APPLICATION NOTE

MITSUBISHI ELECTRIC
Silicon RF Power Semiconductors

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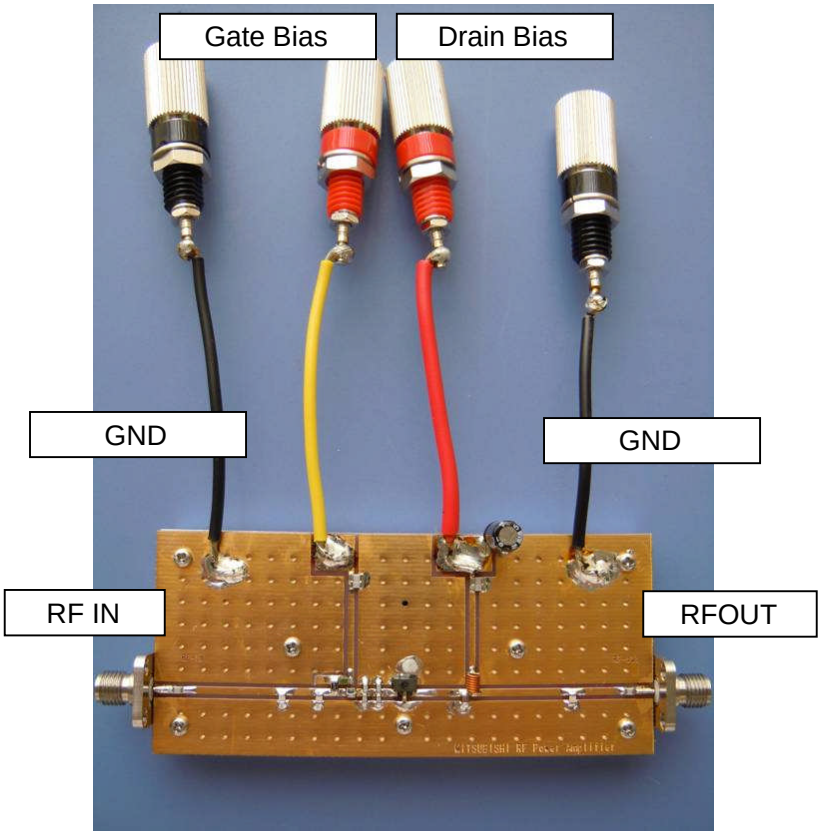
(Taking charge of Silicon RF by
MIYOSHI Electronics)

SUBJECT: RD01MUS2B single-stage amplifier with f=890-941MHz evaluation board

Features:

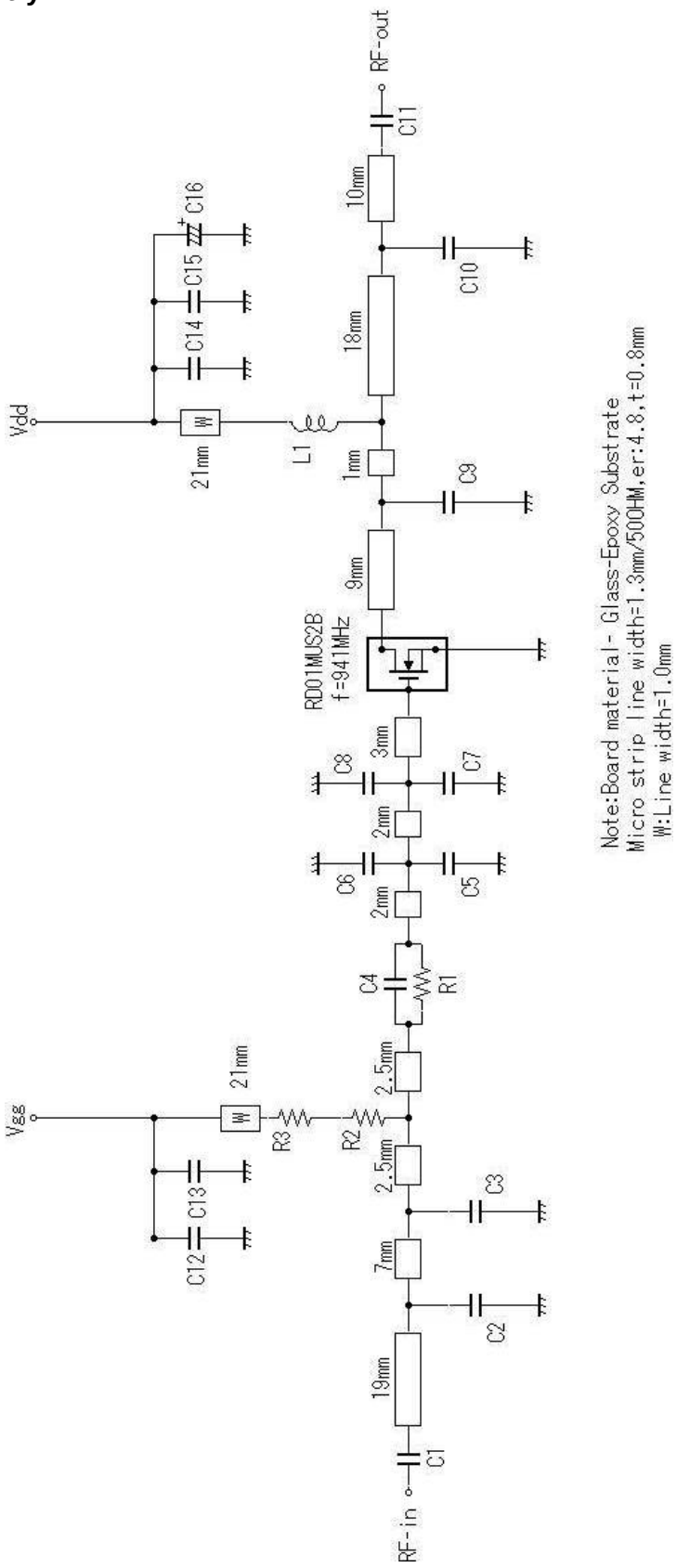
- The evaluation board for RD01MUS2B
- Frequency: 890-941MHz
- Typical input power: 30mW
- Typical output power: 1.5W
- Quiescent Current: 40mA
- Operating Current: 0.33A
- Surface-mounted RF power amplifier structure



PCB L=90mm W=40mm

Contents

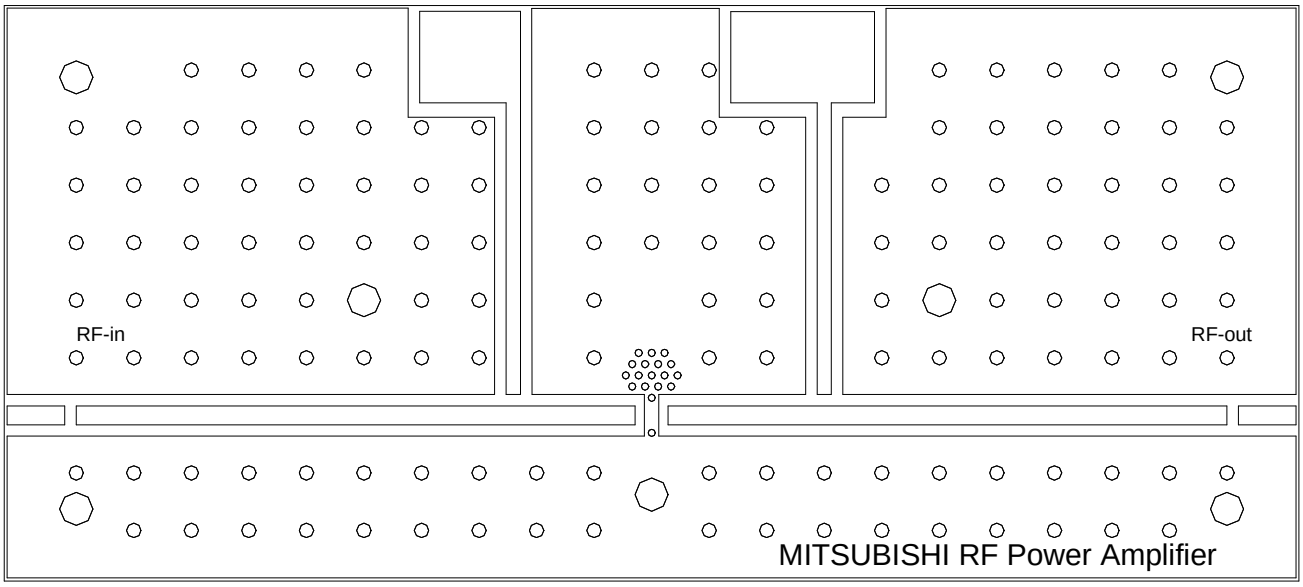
1. Equivalent Circuitry



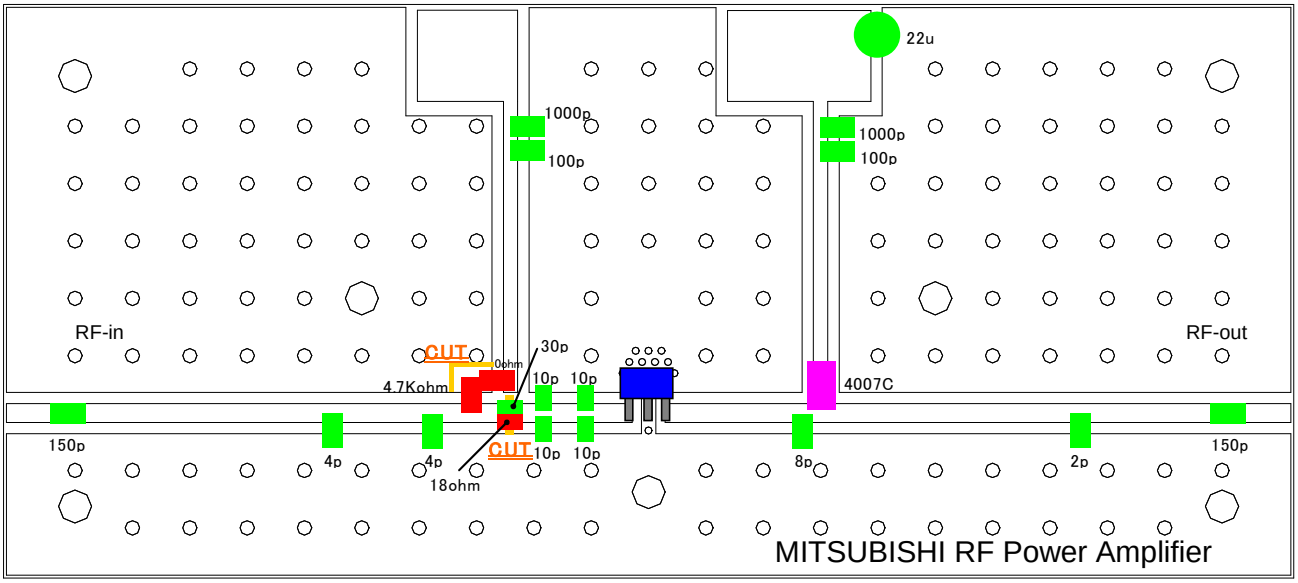
2. PCB Layout

BOARD OUTLINE: 90.0*40.0(mm)
MATERIAL : FR-4<R1705>
THICKNESS : 0.8(mm)

TOP VIEW



TOP VIEW (Parts mounting)



3. Component List

- Component List

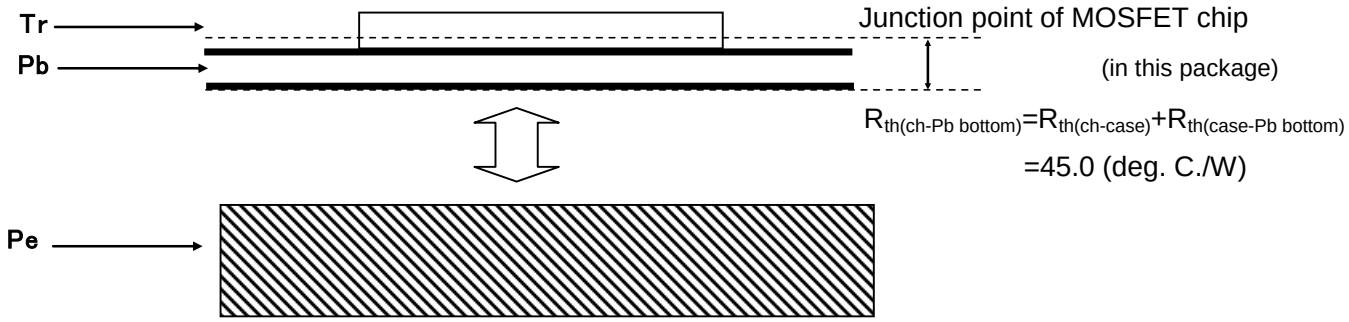
No.	Description	P/N	Qty	Manufacturer
Tr	MOSFET	RD01MUS2B	1	Mitsubishi Electric Corporation
C 1	150 pF 2012 50V	GRM2162C1H151JA01D	1	MURATA MANUFACTURING CO.
C 2	4 pF 2012 50V	GRM2162C1H4R0CD01D	1	MURATA MANUFACTURING CO.
C 3	4 pF 2012 50V	GRM2162C1H4R0CD01D	1	MURATA MANUFACTURING CO.
C 4	30 pF 2012 50V	GRM1882C1H300JA01D	1	MURATA MANUFACTURING CO.
C 5	10 pF 1608 50V	GRM1882C1H100JA01D	1	MURATA MANUFACTURING CO.
C 6	10 pF 1608 50V	GRM1882C1H100JA01D	1	MURATA MANUFACTURING CO.
C 7	10 pF 1608 50V	GRM1882C1H100JA01D	1	MURATA MANUFACTURING CO.
C 8	10 pF 1608 50V	GRM1882C1H100JA01D	1	MURATA MANUFACTURING CO.
C 9	8 pF 2012 50V	GRM2162C1H8R0DZ01D	1	MURATA MANUFACTURING CO.
C 10	2 pF 2012 50V	GRM2162C1H2R0CD01D	1	MURATA MANUFACTURING CO.
C 11	150 pF 2012 50V	GRM2162C1H151JA01D	1	MURATA MANUFACTURING CO.
C 12	100 pF 2012 50V	GRM2162C1H101JA01D	1	MURATA MANUFACTURING CO.
C 13	1000 pF 2012 50V	GRM2162C1H102JA01D	1	MURATA MANUFACTURING CO.
C 14	100 pF 2012 50V	GRM2162C1H101JA01D	1	MURATA MANUFACTURING CO.
C 15	1000 pF 2012 50V	GRM2162C1H102JA01D	1	MURATA MANUFACTURING CO.
C 16	22 uF 50V	H1002	1	NICHICON CORPORATION
L 1	37 nH * Diameter: Wire=0.4mm Inside=1.6mm T/N of coils=7		1	YC CORPORATION Co.,Ltd.
R 1	18 ohm 1608	RPC05T180J	1	TAIYOSHA ELECTRIC CO.
R 2	4.7k ohm 2012	RPC10T472J	1	TAIYOSHA ELECTRIC CO.
R 3	0 ohm 2012	RPC10N0R0J	1	TAIYOSHA ELECTRIC CO.
Pb	PCB	MS3A0138	1	Homebuilt
Rc	SMA female connector	HRM-300-118S	2	HIROSE ELECTRIC CO.,LTD
Bc 1	Bias connector red color	TM-605R	2	MSK Corporation
Bc 2	Bias connector black color	TM-605B	2	MSK Corporation
Pe	Aluminum pedestal		1	Homebuilt
	Conducting wire		4	Homebuilt
	Screw M2		11	-

* Inductor of Rolling Coil measurement condition : f=100MHz

- Standard Deliverable

TYPE1	Evaluation Board assembled with all the component
TYPE2	PCB (raw board)

4. Thermal Design of Heat Sink



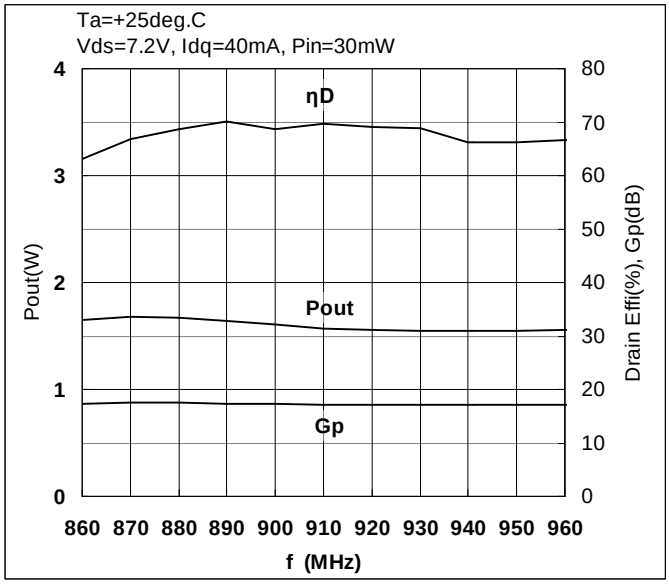
$Tch_{(delta)}$=(Pout/Efficiency-Pout+Pin) x $R_{th(ch\text{-}Pb\ bottom)}$=(1W/60%-1W+0.03) x 45 = 31 (deg. C.)
Also, operating Tj ("$Tj_{(op)}$")=120 (deg. C.), in case of RD series that $Tch_{(max)}$ = 150 (deg. C.)
Therefore $T_{Pb\ bottom\text{-}air}$ as delta temperature between Pb bottom and the ambient 60 deg. C.
$T_{Pb\ bottom\text{-}air}$="$Tj_{(op)}$"- $Tch_{(delta)}$ - $Ta_{(60deg.C.)}$=120-31-60=29 (deg. C.)

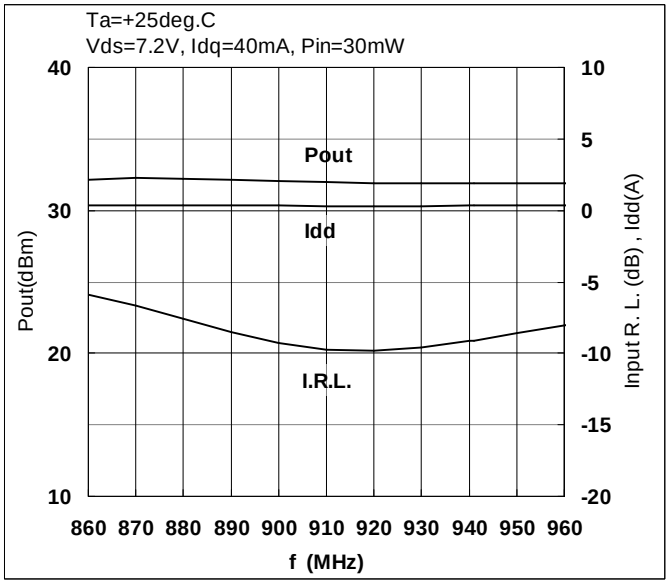
In terms of long-term reliability, "$Tj_{(op)}$" has to be kept less than 120 deg. C. i.e. $T_{Pb\ bottom\text{-}air}$ has to be less than 29 deg. C..
The thermal resistance of the heat sink to border it:
$Rth_{(Pb\ bottom\text{-}air)}$=$T_{Pb\ bottom\text{-}air}$/(Pout/Efficiency-Pout+Pin)=29/(1W/60%-1W+0.03)= 41 (deg. C./W)
Therefore
it is preferable that the thermal resistance of the heat sink is much smaller than 41 deg. C./W.

5. Typical Performance

5-1. Frequency vs.

OUTPUT POWER, POWER GAIN, DRAIN EFFICIENCY, DRAIN CURRENT and INPUT RETURN LOSS
(Vds=7.2V)



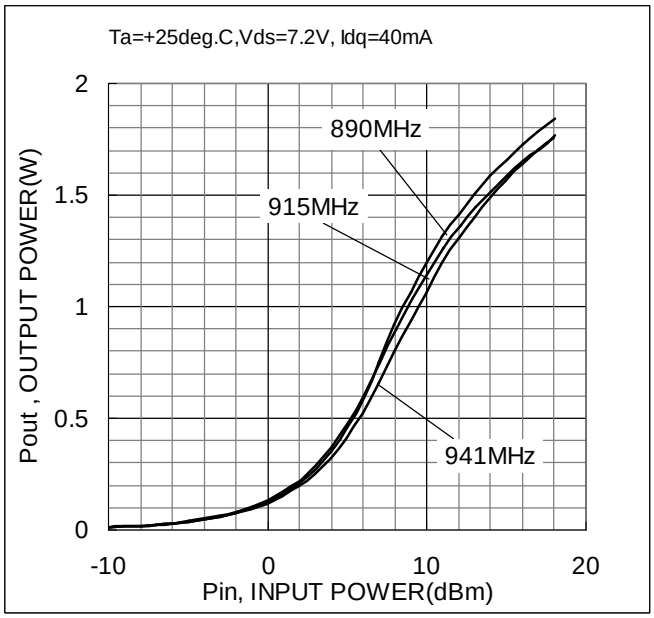


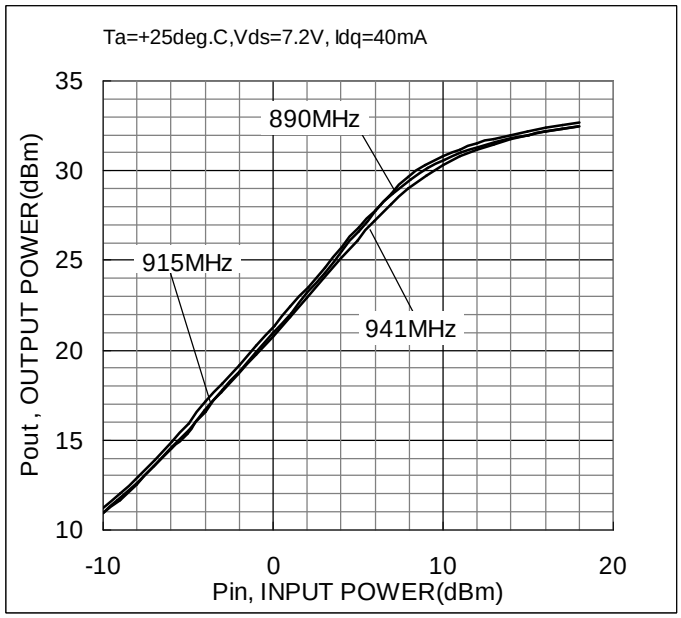
Ta=+25deg. C., Vds=7.2V, Idq=40mA, Pin=30mW

Freq.	Vgg	Pin		Pout		Gp	ID(RF)	ηadd	ηD	I.R.L.
(MHz)	(V)	(dBm)	(W)	(dBm)	(W)	(dB)	(A)	(%)	(%)	(dB)
860	1.38	14.8	0.03	32.2	1.65	17.4	0.36	62.0	63.1	-5.9
870	1.38	14.8	0.03	32.3	1.68	17.5	0.35	65.7	66.8	-6.7
880	1.38	14.8	0.03	32.2	1.67	17.5	0.34	67.4	68.6	-7.6
890	1.38	14.8	0.03	32.1	1.64	17.3	0.33	68.7	70.0	-8.5
900	1.38	14.8	0.03	32.1	1.60	17.2	0.33	67.3	68.6	-9.3
910	1.38	14.8	0.03	32.0	1.57	17.2	0.31	68.4	69.8	-9.8
920	1.38	14.8	0.03	31.9	1.55	17.1	0.31	67.6	69.0	-9.8
930	1.38	14.8	0.03	31.9	1.55	17.1	0.31	67.5	68.8	-9.6
940	1.38	14.8	0.03	31.9	1.55	17.1	0.33	64.8	66.1	-9.2
941	1.38	14.8	0.03	31.9	1.55	17.1	0.33	64.8	66.1	-9.1
950	1.38	14.8	0.03	31.9	1.55	17.1	0.33	65.0	66.3	-8.6
960	1.38	14.7	0.03	31.9	1.56	17.2	0.33	65.3	66.6	-8.0

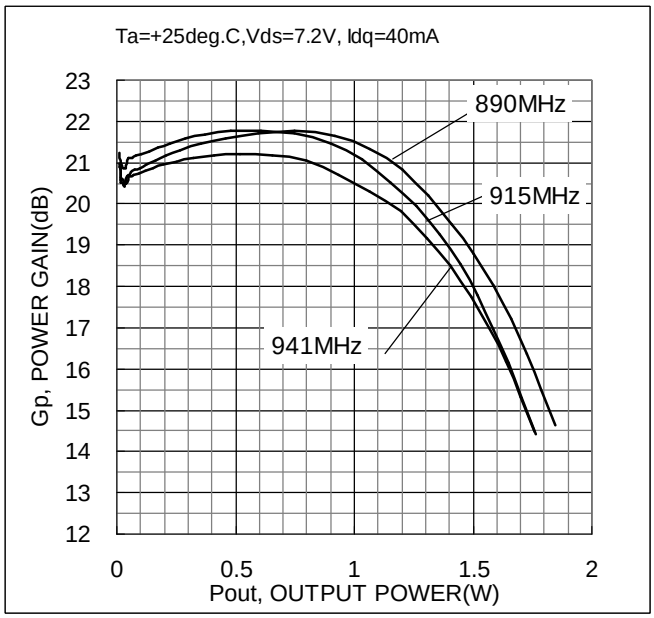
5-2. RF Power vs.

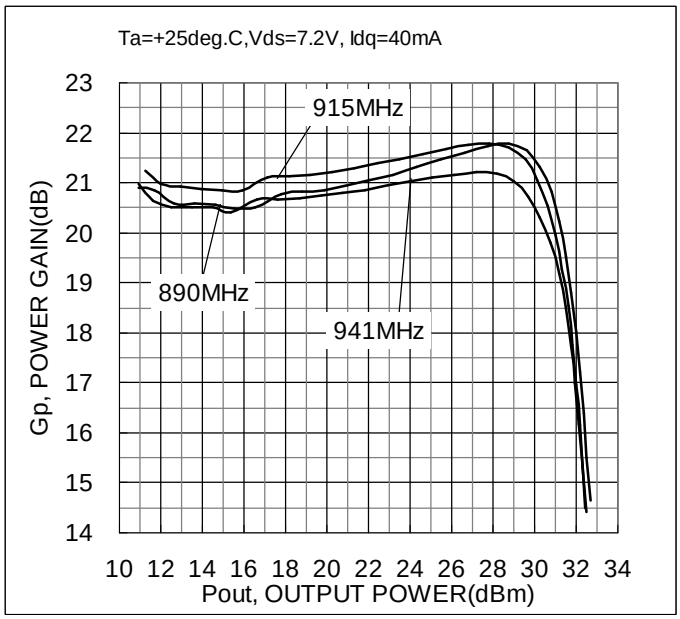
INPUT POWER (Vds=7.2V)



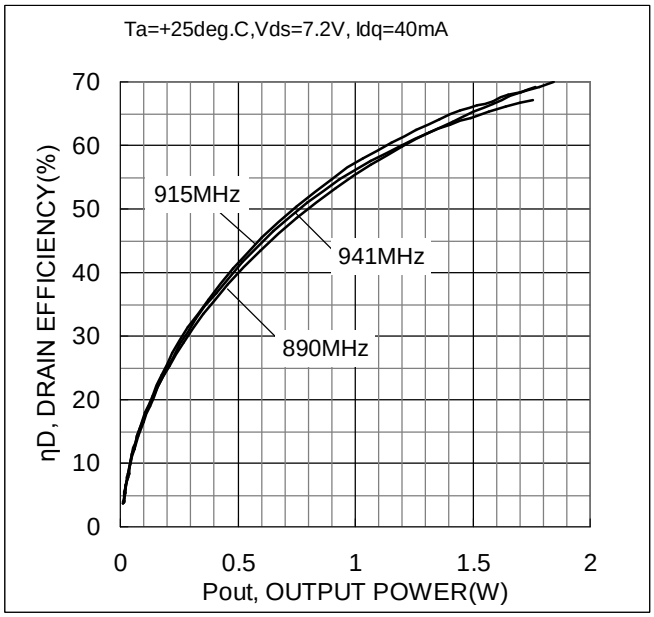


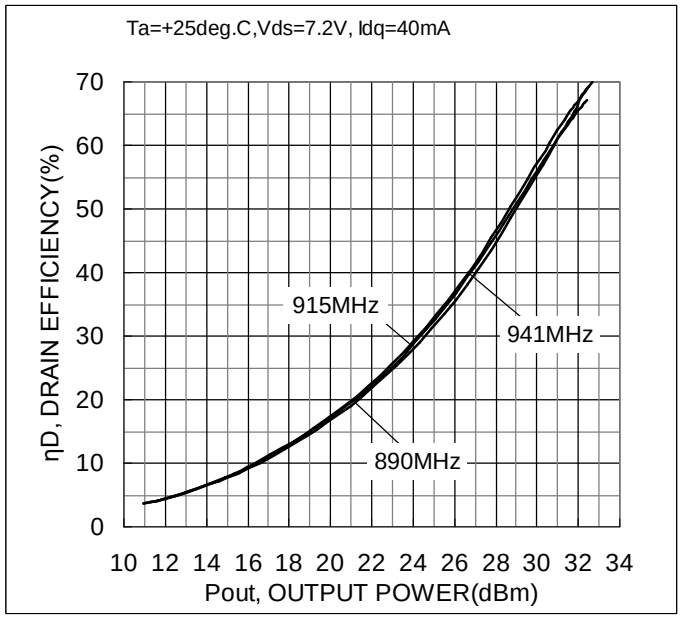
POWER GAIN (Vds=7.2V)



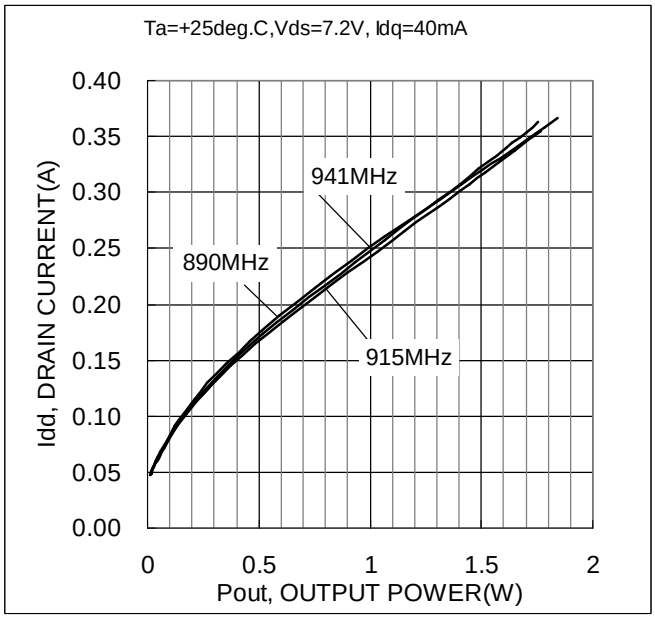


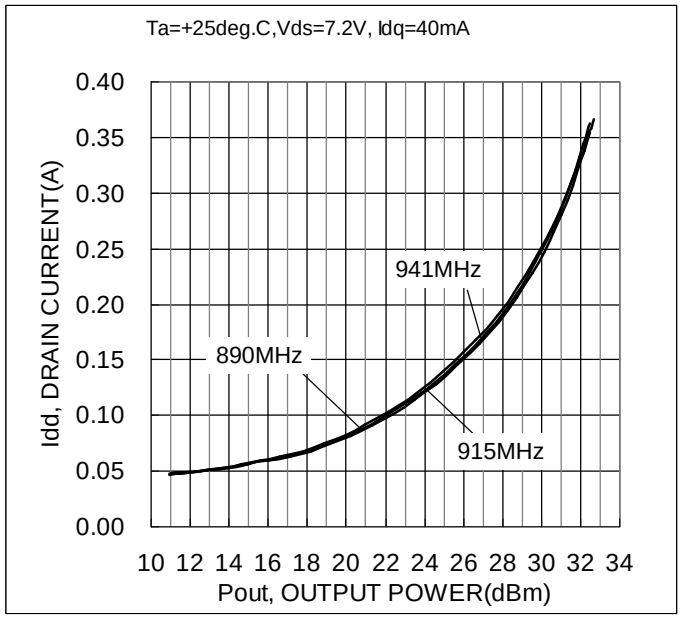
DRAIN EFFICIENCY (Vds=7.2V)



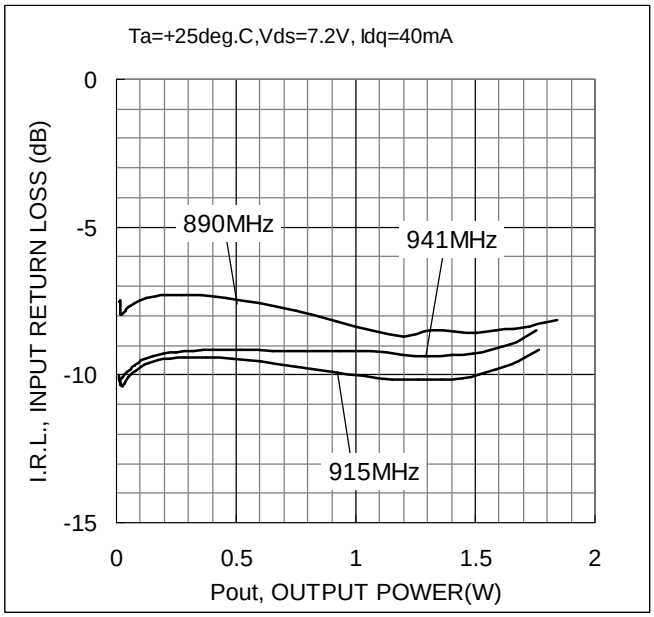


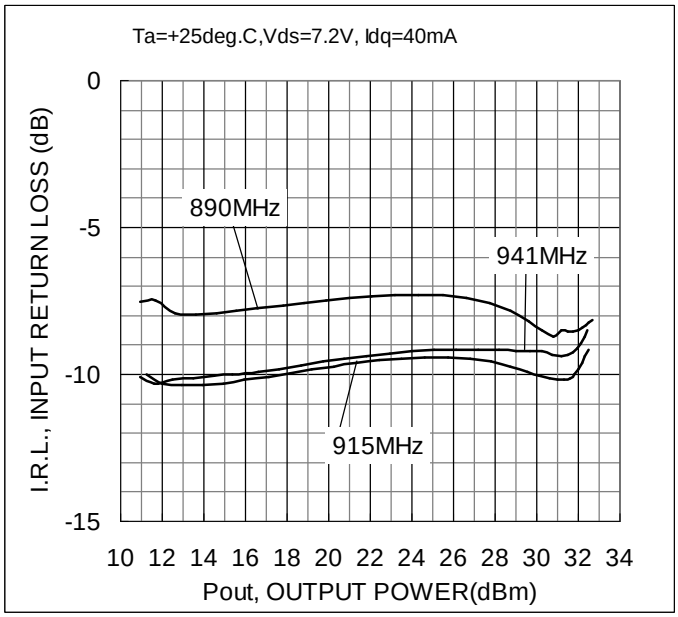
DRAIN CURRENT (Vds=7.2V)





INPUT RETURN LOSS (Vds=7.2V)





Ta=+25deg. C., Vds=7.2V, Idq=40mA

890MHz	Vgg	Pin		Pout		Gp	ID(RF)	ηadd	ηD	I.R.L.
	(V)	(dBm)	(mW)	(dBm)	(W)	(dB)	(A)	(%)	(%)	(dB)
	1.38	-10.0	0.1	10.9	0.0	20.9	0.05	3.6	3.6	-7.5
	1.38	-9.2	0.1	11.7	0.0	20.8	0.05	4.1	4.2	-7.5
	1.38	-8.0	0.2	12.6	0.0	20.6	0.05	4.9	5.0	-7.9
	1.38	-7.0	0.2	13.6	0.0	20.6	0.05	6.0	6.1	-8.0
	1.38	-6.0	0.3	14.6	0.0	20.6	0.06	7.1	7.2	-7.9
	1.38	-4.9	0.3	15.6	0.0	20.5	0.06	8.4	8.5	-7.8
	1.38	-3.9	0.4	16.6	0.0	20.5	0.06	9.9	10.0	-7.7
	1.38	-3.0	0.5	17.8	0.1	20.8	0.07	12.2	12.3	-7.7
	1.38	-2.0	0.6	18.8	0.1	20.8	0.07	14.2	14.3	-7.6
	1.38	-1.0	0.8	19.9	0.1	20.9	0.08	16.3	16.4	-7.5
	1.38	0.0	1.0	21.0	0.1	20.9	0.09	18.8	19.0	-7.4
	1.38	1.0	1.3	22.1	0.2	21.1	0.10	21.8	22.0	-7.3
	1.38	2.0	1.6	23.2	0.2	21.2	0.11	25.1	25.2	-7.3
	1.38	3.0	2.0	24.3	0.3	21.3	0.13	28.8	29.0	-7.3
	1.38	4.0	2.5	25.5	0.4	21.5	0.15	33.1	33.4	-7.3
	1.38	5.0	3.2	26.6	0.5	21.6	0.17	37.8	38.1	-7.4
	1.38	6.0	4.0	27.8	0.6	21.7	0.19	43.1	43.4	-7.6
	1.38	7.0	5.0	28.8	0.7	21.8	0.21	48.2	48.5	-7.8
	1.38	8.0	6.3	29.6	0.9	21.7	0.24	52.9	53.3	-8.2
	1.38	9.0	7.9	30.3	1.1	21.3	0.26	56.5	56.9	-8.5
	1.38	10.0	9.9	30.8	1.2	20.8	0.28	59.3	59.8	-8.7
	1.38	11.0	12.5	31.2	1.3	20.2	0.29	61.4	62.0	-8.5
	1.38	12.0	15.8	31.5	1.4	19.5	0.31	63.1	63.8	-8.6
	1.38	13.0	19.9	31.8	1.5	18.8	0.32	64.4	65.3	-8.6
	1.38	14.0	25.0	32.0	1.6	18.0	0.33	65.5	66.5	-8.5
	1.38	15.0	31.6	32.2	1.7	17.2	0.34	66.4	67.7	-8.4
	1.38	16.0	39.8	32.4	1.7	16.4	0.35	67.0	68.5	-8.3
	1.38	17.0	50.3	32.5	1.8	15.5	0.36	67.3	69.3	-8.2
	1.38	18.0	63.3	32.7	1.8	14.6	0.37	67.6	70.0	-8.1

915MHz

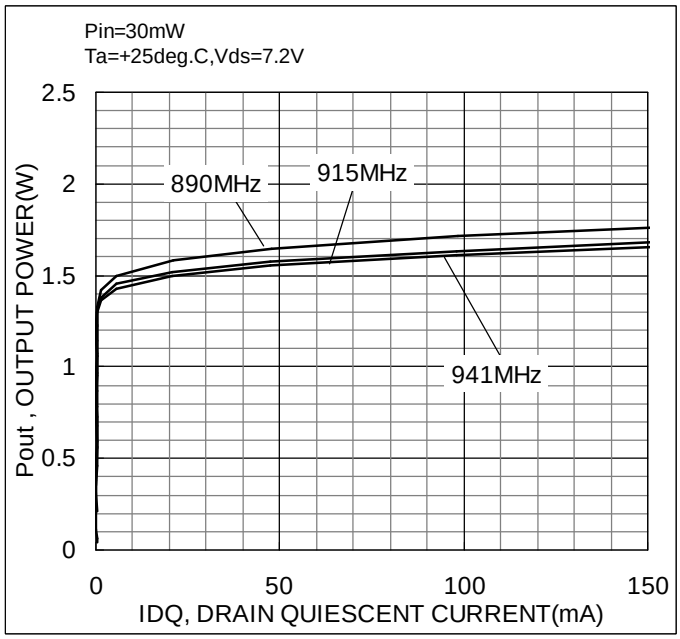
Vgg	Pin		Pout		Gp	ID(RF)	ηadd	ηD	I.R.L.
(V)	(dBm)	(W)	(dBm)	(W)	(dB)	(A)	(%)	(%)	(dB)
1.38	-10.0	0.1	11.2	0.0	21.2	0.05	3.9	3.9	-10.0
1.38	-9.0	0.1	12.0	0.0	21.0	0.05	4.5	4.5	-10.3
1.38	-8.0	0.2	13.0	0.0	20.9	0.05	5.4	5.4	-10.3
1.38	-6.9	0.2	13.9	0.0	20.9	0.05	6.4	6.5	-10.4
1.38	-5.9	0.3	14.9	0.0	20.9	0.06	7.7	7.7	-10.3
1.38	-4.9	0.3	15.9	0.0	20.8	0.06	9.1	9.2	-10.2
1.38	-4.0	0.4	17.1	0.1	21.1	0.06	11.3	11.4	-10.1
1.38	-3.0	0.5	18.2	0.1	21.1	0.07	13.3	13.4	-10.0
1.38	-2.0	0.6	19.2	0.1	21.2	0.07	15.4	15.5	-9.8
1.38	-1.0	0.8	20.2	0.1	21.2	0.08	17.8	17.9	-9.7
1.38	0.0	1.0	21.3	0.1	21.3	0.09	20.4	20.6	-9.6
1.38	1.0	1.3	22.4	0.2	21.4	0.10	23.7	23.8	-9.5
1.38	2.0	1.6	23.5	0.2	21.5	0.11	27.1	27.3	-9.5
1.38	3.0	2.0	24.6	0.3	21.6	0.13	31.2	31.4	-9.4
1.38	4.0	2.5	25.7	0.4	21.7	0.15	35.4	35.6	-9.4
1.38	5.1	3.2	26.8	0.5	21.8	0.16	40.4	40.7	-9.5
1.38	6.0	4.0	27.8	0.6	21.8	0.18	45.2	45.5	-9.6
1.38	7.0	5.1	28.8	0.7	21.7	0.21	50.1	50.4	-9.7
1.38	8.1	6.4	29.5	0.9	21.5	0.23	54.4	54.8	-9.9
1.38	9.1	8.1	30.1	1.0	21.1	0.25	57.6	58.0	-10.0
1.38	10.1	10.2	30.6	1.2	20.5	0.27	59.9	60.4	-10.1
1.38	11.0	12.7	31.0	1.3	20.0	0.28	61.9	62.5	-10.2
1.38	12.1	16.1	31.3	1.4	19.3	0.29	63.3	64.1	-10.2
1.38	13.0	20.2	31.6	1.4	18.6	0.31	64.5	65.5	-10.1
1.38	14.0	25.3	31.8	1.5	17.8	0.32	65.1	66.2	-10.0
1.38	15.0	31.9	32.0	1.6	17.0	0.33	65.6	67.0	-9.8
1.38	16.0	40.2	32.2	1.7	16.1	0.34	66.3	68.0	-9.6
1.38	17.0	50.5	32.3	1.7	15.3	0.35	66.4	68.4	-9.4
1.38	18.0	63.7	32.5	1.8	14.4	0.35	66.7	69.2	-9.1

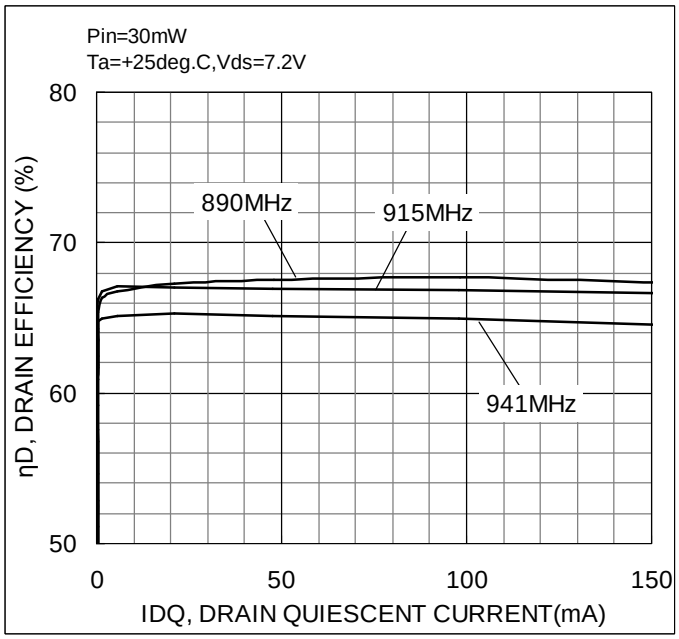
941MHz

Vgg	Pin		Pout		Gp	ID(RF)	ηadd	ηD	I.R.L.
(V)	(dBm)	(W)	(dBm)	(W)	(dB)	(A)	(%)	(%)	(dB)
1.38	-10.0	0.1	10.9	0.0	21.0	0.05	3.6	3.7	-10.1
1.38	-9.0	0.1	11.6	0.0	20.6	0.05	4.1	4.2	-10.3
1.38	-8.0	0.2	12.5	0.0	20.5	0.05	4.9	4.9	-10.2
1.38	-7.0	0.2	13.5	0.0	20.5	0.05	5.9	6.0	-10.1
1.38	-6.0	0.3	14.5	0.0	20.5	0.05	7.1	7.2	-10.1
1.38	-5.0	0.3	15.4	0.0	20.4	0.06	8.2	8.3	-10.0
1.38	-4.0	0.4	16.6	0.0	20.7	0.06	10.3	10.4	-9.9
1.38	-3.0	0.5	17.6	0.1	20.7	0.07	12.1	12.2	-9.8
1.38	-2.0	0.6	18.7	0.1	20.7	0.07	14.1	14.2	-9.7
1.38	-1.0	0.8	19.7	0.1	20.7	0.08	16.3	16.5	-9.6
1.38	0.0	1.0	20.8	0.1	20.8	0.09	18.7	18.9	-9.5
1.38	1.0	1.2	21.8	0.2	20.9	0.10	21.5	21.6	-9.4
1.38	2.0	1.6	22.9	0.2	20.9	0.11	24.8	25.0	-9.3
1.38	3.0	2.0	24.0	0.3	21.0	0.12	28.4	28.7	-9.2
1.38	4.0	2.5	25.1	0.3	21.1	0.14	32.4	32.6	-9.2
1.38	4.9	3.1	26.1	0.4	21.2	0.15	36.4	36.7	-9.1
1.38	5.9	3.9	27.2	0.5	21.2	0.17	41.4	41.7	-9.1
1.38	7.0	5.0	28.2	0.7	21.2	0.20	46.2	46.6	-9.2
1.38	8.0	6.3	29.0	0.8	21.0	0.22	50.6	51.0	-9.2
1.38	9.0	7.9	29.7	0.9	20.7	0.24	54.2	54.6	-9.2
1.38	10.0	9.9	30.3	1.1	20.3	0.26	56.9	57.5	-9.2
1.38	11.0	12.5	30.8	1.2	19.8	0.28	59.4	60.0	-9.3
1.38	12.0	15.8	31.2	1.3	19.2	0.29	61.2	61.9	-9.4
1.38	13.0	19.8	31.5	1.4	18.5	0.31	62.4	63.3	-9.3
1.38	14.0	25.0	31.7	1.5	17.7	0.32	63.3	64.4	-9.3
1.38	15.0	31.3	32.0	1.6	17.0	0.33	64.1	65.4	-9.1
1.38	16.0	39.6	32.2	1.6	16.2	0.34	64.6	66.2	-9.0
1.38	17.0	49.8	32.3	1.7	15.3	0.35	64.8	66.7	-8.7
1.38	18.0	62.5	32.5	1.8	14.5	0.36	64.8	67.2	-8.5

5-3. Drain Quiescent Current vs.

OUTPUT POWER and DRAIN EFFICIENCY (Vds=7.2V)





Ta=+25deg. C., Vds=7.2V, Pin=30mW

890MHz

Vgg (V)	Idq (mA)	Pin (dBm)	Pin (W)	Pout (dBm)	Pout (W)	Idd (A)	ηD (%)	ηadd (%)	Gain (dB)	I.R.L. (dB)
0.71	0.2	14.8	0.03	29.8	0.94	0.22	59.4	57.6	15.0	-5.5
0.80	0.3	14.8	0.03	30.3	1.08	0.24	61.9	60.2	15.6	-5.8
0.90	0.3	14.8	0.03	30.9	1.23	0.27	64.3	62.7	16.1	-6.5
1.01	0.3	14.8	0.03	31.2	1.33	0.28	65.4	63.9	16.5	-6.6
1.10	1.4	14.8	0.03	31.5	1.42	0.30	66.4	65.0	16.8	-7.2
1.20	5.5	14.8	0.03	31.8	1.50	0.31	66.8	65.5	17.0	-7.4
1.31	21.0	14.8	0.03	32.0	1.58	0.33	67.3	66.0	17.2	-7.9
1.40	47.9	14.8	0.03	32.2	1.65	0.34	67.5	66.3	17.4	-8.3
1.50	98.3	14.8	0.03	32.4	1.72	0.35	67.7	66.5	17.6	-8.9
1.61	165.1	14.8	0.03	32.5	1.77	0.37	67.3	66.1	17.7	-9.5

915MHz

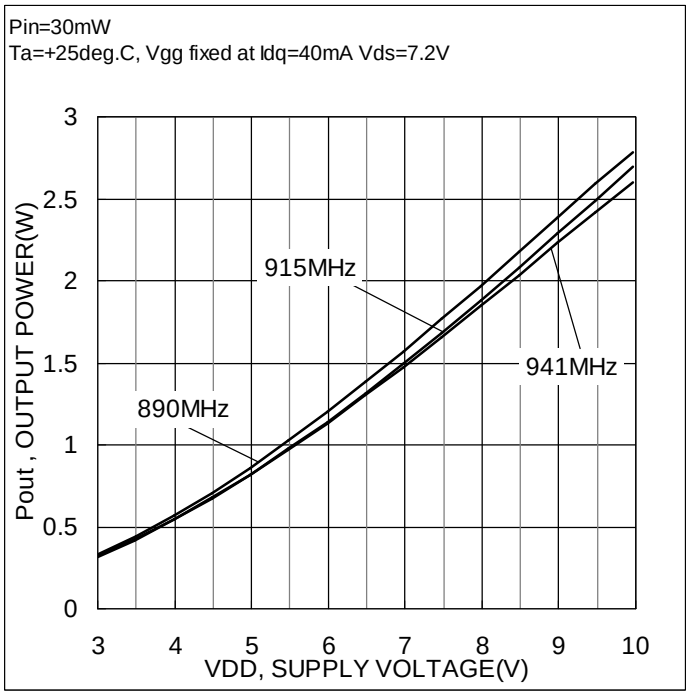
Vgg (V)	Idq (mA)	Pin (dBm)	Pin (W)	Pout (dBm)	Pout (W)	Idd (A)	ηD (%)	ηadd (%)	Gain (dB)	I.R.L. (dB)
0.71	0.2	14.8	0.03	30.3	1.06	0.23	63.5	61.7	15.5	-7.2
0.80	0.2	14.8	0.03	30.6	1.15	0.25	64.9	63.2	15.8	-7.7
0.90	0.2	14.8	0.03	30.9	1.24	0.26	65.6	64.0	16.1	-7.9
1.01	0.4	14.8	0.03	31.2	1.32	0.28	66.2	64.7	16.4	-8.2
1.10	1.3	14.8	0.03	31.4	1.38	0.29	66.7	65.3	16.6	-8.6
1.20	5.5	14.8	0.03	31.6	1.46	0.30	67.1	65.7	16.9	-9.0
1.31	20.9	14.8	0.03	31.8	1.52	0.32	67.0	65.7	17.0	-9.4
1.40	47.6	14.8	0.03	32.0	1.57	0.33	67.0	65.7	17.2	-9.8
1.50	97.9	14.8	0.03	32.1	1.63	0.34	66.8	65.6	17.4	-10.2
1.61	164.7	14.8	0.03	32.3	1.69	0.35	66.6	65.4	17.5	-10.6

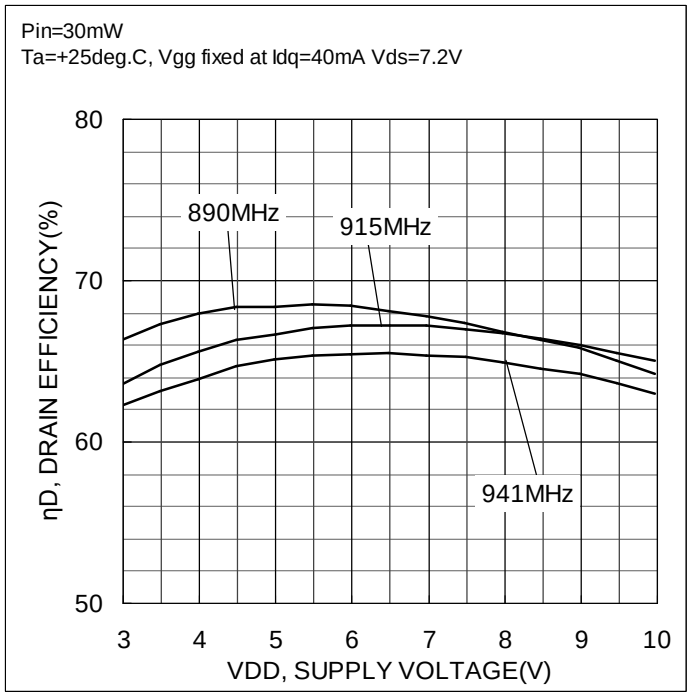
941MHz

Vgg (V)	Idq (mA)	Pin (dBm)	Pin (W)	Pout (dBm)	Pout (W)	Idd (A)	ηD (%)	ηadd (%)	Gain (dB)	I.R.L. (dB)
0.71	0.2	14.8	0.03	30.3	1.06	0.24	62.4	60.7	15.5	-7.5
0.80	0.2	14.8	0.03	30.6	1.14	0.25	63.5	61.8	15.8	-7.7
0.90	0.2	14.8	0.03	30.9	1.22	0.26	64.1	62.5	16.1	-7.9
1.01	0.4	14.8	0.03	31.1	1.30	0.28	64.8	63.3	16.4	-8.2
1.10	1.4	14.8	0.03	31.3	1.36	0.29	65.0	63.6	16.6	-8.4
1.20	5.5	14.8	0.03	31.6	1.43	0.31	65.1	63.8	16.8	-8.7
1.31	20.9	14.8	0.03	31.8	1.50	0.32	65.3	64.0	17.0	-9.0
1.40	47.5	14.8	0.03	31.9	1.55	0.33	65.2	63.9	17.1	-9.2
1.50	97.9	14.8	0.03	32.1	1.61	0.35	64.9	63.7	17.3	-9.4
1.61	164.6	14.8	0.03	32.2	1.67	0.36	64.5	63.3	17.4	-9.5

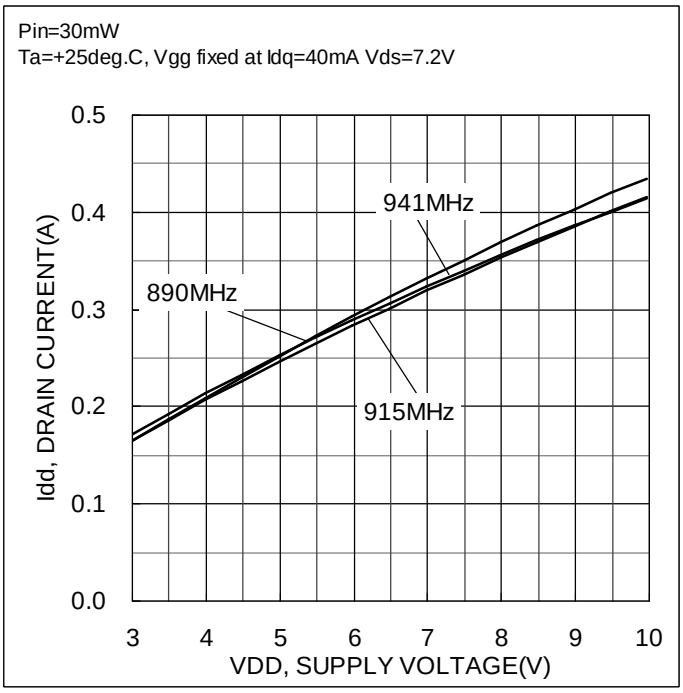
5-4. DC Power Supply vs.

OUTPUT POWER and DRAIN EFFICIENCY (Idq=40mA)





DRAIN CURRENT (Idq=40mA)



Ta=+25deg. C., Idq=40mA

890MHz

Vgg (V)	Vdd (V)	Idq (mA)	Pin (dBm)	Pin (mW)	Pout (dBm)	Pout (W)	Idd (A)	ηD (%)	ηadd (%)	Gain (dB)	I.R.L. (dB)
1.38	3.0	37.3	14.8	0.03	25.1	0.3	0.16	66.3	60.2	10.3	-8.0
1.38	3.5	37.7	14.8	0.03	26.4	0.4	0.19	67.3	62.7	11.6	-8.2
1.38	4.0	38.4	14.8	0.03	27.5	0.6	0.21	68.0	64.4	12.7	-8.4
1.38	4.5	38.9	14.8	0.03	28.5	0.7	0.23	68.3	65.4	13.7	-8.5
1.38	5.0	39.5	14.8	0.03	29.3	0.9	0.25	68.4	66.0	14.6	-8.5
1.38	5.5	40.1	14.8	0.03	30.1	1.0	0.27	68.5	66.5	15.3	-8.6
1.38	6.0	40.7	14.8	0.03	30.8	1.2	0.29	68.5	66.7	16.0	-8.6
1.38	6.5	41.3	14.8	0.03	31.4	1.4	0.31	68.2	66.7	16.6	-8.6
1.38	7.0	42.0	14.8	0.03	32.0	1.6	0.33	67.8	66.5	17.2	-8.6
1.38	7.5	42.8	14.8	0.03	32.5	1.8	0.35	67.4	66.3	17.7	-8.6
1.38	8.0	43.4	14.8	0.03	32.9	2.0	0.37	66.9	65.8	18.2	-8.5
1.38	8.5	44.2	14.8	0.03	33.4	2.2	0.39	66.3	65.4	18.6	-8.5
1.38	9.0	44.7	14.8	0.03	33.8	2.4	0.40	65.8	65.0	19.0	-8.4
1.38	9.5	45.6	14.8	0.03	34.1	2.6	0.42	65.1	64.3	19.3	-8.4
1.38	10.0	46.6	14.8	0.03	34.5	2.8	0.44	64.2	63.5	19.7	-8.3

915MHz

Vgg (V)	Vdd (V)	Idq (mA)	Pin (dBm)	Pin (W)	Pout (dBm)	Pout (W)	Idd (A)	ηD (%)	ηadd (%)	Gain (dB)	I.R.L. (dB)
1.38	3.0	37.3	14.8	0.03	25.0	0.3	0.17	63.6	57.6	10.2	-9.0
1.38	3.5	37.8	14.8	0.03	26.2	0.4	0.19	64.8	60.2	11.5	-9.3
1.38	4.0	38.5	14.8	0.03	27.3	0.5	0.21	65.6	62.0	12.6	-9.5
1.38	4.5	39.0	14.8	0.03	28.3	0.7	0.23	66.4	63.4	13.5	-9.6
1.38	5.0	39.7	14.8	0.03	29.1	0.8	0.25	66.7	64.2	14.4	-9.7
1.38	5.5	40.1	14.8	0.03	29.9	1.0	0.26	67.0	65.0	15.1	-9.8
1.38	6.0	40.8	14.8	0.03	30.6	1.1	0.28	67.3	65.5	15.8	-9.9
1.38	6.5	41.4	14.8	0.03	31.2	1.3	0.30	67.2	65.7	16.4	-9.9
1.38	7.0	42.0	14.8	0.03	31.8	1.5	0.32	67.2	65.9	17.0	-9.9
1.38	7.5	42.7	14.8	0.03	32.3	1.7	0.34	67.0	65.8	17.5	-9.9
1.38	8.0	43.4	14.8	0.03	32.7	1.9	0.35	66.7	65.7	18.0	-9.8
1.38	8.5	44.2	14.8	0.03	33.2	2.1	0.37	66.4	65.5	18.4	-9.8
1.38	9.0	44.8	14.8	0.03	33.6	2.3	0.39	66.0	65.2	18.8	-9.7
1.38	9.5	45.6	14.8	0.03	34.0	2.5	0.40	65.6	64.8	19.2	-9.6
1.38	10.0	46.5	14.8	0.03	34.3	2.7	0.42	65.1	64.3	19.5	-9.5

941MHz

Vgg (V)	Vdd (V)	Idq (mA)	Pin (dBm)	Pin (W)	Pout (dBm)	Pout (W)	Idd (A)	ηD (%)	ηadd (%)	Gain (dB)	I.R.L. (dB)
1.38	3.0	37.3	14.8	0.03	25.0	0.3	0.17	62.3	56.5	10.3	-8.6
1.38	3.5	37.8	14.8	0.03	26.3	0.4	0.19	63.2	58.7	11.5	-8.8
1.38	4.0	38.4	14.8	0.03	27.4	0.5	0.21	63.9	60.4	12.6	-8.9
1.38	4.5	38.9	14.8	0.03	28.3	0.7	0.23	64.8	61.9	13.5	-9.0
1.38	5.0	39.4	14.8	0.03	29.1	0.8	0.25	65.1	62.7	14.4	-9.1
1.38	5.5	40.2	14.8	0.03	29.9	1.0	0.27	65.3	63.3	15.1	-9.2
1.38	6.0	40.6	14.8	0.03	30.5	1.1	0.29	65.4	63.7	15.7	-9.2
1.38	6.5	41.4	14.8	0.03	31.2	1.3	0.31	65.6	64.1	16.4	-9.2
1.38	7.0	42.0	14.8	0.03	31.7	1.5	0.32	65.3	64.0	16.9	-9.1
1.38	7.5	42.6	14.8	0.03	32.2	1.7	0.34	65.3	64.1	17.4	-9.1
1.38	8.0	43.4	14.8	0.03	32.7	1.8	0.36	64.9	63.9	17.9	-9.1
1.38	8.5	44.1	14.8	0.03	33.1	2.0	0.37	64.5	63.6	18.3	-9.0
1.38	9.0	44.8	14.8	0.03	33.5	2.2	0.39	64.2	63.4	18.7	-8.9
1.38	9.5	45.6	14.8	0.03	33.8	2.4	0.40	63.7	62.9	19.0	-8.9
1.38	10.0	46.4	14.8	0.03	34.2	2.6	0.41	63.0	62.3	19.4	-8.8

6. Revision history

Revision	Change	Date
-	Initial release	11-Nov.-2011