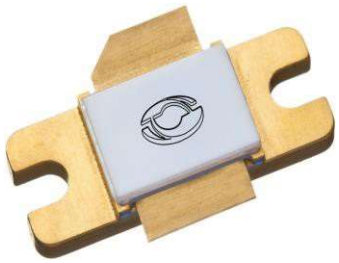
1214GN-600VHE

600 Watts • 50 Volts • 300us, 10%
1200-1400 MHz L-Band Radar

GENERAL DESCRIPTION

The 1214GN-600VHE is an internally matched, COMMON SOURCE, class AB GaN on SiC HEMT transistor capable of providing over 16.9dB gain, 60% drain efficiency, 600 Watts of pulsed RF output power at 300µs pulse width, 10% duty factor across the 1200 to 1400 MHz band. The transistor has internal pre-match for optimal performance. This transistor is ideal for use in L-band pulsed primary radar output stages. It utilizes gold metallization and eutectic attach to provide highest reliability and superior ruggedness.

CASE OUTLINE
55-KR
Common Source



ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation

Device Dissipation @ 25°C 1200 W

Maximum Voltage and Current

Drain-Source Voltage (V_{DSS}) 65 V
Gate-Source Voltage (V_{GS}) -8 to +0 V

Maximum Temperatures

Storage Temperature (T_{STG}) -55 to +150°C
Operating Junction Temperature +225°C

ELECTRICAL CHARACTERISTICS @ 25°C

Symbol	Characteristics	Test Conditions	Min	Typ	Max	Units
P_{OUT}	Output Power	Pout=600W, Freq=1200, 1300, 1400 MHz	600			W
G_P	Power Gain	Pout=600W, Freq=1200, 1300, 1400 MHz	16.9	17.5		dB
η_P	Drain Efficiency	Pout=600W, Freq=1200, 1300, 1400 MHz	60	63		%
Dr	Droop	Pout=600W, Freq=1200, 1300, 1400 MHz			0.8	dB
VSWR-T	Load Mismatch Tolerance	Pout=600W, Freq=1400 MHz			3:1	
Θ_{JC}	Thermal Resistance	Pulse Width=300uS, Duty=10%			0.23	°C/W

- **Constant Gate Bias Condition: Vdd=+50V, I_{DQ}=200mA average current (V_{GS}= -2.0 ~ -4.5V)**

FUNCTIONAL CHARACTERISTICS @ 25°C

$I_{D(Off)}$	Drain leakage current	V_{GS} = -8V, V_D = 50V			64	mA
$I_{G(Off)}$	Gate leakage current	V_{GS} = -8V, V_D = 0V			20	mA

Export Classification: EAR-99

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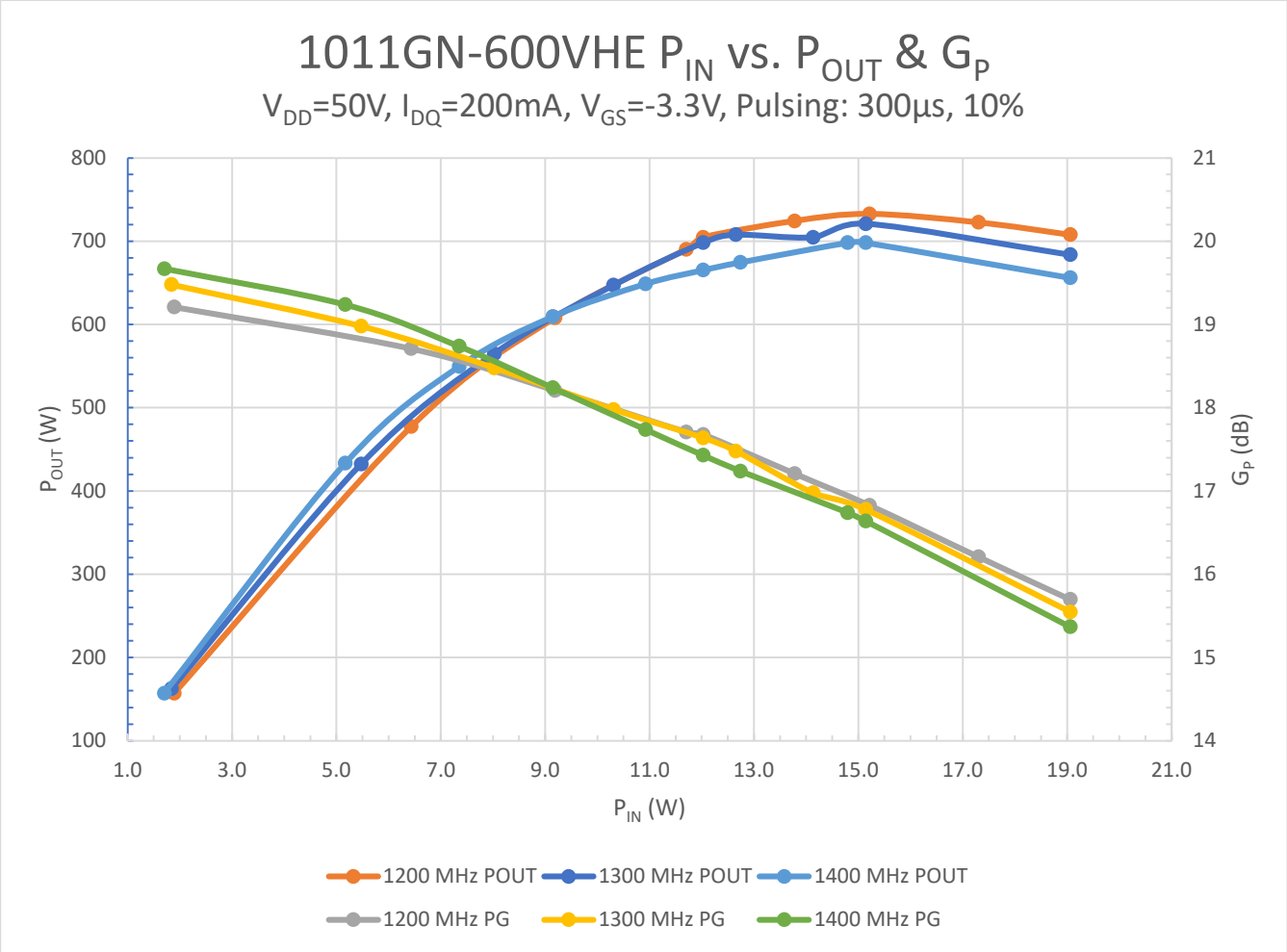
TYPICAL BROAD BAND PERFORMACE DATA

1214GN-600VHE VDD = 50V IDQ = 200mA VGS = -3.3V Pulsing: 300µS - 10%

Frequency	P_{IN} (dBm)	P_{IN} (W)	P_{OUT} (dBm)	P_{OUT} (W)	G_P (dB)	IRL (dB)	η_D (%)	Droop (dB)
1200 MHz	40.8	12.0	58.48	705	17.7	-12.8	63%	0.55
1300 MHz	40.8	12.0	58.44	698	17.6	-11.7	68%	0.50
1400 MHz	40.8	12.0	58.23	665	17.4	-10.8	73%	0.30



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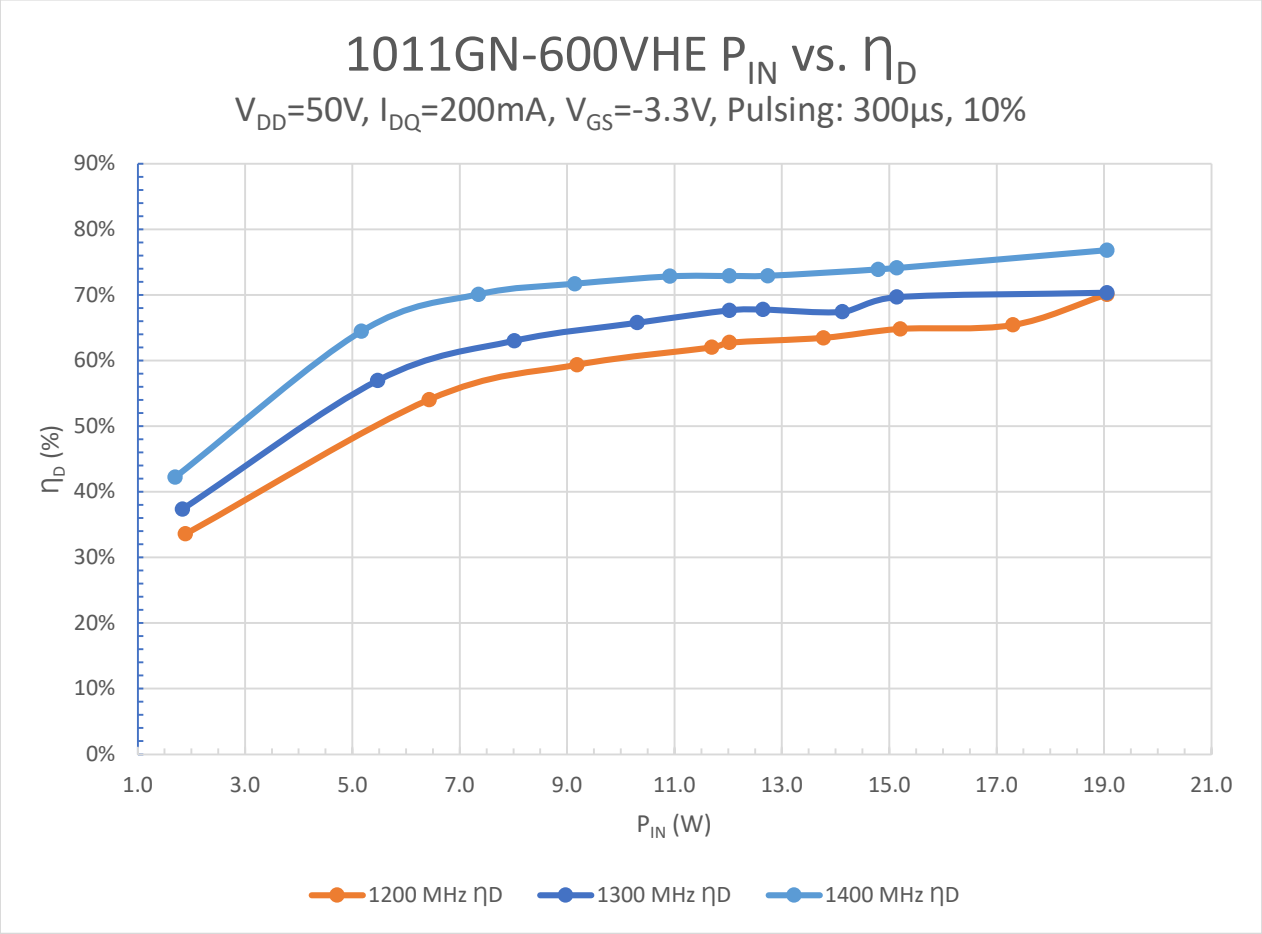

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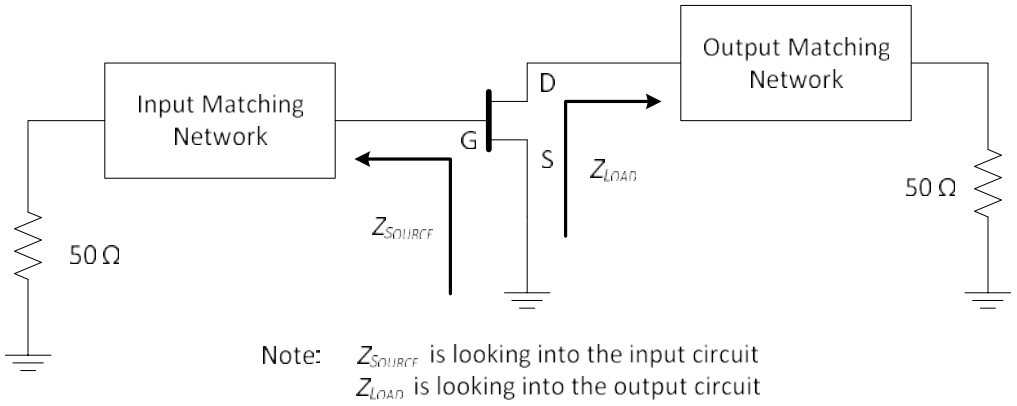
TRANSISTOR IMPEDANCE INFORMATION



Note: Z_{SOURCE} is looking into the input circuit
Z_{LOAD} is looking into the output circuit

Impedance Data		
Freq	**Z_{SOURCE}**	**Z_{LOAD}**
1.2 GHz	1.34 + j0.03	1.496 - j1.176
1.3 GHz	1.28 + j0.62	1.551 - j0.950
1.4 GHz	1.21 + j1.2	1.510 - j0.777

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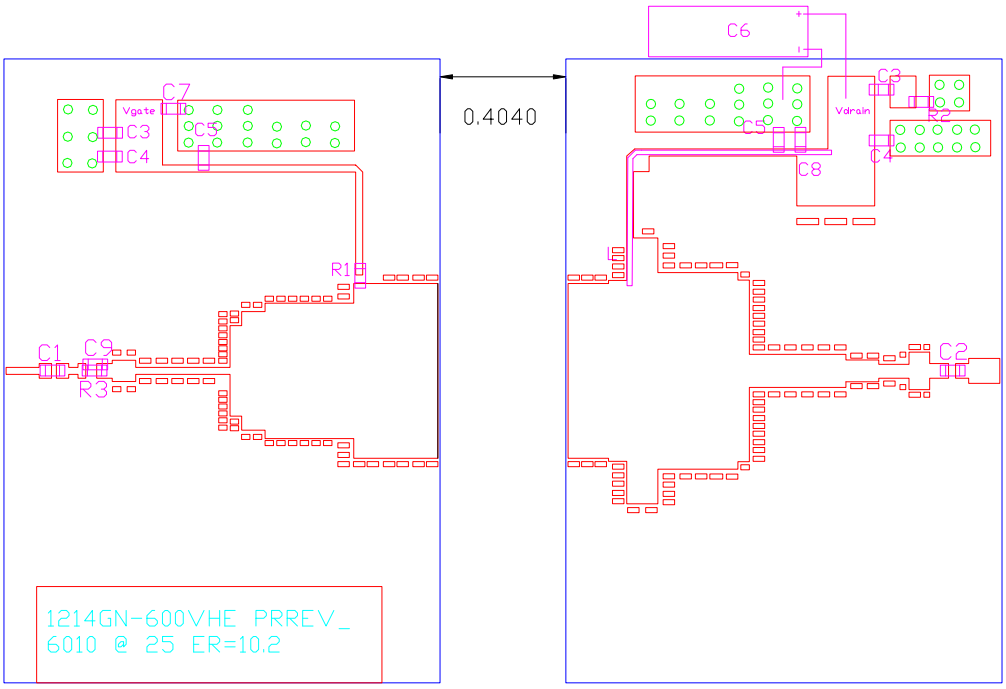
TEST CIRCUIT AND BOM



1214GN-600VHE Er=10.2 H=25mil PR Rev _

Component List		
Item	Description	Value
C1	ATC 800A	100pF
C2	ATC 800R	100PF
C3	ATC 200B	100000pF
C4	CER 250V 10% X7R 1206	1000pF
C5	ATC 100B	120PF
C6	Elyctrolytic Capacitor (63V)	6800UF
C7	mono capacitor	2.2uF
C8	ATC800A	33pF
C9	ATC 100A	9.1pF
R1	0805	10 ohm
R2	0805	2.2ohm
R3	0805	309 ohm
note	C3, C4 X2	
note	C9 is stacked on R3	

Test circuit dxf file available upon request.

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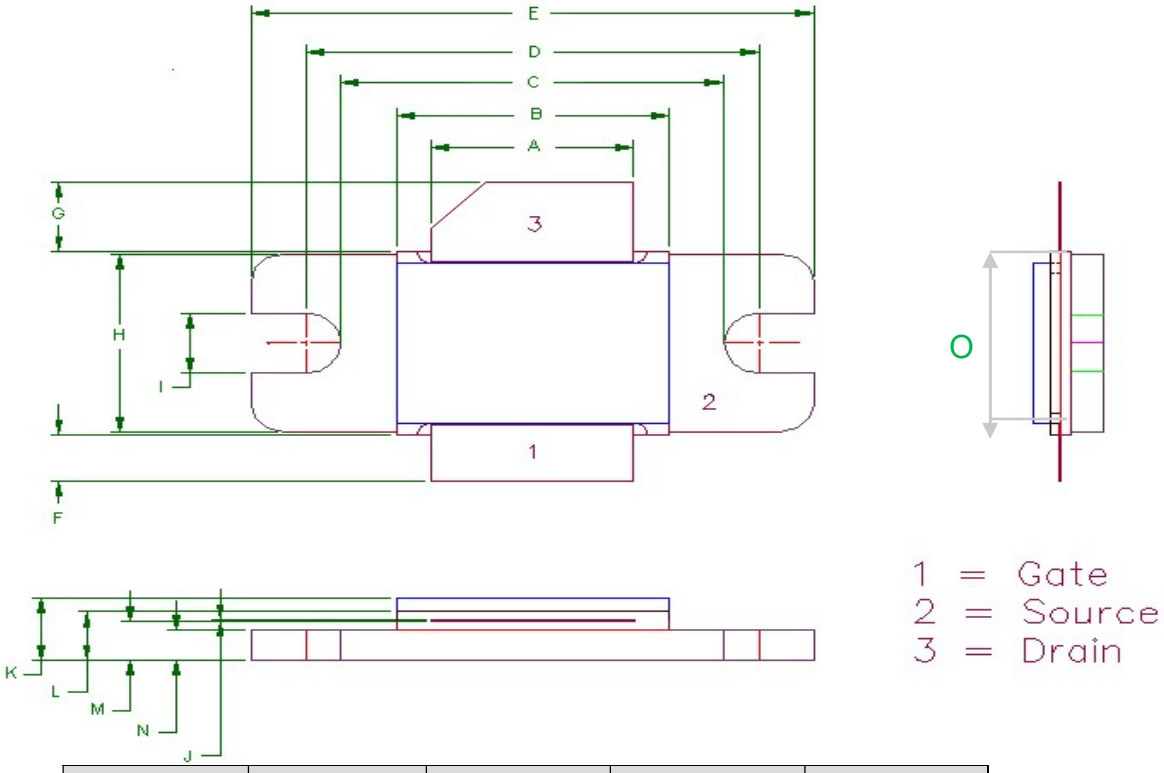
55-KR PACKAGE DIMENSIONS



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
O	398	10.11	404	10.26

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About Microsemi

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Revision History

Revision Level / Date	Para. Affected	Description
- / July 2015		Initial Release
R3 / August 2017	Various-	Idq=200mA & Test Circuit Optimizations
R4 / August 2017	Typical Data	Updated typical data and charts