How Spektrum complies with European Standard EN 300 328

4.2.1 FHSS modulation

FHSS modulation shall:

either:

a) make use of at least 15 well defined, non-overlapping hopping channels separated by the channel bandwidth as measured at 20 dB below peak power;

or if capable of adaptive frequency hopping:

b) at least be capable of operating over a minimum of 90 % of the band specified in table 1, from which at any given time a minimum of 20 channels or hopping channels shall be used.

For both cases, the minimum channel separation shall be 1 MHz, while the dwell time per channel shall not exceed 0,4 s.

While the equipment is operating (transmitting and/or receiving) each channel of the hopping sequence shall be occupied at least once during a period not exceeding four times the product of the dwell time per hop and the number of channels. Systems that meet the above constraints shall be tested according to the requirements for FHSS modulation.
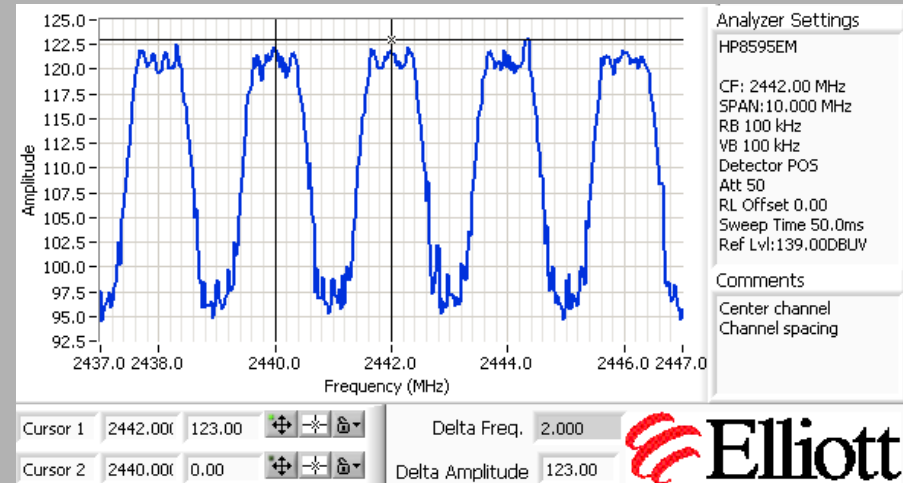
Max 20dB Bandwidth
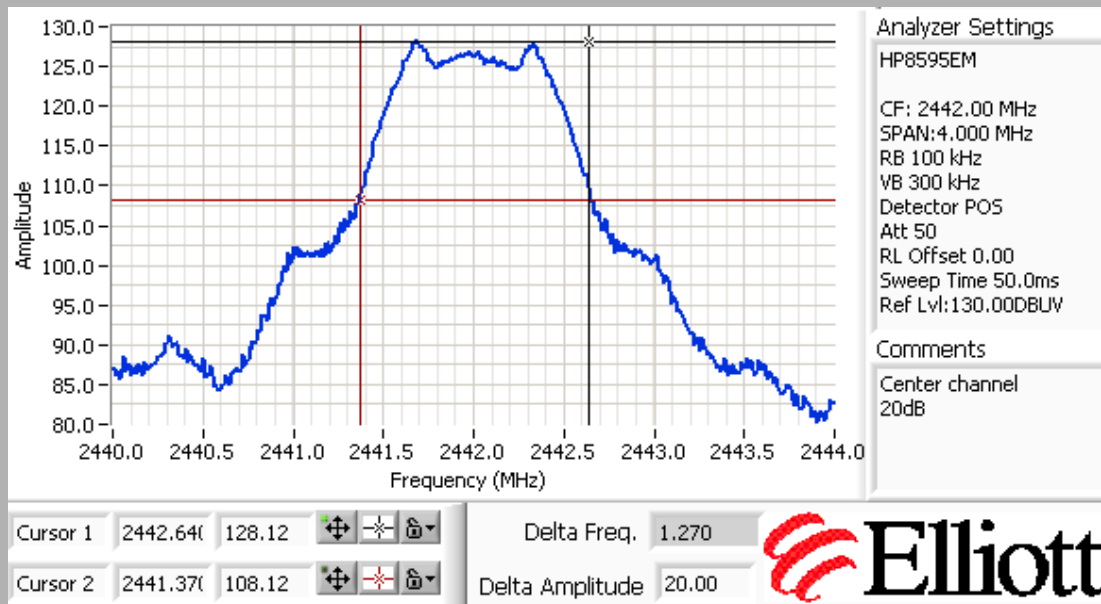
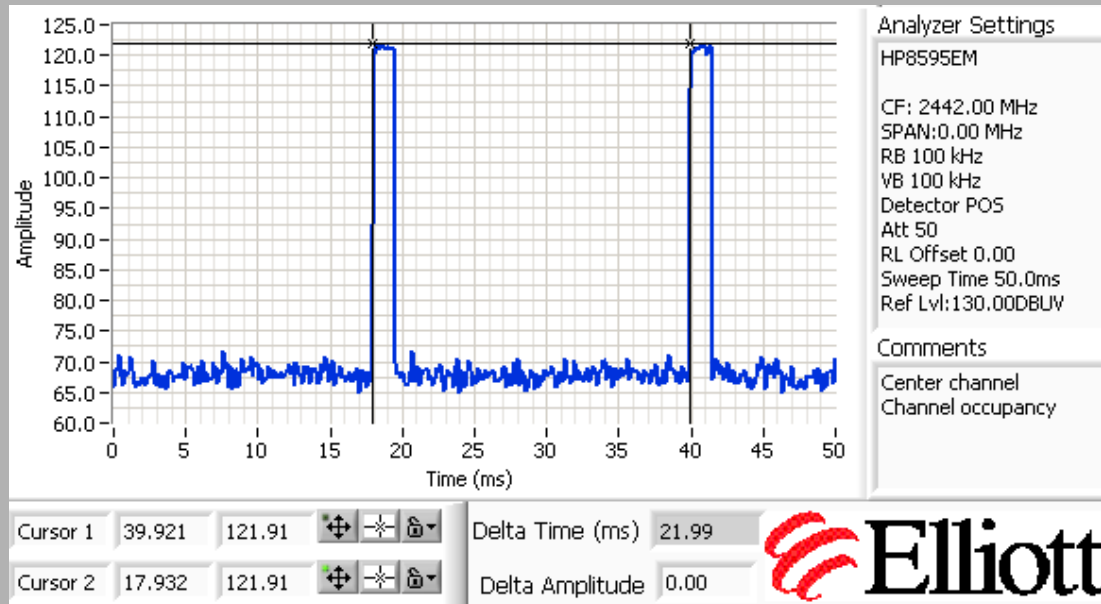1.27MHz 20dB bandwidth

Non-overlapping channels
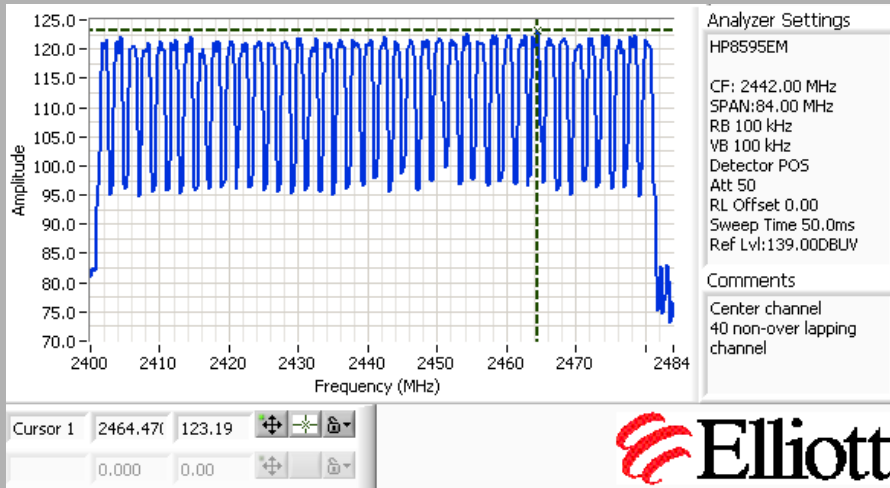
40 Non-overlapping channels

Separated by 2MHz

"a) make use of at least 15 well defined, non-overlapping hopping channels separated by the channel bandwidth as measured at 20 dB below peak power;"
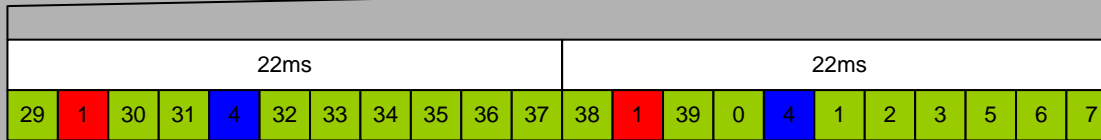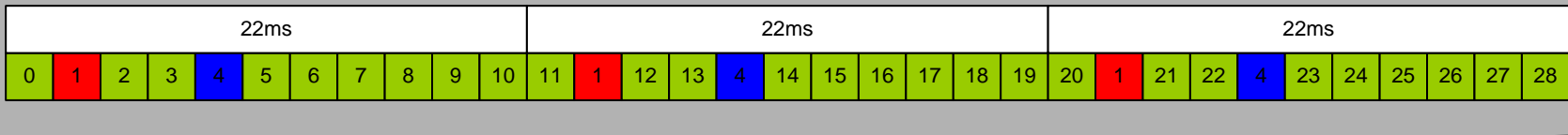
Dwell per channel

Dwell time per channel = 2ms

"For both cases, the minimum channel separation shall be 1 MHz, while the dwell time per channel shall not exceed 0,4 s."
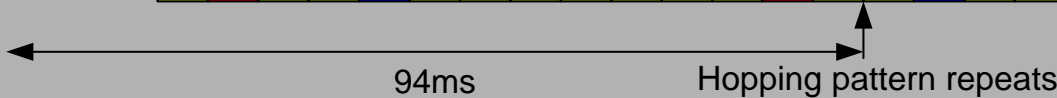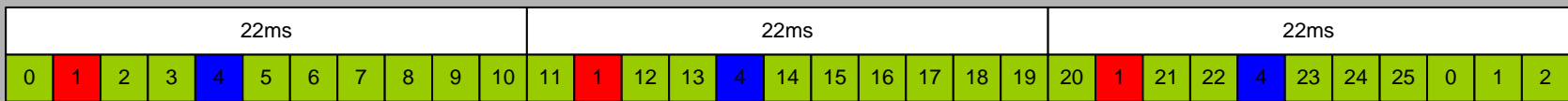
Channel Occupancy

EUROPE (GENERAL)

22ms											22ms									22ms								
0	1	2	3	4	5	6	7	8	9	10	11	1	12	13	4	14	15	16	17	18	19	20	1	21	22	4	23	24	25	26	27	28

22ms										22ms								
29	1	30	31	4	32	33	34	35	36	37	38	1	39	0	4	1	2	3	5	6	7

← 94ms →   Hopping pattern repeats

Each channel is occupied at least once in 47 hopping slots. (Limit is 4 * 2ms * 40 = 320ms)

EUROPE (FRANCE)

22ms											22ms									22ms								
0	1	2	3	4	5	6	7	8	9	10	11	1	12	13	4	14	15	16	17	18	19	20	1	21	22	4	23	24	25	0	1	2

← 60ms →   Hopping pattern repeats

13 Receive channel

1 4 Transmit channels

Each channel is occupied at least once in 30 hopping slots. (Limit is 4 * 2ms * 26 = 208ms)

"While the equipment is operating (transmitting and/or receiving) each channel of the hopping sequence shall be occupied at least once during a period not exceeding four times the product of the dwell time per hop and the number of channels."

- "Why only transmit on 2 hopping channels if you're allowed to transmit on all 40?"

  - RC data-rate is very low (3 – 4 kbps).
    - DSM2 is 250kbps
  - 2 channels gives excellent frequency diversity
  - Doesn't pollute the band
  - Allows for future features such as telemetry