

**APPLICATION FOR EQUIPMENT CERTIFICATION**

**FCC FORM 731**

**AND**

**SUPPORTING DOCUMENTATION**

**SUBMITTED TO:**

**FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF ENGINEERING AND TECHNOLOGY  
LABORATORY DIVISION  
7435 OAKLAND MILLS ROAD  
COLUMBIA, MD 21046-1609**

**FOR:**

**ROHDE & SCHWARZ**

**NV8200 SERIES TRANSMITTER FAMILY**

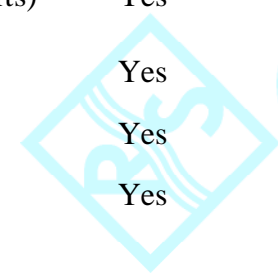
**26 May 2008**

# NV8200 series Transmitter FCC Certification Application

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NV8206V Transmitter Block Diagrams		Yes
NV8206E/V System Manual	(7-parts)	Yes
SV800 Exciter Instrument Manual	(7-parts)	Yes
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NV8206 Internal Photographs		Yes
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## Summary of Application for Certification of Equipment

Rohde & Schwarz, Inc. is hereby applying for Equipment Certification for the NV8200 family of UHF solid state transmitters. This is to permit licensed operation pursuant to 47CFR§27.51 and 47CFR§74.795. To that end we are electronically submitting an Application for Equipment Authorization, FCC form 731 as specified by 47CFR§27.1033, Application for Certification. Along with that form we are including as Exhibits the requisite documentation, including reports of various measurements conducted in accordance with 47CFR§2, that demonstrate compliance with the pertinent sections of 47CFR§27, 47CFR§74 and 47CFR§2.

## 47CFR§2.1033(c) APPLICATION FOR CERTIFICATION INFORMATION

### 47CFR§2.1033(c)(1) Name of Applicant / Mailing Address:

Rohde & Schwarz, Inc	Rohde & Schwarz, GmbH & Co. KG
8661A Robert Fulton Drive	Broadcasting Division
Columbia, MD 21046-2255	Mühldorfstraße 15
	D-81671
	München
	Federal Republic of Germany

### 47CFR§2.1033(c)(2) FCC Identifier:

Please refer to Exhibit *NV8200 FCC ID Label and Placement* for examples of the FCC ID labels and the manufacturer's information labels for the NV8200 family of transmitters.

### 47CFR§2.1033(c)(3) Installation and Operating Instructions:

Exhibits *NV8206E/V System Manual*, *SV800 Exciter Instrument Manual* and *NetCCU 800 Instrument Manual* contains complete, detailed instructions to guide the end user from receiving the unit up to the point of turn-on, including instructions on making all necessary adjustment and calibration procedures to that end. Virtually all of the information presented is applicable to all transmitters in the NV8200 family.

### 47CFR§2.1033(c)(4) Type or Types of Emission:

6M00W7W for Part 27 operation  
5M38C7W for Part 74 operation

Please refer to Exhibit *Description of Qualcomm MediaFLO Modulation*

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*Characteristics* for an overview of the modulation methodology employed for Part 27 operation.

The eight-level vestigial sideband modulation utilized for Part 74 operation conforms to the standards described by the Advanced Television Standards Committee as described in 47CFR§73.682(d).

## **47CFR§2.1033(c)(5) Frequency Range:**

698-mHz to 746-mHz for Part 27 operation

470-mHz to 806 mHz for Part 74 operation

Please refer to *NV8200 Transmitter Family General Specifications*, for a complete listing of specifications for all models in the NV8200 transmitter family covered by this application.

## **47CFR§2.1033(c)(6) Range of Operating Power Values or Specific Operating Power Levels:**

The various transmitters covered under this application, and their rated power output levels, are shown in Exhibit *NV8200 Transmitter Family General Specifications*. The output power level of any transmitter in the family can be reduced to any reasonable level (100% to approximately 20%) that may be required during installation. Varying the output power during operation is not considered to be a routine occurrence. Please see Exhibit *NV8206E/N System Manual* and also Exhibit *NetCCU 800 Instrument Manual* for instructions on making such adjustment.

## **47CFR§2.1033(c)(7) Maximum Power Rating:**

Please refer to Exhibit *NV8200 Family General Specifications* for the power rating for each transmitter model covered under this application. Note that the maximum rated output power is limited by the non-linearity of the solid-state amplification devices utilized in the combined final stages of the transmitters.

## **47CFR§2.1033(c)(8) Final Stage DC Voltage and Currents:**

VH8200A1 UHF Power Amplifier Module

LDMOS transistor, 8 devices per amplifier module.

Final stage DC operating parameters for OFDM (MediaFLO) waveform are:

E = 32-volts, DC

I ≈ 5.8 amperes/transistor, 46.4-amperes/amplifier module,

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Total power output is  $\approx$  230-watts with OFDM/MediaFLO modulation waveform.

Final stage DC operating parameters for 8-VSB (ATSC) waveform are:

$E = 32$ -volts, DC

$I \approx 7.4$  amperes/transistor, 59.2-amperes/amplifier module,

Total power output is  $\approx$  345-watts with 8-VSB (ATSC) modulation waveform.

## **47CFR§2.1033(c)(9) Tune-Up Procedure:**

As the transmitters in the NV8200 family are broadband in design there is no tune-up procedure, per se. The Exhibit *NV8200 Parts List and Tune Up Procedure* gives a brief outline of the commissioning process needed to prepare a transmitter for operation. Commissioning and adjustments are further described in great detail in the Exhibit *NV8206E/V System Manual*.

## **47CFR§2.1033(c)(10) Schematic Diagrams, Circuitry Descriptions for Frequency Stability, Suppression of Spurious Emissions, Modulation Limiting and Power Limiting:**

The operating circuitry of the transmitter is described briefly in the Exhibit *NV8200 Operational Description*. Much greater detail can be found throughout Exhibits: *NV8206E/V Transmitter System Manual*, *SV800 Exciter Instrument Manual*, *NetCCU 800 Instrument Manual* and *VH8300A1 UHF Power Amplifier Instrument Manual*. Detailed schematic diagrams, parts lists and circuit card layouts can be found in those same Exhibits. Block diagrams of the exciter and transmitter are available in the Exhibit *NV8206V Block Diagrams*.

In addition to the standard harmonic filter, spurious emissions are limited by both the clean exciter design with its equalization/precorrector capabilities and by a channel “mask” filter at the output terminal of each transmitter. That “mask” filter is supplied by a third party.

The overall requirements for that filter for operation under Part 27 are specified in the Exhibit *Qualcomm Source Control Document for Channel Mask Filter*. The measured response for that filter can be found in the Exhibit *Dielectric Mask Filter Response Measurements for MediaFLO*.

For Part 74 operation the “mask” filter is specified to meet the requirements for “stringent” operation as described in 47CFR§74.794(a)(2)(ii) and the filter utilized for the measurements taken for the Exhibit *NV8206V Rohde & Schwarz ATSC Conducted Performance Measurement Report* meets that requirement.



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## **47CFR§2.1033(c)(11) Equipment Identification Plate Photo:**

Refer to Exhibit *NV8200 FCC ID Label and Placement*, for a photograph of a typical Rohde & Schwarz transmitter's manufacturer's ID label as well as the same information for the FCC ID label specific to this transmitter model line.

## **47CFR§2.1033(c)(12) Photographs of Transmitter Equipment:**

Photographs of the exterior of the transmitter may be found in the Exhibit *NV8206V Exterior Photographs*.

Photographs of the interior of the transmitter may be seen in the Exhibit *NV8206 Interior Photographs*.

Photographs of the circuit assemblies of the SV800 exciter can be found in the Exhibit *SV 800 Exciter Printed Circuit Board Photographs*.

Photographs of the exterior and interior of the VH8200A1 UHF Power Amplifier can be located in the Exhibit *VH8200A1 Power Amplifier Internal Photographs*.

Additional photographs may be viewed throughout the Exhibits of the manuals for the transmitter and its sub-systems.

## **47CFR§2.1033(c)(13) Details of Digital Modulation Technique: and 47CFR§2.1047 Modulation Characteristics:**

Please refer to the Exhibit *Description of MediaFLO Modulation Characteristics* for a description of the modulation methodology for Certification under Part 27.

For Part 74 operation eight level vestigial sideband, or 8-VSB, as defined for DTV service by the Advanced Television Standards Committee and referenced in 47CFR§73.682(d), is employed.

## **47CFR§2.1046 RF Power Output:**

Please refer to Exhibit *NV8206V Nokia Siemens Laboratory Test Report A0WS0005* for power output measurements for Part 27 operation with the OFDM (MediaFLO) waveform.

Power output measurements for Part 74 operation may be found in the Exhibit *NV8206V Rohde & Schwarz ATSC Conducted Performance Measurement Report*.

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## **Data Required by §§2.1046 Through §§2.1057 Inclusive, Measured in Accordance with §2.1041:**

Exhibit *Sx 800 Exciter Temperature Stability Test Report* demonstrates compliance with §2.1046 and §27.54 for the temperature stability requirements. The demonstrated stability is independent of the modulation waveform.

The Exhibit *NV8206V Nokia Siemens Laboratory Test Report A0WS0005* shows compliance with the requirements of §2.1046 for RF power output for Part 27 operation with OFDM (MediaFLO) modulation and also attests to compliance with all other required criteria from Part 2 as well as §27.53, Emissions Limits.

The Exhibit *NV8206V Rohde & Schwarz ATSC Conducted Performance Measurement Report* shows compliance with the requirements of §2.1046 for RF power output and also attests to compliance with all other required criteria from Part 2 as well as the pertinent sections of Part 74.

## **47CFR§74.794 Digital Emissions:**

Please refer to *NV8206V Rohde & Schwarz ATSC Conducted Performance Measurement Report* for measurement of emissions for Part 74 operation with the 8-VSB (ATSC) waveform.

## **47CFR§74.794(b)(1) Digital Emissions, Harmonic Filter Suppression in GPS Bands:**

Measurements were taken with a network analyzer on a standard harmonic filter of the type included as part of each NV8200-series transmitter. The resulting data, presented in Exhibit *Rohde & Schwarz Part Number 2096.6508.02 Harmonic Filter Response in GPS Bands Measurement Report*, demonstrates compliance with this requirement.

## **47CFR§74.795(b) Requirements to be Met Before Digital Low Power TV and TV Translator Transmitters will be Certificated by the FCC:**

Compliance of the NV8200 transmitter family with the requirements of this Section is demonstrated in Exhibits *NV8206V Rohde & Schwarz ATSC Conducted Performance Measurement Report* and *Sx 800 Exciter Temperature Stability Test Report*.

