



# GSM 9000 INDOOR BTS RADIO TEST REPORT PCS1900 & GSM850 FCC PART24&PART22

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## **PUBLICATION HISTORY**

This document is modified for every change in the regulatory documentation of FCC mark file.

TCF Version	Date	Content of evolution	Comments	Author
01.01/EN	10/Dec/2007	Creation	GSM 9000 Indoor BTS FCC Part24&Part22 Compliance	Ray Hu / GDNT

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## 1. INTRODUCTION

This document presents the measurement results of tests performed on this report presents the test data in accordance with FCC Part 24 and also the test data in accordance with FCC Part 22, for the Nortel Networks GSM 9000 Indoor BTS in Dual Band GSM850 / PCS1900 band.

This report presents test data for GMSK and 8PSK modulation (EDGE functionality).

#### 1.1 SCOPE OF THIS DOCUMENT

This document applies to the Nortel Networks GSM 9000 Indoor BTS.

GSM 9000 Indoor BTS can integrate a maximum of 3 Radio-Modules (RM).

This report presents the test data in accordance with FCC Part 24 for the S9000 Indoor Base-stations in PCS1900 band configured with:

Radio module PCS1900 30W for GMSK & Edge

This report presents also the test data in accordance with FCC Part 22, for the S18000 Indoor Base-stations in 850 Band configured with:

New radio module HPRM GSM850 (GMSK 60W / Edge 45W)

These results can be applied for Dual Band GSM850 / PCS1900 GSM9000 BTS configuration.

#### 1.2 AUDIENCE FOR THIS DOCUMENT

This document is to be used by any person needing a view on Nortel Networks GSM 9000 Indoor BTS.

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## 2. RELATED DOCUMENTS

## 2.1 APPLICABLES DOCUMENTS

[A1]	47CFR Part 24	PERSONAL COMMUNICATION SERVICES, January 2003
[A2]	CFR 47 Part22	PUBLIC MOBILE SERVICES
[A3]	47 CFR Part2	FREQUENCY ALLOCATION AND RADIO TREATY MATTERS;
		GENERAL RULES AND REGULATIONS , October 2003
[A4]	IC RSS-133	Spectrum Management and Telecommunication Policy - Radio
		Standard Specifications, Issue 3- June 2005

## **2.2 REFERENCE DOCUMENTS**

[R1] PE/BTS/DPL/ S9K_RF-TP01 RF test plan for GSM 9000 BTS
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- [R2] Radio Test Report for FCC Regulatory in extreme conditions of GSM 9000 Indoor BTS 1900MHz
- [R3] PE/BTS/DJD/021878 GSM 18000 Indoor BTS Radio Test Report according to FCC Part 24 & FCC Part 22 (FCC ID AB6BTS18IND)

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## 3. ABBREVIATIONS AND DEFINITIONS

## 3.1 ABBREVIATIONS

RM	Radio Module
BCF	Base Common Function
BTS	Base Transceiving Station
DDM	Dual Diplexer Module

**GSM** Global System for Mobile Communications

**GPRS** General Packet Radio Service **EDGE** Enhanced Data for GSM Evolution PDTCH Packet Data Logical Channel

PA Power Amplifier

**EDGE Single Carrier PA** e-SCPA Edge High Power Amplifier HePA LNA Low Noise Amplifier

**OMC** Operation and Maintenance Center

**Trans-Coding Unit** TCU Mobile Switching Center **MSC** 

RF Radio Frequency Tx Transmitter TxF **Emission Filter** 

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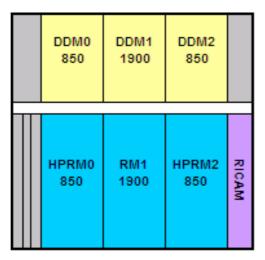
## 3.2 DEFINITIONS

```
BTS9000:
                               Nortel product line
                   Bottom ARFCN. Downlink (BTS Tx) and Uplink (BTS Rx) frequencies are given as follow:
В
                   GSM 850:
                                         F_{B \text{ downlink}} = 869.2 \text{MHz}; F_{B \text{ uplink}} = 824.2 \text{ MHz}
                   PGSM900:
                                         F_{B \; downlink} = 935.2 MHz \; ; \quad F_{B \; uplink} = 890.2 \; MHz \; \label{eq:FB}
                   EGSM900:
                                         F_{B \text{ downlink}} = 925.2 \text{MHz}; F_{B \text{ uplink}} = 880.2 \text{ MHz}
                   DCS1800:
                                         F_{B \text{ downlink}} = 1805.2 \text{ MHz}; F_{B \text{ uplink}} = 1710.2 \text{ MHz}
                   PCS1900:
                                         F_{B \text{ downlink}} = 1930.2 \text{ MHz}; F_{B \text{ uplink}} = 1850.2 \text{ MHz}
M
                   Middle ARFCN. Downlink (BTS Tx) and Uplink (BTS Rx) frequencies are given as follow:
                   GSM 850:
                                         F_{M \text{ downlink}} = 881.4 \text{ MHz}; F_{M \text{ uplink}} = 836.4 \text{ MHz}
                   PGSM900:
                                         F_{M \text{ downlink}} = 947.4 \text{ MHz}; F_{M \text{ uplink}} = 902.4 \text{ MHz}
                   EGSM900:
                                         F_{M \; downlink} = 937.4 \; MHz \; ; \quad F_{M \; uplink} = 892.4 \; MHz \; \label{eq:fmdownlink}
                   DCS1800:
                                         F_{M\;downlink}=1842.4\;MHz ; F_{M\;uplink}=1747.4\;MHz
                   PCS1900:
                                         F_{M \; downlink} = 1960.0 \; MHz ; F_{M \; uplink} = 1880.0 \; MHz
T
                   Top ARFCN. Downlink (BTS Tx) and Uplink (BTS Rx) frequencies are given as follow:
                   GSM 850:
                                         F_{T \text{ downlink}} = 893.8 \text{ MHz}; F_{T \text{ uplink}} = 848.8 \text{ MHz}
                   PGSM900:
                                         F_{T \text{ downlink}} = 959.8 \text{ MHz}; F_{T \text{ uplink}} = 914.8 \text{ MHz}
                   EGSM900:
                                         F_{T \text{ downlink}} = 949.8 \text{ MHz}; F_{T \text{ uplink}} = 904.8 \text{ MHz}
                   DCS1800:
                                         F_{T \text{ downlink}} = 1879.8 \text{ MHz}; F_{T \text{ uplink}} = 1784.8 \text{ MHz}
                   PCS1900:
                                         F_{T \text{ downlink}} = 1989.8 \text{ MHz}; F_{T \text{ uplink}} = 1909.8 \text{ MHz}
```

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## 4. TEST CONFIGURATION





Tests are performed on Radio Module (RM) in first slot RM0 for GSM850 & in second slot for PCS1900.

Radio Module is equipped with three identical RF ways Tx0, Tx1, and Tx2. For the RM of GSM850, each Tx path includes a 60W Power amplifier. For the RM of GSM1900, each Tx path includes a 30W Power amplifier.

Two types of coupling device are tested:

- DDM H2 on way Tx0 & Tx1.
- Diplexer on way Tx2.

Diplexer is the worst case for spurious level.

H2 combiner introduces additional 3dB losses

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## 4.2 MODULE CONFIGURATION UNDER TEST

Designation	Hardware code PEC Code	Release	Serial number	comments
BTS CABINET	NTLE01AA	01	NNTM78901QKA	-
RICAM	NTN024AA	04	NNTMGWF3006R	-
ALPRO	NTQA11CA	01	NNTM7890WE32	-
SICS	NTN071GM	V1	-	-
HPRM 0	NTN050JA	01	NNTM78901Q5Y	GSM850
RM 1	NTN050PM	02	NNTM78901QDD	PCS1900
HPRM 2	NTN050JA	01	NNTM78901Q65	GSM850
DDM 0 W/VSWR	NTN063HA	D1	MANT01X00002	GSM850
DDM 1 W/VSWR	NTN063AA	04	FICT03002DXL	PCS1900
DDM 2 W/VSWR	NTN063HA	D1	MANT01X00005	GSM850

Interconnect Digital board

HARDWARE EQUIPEMENT UNDER TEST					
Description	Hardware code	Comment			
Interconnect board					
Logical board					
IFM 0 - IFM 1	NTN025AA NTN025AF				
ICM 0 - ICM 1	NTN023AA NTN023AF				
ABM 0 – ABM 1	NTN029AA NTN029AA				
RICAM	NTN024AA				

## 4.3 TEST EQUIPMENT

Equipment	Model	S/N	Last Cal.	Cal. due
PSA series spectrum analyzer	E4443A	MY46181134	2007-6-14	2008-6-14
VSA series spectrum analyzer	E4406A	US40062090	2007-10-29	2008-10-29
Spectrum Analyzer	FSEA30	100054	2007-10-29	2008-10-29

## 4.4 BTS SOFTWARE

BTS Load software version: v15e3e05

Test bench software version: Integration Test v4.04

## 4.5 TEST SOFTWARE

TIL\_alarm: V01f 205
TIL\_COAM: V15e404
WINTOOL: V04B4\_E09.0
WIN TMI: V03D306

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## 5. TEST REPORT: HPRM 60W GSM850

## 5.1 INTRODUCTION

The following information is to introduce GSM 9000 BTS for Nortel Network., in accordance with FCC Part 22 and Part 2 of the FCC Rules and Regulations.

The measurement procedures were in accordance with the requirements of Part 2.999

## **5.2 MEASUREMENT RESULTS**

## **Measurement Results Summary:**

Test Case	GMSK	8PSK	RESULT	Note
RF Power Output	В,М,Т	В,М,Т	Complies	Vmin (-40V) / Vmax (-57V)
Frequency Stability	В,М,Т	NT	Complies	From -5°C to +45 °C by 10°C step
Occupied Bandwidth	В,М,Т	B,M,T	Complies	
Spurious Emissions at Antenna Terminals	В,М,Т	В,М,Т	Complies	

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#### 5.3 NAME OF TEST: RF POWER OUTPUT

#### 5.3.1 FCC REQUIREMENTS - FCC PART 22.913L

- (a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (e.i.r.p.) with an antenna height up to 300 meters HAAT. See 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power. In no case may the peak output power of a base station transmitter exceed 500 watts.
- (b) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

Specification for Radio Modulation Test:

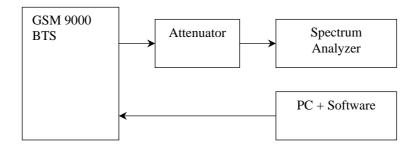
DDM Duplexer configuration:

GMSK:  $46.8 dBm \pm 2.5 dB$ 8PSK:  $45.5 dBm \pm 2.5 dB$ 

DDM H2 configuration:

GMSK: 42.8 dBm  $\pm 2.5 dB$  8PSK: 41.5 dBm  $\pm 2.5 dB$ 

#### 5.3.2 TEST PRINCIPLE



The BTS was configured to transmit at maximum power (static level 0):

- for GMSK modulation, in mode GMSK no synchro,
- for 8PSK modulation, in mode logical PDCH, Type GPRS, coding MCS5.

Measurements were carried on frequencies which are C128 (B), C131, C183, C190 (M), C231, 241, and C251 (T).

The output power was measured using the PSA which has the following settings:

Mode: Average

Reference Level Offset: Corrected to account for cable(s) and attenuator losses

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#### **5.3.3 TEST RESULTS**

The Table shows the test results of RF Output Power for **GMSK & 8PSK** modulation with several coupling configurations:

#### 5.3.3.1 TESTS AT TEMPERATURE -5 °C

#### 5.3.3.1.1 MEAN RF POWER @ -40VDC

#### > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.96dBm	Pass
C126	8PSK	41.96dBm	Pass
C131	GMSK	43.05dBm	Pass
C151	8PSK	42.19dBm	Pass
C192	GMSK	43.12dBm	Pass
C183	8PSK	42.06dBm	Pass
C190	GMSK	43.15dBm	Pass
C190	8PSK	42.08dBm	Pass
C231	GMSK	43.41dBm	Pass
C231	8PSK	42.38dBm	Pass
C241	GMSK	43.43dBm	Pass
C241	8PSK	42.34dBm	Pass
C251	GMSK	43.39dBm	Pass
C251	8PSK	42.37dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.93dBm	Pass
C126	8PSK	45.78dBm	Pass
C131	GMSK	46.95dBm	Pass
C131	8PSK	45.86dBm	Pass
C102	GMSK	46.84dBm	Pass
C183	8PSK	45.67dBm	Pass
C190	GMSK	46.86dBm	Pass
C190	8PSK	45.72dBm	Pass
C231	GMSK	47.28dBm	Pass
C231	8PSK	46.18dBm	Pass
C241	GMSK	47.22dBm	Pass
C241	8PSK	46.14dBm	Pass
C251	GMSK	47.15dBm	Pass
C251	8PSK	46.03dBm	Pass

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## 5.3.3.1.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.95dBm	Pass
C128	8PSK	41.90dBm	Pass
C131	GMSK	43.05dBm	Pass
CISI	8PSK	41.91dBm	Pass
C183	GMSK	43.06dBm	Pass
C165	8PSK	41.98dBm	Pass
C190	GMSK	43.11dBm	Pass
C190	8PSK	41.93dBm	Pass
C231	GMSK	43.44dBm	Pass
C251	8PSK	42.34dBm	Pass
C241	GMSK	43.41dBm	Pass
C241	8PSK	42.33dBm	Pass
C251	GMSK	43.36dBm	Pass
	8PSK	42.40dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.91dBm	Pass
C126	8PSK	45.67dBm	Pass
C131	GMSK	46.97dBm	Pass
C131	8PSK	45.86dBm	Pass
C183	GMSK	46.85dBm	Pass
C183	8PSK	45.71dBm	Pass
C190	GMSK	46.95dBm	Pass
C190	8PSK	45.75dBm	Pass
C231	GMSK	47.23dBm	Pass
C231	8PSK	41.46dBm	Pass
C241	GMSK	47.19dBm	Pass
C241	8PSK	46.10dBm	Pass
C251	GMSK	47.15dBm	Pass
C251	8PSK	45.96dBm	Pass

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## 5.3.3.2 TESTS AT TEMPERATURE +5 °C

## 5.3.3.2.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.94dBm	Pass
C128	8PSK	41.93dBm	Pass
C131	GMSK	43.03dBm	Pass
C131	8PSK	41.88dBm	Pass
C183	GMSK	43.02dBm	Pass
C185	8PSK	41.87dBm	Pass
C190	GMSK	43.07dBm	Pass
C190	8PSK	41.88dBm	Pass
C231	GMSK	43.33dBm	Pass
C231	8PSK	42.36dBm	Pass
C241	GMSK	43.33dBm	Pass
C241	8PSK	42.29dBm	Pass
C251	GMSK	43.31dBm	Pass
	8PSK	42.28dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.81dBm	Pass
C126	8PSK	45.73dBm	Pass
C131	GMSK	46.91dBm	Pass
C131	8PSK	45.87dBm	Pass
C183	GMSK	46.80dBm	Pass
C165	8PSK	45.80dBm	Pass
C190	GMSK	46.80dBm	Pass
C190	8PSK	45.72dBm	Pass
C231	GMSK	47.20dBm	Pass
C231	8PSK	46.19dBm	Pass
C241	GMSK	47.15dBm	Pass
C241	8PSK	46.03dBm	Pass
C251	GMSK	47.12dBm	Pass
C231	8PSK	46.01dBm	Pass

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## 5.3.3.2.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.96dBm	Pass
C128	8PSK	41.96dBm	Pass
C131	GMSK	43.02dBm	Pass
C131	8PSK	41.93dBm	Pass
C183	GMSK	43.00dBm	Pass
C185	8PSK	41.98dBm	Pass
C190	GMSK	43.09dBm	Pass
C190	8PSK	42.09dBm	Pass
C231	GMSK	43.35dBm	Pass
C231	8PSK	42.39dBm	Pass
C241	GMSK	43.34dBm	Pass
C241	8PSK	42.18dBm	Pass
C251	GMSK	43.30dBm	Pass
	8PSK	42.28dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.84dBm	Pass
C126	8PSK	45.74dBm	Pass
C131	GMSK	46.89dBm	Pass
C131	8PSK	45.84dBm	Pass
C183	GMSK	46.78dBm	Pass
C183	8PSK	45.68dBm	Pass
C190	GMSK	46.78dBm	Pass
C190	8PSK	45.70dBm	Pass
C231	GMSK	47.19dBm	Pass
C231	8PSK	46.19dBm	Pass
C241	GMSK	47.17dBm	Pass
C241	8PSK	46.15dBm	Pass
C251	GMSK	47.10dBm	Pass
C251	8PSK	46.08dBm	Pass

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## 5.3.3.3 TESTS AT TEMPERATURE +15 °C

## 5.3.3.3.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.91dBm	Pass
C126	8PSK	41.87dBm	Pass
C121	GMSK	42.96dBm	Pass
C131	8PSK	41.95dBm	Pass
C183	GMSK	42.99dBm	Pass
C165	8PSK	41.92dBm	Pass
C190	GMSK	43.06dBm	Pass
C190	8PSK	41.95dBm	Pass
C231	GMSK	43.31dBm	Pass
C231	8PSK	42.25dBm	Pass
C241	GMSK	43.31dBm	Pass
C241	8PSK	42.34dBm	Pass
C251	GMSK	43.28dBm	Pass
	8PSK	42.28dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.80dBm	Pass
C126	8PSK	44.07dBm	Pass
C131	GMSK	46.87dBm	Pass
C131	8PSK	45.78dBm	Pass
C183	GMSK	46.75dBm	Pass
C165	8PSK	45.67dBm	Pass
C190	GMSK	46.74dBm	Pass
C190	8PSK	45.62dBm	Pass
C231	GMSK	47.16dBm	Pass
C231	8PSK	46.05dBm	Pass
C241	GMSK	47.13dBm	Pass
C241	8PSK	46.09dBm	Pass
C251	GMSK	47.07dBm	Pass
C231	8PSK	46.12dBm	Pass

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## 5.3.3.3.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.90dBm	Pass
C128	8PSK	41.80dBm	Pass
C131	GMSK	42.99dBm	Pass
C151	8PSK	42.04dBm	Pass
C183	GMSK	42.97dBm	Pass
C165	8PSK	41.96dBm	Pass
C190	GMSK	43.04dBm	Pass
C190	8PSK	41.87dBm	Pass
C231	GMSK	43.31dBm	Pass
C231	8PSK	42.29dBm	Pass
C241	GMSK	43.28dBm	Pass
C241	8PSK	42.24dBm	Pass
C251	GMSK	43.23dBm	Pass
	8PSK	42.18dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.76dBm	Pass
C126	8PSK	45.74dBm	Pass
C131	GMSK	46.82dBm	Pass
C131	8PSK	45.76dBm	Pass
C183	GMSK	46.72dBm	Pass
C183	8PSK	45.64dBm	Pass
C190	GMSK	46.75dBm	Pass
C190	8PSK	45.73dBm	Pass
C231	GMSK	47.15dBm	Pass
C231	8PSK	46.16dBm	Pass
C241	GMSK	47.13dBm	Pass
C241	8PSK	46.03dBm	Pass
C251	GMSK	47.05dBm	Pass
C251	8PSK	46.07dBm	Pass

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## 5.3.3.4 TESTS AT TEMPERATURE +25 °C

## 5.3.3.4.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.86dBm	Pass
C126	8PSK	41.80dBm	Pass
C121	GMSK	42.93dBm	Pass
C131	8PSK	41.83dBm	Pass
C183	GMSK	42.95dBm	Pass
C165	8PSK	41.97dBm	Pass
C190	GMSK	43.02dBm	Pass
C190	8PSK	41.90dBm	Pass
C231	GMSK	43.24dBm	Pass
C231	8PSK	42.23dBm	Pass
C241	GMSK	43.24dBm	Pass
C241	8PSK	42.26dBm	Pass
C251	GMSK	43.21dBm	Pass
C251	8PSK	42.23dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.70dBm	Pass
C126	8PSK	45.80dBm	Pass
C131	GMSK	46.79dBm	Pass
C131	8PSK	45.81dBm	Pass
C183	GMSK	46.69dBm	Pass
C165	8PSK	45.67dBm	Pass
C190	GMSK	46.69dBm	Pass
C190	8PSK	45.66dBm	Pass
C231	GMSK	47.14dBm	Pass
C231	8PSK	46.25dBm	Pass
C241	GMSK	47.12dBm	Pass
C241	8PSK	46.12dBm	Pass
C251	GMSK	47.04dBm	Pass
C251	8PSK	46.04dBm	Pass

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## 5.3.3.4.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.83dBm	Pass
C128	8PSK	41.84dBm	Pass
C131	GMSK	42.93dBm	Pass
C131	8PSK	42.25dBm	Pass
C183	GMSK	42.98dBm	Pass
C185	8PSK	41.95dBm	Pass
C190	GMSK	43.03dBm	Pass
C190	8PSK	41.97dBm	Pass
C231	GMSK	43.26dBm	Pass
C231	8PSK	42.19dBm	Pass
C241	GMSK	43.24dBm	Pass
C241	8PSK	42.20dBm	Pass
C251	GMSK	43.23dBm	Pass
C231	8PSK	42.34dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.75dBm	Pass
C126	8PSK	45.74dBm	Pass
C131	GMSK	46.80dBm	Pass
C131	8PSK	45.76dBm	Pass
C183	GMSK	46.70dBm	Pass
C183	8PSK	45.58dBm	Pass
C190	GMSK	46.72dBm	Pass
C190	8PSK	45.68dBm	Pass
C231	GMSK	47.13dBm	Pass
C231	8PSK	46.06dBm	Pass
C241	GMSK	47.10dBm	Pass
C241	8PSK	46.08dBm	Pass
C251	GMSK	46.73dBm	Pass
C231	8PSK	46.03dBm	Pass

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## 5.3.3.5 TESTS AT TEMPERATURE +35 °C

## 5.3.3.5.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.71dBm	Pass
C126	8PSK	41.82dBm	Pass
C131	GMSK	42.87dBm	Pass
C151	8PSK	41.85dBm	Pass
C183	GMSK	42.88dBm	Pass
C165	8PSK	41.82dBm	Pass
C190	GMSK	42.94dBm	Pass
C190	8PSK	41.87dBm	Pass
C231	GMSK	42.15dBm	Pass
C231	8PSK	42.10dBm	Pass
C241	GMSK	43.15dBm	Pass
C241	8PSK	42.16dBm	Pass
C251	GMSK	43.16dBm	Pass
C231	8PSK	42.13dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.68dBm	Pass
C126	8PSK	45.73dBm	Pass
C131	GMSK	46.75dBm	Pass
C131	8PSK	45.74dBm	Pass
C183	GMSK	46.63dBm	Pass
C165	8PSK	45.63dBm	Pass
C190	GMSK	46.64dBm	Pass
C190	8PSK	45.62dBm	Pass
C231	GMSK	47.04dBm	Pass
C231	8PSK	46.05dBm	Pass
C241	GMSK	47.00dBm	Pass
C241	8PSK	46.02dBm	Pass
C251	GMSK	46.97dBm	Pass
C231	8PSK	46.01dBm	Pass

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## 5.3.3.5.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	42.77dBm	Pass
C128	8PSK	41.76dBm	Pass
C131	GMSK	42.84dBm	Pass
C151	8PSK	41.80dBm	Pass
C183	GMSK	42.84dBm	Pass
C165	8PSK	41.76dBm	Pass
C190	GMSK	42.90dBm	Pass
C190	8PSK	41.83dBm	Pass
C231	GMSK	43.16dBm	Pass
C231	8PSK	48.14dBm	Pass
C241	GMSK	43.15dBm	Pass
C241	8PSK	42.15dBm	Pass
C251	GMSK	43.16dBm	Pass
C231	8PSK	42.13dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.69dBm	Pass
C126	8PSK	45.60dBm	Pass
C131	GMSK	46.69dBm	Pass
C131	8PSK	45.62dBm	Pass
C183	GMSK	46.58dBm	Pass
C183	8PSK	45.65dBm	Pass
C190	GMSK	46.60dBm	Pass
C190	8PSK	45.52dBm	Pass
C231	GMSK	47.05dBm	Pass
C231	8PSK	46.04dBm	Pass
C241	GMSK	47.01dBm	Pass
C241	8PSK	46.08dBm	Pass
C251	GMSK	46.97dBm	Pass
C231	8PSK	45.95dBm	Pass

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## 5.3.3.6 TESTS AT TEMPERATURE +45 °C

## 5.3.3.6.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	44.63dBm	Pass
C126	8PSK	43.73dBm	Pass
C131	GMSK	44.71dBm	Pass
C131	8PSK	43.63dBm	Pass
C183	GMSK	44.74dBm	Pass
C165	8PSK	43.74dBm	Pass
C190	GMSK	44.79dBm	Pass
C190	8PSK	43.80dBm	Pass
C231	GMSK	45.06dBm	Pass
C231	8PSK	44.06dBm	Pass
C241	GMSK	45.04dBm	Pass
C241	8PSK	44.04dBm	Pass
C251	GMSK	45.02dBm	Pass
C231	8PSK	44.01dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	47.00dBm	Pass
C120	8PSK	45.67dBm	Pass
C131	GMSK	47.08dBm	Pass
C131	8PSK	45.65dBm	Pass
C183	GMSK	47.00dBm	Pass
C165	8PSK	45.64dBm	Pass
C190	GMSK	47.02dBm	Pass
C190	8PSK	45.50dBm	Pass
C231	GMSK	47.49dBm	Pass
C231	8PSK	46.07dBm	Pass
C241	GMSK	47.41dBm	Pass
C241	8PSK	45.96dBm	Pass
C251	GMSK	47.38dBm	Pass
C231	8PSK	45.96dBm	Pass

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## 5.3.3.6.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	44.61dBm	Pass
C126	8PSK	43.68dBm	Pass
C131	GMSK	44.72dBm	Pass
CISI	8PSK	43.77dBm	Pass
C183	GMSK	44.70dBm	Pass
C183	8PSK	43.76dBm	Pass
C190	GMSK	44.77dBm	Pass
C190	8PSK	43.71dBm	Pass
C231	GMSK	45.05dBm	Pass
C231	8PSK	44.05dBm	Pass
C241	GMSK	45.03dBm	Pass
C241	8PSK	44.07dBm	Pass
C251	GMSK	45.02dBm	Pass
C231	8PSK	44.05dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C128	GMSK	46.58dBm	Pass
C126	8PSK	45.48dBm	Pass
C131	GMSK	46.62dBm	Pass
C131	8PSK	45.71dBm	Pass
C183	GMSK	46.52dBm	Pass
C183	8PSK	45.55dBm	Pass
C190	GMSK	46.54dBm	Pass
C190	8PSK	45.62dBm	Pass
C231	GMSK	46.97dBm	Pass
C231	8PSK	46.01dBm	Pass
C241	GMSK	46.96dBm	Pass
C241	8PSK	45.89dBm	Pass
C251	GMSK	46.90dBm	Pass
C231	8PSK	45.99dBm	Pass

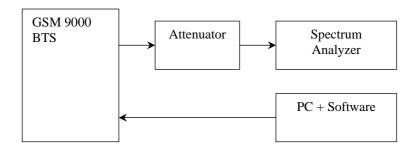
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## 5.4 NAME OF TEST: PHASE AND MEAN FREQUENCY ERROR

## **5.4.1 FCC REQUIREMENTS**

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### **5.4.2 TEST PRINCIPLE**



The BTS was configured to transmit at maximum power (static level 0):

- for GMSK modulation, in mode GMSK synchro.

Measurements were carried on frequencies which are C128 (B), C190 (M), & C251 (T).

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#### **5.4.3 TEST RESULTS**

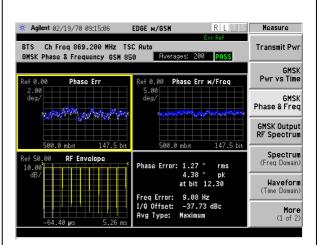
The Table shows the test results of Phase and Mean Frequency for **GMSK** modulation with several coupling configurations:

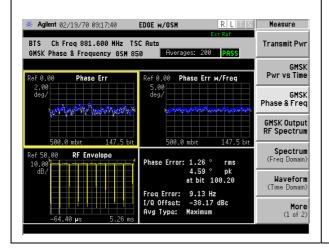
#### 5.4.3.1 TESTS AT TEMPERATURE -5 °C

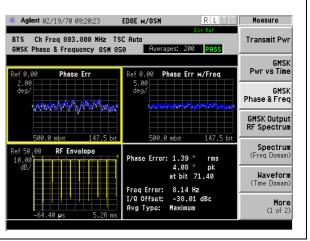
#### 5.4.3.1.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase PK	4.38	Pass
В	Phase RMS	1.27	Pass
	Freq. Error	9.08	Pass
	Phase PK	4.59	Pass
M	Phase RMS	1.26	Pass
	Freq. Error	9.13	Pass
	Phase PK	4.08	Pass
Т	Phase RMS	1.39	Pass
	Freq. Error	8.14	Pass







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## > Diplexer configuration:

CHN	Measure	Average	Sanction	<b>★ Agilent</b> 02/19/70 09:41:02 <b>EDGE w/GSM</b> R L T S	System
	Phase RMS	1.29	Pass		how Eri
В	Phase PK	3.74	Pass	GMSK Phase & Frequency GSM 850 Averages: 200 PASS	Refere
	Freq. Error	8.49	Pass	Ref 0.00	Neiere
	Phase RMS	1.17	Pass	deg/	Alignme
M	Phase PK	3.53	Pass		Config
	Freq. Error	8.29	Pass		Time/D
	Phase RMS	1.20	Pass	10.00 Phase Error: 1.29 ° rms 3.74 ° pk at bit 147.50 Die	isp Upd
Т	Phase PK	3.44	Pass	Freq Error: 8.49 Hz	isp opu
	Freq. Error	7.61	Pass	-64.40 µs 5.26 ms	(1
				=04,40 ps 3,20 lls	
Agilent 02	2/19/70 09:43:25 <b>EDGE</b>	: w/6SM RL	T S Measure		Measur
TS Ch F	2/19/70 09:43:25 EDGE Freq 881.600 MHz TSC Aut a & Frequency 05M 850	Ext Ref	Transmit Pwr		
TS ChF MSK Phase	req 881.600 MHz TSC Au e & Frequency GSM 850	Ext Ref	Transmit Pwr	# Agilent 02/19/70 09:45:43	ransmit (
TS Ch F MSK Phase of 0.00 2.00	Freq 881.600 MHz TSC Aut e & Frequency GSM 850 Phase Err Ref	to Averages: 200 PAS	Transmit Pwr	# Agilent 02/19/70 09:45:43 EDGE w/6SM R L TS  BTS Ch Freq 893.800 MHz TSC Auto 6MSK Phase & Frequency 6SM 850 Averages: 200 PRSS  Ref 0.00 Phase Err	ransmit G Pwr vs G
TS Ch F MSK Phase of 0.00 2.00 deg/	Phase Err Ref 5	Averages: 200 PAS  0.00 Phase Err w/Free 0.00 Phase Err w/Free 0.00 Phase Err w/Free 0.00 Phase Err w/Free	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/19/70 09:45:43	ransmit Pwr vs nase & F
F 60 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Phase Err Phase Err Sd Smbit 147.5 bit RF Envelope	### Ref Ref    Riverages: 200   PRS	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/19/70 09:45:43 EDGE w/6SM R L TS  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency 6SM 850 PASS  Ref 0.00 Phase Err	ransmit Pwr vs nase & F GMSK Ou F Spec
TS Ch F MSK Phase of 0.00 2.00 deg/	Phase Err Ref S di mbit 147.5 bit RF Envelope Pha	### Ref Ref    Averages: 200   PAS	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/19/70 09:45:43 EDGE w/6SM R L TS  BTS Ch Freq 893.800 MHz TSC Auto 6MSK Phase & Frequency 6SM 850 Averages: 200 PRSS  Ref 0.00 Phase Err	Measure ransmit  GPWr vs  Gnase & F  MSK Out F Speci (Freq Do  Wave (Time Do

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## 5.4.3.1.2 PHASE AND FRENQUENCY ERROR @ -57VDC

## > H2D configuration:

HN	Measure	Average	Sanction	<b>★ Agilent</b> 02/19/70 09:15:06 <b>EDGE w/GSM</b> R L T S	Measure
	Phase RMS	1.27	Pass	BTS Ch Freq 869.200 MHz TSC Auto	Transmit
В	Phase PK	4.38	Pass	GMSK Phase & Frequency GSM 850 Regress: 200 PRSS	
	Freq. Error	9.08	Pass	Ref 0.00 Phase Err Ref 0.00 Phase Err #/Freq 5.00 State	Pwr vs 1
	Phase RMS	1.26	Pass		Phase & F
М	Phase PK	4.59	Pass		GMSK Out RF Spect
	Freq. Error	9.13	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit  Ref 50:00 <b>RF Envelope</b>	Spect (Freq Doi
	Phase RMS	1.39	Pass	10.00 Phase Error: 1.27 ° rms dB/ dB/ at bit 12.30	Wavef
Т	Phase PK	4.08	Pass	Freq Error: 9.08 Hz	(Time Do
	Freq. Error	8.14	Pass	I/O Offset: -37.73 dBc Avg Type: Maximum	(1 i
				-64.40 µs 5.26 ms	
		E w/6SM R L		# Agilent 02/19/70 09:20:23	Measure
TS Ch F	2/19/70 09:17:40 EDGI req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref	Transmit Pwr		Measure
S Ch F ISK Phase	req 881.600 MHz TSC Au a & Frequency GSM 850 Phase Err Re	Averages: 200 PAS  f 0.00 Phase Err w/Fre	Transmit Pwr	# Agilent 02/19/70 09:20:23	Measure Transmit  G Pwr vs 1
TS Ch F MSK Phase f 0.00 2.00	req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref ito Averages: 200 PAS	Transmit Pwr	# Agilent 02/19/70 09:20:23	Measure Transmit
TS Ch F MSK Phase	req 881.600 MHz TSC Au a & Frequency GSM 850 Phase Err	Averages: 200 PAS  Averages: 200 PAS  6 0.00 Phase Err #/Fre 5.00  Jeg/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/19/70 09:20:23 EDGE w/GSM R L SET ROF  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Riverages: 200 PRSS  Ref 0.00 Phase Err 2.00 deg/	Measure Transmit 6 Pwr vs
f 0.00 500.66	Phase Err  Phase Err  Phase Err  Re  minute 147.5 bit  RF Envelope	Averages: 200 PAS  ###	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum (Freq Domain)	# Agilent 02/19/70 09:20:23 EDGE w/6SM R L S  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency 6SM 850 Averages: 200 PASS  Ref 0.00 Phase Err 2.00 deg/	Measure Transmit  General Section 1
f 500.00 f 500.00	Phase Err  Phase Err  Ref  a mbit 147.5 bit  RF Envolope  Ph	Averages: 200 PAS  6.00 Phase Err w/Fre 5.00  6.00 Phase Err w/Fre 5.00 Phase Err w/Fre	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum (Freq Domain)	## Agilent 02/19/70 09:20:23	Measure Transmit  Ferrors  GPHY VS  GPHASE & F  GMSK Out RF Spect

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## > Diplexer configuration:

HN	Measure	Average	Sanction	* Agilent 02/19/70 10:01:10	EDGE w/GSM	R L T S Measure
	Phase RMS	1.33	Pass	BTS Ch Freq 869.200 MHz		Ext Ref Transmit
В	Phase PK	4.08	Pass	GMSK Phase & Frequency GSM	850 Averages: 2	G
	Freq. Error	9.78	Pass	Ref 0.00 Phase Err	Ref 0.00 Phase I	
	Phase RMS	1.19	Pass	deg/	deg/	Phase & F
M	Phase PK	3.98	Pass			GMSK Ou RF Spec
	Freq. Error	8.83	Pass	500.0 mbit 147.5 b		147.5 bit Spec
	Phase RMS	1.17	Pass	10.00 dB/	Phase Error: 1.3	B° pk
Т	Phase PK	3.55	Pass		Freq Error: 9.7	(Time Do
	From Frenk	0.00				.13 dBc
	Freq. Error	9.99	Pass	-64.40 µs 5.26 n	Avg Type: Maxim	uum (1
Agilent 02	· ·	9.99 E W/GSM R L		-64.40 µs 5.26 n	Avg Type: Maxin	
rs ChF	:/19/70 09:58:41 EDGI	E w/GSM R L	Measure Transmit Pwr	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 MHz	EDGE W/GSM	R L T S Measur
S Ch F ISK Phase	:/19/70 09:58:41 EDGI req 881.600 MHz TSC Au & Frequency GSM 850	E W/9SM R L Ext Ref tto Averages: 200 PRS	Transmit Pwr	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM	EDGE w/GSM TSC Auto 850 Averages: 2	R L T S Measure  Ext Rof Transmit  OO PASS
'S Ch F	:/19/70 09:58:41 EDGI req 881.600 MHz TSC Au 8 Frequency 6SM 850  Phase Err	E W/GSM R L Ext Ref	Transmit Pwr  GMSK Pwr vs Time  GMSK	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 MHz	EDGE W/GSM	R L T S Measure  Ext Rof Transmit  OO PASS
S Ch F ISK Phase	1/19/70 09:58:41 EDGI req 881.600 MHz TSC Au & Frequency 6SM 850 Phase Err Re	E w/GSM R L  Ext Ref tto Averages: 200 PRS  6 0.00 Phase Err w/Fre	Transmit Pwr  GMSK Pwr vs Time	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00	EDGE W/GSM TSC Auto 850 Averages: 2	RLTS Measur  Ext Ref Transmit PWr vs
S Ch F ISK Phase f 0.00 2.00 leg/ 500.0	2/19/70 09:58:41 EDGI req 891.600 MHz TSC Au & Frequency 6SM 850  Phase Err Rei a mbit 147.5 bit  RF Envelope	E w/GSM R L  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  1.00  1.00  500.0 mbit 147	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum Spectrum	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 MHz 0MSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 deg/ 508.0 mbit 147.5 b	EDGE W/GSM TSC Auto 850 Averages: 2  Ref 0.00 Phase   5.00 deg/	RILLIS Measure  Transmit  Frr H/Freq  Phase & F  GMSK Ou  RF Spec
S Ch F Phase F 0.00 2.00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2/19/70 09:58:41 EDGI req 891.600 MHz TSC Au & Frequency 6SM 850  Phase Err Rei a mbit 147.5 bit  RF Envelope	E w/GSM R L  Ext Ref  to  Averages: 200 PAS  6.00 Phase Err w/Fre  5.00  5.00 mbit 147.  ase Error: 1.19 ° rms  3.98 ° pk	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain)	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 HHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 deg/	EDGE w/GSM TSC Auto 850 Averages: 2  Ref 0.00 Phase 5.00 deg/	R L S Measure  Ext Ref Transmit  Pwr vs  Phase & F  GMSK Ou RF Spec  Transmit  Spec (Freq Do
F 0.00 2.00 deg/	Phase Err  Phase Err  Ref Envelope  Ph	E W/GSM  Ext Ref  Ritto  Rerages: 200 Pas  f 0.00 Phase Err W/Fre 5,00 500.0 mbit 147.  ase Error: 1.19 ° rms	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain)	# Agilent 02/19/70 09:56:01  BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 6SM  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbjt 147.5 b  Ref 60.00 RF Envelope 10.00	EDGE W/GSM  TSC Auto 850  Ref 0.00 Phase 1 5.00 deg/ Phase Error: 1.1 3.5 at bi Freq Error: 9.9	R L S Measure  Fit Ref Transmit  PWr vs  GMSK Ou RF Spec (Freq Do  7 ° rms 5 ° pk 7 1.20  Have (Time Do

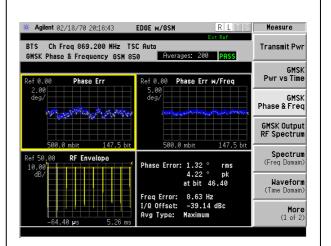
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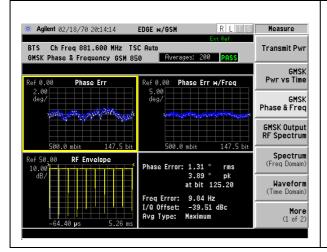
#### 5.4.3.2 TESTS AT TEMPERATURE +5 °C

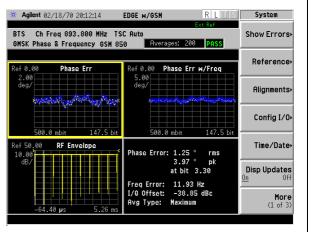
#### 5.4.3.2.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	1.32	Pass
В	Phase PK	4.22	Pass
	Freq. Error	8.63	Pass
	Phase RMS	1.31	Pass
M	Phase PK	3.89	Pass
	Freq. Error	9.84	Pass
	Phase RMS	1.25	Pass
Т	Phase PK	3.97	Pass
	Freq. Error	11.93	Pass







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## > Diplexer configuration:

HN	Measure	Average	Sanction	
	Phase RMS	1.25	Pass	BTS Ch Freq 869.200 MHz TSC Auto Show E
В	Phase PK	3.75	Pass	6MSK Phase & Frequency 6SM 850 Averages: 200 PASS Refer
	Freq. Error	21.02	Pass	Ref 0.00
	Phase RMS	1.27	Pass	Align
M	Phase PK	3.68	Pass	Conf
	Freq. Error	19.38	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 60.00 RF Envelope Time.
	Phase RMS	1.15	Pass	10.00 Phase Error: 1.25 ° rms 3.75 ° pk at bit 108.10 Disp Up
Т	Phase PK	3.33	Pass	Freq Error: 21.02 Hz
	Freq. Error	14.69	Pass	I/O Offset: -45.53 dBc Avg Type: Maximum
	1 104 2	1		-64.40 µs 5.26 ms
Agilent 02	·	E w/GSM R L	System	# Agilent 02/18/70 20:03:00 EDGE w/GSM R L S Measu
TS Ch F	·	E w/GSM R L	Show Errors	-64.40 µs 5.26 ms
S ChF ISK Phase	:/18/70 20:01:01 EDGI req 881.600 MHz TSC Au & Frequency GSM 850	E m/6SM R L Ext Ref uto Averages: 200 PAS	Show Errors	# Agilent 02/18/70 20:03:00 EDGE w/GSM R L S Meast  BTS Ch Freq 893.800 MHz TSC Auto 6MSK Phase & Frequency 6SM 850 Averages: 200 PASS
S Ch F ISK Phase	:/18/70 20:01:01 EDGI req 881.600 MHz TSC Au & Frequency 6SM 850 Phase Err Re	E W/GSM R L  Ext Ref	Show Errors	# Agilent 02/18/70 20:03:00 EDGE w/GSM R L S Measu BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS
rs ChF	1/18/70 20:01:01 EDGI req 881.600 MHz TSC Au 8 Frequency GSM 850 Phase Err	E w/GSM R L  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  5 000	Show Errors	# Agilent 02/18/70 20:03:00 EDGE w/GSM R L S Meast  BTS Ch Freq 893.800 MHz TSC Ruto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq 2.00 deg/
S Ch F FISK Phase F 0.00 2.00 1.00 1.00 1.00 1.00 1.00 1.00	### Phase Err   Ref	E W/GSM  Ext Rof  Averages: 200 PAS  F 0.00 Phase Err W/Fre  5.00  500.0 mbit 147.  ase Error: 1.27 ° rms	Show Errors  Reference  Alignments  Config I/O  Time/Date	# Agilent 02/18/70 20:03:00 EDGE w/GSM R L S Meast  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 Pass  Ref 0.00 Phase Err
S Ch F ISK Phase 0.00 2.00 leg/ 500.6	Phase Err  Phase Err  Ref Envelope  Ph	E W/OSM R L  Ext Ref  Averages: 200 PAS  f 0.00 Phase Err w/Fre  500.0 mbit 147.	Show Errors  Reference  Alignments  Config I/O  Time/Date	# Agilent 82/18/78 20:03:00 EDGE w/GSM R L S Measu  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 8.00 Phase Err W/Freq 2.00 deg/ deg/ Phase & GMSK CRF Spe  S00.0 mbit 147.5 bit S00.0 mbit S00.

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## 5.4.3.2.2 PHASE AND FRENQUENCY ERROR @ -57VDC

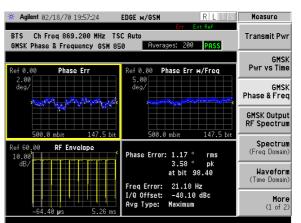
## > H2D configuration:

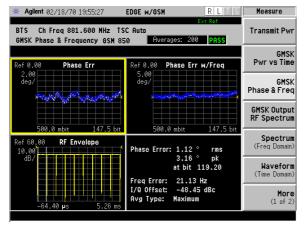
HN	Measure	Average	Sanction	# Agilent 02/18/70 20:18:08 EDGE w/GSM R L □ □ □	Measure
	Phase RMS	1.27	Pass	BTS Ch Freq 869.200 MHz TSC Auto	Transmit F
В	Phase PK	3.78	Pass	6MSK Phase & Frequency 6SM 850 Averages: 200 PASS	GN
	Freq. Error	7.70	Pass	Ref 0.00         Phase Err         Ref 0.00         Phase Err w/Freq           2.00         5.00	Pwr vs T
	Phase RMS	1.26	Pass	deg/	Phase & F
М	Phase PK	3.93	Pass		GMSK Out RF Spect
	Freq. Error	7.98	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spect
	Phase RMS	1.36	Pass	10.00 Phase Error: 1.27 ° rms dB/ 3.78 ° pk	(Freq Dor
Т	Phase PK	4.05	Pass	at bit 113.20 Freq Error: 7.70 Hz	Wavef (Time Do
	Eroa Error	44.00	-	I/Q Offset: -39.61 dBc	M
	Freq. Error	11.68	Pass	-64.40 µs 5.26 ms	(1 :
Agilent 02	·	E W/GSM R L	Pass Measure	# Agilent 02/18/70 20:23:05 EDGE w/GSM R L S	
rs ChF	·	E w/GSM R L	Measure Transmit Pwr	-64,40 µs 5.26 ms	(1 c
S Ch F ISK Phase	2/18/70 20:21:02 EDGI req 881.600 MHz TSC Au a Frequency GSM 850  Phase Err Re	E W/GSM R L  Ext Ref  Ito  Averages: 200 PRS  F 0.80 Phase Err W/Fre	Transmit Pwr	# Agilent 02/18/70 20:23:05 EDGE w/GSM R L ST Ref  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 280 PASS  Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq	Measure
S Ch F	2/18/70 20:21:02 EDGI req 881.600 MHz TSC Au 2 & Frequency GSM 850 Phase Err Re	E m/6SM R L Ext Ref uto Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 20:23:05 EDGE w/GSM R L	Measure Transmit
S Ch F ISK Phase	2/18/70 20:21:02 EDGI req 881.600 MHz TSC Au a Frequency GSM 850 Phase Err	E w/GSM R L  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  5.00	Measure Transmit Pwr  S GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum	# Agilent 02/18/70 20:23:05 EDGE w/GSM R L	Measure Transmit  6 Pwr vs 1
f 0.00 2.00 deg/ 500.0	2/18/70 20:21:02 EDGI req 881.600 MHz TSC Au a Frequency 65M 850  Phase Err A minit 147.5 bit RF Envelope	E w/GSM R L  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  5.00	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	# Agilent 02/18/70 20:23:05 EDGE w/GSM R L S Ref 8.00 Phase Err w/Freq 2.00 Phase Err 2.00 Phase Err 3.00 Phase Err 4.7.5 bit S00.0 mbit 147.5 bit S00.0 mbit 147.5 bit S00.0 mbit 147.5 bit	Measure Transmit  G Pwr vs 1  G Phase & F  GMSK Out
S Ch F ISK Phase F 0.00 2.00 Jeg/	Phase Err  Phase Err  Ref Envelope  Ph	E W/6SM R L  Ext Ref  Averages: 200 PAS  f 0.00 Phase Err W/Fre  5.00  500.0 mbit 147	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain)	## Agilent 02/18/70 20:23:05 EDGE w/GSM RL   Set Ref  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err   Ref 0.00 Phase Err w/Freq   5.00 deg/ deg/ deg/   47.5 bit   500.0 mbit   147.5 bit   8ref 50.00 RF Envelope	Measure Transmit  Pwr vs 1  6 Phase & F  GMSK Out RF Spect

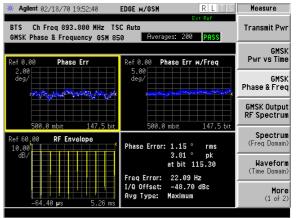
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## > Diplexer configuration:

CHN	Measure	Average	Sanction	# Agilent 02/18/70 19:57:
	Phase RMS	1.17	Pass	BTS Ch Freq 869.200
В	Phase PK	3.58	Pass	GMSK Phase & Frequency
	Freq. Error	21.18	Pass	Ref 0.00 Phase Err
	Phase RMS	1.12	Pass	deg/
М	Phase PK	3.16	Pass	
	Freq. Error	21.13	Pass	500.0 mbit 1 Ref 60.00 <b>RF Envelop</b>
	Phase RMS	1.15	Pass	10.00 dB/
Т	Phase PK	3.01	Pass	
	Freq. Error	22.09	Pass	-64,40 µs
Agilent 02	/18/70 19:55:27 <b>EDG</b> I	: w/GSM R L	T S  Measure	# Agilent 02/18/70 19:52
	req 881.600 MHz TSC Au & Frequency GSM 850		Transmit Pwr	BTS Ch Freq 893.800 GMSK Phase & Frequency
Ref 0.00	Phase Err Ref	0.00 Phase Err w/Fre	GMSK Pwr vs Time	Ref 0.00 Phase Err
2.00 deg/	9	i.00	GMSK Phase & Freq	2.00 deg/







Nortel Networks confidential

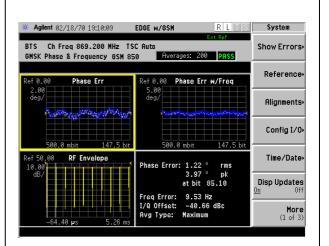
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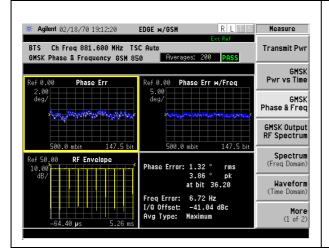
#### 5.4.3.3 TESTS AT TEMPERATURE +15 °C

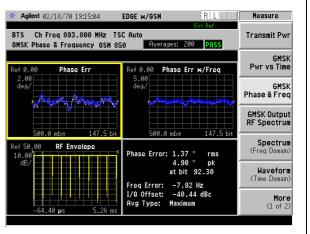
#### 5.4.3.3.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	1.22	Pass
В	Phase PK	3.97	Pass
	Freq. Error	9.53	Pass
	Phase RMS	1.32	Pass
М	Phase PK	3.86	Pass
	Freq. Error	6.72	Pass
	Phase RMS	1.37	Pass
Т	Phase PK	4.30	Pass
	Freq. Error	-7.92	Pass







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## > Diplexer configuration:

CHN	Measure	Average	Sanction	* Agilent 02/18/70 19:31:08	EDGE w/GSM R L	T S Measu
	Phase RMS	1.17	Pass	BTS Ch Freq 869.200 MHz		Transm
В	Phase PK	3.93	Pass	GMSK Phase & Frequency GSM	850 Averages: 200 PAS	
	Freq. Error	-14.86	Pass	Ref 0.00 Phase Err 2.00	Ref 0.00 Phase Err w/Fre	Pwr vs
	Phase RMS	1.15	Pass	deg/	deg/	Phase 8
M	Phase PK	3.74	Pass			GMSK 0 RF Spe
	Freq. Error	-15.65	Pass	500.0 mbit 147.5 Ref 60,00 <b>RF Envelope</b>		.5 bit Spe
	Phase RMS	1.20	Pass	10.00 dB/	Phase Error: 1.17° rm: 3.93° pk at bit 2.30	
Т	Phase PK	3.04	Pass		Freq Error: -14.86 Hz	(Time D
	Freq. Error	-17.02	Pass	-64,40 µs 5,26	I/Q Offset: -47.50 dBc Avg Type: Maximum	(1
Agilent 02	:/18/70 19:29:01 <b>EDGE</b>	E M/GSM RL	T S Measure	# Agilent 02/18/70 19:26:47	EDGE W/GSM R L	TSS
S Ch F	:/18/70 19:29:01 EDGE req 881.600 MHz TSC Au 8 Frequency 65M 850	Ext Ref	Transmit Pwr	# Agilent 02/18/70 19:26:47  BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 6SM	TSC Auto	Show Er
S Ch F	req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref	Transmit Pwr	BTS Ch Freq 893.800 MHz	TSC Auto	Show Er
S Ch F SK Phase	req 881.600 MHz TSC Aut & Frequency GSM 850  Phase Err Ref	to Averages: 200 PAS	Transmit Pwr	BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM	TSC Auto Ext Ref 850 Averages: 200 PAS	Show Er
S Ch F SK Phase	req 881.600 MHz TSC Aut & Frequency GSM 850  Phase Err Ref	Averages: 200 PAS  0.00 Phase Err #/Fre 1.00	Transmit Pwr  GMSK Pwr vs Time  GMSK	BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM Ref 0.00 Phase Err	TSC Auto 850 Averages: 200 PAS  Ref 0.00 Phase Err #/Fre 5.00 deg/	Show Er
S Ch F SK Phase 0.00000000000000	req 881.600 MHz TSC Aut & Frequency GSM 850  Phase Err  Phase Err  S  di  mbit 147.5 bt  RF Envelope	Averages: 200 PAS  0.00 Phase Err w/Fre 0.00 500.0 mbit 147.  ase Error: 1.15 ° rms	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  Greq Domain)	BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 deg/ 580.0 mbit 147.5  Ref 60.00 RF Envelope	TSC Auto 850	Refer  Alignm Confi
S Ch F SK Phase 0.00 2.00 eg/ 500.6	Phase Err  Phase Err  Ref  Multiple 147.5 bit  RF Envelope  Phase Err  Ref  Phase Err  P	Averages: 200 PAS  0.00 Phase Err w/Fre 5.00 500.0 mbit 147.	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  Greq Domain)	BTS Ch Freq 893,800 MHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5  Ref 60,00 RF Envelope	Ref 0.00 Phase Err w/Fre 5.00 deg/ 500.0 mbit 147	Refer  Alignm Confi

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## 5.4.3.3.2 PHASE AND FRENQUENCY ERROR @ -57VDC

## > H2D configuration:

IN	Measure	Average	Sanction	# Agilent 02/18/70 20:18:08 EDGE w/GSM R L □ S	Measure
	Phase RMS	1.27	Pass		Fransmit F
	Phase PK	3.78	Pass	GMSK Phase & Frequency GSM 850 Averages: 200 PASS	G
	Freq. Error	7.70	Pass	2.00 Filase Ell Rei 5.00 Filase Ell Wyried	Pwr vs
	Phase RMS	1.26	Pass	deg/ deg/ Ph	hase & F
	Phase PK	3.93	Pass	RI	GMSK Ou RF Spec
	Freq. Error	7.98	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spec
	Phase RMS	1.36	Pass	10.00 Phase Error: 1.27 ° rms 3.78 ° pk	(Freq Do
Г	Phase PK	4.05	Pass	Freq Error: 7.70 Hz	(Time Do
	Freq. Error	11.68	Pass	I/Q Offset: -39.61 dBc	1
	Fleq. Elloi	11.00	r ass	—64.40 µs 5.26 ms нуу уре. нахишиш	(1
i <b>gilent</b> 02	· ·	E w/GSM R L	T ass	-64.40 µs 5.26 ms	(1 Measure
Ch F	· ·	E w/GSM R L	Measure Transmit Pwr	—64.40 µs 5.26 ms   Ж Agilent 02/18/70 20:23:05 EDGE м/GSM RIL ТО	
Ch F C Phase	:/18/70 20:21:02	E W/GSM R L Ext Ref ito Averages: 200 PAS f 0.00 Phase Err W/Fre	Transmit Pwr	# Agillont 02/18/70 20:23:05 EDGE w/GSM R L TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PRSS  Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq	Measur Fransmit
Ch F K Phase	1/18/70 20:21:02 EDGI req 881.600 MHz TSC Au & Frequency 6SM 850 Phase Err Ref	E m/6SM R L Ext Ref uto Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 20:23:05 EDGE w/GSM RILLS  BTS Ch Freq 893.900 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err 2.00 deg/	Measuro Fransmit Pwr vs
Ch F K Phase	2/18/70 20:21:02 EDGI req 881.600 MHz TSC Au 8 Frequency GSH 850 Phase Err	E w/GSM RIL  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  5 00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 20:23:05 EDGE w/GSM R L STORM BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err Freq 5.00 Geg/ Phase Err w/Freq 5.00 Geg/ Phase Err w/Freq FREQ FREQ FREQ FREQ FREQ FREQ FREQ FREQ	Measur Fransmit Pwr vs 6 hase & f
0.00 0.00 0.00 500.6	### Phase Err   Ref   Phase Err   Ph	E w/GSM RIL  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  5 00	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	Agilent 02/18/70 20:23:05 EDGE w/9SM RLL TSC Auto GMSK Phase & Frequency GSH 850 Averages: 200 PASS  Ref 0.00 Phase Err	Measur Fransmit Pwr vs Chase & F GMSK Ou RF Spec
O.00	Phase Err  Phase Err  Ref Envelope  Ph. 147.5 bit  RF Envelope  Ph. 20:21:02  EDGI  TSC Au  RF Envelope  Ph. 20:21:02  EDGI  TSC Au  T	E W/GSM RILL  Ext Ref  Averages: 200 PAS  f 0.00 Phase Err w/Fre  jeg/ 500.0 mbit 147	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain)	# Agilent 02/18/70 20:23:05 EDGE w/GSM RILLIS  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850  Ref 0.00 Phase Err 2.00 deg/  Phase Err w/Freq 5.00 Phase Err w/Freq 5.00 Ombit 147.5 bit  Ref 50.00 RF Envelope 10.00  Phase Err : 1.36 or ms 4.05 op k 4.05 op k 4.05 op k	Measuro

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R L T S Measure

GMSK Output RF Spectrum

Spectrum (Freq Domain)

Waveform (Time Domain)

Transmit Pwr

GMSK Phase & Freq

> Waveform (Time Domain)

R L T S Measure

Err w/Freq

Err w/Freq

Phase Error: 1.15 ° rms 3.81 ° pk at bit 115.30

Freq Error: 22.09 Hz I/O Offset: -48.70 dBc Avg Type: Maximum

# > Diplexer configuration:

Phase Error: 1.12 ° rms 3.16 ° pk at bit 119.20

Freq Error: I/Q Offset: Avg Type:

21.13 Hz -48.45 dBc Maximum

Freq. Error         21.18         Pass           Phase RMS         1.12         Pass           Phase PK         3.16         Pass           Freq. Error         21.13         Pass           Phase RMS         1.15         Pass	Phase PK   3.58   Pass   Ref 0.00   Phase Err   2.00   Phase PK   2.00   Phase PK   3.16   Pass   Phase PK   3.16   Pass   Phase PK   3.15   Pass   Phase PK   3.15   Pass   Phase PK   3.01   Pass   Phase PK   Phase PK   3.01   Pass   Phase PK   Phas	HN	Measure	Average	Sanction	* Agilent 02/18/70 19:57:24 E
Phase PK         3.58         Pass           Freq. Error         21.18         Pass           Phase RMS         1.12         Pass           Phase PK         3.16         Pass           Freq. Error         21.13         Pass           Phase RMS         1.15         Pass           Phase PK         3.01         Pass           Freq. Error         23.00         Pass	Phase PK   3.58		Phase RMS	1.17	Pass	BTS Ch Freq 869.200 MHz TSC
Freq. Error         21.18         Pass           Phase RMS         1.12         Pass           Phase PK         3.16         Pass           Freq. Error         21.13         Pass           Phase RMS         1.15         Pass           Phase PK         3.01         Pass           Freq. Error         23.00         Pass	Phase RMS 1.12 Pass Phase PK 3.16 Pass Freq. Error 21.13 Pass Phase RMS 1.15 Pass Phase PK 3.01 Pass Phase PK 3.01 Pass Freq. Error 22.00 Pass  Freq. Error 22.00 Pass    Phase PK   Phase	В	Phase PK	3.58	Pass	GMSK Phase & Frequency GSM 850
Phase RMS         1.12         Pass           Phase PK         3.16         Pass           Freq. Error         21.13         Pass           Phase RMS         1.15         Pass           Phase PK         3.01         Pass           Freq. Error         23.00         Pass	Phase RMS		Freq. Error	21.18	Pass	2.00
Freq. Error         21.13         Pass           Phase RMS         1.15         Pass           Phase PK         3.01         Pass	Freq. Error 21.13 Pass Phase RMS 1.15 Pass Phase PK 3.01 Pass Freq. Error 22.00 Pass    Production   Producti		Phase RMS	1.12	Pass	deg/
Freq. Error         21.13         Pass           Phase RMS         1.15         Pass           Phase PK         3.01         Pass	Phase RMS 1.15 Pass  Phase PK 3.01 Pass  Freq. Error 22.00 Pass    Phase PK	M	Phase PK	3.16	Pass	
Phase RMS 1.15 Pass  Phase PK 3.01 Pass  Frog Frog Street 23.00 Pass	Phase RMS 1.15 Pass Phase PK 3.01 Pass Freq. Error 22.00 Pass    Phase PK   P		Freq. Error	21.13	Pass	
Frog From 22.00 Page	Freq. Error 22.00 Pass    Freq. Error   22.00   Pass   Freq.		Phase RMS	1.15	Pass	10.00
Frog Error 22.00 Page	Freq. Error 22.00 Pass    Gillent 02/18/70 19:55:27   EDGE w/6SM   R L   S   Measure	Т	Phase PK	3.01	Pass	
	gillent 02/18/70 19:55:27		Freq. Error	22.00	Pass	-64 40 us 5 26 ms
	Ch Freq 881.600 MHz TSC Auto Transmit Pwr BTS Ch Freq 893.800 MHz TSC		Freq. Error	22.00	Pass	-64.40 µs 5.26 ms
Phase & Frequency GSM 850 Averages: 200 PASS GMSK Phase & Frequency GSM 850		0.00 .00 eg/		.00	Pwr vs Time  GMSK Phase & Freq	Ref 0.00
GMSK   Phase Err   Ref 0.00   Phase Err   W/Freq     GMSK	5.00   Chiase E1   W/11eq   Chiase E1   W/11eq   Chiase E1   W/11eq   Chiase E1   Chiase E				GMSK Output RF Spectrum	
GMSK Pwr vs Time  S.00  GMSK Pwr vs Time  GMSK Phase Err  GMSK Phase & Freq  GMSK Output RF Spectrum	5.00 Filase ET A/FIGURE SMSK Phase & Freq  GMSK Output RF Spectrum					

Waveform (Time Domain)

> More (1 of 2)

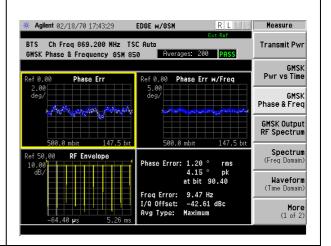
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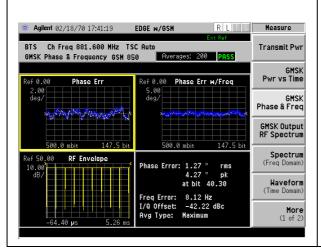
#### 5.4.3.4 TESTS AT TEMPERATURE +25 °C

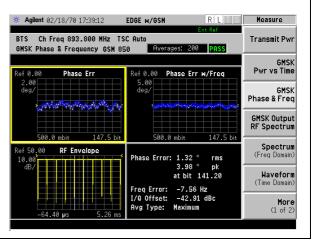
#### 5.4.3.4.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	1.20	Pass
В	Phase PK	4.15	Pass
	Freq. Error	9.47	Pass
	Phase RMS	1.27	Pass
M	Phase PK	4.27	Pass
	Freq. Error	8.12	Pass
	Phase RMS	1.32	Pass
Т	Phase PK	3.98	Pass
	Freq. Error	-7.56	Pass







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# > Diplexer configuration:

HN	Measure	Average	Sanction	* Agilent 02/18/70 17:23:23	EDGE w/GSM	R L T S Ma	easure
	Phase RMS	1.27	Pass	BTS Ch Freq 869.200 MHz			nsmit P
В	Phase PK	4.27	Pass	GMSK Phase & Frequency GSI	H 850 Hiverages:	200 PASS	GM
	Freq. Error	-16.47	Pass	Ref 0.00 Phase Err 2.00 deg/	Ref 0.00 Phase 5.00 deg/	Err w/Freq Pw	r vs Ti GM
	Phase RMS	1.18	Pass	ueg/	deg/	Phas	se & Fr
M	Phase PK	3.92	Pass				SK Out Spect
	Freq. Error	-14.44	Pass	500.0 mbit 147.5 Ref 60.00 <b>RF Envelope</b>			Specti reg Dom
	Phase RMS	1.16	Pass	10.00 dB/		27 ° pk	Wavefo
Т	Phase PK	3.89	Pass		Freq Error: -1	6.47 Hz	ime Dom
		40.44	_	<b>                                      </b>		5.58 dBc	Me
	Freq. Error	-16.11	Pass	-64.40 µs 5.26	Ms Avg Type: Max	imum	
Agilent 02	· ·	: w/GSM R L		-64.40 µs 5.26	EDGE w/GSM	R L TS N	(1 0
S Ch F	· ·	E m/GSM R L	Measure Transmit Pwr		EDGE W/GSM	R L T S Me	(1 o
S Ch F SK Phase	/18/70 17:25:48 EDGI req 881.600 MHz TSC Au & Frequency GSM 850	E M/GSM R L Ext Ref to Averages: 200 PAS	Transmit Pwr	** Agilent 02/18/70 17:28:02  BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 6Si	EDGE W/GSM TSC Auto M 850 Averages:	R L T S Me Ext Ref 200 PASS	(1 o easure nsmit F
S Ch F	/18/70 17:25:48 EDGI req 881.600 MHz TSC Au & Frequency 6SM 850 Phase Err Re	E W/GSM R L Ext. Ref.	Transmit Pwr	* Agilent 02/18/70 17:28:02  BTS Ch Freq 893.800 MHz	EDGE W/GSM	R L No No Exc Ref Tra 200 PASS PW	(1 o
S Ch F ISK Phase	/18/70 17:25:48 EDGI req 881.600 MHz TSC Au & Frequency GSM 850 Phase Err	E w/GSM R L  Ext Ref to Averages: 200 PAS  0.00 Phase Err w/Fre 5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 17:28:02 BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 65/ Ref 0.00 Phase Err 2.00 deg/	EDGE W/GSM TSC Auto M 850 Averages:  Ref 0.00 Phase 5.00 deg/	R L Mo Ext Ref 200 PASS  Err W/Freq Phase GMSRF:	easure nsmit F GM vr vs T
S Ch F FISK Phase	/18/70 17:25:48 EDGI req 891.600 MHz TSC Au. & Frequency 6SM 850  Phase Err  Phase Err  Rei  mbit 147.5 bit  RF Envelope	E W/GSM R Let Ref.  Reverages: 200 Pas  0.00 Phase Err W/Fre.  0.00 Phase Err W/Fre.  5.00 Mblt 147  ase Error: 1.18 ° rm	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	# Agilent 02/18/70 17:28:02  BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 6Si  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5  Ref 60.00 RF Envelope 10.00	EDGE W/GSM TSC Auto M 850 Averages:  Ref 0.00 Phase 5.00 deg/ Phase Error: 1.	R L Tra  200 PASS  Err W/Freq Phas  147.5 bit  16 ° rms  Fr (Fr	easure nsmit F GM vr vs T GM se & FI
S Ch F ISK Phase 0.00 2.00 leg/ 500.6	/18/70 17:25:48 EDGI req 881.600 MHz TSC Au & Frequency GSM 850  Phase Err Re  a mbit 147.5 bit  RF Envelope Ph	E w/6SM R L Ext Ref  to Averages: 200 PASE  0.00 Phase Err w/Fre  1.00  1.00  5.00  1.147	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	Agilent 02/18/70 17:28:02  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSI  Ref 0.00 Phase Err 2.00 deg/ deg/ 500.0 mbit 147.5  Ref 60.00 RF Envelope	TSC Auto M 850 Averages:  Ref 0.00 Phase 5.00 deg/ Phase Error: 1. 3.	R L TS Mc Ext Ref 200 PASS  Err W/Freq Phas 147.5 bit 16 ° rms 39 ° pk bit 2.30	easure nsmit F GM Vr vs T GM se & FI SK Out Specti

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## 5.4.3.4.2 PHASE AND FRENQUENCY ERROR @ -57VDC

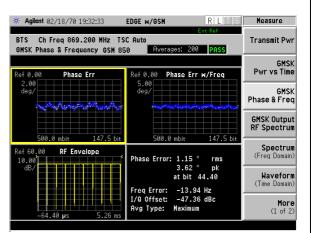
# > H2D configuration:

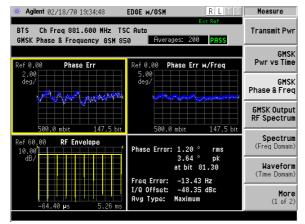
HN	Measure	Average	Sanction	<b>★ Agilent</b> 02/18/70 19:08:07 <b>EDGE w/GSM</b> R L T S	Measure
	Phase RMS	1.29	Pass	BTS Ch Freq 869.200 MHz TSC Auto	Transmit P
В	Phase PK	4.17	Pass	GMSK Phase & Frequency GSM 850 Averages: 200 PASS	GM
	Freq. Error	9.09	Pass	Ref 0.00	Pwr vs T
	Phase RMS	1.24	Pass	deg/	Phase & Fr
M	Phase PK	4.29	Pass		GMSK Outp
	Freq. Error	8.80	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Specti
	Phase RMS	1.26	Pass	10.00 Phase Error: 1.29 ° rms dB/ 4.17 ° pk	(Freq Dom
Т	Phase PK	3.86	Pass	at bit 6.30 Freq Error: 9.09 Hz	(Time Dom
	Freq. Error	-10.50	Pass	I/O Offset: -40.89 dBc	Mo
	1 11041 21101	10.30	1 433	-64.40 µs 5.26 ms	(1 0
Agilent 02	· ·	E W/6SM R L		64.40 µs 5.26 ms NV9 Туре: нахішиш NV9 Туре: нахіши N	(1 o
TS Ch F		E w/GSM R L	Measure Transmit Pwr	-64.40 µs 5.26 ms	Measure
TS ChF MSK Phase	:/18/70 19:05:30 EDGI req 881.600 MHz TSC Au & Frequency GSM 850	E m/6SM R L Ext Ref sta Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 19:03:15	Measure Transmit P  GM Pwr vs T
TS Ch F MSK Phase f 0.00 2.00	1/18/70 19:05:30 EDGI req 881.600 MHz TSC Au & Frequency GSM 850 Phase Err Re	E W/GSM R L Ext Ref.	Transmit Pwr	# Agilent 02/18/70 19:03:15 EDGE w/GSM R L TSC Ruto	Measure Transmit F
TS Ch F MSK Phase of 0.00 2.00 deg/	1/18/70 19:05:30 EDGI req 881.600 MHz TSC Au & Frequency GSM 850 Phase Err	E w/GSM RIL  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 19:03:15 EDGE w/GSM R L STREET BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err w/Freq 5.00 deg/	Measure Transmit F  GN Pwr vs T
F 50 .00	### Phase Err   Re-	E W/GSM Ext Ref.  Averages: 200 Pas  6 0.00 Phase Err W/Fre 5.00 Free Free Free Free Free Free Free Fr	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	# Agilent 02/18/70 19:03:15 EDGE w/GSM R L S  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850  Ref 0.00 Phase Err 2.00 deg/ 4.00 Mblt 147.5 bit  Ref 50.00 mblt 147.5 bit  Ref 50.00 RF Envelope 10.00 Phase Err 1.26 ° rms	Measure Transmit F  Gh Pwr vs T  Gh Phase & Fi  GMSK Out
f 50 .00 500 f 50 .00	### Phase Err   Repair   Phase Err   Phase Err   Phase Err   Repair   Phase Err   Phase Er	E W/GSM R L  Ext Ref  Averages: 200 PAS  f 0.00 Phase Err W/Fre  5.00  5.00 Mbit 147	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	# Agilent 02/18/70 19:03:15 EDGE w/GSM R L S  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err	Measure Transmit F  GN Pwr vs T  GN Phase & Fr  GMSK Out RF Specti

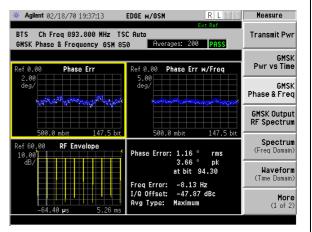
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## > Diplexer configuration:

CHN	Measure	Average	Sanction
	Phase RMS	1.15	Pass
В	Phase PK	3.62	Pass
	Freq. Error	-13.94	Pass
	Phase RMS	1.20	Pass
M	Phase PK	3.64	Pass
	Freq. Error	-13.43	Pass
	Phase RMS	1.16	Pass
Т	Phase PK	3.66	Pass
	Freq. Error	-8.13	Pass
Agilent 02	/18/70 19:34:48 <b>EDG</b> I	Ew/GSM R L	T S Measure







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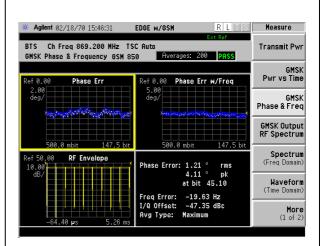
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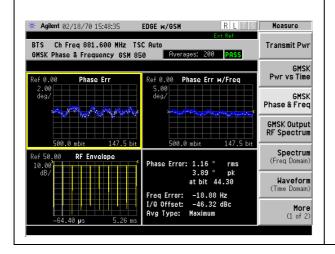
#### 5.4.3.5 TESTS AT TEMPERATURE +35 °C

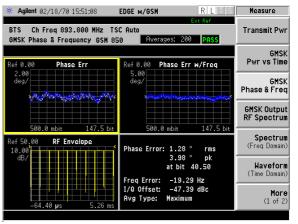
#### 5.4.3.5.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	121	Pass
В	Phase PK	4.11	Pass
	Freq. Error	-19.63	Pass
	Phase RMS	1.16	Pass
М	Phase PK	3.89	Pass
	Freq. Error	-18.88	Pass
	Phase RMS	1.28	Pass
Т	Phase PK	3.98	Pass
	Freq. Error	-19.29	Pass







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# > Diplexer configuration:

CHN	Measure	Average	Sanction	* Agilent 02/18/70 16:02:06	EDGE w/GSM	R L T S System
	Phase RMS	1.17	Pass	BTS Ch Freq 869.200 MHz		Ext Ref Show Er
В	Phase PK	3.03	Pass	GMSK Phase & Frequency GSM	850 Averages: 20	PASS Refere
	Freq. Error	-10.17	Pass	Ref 0.00 Phase Err 2.00	5.00	r w/Freq
	Phase RMS	1.24	Pass	deg/	deg/	Alignm
M	Phase PK	3.72	Pass			Config
	Freq. Error	-9.95	Pass	500.0 mbit 147.5 Ref 60.00 <b>RF Envelope</b>		147.5 bit Time/
	Phase RMS	1.13	Pass	10.00 dB/	Phase Error: 1.17 3.83	° pk
Т	Phase PK	3.69	Pass		Freq Error: -10.	
	Freq. Error	-6.27	Pass		Avg Type: Maximu	28 dBc im (1
				_64.40 μs 5.26	ms	
Agilent 02	·	E m/GSM R L	T   System	-64.40 ps 5.26  ** Agilent 02/18/70 16:07:25	EDGE W/GSM	
rs ChF	2/18/70 16:04:09 EDGE req 881.600 MHz TSC Au	E W/GSM R L  Ext Ref	Show Errors	* Agilent 02/18/70 16:07:25  BTS Ch Freq 893.800 MHz	EDGE W/GSM	Ext Ref Show Er
TS ChF ISK Phase	2/18/70 16:04:09 EDGE Freq 881.600 MHz TSC Au e & Frequency GSM 850	E W/GSM R L Ext. Ref ita Averages: 200 PAS	Show Errors	* Agilent 02/18/70 16:07:25  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM	EDGE w/GSM TSC Auto 850 Averages: 20	Show Er
rs ChF	2/18/70 16:04:09 EDGE req 881.600 MHz TSC Au a & Frequency 0SM 850  Phase Err Ref	E W/GSM R L  Ext Ref	Show Errors	* Agilent 02/18/70 16:07:25  BTS Ch Freq 893.800 MHz	EDGE W/GSM	Show Er  Refere
f 0.00 2.00 deg/	2/18/70 16:04:09 EDGE req 881.600 MHz TSC Au a & Frequency 0SM 850  Phase Err Ref	E W/GSM R L  Ext Ref  Ito  Averages: 200 PAS  6.00 Phase Err W/Fre  5.00	Show Errors	# Agilent 02/18/70 16:07:25  BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 6SM  Ref 0.00 Phase Err 2.00	EDGE w/GSM  TSC Auto 1850 Averages: 26  Ref 0.00 Phase Ender 1950  4 Average 1950  Average 2050  Ref 0.00 Phase Ender 1950  Ref 0.00 Phase Phase Ender 1950  Ref 0.00 Phase Ph	Show Er  PASS  Refero  Alignm
f 0.00 2.00 deg/ 500.0	2/18/70 16:04:09 EDGE req 891.600 MHz TSC Au a & Frequency GSM 850  Phase Err  Phase Err  O mbit 147.5 bit  RF Envelope	E W/GSM  Ext Rof  Rorages: 200 PAS  f 0.00 Phase Err W/Fre 5,000 500.0 mbit 147.  ase Error: 1.24 ° rms	Show Errors  Reference  Alignments  Config I/O  Time/Date	# Agilent 02/18/70 16:07:25  BTS Ch Freq 893.800 MHz 6MSK Phase & Frequency 6SM  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5  Ref 60.00 RF Envelope 10.00	EDGE w/GSM  TSC Auto 1850	Show Er  Reference Referen
f 0.00 2.00 deg/	Phase Err  Phase Err  Ref Envelope  Phase Prevelope  Phase Prevelope	E W/GSM R L  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  1.00  1.00  500.0 mblt 147.	Show Errors  Reference  Alignments  Config I/O  Time/Date	Agilent 02/18/70 16:07:25  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5  Ref 60.00 RF Envelope	TSC Auto 850 Averages: 20  Ref 0.00 Phase Er 5,00 deg/ Phase Error: 1.13 3.69	Show Er  PASS  Reference  Reference  Alignm  147.5 bit  rms pk Disp Upc On

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## 5.4.3.5.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

HN	Measure	Average	Sanction	<b>★ Agilent</b> 02/18/70 15:44:56	Measure
	Phase RMS	1.35	Pass	BTS Ch Freq 869.200 MHz TSC Auto	Transmit P
В	Phase PK	4.60	Pass	6MSK Phase & Frequency 6SM 850 Averages: 200 PASS	GM:
	Freq. Error	-21.17	Pass	Ref 0.00	Pwr vs T
	Phase RMS	1.31	Pass	deg/	Phase & Fr
M	Phase PK	3.94	Pass		GMSK Outp
	Freq. Error	-13.38	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Specti
	Phase RMS	1.31	Pass	10.00 Phase Error: 1.35 ° rms dB/ 4.60 ° pk	(Freq Dom
Т	Phase PK	4.12	Pass	at bit 44.40 Freq Error: -21.17 Hz	Wavefo (Time Dom
				I/O Offset: -45.22 dBc	
	Freq. Error	-20.99	Pass	-64.40 µs 5.26 ms	
Agilent 02	· ·	-20.99		Avg Type: Maximum	
TS Ch Fi	· ·	E w/GSM R L	Measure Transmit Pwr	-64,40 µs 5.26 ms	Measure  Transmit F
S Ch Fi ISK Phase	:/18/70 15:40:48 EDGI req 881.600 MHz TSC Au & Frequency GSM 850	E M/GSM R L Ext Ref. Ita Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 15:43:27 EDGE w/GSM  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850  Avg Type: Maximum  PARS  Avg Type: Maximum  RLL  Frequency  Avg Type: Maximum  RLL  Frequency  Avg Type: Maximum  Avg Type: Maximum  RLL  Frequency  Avg Type: Maximum  Avg Type: Maximum	(1 o
S Ch Fi	1/18/70 15:40:48 EDGI req 881.600 MHz TSC Au & Frequency 6SM 850 Phase Err Ref	E W/GSM R L Ext. Ref.	Transmit Pwr	# Agilent 02/18/70 15:43:27 EDGE w/GSM R L TSC BTS Ch Freq 893.800 MHz TSC Auto	Measure Transmit F
F Ch F MSK Phase	req 881.600 MHz TSC Au 2 & Frequency GSM 850	E w/GSM R L  Ext Ref  to Averages: 200 pas  6.00 Phase Err w/Fre 5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 15:43:27 EDGE w/GSM RIL STREET REPORT OF THE PROPERTY OF TH	Measure Transmit F Pwr vs T
F 50 .00	2/18/70 15:40:48 EDGI req 881.600 MHz TSC Au & Frequency 6SM 850  Phase Err Ref a mbit 147.5 bit RF Envelope	E W/GSM  Ext Ref.  Riverages: 200 Pas  6 0.00 Phase Err W/Fre 1,00 Free Pas 1,00 Phase Err W/Fre 1,00 Phase Err W/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum (Freq Domain)	# Agillent 02/18/70 15:43:27 EDGE w/GSM RIL   Street Ref   Street Ref	Measure Transmit F  Pwr vs T  Phase & Fi  GMSK Out
f 0.00 2.00 deg/ 500.0	Phase Err  Phase Err  Ref Envelope  Ph. 15:40:48  Phase Err  Ref Envelope  Ph. 147.5 bit	E W/GSM R L Ext Ref  Ext Ref  Averages: 200 PASE  6 0.00 Phase Err W/Fre  1.00 Phase Err W/Fre  1.00 Phase Err W/Fre	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum (Freq Domain)	# Agilent 02/18/70 15:43:27 EDGE w/GSM R L Street Ref  BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 950  Ref 0.00 Phase Err 2.00 deg/ 500.0 mblt 147.5 bit  Ref 50.00 RF Envelope	Measure Transmit F  Pwr vs T  Phase & FI  GMSK Out RF Spect

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# > Diplexer configuration:

HN	Measure	Average	Sanction	* Agilent 02/18/70 16:10:04	EDGE w/GSM	RLTS	System
	Phase RMS	1.24	Pass	BTS Ch Freq 869.200 MHz		Ext Ref	Show Erro
В	Phase PK	4.06	Pass	GMSK Phase & Frequency GSM	850 Hverages:	200 PASS	Referen
	Freq. Error	9.80	Pass	Ref 0.00 Phase Err 2.00	Ref 0.00 Phase 5.00 deg/	Err w/Freq	
	Phase RMS	1.18	Pass	W. J.	A		Alignme
M	Phase PK	3.80	Pass				Config
	Freq. Error	11.56	Pass	500.0 mbit 147.5 l Ref 60.00 <b>RF Envelope</b>		147.5 bit	Time/Da
	Phase RMS	1.20	Pass	10.00 dB/		24° rms 06° pk it 60.40	Disp Upda
т	Phase PK	3.60	Pass		Freq Error: 9.8	30 Hz	On
	Freq. Error	9.52	Pass	-64.40 µs 5.26	Avg Type: Maxi	H.92 dBc mum	
Agilent 02	·	9.52		-64,40 µs 5,26	Avg Type: Maxi		
S Ch Fi	·	E m/GSM R L	Show Errors		Avg Type: Maxims  EDGE W/GSM  TSC Auto	mum	(1 o
S Ch Fi SK Phase	/18/70 16:13:10 EDGE req 881.600 MHz TSC Au & Frequency GSM 850	E W/GSM R L Ext. Ref.	Show Errors	* Agilent 02/18/70 16:15:21  BTS Ch Freq 893.800 MHz	Avg Type: Maximum EDGE w/GSM  TSC Auto Averages:  Ref 8.00 Phase	R L T S  Ext Ref	System Show Erro
S Ch Fi	/18/70 16:13:10 EDGE req 881.600 MHz TSC Au & Frequency GSM 850  Phase Err Ref	E M/GSM R L Est Roi to Averages: 200 PAS	Show Errors	* Agilient 02/18/70 16:15:21  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM	Avg Type: Maxims  EDGE w/GSM  TSC Auto  Averages:	R L T S Ext Ref 200 PASS	System Show Erro
S Ch Fi	/18/70 16:13:10 EDGE req 881.600 MHz TSC Au & Frequency GSM 850  Phase Err  Ref	E w/GSM R L Ext Rer to Averages: 200 PASS Err w/Fre 1,900 Phase Err w/Fre 1,900 PASS Err w/Fr	Show Errors  Reference  Alignments  Config 1/0	# Agilent 02/18/70 16:15:21  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 deg/	EDGE W/GSM  TSC Auto 850  Ref 0.00 Phase 5.00 deg/	RILIS Ext Ref 200 PRSS Err M/Freq	System Show Erro
S Ch Fi SK Phase 0.00 .00 eg/ 500.6	/18/70 16:13:10 EDGE req 881.600 MHz TSC Au & Frequency 6SM 850  Phase Err Phase Err Ref d mbit 147.5 bit RF Envelope	E W/GSM R Lat Ref  Ref Ref  6.00 Phase Err W/Fre  6.00 Phase Err W/Fre  5.00 mbit 147  ase Error: 1.18 ° rm	System Show Errors Reference Alignments Config I/O Time/Date	** Agilent 02/18/70 16:15:21  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency 6SM  Ref 0.00 Phase Err 2.00	Ref 0.00 Phase 5.00 deg/	Ext Ref  200 PRS  Err W/Freq  147.5 bit  20 ° rms	System Show Erro Referen
S Ch Fi	/18/70 16:13:10 EDGE req 881.600 MHz TSC Au & Frequency GSM 850  Phase Err  Ref  a mbit 147.5 bit  RF Envelope Phase Err	E w/6SM R L Ext Ref  to Averages: 200 PASE  0.00 Phase Err w/Fre  1.00  500.0 mbit 147	S System Show Errors Reference Alignments Config 1/0 Time/Date	# Agilent 02/18/70 16:15:21  BTS Ch Freq 893.800 MHz GMSK Phase & Frequency GSM  Ref 0.00 Phase Err 2.00 des/ 500.0 mbit 147.5 i	EDGE W/GSM  TSC Auto 850  Ref 0.00 Phase 5.00 deg/ Phase Error: 1.2 3.6	R L S Ext Ref 200 PASS  Err w/Freq 147.5 bit 20 ° rms 33 ° pk it 56.40	System Show Erro Referer Alignme

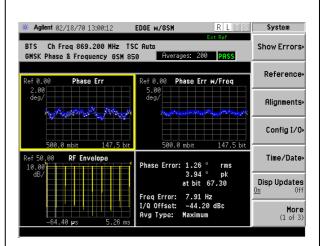
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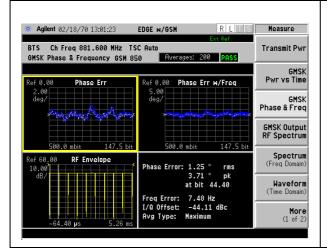
#### 5.4.3.6 TESTS AT TEMPERATURE +45 °C

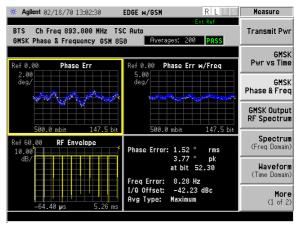
#### 5.4.3.6.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	1.26	Pass
В	Phase PK	3.94	Pass
	Freq. Error	7.91	Pass
	Phase RMS	1.25	Pass
M	Phase PK	3.71	Pass
	Freq. Error	7.48	Pass
	Phase RMS	1.52	Pass
Т	Phase PK	3.77	Pass
	Freq. Error	8.28	Pass







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# > Diplexer configuration:

CHN	Measure	Average	Sanction	# Agilent 02/18/70 13:18:26 EDGE w/GSM R L T S □	Syster
	Phase RMS	1.24	Pass	BTS Ch Freq 869.200 MHz TSC Auto	Show Eri
В	Phase PK	3.66	Pass	6MSK Phase & Frequency 6SM 850 Averages: 200 PASS	Refere
	Freq. Error	8.48	Pass	Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq 2.00 5.00 5.00 deg/	Refere
	Phase RMS	1.24	Pass	deg/	Alignme
M	Phase PK	4.40	Pass		Config
	Freq. Error	6.67	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 60,00 RF Envelope	Time/D
	Phase RMS	1.29	Pass	10.00 Phase Error: 1.24 ° rms dB/ B A B A B A B A B A B A B A B B A B A	Disp Upd
Т	Phase PK	3.72	Pass	Freq Error: 8.48 Hz	<u>On</u>
	Freq. Error	-6.15	Pass	I/O Offset: -45.13 dBc	(1
Agilent 02	:/18/70 13:17:12 <b>EDG</b> E	Ew/GSM RL	T S  System		Measur
TS Ch F	req 881.600 MHz TSC Au	Ext Ref	Show Errors	BTS Ch Freq 893.800 MHz TSC Auto	Measur Transmit
TS ChF MSK Phase	req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref Ito Averages: 200 PAS	Show Errors	BTS Ch Freq 893.800 MHz TSC Auto 6MSK Phase & Frequency 6SM 850 Averages: 200 PASS	Transmit
TS Ch F MSK Phase of 0.00 2.00	req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref	Show Errors	Ext Ref   BTS   Ch Freq 893.800 MHz   TSC Auto   GMSK Phase & Frequency GSM 850   Averages: 200   PASS	Transmit G Pwr vs
TS Ch F MSK Phase of 0.00 2.00 deg/	req 881.600 MHz TSC Au & Frequency GSM 850	Averages: 200 PAS  Florages: 200	Show Errors	Ext Ref   BTS   Ch Freq 893.800 MHz   TSC Auto   GMSK Phase & Frequency GSM 850   Averages: 200   PASS	Transmit  Pwr vs  Chase & I
F 60 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Phase Err  Phase Err  Phase Err  Ref  mbit 147.5 bit  RF Envelope	### Ref Ref   Riverages: 200   PAS    F 0.00   Phase Err   M/Fref   5.00   Fref   5.00   Mbit   147.   ase Error: 1.24 ° rms	Show Errors  Reference  Alignments  Config I/O  Time/Date	BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PRSS  Ref 0.00 Phase Err 2.00 deg/  S00.0 mbit 147.5 bit S00.0 mbit 147.5 bit S00.0 mbit 147.5 bit 1.29 ° rms	Transmit  Pwr vs  Phase & I  GMSK Ou  RF Spec
TS Ch F MSK Phase of 0.00 2.00 deg/	Phase Err  Phase Err  Ref Envelope  Phase Trequency GSM 850	Averages: 200 PAS:  6.00 Phase Err w/Free 6.00 Phase 5.00 6eg/	Show Errors  Reference  Alignments  Config I/O  Time/Date	BTS Ch Freq 893.800 MHz TSC Auto 6MSK Phase & Frequency 6SM 850  Ref 0.00 Phase Err 2.00 deg/ deg/ S00.0 mbit 147.5 bit  Ref 60.00 RF Envelope	

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## 5.4.3.6.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

HN	Measure	Average	Sanction	<b>★ Agilent</b> 02/18/70 10:35:09 <b>EDGE w/GSM</b> R L T S	Measur
	Phase RMS	1.25	Pass		Transmi
В	Phase PK	3.78	Pass	GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Avg Bursts 200	
	Freq. Error	9.61	Pass	Ref 0.00	Pwr vs
	Phase RMS	1.26	Pass	deg/	Phase &
М	Phase PK	3.60	Pass		GMSK 0 RF Spe
	Freq. Error	-21.78	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spec
	Phase RMS	1.38	Pass	10.00 Phase Error: 1.25 ° rms 3.78 ° pk	(Freq D
Т	Phase PK	3.58	Pass	at bit 73.10 Freg Error: 9.61 Hz	Wave (Time D
	Freq. Error	7.78	Pass	I/O Offset: -45.94 dBc Avg Type: Maximum -64.40 us 5.26 ms	(1
Agilent 02	2/18/70 10:55:04 <b>EDG</b> I	Ew/GSM R L	T  S   Measure		Syste
S Ch F	:/18/70 10:55:04 EDGI req 881.600 MHz TSC Au a & Frequency 65M 850	Ext Ref	Transmit Pwr	Ext Ref	
S ChF SK Phase	req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref	Transmit Pwr	BTS Ch Freq 893.800 MHz TSC Auto	Show Er
S Ch F SK Phase	req 881.600 MHz TSC Au & Frequency GSM 850	Ext Ref Ito Averages: 200 PAS	Transmit Pwr	BTS Ch Freq 893.800 MHz TSC Auto 6MSK Phase & Frequency 6SM 850 Averages: 200 PRSS	Show Er
S Ch F SK Phase	req 881.600 MHz TSC Au 2 & Frequency GSM 850 Phase Err	Averages: 200 Pas	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err 2.00 deg/	Show Er Refer
S Ch F SK Phase 0.00 .00 eg/	Phase Err Phase Err Phase Err Phase Err Re	Averages: 200 Pas	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	BTS Ch Freq 893,800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200 PASS  Ref 0.00 Phase Err 2.00 deg/ deg/ deg/ deg/ S00.0 mbit 147.5 bit  Ref 60,00 RF Envelope	Show Er Refer Alignm Confi
S Ch F ISK Phase 0.00 2.00 leg/ 500.6	Phase Err Phase Err Phase Err Phase Err Re	Averages: 200 PAS  6.00 Phase Err w/Fre 5.00  6.00 Phase Err w/Fre 5.00 Averages: 200 PAS	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum (Freq Domain)  Haveform	STS   Ch Freq 893,800 MHz   TSC Auto   State	Syste Show Er Refero Alignm Config Time/
f 0.00 2.00 deg/ 500.0	Phase Err  The phase	Averages: 200 PAS  6 0.00 Phase Err w/Fre 5.00 deg/ 5.00 mbit 147  ase Error: 1.26 ° rm 3.60 ° pk	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum (Freq Domain)	BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850  Ref 0.00 Phase Err 2.00 deg/  S00.0 mbit 147.5 bit  Ref 60.00 RF Envelope 10.000 10.000  Phase Err #/Freq 5.00 10.000  Phase Err #/Freq 5.00 10.000  Phase Err #/Freq 5.00 10.000 10.000  Phase Err #/Freq 5.00 10.0000 10.000 10.00	Refer Alignm Confi Time/

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Measure

GMSK Output RF Spectrum

Spectrum (Freq Domain)

Waveform (Time Domain)

Measure Transmit Pwr

GMSK Phase & Freq

> Waveform (Time Domain)

Freq Error: 8.42 Hz I/O Offset: -44.30 dBc Avg Type: Maximum

# > Diplexer configuration:

HN	Measure	Average	Sanction	₩ Agilent 02/18/70 13:47:43 EDGE w/GSM
	Phase RMS	1.23	Pass	BTS Ch Freq 869.200 MHz TSC Auto
В	Phase PK	4.27	Pass	6MSK Phase & Frequency 6SM 850 Averages: 200
	Freq. Error	-8.29	Pass	Ref 0.00
	Phase RMS	1.26	Pass	deg/
М	Phase PK	5.55	Pass	y 19 9 19 10 10 10 10 10 10 10 10 10 10 10 10 10
	Freq. Error	7.71	Pass	500.0 mbit 147.5 bit 500.0 mbit  Ref 60.00 RF Envelope
	Phase RMS	1.40	Pass	10.00 Phase Error: 1.23 ° dB/ 4.27 °
т	Phase PK	4.24	Pass	at bit 42 Freq Error: -8.29 Hz
	Freq. Error	8.42	Pass	I/O Offset: -43.15 of Avg Type: Maximum
Agilent 02	/18/70 13:46:11 <b>ED</b> 0	SE W/GSM R L	S   Measure	* Agilent 02/18/70 13:44:55 EDGE w/GSM
	req 881.600 MHz TSC A & Frequency GSM 850		Transmit Pwr	BTS Ch Freq 893.800 MHz TSC Auto GMSK Phase & Frequency GSM 850 Averages: 200
ef 0.00		of 0.00 Phase Err w/Freq	GMSK Pwr vs Time	Ref 0.00 Phase Err Ref 0.00 Phase Err w
2.00 deg/		5.00 deg/	GMSK Phase & Freq	2,00 deg/
			CHCK Outsuit	
500.6	) mbit 147.5 bit	500.0 mbit 147.5	GMSK Output RF Spectrum	500.0 mbit 147.5 bit 500.0 mbit

Waveform (Time Domain)

Freq Error: 7.71 Hz I/O Offset: -44.55 dBc Avg Type: Maximum

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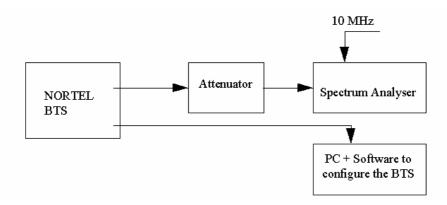
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## 5.5 NAME OF TEST: SPURIOUS EMISSION AT TERMINALS

#### 5.5.1 FCC REQUIREMENTS LIMITS

- (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.
- (b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
- (c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- (d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

#### 5.5.2 TEST PRINCIPLE



For adjacent channels emissions, the BTS nominal carrier frequency was adjusted to each block edge channel.

Channels 128 and 251 are those channels which are at the lower and upper edges of the 850 band respectively.

The BTS was configured to transmit at maximum power (static level 0) or a reduced power:

- · For GMSK modulation, in mode GMSK no synchro.
- · For 8PSK modulation, in mode logical PDCH, Type GPRS, coding MCS5.

Initially the transmitter was set to operate to maximum power. Then in case of out of limits, the power has been decreased by 2 dB.

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For these measurements, the resolution bandwidth was of the spectrum analyzer was set to at le ast 1% of the emission bandwidth. In this case the emission bandwidth measured was closed to 300 kHz. Therefore, the resolution bandwidth was set to 3 kHz. The spectrum analyzer had the following settings for adjacent band:

Resolution bandwidth: 3 kHz Video bandwidth: 10 kHz Span: 1 MHz

Reference level: 30 dBm

Reference Level Offset: Corrected to account for cable(s), filter and attenuator losses

Level range: 100 dB
Sweep time: Coupled
Detector: Sample
Trace: Average
Sweep count: 200

The spectrum analyzer had the following settings for out of block emissions.

Resolution bandwidth: 1 MHz Video bandwidth: 1 MHz

The emissions were investigated up to the twentieth harmonic of the fundamental emission (20 GHz).

The measured level of the emissions was recorded and compared to the -13 dBm limit.

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## 5.5.3 CONCLUSION

GSM850 Radio Modules used with 60W Power Amplifier configuration

Description	Hardware code	Comment				
Radio Modules GSM 850						
HPRM 3T 60W GSM850	NTN050JA	Radio Module 850Mhz (GMSK 60W / 8PSK 45W )				
GSM850 Coupling m	odule					
DDM 850 H2	NTN063HA	With TOS meter				
	NTN063HM	With out TOS meter				
DDM 850	NTN063JA	With TOS meter				
	NTN063JM	With out TOS meter				
Tx Filter 850	NTN064HA	With TOS meter				
H2	NTN064HM	Without TOS meter				
Tx Filter 850	NTN064JA	With TOS meter				
	NTN064JM	Without TOS meter				

Power limitation to comply with Adjacent Band spurious at antenna connector GSM850:

BTS Antenna Power	GMSK modulation	8PSK modulation
DDM Dp configuration	47.1 dBm / 51.3W	46 dBm / 39.8W
DDM H2 configuration	43.2 dBm / 12.6W	42.2 dBm / 12.6W

Coupling configuration	System Power limitation GMSK modulation	System Power limitation 8 PSK modulation
DDM Diplexer Tx Filter (w/oH2)	Power Limitation: Pmax – 6 dB Except ARFCN 238, 241: Pmax	Power Limitation: Pmax – 4 dB Except ARFCN 238, 241: Pmax
Power Limitation :  DDM H2		Pmax

For Edge Channel ARFCN 128, 131, 133, 181, 183, 231, 233, 251, power has to be reduced by <u>6dB</u> (<u>GMSK</u>) or <u>4dB</u> (<u>8PSK</u>) in order to meet spurious emission requirement.

For Edge Channel ARFCN 238, 241, maximum power has allowed to meet spurious emission requirement.

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#### 5.5.4 TEST RESULTS

# > TEST RESULTS WITH DDM DIPLEXER CONFIGURATION FOR GMSK MODULATION

The reference level for spurious emissions at the antenna terminals is taken from the measured output power (47.1 dBm = 51.3 Watts).

Therefore the spurious emissions must be attenuated by at least 43 + 10\*Log(51.3) = 60.1 dB

The measured output power was 47.1 dBm therefore the limit is 47.1 - 60.1 = -13 dBm.

Spurious measurement is performed with the DDM diplexer configuration.

The Nominal power at antenna connector: PGMSK diplexer Max = 47.1 dBm

**Test result for GMSK Modulation HD Configuration** 

Channel	Power Level (Pmax)	Power Level (Pmax-2)	Power Level (Pmax-4)	Power Level (Pmax-6)	Margin (dB)
C128			-13.14		-0.14
C131				-13.05	-0.05
C133				-14.48	-1.48
C181				-13.27	-0.27
C183				-14.49	-1.49
C231				-13.01	-0.01
C233				-14.17	-1.17
C251				-14.33	-1.33

Power limitation Pmax –6 dB ensures the Adjacent Band spurious compliance at antenna connector GSM850 for Diplexer configuration.

H2D configuration introduces additional 4dB losses for Tx path and involves the Power limitation Pmax –2dB for Adjacent Band spurious compliance.

# > TEST RESULTS WITH DDM DIPLEXER CONFIGURATION FOR 8PSK MODULATION

The reference level for spurious emissions at the antenna terminals is taken from the measured output power (46 dBm = 39.8 Watts).

Therefore the spurious emissions must be attenuated by at least 43 + 10\*Log(39.8) = 59 dB

The measured output power was 46 dBm therefore the limit is 46 - 59 = -13 dBm.

Spurious measurement is performed with the DDM diplexer configuration.

The Nominal power at antenna connector: P8PSK diplexer Max = 46.4 dBm

**Test result for 8PSK Modulation HD Configuration** 

	Spurious Emission Level (dBm)					
Channel	Power Level (Pmax)	Power Level (Pmax-2)	Power Level (Pmax-4)	Margin (dB)		
C128			-14.06	-1.06		
C131			-14.90	-1.90		
C183			-14.06	-1.06		
C231		-13.16		-0.16		
C251		-13.17		-0.17		

Power limitation Pmax –4 dB ensures the Adjacent Band spurious compliance at antenna connector GSM850 for Diplexer configuration.

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#### > TEST RESULTS WITH DDM H2 CONFIGURATION FOR 8PSK MODULATION

The reference level for spurious emissions at the antenna terminals is taken from the measured output power (42.2 dBm = 16.6 Watts).

Therefore the spurious emissions must be attenuated by at least 43 + 10\*Log (16.6) = 55.2 dB

The measured output power was 42.2 dBm therefore the limit is 42.2 - 55.2 = -13 dBm.

Spurious measurement is performed with the DDM H2 configuration.

The Nominal power at antenna connector: P8PSK H2 Max = 42.2 dBm

Test result for 8PSK Modulation H2 Configuration

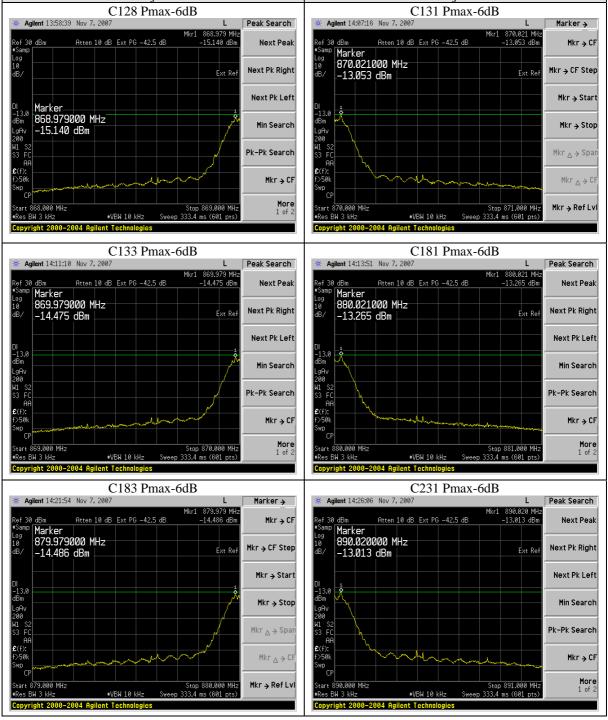
	Spurious Emission Level (dBm)					
Channel	Power Level (Pmax)	Power Level (Pmax-2)	Power Level (Pmax-4)	Margin (dB)		
C128	-13.63			-0.63		
C131	-14.64			-0.64		
C183	-13.17			-0.17		
C231	-14.60			-1.60		
C251	-14.43			-1.4		

## > Test result for Out of block spurious emission – Channel 189 HD Configuration

Power (dB)	Frequency MHz	Spurious Emission Level - GMSK	Spurious Emission Level – 8PSK
	100 kHz – 50MHz	-42	-43
	50 MHz -500 MHz	-41	-41
	500 MHz – 880.2 MHz	-37	-38
Pmax	882.6 MHz – 1970.2 MHz	-27	-27
-	1970.2 MHz – 1994.8 MHz	-42	-42
	1994.8 MHz – 3 GHz	-37	-37
	3 GHz – 10 GHz	-38	-38
	10 GHz – 20 GHz	-35	-35
	Margin	> 10 dB	> 14 dB

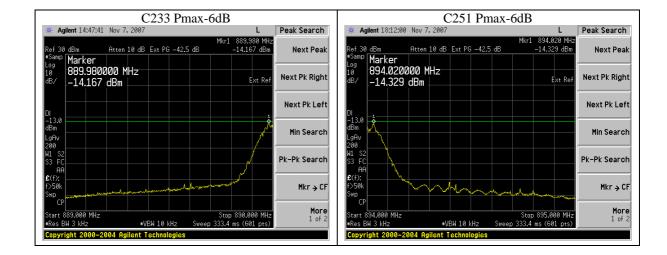
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Figure: In Band - Edge block channel - 1MHz adjacent band **GMSK Modulation –HD Configuration** -1 MHz adjacent band +1MHz adjacent band C128 Pmax-6dB C131 Pmax-6dB Agilent 13:58:39 Nov 7, 200 Peak Search Agilent 14:07:16 Nov 7, 200 868.979 MH -15.140 dBn Atten 10 dB Ext PG -42.5 dB Atten 10 dB Ext PG -42.5 dB Next Peak Next Pk Right Fv+ Ra



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## GSM 9000 Indoor BTS Radio Test Report PCS1900 & GSM850 FCC Part24&Part22



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+1MHz adjacent band -1 MHz adjacent band C128 Pmax C131 Pmax Agilent 18:26:46 Nov 7, 200 Peak Search Peak Search 870.021 MH: -14.641 dBm Atten 10 dB Ext PG -42.5 dB Atten 10 dB Ext PG -42.5 dB Next Peak Next Peak Next Pk Right Next Pk Right Ext Re Ext Re Next Pk Left Next Pk Left Min Search Min Search Pk-Pk Search Pk-Pk Search Mkr → CF Mkr → CF Stop 871.000 MH: art 868.000 MHz es BW 3 kHz tart 870.000 MHz Res BW 3 kHz Stop 869.000 MHz Copyright 2000-2004 Agilent Technologies Copyright 2000-2004 Agilent Technologies C183 Pmax C231 Pmax \* Agilent 18:31:14 Nov 7, 2007 K Agilent 18:33:29 Nov 7, 2007 Peak Search Peak Search 879.988 MH -13.165 <u>d</u>Br Atten 10 dB Ext PG -42.5 dB Atten 10 dB Ext PG -42.5 dB Next Peak Next Peak Marker 890.020000 MHz -14.596 dBm Next Pk Right Next Pk Right Next Pk Left Next Pk Left Min Search Min Search Pk-Pk Search Pk-Pk Search Mkr → CF Mkr → CF CP tart 879.000 Res BW 3 kHz art 890.000 MHz es BW 3 kHz ≢VBW 10 kHz ≠VBW 10 kHz C241 Pmax C251 Pmax Atten 10 dB Ext PG -42.5 dB Next Peak **Next Peal** Marker 891.572100 MHz -13.906 dBm Marker 894.021000 MHz -14.427 dBm Next Pk Right Next Pk Right Next Pk Left Next Pk Left Min Search Min Search Pk-Pk Search Pk-Pk Search Mkr → CF Mkr → CF art 890.660 0 MHz (es BW 3 JUL More 1 of 2 More 1 of 2 Stop 895.000 MH: 333.4 ms (601 pts) Stop 891.600 0 MHz 313.4 ms (601 nts) ≠VBW 10 kHz ≠VBW 10 kHz Copyright 2000-2004 Agilent Tech Copyright 2000-2004 Agilent Tech

Figure: In Band – Edge block channel -1 MHz adjacent band 8PSK Modulation – H2 Configuration

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+1MHz adjacent band -1 MHz adjacent band C128 Pmax-4dB C131 Pmax-4dB Agilent 15:19:51 Nov 7, 200 Peak Search Agilent 15:17:25 Nov 7, 200 R T Peak Search 868.987 MH -14.064 dBm Atten 10 dB Ext PG -42.5 dB Atten 10 dB Ext PG -42.5 dB Next Peak **Next Peak** Marker 868.987000 MHz Next Pk Right Next Pk Right Ext Re Ext Re -14.064 dBm Next Pk Left Next Pk Left Min Search Min Search Pk-Pk Search Pk-Pk Search Mkr → CF Mkr → CF P CP Stop 871.000 MH: tart 868.000 MHz Res BW 3 kHz tart 870.000 MHz Res BW 3 kHz Stop 869.000 MHz Copyright 2000-2004 Agilent Technologies Copyright 2000-2004 Agilent Technologies C183 Pmax-4dB C231 Pmax-4dB Agilent 15:15:11 Nov 7, 2007 \* Agilent 15:12:19 Nov 7, 2007 Freq/Channel Peak Search Center Freq Atten 10 dB Ext PG -42.5 dB Atten 10 dB Ext PG -42.5 dB Next Peak Marker 879.987000 MHz -14.062 dBm Marker 890.022000 MHz -13.159 dBm Start Freq 879.000000 MHz Next Pk Right Stop Freq 880,000000 MHz Next Pk Left CF Step Min Search gAv 200 Freq Offset Pk-Pk Search Signal Track Mkr → CF CP tart 879.000 MHz Res BW 3 kHz tart 890.000 MHz Res BW 3 kHz ≢VBW 10 kHz ≢VBW 10 kHz C251 Pmax-4dB Agilent 15:06:28 Nov 7, 20 Peak Search 894.009 MH: -13.166 dBm Atten 10 dB Ext PG -42.5 dB Next Peak Marker 894.009000 MHz Next Pk Right Ext Re -13.166 dBm Next Pk Left Min Search Pk-Pk Search Mkr → CF More 1 of 2 Stop 895.000 MHz Sweep 333.4 ms (601 pts)

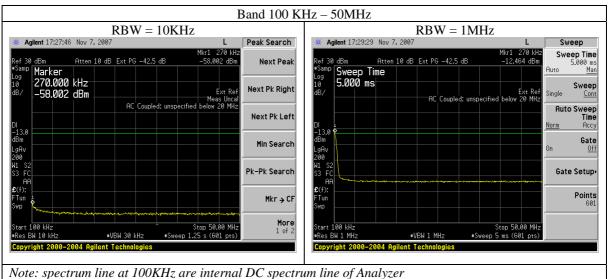
Figure: In Band - Edge block channel -1MHz adjacent band **8PSK Modulation –HD Configuration** 

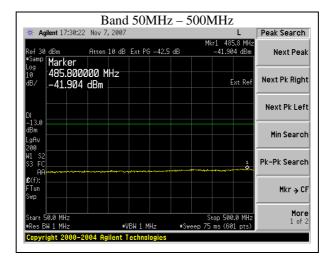
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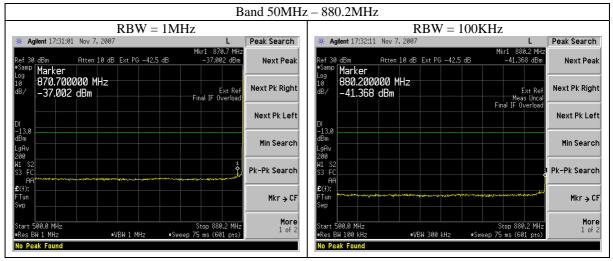
≢VBW 10 kHz

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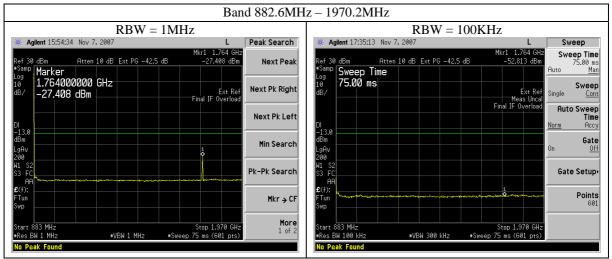
PE/BTS/DJD/022904 01.01 / EN Standard 10/Dec/2007 Page 58/112 Figure: Out of block emission (Channel 189, Pmax) **GMSK Modulation – HD Configuration** 

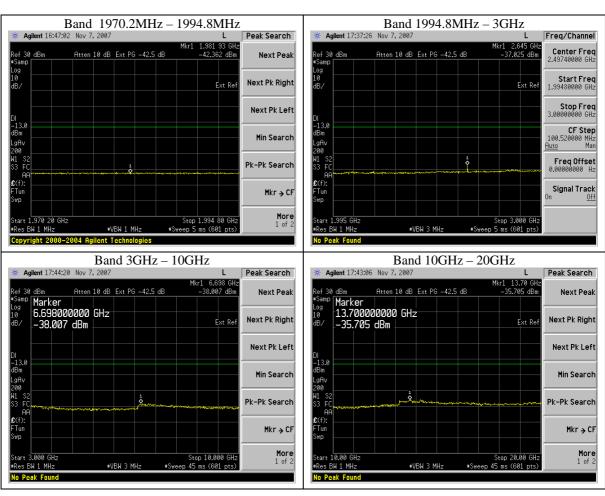






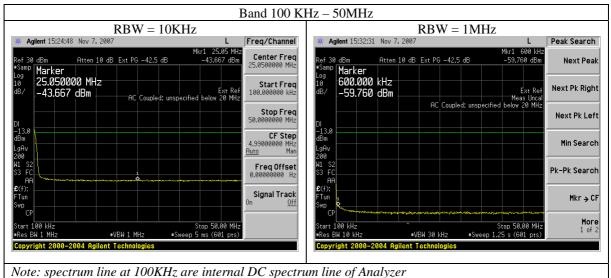
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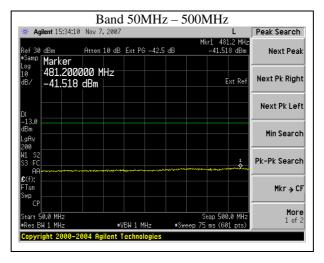


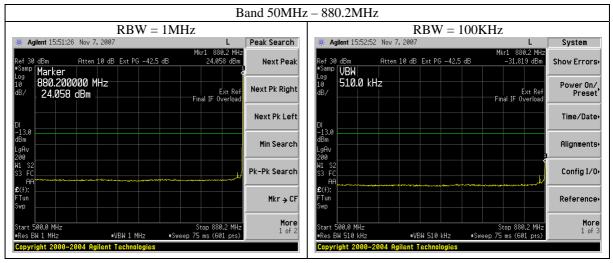
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Figure: Out of block emission (Channel 189, Pmax) 8PSK Modulation – HD Configuration

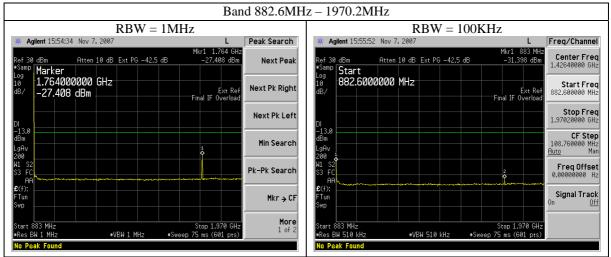


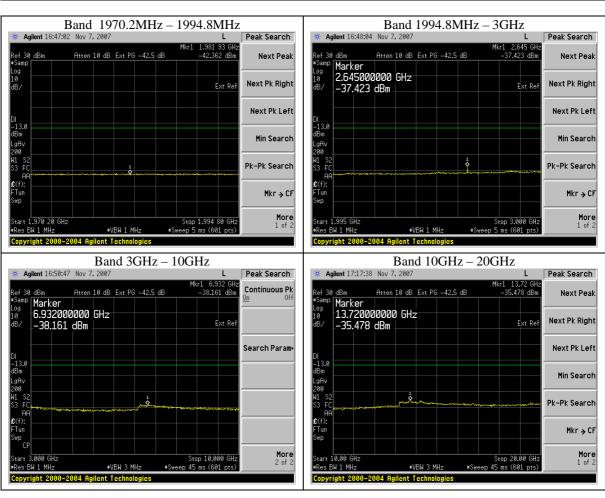
Note: spectrum tine at 100KHz are internal DC spectrum line of Analyzer





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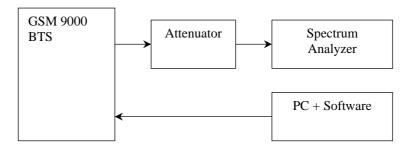
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## 5.6 NAME OF TEST: OCCUPIED BANDWITH

#### 5.6.1 FCC REQUIREMENTS

The occupied bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### 5.6.2 TEST PRICIPLE



The BTS was configured to transmit at maximum power (Static Level 0). Measurements were made at frequencies which were at the bottom and top of the transmit band.

The occupied bandwidth was measured by determining the bandwidth out of which all emissions are attenuated at least 26 dB below the transmitter power.

The spectrum analyzer had the following settings:

Resolution bandwidth: 10 kHz
Video bandwidth: 30 kHz
Span: 1 MHz
Reference level: 40 dBm

Reference Level Offset: Corrected to account for cable(s) and attenuator losses

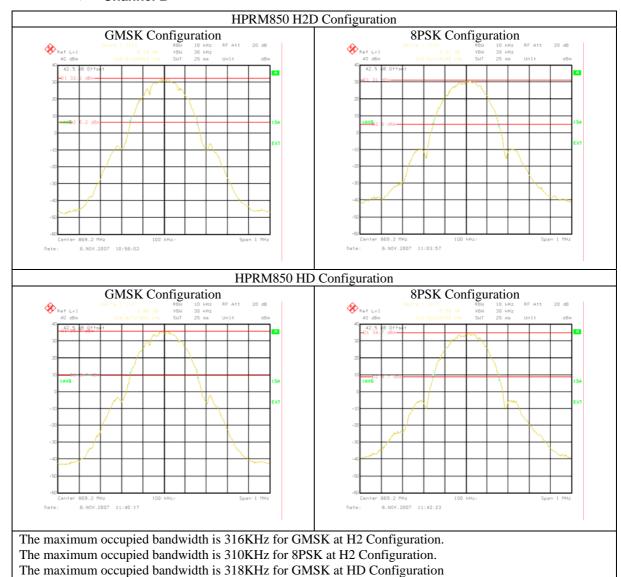
Level range: 100 dB Sweep time: 25 ms

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## **5.6.3 TEST RESULTS**

#### > Channel B

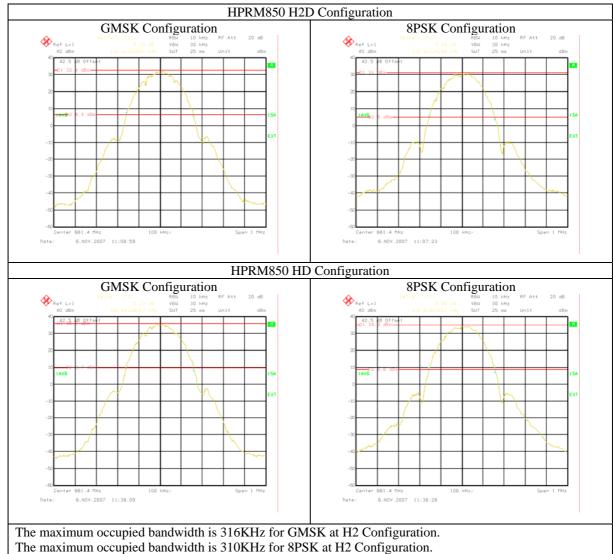


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The maximum occupied bandwidth is 312KHz for 8PSK at HD Configuration

#### > Channel M



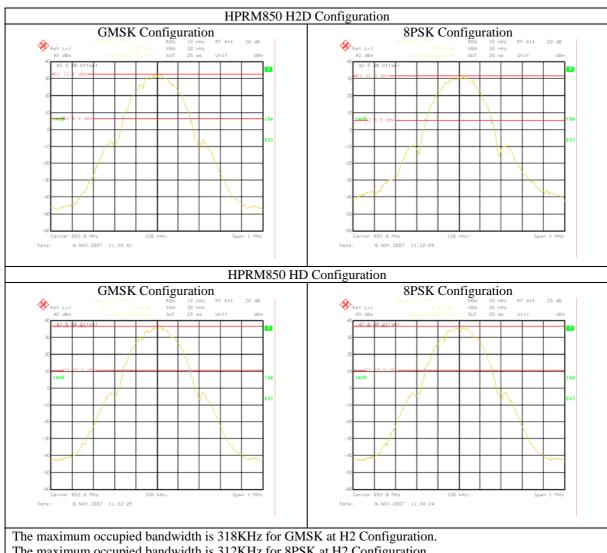
The maximum occupied bandwidth is 320KHz for GMSK at HD Configuration

The maximum occupied bandwidth is 314KHz for 8PSK at HD Configuration

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## > Channel T



The maximum occupied bandwidth is 312KHz for 8PSK at H2 Configuration.

The maximum occupied bandwidth is 318KHz for GMSK at HD Configuration

The maximum occupied bandwidth is 320KHz for 8PSK at HD Configuration

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# 6. TEST REPORT: RM 30W PCS1900

## 6.1 INTRODUCTION

The following information is submitted for update of the type acceptance of a Broadband PCS Base Station for Northern Telecom, Inc., in accordance with FCC Part 22 and Part 2 of the FCC Rules and Regulations.

The measurement procedures were in accordance with the requirements of Part 2.

# **6.2 MEASUREMENT RESULTS**

## **Measurement Results Summary:**

Test Case	GMSK	8PSK	RESULT	Note
RF Power Output	В,М,Т	B,M,T	Complies	Vmin (-40V) / Vmax (-57V)
Frequency Stability	В,М,Т	NT	Complies	From -5°C to +45 °C by 10°C step
Occupied Bandwidth	В,М,Т	B,M,T	Complies	
Spurious Emissions at Antenna Terminals	В,М,Т	B,M,T	Complies	

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## 6.3 NAME OF TEST: RF POWER OUTPUT

#### 6.3.1 FCC REQUIREMENTS - FCC PART 24.232

Base stations are limited to 1640 watts peak equivalent isotropically radiated power (e.i.r.p.) with an antenna height up to 300 meters HAAT. See 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power. In no case may the peak output power of a base station transmitter exceed 100 watts.

Specification for DDM H2configuration in GMSK:

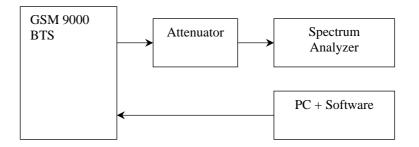
DDM Duplexer configuration:

GMSK:  $44.8 dBm \pm 2.5 dB$ 8PSK:  $44.8 dBm \pm 2.5 dB$ 

DDM H2 configuration:

GMSK: 40.8 dBm  $\pm 2.5 dB$  8PSK: 40.8 dBm  $\pm 2.5 dB$ 

#### **6.3.2 TEST PRINCIPLE**



The BTS was configured to transmit at maximum power (static level 0):

- For GMSK modulation, in mode GMSK no synchro,
- For 8PSK modulation, in mode logical PDCH, Type GPRS, coding MCS5.

Measurements were carried on frequencies which are C512, C661 and C810.

The output power was measured using the PSA which has the following settings:

Mode: Average

Reference Level Offset: Corrected to account for cable(s) and attenuator losses

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## 6.3.3 TEST RESULTS

The Table shows the test results of RF Output Power for **GMSK & 8PSK** modulation with several coupling configurations:

# 6.3.3.1 TESTS AT TEMPERATURE -5 °C

## 6.3.3.1.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.33dBm	Pass
C310	8PSK	39.40dBm	Pass
C661	GMSK	39.72dBm	Pass
C661	8PSK	39.81dBm	Pass
C810	GMSK	39.64dBm	Pass
Colu	8PSK	39.68dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.74dBm	Pass
C310	8PSK	42.84dBm	Pass
C661	GMSK	43.13dBm	Pass
C661	8PSK	43.23dBm	Pass
C810	GMSK	43.08dBm	Pass
C810	8PSK	43.19dBm	Pass

## 6.3.3.1.2 MEAN RF POWER @ -57VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.37dBm	Pass
C310	8PSK	39.41dBm	Pass
C661	GMSK	39.73dBm	Pass
C001	8PSK	39.81dBm	Pass
C810	GMSK	39.66dBm	Pass
C810	8PSK	39.68dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.74dBm	Pass
C510	8PSK	42.82dBm	Pass
0661	GMSK	43.13dBm	Pass
C661	8PSK	43.24dBm	Pass
C810	GMSK	43.09dBm	Pass
	8PSK	43.22dBm	Pass

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## 6.3.3.2 TESTS AT TEMPERATURE +5 °C

## 6.3.3.2.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.50dBm	Pass
	8PSK	39.61dBm	Pass
C661	GMSK	39.82dBm	Pass
	8PSK	39.93dBm	Pass
C810	GMSK	39.81dBm	Pass
	8PSK	39.87dBm	Pass

## > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.85dBm	Pass
C510	8PSK	43.05dBm	Pass
C661	GMSK	43.28dBm	Pass
	8PSK	43.44dBm	Pass
C810	GMSK	43.22dBm	Pass
	8PSK	43.52dBm	Pass

## 6.3.3.2.2 MEAN RF POWER @ -57VDC

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.48dBm	Pass
C310	8PSK	39.53dBm	Pass
0661	GMSK	39.89dBm	Pass
C661	8PSK	39.95dBm	Pass
C810	GMSK	39.80dBm	Pass
	8PSK	39.86dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.88dBm	Pass
C310	8PSK	43.01dBm	Pass
C661	GMSK	43.27dBm	Pass
	8PSK	43.42dBm	Pass
C810	GMSK	43.21dBm	Pass
	8PSK	43.41dBm	Pass

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## 6.3.3.3 TESTS AT TEMPERATURE +15 °C

## 6.3.3.3.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.44dBm	Pass
C310	8PSK	39.45dBm	Pass
C((1	GMSK	39.81dBm	Pass
C661	8PSK	39.84dBm	Pass
C810	GMSK	39.71dBm	Pass
	8PSK	39.70dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.86dBm	Pass
C510	8PSK	42.97dBm	Pass
C661	GMSK	43.22dBm	Pass
	8PSK	43.23dBm	Pass
C810	GMSK	43.17dBm	Pass
	8PSK	43.35dBm	Pass

## 6.3.3.3.2 MEAN RF POWER @ -57VDC

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.48dBm	Pass
C310	8PSK	39.54dBm	Pass
0001	GMSK	39.78dBm	Pass
C661	8PSK	39.92dBm	Pass
C810	GMSK	39.72dBm	Pass
	8PSK	39.78dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.86dBm	Pass
C310	8PSK	42.97dBm	Pass
C661	GMSK	43.22dBm	Pass
	8PSK	43.34dBm	Pass
C810	GMSK	43.16dBm	Pass
	8PSK	43.31dBm	Pass

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## 6.3.3.4 TESTS AT TEMPERATURE +25 °C

## 6.3.3.4.1 MEAN RF POWER @ -40VDC

## > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.42dBm	Pass
C310	8PSK	39.55dBm	Pass
C((1	GMSK	39.80dBm	Pass
C661	8PSK	39.92dBm	Pass
C810	GMSK	39.72dBm	Pass
	8PSK	39.82dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.83dBm	Pass
C510	8PSK	42.94dBm	Pass
C661	GMSK	43.21dBm	Pass
	8PSK	43.32dBm	Pass
C810	GMSK	43.16dBm	Pass
	8PSK	43.28dBm	Pass

## 6.3.3.4.2 MEAN RF POWER @ -57VDC

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.44dBm	Pass
C310	8PSK	39.51dBm	Pass
0661	GMSK	39.78dBm	Pass
C661	8PSK	39.89dBm	Pass
C810	GMSK	39.72dBm	Pass
	8PSK	39.78dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.81dBm	Pass
	8PSK	42.93dBm	Pass
C661	GMSK	43.22dBm	Pass
	8PSK	43.33dBm	Pass
C810	GMSK	43.18dBm	Pass
	8PSK	43.32dBm	Pass

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# 6.3.3.5 TESTS AT TEMPERATURE +35 °C

### 6.3.3.5.1 MEAN RF POWER @ -40VDC

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.33dBm	Pass
C310	8PSK	39.47dBm	Pass
C661	GMSK	39.72dBm	Pass
C001	8PSK	39.72dBm	Pass
C810	GMSK	39.65dBm	Pass
C810	8PSK	39.71dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.77dBm	Pass
C310	8PSK	42.92dBm	Pass
C661	GMSK	43.13dBm	Pass
C001	8PSK	43.24dBm	Pass
C810	GMSK	43.09dBm	Pass
C010	8PSK	43.25dBm	Pass

### 6.3.3.5.2 MEAN RF POWER @ -57VDC

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.37dBm	Pass
C310	8PSK	39.47dBm	Pass
C661	GMSK	39.75dBm	Pass
C001	8PSK	39.85dBm	Pass
C810	GMSK	39.68dBm	Pass
C810	8PSK	39.70dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.75dBm	Pass
C310	8PSK	42.90dBm	Pass
C661	GMSK	43.13dBm	Pass
C001	8PSK	43.23dBm	Pass
C910	GMSK	43.09dBm	Pass
C810	8PSK	42.86dBm	Pass

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# 6.3.3.6 TESTS AT TEMPERATURE +45 °C

# 6.3.3.6.1 MEAN RF POWER @ -40VDC

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.33dBm	Pass
C310	8PSK	39.40dBm	Pass
C661	GMSK	39.72dBm	Pass
C001	8PSK	39.81dBm	Pass
C810	GMSK	39.64dBm	Pass
C810	8PSK	39.68dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.74dBm	Pass
C310	8PSK	42.84dBm	Pass
C661	GMSK	43.13dBm	Pass
C001	8PSK	43.23dBm	Pass
C810	GMSK	43.08dBm	Pass
C010	8PSK	43.19dBm	Pass

### 6.3.3.6.2 **MEAN RF POWER @ -57VDC**

# > H2D configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	39.37dBm	Pass
C310	8PSK	39.41dBm	Pass
C661	GMSK	39.73dBm	Pass
C001	8PSK	39.81dBm	Pass
C810	GMSK	39.66dBm	Pass
C810	8PSK	39.68dBm	Pass

# > Diplexer configuration:

ARFCN	Modulation	Mean Power	Sanction
C510	GMSK	42.74dBm	Pass
C310	8PSK	42.82dBm	Pass
C661	GMSK	43.13dBm	Pass
C001	8PSK	43.24dBm	Pass
C810	GMSK	43.09dBm	Pass
C810	8PSK	43.22dBm	Pass

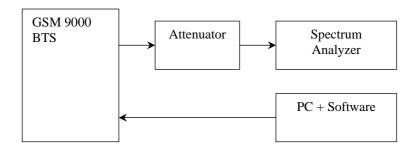
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# 6.4 NAME OF TEST: PHASE AND MEAN FREQUENCY ERROR

### 6.4.1 FCC REQUIREMENTS

The occupied bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

### **6.4.2 TEST PRINCIPLE**



The BTS was configured to transmit at maximum power (static level 0):

- for GMSK modulation, in mode GMSK synchro.

Measurements were carried on frequencies which are C512 (B), C661 (M), & C810 (T).

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### **6.4.3 TEST RESULTS**

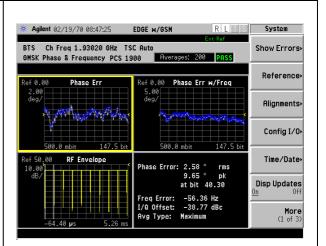
The Table shows the test results of Phase and Mean Frequency for **GMSK** modulation with several coupling configurations:

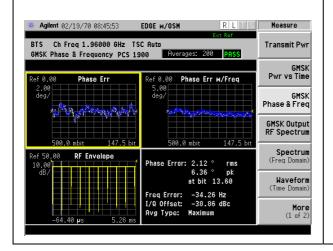
#### 6.4.3.1 TESTS AT TEMPERATURE -5 °C

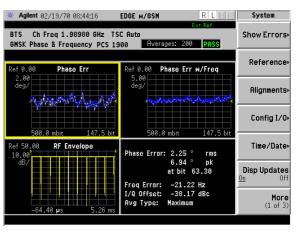
### 6.4.3.1.1 PHASE AND FRENQUENCY ERROR @ -40VDC

#### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase PK	2.58	Pass
В	Phase RMS	9.65	Pass
	Freq. Error	-56.36	Pass
	Phase PK	2.12	Pass
М	Phase RMS	6.36	Pass
	Freq. Error	-34.26	Pass
	Phase PK	2.25	Pass
T	Phase RMS	6.94	Pass
	Freq. Error	-21.22	Pass







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HN	Measure	Average	Sanction	* Agilent 02/19/70 08:36:04	EDGE w/GSM	RLTS	Measure
	Phase RMS	2.47	Pass	BTS Ch Freq 1.93020 GHz		Ext Ref	Transmit P
В	Phase PK	9.53	Pass	GMSK Phase & Frequency PCS	1900 Averages:	200 PHSS	GM
	Freq. Error	-20.39	Pass	Ref 0.00 Phase Err	Ref 0.00 Phase 5.00	Err w/Freq	Pwr vs Ti
	Phase RMS	2.47	Pass	deg/	deg/		GM Phase & Fr
М	Phase PK	9.86	Pass	Y C Y			GMSK Outp RF Spectr
	Freq. Error	-22.45	Pass	500.0 mbit 147.5 b Ref 50.00 <b>RF Envelope</b>	it 500.0 mbit	147.5 bit	Spectr (Freg Dom
	Phase RMS	2.68	Pass	10.00 dB/		i3 ° pk ′	Wavefo
Т	Phase PK	11.31	Pass		Freq Error: -20		(Time Dom
	Freq. Error	-22.48	Pass		I/Q Offset: -39 Avg Type: Maxi	0.01 dBc	, Mo
	Fleq. Elloi	-22.40	Pass	-64,40 µs 5.26 r	IS NY TYPE. HAXI	mum	(1 01
Agilent 02		-22.40		-64.40 µs 5.26 r	EDGE W/GSM	R L TS	(1 o
S Ch F	·	E m/GSM R L	Measure Transmit Pwr		EDGE W/GSM		System
6 Ch F 6K Phase	:/19/70 08:37:37 EDG req 1.96000 6Hz TSC Au & Frequency PCS 1900	E W/GSM R L Ext Ref.	Transmit Pwr	* Agilent 02/19/70 08:38:53  BTS Ch Freq 1.98980 6Hz	EDGE W/GSM	RILTS Ext Ref 200 PASS	System Show Erro
S Ch F SK Phase	1/19/70 08:37:37 EDG req 1.96000 6Hz TSC Au & Frequency PCS 1900  Phase Err Re	E M/GSM R L Ext Ref tto Averages: 200 PAS	Transmit Pwr	* Agilent 02/19/70 08:38:53  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS	EDGE w/GSM TSC Auto 1900 Averages:	RILTS Ext Ref 200 PASS	System Show Erro Referen Alignmer
S Ch F SK Phase	1/19/70 08:37:37 EDG req 1.96000 6Hz TSC Au & Frequency PCS 1900  Phase Err Re	E w/GSM RIL  Ext Per Ito Averages: 200 PAS  6.00 Phase Err w/Fre 5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK	# Agilent 02/19/70 08:38:53  BTS Ch Freq 1.98990 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00	EDGE w/GSM TSC Auto 1900 Averages:  Ref 0.00 Phase 5.00 deg/	RILTS Ext Ref 200 PASS	System Show Erro Referen
0.00 0.00 .00 500.0	2/19/70 08:37:37 EDG req 1.96000 GHz TSC At 8 Frequency PCS 1900  Phase Err  Re ambit 147.5 bit RF Envelope	E W/6SM R Lat Ref.  Riverages: 200 Pas  f 0.00 Phase Err W/Fre 5,00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/19/70 08:38:53  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 590.0 mbit 147.5 b  Ref 50.00 RF Envelope 10.00	EDGE w/GSM TSC Auto 1900 Averages:  Ref 0.00 Phase 5.00 deg/ Phase Error: 2.6	R L S Ext Ref 200 PASS Err W/Freq 147.5 bit	System Show Erro Referen Alignmer
0.00 0.00 0.00 500.6	Phase Err  Phase Err  Re  RE Envelope  Ph	E w/GSM RIL  Ext Ref  Averages: 200 PAS  6 0.00 Phase Err w/Fre  1.00  1	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/19/70 08:38:53  BTS Ch Freq 1.98980 6Hz  6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/	EDGE W/GSM  TSC Auto 1900 Averages:  Ref 0.00 Phase 5.00 deg/  Phase Error: 2.6 11. at b	R L S  Ext Ref  200 PASS  Err W/Freq  147.5 bit  38 ° rms 31 ° pk it 14.30	System Show Error Referen Alignmer

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# 6.4.3.1.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

HN_	Measure	Average	Sanction	* Agilent 02/19/70 10:05:34 EDGE w/GSM R L T S	Measure
	Phase RMS	2.24	Pass	BTS Ch Freq 1.93020 GHz TSC Auto	Transmit P
	Phase PK	6.09	Pass	GMSK Phase & Frequency PCS 1900 Riverages: 200 PASS	GN
	Freq. Error	-16.48	Pass	Ref 0.00	Pwr vs T
	Phase RMS	2.11	Pass	deg/	Phase & F
	Phase PK	5.84	Pass		GMSK Out
	Freq. Error	-16.84	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spect (Freq Do
	Phase RMS	2.10	Pass	10.00 Phase Error: 2.24 ° rms 6.09 ° pk at bit 122.40	Wave
	Phase PK	5.90	Pass	Freq Error: -16.48 Hz  I/O Offset: -38.95 dBc	(Time Do
		45.40	D	Avg Type: Maximum	۱
	Freq. Error	-15.16	Pass	-64.40 µs 5.26 ms	1)
gilent 02	· · · · · · · · · · · · · · · · · · ·	E w/GSM R L			
Ch F	· · · · · · · · · · · · · · · · · · ·	E W/6SM R L	Measure Transmit Pwr	64.40 µs	Measure Transmit
Ch Fi Phase	/19/70 10:06:45 EDG req 1.96000 GHz TSC A & Frequency PCS 1900	E W/GSM R L  Ext Ref uto  Averages: 200 PRS	Measure Transmit Pwr	# Agilent 02/19/70 10:07:56 EDGE m/GSM RIL S  BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	Measure Transmit
Ch Fi Phase	/19/70 10:06:45 ED6 req 1.96000 6Hz TSC A & Frequency PCS 1900 Phase Err Re	E W/6SM R L Ext Ref	Measure Transmit Pwr	# Agilent 02/19/70 10:07:56 EDGE w/GSM RLLTS BTS Ch Freq 1.98980 GHz TSC Auto	Transmit  G Pwr vs
Ch Fi Phase	/19/70 10:06:45 EDG req 1.96000 6Hz TSC A & Frequency PCS 1900 Phase Err	E W/GSM R L Ext Ref uto Averages: 200 PAS:  f 0.00 Phase Err W/Frec 5.00 deg/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilant 02/19/70 10:07:56 EDGE w/GSM R L S  BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PRSS  Ref 0.00 Phase Err	Measure
Ch Fr Phase	/19/70 10:06:45 ED6 req 1.96000 GHz TSC A & Frequency PCS 1900  Phase Err  whit 147.5 bit  RF Envelope	Averages: 200 PAS:  Fig. 00 Phase Err w/Fred  500.0 mbit 147.  The same Error: 2.11 ° rms	Measure Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	# Agilent 02/19/70 10:07:56 EDGE w/6SM R L S  BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err 2.00 deg/  Geg/  Ref 50.00 RF Envelope Phase Error: 2.10 ° rms	Measur Transmit Pwr vs Phase & F
Ch Fi Phase	/19/70 10:06:45 EDG req 1.96000 6Hz TSC A & Frequency PCS 1900  Phase Err  whit 147.5 bit  RF Envelope  PF	E w/6SM R L  Ext Ref  uto Averages: 200 PAS:  f 0.00 Phase Err w/Frec  deg/ 500.0 mbit 147.	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	# Agilent 02/19/70 10:07:56 EDGE w/GSM  BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/  S00.0 mbit 147.5 bit  Ref 50.00 RF Envelope	Measurd Transmit  Pwr vs  Phase & F  GMSK Ou RF Spec  Spec

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1	Measure	Average	Sanction	<b>★ Agilent</b> 02/19/70 08:29:33 <b>EDGE w/GSM</b> R L T S	Measure
	Phase RMS	2.49	Pass	BTS Ch Freq 1.93020 GHz TSC Auto	Transmit
	Phase PK	10.99	Pass	OMSK Phase & Frequency PCS 1900 Averages: 200 PASS	
	Freq. Error	31.37	Pass	Ref 0.00	Pwr vs
F	Phase RMS	2.52	Pass	deg/	Phase &
P	hase PK	10.36	Pass		GMSK 0 RF Spe
F	req. Error	40.19	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spe
F	Phase RMS	2.75	Pass	10.00 Phase Error: 2.49 ° rms dB/ 10.99 ° pk	(Freq D
	Phase PK	9.17	Pass	at bit 12.30 Freq Error: 31.37 Hz	Wav (Time [
ŀ	Freq. Error	30.43	Pass	1/Q Offset: -38.50 dBc Avg Type: Maximum	(3
Ch F	/19/70 08:25:14 ED6 req 1.96000 GHz TSC A: & Frequency PCS 1900	Ext Refuto Averages: 200 PAS	Transmit Pwr	# Agilent 02/19/70 08:27:14 EDGE w/GSM R L	Measu Transmi
Ch F	req 1.96000 GHz TSC A & Frequency PCS 1900	Ext Ref	Transmit Pwr	BTS Ch Freq 1.98980 GHz TSC Auto	Transm
Ch Fi hase	req 1.96000 GHz TSC A & Frequency PCS 1900 Phase Err Re	uto Averages: 200 PAS	Transmit Pwr	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	
n Fr	req 1.96000 GHz TSC A: & Frequency PCS 1900	Averages: 200 PAS  f 0.00 Phase Err w/Fre- 5.00 deg/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PRSS  Ref 0.00 Phase Err 2.00 deg/	Transm Pwr v
th Francisco	Phase Err  Phase Err  This is a second of the second of th	Averages: 200 PAS  of 0.00 Phase Err W/Fres 5.00 deg/ 500.0 mbit 147.	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900  Ref 0.00	Pwr v Phase 8
Ch Fi	Phase Err  Phase Err  The phase Frequency PCS 1900  Phase Err  Representation of the phase Frequency PCS 1900  Phase Err  Representation of the phase Frequency PCS 1900  Repr	Averages: 200 PAS  of 0.00 Phase Err w/Fred  deg/  5.00 deg/  5.00 mbit 147.	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	BTS Ch Freq 1.98980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/ deg/ S00.0 mbit 147.5 bit Ref 50.00 RF Envelope	Pwr v Phase GMSK RF Sp

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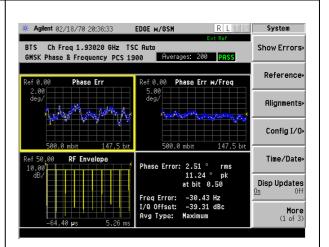
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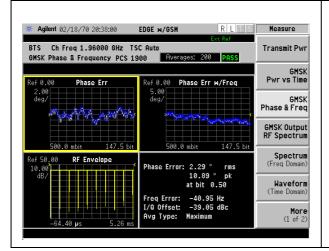
### 6.4.3.2 TESTS AT TEMPERATURE +5 °C

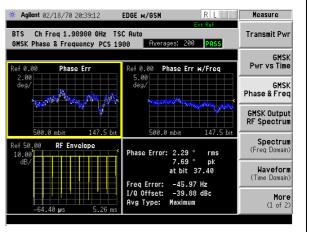
### 6.4.3.2.1 PHASE AND FRENQUENCY ERROR @ -40VDC

### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	2.51	Pass
В	Phase PK	11.24	Pass
	Freq. Error	-30.43	Pass
	Phase RMS	2.29	Pass
M	Phase PK	10.89	Pass
	Freq. Error	-40.95	Pass
	Phase RMS	2.29	Pass
Т	Phase PK	7.69	Pass
	Freq. Error	-45.97	Pass







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CHN	Measure	Average	Sanction	* Agilent 02/18/70 20:43:12	EDGE w/GSM R L	T S Measu
	Phase RMS	2.82	Pass	BTS Ch Freq 1.93020 GHz		Transmi
В	Phase PK	11.99	Pass	GMSK Phase & Frequency PCS	1900 Averages: 200 PAS	
	Freq. Error	-46.52	Pass	Ref 0.00	Ref 0.00 Phase Err w/Fre	q Pwr vs
	Phase RMS	2.76	Pass	deg/	ueg/	Phase &
M	Phase PK	10.95	Pass			GMSK 0 RF Spe
	Freq. Error	-44.15	Pass	500.0 mbit 147.5 k Ref 50,00 <b>RF Envelope</b>		.5 bit Sper
	Phase RMS	2.74	Pass	10.00 dB/	Phase Error: 2.82° rms 11.99° pk at bit 12.30	Wave
Т	Phase PK	10.46	Pass		Freq Error: -46.52 Hz	(Time D
	Freq. Error	-46.80	Pass	-64.40 µs 5.26 r	I/O Offset: -40.01 dBc Avg Type: Maximum	(1
Agilent 02	/18/70 20:44:36 <b>EDG</b>	E w/GSM R L	TS System	業 <b>Agilent</b> 02/18/70 20:46:10	EDGE M/GSM R L	TS Measu
S Ch F	req 1.96000 GHz TSC A	Ext Ref uto	Show Errors	* Agilent 02/18/70 20:46:10  BTS Ch Freq 1.98980 6Hz	EDGE W/GSM R L  Ext Ref TSC Auto	Transmi
S Ch F		Ext Ref	Show Errors	# Agilent 02/18/70 20:46:10	EDGE W/GSM R L  Ext Ref TSC Auto	Transmi
S Ch F	req 1.96000 GHz TSC Ai	Averages: 200 PAS  f 0.00 Phase Err w/Fre	Show Errors	# Agilent 02/18/70 20:46:10  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00	EDGE w/GSM R L  Ext Ref TSC Auto 1900 Averages: 200 PRS  Ref 0.00 Phase Err w/Fre- 5.00	Transmi
S Ch F ISK Phase	req 1.96000 GHz TSC Ai	Averages: 200 PAS  f 0.00 Phase Err w/Fre	Show Errors	# Agilent 02/18/70 20:46:10  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err	EDGE W/GSM RL Ext Ref TSC Auto 1900 Averages: 200 PRS  Ref 0.00 Phase Err W/Fre	Transmi
S Ch F SK Phase	req 1.96000 GHz TSC A: & Frequency PCS 1900 Phase Err	Averages: 200 pag  f 0.00 Phase Err w/Fre 5.00 deg/	Show Errors  Reference  Alignments  Config I/O	# Agilent 02/18/70 20:46:10  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/	EDGE W/GSM R L Ext Ref TSC Auto 1900 Averages: 200 PAS  Ref 0.00 Phase Err W/Fre- 5.00 deg/	Pwr vs Phase & GMSK 0 RF Spei
S Ch F   SK Phase   0.00   2.00   1.0	Phase Err  Phase Err  Phase Frequency PCS 1900  Phase Err  Re  PRE Envelope	Averages: 200 pag  f 0.00 Phase Err w/Fre 5.00 deg/	Show Errors  Reference  Alignments  Config I/O  Time/Date	# Agilent 02/18/70 20:46:10  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.00 mbit 147.5 t  Ref 50.00 RF Envelope	EDGE W/GSM R L Ext Ref TSC Auto 1900 Averages: 200 PAS  Ref 0.00 Phase Err w/Fre- 5.00 deg/	Phase & GMSK 0 RF Spei
S Ch F SK Phase	Phase Err  Phase Err  Reference Are the second of the seco	Averages: 200 PAS  f 0.00 Phase Err w/Fre 5.00 deg/ 500.0 mbit 147	Show Errors  Reference  Alignments  Config I/0  I ime/Date	# Agilent 02/18/70 20:46:10  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/	EDGE w/GSM R L  Ext Ref  TSC Auto 1900 Averages: 200 PRS  Ref 0.00 Phase Err w/Fre 5.00 deg/	Phase & GMSK 0 RF Spei

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# 6.4.3.2.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

IN	Measure	Average	Sanction	<b> ★ Agilent</b> 02/18/70 20:34:49 <b>EDGE w/GSM</b> R L T S	
	Phase RMS	2.66	Pass	BTS Ch Freq 1.93020 GHz TSC Auto	
В	Phase PK	12.10	Pass	GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	r
	Freq. Error	18.28	Pass	Ref 0.00	
	Phase RMS	2.22	Pass	deg/	F
М	Phase PK	9.72	Pass		
	Freq. Error	-22.30	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit  Ref 50.00 RF Envelope	
	Phase RMS	2.12	Pass	10.00 Phase Error: 2.66 ° rms dB/ 12.10 ° pk	H
Т	Phase PK	9.43	Pass	at bit 40.30 Freq Error: 18.28 Hz	
	Freq. Error	-19.00	Pass	I/Q Offset: -39.88 dBc Avg Type: Maximum	
				-	
<b>Agilent</b> 02	/18/70 20:33:40 <b>EDG</b>	E w/GSM R L	T S  Measure	<b>※ Agilent</b> 02/18/70 20:32:29	
Ch Fi	/18/70 20:33:40 EDG req 1.96000 6Hz TSC A: & Frequency PCS 1900	Ext Ref	Transmit Pwr		S
Ch Fi K Phase	req 1.96000 GHz TSC Ac & Frequency PCS 1900	Ext Ref uto Averages: 200 PAS	Transmit Pwr	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	s
Ch Fi	req 1.96000 GHz TSC Au & Frequency PCS 1900 Phase Err	Ext Ref	Transmit Pwr	BTS Ch Freq 1.98980 GHz TSC Auto	S
Ch Fi K Phase	Phase Err	Averages: 200 Pas  Reverages: 200 Pas  6 0.00 Phase Err #/Fre 5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	BTS Ch Freq 1.99980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/	s
Ch Fi K Phase 0.00 00 500.0	Phase Err  This is a second of the second of	Rverages: 200 PAS  f 0.00 Phase Err w/Fre 5.00 deg/ 500.0 mbit 147 ase Error: 2.22 ° rm:	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	BTS Ch Freq 1.99980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5 bit  Ref 50.00 RF Envelope 10.00 Phase Err x - Freq 5.00 mbit 147.5 bit  Phase Error: 2.12 ° rms	s
Ch F K Phase 0.00 00 99 500.0	Phase Err Re  The phase Err Re	Averages: 200 pas  f 0.00 Phase Err w/Fre 5.00 deg/ 500.0 mbit 147 asse Error: 2.22 ° rm 9.72 ° pk at bit 0.50	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	BTS Ch Freq 1.99980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/  500.0 mbit 147.5 bit  Ref 50.00 RF Envelope 10.00  BY Phase Err 2.12 ° rms 9.43 ° pk at bit 0.50	D On
Ch Fi K Phase 0.00 00 500.0	Phase Err  Phase Err  Re  Re  Re  Re  Re  Re  Re  Re  Re	Averages: 200 pas  f 0.00 Phase Err w/Fre 5.00 deg/ 5.00.0 mbit 147  ase Error: 2.22 ° rm: 9.72 ° pk	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain) Haveform	BTS Ch Freq 1.99980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/  S00.0 mbit 147.5 bit  Ref 50.00 RF Envelope 10.00 Phase Err 2.12 ° rms 9.43 ° pk	

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CHN	Measure	Average	Sanction	<b>※ Agilent</b> 02/18/70 20:51:15	Measur
	Phase RMS	3.30	Pass	BTS Ch Freq 1.93020 GHz TSC Auto	Transmit
В	Phase PK	13.15	Pass	6MSK Phase & Frequency PCS 1900 Averages: 200 PASS	
	Freq. Error	-35.12	Pass	Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq 2.00 dea/ dea/	Pwr vs
	Phase RMS	2.74	Pass	deg/	Phase &
M	Phase PK	11.85	Pass		GMSK Ou RF Spec
	Freq. Error	-40.38	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spec (Freg Do
	Phase RMS	2.54	Pass	10.00 Phase Error: 3.30 ° rms 13.15 ° pk at bit 37.10	Wave
Т	Phase PK	9.95	Pass	Freq Error: -35.12 Hz	(Time Do
	Freq. Error	-40.34	Pass	I/O Offset: -38.95 dBc Avg Type: Maximum -64.40 µs 5.26 ms	(1
Agilent 02	2/18/70 20:48:40 <b>EDG</b> I	Ew/GSM R L	T S Measure	* Agilent 02/18/70 20:47:32 EDGE W/GSM R L	Measur
TS Ch F	2/18/70 20:48:40 EDGI req 1.96000 6Hz TSC Au 9 & Frequency PCS 1900	Ext Ref	Transmit Pwr		Measur Transmit
TS ChF MSK Phase	req 1.96000 GHz TSC Au a & Frequency PCS 1900	Ext Ref	Transmit Pwr	* Agilent 02/18/70 20:47:32 ED6E м/6SM R L	Transmit
TS Ch F MSK Phase of 0.00 2.00	req 1.96000 GHz TSC Au a & Frequency PCS 1900  Phase Err Ref	Ext Ref Ito Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 20:47:32 ED6E w/6SM R L	
TS Ch F MSK Phase of 0.00 2.00 deg/	Phase Err	Averages: 200 PAS  6 0.80 Phase Err #/Fre 5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 20:47:32 ED6E w/6SM R L ST SC Auto GMSK Phase & Frequency PCS 1900 Reverges: 200 PASS  Ref 0.00 Phase Err	Transmit  O  Pwr vs  O  Phase & I  GMSK Ou
f 0.00 2.00 deg/ 500.00	Phase Err  Phase Err  Ref  mbit 147.5 bit  RF Envelope	Averages: 200 PAS  ###	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  Spectrum	# Agilent 02/18/70 20:47:32 ED6E w/6SM R L ST SC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err	Transmit Pwr vs
TS Ch F MSK Phase of 0.00 2.00 deg/	Phase Err  O mbit 147.5 bit  RF Envolope  Phi	Averages: 200 PAS  6.00 Phase Err w/Fre- 5.00  6.00 Mbit 147.	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  Spectrum	# Agilent 02/18/70 20:47:32 EDGE w/GSM R L Sex Ref  BTS Ch Freq 1.98990 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err W/Freq 2.00 deg/ deg/ 500.0 mbit 147.5 bit  Ref 50.00 RF Envelope	Transmit  Pwr vs  C  Phase & F  GMSK Ou  RF Spec  Spec

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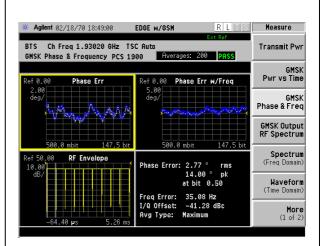
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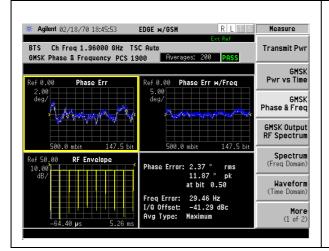
### 6.4.3.3 TESTS AT TEMPERATURE +15 °C

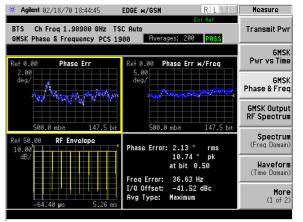
### 6.4.3.3.1 PHASE AND FRENQUENCY ERROR @ -40VDC

### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	2.77	Pass
В	Phase PK	14.00	Pass
	Freq. Error	35.08	Pass
	Phase RMS	2.37	Pass
М	Phase PK	11.87	Pass
	Freq. Error	29.46	Pass
	Phase RMS	2.13	Pass
Т	Phase PK	10.74	Pass
	Freq. Error	36.63	Pass







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HN	Measure	Average	Sanction	<b>※ Agilent</b> 02/18/70 18:36:28 <b>EDGE w/GSM</b> R L □	S Measure
	Phase RMS	2.99	Pass	BTS Ch Freq 1.93020 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	Transmit P
В	Phase PK	13.39	Pass		GM Burr vo Ti
	Freq. Error	33.27	Pass	Ref 0.00	Pwr vs Ti
	Phase RMS	3.02	Pass	Maring part and	Phase & Fr
M	Phase PK	11.74	Pass		GMSK Outp RF Spectr
	Freq. Error	33.62	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 b Ref 50.00 <b>RF Envelope</b>	Spectr (Freq Doma
	Phase RMS	2.73	Pass	10.00 Phase Error: 2.99 ° rms dB/ 13.39 ° pk	Wavefo
т	Phase PK	10.19	Pass	at bit 38.10 Freg Error: 33.27 Hz	(Time Dom
	Freq. Error	37.78	Pass	I/O Offset: -37.16 dBc Avg Type: Maximum	Mc (1 of
	· · · · · · · · · · · · · · · · · · ·			-64.40 µs 5.26 ms	
Agilent 02	:/18/70 18:37:55 <b>EDG</b>	E w/6SM R L	Measure Measure	—64.40 µs 5.26 ms ——54.40 µs 5.26 ms ————————————————————————————————————	S Measure
'S Ch F	7/18/70 18:37:55 ED6	Ext Ref	Transmit Pwr		
S Ch F ISK Phase	req 1.96000 GHz TSC A	Ext Ref	Transmit Pwr	# Agilent 02/18/70 18:39:05 EDGE w/GSM R L  Ext. Ref  BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq	S   Measure
S Ch F SK Phase	req 1.96000 GHz TSC A	Ext Ref uto Averages: 200 PAS	Transmit Pwr	# Agilient 02/18/70 18:39:05 EDGE w/GSM R L    Ext Ref  BTS Ch Freq 1.98980 GHz TSC Auto  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	Measure Transmit P
S Ch F ISK Phase f 0.00 2.00	req 1.96000 GHz TSC A	Averages: 200 Pas  f 0.00 Phase Err w/Fre 5.00 deg/	Transmit Pwr  GMSK Pwr vs Time  GMSK	# Agilent 02/18/70 18:39:05 EDGE w/GSM R L  Ext Ref  BTS Ch Freq 1.98980 GHz TSC Auto  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq  2.00 5.00	Transmit P  GM Pwr vs T  GM Phase & Fr  GMSK Out, RF Spectr
S Ch F SK Phase 0.00 .00 eg/	Phase Err Phase Err Phase Frequency PCS 1900  Phase Frr Re Phase Frr Re RF Envelope	Averages: 200 PAS  From Phase Err W/Fre  5.00 Phase Err W/Fre  5.00 Mbit 147  asse Error: 3.02 ° rms	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/18/70 18:39:05 ED6E w/6SM R L  BTS Ch Freq 1.98980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err 5.00 deg/	Transmit P  GM Pwr vs Ti  GM Phase & Fr  GMSK Outp
S Ch F SK Phase 0.00 2.00	Phase Err  Phase Err  a mbit 147.5 bit  RF Envelope	Averages: 200 PAS  f 0.00 Phase Err w/Fre 5.00 deg/ 500.0 mbit 147	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/18/70 18:39:05 EDGE w/GSM R L   Ext Ref  BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err	Measure Transmit F Pwr vs T  GH Phase & FI  GMSK Out RF Specti

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# 6.4.3.3.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

	Measure	Average	Sanction	<b>※ Agilent</b> 02/18/70 18:50:49 <b>EDGE w/GSM</b> R L T S
	Phase RMS	2.84	Pass	BTS Ch Freq 1.93020 GHz TSC Auto
	Phase PK	12.29	Pass	OMSK Phase & Frequency PCS 1900 Averages: 200 PASS
ľ	Freq. Error	29.23	Pass	Ref 0.00
	Phase RMS	2.53	Pass	deg/
-	Phase PK	12.07	Pass	
	Freq. Error	35.28	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit  Ref 50.00 RF Envelope
	Phase RMS	2.18	Pass	10.00 Phase Error: 2.84 ° rms dB/ 12.29 ° pk
	Phase PK	10.21	Pass	at bit 39.90 Freq Error: 29.23 Hz
	Freq. Error	28.08	Pass	I/O Offset: -41.27 dBc Avg Type: Maximum  -64.40 µs 5.26 ms
t 02/	18/70 18:51:56 <b>EC</b>	OGE W/GSM R L	S   Measure	<b>※ Agilent</b> 02/18/70 18:53:18 <b>EDGE w/GSM</b> R L T S
	eq 1.96000 GHz TSC & Frequency PCS 1906		Transmit Pwr	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS
		Ref 0.00 Phase Err w/Freq	GMSK Pwr vs Time	
	Pilase Eff	5.00 Phase cir W/Freq deg/	GMSK Phase & Freq	Ref 0.00   Phase Err   Ref 0.00   Phase Err w/Frcq
N/			GMSK Output RF Spectrum	
	mbit 147.5 bit	500.0 mbit 147.5	Spectrum	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 RF Envelope
	RF Envelope			
00.0 r		Phase Error: 2.53° rms 12.07° pk at bit 0.50	(Freq Domain)	10.00

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## Phase PK   11.24   Pass	Measure	EDGE W/GSM R L T S	* Agilent 02/18/70 18:34:48	Sanction	Average	Measure	HN
## Phase PK	Transmit P	C Auto	-	Pass	2.92	Phase RMS	
Phase RMS	GM	00 Hverages: 200 PASS	GMSK Phase & Frequency PCS	Pass	11.24	Phase PK	В
Phase RMS	Pwr vs T	5.00	2.00	Pass	40.53	Freq. Error	
Freq. Error 31.50 Pass  Phase RMS 2.66 Pass  Phase PK 9.49 Pass  Freq. Error 35.84 Pass  GMSK Phase & Frequency PCS 1900 Phase Err W/Freq GMSK Phase & Frequency PCS 1900 Phase Err W/Freq GMSK Dutput RF Spectrum (Freq Donain) S00.0 mblt 147.5 bit Spectrum (Freq Donain) 10.31 ° pk at bit 37.5 bit Spectrum (Freq Donain) 10.31 ° pk at bit 37.5 bit Spectrum (Freq Donain) 10.31 ° pk at bit 37.5 bit Spectrum (Freq Donain) Haveform  Freq. Error 31.50 Pass Frequency PCS 1900 Phase Err W/Freq Onain) 10.31 ° pk at bit 37.5 bit Spectrum (Freq Donain) Haveform  Freq. Error 31.50 Pass Frequency PCS 1900 Phase Err W/Freq Onain) 10.31 ° pk at bit 37.5 bit Spectrum (Freq Donain) Haveform  Freq. Error 31.50 Pass Error 2.92 ° rms 147.5 bit	Phase & Fr	No.	uegr Ann Aug Ann	Pass	2.55	Phase RMS	
Phase RMS 2.66 Pass  Phase PK 9.49 Pass  Freq. Error 35.84 Pass  Freq. Error 35.84 Pass    Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Phase PK   9.49   Pass   Pass   Pass   Phase PK   9.49   Pass   Pass   Pass   Phase PK   9.49   Pass   P	GMSK Out			Pass	10.31	Phase PK	М
Phase RMS 2.66 Pass Phase PK 9.49 Pass Freq. Error 35.84 Pass  Freq. Error 35.84 Pass    10,807	Spectr	500.0 mbit 147.5 bit		Pass	31.50	Freq. Error	
Phase PK 9.49 Pass  Freq. Error 35.84 Pass  Agilent 02/18/70 18:33:40 EDGE w/6SM R L S Measure  Ext Ref Ch Freq 1.96000 6Hz TSC Auto K Phase & Frequency PCS 1900 Averages: 200 Pass  GMSK Phase & Frequency PCS 1900 Averages: 200 Pass  GMSK Phase & Frequency PCS 1900 Averages: 200 Pass  GMSK Phase & Frequency PCS 1900 Averages: 200 Pass  GMSK Phase & Frequency PCS 1900 Averages: 200 Pass  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.53 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.55 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.55 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.55 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.55 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.55 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.55 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.50 Hz I/0 0ffset: -39.51 dBc Ryg Type: Maximum  Freq Error: 40.50	(Freq Dom	11.24 ° pk	10.00	Pass	2.66	Phase RMS	
Freq. Error 35.84 Pass  Agilent 02/18/70 18:33:40 EDGE W/6SM R L S Measure  Ext Ref Ch Freq 1.96000 6Hz TSC Auto K Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Pwr vs Time S.00 Phase Err GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Output RF Spectrum (Freq Domain) Sould but 147.5 bit So	Wavefo (Time Dom	Freq Error: 40.53 Hz		Pass	9.49	Phase PK	Т
Agilent 02/18/70 18:33:40 EDGE w/6SM R L Set Ref S Ch Freq 1.96000 6Hz TSC Auto SK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Pwr vs Time  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Pwr vs Time  GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  GMSK Pha	(1 o			<b>D</b>	05.04		
S Ch Freq 1.98080 6Hz TSC Auto SK Phase & Frequency PCS 1900  Ref 8.00 Phase Err W/Freq Sould mbit 147.5 bit  Sould mbit 147.5 bit  Spectrum  Spectrum  Spectrum  Spectrum  Freq Domain  10.31 pk at bit 37.50  Haveform  Transmit Pwr  Transmit Pwr  BTS Ch Freq 1.98980 6Hz TSC Auto GMSK Phase & Frequency PCS 1900  Ref 9.00 Phase Err Sould mbit 147.5 bit Spectrum  Ref 9.00 Phase Err Sould mbit 147.5 bit Spectrum  (Freq Domain)  Haveform  Transmit Pwr  BTS Ch Freq 1.98980 6Hz TSC Auto GMSK Phase & Frequency PCS 1900  Ref 9.00 Phase Err Sould mbit 147.5 bit Spectrum  (Freq Domain)  Haveform			-64.40 µs 5.26 m	Pass	35.84	Freq. Error	
Comparison of	Measure				w/6SM R.L.	<u> </u>	Agilent 02.
1.00		Ext Ref	** Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 6Hz	Transmit Pwr	m/GSM R L Ext Rof	/18/70 18:33:40 EDG	S Ch Fr
GMSK Output RF Spectrum  500.00 mbit 147.5 bit 500.00 mbit 147.5 bit  500.00 RF Envelope 00 Phase Error: 2.55 ° rms 10.31 ° pk at bit 37.50  Haveform  Ref 50.00 RF Envelope 10.00 Phase Error: 2.66 ° rms 9.49 ° pk at bit 37.50	Transmit P	C Auto OO Averages: 200 PASS	** Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 GHz GMSK Phase & Frequency PCS	Transmit Pwr	w/9SM R L Ext Ref to Averages: 200 PASS	/18/70 18:33:40 EDG req 1.96000 GHz TSC Au & Frequency PCS 1900	6 Ch Fr 6K Phase
RF Spectrum  500.0 mbit 147.5 bit 500.0 mbit 147.5	Transmit P GM Pwr vs T	C Auto	# Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 GHz  GMSK Phase & Frequency PCS  Ref 0.00 Phase Err  2.00	Transmit Pwr  GMSK Pwr vs Time	w/GSM R L  Ext Ref to  Averages: 200 PRSS  0.00 Phase Err w/Freq	/18/70 18:33:40 EDG req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err Re	Ch Fr K Phase
50,00 RF Envelope 00 Phase Error: 2.55 ° rms 10.31 ° pk	Transmit P GM Pwr vs T	C Auto	# Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 GHz  GMSK Phase & Frequency PCS  Ref 0.00 Phase Err  2.00	Transmit Pwr  GMSK Pwr vs Time  GMSK	w/GSM R L  Ext Ref to  Averages: 200 PRSS  0.00 Phase Err w/Freq	/18/70 18:33:40 EDG req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err Re	Ch Fr K Phase
10.31 ° pk	Transmit F  GM Pwr vs T  GM Phase & Fr	C Auto	# Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 GHz  GMSK Phase & Frequency PCS  Ref 0.00 Phase Err  2.00 deg/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	W/GSM R L Ext Ref to Averages: 200 PASS  0.00 Phase Err W/Freq 00 09/	/18/70 18:33:40 ED6 req 1.96000 6Hz TSC At 8 Frequency PCS 1900  Phase Err	S Ch Fr SK Phase 0.00 .00 eg/
	Transmit F  GM  Pwr vs T  GM  GMSK Out  RF Specti	C Auto  Averages: 200 PASS  Ref 0.00 Phase Err W/Freq  5.00  deg/  500.0 mbit 147.5 bit	# Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5 bi  Ref 50,00 RF Envelope	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	R L  Ext Ref to Averages: 200 PRSS  0.00 Phase Err w/Freq .00 .00 Phase Err w/Freq	/18/70 18:33:40 EDG req 1.96000 GHz TSC At & Frequency PCS 1900  Phase Err Re of the p	Ch Fr K Phase 0.00 00 9/ 500.0
Freq Error: 31.50 Hz I/0 Offset: -38.52 dBc More	Transmit P	C Auto 00	# Agilent 02/18/70 18:32:33  BTS Ch Freq 1.98980 GHz GMSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5 bi  Ref 50.00 RF Envelope 10.00	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain)  Haveform	#/6SM R L   Ext Ref to Averages: 200 PASS  0.00 Phase Err #/Freq .00 .00 Phase Err #/Freq .00 .00 Phase Err #/Freq .00 .00 Phase Err #/Freq	/18/70 18:33:40 EDG req 1.96000 GHz TSC At & Frequency PCS 1900  Phase Err Re of the p	0.00 0.00 99/

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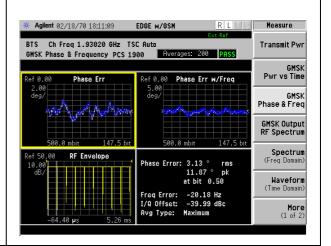
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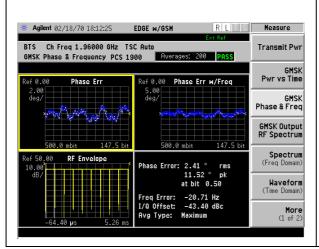
### 6.4.3.4 TESTS AT TEMPERATURE +25 °C

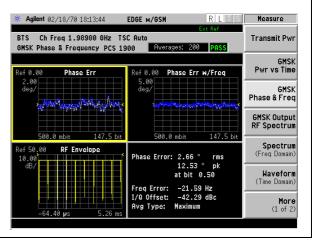
### 6.4.3.4.1 PHASE AND FRENQUENCY ERROR @ -40VDC

### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	3.13	Pass
В	Phase PK	11.87	Pass
	Freq. Error	-20.18	Pass
	Phase RMS	2.41	Pass
M	Phase PK	11.52	Pass
	Freq. Error	-20.71	Pass
	Phase RMS	2.66	Pass
Т	Phase PK	12.53	Pass
	Freq. Error	-21.59	Pass







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R L T S Measure

GMSK Output RF Spectrum

Spectrum (Freq Domain)

Waveform (Time Domain)

Transmit Pwr

GMSK Phase & Freq

Waveform (Time Domain)

Freq Error: 21.77 Hz I/O Offset: -40.40 dBc Avg Type: Maximum

R L T S Measure

w/Freq

# Diplexer configuration:

Freq Error: I/Q Offset: Avg Type:

-19.19 Hz -38.67 dBc Maximum

IN	Measure	Average	Sanction	<b>★ Agilent</b> 02/18/70 18:21:37 <b>EDGE w/GSM</b>
	Phase RMS	2.10	Pass	BTS Ch Freq 1.93020 GHz TSC Auto
3	Phase PK	7.53	Pass	GMSK Phase & Frequency PCS 1900 Average
	Freq. Error	21.66	Pass	Ref 0.00 Phase Err Ref 0.00 Phi
	Phase RMS	2.71	Pass	deg/
М	Phase PK	8.72	Pass	
	Freq. Error	-19.19	Pass	500.0 mbit 147.5 bit 500.0 m Ref 50,00 <b>RF Envelope</b>
	Phase RMS	2.39	Pass	10.00 Phase Error:
Т	Phase PK	7.89	Pass	Freq Error:
	Freq. Error	21.77	Pass	I/Q Offset:   Avg Type:    -64.40 µs   5.26 ms
	/18/70 18:20:34 EDG	E w/GSM R L	T S Measure	# Agilent 02/18/70 18:19:22 EDGE w/GSM
		to	Transmit Dur	
MSK Phase	& Frequency PCS 1900	Averages: 200 PASS	GMSK	
	Phase Err Re		GMSK	GMSK Phase & Frequency PCS 1900 Averag
MSK Phase of 0.00 2.00	Phase Err	Averages: 200 PASS  f 0.00 Phase Err w/Freq	GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	GMSK Phase & Frequency PCS 1900   Average
f 0.00 2.00 deg/	Phase Err  Phase Err  Phase Err  Re  Mbit 147.5 bit  RF Envelope	Averages: 200 PASS  f 0.00 Phase Err w/Freq 1.00 1.00 1.00	GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	Ref 0.00

Waveform (Time Domain)

More (1 of 2)

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# 6.4.3.4.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

Phase RMS			
i ilase itivio	2.89	Pass	# Agilent 02/18/70 18:09:33
Phase PK	12.51	Pass	GMSK Phase & Frequency PCS 1900 Averages: 200 PASS
Freq. Error	-16.70	Pass	Ref 0.00
Phase RMS	2.37	Pass	deg/
Phase PK	11.03	Pass	
Freq. Error	-17.70	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>
Phase RMS	2.39	Pass	10.00 Phase Error: 2.89 ° rms dB/ 12.51 ° pk
Phase PK	12.62	Pass	at bit 41.10 Freq Error: -16.70 Hz
Freq. Error	15.87	Pass	1/0 Offset: -41.43 dBc Avg Type: Haximum 5.26 ms
18/70 18:08:10 <b>EDG</b>	E w/GSM R L	T   S   Measure	# Agilent 02/18/70 18:06:32 EDGE w/GSM R L T S
eq 1.96000 GHz TSC Au & Frequency PCS 1900		Transmit Pwr	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PRSS
Phase Frr Re	f 0 00 Phase Frr w/Fre	GMSK Pwr vs Time	Ref 0.00 Phase Err Ref 0.00 Phase Err w/Freq
	5.00	GMSK Phase & Freq	2.00 deg/
mbit 147.5 bit	500.0 mbit 147.	GMSK Output RF Spectrum 5 bit	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit
RF Envelope Ph		Spectrum (Freq Domain)	Ref 50,00 RF Envelope 10.00 Phase Error: 2.39 ° rms
	11.83° pk at bit 0.50 eq Error: -17.70 Hz	Waveform (Time Domain)	dB/ 12.62° pk at bit 0.50
			Freq Error: 15.87 Hz
	Freq. Error Phase RMS Phase PK Freq. Error Phase RMS Phase PK Freq. Error  18/70 18:08:10 EDG aq 1.96000 6Hz TSC A a Frequency PCS 1900  Phase Err RF Envelope	Freq. Error -16.70  Phase RMS 2.37  Phase PK 11.03  Freq. Error -17.70  Phase RMS 2.39  Phase PK 12.62  Freq. Error 15.87  Phase PK 12.62  Freq. Error Phase Error 15.87  Phase Error Phase Err W/Fred Solution Phase Error Phase Error 11.83 ° pk	Freq. Error -16.70 Pass  Phase RMS 2.37 Pass  Phase PK 11.03 Pass  Freq. Error -17.70 Pass  Phase RMS 2.39 Pass  Phase PK 12.62 Pass  Freq. Error 15.87 Pass  Freq. Error 15.87 Pass  Phase Error 15.87 Pass  Phase Err N/Freq GMSK Pwr vs Time  Frequency PCS 1900 Phase Err N/Freq GMSK Pwr vs Time  GMSK Phase & Frequency PCS 1900 GMSK Phase & Freq Dmain)

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CHN	Measure	Average	Sanction	* Agilent 02/18/70 18:23:00	EDGE w/GSM	R L T S Measur
	Phase RMS	2.40	Pass	BTS Ch Freq 1.93020 GHz	TSC Auto	Ext Ref Transmit
В	Phase PK	8.29	Pass	GMSK Phase & Frequency PCS	1900 Averages: 200	
	Freq. Error	21.52	Pass	Ref 0.00 Phase Err 2.00 deg/	Ref 0.00 Phase Err 5.00 deg/	W/Freq Pwr vs
	Phase RMS	2.37	Pass	10097 100 100 100 100 100 100 100 100 100 10	A CONTRACTOR	Phase &
M	Phase PK	6.32	Pass			GMSK Ou RF Spec
	Freq. Error	20.50	Pass	500.0 mbit 147.5 k Ref 50.00 <b>RF Envelope</b>	30070 111111	147.5 bit Spec
	Phase RMS	2.34	Pass	10.00 dB/	Phase Error: 2.40 9 8.29 9 at bit	pk
Т	Phase PK	8.20	Pass		Freq Error: 21.52	Hz (Time Do
	Freq. Error	20.48	Pass	-64.40 µs 5.26 r	I/Q Offset: -40.3 Avg Type: Maximum	
	·			-04,40 <b>p</b> S 3,20 l	ns e	
Agilent 02	:/18/70 18:24:32 <b>EDGE</b>	E W/GSM R L	T   S   Measure	# <b>Agilent</b> 02/18/70 18:26:02	EDGE W/GSM	R L T S Measur
TS Ch F	:/18/70 18:24:32 EDGE req 1.96000 GHz TSC Aut & Frequency PCS 1900	Ext Ref	Transmit Pwr		EDGE W/GSM	Ext Ref Transmit
TS ChF MSK Phase	req 1.96000 GHz TSC Au & Frequency PCS 1900	Ext Ref	Transmit Pwr	# Agilient 02/18/70 18:26:02  BTS Ch Freq 1.98980 6Hz	EDGE W/GSM	Ext Ref Transmit PASS
TS Ch F MSK Phase	req 1.96000 GHz TSC Aut & Frequency PCS 1900  Phase Err Ref	to Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 18:26:02  BTS Ch Freq 1.98980 6Hz GMSK Phase & Frequency PCS	EDGE w/GSM TSC Auto 1900 Rverages: 200	Ext Ref Transmit PASS
TS Ch F MSK Phase	Phase Err	Averages: 200 PAS  0.00 Phase Err w/Free 0.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 18:26:02  BTS Ch Freq 1.98980 6Hz GMSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/	EDGE w/GSM  TSC Auto 1900	PASS  PWr vs  (M/Freq  PWr vs  (M/Freq  Phase & GMSK Our RF Spec
TS Ch F MSK Phase of 0.00 2.00 deg/ 500.0	Phase Err Phase Err Phase Err Phase Err Ref S di RF Envelope	### Ref	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	# Agilent 02/18/70 18:26:02  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5 t  Ref 50.00 FF Envelope	EDGE w/6SM  TSC Auto 1900 Averages: 200  Ref 0.00 Phase Err 5.00 deg/ 500.0 mbit  Phase Error: 2.34	Phase & GMSK Ou RF Spec
TS Ch F MSK Phase	Phase Err  Phase Err  Ref  Ref  Ref  Ref  Ref  Ref  Ref  R	### Ref Ref    Averages: 200   PAS	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	# Agilent 02/18/70 18:26:02  BTS Ch Freq 1.98980 6Hz  GMSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 des/ 580.0 mbit 147.5 E  Ref 50.00 RF Envelope	EDGE w/GSM  TSC Auto 1900 Averages: 200  Ref 0.00 Phase Err 5.00 deg/	Phass    Pass   Transmit

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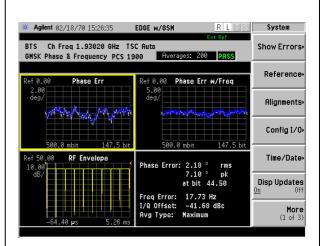
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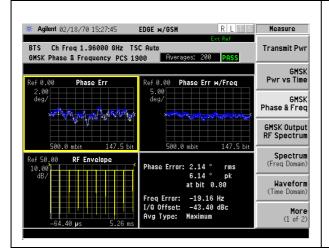
### 6.4.3.5 TESTS AT TEMPERATURE +35 °C

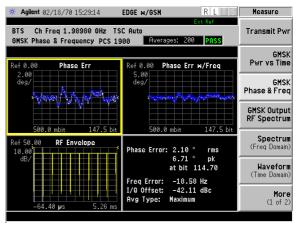
### 6.4.3.5.1 PHASE AND FRENQUENCY ERROR @ -40VDC

### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	2.18	Pass
В	Phase PK	7.10	Pass
	Freq. Error	17.73	Pass
	Phase RMS	2.14	Pass
M	Phase PK	6.14	Pass
	Freq. Error	-19.16	Pass
	Phase RMS	2.10	Pass
Т	Phase PK	6.71	Pass
	Freq. Error	-18.58	Pass

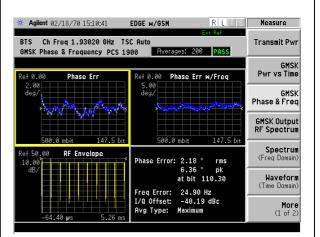


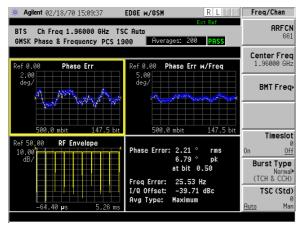


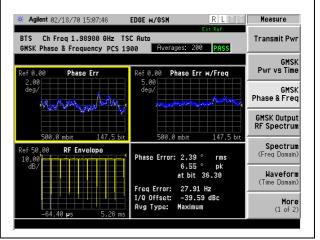


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CHN	Measure	Average	Sanction
	Phase RMS	2.10	Pass
В	Phase PK	6.36	Pass
	Freq. Error	24.90	Pass
	Phase RMS	2.21	Pass
M	Phase PK	6.79	Pass
	Freq. Error	25.53	Pass
	Phase RMS	2.30	Pass
Т	Phase PK	6.55	Pass
	Freq. Error	27.91	Pass
			•







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# 6.4.3.5.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

IN	Measure	Average	Sanction	<b>※ Agilent</b> 02/18/70 15:17:49 <b>EDGE w/GSM</b> R L T S	Measu
	Phase RMS	2.13	Pass	BTS Ch Freq 1.93020 GHz TSC Auto	Transm
В	Phase PK	6.09	Pass	GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	
	Freq. Error	-16.16	Pass	Ref 0.00	Pwr v
	Phase RMS	2.12	Pass	deg/	Phase 8
M	Phase PK	6.58	Pass		GMSK C
	Freq. Error	-19.94	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spe
	Phase RMS	2.12	Pass	10.00 Phase Error: 2.13 ° rms dB/ 6.09 ° pk	(Freq (
Т	Phase PK	5.90	Pass	at bit 54.30 Freg Error: -16.16 Hz	Wav (Time [
	Гион Гиион	40.70	_	I/Q Offset: -41.63 dBc	
	Freq. Error	19.70	Pass	-64.40 µs 5.26 ms	(
Agilent 02		19.70			
S Ch F		E w/GSM R L	Measure Transmit Pwr	-64.40 <b>µ</b> s 5.26 ms	Measu
S Ch F SK Phase	7/18/70 15:16:41 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err Re	E w/GSM R L Ext Ref  Ito Averages: 200 PAS  f 0.00 Phase Err w/Fre	Transmit Pwr	# Agilent 02/18/70 15:15:34 EDGE w/GSM R L	Measu
S Ch F SK Phase	1/18/70 15:16:41 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900 Phase Err Re	E m/GSM R L Ext Ref ita Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 15:15:34 EDGE w/GSM R L TS	Measu Transm Pwr v
S Ch F SK Phase	1/18/70 15:16:41 ED60 req 1.96000 6Hz TSC Au & Frequency PCS 1900  Phase Err	E W/GSM R L Ext Ref Ita Averages: 200 PAS  f 0.00 Phase Err W/Fre 5.00	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 15:15:34 EDGE w/GSM R L ST Ref Both Street	Measu Transm Pwr vs
S Ch F SK Phase 0.00 .00 eg/ 500.0	### Phase Err   Re-	E W/GSM Ext Ref.  Averages: 200 Pas  6 0.00 Phase Err W/Fre  5.00  500.0 mbit 147  ase Error: 2.12 ° rm:	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum Spectrum	# Agilent 02/18/70 15:15:34 EDGE w/GSM R L ST ST Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS  Ref 0.00 Phase Err 2.00 Phase Err w/Freq 5.00 Phase Ph	Measur Transm Pwr vs Phase 8 GMSK C RF Spe
S Ch F SK Phase	2/18/70 15:16:41 EDGi req 1.96000 6Hz TSC Au & Frequency PCS 1900  Phase Err Re a mbit 147.5 bit  RF Envolope Ph	E W/6SM R L Ext Ref itto Averages: 200 PAS f 0.00 Phase Err W/Fre 5.00 Phase Err W/Fre 5.00 Phase Err W/Fre	Transmit Pwr  GMSK Pwr vs Time GMSK Phase & Freq GMSK Output RF Spectrum (Freq Domain)	## Agilent 02/18/70 15:15:34	Measu Transmi Pwr vs Phase & GMSK 0 RF Spe Spe (Freq [ Havi (Time [

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HN	Measure	Average	Sanction	* Agilent 02/18/70 15:03:23	EDGE w/GSM	R L T S System
	Phase RMS	2.20	Pass	BTS Ch Freq 1.93020 GHz		Ext Ref Show Err
В	Phase PK	6.65	Pass	GMSK Phase & Frequency PCS	Averages: 2	Refere
	Freq. Error	31.30	Pass	Ref 0.00 Phase Err 2.00 deg/	Ref 0.00 Phase I 5.00 deg/	Frr w/Freq
	Phase RMS	2.36	Pass	WA 1	With the second	Alignme
М	Phase PK	7.80	Pass			Config
	Freq. Error	35.51	Pass	500.0 mbit 147.5 l Ref 50.00 <b>RF Envelope</b>		147.5 bit Time/D
	Phase RMS	2.41	Pass	10.00 dB/	Phase Error: 2.2	
Т	Phase PK	7.01	Pass		Freq Error: 31.	<u> </u>
	Freq. Error	37.60	Pass	-64.40 µs 5.26	Avg Type: Maxin	.67 dBc uum (1
Agilent 02	· ·	E W/GSM R L		-64.40 µs 5.26	Avg Type: Maxin	I
S Ch Fi	· ·	E w/GSM R L	Measure Transmit Pwr		Avg Type: Maxim  EDGE W/GSM  TSC Auto	R L S Measure  Evt Ref  Transmit
S Ch Fi SK Phase	/18/70 15:02:08 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900	E W/GSM R L Ext Ref.	Transmit Pwr	# Agilient 02/18/70 15:00:59  BTS Ch Freq 1.98980 6Hz	Avg Type: Maximms  EDGE M/GSM  TSC Auto 1900 Averages: 2	R L S Measure  Evt Ref  Transmit
S Ch Fi	/18/70 15:02:08 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err Ref	E M/95M R L Ext Ref to Averages: 200 PAS	Transmit Pwr	# Agilent 02/18/70 15:00:59  BTS Ch Freq 1.98980 6Hz GMSK Phase & Frequency PCS	Avg Type: Maximms  EDGE M/GSM  TSC Auto 1900 Averages: 2	R L S Measure  Ext Ref  Transmit
S Ch F SK Phase	/18/70 15:02:08 EDGI req 1.96000 6Hz TSC Au & Frequency PCS 1900	E W/GSM RIL  Ext Ref to Averages: 200 PAS  0.00 Phase Err W/Fre .000	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 15:00:59  BTS Ch Freq 1.98980 6Hz GMSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/	EDGE W/GSM  TSC Auto 1900 Averages: 2  Ref 0.00 Phase deg/	RIL S Measure  Freq Pwr vs  GMSK Ou RF Spec
S Ch Fi SK Phase 0.00 .00 eg/ 500.0	/18/70 15:02:08 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err  Phase Err  Ref  mbit 147.5 bit  RF Envelope	RVerages: 200 Pase Err W/Fre 500.0 mbit 147	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/18/70 15:00:59  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5 i	Ref 0.00 Phase 5.00 deg/	RIL S Measure  Fix Rof Transmit  One Pass  Gerr M/Freq  Phase & F  GMSK Ou RF Spec  147.5 bit  Spec  Freq Do  Freq Do  Freq Do  Freq Do
S Ch F SK Phase	/18/70 15:02:08 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err  Ref  a mbit 147.5 bit  RF Envelope Phi	E w/6SM R L  Ext Ref  to Averages: 200 PAS  0.00 Phase Err w/Fre  .00  500.0 mbit 147	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum	# Agilent 02/18/70 15:00:59  BTS Ch Freq 1.98990 6Hz  GMSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5 1	Avg Type: Haxing  EDGE W/GSM  TSC Auto 1900 Averages: 2  Ref 0.00 Phase 5.00 deg/	RLLS Measure Ett Nof Transmit Pwr vs Phase & F GMSK Ou RF Spec 147.5 bit Spec (Freq Do Freq Do Wave (Time Do

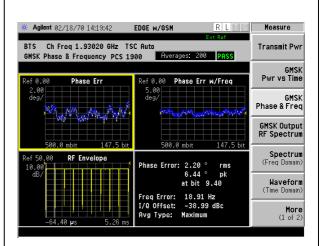
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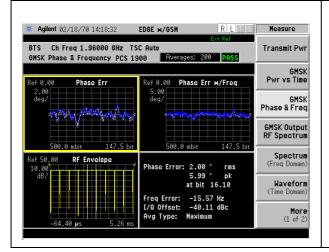
### 6.4.3.6 TESTS AT TEMPERATURE +45 °C

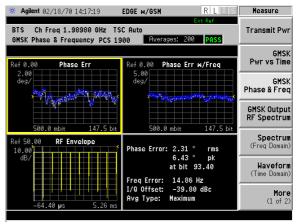
### 6.4.3.6.1 PHASE AND FRENQUENCY ERROR @ -40VDC

### > H2D configuration:

CHN	Measure	Average	Sanction
	Phase RMS	2.20	Pass
В	Phase PK	6.44	Pass
	Freq. Error	18.91	Pass
	Phase RMS	2.00	Pass
М	Phase PK	5.99	Pass
	Freq. Error	-15.57	Pass
	Phase RMS	2.31	Pass
Т	Phase PK	6.43	Pass
	Freq. Error	14.86	Pass







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CHN	Measure	Average	Sanction	* Agilent 02/18/70 14:31:06	EDGE w/GSM	R L T S Syste
	Phase RMS	2.16	Pass	BTS Ch Freq 1.93020 GHz	TSC Auto	t Ref Show E
В	Phase PK	6.76	Pass	GMSK Phase & Frequency PCS	1900 Averages: 200	PASS Refer
	Freq. Error	-18.69	Pass	Ref 0.00 Phase Err 2.00 Phase Err	Ref 0.00 Phase Err v	/Freq
	Phase RMS	2.14	Pass	deg/	deg/	Align
М	Phase PK	6.62	Pass	4, 54		Confi
	Freq. Error	-22.46	Pass	500.0 mbit 147.5 Ref 50.00 <b>RF Envelope</b>		147.5 bit Time/
	Phase RMS	2.42	Pass	10.00 dB/	Phase Error: 2.16 ° 6.76 °	rms pk 2.40 Disp Up
Т	Phase PK	6.90	Pass		at bit 33 Freq Error: -18.69	Hz <u>On</u>
	Freq. Error	-21.84	Pass	-64.40 µs 5.26	I/Q Offset: -39.90 Avg Type: Maximum	dBc (3
Agilent 02	2/18/70 14:33:06 <b>EDGE</b>	E W/GSM R L	TS Measure	# Agilent 02/18/70 14:34:12	EDGE w/GSM	R L T S Syste
S Ch F	2/18/70 14:33:96 EDGE Freq 1.96000 GHz TSC Au a & Frequency PC\$ 1900	Ext Ref	Transmit Pwr	# Agilent 02/18/70 14:34:12  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS	TSC Auto	t Ref Show Ei
S Ch F	Freq 1.96000 GHz TSC Au e & Frequency PCS 1900	Ext Ref	Transmit Pwr	BTS Ch Freq 1.98980 GHz	TSC Auto	Show E
S ChF SKPhase	req 1.96000 GHz TSC Au e & Frequency PCS 1900  Phase Err Ref	Ext Ref to Averages: 200 PAS	Transmit Pwr	BTS Ch Freq 1.98980 GHz GMSK Phase & Frequency PCS	TSC Auto 1900 Averages: 200	PASS Refer
S Ch F SK Phase	req 1.96000 GHz TSC Au e & Frequency PCS 1900  Phase Err Ref	Averages: 200 PAS  0.00 Phase Err w/Fre	Transmit Pwr  GMSK Pwr vs Time  GMSK	BTS Ch Freq 1.98980 6Hz GMSK Phase & Frequency PCS Ref 0.00 Phase Err 2.00	TSC Auto 1900 Averages: 200  Ref 0.00 Phase Err # 5.00 deg/	PASS Show Ei
S Ch F SK Phase 0.00 .00 .00 .00 .00 .00	Phase Err Phase Err Ombit 147.5 bit  RF Envelope	Averages: 200 Pas  0.00 Phase Err w/Fre 0.00 500.0 mbit 147  ase Error: 2.14 ° rm	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	BTS Ch Freq 1.98980 GHz GMSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.00 mbit 147.5  Ref 50.00 RF Envelope	TSC Auto 1900 Averages: 200  Ref 0.00 Phase Err # 5.00 deg/  John Strom	PASS Show Ei
S Ch F SK Phase 0.00 .00 eg/	Phase Err  O mbit 147.5 bit  RF Envolope  Phase Trequency PCS 1900	Averages: 200 PAS  0.00 Phase Err w/Fre 5.00  6.00 Phase Err w/Fre 5.00 Phase Err w/Fre	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PCS  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5  Ref 50.00 RF Envelope	Ref 0.00 Phase Err v 5.00 deg/	PASS Refer  //Freq Alignm 147.5 bit rms pk Disp Up On

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# 6.4.3.6.2 PHASE AND FRENQUENCY ERROR @ -57VDC

# > H2D configuration:

HN	Measure	Average	Sanction	★ Agilent 02/18/70 14:01:21 EDGE w/GSM R L T S	Measure
	Phase RMS	2.04	Pass	BTS Ch Freq 1.93020 GHz TSC Auto	Transmit P
	Phase PK	6.81	Pass	6MSK Phase & Frequency PCS 1900 Averages: 200 PASS	GN
	Freq. Error	14.56	Pass	Ref 0.00	Pwr vs 1
	Phase RMS	2.21	Pass	deg/	Phase & F
	Phase PK	7.70	Pass		GMSK Out RF Spect
	Freq. Error	-24.89	Pass	500.0 mbit 147.5 bit 500.0 mbit 147.5 bit Ref 50.00 <b>RF Envelope</b>	Spect
	Phase RMS	2.14	Pass	10.00 Phase Error: 2.04 ° rms dB/ 6.81 ° pk	(Freq Do
	Phase PK	7.29	Pass	at bit 51.40 Freg Error: 14.56 Hz	Wavef (Time Do
	Freq. Error	-18.48	Pass	I/Q Offset: -40.21 dBc   Rvg Type: Haximum	(1
Agilent 02	7/18/70 13:55:23 <b>Edgi</b>	E w/GSM R L	T S  System	<b>※ Agilent</b> 02/18/70 14:00:11 <b>EDGE м/GSM</b> R L Т С	System
Ch Fi	:/18/70 13:55:23 EDGI req 1.96000 GHz TSC Au & Frequency PCS 1900	Ext Ref	Show Errors		System Show Erro
Ch Fi C Phase	req 1.96000 GHz TSC Au & Frequency PCS 1900	Ext Ref	Show Errors	BTS Ch Freq 1.98980 GHz TSC Auto	
Ch Fi K Phase	req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err Ref	ext Ref uto Averages: 200 PAS	Show Errors	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900 Averages: 200 PASS	Show Err
6 Ch Fi 6K Phase 0.00	req 1.96000 GHz TSC Au b & Frequency PCS 1900 Phase Err Rei	Averages: 200 PAS  F0.00 Phase Err W/Fre 5.00	Show Errors	BTS Ch Freq 1.98980 GHz TSC Auto GMSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err Ref 0.00 Phase Err W/Freq 2.00	Show Err
Ch F F K Phase 20.00 00 9/ 500.0	Phase Err Phase Err Phase Err Phase Err Phase Err Ref Phase Err Ref Ref Ref Envelope	Atto Rerages: 200 PAS  6 0.00 Phase Err W/Fre 5.00 Seg/ 500.0 mbit 147  ase Error: 2.21 ° rm	Reference  Alignments  Config I/O  Time/Date	BTS Ch Freq 1.98980 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 8.00	Show Err Referen Alignme Config
0.00 0.00 99/	Phase Err  Phase Err  Ref Envelope  Ph. Phase Err  Ref Envelope  Ph.	Averages: 200 pas  f 0.00 Phase Err w/Fre 5.00 deg/ 5.00.0 mbit 147  ase Error: 2.21 ° rm 7.78 ° pk at bit 87.20	Reference  Alignments  Config I/O  Time/Date	BTS Ch Freq 1.98990 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00 Phase Err 2.00 deg/  S00.0 mbit 147.5 bit  Ref 50.00 RF Envelope 10.00  BY Phase Error: 2.14 ° rms 7.29 ° pk at bit 95.40	Show Err Referen
S Ch F SK Phase	Phase Err Ref	Averages: 200 pas  f 0.00 Phase Err W/Fre 5.00 deg/ 5.00 0 mbit 147  ase Error: 2.21 ° rm 7.78 ° pk	Reference  Alignments  Config I/O  Time/Date  Disp Updates	BTS Ch Freq 1.98990 6Hz TSC Auto 6MSK Phase & Frequency PCS 1900  Ref 0.00	Show Errick Reference Alignman Configuration Time/I

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HN	Measure	Average	Sanction	* Agilent 02/18/70 14:39:10	EDGE W/GSM	RLTS	Measure
	Phase RMS	2.21	Pass	BTS Ch Freq 1.93020 GHz		Ext Ref	Transmit F
В	Phase PK	6.24	Pass	GMSK Phase & Frequency PC			GI
	Freq. Error	20.40	Pass	Ref 0.00 Phase Err 2.00 deg/	Ref 0.00 Phase E 5.00 deg/	rr w/Freq	Pwr vs T
	Phase RMS	2.47	Pass			Nacional Confession	Phase & F
М	Phase PK	6.31	Pass	4. 8			GMSK Out RF Spect
	Freq. Error	17.26	Pass	500.0 mbit 147.5 Ref 50,00 <b>RF Envelope</b>	bit 500.0 mbit  Phase Error: 2.2	147.5 bit	Spect (Freg Dom
	Phase RMS	2.39	Pass	10.00 dB/	6.2		Wavef
Т	Phase PK	6.71	Pass		Freq Error: 20.4		(Time Don
							M
	Freq. Error	18.49	Pass	-64.40 µs 5.26	Avg Type: Maxim		
<b>Agilent</b> 02	·	18.49		-64.40 µs 5.26	Avg Type: Maxim		
S Ch Fi	·	: μ/GSM R L Ext Rof	Measure Transmit Pwr		Avg Type: Maxim  EDGE W/GSM  TSC Auto	R L T S Ext Ref	(1 0
6 Ch Fi 6K Phase 0.00	:/18/70 14:40:33 EDGE req 1.96000 GHz TSC Au & Frequency PCS 1900  Phase Err Ref	Ext Ref to Averages: 200 PAS 0.00 Phase Err w/Fre	Transmit Pwr	* Agilent 02/18/70 14:41:45 BTS Ch Freq 1.98980 6Hz	EDGE W/GSM  TSC Auto \$ 1900	R L T S Ext Ref	(1 o
S Ch Fi SK Phase	1:/18/70 14:40:33 EDGE req 1.96000 GHz TSC Au & Frequency PCS 1900 Phase Err Ref	Ext. Rof.  to  Alverages: 200 PAS	Transmit Pwr	* Agilent 02/18/70 14:41:45  BTS Ch Freq 1.98980 GHz  GMSK Phase & Frequency PC	Avg Type: Maxim  EDGE w/GSM  TSC Auto S 1900  Averages: 2	R L TS Ext Ref	System Show Erro
S Ch Fi SK Phase 0.00 .00	1/18/70 14:40:33 EDGE req 1.96000 GHz TSC Ru 2 Frequency PCS 1900  Phase Err	Ext Ref to Averages: 200 PAS  0.00 Phase Err W/Fre eg/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum	# Agilent 02/18/70 14:41:45 BTS Ch Freq 1.98980 GHz GMSK Phase & Frequency PC  Ref 0.00 Phase Err 2.00 deg/	EDGE W/GSM  TSC Auto S 1900  Averages: 2  Ref 0.00 Phase 5 5.00 deg/	R L TS	System Show Erro Referer Alignmen
6 Ch Fi 6K Phase 0.00 .00 .99 500.00	### Phase Err   Ref	E W/6SM R L  Ext Ref  to  Averages: 200 PAS  0.00 Phase Err W/Fre  90  500.0 mbit 147  ase Error: 2.47 ° rm	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	# Agilent 02/18/70 14:41:45  BTS Ch Freq 1.98980 GHz GMSK Phase & Frequency PC  Ref 0.00 Phase Err 2.00 deg/ 500.0 mbit 147.5  Ref 50.00 RF Envelope 10.00	Ref 0.00 Phase 5.00 deg/	Ext Ref	System Show Erro
S Ch Fi SK Phase 0.00 .00	Phase Err  Phase Err  Ref Envelope  Photographic Articles of the control of the c	Ext Ref to Averages: 200 PASE 0.00 Phase Err w/Fre eg/	Transmit Pwr  GMSK Pwr vs Time  GMSK Phase & Freq  GMSK Output RF Spectrum  Spectrum  (Freq Domain)	# Agilent 02/18/70 14:41:45  BTS Ch Freq 1.98980 6Hz 6MSK Phase & Frequency PC  Ref 0.00 Phase Err 2.00 deg/ deg/ 500.0 mbit 147.5  Ref 50,00 RF Envelope	EDGE W/GSM  TSC Auto S 1900 Averages: 2  Ref 0.00 Phase 5 5.00 dey  Phase Error: 2.3: 6.7:	R L S Ext fet 2006 PASS 20	System Show Error Referer Alignmen

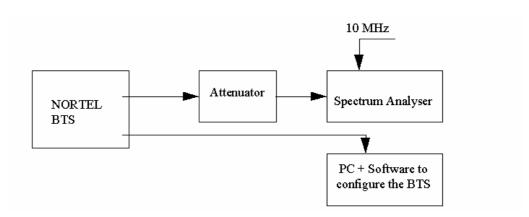
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# 6.5 NAME OF TEST: SPURIOUS EMISSION AT TERMINALS

### 6.5.1 FCC REQUIREMENTS LIMITS

- (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.
- (b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
- (c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- (d) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

### 6.5.2 TEST PRICIPLE



For adjacent channels emissions, the BTS nominal carrier frequency was adjusted to each block edge channel.

Channels 512 and 810 are those channels which are at the lower and upper edges of the PCS 1900 band respectively.

The BTS was configured to transmit at maximum power (static level 0) or a reduced power:

- · For GMSK modulation, in mode GMSK no synchro.
- · For 8PSK modulation, in mode logical PDCH, Type GPRS, coding MCS5.

Initially the transmitter was set to operate to maximum power. Then in case of out of limits, the power has been decreased by 2 dB.

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For these measurements, the resolution bandwidth was of the spectrum analyzer was set to at le ast 1% of the emission bandwidth. In this case the emission bandwidth measured was closed to 300 kHz. Therefore, the resolution bandwidth was set to 3 kHz. The spectrum analyzer had the following settings for adjacent band:

Resolution bandwidth: 3 kHz Video bandwidth: 10 kHz Span: 1 MHz

Reference level: 30 dBm

Reference Level Offset: Corrected to account for cable(s), filter and attenuator losses

Level range: 100 dB
Sweep time: Coupled
Detector: Sample
Trace: Average
Sweep count: 200

The spectrum analyzer had the following settings for out of block emissions.

Resolution bandwidth: 1 MHz Video bandwidth: 1 MHz

The emissions were investigated up to the twentieth harmonic of the fundamental emission (20 GHz).

The measured level of the emissions was recorded and compared to the -13 dBm limit.

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# 6.5.3 CONCLUSION

GSM1900 Radio Modules used with 30W Power Amplifier configuration

Radio modules PCS1900	Hardware Code	Comment
RM 30W PCS1900	NTN050PM	
PCS1900 Coupling module		
PCS1900 DDM H2	NTN063AA NTN063AM	DDM 1900 W/VSWR W/HYBRIDS DDM 1900 W/O VSWR W/HYBRIDS
PCS1900 DDM	NTN063BA NTN063BM	DDM 1900 W/VSWR W/O HYBRIDS DDM 1900 W/O VSWR W/O HYBRIDS
TXF H2D	NTN064AA NTN064AM	TX FILTER 1900 W/VSWR W/HYB TX FILTER 1900 W/O VSWR W/HYB
TXF HD	NTN064BA NTN064BM	TX FILTER 1900 W/VSWR W/O HYB TX FILTER 1900 W/O VSWR W/OHYB

Power limitation to comply to Adjacent Band spurious at antenna connector PCS1900:

BTS Antenna Power	GMSK modulation	8PSK modulation
DDM Dp configuration	43.3 dBm / 21.4W	43 dBm / 20W
DDM H2 configuration	39.8 dBm	39.9 dBm

Coupling configuration	System Power limitation  GMSK modulation	System Power limitation 8 PSK modulation
DDM Duplexer Tx Filter ( without H2 )	Power Limitation: Pmax – 2 dB	Power Limitation : Pmax – 2 dB
DDM H2 Tx Filter H2	Pmax	Pmax

 $\underline{\text{Note}} = \text{For GMSK modulation}$ , Power limitation Pmax-2dB ensures the FCC compliance to Adjacent Band spurious.

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#### 6.5.4 TEST RESULTS

#### > TEST RESULTS WITH DDM H2 CONFIGURATION

The reference level for spurious emissions at the antenna terminals is taken from the measured output power (39.8 dBm = 9.5Watts).

Therefore the spurious emissions must be attenuated by at least 43 + 10\*Log(9.5) = 54 dB

The measured output power was 39.8 dBm therefore the limit is 39.8 - 52.8 = -13 dBm.

Spurious measurement is performed with the DDM H2 configuration.

The Nominal power at antenna connector: PGMSK H2 Max = 39.8 dBm

The Nominal power at antenna connector: P8PSK H2 Max = 39.9 dBm

#### Table shows the result for Spurious Emission at Antenna Terminal

Test result for GMSK Modulation H2 Configuration

Channel	Power Level (Pmax)	Power Level (Pmax-2)	Power Level (Pmax-4)	Power Level (Pmax-6)	Margin (dB)
C512	-15.57				-2.57
C810	-13.67				-0.67

Test result for 8PSK Modulation H2 Configuration

	Spurious Emission Level (dBm)				
Channel	Power Level (Pmax)	Power Level (Pmax-2)	Power Level (Pmax-4)	Power Level (Pmax-6)	Margin (dB)
C512	-15.08				-2.08
C810	-14.52				-1.52

### TEST RESULTS WITH DDM DIPLEXER CONFIGURATION

The reference level for spurious emissions at the antenna terminals is taken from the measured output power (43.3 dBm = 21.4 Watts).

Therefore the spurious emissions must be attenuated by at least 43 + 10\*Log(21.4) = 56.3 dB

The measured output power was 43.3 dBm therefore the limit is 43.3 - 56.3 = -13 dBm.

Spurious measurement is performed with the DDM diplexer configuration.

The Nominal power at antenna connector: PGMSK diplexer Max = 43.3 dBm

The Nominal power at antenna connector: P8PSK diplexer Max = 43 dBm

### • Test result for GMSK Modulation HD Configuration

	Spurious Emission Level (dBm)				
Channel	Power Level	Power Level	Power Level	Power Level	Margin (dB)
C512	( <b>Pmax</b> ) -13.23	(Pmax-2)	(Pmax-4)	(Pmax-6)	-0.23
C810	-14.08				-1.08

### • Test result for 8PSK Modulation HD Configuration

	Spurious Emission Level (dBm)				
Channel	Power Level	Power Level	Power Level	Power Level	Margin (dB)
	(Pmax)	(Pmax-2)	(Pmax-4)	( <b>Pmax-6</b> )	
C512	-13.53				-0.53
C810	-13.47				-0.47

Conclusion = For PCS1900 modules under tests, the maximum emission power Pmax (GMSK&8PSK) allows to meets the FCC spurious tests compliance.

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# GSM 9000 Indoor BTS Radio Test Report PCS1900 & GSM850 FCC Part24&Part22

# Test result for Out of block spurious emission – Channel 810 HD Configuration

Power (dB)	Frequency MHz	Spurious Emission Level – 8PSK
	100 kHz – 50MHz	-37
	50 MHz -500 MHz 500 MHz – 1970.2 MHz	-40 -41
	1970.2 MHz – 1974 MHz	-55
Pmax	1974 MHz – 1975 MHz	-65
	1991 MHz – 1994.8 MHz	-31
	1994.8MHz – 4 GHz	-38
	4 GHz – 8 GHz	-37
	8 GHz – 12 GHz	-38
	8 GHz – 12 GHz	-37
Margin		> 18 dB

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# Figure: In Band – Edge block channel – 1MHz adjacent band GMSK Modulation –H2 configuration

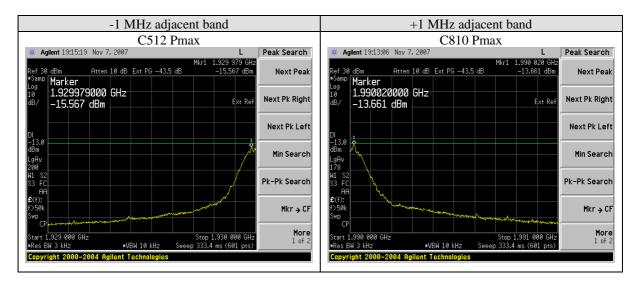
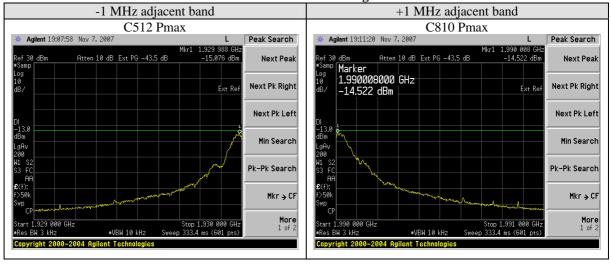


Figure: In Band – Edge block channel – 1MHz adjacent band 8PSK Modulation –H2 configuration



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# Figure: In Band – Edge block channel – 1MHz adjacent band GMSK Modulation –HD configuration

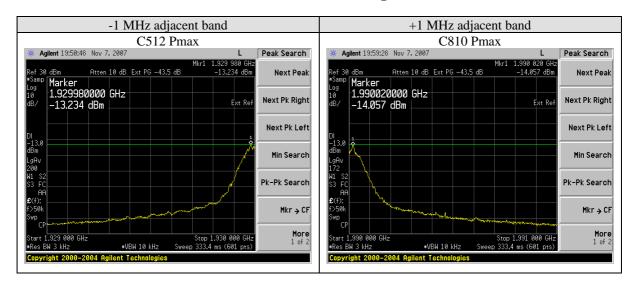
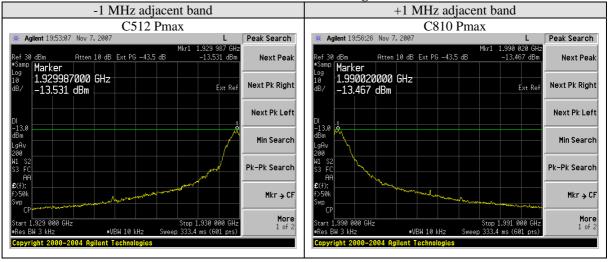
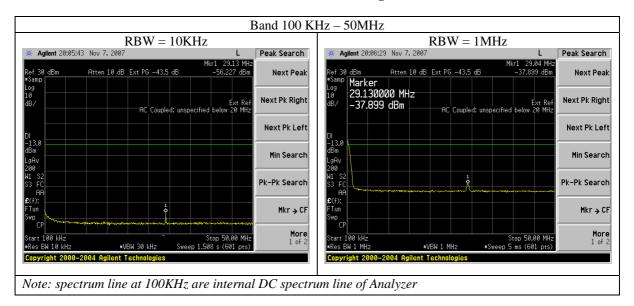


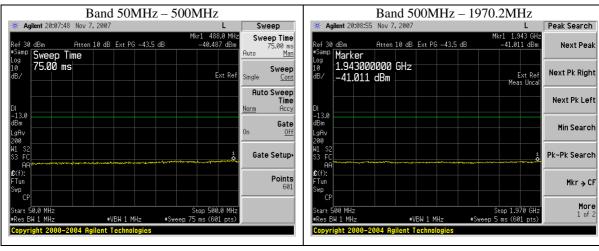
Figure: In Band – Edge block channel – 1MHz adjacent band 8PSK Modulation –HD configuration

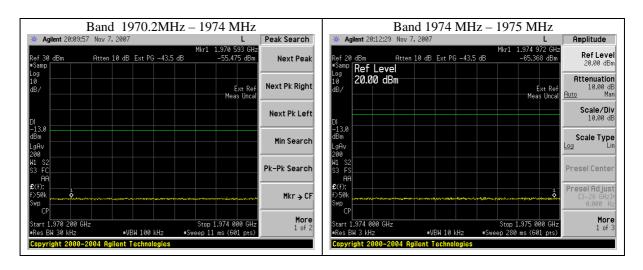


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Figure: Out of block emission (Channel 810, Pmax) 8PSK Modulation – HD Configuration

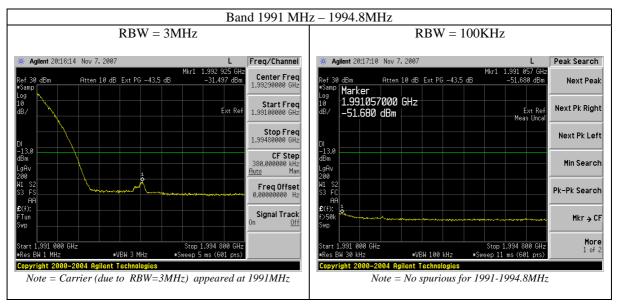


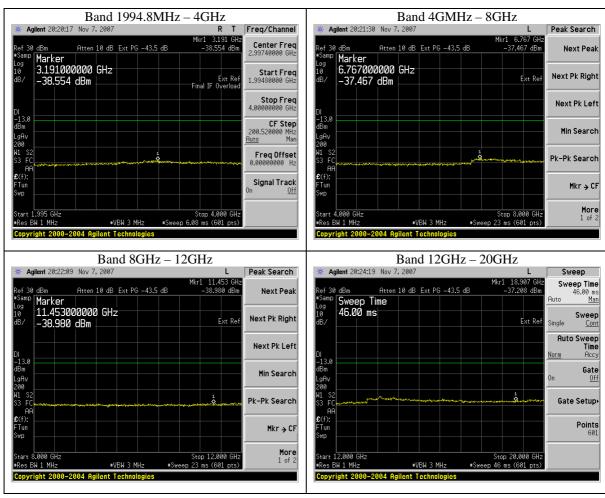




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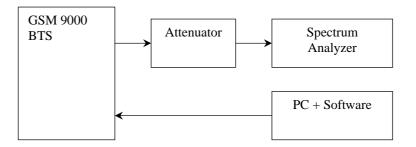
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# 6.6 NAME OF TEST: OCCUPIED BANDWITH

### 6.6.1 FCC REQUIREMENTS

The occupied bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

### 6.6.2 TEST PRINCIPLE



The BTS was configured to transmit at maximum power (Static Level 0). Measurements were made at frequencies which were at the bottom and top of the transmit band.

The occupied bandwidth was measured by determining the bandwidth out of which all emissions are attenuated at least 26 dB below the transmitter power.

The spectrum analyzer had the following settings:

Resolution bandwidth: 10 kHz
Video bandwidth: 30 kHz
Span: 1 MHz
Reference level: 40 dBm

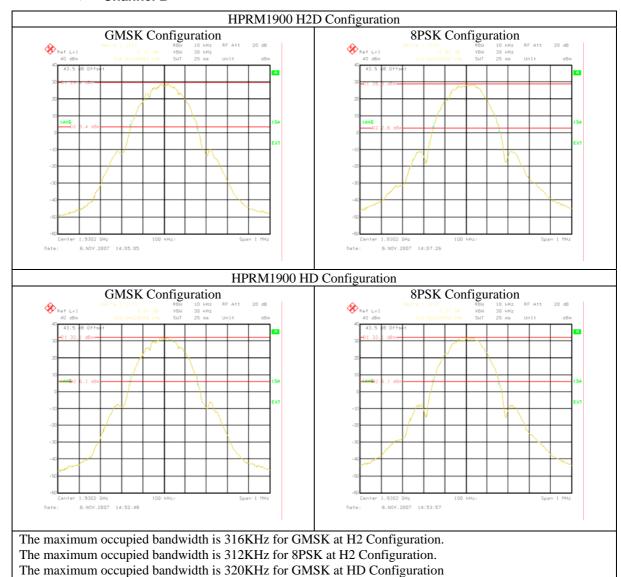
Reference Level Offset: Corrected to account for cable(s) and attenuator losses

Level range: 100 dB Sweep time: 25 ms

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# 6.6.3 TEST RESULTS

### > Channel B

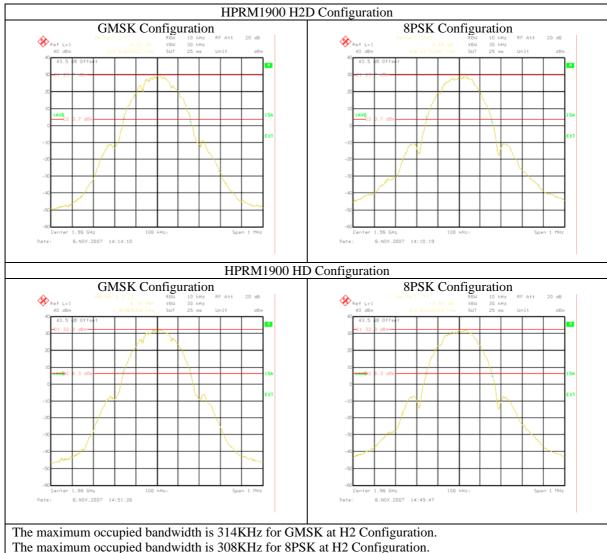


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The maximum occupied bandwidth is 312KHz for 8PSK at HD Configuration

### > Channel M



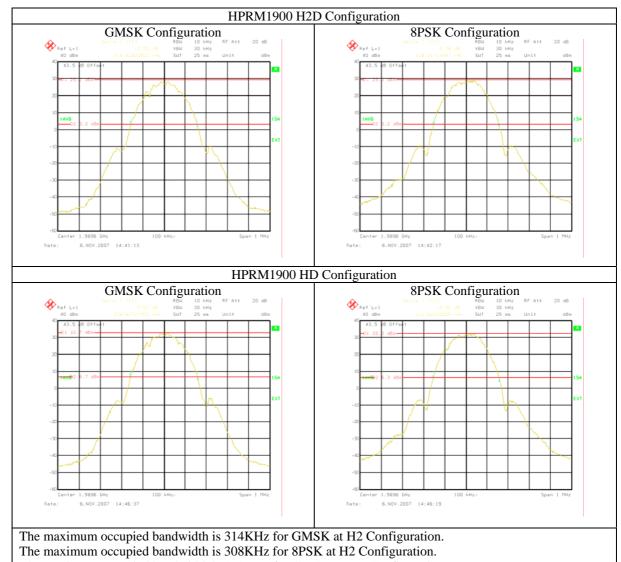
The maximum occupied bandwidth is 318KHz for GMSK at HD Configuration

The maximum occupied bandwidth is 312KHz for 8PSK at HD Configuration

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### > Channel T



The maximum occupied bandwidth is 318KHz for GMSK at HD Configuration

The maximum occupied bandwidth is 312KHz for 8PSK at HD Configuration

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