

## 12.2-12.7 GHz Special Temporary Authorization (“STA”) Application

### 1 Introduction

Qualcomm's technologies powered the smartphone revolution and connected billions of people. We pioneered 3G and 4G – and now we are leading the way to 5G and a new era of intelligent, connected devices. Our products are revolutionizing industries, including automotive, computing, IoT, healthcare and data center, and are allowing millions of devices to connect with each other in ways never before imagined. Qualcomm Incorporated includes our licensing business, QTL, and the vast majority of our patent portfolio. Qualcomm Technologies, Inc., a subsidiary of Qualcomm Incorporated, operates, along with its subsidiaries, all of our engineering, research and development functions, and all of our products and services businesses, including, our QCT semiconductor business. For more information, visit Qualcomm’s [website](#), [OnQ blog](#), [Twitter](#) and [Facebook](#) pages.

Qualcomm is conducting limited antenna pattern testing of satellite antennas designed for use in the 12.2-12.7 GHz frequency range. The antenna testing requires a large separation distance to gather far field data due to the frequencies and antenna aperture size and cannot be completed in Qualcomm anechoic chamber.

This request was originally made for a single frequency range of 11.7-12.7GHz.

The 11.7-12.2GHz band has been granted (call sign WK9XXU) and for the 12.2-12.7GHz band the FCC directed Qualcomm to work with BSS operators to obtain their consent and agree interference levels in the band 12.2-12.7GHz.

At the request of BSS operators, the interference "EPFD" level requested should be < -171dBW/M<sup>2</sup>/4KHz. The configuration described here meets those requested levels and simulations have been shared with all BSS operators concerned and their agreements are recorded in appendix A.

Qualcomm respectfully requests the Commission to grant a STA to enable Qualcomm to complete these important antenna characterization measurements

### 2 Transmitter Information

Testing is temporary and expected to occur periodically for up to six months while the test setup is evaluated. The transmitter will only be operational during active testing that occurs at any time during the day or week. Qualcomm anticipates a frequency will be active for periods of 10-30 minutes when testing is active.

A highly directional antenna, with very low power levels has been selected to meet BSS operators requested interference levels of -171dBW/M<sup>2</sup>/4KHz . It is mounted and pointed so as to use the building structure to provide additional shielding to back-lobes is shown in figure 1 and 2. Table 1 defines the transmitter information and Table 2 defines the site location.

A single, low-power continuous wave form (“CW”), measurement signal will be transmitted from the site defined in Table 2 at a fixed orientation. Eight test frequencies which have been agreed with BSS operators are specified in Table 3.

The equipment under test (“EUT”) is a receive antenna that is located on another building as shown in Figure 2. The receive antenna’s orientation is moved in a process to evaluate the antenna pattern.

**Table 1 Transmitter Information**

Type	Frequency (GHz)	Peak EIRP				Peak Antenna Gain (dBi)	Emission BW
		dBm	dBW	W EIRP	W ERP		
Fixed	12.2-12.7 (At table 3 intervals)	15.6	-14.4	0.036	0.036	30.7	CW

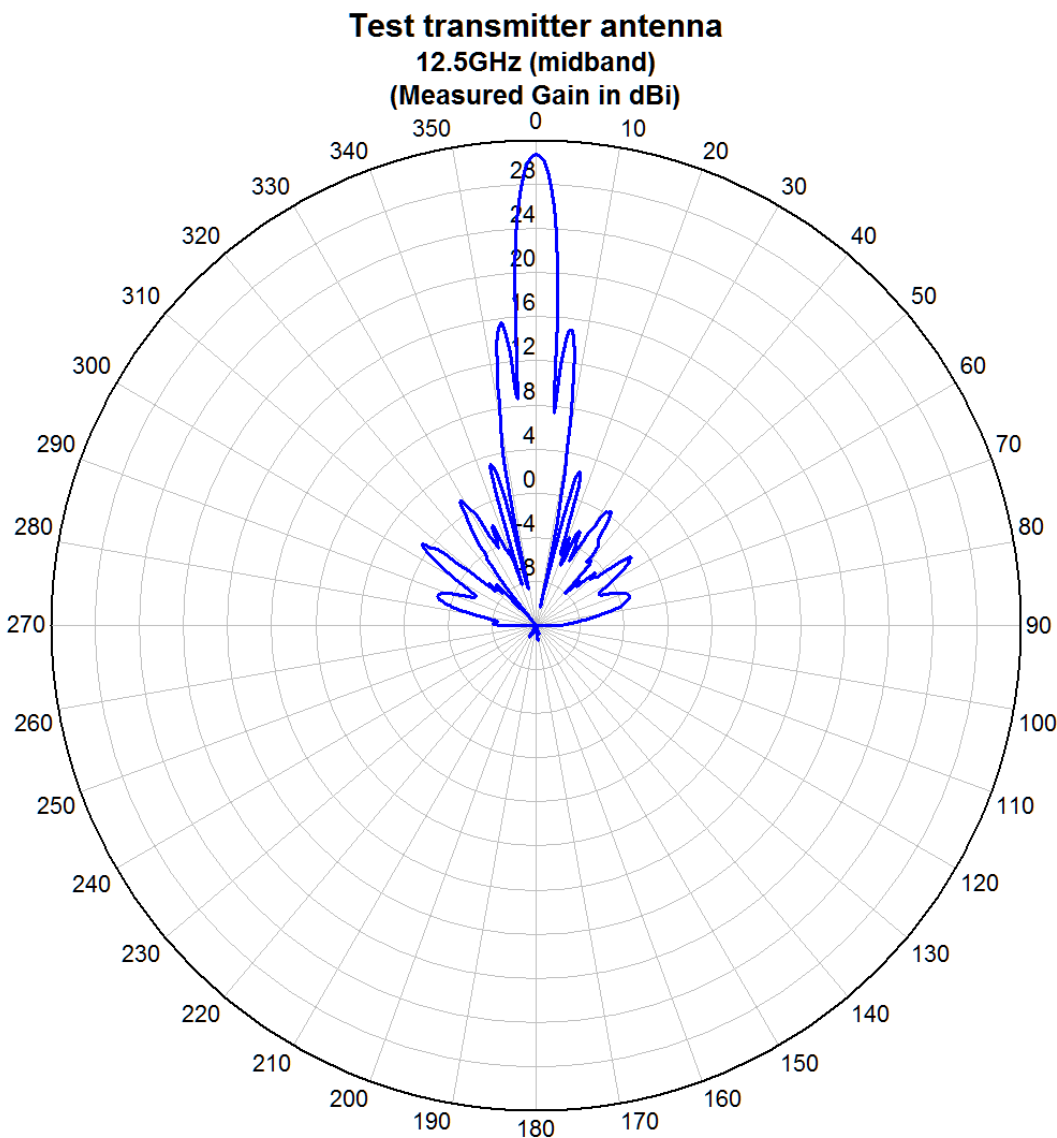


Figure 1 Fixed Site Antenna Pattern

Figure 2 Location of Test antenna and transmit path

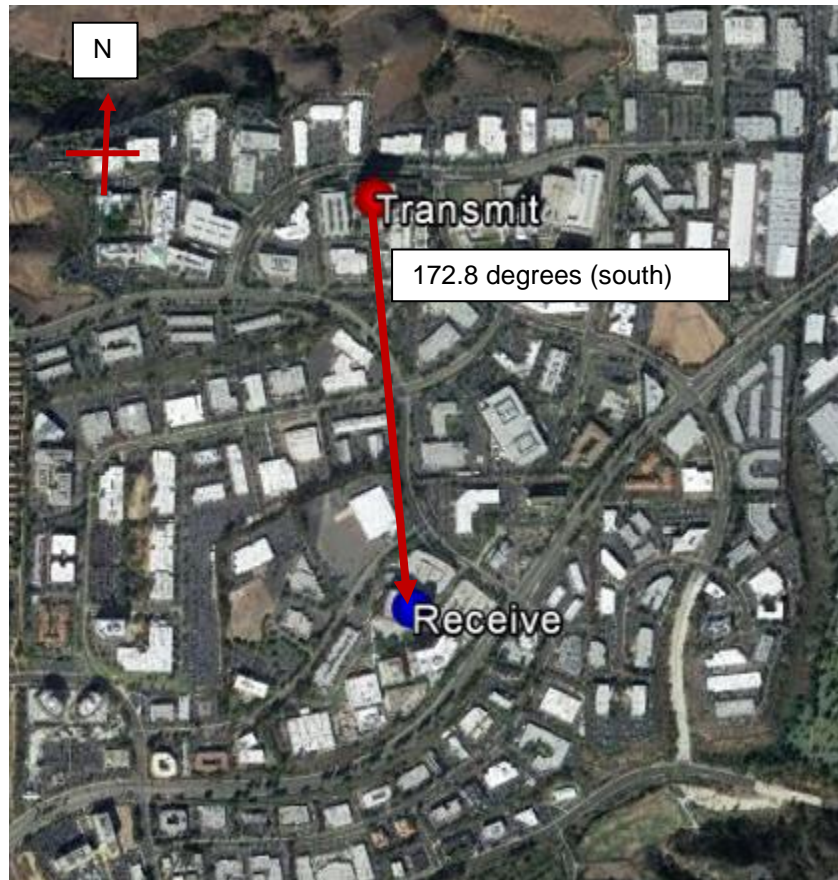


Table 2 Transmitter Site Information

Site #	Address	County	Lat	Long	3dB Beamwidth	Azimuth	Elevation	Antenna Type
1	5745 Pacific Center Blvd San Diego, CA 92121	San Diego	32 54 14 N	117 11 47 W	4 degrees	172.8 degrees (south)	+2.8 degrees above horizon	Directional 15 inch reflector

**Table 3 BSS Coordinated Transmitter Test Frequencies**

Test frequency	BSS Channel number	BSS CH center Frequency (MHz)
12,238.68	2	12,238.58
12,297.00	6	12,296.90
12,355.32	10	12,355.22
12,413.64	14	12,413.54
12,471.96	18	12,471.86
12,530.28	22	12,530.18
12,588.60	26	12,588.50
12,646.92	30	12,646.82

All test signals are Continuous Wave (CW) with an Emission designator 100HN0N with an input power to the antenna of -45dBW.

### 3 License Requested

Qualcomm respectfully requests the Commission to grant an experimental license to enable us to start important antenna performance measurements

### 4 Points of Contact to stop transmission

The following points of contact is available as a stop buzzer.

Email [ku.spectrum.shutdown@qti.qualcomm.com](mailto:ku.spectrum.shutdown@qti.qualcomm.com); or

Brian Jones  
 5775 Morehouse Drive  
 San Diego  
 CA 92121  
 858 658 4751  
 858 837 2104 (24 hrs hour contact)  
 brjones@qualcomm.com

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## APPENDIX A – BSS Operators (DISH TV, DIRECTV and ECHOSTAR) Consents.(DRAFT)

**DIRECTV Consent**

Dear Brian,

In regards to the Qualcomm experimental license request, call sign WK9XXU, for an antenna test range at your San Diego facility to operate at discrete frequencies in the 12.2-12.7 GHz band, based on the information and analysis that Qualcomm has provided, along with our own independent analysis, I offer DIRECTV/AT&T's consent. I presume that this e-mail will suffice as sufficient for the purposes of the FCC.

Best regards,  
Jack Wengryniuk  
Sr. Director  
Spectrum Management and Regulatory Affairs  
AT&T Entertainment Group

**DISH TV Consent**

Formal legal letter is pending, here is the informal consent:

Hi Brian:

Thanks for all your help on the matter. With the proposed changes to the STA, we are ok to consent. Can you send us an updated STA with the proposed changes?

John

**Echostar Consent**

Waiting for consent from Echostar.