

# APPLICATION NOTE

Document NO. AN-VHF-027-B

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**SUBJECT:** RD100HHF1 PushPull Amplifier

## **SUMMARY:**

This application note shows the RF characteristics data(IMD3 IMD5) for 30MHz with RD100HHF1 PushPull Amplifier.

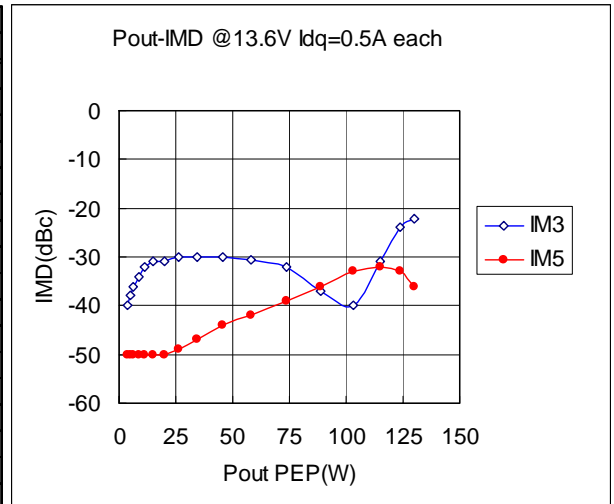
- Sample : RD100HHF1
  
- Measurement conditions :
  - 1-1. @f1=30MHz f2=30.001MHz: Vdd=13.6V, Idq=0.5A (Vgg adj.)
  - 1-2. @f1=30MHz f2=30.001MHz: Vdd=12.5V, Idq=0.5A (Vgg adj.)
  
  - 2-1. @f1=30MHz f2=30.001MHz: Vdd=13.6V, Idq=1A (Vgg adj.)
  - 2-2. @f1=30MHz f2=30.001MHz: Vdd=12.5V, Idq=1A (Vgg adj.)
  
- Results :
  - Page 2-3 shows IMD3,5 -Output Power @f=30MHz.
  - Page 4 shows IMD3,5-frequency @100WPEP f=1.6MHz-30MHz.
  - Page 5 shows the circuit schematic.
  - Page 6 shows the circuit board picture & IMD test setup.

1. IMD3,5 -Output Power @f=30MHz.

1-1. Conditions1

Freq = 30MHz & 30.001MHz  
 VDD=13.6V, Idq=0.5A each@Vgg adj.

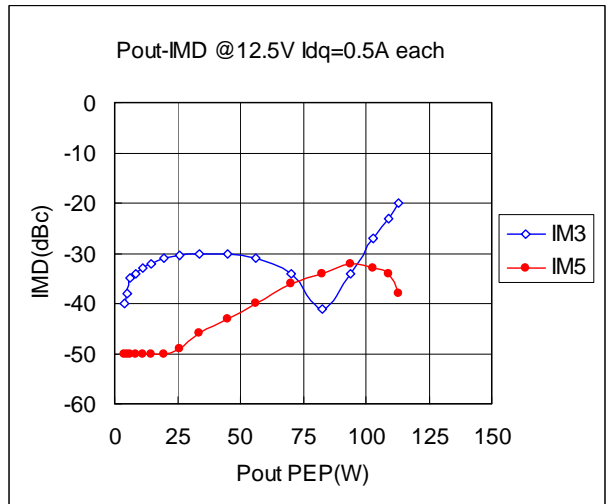
Pin	Pout	Gain	IM3	IM5	Id
W-PEP	W-PEP	dB	dBc	dBc	A
0.26	3.9	11.8	-40	-50	2.03
0.32	5.05	12.0	-38	-50	2.25
0.397	6.48	12.1	-36	-50	2.48
0.504	8.6	12.3	-34	-50	2.78
0.63	11.2	12.5	-32	-50	3.1
0.8	15	12.7	-31	-50	3.51
0.998	19.7	13.0	-31	-50	3.95
1.26	26.3	13.2	-30	-49	4.49
1.57	34.4	13.4	-30	-47	5.08
1.99	45.5	13.6	-30	-44	5.8
2.46	57.9	13.7	-30.5	-42	6.54
3.11	73.8	13.8	-32	-39	7.46
3.87	88.6	13.6	-37	-36	8.37
4.9	103	13.2	-40	-33	9.4
6.1	115	12.8	-31	-32	10.35
7.7	124	12.1	-24	-33	11.3
9.5	130	11.4	-22	-36	12.12



1-2. Conditions2

Freq = 30MHz & 30.001MHz  
 VDD=12.5V, Idq=0.5A each@Vgg adj.

Pin	Pout	Gain	IM3	IM5	Id
W-PEP	W-PEP	dB	dBc	dBc	A
0.26	3.8	11.6	-40	-50	2.05
0.32	4.97	11.9	-38	-50	2.26
0.397	6.38	12.1	-35	-50	2.48
0.504	8.47	12.3	-34	-50	2.77
0.63	11.1	12.5	-33	-50	3.09
0.8	14.8	12.7	-32	-50	3.49
0.998	19.4	12.9	-31	-50	3.93
1.26	26	13.1	-30.5	-49	4.47
1.57	33.9	13.3	-30	-46	5.06
1.99	44.7	13.5	-30	-43	5.78
2.46	56.3	13.6	-31	-40	6.51
3.11	70.2	13.5	-34	-36	7.4
3.87	82.6	13.3	-41	-34	8.28
4.9	94	12.8	-34	-32	9.22
6.1	103	12.3	-27	-33	10.08
7.7	109	11.5	-23	-34	10.91
9.5	113	10.8	-20	-38	11.62



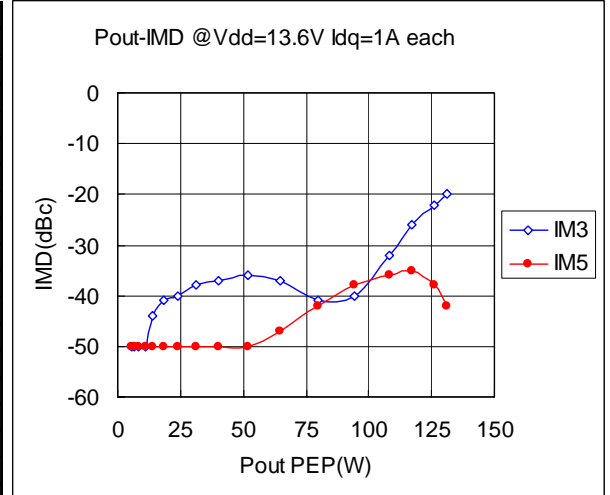
# RD100HHF1 PushPull Amplifier

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## 1-3. Conditions3

Freq = 30MHz & 30.001MHz  
 VDD=13.6V, Idq=1A each@Vgg adj.

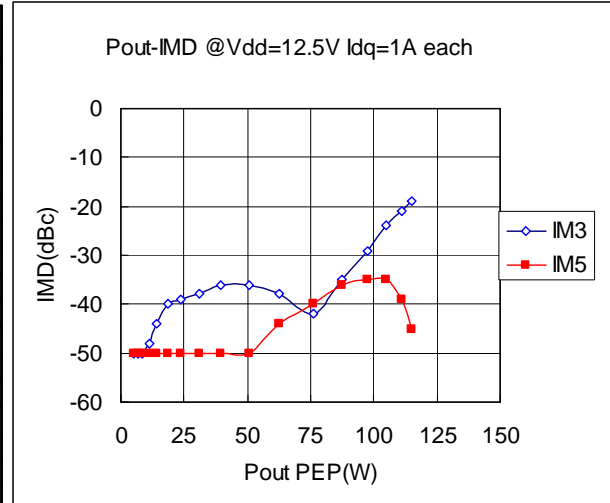
Pin	Pout	Gain	IM3	IM5	Id
W-PEP	W-PEP	dB	dBc	dBc	A
0.26	5.38	13.2	-50	-50	2.99
0.32	6.85	13.3	-50	-50	3.18
0.397	8.58	13.3	-50	-50	3.39
0.504	11.1	13.4	-50	-50	3.67
0.63	14.2	13.5	-44	-50	3.98
0.8	18.5	13.6	-41	-50	4.38
0.998	23.8	13.8	-40	-50	4.83
1.26	31.1	13.9	-38	-50	5.38
1.57	39.9	14.1	-37	-50	5.97
1.99	51.7	14.1	-36	-50	6.69
2.46	64.6	14.2	-37	-47	7.43
3.11	80	14.1	-41	-42	8.35
3.87	94.2	13.9	-40	-38	9.28
4.9	108	13.4	-32	-36	10.26
6.1	117	12.8	-26	-35	11.14
7.7	126	12.1	-22	-38	12.05
9.5	131	11.4	-20	-42	12.82



## 1-4. Conditions4

Freq = 30MHz & 30.001MHz  
 VDD=12.5V, Idq=1A each@Vgg adj.

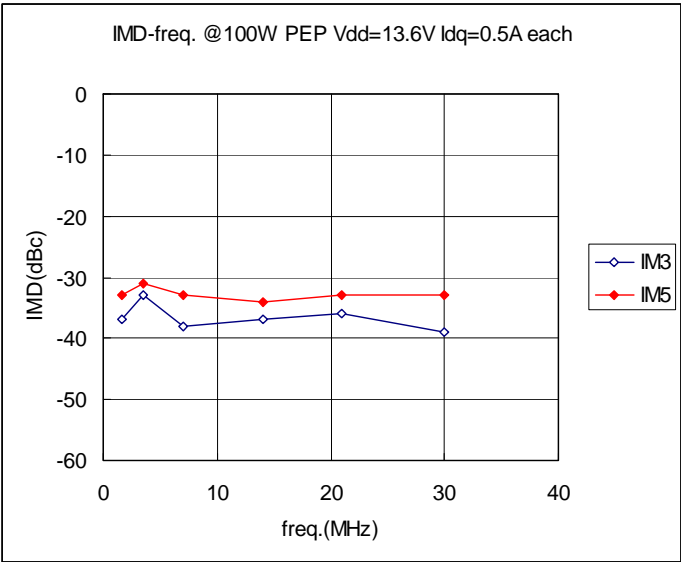
Pin	Pout	Gain	IM3	IM5	Id
W-PEP	W-PEP	dB	dBc	dBc	A
0.26	5.31	13.1	-50	-50	2.92
0.32	6.8	13.3	-50	-50	3.11
0.397	8.52	13.3	-50	-50	3.33
0.504	11.1	13.4	-48	-50	3.62
0.63	14.1	13.5	-44	-50	3.93
0.8	18.4	13.6	-40	-50	4.34
0.998	23.6	13.7	-39	-50	4.78
1.26	30.9	13.9	-38	-50	5.32
1.57	39.5	14.0	-36	-50	5.91
1.99	51	14.1	-36	-50	6.63
2.46	62.8	14.1	-38	-44	7.36
3.11	76	13.9	-42	-40	8.24
3.87	87.4	13.5	-35	-36	9.09
4.9	97.8	13.0	-29	-35	10.01
6.1	105	12.4	-24	-35	10.83
7.7	111	11.6	-21	-39	11.63
9.5	115	10.8	-19	-45	12.31



2. IMD3,5-frequency @100WPEP f=1.6MHz-30MHz.

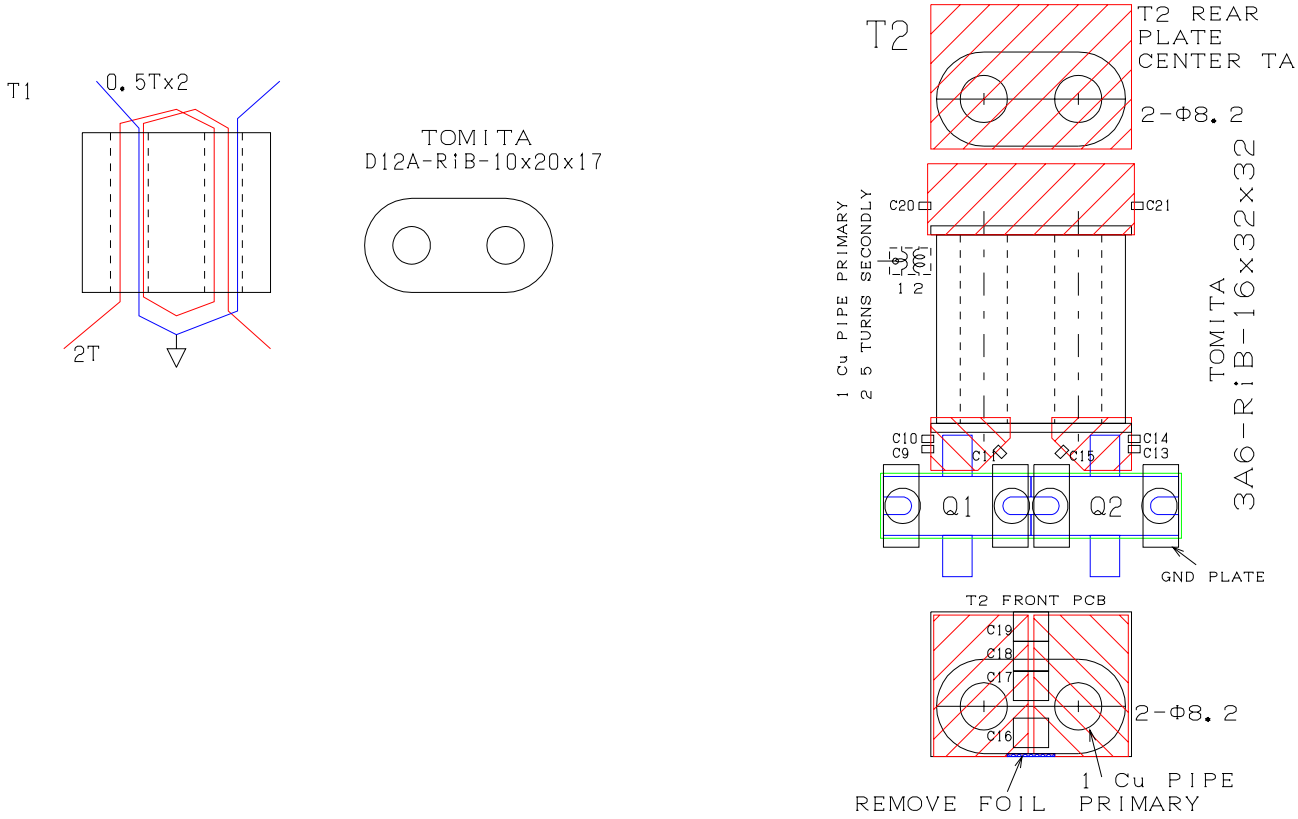
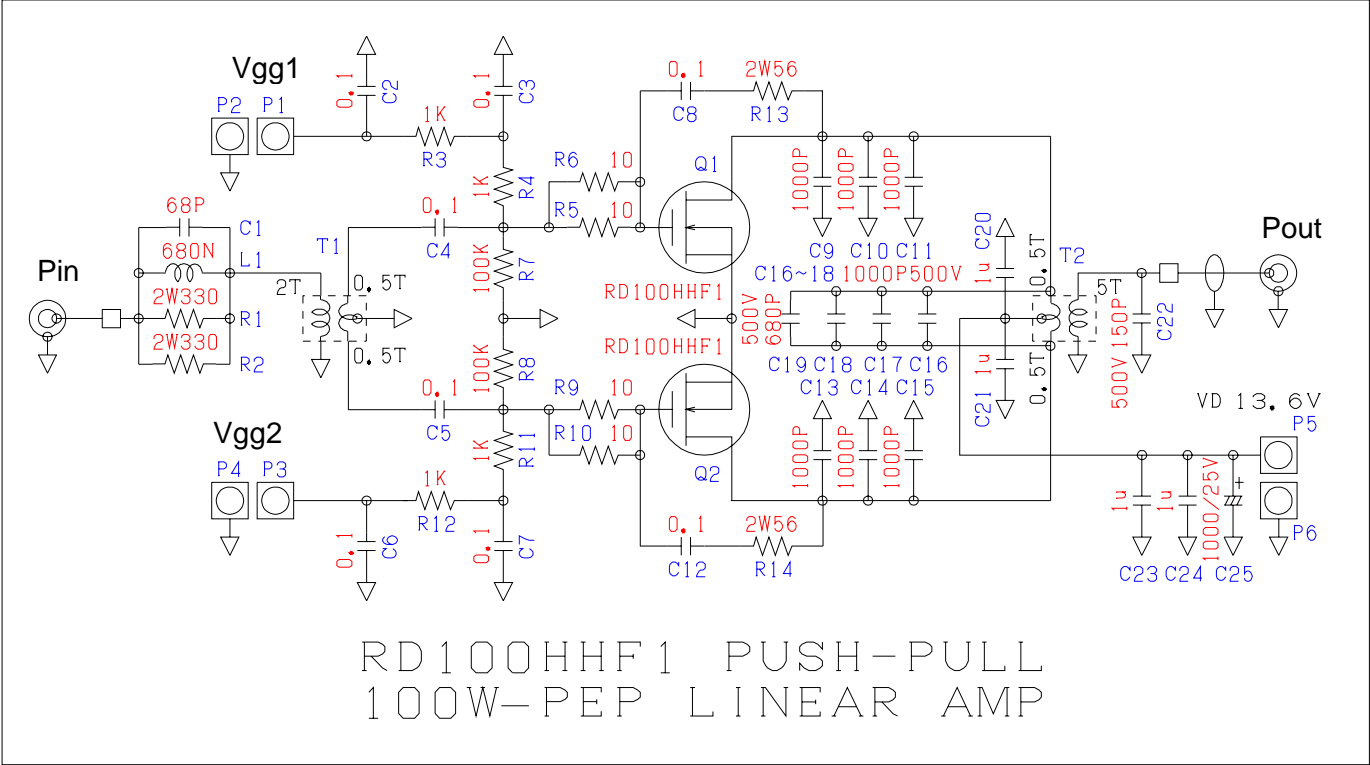
Vdd=13.6V  
Idq=0.5A each @Vgg adj.  
Pout=100W PEP @Pin adj.

freq.	Pin	IM3	IM5	Id
MHz	W-PEP	dBc	dBc	A
1.6	5.25	-37	-33	11.7
3.5	6.75	-33	-31	13
7	6.87	-38	-33	14.2
14	4.99	-37	-34	14.6
21	4.99	-36	-33	10
30	4.67	-39	-33	9.5

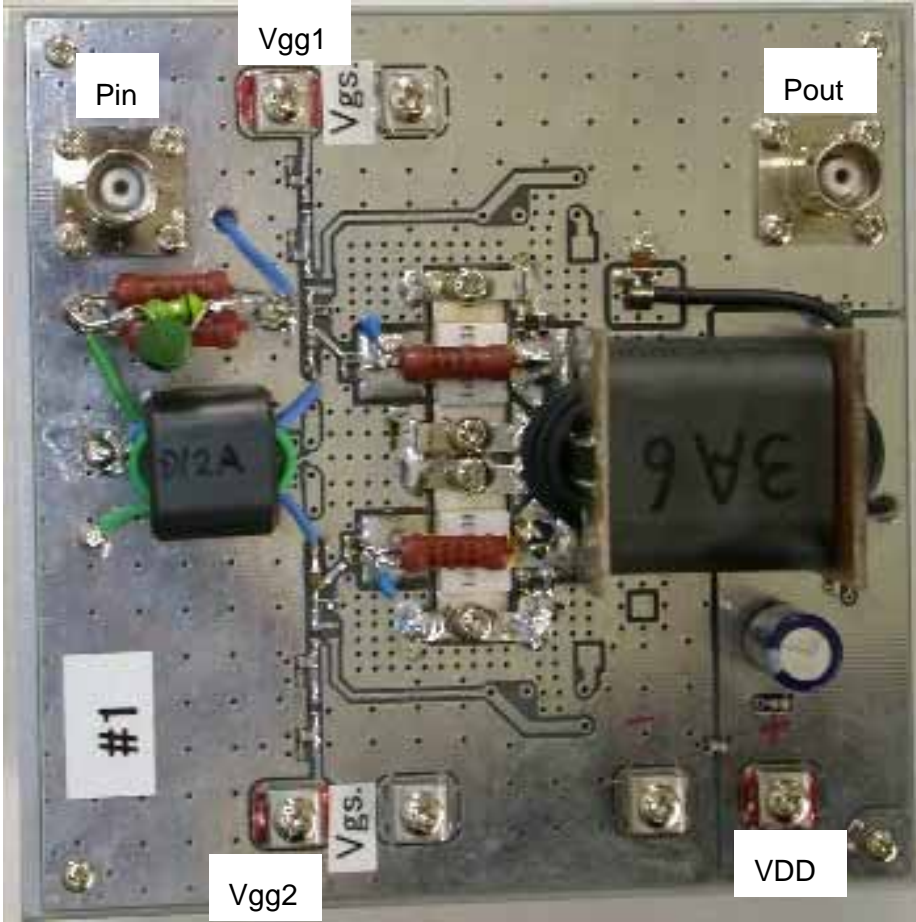


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3. Circuit schematic.



4. Circuit board.



4. Test set-up

