



FCC Permissive Change Class2 for the HePA1900 V3 introduction in BTS S8000 (FCC ID AB6S8000BTS) and BTS S12000(FCC ID AB6S12000BTS)

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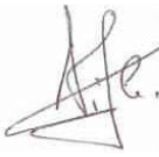
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1 INTRODUCTION

1.1. OBJECT

This document describes the introduction of new “**HePA PCS19000 V3**” in BTS S8000 and BTS 12000 Nortel product.

The S8000 Outdoor BTS is already certified according to FCC Part 22 & 24, under the following **FCC Id: AB6S8000BTS**.

The S12000 Outdoor BTS is already certified according to FCC Part 22 & 24, under the following **FCC Id: AB6S12000BTS**.

1.2. AUDIENCE FOR THIS DOCUMENT

This document is addressed to Nortel Networks R&D and representative external organization.

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2. RELATED DOCUMENTS

2.1. REFERENCE DOCUMENTS

[R1]	PCS/BTS/DJD/017459	FCC Part 24/Part22 Test Report for S8000 Indoor and Outdoor Base stations FCC ID#AB6S8000BTS
[R2]	PCS/BTS/DJD/017461	FCC Part 24/Part22 Test Report for S12000 Indoor and Outdoor Base stations FCC ID#AB6S12000BTS

2.2. APPLICABLE DOCUMENTS

Only regulatory documents are listed below, detailed standards regarding testing are not described below.

GENERAL

[A1]	47 CFR Part 1	PRACTICE AND PROCEDURE
[A2]	47 CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

EMC DOCUMENTS

[A3]	47 CFR Part 15	RADIO FREQUENCY DEVICES
[A4]	ICES 003	Digital apparatus
[A5]	CISPR 22	Limits and methods of measurement of radio disturbance characteristics of information technology equipment

RADIO DOCUMENTS

GSM RADIO DOCUMENTS

[A6]	3GPP TS 11.21	3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Base Station System (BSS) equipment specification; Radio aspects (Release 1999)
[A7]	3GPP TS 05.05	Technical Specification Group GSM/EDGE Radio Access Network; Radio transmission and reception (Release 1999)
[A8]	47 CFR Part 24	PERSONAL COMMUNICATIONS SERVICES
[A9]	47 CFR Part 22	PUBLIC MOBILE SERVICES
[A10]	RSS 133	Personal Communication Services in the 2GHz band

3. EVOLUTION DESCRIPTION

Nortel introduces a new **PCS1900 High Power Amplifier V3 version (HePA PCS1900 V3)** in BTS S8000 & BTS12000 Indoor and Outdoor versions.

Nortel Code = NTQA50RA Rel 07

Andrew Code = RF100576

This new version HePA V3 module allows to prevent from RF power transistor component obsolescence on the current production of previous HePA version V1 (NTQA50RA Rel 01 to 06 – Andrew E15Q40P09B)

The new HePA PCS 1900 V3 module has the same EMC and Radio specification as the previous version already introduced in the BTS S8000 and S12000.

- Same Output Power in GMSK and Edge
- Equivalent or better Power DC consumption.
- Same Digital and RF interface.

For these BTS, the Power Amplifier is an independent module which can insert directly in a BTS slot. The RF driver module (eDRX) provides it RF low power by a RF cable. The HePA output is linked to Duplexer by a RF cable.

This **HePA PCS1900 (60W GMSK/45W 8PSK)** is designed and is manufactured by the provider ANDREW. ANDREW will perform the FCC module qualification under FCC ID (**FCC ID S8L-100576HePA**)

Nortel has already introduced a previous version of Andrew HePA PCS1900 (60W/45W) (NTQA50RA Rel 01) in BTS S8000 (**FCC ID#AB6S8000BTS**) and BTS S12000 (**FCC ID#AB6S12000BTS**).

4. ANALYSIS

The introduction of the new HePA PCS1900 V3 module is done by Permissive Change Class 2 to update the FCC Files (BTS S8000 & BTS 12000).

The certification of Power Amplifier HePA1900 V3 introduction is done on the basis of the following documents:

- **HePA PCS1900 V3 Module** =

For FCC Part15, EMC module tests are performed by Andrew, PA module FCC ID certification are delivered by Andrew.

ANDREW provides also tests status report including **Part 24 tests** (for radiated spurious emissions §2.1053), PA enclosure radiated spurious still meets -13dBm (with testing in accordance with TIA-603, which means radiated spurious emissions will need to be tested with substitution method).

These documents are including into the Permissive Change Class 2 Files.

As the BTS is already certified with an equivalent HePA1900 (60W GMSK/45W 8PSK) module which has same module technical specification, any EMC tests at BTS integration level has been performed.

Radiated spurious emissions (2.1053) is not required at BTS level, module compliance to (§2.1053) allow to ensures that BTS enclosure still meets radiated spurious -13dBm with the new HePA1900 V3 versions.

The BTS S8000 and BTS S12000 compliance are ensured by the compliance of HePA PCS1900 module to Part15 and Part24.

- **BTS S8000 & BTS S12000** =

-For **FCC Part 24**, FCC radio test are performed in BTS S12000 at ambient temperature.

As BTS S12000 and BTS S8000 used the same BTS mechanical architecture, modules and same RF paths, HePA1900 has the same behaviour and RF performances for two models.

The following radio performances are checked for BTS radio integration tests in normal conditions with BTS S8000 Duplexer configuration for modulation GMSK (60W), 8PSK(45W),

-Mean RF power, Spectrum bandwithd, Spurious Test.

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-FCC Part 24, FCC radio test (frequency stability) in extreme conditions

HePA PCS1900 (60W) Consumption Analysis

Consumption measurement:

HePA PCS1900 (60W) version V1 & V3 Consumption measurement:

Table : Test DC Power Consumption, GMSK Signal

	Measure	Unit	Freq: 1930200 KHz	Freq: 1960000 KHz	Freq: 1989800 KHz
	Voltage	V	-48	-48	-48
HePA PCS1900 (60W) version V3	DC-Power	W	206	207	207
HePA PCS1900 (60W) version V1	DC-Power	W	251,7	250,9	251,7

Conclusion:

The evolution HePA1900 version V3 (Pdc= 207W) has a lower consumption than the previous version V1 (Pdc= 250W)

BTS Radio integration Tests in extreme temperature =Frequency stability performance
Impact:

BTS frequency stability has not been done because the PA has no impact on BTS frequency stability. The frequency stability is managed by radio driver module (eDRX).

The HePA V3 module has lower consumption and lower thermal dissipation as previous version.

So it does not impact eDRX module thermal environment inside BTS and doesn't impact BTS frequency stability.

DOCUMENTS Delivered for FCC Permissive Change Class 2

1. HePA module FCC ID Grant from Andrew provider
 - FCC Id = S8L-100576HEPA

2. BTS integration radio test report at ambient temperature.

FCC Permissive Change Class2 Test report for the HePA PCS1900 V3 introduction in BTS S8000 (AB6S8000BTS) and S12000 (AB6S12000BTS)
PCS/BTS/DJD/023691 V01/EN

5. CONCLUSION

In conclusion, we have established that the **PCS1900 High Power Amplifier version V3 (HePA V3)** introduction is FCC compliant regarding “EMC and Radio “Part 15 & Part 24 performances and keep the same RF performances (Power Emission, Modulation signal, Spurious, frequency stability) at BTS S8000 and BTS S12000 System.

The initial Radio tests and Health analysis performed on **NORTEL S8000 a S12000 BTS** product remain fully applicable to this product after its evolution.

6. ABBREVIATIONS AND DEFINITIONS

6.1. ABBREVIATIONS

3GPP	3 rd Generation Partnership Project
8PSK	Eight Phase Shift Keying
ABM	Alarm Bridge Module
AC	Alternative Current
BTS	Base Transceiver Station
DC	Direct Current
DCS	Digital Cellular System
E1	Standard European PCM link nickname
EMC	ElectroMagnetic Compatibility
ETSI	European Telecommunications Standards Institute
FDD	Frequency Division Duplex
GMSK	Gaussian Modulation Shift Keying
GSM	Global System for Mobile communications
HPRM	High Power Radio Module
ICM	Interface Control Module
IEC	International Electro-technical Commission
IFM	InterFace Module
ITU	International Telecommunication Union
PA	Power Amplifier
PCM	Pulse Code Modulation
PSU	Power Supply Unit
R&D	Research & Development
R&TTE	Radio and Telecommunication Terminal Equipment
RF	Radio Frequency
RM	Radio Module
RX	Receive
T1	Standard US PCM system (1.544 Mbit/s)
TDD	Time Division Duplex
TX	Transmit

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