Emission Designator Justification for E2-455-C92 Licensed Radio

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1 Introduction

This document outlines justification for FCC Emissions Designators requested for the E2-455-C92 radio.

The E2-455-C92 Licensed radio operates in the 930-960MHz band outlined in Standard Channel Spacing/Bandwidth table in FCC Part 90.209(5). In this band Authorized bandwidth of 20kHz, 11.25kHz and 6kHz is specified. Subnote 3 points out equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth.

2 Emission Designator Format

Emission Designator format is described in CFR Title 47, Part 2, Section 2.201.

The first four characters of a modern emissions designator indicate the Necessary Bandwidth. Necessary Bandwidth has been equated to the Authorised Bandwidth, and test report illustrates that this requirement is met.

The 5th character in a modern emissions designator is the modulation type.

- “F” represents “Angle-modulated, Straight FM”
- “D” represents “Carrier is amplitude and angle modulated”

The 6th character indicates the type of signal modulating the transmitter carrier.

- For the E2-455-C92 radio this is always “1” Digital modulation, no subcarrier”

The 7th character of the emission designator signifies what type of data is being transmitted.

- For the E2-455-C92 radio this is always “D” – representing “Data, telemetry, telecommand”

3 Nominated Emissions Designators

The table below outlines nominated Emissions Designators.

Formulae listed for Necessary Bandwidth are from FCC 47 CFR2.202(g)

FCC Part 90.209(a) outlines

> *Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant. In those cases where § 2.202 of this chapter does not provide a formula for the computation of necessary bandwidth, the occupied bandwidth, as defined in part 2 of this chapter, may be used in lieu of the necessary bandwidth.*

Emission Designator	11K0F1D	19K0F1D	5K00D1D	10K0D1D	20K0D1D
FCC Mask	D	C	E	D	C
Modulation	4FSK	4FSK	64QAM	64QAM	64QAM
Channel Bandwidth	12.5kHz	25kHz	6.25kHz	12.5kHz	25kHz
Authorised Bandwidth	11.25kHz	20kHz	6kHz	11.25kHz	20kHz
Measured 99% Occupied Bandwidth	5.954kHz	11.709kHz	4.878kHz	9.814kHz	19.701kHz
Necessary Bandwidth Formula in	$(R/\log_2 S) + 2DK$	$(R/\log_2 S) + 2DK$	$2R/\log_2 S$	$2R/\log_2 S$	$2R/\log_2 S$
Necessary Bandwidth	11.0kHz	19.0kHz	8.0kHz	16.0kHz	32.0kHz
Number of Signalling States (S)	4	4	64	64	64
Data Rate (R)	9600bps	19200bps	24000bps	48000bps	96000bps
Measured Peak Deviation (D)	3.1kHz	4.7kHz	n/a	n/a	n/a
Signal Distortion Factor (K)	1	1	1	1	1

4 REVISION HISTORY

Issue No.	Date	Details of Amendment
1.0	27/1/2022	Initial Issue