

RECOMMENDATION ITU-R M.1739

Protection criteria for wireless access systems, including radio local area networks, operating in the mobile service in accordance with Resolution 229 (WRC-03) in the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz

(2006)

Scope

This Recommendation provides protection criteria for wireless access systems, including radio local area networks (WAS/RLAN), operating in the mobile service in accordance with Resolution 229 (WRC-03), for the purposes of carrying out compatibility studies with services or applications from which WAS/RLAN systems are to be protected.

The ITU Radiocommunication Assembly,

considering

- a) that wireless access systems (WAS), including radio local area networks (RLANs) provide effective broadband solutions;
- b) that while some administrations do not afford protection for WAS/RLAN stations in their national rules, other administrations afford protection for WAS/RLAN stations in their national rules;
- c) that for the purposes of carrying out compatibility studies regarding services or applications from which WAS/RLAN systems are entitled to be protected, the development of a Recommendation defining protection criteria for WAS/RLAN stations operating in accordance with Resolution 229 (WRC-03) is desirable,

recognizing

- a) that there are primary allocations to the mobile service in the bands 5 150-5 350 MHz and 5 470-5 725 MHz for the implementation of WAS, including RLANs (WAS/RLAN);
- b) that WAS/RLAN systems operating in accordance with Resolution 229 (WRC-03) should not suffer significant data rate and/or range impairments as a result of interference from services or applications from which WAS/RLAN systems are entitled to protection, but may not claim protection from, and shall not cause interference to, certain other primary services as defined in the Radio Regulations;
- c) that some limited degree of interference or interference potential from services or applications from which WAS/RLAN systems are entitled to protection must be tolerated by WAS/RLAN stations,

noting

- a) that an analysis of the effects of interference on WAS/RLAN systems is contained in Annex 1,

recommends

1 that, for the purposes of conducting compatibility studies with respect to services or applications from which WAS/RLAN systems are entitled, according to their status, to be protected, the protection criteria for WAS/RLAN systems operating in the mobile service in accordance with Resolution 229 (WRC-03) should be as follows:

- the I/N ratio at the WAS/RLAN receiver should not exceed -6 dB, assuring that degradation to a WAS/RLAN receiver's sensitivity will not exceed approximately 1.0 dB as described in Annex 1.

Annex 1

Development of the protection criteria for WAS/RLAN systems operating in the mobile service in accordance with Resolution 229 (WRC-03) in the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz

1 Analysis of typical WAS/RLAN range/data rate performance without interference

For typical WAS/RLAN system deployments, an appropriate path-loss model is free space (r^2) up to a breakpoint of 5 m, and r^4 after that. This model offers a simple, but reasonably realistic approximation of propagation at the frequencies in question in a typical modern indoor office environment consisting primarily of relatively open “cubicle” space with a variety of moderate obstructions and reflective surfaces.

For WAS/RLAN systems operating under the provisions of Resolution 229 (WRC-03) the frequency of operation is in the 5 GHz range.

As a representative system, for the sake of analysis, a system with 20 dBm transmit power, a 20 MHz bandwidth, a 5 dB noise figure, and 0 dBi antennas at both ends of the link between the WAS/RLAN transmitter and the intended receiver is modelled.

Given these basic system parameters, and the required S/N ratio to achieve various standard data rates, the achievable ranges at those various standard data rates without interference are given in Table 1.

TABLE 1

Achievable range vs. data rate without interference

Data rate (Mbit/s)	Required S/N (dB)	Range (m)
54	25	29.1
48	22	34.6
36	19	41.1
24	16	48.8
18	13	58.0
12	10	68.9
9	8	77.4
6	5	91.9