

**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
RADIO STATION CONSTRUCTION PERMIT
AND LICENSE**

EXPERIMENTAL

(Nature of Service)

XD FX MO

(Class of Station)

WE2XNR

(Call Sign)

0040-EX-CM-2019

(File Number)

NAME Nokia Solutions and Networks US LLC

Subject to the provisions of the Communications Act of 1934, subsequent acts, and treaties, and all regulations heretofore or hereafter made by this Commission, and further subject to the conditions and requirements set forth in this license, the licensee hereof is hereby authorized to use and operate the radio transmitting facilities hereinafter described for radio communications in accordance with the program of experimentation described by the licensee in its application for license.

Operation: In accordance with Sec. 5.3(j) of the Commission's Rules

Station Locations

- (1) Irving, TX - NL 32-53-36; WL 96-58-02; MOBILE: Nokia Building Facility, Irving, TX, within 1 km
- (2) Sunnyvale (SANTA CLARA), CA - NL 37-22-36; WL 122-02-07; MOBILE: , within 1 km
- (3) Mountain View (SANTA CLARA), CA - NL 37-23-20; WL 122-03-07; MOBILE: , within 2 km
- (4) Naperville (DU PAGE), IL - NL 41-48-44; WL 88-07-11; MOBILE: Nokia Facility, within 2 km, centered around NL 41-48-44; WL 88-07-11
- (5) Coppell (DALLAS), TX - NL 32-56-08; WL 96-59-01; MOBILE: Nokia Campus, within 1 km, centered around NL 32-56-08; WL 96-59-01

Frequency Information

Irving, TX - NL 32-53-36; WL 96-58-02; MOBILE: Nokia Building Facility, Irving, TX, within 1 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
699-716 MHz	MO	18M0W9W	251 mW (ERP)	
717-728 MHz	FX	10M0F9W 5M00D7W	251 mW (ERP)	

This authorization effective June 13, 2019 and
will expire 3:00 A.M. EST August 01, 2020

**FEDERAL
COMMUNICATIONS
COMMISSION**



Frequency Information

Irving, TX - NL 32-53-36; WL 96-58-02; MOBILE: Nokia Building Facility, Irving, TX, within 1 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
729-756 MHz	FX	18M0W9W 20M0F9W 10M0W7W 5M00D7W	251 mW (ERP)	
777-787 MHz	MO	10M0W9W	251 mW (ERP)	
800-821 MHz	MO	30M0W9W	251 mW (ERP)	
824-849 MHz	MO	25M0W9W	251 mW (ERP)	
832-862 MHz	FX	30M0W9W	251 mW (ERP)	
859-894 MHz	FX	25M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
896-902 MHz		40M0W9W	251 mW (ERP)	
1525-1559 MHz	FX	30M0W9W	251 mW (ERP)	
1626.5-1660.5 MHz	MO	30M0W9W	251 mW (ERP)	

Frequency Information

Irving, TX - NL 32-53-36; WL 96-58-02; MOBILE: Nokia Building Facility, Irving, TX, within 1 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1710-1755 MHz	MO	40M0W9W	60 W (ERP)	
1805-1880 MHz	FX	20M0F9W	251 mW (ERP)	
1850-1910 MHz	MO	40M0W9W	251 mW (ERP)	
1910-1930 MHz	FX	20M0W9W	251 mW (ERP)	
1910-1930 MHz	MO	20M0W9W	251 mW (ERP)	
1920-1980 MHz	MO	40M0W9W	251 mW (ERP)	
1930-1995 MHz	FX	40M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
2000-2020 MHz	MO	20M0W9W	251 mW (ERP)	
2110-2170 MHz	FX	40M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	

Frequency Information

Irving, TX - NL 32-53-36; WL 96-58-02; MOBILE: Nokia Building Facility, Irving, TX, within 1 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2110-2155 MHz	FX	40M0W9W	60 W (ERP)	
2180-2200 MHz	FX	20M0W9W	251 mW (ERP)	
2355 MHz	FX	10M0F9W 5M00D7W	251 mW (ERP)	
2500-2690 MHz	MO	40M0W9W 5M00D7W 20M0F9W	251 mW (ERP)	
2500-2690 MHz	FX	40M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
2500-2570 MHz	MO	40M0W9W	251 mW (ERP)	
3400-3600 MHz	FX	40M0W9W	7.5 mW (ERP)	
3400-3600 MHz	MO	40M0W9W	7.5 mW (ERP)	
3600-3800 MHz	FX	40M0W9W	251 mW (ERP)	

Frequency Information

Sunnyvale (SANTA CLARA), CA - NL 37-22-36; WL 122-02-07; MOBILE: , within 1 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
698-716 MHz	FX	10M0F9W	251 mW (ERP)	
728-746 MHz		10M0F9W	251 mW (ERP)	
746-756 MHz	FX	10M0F8W	251 mW (ERP)	
777-787 MHz	FX	10M0F9W	251 mW (ERP)	
869-894 MHz	FX	248KG7W 5M00F9W	160 mW (ERP)	
1710-1755 MHz	MO	5M00F9W	251 mW (ERP)	
1850-1910 MHz	MO	333KG7W 4M00F9W	251 mW (ERP)	
1920-1980 MHz	MO	5M00F9W	251 mW (ERP)	
1930-1990 MHz	FX	333KG7W 4M00F9W	160 mW (ERP)	

Frequency Information

Sunnyvale (SANTA CLARA), CA - NL 37-22-36; WL 122-02-07; MOBILE: , within 1 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2110-2170 MHz	FX	5M00F9W	160 mW (ERP)	

Mountain View (SANTA CLARA), CA - NL 37-23-20; WL 122-03-07; MOBILE: , within 2 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
699-716 MHz	MO	18M0W9W	251 mW (ERP)	
729-746 MHz	FX	18M0W9W	251 mW (ERP)	
746-756 MHz	FX	10M0W7W	251 mW (ERP)	
777-787 MHz	MO	10M0W9W	251 mW (ERP)	
800-821 MHz	MO	30M0W9W	251 mW (ERP)	
824-849 MHz	MO	25M0W9W	251 mW (ERP)	
832-862 MHz	FX	30M0W9W	251 mW (ERP)	
869-894 MHz	FX	25M0W9W	251 mW (ERP)	

Frequency Information

Mountain View (SANTA CLARA), CA - NL 37-23-20; WL 122-03-07; MOBILE: , within 2 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1525-1559 MHz	FX	30M0W9W	251 mW (ERP)	
1626.5-1660.5 MHz	MO	30M0W9W	251 mW (ERP)	
1710-1755 MHz	MO	40M0W9W	251 mW (ERP)	
1850-1910 MHz	MO	40M0W9W	251 mW (ERP)	
1910-1930 MHz	FX	20M0W9W	251 mW (ERP)	
1910-1930 MHz	MO	20M0W9W	251 mW (ERP)	
1920-1980 MHz	MO	40M0W9W	251 mW (ERP)	
1930-1990 MHz	FX	40M0W9W	251 mW (ERP)	
2000-2020 MHz	MO	20M0W9W	251 mW (ERP)	
2110-2170 MHz	FX	40M0W9W	251 mW (ERP)	

Frequency Information

Mountain View (SANTA CLARA), CA - NL 37-23-20; WL 122-03-07; MOBILE: , within 2 km

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2110-2155 MHz	FX	40M0W9W	251 mW (ERP)	
2180-2200 MHz	FX	20M0W9W	251 mW (ERP)	
2500-2570 MHz	MO	40M0W9W	251 mW (ERP)	
2570-2620 MHz	FX	40M0W9W	251 mW (ERP)	
2570-2620 MHz	MO	40M0W9W	251 mW (ERP)	
2620-2690 MHz	FX	40M0W9W	251 mW (ERP)	
3400-3550 MHz	FX	40M0W9W	7.5 mW (ERP)	
3400-3600 MHz	MO	40M0W9W	7.5 mW (ERP)	
3650-3800 MHz	FX	40M0W9W	251 mW (ERP)	

Frequency Information

Naperville (DU PAGE), IL - NL 41-48-44; WL 88-07-11; MOBILE: Nokia Facility, within 2 km, centered around NL 41-48-44; W

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
698-716 MHz	FX	10M0F9W	251 mW (ERP)	
728-746 MHz	FX	10M0F9W	251 mW (ERP)	
746-756 MHz	FX	10M0F9W	251 mW (ERP)	
777-787 MHz	MO	10M0F9W	251 mW (ERP)	
869-894 MHz	FX	5M00F9W 248KG7W	160 mW (ERP)	
896-902 MHz	FX	40M0W9W	252 mW (ERP)	
1710-1755 MHz	MO	5M00F9W	251 mW (ERP)	
1850-1910 MHz	MO	5M00F9W 333KG7W	160 mW (ERP)	
1920-1980 MHz	MO	5M00F9W	251 mW (ERP)	
2110-2170 MHz	FX	5M00F9W	251 mW (ERP)	

Frequency Information

Coppell (DALLAS), TX - NL 32-56-08; WL 96-59-01; MOBILE: Nokia Campus, within 1 km, centered around NL 32-56-08; WL

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
699-716 MHz	MO	18M0W9W	251 mW (ERP)	
717-728 MHz	FX	10M0F9W 5M00D7W	251 mW (ERP)	
729-756 MHz	FX	18M0W9W 20M0F9W 5M00D7W 10M0W7W	251 mW (ERP)	
777-787 MHz	MO	10M0W9W	251 mW (ERP)	
800-821 MHz	MO	30M0W9W	251 mW (ERP)	
824-849 MHz	MO	25M0W9W	251 mW (ERP)	
832-862 MHz	FX	30M0W9W	251 mW (ERP)	
859-894 MHz	FX	25M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
896-902 MHz	FX	40M0W9W	251 mW (ERP)	

Frequency Information

Coppell (DALLAS), TX - NL 32-56-08; WL 96-59-01; MOBILE: Nokia Campus, within 1 km, centered around NL 32-56-08; WL

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
1525-1559 MHz	FX	30M0W9W	251 mW (ERP)	
1626.5-1660.5 MHz	MO	30M0W9W	251 mW (ERP)	
1710-1755 MHz	MO	40M0W9W	60 W (ERP)	
1805-1880 MHz	FX	20M0F9W	251 mW (ERP)	
1850-1910 MHz	MO	40M0W9W	251 mW (ERP)	
1910-1930 MHz	FX	20M0W9W	251 mW (ERP)	
1910-1930 MHz	MO	20M0W9W	251 mW (ERP)	
1920-1980 MHz	MO	40M0W9W	251 mW (ERP)	
1930-1995 MHz	FX	40M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
2000-2020 MHz	MO	20M0W9W	251 mW (ERP)	

Frequency Information

Coppell (DALLAS), TX - NL 32-56-08; WL 96-59-01; MOBILE: Nokia Campus, within 1 km, centered around NL 32-56-08; WL

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
2110-2155 MHz	FX	40M0W9W	60 W (ERP)	
2110-2170 MHz	FX	40M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
2180-2200 MHz	FX	20M0W9W	251 mW (ERP)	
2355 MHz	FX	10M0F9W 5M00D7W	251 mW (ERP)	
2500-2690 MHz	FX	40M0W9W 5M00D7W 20M0F9W	251 mW (ERP)	
2500-2690 MHz	MO	40M0W9W 20M0F9W 5M00D7W	251 mW (ERP)	
2500-2570 MHz	MO	40M0W9W	251 mW (ERP)	
3400-3600 MHz	MO	40M0W7W	7.5 W (ERP)	

Frequency Information

Coppell (DALLAS), TX - NL 32-56-08; WL 96-59-01; MOBILE: Nokia Campus, within 1 km, centered around NL 32-56-08; WL

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
3400-3600 MHz	FX	40M0W9W	7.5 mW (ERP)	
3600-3800 MHz	FX	40M0W9W	251 mW (ERP)	

Special Conditions:

- (1) Operation requires consent of affected Educational Broadband Service/Broadband Radio Service (EBS/BRS) licensees.
- (2) Operation in the 1850-1910 or 1930-1990 MHz band requires prior frequency coordination with 2 GHz microwave users and consent of PCS licensees to avoid interference.
- (3) Operation is subject to prior coordination with the Associated Public Safety Communications Officers, Inc. (APCO); ATTN: Director of Frequency Coordination; 351 North Williamson Blvd.; Daytona Beach, FL 32114-1112; Telephone: (386) 322-2500.
- (4) Operation in the 1695-1780 MHz, 1915-1920 MHz, 1995-2020 MHz or 2110-2200 MHz band requires consent of local Advanced Wireless Service (AWS) licensee(s) to avoid interference.
- (5) Operation in the 824-849 or 869-894 MHz band requires consent of local cellular licensee(s) to avoid interference.
- (6) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.
- (7) Licensee should be aware that other stations may be licensed on these frequencies and if any interference occurs, the licensee of this authorization will be subject to immediate shut down.
- (8) The station identification requirements of Section 5.115 of the Commission's Rules are waived.
- (9) Operation is subject to prior coordination with the local Society of Broadcast Engineers, Inc. (SBE) frequency coordinator. Consult the list at https://www.sbe.org/sections/freq_local.php to find the appropriate coordinator.
- (10) The stop buzzer contact for this project is Glenn Steitz
Phone: (973) 214-0028 Email: glenn.steitz@nokia-bell-labs.com
- (11) Experimental station shall use the minimum power level necessary to establish communications links to minimize potential interference to licensed users.

Special Conditions:

- (12) Prior to commencing any operations in the frequencies below, Nokia Solutions and Networks US LLC must obtain consent from the following within 50 miles of the contours of the testing area:
- > 700 MHz licensees (698-758 MHz and 775-788 MHz)
 - > 700 MHz Upper Band licensees (746-758 MHz and 775-788 MHz)
 - > SMR licensees (809-824 MHz/854-869 MHz)
 - > B/ILT licensees (809-824 MHz/854-869 MHz)
 - > Cellular licensees (824-849 MHz/869-894 MHz)
 - > Commercial Air-Ground licensee (849-851 MHz/894-896 MHz)
 - > SMR licensees (896-901 MHz/935-940 MHz)
 - > B/ILT licensees (896-901 MHz/935-940 MHz)
 - > Narrowband PCS licensees (901-902/930-931/940-941 MHz)
 - > Broadband PCS licensees (1850-1910 MHz/1930-1990 MHz)
 - > WCS (2305-2320 MHz/2345-2360 MHz) licensee (AT&T)
- (13) For Each proposed venue, Nokia Solutions and Networks US LLC must
- > Secure consents from the Advance Wireless Service licensees prior to operation in 1710-2200 MHz range.
 - > Obtain consents from the Educational Broadband Service and the Broadband Radio Service licensees prior to operation in 2500-2690 MHz range.
 - > Maintain operation separation from the grandfathered earth stations as defined in Part 90, Subpart Z, or coordinate an agreement with the grandfathered earth station licensees prior to operation in 3650-3700 MHz band.
 - > Consult the ULS database to ensure that the operation will not cause harmful interference to any existing registered stations in the 3650-3700 MHz band, and notify the registered users in the proposed geographic areas prior to operation in this band.
- (14) Operation in the 3550-3650 MHz Frequency Band in Mountain View, CA area is not allowed due to the NAVY Objection.