



GRF5604
420-470 MHz

Schematic:

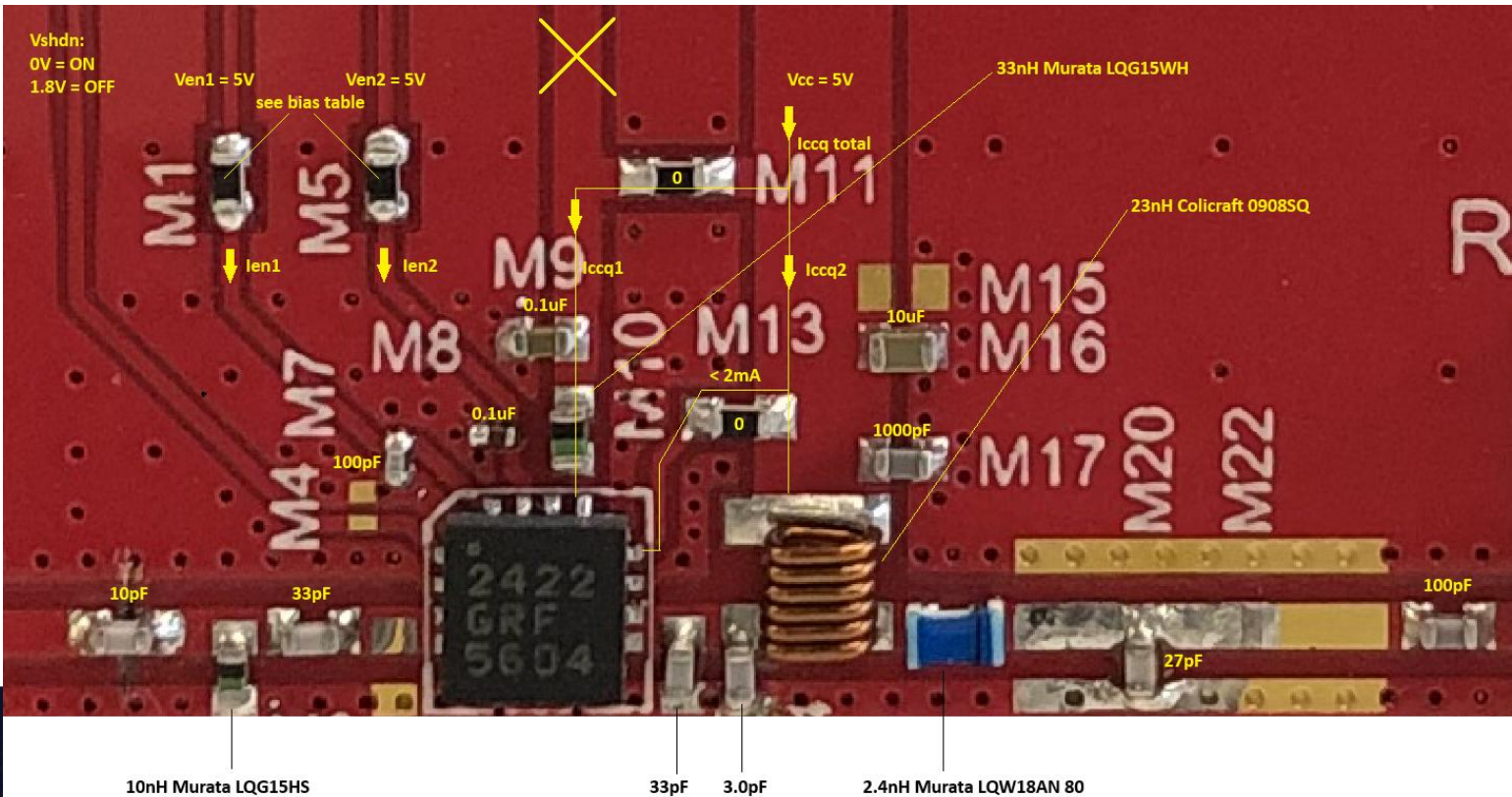
GRF5604 in two configurations:

- 1. Nominal → set up for maximum compression point and saturated output power.
- 2. Linear → set up to accommodate signal requiring backed off linearity. In this case we will use 5 MHz QPSK with PAPR = 4.85 dB.

Obvious difference between the two is higher bias for the linear case. More subtle linearity hooks as follows:

- M10 = 33nH
- M7/M8 = 100pF/0.1uF
- 10uF at M16

Bias Point	Bias R M1 ohm	Bias R M5 ohm	Vcc V	Iccq total mA	Iccq1 mA	Iccq2 mA	Ven1 V	Ien1 mA	Ven2 V	Ien2 mA
Nominal	2000	6000	5	248	60	188	5	1.9	5	0.43
Linear	2430	3000	5	416	47	369	5	1.53	5	0.86

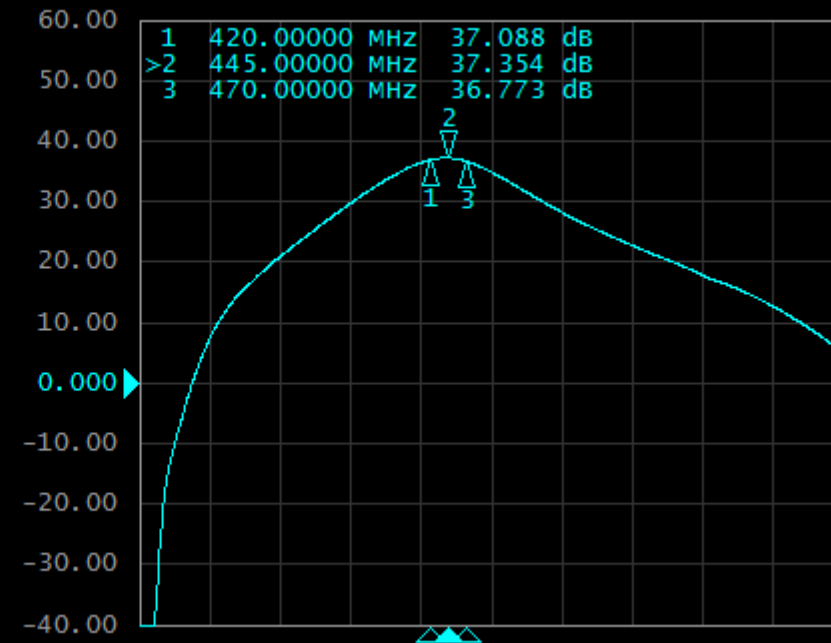


Response:

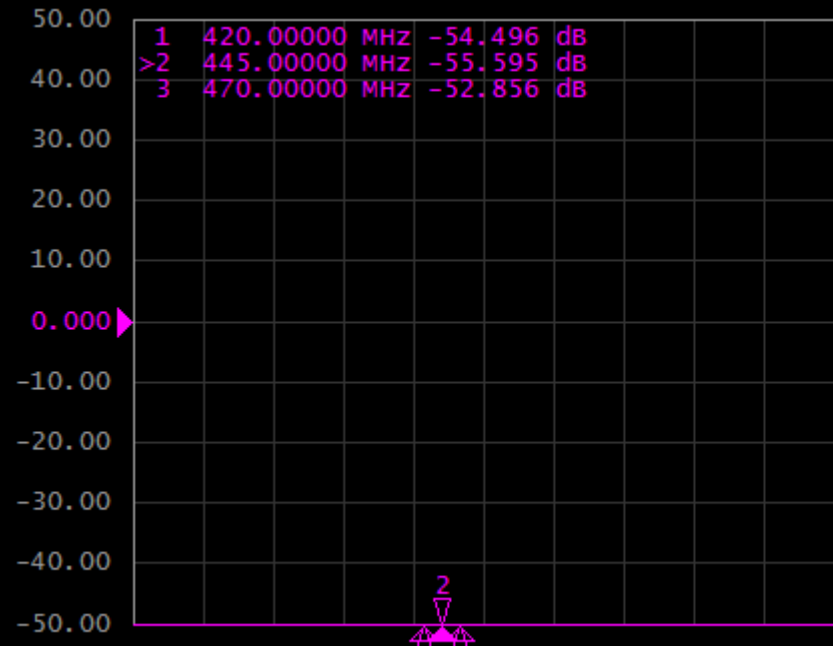
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F2]



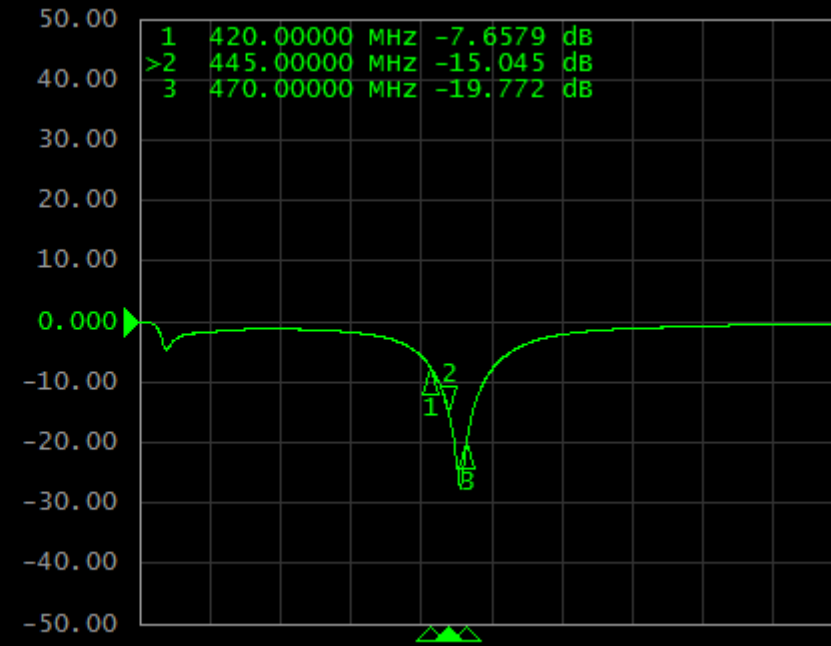
Tr2 S21 Log Mag 10.00dB/ Ref 0.000dB [F2]



Tr3 S12 Log Mag 10.00dB/ Ref 0.000dB [F2]



Tr4 S22 Log Mag 10.00dB/ Ref 0.000dB [F2]



1 Start 10 MHz

IFBW 10 kHz

Stop 1 GHz

Compare standard data for the two configurations:

Notable trade off being higher OIP3 and lower OP1dB for the linear case.

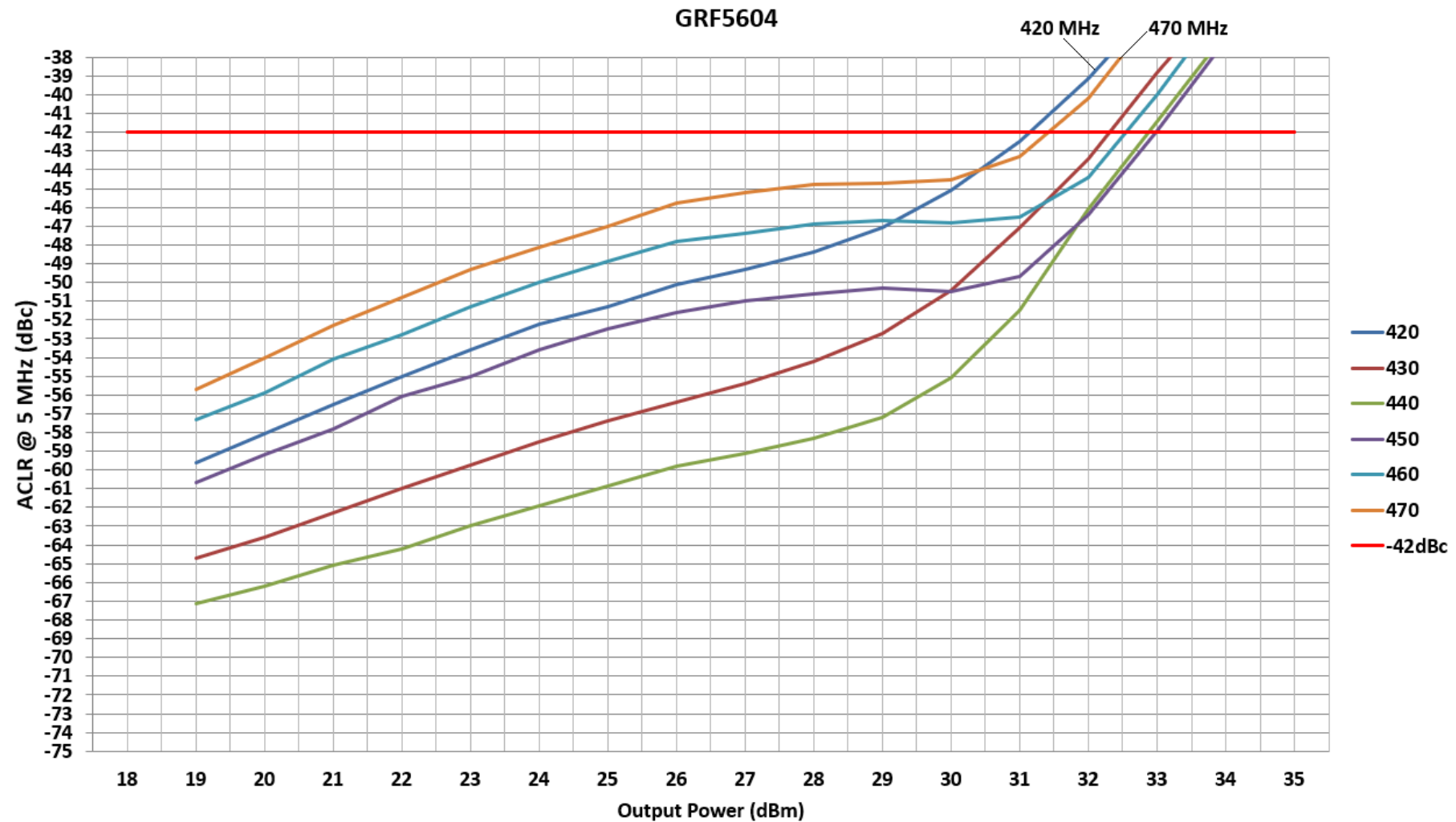
Configuration	Freq MHz	Vcc V	Iccq mA	Ven1 V	Ien1 mA	Ven2 V	Ien2 mA	Vshdn V	Ishdn mA	IP3 Tone Power dBm	IP3 Tone Spacing MHz	Gain dB	OIP3 dBm	OP1dB dBm	PAE %	EVB NF dB
Nominal	420	5	249.4	5	1.9	5	0.43	0	0	22	0.6	37.4	36.4	36.2	48.8	3.6
Nominal	430	5	249.4	5	1.9	5	0.43	0	0	22	0.6	37.5	36.5	36.8	53.9	3.6
Nominal	440	5	249.4	5	1.9	5	0.43	0	0	22	0.6	37.4	36.5	37.5	60.2	3.5
Nominal	450	5	249.4	5	1.9	5	0.43	0	0	22	0.6	37.5	36.4	37.5	58.9	3.5
Nominal	460	5	249.4	5	1.9	5	0.43	0	0	22	0.6	37.2	36.2	36.7	50.2	3.5
Nominal	470	5	249.4	5	1.9	5	0.43	0	0	22	0.6	36.8	36.4	35.8	43.8	3.6
Linear	420	5	412.9	5	1.53	5	0.86	0	0	22	0.6	37.8	43.5	34.3	38.8	3.6
Linear	430	5	412.9	5	1.53	5	0.86	0	0	22	0.6	37.8	47.4	35.5	45.4	3.6
Linear	440	5	412.9	5	1.53	5	0.86	0	0	22	0.6	37.9	49	36.2	49.6	3.5
Linear	450	5	412.9	5	1.53	5	0.86	0	0	22	0.6	37.9	44.5	36.2	48.8	3.5
Linear	460	5	412.9	5	1.53	5	0.86	0	0	22	0.6	37.7	42.5	35.4	43.9	3.5
Linear	470	5	412.9	5	1.53	5	0.86	0	0	22	0.6	37.1	41.4	34.4	38.6	3.6

Saturated output power for the nominal case:

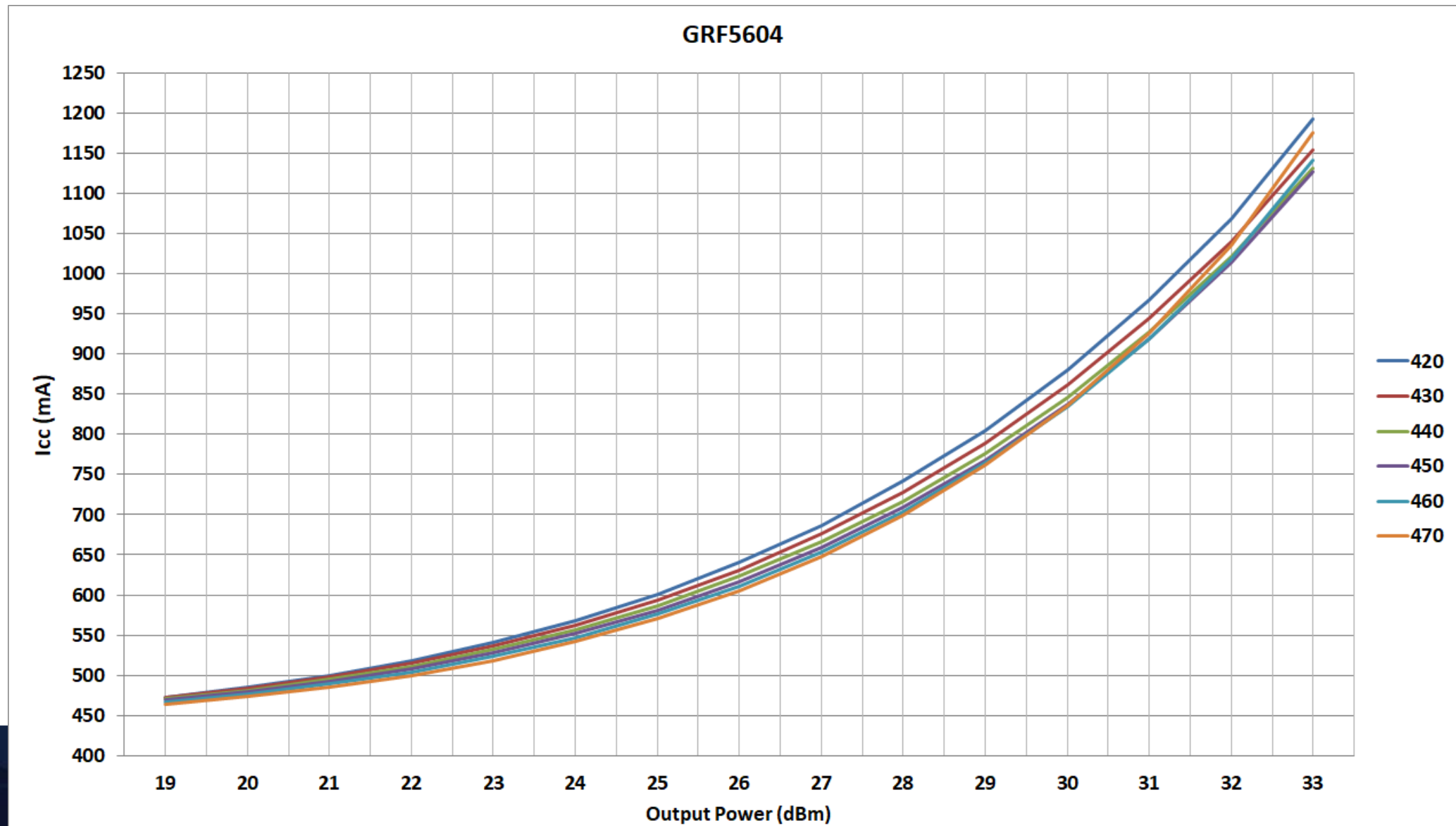
Configuration	Freq MHz	Vcc V	Iccq mA	Ven1 V	Ien1 mA	Ven2 V	Ien2 mA	Vshdn V	Ishdn mA	Pin dBm	Psat dBm	Gain dB	PAE %
Nominal Psat	420	5	249	5	1.9	5	0.43	0	0	5	36.88	31.88	54.3
Nominal Psat	430	5	249	5	1.9	5	0.43	0	0	5	37.41	32.41	59.1
Nominal Psat	440	5	249	5	1.9	5	0.43	0	0	5	37.72	32.72	62.6
Nominal Psat	450	5	249	5	1.9	5	0.43	0	0	5	37.74	32.74	62.7
Nominal Psat	460	5	249	5	1.9	5	0.43	0	0	5	37.27	32.27	55.6
Nominal Psat	470	5	249	5	1.9	5	0.43	0	0	5	36.44	31.44	46.6

ACLR for the linear case:

Limiters, as expected, at 420 MHz/470 MHz band edges.



ACLR current:





Contact Us

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