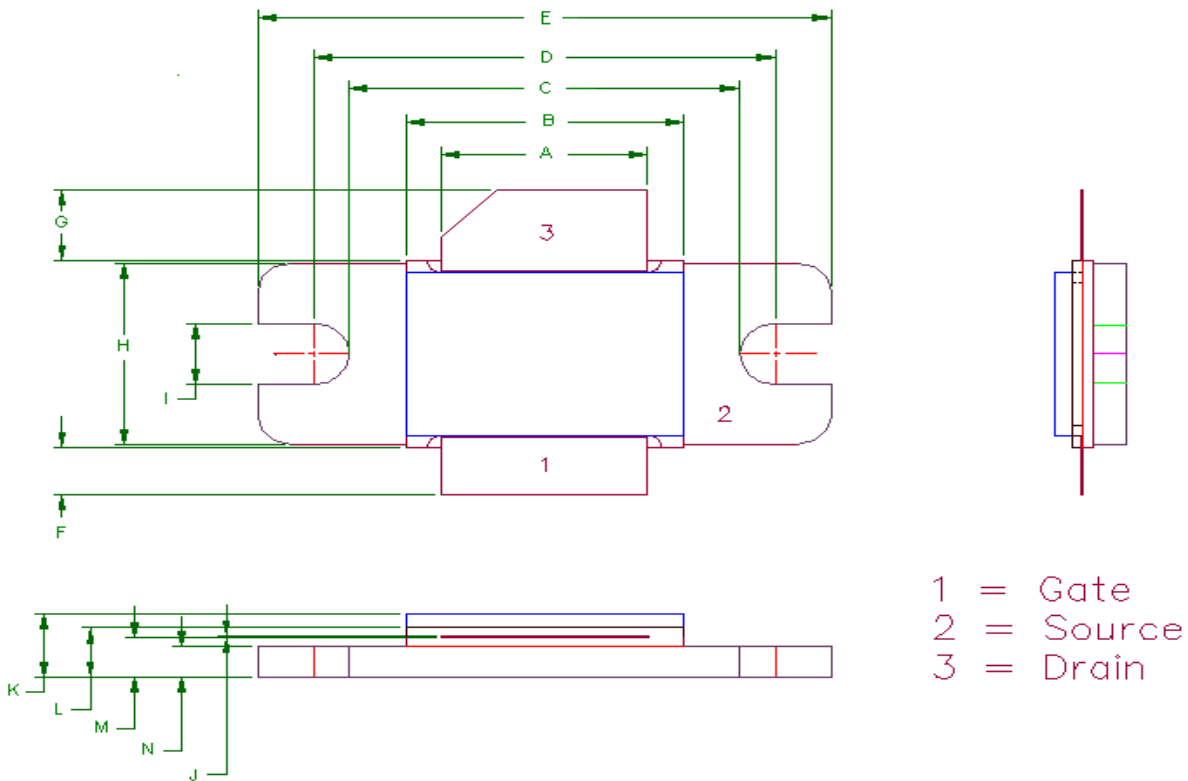
**Board Material: Roger Duriod 6006 @ 25 Mil Thickness, Er=6.15**

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	100	O	820	250
C2	Chip Cap A size	ATC800A680JT250XT	68pF	I1	35	120	O1	116	110
C3	Chip Cap B size	ATC200B103KW50XT	10,000pF	I2	35	106	O2	290	450
C4	Chip Cap B size	ATC100B102102KW50XT	1000pF	I3	35	150	O3	125	135
C5	Chip Cap B size	ATC100B101FW1000XT	100pF	I4	35	106	O4	86	170
C6	Electrolytic Cap (63V)	ANY	4700uF	I5	35	100	O5	35	150
R1	Chip Resistor size 0805	ANY	20.5 ohms	I6	430	300	O6	35	226
R2	Chip Resistor size 0805	ANY	2 ohm	I7	180	182	O7	35	110
L	RF Choke 20 AWG Copper wire			I8	346	78	O8	35	125
	L=1350 mil solder on top of the output choke			I9	560	236	O9	35	138
				I10	35	355	O10	35	138
<b>Note:</b>				I11	35	745	O11	35	730
	Need 2x of C3,C4,C5			I12	315	200	O12	250	200
				I13	280	190	O13	160	140
				I14	200	670	O14	130	680
							O15	70	140
							W	70	60

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### 55-KR PACKAGE DIMENSION



Dimension	Min (mil)	Min (mm)	Max (mil)	Max (mm)
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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

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M	085	2.16	86	2.18
N	065	1.65	66	1.68

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**Revision History**

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