



FCC CFR47 PART 22 SUBPART H CERTIFICATION

TEST REPORT AMENDMENT

FOR

SINGLE CHANNEL CELLULAR AMPLIFIER

TESTED WITH ADDITIONAL MODULATION TYPES
CDPD AND AMPS (INCLUDING VOICE, VOICE +SAT, WIDEBAND DATA)

MODEL: SCA9125-50

FCC ID: E675JS0039

REPORT NUMBER: 99U0404

ISSUE DATE: SEPTEMBER 14, 1999

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TABLE OF CONTENTS**PAGE**

FCC PART 2 CERTIFICATION ADDITIONAL TEST RESULTS:.....	3
SECTION 2.1046: RF POWER OUTPUT	3
SECTION 2.1049: OCCUPIED BANDWIDTH	5
SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL.	8

Attachment :

- ***Section 2.1046 plots from 1 to 4***
- ***Section 2.1049 plots from 5 to 27***
- ***Section 2.1051 plots from 28 to 35***

AMENDMENT BACKGROUND:

In reference to our RF power amplifier, proposed FCC ID No. E67 5JS0039, the reason the additional modulation types were not included in the original filing, but are being appended later, results from a clarification by our customer, Nortel Networks, regarding how the amplifier will be used. This amplifier is intended to be used in two types of dual mode transmitter systems, which can be selected to operate in the following modes:

- 1) Transmitter Type 1: TDMA or AMPS (including Voice, Voice + SAT, and Wideband Data)
- 2) Transmitter Type 2: TDMA or CDPD

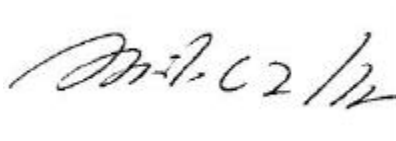
Only 1 mode can be selected at a time, and the amplifier is used with only one carrier.

Powerwave's understanding at the time of the original testing was that the amplifiers would only be used with TDMA modulation.

Nortel uses a software interface with their transmit/receive unit to select which type of signal is transmitted. This selection is completely independent of the amplifier.

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Report prepared by :



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FCC PART 2 CERTIFICATION ADDITIONAL TEST RESULTS:**SECTION 2.1046: RF POWER OUTPUT****Equipment used.**

HP Spectrum Analyzer/8593EM

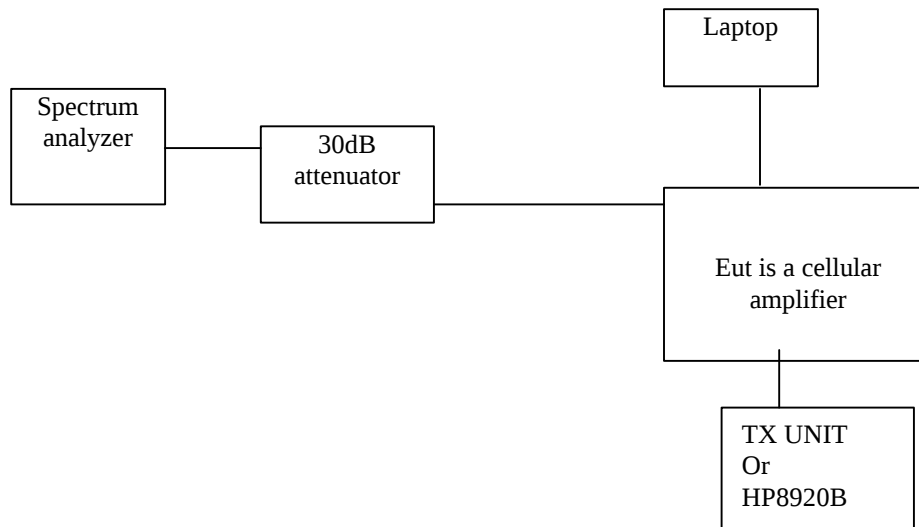
Narda 30dB Attenuator

Flexco low loss cables, 9ft. (Loss: 0.85 dB/ft @ 26GHz)

HP RF Communication test set/8920B

Transmitter Unit/TRU II NNTM53101DYE

Laptop computer.

TEST SETUP:**Minimum Requirement:**

Section 22.913(a) Maximum ERP: The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Test Procedure:

Turn on the EUT and connected the transmitter antenna output to spectrum analyzer using a low loss cable. RES b/w. was set to 30kHz and adjusted spectrum analyzer to center frequency at the highest amplitude appearing on spectral display. Then set spectrum analyzer frequency span to show signal on spectrum analyzer. This test was done for low, middle, and high channel both for analog and digital modulations.

Test Result:

Power was measured with Spectrum analyzer. Plots of Voice and Wideband modulation power output are included. CDPD Modulation power was measured by customer, which came to be **+47 dBm**.

AMPS MODE	
	PLOT NUMBER
LOW: 50Watts (47 dBm)	1
HIGH:	2
WIDEBAND MODE	
	PLOT NUMBER
LOW:	3
HIGH:	4

SECTION 2.1049: OCCUPIED BANDWIDTH

Equipment used.

HP Spectrum Analyzer/8593EM

Narda 30dB Attenuator

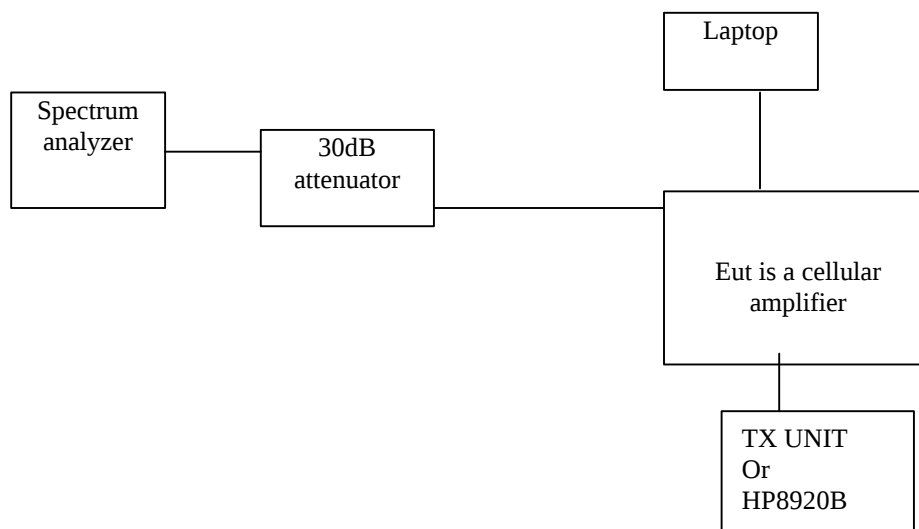
Flexco low loss cables, 9ft. (Loss: 0.85 dB/ft @ 26GHz)

HP RF Communication test set/8920B

Transmitter Unit/TRU II NNTM53101DYE

Laptop computer.

TEST SETUP:



Minimum Requirement:

AMPS:

(A) For voice modulation

22.917(B) F3E/F3D: On any frequency removed from the carrier by greater than 20 kHz up to and including 45 kHz: At least 26 dBc;

2. On any frequency removed from the carrier frequency by greater than 45 kHz up to the first multiple of the carrier frequency: At least 60 dBc or $43 + 10 \log(\text{mean output power in watts})$ dBc, whichever is the lesser attenuation

(B) Wideband and CDPD modulation.

22.917 (d) F1D emission mask; F1D emissions, the mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) as follows:

- 1) On any frequency removed from the carrier frequency by more than 20kHz, but no more than 45kHz: at least 26dB.
- 2) On any frequency removed from the carrier frequency by more than 45kHz, but no more than 90kHz: at least 45dB.
- 3) On any frequency removed from the carrier frequency by more than 90kHz, up to the first multiple of the carrier frequency: at least 60dB or $43 + \log(P)$ dB, whichever is the lesser attenuation.

Test Procedure:

- (A) For voice modulation use section 2.1049 (c)(1): The plots depict the carrier signal modulated with a 2500 Hz test signal and a frequency deviation of +/- 12 kHz
- (B) For Wideband modulation: Modulated transmitter with a 10 kilobit/second data pattern creating a frequency deviation not exceeding +/- 8 kHz

A RES BW: 30kHz cannot be used, instead a RES BW: 300Hz was used to measure signal.

Test Result:

Data on the bandwidth occupied by this transmitter is presented in graphical form using spectrum analyzer plots and included is a 30 kHz plot showing it cannot be used. Customer performed CDPD modulation.

30 kHz PLOT	5
AMPS MODE	
	PLOT NUMBER
LOW	6
	7
	8
	9
HIGH	10
	11
	12
	13
WIDEBAND MODE	
	PLOT NUMBER
LOW	14
	15
	16
	17
	18
	19
HIGH	20
	21
	22
	23
	24
	25
CDPD MODE	
	PLOT NUMBER
MIDDLE	26
	27

SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL.**Equipment used.**

HP Spectrum Analyzer/8593EM

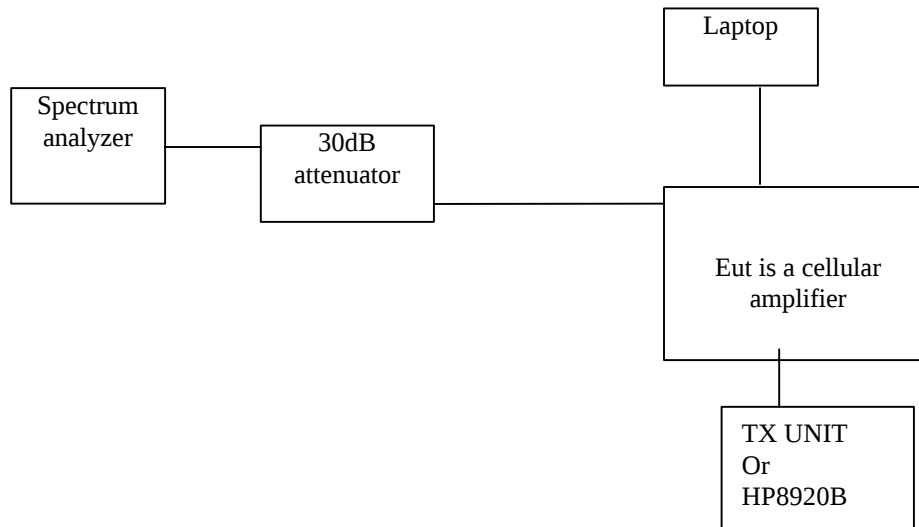
Narda 30dB Attenuator

Flexco low loss cables, 9ft. (Loss: 0.85 dB/ft @ 26GHz)

HP RF Communication test set/8920B

Transmitter Unit/TRU II NNTM53101DYE

Laptop computer.

TEST SETUP:

Note: System integrator will be installing a low pass filter at the antenna terminal output to attenuate the second harmonic.

Minimum Requirement:**22.917(e) Out of Band emissions:**

The magnitude of each spurious and harmonic emissions that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be more than $43 + 10 \log (\text{mean output power})$ dBc below the mean power output, which is equivalent to **-13 dBm**.

Test Result:

Refer to spectrum plots attached. Plots are from 5MHz to 10th harmonic of the carrier frequency. Table shows the order of plots for Voice and Wideband modulations. Customer performed CDPD modulation, but no out-of-band was performed, since results by other modulation produce similar harmonic and spurious emissions, by engineering judgement, CDPD will also produce similar emissions.

AMPS MODE		WIDEBAND MODE
	PLOT NUMBER	PLOT NUMBER
LOW	28	32
	29	33
HIGH	30	34
	31	35