

# APPLICATION NOTE

Document NO. AN-UHF-060-A  
Date : 19<sup>th</sup> Oct. 2004  
Rev.date : 22<sup>th</sup> June. 2010  
Prepared : M.Wada, S.Kametani  
Confirmed : T.Ohkawa  
(Taking change of Silicon RF By  
MIYOSHI Electronics)

**SUBJECT: RD01MUS1 RF Characteristics at Vdd=3.6/ 4.5/ 7.2V**

## **SUMMARY:**

- **Sample history:**

**Assembly Lot number : 3X2**

- **Sample quantity: RD01MUS1: 3 pieces**

**Pin-Po is one device data (#3).**

- **Evaluate conditions:**

**It is basic on following specifications**

**f=135MHz,Pin=30mW,Vdd=7.2V,Idq=100mA(Vgg adj.)**

**f=527MHz,Pin=30mW,Vdd=7.2V,Idq=100mA(Vgg adj.)**

- **Results: Page 2 shows RF data**

**Page 3-4 show Pin-Po data (@Vdd=3.6V)**

**Page 5-6 show Pin-Po data (@Vdd=4.5V)**

**Page 7-8 show Pin-Po data (@Vdd=7.2V)**

**Page 9-10 show matching circuit**

## RD01MUS1 RF Characteristics at Vdd=3.6/4.5V/7.2V

- AN-UHF-060 -A

### 1. RD01MUS1 RF data

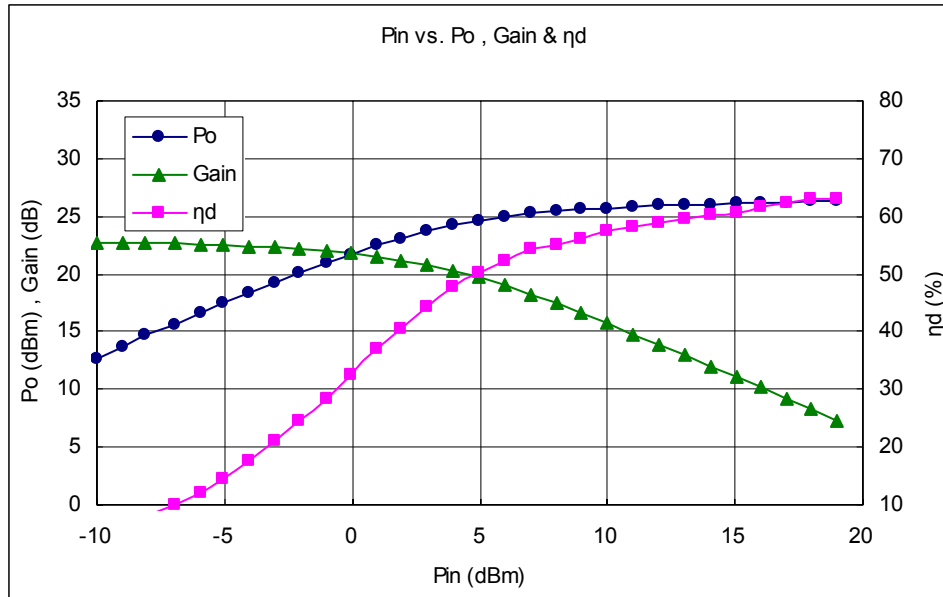
Conditons: f=135MHz, Vdd=7.2V, Idq=100mA Pin=30mW

S/N	f (MHz)	Vdd (V)	V <sub>gg</sub> (V)	Pin (W)	Pout (dBm)	Pout (W)	G <sub>p</sub> (dB)	ID(RF) (A)	$\eta$ d (%)	R.Loss (dB)
#1	135	3.6	2.576	0.030	26.14	0.41	11.4	0.186	61.37	-16.19
#2	135		2.646	0.030	26.13	0.41	11.4	0.188	60.68	-14.80
#3	135		2.621	0.030	26.07	0.40	11.3	0.187	60.05	-16.03
#1	135	4.5	2.572	0.030	28.09	0.64	13.3	0.227	63.06	-15.59
#2	135		2.632	0.030	28.02	0.63	13.3	0.226	62.30	-14.60
#3	135		2.600	0.030	28.00	0.63	13.2	0.225	62.34	-15.55
#1	135	7.2	2.524	0.030	31.98	1.58	17.2	0.336	65.26	-14.90
#2	135		2.598	0.030	31.96	1.57	17.2	0.337	64.69	-13.81
#3	135		2.574	0.030	31.95	1.57	17.2	0.338	64.32	-14.52

Conditons: f=527MHz, Vdd=7.2V, Idq=100mA Pin=30mW

S/N	f (MHz)	Vdd (V)	V <sub>gg</sub> (V)	Pin (W)	Pout (dBm)	Pout (W)	G <sub>p</sub> (dB)	ID(RF) (A)	$\eta$ d (%)	R.Loss (dB)
#1	527	3.6	2.586	0.030	26.01	0.40	11.2	0.176	63.04	-16.28
#2	527		2.654	0.030	25.90	0.39	11.1	0.175	61.72	-12.66
#3	527		2.629	0.030	25.95	0.39	11.2	0.176	62.04	-14.45
#1	527	4.5	2.629	0.030	27.86	0.61	13.1	0.213	63.67	-16.00
#2	527		2.634	0.030	27.78	0.60	13.0	0.211	63.17	-12.12
#3	527		2.619	0.030	27.81	0.60	13.1	0.213	63.06	-12.54
#1	527	7.2	2.535	0.030	31.60	1.45	16.8	0.313	64.21	-12.01
#2	527		2.603	0.030	31.44	1.39	16.7	0.307	62.96	-11.54
#3	527		2.588	0.030	31.59	1.44	16.8	0.314	63.83	-10.71

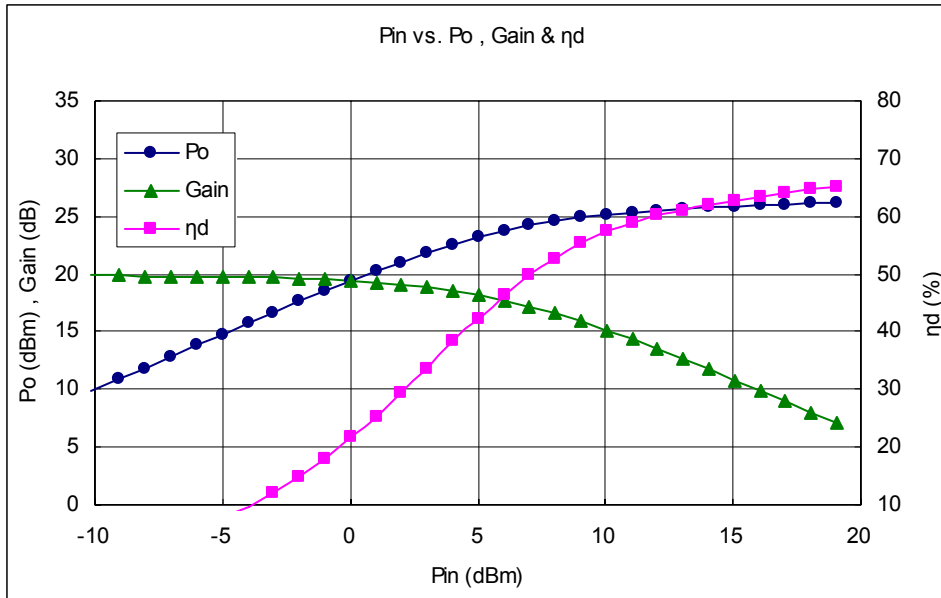
2. RD01MUS1 Pin-Po data (@f=135MHz, Vdd=3.6V)



f= 135 (MHz)  
 Vdd= 3.6 (V)  
 Idq= 100 (mA)  
 Vgg= 2.61 (V)

Pin		Po		I <sub>dd</sub>	η <sub>d</sub>	Gain	R.L.	Harmonics	Harmonics
(dBm)	(W)	(dBm)	(W)	(A)	(%)	(dB)	(dB)	2fo(dBc)	3fo(dBc)
-10.03	0.000	12.73	0.02	0.101	5.15	22.76	-6.00	<-50	<-50
-9.00	0.000	13.72	0.02	0.102	6.41	22.71	-7.07	<-50	<-50
-8.09	0.000	14.67	0.03	0.102	7.98	22.76	-7.56	<-50	<-50
-6.98	0.000	15.64	0.04	0.103	9.87	22.61	-8.31	<-50	<-50
-5.96	0.000	16.58	0.05	0.104	12.15	22.54	-9.06	<-50	<-50
-5.07	0.000	17.50	0.06	0.107	14.60	22.57	-9.50	<-50	<-50
-4.01	0.000	18.41	0.07	0.110	17.52	22.43	-10.15	<-50	<-50
-3.03	0.000	19.29	0.08	0.112	21.05	22.32	-10.51	-36.99	<-50
-2.05	0.001	20.14	0.10	0.117	24.52	22.19	-10.85	-37.17	<-50
-1.03	0.001	20.96	0.12	0.122	28.43	21.99	-11.10	-37.11	<-50
-0.09	0.001	21.73	0.15	0.127	32.56	21.82	-11.15	-36.05	<-50
0.94	0.001	22.47	0.18	0.133	36.87	21.53	-11.34	-36.22	<-50
1.91	0.002	23.12	0.21	0.141	40.44	21.21	-11.48	-36.42	<-50
2.91	0.002	23.71	0.24	0.148	44.15	20.80	-11.59	-35.20	<-50
3.93	0.002	24.23	0.26	0.154	47.72	20.30	-11.77	-35.54	<-50
4.92	0.003	24.64	0.29	0.161	50.24	19.72	-11.97	-35.23	<-50
5.96	0.004	24.98	0.31	0.167	52.39	19.02	-12.33	-35.30	<-50
6.97	0.005	25.24	0.33	0.171	54.28	18.27	-12.73	-35.36	<-50
7.99	0.006	25.44	0.35	0.176	55.22	17.45	-13.20	-35.73	<-50
8.99	0.008	25.59	0.36	0.179	56.24	16.60	-13.80	-35.71	-42.95
10.00	0.010	25.72	0.37	0.180	57.60	15.72	-14.39	-35.46	-43.04
11.02	0.013	25.83	0.38	0.183	58.05	14.81	-15.03	-35.77	<-50
12.02	0.016	25.92	0.39	0.184	58.94	13.89	-15.58	-35.56	-43.62
13.03	0.020	25.99	0.40	0.185	59.65	12.96	-16.06	-35.80	-43.44
14.02	0.025	26.06	0.40	0.186	60.21	12.04	-16.38	-36.03	<-50
15.03	0.032	26.11	0.41	0.187	60.69	11.08	-15.84	-35.77	-43.33
16.02	0.040	26.16	0.41	0.186	61.72	10.14	-15.84	-35.66	-44.12
17.01	0.050	26.21	0.42	0.186	62.39	9.20	-15.75	-34.86	<-50
18.00	0.063	26.25	0.42	0.186	63.00	8.25	-15.60	-35.19	-44.23
19.02	0.080	26.29	0.43	0.188	62.92	7.27	-15.39	-34.75	-43.85

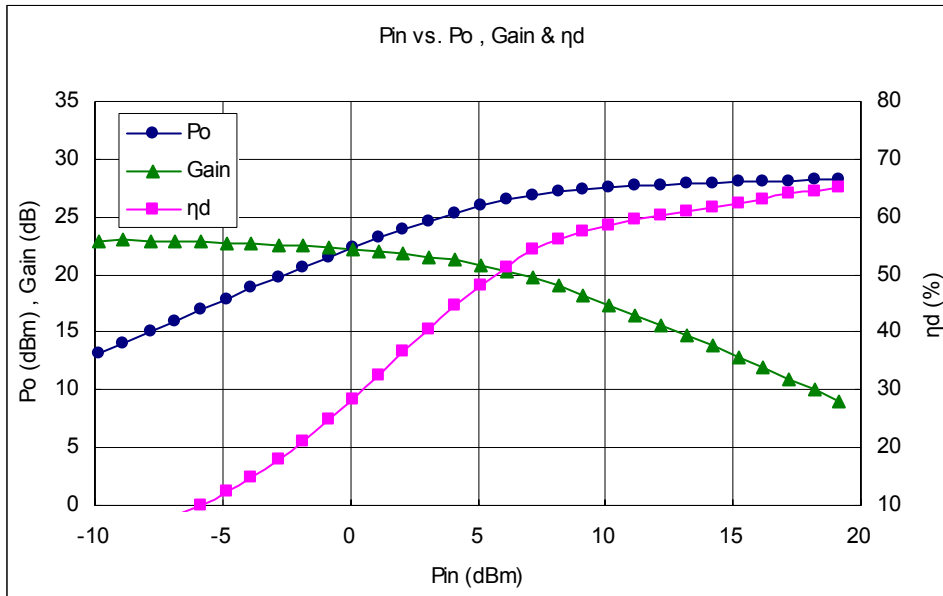
3. RD01MUS1 Pin-Po data (@f=527MHz, Vdd=3.6V)



f= 527 (MHz)  
 Vdd= 3.6 (V)  
 Idq= 100 (mA)  
 Vgg= 2.619 (V)

Pin		Po		Idd	ηd	Gain	R.L.	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
(dBm)	(W)	(dBm)	(W)						
-10.15	0.000	9.85	0.01	0.102	2.63	20.00	-1.91	<-50	<-50
-9.05	0.000	10.83	0.01	0.103	3.27	19.88	-2.89	<-50	<-50
-8.01	0.000	11.82	0.02	0.103	4.10	19.82	-3.17	<-50	<-50
-7.01	0.000	12.80	0.02	0.103	5.14	19.81	-3.35	<-50	<-50
-6.00	0.000	13.79	0.02	0.104	6.40	19.79	-3.45	<-50	<-50
-4.97	0.000	14.76	0.03	0.105	7.92	19.73	-3.58	<-50	<-50
-4.00	0.000	15.72	0.04	0.106	9.79	19.73	-3.61	-33.01	<-50
-2.99	0.001	16.68	0.05	0.106	12.21	19.67	-3.73	-34.02	<-50
-1.98	0.001	17.62	0.06	0.108	14.87	19.60	-3.80	-33.36	<-50
-0.99	0.001	18.54	0.07	0.110	18.02	19.52	-3.85	-32.69	<-50
0.01	0.001	19.41	0.09	0.112	21.67	19.40	-2.97	-31.92	<-50
1.01	0.001	20.25	0.11	0.116	25.34	19.23	-3.01	-31.29	<-50
2.00	0.002	21.05	0.13	0.120	29.49	19.05	-3.03	-29.87	<-50
3.00	0.002	21.81	0.15	0.125	33.70	18.80	-3.03	-29.28	<-50
4.05	0.003	22.52	0.18	0.129	38.48	18.47	-3.09	-28.31	-39.24
5.04	0.003	23.16	0.21	0.136	42.29	18.12	-3.16	-27.63	-38.87
6.03	0.004	23.72	0.24	0.141	46.37	17.68	-3.33	-26.91	-38.70
7.02	0.005	24.19	0.26	0.146	49.90	17.16	-3.65	-26.49	-37.87
8.01	0.006	24.57	0.29	0.151	52.74	16.57	-4.13	-25.71	-37.33
9.03	0.008	24.89	0.31	0.155	55.30	15.87	-4.82	-25.47	-36.69
10.02	0.010	25.14	0.33	0.158	57.44	15.12	-5.62	-25.21	-36.27
11.04	0.013	25.35	0.34	0.162	58.71	14.31	-6.56	-25.17	-35.87
12.05	0.016	25.51	0.36	0.164	60.23	13.46	-7.54	-24.99	-34.90
13.06	0.020	25.65	0.37	0.167	61.04	12.59	-8.52	-24.95	-35.57
14.07	0.026	25.76	0.38	0.169	61.97	11.70	-9.42	-24.78	-35.81
15.07	0.032	25.86	0.39	0.171	62.68	10.79	-10.17	-24.90	-35.65
16.05	0.040	25.95	0.39	0.173	63.24	9.90	-10.70	-24.82	-35.52
17.06	0.051	26.03	0.40	0.174	64.05	8.97	-11.05	-24.85	-35.55
18.05	0.064	26.11	0.41	0.175	64.77	8.05	-11.18	-24.92	-35.58
19.05	0.080	26.18	0.41	0.177	65.05	7.12	-11.16	-25.00	-35.10

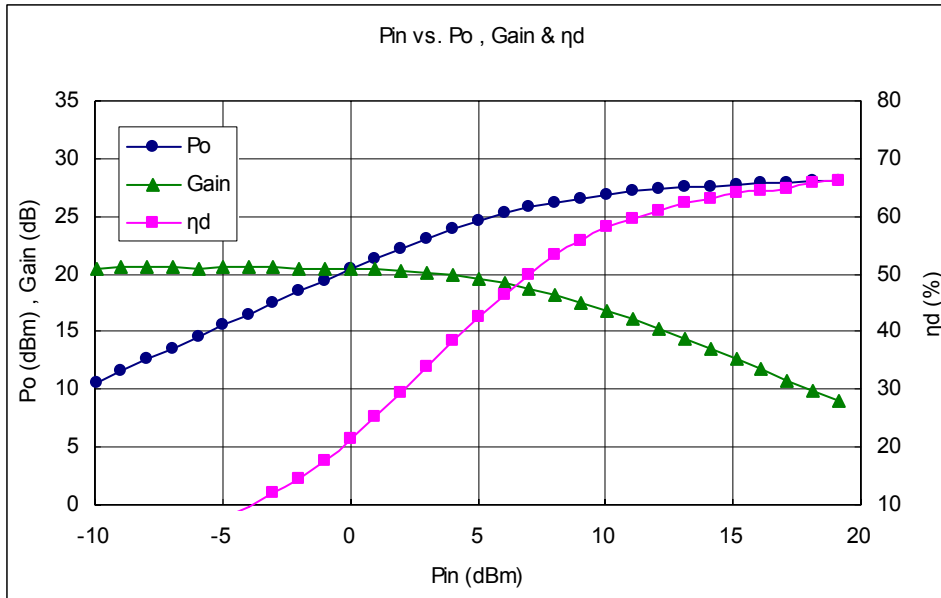
4. RD01MUS1 Pin-Po data (@f=135MHz, Vdd=4.5V)



f= 135 (MHz)  
 Vdd= 4.5 (V)  
 Idq= 100 (mA)  
 Vgg= 2.611 (V)

Pin		Po		Idd	ηd	Gain	R.L.	Harmonics	Harmonics
(dBm)	(W)	(dBm)	(W)						
-9.84	0.000	13.10	0.02	0.104	4.36	22.94	-6.23	<-50	<-50
-8.89	0.000	14.09	0.03	0.105	5.43	22.98	-7.02	<-50	<-50
-7.84	0.000	15.05	0.03	0.105	6.77	22.89	-7.61	<-50	<-50
-6.85	0.000	16.02	0.04	0.108	8.23	22.88	-8.72	<-50	<-50
-5.81	0.000	16.98	0.05	0.109	10.17	22.79	-9.31	<-50	<-50
-4.86	0.000	17.91	0.06	0.111	12.36	22.77	-9.95	<-50	<-50
-3.89	0.000	18.84	0.08	0.115	14.80	22.73	-10.54	-36.84	<-50
-2.79	0.001	19.75	0.09	0.117	17.94	22.54	-11.14	-37.03	<-50
-1.89	0.001	20.63	0.12	0.121	21.22	22.51	-11.45	-36.12	<-50
-0.85	0.001	21.50	0.14	0.127	24.73	22.35	-12.09	-36.60	<-50
0.13	0.001	22.32	0.17	0.133	28.53	22.20	-12.40	-35.20	<-50
1.13	0.001	23.15	0.21	0.141	32.52	22.01	-12.65	-35.14	<-50
2.10	0.002	23.90	0.25	0.149	36.61	21.80	-12.87	-35.40	<-50
3.09	0.002	24.64	0.29	0.160	40.39	21.54	-13.07	-34.60	<-50
4.09	0.003	25.33	0.34	0.170	44.56	21.23	-13.18	-34.41	<-50
5.10	0.003	25.93	0.39	0.181	48.12	20.83	-13.21	-34.55	<-50
6.12	0.004	26.45	0.44	0.192	51.15	20.33	-13.26	-34.38	<-50
7.12	0.005	26.86	0.49	0.199	54.24	19.74	-13.31	-34.38	<-50
8.14	0.007	27.17	0.52	0.207	55.96	19.04	-13.49	-34.58	<-50
9.13	0.008	27.39	0.55	0.212	57.49	18.26	-13.82	-34.41	<-50
10.15	0.010	27.56	0.57	0.217	58.43	17.41	-14.27	-34.67	<-50
11.16	0.013	27.70	0.59	0.220	59.43	16.53	-14.77	-34.67	<-50
12.17	0.016	27.81	0.60	0.223	60.13	15.63	-15.26	-34.95	<-50
13.18	0.021	27.90	0.62	0.225	60.84	14.71	-15.67	-34.83	-45.45
14.19	0.026	27.97	0.63	0.226	61.65	13.78	-15.34	-34.84	<-50
15.18	0.033	28.04	0.64	0.227	62.31	12.85	-15.45	-34.74	-45.80
16.19	0.042	28.10	0.65	0.228	62.90	11.91	-15.48	-34.46	<-50
17.16	0.052	28.15	0.65	0.227	63.96	10.99	-15.41	-34.44	<-50
18.16	0.065	28.20	0.66	0.228	64.40	10.04	-15.28	-33.93	<-50
19.17	0.083	28.25	0.67	0.228	65.10	9.08	-15.10	-33.74	<-50

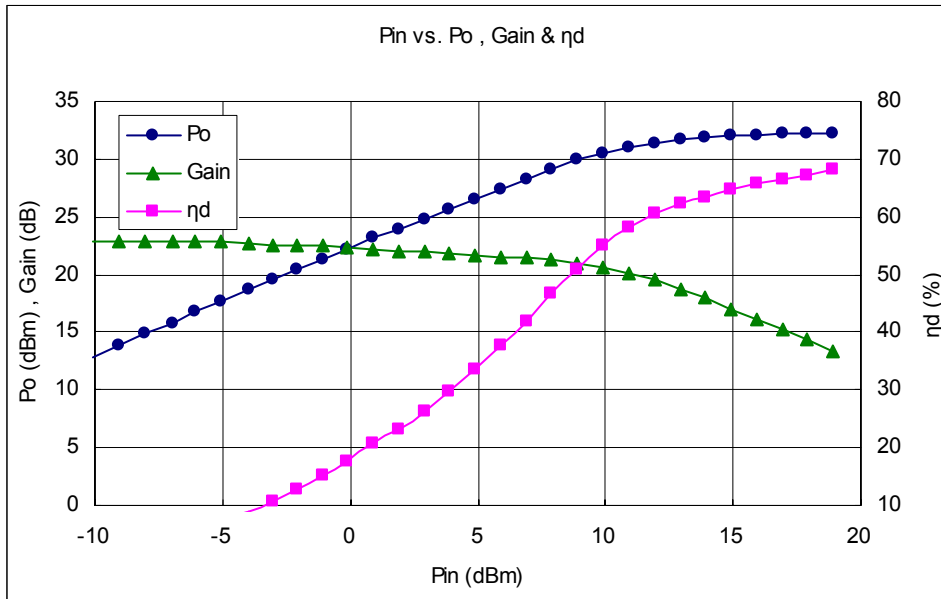
5. RD01MUS1 Pin-Po data (@f=527MHz, Vdd=4.5V)



f= 527 (MHz)  
 Vdd= 4.5 (V)  
 Idq= 100 (mA)  
 Vgg= 2.601 (V)

Pin		Po		Idd	ηd	Gain	R.L.	Harmonics	Harmonics
(dBm)	(W)	(dBm)	(W)						
-9.93	0.000	10.61	0.01	0.100	2.55	20.53	-2.74	<-50	<-50
-8.98	0.000	11.59	0.01	0.100	3.21	20.57	-3.50	<-50	<-50
-7.99	0.000	12.59	0.02	0.100	4.03	20.58	-3.75	<-50	<-50
-6.96	0.000	13.58	0.02	0.101	5.01	20.53	-4.02	<-50	<-50
-5.94	0.000	14.58	0.03	0.102	6.26	20.52	-4.20	-33.26	<-50
-4.99	0.000	15.57	0.04	0.104	7.70	20.55	-4.32	-33.26	<-50
-4.01	0.000	16.54	0.05	0.105	9.55	20.55	-4.38	-32.62	<-50
-3.00	0.001	17.54	0.06	0.105	12.00	20.53	-4.54	-32.21	<-50
-2.00	0.001	18.50	0.07	0.108	14.57	20.50	-4.67	-31.37	<-50
-0.98	0.001	19.49	0.09	0.111	17.79	20.46	-4.78	-30.72	<-50
0.00	0.001	20.42	0.11	0.115	21.30	20.42	-4.85	-29.77	<-50
0.99	0.001	21.35	0.14	0.120	25.28	20.36	-4.98	-28.29	<-50
1.99	0.002	22.24	0.17	0.127	29.29	20.25	-4.30	-27.69	<-50
2.98	0.002	23.08	0.20	0.133	33.95	20.10	-4.37	-26.37	<-50
4.02	0.003	23.87	0.24	0.141	38.42	19.85	-4.42	-25.75	-40.47
5.02	0.003	24.58	0.29	0.150	42.51	19.56	-4.42	-25.16	-39.26
6.02	0.004	25.22	0.33	0.159	46.44	19.20	-4.40	-24.82	-38.86
7.02	0.005	25.76	0.38	0.168	49.86	18.74	-4.49	-24.46	-38.71
8.03	0.006	26.22	0.42	0.175	53.15	18.19	-4.72	-24.28	-37.27
9.04	0.008	26.59	0.46	0.182	55.65	17.55	-5.13	-23.98	-37.02
10.05	0.010	26.88	0.49	0.187	58.00	16.84	-5.70	-24.02	-36.48
11.07	0.013	27.13	0.52	0.192	59.73	16.05	-6.42	-23.96	-36.07
12.08	0.016	27.32	0.54	0.197	60.84	15.24	-7.22	-23.97	-36.18
13.10	0.020	27.48	0.56	0.200	62.17	14.38	-8.06	-23.94	-35.49
14.11	0.026	27.61	0.58	0.203	63.18	13.50	-8.85	-23.97	-35.62
15.11	0.032	27.73	0.59	0.206	63.92	12.61	-9.51	-24.02	-35.60
16.09	0.041	27.83	0.61	0.209	64.46	11.73	-10.00	-24.00	-35.44
17.11	0.051	27.91	0.62	0.212	64.85	10.81	-10.36	-24.05	-35.46
18.10	0.065	27.99	0.63	0.213	65.73	9.89	-10.53	-23.92	-35.34
19.11	0.081	28.07	0.64	0.215	66.24	8.96	-10.57	-24.15	-35.43

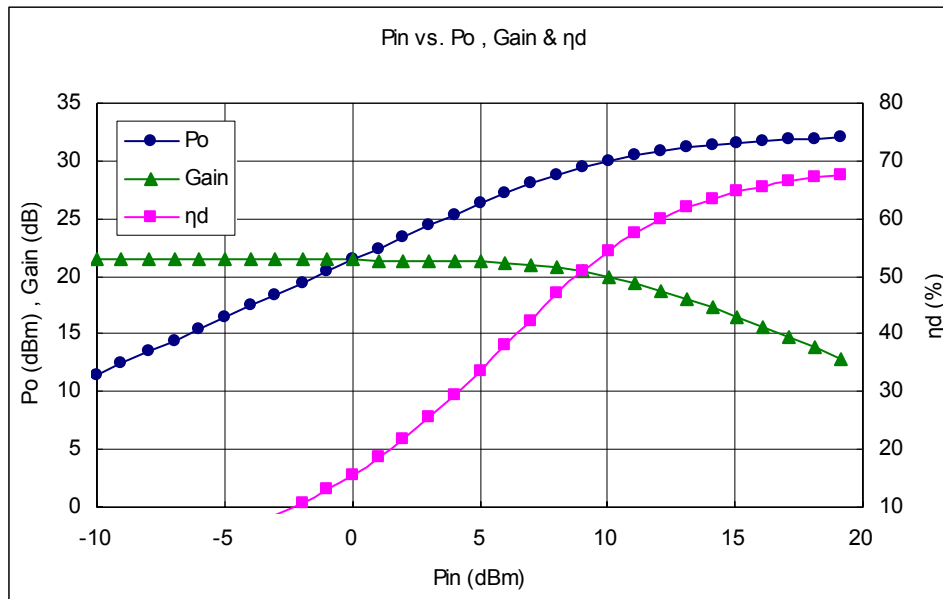
6. RD01MUS1 Pin-Po data (@f=135MHz, Vdd=7.2V)



f= 135 (MHz)  
 Vdd= 7.2 (V)  
 Idq= 100 (mA)  
 Vgg= 2.574 (V)

Pin		Po		Idd	ηd	Gain	R.L.	Harmonics	
(dBm)	(W)	(dBm)	(W)					(A)	(%)
-10.05	0.000	12.89	0.02	0.103	2.62	22.94	-6.77	<-50	<-50
-9.07	0.000	13.86	0.02	0.103	3.28	22.93	-7.63	<-50	<-50
-8.07	0.000	14.84	0.03	0.104	4.07	22.91	-8.17	<-50	<-50
-6.98	0.000	15.82	0.04	0.106	5.00	22.80	-9.07	<-50	<-50
-6.08	0.000	16.78	0.05	0.108	6.12	22.86	-9.64	<-50	<-50
-5.09	0.000	17.72	0.06	0.110	7.46	22.81	-10.56	<-50	<-50
-4.00	0.000	18.66	0.07	0.112	9.11	22.66	-11.73	-36.97	<-50
-3.02	0.000	19.57	0.09	0.116	10.85	22.60	-12.22	-36.51	<-50
-2.07	0.001	20.48	0.11	0.120	12.93	22.56	-12.77	-36.16	<-50
-1.09	0.001	21.39	0.14	0.125	15.29	22.47	-13.53	-35.74	<-50
-0.10	0.001	22.25	0.17	0.132	17.67	22.35	-14.05	-35.05	<-50
0.91	0.001	23.14	0.21	0.139	20.57	22.23	-14.68	-34.47	<-50
1.89	0.002	23.97	0.25	0.150	23.12	22.08	-15.17	-34.25	<-50
2.90	0.002	24.83	0.30	0.160	26.40	21.93	-15.56	-33.48	<-50
3.89	0.002	25.70	0.37	0.173	29.81	21.81	-16.01	-33.05	<-50
4.88	0.003	26.56	0.45	0.187	33.61	21.68	-16.60	-32.90	<-50
5.91	0.004	27.44	0.55	0.204	37.72	21.53	-16.83	-32.64	<-50
6.90	0.005	28.31	0.68	0.224	41.99	21.41	-16.92	-32.21	<-50
7.90	0.006	29.15	0.82	0.245	46.56	21.25	-16.87	-32.09	<-50
8.88	0.008	29.90	0.98	0.266	50.99	21.02	-16.55	-32.27	<-50
9.88	0.010	30.55	1.14	0.287	54.98	20.68	-16.18	-32.23	<-50
10.88	0.012	31.07	1.28	0.305	58.26	20.19	-15.79	-32.35	-48.38
11.90	0.015	31.43	1.39	0.318	60.74	19.54	-14.47	-32.47	-48.06
12.91	0.020	31.67	1.47	0.327	62.44	18.76	-15.23	-32.62	-47.60
13.91	0.025	31.84	1.53	0.334	63.54	17.94	-14.60	-32.48	-47.40
14.92	0.031	31.97	1.57	0.338	64.67	17.05	-14.67	-32.49	-47.95
15.91	0.039	32.07	1.61	0.340	65.80	16.16	-14.70	-32.31	-48.05
16.91	0.049	32.16	1.64	0.343	66.52	15.24	-14.71	-32.10	-48.32
17.90	0.062	32.23	1.67	0.345	67.30	14.34	-14.61	-31.99	-48.07
18.90	0.078	32.30	1.70	0.345	68.30	13.40	-14.54	-31.97	-48.39

7. RD01MUS1 Pin-Po data (@f=527MHz, Vdd=7.2V)

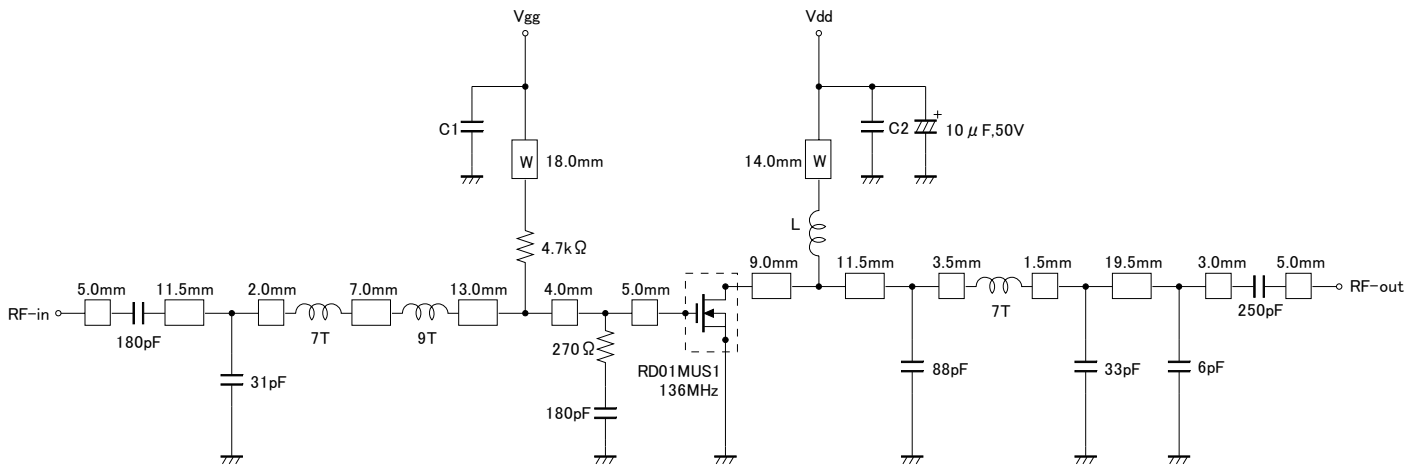


f= 527 (MHz)  
 Vdd= 7.2 (V)  
 Idq= 100 (mA)  
 Vgg= 2.579 (V)

Pin		Po		Idd	ηd	Gain	R.L.	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
(dBm)	(W)	(dBm)	(W)						
-9.98	0.000	11.47	0.01	0.102	1.91	21.44	-3.49	<-50	<-50
-9.05	0.000	12.46	0.02	0.102	2.40	21.51	-4.33	<-50	<-50
-7.97	0.000	13.45	0.02	0.102	3.02	21.43	-4.71	<-50	<-50
-6.97	0.000	14.47	0.03	0.104	3.73	21.43	-5.08	-32.83	<-50
-6.04	0.000	15.46	0.04	0.104	4.70	21.50	-5.11	-32.43	<-50
-4.97	0.000	16.44	0.04	0.106	5.78	21.41	-5.26	-32.20	<-50
-3.98	0.000	17.43	0.06	0.108	7.12	21.41	-5.51	-31.40	<-50
-3.00	0.001	18.44	0.07	0.111	8.73	21.44	-5.68	-30.77	<-50
-1.97	0.001	19.45	0.09	0.113	10.83	21.42	-5.85	-29.81	<-50
-0.99	0.001	20.42	0.11	0.117	13.09	21.41	-6.02	-28.83	<-50
0.01	0.001	21.41	0.14	0.123	15.63	21.40	-6.23	-27.78	<-50
1.01	0.001	22.39	0.17	0.129	18.66	21.38	-6.48	-26.69	<-50
1.99	0.002	23.37	0.22	0.138	21.86	21.38	-6.75	-25.57	<-50
3.01	0.002	24.35	0.27	0.148	25.55	21.34	-7.05	-24.63	-39.89
4.03	0.003	25.31	0.34	0.161	29.31	21.28	-7.34	-23.84	-40.27
5.02	0.003	26.26	0.42	0.174	33.72	21.24	-6.87	-23.14	-39.40
6.01	0.004	27.17	0.52	0.190	38.07	21.16	-7.00	-22.60	-40.25
7.01	0.005	28.02	0.63	0.208	42.36	21.01	-7.00	-22.30	-39.93
8.03	0.006	28.82	0.76	0.225	47.01	20.78	-6.83	-21.97	-39.60
9.04	0.008	29.49	0.89	0.242	51.01	20.45	-6.62	-21.78	-39.13
10.04	0.010	30.05	1.01	0.258	54.46	20.01	-6.43	-21.73	-38.40
11.07	0.013	30.51	1.12	0.271	57.61	19.44	-6.41	-21.77	-37.49
12.08	0.016	30.86	1.22	0.282	60.04	18.78	-6.57	-21.78	-36.97
13.09	0.020	31.14	1.30	0.291	62.00	18.05	-6.89	-21.85	-36.49
14.10	0.026	31.36	1.37	0.299	63.47	17.26	-7.31	-21.90	-36.09
15.10	0.032	31.53	1.42	0.306	64.62	16.43	-7.73	-21.86	-35.45
16.09	0.041	31.68	1.47	0.312	65.53	15.59	-8.12	-21.91	-35.39
17.11	0.051	31.80	1.51	0.316	66.58	14.70	-8.47	-22.10	-35.26
18.11	0.065	31.91	1.55	0.321	67.16	13.80	-8.73	-22.15	-35.34
19.11	0.081	32.00	1.59	0.326	67.57	12.89	-8.90	-22.27	-35.22



8. Matching circuit (@f=135MHz, Vdd=7.2V)



L: 9 Turns, D: 0.43mm,  $\phi$  2.46 (the outside diameter)

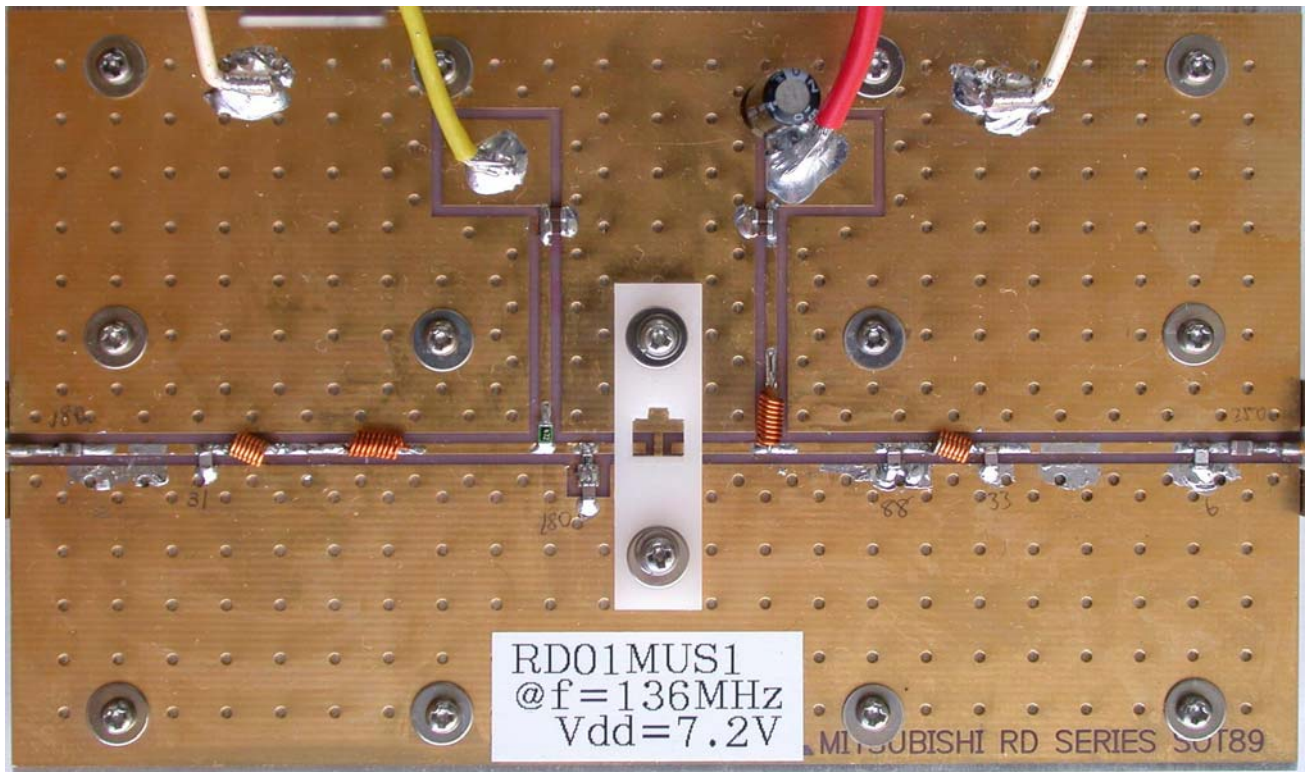
Enameled wire (mm)

C1, C2: 1000pF, 0.022  $\mu$ F in parallel

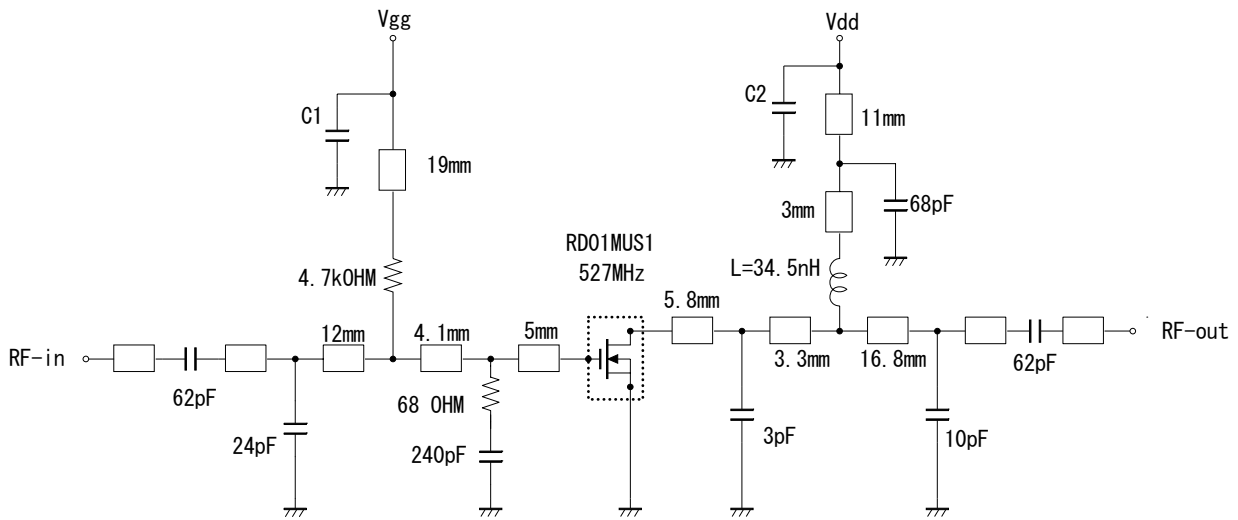
Note: Board material - glass epoxy substrate

micro strip line width = 1.0mm / 50  $\Omega$ ,  $\epsilon_r$ : 4.8, t: 0.6mm

W: line width = 1.0mm



9. Matching circuit (@f=527MHz, Vdd=7.2V)



Note: Board material- Glass epoxy copper-clad laminates FR-4  
Micro strip line width=1mm, er:4.8, t=0.6mm

L: Enameled wire 5Turns, D:0.43mm, 2.46mm O.D  
C1, C2: 1000pF, 0.022uF in parallel

