

EXHIBIT 1

Hitachi 25GHz band Microwave Radio Link

Objective:

Hitachi Telecom USA requests an experimental license to examine the use of 25GHz band Microwave Radio Link system connected to a network camera or a PC in USA.

The purpose of this experiment is to evaluate the functionality of such a system connected to a network camera or a PC as well as each of their applications in which a 25GHz Microwave Radio Link system can be used. Tests and demonstration will be done to evaluate the quality of the data transmission.

System Description:

The proposed Microwave Radio Link system which is consisting of a pair of Microwave Radio Link equipment is a 25GHz-band data communication system which achieves 56Mbps high speed throughput for each down link and up link and enables wireless connection instead of LAN cable (equivalent to 100BASE-TX wired LAN).

Since this system establishes data communication link using radio, a high speed communication link can be easily built up even in the area in which it is difficult to lay wire circuit.

The bit rate of this system is maximum 150Mbps and almost equal to that of optical fiber. In addition, the bi-directional communication with effective throughput 56Mbps is more than enough to transmit high-capacity data and achieve multimedia communication.

DC power supply to Microwave Radio Link equipment is made by Power over Ethernet (PoE) compliant with IEEE802.3af. Peripheral equipment such as a network camera or a PC can be connected to Microwave Radio Link equipment via PoE unit by using LAN cables (100BASE-TX).

Equipment Required

The following equipment will be used to conduct the test.

- * A pair of Microwave Radio Link equipments which includes fixing brackets (HP5-010100)
- * A pair of PoE units with AC adapters (BIJ-POE-1P)
- * 1 set of Network camera with AC adapter (KV-IP11)
- * 1 set of Personal Computer
- * 4 pieces of LAN cables (100BASE-TX)

EXHIBIT 1

Theory of Operation

The Microwave Radio Link system occupies 40MHz bandwidth within 24.78GHz~25.22GHz, and if the interference is detected, the system will automatically switch over to the other bandwidth in order to secure the stable circuit quality. Tx output power of Microwave Radio Link equipment is 2mW and duplex method is TDD.

Besides, this Microwave Radio Link equipment adopts the pencil beam antenna which prevents radio wave from spreading. (Only 4 degrees)

The weight of a Microwave Radio Link equipment is only 2kg even though an antenna is embedded in it. In addition, the positioning of opposed two Microwave Radio Link equipments can be done by taking a direction with visual checking. Therefore, the installation is quite easy.

Contribution to Radio Art

The concept of this Microwave Radio Link system is to establish the wireless data communication link by using license-exempt frequency band. Though this equipment was designed to meet the license-exempt band in Japan and has not been finished modifying to the US license-exempt band yet, in near future, this equipment is planned to be modified to meet the license-exempt band (ISM band : 24GHz band) in US. Availability of the equipment compliant with US license-exempt band is beneficial for everyone and every company in US who is looking for the data communication link which is easy to deploy without frequency application.

Specifications

Item	Specification		
Frequency	24.78 ~ 25.22GHz		
Antenna	17cm square, Gain: 31dBi, Beam Angle: 4 degrees		
EIRP	+20dBm/MHz or less		
Duplex method	TDD		
Tx power	2mW		
Bit rate	150Mbps : 64QAM mode		
	100Mbps : 16QAM mode		
	50Mbps : QPSK mode		
Throughput by distance	Bit rate	Throughput (Up/Down link)	Distance
	150Mbps	56/56Mbps	1km
	100Mbps	38/38Mbps	1.5km
	50Mbps	18/18Mbps	2km