

8.5 20 dB Emission Bandwidth(15.215 (c))

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

8.5.1 Test procedure

As per ANSI C63:10-2013:

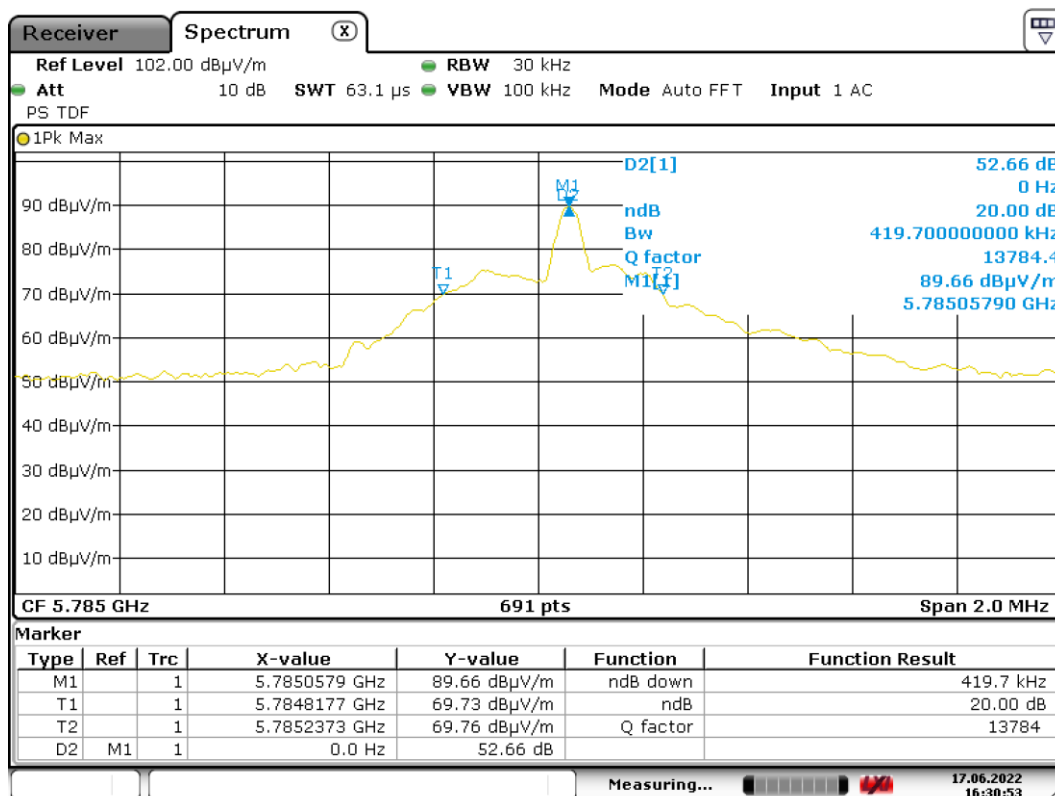
- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level. Specific guidance is given in 4.1.5.2.
- d) Steps a) through c) might require iteration to adjust within the specified tolerances.
- e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
- f) Set detection mode to peak and trace mode to max hold.
- g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyser marker to the highest level of the displayed trace (this is the reference value).
- h) Determine the “-xx dB down amplitude” using $[(\text{reference value}) - xx]$. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
- i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyser and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).
- j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “-xx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “-xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.
- k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

8.5.2 Test instruments

Description	Model No.	SIQ No.	Last calibration	Calibrated until	Calibration period	Used
Rohde-Schwarz, Spectrum analyzer	FSV 40	/	2021-04	2022-10	18 months	X
Rohde-Schwarz, RFI receiver	ESU8	105187	2020-07	2022-07	24 months	
Rohde-Schwarz, RFI receiver	ESU26	106897	2021-01	2023-07	18 months	X
Comtest Engineering, Semi Anechoic Chamber SAC 1	SAC 3m	NPS001	2020-06	2022-06	24 months	X
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 109843)	109063	2020-07	2022-07	24 months	
Rohde & Schwarz, Horn Antenna	HF907 (SN 102494)	109064	2020-08	2022-08	24 months	
Comtest Engineering, Semi Anechoic Chamber SAC 2	SAC 3m	NPS002	2020-06	2022-06	24 months	X
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 100842)	109056	2020-07	2022-07	24 months	X
Rohde & Schwarz, Horn Antenna	HF907 (SN 102508)	109057	2020-08	2022-08	24 months	X
Horn Antenna, EMCO	3116	/	2021-10	2024-10	36 months	X
Maturo, Turn table (2 m diameter)	TT 2.0 SI	/	N/A	N/A	N/A	X
Maturo, Bore-sight antenna mast	BAM-4.0-P	/	N/A	N/A	N/A	X
Maturo, Multi-channel positioning equipment	Maturo NCD	/	N/A	N/A	N/A	X
Schwarzbeck Active loop antenna	FMZB 1519B	/	2021-04	2022-10	18 months	X
Rohde-Schwarz, AMN	ENV216	/	2021-08	2023-02	18 months	X

8.5.3 Test results

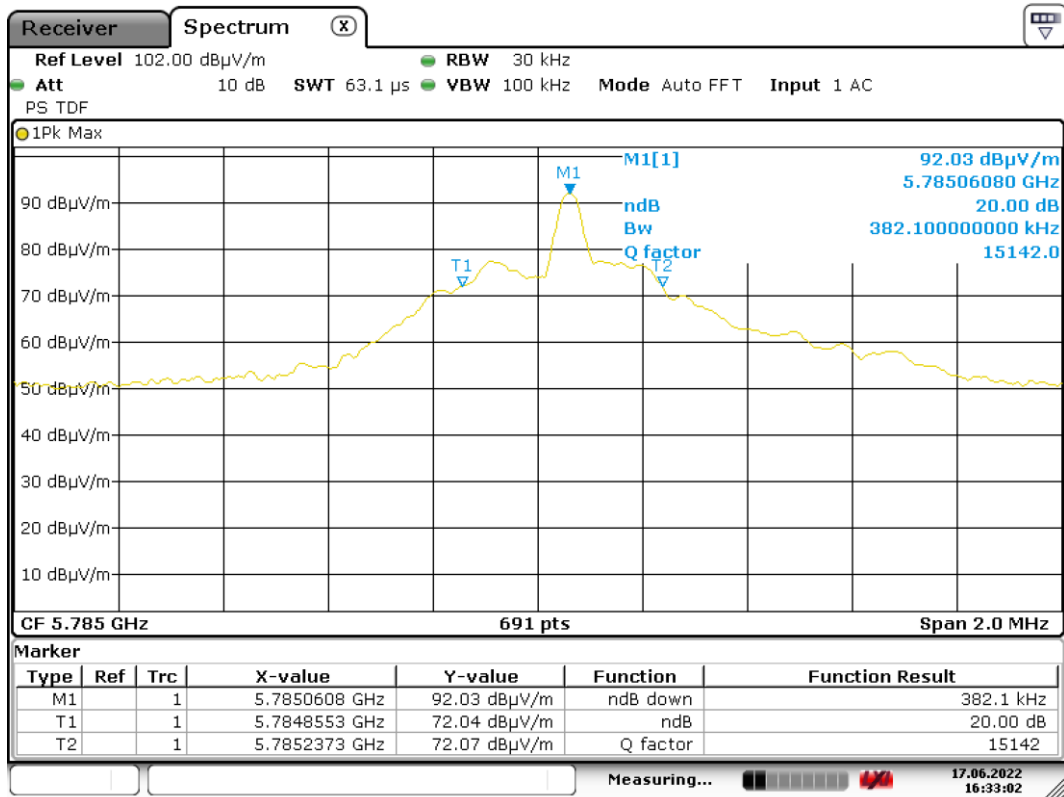
EUT: Wine climate cabinet
Supply: Uin: 120 V, 60 Hz
Operating modes: Proximity sensor turned on
Antenna Polarization: Vertical



Date: 17.JUN.2022 16:30:53

DUT Frequency (MHz)	20 Db Bandwidth (kHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBμV/m)	Result
5785.05	419.700	5784.81	5785.23	89.66	PASS

EUT: Wine climate cabinet
 Supply: Uin: 120 V, 60 Hz
 Operating modes: Proximity sensor turned on
 Antenna Polarization: Horizontal

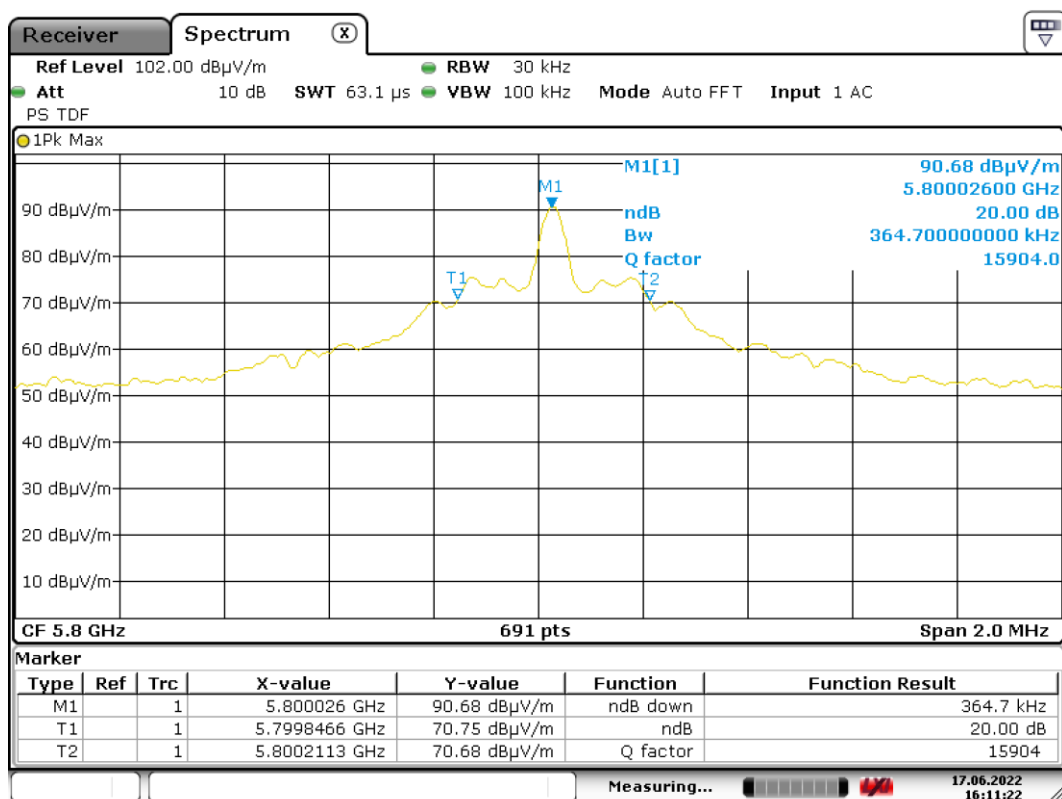


Date: 17.JUN.2022 16:33:03

DUT Frequency (MHz)	20 Db Bandwidth (kHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBμV/m)	Result
5785.06	382.10	5784.85	5785.23	92.03	PASS

EUT:
Supply:
Operating modes:
Antenna Polarization:

Wine climate cabinet
Uin: 120 V, 60 Hz
Proximity sensor turned on
Vertical



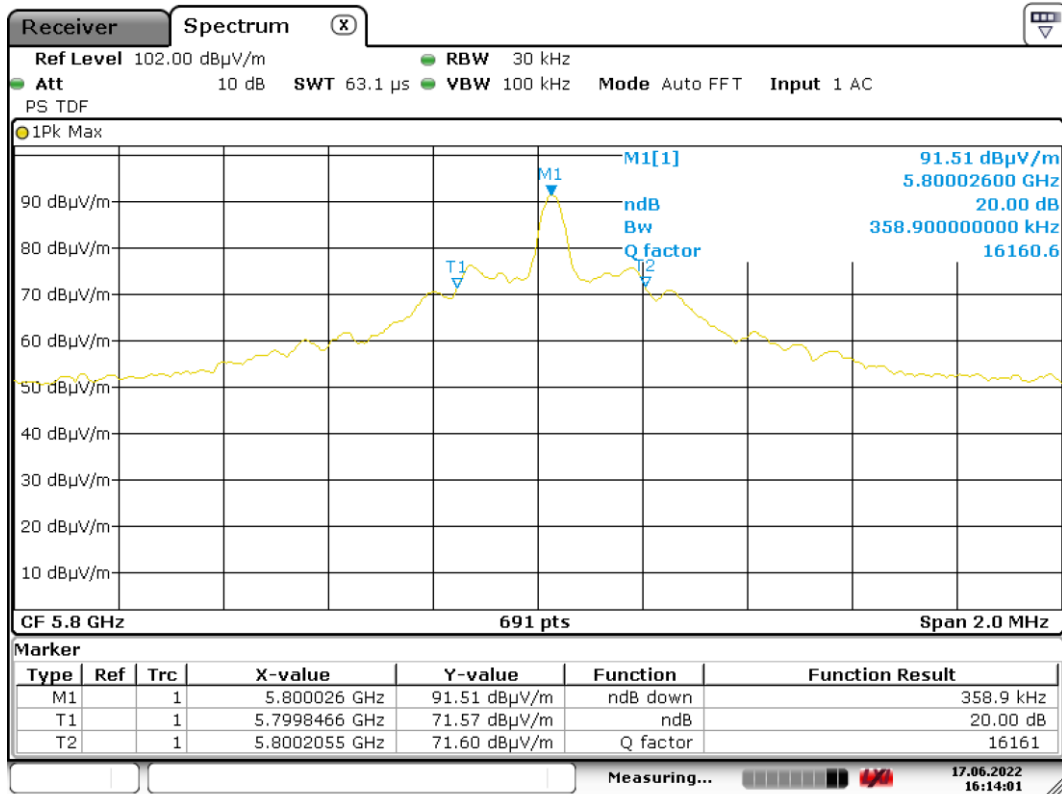
Date: 17.JUN.2022 16:11:22

DUT Frequency (MHz)	20 Db Bandwidth (kHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBμV/m)	Result
5800	364.70	5799.84	5800.21	90.68	PASS



EUT:
Supply:
Operating modes:
Antenna Polarization:

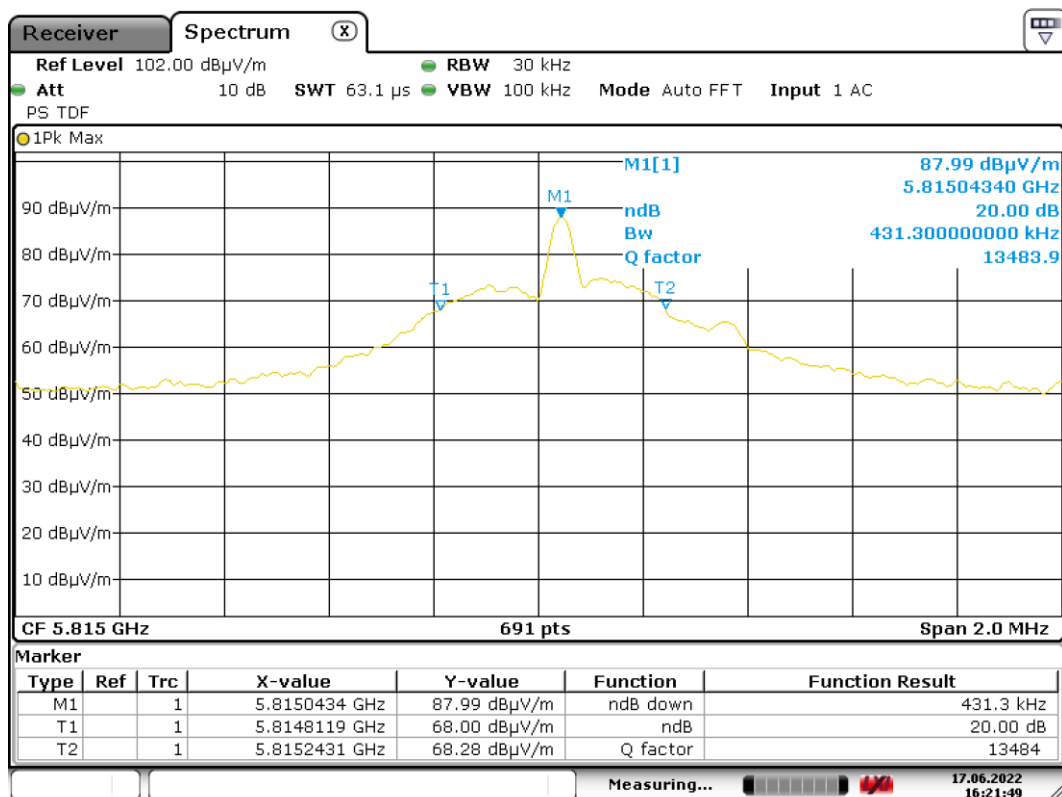
Wine climate cabinet
Uin: 120 V, 60 Hz
Proximity sensor turned on
Horizontal



Date: 17.JUN.2022 16:14:00

DUT Frequency (MHz)	20 Db Bandwidth (kHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBμV/m)	Result
5799.84	358.90	5799.84	5800.20	91.51	PASS

EUT: Wine climate cabinet
Supply: Uin: 120 V, 60 Hz
Operating modes: Proximity sensor turned on
Antenna Polarization: Vertical



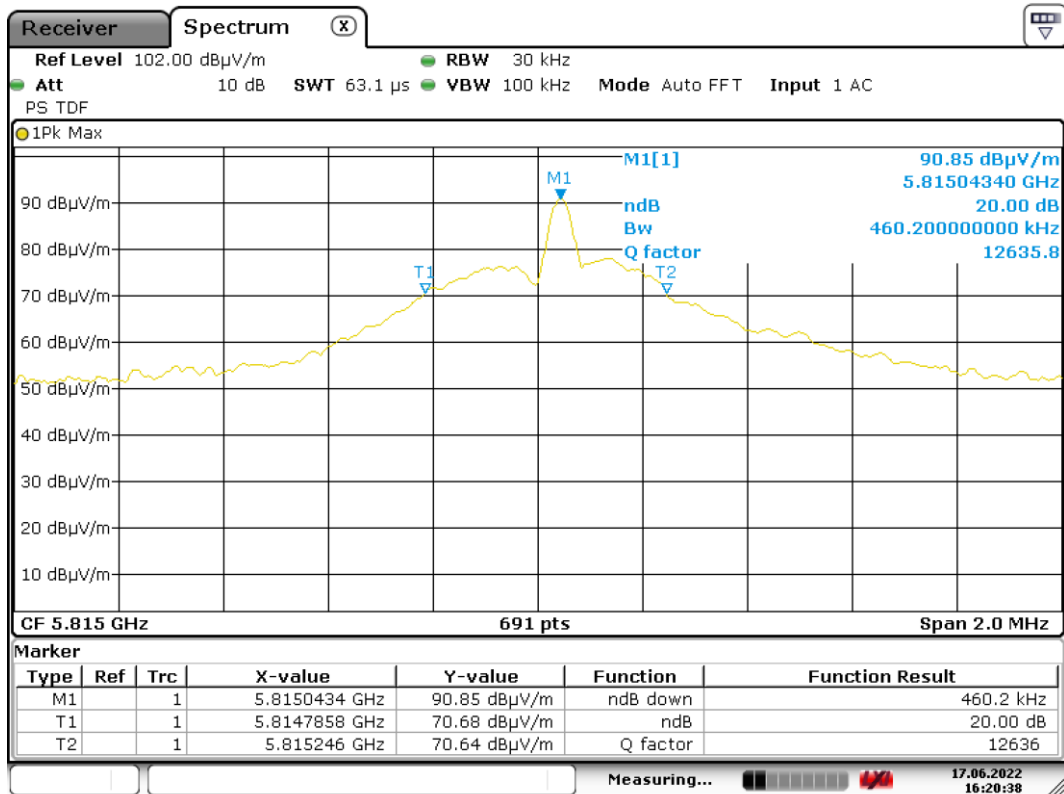
Date: 17.JUN.2022 16:21:50

DUT Frequency (MHz)	20 Db Bandwidth (kHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBμV/m)	Result
5815.04	431.30	5814.81	5815.24	87.99	PASS



EUT:
Supply:
Operating modes:
Antenna Polarization:

Wine climate cabinet
U_{in}: 120 V, 60 Hz
Proximity sensor turned on
Horizontal



Date: 17.JUN.2022 16:20:39

DUT Frequency (MHz)	20 Db Bandwidth (kHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Max Level (dBμV/m)	Result
5815.04	460.20	5814.78	5815.24	90.85	PASS