

# APPLICATION NOTE

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(Taking charge of Silicon RF by  
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**SUBJECT:** RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

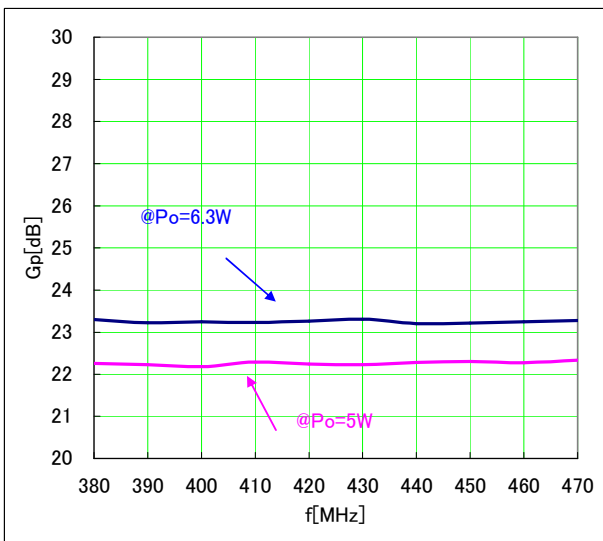
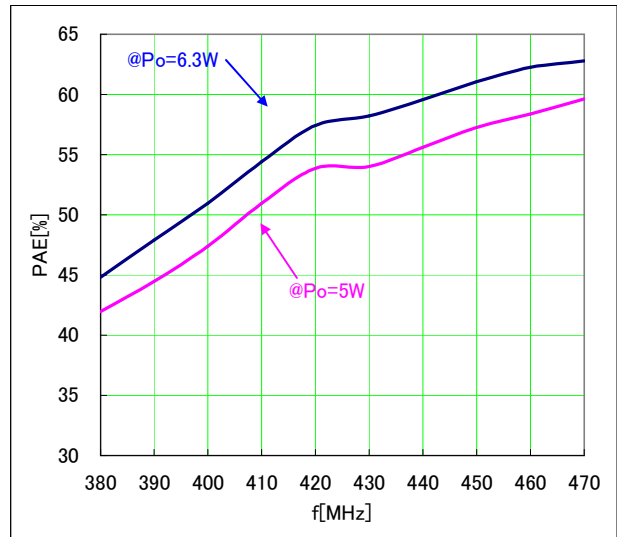
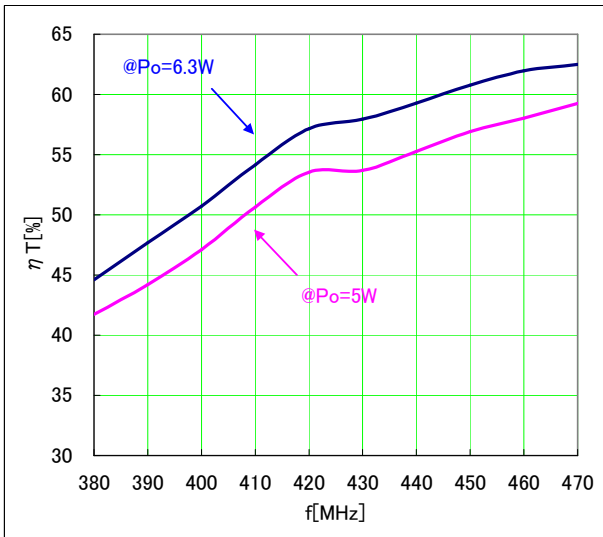
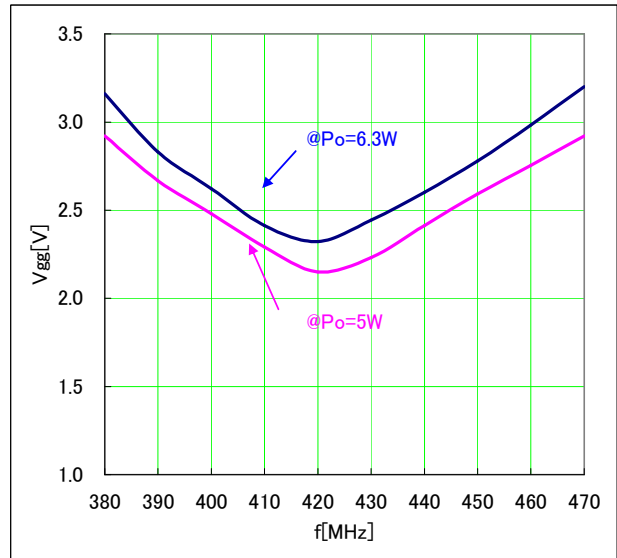
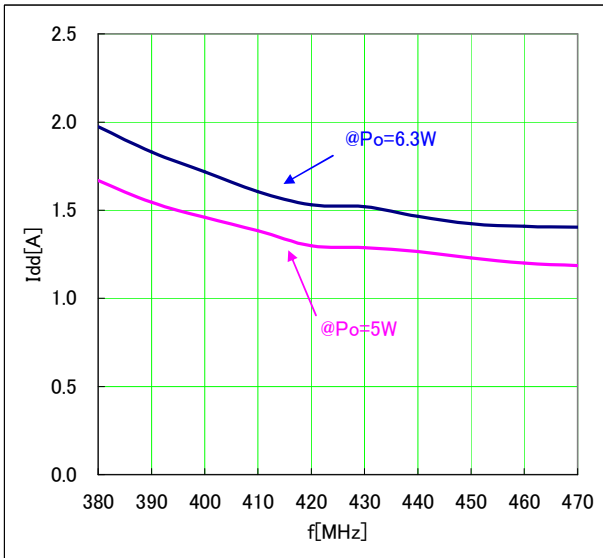
## SUMMARY:

This application note shows the RF wide band characteristics data  
(Frequency, Pout vs. Pin, Pout vs. Vgg characteristics) at 380 to 470 MHz band.

- Sample history :
  - RD01MUS2 : Lot number "571"
  - RD07MUS2B : Lot number "105AB-G"
  
- Evaluate conditions :
  - @f=380 to 470MHz : Vdd=7.2V, Vgg=3.5V
  
- Results :
  - Page 2-5. shows the typical Frequency characteristics data.
  - Page 6-12. shows the typical Pout vs. Pin characteristics data.
  - Page 13-15. shows the typical Pout vs. Vgg characteristics data.
  - Page 16-18. shows the typical Pout vs. Vdd characteristics data.
  - Page 19-20. shows the equivalent circuit.

### Frequency characteristics 1

@ **V<sub>gg</sub> Control** (@P<sub>o</sub>=6.3W, 5W), V<sub>dd</sub>=7.2V, P<sub>i</sub>=30mW (=14.77dBm)



## Frequency characteristics 1 data

**@ Po=6.3W**, Vdd=7.2V, Pi=30mW (=14.77dBm)

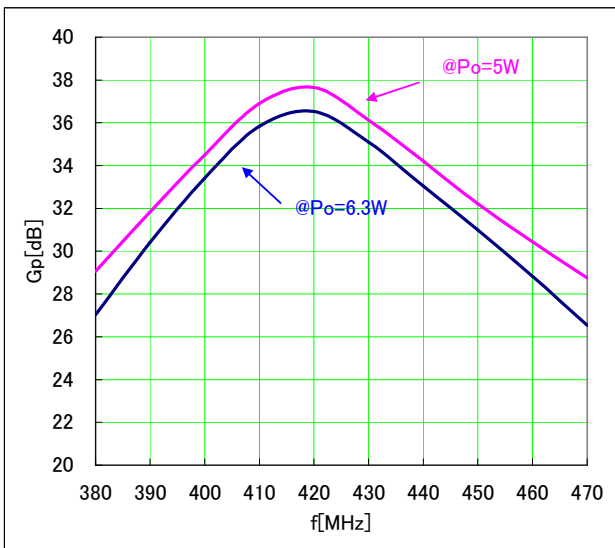
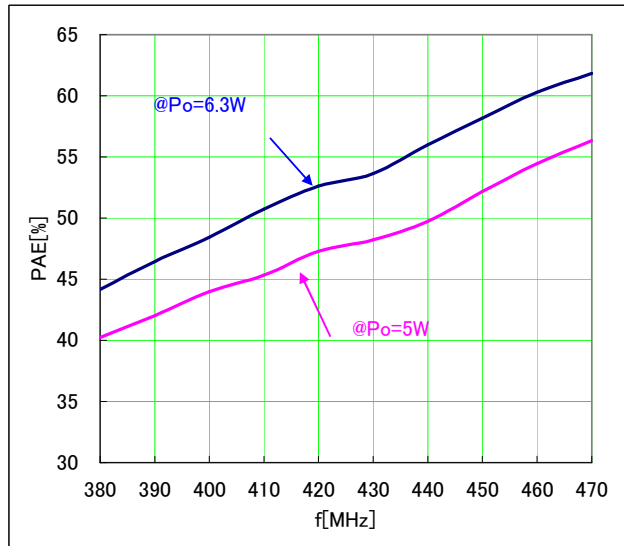
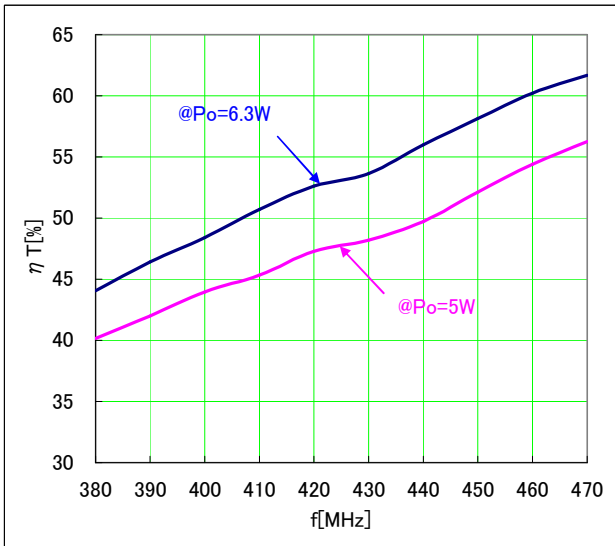
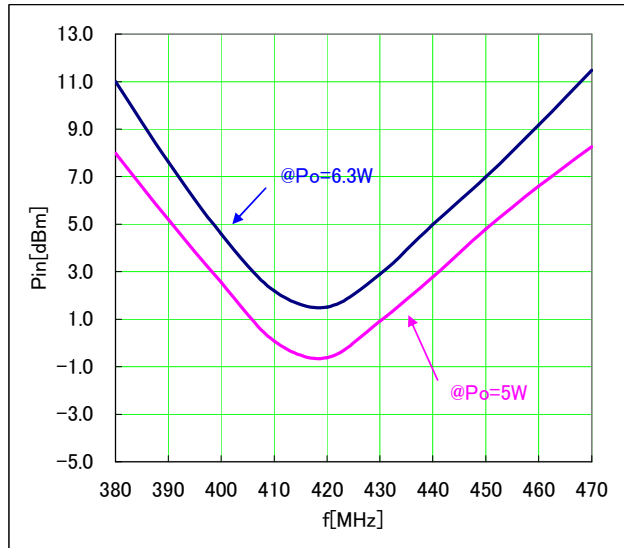
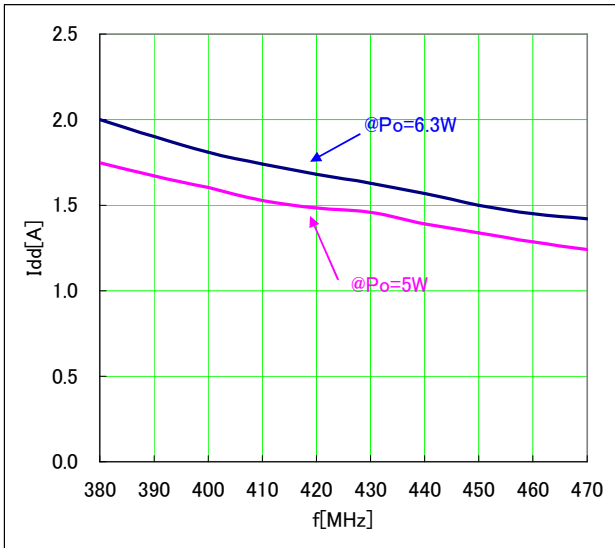
f [MHz]	Vgg [V]	Gp [dB]	Idd [A]	$\eta_T$ [%]	P.A.E. [%]	2fo [dBc]	3fo [dBc]	R.L. [dB]
380	3.16	23.3	1.97	44.8	44.6	-26.3	-56.5	-3.0
390	2.83	23.2	1.83	47.9	47.7	-25.7	-59.0	-3.4
400	2.62	23.2	1.72	51.0	50.7	-24.8	-59.0	-4.0
410	2.41	23.2	1.61	54.4	54.2	-23.0	-58.3	-5.1
420	2.32	23.3	1.53	57.4	57.2	-21.5	-61.0	-7.0
430	2.44	23.3	1.52	58.2	58.0	-24.2	-61.5	-8.6
440	2.60	23.2	1.47	59.6	59.3	-29.7	-58.3	-8.1
450	2.78	23.2	1.42	61.1	60.8	-35.3	-58.2	-7.8
460	2.98	23.2	1.41	62.3	62.0	-39.3	-56.8	-8.0
470	3.20	23.3	1.40	62.8	62.5	-42.8	-58.2	-8.3

**@ Po=5W**, Vdd=7.2V, Pi=30mW (=14.77dBm)

f [MHz]	Vgg [V]	Gp [dB]	Idd [A]	$\eta_T$ [%]	P.A.E. [%]	2fo [dBc]	3fo [dBc]	R.L. [dB]
380	2.92	22.3	1.67	42.0	41.7	-21.3	-38.7	-3.1
390	2.67	22.2	1.55	44.5	44.2	-21.0	-54.3	-3.4
400	2.48	22.2	1.46	47.4	47.1	-20.5	-53.7	-4.0
410	2.29	22.3	1.38	51.0	50.7	-19.8	-55.7	-4.8
420	2.15	22.2	1.30	53.9	53.5	-17.8	-57.2	-6.2
430	2.23	22.2	1.29	54.0	53.7	-20.7	-57.2	-7.9
440	2.41	22.3	1.27	55.6	55.3	-27.0	-58.3	-7.7
450	2.59	22.3	1.23	57.3	56.9	-32.7	-53.7	-7.5
460	2.75	22.3	1.20	58.4	58.0	-37.5	-55.5	-7.7
470	2.92	22.3	1.19	59.6	59.3	-41.7	-52.7	-8.1

### Frequency characteristics 2

@ **Pin Control** (@Po=6.3W, 5W), Vdd=7.2V, Vgg=3.5V (Idq=404mA)



## Frequency characteristics 2 data

**@ Po=6.3W**, Vdd=7.2V, Vgg=3.5V (Idq=490mA)

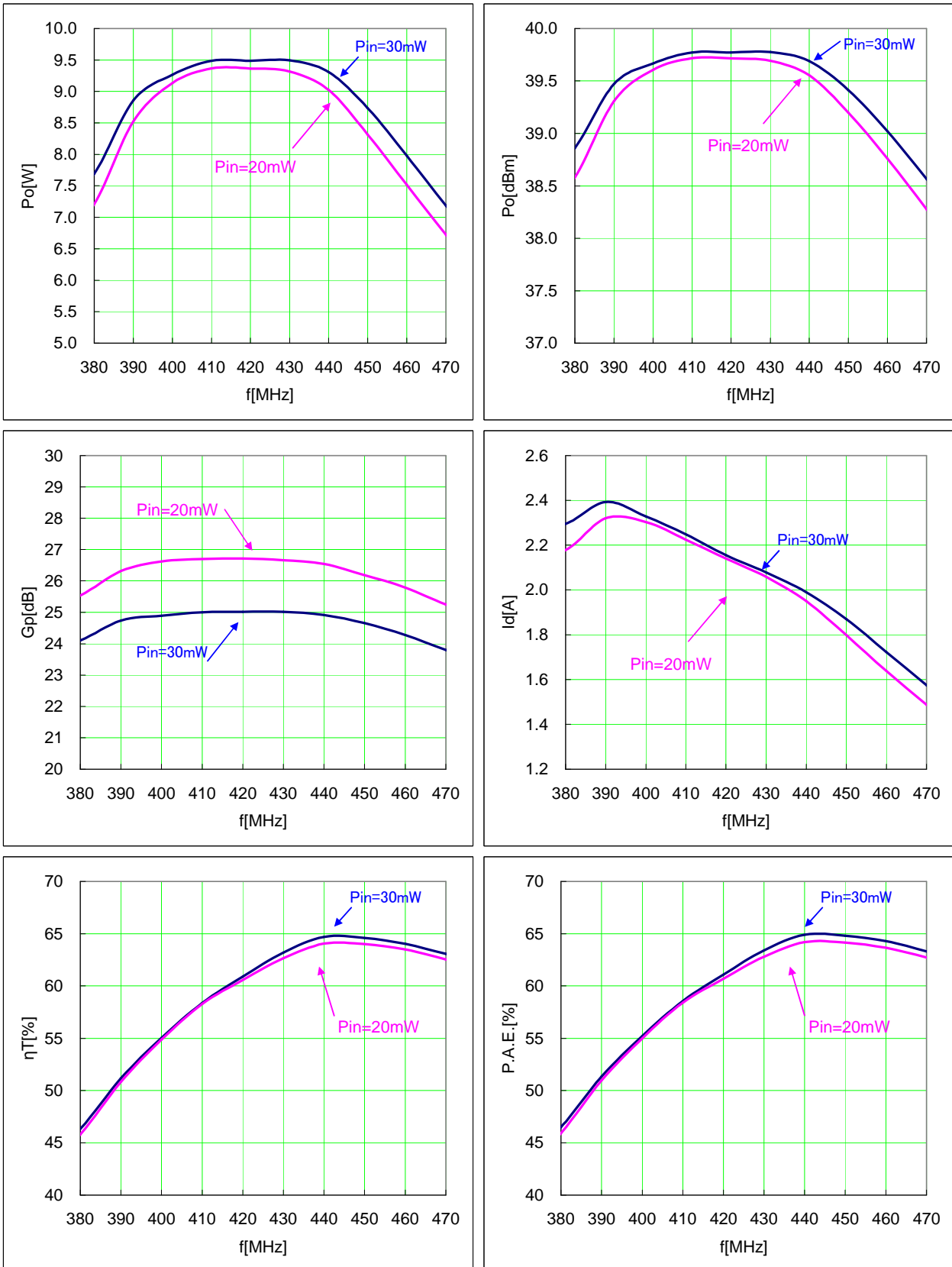
f [MHz]	Pin [dBm]	Pin [W]	Gp [dB]	I <sub>dd</sub> [A]	$\eta_T$ [%]	P.A.E. [%]	2fo [dBc]	3fo [dBc]	R.L. [dB]
380	11.01	0.013	27.0	2.00	44.2	44.1	-29.0	-54.7	-3.3
390	7.62	0.006	30.4	1.90	46.4	46.4	-30.8	-53.2	-3.8
400	4.59	0.003	33.4	1.81	48.4	48.4	-30.3	-53.7	-4.9
410	2.20	0.002	35.8	1.74	50.7	50.7	-29.2	-52.5	-7.7
420	1.52	0.001	36.5	1.68	52.6	52.6	-27.2	-51.5	-14.9
430	2.89	0.002	35.1	1.63	53.6	53.6	-28.0	-54.0	-15.0
440	4.98	0.003	33.0	1.57	56.0	56.0	-33.0	-54.5	-10.7
450	6.99	0.005	31.0	1.50	58.2	58.1	-37.3	-52.5	-9.1
460	9.17	0.008	28.8	1.45	60.3	60.2	-40.3	-51.5	-8.7
470	11.47	0.014	26.5	1.42	61.8	61.7	-43.3	-54.0	-8.6

**@ Po=5W**, Vdd=7.2V, Vgg=3.5V (Idq=490mA)

f [MHz]	Pin [dBm]	Pin [W]	Gp [dB]	I <sub>dd</sub> [A]	$\eta_T$ [%]	P.A.E. [%]	2fo [dBc]	3fo [dBc]	R.L. [dB]
380	7.99	0.006	29.1	1.75	40.2	40.2	-25.5	-52.3	-3.3
390	5.20	0.003	31.8	1.67	42.0	42.0	-26.7	-53.0	-3.9
400	2.56	0.002	34.5	1.60	44.0	43.9	-26.5	-51.7	-4.8
410	0.08	0.001	36.9	1.53	45.3	45.3	-25.5	-51.7	-7.6
420	-0.61	0.001	37.6	1.48	47.3	47.3	-24.2	-48.7	-14.7
430	0.92	0.001	36.1	1.46	48.2	48.2	-26.2	-48.7	-14.8
440	2.77	0.002	34.2	1.39	49.7	49.7	-31.5	-51.7	-10.6
450	4.80	0.003	32.2	1.34	52.2	52.1	-36.7	-50.3	-9.1
460	6.60	0.005	30.4	1.29	54.4	54.4	-40.5	-47.7	-8.7
470	8.26	0.007	28.8	1.24	56.3	56.2	-44.2	-50.3	-8.7

### Frequency characteristics 3

@ **Pin Control** (@Pi=30mW, 20mW), Vdd=7.2V, Vgg=3.5V (Idq=490mA)



## Frequency characteristics 3 data

**@ Pi=30mW**, Vdd=7.2V, Vgg=3.5V (Idq=490mA)

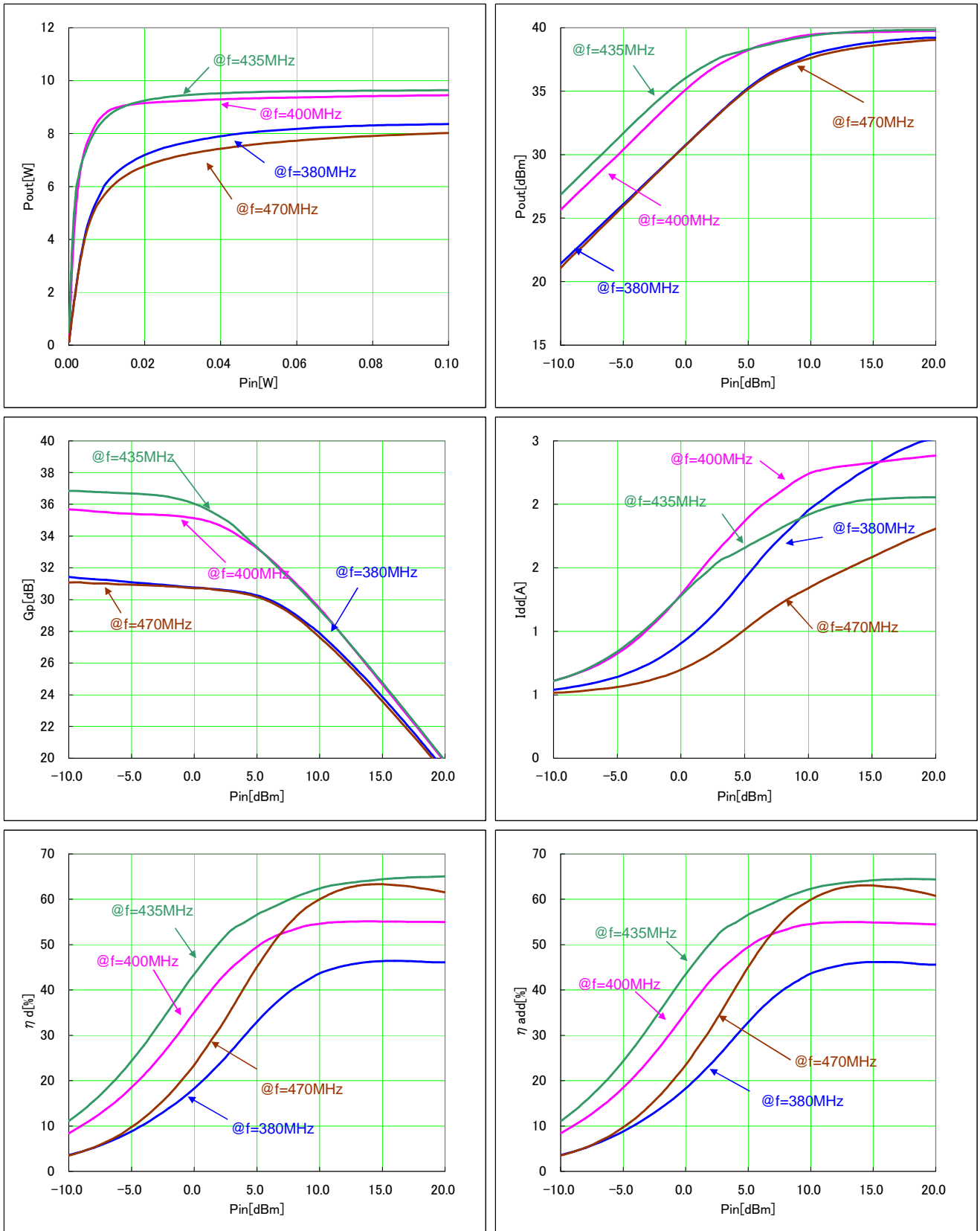
f [MHz]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta$ d [%]	P.A.E. [%]	2fo [dBc]	3fo [dBc]	R.L. [-dB]
370	38.49	7.1	23.7	2.28	43.0	42.8	-27.0	-58.0	-3.0
380	38.86	7.7	24.1	2.30	46.5	46.3	-32.7	-58.8	-3.0
390	39.47	8.9	24.7	2.39	51.3	51.2	-37.3	-60.5	-3.6
400	39.67	9.3	24.9	2.33	55.2	55.0	-39.2	-60.5	-5.9
410	39.77	9.5	25.0	2.25	58.6	58.4	-33.3	-58.0	-8.8
420	39.77	9.5	25.0	2.16	61.1	60.9	-28.0	-61.7	-12.7
430	39.77	9.5	25.0	2.08	63.4	63.2	-27.5	-61.7	-14.0
440	39.69	9.3	24.9	1.99	64.9	64.7	-31.5	-63.3	-10.7
450	39.41	8.7	24.7	1.87	64.8	64.6	-35.5	-61.3	-8.9
460	39.02	8.0	24.3	1.72	64.3	64.0	-38.8	-59.8	-8.5
470	38.57	7.2	23.8	1.58	63.3	63.1	-42.0	-56.0	-8.6
480	38.09	6.4	23.3	1.44	62.3	62.0	-44.8	-55.8	-8.8

**@ Pi=20mW**, Vdd=7.2V, Vgg=3.5V (Idq=490mA)

f [MHz]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta$ d [%]	P.A.E. [%]	2fo [dBc]	3fo [dBc]	R.L. [-dB]
370	38.14	6.5	25.1	2.15	42.1	41.9	-27.2	-55.8	-3.0
380	38.58	7.2	25.5	2.18	45.9	45.8	-31.0	-57.3	-3.1
390	39.31	8.5	26.3	2.32	51.0	50.8	-38.3	-60.7	-3.5
400	39.61	9.1	26.6	2.30	55.0	54.9	-40.0	-62.0	-5.6
410	39.72	9.4	26.7	2.23	58.4	58.3	-33.8	-62.0	-9.3
420	39.72	9.4	26.7	2.14	60.7	60.6	-28.2	-60.7	-14.8
430	39.69	9.3	26.7	2.06	62.8	62.7	-27.5	-60.7	-14.2
440	39.55	9.0	26.5	1.95	64.2	64.1	-31.7	-60.7	-10.3
450	39.20	8.3	26.2	1.80	64.2	64.0	-35.8	-59.5	-8.9
460	38.76	7.5	25.8	1.64	63.7	63.5	-39.2	-58.8	-8.6
470	38.28	6.7	25.2	1.49	62.7	62.5	-42.2	-56.7	-8.6
480	37.78	6.0	24.8	1.35	61.6	61.4	-45.8	-56.7	-8.8

**Pout vs. Pin characteristics**

@ Vdd=7.2V, Vgg=3.5V (Idq=490mA), **f=380MHz**, **f=400MHz**, **435MHz**, **470MHz**





**Pout vs. Pin characteristics data**@ [f=380MHz](#), Vgg=3.5V (Idq=490mA)

Vdd [V]	Pin [dBm]	Pin [W]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta$ d [%]	P.A.E. [%]	R.L. [-dB]
7.20	-10.07	0.00	21.35	0.14	31.43	0.54	3.5	3.5	-3.0
7.20	-8.99	0.00	22.35	0.17	31.34	0.55	4.3	4.3	-3.0
7.20	-7.98	0.00	23.31	0.21	31.29	0.57	5.2	5.2	-3.1
7.20	-7.01	0.00	24.22	0.26	31.24	0.59	6.2	6.2	-3.5
7.20	-6.00	0.00	25.17	0.33	31.17	0.61	7.4	7.4	-3.2
7.20	-5.01	0.00	26.08	0.41	31.09	0.64	8.8	8.8	-3.4
7.20	-3.99	0.00	27.04	0.51	31.03	0.68	10.4	10.3	-3.4
7.20	-3.01	0.00	27.96	0.62	30.96	0.72	12.0	12.0	-3.3
7.20	-2.01	0.00	28.88	0.77	30.89	0.77	13.9	13.9	-3.3
7.20	-1.00	0.00	29.82	0.96	30.82	0.83	16.0	16.0	-3.4
7.20	-0.01	0.00	30.75	1.19	30.76	0.90	18.3	18.2	-3.4
7.20	1.01	0.00	31.71	1.48	30.70	0.99	20.9	20.9	-3.3
7.20	2.00	0.00	32.63	1.83	30.63	1.08	23.7	23.6	-3.4
7.20	2.96	0.00	33.52	2.25	30.55	1.18	26.6	26.5	-3.3
7.21	4.02	0.00	34.46	2.79	30.44	1.30	29.9	29.9	-3.4
7.21	4.99	0.00	35.26	3.36	30.27	1.42	32.9	32.9	-3.3
7.21	5.99	0.00	35.98	3.96	29.99	1.54	35.8	35.8	-3.3
7.21	6.99	0.01	36.59	4.56	29.60	1.65	38.3	38.3	-3.4
7.21	8.01	0.01	37.09	5.12	29.08	1.76	40.5	40.4	-3.4
7.21	9.04	0.01	37.51	5.64	28.48	1.86	42.2	42.1	-3.4
7.21	9.94	0.01	37.87	6.12	27.93	1.95	43.6	43.5	-3.3
7.21	11.03	0.01	38.15	6.53	27.12	2.03	44.6	44.5	-3.3
7.21	12.01	0.02	38.37	6.87	26.36	2.10	45.4	45.2	-3.2
7.21	12.96	0.02	38.56	7.17	25.60	2.17	45.9	45.7	-3.1
7.21	13.99	0.03	38.73	7.46	24.74	2.24	46.2	46.1	-3.1
7.21	15.02	0.03	38.86	7.69	23.84	2.30	46.4	46.2	-3.1
7.21	15.98	0.04	38.97	7.89	22.99	2.36	46.4	46.2	-3.1
7.21	16.98	0.05	39.07	8.07	22.09	2.41	46.4	46.1	-3.1
7.21	18.08	0.06	39.15	8.21	21.06	2.46	46.3	45.9	-3.1
7.21	18.98	0.08	39.19	8.30	20.21	2.50	46.1	45.7	-3.2
7.21	20.02	0.10	39.22	8.36	19.20	2.52	46.1	45.6	-3.3

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

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@ **f=400MHz**, Vgg=3.5V (Idq=490mA)

Vdd [V]	Pin [dBm]	Pin [W]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta$ d [%]	P.A.E. [%]	R.L. [-dB]
7.20	-9.99	0.00	25.69	0.37	35.67	0.61	8.4	8.4	-3.9
7.20	-9.03	0.00	26.61	0.46	35.64	0.64	10.0	10.0	-6.3
7.20	-8.02	0.00	27.54	0.57	35.57	0.67	11.7	11.7	-4.0
7.20	-7.03	0.00	28.48	0.70	35.51	0.71	13.7	13.7	-3.9
7.20	-6.03	0.00	29.41	0.87	35.44	0.76	15.9	15.9	-4.2
7.20	-5.02	0.00	30.38	1.09	35.40	0.82	18.4	18.4	-4.4
7.20	-4.03	0.00	31.34	1.36	35.37	0.89	21.2	21.2	-4.3
7.20	-3.06	0.00	32.29	1.69	35.35	0.97	24.2	24.2	-4.4
7.20	-1.98	0.00	33.33	2.15	35.31	1.08	27.8	27.8	-4.5
7.20	-1.04	0.00	34.19	2.63	35.23	1.17	31.2	31.2	-4.5
7.21	0.00	0.00	35.12	3.25	35.12	1.29	35.0	35.0	-4.6
7.21	0.96	0.00	35.93	3.91	34.96	1.41	38.5	38.5	-4.7
7.21	2.02	0.00	36.70	4.67	34.68	1.54	42.2	42.2	-4.8
7.21	3.01	0.00	37.29	5.36	34.28	1.65	45.0	45.0	-4.8
7.21	4.01	0.00	37.78	6.00	33.77	1.76	47.4	47.4	-5.0
7.21	4.99	0.00	38.24	6.66	33.25	1.87	49.5	49.5	-5.2
7.21	6.00	0.00	38.61	7.25	32.61	1.96	51.3	51.2	-5.1
7.21	6.98	0.00	38.87	7.71	31.89	2.04	52.5	52.4	-5.1
7.21	8.02	0.01	39.10	8.13	31.08	2.11	53.4	53.3	-5.0
7.21	8.98	0.01	39.31	8.52	30.32	2.18	54.2	54.1	-4.9
7.21	10.19	0.01	39.47	8.86	29.28	2.25	54.7	54.6	-5.1
7.21	10.94	0.01	39.53	8.98	28.59	2.27	54.9	54.8	-5.1
7.21	11.97	0.02	39.58	9.08	27.61	2.29	55.0	54.9	-5.4
7.21	12.95	0.02	39.61	9.15	26.66	2.30	55.1	55.0	-5.6
7.21	13.95	0.02	39.64	9.20	25.69	2.32	55.1	55.0	-5.8
7.21	15.00	0.03	39.66	9.24	24.66	2.33	55.1	54.9	-5.9
7.21	16.00	0.04	39.68	9.29	23.68	2.34	55.1	54.8	-6.0
7.21	17.01	0.05	39.70	9.34	22.69	2.35	55.0	54.7	-5.9
7.21	18.02	0.06	39.72	9.37	21.70	2.36	55.0	54.7	-5.9
7.21	19.01	0.08	39.74	9.42	20.73	2.38	55.0	54.6	-5.9
7.21	20.00	0.10	39.75	9.45	19.76	2.38	55.0	54.4	-5.8

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

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@ **f=435MHz**, Vgg=3.5V (Idq=490mA)

Vdd [V]	Pin [dBm]	Pin [W]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
7.20	-9.98	0.00	26.88	0.49	36.85	0.61	11.1	11.1	-14.9
7.20	-8.99	0.00	27.84	0.61	36.83	0.64	13.2	13.2	-13.5
7.20	-8.04	0.00	28.75	0.75	36.79	0.68	15.4	15.4	-13.5
7.20	-6.99	0.00	29.76	0.95	36.75	0.72	18.2	18.2	-13.5
7.20	-5.99	0.00	30.73	1.18	36.72	0.78	21.1	21.1	-13.8
7.20	-5.01	0.00	31.68	1.47	36.69	0.84	24.3	24.3	-14.6
7.20	-4.03	0.00	32.61	1.83	36.64	0.91	27.8	27.8	-14.6
7.20	-3.00	0.00	33.58	2.28	36.58	1.00	31.7	31.7	-14.7
7.20	-2.03	0.00	34.43	2.78	36.47	1.09	35.5	35.5	-14.8
7.20	-1.03	0.00	35.26	3.36	36.30	1.18	39.5	39.5	-12.7
7.21	-0.01	0.00	36.03	4.01	36.04	1.28	43.5	43.5	-12.6
7.21	1.00	0.00	36.70	4.68	35.70	1.38	47.1	47.1	-12.4
7.21	2.00	0.00	37.25	5.31	35.26	1.46	50.4	50.4	-12.5
7.21	3.01	0.00	37.76	5.97	34.74	1.55	53.3	53.3	-12.3
7.21	4.02	0.00	38.02	6.34	34.00	1.60	54.9	54.9	-12.3
7.21	5.05	0.00	38.32	6.79	33.26	1.66	56.7	56.7	-12.2
7.21	6.00	0.00	38.54	7.15	32.55	1.71	57.9	57.9	-11.9
7.21	7.01	0.01	38.77	7.53	31.76	1.77	59.2	59.2	-11.7
7.21	8.00	0.01	38.99	7.93	30.99	1.82	60.5	60.4	-11.5
7.21	9.02	0.01	39.19	8.30	30.17	1.87	61.5	61.5	-11.3
7.21	10.02	0.01	39.36	8.63	29.34	1.92	62.4	62.3	-11.3
7.21	10.95	0.01	39.49	8.88	28.53	1.96	63.1	63.0	-11.3
7.21	12.02	0.02	39.59	9.10	27.57	1.99	63.5	63.4	-11.4
7.21	13.05	0.02	39.66	9.25	26.61	2.01	63.9	63.7	-11.7
7.21	14.01	0.03	39.72	9.37	25.70	2.03	64.1	63.9	-12.1
7.21	15.00	0.03	39.76	9.46	24.76	2.04	64.4	64.2	-12.5
7.21	16.00	0.04	39.79	9.53	23.79	2.05	64.6	64.4	-12.6
7.21	17.03	0.05	39.81	9.57	22.78	2.05	64.8	64.4	-12.4
7.21	18.00	0.06	39.82	9.60	21.82	2.05	64.9	64.5	-12.0
7.21	19.00	0.08	39.83	9.62	20.83	2.06	65.0	64.4	-11.5
7.21	19.99	0.10	39.84	9.64	19.85	2.06	65.1	64.4	-11.0

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

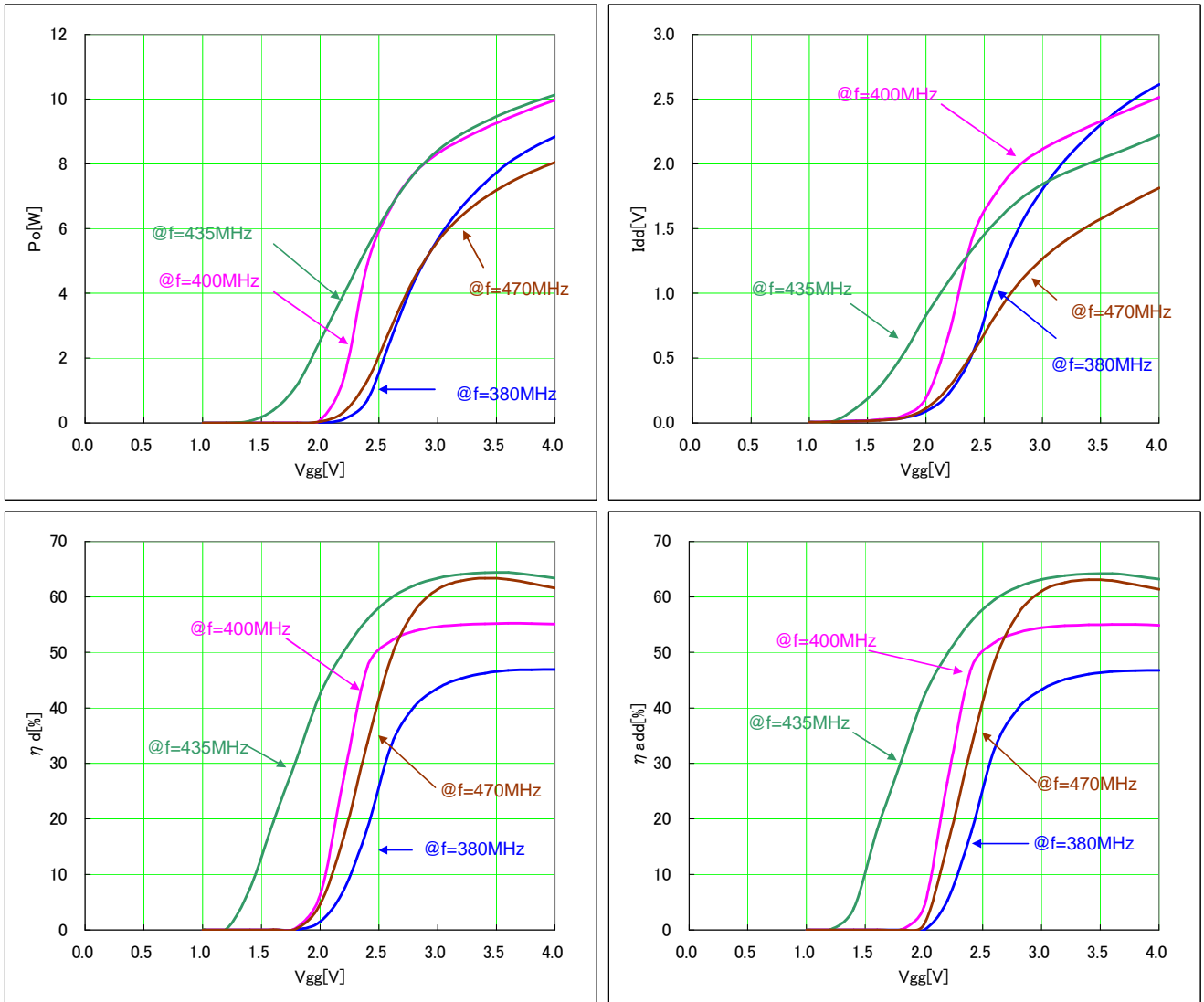
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@ **f=470MHz**, Vgg=3.5V (Idq=404mA)

Vdd [V]	Pin [dBm]	Pin [W]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
7.20	-10.01	0.00	21.06	0.13	31.07	0.52	3.4	3.4	-13.9
7.20	-9.05	0.00	22.04	0.16	31.08	0.52	4.3	4.3	-10.9
7.20	-8.00	0.00	23.01	0.20	31.01	0.53	5.3	5.3	-10.2
7.20	-7.01	0.00	24.00	0.25	31.01	0.54	6.5	6.5	-10.5
7.20	-6.02	0.00	24.94	0.31	30.96	0.55	7.9	7.9	-10.5
7.20	-5.02	0.00	25.92	0.39	30.94	0.56	9.7	9.7	-8.8
7.20	-4.01	0.00	26.89	0.49	30.91	0.58	11.7	11.7	-9.3
7.20	-3.03	0.00	27.84	0.61	30.87	0.60	14.1	14.1	-8.5
7.20	-1.96	0.00	28.87	0.77	30.83	0.63	17.0	17.0	-8.6
7.20	-0.98	0.00	29.79	0.95	30.78	0.66	20.1	20.1	-8.9
7.20	0.04	0.00	30.75	1.19	30.72	0.70	23.6	23.6	-8.7
7.20	0.94	0.00	31.64	1.46	30.69	0.74	27.2	27.2	-8.8
7.20	2.04	0.00	32.62	1.83	30.58	0.80	31.6	31.6	-8.7
7.20	2.99	0.00	33.49	2.23	30.50	0.86	35.9	35.9	-8.8
7.20	4.00	0.00	34.37	2.73	30.37	0.94	40.6	40.5	-8.8
7.20	4.98	0.00	35.15	3.27	30.17	1.01	44.9	44.9	-8.7
7.20	6.01	0.00	35.87	3.87	29.86	1.09	49.2	49.2	-8.7
7.20	6.97	0.00	36.44	4.41	29.47	1.16	52.7	52.7	-8.7
7.21	7.94	0.01	36.92	4.91	28.98	1.23	55.7	55.6	-8.7
7.21	8.92	0.01	37.30	5.37	28.38	1.28	58.1	58.0	-8.7
7.21	10.02	0.01	37.63	5.80	27.61	1.34	60.0	59.9	-8.7
7.21	10.98	0.01	37.90	6.16	26.92	1.39	61.4	61.2	-8.6
7.21	11.99	0.02	38.12	6.49	26.13	1.44	62.4	62.2	-8.6
7.21	12.94	0.02	38.29	6.75	25.36	1.49	63.0	62.8	-8.6
7.21	13.99	0.03	38.46	7.01	24.47	1.54	63.3	63.1	-8.6
7.21	15.01	0.03	38.59	7.23	23.58	1.59	63.3	63.0	-8.6
7.21	16.02	0.04	38.71	7.43	22.69	1.63	63.1	62.8	-8.5
7.21	17.00	0.05	38.81	7.61	21.81	1.68	62.9	62.5	-8.5
7.21	18.01	0.06	38.90	7.77	20.90	1.73	62.5	62.0	-8.5
7.21	19.00	0.08	38.98	7.91	19.98	1.77	62.1	61.4	-8.5
7.21	19.99	0.10	39.04	8.02	19.05	1.81	61.5	60.8	-8.6

### Pout vs. Vgg characteristics

@ Vdd=7.2V, Pi=30mW (=14.77dBm), [f=380MHz](#), [f=400MHz](#), [435MHz](#), [470MHz](#)



**Pout vs. Vgg characteristics data**@ **f=380MHz**, Vdd=7.2V, Pi=30mW (=14.77dBm)

Vgg [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.00	0.000	-36.49	0.00	-51.28	0.01	0.0	0.0	-3.3
1.20	0.000	-33.45	0.00	-48.34	0.01	0.0	0.0	-3.3
1.40	0.000	-29.93	0.00	-44.70	0.02	0.0	0.0	-3.2
1.60	0.000	-23.88	0.00	-38.64	0.02	0.0	0.0	-3.2
1.80	0.000	-8.43	0.00	-23.20	0.04	0.1	0.0	-3.2
2.00	0.000	9.97	0.01	-4.82	0.09	1.5	0.0	-3.2
2.20	0.003	20.75	0.12	6.00	0.23	7.2	5.4	-3.1
2.40	0.003	28.55	0.72	13.78	0.54	18.4	17.6	-3.1
2.60	0.010	34.11	2.58	19.36	1.08	33.0	32.7	-3.0
2.80	0.033	36.39	4.35	21.60	1.51	40.2	39.9	-3.0
3.00	0.088	37.53	5.67	22.78	1.81	43.6	43.3	-2.9
3.20	0.198	38.22	6.64	23.46	2.04	45.3	45.1	-2.9
3.40	0.383	38.70	7.41	23.98	2.22	46.3	46.1	-2.9
3.60	0.648	39.04	8.02	24.22	2.38	46.7	46.6	-2.9
3.80	0.990	39.28	8.47	24.49	2.51	46.9	46.7	-3.0
4.00	1.393	39.46	8.84	24.70	2.61	46.9	46.8	-3.1

@ **f=400MHz**, Vdd=7.2V, Pi=30mW (=14.77dBm)

Vgg [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.00	0.003	-36.21	0.00	-50.98	0.01	0.0	0.0	-3.9
1.20	0.000	-28.92	0.00	-43.69	0.01	0.0	0.0	-3.8
1.40	0.000	-22.80	0.00	-37.58	0.02	0.0	0.0	-3.8
1.60	0.000	-18.59	0.00	-33.36	0.03	0.0	0.0	-3.7
1.80	0.000	2.56	0.00	-12.19	0.06	0.5	0.0	-3.7
2.00	0.000	19.49	0.09	4.75	0.19	6.4	4.3	-3.7
2.20	0.003	31.33	1.36	16.57	0.69	27.2	26.6	-3.8
2.40	0.003	36.91	4.91	22.10	1.44	47.4	47.1	-3.9
2.60	0.010	38.22	6.65	23.42	1.77	52.0	51.8	-3.9
2.80	0.033	38.86	7.70	24.09	1.99	53.8	53.6	-4.1
3.00	0.088	39.20	8.32	24.43	2.11	54.6	54.4	-4.5
3.20	0.198	39.41	8.74	24.65	2.21	55.0	54.8	-5.0
3.40	0.383	39.59	9.10	24.81	2.29	55.1	55.0	-5.6
3.60	0.648	39.74	9.41	24.98	2.37	55.2	55.0	-6.1
3.80	0.988	39.87	9.70	25.08	2.44	55.2	55.0	-6.8
4.00	1.393	39.99	9.98	25.21	2.51	55.1	54.9	-7.4

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

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@ **f=435MHz**, Vdd=7.2V, Pi=30mW (=14.77dBm)

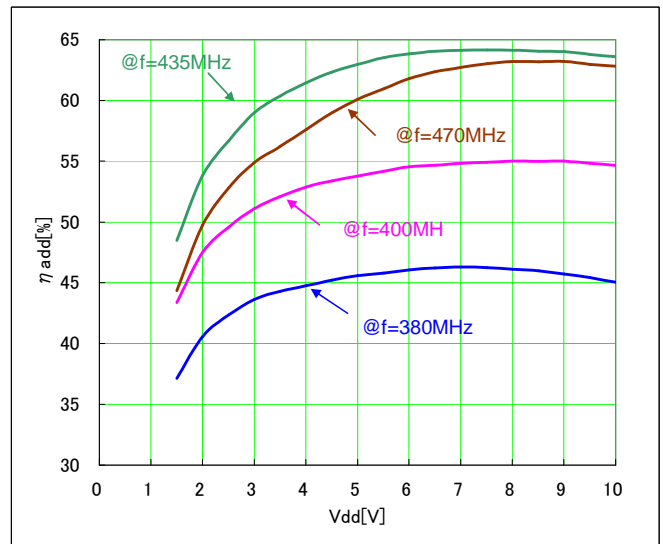
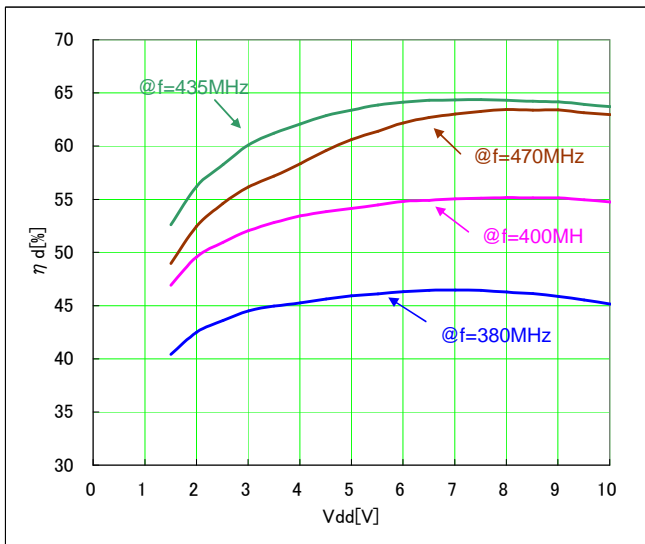
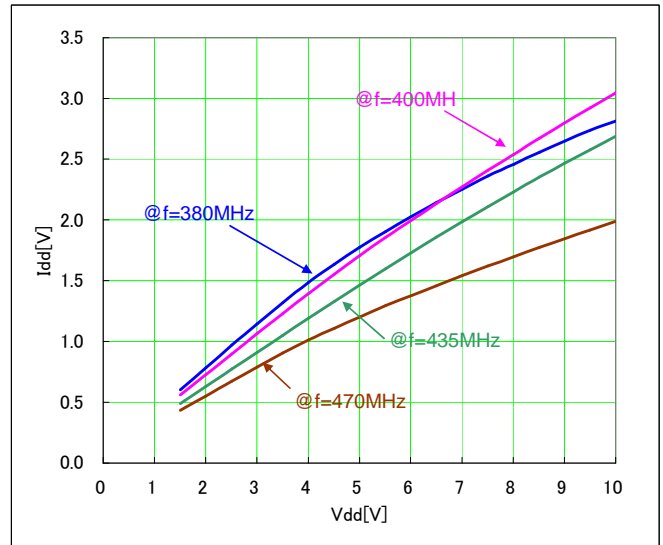
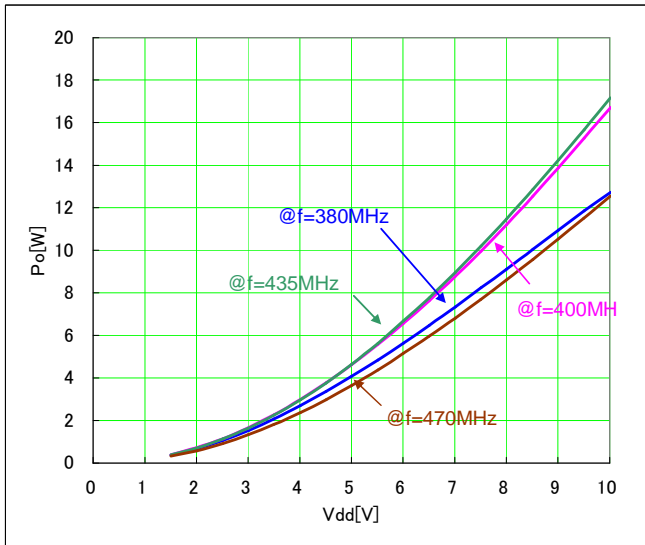
Vgg [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.00	0.003	-18.79	0.00	-33.55	0.01	0.0	0.0	-5.6
1.20	0.003	-11.76	0.00	-26.52	0.01	0.1	0.0	-5.7
1.40	0.000	17.92	0.06	3.17	0.12	7.5	3.9	-6.1
1.60	0.003	25.95	0.39	11.19	0.28	19.5	18.0	-6.6
1.80	0.000	30.69	1.17	15.88	0.53	31.0	30.2	-6.9
2.00	0.003	34.06	2.55	19.31	0.83	42.6	42.1	-7.2
2.20	0.003	35.98	3.96	21.18	1.10	50.1	49.7	-7.4
2.40	0.003	37.34	5.42	22.57	1.35	55.9	55.6	-7.7
2.60	0.010	38.25	6.69	23.49	1.55	59.7	59.5	-8.3
2.80	0.033	38.86	7.69	24.05	1.72	62.0	61.8	-9.0
3.00	0.088	39.25	8.42	24.46	1.84	63.4	63.1	-9.8
3.20	0.195	39.50	8.91	24.72	1.93	64.1	63.8	-10.8
3.40	0.380	39.68	9.30	24.91	2.01	64.3	64.1	-11.9
3.60	0.645	39.83	9.62	25.02	2.07	64.4	64.2	-12.8
3.80	0.983	39.95	9.89	25.20	2.15	63.9	63.8	-13.6
4.00	1.388	40.06	10.14	25.30	2.22	63.4	63.2	-14.1

@ **f=470MHz**, Vdd=7.2V, Pi=30mW (=14.77dBm)

Vgg [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.00	0.003	-33.34	0.00	-48.06	0.01	0.0	0.0	-7.4
1.20	0.000	-23.72	0.00	-38.45	0.01	0.0	0.0	-7.3
1.40	0.003	-19.64	0.00	-34.39	0.01	0.0	0.0	-7.3
1.60	0.000	-16.19	0.00	-30.94	0.02	0.0	0.0	-7.3
1.80	0.000	-0.95	0.00	-15.70	0.04	0.3	0.0	-7.3
2.00	0.003	15.86	0.04	1.11	0.11	4.7	1.1	-7.4
2.20	0.003	25.22	0.33	10.47	0.28	16.6	15.1	-7.5
2.40	0.003	31.18	1.31	16.39	0.54	33.8	33.0	-7.7
2.60	0.010	34.68	2.93	19.90	0.83	48.9	48.4	-7.8
2.80	0.033	36.49	4.46	21.74	1.08	57.3	56.9	-7.9
3.00	0.088	37.49	5.61	22.75	1.27	61.4	61.0	-8.1
3.20	0.193	38.05	6.38	23.29	1.41	62.9	62.6	-8.3
3.40	0.378	38.43	6.96	23.64	1.53	63.4	63.1	-8.4
3.60	0.640	38.69	7.39	23.95	1.63	63.1	62.9	-8.5
3.80	0.980	38.89	7.75	24.14	1.72	62.4	62.2	-8.6
4.00	1.385	39.06	8.05	24.27	1.82	61.6	61.3	-8.7

**Pout vs. Vdd characteristics**

@ V<sub>gg</sub>=3.5V, P<sub>i</sub>=30mW (=14.77dBm), f=380MHz, f=400MHz, 435MHz, 470MHz





**Pout vs. Vdd characteristics data**@ **f=380MHz**, Vgg=3.5V, Pi=30mW (=14.77dBm)

Vdd [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.5	0.400	25.6	0.4	10.9	0.60	40.4	37.1	-4.6
2.0	0.408	28.2	0.7	13.5	0.78	42.5	40.6	-4.4
2.5	0.418	30.3	1.1	15.5	0.97	43.6	42.4	-4.2
3.0	0.425	31.9	1.5	17.1	1.15	44.5	43.6	-3.8
3.5	0.433	33.2	2.1	18.4	1.32	45.0	44.3	-3.6
4.0	0.440	34.3	2.7	19.5	1.49	45.3	44.8	-3.4
4.5	0.448	35.3	3.4	20.5	1.64	45.6	45.2	-3.2
5.0	0.458	36.1	4.1	21.3	1.77	45.9	45.6	-3.1
5.5	0.465	36.9	4.8	22.1	1.91	46.1	45.8	-3.1
6.0	0.475	37.5	5.6	22.7	2.03	46.3	46.0	-3.0
6.5	0.483	38.1	6.5	23.3	2.14	46.4	46.2	-3.0
7.0	0.493	38.7	7.3	23.9	2.25	46.5	46.3	-3.0
7.5	0.503	39.2	8.2	24.3	2.36	46.4	46.3	-3.0
8.0	0.515	39.6	9.1	24.8	2.46	46.3	46.1	-3.0
8.5	0.525	40.0	10.0	25.3	2.56	46.1	46.0	-2.9
9.0	0.538	40.4	10.9	25.6	2.65	45.8	45.7	-3.0
9.5	0.550	40.7	11.9	26.0	2.74	45.5	45.4	-3.0
10.0	0.565	41.0	12.7	26.3	2.82	45.1	45.0	-3.1

@ **f=400MHz**, Vgg=3.5V, Pi=30mW (=14.77dBm)

Vdd [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.5	0.400	26.0	0.4	11.2	0.56	46.9	43.4	-6.5
2.0	0.410	28.6	0.7	13.8	0.73	49.6	47.5	-6.5
2.5	0.418	30.6	1.1	15.8	0.90	50.9	49.6	-6.5
3.0	0.425	32.2	1.7	17.5	1.07	52.0	51.1	-6.4
3.5	0.433	33.6	2.3	18.8	1.23	52.8	52.1	-6.4
4.0	0.440	34.8	3.0	20.0	1.40	53.4	52.9	-6.3
4.5	0.450	35.8	3.8	21.0	1.55	53.8	53.4	-6.2
5.0	0.458	36.6	4.6	21.9	1.71	54.1	53.8	-6.1
5.5	0.465	37.5	5.6	22.7	1.86	54.5	54.2	-6.0
6.0	0.475	38.2	6.6	23.4	2.00	54.8	54.5	-6.0
6.5	0.485	38.8	7.6	24.1	2.14	54.9	54.7	-5.9
7.0	0.495	39.4	8.8	24.7	2.28	55.0	54.8	-5.8
7.5	0.503	40.0	10.0	25.2	2.41	55.1	54.9	-5.7
8.0	0.515	40.5	11.2	25.7	2.54	55.2	55.0	-5.6
8.5	0.525	41.0	12.5	26.2	2.67	55.1	55.0	-5.5
9.0	0.538	41.4	13.9	26.7	2.80	55.1	55.0	-5.4
9.5	0.550	41.8	15.3	27.1	2.92	54.9	54.8	-5.2
10.0	0.565	42.2	16.7	27.5	3.05	54.7	54.7	-5.1

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

- AN-UHF-097-C-

@ **f=435MHz**, Vgg=3.5V, Pi=30mW (=14.77dBm)

Vdd [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.5	0.405	25.9	0.4	11.1	0.49	52.6	48.5	-9.8
2.0	0.413	28.5	0.7	13.7	0.63	56.2	53.8	-10.2
2.5	0.420	30.5	1.1	15.8	0.77	58.3	56.7	-10.7
3.0	0.428	32.2	1.6	17.3	0.91	60.1	59.0	-11.1
3.5	0.435	33.5	2.2	18.7	1.05	61.2	60.4	-11.5
4.0	0.443	34.7	3.0	19.9	1.19	62.1	61.5	-11.9
4.5	0.450	35.8	3.8	21.0	1.33	62.9	62.3	-12.2
5.0	0.458	36.7	4.6	21.9	1.46	63.4	63.0	-12.5
5.5	0.468	37.5	5.6	22.7	1.60	63.9	63.5	-12.6
6.0	0.475	38.2	6.7	23.5	1.73	64.1	63.8	-12.6
6.5	0.483	38.9	7.8	24.1	1.86	64.3	64.0	-12.6
7.0	0.493	39.5	9.0	24.8	1.99	64.3	64.1	-12.4
7.5	0.503	40.1	10.2	25.3	2.11	64.4	64.2	-12.3
8.0	0.513	40.6	11.5	25.8	2.23	64.3	64.1	-12.0
8.5	0.523	41.1	12.9	26.3	2.35	64.2	64.0	-11.8
9.0	0.535	41.5	14.2	26.8	2.47	64.2	64.0	-11.6
9.5	0.548	41.9	15.7	27.2	2.58	63.9	63.8	-11.4
10.0	0.560	42.3	17.2	27.5	2.69	63.7	63.6	-11.3

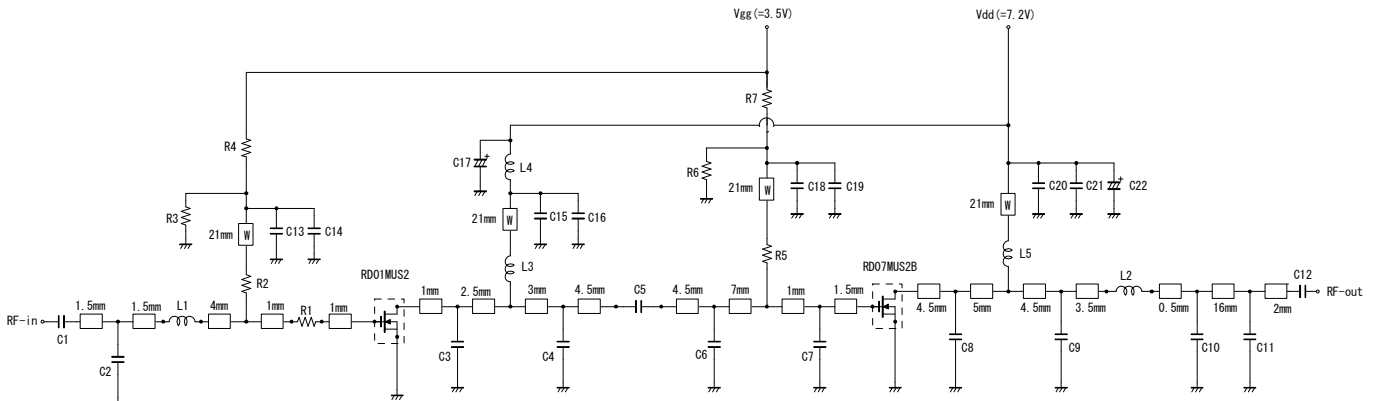
@ **f=470MHz**, Vgg=3.5V, Pi=30mW (=14.77dBm)

Vdd [V]	Idq [A]	Po [dBm]	Po [W]	Gp [dB]	Idd [A]	$\eta_d$ [%]	P.A.E. [%]	R.L. [-dB]
1.5	0.403	25.0	0.3	10.3	0.43	49.0	44.4	-11.3
2.0	0.410	27.6	0.6	12.8	0.55	52.4	49.7	-10.6
2.5	0.418	29.6	0.9	14.9	0.67	54.6	52.8	-9.9
3.0	0.425	31.2	1.3	16.5	0.79	56.2	54.9	-9.3
3.5	0.433	32.6	1.8	17.9	0.91	57.2	56.2	-8.8
4.0	0.440	33.7	2.4	19.0	1.01	58.4	57.6	-8.6
4.5	0.448	34.7	3.0	20.0	1.11	59.6	59.0	-8.5
5.0	0.458	35.6	3.6	20.9	1.20	60.6	60.1	-8.5
5.5	0.465	36.4	4.4	21.7	1.29	61.4	61.0	-8.5
6.0	0.473	37.1	5.1	22.4	1.38	62.2	61.8	-8.5
6.5	0.483	37.7	5.9	23.0	1.46	62.7	62.4	-8.5
7.0	0.493	38.3	6.8	23.6	1.54	63.0	62.7	-8.5
7.5	0.500	38.9	7.7	24.1	1.62	63.3	63.0	-8.5
8.0	0.510	39.3	8.6	24.6	1.70	63.4	63.2	-8.5
8.5	0.523	39.8	9.6	25.0	1.77	63.4	63.2	-8.5
9.0	0.533	40.2	10.5	25.4	1.85	63.4	63.2	-8.5
9.5	0.545	40.6	11.5	25.8	1.92	63.1	63.0	-8.5
10.0	0.558	41.0	12.5	26.2	1.99	63.0	62.8	-8.5

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

- AN-UHF-097-C-

Equivalent circuit (@f=400 to 470MHz)



Note: Board material- Glass-Epoxy Substrate  
 Micro strip line width=1.3mm/50ohm, er:4.8, t=0.8mm  
 W: Line width=1.0mm

Parts Type		Value	Type name	Vender
Capacitor	C1	100pF	GRM2162C1H101GD01E	Murata Manufacturing Co., Ltd.
	C2	12pF	GRM2162C1H120GD01E	Murata Manufacturing Co., Ltd.
	C3	22pF	GRM2162C1H220GD01E	Murata Manufacturing Co., Ltd.
	C4	8pF	GRM2162C1H8R0DD01E	Murata Manufacturing Co., Ltd.
	C5	39pF	GRM2162C1H390GD01E	Murata Manufacturing Co., Ltd.
	C6	20pF	GRM2162C1H200GD01E	Murata Manufacturing Co., Ltd.
	C7	54pF	GRM2162C1H540GD01E	Murata Manufacturing Co., Ltd.
	C8	24pF	GRM2162C1H240GD01E	Murata Manufacturing Co., Ltd.
	C9	20pF	GRM2162C1H200GD01E	Murata Manufacturing Co., Ltd.
	C10	3pF	GRM2163C1H3R0CD01E	Murata Manufacturing Co., Ltd.
	C11	3pF	GRM2163C1H3R0CD01E	Murata Manufacturing Co., Ltd.
	C12	100pF	GRM2162C1H101GD01E	Murata Manufacturing Co., Ltd.
	C13	1000pF	GRM216R11H102KA01E	Murata Manufacturing Co., Ltd.
	C14	10000pF	GRM216R11H103KA01E	Murata Manufacturing Co., Ltd.
Resistance	R1	12 OHM	RPC05-120	Taiyosha Electric Co.,Ltd.
	R2	1K OHM	RPC10-102	Taiyosha Electric Co.,Ltd.
	R3	56K OHM	RPC05-563	Taiyosha Electric Co.,Ltd.
	R4	20K OHM	RPC05-203	Taiyosha Electric Co.,Ltd.
	R5	4.7K OHM	CR1/10-472JB	Hokuriku Electric Industry Co.,Ltd.
	R6	15K OHM	RPC05-153	Taiyosha Electric Co.,Ltd.
	R7	20K OHM	RPC05-203	Taiyosha Electric Co.,Ltd.
Inductance	L1	8.2nH(Chip Inductor)	LQG11A8N2S00	Murata Manufacturing Co., Ltd.
	L2	8.0nH Enameled wire 2Turns, Diameter:0.23mm,φ1.66mm (the out side diameter)	2302S	Yoneda Processing Place Co.,Ltd.
	L3	28.0nH Enameled wire 6Turns, Diameter:0.23mm,φ1.66mm (the out side diameter)	2306C	Yoneda Processing Place Co.,Ltd.
	L4	8.0nH Enameled wire 2Turns, Diameter:0.23mm,φ1.66mm (the out side diameter)	2302S	Yoneda Processing Place Co.,Ltd.
	L5	28.0nH Enameled wire 6Turns, Diameter:0.23mm,φ1.66mm (the out side diameter)	2306C	Yoneda Processing Place Co.,Ltd.

RD01MUS2 & RD07MUS2B RF characteristics data at 380 to 470MHz. (Vdd=7.2V)

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