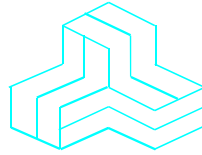


ENGINEERING TEST SUMMARY



SD4 Data Transceiver
Model No.: SD4
FCC ID: E5MDS-SD4

Applicant:

GE MDS LLC
175 Science Parkway
Rochester NY 14620

Prepared in Accordance With

Federal Communications Commission (FCC)
47 CFR, Parts 2 and 22

UltraTech's File No.: MIC-159Q_C2PC

This Test summary is Issued under the Authority
of Mr. Tri M. Luu
Vice President of Engineering
UltraTech Group of Labs

Date: September 12, 2012

Prepared by: Dharmajit Solanki

Issued Date: September 12, 2012

*The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.
This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

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FCC

91038



1309



Approved Test Facility

46390-2049



NVLAP Lab Code
200093-0



SL2-IN-E-1119R



Korea KCC-RRL
CA2049

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All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

1.1. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Part 90 & Part 22 comparison table:

| FCC Section(s) complied as per filed Original Test Reports | Test Requirements | Measured Values as per Original filing | Compliance with sections from Part 22 |
|--|--|---|---|
| 1.1307, 1.1310, 2.1091 & 2.1093 | RF Exposure Limit | Refer to RF Expo Exhibit of Original filing | -- |
| 2.1046, 90.279 & 90.205 | Conducted RF Power Output & ERP | - 37.4dBm (5.5 Watts) - ERP limit is based on the antenna HAAT and service area, specified as given in Table 2 | - No conducted limit specified. - Sections 22.565 & 22.659 specified Max ERP limits of 100W for base station and 50W for mobile station and must not be exceeded by the users. |
| 2.1047 & 90.210 | Modulation Characteristics | -- | -- |
| 2.1049, 90.209 & 90.210 | Occupied Bandwidth & Emission Mask | Refer to plots | -- |
| 2.1051, 2.1057 & 90.210 | Spurious Emissions at Antenna Terminal (30 MHz to 5 GHz) | -22.2dBm @812.191MHz (-2.2dB) Limit of 55 + 10 log (P) dB applied | Sec 22.359 specify the limit of 43 + 10 log (P) dB, which is less stringent than the applied limit, hence this device complies. |
| 2.1053, 2.1057 & 90.210 | Radiated Spurious Emissions (30 MHz to 5 GHz) | 45.6dBμV/m @ 875MHz (-26.8dB) Limit of 55 + 10 log (P) dB applied | Sec 22.359 specify the limit of 43 + 10 log (P) dB, which is less stringent than the applied limit, hence this device complies. |
| 2.1055 & 90.213 | Frequency Stability | 388 Hz | Sec 22.355 specify the worst limit of 2.5ppm or 1015 Hz. Hence the device complies. |
| 90.214 | Transient Frequency Behavior | Refer to plots | -- |
| 15.109 | Receiver Spurious Emissions | 37.96dBμV/m @ 875MHz (-8.1dB) | -- |

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1.2. RF POWER OUTPUT [§§ 22.565 & 22.659]

1.2.1. Limits

§ 22.565 : The transmitting power of base, mobile and fixed transmitters operating on the channels listed in § 22.561 must not exceed the limits in this section. (a) *Maximum ERP*. The effective radiated power (ERP) of base and fixed transmitters must not exceed the applicable limits in this paragraph under any circumstances.

| Frequency range (MHz) | Maximum ERP (watts) |
|-----------------------|---------------------|
| 152–153 | 1400 |
| 157–159 | 150 |
| 454–455 | 3500 |
| 459–460 | 150 |

(b) Basic power limit. Except as provided in paragraph (d) of this section, the ERP of base transmitters must not exceed 500 Watts.

(c) Height-power limits. Except as provided in paragraph (d) of this section, the ERP of base transmitters must not exceed the amount that would result in an average distance to the service contour of 41.6 kilometers (26 miles) for VHF channels or 30.7 kilometers (19 miles) for UHF channels. The average distance to the service contour is calculated by taking the arithmetic mean of the distances determined using the procedures specified in § 22.567 for the eight cardinal radial directions, excluding cardinal radial directions for which 90% or more of the distance so calculated is over water.

(d) Encompassed interfering contour areas. Base transmitters are exempt from the basic power and height-power limits of this section if the area within their interfering contours is totally encompassed by the interfering contours of operating co-channel based transmitters controlled by the same licensee. For the purpose of this paragraph, operating transmitters are authorized transmitters that are providing service to subscribers.

(e) Adjacent channel protection. The ERP of base and fixed transmitters must not exceed 500 Watts if they transmit on channel 454.025 MHz and are located less than 7 kilometers (4.3 miles) from any Private Radio Services station receiving on adjacent channel 454.0000 MHz.

(f) Mobile transmitters. The transmitter output power of mobile transmitters must not exceed 60 watts.

§ 22.659 : The purpose of the rules in this section, which limit effective radiated power (ERP), is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur. The protected TV station locations specified in this section are the locations of record as of September 1974, and these do not change even though the TV stations may have been subsequently relocated.

(a) *Maximum ERP*. The ERP of base transmitters must not exceed 100 Watts under any circumstances. The ERP of mobile transmitters must not exceed 60 Watts under any circumstances.

1.2.2. Summary

ERP power must not be exceeded by the user, addressed at the time of licensing.

1.3. TRANSMITTER ANTENNA POWER CONDUCTED & RADIATED SPURIOUS/HARMONIC EMISSIONS [§§ 22.359]

1.3.1. Limits

§ 22.359 The rules in this section govern the spectral characteristics of emissions in the Public Mobile Services, except for the Air-Ground Radiotelephone Service (see § 22.861, instead) and the Cellular Radiotelephone Service (see § 22.917, instead).

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

1.3.2. Summary

Sec 22.359 specify the limit of $43 + 10 \log (P)$ dB, which is less stringent than the applied limit of $55 + 10 \log (P)$, hence this device complies.

1.4. FREQUENCY STABILITY [§§ 22.355]

1.4.1. Limits

See § 22.355 : Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C–1 of this section.

TABLE C–1—FREQUENCY TOLERANCE FOR TRANSMITTERS IN THE PUBLIC MOBILE SERVICES

| Frequency Range (MHz) | Minimum Frequency Stability (ppm) | | |
|-----------------------|-----------------------------------|-----------------|-------|
| | Fixed and Base Stations | Mobile Stations | |
| | | > 3 W | ≤ 3 W |
| 450–512 | 2.5 | 5.0 | 5.0 |

1.4.2. Summary

Sec 22.355 specify the worst limit of 2.5ppm or 1015 Hz, the measured value of 388 Hz is well within this limit, hence the device complies.