

Transmitter Occupied Bandwidth and Emission Designator Determination

RULE PART NUMBER: 2.201, 2.202, 2.1049 (h), 90.543(d), 90.27.53(d)(4)

Necessary Bandwidth Measurement (90.202.(c)(4)) and Emission Designator

This radiomodem uses digital modulation signals, passing through a pulse shaping DSP implemented low-pass filter to an FM transceiver. The equations for the filter are Nyquist-based being driven by the data symbol rates, they are detailed in modulation source description paragraph, in next page. The necessary bandwidth calculation for this type of modulation is not covered by paragraphs (1), (2) or (3) from 2.202(c), the result exceeding by far the real necessary bandwidth obtained through simulations or measurement.

Therefore, the approach outlined in (2.202(c)(4)) is applicable in this case.

The results of 99% Occupied Bandwidth measurement are:

Bit rate	Symbol rate	Filter equation	Deviation (1kHz tone)	Occupied Bandwidth	Emission designator
128000 bps	32000 bauds	Raised Cosine	± 8.3 KHz	27.67kHz	28K0F1D

The value of the necessary bandwidth (and implicitly of the emission designator) doesn't exceed the authorized bandwidth of 50kHz (90.543(d)).

Occupied Bandwidth Measurement (90.202(c)(4))

The Occupied Bandwidth measurement option of the instrument (8563EC spectrum analyzer from Agilent) calculates and provides the values used above for the emission designator.

The percentage setting of the measurement has been set to 99% following the definition of the **Occupied Bandwidth** “the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission” (FCC 2.202)

The measurement has been performed using the Occupied Bandwidth Measurement Function of 8563EC the resulting value was recorded as Occupied Bandwidth.

UNIT UNDER TEST: Prototype unit

TEST RESULTS: 27.67kHz

TEST CONDITIONS: Standard Test Conditions, 25 C

TEST EQUIPMENT: IFR COM-120B – communication analyzer used for deviation meter IF bandwidth 300kHz
Spectrum Analyzer, Model HP 8563EC

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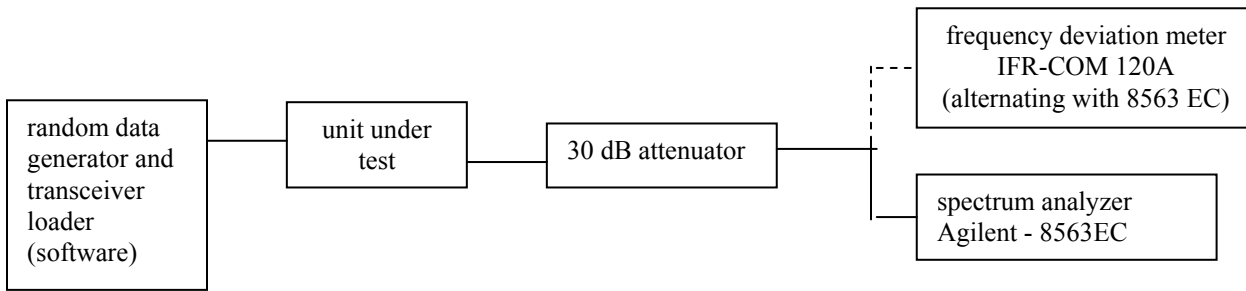
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DATE: 12/06/02

The set-up and the plot acquired during the occupied bandwidth are provided next page.

The measurement set-up is:



The plot acquired during the occupied bandwidth

