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POWER PRODUCTS GROUP

0912GN-300

300 Watts - 65 Volts, 128 µs, 10%
Broad Band Data Link 960 - 1215 MHz

GENERAL DESCRIPTION

The 0912GN-300 is an internally matched, COMMON SOURCE, class AB GaN on SiC HEMT transistor capable of providing over 18dB gain, 300 Watts of pulsed RF output power at 128µs pulse width, 10% duty factor across the 960 to 1215 MHz band. The transistor has internal pre-match for optimal performance. This hermetically sealed transistor can be used for Broadband Avionics Data Link applications. It utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 600 W

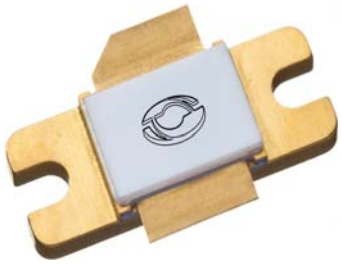
Maximum Voltage and Current

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 +200 °C

CASE OUTLINE
55-KR
Common Source



ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
Pout	Output Power	Pout=300W, Freq=960, 1090, 1215 MHz	300			W
Gp	Power Gain	Pout=300W, Freq=960, 1090, 1215 MHz	17.5	18.5		dB
ηd	Drain Efficiency	Pout=300W, Freq=960, 1090, 1215 MHz	45	52		%
Dr	Droop	Pout=300W, Freq=960, 1090, 1215 MHz			0.7	dB
VSWR-T	Load Mismatch Tolerance	Pout=300W, Freq= 1215MHz			3:1	
Θjc	Thermal Resistance	Pulse Width=128uS, Duty=10%			0.3	°C/W

- **Bias Condition: Vdd=+65V, Idq=50mA average current (Vgs= -2.0 ~ -4.5V) with Gate Pulsing at Pulse Width 400us, Period at 1.28ms**

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	V_{gS} = -8V, V_D = 65V			6	mA
$I_{G(Off)}$	Gate leakage current	V_{gS} = -8V, V_D = 0V			5	mA
BV_{DSS}	Drain-source breakdown voltage	V_{gs} =-8V, I_D = 5mA	250			V

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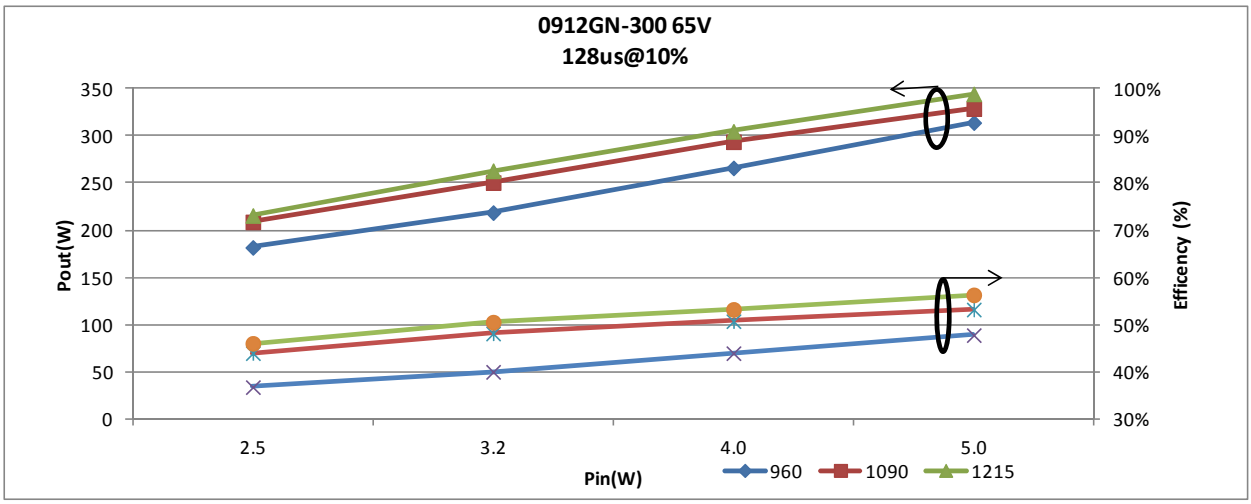
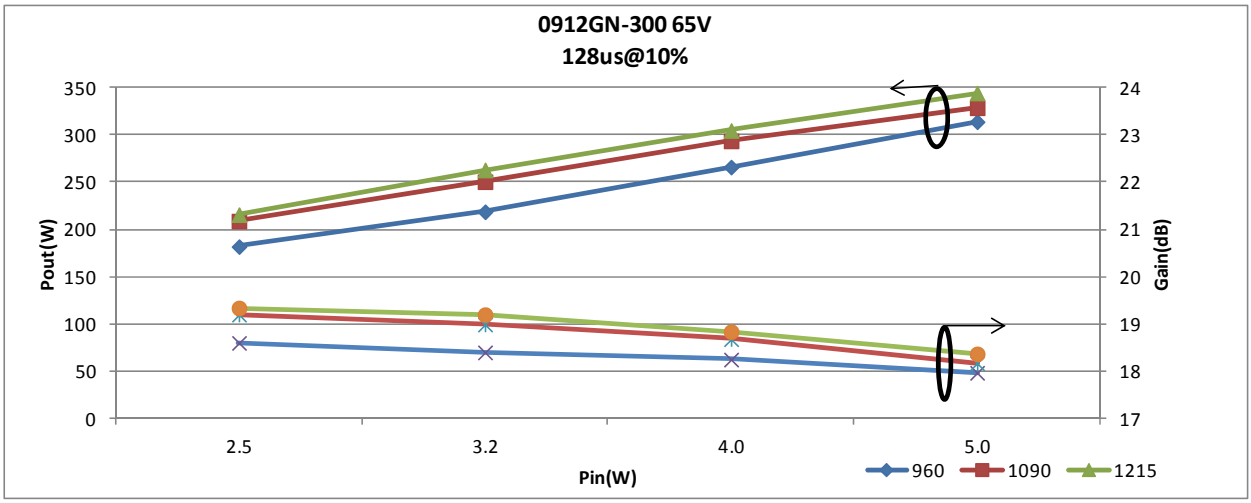
Typical RF Performance Data

Frequency	Pin (W)	Pout (W)	Id (A)	Eff (%)	RL(dBc)	G (dB)
0.96GHz	4.6	300	0.98	47	-7	18.2
1.09GHz	4.1	300	0.89	51.8	-7	18.6
1.215GHz	3.8	300	0.86	53.8	-12	18.9





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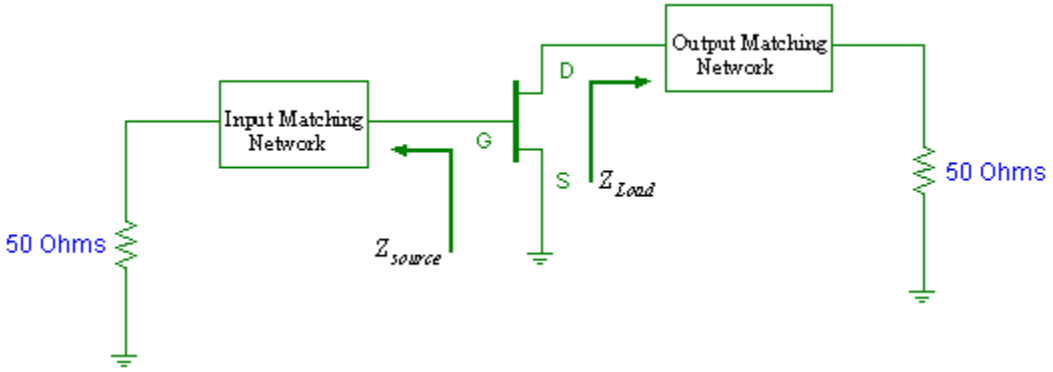
Transistor Impedance Information



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

	Impedance Data	
Freq (GHz)	**Zsource**	**ZLoad**
0.96	1.68 – j2.96	3.245 – j2.446
1.09	1.58 – j1.68	3.368 - j1.859
1.215	1.59 - j0.42	3.415 – j1.385

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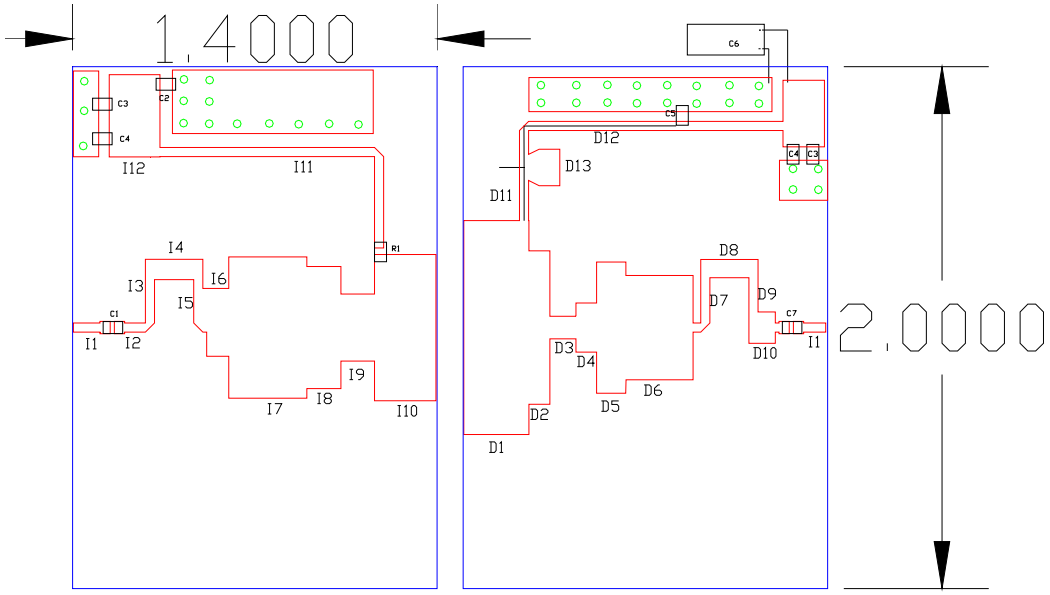
TEST CIRCUIT DIAGRAM



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

Component List				Input layout				Output layout		
Item	Description	Value		Item	W(mil)	L(mil)		Item	W(mil)	L(mil)
C1	ATC 800A	100pF		I1	36	95		D1	820	250
C2	ATC 100B	100PF		I2	36	80		D2	588	80
C3	ATC 100B	10000pF		I3	166	36		D3	86	100
C4	ATC 100B	1000pF		I4	78	220		D4	188	80
C5	ATC 100B	56PF		I5	201	36		D5	502	112
C6	Elyctrylic Capacitor (63V)	2200UF		I6	260	85		D6	400	258
C7	ATC 800A	12PF		I7	542	300		D7	210	36
R1	0805	11.5 ohm		I8	468	130		D8	70	220
				I9	258	130		D9	130	36
note	C3, C4 X2			I10	560	236		D10	120	102
				I11	36	1200		D11	36	204
				I12	315	195		D12	36	741
								D13	140	80

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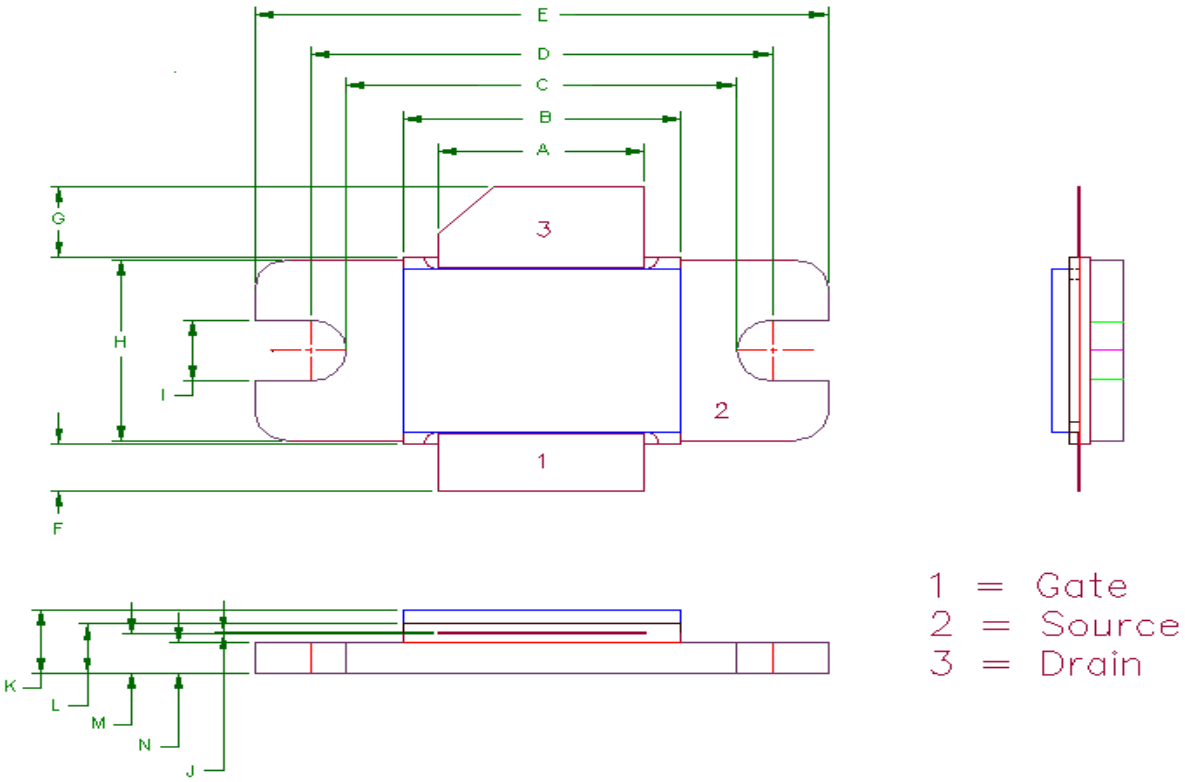
55-KR Package Dimension



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