



Necessary Bandwidth Calculation (B_n)

B_n is a calculation based on communication parameters set in the radio hardware. Both the FCC and IC define the same basic calculations in Part 2.202 and TRC-43.

Item	Throughput (kbps)	Modulation Type	Symbol rate (kbps)	Calculated Necessary BW (kHz)	Measured 99% BW (kHz)	Emissions Designator IC	Emissions Designator FCC
1	9.65	2FSK	9.650	14.2	8.4	8K4F1WCN	8K4F1W
2	19.3	4FSK	9.650	14.2	7.8	7K8F1WCN	7K8F1W
3	30.717	8PSK	10.239	20.478	10.2	10K2W1WCN	10K2W1W
4	40.956	16QAM	10.239	20.478	10.2	10K2W1WCN	10K2W1W
5	51.195	32QAM	10.239	20.478	10.5	10K5W1WCN	10K5W1W
6	61.434	64QAM	10.239	20.478	10.2	10K2W1WCN	10K2W1W

Formulas from Title 47 CFR, Part 2.202 (g)

For FSK emissions: $B_n = (R/\log_2 S) + 2DK, K = 1,$
 For 2FSK
 $= (9.65k/1) + 2 (2.262k)$
 $= 14.2 \text{ kHz}$

For PSK and QAM $B_n = 2RK/\log_2 S, K=1$
 $= 2(30.717k/3)$
 $= 20.478 \text{ kHz}$

Measurements show the actual bandwidth for this product to be considerably less than the calculations indicate. Part 90.202 (c) (3) allows measurement where calculations do not covered by the documentation. The Xetawave modulation scheme combines a pulse preceding the packet data.