

APPLICATION NOTE

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(Taking charge of Silicon RF by
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SUBJECT:

RD00HVS1 & RD02MUS1B 2-stage amplifier RF performance at $f=135\text{-}175\text{MHz}$, $V_{dd}=7.2/6.5\text{V}$

SUMMARY:

This application note shows the RF wide-band characteristics data (Frequency characteristics, Pout vs. Pin characteristics, Pout vs. Vdd characteristics) at $f=135$ to 175MHz .

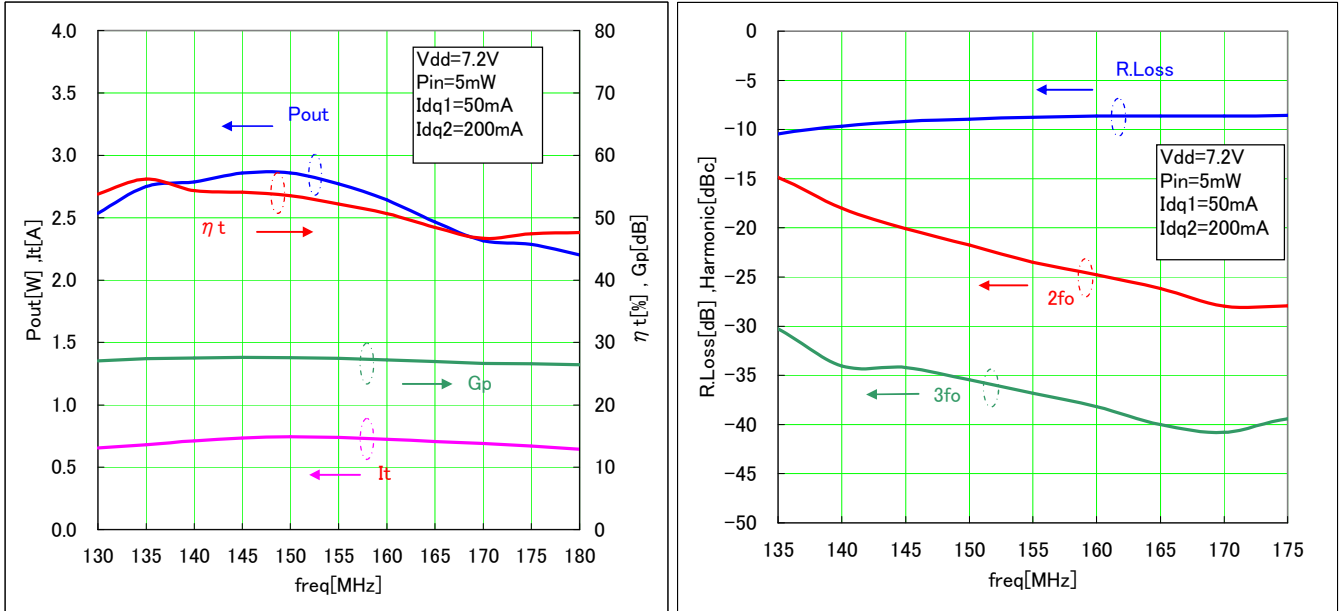
- Sample history:
 - RD00HVS1: Lot number "551"
 - RD02MUS1B: Lot number "105AB-G"

- Evaluate conditions:
 - @ $f=135\text{MHz}$ to 175MHz , $V_{dd}=7.2\text{V}/6.5\text{V}$, $I_{dq1}=50\text{mA}$ (V_{gg1} adj.), $I_{dq2}=200\text{mA}$ (V_{gg2} adj.)
 - Typical V_{gg} : $V_{gg1}=V_{gg2}=3.5\text{V}$

- Results:
 - Page 2 shows the typical frequency characteristics data @ $V_{dd}=7.2\text{V}$.
 - Page 3 shows the typical frequency characteristics data @ $V_{dd}=6.5\text{V}$.
 - Page 4-6 shows the typical Pout vs. Pin characteristics data @ $V_{dd}=7.2\text{V}$.
 - Page 7-9 shows the typical Pout vs. Pin characteristics data @ $V_{dd}=6.5\text{V}$.
 - Page 10-12 shows the typical Pout vs. Vdd characteristics data.
 - Page 13-14 shows the equivalent circuit.

Frequency characteristics

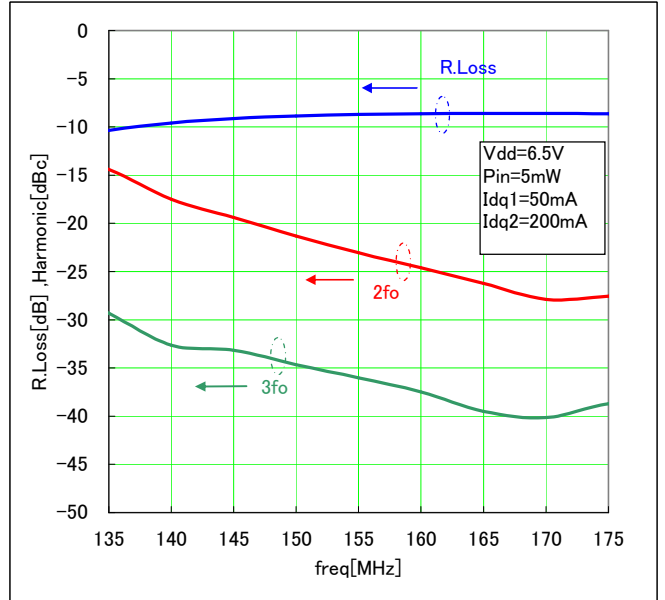
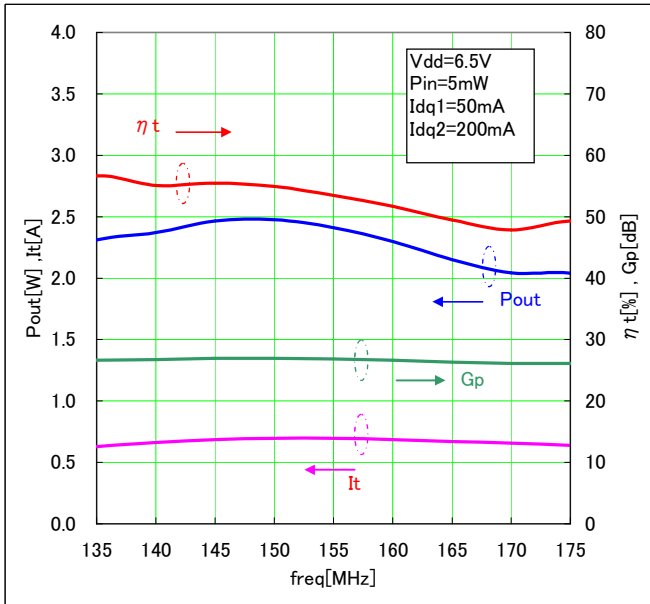
@Vdd=7.2V, Pin=5mW, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)



Freq [MHz]	Pout		Gp [dB]	R.Loss [dB]	It [A]	ηt [%]	2fo [dBc]	3fo [dBc]
	[dBm]	[W]						
130	34.0	2.54	27.0	-11.7	0.66	53.8	-13.0	-27.5
135	34.4	2.75	27.4	-10.4	0.68	56.2	-14.9	-30.3
140	34.5	2.79	27.5	-9.7	0.71	54.4	-18.0	-34.0
145	34.6	2.86	27.6	-9.2	0.74	54.1	-20.1	-34.2
150	34.6	2.86	27.6	-8.9	0.74	53.5	-21.8	-35.5
155	34.4	2.77	27.5	-8.7	0.74	52.2	-23.5	-36.8
160	34.2	2.64	27.2	-8.6	0.73	50.7	-24.8	-38.2
165	33.9	2.47	26.9	-8.6	0.71	48.4	-26.2	-40.0
170	33.6	2.32	26.6	-8.6	0.69	46.7	-28.0	-40.8
175	33.6	2.29	26.6	-8.6	0.67	47.5	-28.0	-39.4
180	33.4	2.20	26.5	-8.5	0.64	47.6	-27.7	-39.4

Frequency characteristics

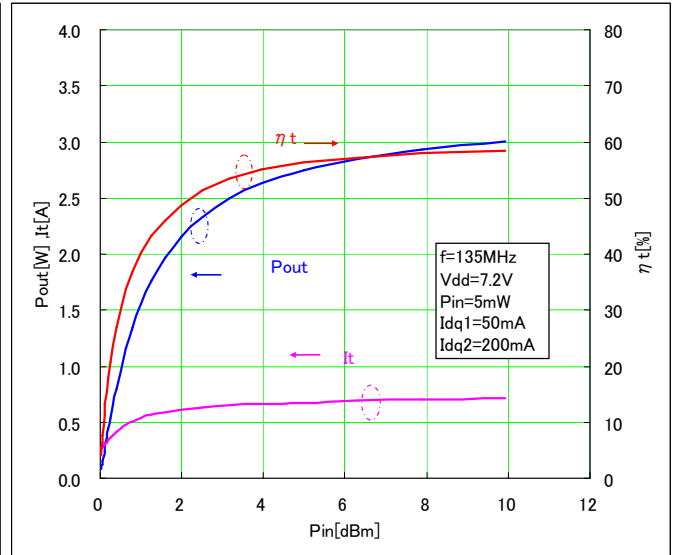
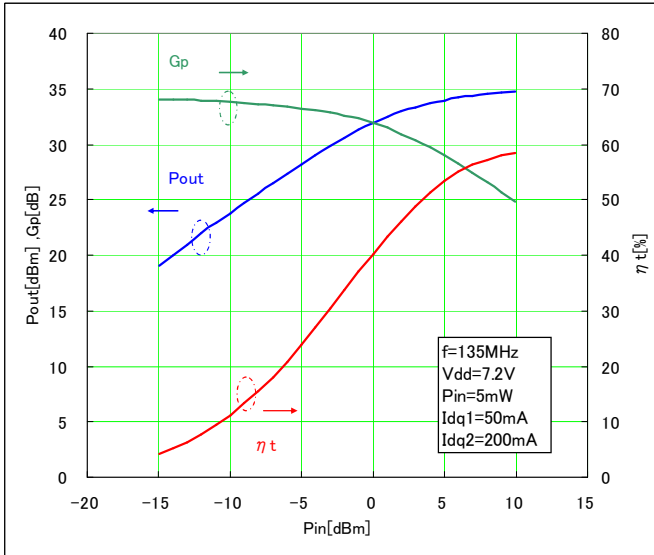
@Vdd=6.5V, Pin=5mW, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)



Freq [MHz]	Pout		Gp [dB]	R..Loss [dB]	It [A]	ηt [%]	2fo [dBc]	3fo [dBc]
	[dBm]	[W]						
130	33.3	2.14	26.3	-11.6	0.61	54.2	-12.4	-26.4
135	33.6	2.31	26.7	-10.4	0.63	56.7	-14.4	-29.3
140	33.8	2.37	26.7	-9.6	0.66	55.1	-17.5	-32.6
145	33.9	2.47	26.9	-9.1	0.69	55.5	-19.4	-33.2
150	33.9	2.48	26.9	-8.9	0.70	54.9	-21.3	-34.7
155	33.8	2.41	26.8	-8.7	0.70	53.5	-23.1	-36.0
160	33.6	2.30	26.6	-8.6	0.69	51.7	-24.6	-37.5
165	33.3	2.15	26.3	-8.6	0.67	49.5	-26.2	-39.5
170	33.1	2.04	26.1	-8.6	0.66	47.8	-27.9	-40.2
175	33.1	2.04	26.1	-8.6	0.64	49.3	-27.6	-38.7
180	32.9	1.94	25.9	-8.5	0.62	48.7	-27.3	-38.5

Pout vs. Pin characteristics

@ f=135MHz, Vdd=7.2V, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)

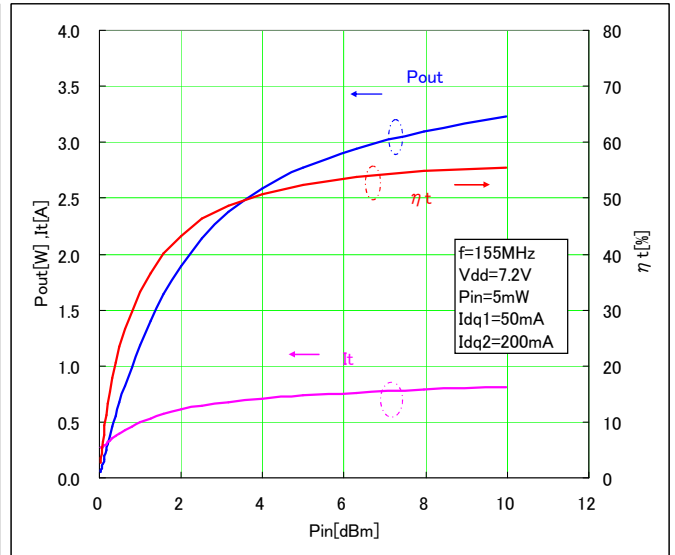
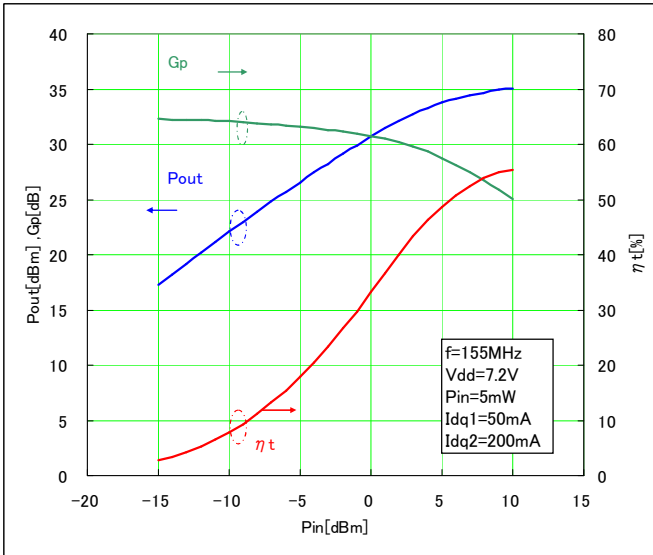


Pin		Pout		Gp	R..Loss	It	η t	2fo	3fo
[dBm]	[W]	[dBm]	[W]	[dB]	.[dB]	[A]	[%]	[dBc]	[dBc]
-15.0	0.03	19.1	0.08	34.1	-4.1	0.27	4.2	-28.9	-
-14.0	0.04	20.0	0.10	34.0	-4.3	0.27	5.2	-27.9	-
-13.0	0.05	21.0	0.13	34.0	-5.3	0.28	6.4	-27.0	-
-12.0	0.06	21.9	0.16	34.0	-6.1	0.28	7.7	-26.1	-
-11.0	0.08	22.9	0.20	33.9	-6.9	0.29	9.4	-25.1	-
-10.0	0.10	23.8	0.24	33.8	-7.8	0.30	11.1	-24.2	-49.9
-9.0	0.13	24.7	0.30	33.7	-8.3	0.31	13.3	-23.2	-48.7
-8.0	0.16	25.6	0.36	33.6	-9.0	0.33	15.5	-22.4	-47.4
-7.0	0.20	26.5	0.45	33.5	-9.7	0.34	18.1	-21.5	-46.2
-6.0	0.25	27.4	0.54	33.4	-10.5	0.36	20.8	-20.8	-45.1
-5.0	0.32	28.2	0.66	33.2	-11.0	0.39	23.9	-20.2	-44.2
-4.0	0.40	29.0	0.80	33.0	-11.4	0.41	26.9	-19.7	-43.2
-3.0	0.50	29.8	0.96	32.9	-12.0	0.44	30.3	-19.2	-42.2
-2.0	0.63	30.6	1.16	32.6	-12.4	0.48	33.8	-18.9	-40.8
-1.0	0.79	31.3	1.35	32.3	-12.7	0.51	37.0	-18.6	-39.4
0.0	1.00	31.9	1.56	31.9	-11.0	0.54	40.3	-18.2	-37.5
1.0	1.25	32.5	1.76	31.5	-10.9	0.57	43.3	-17.7	-35.7
2.0	1.58	32.9	1.97	30.9	-10.8	0.59	46.1	-17.1	-34.0
3.0	1.99	33.3	2.15	30.3	-10.6	0.62	48.7	-16.4	-32.7
4.0	2.51	33.7	2.34	29.7	-10.7	0.63	51.3	-15.8	-31.6
5.0	3.15	34.0	2.50	29.0	-10.7	0.65	53.4	-15.3	-30.8
6.0	3.96	34.2	2.63	28.2	-10.5	0.67	55.1	-14.9	-30.2
7.0	4.99	34.4	2.75	27.4	-10.3	0.68	56.4	-14.6	-29.8
8.0	6.32	34.6	2.85	26.5	-10.2	0.69	57.2	-14.4	-29.5
9.0	7.90	34.7	2.93	25.7	-10.2	0.70	58.0	-14.3	-29.3
10.0	9.92	34.8	3.00	24.8	-10.0	0.72	58.4	-14.1	-29.2

Remarks: "-" is out of range.

Pout vs. Pin characteristics

@ f=155MHz, Vdd=7.2V, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)

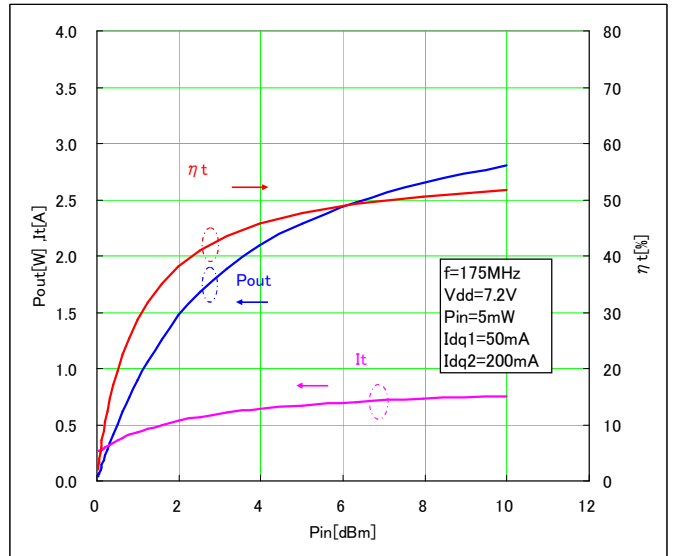
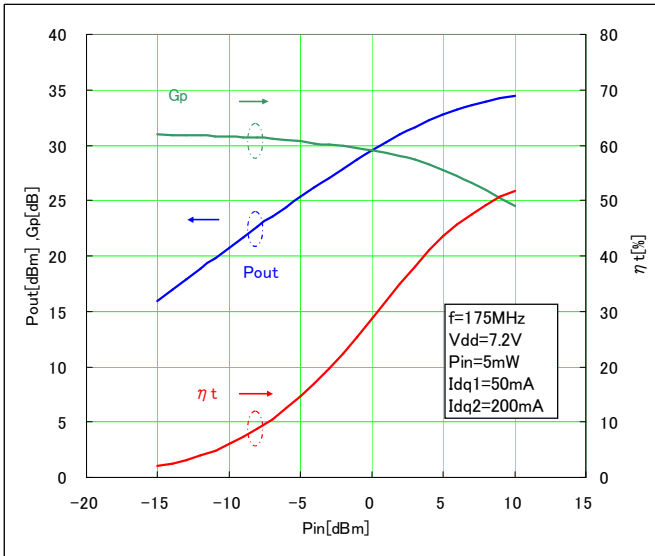


Pin		Pout		Gp	R..Loss	It	η t	2fo	3fo
[dBm]	[W]	[dBm]	[W]	[dB]	[dB]	[A]	[%]	[dBc]	[dBc]
-15.0	0.03	17.3	0.05	32.3	-4.2	0.27	2.8	-35.3	-
-14.0	0.04	18.2	0.07	32.3	-4.0	0.27	3.5	-34.2	-
-13.0	0.05	19.2	0.08	32.2	-4.6	0.27	4.3	-33.4	-
-12.0	0.06	20.2	0.10	32.2	-5.6	0.28	5.3	-32.3	-
-11.0	0.08	21.1	0.13	32.1	-6.2	0.28	6.4	-31.3	-
-10.0	0.10	22.1	0.16	32.1	-6.7	0.29	7.8	-30.3	-
-9.0	0.13	23.0	0.20	32.0	-7.4	0.30	9.4	-29.4	-
-8.0	0.16	23.9	0.25	31.9	-8.0	0.31	11.2	-28.4	-50.4
-7.0	0.20	24.8	0.30	31.8	-8.6	0.32	13.2	-27.5	-49.0
-6.0	0.25	25.7	0.37	31.7	-9.1	0.34	15.3	-26.7	-47.3
-5.0	0.32	26.6	0.45	31.6	-9.5	0.35	17.9	-25.9	-45.8
-4.0	0.40	27.4	0.55	31.4	-9.9	0.38	20.5	-25.2	-44.6
-3.0	0.50	28.3	0.67	31.3	-10.1	0.40	23.4	-24.7	-43.6
-2.0	0.63	29.1	0.82	31.1	-8.5	0.43	26.7	-24.2	-42.4
-1.0	0.79	29.9	0.99	31.0	-8.5	0.46	29.8	-23.9	-41.4
0.0	1.00	30.7	1.18	30.7	-8.6	0.50	33.2	-23.6	-40.5
1.0	1.25	31.5	1.40	30.5	-8.8	0.53	36.6	-23.5	-39.6
2.0	1.58	32.2	1.64	30.2	-8.8	0.57	40.1	-23.4	-38.7
3.0	1.99	32.8	1.89	29.8	-8.7	0.61	43.3	-23.2	-37.9
4.0	2.50	33.3	2.14	29.3	-8.7	0.64	46.2	-23.1	-37.4
5.0	3.15	33.8	2.38	28.8	-8.9	0.68	48.7	-23.1	-36.8
6.0	3.98	34.1	2.59	28.1	-8.8	0.71	50.8	-23.1	-36.5
7.0	4.99	34.4	2.77	27.4	-8.8	0.74	52.4	-23.1	-36.3
8.0	6.29	34.7	2.94	26.7	-8.7	0.76	53.8	-23.1	-36.1
9.0	7.95	34.9	3.10	25.9	-8.7	0.79	54.8	-23.1	-35.9
10.0	9.98	35.1	3.23	25.1	-8.6	0.81	55.5	-23.1	-35.9

Remarks: “-“ is out of range.

Pout vs. Pin characteristics

@ f=175MHz, Vdd=7.2V, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)

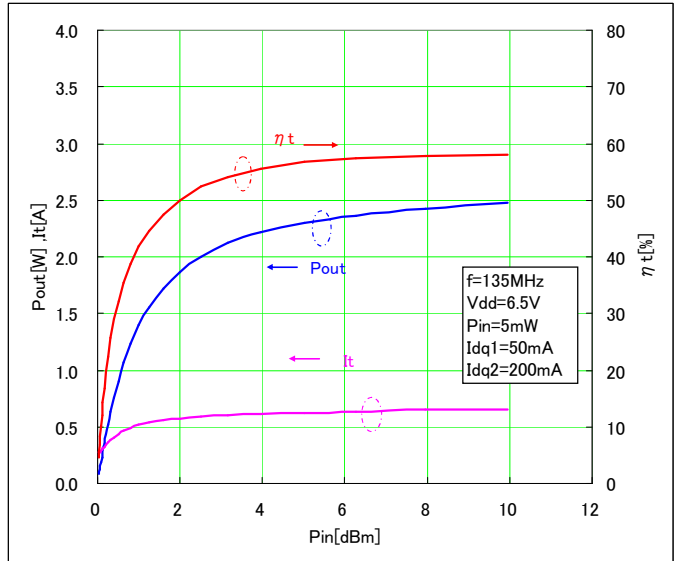
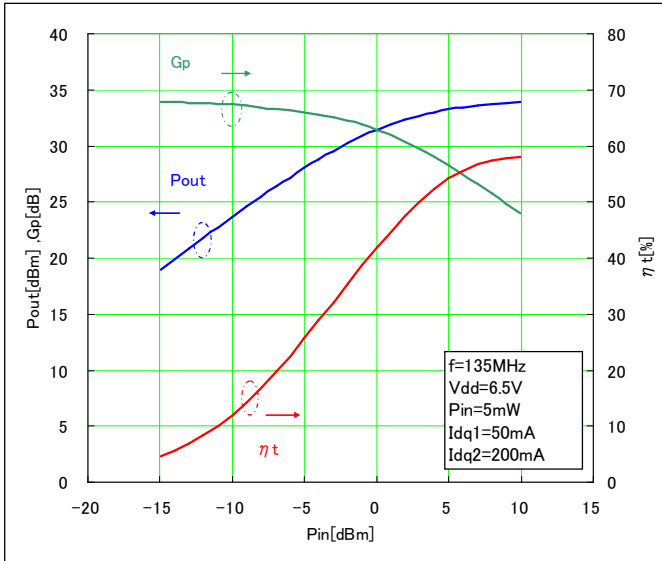


Pin		Pout		Gp	R..Loss	It	η t	2fo	3fo
[dBm]	[W]	[dBm]	[W]						
-15.0	0.03	16.0	0.04	31.0	-4.3	0.26	2.1	-40.3	-
-14.0	0.04	16.9	0.05	30.9	-4.5	0.26	2.6	-39.6	-
-13.0	0.05	17.9	0.06	30.9	-4.8	0.27	3.2	-38.6	-
-12.0	0.06	18.9	0.08	30.9	-5.5	0.27	4.0	-37.6	-
-11.0	0.08	19.8	0.10	30.8	-6.3	0.27	4.9	-36.6	-
-10.0	0.10	20.8	0.12	30.8	-7.0	0.28	6.0	-35.6	-
-9.0	0.13	21.7	0.15	30.7	-7.6	0.28	7.3	-34.6	-
-8.0	0.16	22.6	0.18	30.6	-8.2	0.29	8.8	-33.6	-
-7.0	0.20	23.6	0.23	30.6	-8.8	0.30	10.6	-32.6	-
-6.0	0.25	24.4	0.28	30.4	-9.2	0.31	12.5	-31.6	-51.1
-5.0	0.32	25.3	0.34	30.3	-9.5	0.32	14.6	-30.6	-49.8
-4.0	0.40	26.2	0.42	30.2	-9.7	0.34	17.0	-29.8	-48.2
-3.0	0.50	27.0	0.51	30.1	-10.0	0.36	19.6	-29.0	-46.8
-2.0	0.63	27.9	0.61	29.9	-8.5	0.38	22.5	-28.3	-45.5
-1.0	0.79	28.7	0.74	29.7	-8.2	0.41	25.4	-27.8	-44.6
0.0	1.00	29.5	0.90	29.5	-8.5	0.44	28.6	-27.4	-43.6
1.0	1.25	30.3	1.06	29.3	-8.6	0.47	31.8	-27.2	-42.9
2.0	1.58	31.0	1.26	29.0	-8.5	0.50	35.0	-27.0	-42.1
3.0	1.99	31.7	1.47	28.7	-8.6	0.54	38.2	-27.0	-41.4
4.0	2.51	32.3	1.68	28.3	-8.6	0.57	41.0	-27.1	-40.7
5.0	3.16	32.8	1.89	27.8	-8.6	0.61	43.5	-27.2	-40.0
6.0	3.97	33.2	2.09	27.2	-8.6	0.64	45.7	-27.4	-39.4
7.0	5.00	33.6	2.28	26.6	-8.6	0.67	47.5	-27.5	-38.9
8.0	6.31	33.9	2.47	25.9	-8.6	0.70	49.3	-27.7	-38.5
9.0	7.97	34.2	2.65	25.2	-8.5	0.73	50.6	-27.9	-38.2
10.0	9.99	34.5	2.81	24.5	-8.5	0.76	51.7	-28.0	-37.9

Remarks: "-" is out of range.

Pout vs. Pin characteristics

@ f=135MHz, Vdd=6.5V, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)

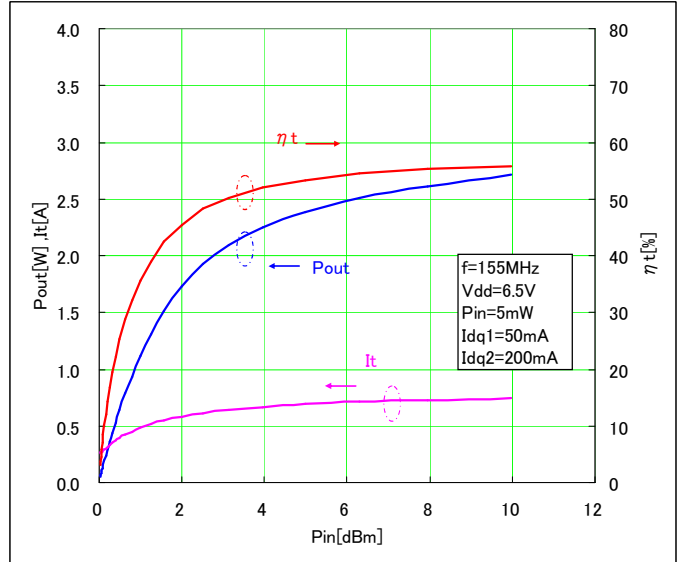
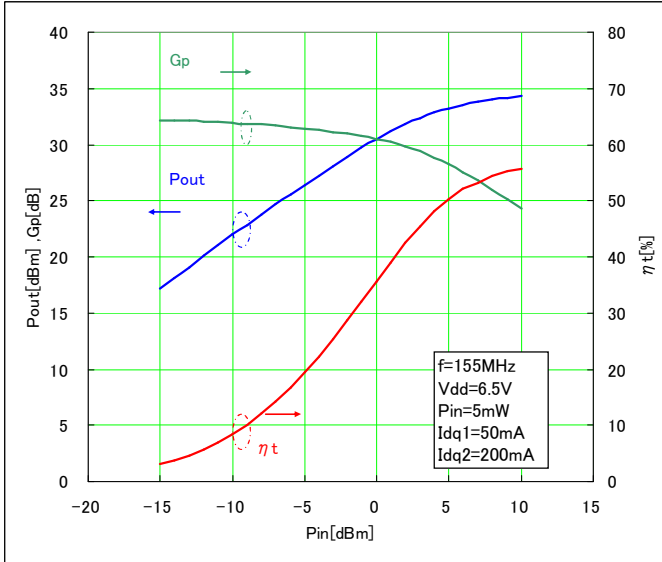


Pin		Pout		Gp	R.Loss	It	η t	2fo	3fo
[dBm]	[W]	[dBm]	[W]	[dB]	[dB]	[A]	[%]	[dBc]	[dBc]
-15.0	0.03	19.0	0.08	33.9	-4.7	0.27	4.6	-29.1	-
-14.0	0.04	19.9	0.10	33.9	-4.9	0.27	5.6	-28.2	-
-13.0	0.05	20.9	0.12	33.9	-5.7	0.28	6.9	-27.3	-
-12.0	0.06	21.8	0.15	33.8	-6.4	0.28	8.4	-26.2	-
-11.0	0.08	22.8	0.19	33.7	-7.3	0.29	10.1	-25.3	-
-10.0	0.10	23.7	0.23	33.7	-8.0	0.30	12.0	-24.3	-49.8
-9.0	0.13	24.6	0.29	33.6	-8.7	0.31	14.3	-23.4	-48.2
-8.0	0.16	25.5	0.35	33.4	-9.3	0.32	16.7	-22.6	-46.8
-7.0	0.20	26.3	0.43	33.3	-10.0	0.34	19.6	-21.8	-45.6
-6.0	0.25	27.2	0.52	33.2	-10.6	0.36	22.4	-21.1	-44.1
-5.0	0.32	28.0	0.63	33.0	-11.1	0.38	25.7	-20.4	-43.1
-4.0	0.40	28.8	0.76	32.8	-11.6	0.41	28.9	-19.9	-41.9
-3.0	0.50	29.6	0.90	32.6	-12.1	0.43	32.1	-19.5	-40.8
-2.0	0.63	30.3	1.07	32.3	-12.5	0.46	35.5	-19.1	-39.3
-1.0	0.79	30.9	1.23	31.9	-10.2	0.49	38.7	-18.6	-37.5
0.0	1.00	31.5	1.40	31.5	-10.7	0.52	41.8	-18.0	-35.8
1.0	1.25	31.9	1.56	30.9	-10.8	0.54	44.6	-17.4	-34.2
2.0	1.59	32.4	1.72	30.3	-10.8	0.56	47.4	-16.6	-32.8
3.0	1.98	32.7	1.86	29.7	-10.8	0.58	50.0	-16.0	-31.7
4.0	2.52	33.0	2.01	29.0	-10.7	0.59	52.4	-15.4	-30.7
5.0	3.16	33.3	2.12	28.3	-10.5	0.60	54.2	-15.0	-30.2
6.0	3.96	33.5	2.22	27.5	-10.4	0.62	55.5	-14.7	-29.8
7.0	5.02	33.6	2.30	26.6	-10.4	0.63	56.7	-14.5	-29.5
8.0	6.27	33.7	2.37	25.8	-10.2	0.64	57.4	-14.3	-29.3
9.0	7.95	33.9	2.43	24.8	-10.1	0.65	57.7	-14.1	-29.1
10.0	9.94	33.9	2.48	24.0	-10.0	0.66	58.1	-14.1	-29.0

Remarks: "-" is out of range.

Pout vs. Pin characteristics

@ f=155MHz, Vdd=6.5V, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)

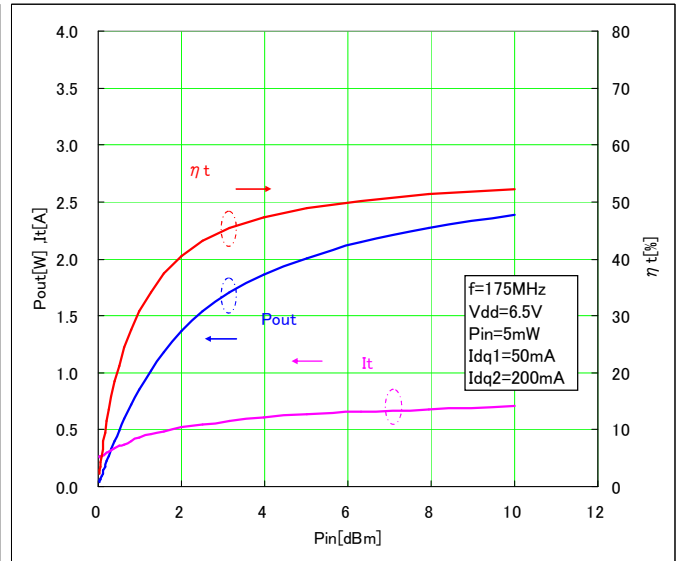
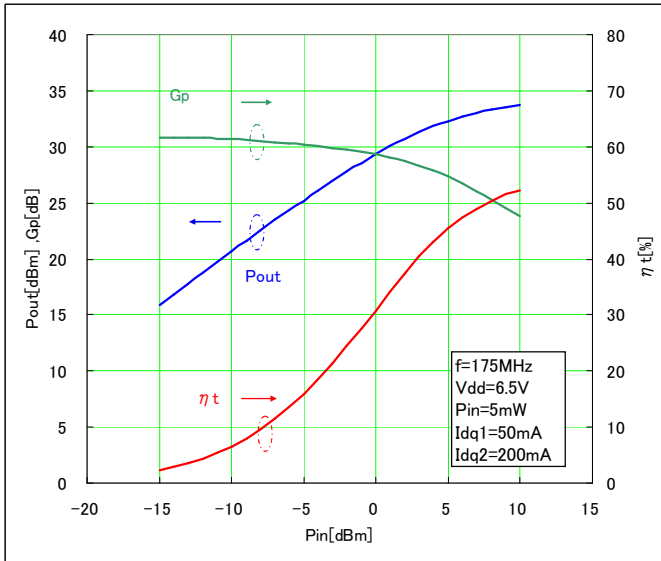


Pin		Pout		Gp	R..Loss	It	η t	2fo	3fo
[dBm]	[W]	[dBm]	[W]						
-15.0	0.03	17.2	0.05	32.2	-4.0	0.26	3.1	-35.3	-
-14.0	0.04	18.1	0.06	32.1	-4.3	0.27	3.8	-34.5	-
-13.0	0.05	19.1	0.08	32.1	-4.7	0.27	4.7	-33.3	-
-12.0	0.06	20.1	0.10	32.1	-5.4	0.27	5.7	-32.5	-
-11.0	0.08	21.0	0.13	32.0	-6.2	0.28	7.0	-31.4	-
-10.0	0.10	22.0	0.16	32.0	-6.8	0.29	8.5	-30.4	-
-9.0	0.13	22.9	0.19	31.9	-7.4	0.29	10.2	-29.5	-
-8.0	0.16	23.8	0.24	31.8	-8.1	0.30	12.1	-28.5	-50.2
-7.0	0.20	24.7	0.29	31.7	-8.6	0.32	14.3	-27.7	-48.6
-6.0	0.25	25.6	0.36	31.6	-9.0	0.33	16.8	-26.7	-46.9
-5.0	0.31	26.4	0.44	31.4	-9.5	0.35	19.4	-26.0	-45.4
-4.0	0.39	27.3	0.53	31.3	-9.8	0.37	22.1	-25.3	-44.3
-3.0	0.50	28.1	0.65	31.1	-8.6	0.39	25.3	-24.8	-42.9
-2.0	0.63	28.9	0.78	31.0	-8.5	0.42	28.7	-24.3	-41.9
-1.0	0.79	29.7	0.94	30.7	-8.8	0.45	32.1	-24.0	-40.9
0.0	0.99	30.5	1.12	30.5	-8.7	0.48	35.6	-23.7	-39.9
1.0	1.25	31.2	1.31	30.2	-8.8	0.52	38.9	-23.5	-39.1
2.0	1.57	31.8	1.52	29.8	-8.8	0.55	42.5	-23.4	-38.3
3.0	1.99	32.4	1.73	29.4	-8.8	0.59	45.5	-23.2	-37.6
4.0	2.51	32.8	1.92	28.8	-8.9	0.62	48.2	-23.1	-37.1
5.0	3.14	33.2	2.09	28.2	-8.7	0.64	50.2	-23.1	-36.7
6.0	3.97	33.5	2.25	27.5	-8.8	0.67	52.1	-23.1	-36.5
7.0	5.00	33.8	2.39	26.8	-8.7	0.69	53.3	-23.1	-36.3
8.0	6.30	34.0	2.51	26.0	-8.7	0.71	54.4	-23.1	-36.0
9.0	7.96	34.2	2.62	25.2	-8.7	0.73	55.2	-23.1	-36.0
10.0	9.99	34.3	2.71	24.3	-8.6	0.75	55.8	-23.2	-35.9

Remarks: "-" is out of range.

Pout vs. Pin characteristics

@ f=175MHz, Vdd=6.5V, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)

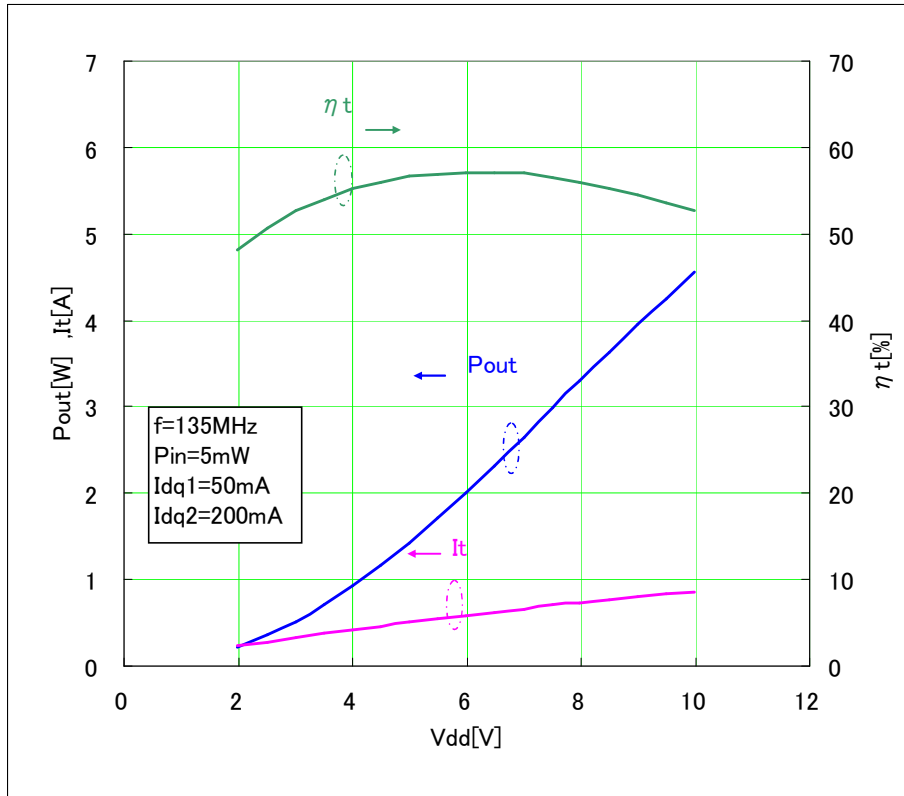


Pin		Pout		Gp	R..Loss	It	η t	2fo	3fo
[dBm]	[W]	[dBm]	[W]						
-15.0	0.03	15.9	0.04	30.8	-3.9	0.26	2.3	-40.5	-
-14.0	0.04	16.8	0.05	30.8	-4.1	0.26	2.8	-39.5	-
-13.0	0.05	17.8	0.06	30.8	-4.6	0.26	3.5	-38.6	-
-12.0	0.06	18.8	0.08	30.8	-5.3	0.27	4.3	-37.9	-
-11.0	0.08	19.7	0.09	30.7	-5.9	0.27	5.4	-36.7	-
-10.0	0.10	20.7	0.12	30.7	-6.8	0.28	6.5	-35.7	-
-9.0	0.13	21.6	0.15	30.6	-7.4	0.28	8.0	-34.7	-
-8.0	0.16	22.5	0.18	30.5	-8.0	0.29	9.6	-33.6	-
-7.0	0.20	23.4	0.22	30.4	-8.7	0.30	11.4	-32.6	-
-6.0	0.25	24.3	0.27	30.3	-9.2	0.31	13.6	-31.6	-51.4
-5.0	0.32	25.2	0.33	30.2	-9.5	0.32	15.9	-30.7	-49.3
-4.0	0.40	26.1	0.40	30.1	-9.8	0.34	18.6	-29.8	-48.0
-3.0	0.50	26.9	0.49	29.9	-10.0	0.36	21.2	-29.0	-46.5
-2.0	0.63	27.7	0.59	29.7	-8.1	0.38	24.4	-28.3	-45.2
-1.0	0.79	28.6	0.72	29.6	-8.5	0.40	27.6	-27.8	-44.2
0.0	1.00	29.3	0.85	29.3	-8.5	0.43	30.8	-27.5	-43.3
1.0	1.26	30.1	1.01	29.1	-8.6	0.46	34.1	-27.2	-42.4
2.0	1.58	30.7	1.18	28.8	-8.6	0.49	37.4	-27.1	-41.6
3.0	2.00	31.4	1.36	28.4	-8.7	0.52	40.4	-27.1	-40.9
4.0	2.51	31.9	1.54	27.9	-8.7	0.55	43.1	-27.1	-40.2
5.0	3.17	32.3	1.70	27.3	-8.7	0.58	45.4	-27.3	-39.6
6.0	3.97	32.7	1.86	26.7	-8.6	0.61	47.4	-27.4	-39.1
7.0	5.00	33.0	2.01	26.0	-8.6	0.63	48.9	-27.5	-38.6
8.0	6.31	33.3	2.15	25.3	-8.6	0.66	50.3	-27.7	-38.3
9.0	7.93	33.6	2.27	24.6	-8.5	0.68	51.5	-27.8	-38.0
10.0	10.00	33.8	2.39	23.8	-8.5	0.71	52.3	-27.9	-37.7

Remarks: "-" is out of range.

Pout vs. Vdd characteristics

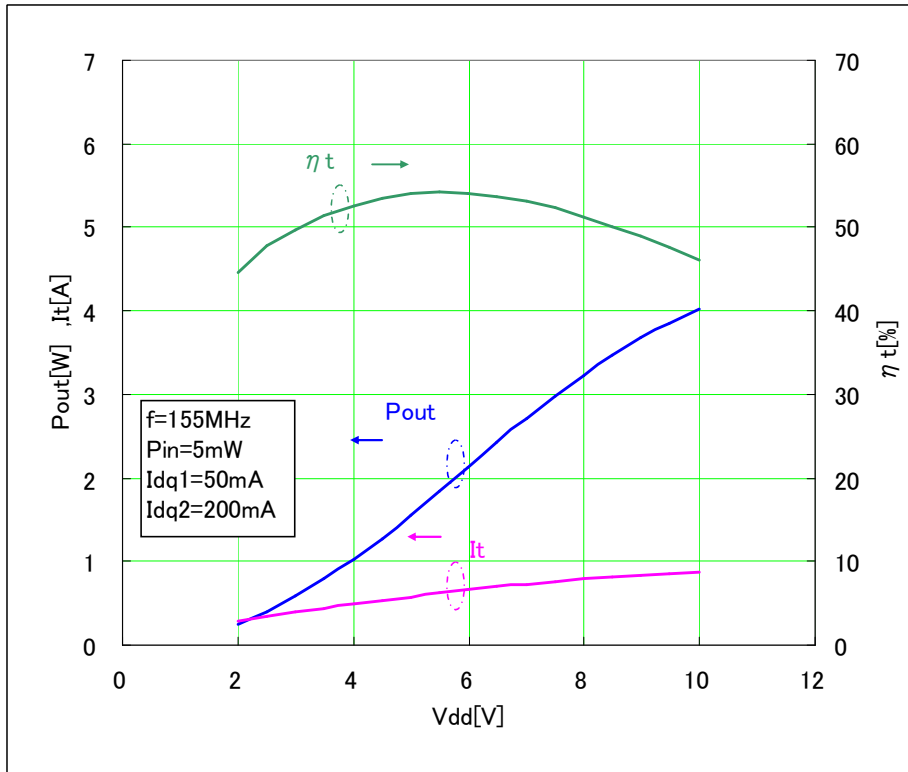
@ f=135MHz, Pin=5mW, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)



Vdd [V]	Pout		Gp [dB]	R..Loss [.dB]	It [A]	η t [%]	2fo [dBc]	3fo [dBc]
	[dBm]	[W]						
2.0	23.4	0.2	16.43	-12.1	0.23	48.1	-14.1	-27.3
2.5	25.5	0.4	18.49	-11.5	0.28	50.7	-14.0	-27.8
3.0	27.1	0.5	20.12	-10.9	0.33	52.6	-13.9	-28.0
3.5	28.5	0.7	21.47	-10.6	0.38	54.0	-13.9	-28.3
4.0	29.7	0.9	22.66	-10.4	0.42	55.2	-14.0	-28.4
4.5	30.7	1.2	23.67	-10.3	0.46	56.0	-14.0	-28.6
5.0	31.5	1.4	24.53	-10.3	0.51	56.6	-14.1	-28.8
5.5	32.3	1.7	25.35	-10.3	0.55	56.9	-14.2	-29.0
6.0	33.0	2.0	26.04	-10.3	0.59	57.1	-14.2	-29.2
6.5	33.7	2.3	26.65	-10.3	0.63	57.0	-14.4	-29.4
7.0	34.2	2.7	27.24	-10.3	0.67	57.0	-14.5	-29.6
7.5	34.7	3.0	27.73	-10.4	0.70	56.6	-14.6	-29.8
8.0	35.2	3.3	28.20	-10.4	0.74	56.0	-14.8	-30.1
8.5	35.6	3.6	28.61	-10.4	0.77	55.3	-15.0	-30.4
9.0	36.0	3.9	28.97	-10.4	0.81	54.5	-15.2	-30.7
9.5	36.3	4.2	29.29	-10.3	0.84	53.6	-15.4	-31.1
10.0	36.6	4.6	29.57	-10.4	0.87	52.7	-15.7	-31.5

Pout vs. Vdd characteristics

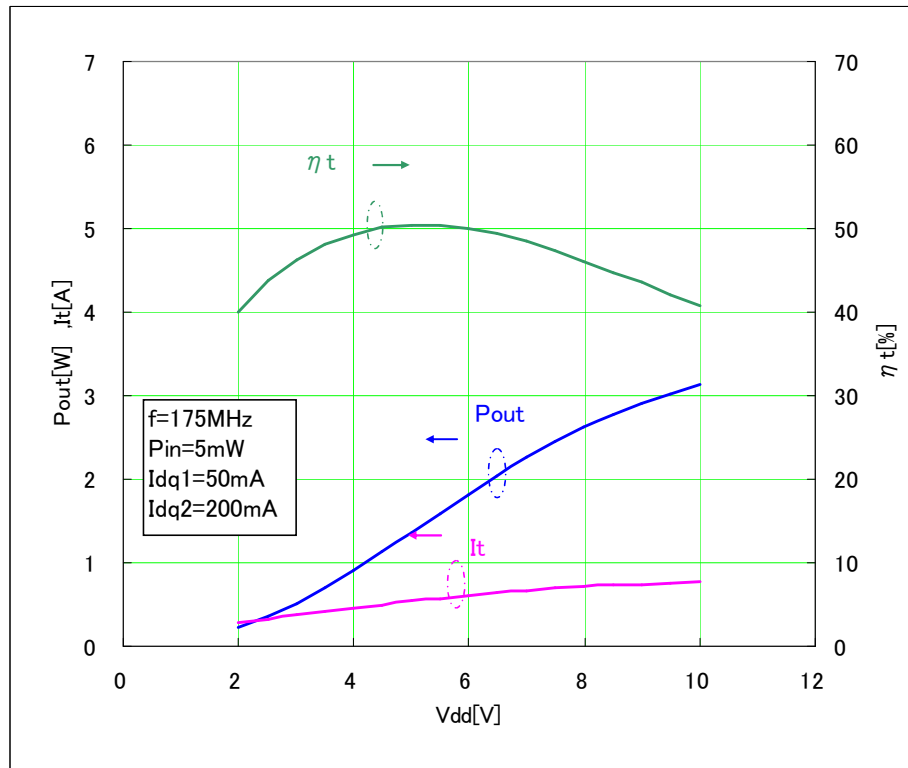
@ f=155MHz, Pin=5mW, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)



Vdd [V]	Pout		Gp [dB]	R..Loss [dB]	It [A]	η t [%]	2fo [dBc]	3fo [dBc]
	[dBm]	[W]						
2.0	24.0	0.3	17.03	-9.4	0.28	44.5	-25.6	-35.8
2.5	26.1	0.4	19.07	-9.0	0.34	47.8	-24.9	-35.8
3.0	27.6	0.6	20.66	-8.9	0.39	49.7	-24.4	-35.8
3.5	29.0	0.8	21.98	-8.8	0.44	51.5	-24.0	-35.9
4.0	30.1	1.0	23.10	-8.7	0.49	52.5	-23.7	-35.9
4.5	31.1	1.3	24.07	-8.7	0.53	53.4	-23.5	-36.0
5.0	31.9	1.5	24.92	-8.7	0.58	54.0	-23.3	-36.1
5.5	32.7	1.8	25.65	-8.7	0.62	54.2	-23.2	-36.2
6.0	33.3	2.1	26.28	-8.7	0.66	54.0	-23.1	-36.2
6.5	33.8	2.4	26.84	-8.7	0.70	53.7	-23.1	-36.2
7.0	34.3	2.7	27.34	-8.7	0.73	53.2	-23.1	-36.2
7.5	34.7	3.0	27.74	-8.7	0.76	52.4	-23.1	-36.2
8.0	35.1	3.2	28.11	-8.7	0.79	51.3	-23.1	-36.2
8.5	35.4	3.5	28.41	-8.7	0.81	50.1	-23.2	-36.2
9.0	35.7	3.7	28.65	-8.7	0.84	49.0	-23.3	-36.1
9.5	35.9	3.9	28.88	-8.7	0.86	47.6	-23.4	-36.1
10.0	36.0	4.0	29.07	-8.7	0.87	46.1	-23.5	-36.1

Pout vs. Vdd characteristics

@ f=175MHz, Pin=5mW, Idq1=50mA(Vgg1 adj.), Idq2=200mA(Vgg2 adj.)



Vdd [V]	Pout		Gp [dB]	R..Loss [dB]	It [A]	η t [%]	2fo [dBc]	3fo [dBc]
	[dBm]	[W]						
2.0	23.5	0.2	16.49	-9.0	0.28	40.1	-31.4	-37.6
2.5	25.5	0.4	18.52	-8.8	0.33	43.7	-29.7	-37.6
3.0	27.1	0.5	20.11	-8.7	0.37	46.2	-28.8	-37.6
3.5	28.4	0.7	21.43	-8.7	0.41	48.2	-28.2	-37.7
4.0	29.6	0.9	22.56	-8.6	0.46	49.3	-27.9	-37.8
4.5	30.5	1.1	23.50	-8.6	0.50	50.2	-27.8	-37.9
5.0	31.3	1.4	24.32	-8.6	0.54	50.5	-27.7	-38.1
5.5	32.0	1.6	25.04	-8.6	0.58	50.4	-27.7	-38.2
6.0	32.6	1.8	25.62	-8.6	0.61	50.0	-27.6	-38.5
6.5	33.1	2.0	26.11	-8.6	0.64	49.4	-27.6	-38.6
7.0	33.5	2.3	26.53	-8.5	0.67	48.5	-27.6	-38.9
7.5	33.9	2.4	26.89	-8.5	0.69	47.3	-27.6	-39.1
8.0	34.2	2.6	27.18	-8.5	0.71	46.1	-27.6	-39.2
8.5	34.4	2.8	27.42	-8.5	0.73	44.8	-27.6	-39.5
9.0	34.6	2.9	27.64	-8.5	0.74	43.5	-27.6	-39.6
9.5	34.8	3.0	27.81	-8.5	0.76	42.1	-27.6	-39.8
10.0	35.0	3.1	27.96	-8.5	0.77	40.8	-27.6	-40.0

Equivalent Circuit (parts list)

Parts Type	Symbol	Value	Type name	Vender
Capasitor	C1	100pF	GRM1882C1H101JA01D	Murata Manufacturing Co.,Ltd.
	C2	5pF	GRM1882C1H5R0CZ01D	Murata Manufacturing Co.,Ltd.
	C3	9pF	GRM1882C1H470JA01D	Murata Manufacturing Co.,Ltd.
	C4	47pF	GRM1882C1H120JA01D	Murata Manufacturing Co.,Ltd.
	C5	160pF	GRM1882C1H180JA01D	Murata Manufacturing Co.,Ltd.
	C6	33pF	GRM1882C1H101JA01D	Murata Manufacturing Co.,Ltd.
	C7	22pF	GRM1882C1H390JA01D	Murata Manufacturing Co.,Ltd.
	C8	47pF	GRM1882C1H300JA01D	Murata Manufacturing Co.,Ltd.
	C9	30pF	GRM1882C1H150JA01D	Murata Manufacturing Co.,Ltd.
	C10	30pF	GRM1882C1H5R0CZ01D	Murata Manufacturing Co.,Ltd.
	C11	100pF	GRM1882C1H9R0DZ01D	Murata Manufacturing Co.,Ltd.
	C12	1nF	GRM188R11H102KA01D	Murata Manufacturing Co.,Ltd.
	C13	1nF	GRM188R11H102KA01D	Murata Manufacturing Co.,Ltd.
	C14	22nF	GRM188R11H223KA01D	Murata Manufacturing Co.,Ltd.
	C15	22uF	UVZ1H220MDD	NICHICON COPORATION
	C16	1nF	GRM188R11H102KA01D	Murata Manufacturing Co.,Ltd.
	C17	1nF	GRM188R11H102KA01D	Murata Manufacturing Co.,Ltd.
	C18	22nF	GRM188R11H223KA01D	Murata Manufacturing Co.,Ltd.
	C19	22uF	UVZ1H220MDD	NICHICON COPORATION
Resistance	R1	390 Ω	RPC10-391J	TAIYOSHA ELECTRIC CO.,Ltd.
	R2	1 Ω	RPC05-1R0J	TAIYOSHA ELECTRIC CO.,Ltd.
	R3	100 Ω	RPC05-101J	TAIYOSHA ELECTRIC CO.,Ltd.
	R4	30K Ω	RPC10-303J	TAIYOSHA ELECTRIC CO.,Ltd.
	R5	10K Ω	RPC05-103J	TAIYOSHA ELECTRIC CO.,Ltd.
	R6	0 Ω	RPC05-0R0	TAIYOSHA ELECTRIC CO.,Ltd.
	R7	100 Ω	RPC05-101J	TAIYOSHA ELECTRIC CO.,Ltd.
	R8	39K Ω	RPC05-393J	TAIYOSHA ELECTRIC CO.,Ltd.
	R9	10K Ω	RPC05-103J	TAIYOSHA ELECTRIC CO.,Ltd.
Inductance	L1	68nH	LLQ1608-A68N	TOKO Co.,Ltd.
	L2	34.5nH Enameled wire 5Turns, Diameter:0.40mm, φ 2.46mm(the out side diameter)	4005A	yc corporation
	L3	34.5nH Enameled wire 5Turns, Diameter:0.40mm, φ 2.46mm(the out side diameter)	4005A	yc corporation
	L4	34.5nH Enameled wire 5Turns, Diameter:0.40mm, φ 2.46mm(the out side diameter)	4005A	yc corporation
	L5	26.3nH Enameled wire 4Turns, Diameter:0.40mm, φ 2.46mm(the out side diameter)	4004C	yc corporation