

# APPLICATION NOTE



## RF POWER SEMICONDUCTORS

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**SUBJECT:** RD07MVS1 & RD01MUS1 RF characteristics data at 800MHz Band.

### SUMMARY:

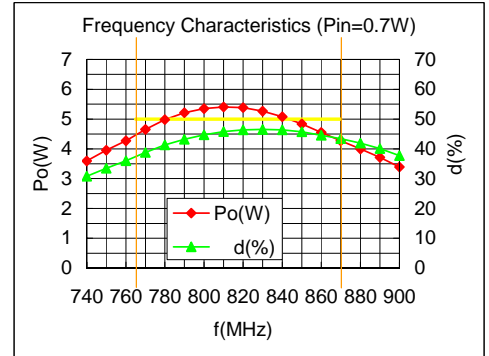
This application note show the RF Wide band characteristics data (Po vs. Frequency characteristics) at 800MHz Band.

- Sample history :
  - RD07MVS1: Lot number "031AA"
  - RD01MUS1: Lot number "291"
  
- Evaluate conditions :
  - RD07MVS1 @f=764-870MHz : Vdd=7.2V, Idq=0.75A (Vgg adj.)
  - RD01MUS1 @f=764-870MHz : Vdd=7.2V, Idq=100mA (Vgg adj.)
  
- Results :
  - Page 2-3 shows the typical RF characteristics (Po vs. Frequency characteristics) data.
  - Page 4-5 shows the Equivalent Circuit.

RD07MVS1 Frequency vs. Pout, ηd characteristics (@ f=764-870MHz)

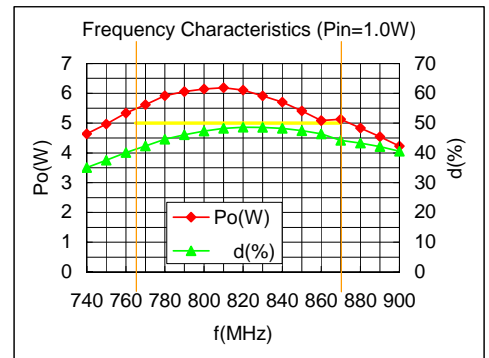
Conditions: Pin=700mW, Vdd=7.2V, Vgs=2.49V, Idq=750mA

f(MHz)	Pin(W)	Po(W)	Gp(dB)	ID(A)	d(%)	R.L (dB)	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
740	0.70	3.60	7.13	1.620	30.83	-2.03	-44.31	<-60
750	0.70	3.95	7.50	1.640	33.48	-2.43	-46.17	<-60
760	0.69	4.27	7.90	1.648	36.01	-2.91	-48.08	<-60
770	0.70	4.65	8.21	1.664	38.81	-3.50	-50.08	<-60
780	0.71	4.98	8.48	1.675	41.31	-4.20	-53.53	<-60
790	0.71	5.21	8.68	1.676	43.21	-5.03	-55.32	<-60
800	0.70	5.35	8.82	1.662	44.71	-6.01	-54.88	<-60
810	0.69	5.41	8.92	1.640	45.81	-7.10	-54.59	<-60
820	0.70	5.38	8.88	1.612	46.39	-8.23	-52.59	<-60
830	0.69	5.26	8.80	1.572	46.51	-9.14	-52.85	<-60
840	0.70	5.08	8.63	1.521	46.39	-9.57	-53.42	<-60
850	0.70	4.84	8.40	1.470	45.70	-9.37	-52.47	<-60
860	0.70	4.55	8.15	1.418	44.59	-8.67	-52.35	<-60
870	0.70	4.27	7.87	1.366	43.45	-7.80	-52.99	<-60
880	0.70	3.99	7.57	1.323	41.93	-6.86	<-60	<-60
890	0.70	3.71	7.23	1.286	40.11	-5.97	<-60	<-60
900	0.69	3.39	6.89	1.249	37.71	-5.21	<-60	<-60



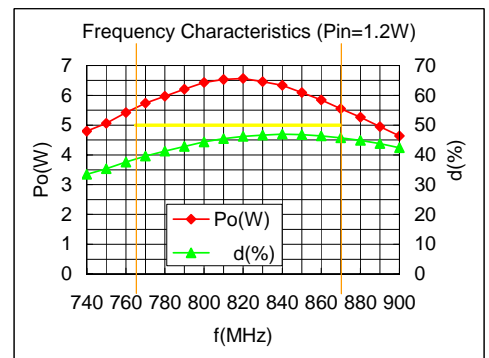
Conditions: Pin=1W, Vdd=7.2V, Vgs=2.49V, Idq=750mA

f(MHz)	Pin(W)	Po(W)	Gp(dB)	ID(A)	d(%)	R.L (dB)	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
740	1.00	4.64	6.68	1.835	35.10	-2.02	-44.97	<-60
750	1.00	4.97	6.98	1.838	37.55	-2.40	-47.98	<-60
760	1.00	5.33	7.27	1.846	40.13	-2.85	-50.26	<-60
770	0.99	5.62	7.52	1.842	42.37	-3.42	-52.54	<-60
780	1.01	5.92	7.68	1.843	44.61	-4.07	<-60	<-60
790	0.99	6.06	7.86	1.824	46.12	-4.87	<-60	<-60
800	0.99	6.14	7.93	1.804	47.29	-5.81	-53.61	<-60
810	1.00	6.18	7.92	1.781	48.22	-6.83	-53.41	<-60
820	1.00	6.10	7.84	1.744	48.61	-7.89	-53.55	<-60
830	0.99	5.92	7.75	1.693	48.53	-8.80	-52.38	<-60
840	1.01	5.70	7.53	1.642	48.25	-9.23	-52.55	<-60
850	1.00	5.41	7.32	1.582	47.48	-9.10	-52.28	<-60
860	0.99	5.08	7.10	1.523	46.35	-8.47	-51.94	<-60
870	1.01	5.13	7.06	1.612	44.20	-7.83	-50.50	<-60
880	1.01	4.84	6.82	1.553	43.25	-6.89	-50.92	<-60
890	1.01	4.55	6.55	1.500	42.10	-6.00	-51.42	<-60
900	1.00	4.23	6.25	1.450	40.51	-5.22	-51.48	<-60



Conditions: Pin=1.2W, Vdd=7.2V, Vgs=2.49V, Idq=750mA

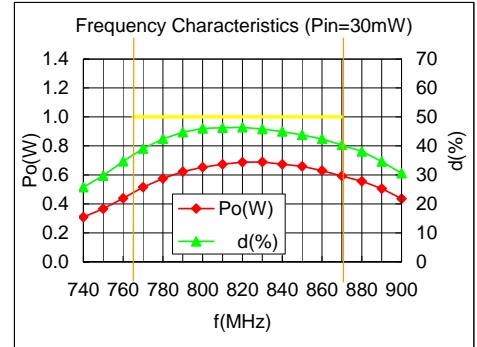
f(MHz)	Pin(W)	Po(W)	Gp(dB)	ID(A)	d(%)	R.L (dB)	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
740	1.20	4.80	6.00	1.989	33.48	-2.08	-38.11	<-60
750	1.19	5.06	6.29	1.988	35.38	-2.47	-36.76	<-60
760	1.19	5.42	6.59	2.002	37.61	-2.91	-34.66	<-60
770	1.20	5.74	6.81	2.011	39.64	-3.48	-31.90	<-60
780	1.19	5.97	7.01	2.011	41.24	-4.13	-33.11	<-60
790	1.19	6.21	7.18	2.011	42.88	-4.92	-37.90	<-60
800	1.21	6.43	7.25	2.014	44.35	-5.84	-42.10	<-60
810	1.20	6.53	7.35	1.996	45.45	-6.87	-46.46	<-60
820	1.22	6.56	7.32	1.972	46.23	-7.95	-48.87	<-60
830	1.19	6.46	7.35	1.923	46.68	-8.83	-49.05	<-60
840	1.21	6.33	7.20	1.874	46.94	-9.28	-49.54	<-60
850	1.19	6.10	7.08	1.809	46.80	-9.16	-50.54	<-60
860	1.20	5.85	6.86	1.752	46.35	-8.54	-50.01	<-60
870	1.20	5.55	6.65	1.688	45.71	-7.71	-49.78	<-60
880	1.20	5.26	6.42	1.628	44.89	-6.80	-51.00	<-60
890	1.19	4.95	6.20	1.568	43.80	-5.94	-51.65	<-60
900	1.20	4.64	5.87	1.519	42.43	-5.17	-51.06	<-60



RD01MUS1 Frequency vs. Pout, ηd characteristics (@ f=764-870MHz)

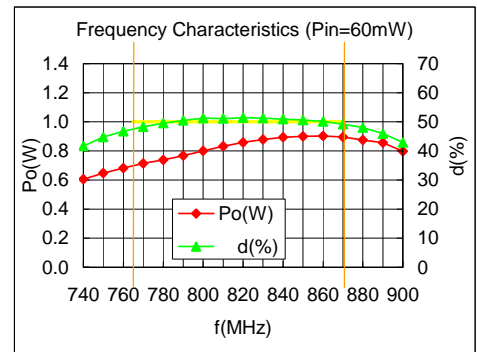
Conditions: Pin=30mW, Vdd=7.2V, Vgs=2.72V, Idq=100mA

f(MHz)	Pin(W)	Po(W)	Gp(dB)	ID(A)	d(%)	R.L (dB)	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
740	0.03	0.31	10.09	0.166	25.75	-5.70	-27.02	<-60
750	0.03	0.37	10.86	0.171	29.76	-5.89	-27.79	<-60
760	0.03	0.44	11.64	0.176	34.66	-6.31	-28.09	<-60
770	0.03	0.52	12.31	0.183	39.12	-7.15	-28.43	<-60
780	0.03	0.57	12.80	0.188	42.43	-8.46	-28.36	<-60
790	0.03	0.62	13.12	0.193	44.75	-10.28	-29.27	<-60
800	0.03	0.65	13.35	0.197	46.06	-12.17	-29.79	<-60
810	0.03	0.67	13.53	0.202	46.29	-13.95	-30.22	<-60
820	0.03	0.69	13.56	0.206	46.40	-15.81	-30.96	<-60
830	0.03	0.69	13.58	0.209	45.81	-16.88	-31.90	<-60
840	0.03	0.67	13.55	0.208	44.92	-16.86	-32.38	<-60
850	0.03	0.66	13.39	0.209	43.79	-16.91	-33.52	<-60
860	0.03	0.63	13.22	0.206	42.44	-16.21	-33.77	<-60
870	0.03	0.59	12.98	0.204	40.35	-15.26	-34.28	<-60
880	0.03	0.56	12.67	0.203	38.04	-14.29	-34.90	<-60
890	0.03	0.51	12.24	0.203	34.61	-13.36	-36.02	<-60
900	0.03	0.44	11.61	0.198	30.56	-12.25	-38.37	<-60



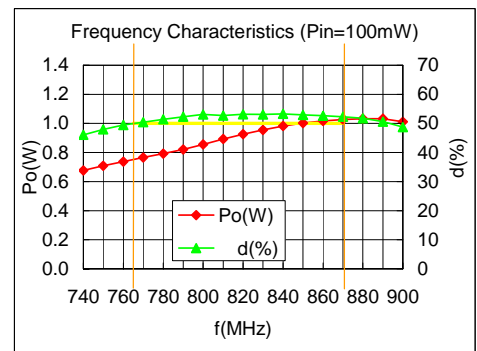
Conditions: Pin=60mW, Vdd=7.2V, Vgs=2.72V, Idq=100mA

f(MHz)	Pin(W)	Po(W)	Gp(dB)	ID(A)	d(%)	R.L (dB)	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
740	0.06	0.61	10.03	0.202	41.66	-8.07	-24.81	<-60
750	0.06	0.65	10.30	0.201	44.76	-9.54	-25.50	<-60
760	0.06	0.68	10.52	0.203	46.70	-11.31	-26.13	<-60
770	0.06	0.71	10.73	0.205	48.31	-13.30	-26.71	<-60
780	0.06	0.74	10.96	0.207	49.55	-15.33	-27.38	<-60
790	0.06	0.77	11.11	0.211	50.48	-17.20	-27.91	<-60
800	0.06	0.80	11.22	0.217	51.25	-18.49	-28.83	<-60
810	0.06	0.83	11.37	0.226	51.13	-19.08	-29.11	<-60
820	0.06	0.86	11.48	0.232	51.39	-19.38	-30.06	<-60
830	0.06	0.88	11.62	0.238	51.28	-19.80	-30.74	<-60
840	0.06	0.89	11.70	0.244	50.89	-21.35	-31.47	<-60
850	0.06	0.90	11.78	0.247	50.59	-23.67	-32.53	<-60
860	0.06	0.90	11.75	0.250	50.14	-26.98	-33.23	<-60
870	0.06	0.90	11.71	0.253	49.14	-27.12	-34.08	<-60
880	0.06	0.87	11.69	0.253	48.01	-21.02	-34.47	<-60
890	0.06	0.86	11.59	0.259	45.95	-17.30	-35.19	<-60
900	0.06	0.80	11.23	0.258	42.91	-14.49	-36.80	<-60

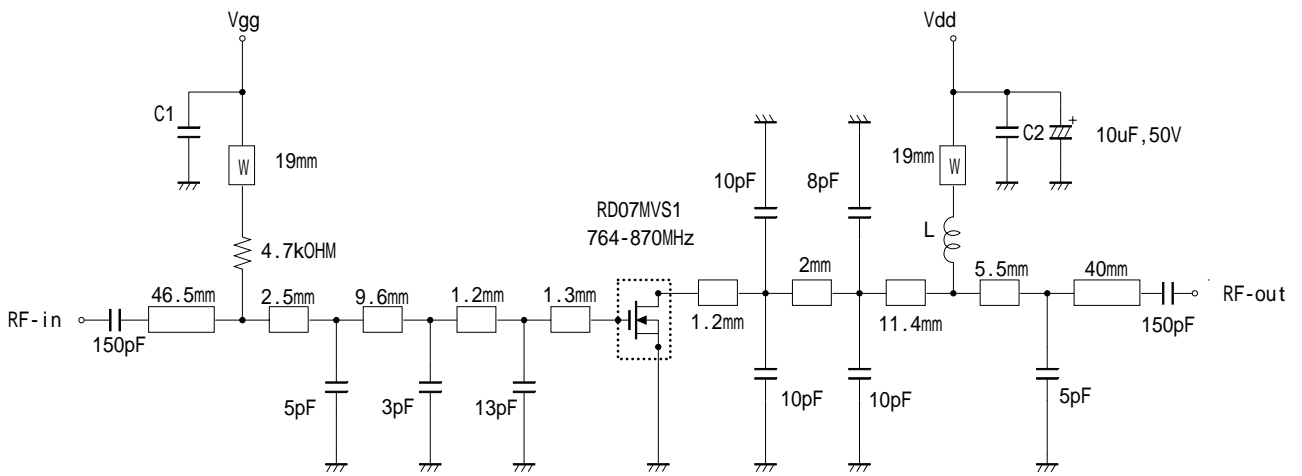


Conditions: Pin=100mW, Vdd=7.2V, Vgs=2.72V, Idq=100mA

f(MHz)	Pin(W)	Po(W)	Gp(dB)	ID(A)	d(%)	R.L (dB)	Harmonics 2fo(dBc)	Harmonics 3fo(dBc)
740	0.10	0.68	8.34	0.204	46.04	-11.31	-24.25	-44.69
750	0.10	0.71	8.52	0.205	47.93	-12.59	-25.10	<-60
760	0.10	0.74	8.69	0.207	49.44	-13.33	-25.78	<-60
770	0.10	0.77	8.81	0.211	50.39	-13.40	-26.43	<-60
780	0.10	0.79	8.99	0.214	51.41	-13.08	-27.04	<-60
790	0.10	0.82	9.16	0.218	52.24	-12.71	-27.89	<-60
800	0.10	0.86	9.34	0.224	53.04	-12.37	-28.40	<-60
810	0.10	0.89	9.49	0.235	52.73	-12.19	-28.81	<-60
820	0.10	0.93	9.62	0.242	53.12	-12.19	-29.52	<-60
830	0.10	0.96	9.81	0.250	53.06	-12.52	-30.12	<-60
840	0.10	0.98	9.90	0.256	53.27	-13.11	-31.03	<-60
850	0.10	1.00	9.99	0.263	52.94	-14.18	-31.93	<-60
860	0.10	1.02	10.09	0.268	52.64	-15.96	-32.52	<-60
870	0.10	1.03	10.09	0.273	52.23	-18.44	-33.32	<-60
880	0.10	1.03	10.11	0.277	51.73	-21.54	-34.24	<-60
890	0.10	1.03	10.18	0.283	50.64	-21.67	-34.38	<-60
900	0.10	1.01	10.00	0.288	48.71	-17.58	-35.23	<-60

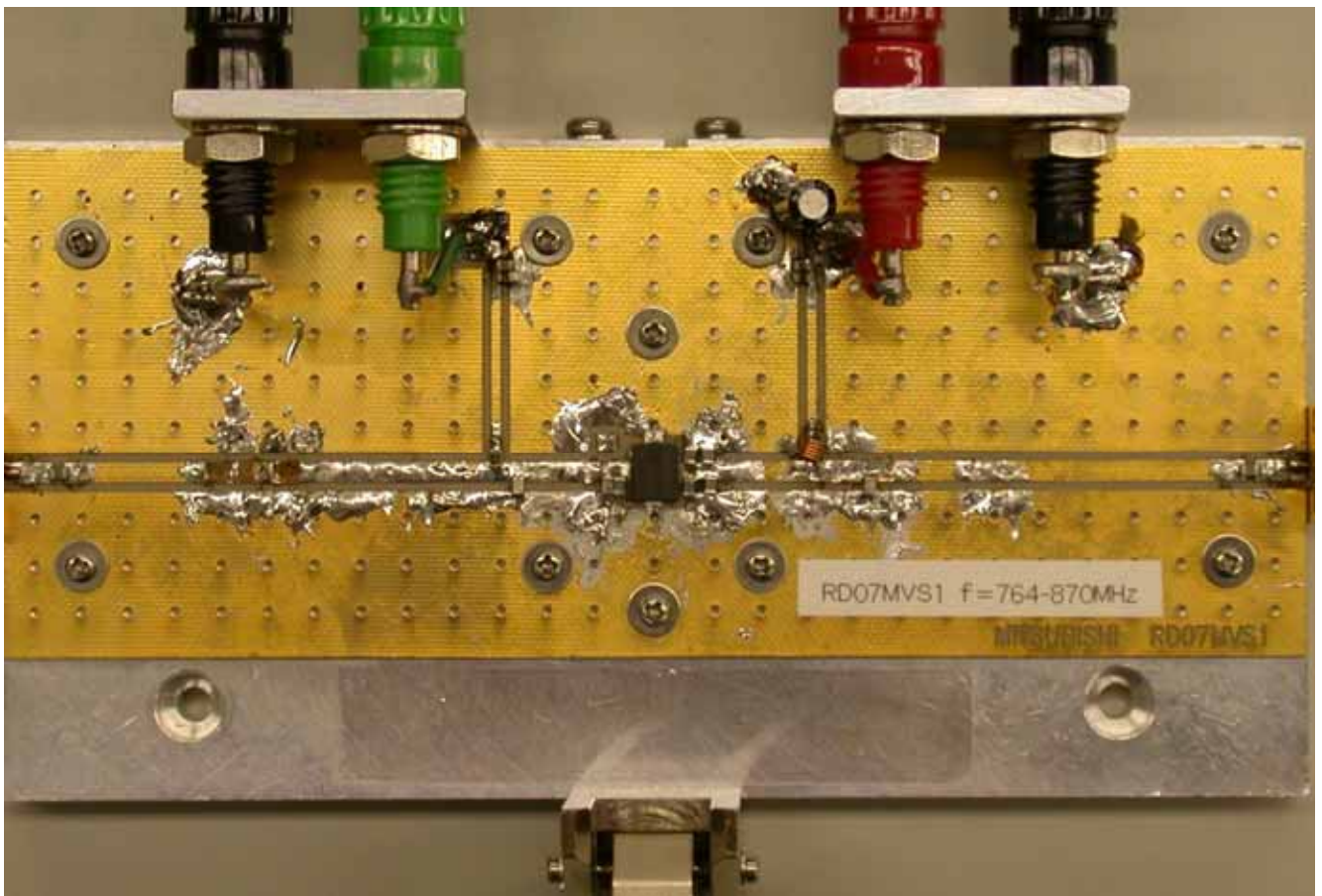


RD07MVS1 Equivalent Circuit (@f=764-870MHz)

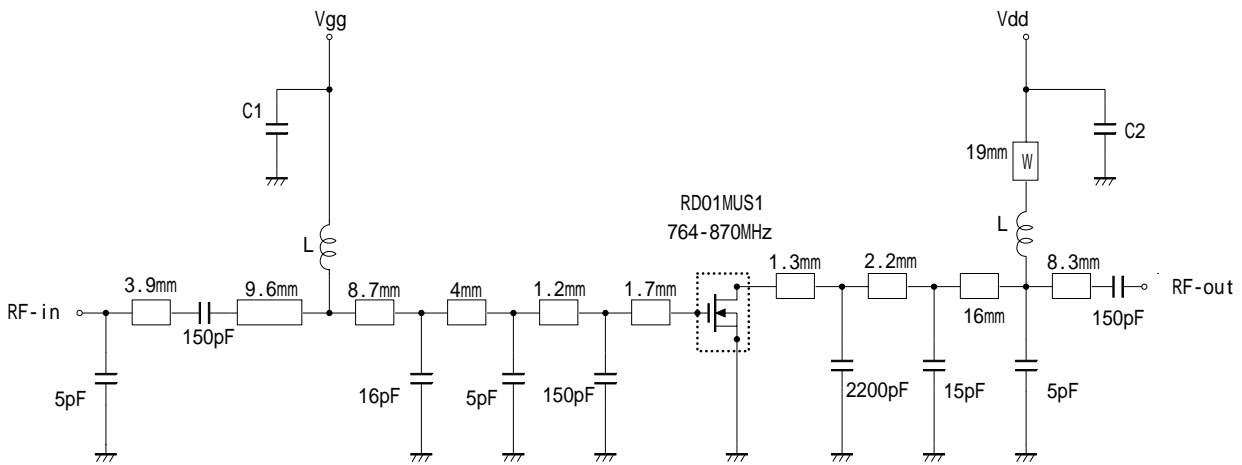


L 34.5nH: Enameled wire 5Turns, D:0.43mm, 2.46mm $\phi$ . D  
 C1, C2: 1000pF, 0.022uF in parallel

Note: Board material - Teflon substrate  
 Micro strip line width=2.2mm/500OHM, er:2.7, t=0.8mm  
 W: Line width=1.0mm



RD01MUS1 Equivalent Circuit (@f=764-870MHz)



L 34.5nH: Enamelled wire 5Turns,D:0.43mm,2.46mmO.D  
 C1,C2:2200pF in parallel

Note:Board material- Teflon substrate  
 Micro strip line width=2.2mm/500HM,er:2.7,t=0.8mm  
 W:Line width=1.0mm

