

Experimental License Application for 4720 – 4820 MHz Testing

Introduction

To evaluate next-generation cellular equipment, Samsung Research America (SRA) requests an experimental license to perform tests between 4720 – 4820 MHz band. The tests will have a single base station and up to 10 mobile radios.

Samsung leads the way in wireless innovation, setting new standards for connectivity, speed, and reliability. With cutting-edge technology and unparalleled expertise, we are redefining the future of mobile communication. Our commitment to research and development ensures that our products stay ahead of the curve, delivering unparalleled experiences to our customers. Experimental licenses such as this help us in pursuit of this mission.

Experiment Description

A maximum average EIRP of 46 dBm in 100 MHz will be divided among all the spatial streams. At each test site, SRA will set up mobile test terminals within a radius of 500 m and a 120° sector.

The radio unit is made up of 4 antennas. We will operate our antenna panel no higher than 23 m off the ground. SRA will perform tests with up to 10 users in a sector. During testing, we plan to place our antenna panel on the corner of a building. The details of the site are shown below in Table 1.

Table 1. Site Location Overview

Site Name	Longitude/Latitude	Azimuth	Antenna Height (m)	Mean EIRP / 100 MHz	Signal Bandwidth	Mean EIRP / MHz	Antenna 3 dB beam width (degrees)
Tennyson	N 33° 4' 23" W 96° 49' 52"	-10°	23	46 dBm	100 MHz	26 dBm	60°



Figure 2: Tennyson Test Site. The transmitter will be placed at the corner of the building during testing. The test will take place across a section of parking lot and courtyard space with mobile units in a within a radius of 500 meter.

Interference Coordination

For a worst-case engineering analysis, we consider a single emitter serving a single user. The transmitter operates with an EIRP of 46 dBm/100 MHz, equivalent to a power spectral density of -34 dBm/Hz, through a directional antenna with a 60-degree horizontal beamwidth and an approximately 10-degree vertical beamwidth. As shown in Figure 2, the transmitter is mounted at a height of 23 meters at the corner of the building at the Tennyson test site, with the main beam oriented within a north-facing sector and all mobile units confined to a radius of 500 meters across the adjacent parking lot and courtyard.

The requested frequencies fall within bands allocated on a primary basis to the Federal fixed and mobile services and coordinated through NTIA, so the proposed operation would be conducted on a non-interference basis contingent upon Federal frequency coordination.

The interference footprint of the proposed operation is inherently limited by the site geometry and the surrounding built environment (parking garage in the boresight direction significantly reduces interference footprint). For the given antenna parameters, the signal power would decay to -106.5dBm/MHz as per 3GPP UMa non-line-of-sight (nLoS) channel model at 500m distance, which is close to noise floor. The test site is situated within a dense built-up campus environment containing numerous surrounding structures, so any propagation path from the transmitter to an external receiver is non-line-of-sight and dominated by diffraction and scattering around and over buildings. Taken together, the antenna pattern and the obstructed, built-up propagation environment confine the region in which the emission could approach an incumbent receiver protection threshold to the immediate vicinity of the controlled test site.

To further ensure no harm to incumbent operations, testing is performed for the minimum time required to complete each measurement, and transmit power will be reduced whenever feasible. Spectrum occupancy is monitored before each test to verify the absence of incumbent activity on

the operating frequencies, and operation ceases if incumbent activity is observed.

SRA is committed to avoiding harmful interference to spectrum incumbents. Tests take place only as needed under direct supervision and monitoring. Immediate requests to end transmissions can be directed to Chance Tarver by email at c.tarver@samsung.com or by phone at [\(325\) 301-8992](tel:(325)301-8992).