

CE RF Test Report

for mobile stations in the GSM 900 and GSM 1800 bands

Product Name : GSM/GPRS Module

Model No. : SIM800

Prepared for:

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Date of Receipt : 04-14-2017

Test Date : 04-20-2017~ 04-30-2017

Issued Date : 05-08-2017

Report No. : UL15820170414RED007-1

Report Version : V1.0

Notes:

The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Test Report Certification

Issued Date : 05-08-2017
Report No. : UL15820170414RED007-1

Product Name : GSM/GPRS Module
Applicant : Shanghai Simcom Wireless Solutions Co., Ltd.
Address : BuildingA, SIM Technology Building, No. 633, Jinzhong Road, Changning District,
Shanghai P.R.China.
Manufacturer : Shanghai Simcom Wireless Solutions Co., Ltd.
Address : BuildingA, SIM Technology Building, No. 633, Jinzhong Road, Changning District,
Shanghai P.R.China.
Model No. : SIM800
EUT Voltage: Low: 3.4V Normal: 3.8V High: 4.2V
Applicable Standard(s) : ETSI EN 301 511 V12.5.1
3GPP TS51.010-1 V13.1.0
Test Result : Complied
Performed Location : Unilab (Shanghai) Co., Ltd.
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1. Summary Of Test Result

1.1. Summary Of Standards And Test Results

The EUT have been tested according to the applicable standards as referenced below:

ETSI EN 301 511	3GPP TS 51 010-1	Test Description	GSM900	GSM1800
§4.2.1	§13.1	Transmitter--Frequency error and phase error	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
		Vibration (X axis)	P	P
		Vibration (Y axis)	P	P
		Vibration (Z axis)	P	P
§4.2.2	§13.2	Transmitter--Frequency error under multipath and interference conditions	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
§4.2.4	§13.16.1	Frequency error and phase error in GPRS multi slot configuration	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
		Vibration (X axis)	P	P
		Vibration (Y axis)	P	P
		Vibration (Z axis)	P	P
§4.2.5	§13.3.4.1	Transmitter output power and burst timing –MS with permanent antenna	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
§4.2.6	§13.4	Transmitter-Output RF spectrum	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
§4.2.10	§13.16.2	Transmitter output power in GPRS multi slot configuration	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P

		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
§4.2.11	§13.16.3	Output RF spectrum in GPRS multi slot configuration	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
§4.2.12	§12.1.10	Conducted spurious emissions-MS allocated a channel	P	P
		Voltage High	P	P
		Voltage Low	P	P
		Voltage Normal	P	P
§4.2.13	§12.1.2	Conducted spurious emissions-MS in idle mode	P	P
		Voltage High	P	P
		Voltage Low	P	P
		Voltage Normal	P	P
§4.2.16	§12.2.1	Radiated spurious emissions-MS allocated a channel	P	P
		Voltage Normal	P	P
§4.2.17	§12.2.2	Radiated spurious emissions-MS in idle mode	P	P
		Voltage Normal	P	P
§4.2.20	§14.7.1	Blocking and spurious response-speech channels	P	P
4.2.32	14.6.1	Intermodulation rejection - speech channels	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
4.2.35	14.8.1	AM suppression - speech channels	P	P
4.2.38	14.5.1.1	Adjacent channel rejection - speech channels (TCH/FS).	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P
4.2.42	14.2.1	Reference sensitivity - TCH/FS	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P

4.2.43	14.2.3	Reference sensitivity - FACCH/F	P	P
4.2.44	14.16.1	Minimum Input level for Reference Performance - GPRS	P	P
		Temperature High, Voltage High	P	P
		Temperature High, Voltage Low	P	P
		Temperature Low, Voltage High	P	P
		Temperature Low, Voltage Low	P	P
		Temperature Normal, Voltage Normal	P	P

Note: P means pass,F means failure, N/A means not applicable.

1.2. Test Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the apparatus

Parameter	Uncertainty
Radio Frequency	3.5 x10 [^] (-8)
Total RF power, conducted	0.47 dB
Spurious emissions, conducted	2.94 dB
Duty Cycle	5.64 dB
Temperature	0.9 °C
Humidity	4.5%RH
DC and low frequency voltages	0.45%

2. General Information

2.1. EUT Description

Product Name:	GSM/GPRS Module
Model Name:	SIM800
Hardware Version:	V2.01
Software Version:	SIM800 R13.08
Support Band:	GSM900/DCS1800
Supported Features:	GPRS/EGPRS(Downlink only)
GPRS Class:	12
Tx Frequency Range:	GSM900:880~915MHz DCS1800:1710~1785MHz
Rx Frequency Range:	GSM900:925~960MHz DCS1800:1805 ~1880MHz
Type of modulation:	GMSK for GSM/GPRS
Antenna Type:	Sucker antenna (SMA connector)
Antenna Gain	GSM900: 3dBi DCS1800: 3dBi

Antenna information: Model GSM antenna: WT-C&G-28-90
Frequency Range (MHz) 824 ~ 960 1710 ~ 1990
VSWR \leq 1.5 (900MHz) \leq 2 (1800MHz)
Gain (dBi): 3
Input Impedance (Ω): 50
Polarization Type: Vertical
Connector Type: SMA
Manufacturer: Shenzhen Rongfengda

3. Technical Test

3.1. Test Environment

Temperature (°C)	20
Humidity (%RH)	52

3.2. Test Equipment List

Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	Agilent	N9038A	MY51210142	11/04/2017
Wireless Connectivity Test Set	Agilent	E5515C	MY49080305	11/06/2017
Power Splitter	Agilent	11667C/ 52401	MY53806148	02/25/2018
DC Power Supply	Agilent	E3610A	MY 40010412	01/01/2018
Trap Filter	WAINWRIGHT INSTRUMENTS MBHD	WRCT902.4-0.2/ 40-5SS	SN5	02/25/2018
Trap Filter	WAINWRIGHT INSTRUMENTS MBHD	WRCD1747.8-0.2/ 40-5SS	SN5	02/25/2018
Dual Channel EPM Series Power Meter	Agilent	E4419B	MY45100301	09/21/2017
ESG Vector Signal Generator	Agilent	4438C	MY42081708	09/21/2017
Power Sensor	Agilent	8485D	MY41090790	09/21/2017
PSA Spectrum Analyzer	Agilent	E4440A	US41421425	09/21/2017
PSG Signal Generator	Agilent	E8257D	MY45470010	09/21/2017
Signalling Unit 2G	ROHDE &SCHWARZ	E1121	E1121000029	09/21/2017
Fading Simulator	Anite	EB Propsim F8	100125	08/18/2018
Power splitter	Mini-Circuits	ZAPD-21	/	/
Bilog Antenna	Schwarzbeck	VULB9160	9160-3316	09/08/2018
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-942	09/08/2018
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-943	09/08/2018
vibration table	STI	DC-1000-13	/	06/24/2017
Cold-heat climate test chamber	Weiss-Voetsch Environmental Testing Instruments(Taicang) Co., Ltd.	C, 180, -40	54686002620010	12/01/2017

Notes:

Normal: the Temperature is +20 °C, the humidity is 52%, the voltage is 3.8V;

TL: the Temperature is -10 °C;

TH: the Temperature is +55°C;

VL: the voltage is 3.4V DC

VH: the voltage is 4.2V DC

There is only show typical and worst test plots in this report.

4. RESULTS

4.1. Transmitter-Frequency error and phase error

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.1

Limits

According to clause 13.1 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1,13.1.2

1) Frequency error

The frequency error shall be less than 0.1ppm, except for GSM 400MS where a value of 0.2ppm shall be used.

2) Phase error

The RMS phase error shall not exceed 5 degrees.

The maximum peak deviation during the useful part of each burst shall not exceed 20 degrees.

Test procedure

1) For one transmitted burst, the SS captures the signal as a series of phase samples over the period of the burst. These samples are evenly distributed over the duration of the burst with a minimum sampling rate of $2/T$, where T is the modulation symbol period. The received phase trajectory is then represented by this array of at least 294 samples.

2) The SS then calculates, from the known bit pattern and the formal definition of the modulator contained in 3GPP TS 05.04, the expected phase trajectory.

3) .From 1) and 2) the phase trajectory error is calculated, and a linear regression line computed through this phase trajectory error. The slope of this regression line is the frequency error of the mobile transmitter relative to the simulator reference. The difference between the regression line and the individual sample points is the phase error of that point.

4) Step 1)to 3) are repeated for 20 bursts, not necessarily contiguous.

5) The SS instructs the MS to its maximum power control level, all other conditions remaining constant. Step1) to 4) are repeated.

6) The SS instructs the MS to its minimum power control level, all other conditions remaining constant. Step1) to 4) are repeated.

7) The MS is hard mounted on a vibration table and vibrated at the frequency/amplitudes specified in annex 1, TC4(3GPP TS 51 010-1 §Annex1.2.4).During the vibration steps 1) to 6) are repeated.

8) The MS is re-positioned on the vibration table in the two orthogonal planes to the plane used in step7). For each of the orthogonal planes step 7) is repeated.

9) Steps 1) to 6) are repeated under extreme test conditions (see annex 1,TC2.2).

Test Result

PASS

GSM900 Middle Channel

Conditions	Frequency Error (Hz)	Phase Error (°)	
		RMS	Peak
normal	3.58	1.26	3.11
TL/VL	4.06	1.07	2.95
TL /VH	6.45	1.18	2.80
TH/VL	-12.91	1.05	2.57
TH/VH	-16.06	1.12	2.82
TN/VN/Vibr.axis X	-9.74	0.92	2.36
TN/VN/Vibr.axis Y	-0.64	1.18	3.01
TN/VN/Vibr.axis Z	-15.73	1.13	2.78

GSM1800 Middle Channel

Conditions	Frequency Error (Hz)	Phase Error(°)	
		RMS	Peak
normal	16.79	1.00	2.71
TL/VL	-1.26	1.03	3.04
TL /VH	6.01	1.07	3.13
TH/VL	-2.39	1.17	2.84
TH/VH	10.50	1.07	3.26
TN/VN/Vibr.axis X	4.02	1.05	3.15
TN/VN/Vibr.axis Y	-1.31	1.12	3.45
TN/VN/Vibr.axis Z	0.18	0.96	2.52

GSM900 Mid Channel normal

Measurement/Instrument Screen									
Control	Phase & Frequency Error						TCH Params		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>3.11° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.26° Pass</div> </div> <div> <div>Frequency</div> <div>3.58 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾		
Change View							Traffic Band		
							PGSM		
							Traffic Channel		
							62		
							MS TX Level		
							5		
							Channel Mode Setup ▾		
							Return		
	Active Cell Connected			Sys Type: GSM					
1 of 2				IntRef	Offset		1 of 2		

GSM900 Mid Channel TL/VL

Measurement/Instrument Screen											
Control		Phase & Frequency Error								TCH Parms	
Phase & Freq. Setup ▾		<div>Peak Phase RMS Phase</div> <div>2.95° Pass 1.07° Pass</div> <div>Frequency</div> <div>4.06 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾	
Change View										Traffic Band	
										PGSM	
										Traffic Channel	
										62	
										HS TX Level	
										5	
										Channel Mode Setup ▾	
										Return	
				Active Cell Connected				Sys Type: GSM			
1 of 2						IntRef		Offset			

GSM900 Mid Channel TL/VH

Measurement/Instrument Screen													
Control		Phase & Frequency Error								TCH Parms			
Phase & Freq. Setup ▾		<div>Peak Phase RMS Phase</div> <div>2.80° Pass 1.18° Pass</div> <div>Frequency</div> <div>6.45Hz Pass</div> <div>Continuous</div>								Downlink Traffic Pouer ▾			
Change View										Traffic Band			
										PGSM			
										Traffic Channel			
										62			
										HS TX Level			
										5			
										Channel Mode Setup ▾			
										Return			
				Active Cell Connected				Sys Type: GSM					
1 of 2						IntRef		Offset				1 of 2	

GSM900 Mid Channel TH/VL Measurement/Instrument Screen												
Control		Phase & Frequency Error								TCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase2.57° PassRMS Phase1.05° Pass</div> <div>Frequency-12.91 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Pouer ▾		
										Traffic BandPGSM		
Change View										Traffic Channel62		
										HS TX Level5		
		Channel Mode Setup ▾										
		Return										
1 of 2				Active Cell Connected				Sys Type: GSM				
											1 of 2	

GSM900 Mid Channel TH/VH Measurement/Instrument Screen															
Control		Phase & Frequency Error								TCH Parms					
Phase & Freq. Setup ▾		<div>Peak Phase2.82° PassRMS Phase1.12° Pass</div> <div>Frequency-16.06Hz Pass</div> <div>Continuous</div>								Downlink Traffic Pouer ▾					
										Traffic BandPGSM					
Change View										Traffic Channel62					
										HS TX Level5					
		Channel Mode Setup ▾													
		Return													
1 of 2				Active Cell Connected				Sys Type: GSM							
						IntRef		Offset						1 of 2	

GSM900 Mid Channel normal vibration X axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error								TCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase2.36° PassRMS Phase0.92° Pass</div> <div>Frequency-9.74 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
Change View										Traffic BandPGSM		
										Traffic Channel62		
										HS TX Level5		
										Channel Mode Setup ▾		
										Return		
1 of 2				Active Cell Connected				Sys Type: GSM			1 of 2	
				IntRef		Offset						

GSM900 Mid Channel normal vibration Y axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error								TCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase3.01° PassRMS Phase1.18° Pass</div> <div>Frequency-0.64Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
Change View										Traffic BandPGSM		
										Traffic Channel62		
										HS TX Level5		
										Channel Mode Setup ▾		
										Return		
1 of 2				Active Cell Connected				Sys Type: GSM			1 of 2	
				IntRef		Offset						

GSM900 Mid Channel normal vibration Z axis

Measurement/Instrument Screen													
Control		Phase & Frequency Error								TCH Parms			
Phase & Freq. Setup ▾		<div>Peak Phase2.78° PassRMS Phase1.13° Pass</div> <div>Frequency-15.73 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾			
Change View										Traffic BandPGSM			
										Traffic Channel62			
										HS TX Level5			
										Channel Mode Setup ▾			
										Return			
1 of 2				Active Cell Connected				Sys Type: GSM					
						IntRef		Offset				1 of 2	

GSM1800 Mid Channel normal

Measurement/Instrument Screen												
Control		Phase & Frequency Error								TCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase2.71° PassRMS Phase1.00° Pass</div> <div>Frequency16.79_{Hz} Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
Change View										Traffic BandDCS		
										Traffic Channel699		
										HS TX Level0		
										Channel Mode Setup ▾		
										Return		
1 of 2				Active Cell Connected		Sys Type: GSM						
				IntRef		Offset				1 of 2		

GSM1800 Mid Channel TL/VH

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GSM1800 Mid Channel TH/VL

Measurement/Instrument Screen									
Control	Phase & Frequency Error						TCH Params		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.84° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.17° Pass</div> </div> <div> <div>Frequency</div> <div>-2.39 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾		
Change View							Traffic Band		
							DCS		
							Traffic Channel		
							699		
							HS TX Level		
							0		
							Channel Mode Setup ▾		
							Return		
				Active Cell Connected			Sys Type: GSM		
1 of 2				IntRef	Offset				1 of 2

GSM1800 Mid Channel TH/VH

Measurement/Instrument Screen									
Control	Phase & Frequency Error						TCH Params		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>3.26° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.07° Pass</div> </div> <div> <div>Frequency</div> <div>10.50 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾		
Change View							Traffic Band		
							DCS		
							Traffic Channel		
							699		
							HS TX Level		
							0		
							Channel Mode Setup ▾		
							Return		
				Active Cell Connected			Sys Type: GSM		
1 of 2				IntRef	Offset				1 of 2

GSM1800 Mid Channel normal vibration X axis

Measurement/Instrument Screen									
Control	Phase & Frequency Error							TCH Parms	
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>3.15° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.05° Pass</div> </div> <div> <div>Frequency</div> <div>4.02 Hz Pass</div> </div> <div>Continuous</div>							Downlink Traffic Power ▾	
Change View								Traffic Band	
								DCS	
								Traffic Channel	
								699	
								HS TX Level	
								0	
								Channel Mode Setup ▾	
								Return	
				Active Cell Connected			Sys Type: GSM		
1 of 2				IntRef	Offset				1 of 2

GSM1800 Mid Channel normal vibration Y axis

Measurement/Instrument Screen									
Control	Phase & Frequency Error							TCH Parms	
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>3.45° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.12° Pass</div> </div> <div> <div>Frequency</div> <div>-1.31 Hz Pass</div> </div> <div>Continuous</div>							Downlink Traffic Power ▾	
Change View								Traffic Band	
								DCS	
								Traffic Channel	
								699	
								HS TX Level	
								0	
								Channel Mode Setup ▾	
								Return	
				Active Cell Connected			Sys Type: GSM		
1 of 2				IntRef	Offset				1 of 2

GSM1800 Mid Channel normal vibration Z axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error								TCH Params		
Phase & Freq. Setup ▾		<div>Peak Phase RMS Phase</div> <div>2.52° Pass 0.96° Pass</div> <div>Frequency</div> <div>0.18 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Pouer ▾		
										Traffic Band		
Change View										DCS		
										Traffic Channel		
		699										
		MS TX Level										
		0										
										Channel Mode Setup ▾		
										Return		
1 of 2				Active Cell Connected				Sys Type: GSM				
				IntRef		Offset						1 of 2

4.2. Transmitter-Frequency error under multipath and interference conditions

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.2

Limits

According to clause 13.2 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1,13.2.2

1. The MS carrier frequency error for each burst shall be accurate to within 0.1ppm(0.2ppm for GSM 400), or 0.1ppm(0.2ppm for GSM 400) compared to signals received from the BS for signal levels down to 3dB below the reference sensitivity level.
2. The MS carrier frequency error for each burst shall be accurate to within 0.1ppm(0.2ppm for GSM 400), or 0.1ppm(0.2ppm for GSM 400) compared to signals received from the BS for 3dB less carrier to interference ratio than the reference ratios(3GPP TS 05.10, sub-clauses 6 and 6.1).

Table 4-9a: Requirements for frequency error under multipath, Doppler shift and interference conditions

T-GSM 810, GSM 850 and GSM 900		DCS 1 800		PCS 1 900	
Propagation condition	Permitted frequency error	Propagation condition	Permitted frequency error	Propagation condition	Permitted frequency error
RA250	±300 Hz	RA130	±400 Hz	RA130	±420 Hz
HT100	±180 Hz	HT100	±350 Hz	HT100	±370 Hz
TU50	±160 Hz	TU50	±260 Hz	TU50	±280 Hz
TU3	±230 Hz	TU1,5	±320 Hz	TU1,5	±330 Hz

Table 4-9b: Requirements for frequency error under multipath, Doppler shift and interference conditions

GSM 450		GSM 480		GSM 700	
Propagation condition	Permitted frequency error	Propagation condition	Permitted frequency error	Propagation condition	Permitted frequency error
RA500	±300 Hz	RA500	±300 Hz	RA 300	±300 Hz
HT200	±180 Hz	HT200	±180 Hz	HT 120	±180 Hz
TU100	±160 Hz	TU100	±160 Hz	TU 60	±160 Hz
TU6	±230 Hz	TU6	±230 Hz	TU 3.6	±230 Hz

NOTE: The frequency error, with reference to the SS carrier frequency as measured in repeats of step 5), for each measured burst shall be less than the values shown in Table 4-9a and Table 4-9b.

Test procedure

- 1) The level of the serving cell BCCH is set to 10dB above the reference sensitivity level() and the fading function set to RA. The SS waits 30s for the MS to stabilize to these conditions. The SS is set up to capture the first burst transmitted by the MS during call establishment. A call is initiated by the SS on a channel in mid ARFCN range as described for the generic call set up procedure but to a TCH at level 10dB above the reference sensitivity level() and fading function set to RA.
- 2) The SS calculates the frequency accuracy of the captured as described in test 13.1.
- 3) The SS sets the serving cell BCCH and TCH to the reference sensitivity level() applicable to the type of MS, still with fading function set to RA and then waits 30s for the MS to stabilize to these conditions..
- 4) The SS shall capture subsequent bursts from the traffic channel in the manner described in test 13.1.
- 5) The SS calculates the frequency accuracy of the captured burst as described in 13.1.
- 6) Steps 4) and 5) are repeated for 5 traffic channel bursts spaced over a period of not less than 20s.
- 7) The initial conditions are established again and steps 1) to 6) are repeated but with fading function set to HT100(HT200 for GSM400, HT120 for GSM 700).

8) The initial conditions are established again and steps 1) to 6) are repeated but with fading function set to TU50(TU100 for GSM400, TU60 for GSM 700).

9) The initial conditions are established again and steps 1) and 2) are repeated but with the following differences:

- the levels of the BCCH and TCH are set to 18dB above reference sensitivity level().
- two further independent interfering signals are sent on the same nominal carrier frequency as the BCCH and TCH and at level 10dB below the level of the TCH and modulated with random data, including the mid-amble.
- the fading function for all channels is set to TU low.

10) The SS waits 100s for the MS to stabilize to these conditions.

11) Repeat steps 4) to 6),except that at step 6) the measurement period must be extended to 200s and number of measurements increased to 20.

12) The initial conditions are established again and steps 1) to 11) are repeated for ARFCN in the Low ARFCN range.

13) The initial conditions are established again and steps 1) to 11) are repeated for ARFCN in the High ARFCN range.

14) Repeat step 8) under extreme test conditions(see annex 1, TC2.2).

Test Result

PASS

Please refer to following worst case data

GSM900 Middle Channel Propagation Condition RA250

Conditions	Frequency Error(Hz)	Frequency Error Limit(Hz)	Result
TN/VN	-5.52	± 300	P
TH/VH	7.66	± 300	P
TH/VL	2.59	± 300	P
TL/VH	3.66	± 300	P
TL/VL	7.40	± 300	P

GSM1800 Middle Channel Propagation Condition RA130

Conditions	Frequency Error(Hz)	Frequency Error Limit(Hz)	Result
TN/VN	1.14	± 400	P
TH/VH	-14.85	± 400	P
TH/VL	14.38	± 400	P
TL/VH	-11.35	± 400	P
TL/VL	8.94	± 400	P

GSM900 Middle Channel Normal
Measurement/Instrument Screen

Control	Phase & Frequency Error						TCH Params
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.69° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.19° Pass</div> </div> <div> <div>Frequency</div> <div>-5.52 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾
Change View							Traffic Band
							PGSM
							Traffic Channel
							62
							HS TX Level
							5
							Channel Mode Setup ▾
							Return
	<div>Active Cell Connected</div> <div>Sys Type: GSM</div>						
1 of 2				IntRef	Offset		1 of 2

GSM900 Middle Channel TH/VH

Measurement/Instrument Screen

Control	Phase & Frequency Error						TCH Params
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>1.86° Pass</div> </div> <div> <div>RMS Phase</div> <div>0.81° Pass</div> </div> <div> <div>Frequency</div> <div>7.66 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾
Change View							Traffic Band
							PGSM
							Traffic Channel
							62
							HS TX Level
							5
							Channel Mode Setup ▾
							Return
	<div>Active Cell Connected</div> <div>Sys Type: GSM</div>						
1 of 2				IntRef	Offset		1 of 2

GSM900 Middle Channel TH/VL

Measurement/Instrument Screen													
Control		Phase & Frequency Error								TCH Parms			
Phase & Freq. Setup ▾		<div>Peak Phase 2.93° Pass</div> <div>RMS Phase 1.22° Pass</div> <div>Frequency 2.59 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾			
Change View										Traffic Band			
										PGSM			
										Traffic Channel			
										62			
										HS TX Level			
										5			
										Channel Mode Setup ▾			
										Return			
										1 of 2			
1 of 2						Active Cell Connected		Sys Type: GSM					
						IntRef		Offset					

GSM900 Middle Channel TL/VH

Measurement/Instrument Screen												
Control		Phase & Frequency Error								TCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase3.11° PassRMS Phase0.98° Pass</div> <div>Frequency3.66 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
Change View										Traffic BandPGSM		
										Traffic Channel62		
										HS TX Level5		
										Channel Mode Setup ▾		
										Return		
										1 of 2		
1 of 2				Active Cell Connected		Sys Type: GSM						
				IntRef		Offset						
										1 of 2		

GSM900 Middle Channel TL/VL

Measurement/Instrument Screen									
Control	Phase & Frequency Error						TCH Params		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.17° Pass</div> </div> <div> <div>RMS Phase</div> <div>0.87° Pass</div> </div> <div> <div>Frequency</div> <div>7.40 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾		
Change View							Traffic Band		
							PGSM		
							Traffic Channel		
							62		
							HS TX Level		
							5		
							Channel Mode Setup ▾		
							Return		
				Active Cell Connected			Sys Type: GSM		
1 of 2				IntRef	Offset				1 of 2

GSM1800 Middle Channel Normal

Measurement/Instrument Screen									
Control	Phase & Frequency Error						TCH Params		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.59° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.01° Pass</div> </div> <div> <div>Frequency</div> <div>1.14 Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾		
Change View							Traffic Band		
							DCS		
							Traffic Channel		
							699		
							HS TX Level		
							0		
							Channel Mode Setup ▾		
							Return		
				Active Cell Connected			Sys Type: GSM		
1 of 2				IntRef	Offset				1 of 2

GSM1800 Middle Channel TH/VH
Measurement/Instrument Screen

Measurement/Instrument Screen											
Control		Phase & Frequency Error								TCH Parms	
Phase & Freq. Setup ▾		<div>Peak Phase RMS Phase</div> <div>3.53° Pass 1.05° Pass</div> <div>Frequency</div> <div>-14.85 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾	
Change View										Traffic Band	
										DCS	
										Traffic Channel	
										699	
										HS TX Level	
										0	
										Channel Mode Setup ▾	
										Return	
				Active Cell Connected				Sys Type: GSM			
1 of 2						IntRef		Offset			

GSM1800 Middle Channel TH/VL
Measurement/Instrument Screen

Measurement/Instrument Screen											
Control		Phase & Frequency Error								TCH Parms	
Phase & Freq. Setup ▾		<div>Peak Phase2.87° PassRMS Phase1.05° Pass</div> <div>Frequency14.38 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾	
Change View										Traffic Band	
										DCS	
										Traffic Channel	
										699	
										MS TX Level	
										0	
										Channel Mode Setup ▾	
										Return	
1 of 2				Active Cell Connected				Sys Type: GSM		1 of 2	
				IntRef		Offset					

GSM1800 Middle Channel TL/VH
Measurement/Instrument Screen

Control	Phase & Frequency Error		TCH Params	
Phase & Freq. Setup ▾	Peak Phase 2.72° Pass		RMS Phase 1.12° Pass	
Change View	Frequency -11.35 Hz Pass		Traffic Band DCS	
	Continuous		Traffic Channel 699	
			HS TX Level 0	
			Channel Mode Setup ▾	
			Return	
			Active Cell Connected Sys Type: GSM	
			IntRef Offset	
1 of 2			1 of 2	

GSM1800 Middle Channel TL/VL
Measurement/Instrument Screen

Control	Phase & Frequency Error		TCH Params	
Phase & Freq. Setup ▾	Peak Phase 2.61° Pass		RMS Phase 1.02° Pass	
Change View	Frequency 8.94 Hz Pass		Traffic Band DCS	
	Continuous		Traffic Channel 699	
			HS TX Level 0	
			Channel Mode Setup ▾	
			Return	
			Active Cell Connected Sys Type: GSM	
			IntRef Offset	
1 of 2			1 of 2	

4.3. Frequency error and phase error in GPRS multi-slot configuration

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.4

Limits

According to clause 13.16.1 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1,13.16.1

- 1 Frequency error
For all measured bursts, the frequency error shall be less than $10E-7$.
- 2 Phase error
For all measured bursts, the RMS phase error shall not exceed 5 degrees.
For all measured bursts, each individual phase error shall not exceed 20 degrees.

Test procedure

- 1) For one transmitted burst on the last slot of the multi-slot configuration, the SS captures the signal as a series of phase samples over the period of the burst. These samples are evenly distributed over the duration of the burst with a minimum sample rate of $2/T$, where T is the modulation symbol period. The received phase trajectory is then represented by this array of at least 294 samples.
- 2) The SS then calculates, from the known bit pattern and the formal definition of the modulator contained in 3GPP TS 05.04, the expected phase trajectory.
- 3) From 1) and 2) the phase trajectory error is calculated, and a linear regression line computed through this phase trajectory error. The slope of this regression line is the frequency error of the mobile transmitter relative to the simulator reference. The difference between the regression line and the individual sample points is the phase error of that point.
- 4) Step 1) to 3) are repeated for 20 bursts, not necessarily contiguous.
- 5) The SS instructs the MS to its maximum power control level by setting the power control parameter ALPHA to 0 and GAMMA for each timeslot to the desired power level in Packet Uplink Assignment message, all other conditions remaining constant. Step1) to 4) are repeated.
- 6) The SS instructs the MS to its minimum power control level, all other conditions remaining constant. Step1) to 4) are repeated.
- 7) The MS is hard mounted on a vibration table and vibrated at the frequency/amplitudes specified in annex 1, TC4(3GPP TS 51 010-1 §Annex1.2.4).During the vibration steps 1) to 6) are repeated.
- 8) The MS is re-positioned on the vibration table in the two orthogonal planes to the plane used in step7). For each of the orthogonal planes step 7) is repeated.
- 9) Steps 1) to 6) are repeated under extreme test conditions(see annex 1,TC2.2).

Test Result

PASS

Please refer to following data plots

Conditions	Frequency Error (Hz)	Phase Error (°)	
		RMS	Peak
Normal	15.19	1.03	2.52
TH/VH	18.32	1.18	3.87
TH/VL	7.48	0.95	2.87
TL/VH	1.57	1.13	3.18
TL/VL	0.71	0.97	2.64
TN/VN/Vibr.axis X	-9.91	1.30	2.95
TN/VN/Vibr.axis Y	-4.95	1.09	3.10
TN/VN/Vibr.axis Z	-9.07	0.95	2.71

GPRS1800 Middle Channel

Conditions	Frequency Error (Hz)	Phase Error (°)	
		RMS	Peak
Normal	-12.28	1.01	2.84
TH/VH	20.50	1.11	2.84
TH/VL	-4.67	0.88	2.44
TL /VH	0.39	1.21	3.62
TL/VL	7.27	1.02	2.54
TN/VN/Vibr.axis X	16.55	1.17	4.00
TN/VN/Vibr.axis Y	3.42	1.23	3.52
TN/VN/Vibr.axis Z	4.60	1.25	3.54

GPRS900 Mid Channel Normal

Measurement/Instrument Screen									
Control	Phase & Frequency Error						PDCH Parms		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.52° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.03° Pass</div> </div> <div> <div>Frequency</div> <div>15.19Hz Pass</div> </div> <div>Continuous</div>						Downlink Traffic Power ▾		
Change View							Traffic Band		
							PGSN		
							Traffic Channel		
							62		
							HS TX Level ▾		
							Coding Scheme		
							CS-4		
							Return		
1 of 2			Active Cell Transferring		Sys Type: GPRS				
			IntRef	Offset					
	1 of 2								

GPRS900 Mid Channel TH/VH

Measurement/Instrument Screen													
Control		Phase & Frequency Error								PDCH Parms			
Phase & Freq. Setup ▾		<div>Peak Phase RMS Phase</div> <div>3.87° Pass 1.18° Pass</div> <div>Frequency</div> <div>18.32 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾			
Change View										Traffic Band			
										PGSM			
										Traffic Channel			
										62			
										HS TX Level ▾			
										Coding Scheme			
										CS-4			
										Return			
				Active Cell Transferring				Sys Type: GPRS					
1 of 2						IntRef		Offset				1 of 2	

GPRS900 Mid Channel TH/VL

Measurement/Instrument Screen												
Control		Phase & Frequency Error								PDCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase2.87° PassRMS Phase0.95° Pass</div> <div>Frequency7.48 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
Change View										Traffic BandPGSM		
										Traffic Channel62		
										HS TX Level ▾		
										Coding SchemeCS-4		
										Return		
1 of 2				Active Cell Transferring				Sys Type: GPRS			1 of 2	
				IntRef		Offset						

GPRS900 Mid Channel TL/VH

Measurement/Instrument Screen										
Control	Phase & Frequency Error							PDCH Parms		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>3.18° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.13° Pass</div> </div> <div> <div>Frequency</div> <div>1.57 Hz Pass</div> </div> <div>Continuous</div>							Downlink Traffic Power ▾		
Change View								Traffic Band		
								PGSN		
								Traffic Channel		
								62		
								HS TX Level ▾		
								Coding Scheme		
								CS-4		
								Return		
				Active Cell Transferring			Sys Type: GPRS			
1 of 2				IntRef	Offset				1 of 2	

GPRS900 Mid Channel TL/VL

Measurement/Instrument Screen										
Control	Phase & Frequency Error							PDCH Parms		
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.64° Pass</div> </div> <div> <div>RMS Phase</div> <div>0.97° Pass</div> </div> <div> <div>Frequency</div> <div>0.71 Hz Pass</div> </div> <div>Continuous</div>							Downlink Traffic Power ▾		
Change View								Traffic Band		
								PGSN		
								Traffic Channel		
								62		
								HS TX Level ▾		
								Coding Scheme		
								CS-4		
								Return		
				Active Cell Transferring			Sys Type: GPRS			
1 of 2				IntRef	Offset				1 of 2	

GPRS900 Mid Channel Normal vibration Y axis									
Measurement/Instrument Screen									
Control		Phase & Frequency Error						PDTCB Parms	
Phase & Freq. Setup ▾		<div> <div>Peak Phase</div> <div>3.10° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.09° Pass</div> </div> <div> <div>Frequency</div> <div>-4.95 Hz Pass</div> </div> <div>Continuous</div>						Dounlink Traffic Power ▾	
Change View								Traffic Band	
								PGSN	
								Traffic Channel	
								62	
								HS TX Level ▾	
								Coding Scheme	
								CS-4	
								Return	
		Active Cell Transferring				Sys Type: GPRS			
1 of 2		IntRef Offset						1 of 2	

GPRS900 Mid Channel Normal vibration Z axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error								PDCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase2.71° PassRMS Phase0.95° Pass</div> <div>Frequency-9.07 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
Change View										Traffic Band		
										PGSM		
										Traffic Channel		
										62		
										HS TX Level ▾		
										Coding Scheme		
										CS-4		
										Return		
				Active Cell Transferring				Sys Type: GPRS				
1 of 2					IntRef	Offset					1 of 2	

GPRS1800 Mid Channel Normal

Measurement/Instrument Screen											
Control		Phase & Frequency Error							PDCH Parms		
Phase & Freq. Setup ▾		<div>Peak Phase2.84° PassRMS Phase1.01° Pass</div> <div>Frequency-12.28 Hz Pass</div> <div>Continuous</div>							Downlink Traffic Power ▾		
Change View									Traffic Band		
									DCS		
									Traffic Channel		
									699		
									HS TX Level ▾		
									Coding Scheme		
									CS-4		
									Return		
				Active Cell Transferring			Sys Type: GPRS				
1 of 2				IntRef		Offset				1 of 2	

GPRS1800 Mid Channel TH/VH

Measurement/Instrument Screen									
Control	Phase & Frequency Error							PDCH Parms	
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.84° Pass</div> </div> <div> <div>RMS Phase</div> <div>1.11° Pass</div> </div> <div> <div>Frequency</div> <div>20.50 Hz Pass</div> </div> <div>Continuous</div>							Downlink Traffic Power ▾	
Change View								Traffic Band	
								DCS	
								Traffic Channel	
	<div>Active Cell Transferring</div> <div>Sys Type: GPRS</div>							699	
								HS TX Level ▾	
								Coding Scheme	
								CS-4	
								Return	
1 of 2				IntRef	Offset				1 of 2

GPRS1800 Mid Channel TH/VL

Measurement/Instrument Screen									
Control	Phase & Frequency Error							PDCH Parms	
Phase & Freq. Setup ▾	<div> <div>Peak Phase</div> <div>2.44° Pass</div> </div> <div> <div>RMS Phase</div> <div>0.88° Pass</div> </div> <div> <div>Frequency</div> <div>-4.67 Hz Pass</div> </div> <div>Continuous</div>							Downlink Traffic Power ▾	
Change View								Traffic Band	
								DCS	
								Traffic Channel	
	<div>Active Cell Transferring</div> <div>Sys Type: GPRS</div>							699	
								HS TX Level ▾	
								Coding Scheme	
								CS-4	
								Return	
1 of 2				IntRef	Offset				1 of 2

GPRS1800 Mid Channel TL/VH

Measurement/Instrument Screen													
Control		Phase & Frequency Error								PDCH Parms			
Phase & Freq. Setup ▾		<div>Peak Phase 3.62° Pass</div> <div>RMS Phase 1.21° Pass</div> <div>Frequency 0.39 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾			
Change View										Traffic Band			
										DCS			
										Traffic Channel			
										699			
										HS TX Level ▾			
										Coding Scheme			
										CS-4			
										Return			
				Active Cell Transferring				Sys Type: GPRS					
1 of 2						IntRef		Offset				1 of 2	

GPRS1800 Mid Channel TL/VL

Measurement/Instrument Screen													
Control		Phase & Frequency Error								PDCH Parms			
Phase & Freq. Setup ▾		<div>Peak Phase2.54° PassRMS Phase1.02° Pass</div> <div>Frequency7.27 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾			
Change View										Traffic Band			
										DCS			
										Traffic Channel			
										699			
										HS TX Level ▾			
										Coding Scheme			
										CS-4			
										Return			
				Active Cell Transferring				Sys Type: GPRS					
1 of 2						IntRef		Offset				1 of 2	

GPRS1800 Mid Channel Normal vibration X axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error									PDCH Params	
Phase & Freq. Setup ▾		<div>Peak Phase 4.00° Pass</div> <div>RMS Phase 1.17° Pass</div> <div>Frequency 16.55 Hz Pass</div> <div>Continuous</div>									Downlink Traffic Power ▾	
											Traffic Band	
Change View											DCS	
											Traffic Channel	
											699	
											MS TX Level ▾	
											Coding Scheme	
											CS-4	
		Return										
1 of 2		<div>Active Cell Transferring</div> <div>Sys Type: GPRS</div>						1 of 2				

GPRS1800 Mid Channel Normal vibration Y axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error								PDCH Params		
Phase & Freq. Setup ▾		<div>Peak Phase3.52° PassRMS Phase1.23° Pass</div> <div>Frequency3.42 Hz Pass</div> <div>Continuous</div>								Downlink Traffic Power ▾		
										Traffic Band		
Change View										DCS		
										Traffic Channel		
										699		
										MS TX Level ▾		
										Coding Scheme		
										CS-4		
		Return										
1 of 2		<div>Active Cell Transferring</div> <div>Sys Type: GPRS</div>						1 of 2				

GPRS1800 Mid Channel Normal vibration Z axis

Measurement/Instrument Screen												
Control		Phase & Frequency Error									PDCH Params	
Phase & Freq. Setup ▾		<div>Peak Phase RMS Phase</div> <div>3.54° Pass 1.25° Pass</div> <div>Frequency</div> <div>4.60 Hz Pass</div> <div>Continuous</div>									Downlink Traffic Power ▾	
Change View											Traffic Band	
											DCS	
											Traffic Channel	
											699	
											MS TX Level ▾	
											Coding Scheme	
											CS-4	
											Return	
1 of 2				Active Cell Transferring				Sys Type: GPRS			1 of 2	
					IntRef	Offset						

4.4. Transmitter output power and burst timing

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.5

Limits

According to clause 13.3 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1,13.3.5

Table 4-10: Bands other than DCS 1800 and PCS 1900 transmitter output power for different power classes

Power class				Power control level (note2)	Transmitter output power dBm	Tolerances	
2	3	4	5			normal	extreme
.				2	39	±2 dB	±2,5 dB
.	.			3	37	±3 dB (note1)	±4 dB (note1)
.	.			4	35	±3 dB	±4 dB
.	.	.		5	33	±3 dB (note1)	±4 dB (note1)
.	.	.		6	31	±3 dB	±4 dB
.	.	.	.	7	29	±3 dB (note1)	±4 dB (note1)
.	.	.	.	8	27	±3 dB	±4 dB
.	.	.	.	9	25	±3 dB	±4 dB
.	.	.	.	10	23	±3 dB	±4 dB
.	.	.	.	11	21	±3 dB	±4 dB
.	.	.	.	12	19	±3 dB	±4 dB
.	.	.	.	13	17	±3 dB	±4 dB
.	.	.	.	14	15	±3 dB	±4 dB
.	.	.	.	15	13	±3 dB	±4 dB
.	.	.	.	16	11	±5 dB	±6 dB
.	.	.	.	17	9	±5 dB	±6 dB
.	.	.	.	18	7	±5 dB	±6 dB
.	.	.	.	19	5	±5 dB	±6 dB
NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.							
NOTE2: There is no requirement to test power control levels 20-31							

Table 4-11: DCS 1800 transmitter output power for different power classes

Power class			Power control level (note2)	Transmitter output power	Tolerances	
1	2	3		dBm	normal	extreme
		.	29	36	±2,0 dB	±2,5 dB
		.	30	34	±3,0 dB	±4,0 dB
		.	31	32	±3,0 dB	±4,0 dB
.	.	.	0	30	±3,0 dB (note1)	±4 dB (note1)
.	.	.	1	28	±3 dB	±4 dB
.	.	.	2	26	±3 dB	±4 dB
.	.	.	3	24	±3 dB (note1)	±4 dB (note1)
.	.	.	4	22	±3 dB	±4 dB
.	.	.	5	20	±3 dB	±4 dB
.	.	.	6	18	±3 dB	±4 dB
.	.	.	7	16	±3 dB	±4 dB
.	.	.	8	14	±3 dB	±4 dB
.	.	.	9	12	±4 dB	±5 dB
.	.	.	10	10	±4 dB	±5 dB
.	.	.	11	8	±4 dB	±5 dB
.	.	.	12	6	±4 dB	±5 dB
.	.	.	13	4	±4 dB	±5 dB
.	.	.	14	2	±5 dB	±6 dB
.	.	.	15	0	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

NOTE2: There is no requirement to test power control levels 16-28

Table 4-12: PCS 1900 transmitter output power for different power classes

Power class			Power control level (note2)	Transmitter output power	Tolerances	
1	2	3		dBm	Normal	Extreme
		.	30	33	±2,0 dB	±2,5 dB
		.	31	32	±2,0 dB	±2,5 dB
.	.	.	0	30	±3,0 dB (note1)	±4 dB (note1)
.	.	.	1	28	±3 dB	±4 dB
.	.	.	2	26	±3 dB	±4 dB
.	.	.	3	24	±3 dB (note1)	±4 dB (note1)
.	.	.	4	22	±3 dB	±4 dB
.	.	.	5	20	±3 dB	±4 dB
.	.	.	6	18	±3 dB	±4 dB
.	.	.	7	16	±3 dB	±4 dB
.	.	.	8	14	±3 dB	±4 dB
.	.	.	9	12	±4 dB	±5 dB
.	.	.	10	10	±4 dB	±5 dB
.	.	.	11	8	±4 dB	±5 dB
.	.	.	12	6	±4 dB	±5 dB
.	.	.	13	4	±4 dB	±5 dB
.	.	.	14	2	±5 dB	±6 dB
.	.	.	15	0	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

NOTE2: There is no requirement to test power control levels 16-29

Table 4-13: Lowest measurement limit for power/time template

	lowest limit
Bands other than DCS 1800 and PCS 1900	-59 dBc or -54 dBm whichever is the highest, except for the timeslot preceding the active slot, for which the allowed level is equal to -59 dBc or -36 dBm, whichever is the highest
DCS 1 800, PCS 1 900	-48 dBc or -48 dBm whichever is the highest

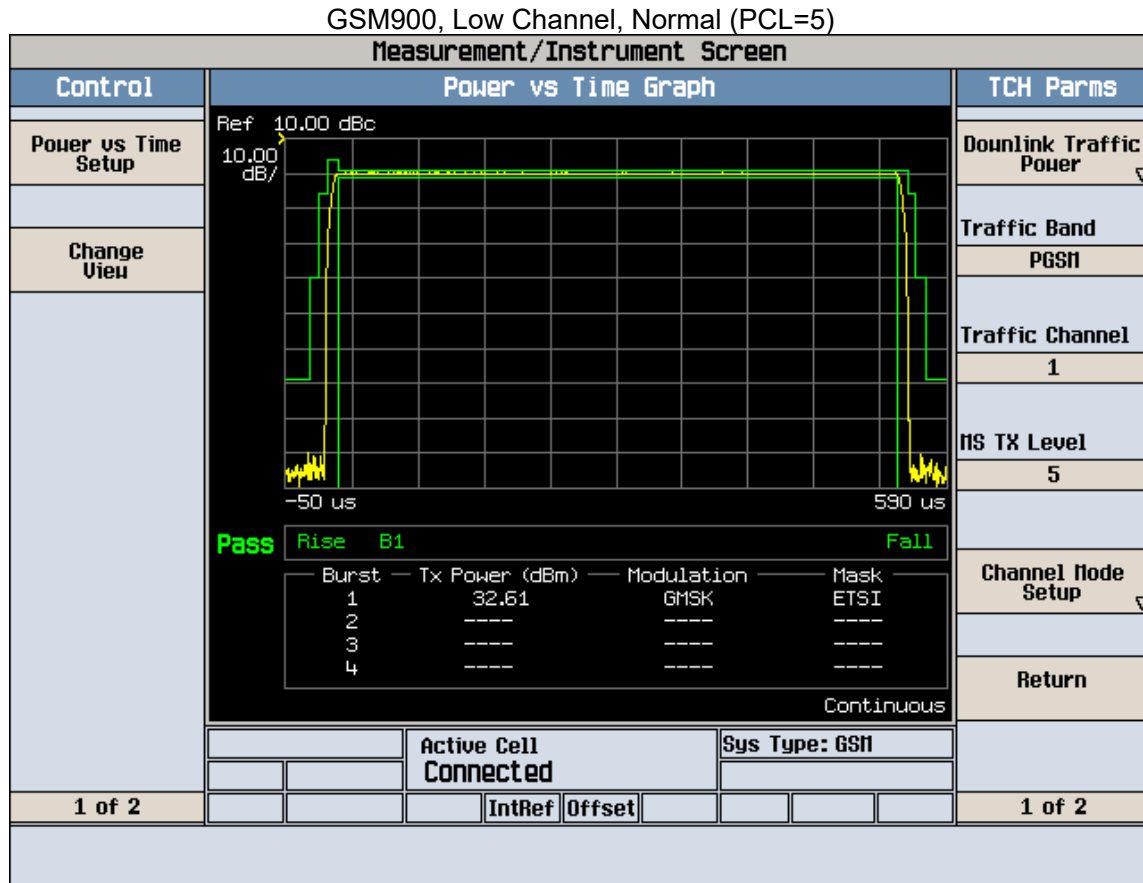
Test procedure

- 1) Measurement of normal burst transmitter output power(see §13.3.4.1.2).
- 2) Measurement of normal burst timing delay..
- 3) Measurement of normal burst power/time relationship.
- 4) Step 1)to 3) are repeated with the MS commanded to operate on each of the nominal output power levels supported by the MS,(see table 4-10,4-11and 4-12) and in step 1) on one nominal output level higher than supported by the MS.
- 5) The SS commands the MS to the maximum power control level supported by the MS and step 1) to 3) are repeated for ARFCN in the Low and High ranges.
- 6) Measurement of access burst transmitter output power.
- 7) Measurement of access burst timing delay.
- 8) Measurement of access burst power/time relationship.

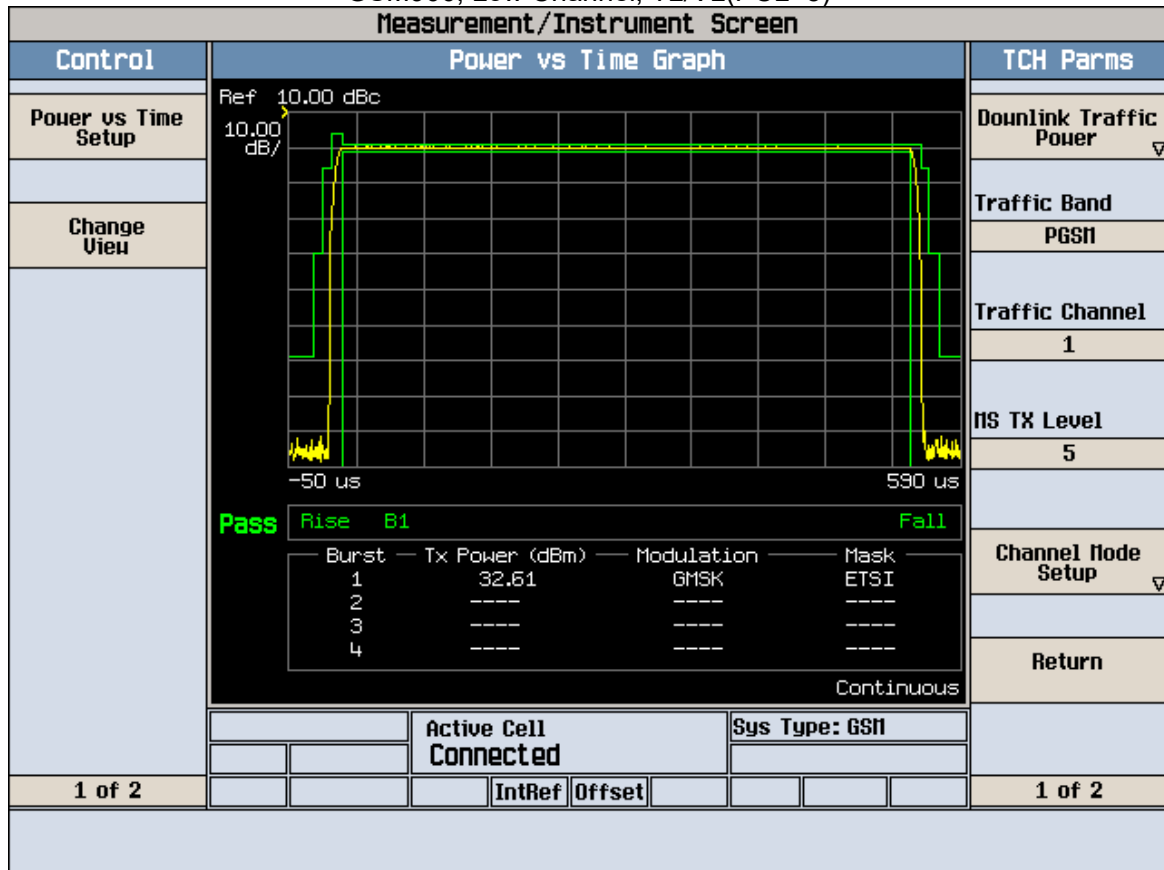
Test Result

PASS

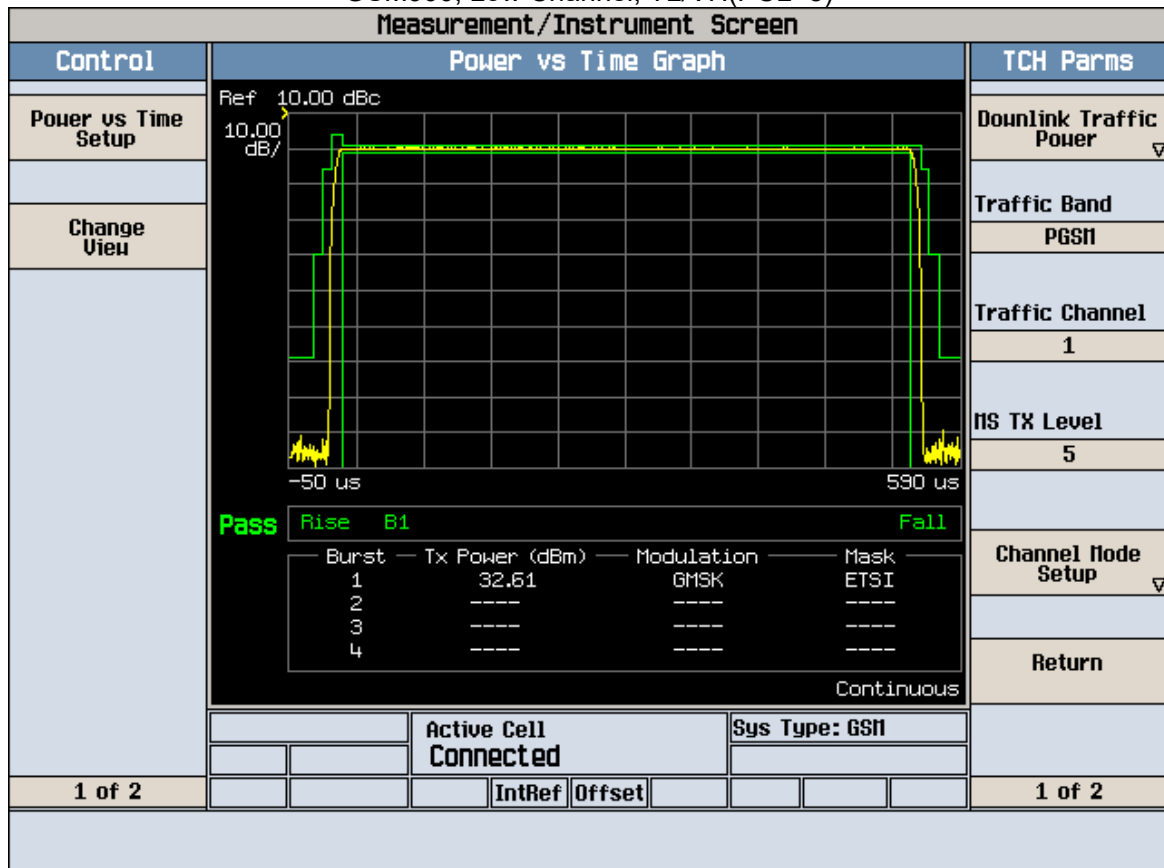
Please refer to following data plots



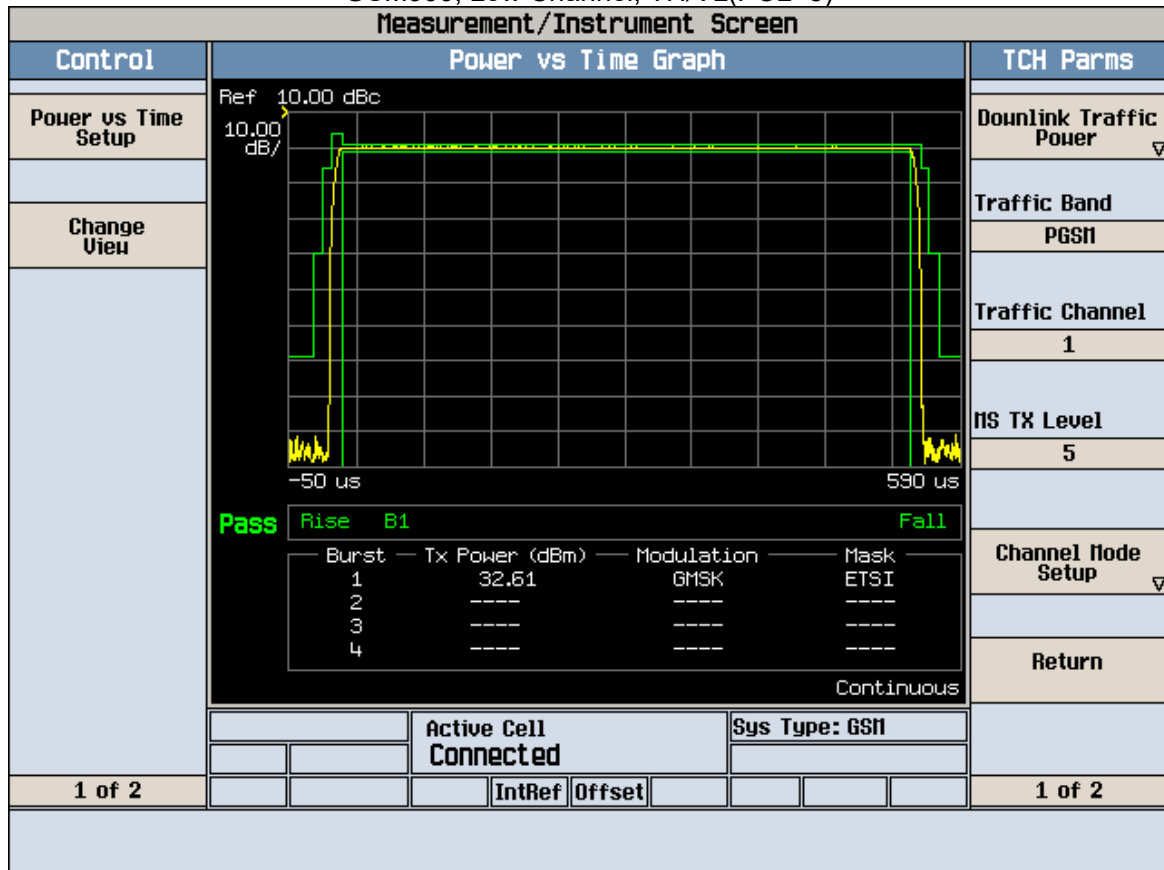
GSM900, Low Channel, TL/VL(PCL=5)



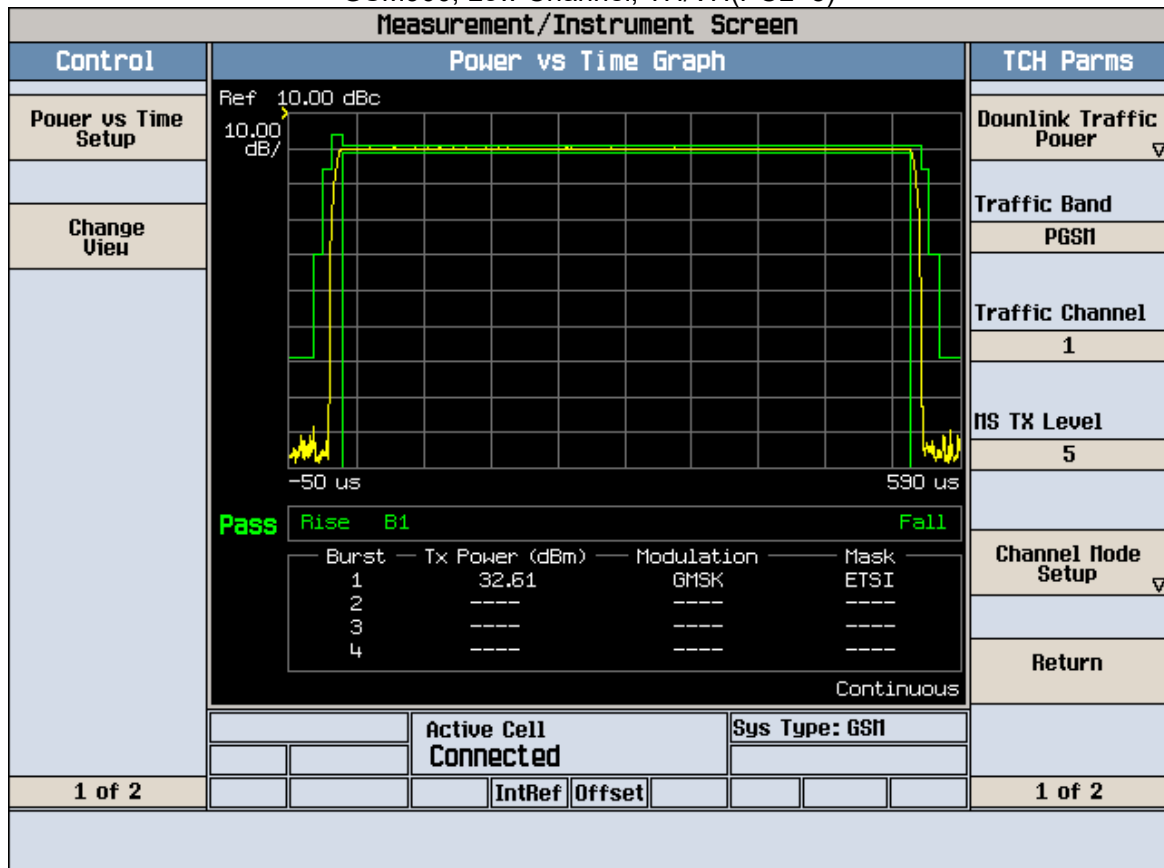
GSM900, Low Channel, TL/VH(PCL=5)



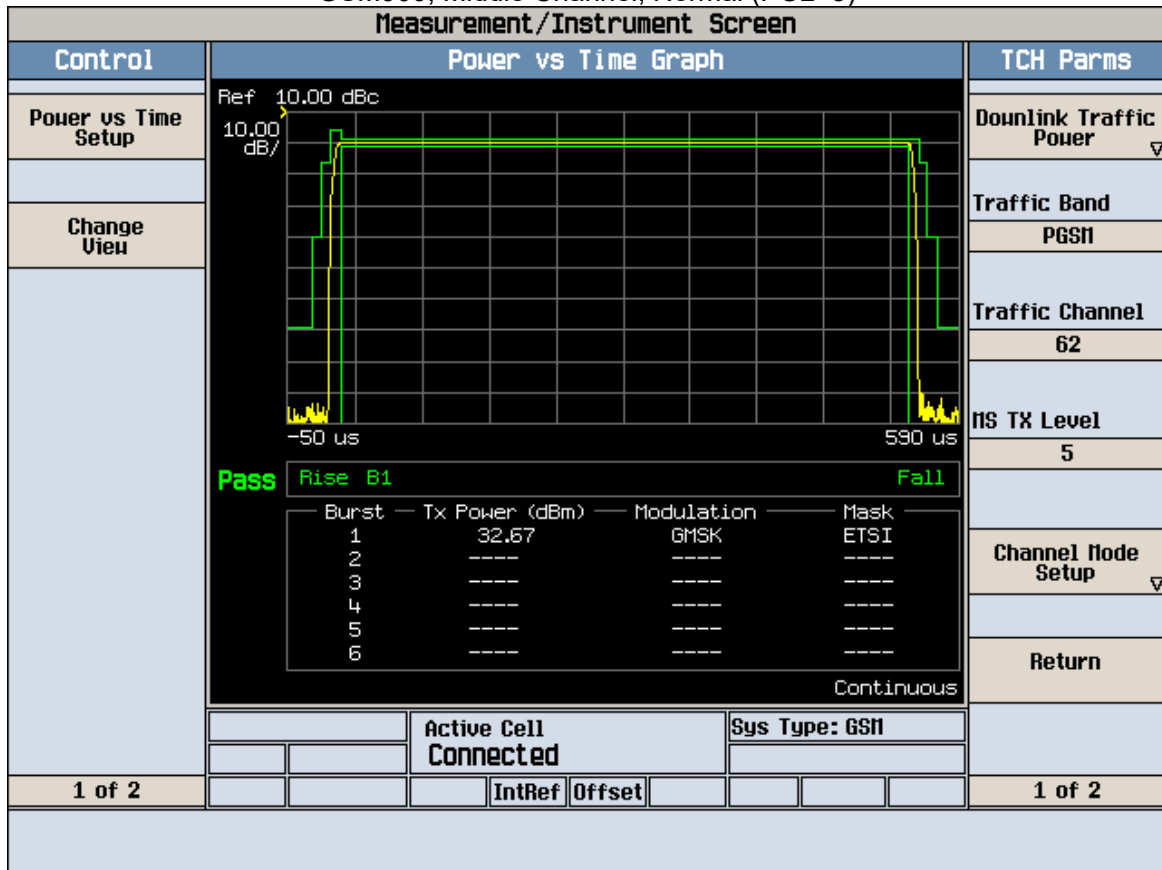
GSM900, Low Channel, TH/VL(PCL=5)



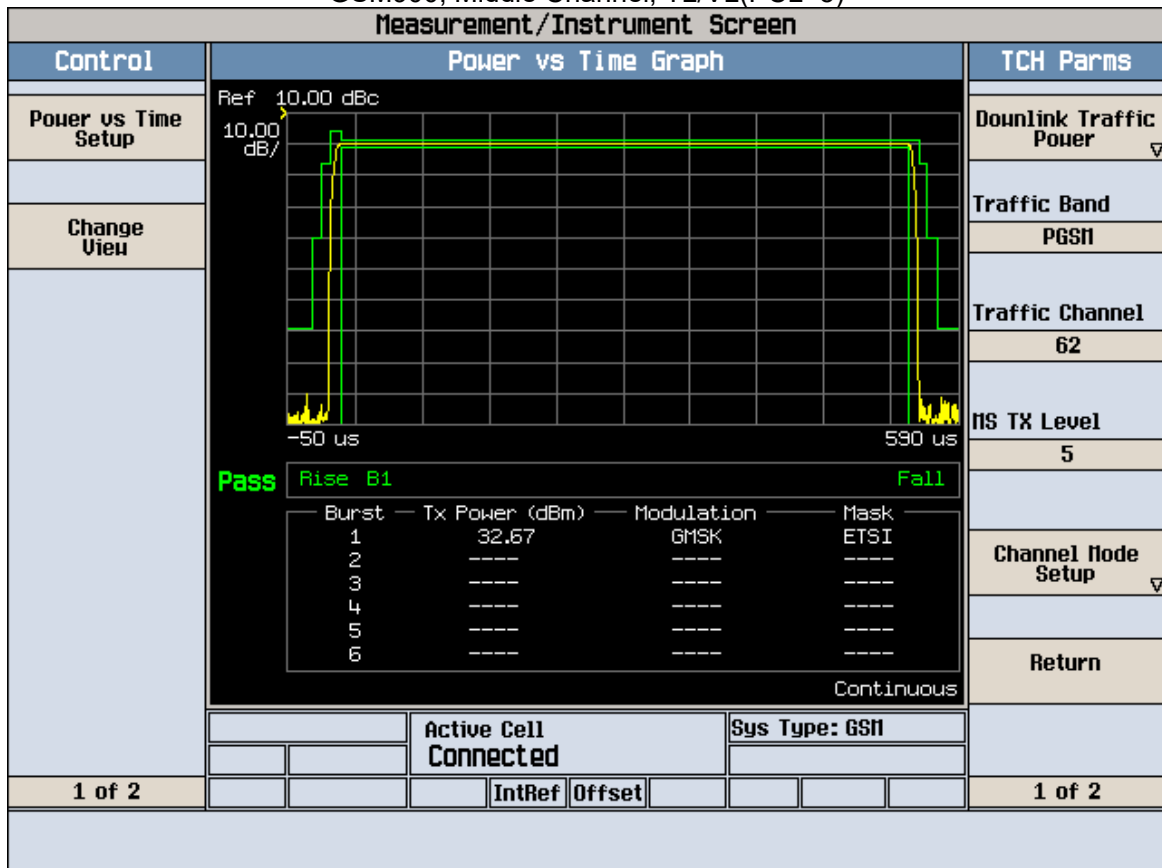
GSM900, Low Channel, TH/VH(PCL=5)



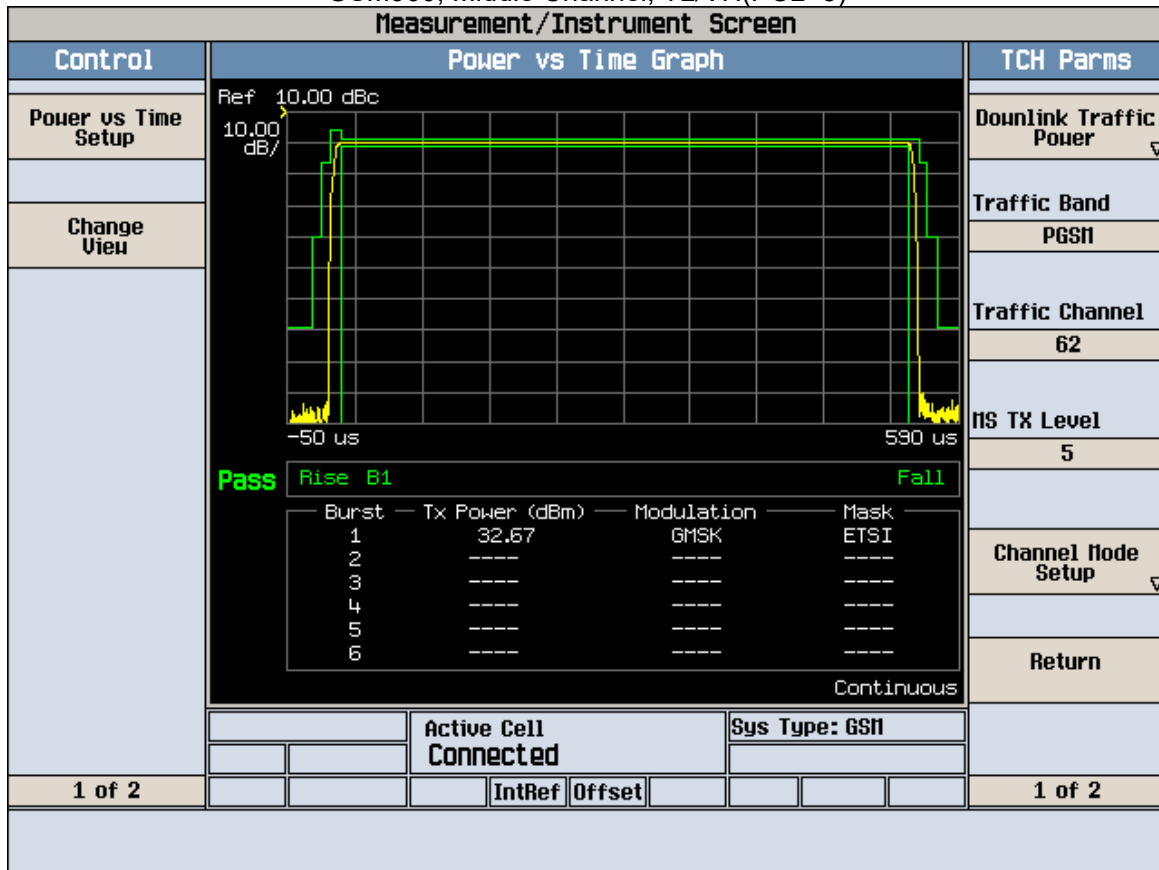
GSM900, Middle Channel, Normal (PCL=5)



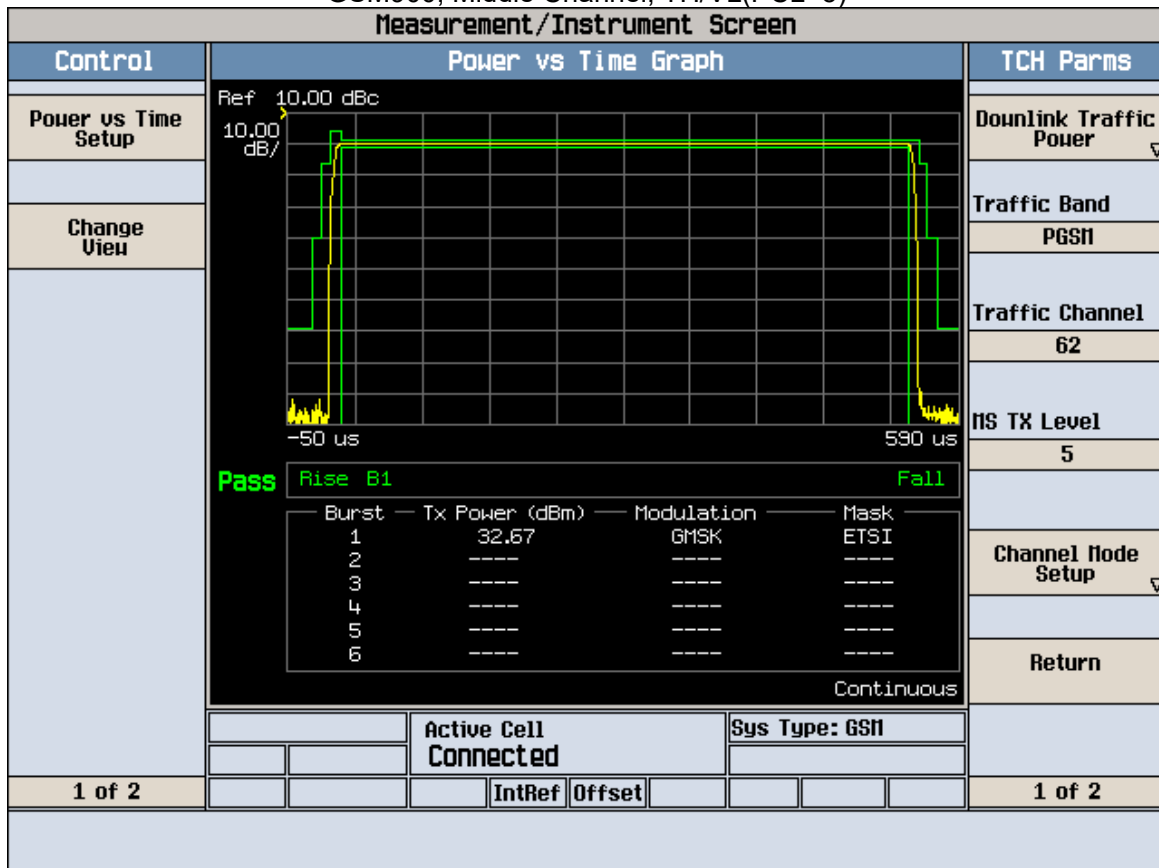
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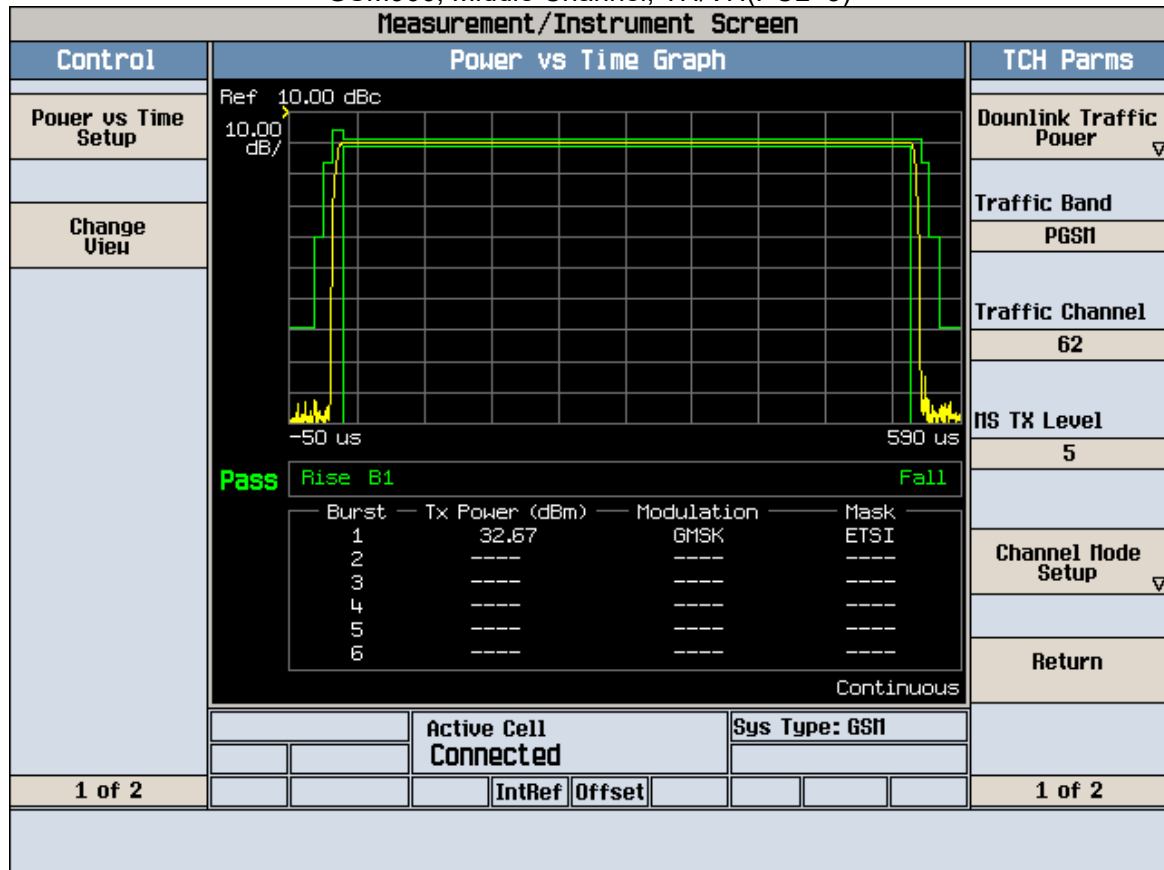
GSM900, Middle Channel, TL/VH(PCL=5)



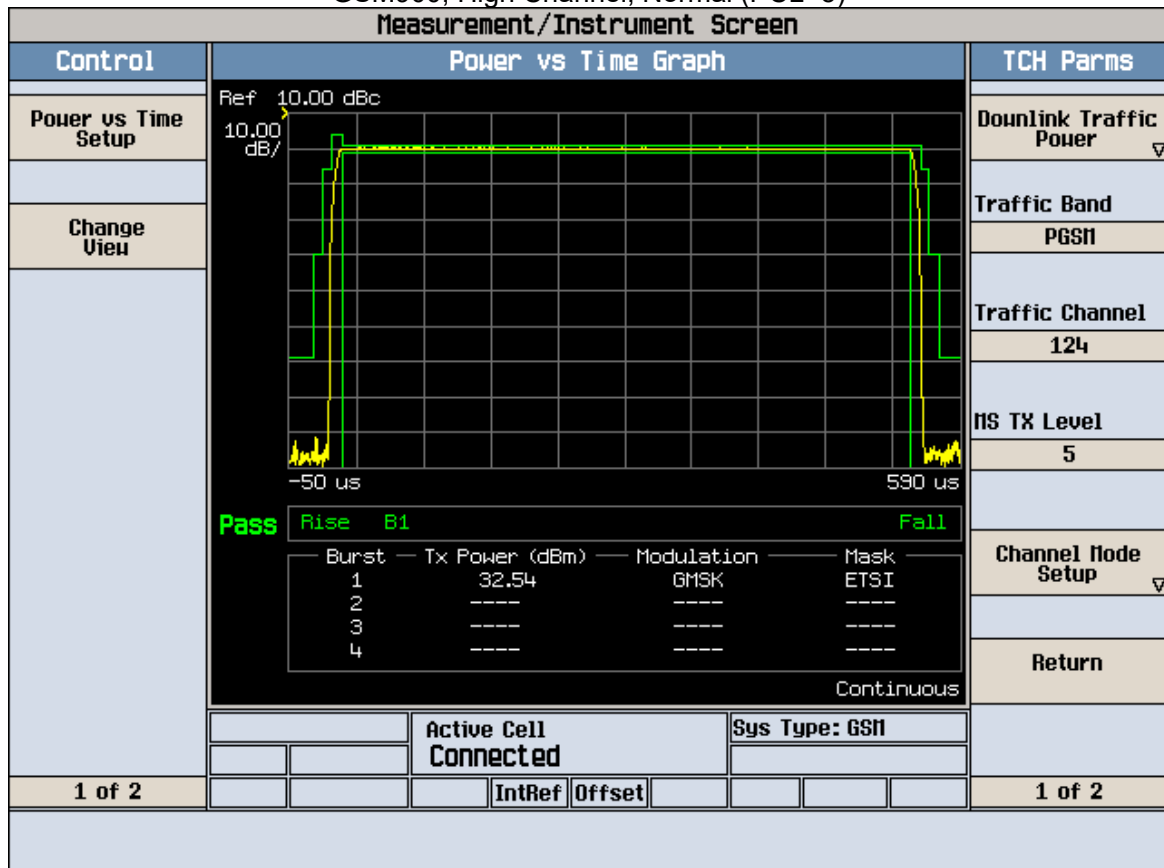
GSM900, Middle Channel, TH/VL(PCL=5)



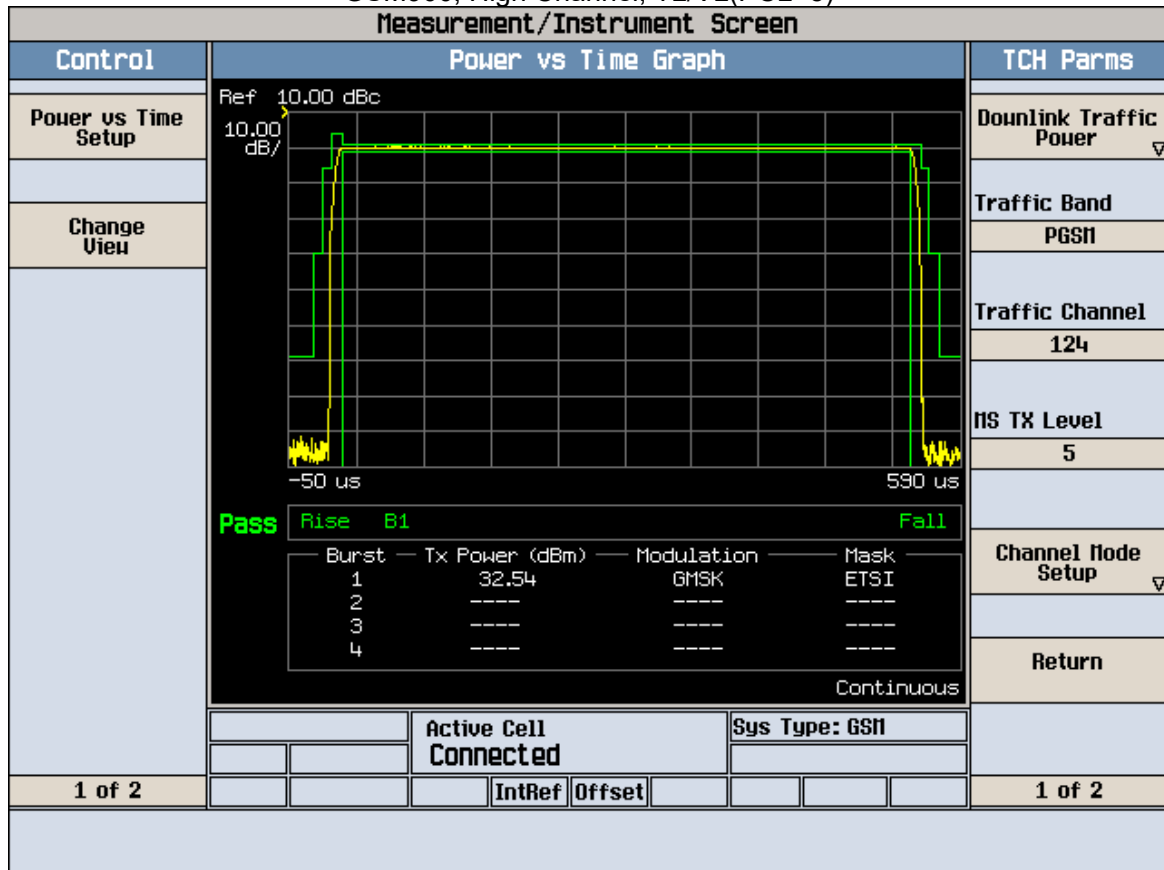
GSM900, Middle Channel, TH/VH(PCL=5)



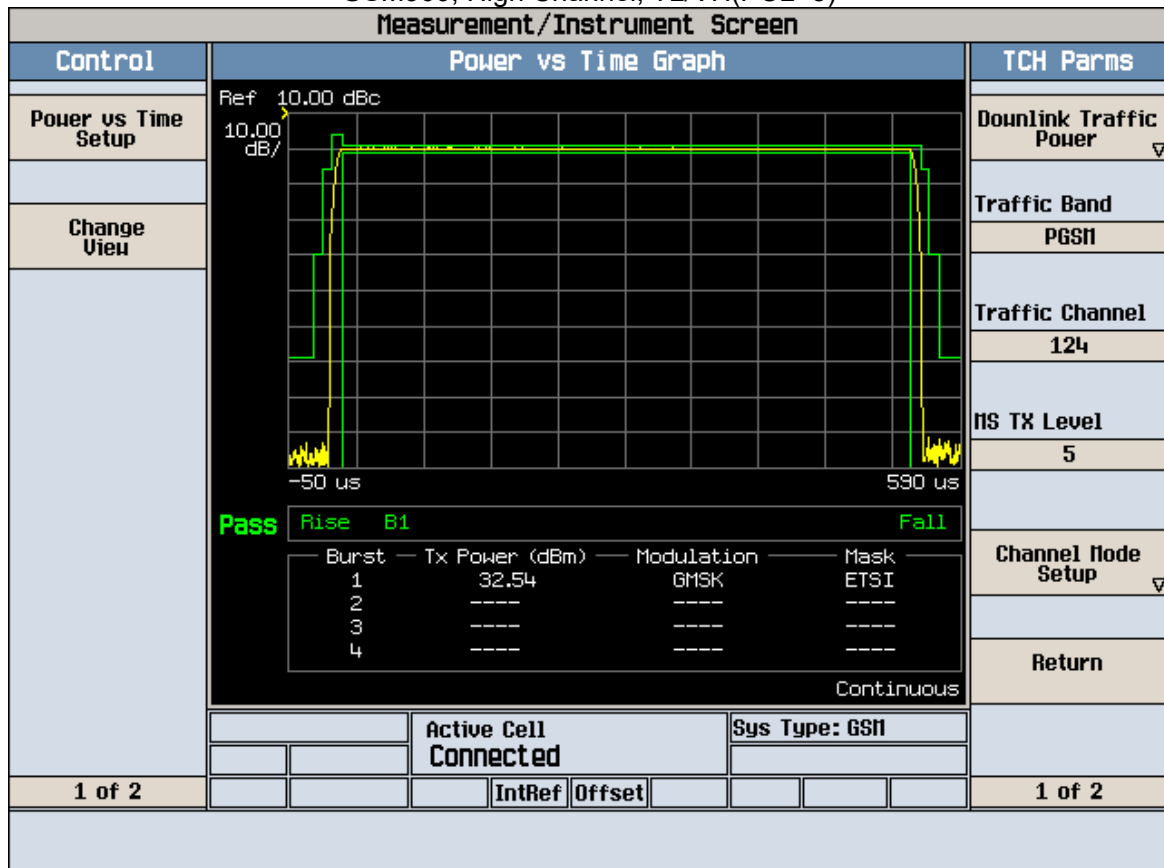
GSM900, High Channel, Normal (PCL=5)



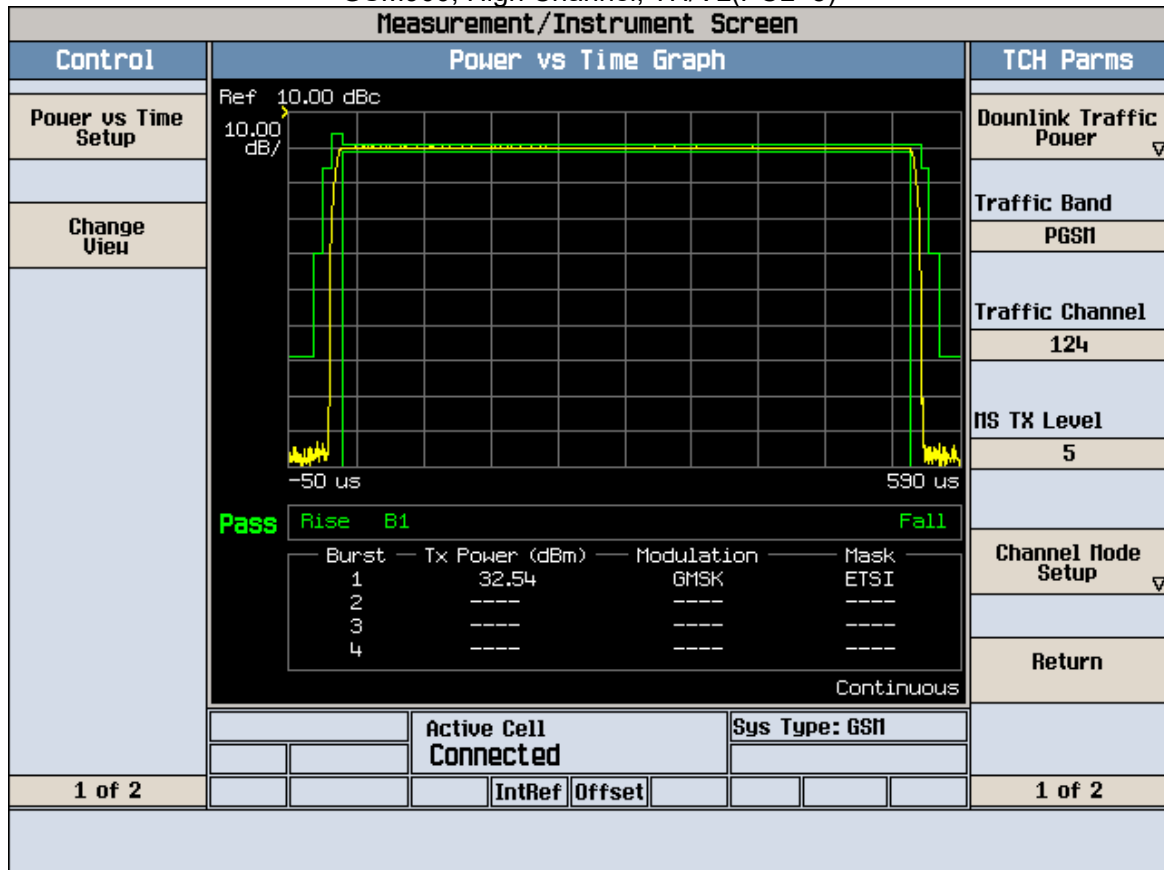
GSM900, High Channel, TL/VL(PCL=5)



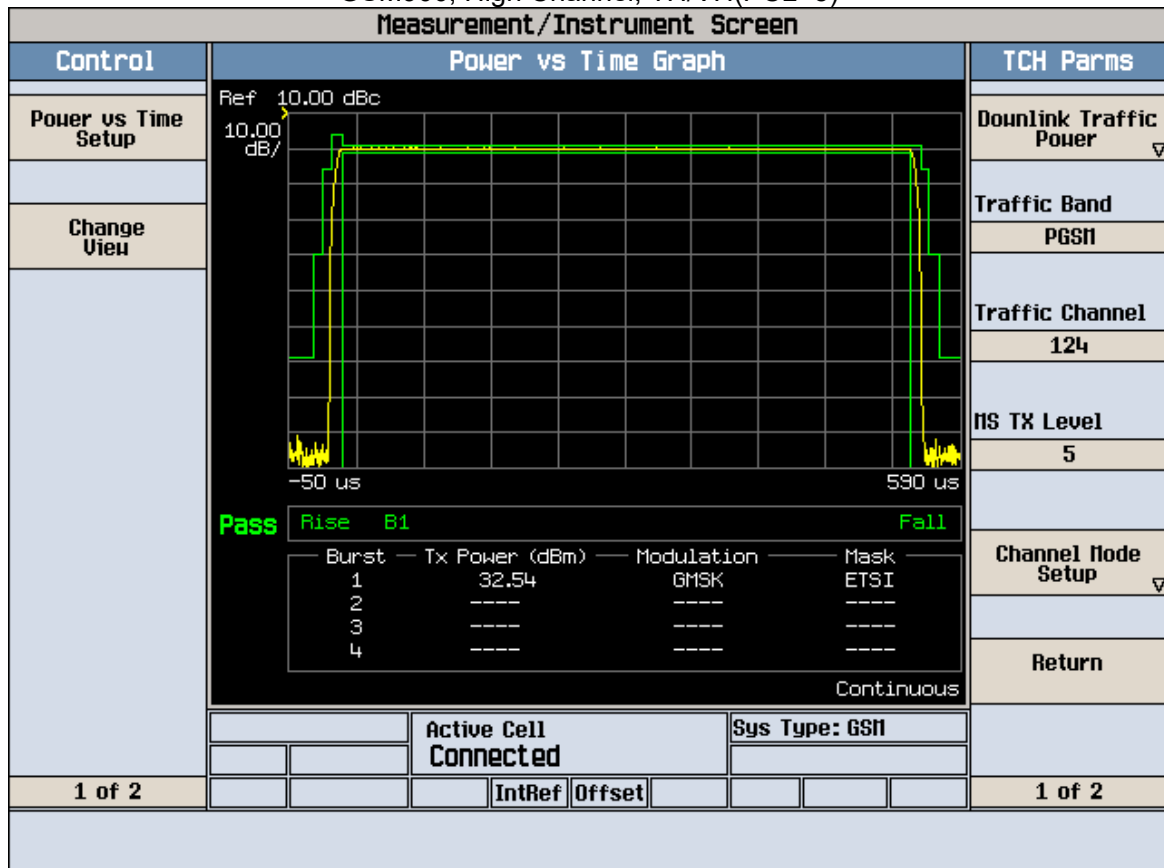
GSM900, High Channel, TL/VH(PCL=5)



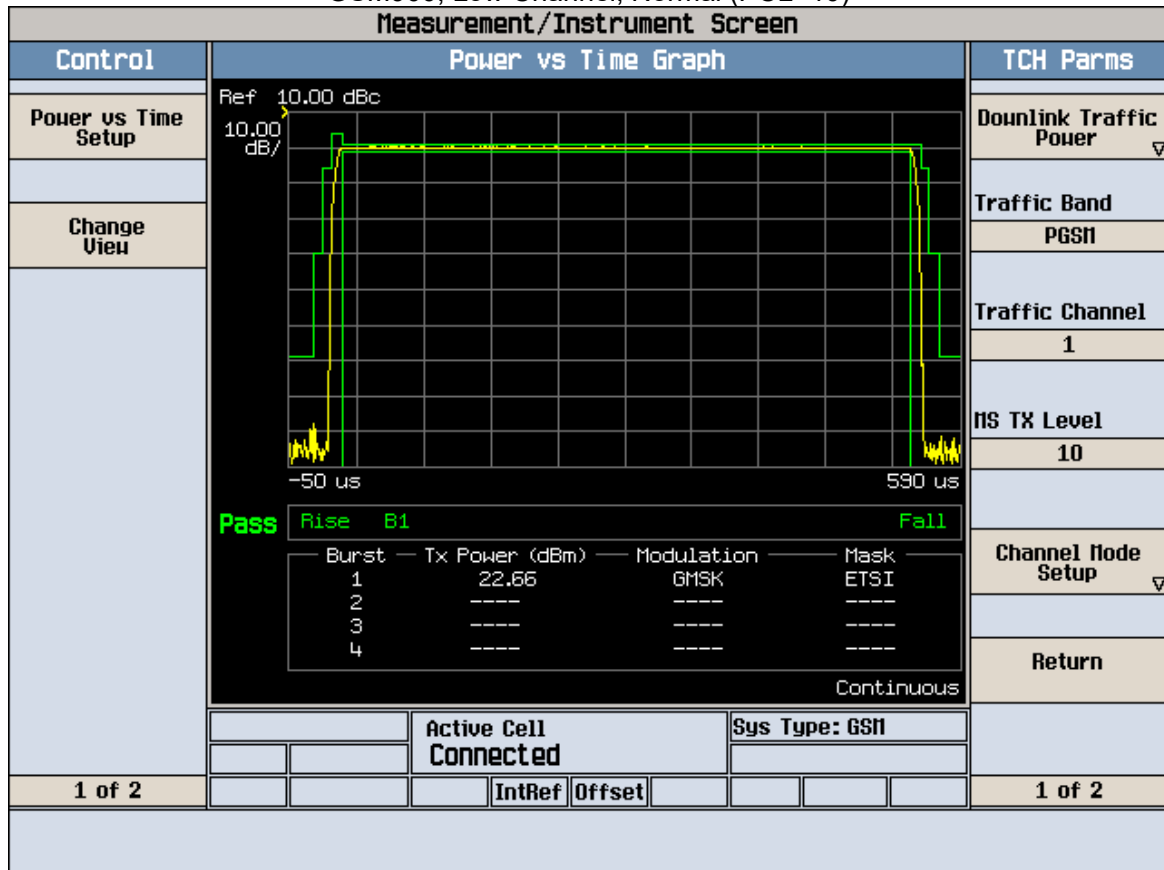
GSM900, High Channel, TH/VL(PCL=5)



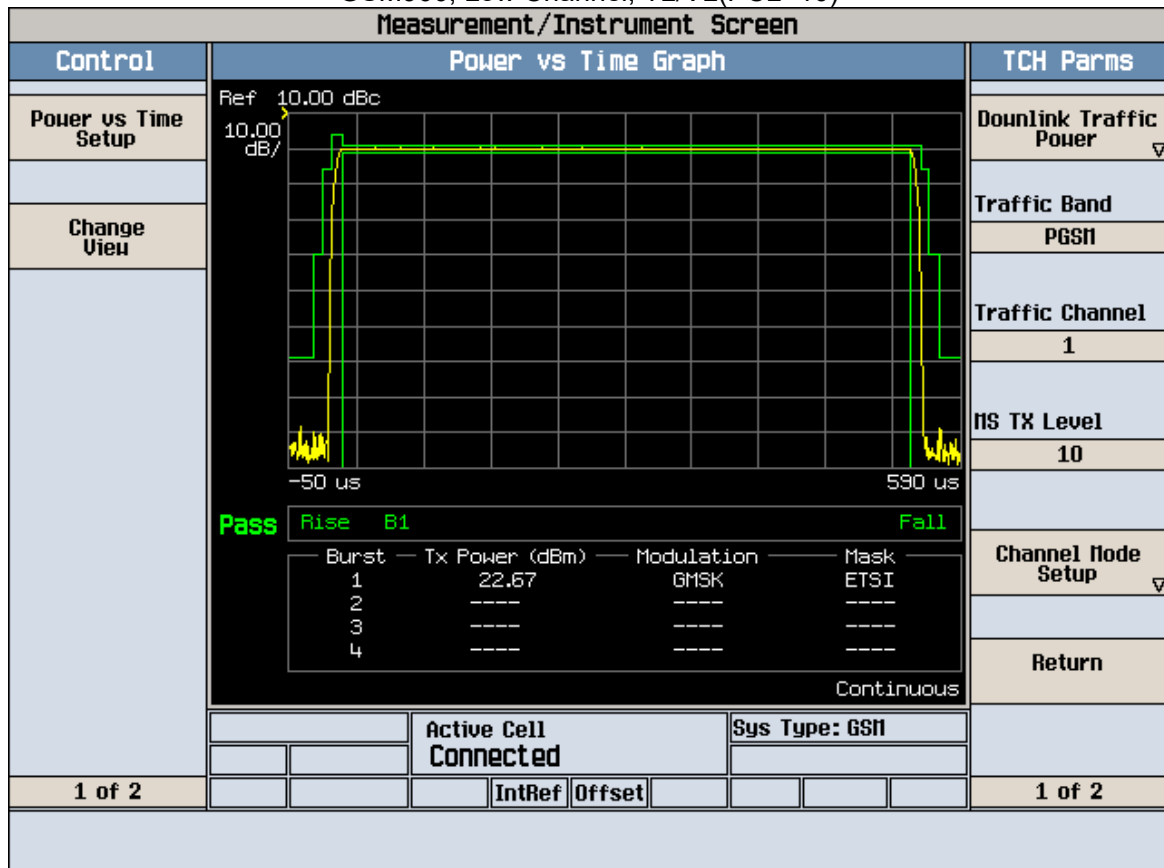
GSM900, High Channel, TH/VH(PCL=5)



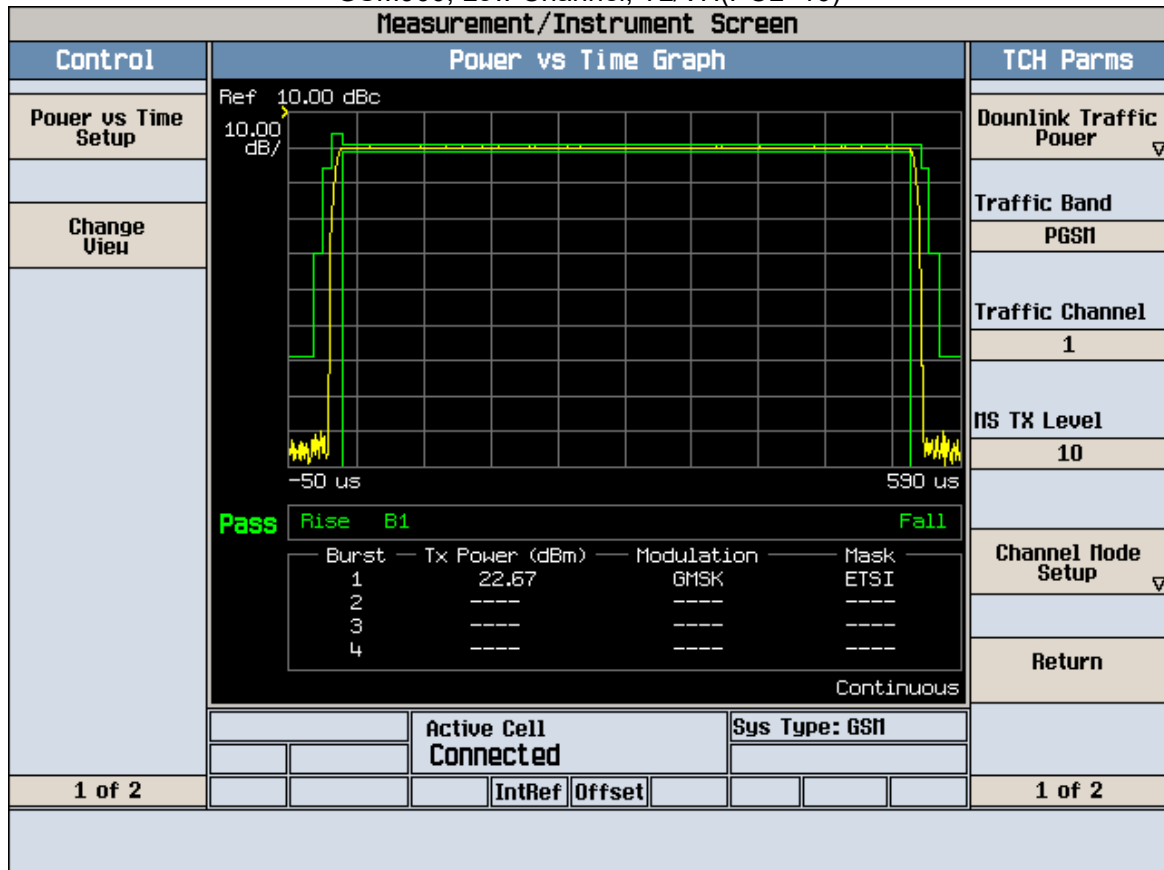
GSM900, Low Channel, Normal (PCL=10)



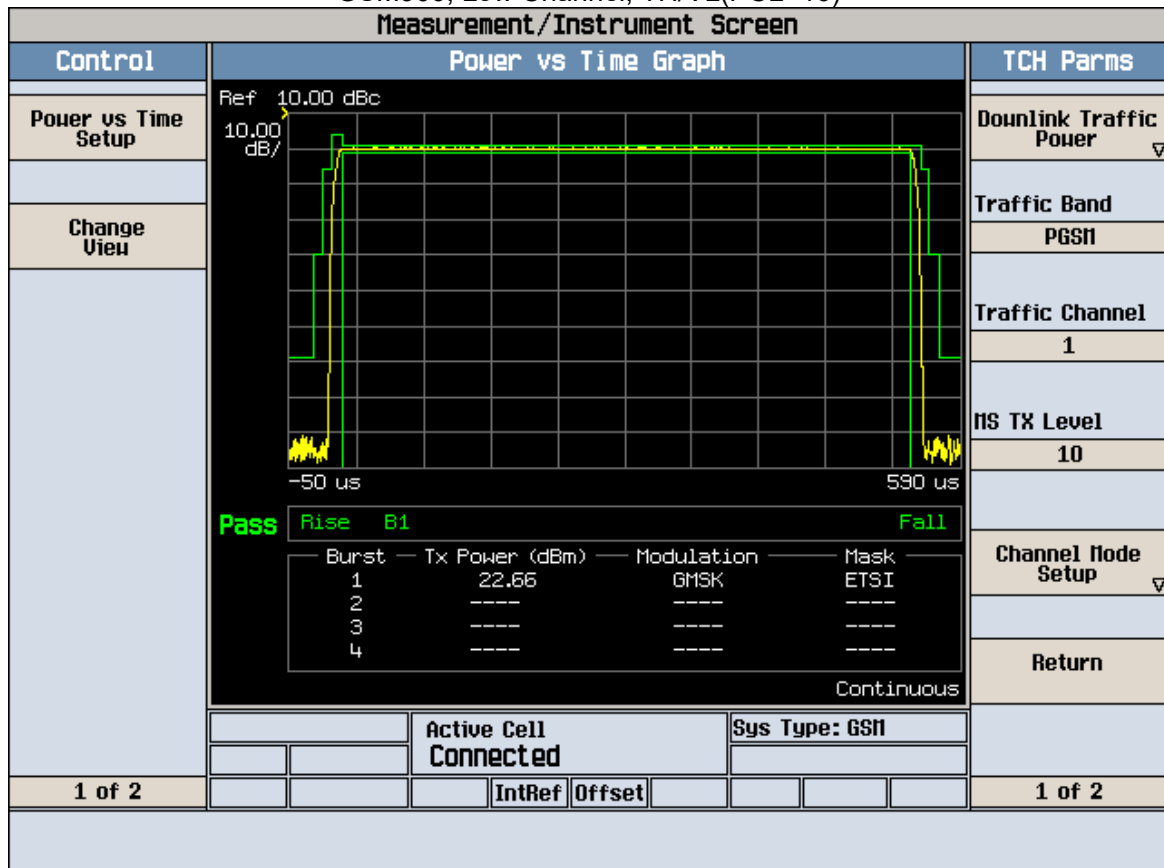
GSM900, Low Channel, TL/VL(PCL=10)



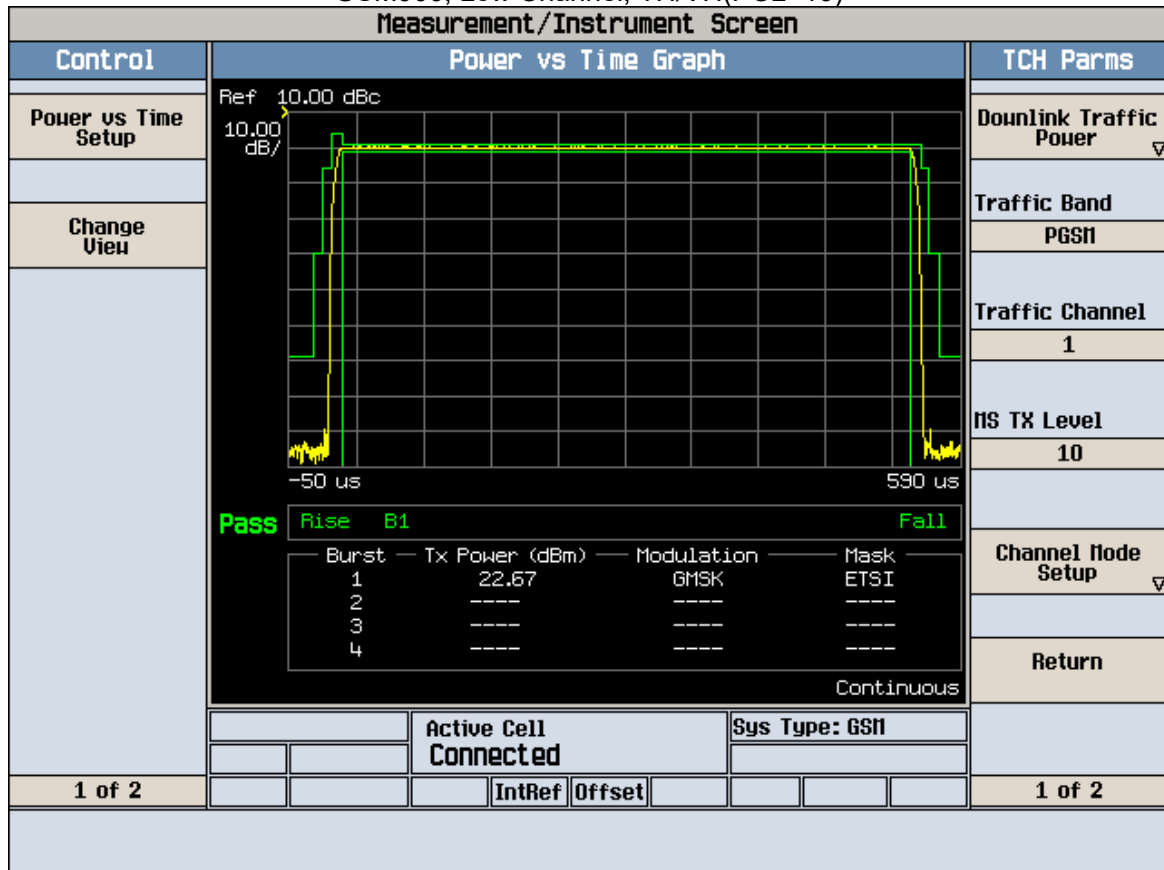
GSM900, Low Channel, TL/VH(PCL=10)



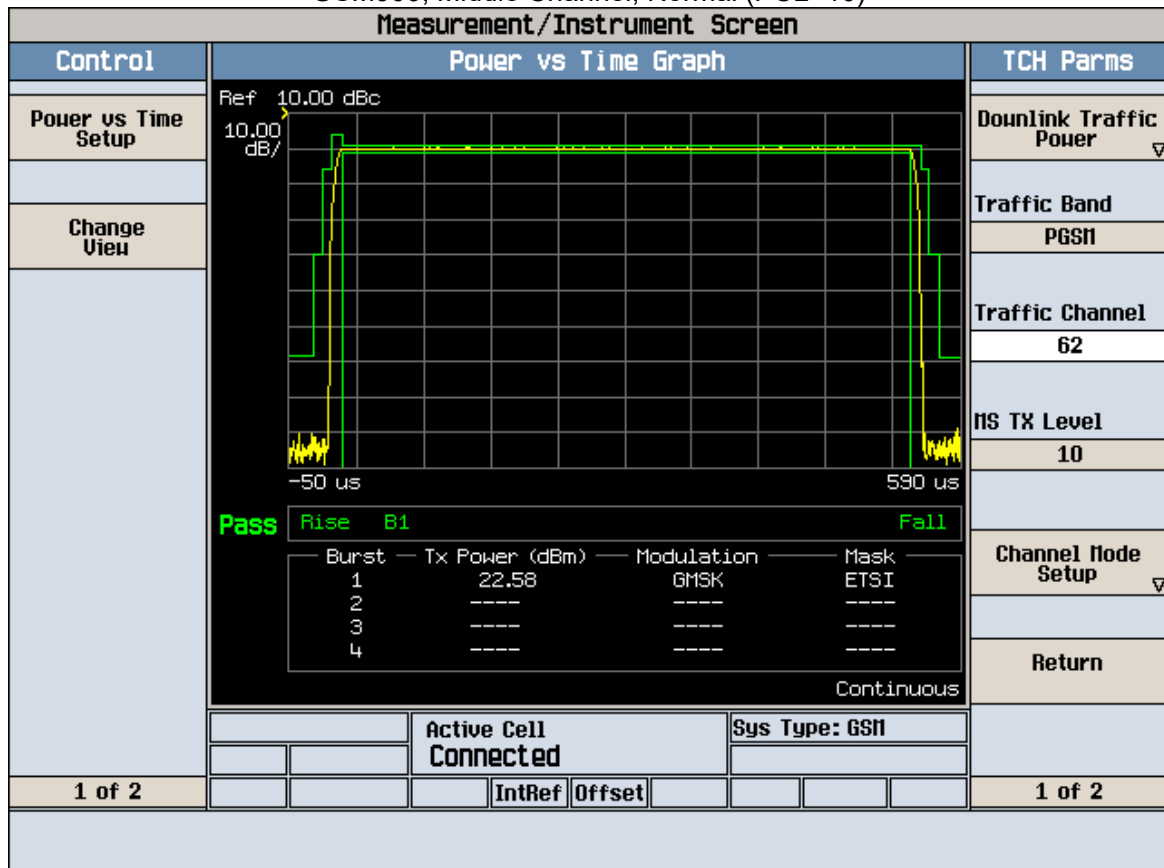
GSM900, Low Channel, TH/VL(PCL=10)



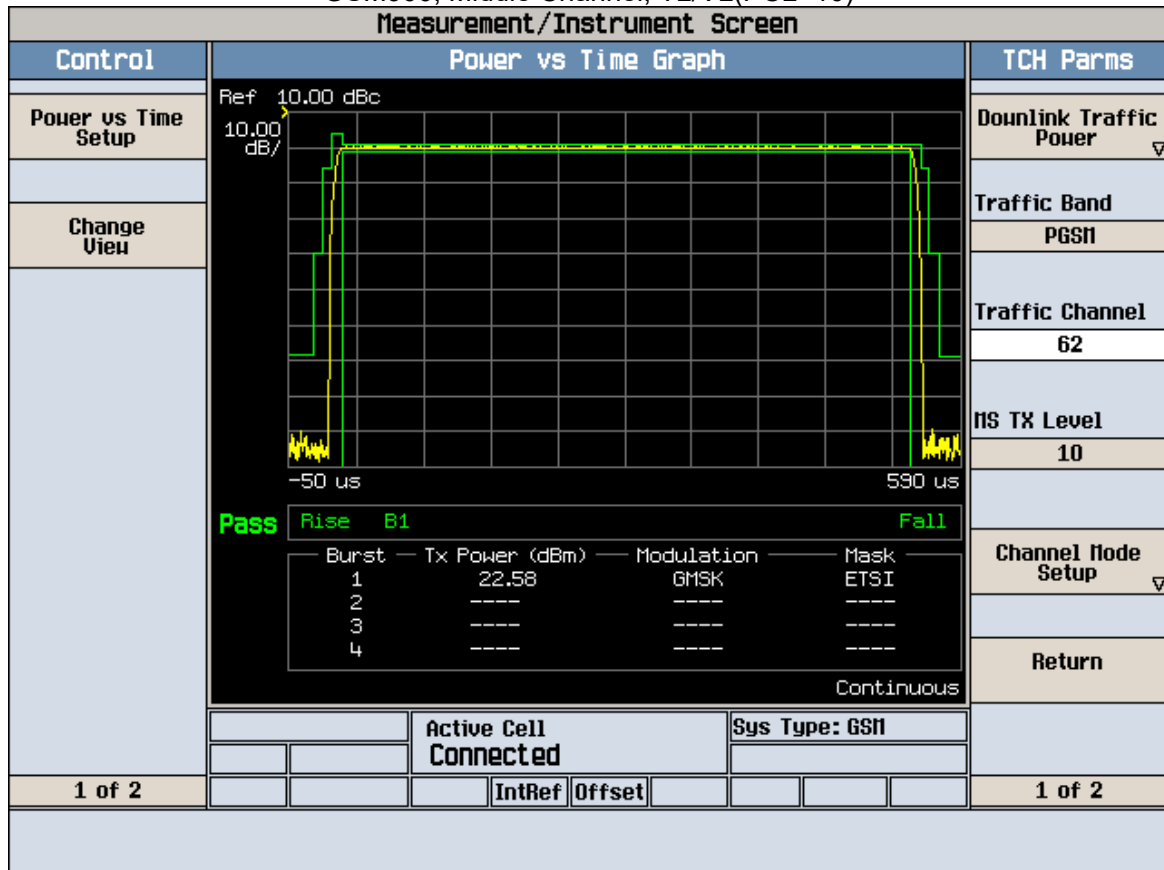
GSM900, Low Channel, TH/VH(PCL=10)



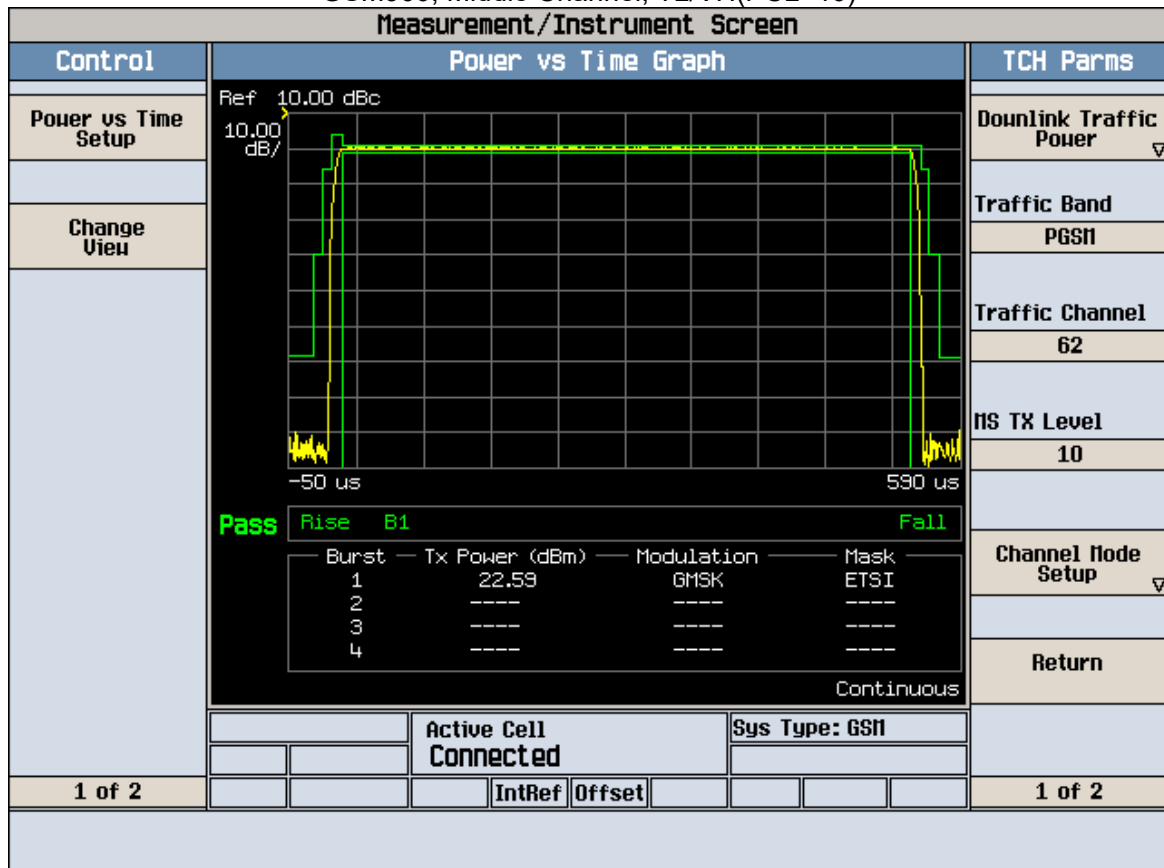
GSM900, Middle Channel, Normal (PCL=10)



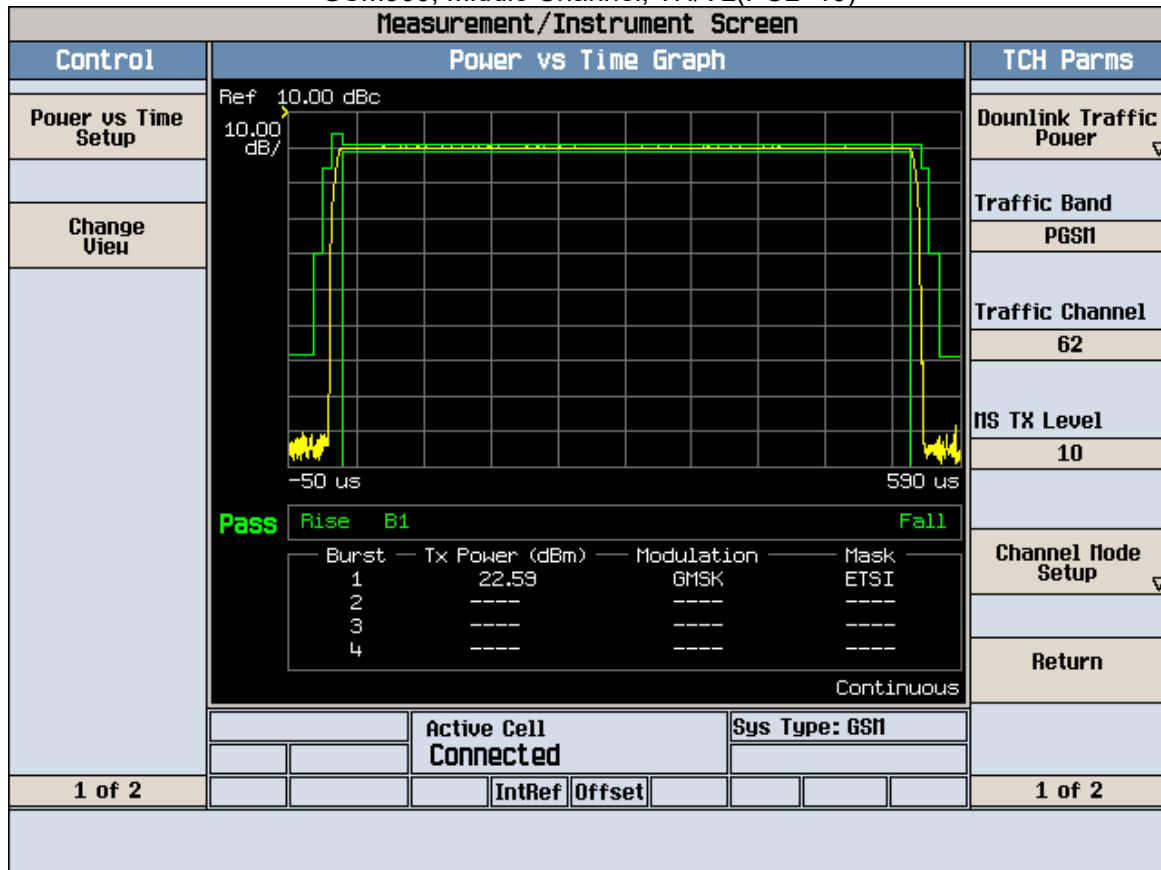
GSM900, Middle Channel, TL/VL(PCL=10)



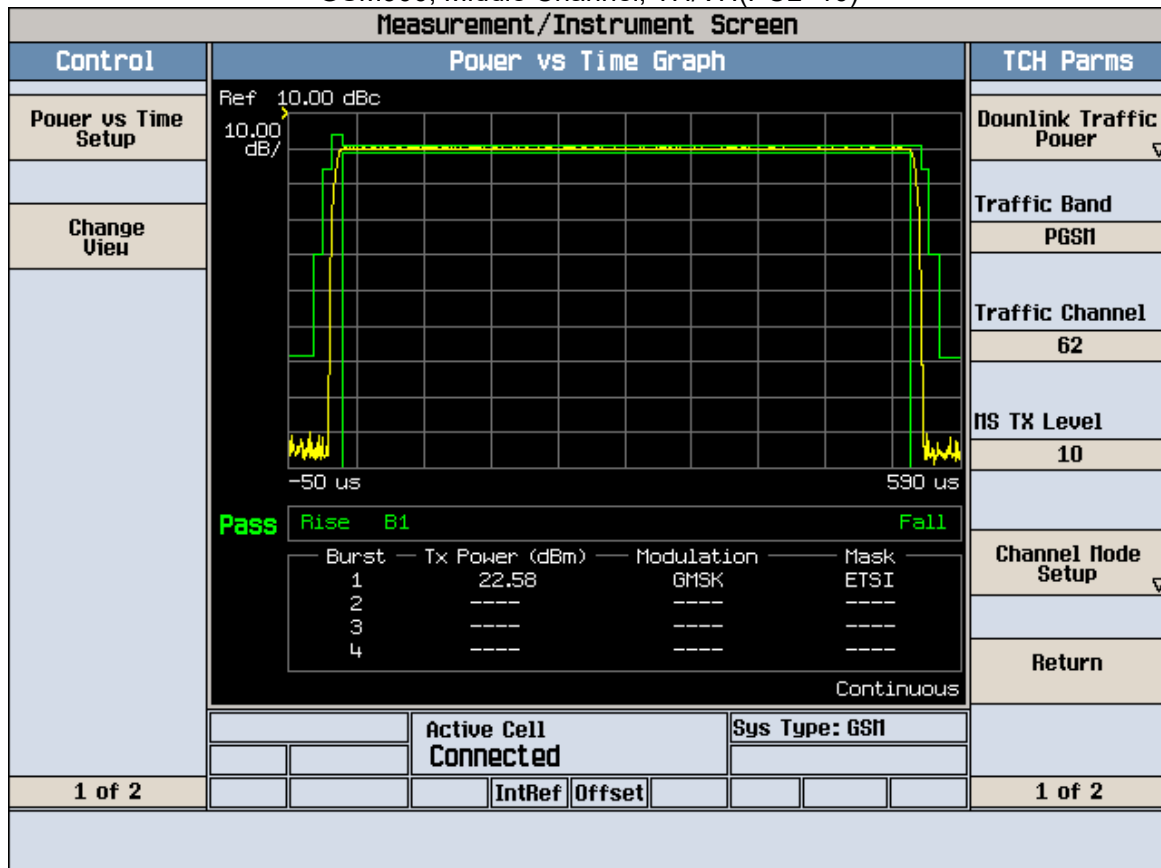
GSM900, Middle Channel, TL/VH(PCL=10)



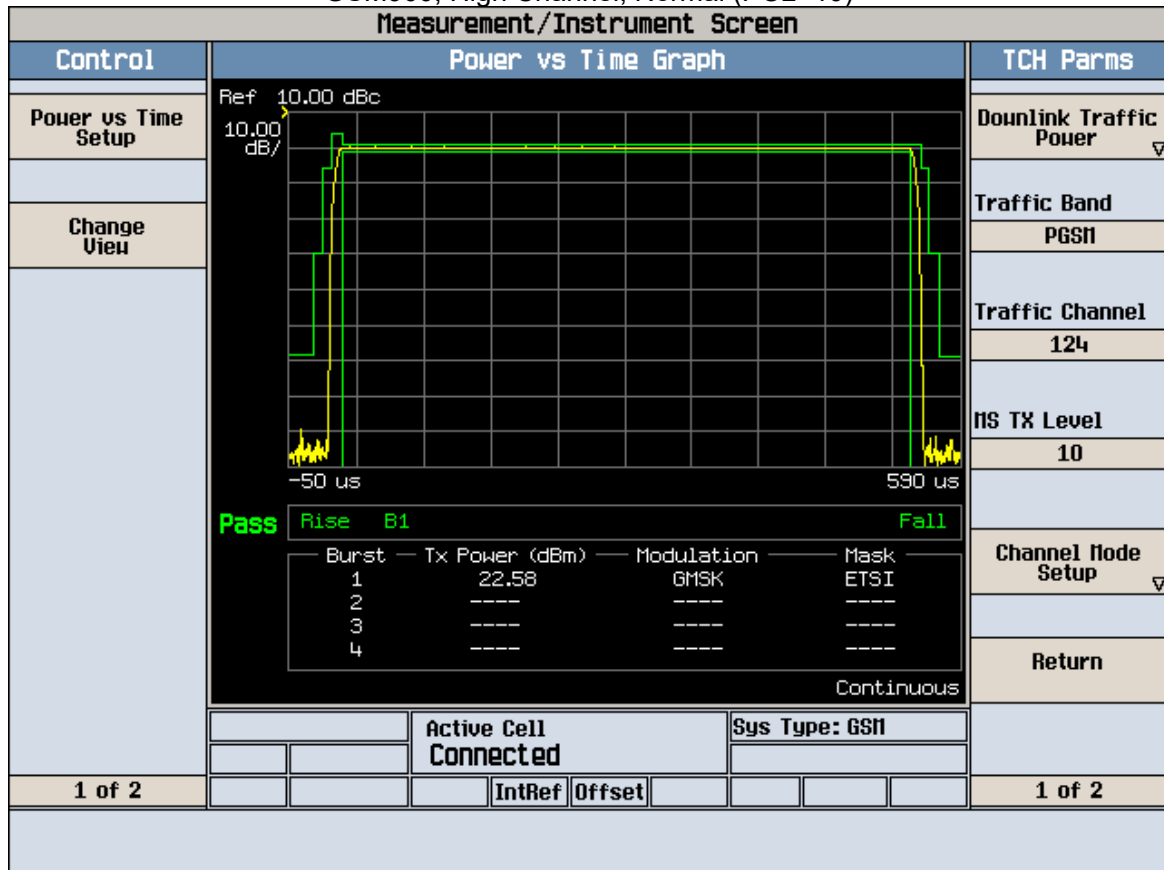
GSM900, Middle Channel, TH/VL(PCL=10)



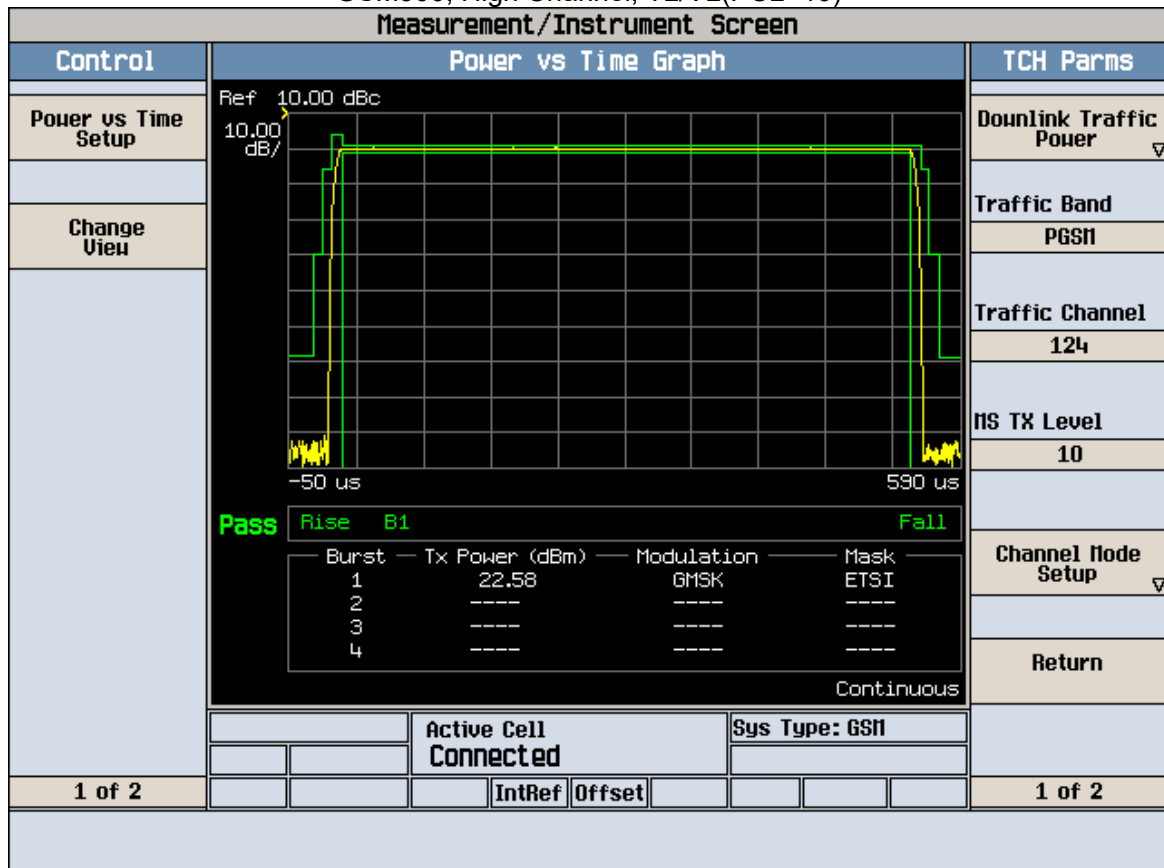
GSM900, Middle Channel, TH/VH(PCL=10)



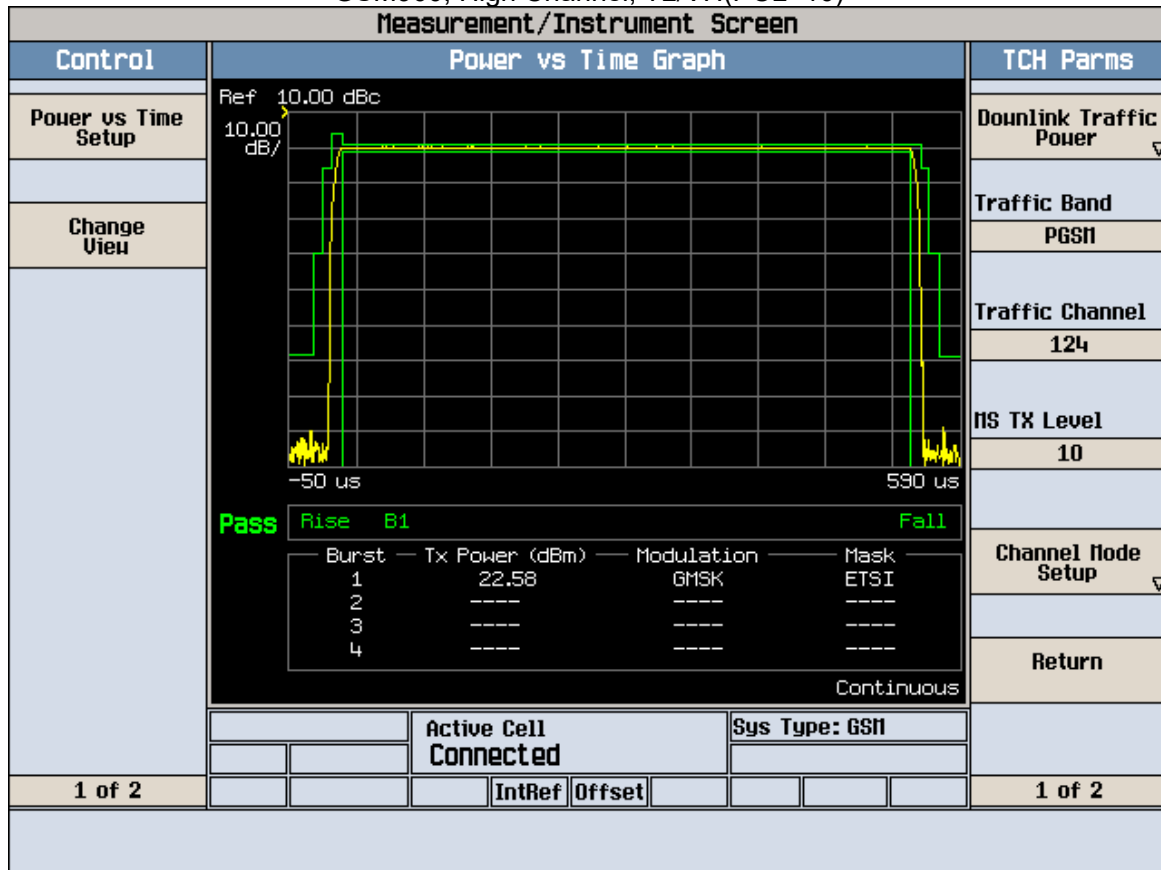
GSM900, High Channel, Normal (PCL=10)



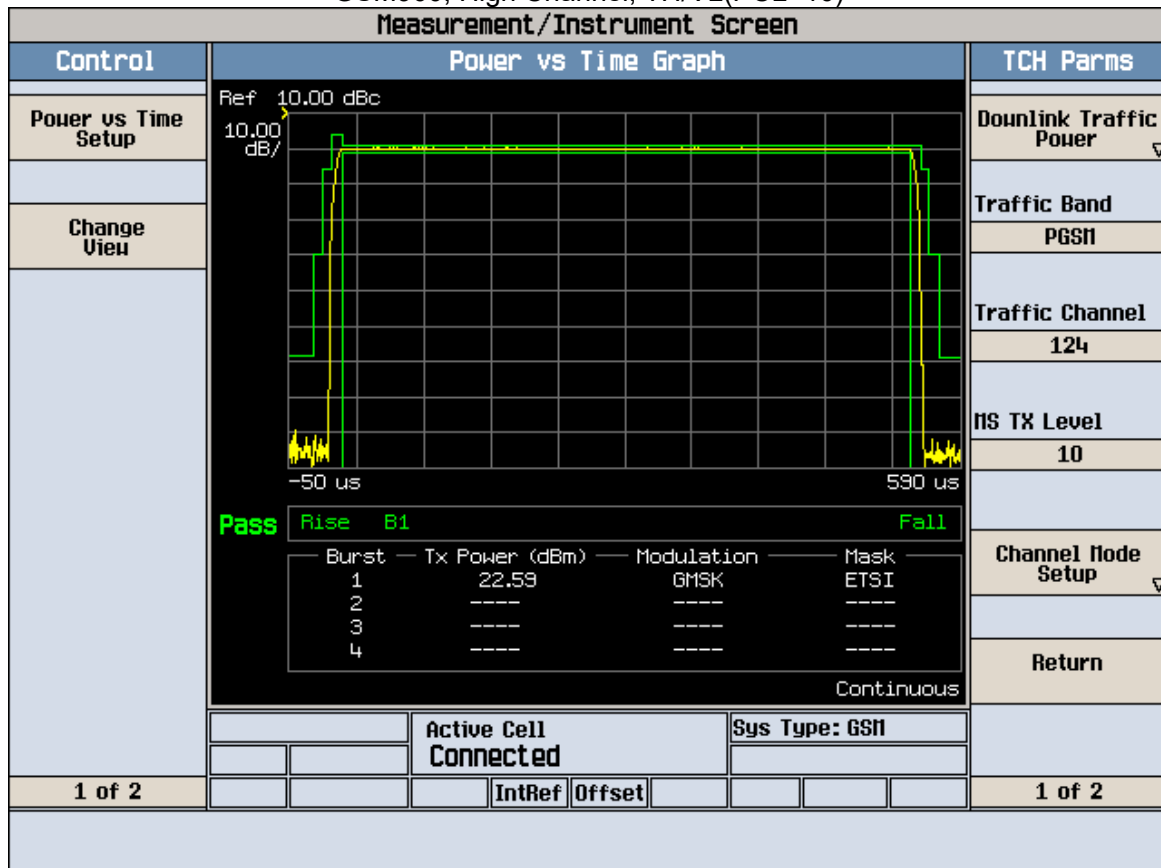
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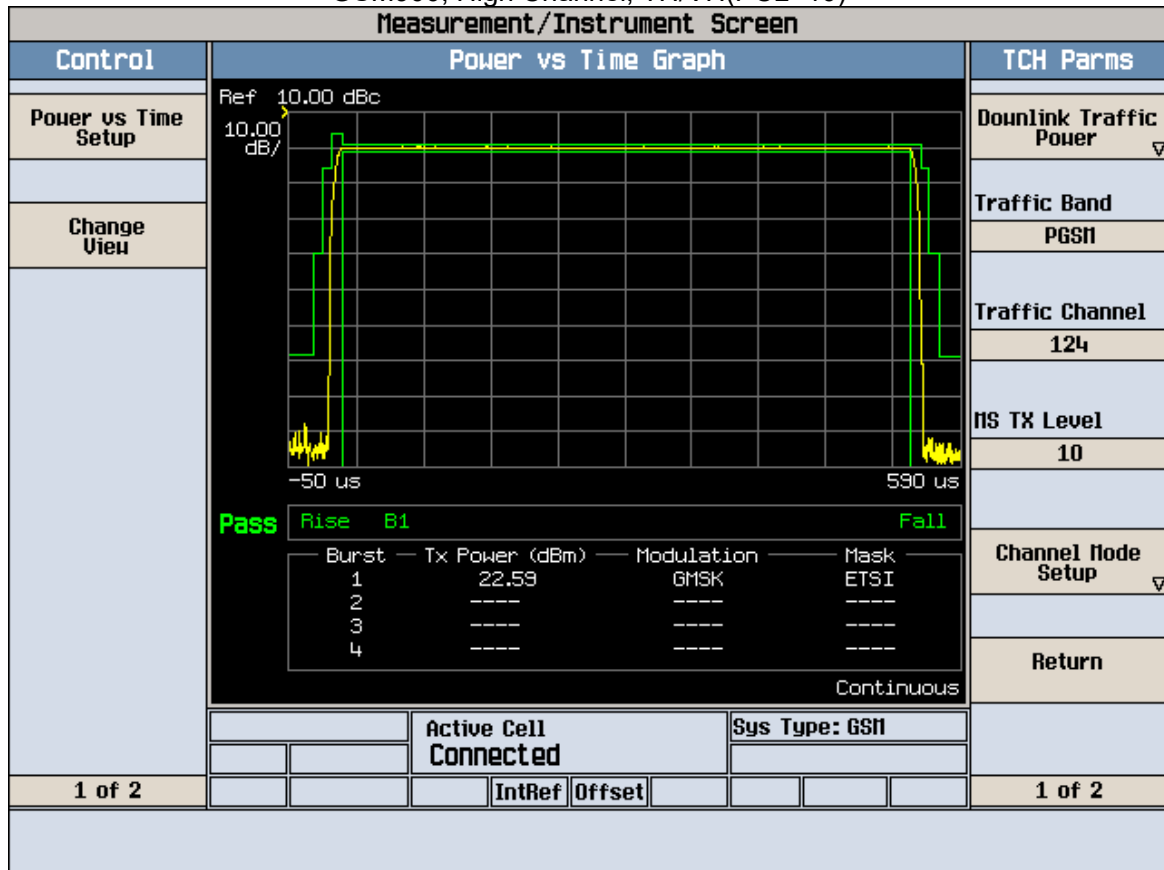
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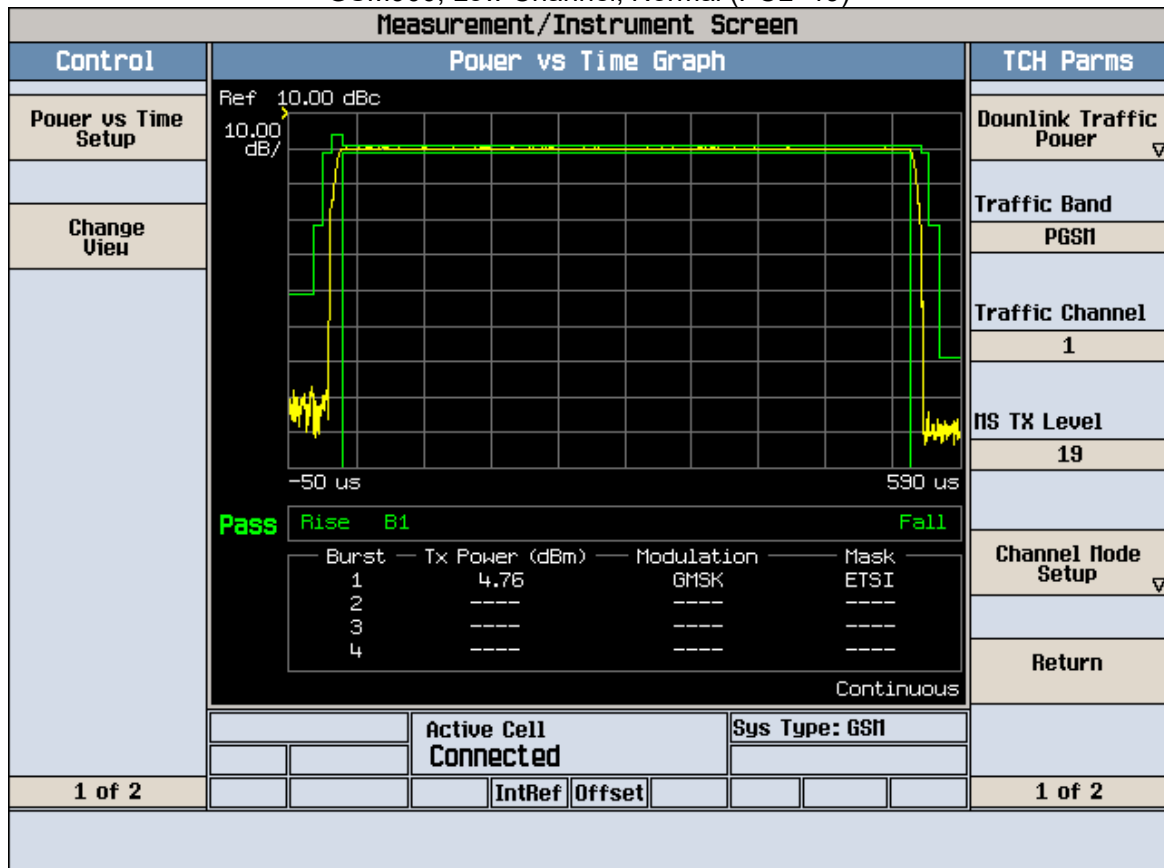
GSM900, High Channel, TH/VL(PCL=10)



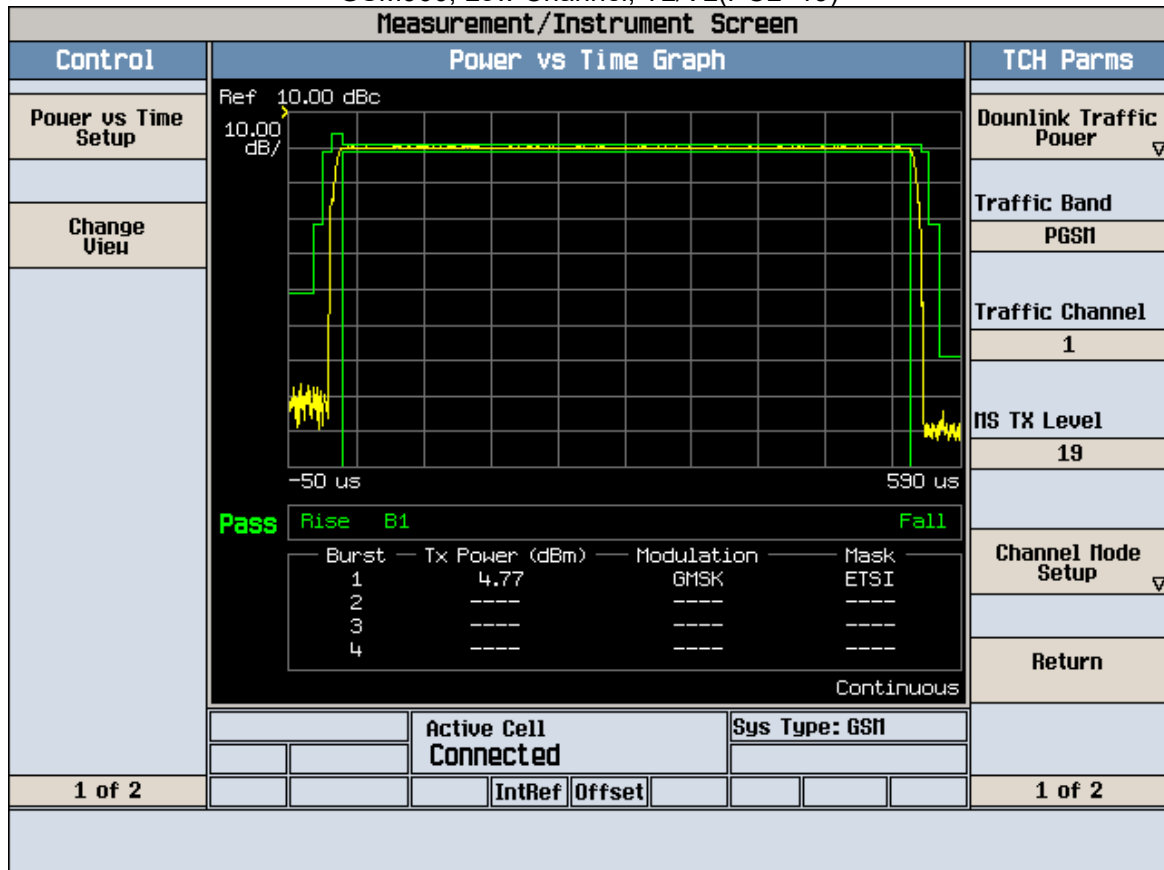
GSM900, High Channel, TH/VH(PCL=10)



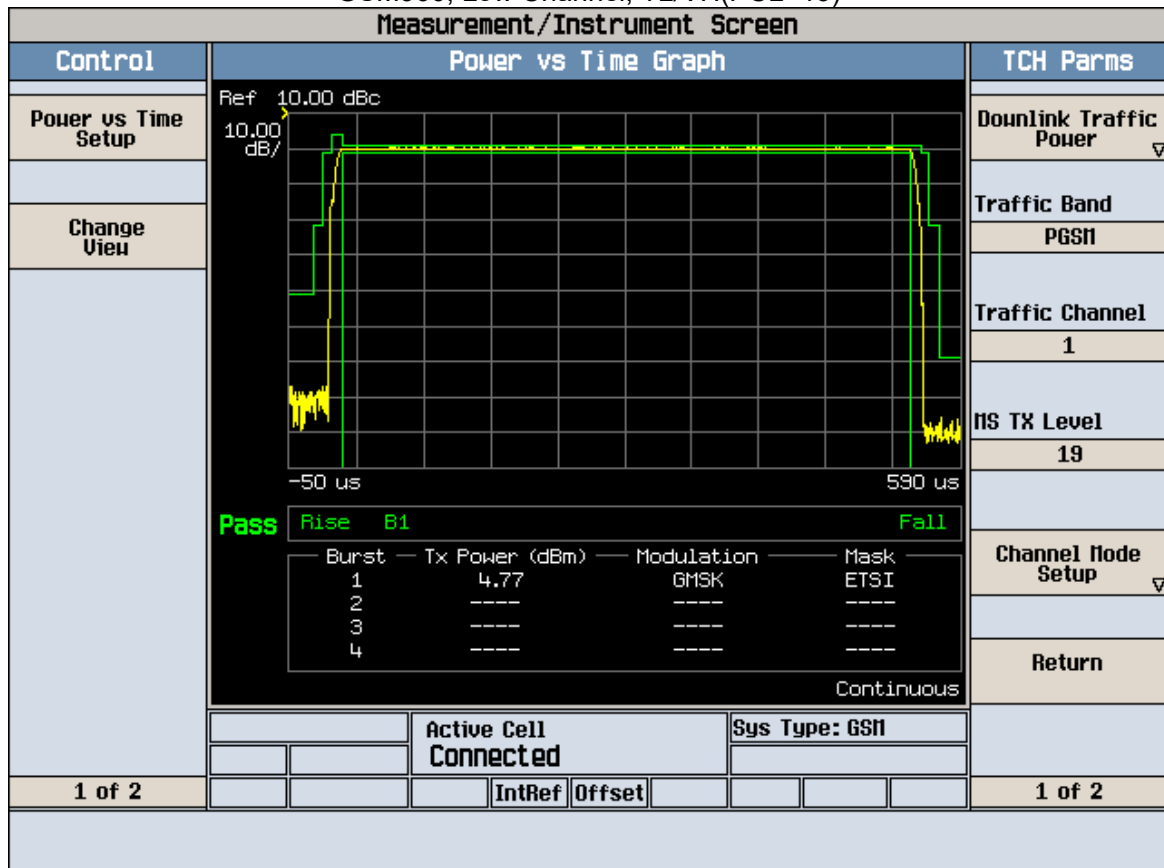
GSM900, Low Channel, Normal (PCL=19)



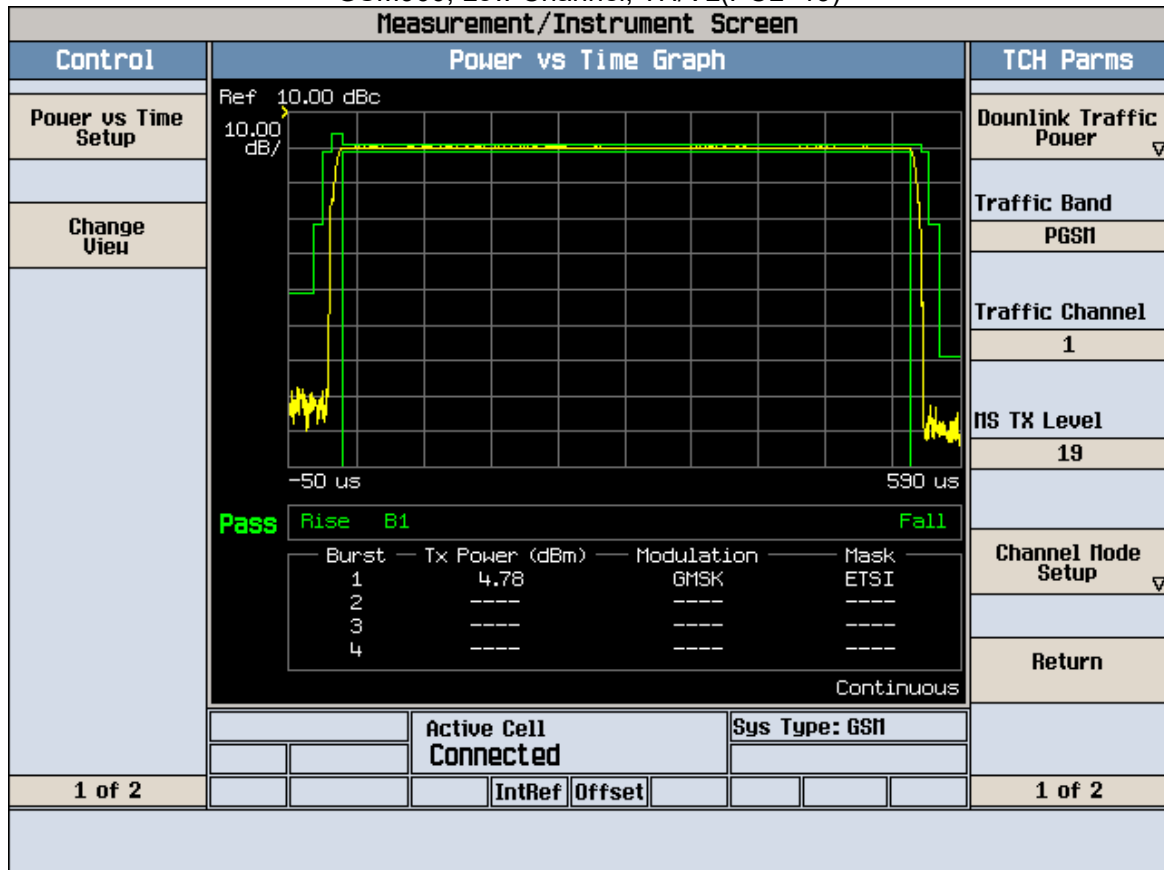
GSM900, Low Channel, TL/VL(PCL=19)



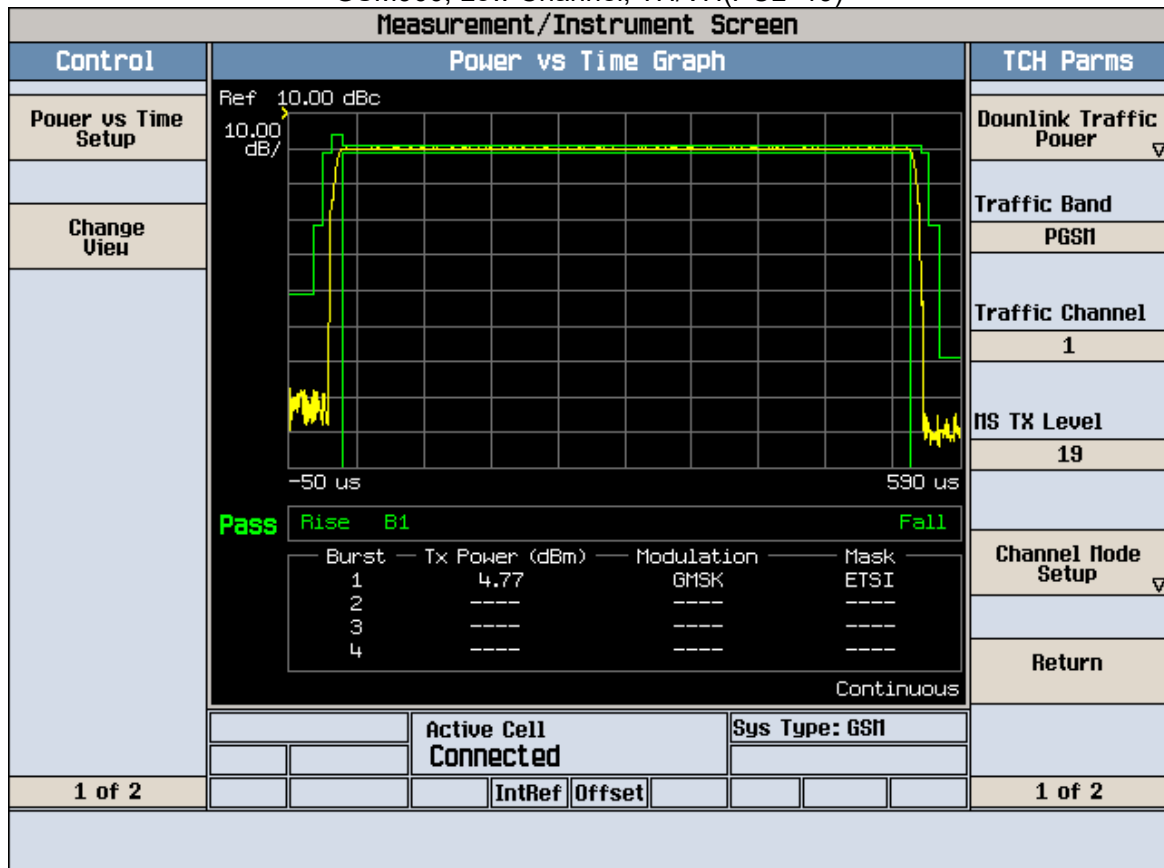
GSM900, Low Channel, TL/VH(PCL=19)



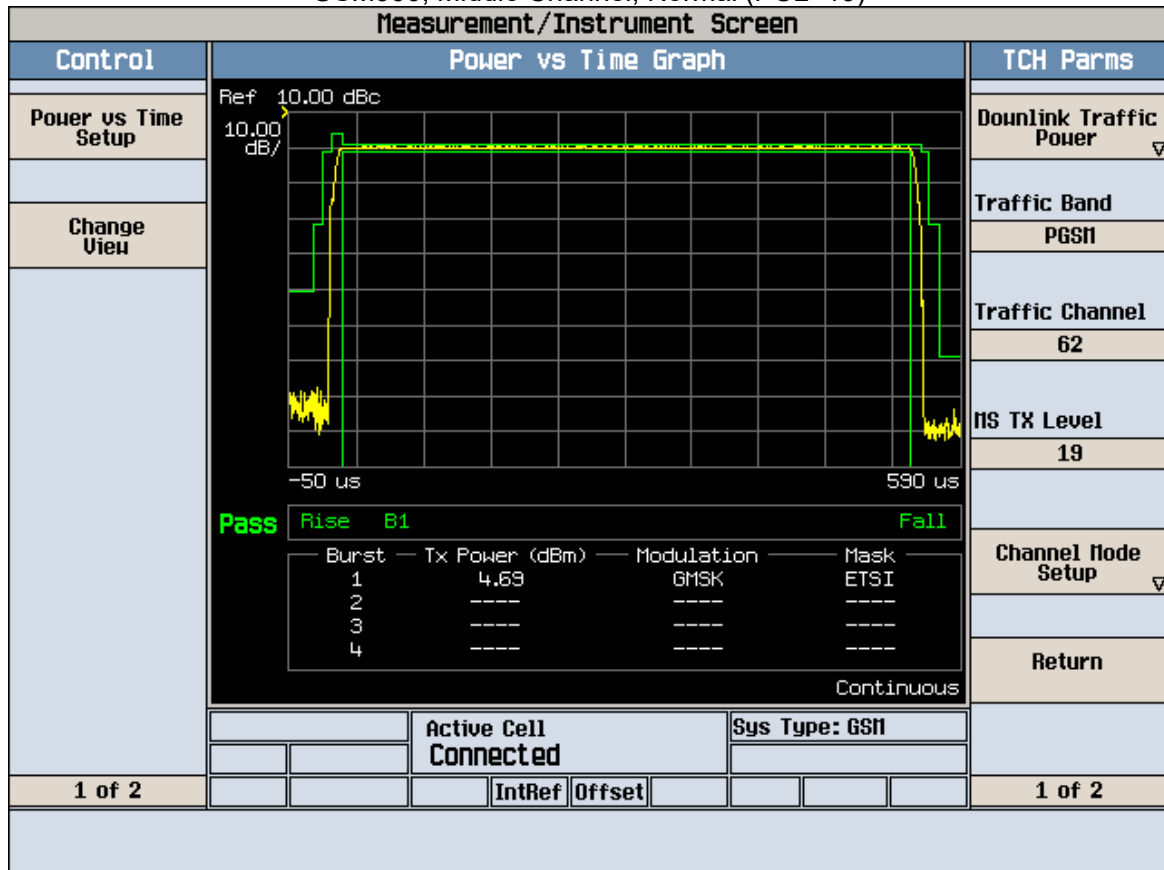
GSM900, Low Channel, TH/VL(PCL=19)



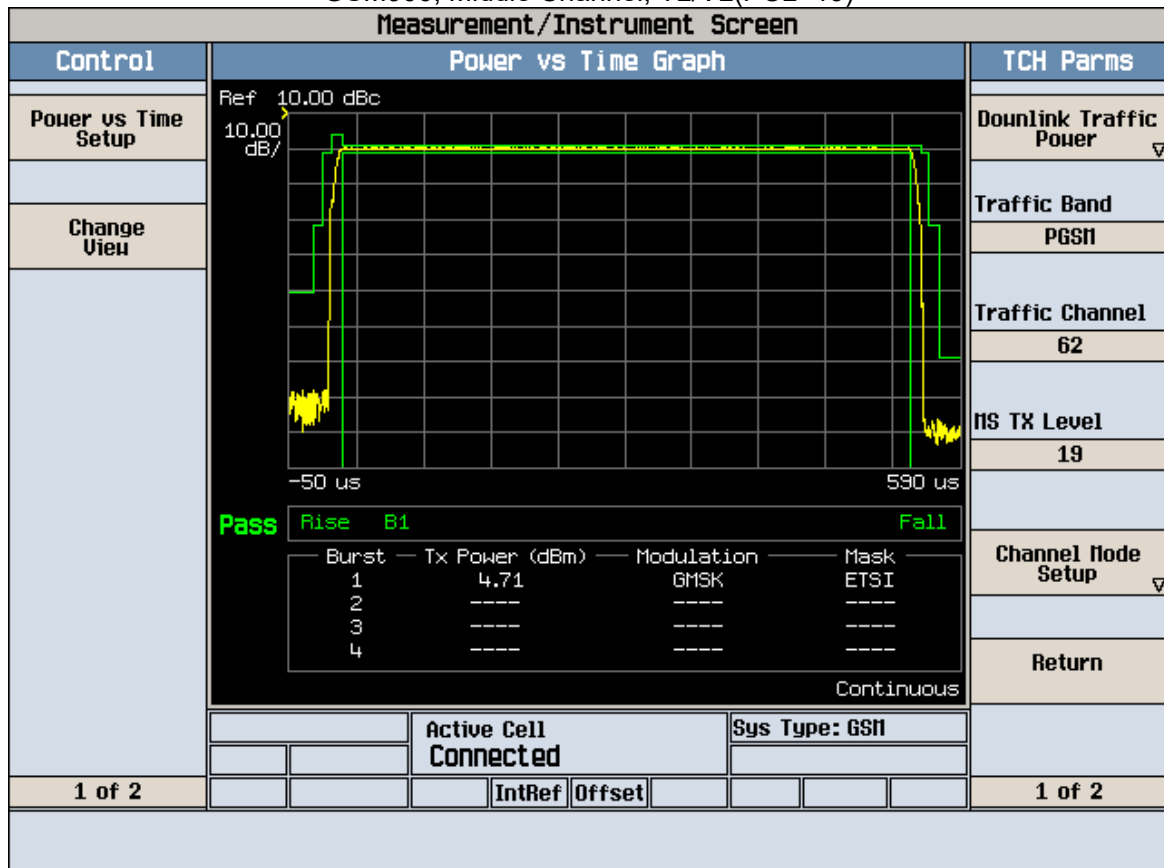
GSM900, Low Channel, TH/VH(PCL=19)



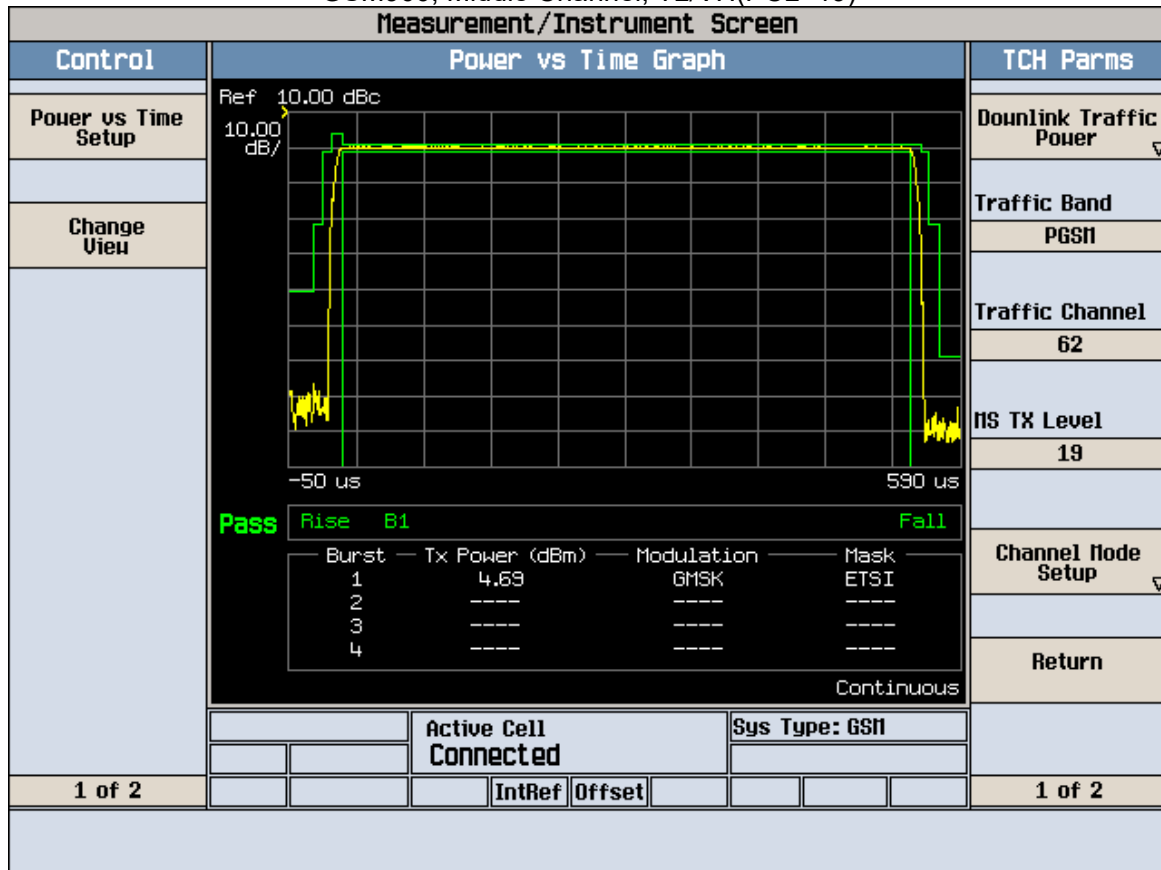
GSM900, Middle Channel, Normal (PCL=19)



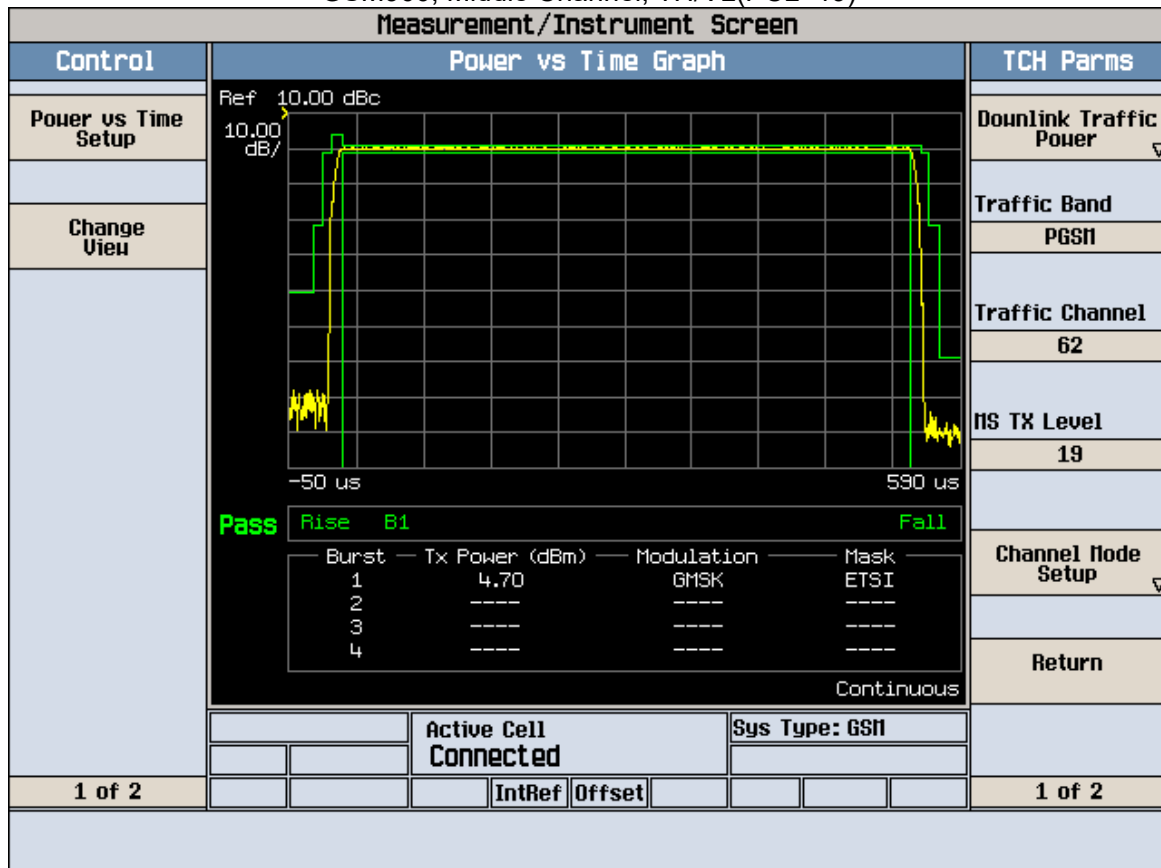
GSM900, Middle Channel, TL/VL(PCL=19)



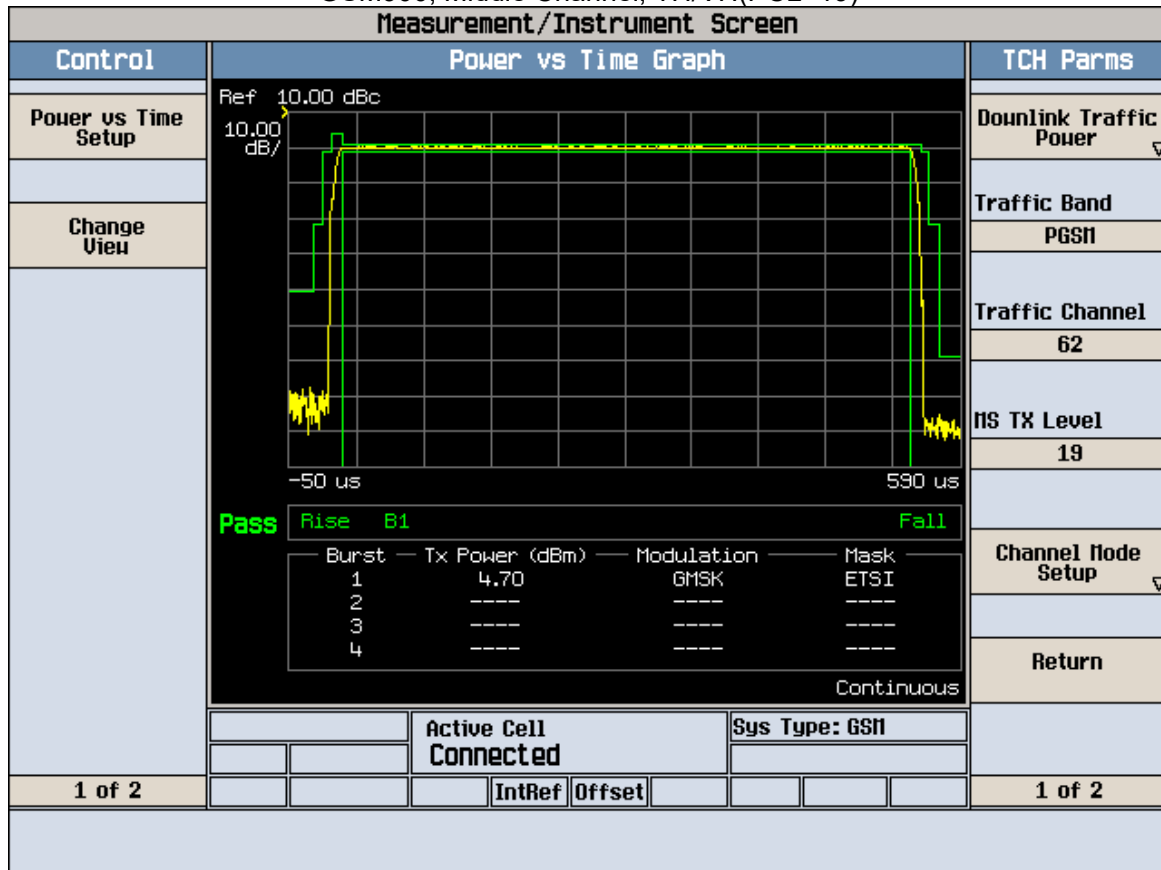
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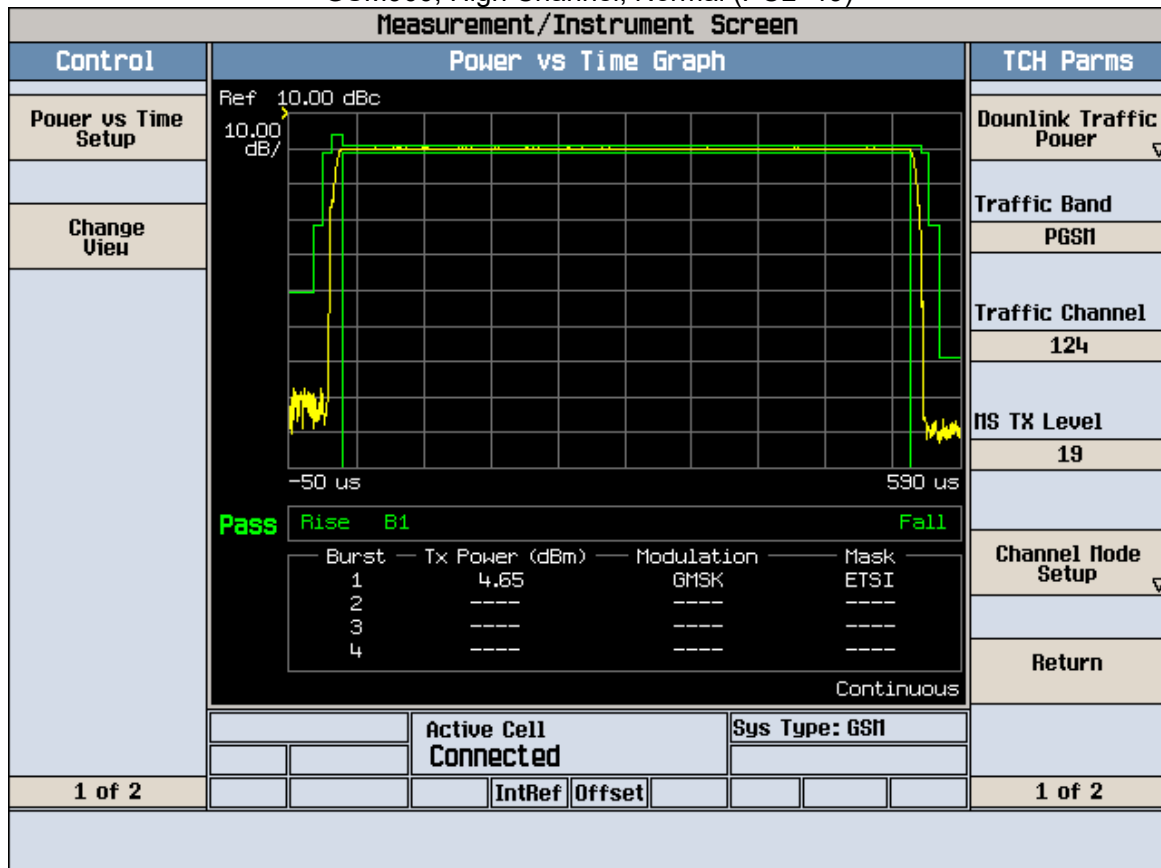
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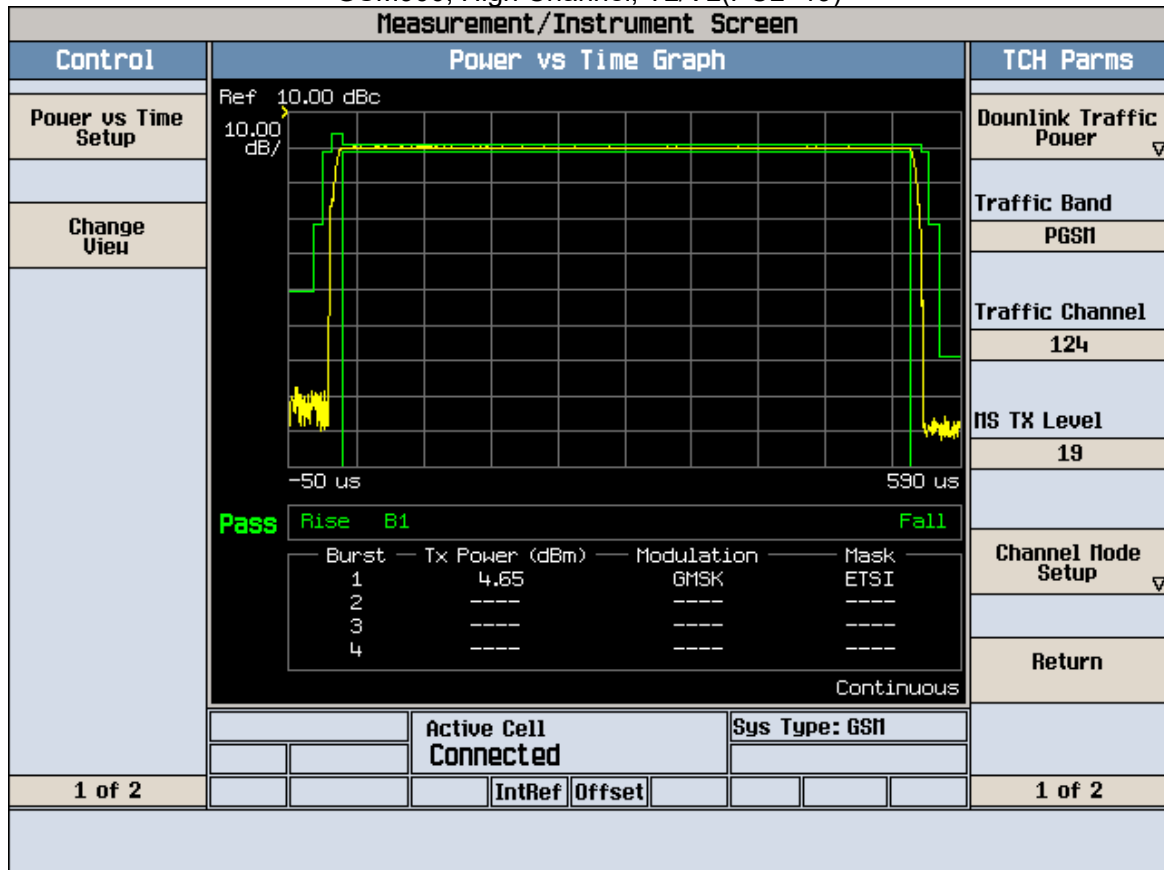
GSM900, Middle Channel, TH/VH(PCL=19)



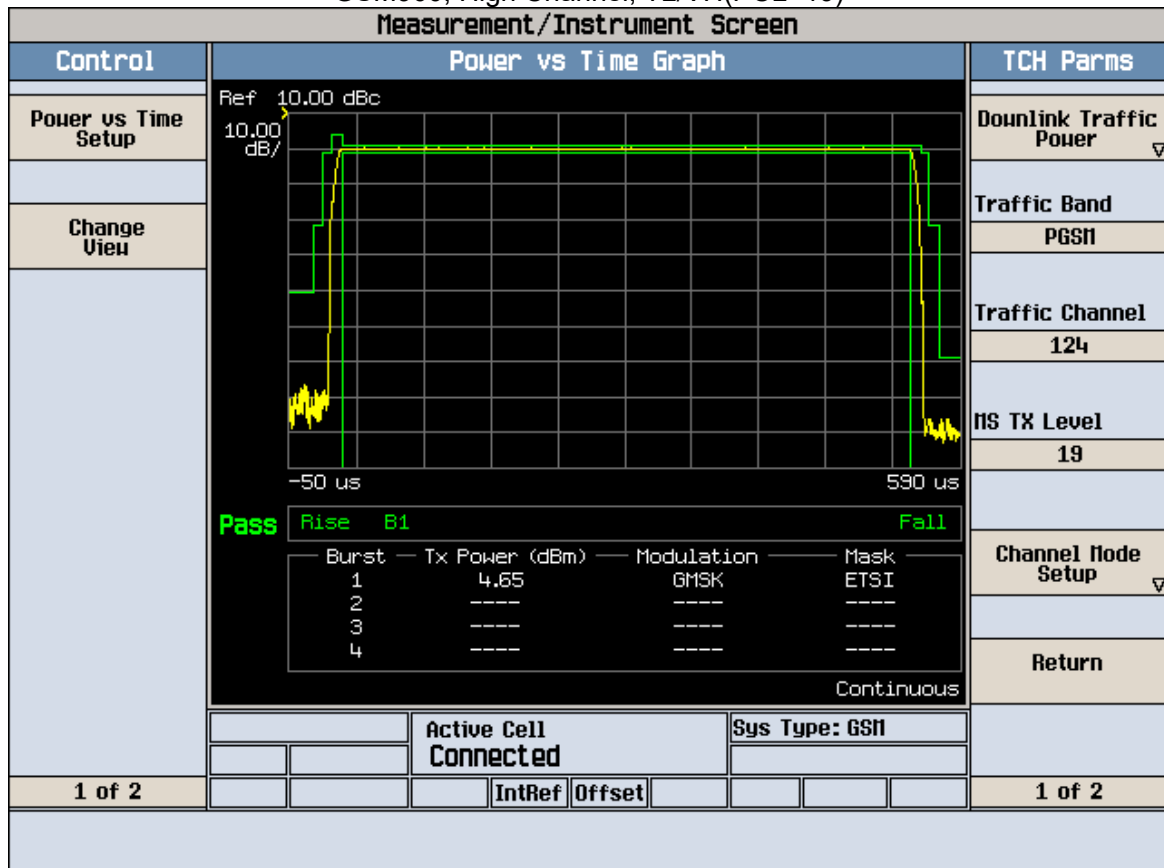
GSM900, High Channel, Normal (PCL=19)



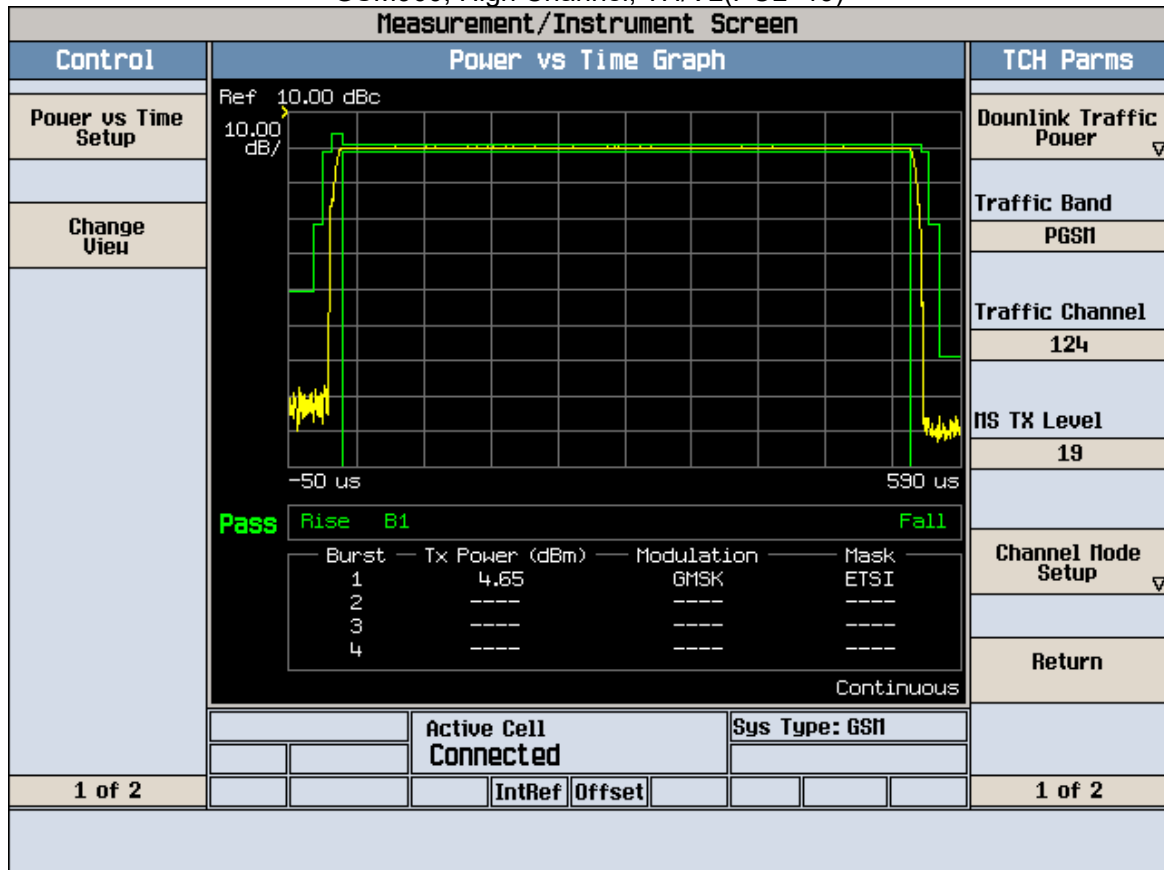
GSM900, High Channel, TL/VL(PCL=19)



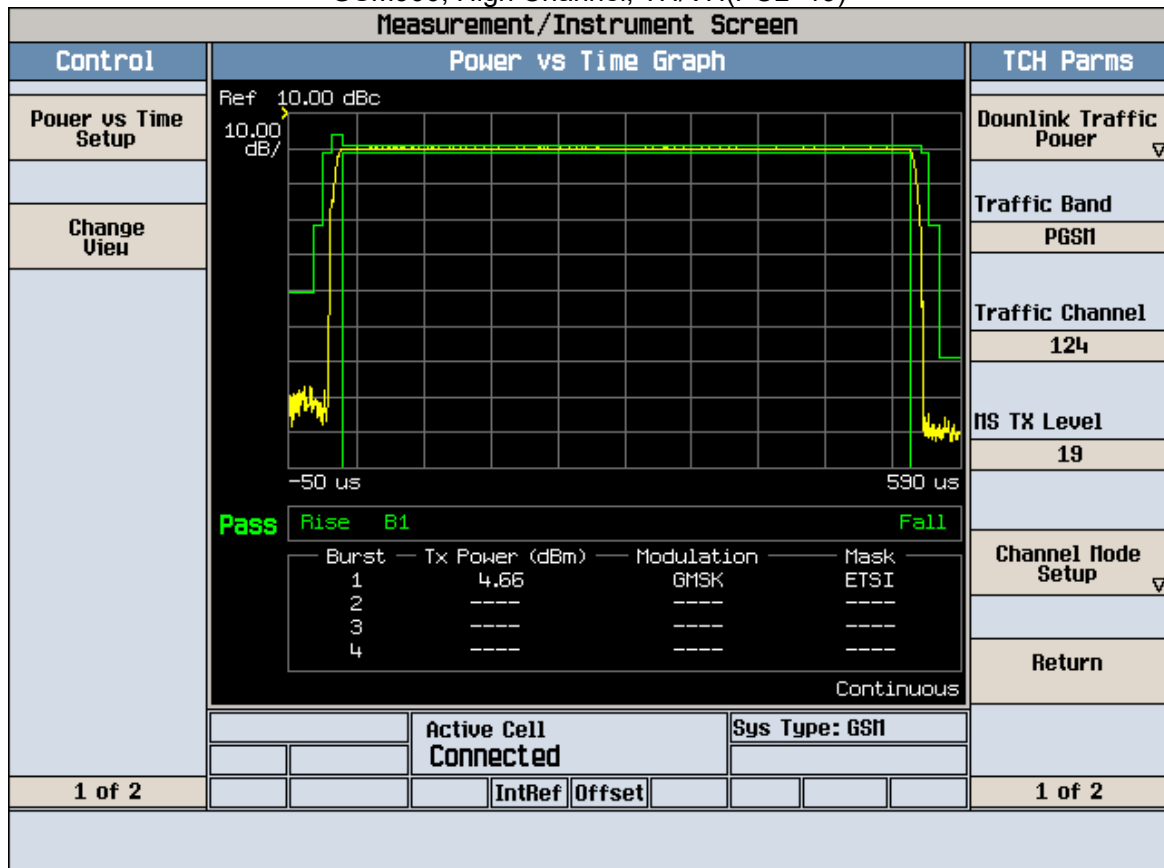
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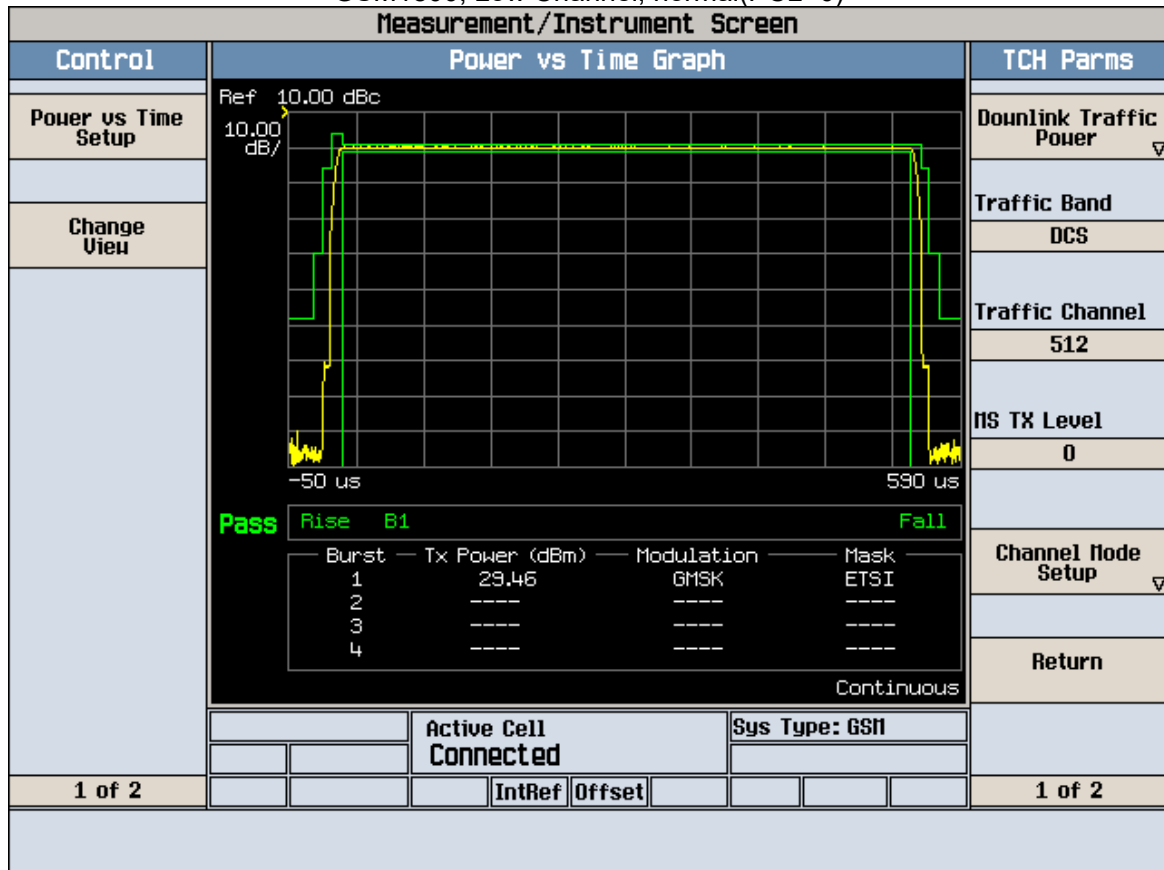
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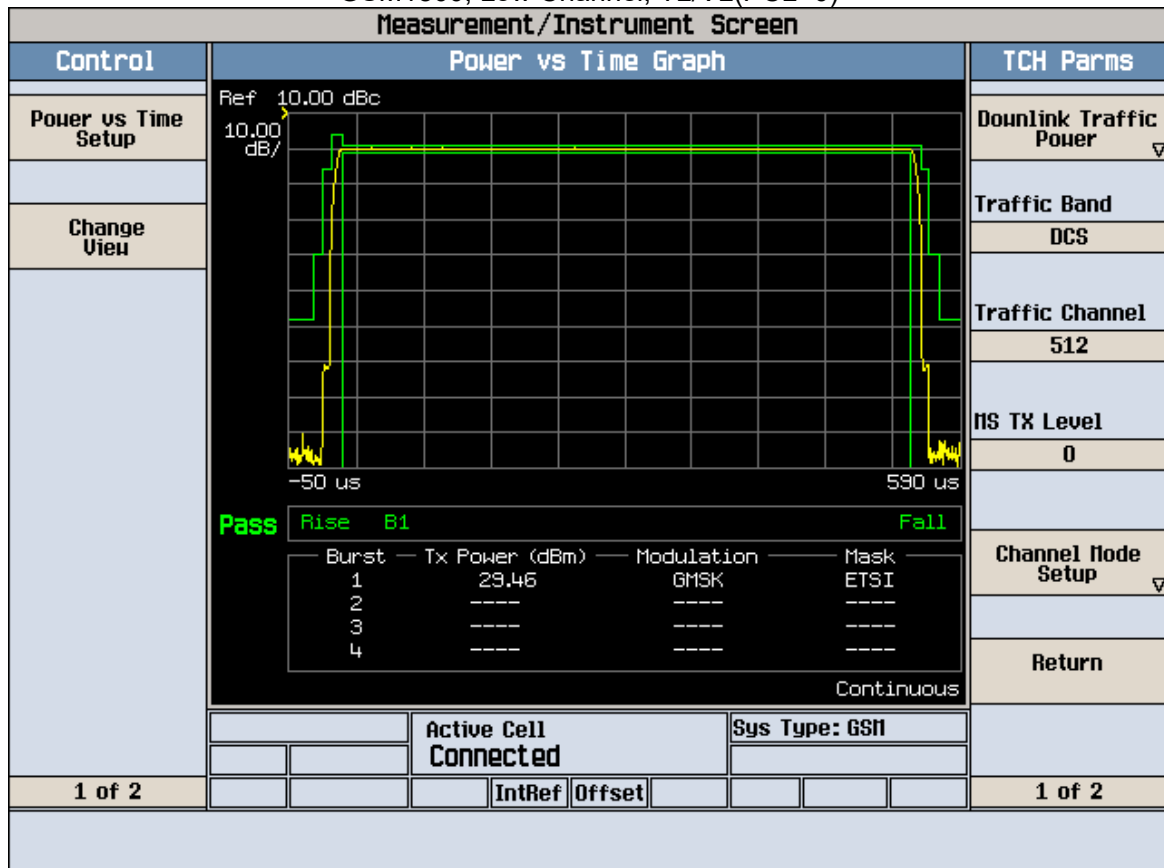
GSM900, High Channel, TH/VH(PCL=19)



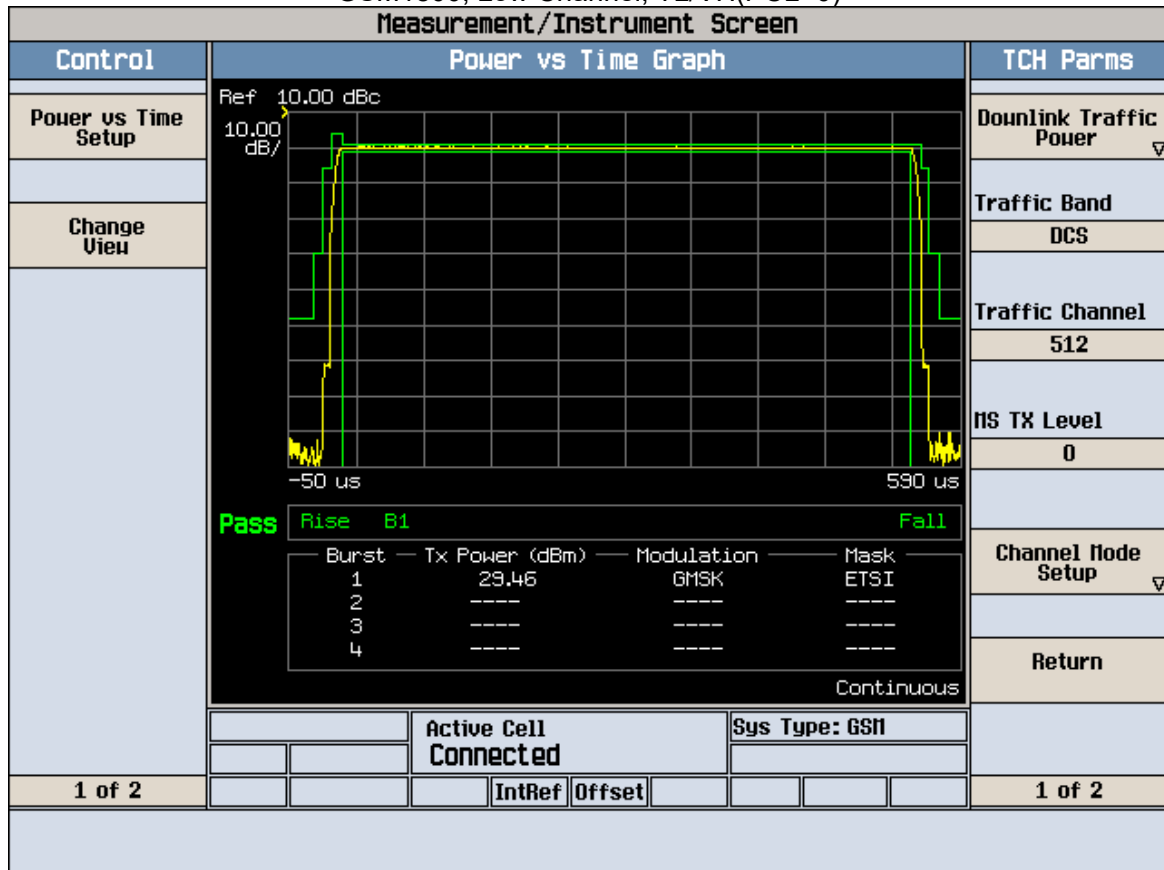
GSM1800, Low Channel, normal(PCL=0)



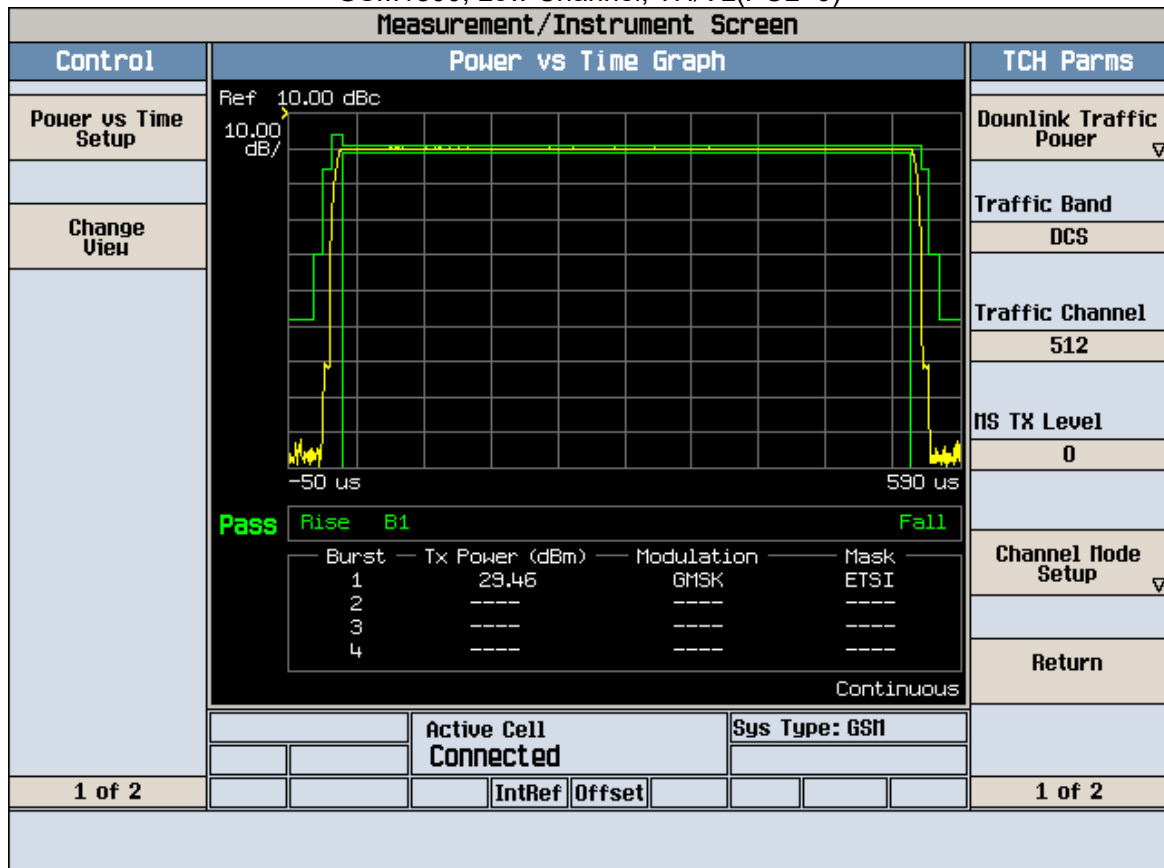
GSM1800, Low Channel, TL/VL(PCL=0)



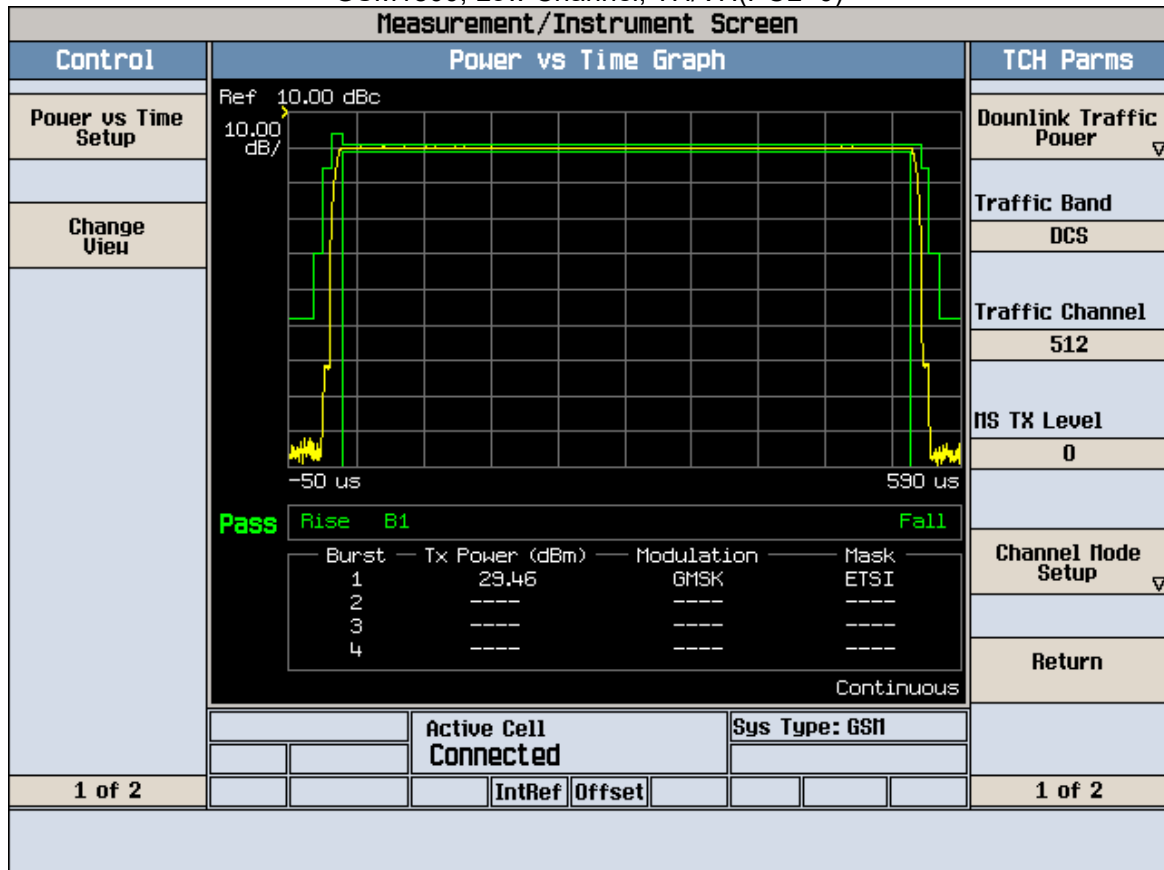
GSM1800, Low Channel, TL/VH(PCL=0)



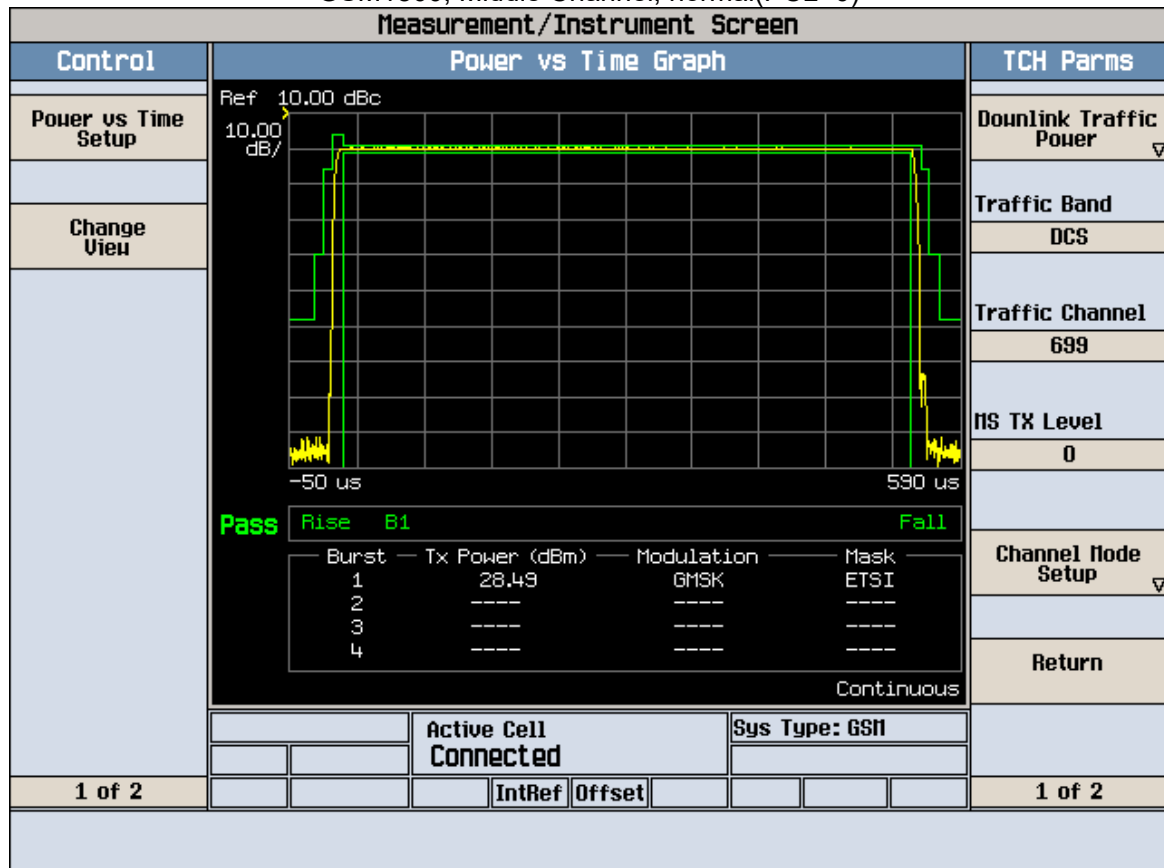
GSM1800, Low Channel, TH/VL(PCL=0)



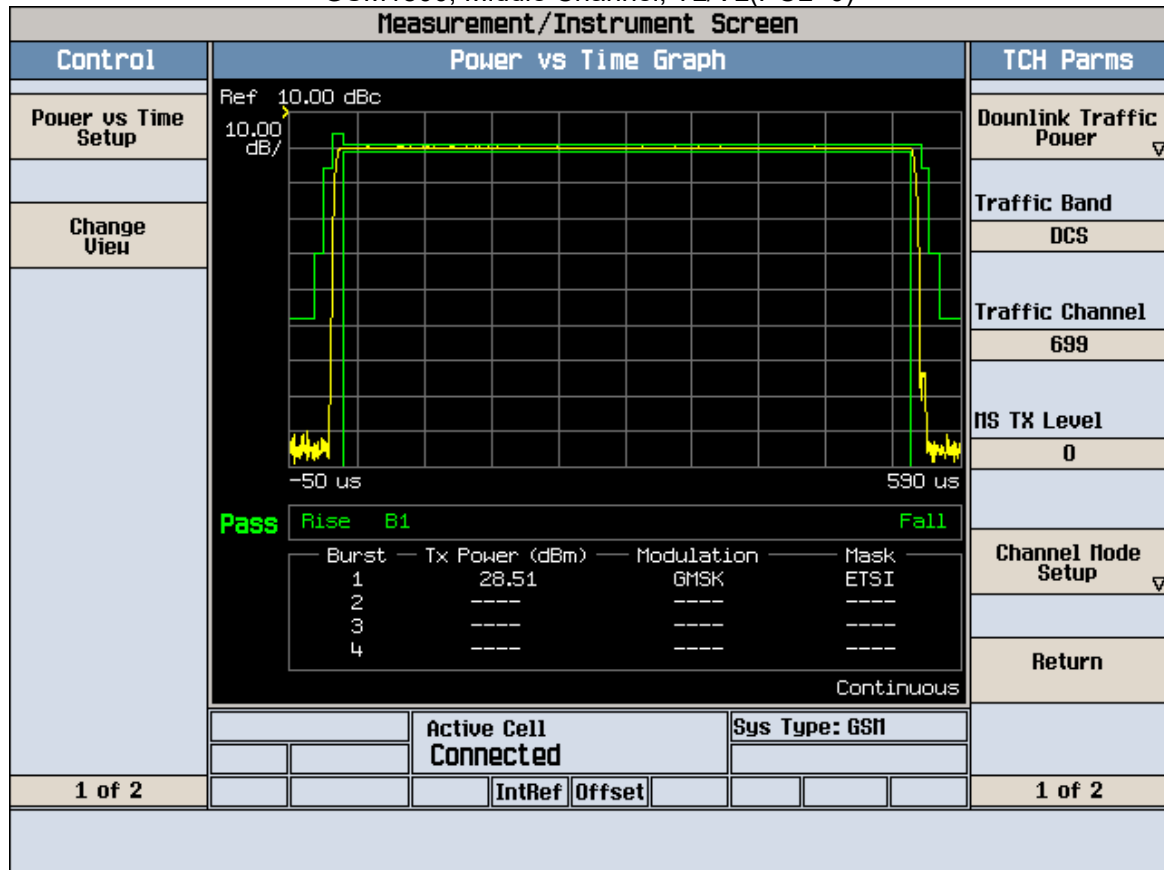
GSM1800, Low Channel, TH/VH(PCL=0)



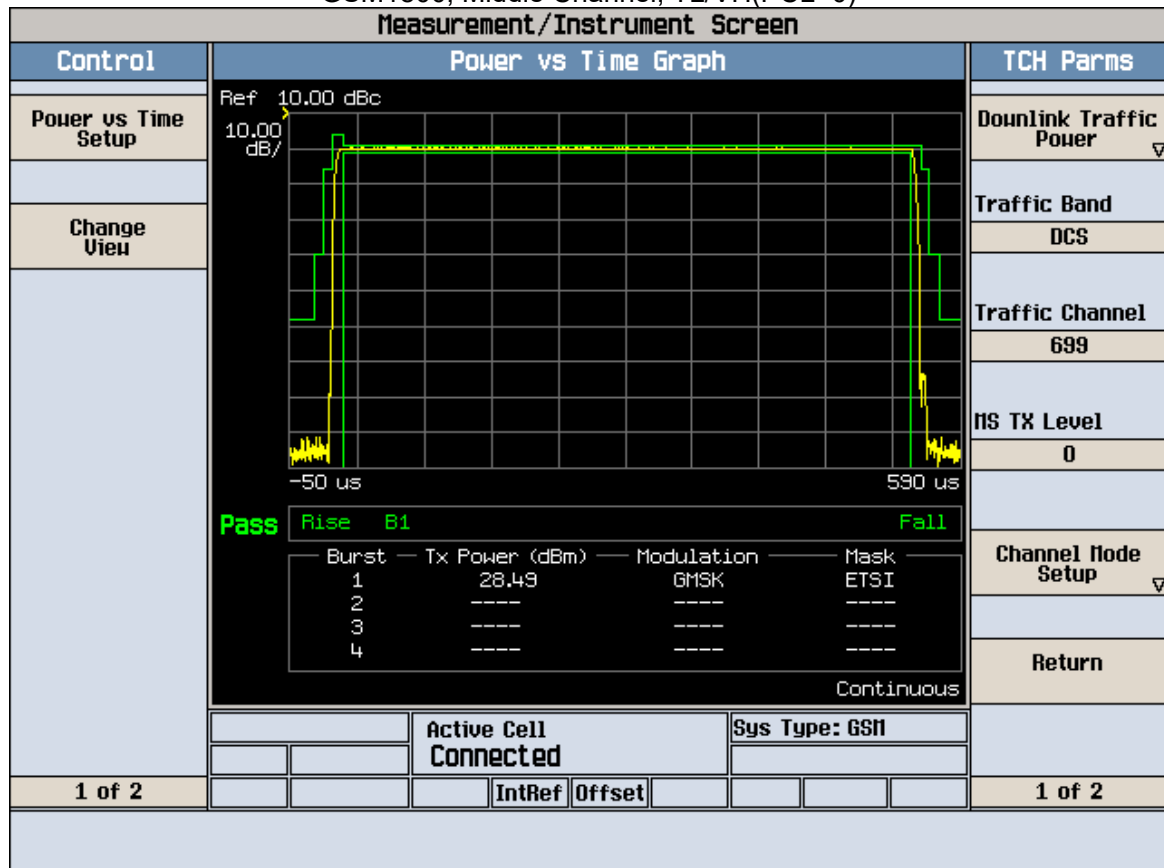
GSM1800, Middle Channel, normal(PCL=0)



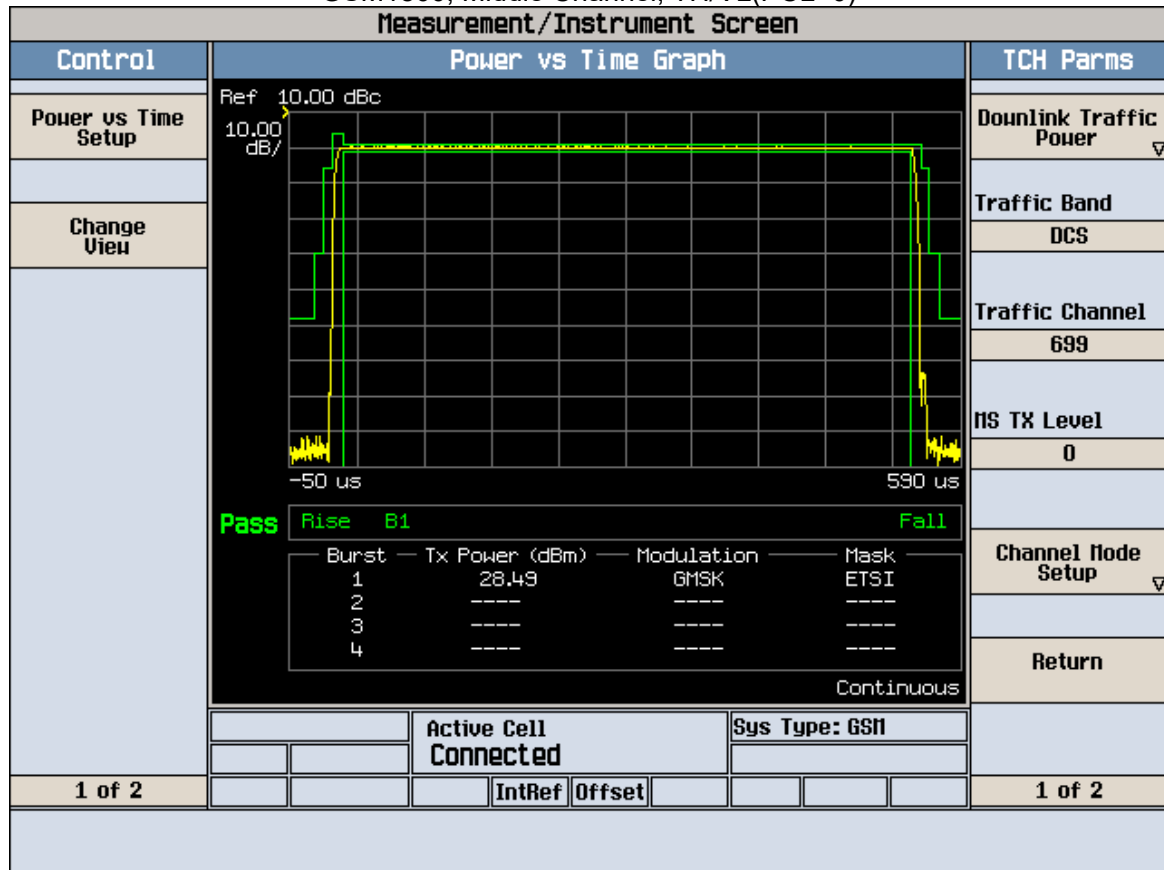
GSM1800, Middle Channel, TL/VL(PCL=0)



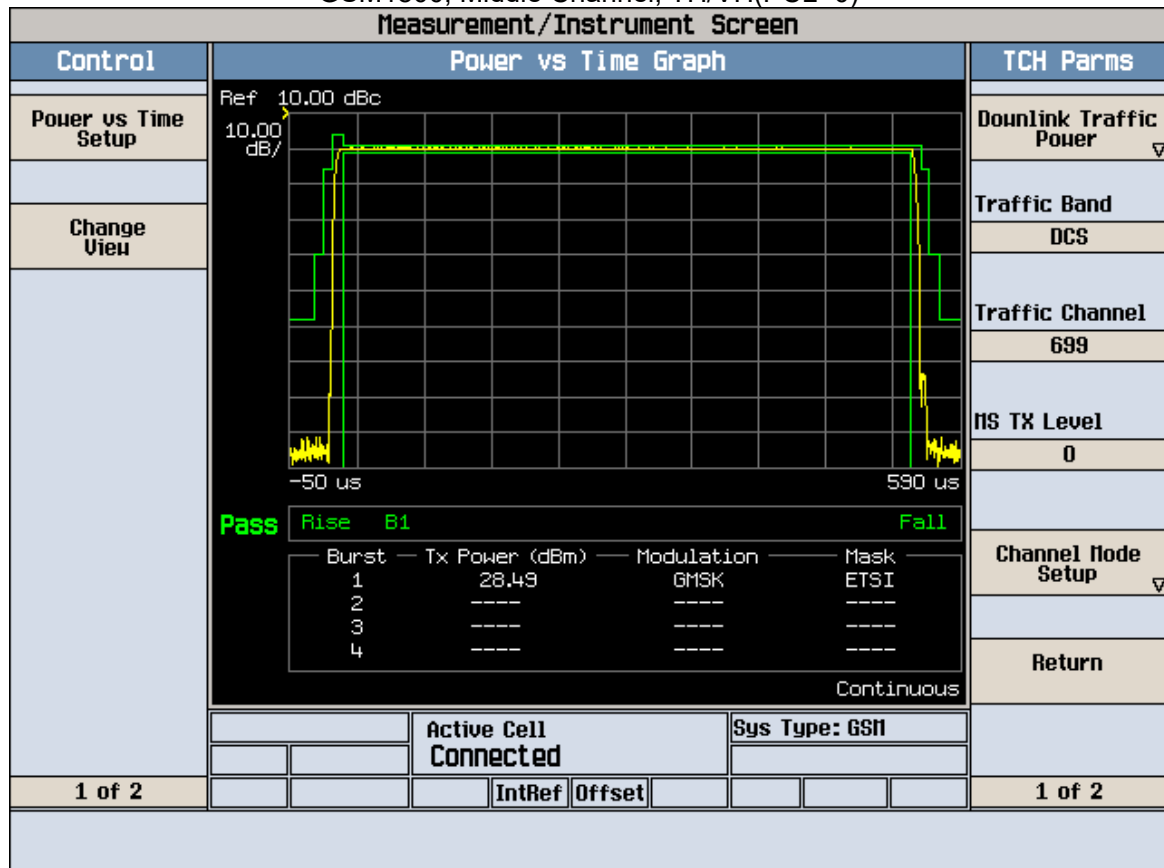
GSM1800, Middle Channel, TL/VH(PCL=0)



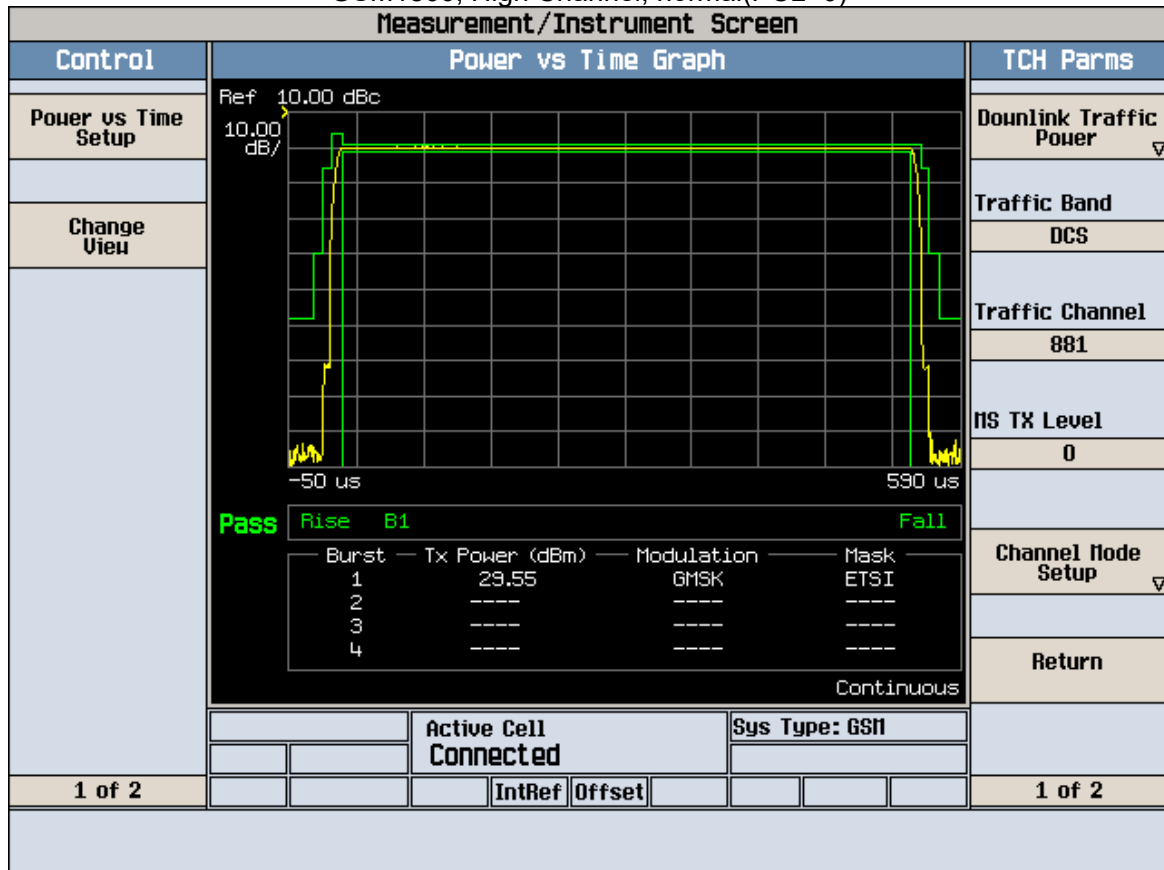
GSM1800, Middle Channel, TH/VL(PCL=0)



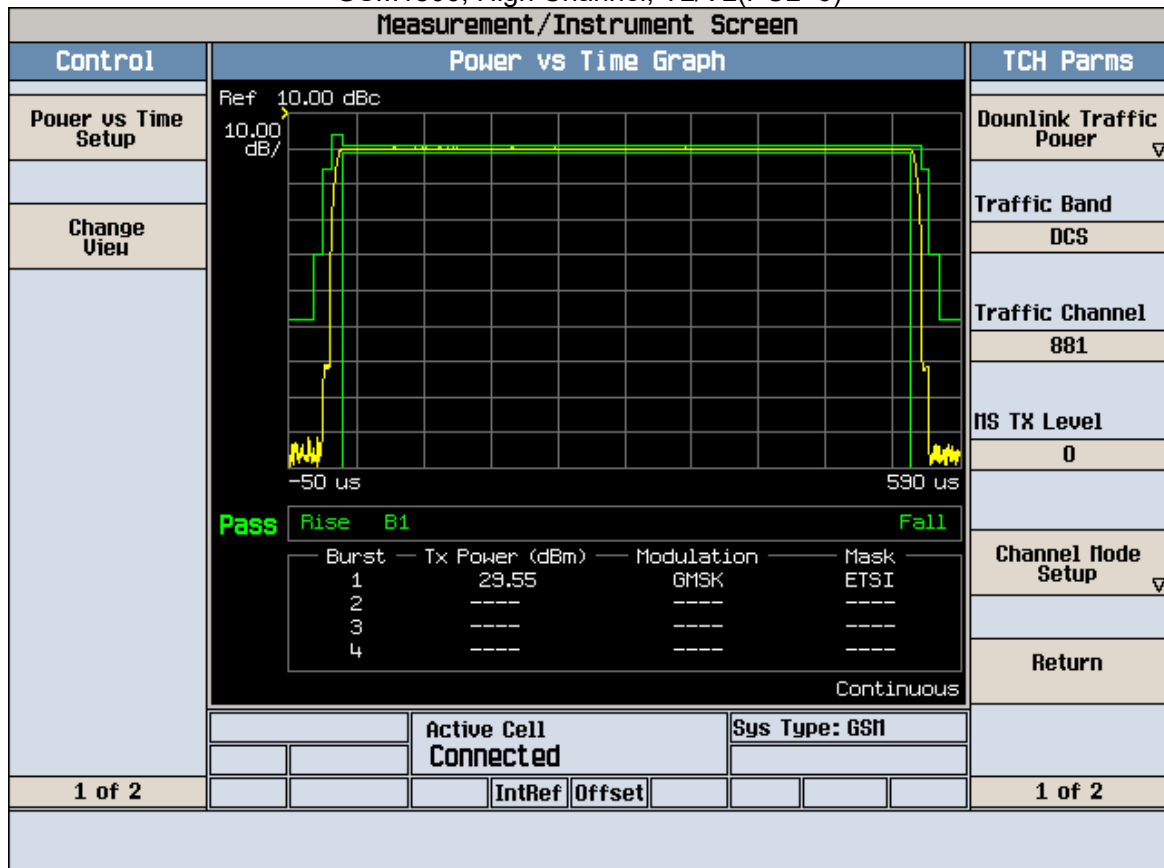
GSM1800, Middle Channel, TH/VH(PCL=0)



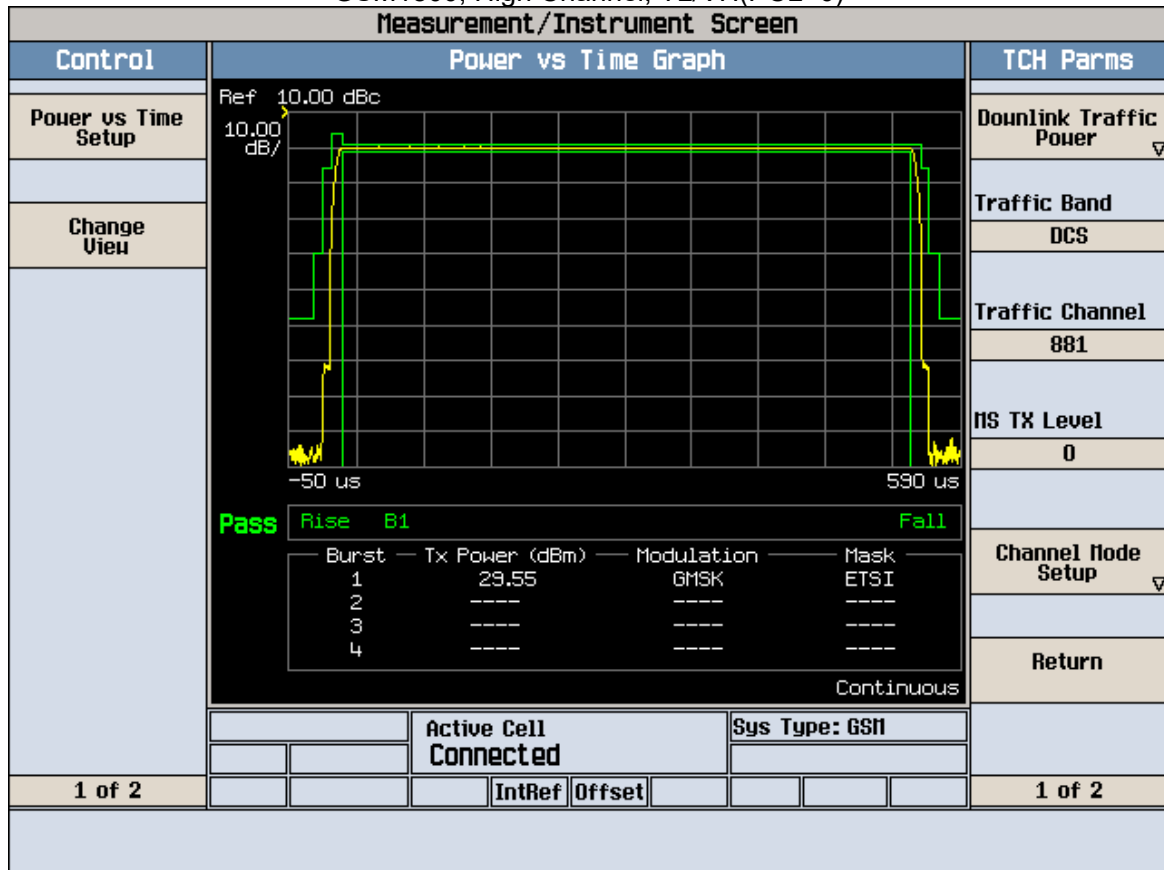
GSM1800, High Channel, normal(PCL=0)



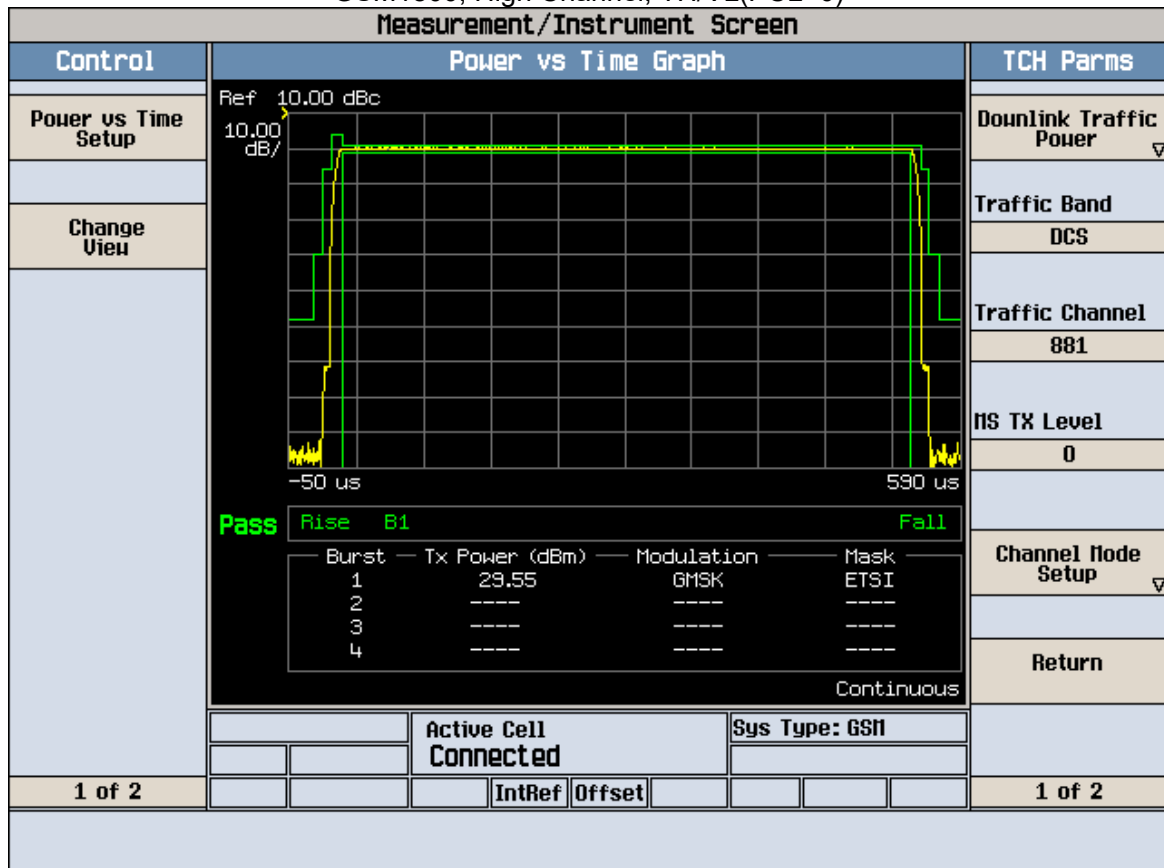
GSM1800, High Channel, TL/VL(PCL=0)



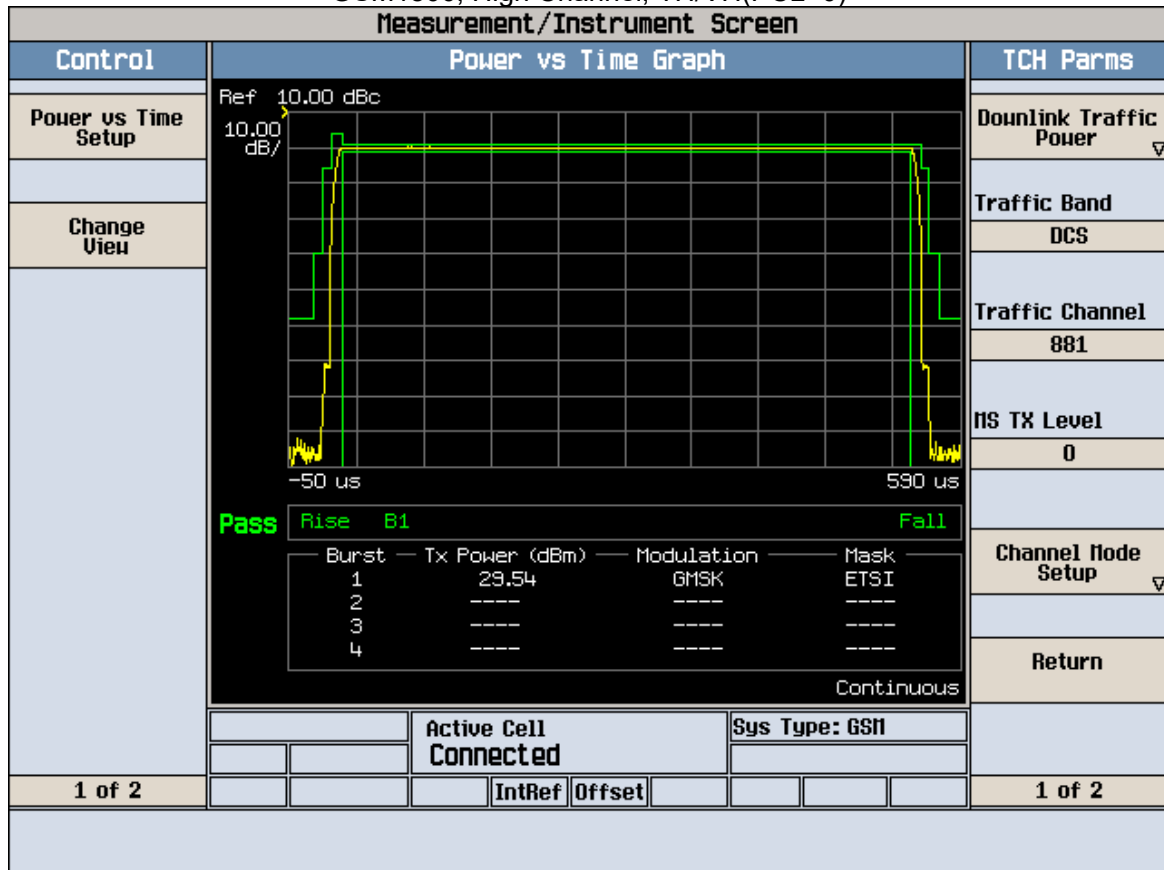
GSM1800, High Channel, TL/VH(PCL=0)



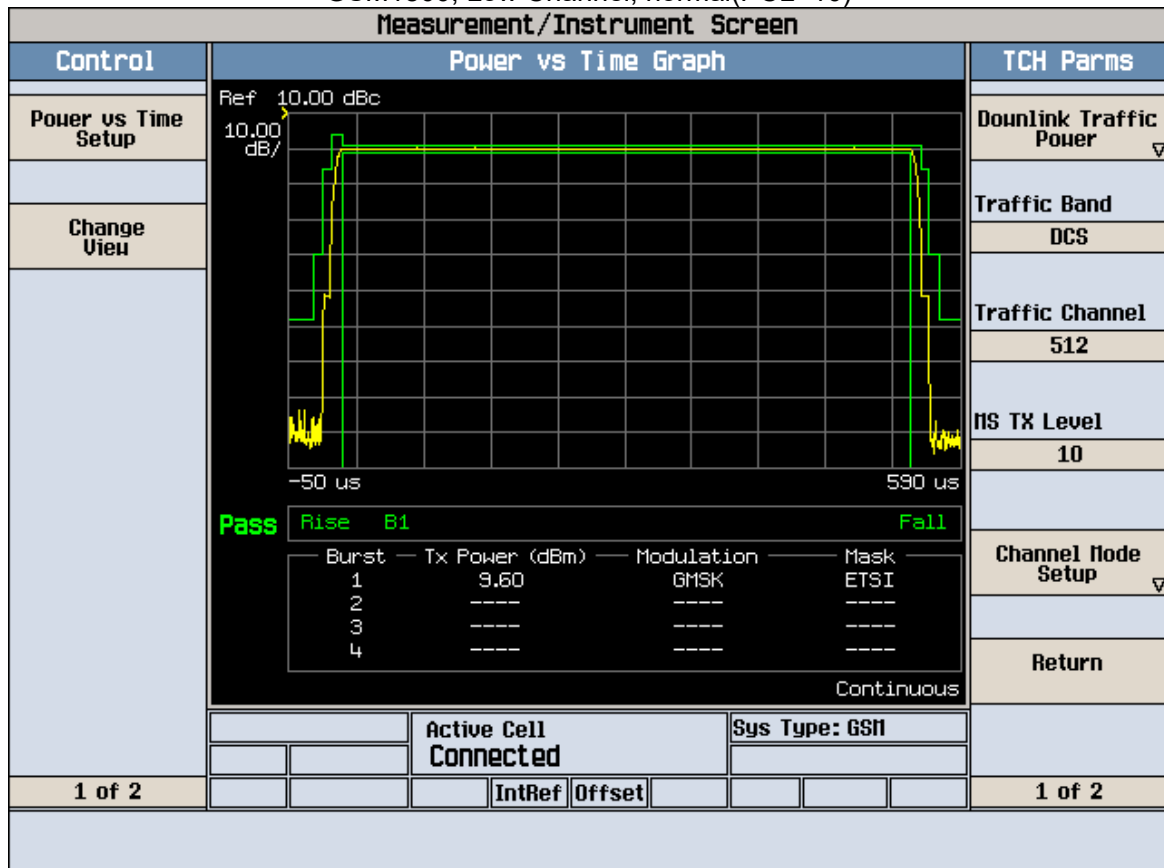
GSM1800, High Channel, TH/VL(PCL=0)



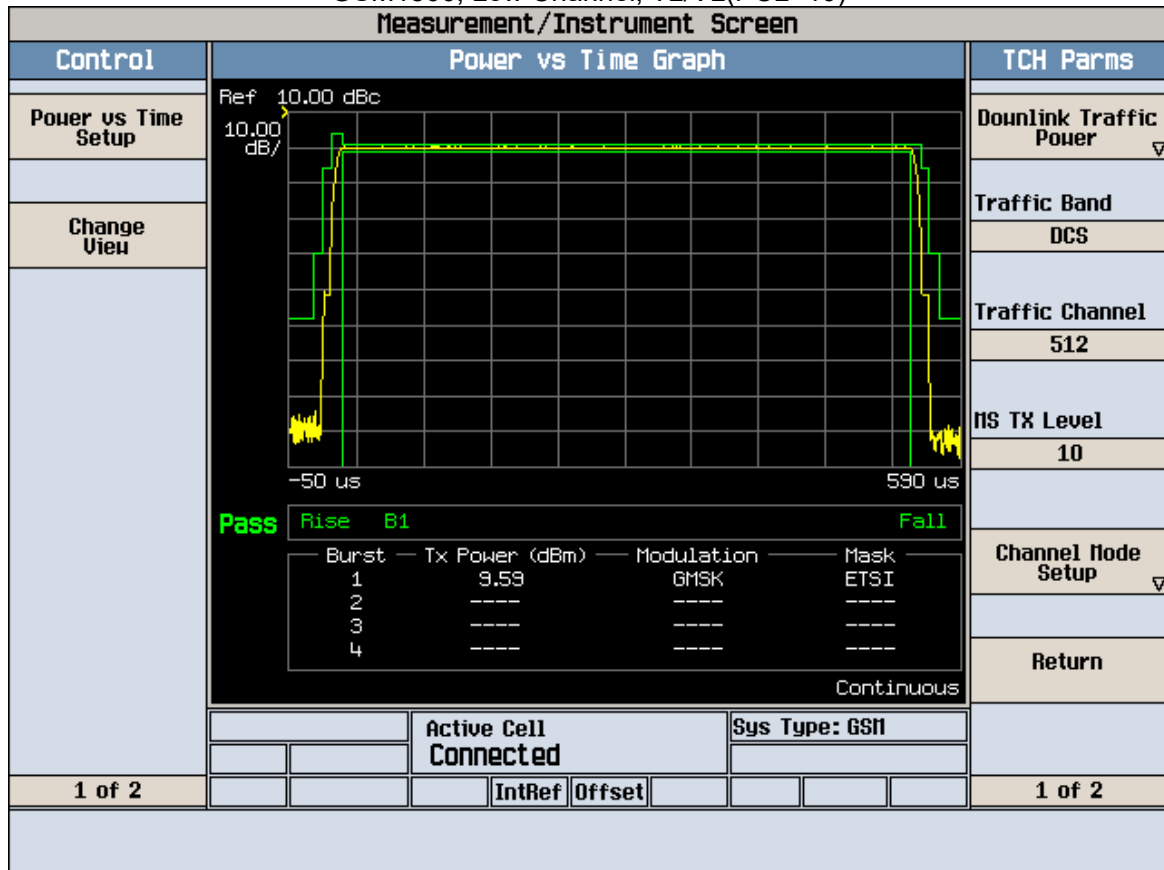
GSM1800, High Channel, TH/VH(PCL=0)



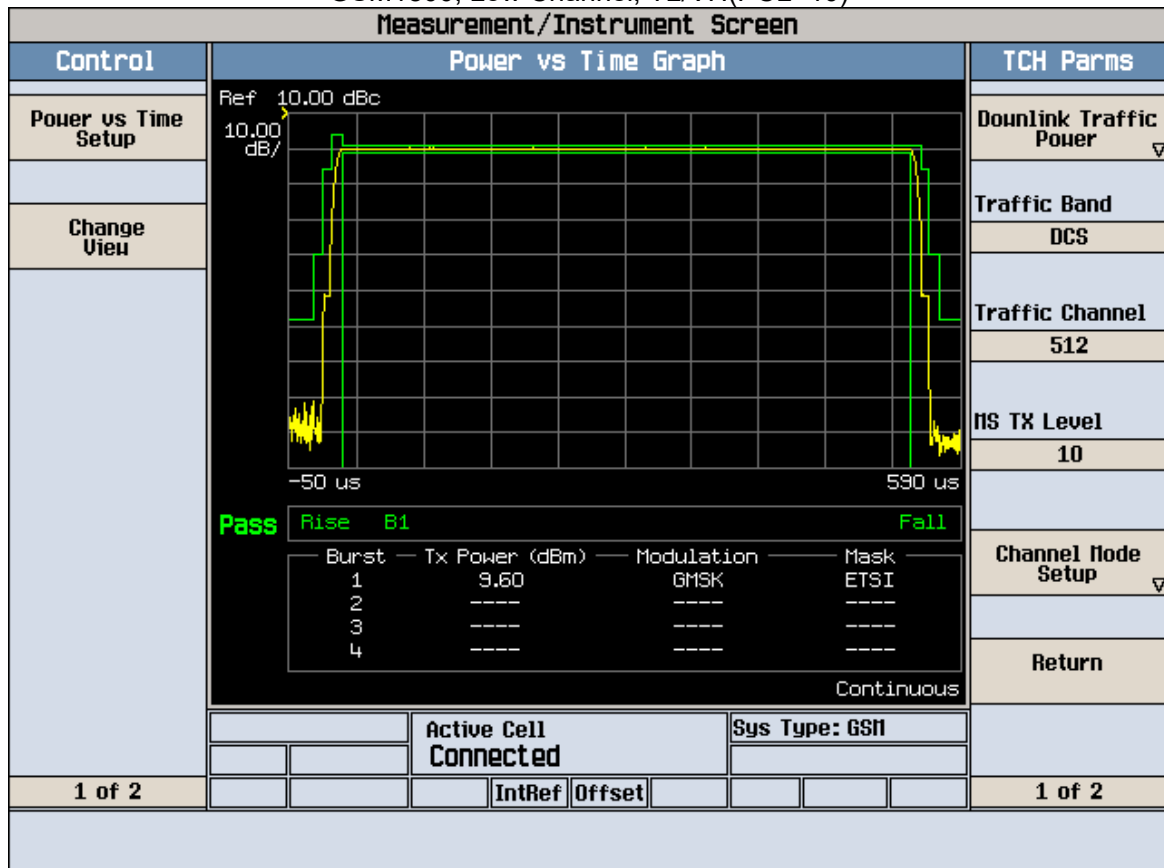
GSM1800, Low Channel, normal(PCL=10)



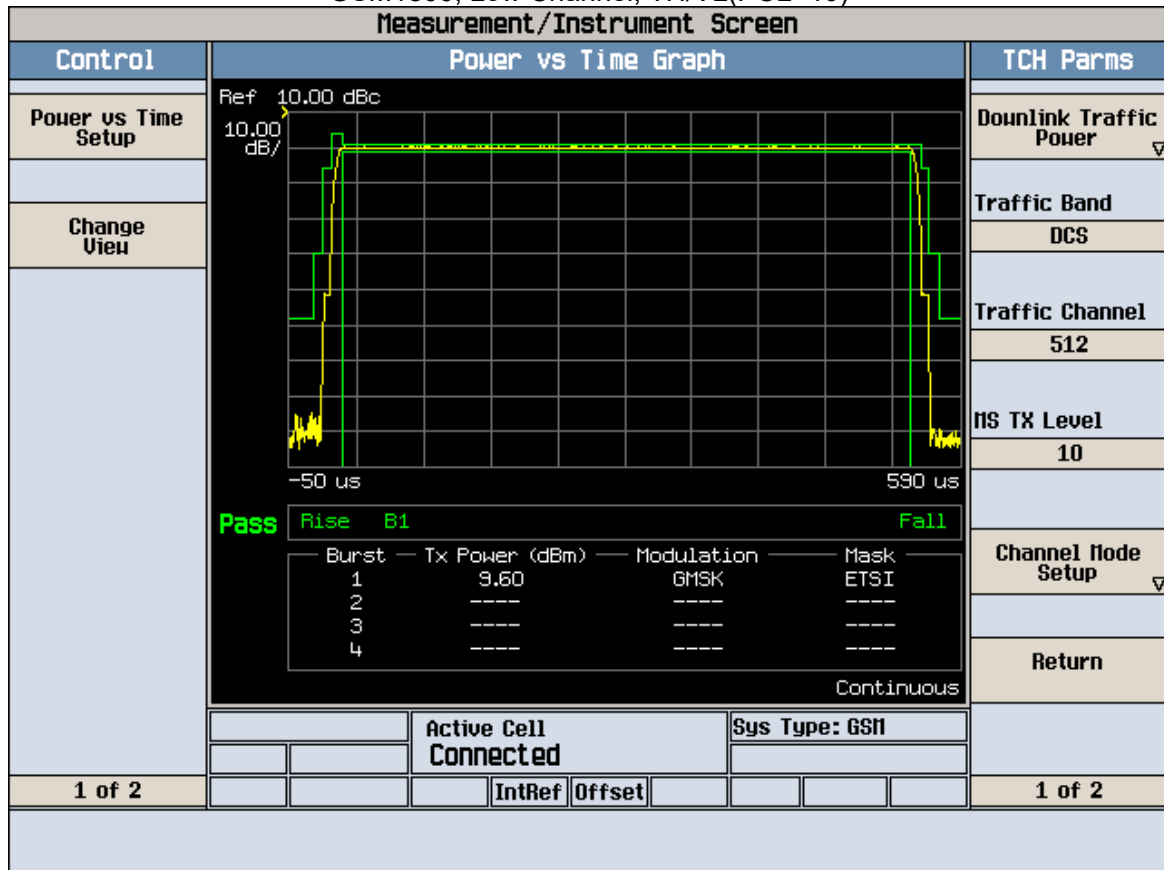
GSM1800, Low Channel, TL/VL(PCL=10)



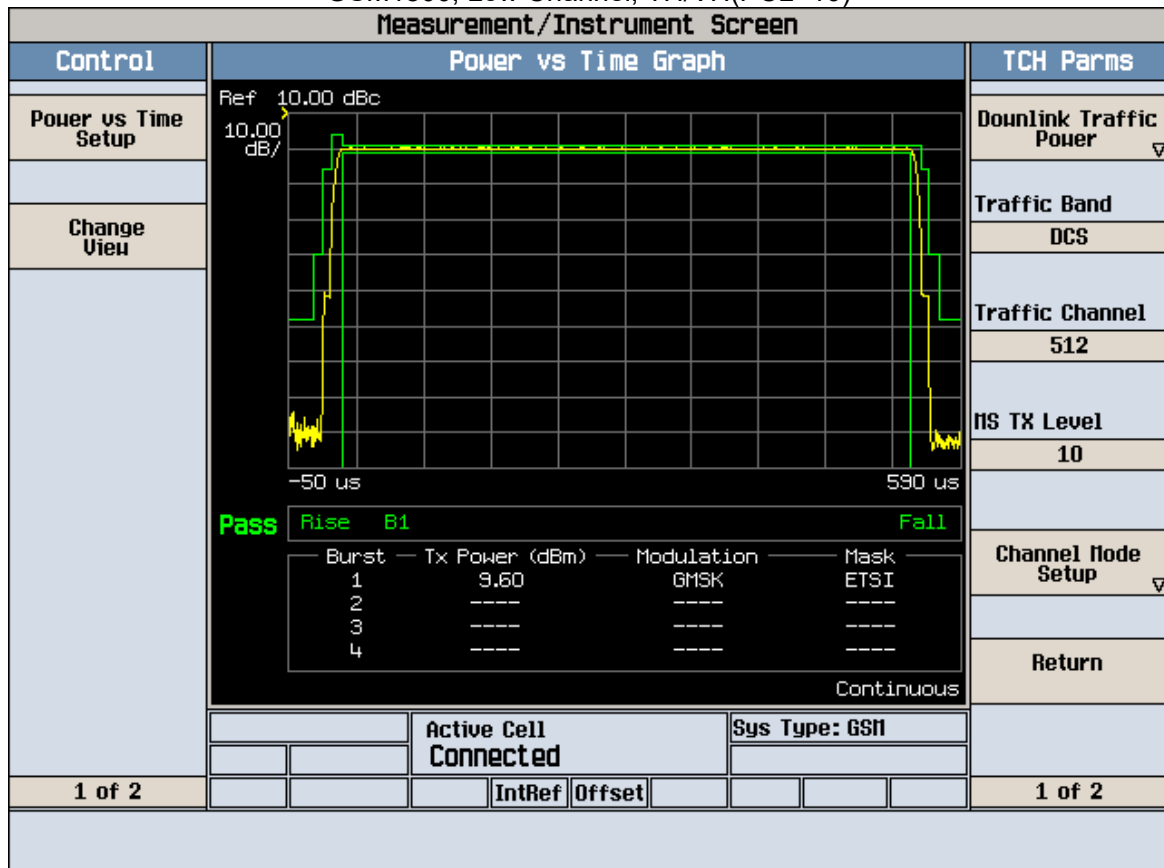
GSM1800, Low Channel, TL/VH(PCL=10)



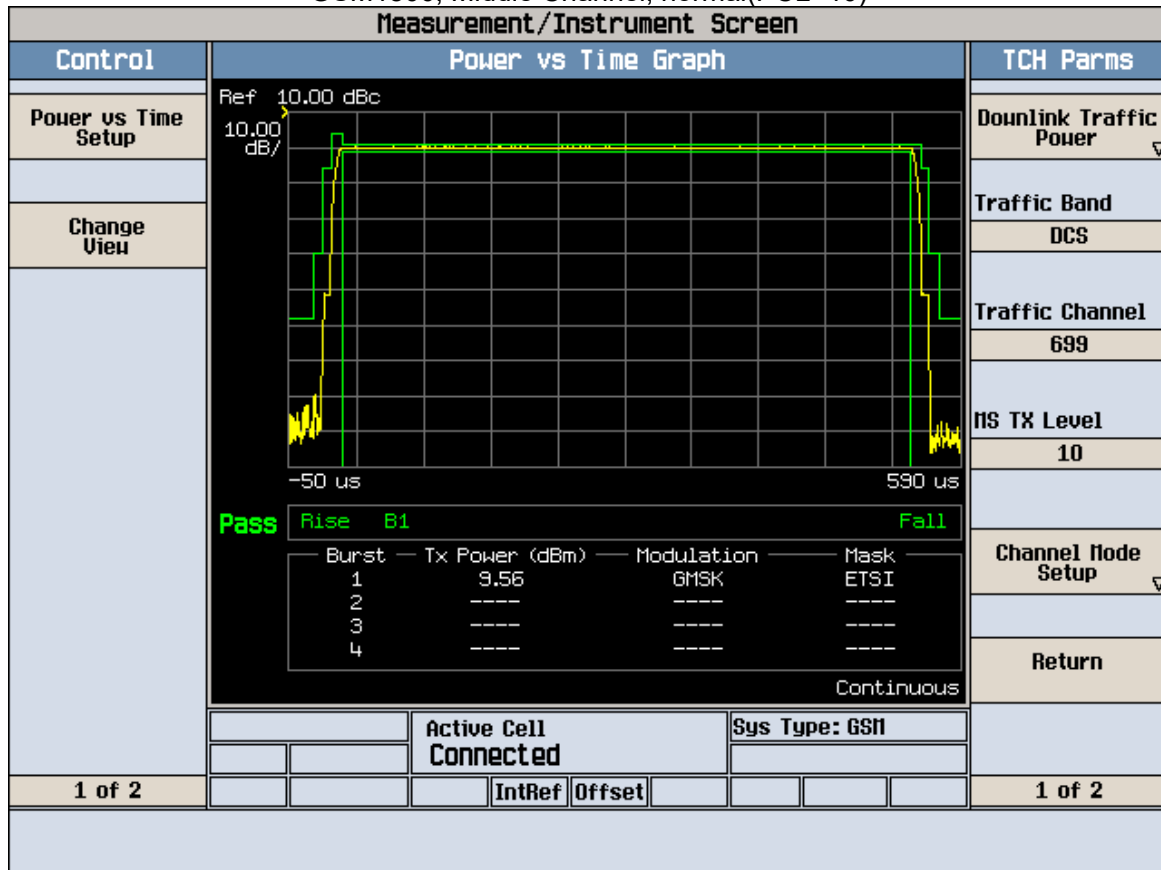
GSM1800, Low Channel, TH/VL(PCL=10)



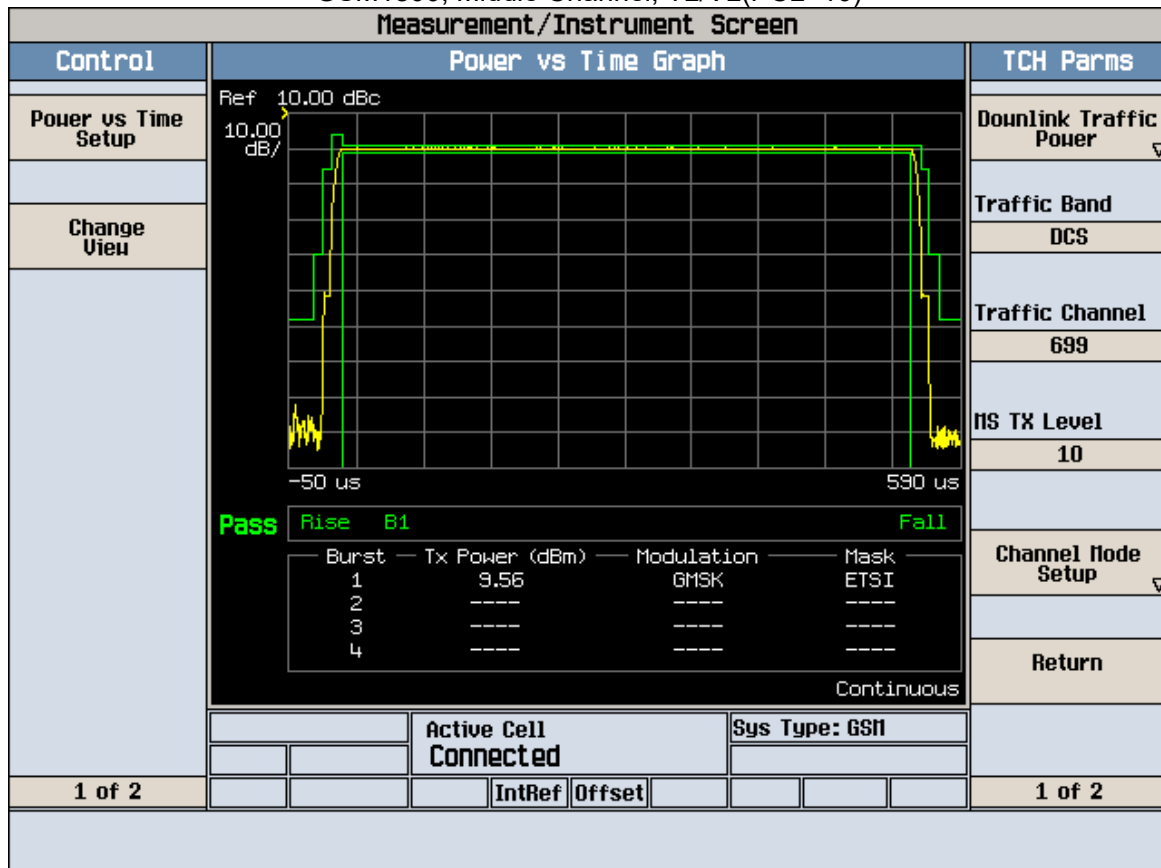
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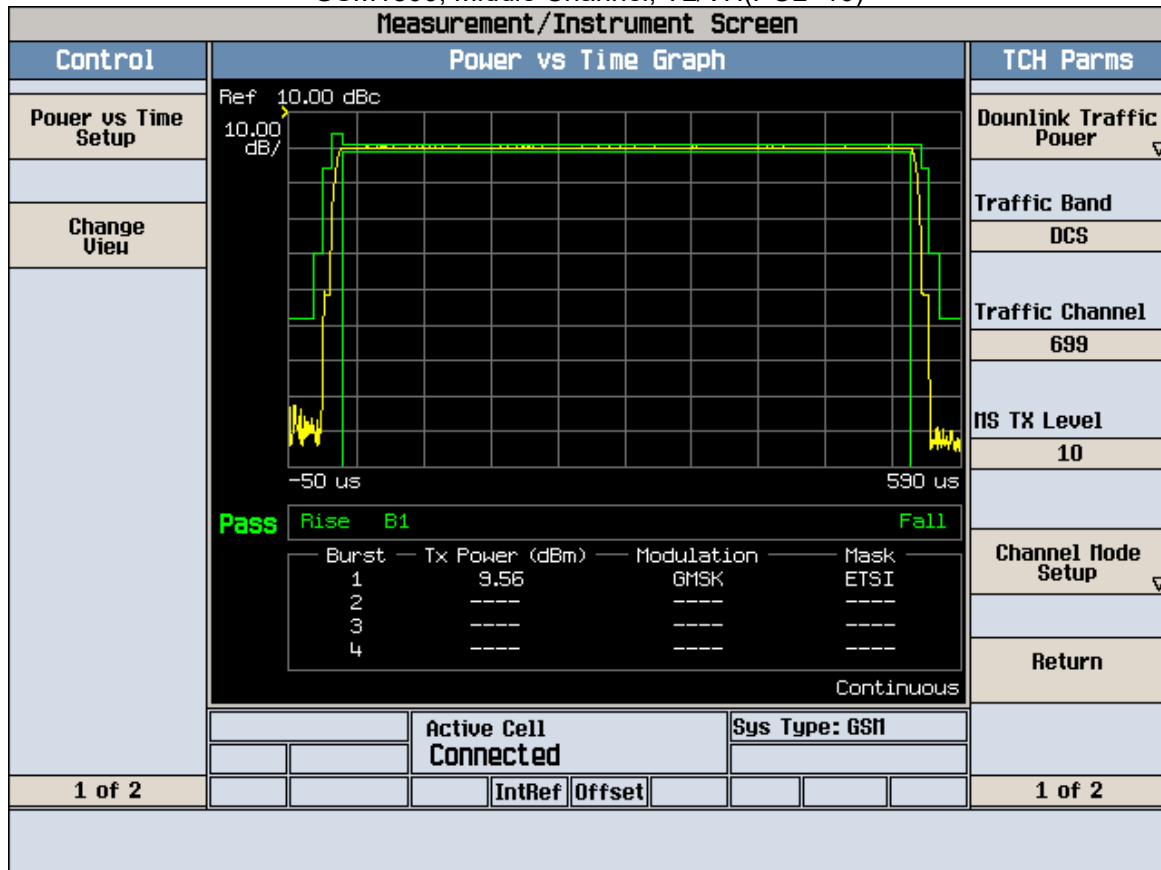
GSM1800, Middle Channel, normal(PCL=10)



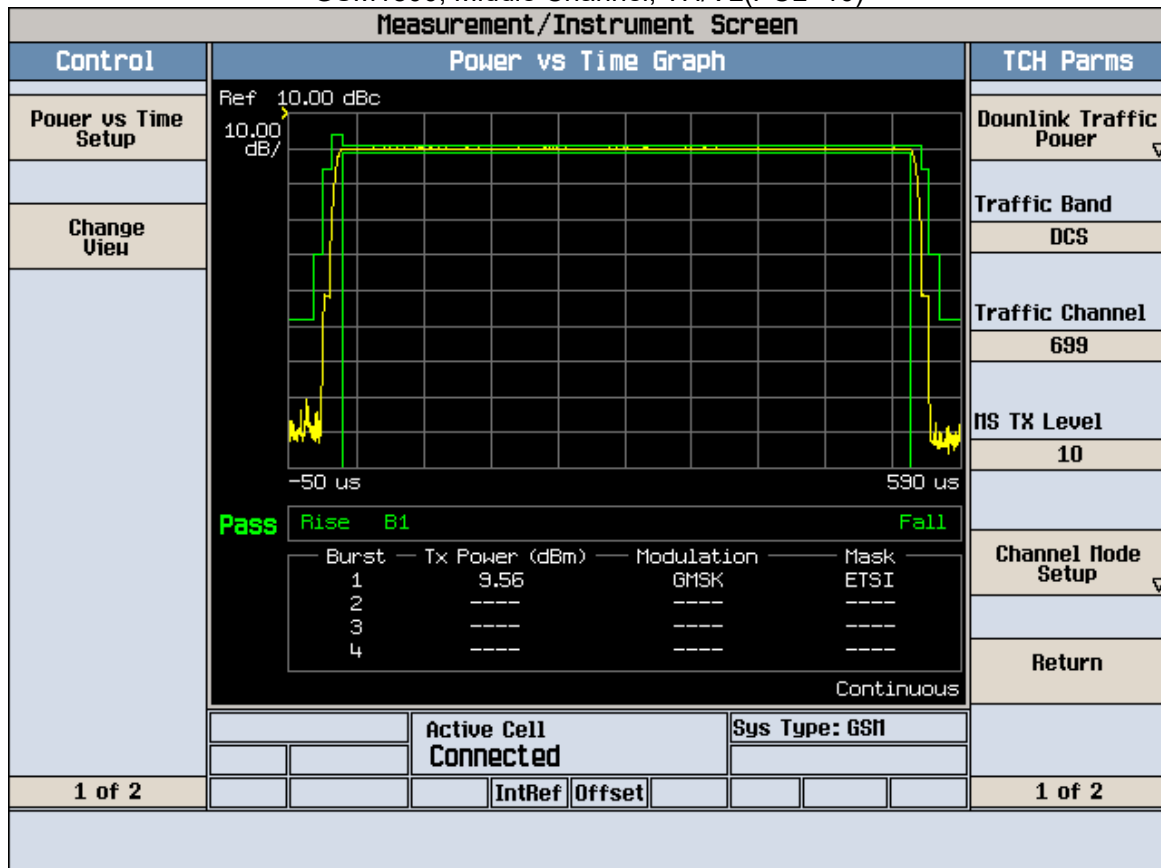
GSM1800, Middle Channel, TL/VL(PCL=10)



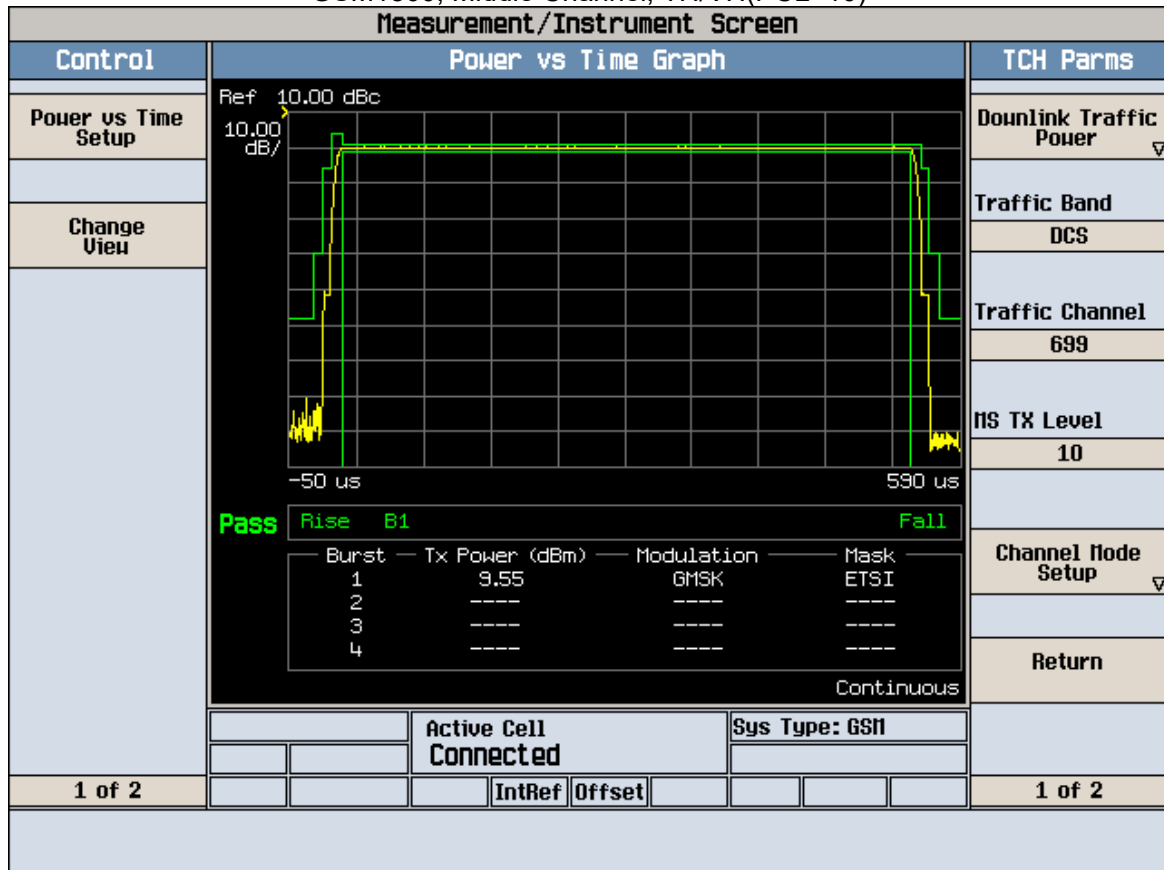
GSM1800, Middle Channel, TL/VH(PCL=10)



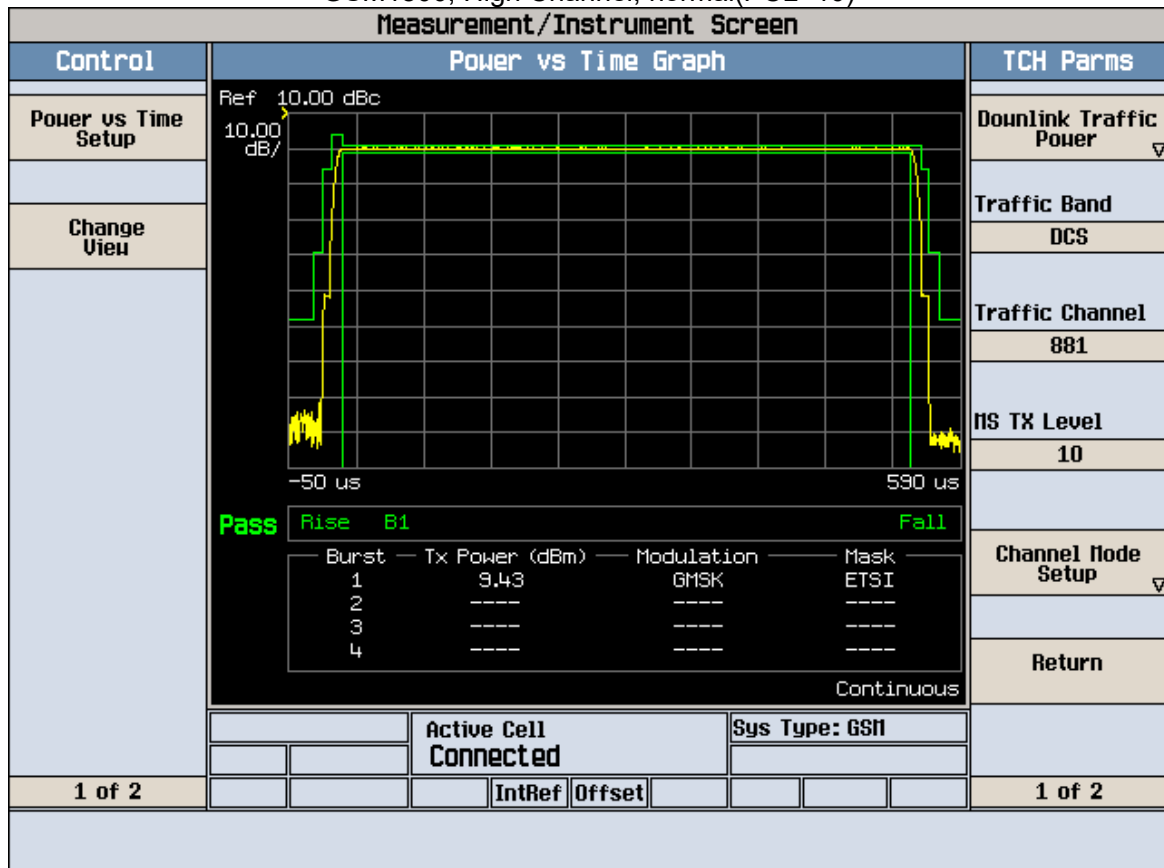
GSM1800, Middle Channel, TH/VL(PCL=10)



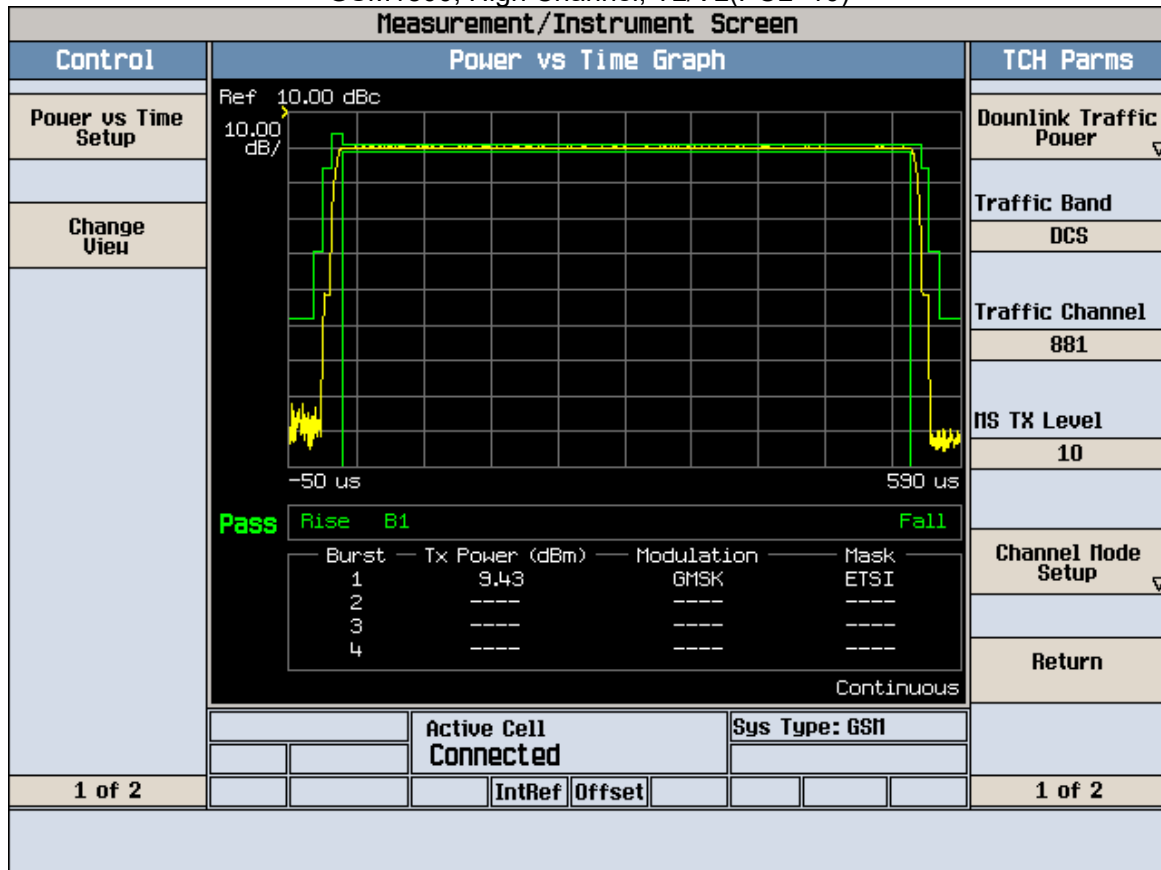
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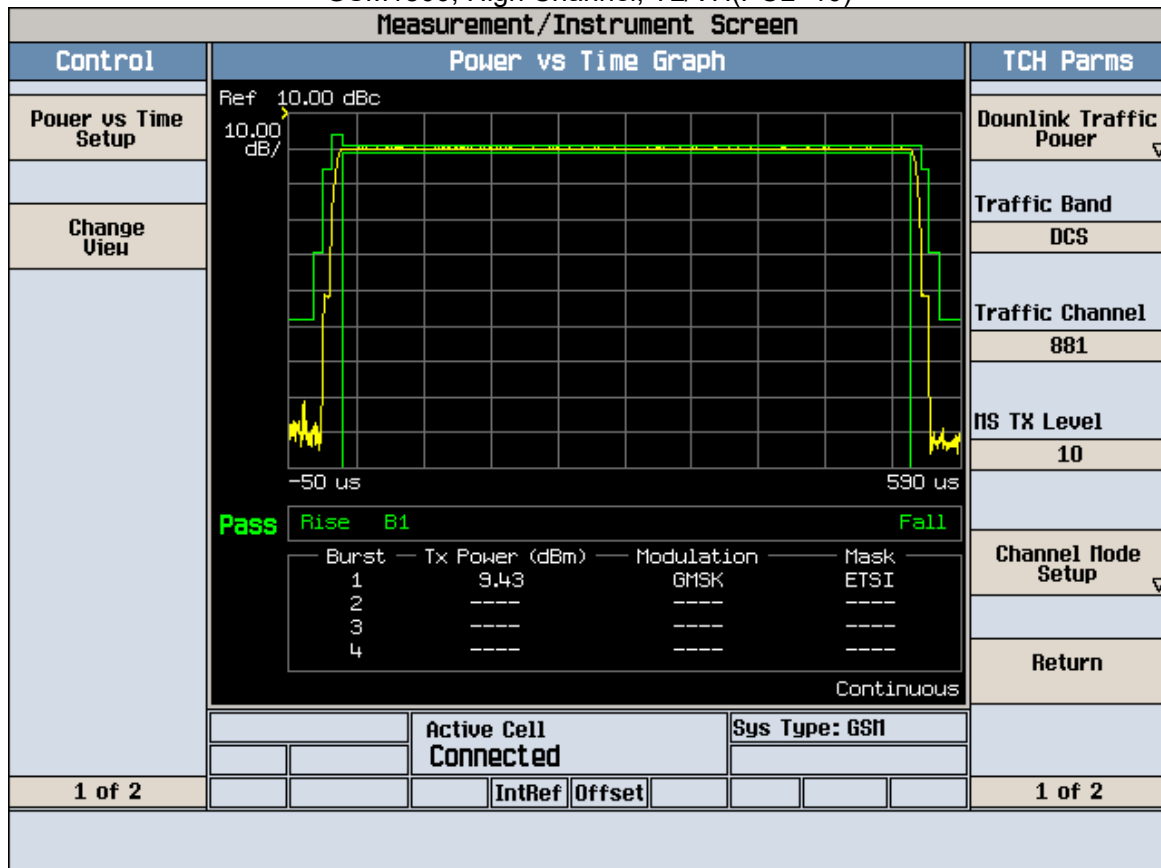
GSM1800, High Channel, normal(PCL=10)



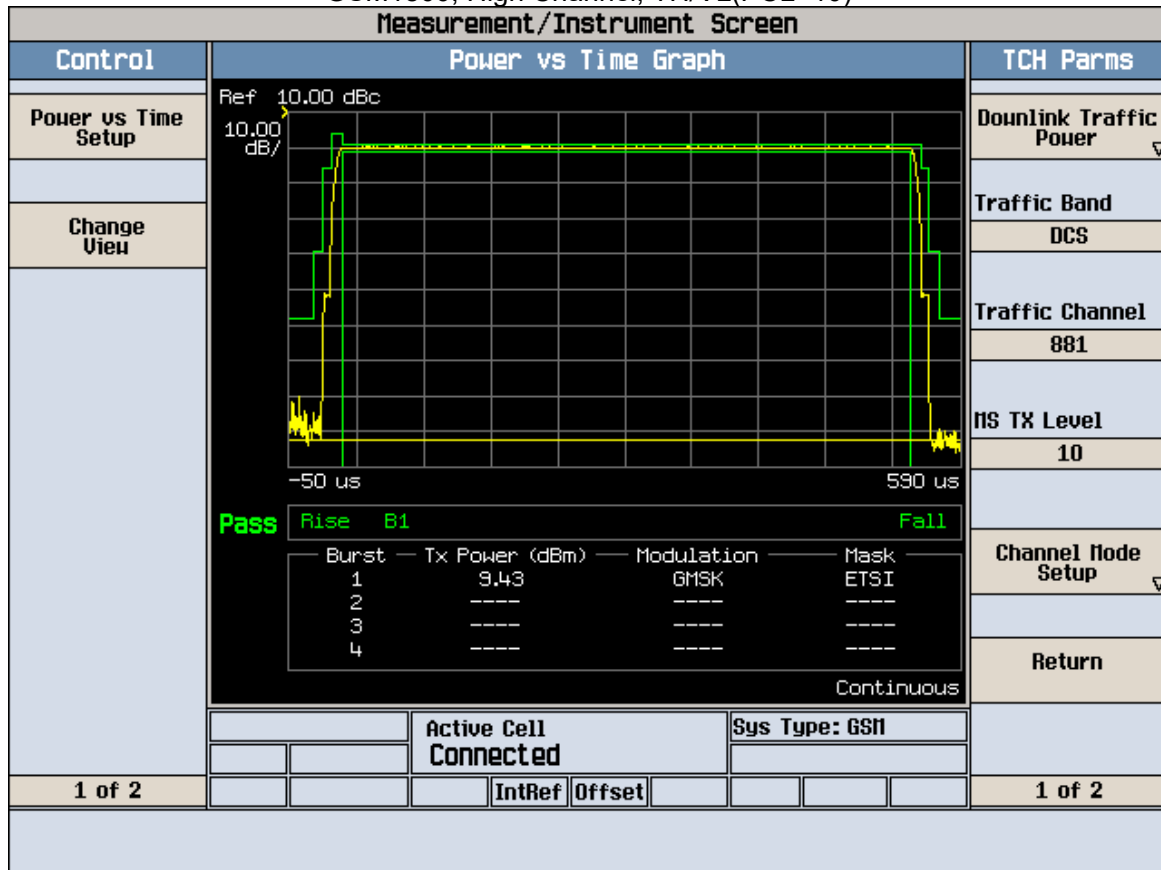
GSM1800, High Channel, TL/VL(PCL=10)



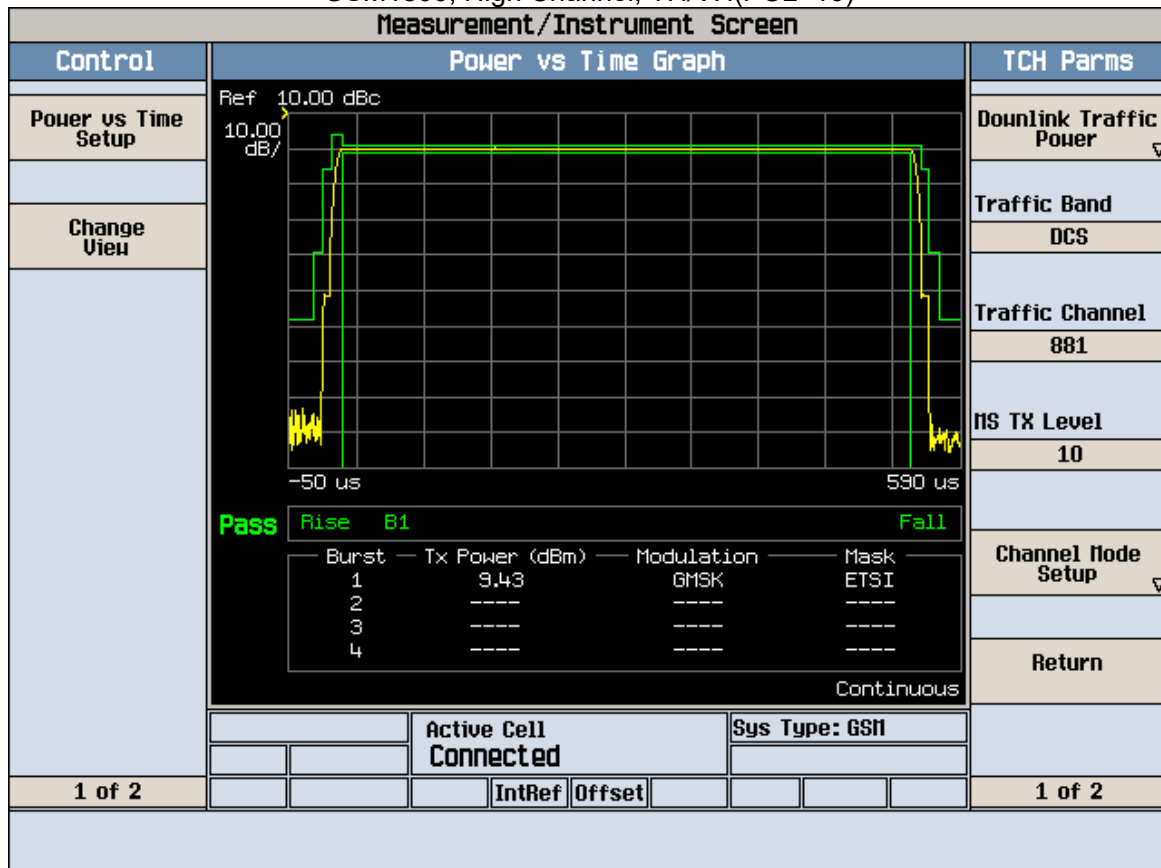
GSM1800, High Channel, TL/VH(PCL=10)



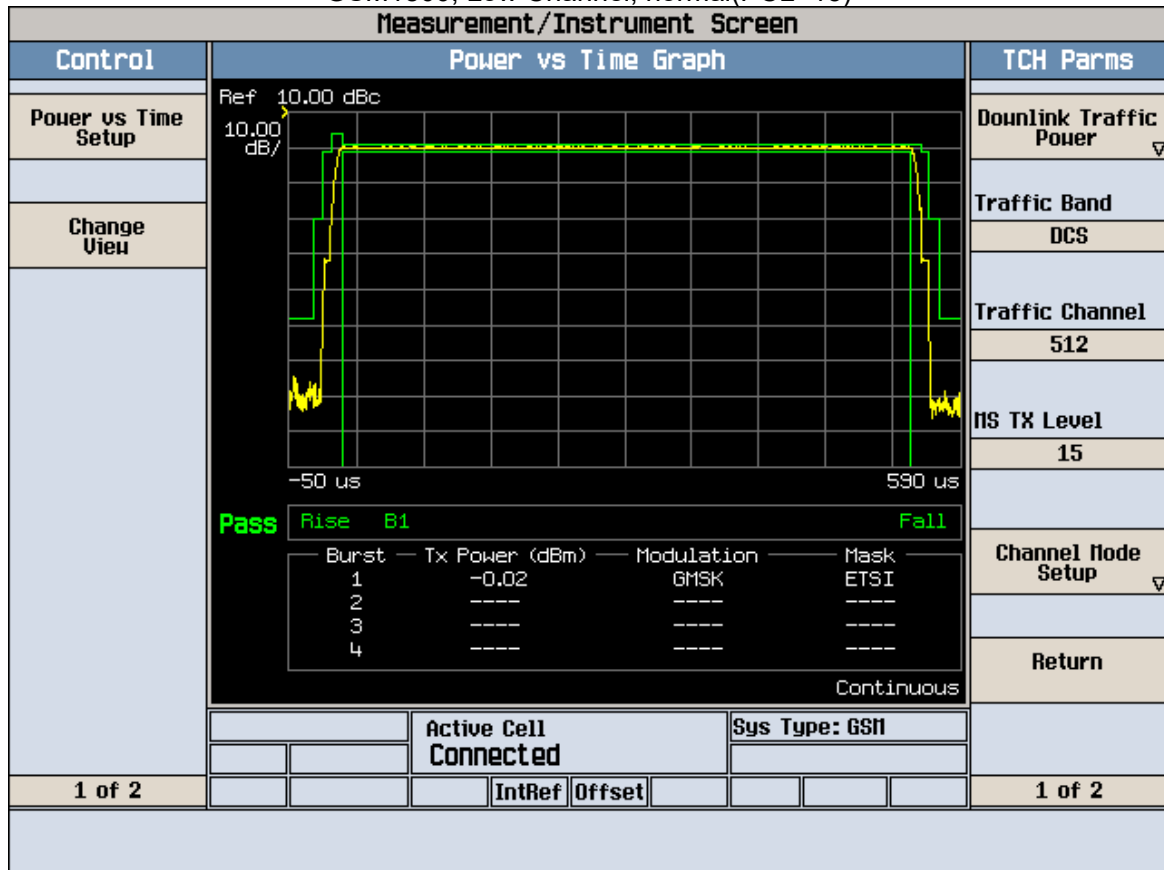
GSM1800, High Channel, TH/VL(PCL=10)



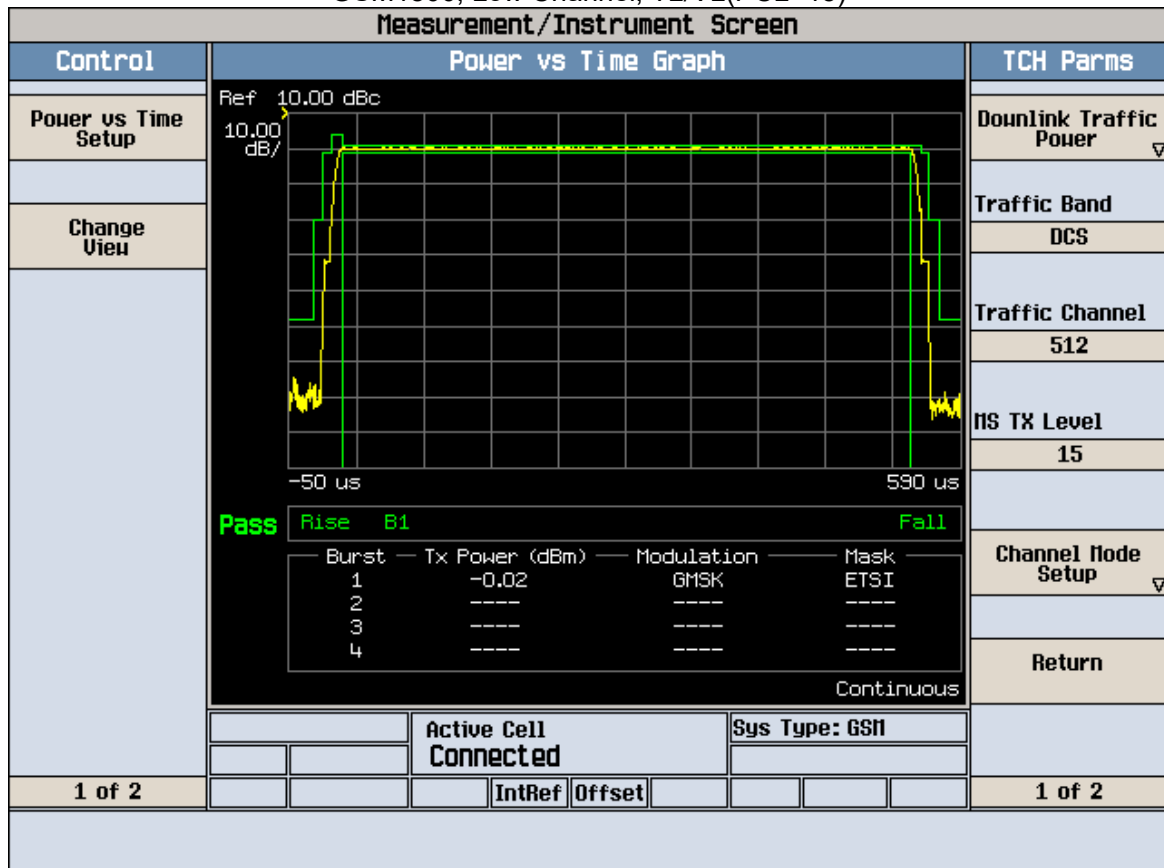
GSM1800, High Channel, TH/VH(PCL=10)



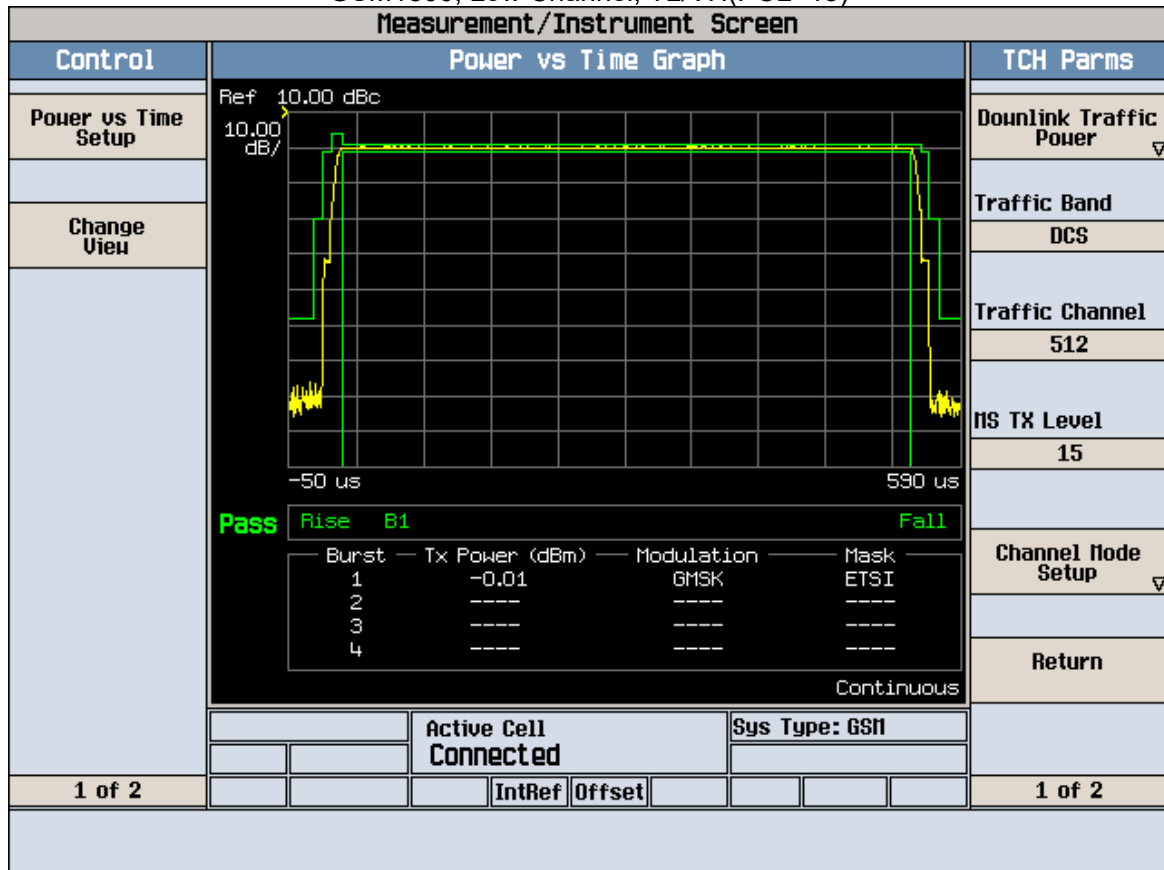
GSM1800, Low Channel, normal(PCL=15)



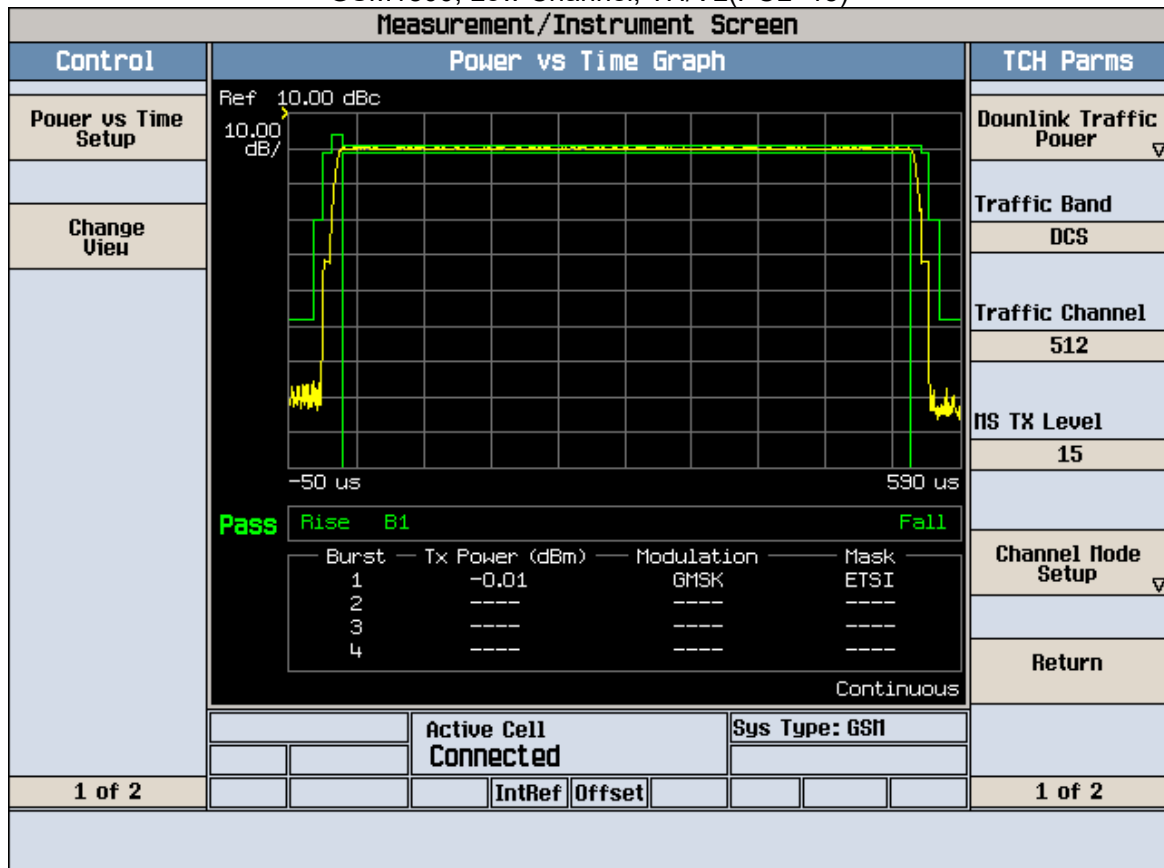
GSM1800, Low Channel, TL/VL(PCL=15)



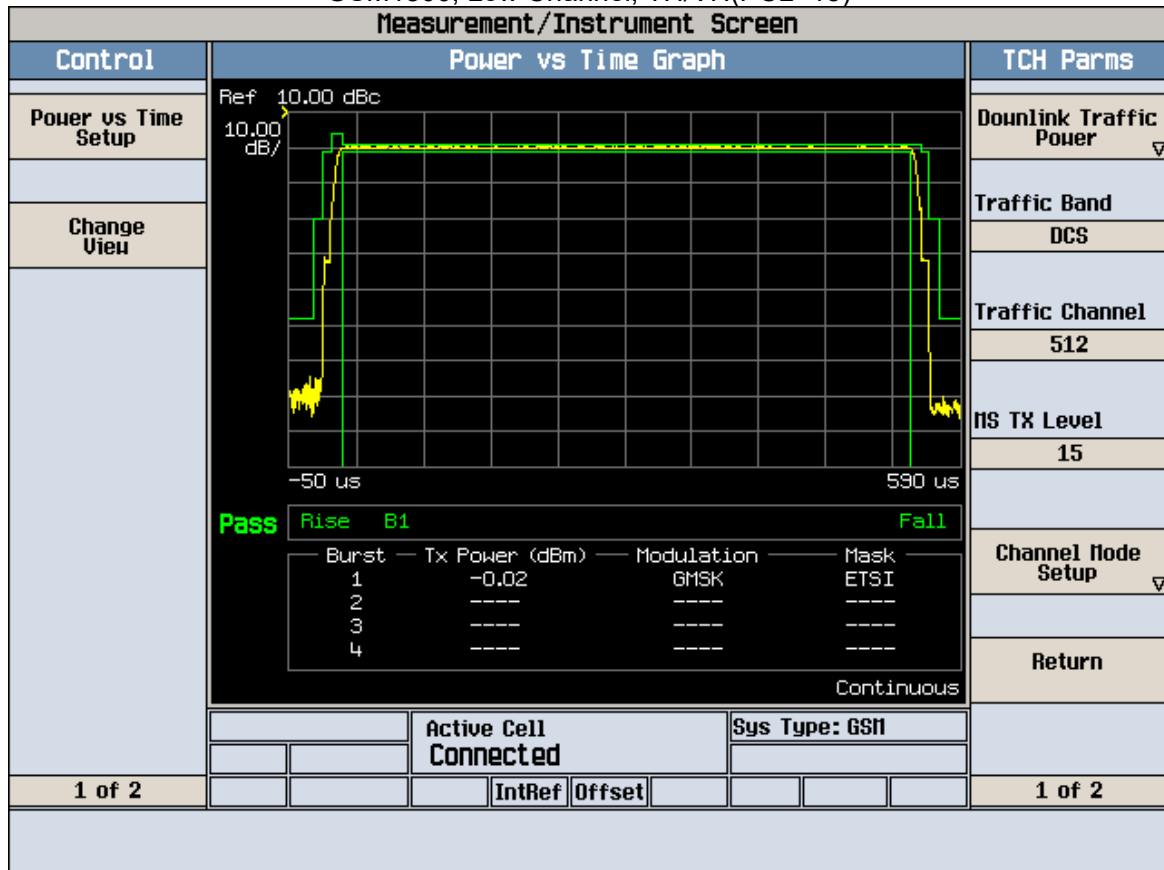
GSM1800, Low Channel, TL/VH(PCL=15)



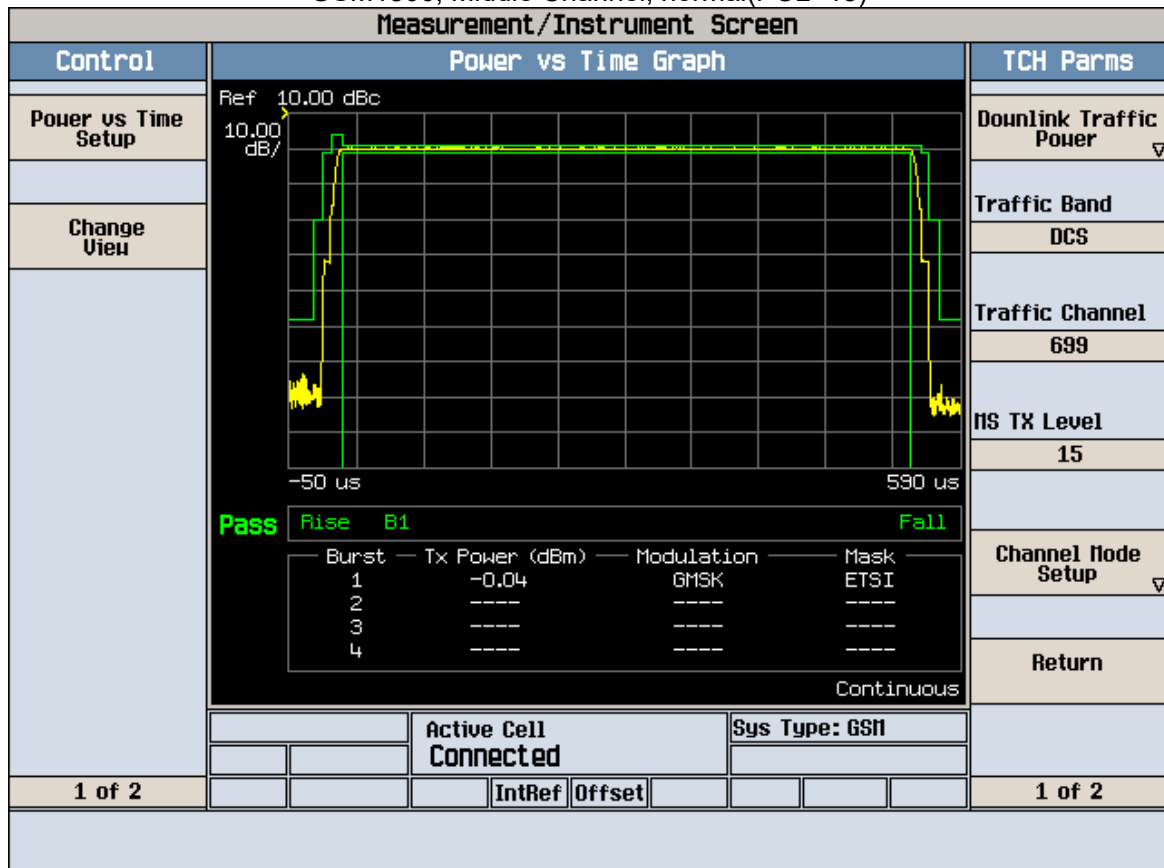
GSM1800, Low Channel, TH/VL(PCL=15)



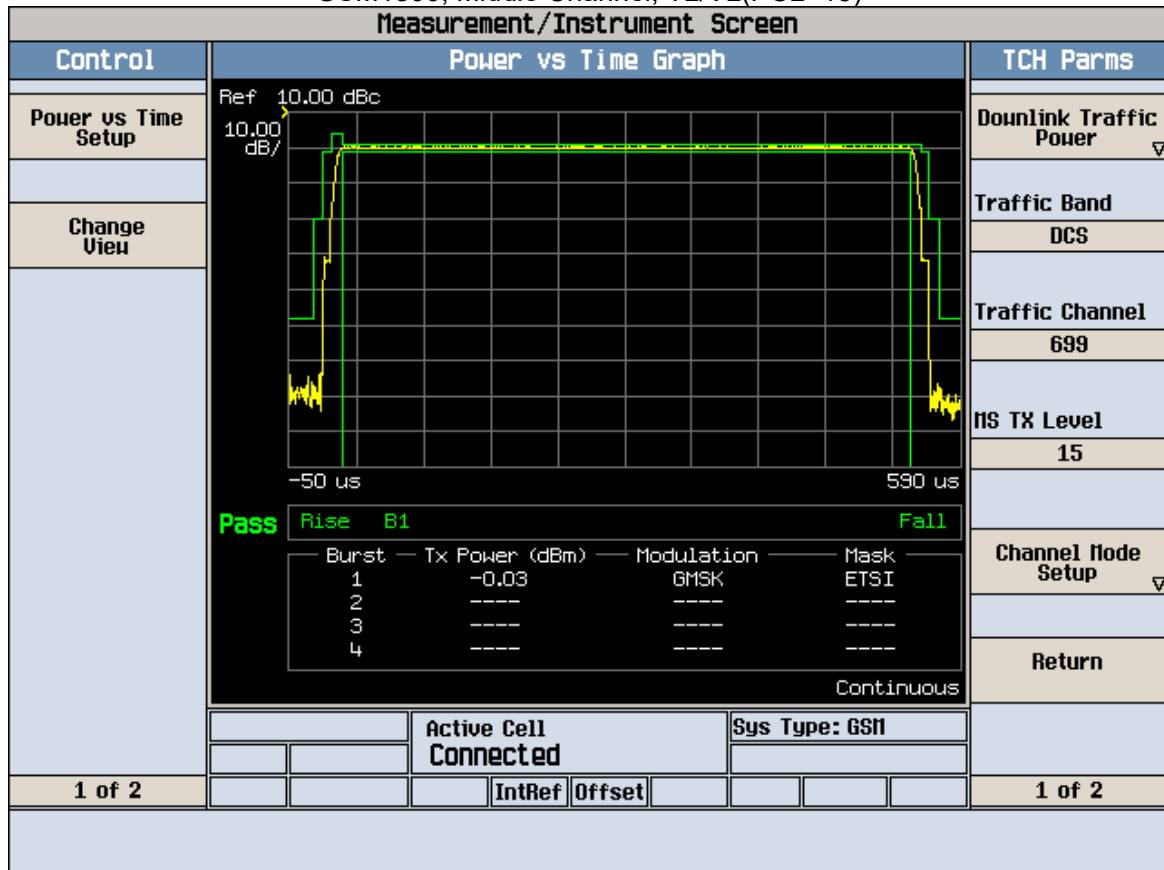
GSM1800, Low Channel, TH/VH(PCL=15)



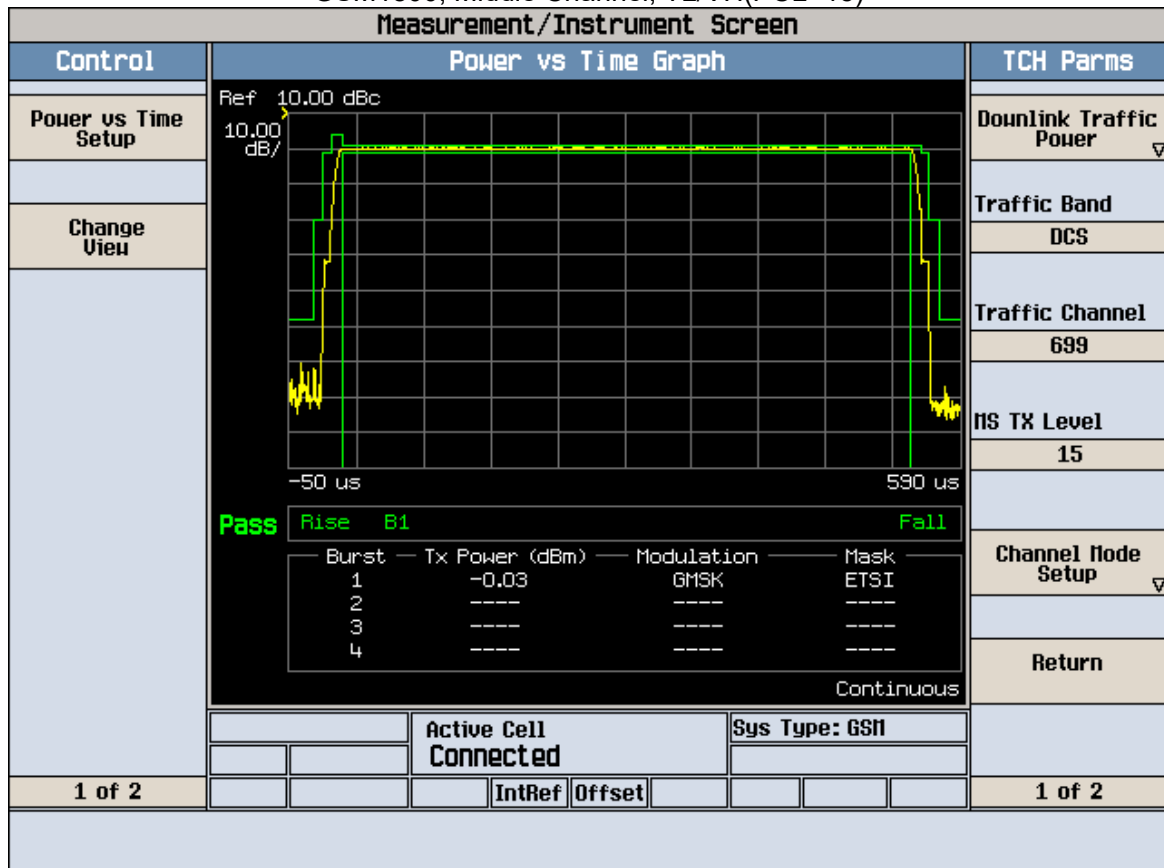
GSM1800, Middle Channel, normal(PCL=15)



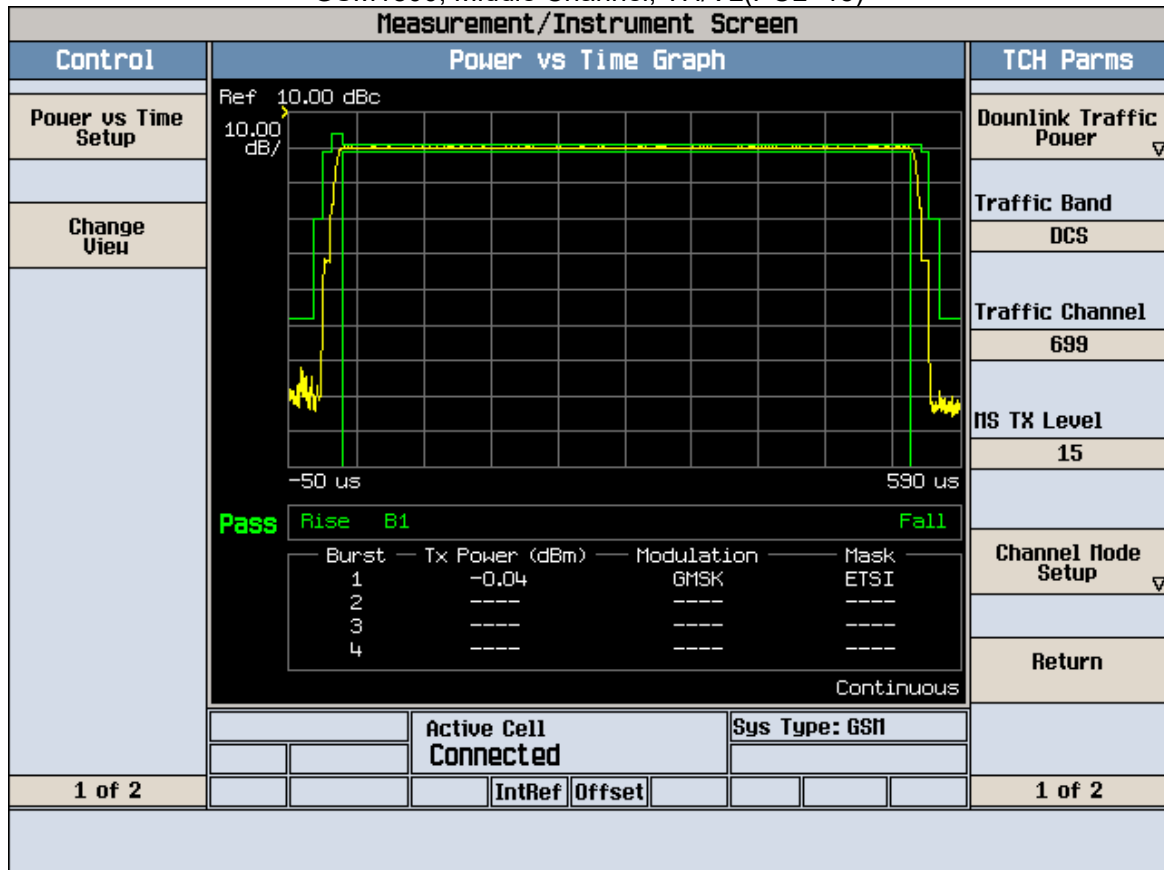
GSM1800, Middle Channel, TL/VL(PCL=15)



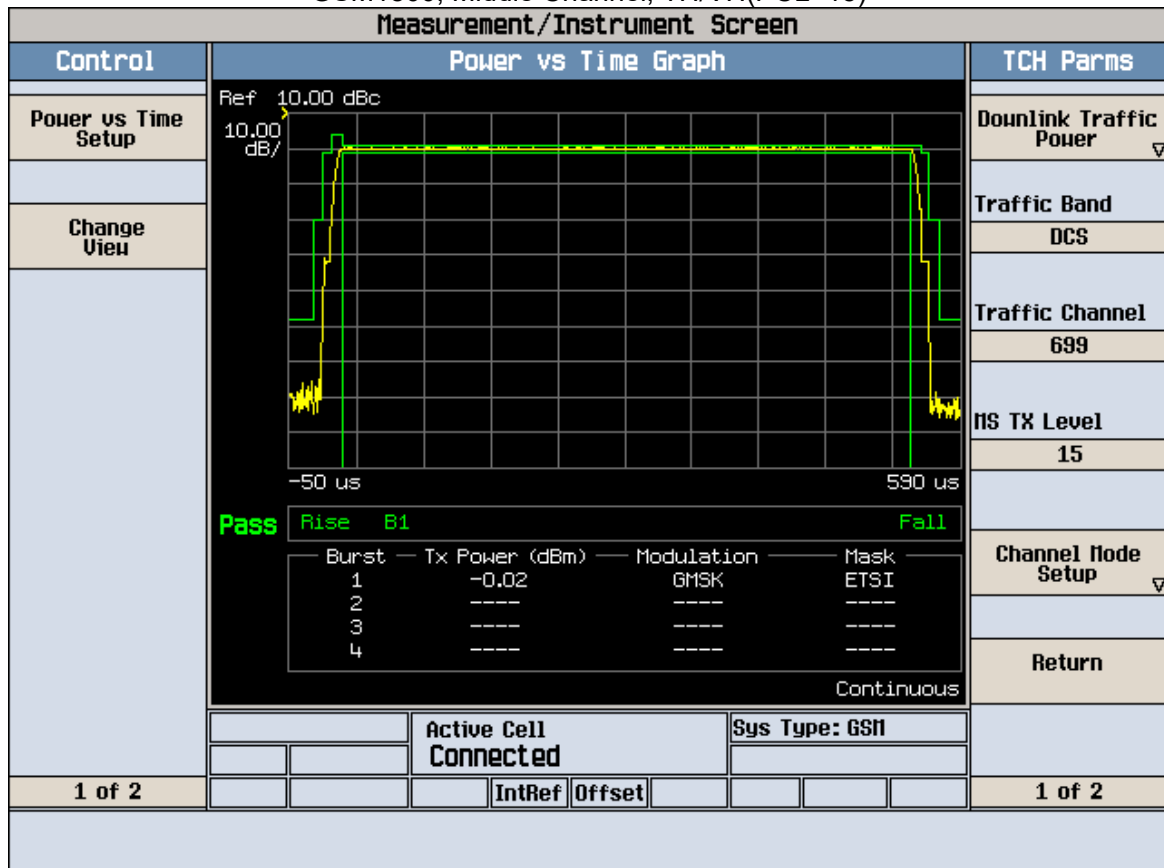
GSM1800, Middle Channel, TL/VH(PCL=15)



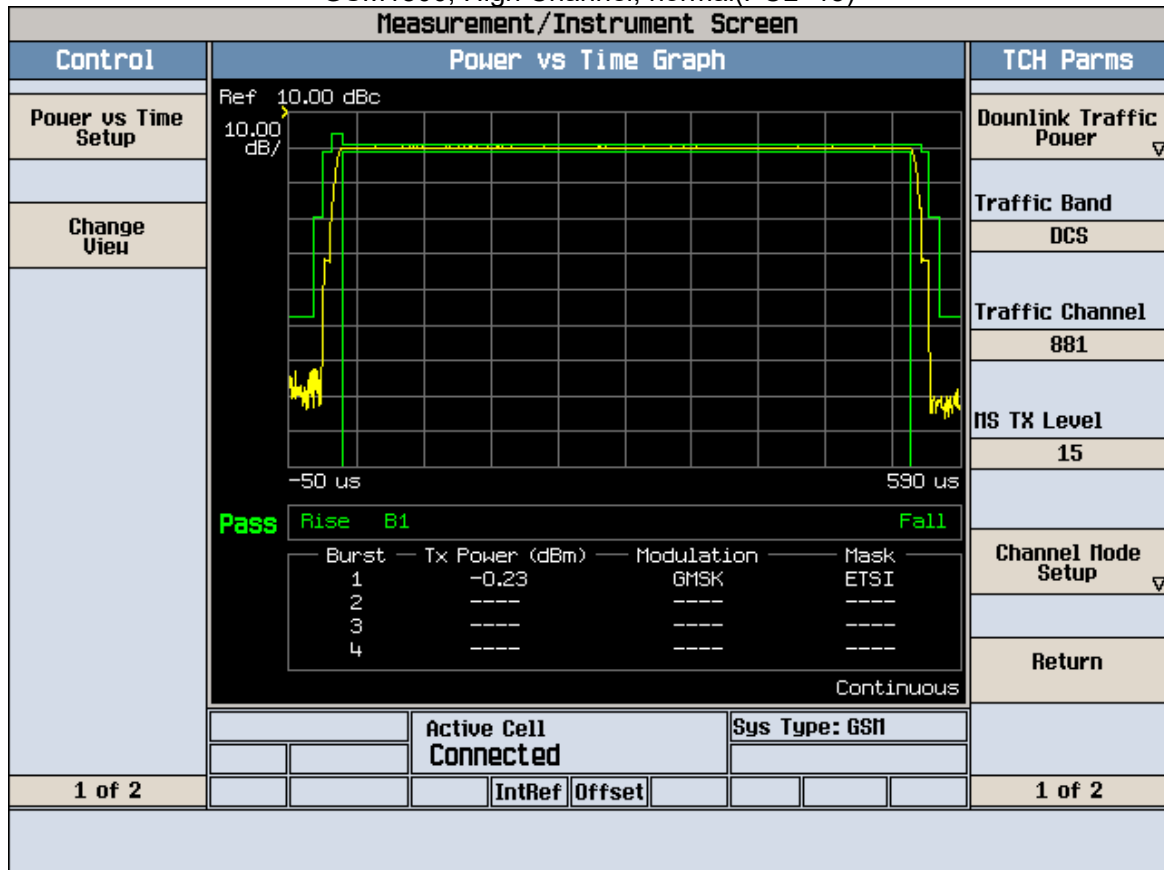
GSM1800, Middle Channel, TH/VL(PCL=15)



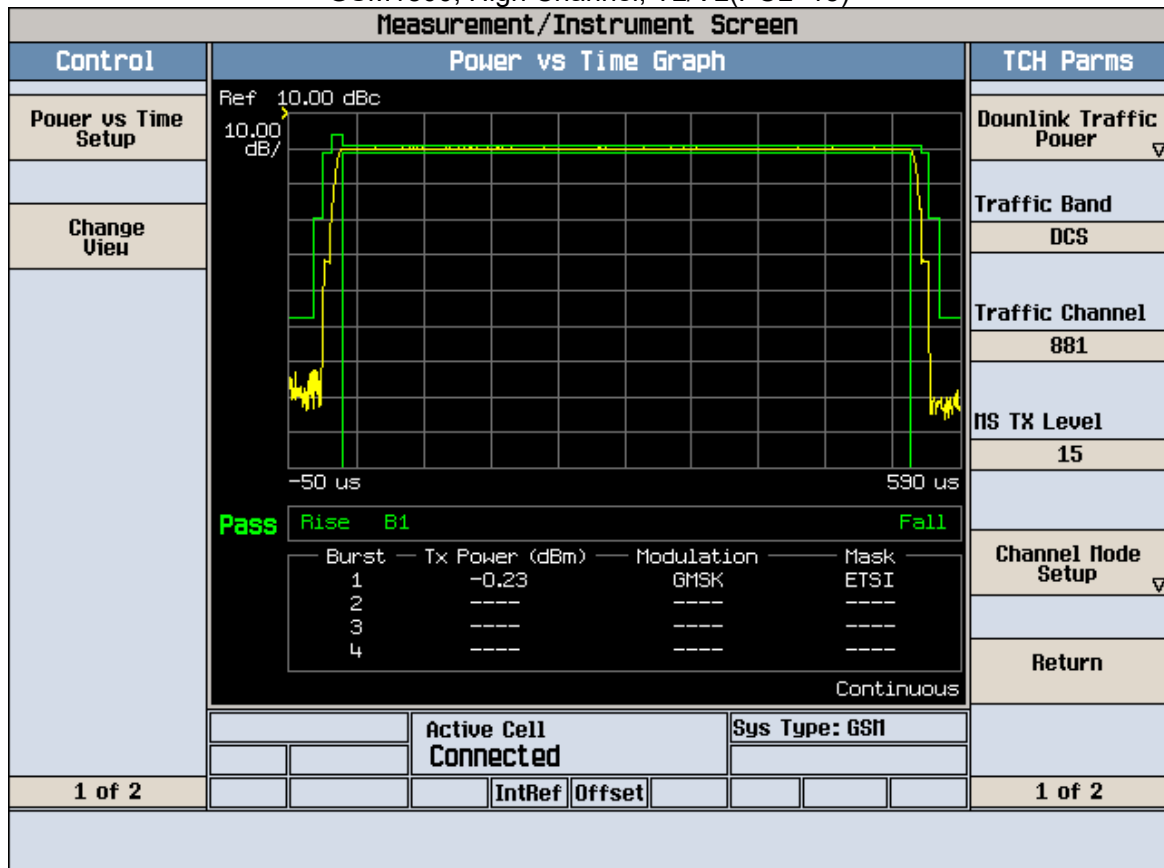
GSM1800, Middle Channel, TH/VH(PCL=15)



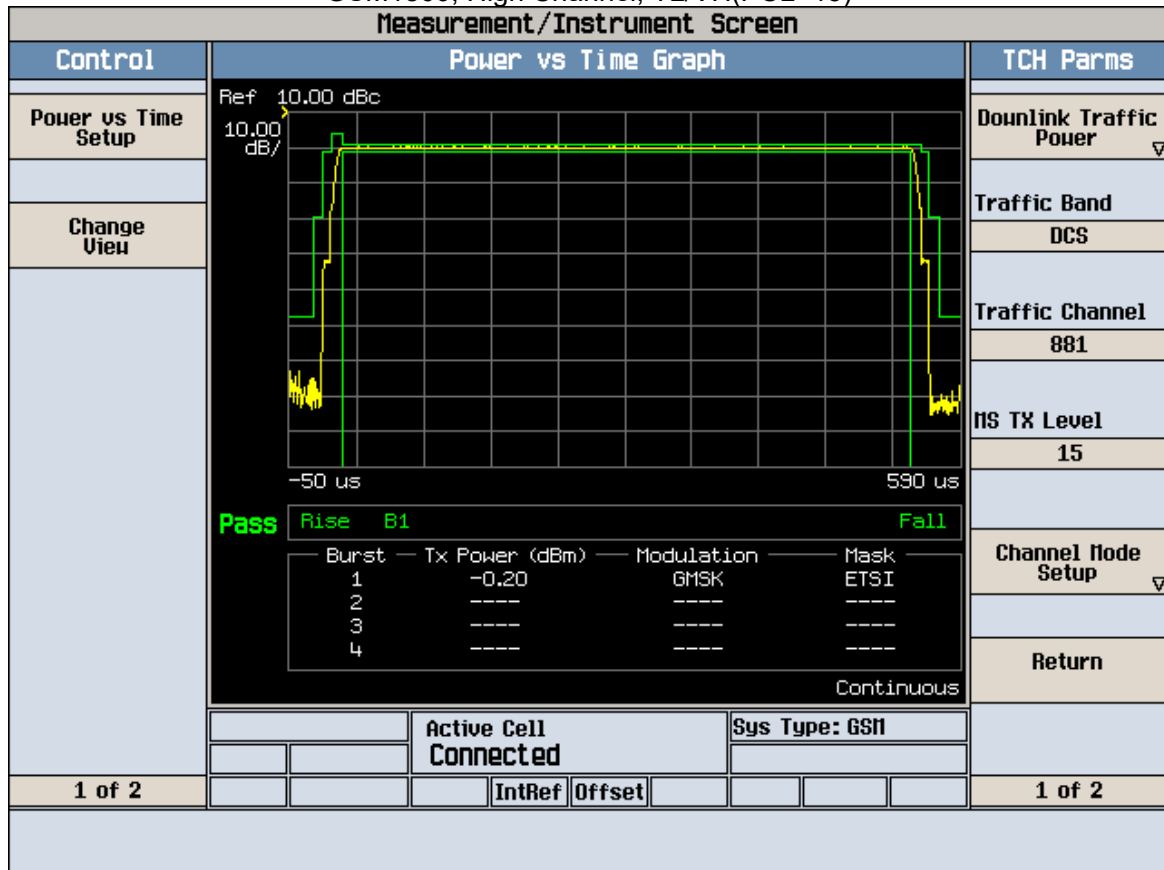
GSM1800, High Channel, normal(PCL=15)



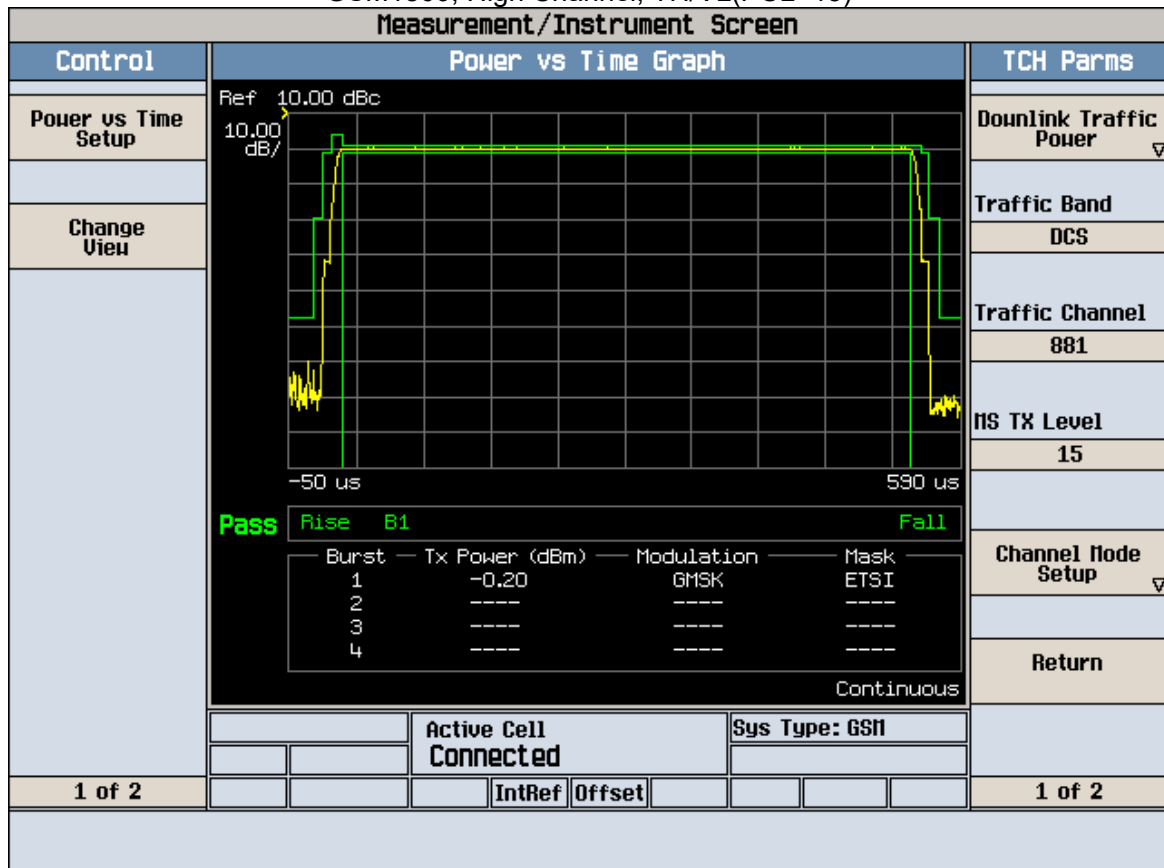
GSM1800, High Channel, TL/VL(PCL=15)



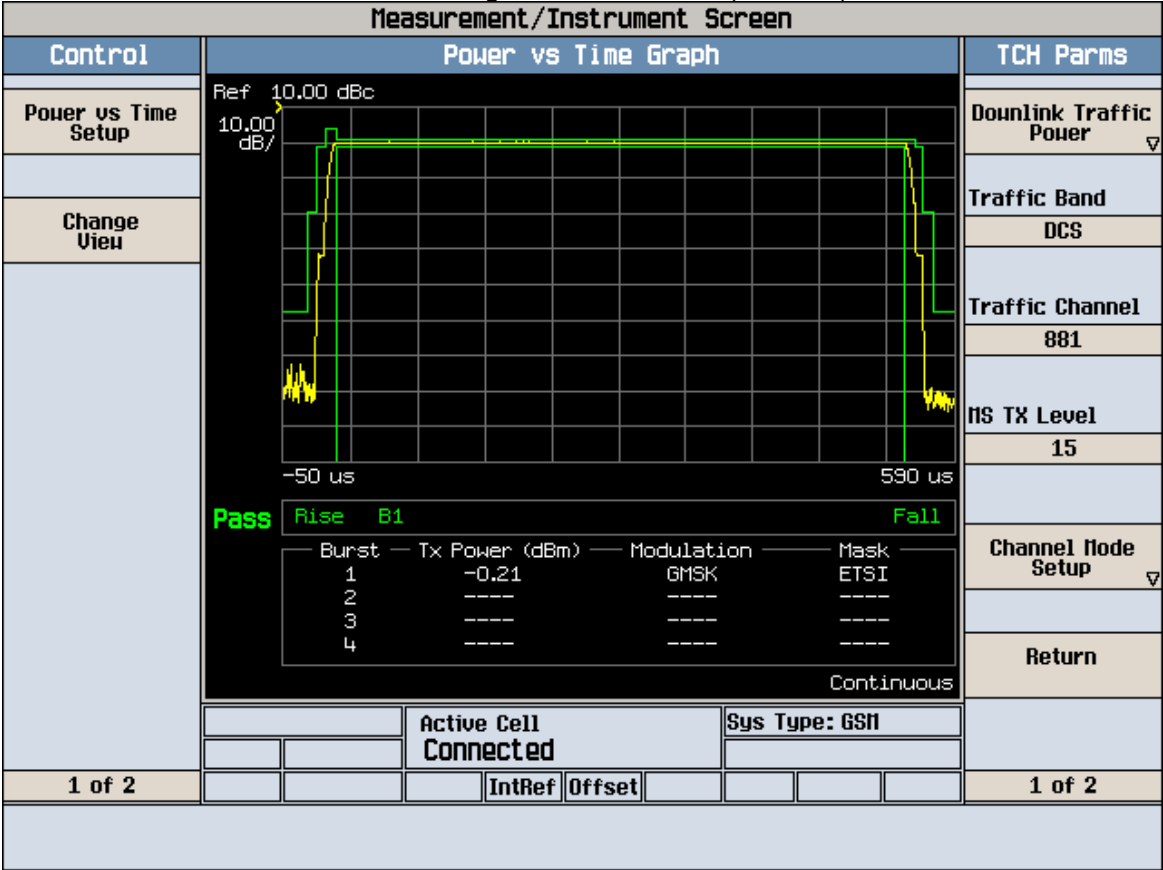
GSM1800, High Channel, TL/VH(PCL=15)



GSM1800, High Channel, TH/VL(PCL=15)



GSM1800, High Channel, TH/VH(PCL=15)



4.5. Transmitter-Output RF spectrum

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.6

Limits

According to clause 13.4 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1,13.4

Table 4-14: GSM 400, GSM 700, T-GSM 850 and GSM 900 spectrum due to modulation out to less than 1800kHz offset

	power levels in dB relative to the measurement at FT				
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to <1800
39	+0,5	-30	-33	-60	-66
37	+0,5	-30	-33	-60	-64
35	+0,5	-30	-33	-60	-62
<= 33	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-51

Table 4-15: DCS 1800 Spectrum due to modulation out to less than 1800kHz offset

	power levels in dB relative to the measurement at FT				
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to <1800
<= 36	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-56

Table 4-16: Spectrum due to modulation from 1800kHz offset to the edge of the transmit band(wideband noise)

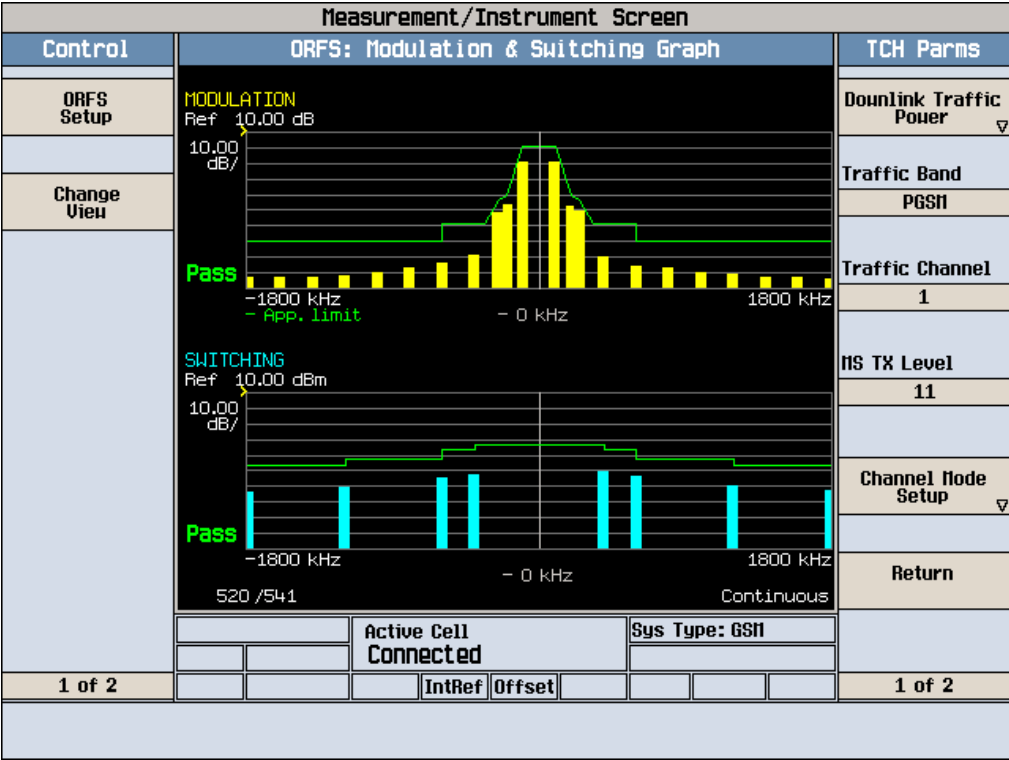
power levels in dB relative to the measurement at FT									
GSM 400, GSM 700, T-GSM 810, GSM 850 and GSM 900				DCS 1 800			PCS 1 900		
Power Level	Frequency offset kHz			Power level	Frequency offset KHz		Power level	Frequency offset kHz	
(dBm)	1 800 to < 3 000	3 000 to < 6 000	>= 6 000	(dBm)	1 800 to < 6 000	>= 6 000	(dBm)	1 800 to < 6 000	>= 6 000
39	-69	-71	-77	36	-71	-79	33	-68	-76
37	-67	-69	-75	34	-69	-77	32	-67	-75
35	-65	-67	-73	32	-67	-75	30	-65	-73
<= 33	-63	-65	-71	30	-65	-73	28	-63	-71
				28	-63	-71	26	-61	-69
				26	-61	-69	<= 24	-59	-67
				<= 24	-59	-67			
The values above are subject to the minimum absolute levels (dBm) below.									
	-46	-46	-46		-51	-51		-51	-51

The following operating conditions were made in accordance with the ETSI 301 511 Clause 4.2.6.
Test Result

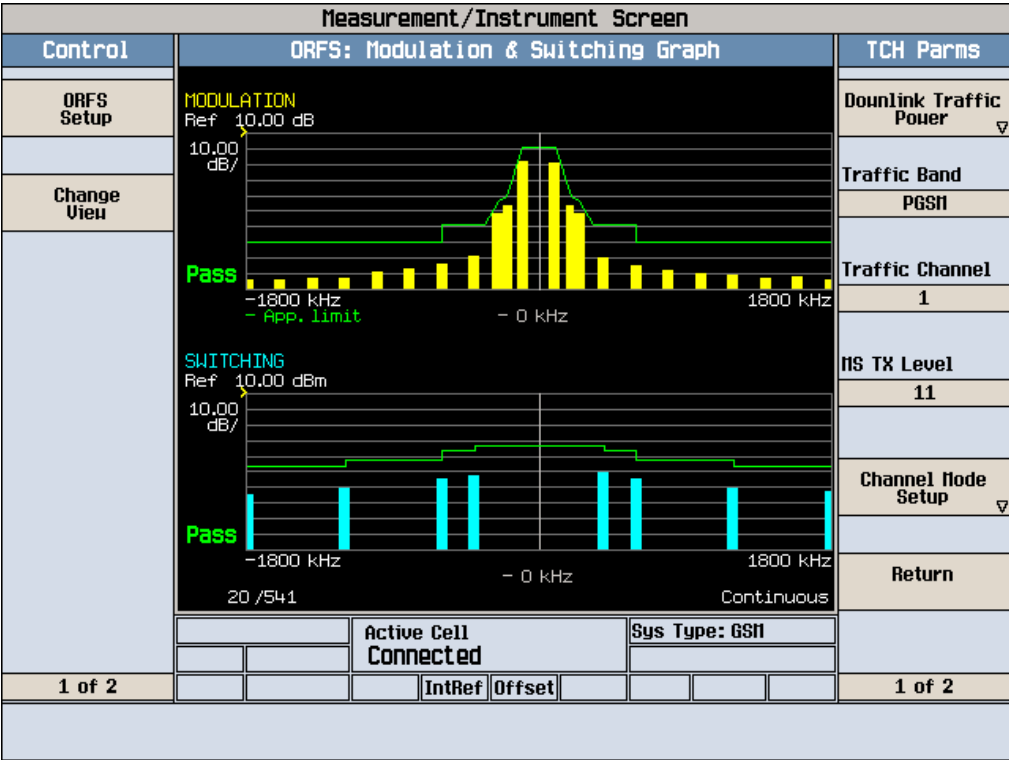
PASS

Please refer to following data plots

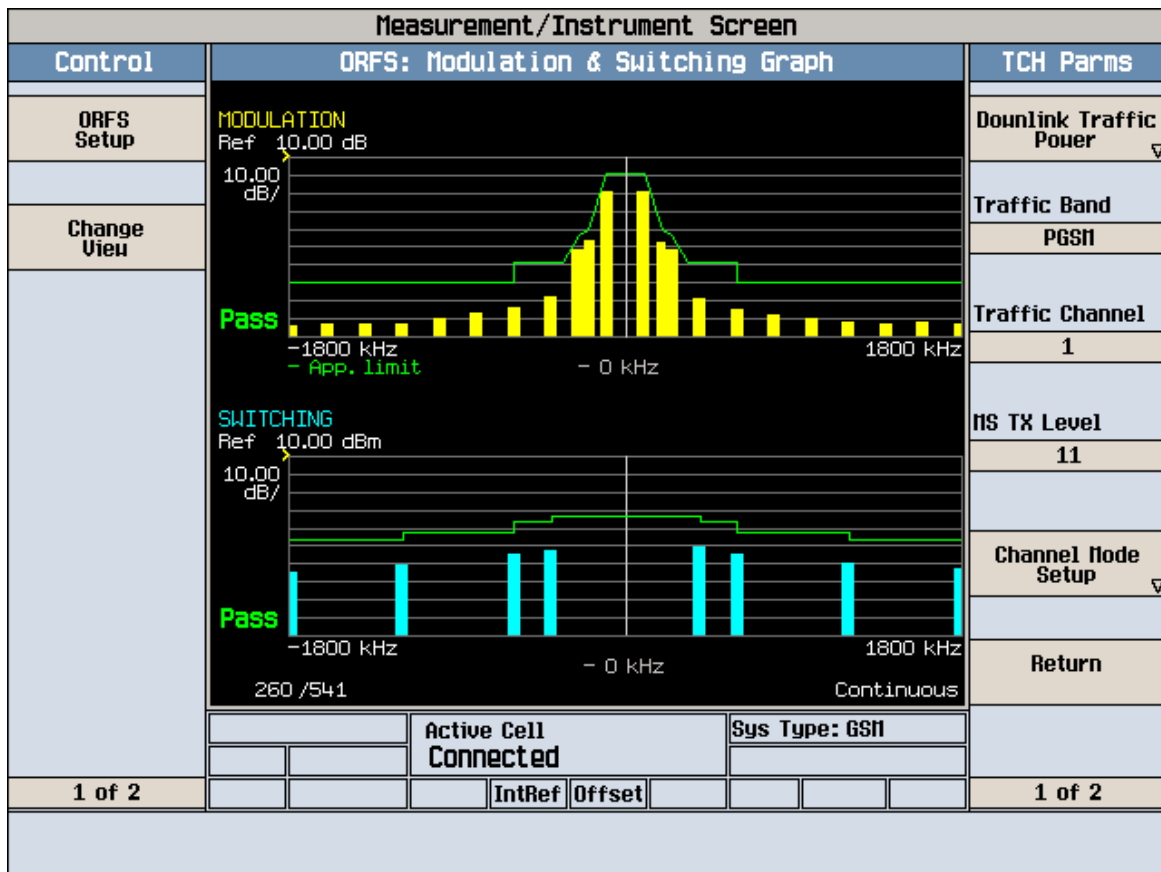
GSM900, Low Channel, Normal



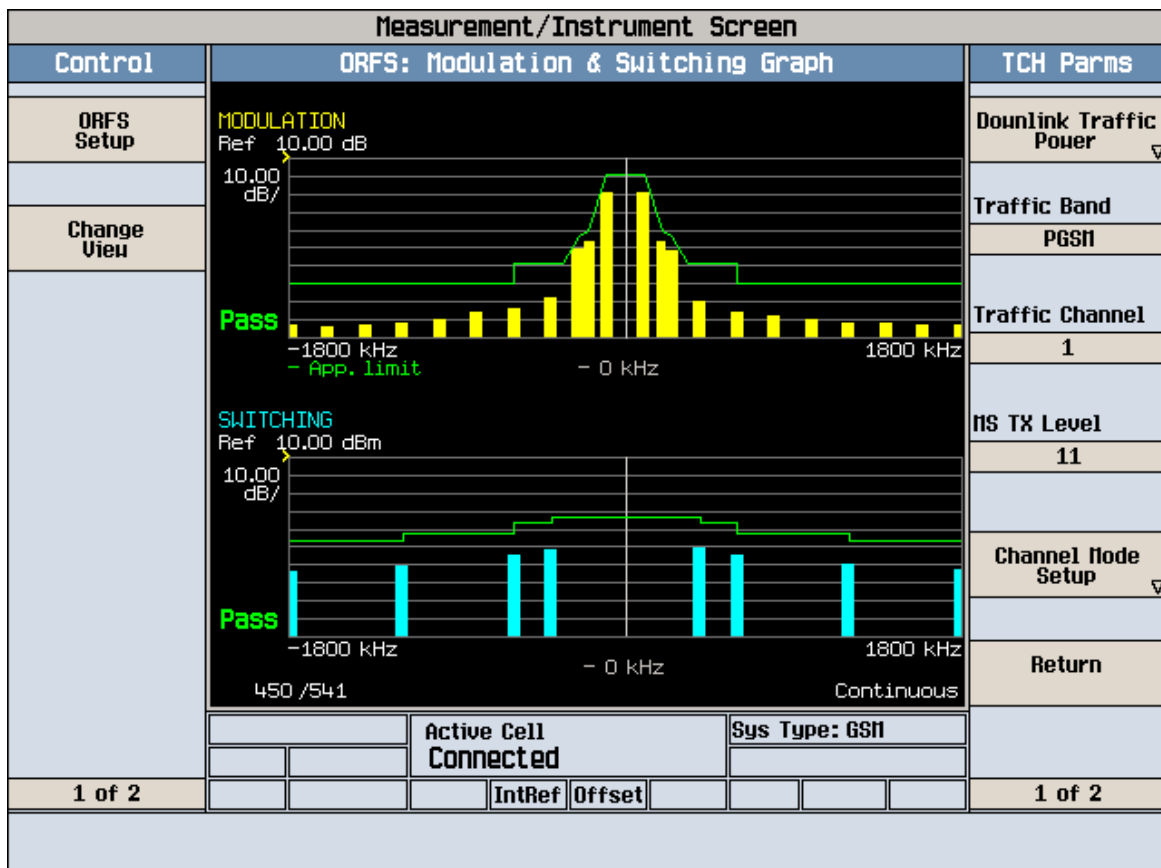
GSM900, Low Channel, TL/VL



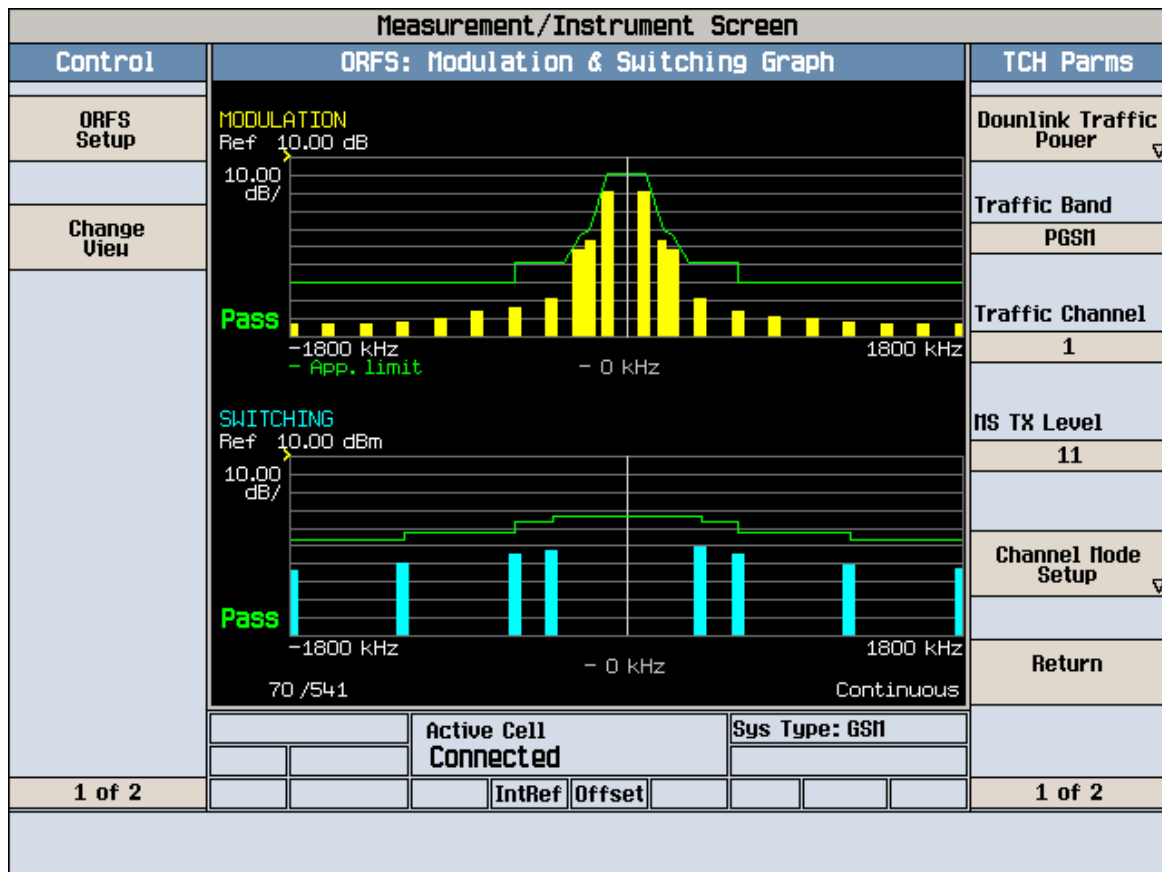
GSM900, Low Channel, TL/VH



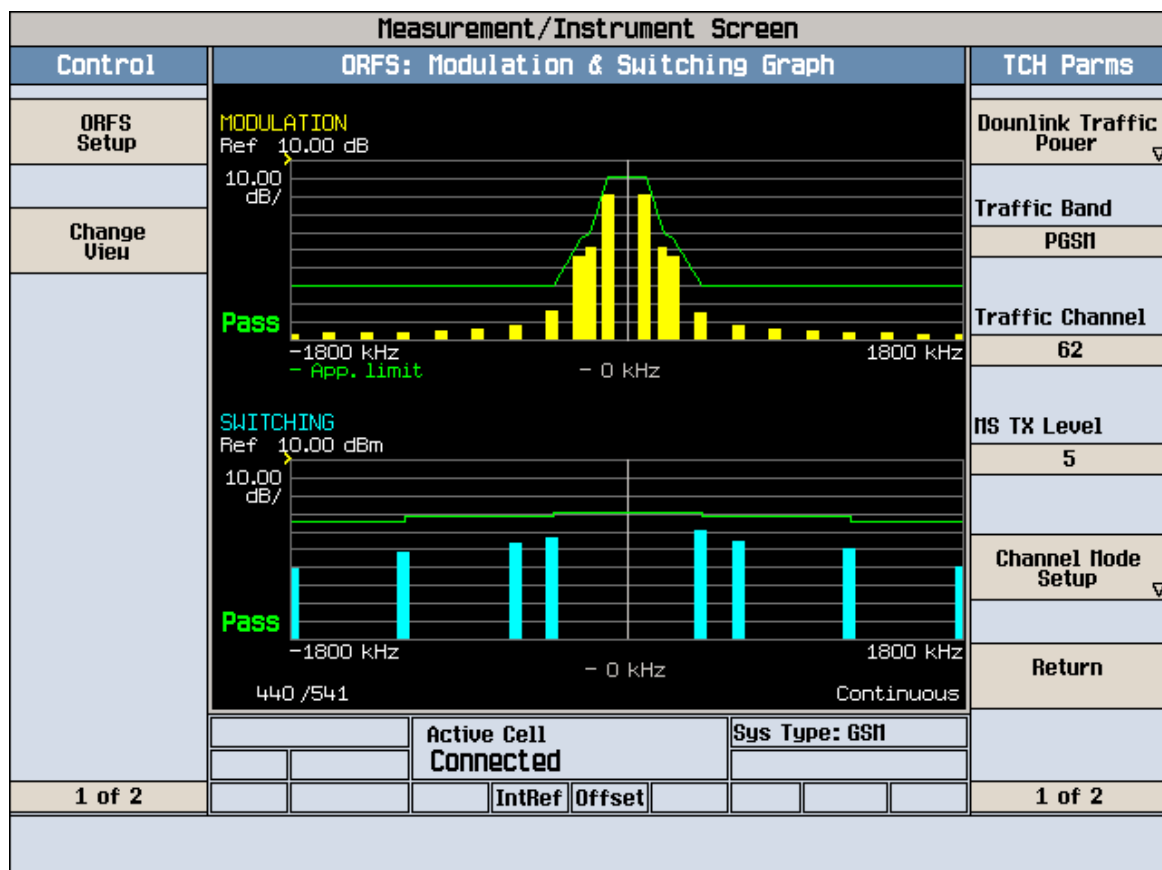
GSM900, Low Channel, TH/VL



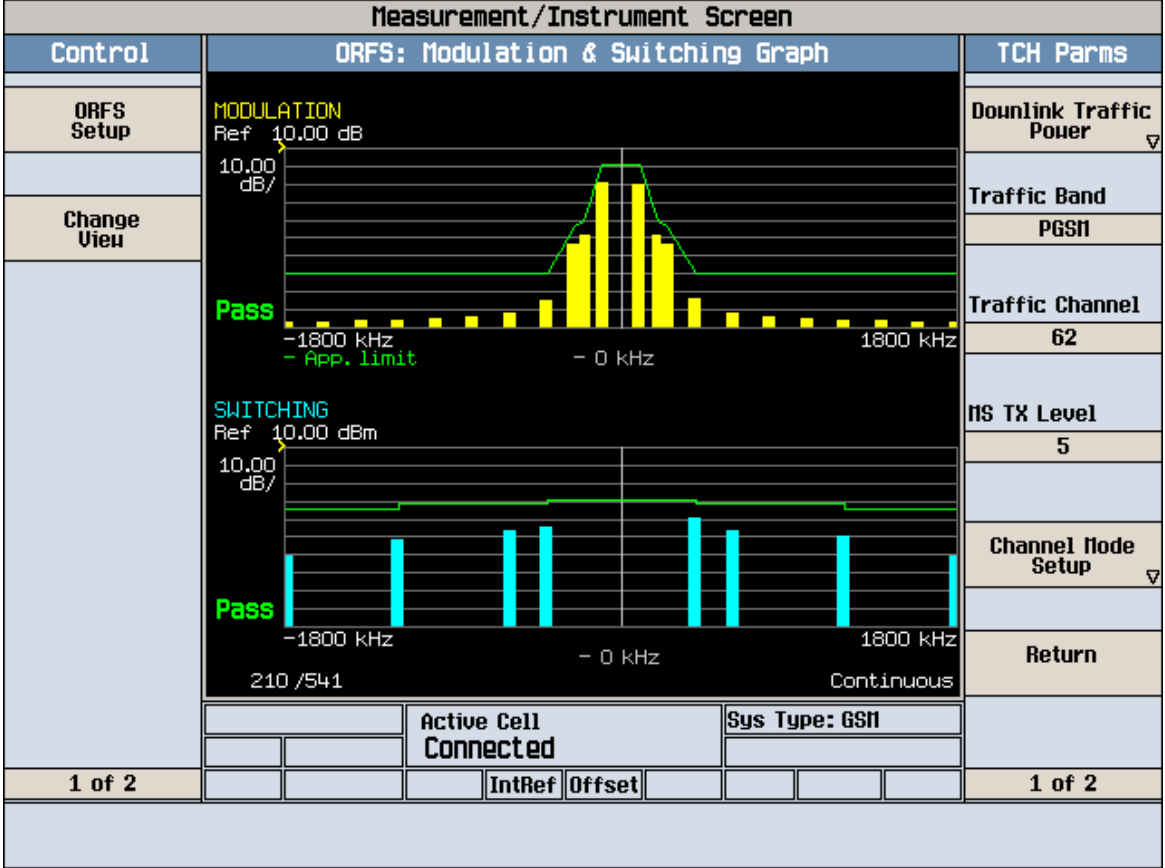
GSM900, Low Channel, TH/VH



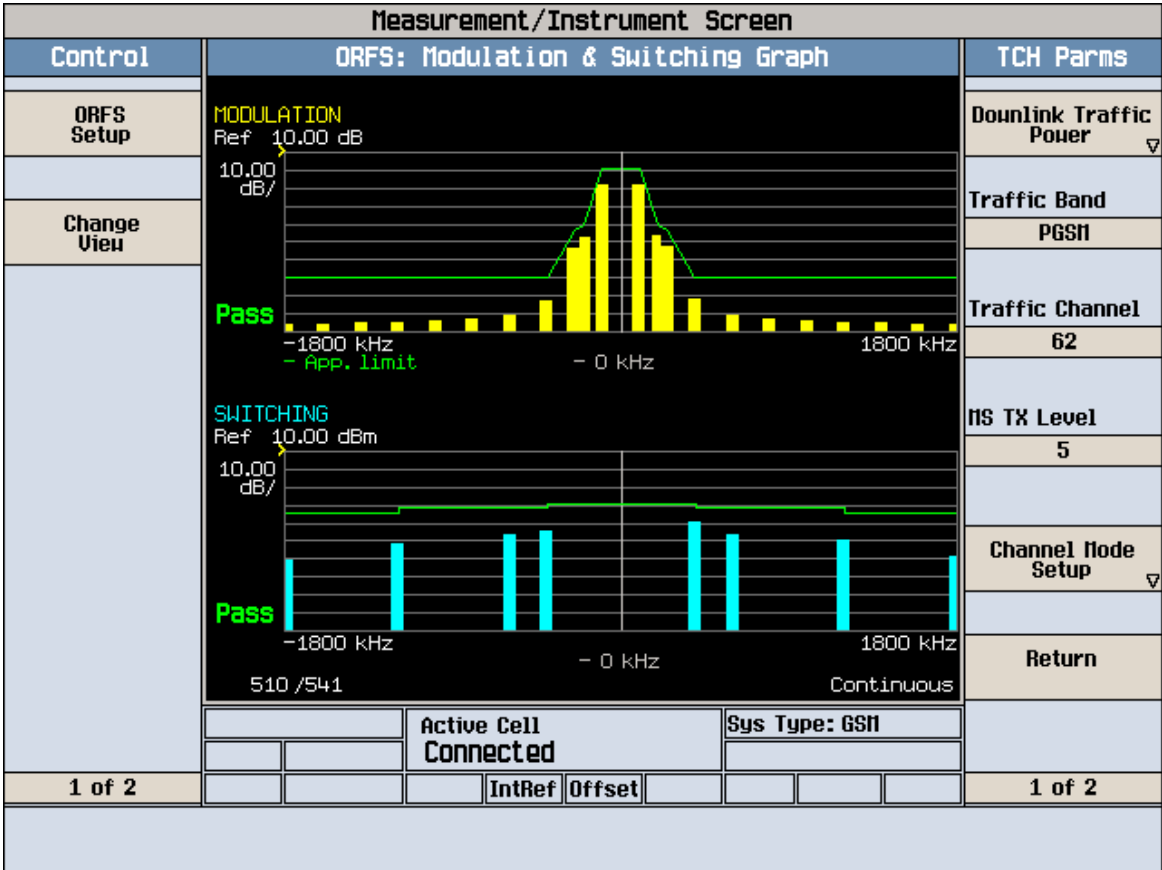
GSM900, Middle Channel, Normal



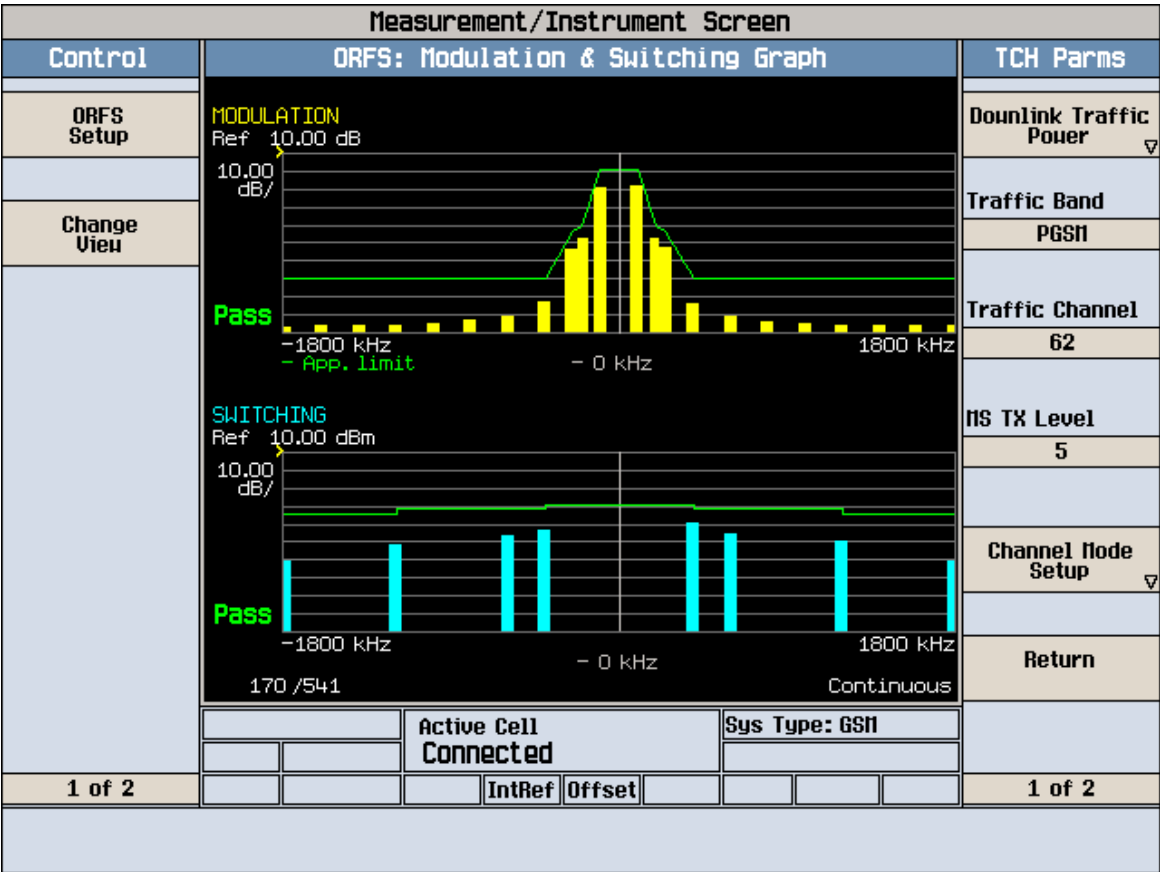
GSM900, Middle Channel, TL/VL



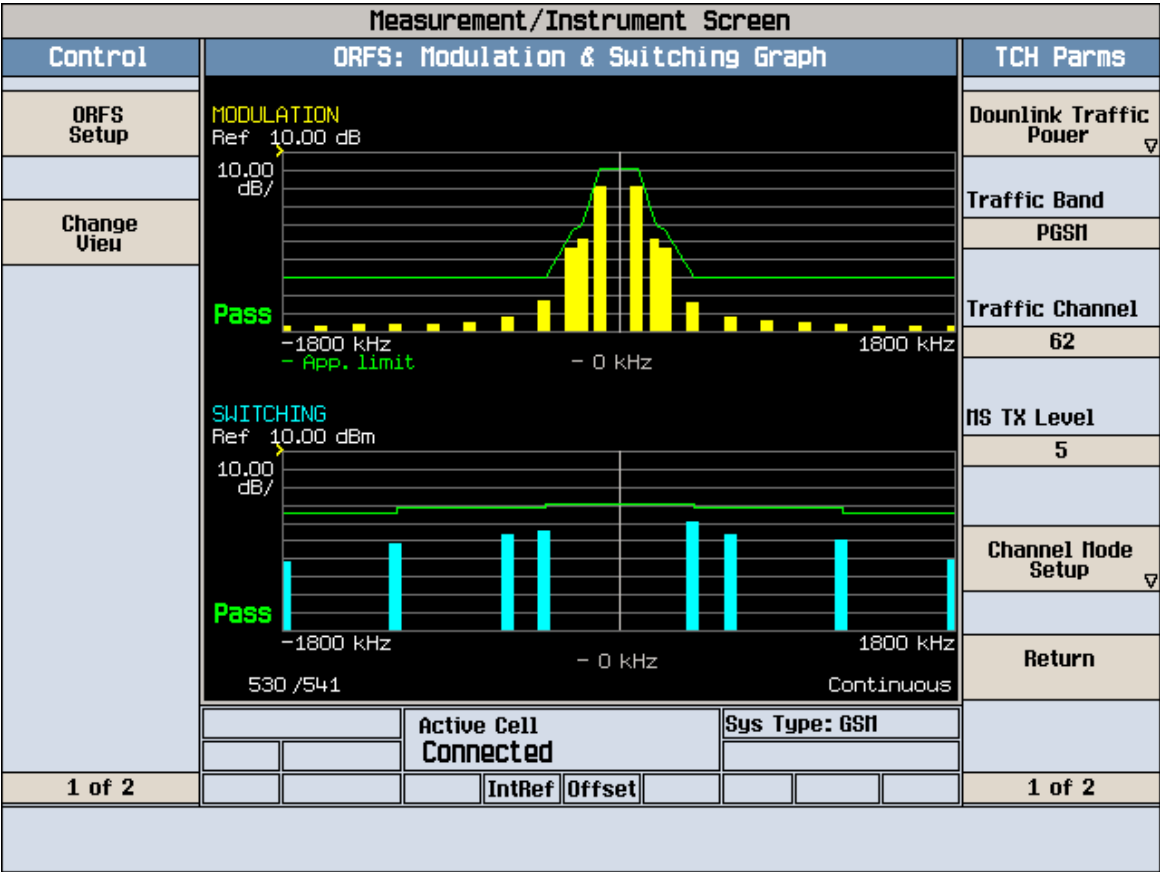
GSM900, Middle Channel, TL/VH



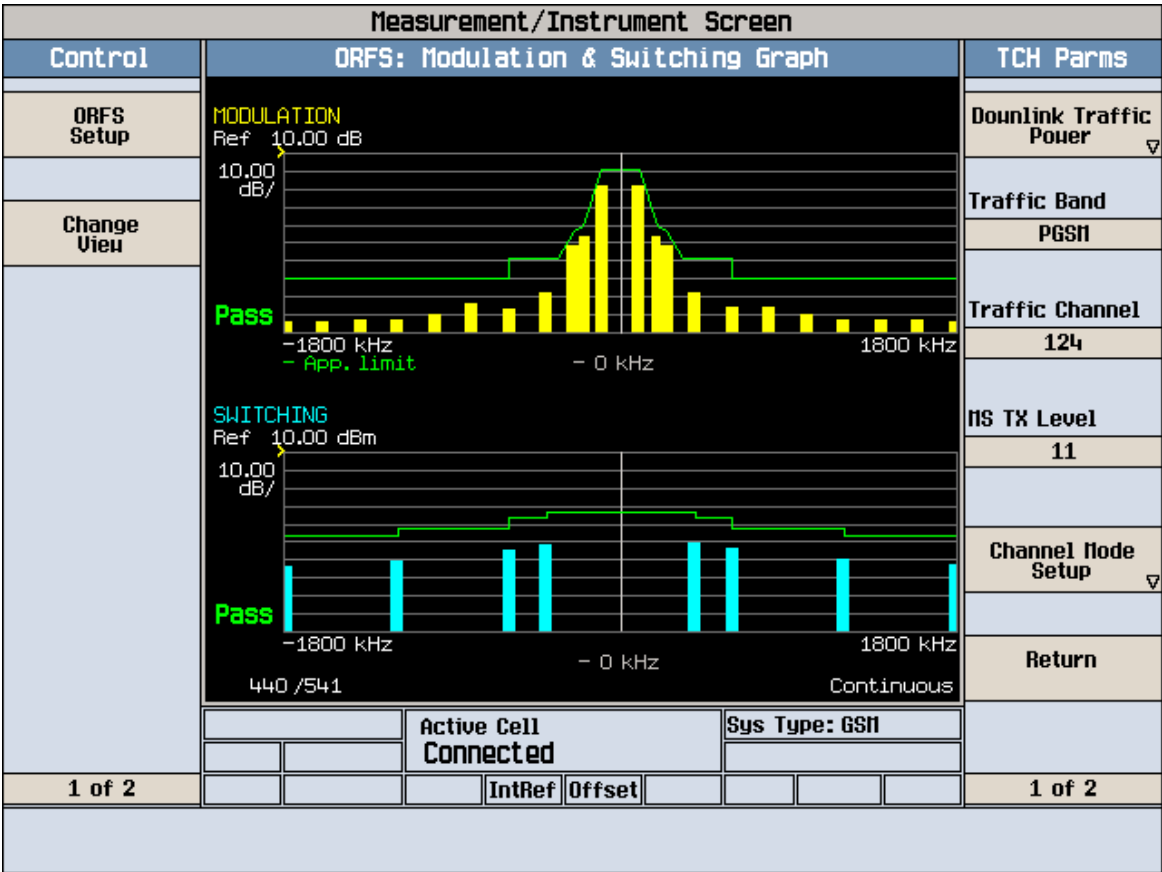
GSM900, Middle Channel, TH/VL



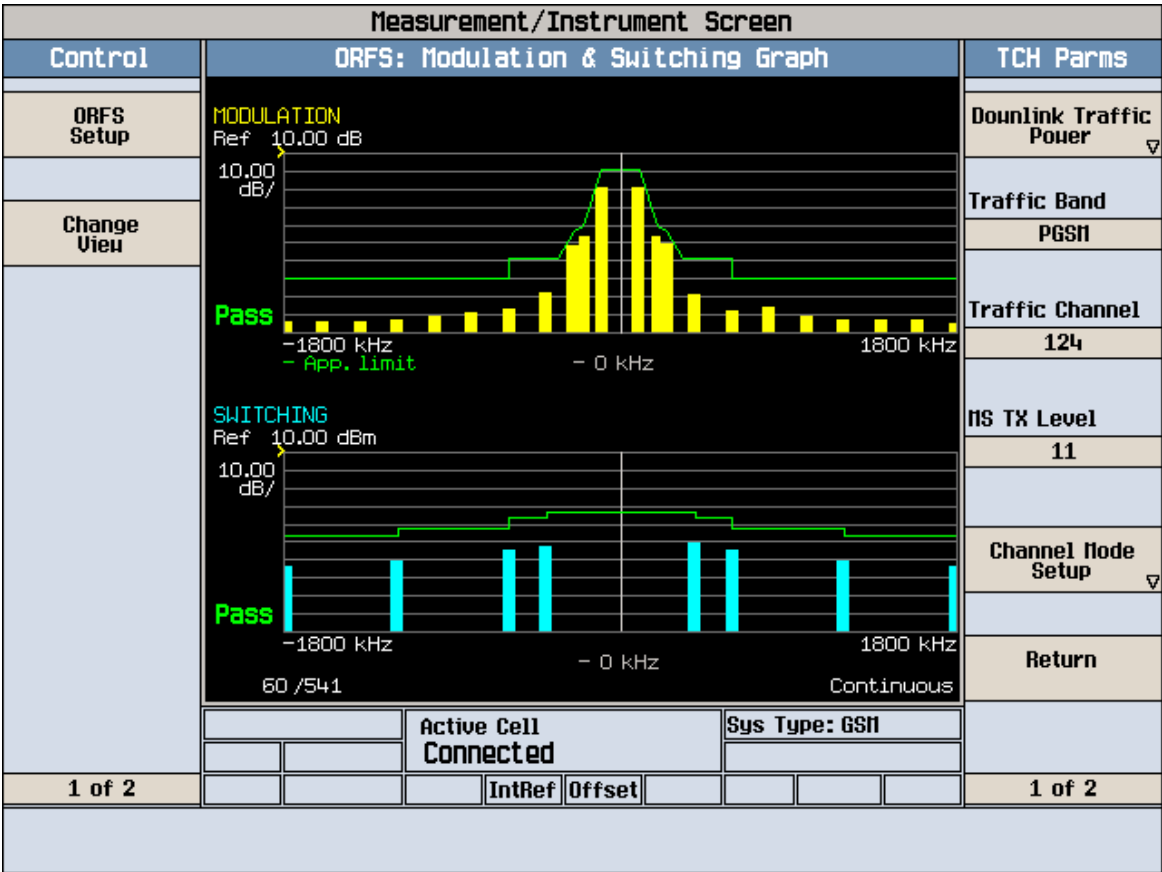
GSM900, Middle Channel, TH/VH



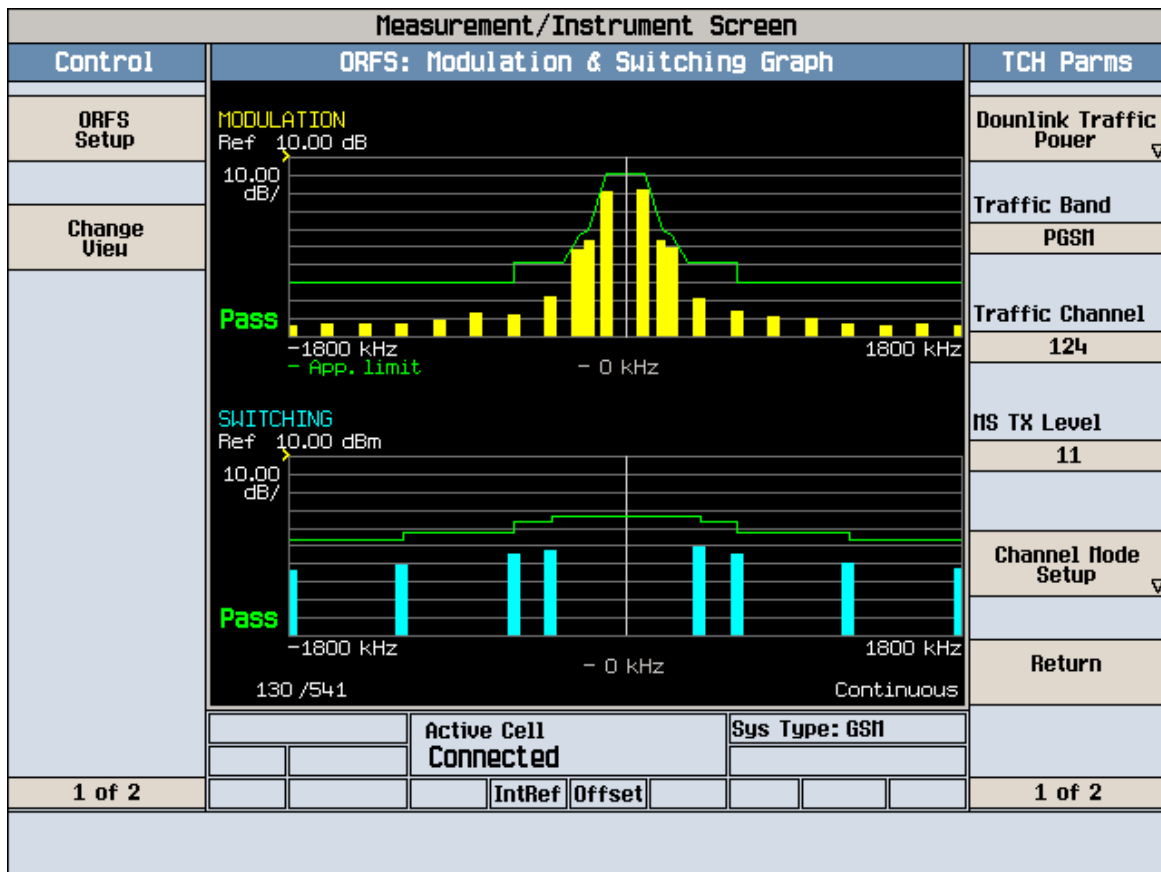
GSM900, High Channel, Normal



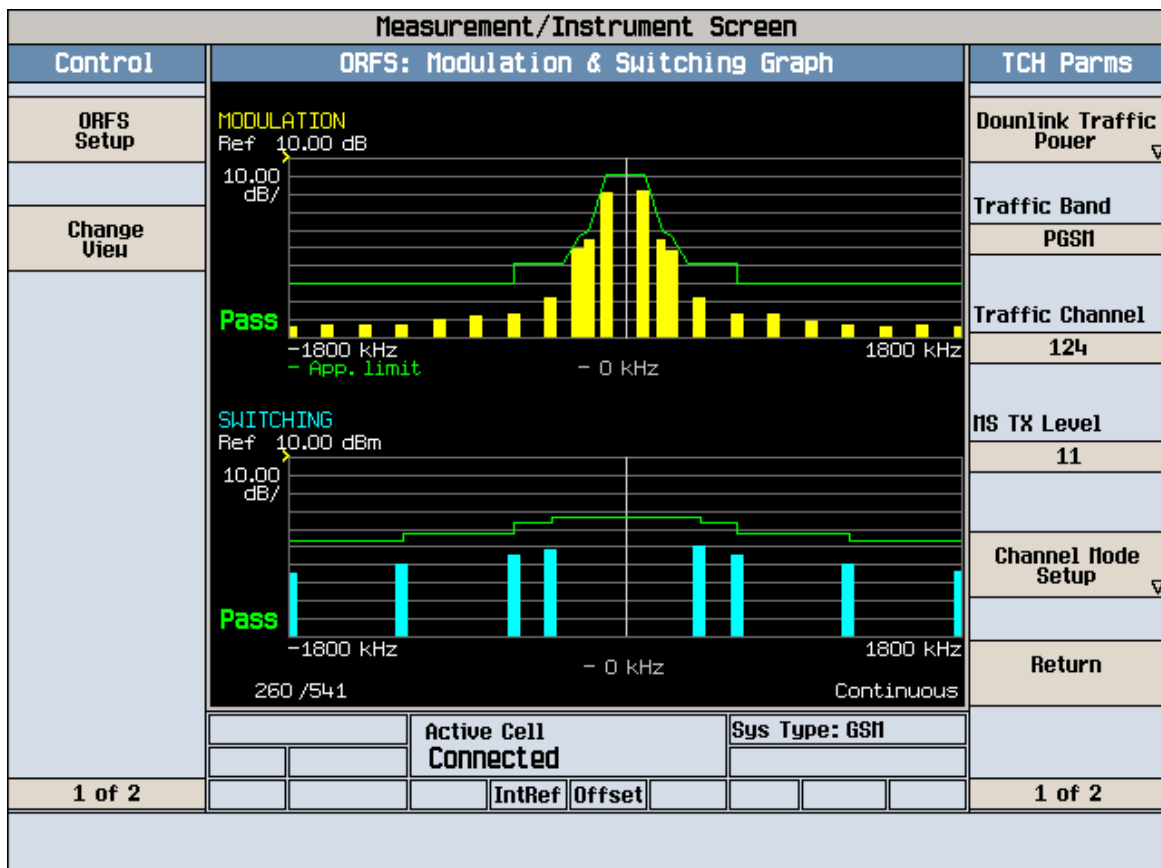
GSM900, High Channel, TL/VL



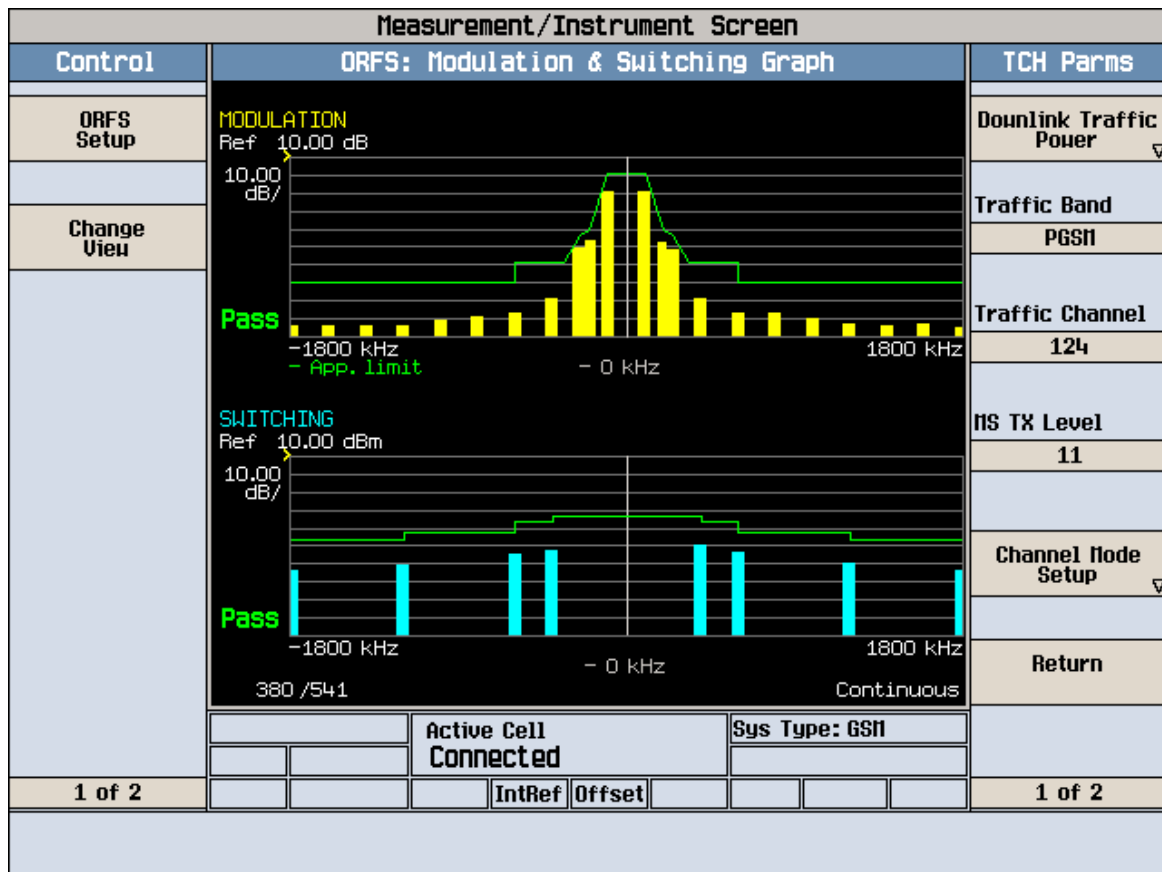
GSM900, High Channel, TL/VH



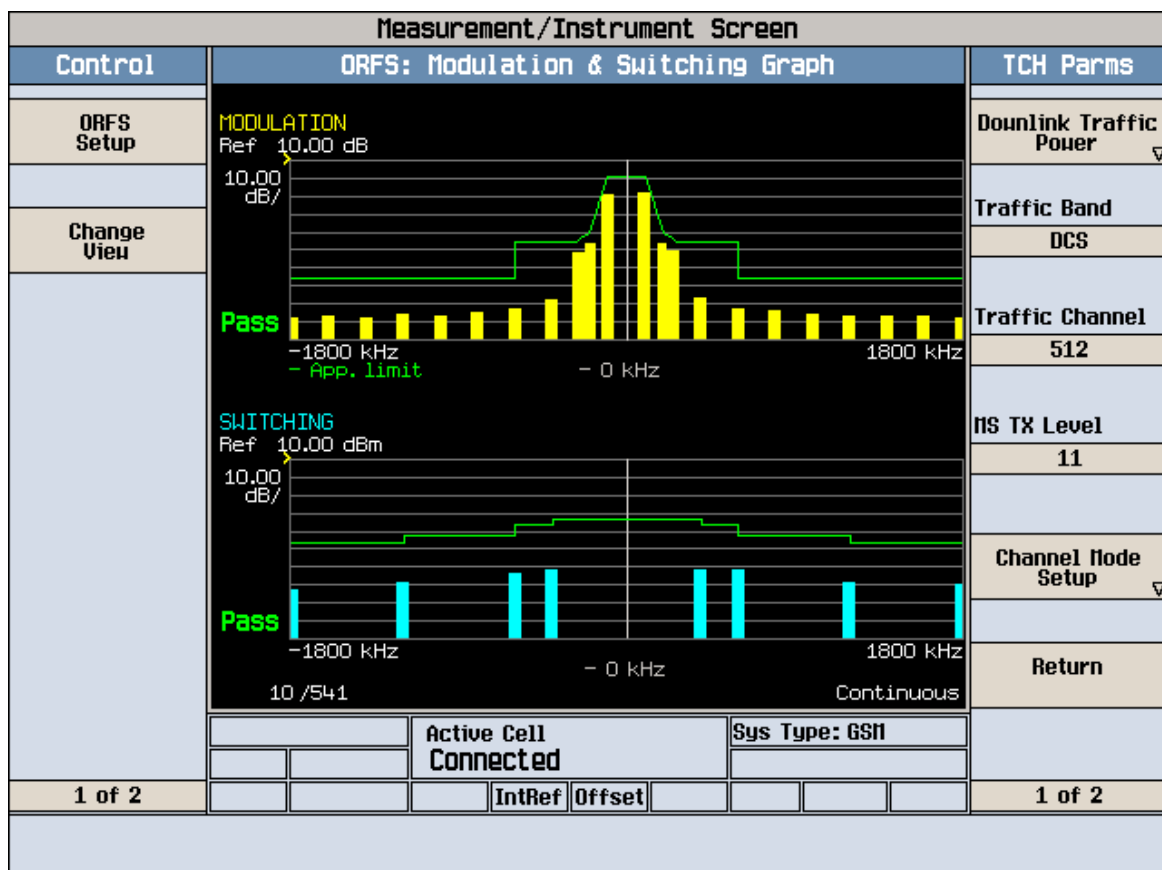
GSM900, High Channel, TH/VL



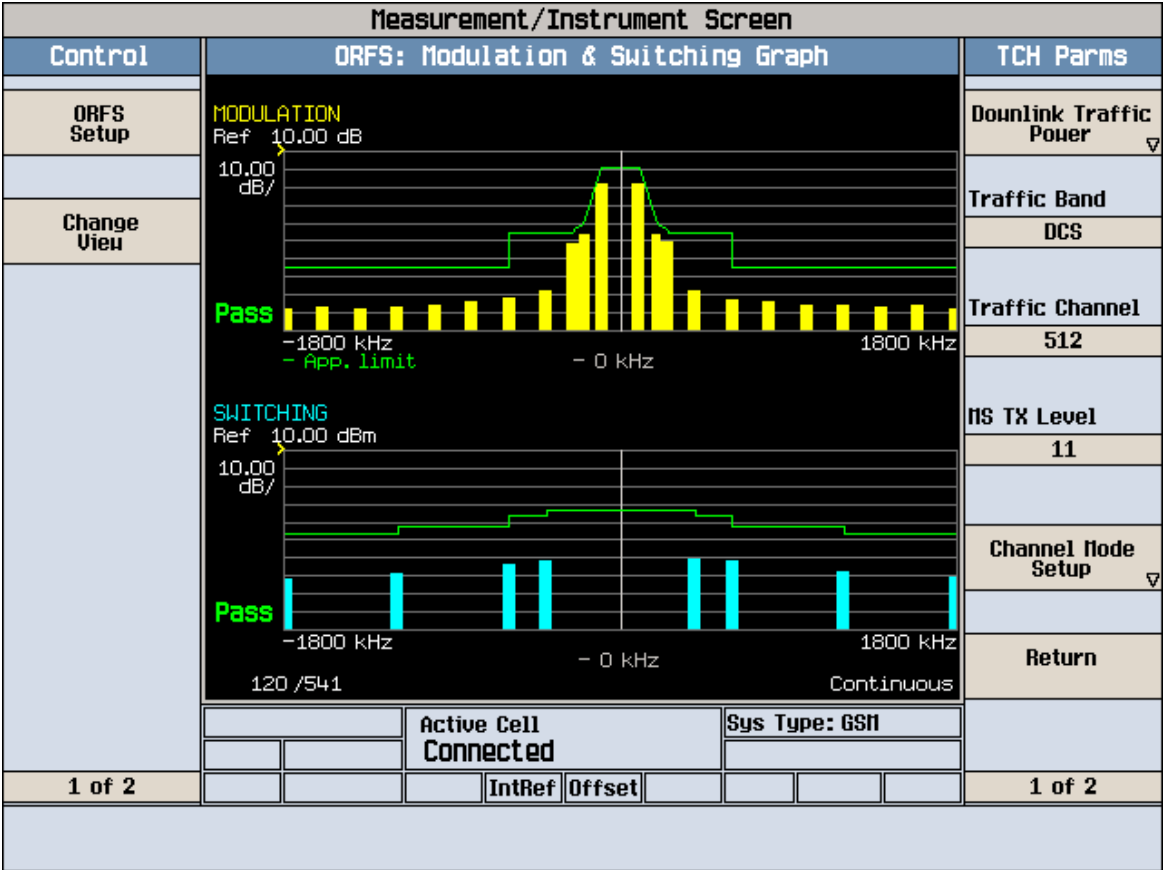
GSM900, High Channel, TH/VH



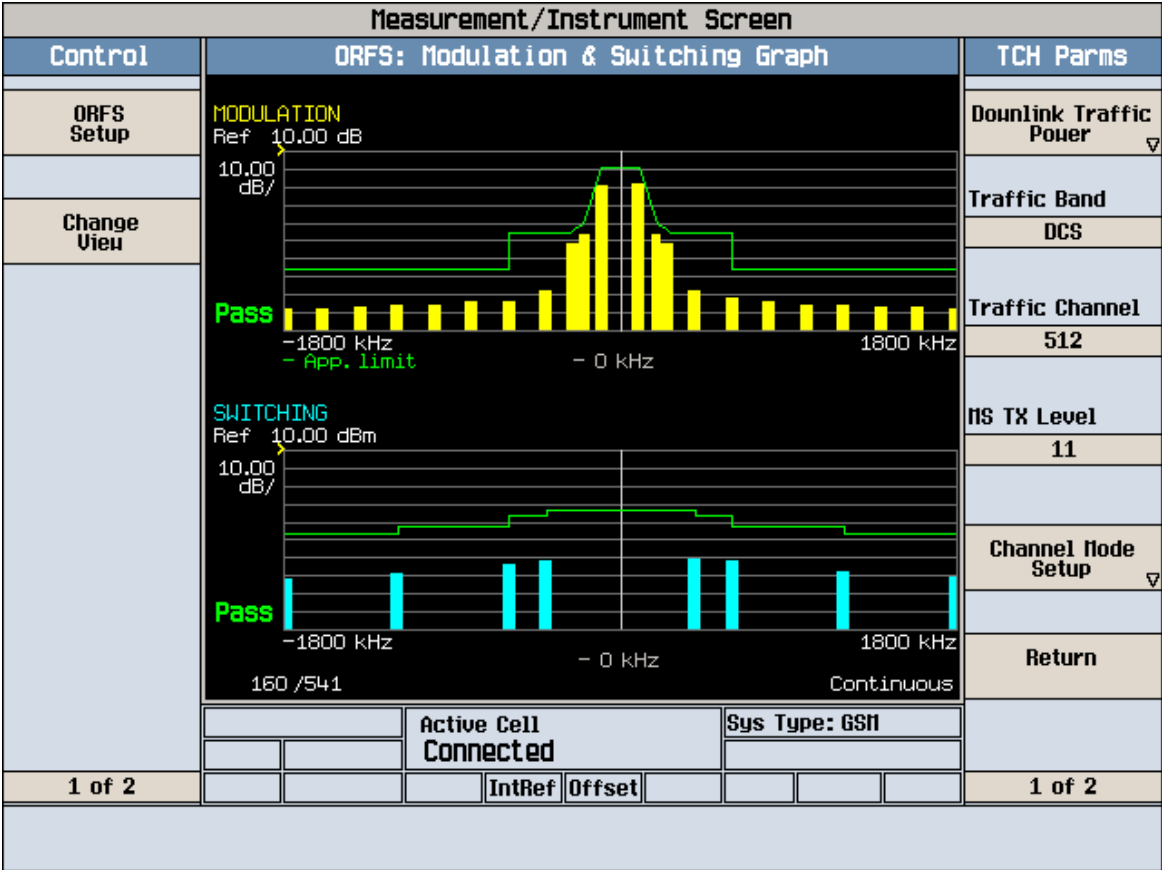
GSM1800, Low Channel, normal



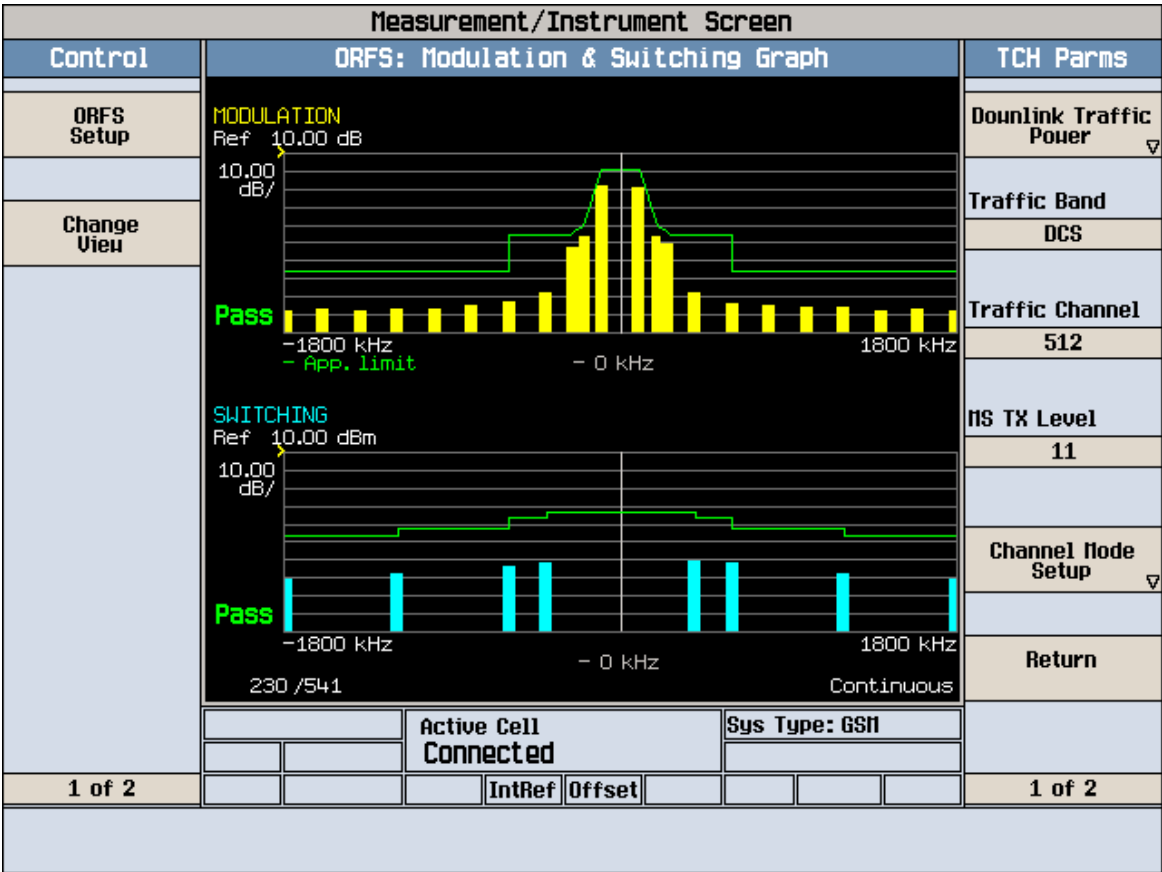
GSM1800, Low Channel, TL/VL



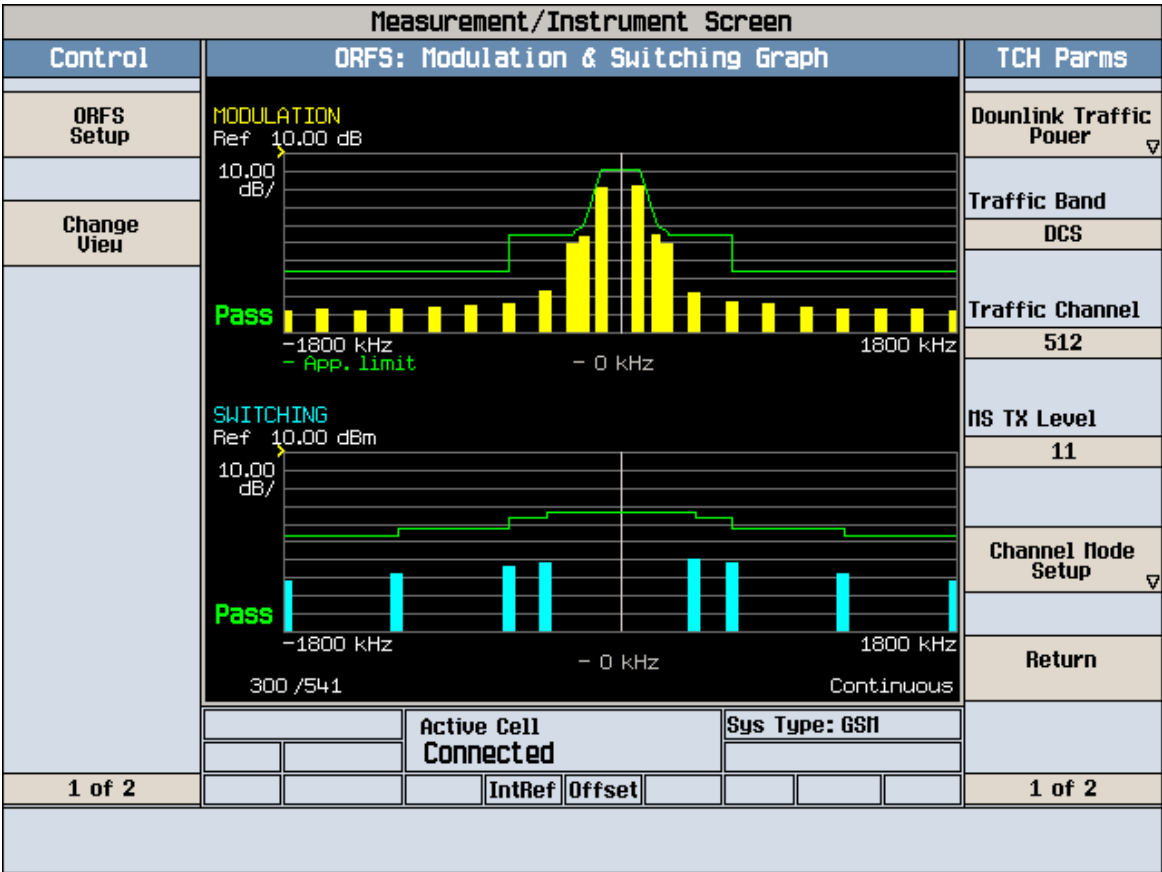
GSM1800, Low Channel, TL/VH



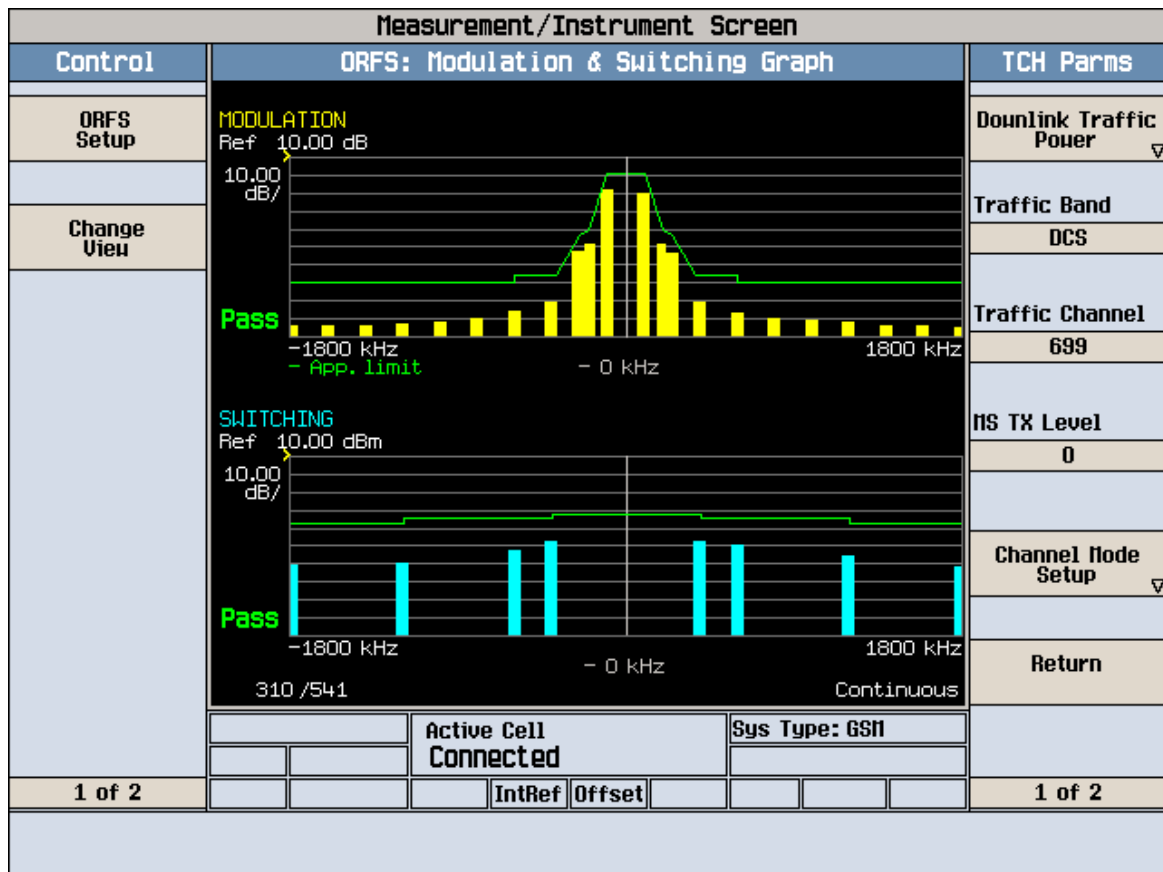
GSM1800, Low Channel, TH/VL



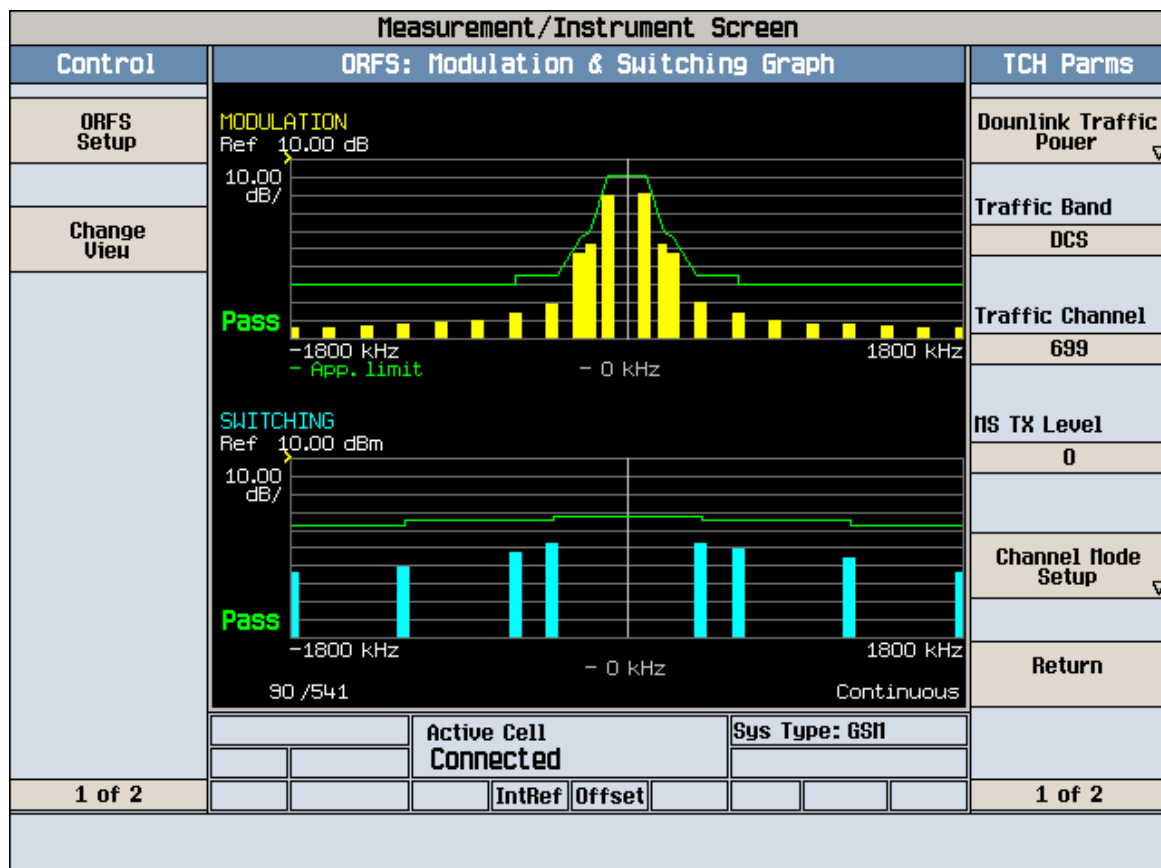
GSM1800, Low Channel, TH/VH



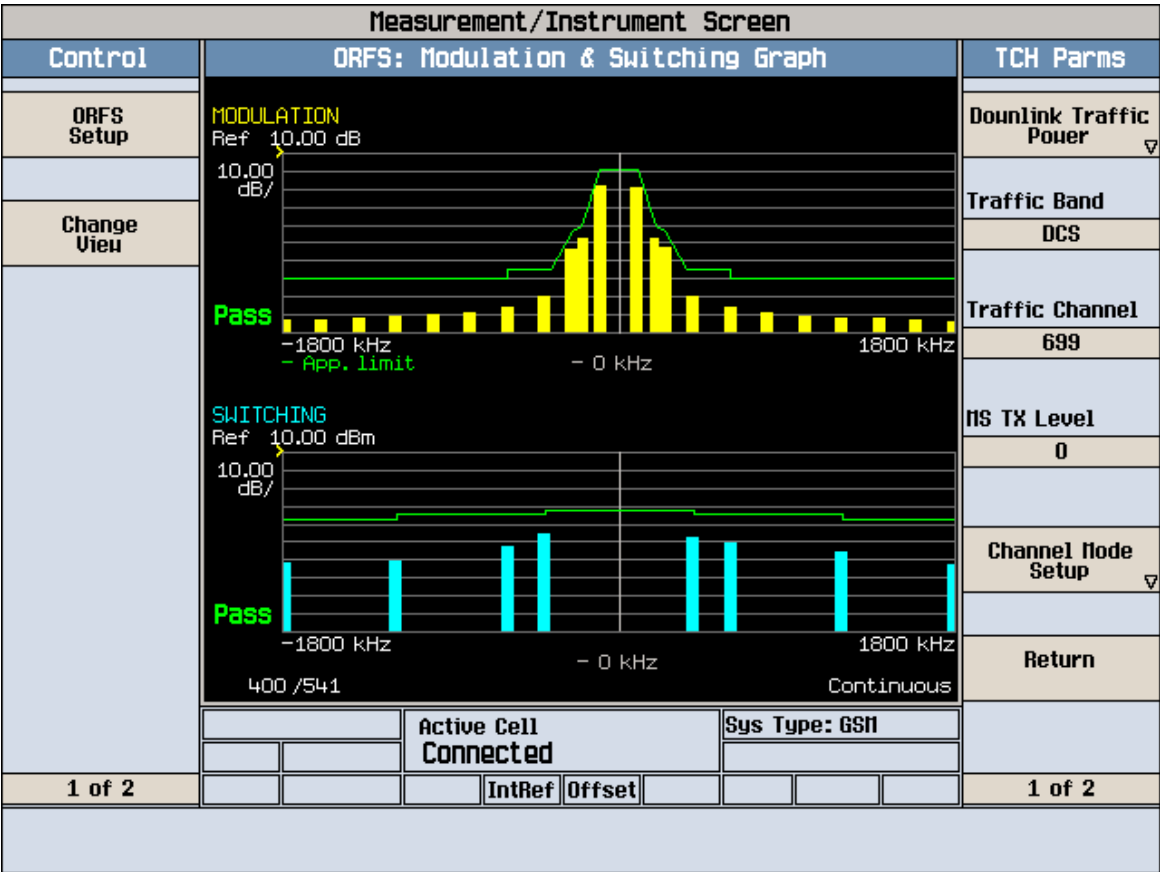
GSM1800, Middle Channel, normal



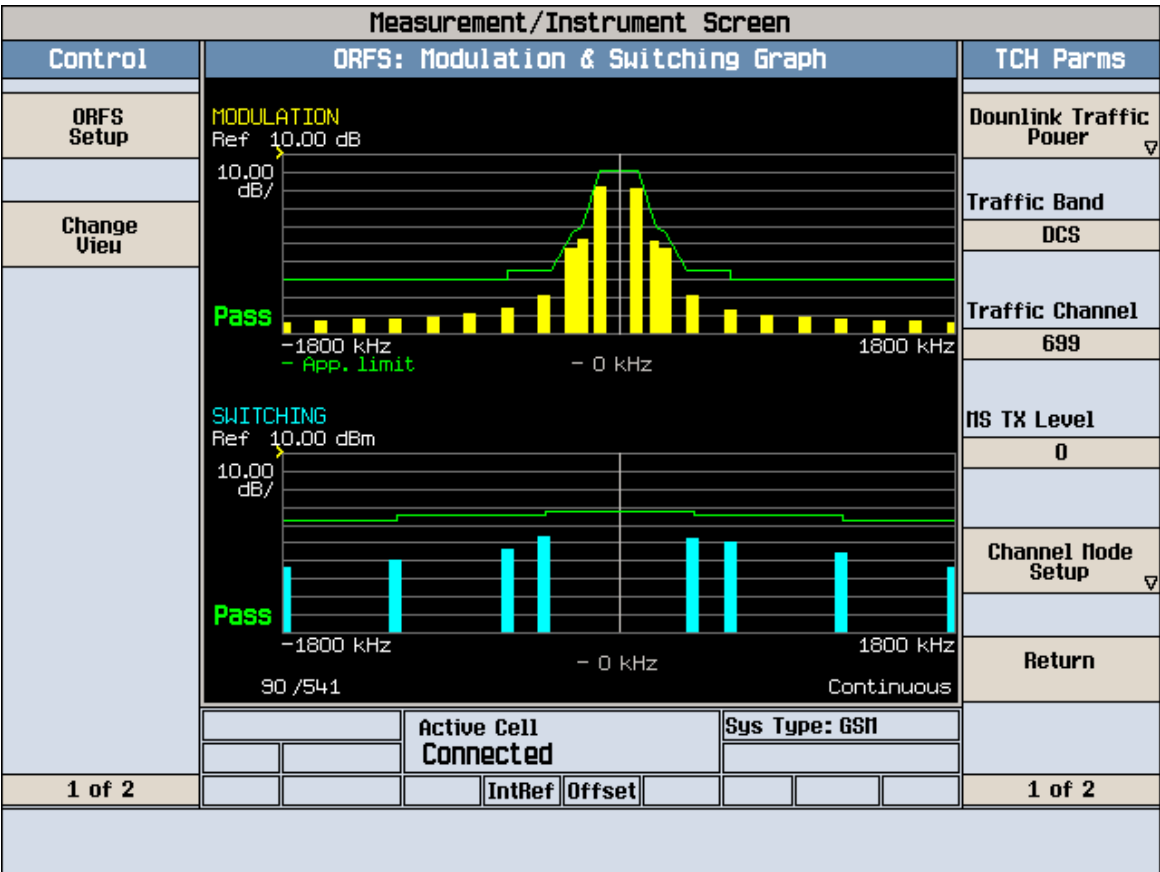
GSM1800, Middle Channel, TL/VL

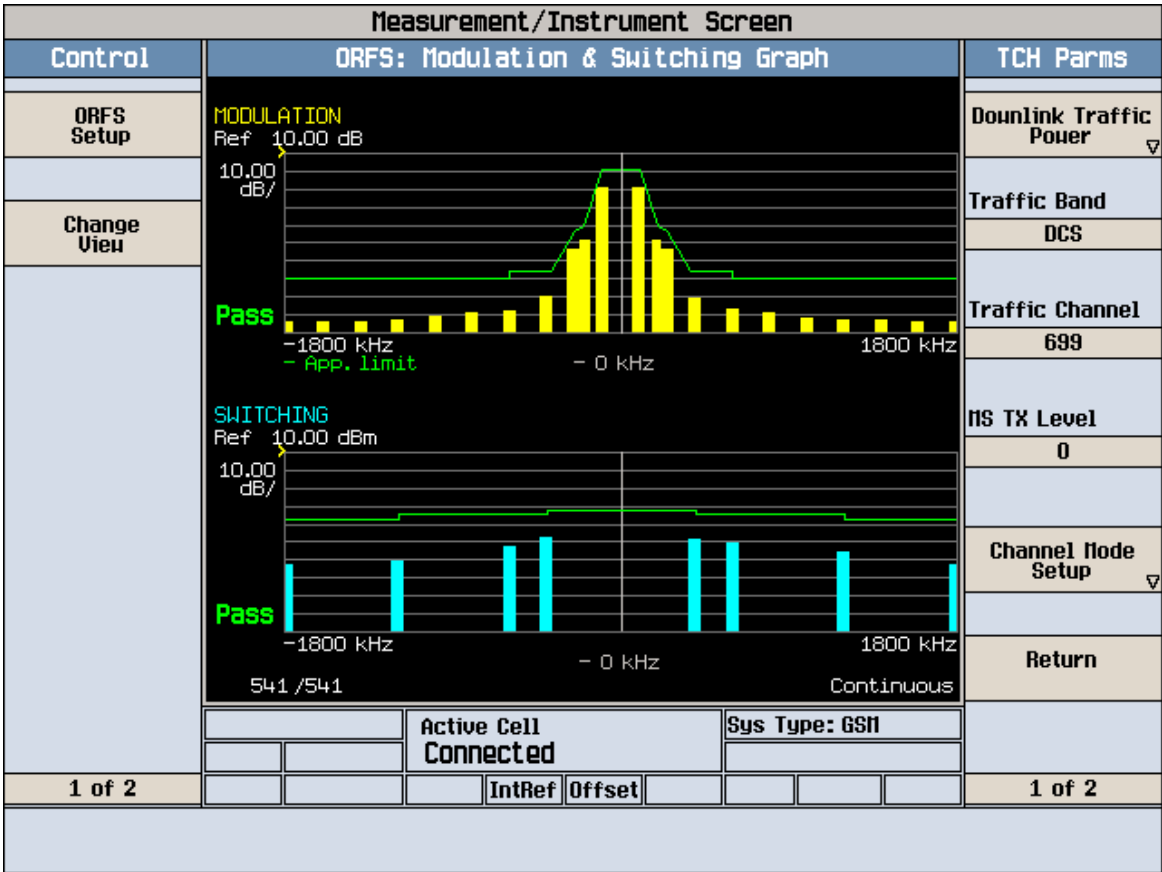


GSM1800, Middle Channel, TL/VH

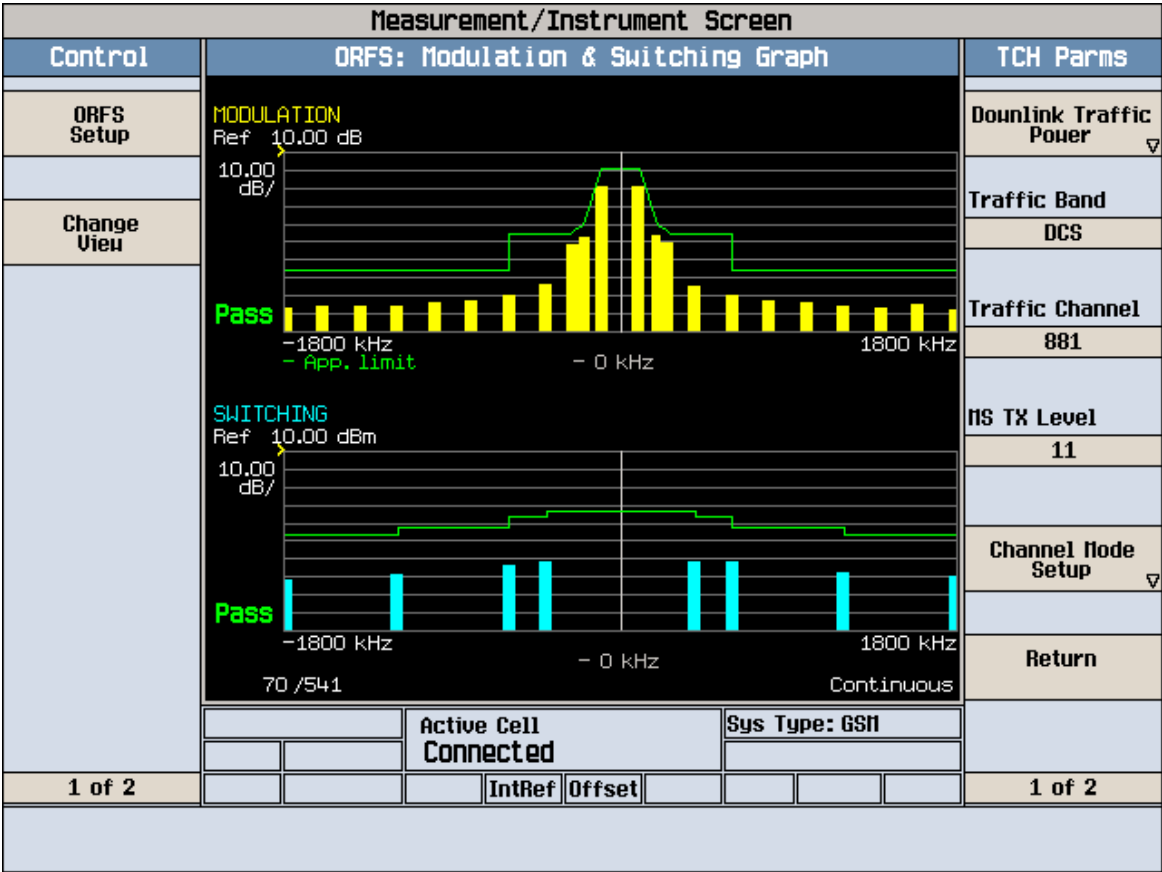


GSM1800, Middle Channel, TH/VL

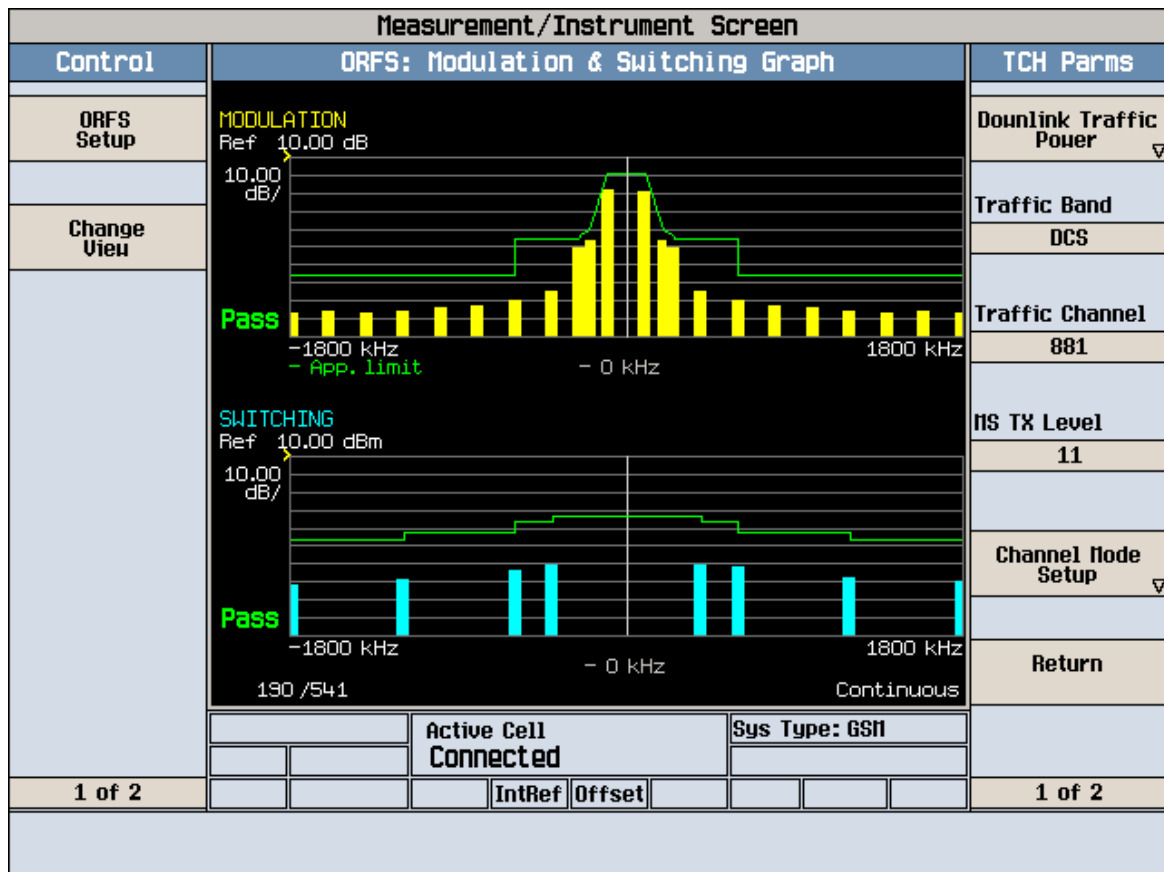




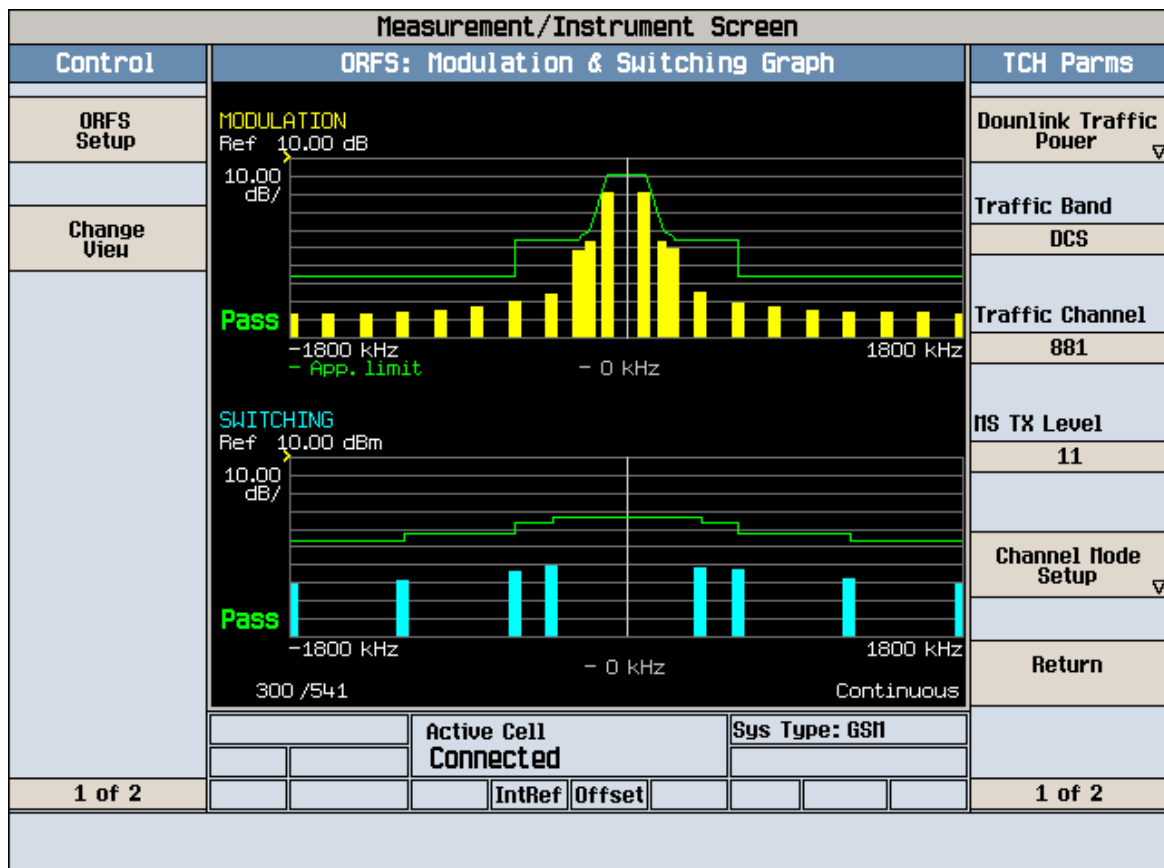
GSM1800, High Channel, normal



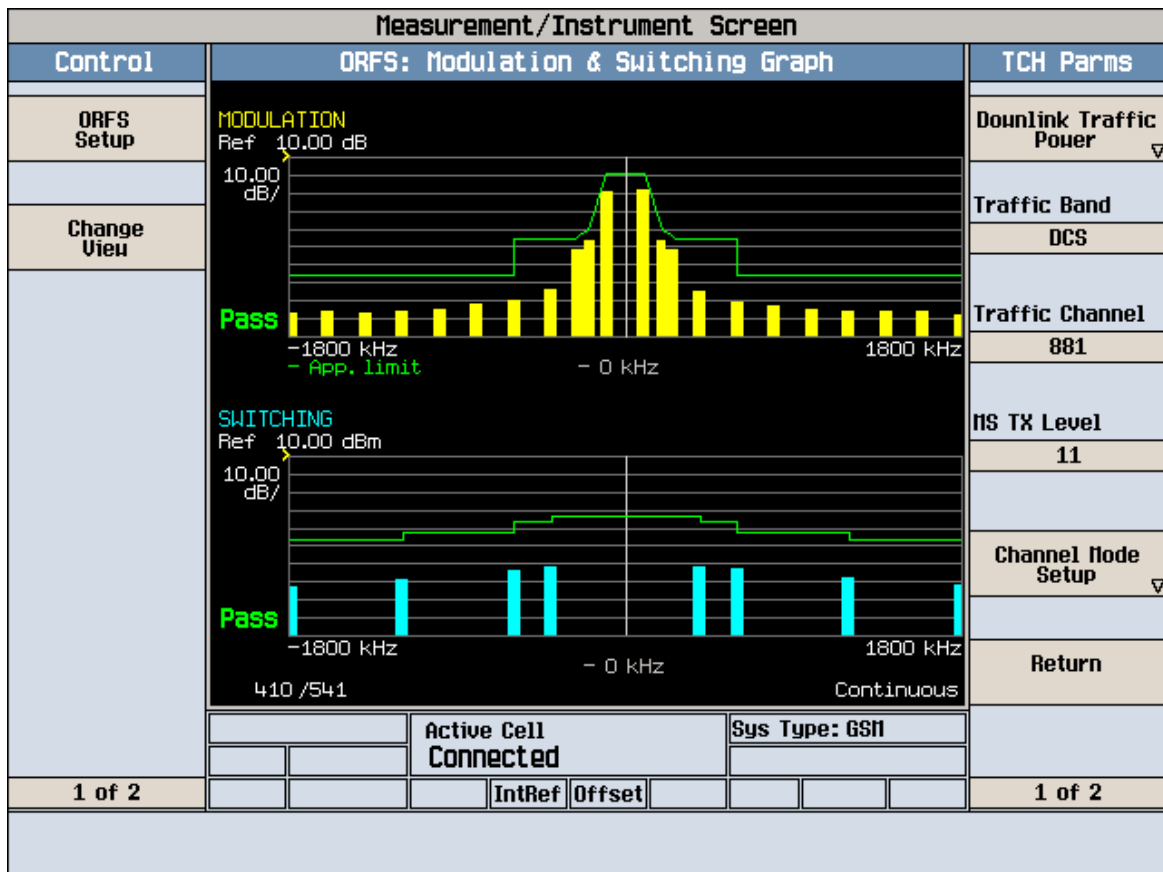
GSM1800, High Channel, TL/VL



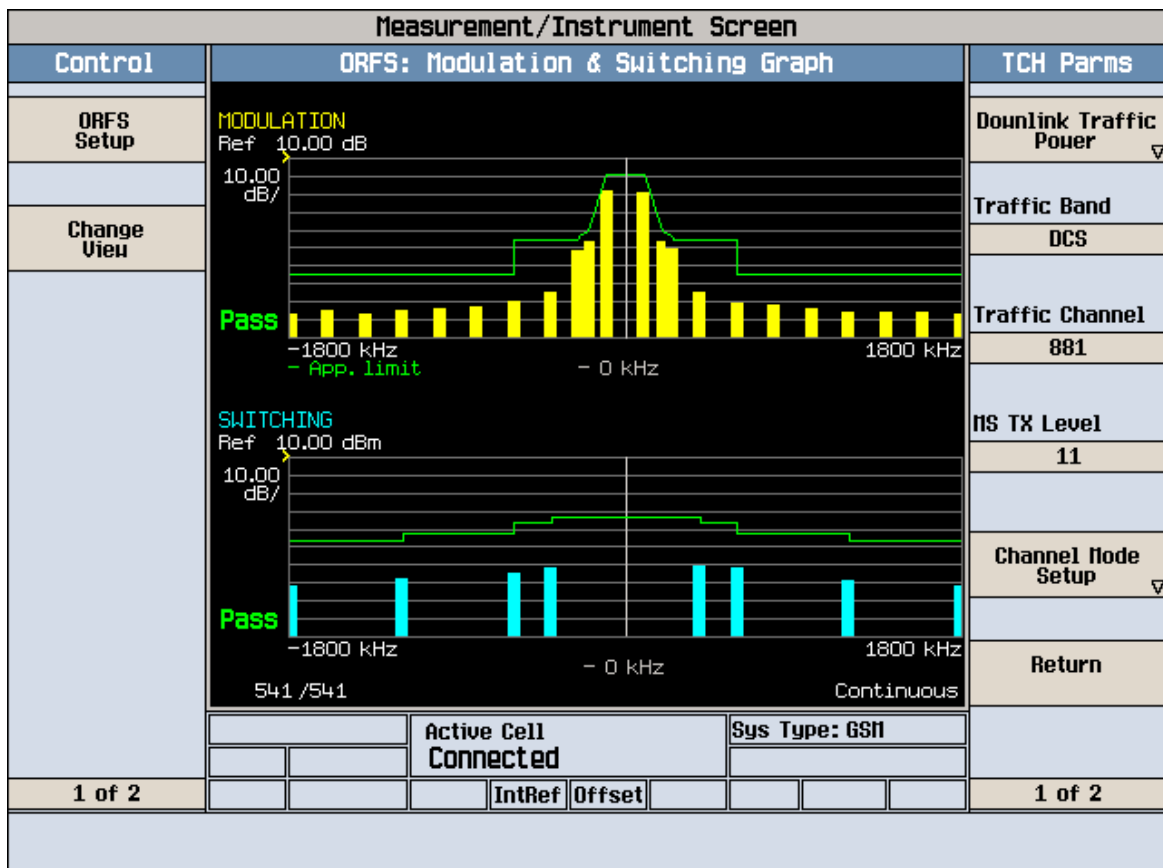
GSM1800, High Channel, TL/VH



GSM1800, High Channel, TH/VL



GSM1800, High Channel, TH/VH



4.6. Transmitter output power in GPRS multi slot configuration

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.10

Limits

According to clause 13.16.2 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1,13.16.2

Table 4-17: Bands other than DCS 1800 and PCS transmitter output power
for different power classes

Power class					Power control level (note 4)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2,3)	Tolerances	
2	3	4	5				dBm	normal	extreme
.	2	0	39	±2 dB	±2,5 dB
.	3	1	37	±3 dB (note 1)	±4 dB (note 1)
.	4	2	35	±3 dB	±4 dB
.	5	3	33	±3 dB (note 1)	±4 dB (note 1)
.	6	4	31	±3 dB	±4 dB
.	7	5	29	±3 dB (note 1)	±4 dB (note 1)
.	8	6	27	±3 dB	±4 dB
.	9	7	25	±3 dB	±4 dB
.	10	8	23	±3 dB	±4 dB
.	11	9	21	±3 dB	±4 dB
.	12	10	19	±3 dB	±4 dB
.	13	11	17	±3 dB	±4 dB
.	14	12	15	±3 dB	±4 dB
.	15	13	13	±3 dB	±4 dB
.	16	14	11	±5 dB	±6 dB
.	17	15	9	±5 dB	±6 dB
.	18	16	7	±5 dB	±6 dB
.	19	17	5	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.

NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.16.2-1a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-1b.

NOTE 3: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.

NOTE 4: There is no requirement to test power control levels 20-31.

Table 4-18: DCS 1800 transmitter output power for different power classes

Power class			Power control level (note 4)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2,3)	Tolerances	
1	2	3			dBm	normal	extreme
	.		29	0	36	$\pm 2,0$ dB	$\pm 2,5$ dB
	.		30	1	34	$\pm 3,0$ dB	$\pm 4,0$ dB
	.		31	2	32	$\pm 3,0$ dB	$\pm 4,0$ dB
.	.		0	3	30	$\pm 3,0$ dB (note_1)	± 4 dB (note_1)
.	.		1	4	28	± 3 dB	± 4 dB
.	.		2	5	26	± 3 dB	± 4 dB
.	.		3	6	24	± 3 dB (note_1)	± 4 dB (note_1)
.	.		4	7	22	± 3 dB	± 4 dB
.	.		5	8	20	± 3 dB	± 4 dB
.	.		6	9	18	± 3 dB	± 4 dB
.	.		7	10	16	± 3 dB	± 4 dB
.	.		8	11	14	± 3 dB	± 4 dB
.	.		9	12	12	± 4 dB	± 5 dB
.	.		10	13	10	± 4 dB	± 5 dB
.	.		11	14	8	± 4 dB	± 5 dB
.	.		12	15	6	± 4 dB	± 5 dB
.	.		13	16	4	± 4 dB	± 5 dB
.	.		14	17	2	± 5 dB	± 6 dB
.	.		15	18	0	± 5 dB	± 6 dB
<p>NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.</p> <p>NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.16.2-2a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-2b.</p> <p>NOTE 3: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.</p> <p>NOTE 4: There is no requirement to test power control levels 16-28.</p>							

Test procedure

- 1) The MS is placed in the anechoic shielded chamber or on the outdoor test site, on an isolated support, in the position for normal use, at a distance of at least 3 meters from a test antenna, connected to the SS.
- 2) With the initial conditions set according to sub clause 13.16.2.4.2.1 the test procedure are done at maximum power for ARFCN in the low, mid, high range, the measurement is made eight times with the MS rotated by $n \times 45$ degrees for all values of n in the range 0 to 7.
- 3) Assessment of test site loss for scaling of received output power measurements.
- 4) Temporary antenna connector calibration factors (transmit).
- 5) Measurements at extreme test conditions.

Test Result

PASS

GPRS 900, Middle Channel, Normal

Measurement/Instrument Screen														
Control		Transmit Power										PDCH Parms		
Transmit Power Setup ▾												Downlink Traffic Power ▾		
				Burst 1	Burst 2	Burst 3	Burst 4	Burst 5	Burst 6			Traffic Band		
		BP		32.66	----	----	----	----	----	----			PGSN	
		ECP		32.66	----	----	----	----	----	----			Traffic Channel	
														62
														HS TX Level ▾
												Coding Scheme		
												CS-4		
												Return		
1 of 2				Active Cell Transferring				Sys Type: GPRS				1 of 2		
					IntRef	Offset								

GPRS 900, Middle Channel, TL/VL

Measurement/Instrument Screen																																								
Control		Transmit Power								PDCH Parms																														
Transmit Power Setup ▾		<table><thead><tr><th></th><th>Burst 1</th><th>Burst 2</th><th>Burst 3</th><th>Burst 4</th><th>Burst 5</th><th>Burst 6</th></tr></thead><tbody><tr><td>BP</td><td>32.66</td><td>----</td><td>----</td><td>----</td><td>----</td><td>----</td></tr><tr><td>ECP</td><td>32.66</td><td>----</td><td>----</td><td>----</td><td>----</td><td>----</td></tr><tr><td colspan="7">Continuous</td></tr></tbody></table>									Burst 1	Burst 2	Burst 3	Burst 4	Burst 5	Burst 6	BP	32.66	----	----	----	----	----	ECP	32.66	----	----	----	----	----	Continuous							Downlink Traffic Power ▾		
	Burst 1									Burst 2	Burst 3	Burst 4	Burst 5	Burst 6																										
BP	32.66									----	----	----	----	----																										
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GPRS 900, Middle Channel, TL/VH

Measurement/Instrument Screen																														
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GPRS 900, Middle Channel, TH/ML

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GPRS 900, Middle Channel, TH/VH

Measurement/Instrument Screen																														
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GPRS 1800, Middle Channel, Normal

Measurement/Instrument Screen																								
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GPRS 1800, Middle Channel, TL/VL

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GPRS 1800, Middle Channel, TL/VH

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GPRS 1800, Middle Channel, TH/VL

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4.7. Output RF spectrum in GPRS multi slot configuration

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.11

Limits

According to clause 13.16.3 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1,13.16.3.5

Table 4-19: GSM 400, GSM700, GSM850 and GSM900 Spectrum
Due to modulation out less than 1800 kHz offset

power levels in dB relative to the measurement at FT					
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to < 1 800
39	+0,5	-30	-33	-60	-66
37	+0,5	-30	-33	-60	-64
35	+0,5	-30	-33	-60	-62
<= 33	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-51

Table 4-20: DCS 1800 Spectrum Due to modulation
out less than 1800 kHz offset

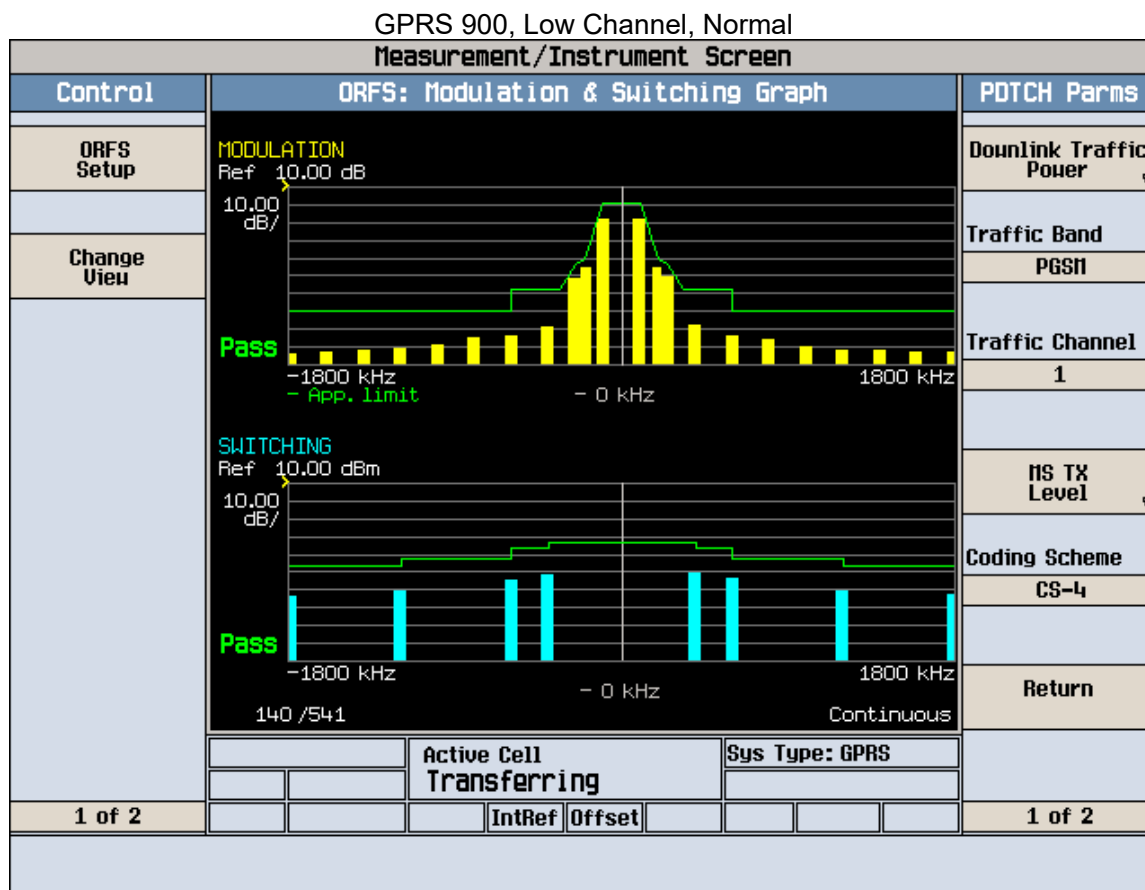
power levels in dB relative to the measurement at FT					
Power level	Frequency offset (kHz)				
(dBm)	0-100	200	250	400	600 to < 1 800
<= 36	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-56

Table 4-21: Spurious emissions in the MS receive bands

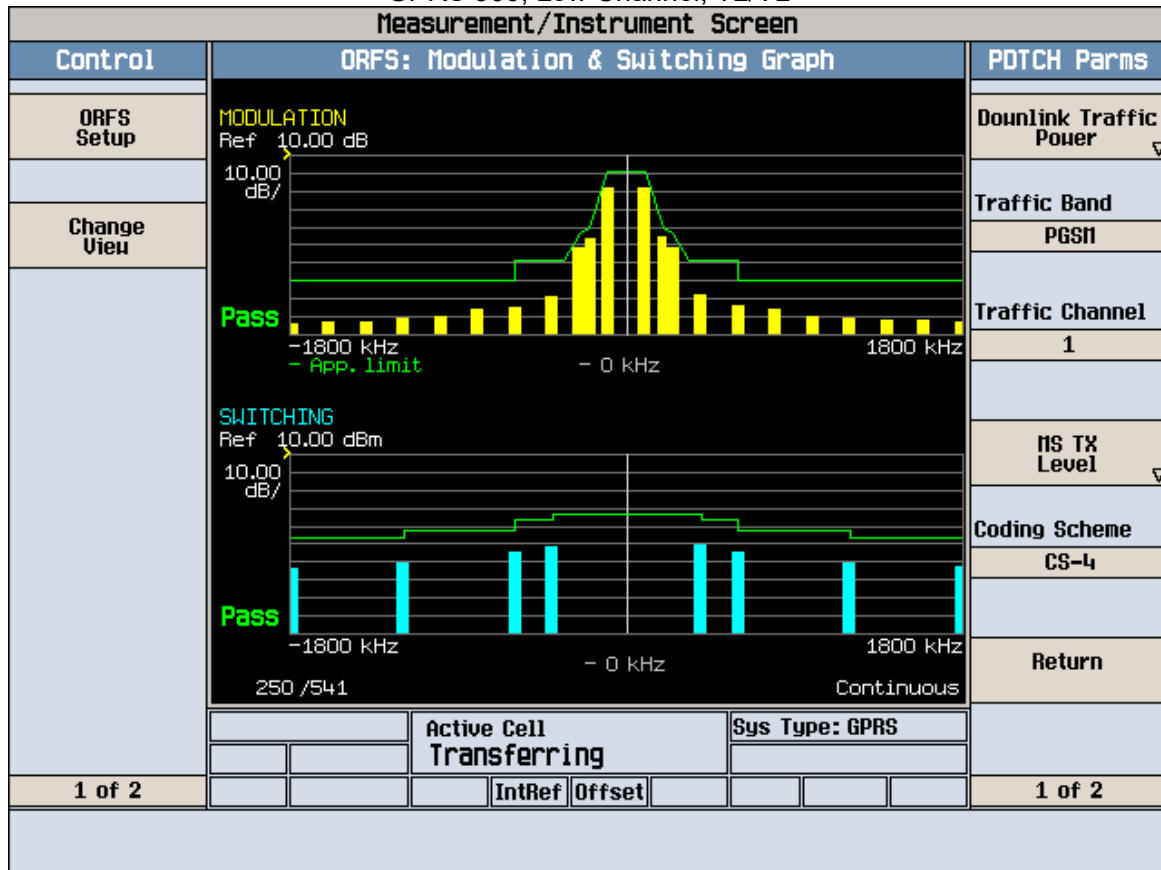
Band (MHz)	Spurious emissions level (dBm)	
	GSM 400, GSM 900 and DCS 1 800	GSM 700 GSM 850 PCS 1 900
925 to 935	-67	
935 to 960	-79	
1805 to 1880	-71	
728 to 736		-73
736 to 746		-79
747 to 757		-79
757 to 763		-73
869 to 894		-79
1930 to 1990		-71

Test procedure

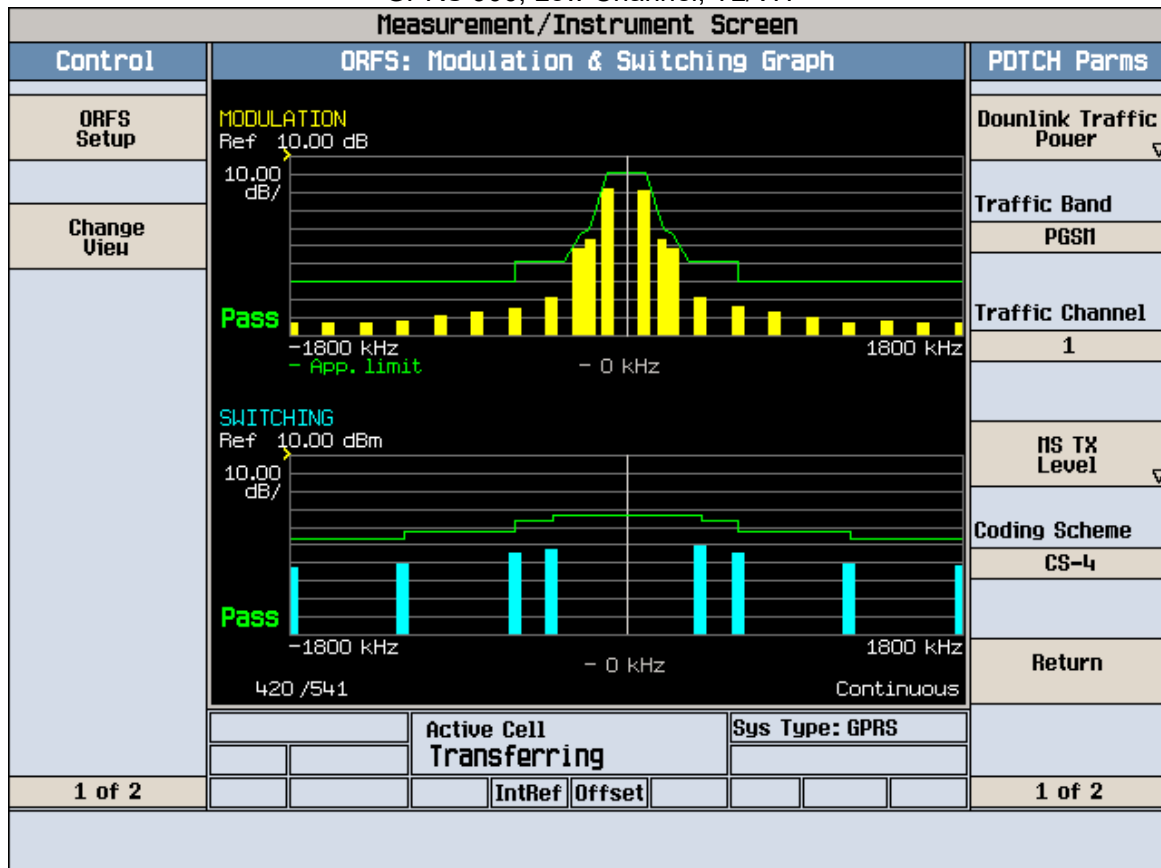
- 1) The test shall be run under the default GPRS with power control parameter ALPHA(a) set to 0.
- 2) The MS shall be operated with its highest number of uplink slots.
- 3) In the step 4) to 9) the FT is equal to the hop pattern ARFCN in the Mid ARFCN range.
- 4) The other settings of the spectrum analyser are set as follows:



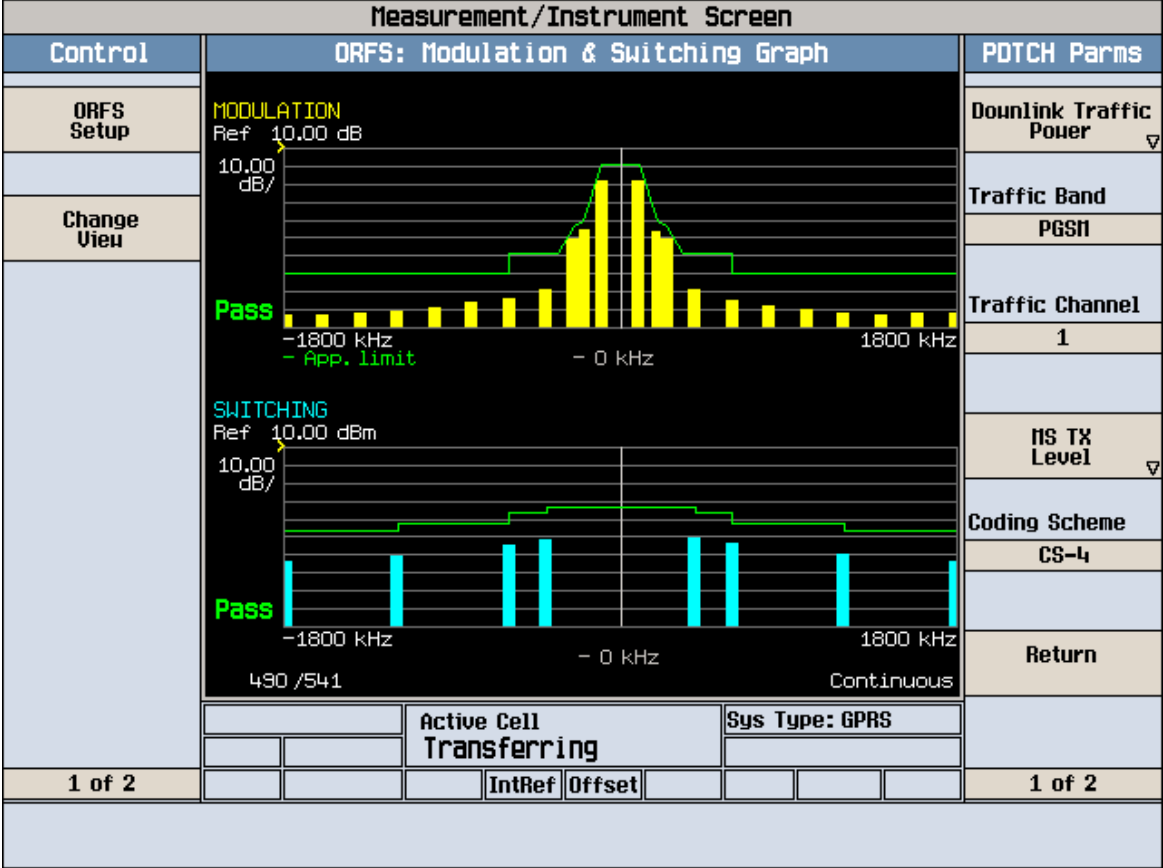
GPRS 900, Low Channel, TL/VL



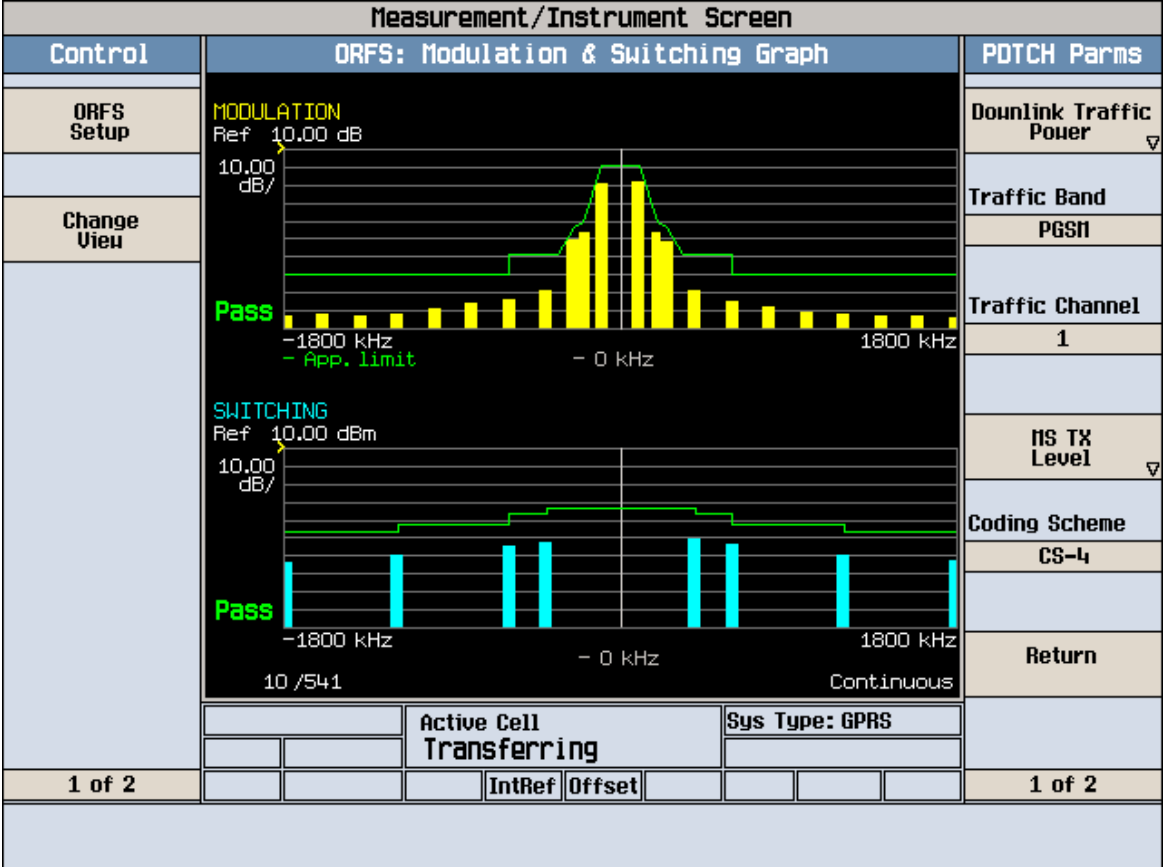
GPRS 900, Low Channel, TL/VH



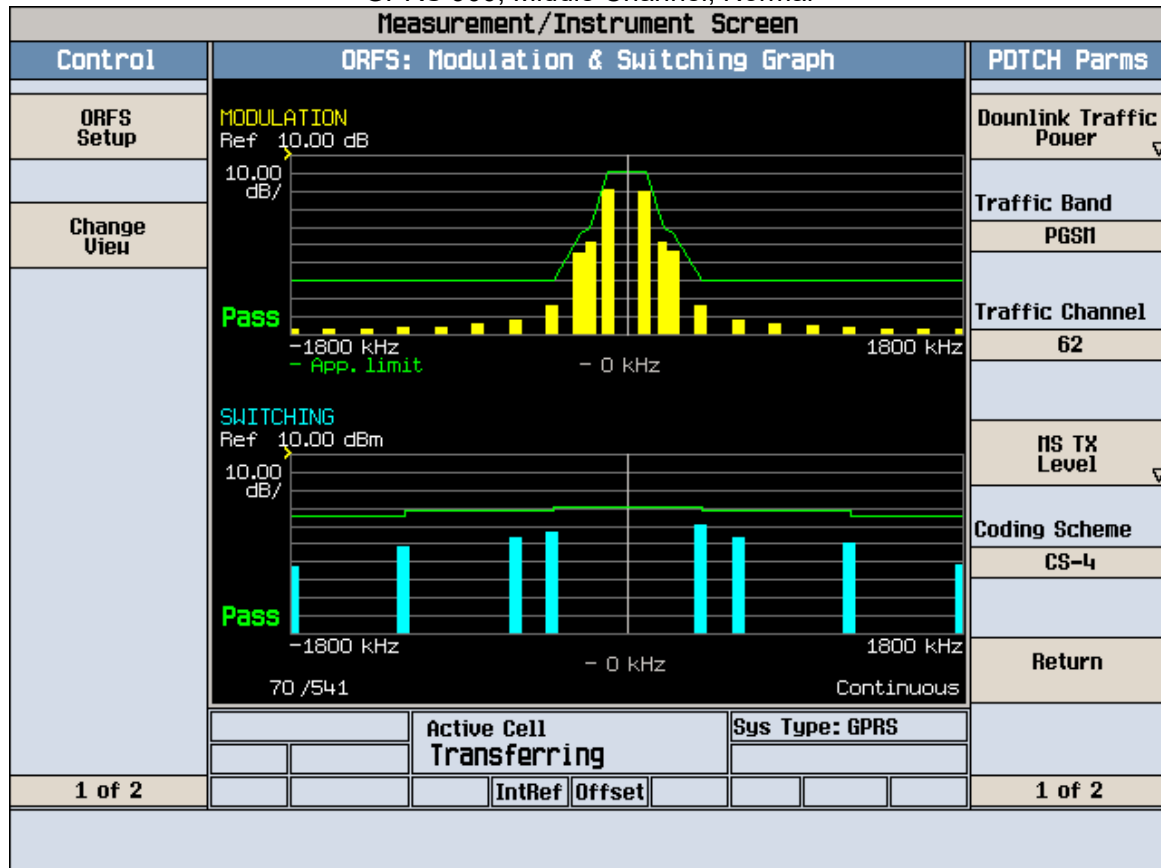
GPRS 900, Low Channel, THVL



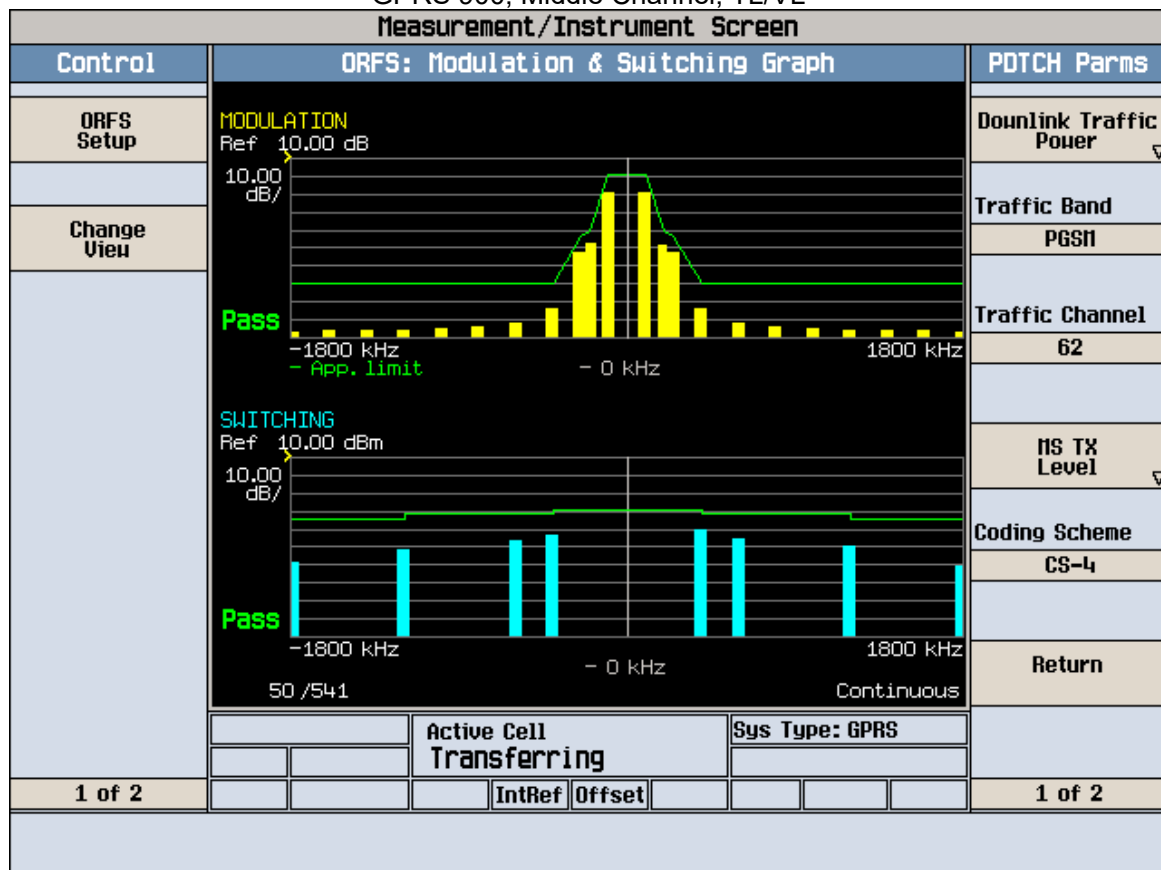
GPRS 900, Low Channel, THVH



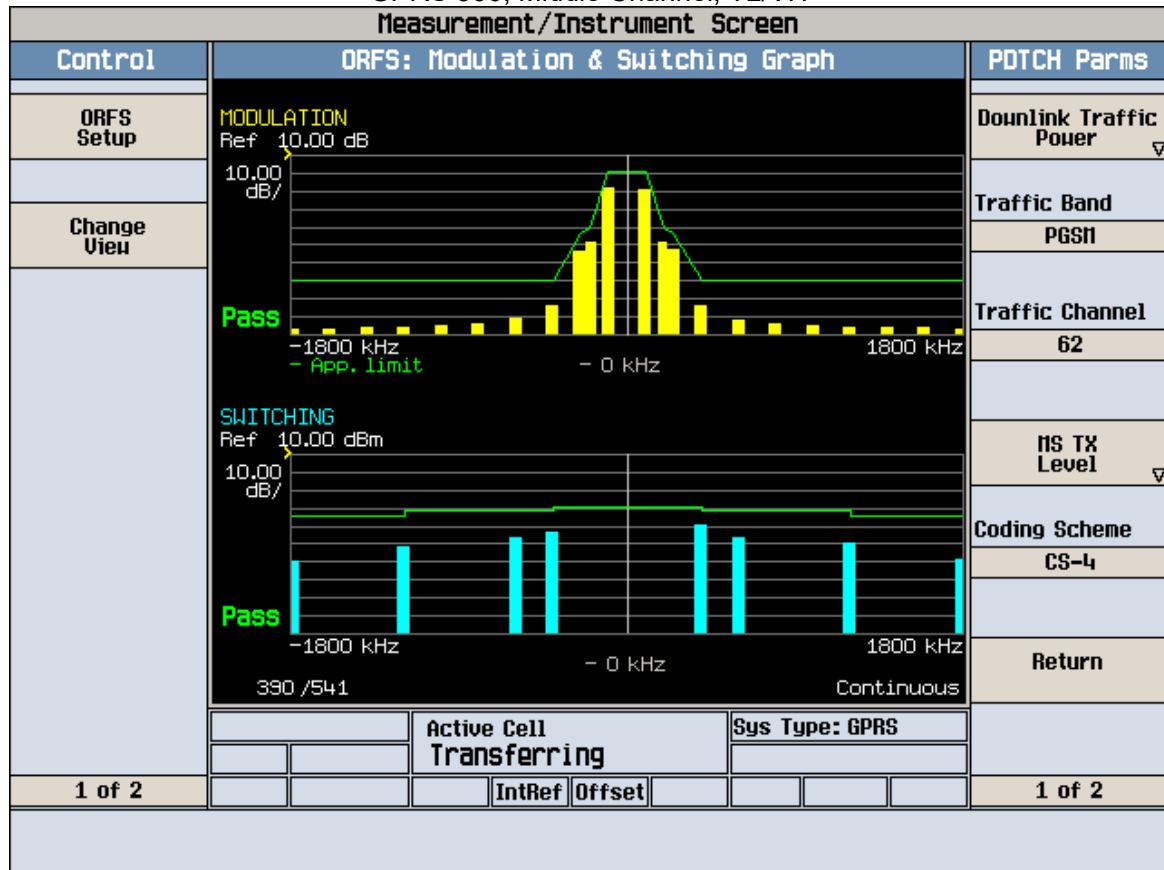
GPRS 900, Middle Channel, Normal



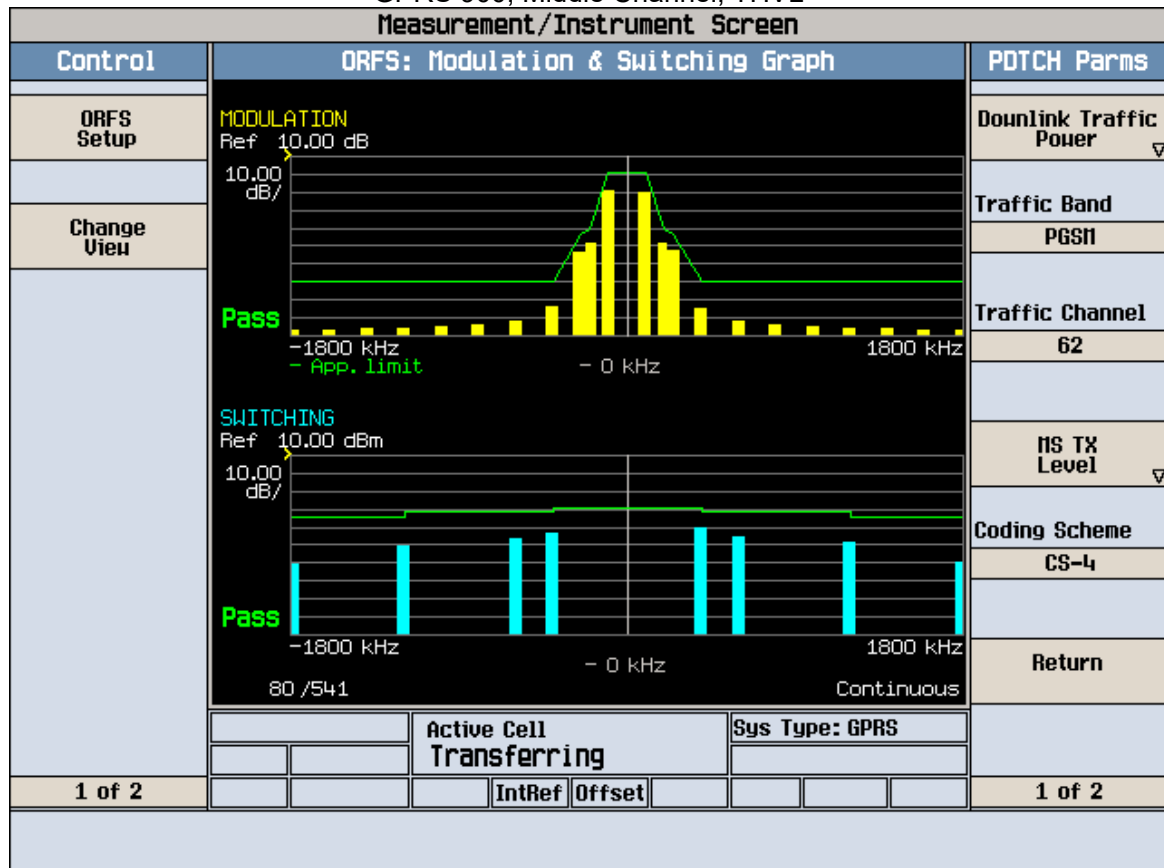
GPRS 900, Middle Channel, TL/VL



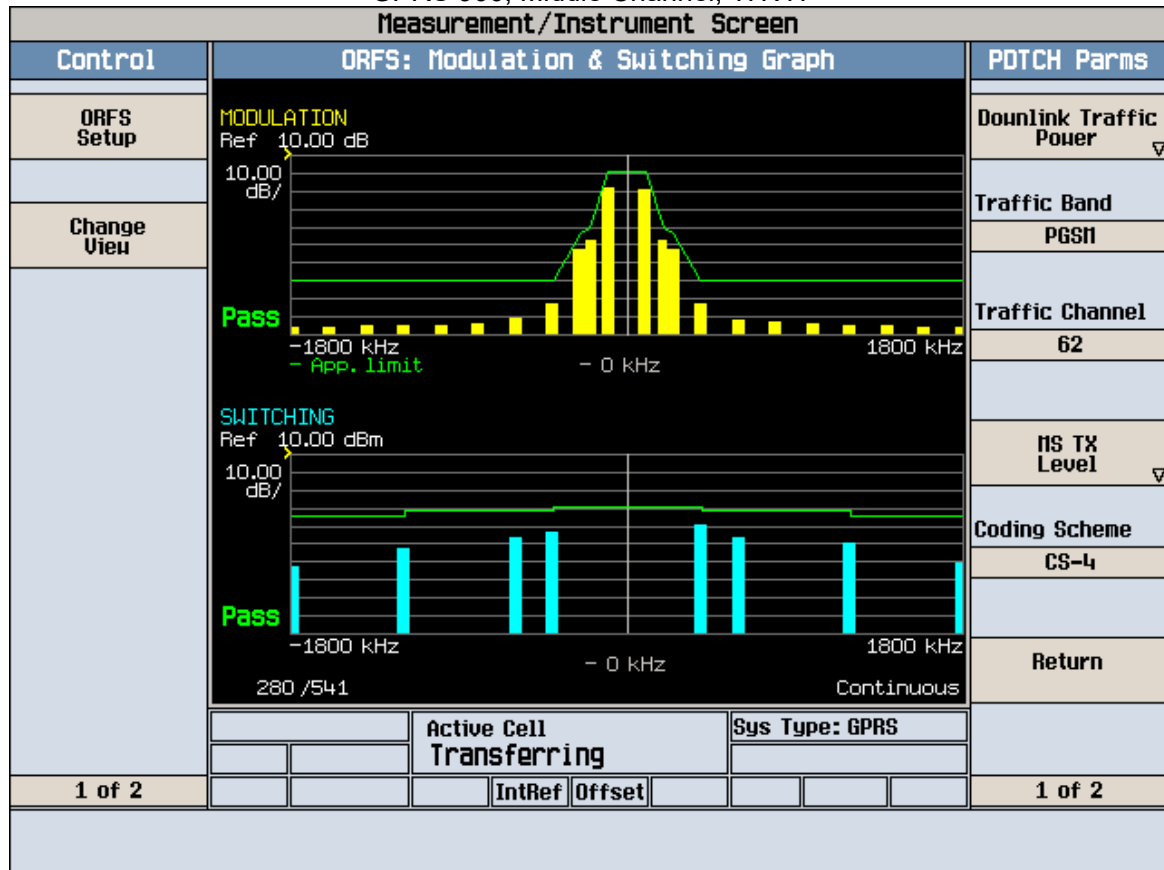
GPRS 900, Middle Channel, TL/VH



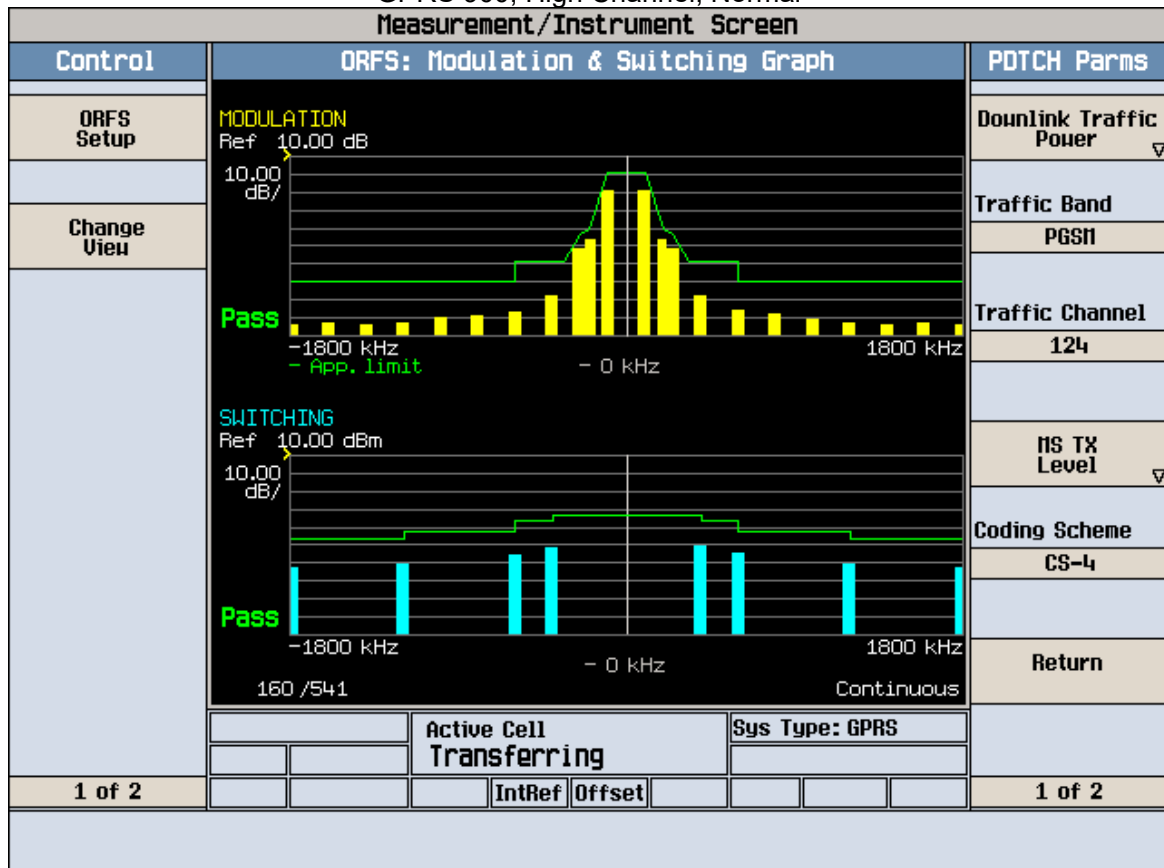
GPRS 900, Middle Channel, THVL



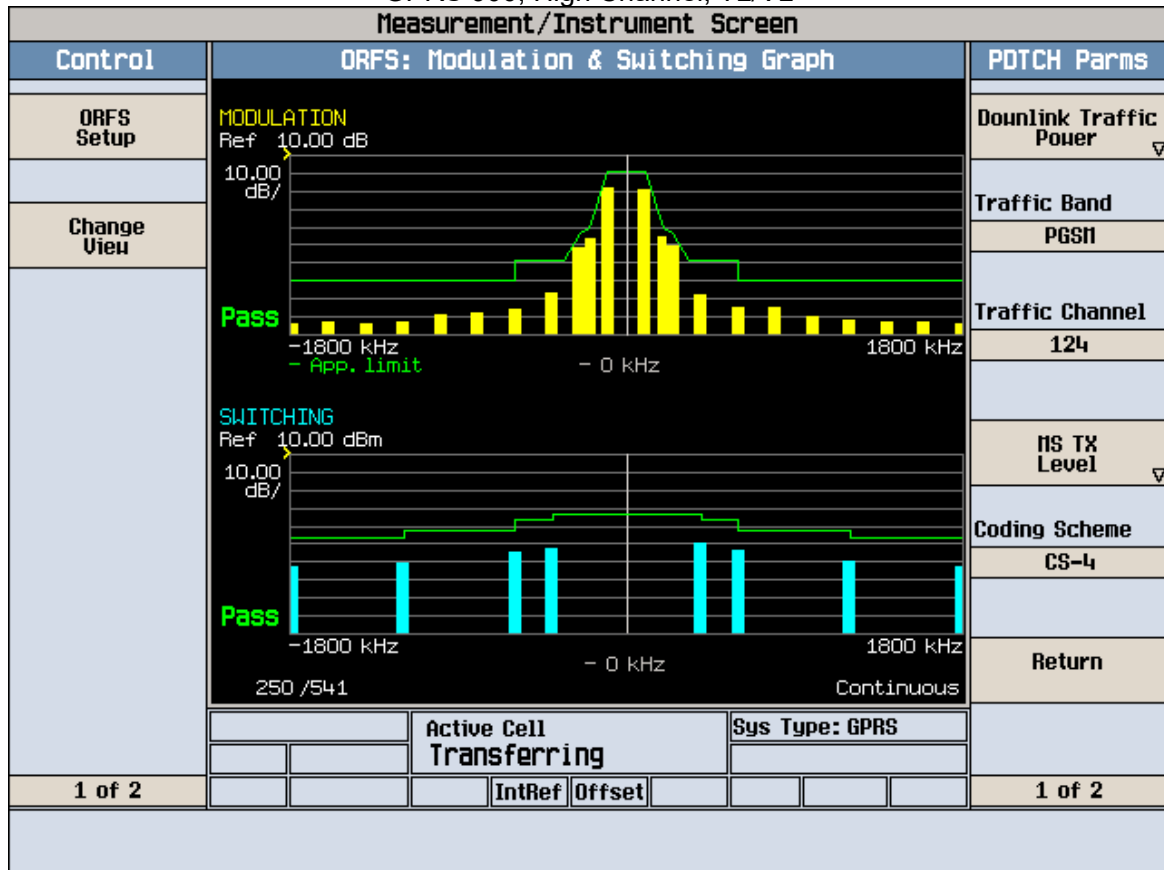
GPRS 900, Middle Channel, THVH



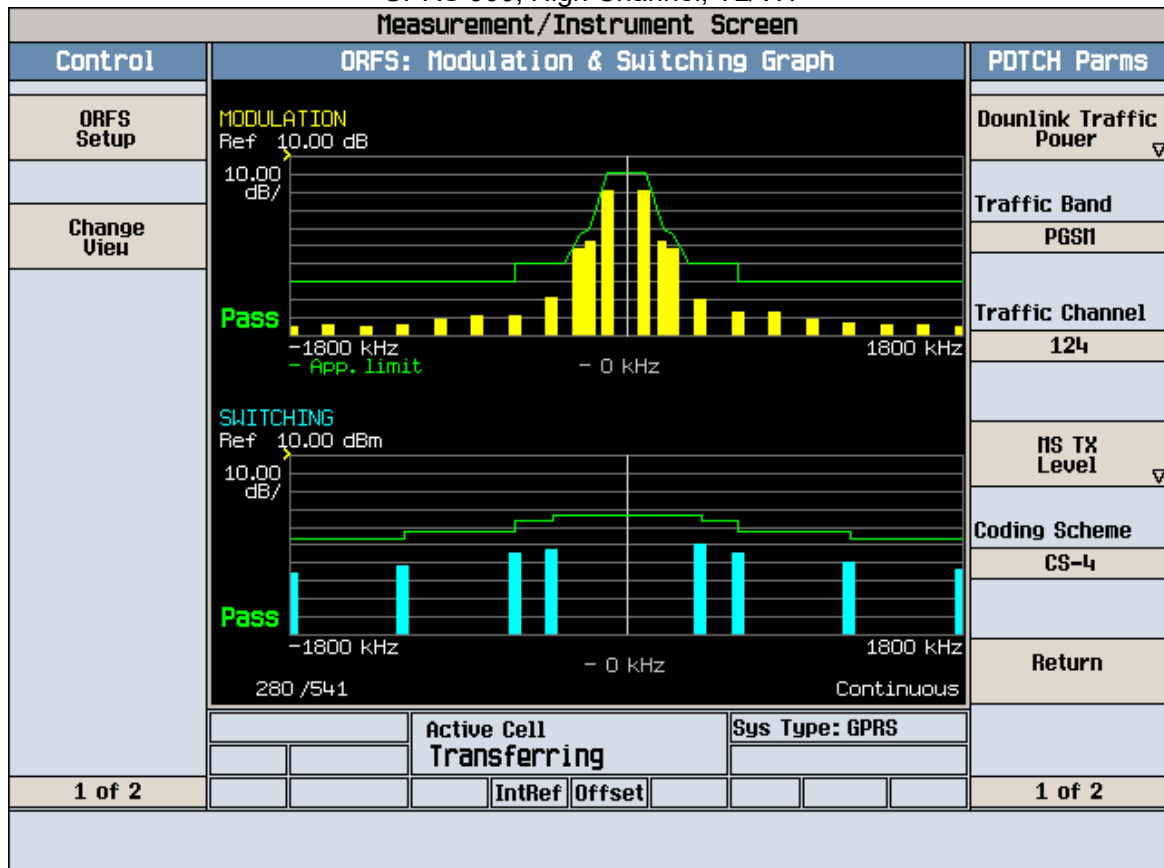
GPRS 900, High Channel, Normal



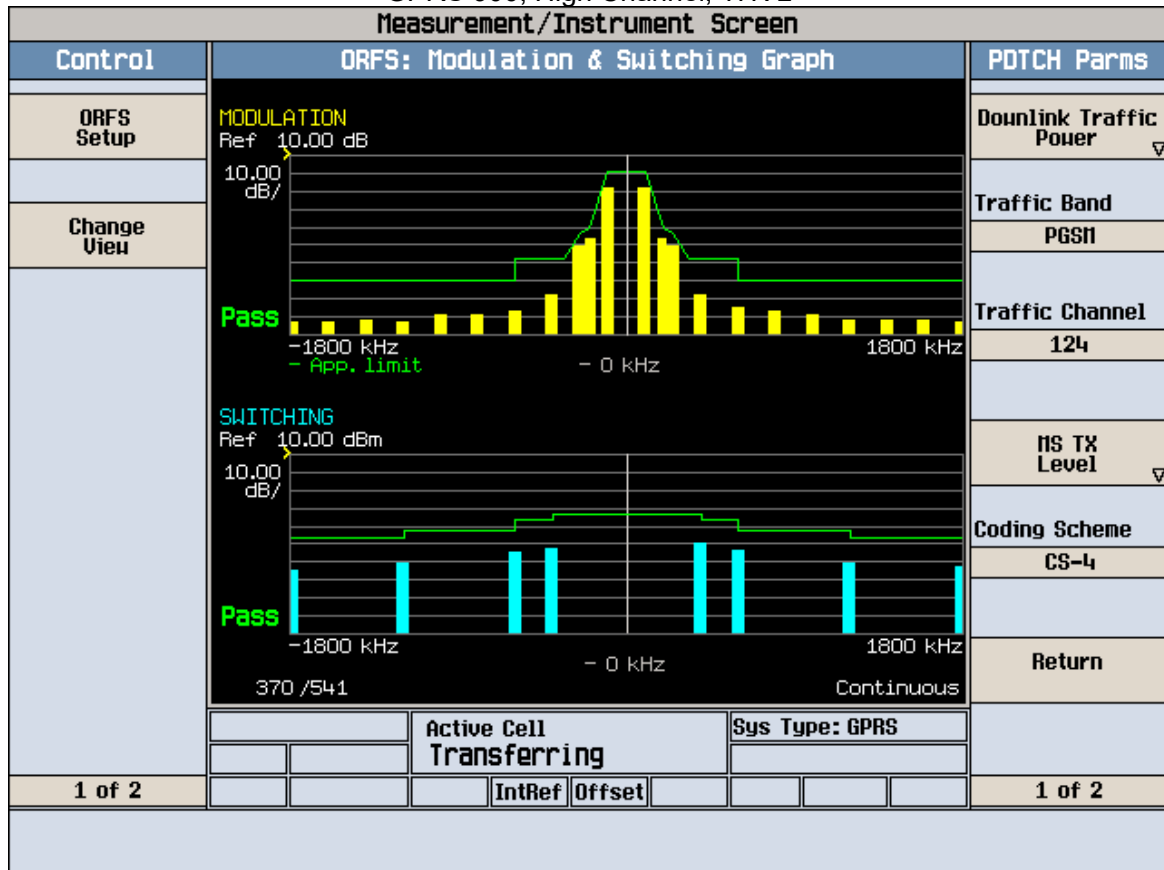
GPRS 900, High Channel, TL/VL



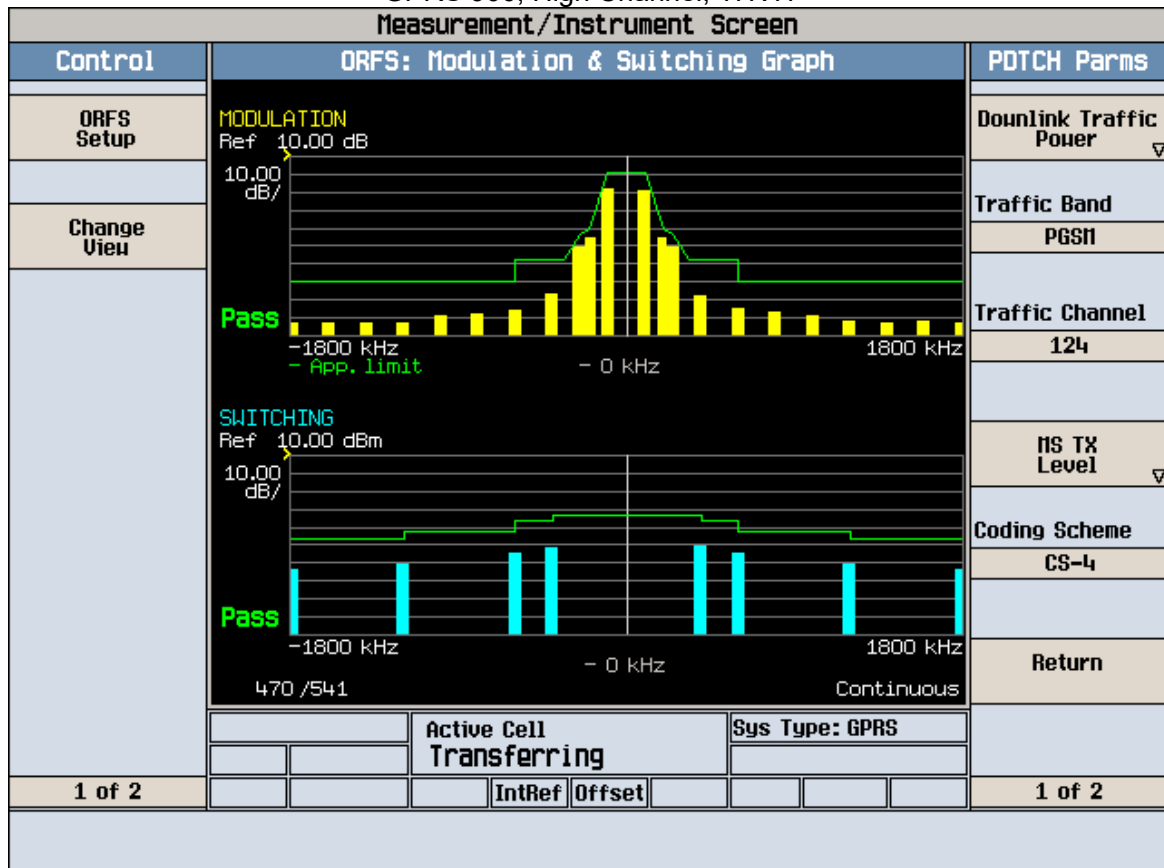
GPRS 900, High Channel, TL/VH



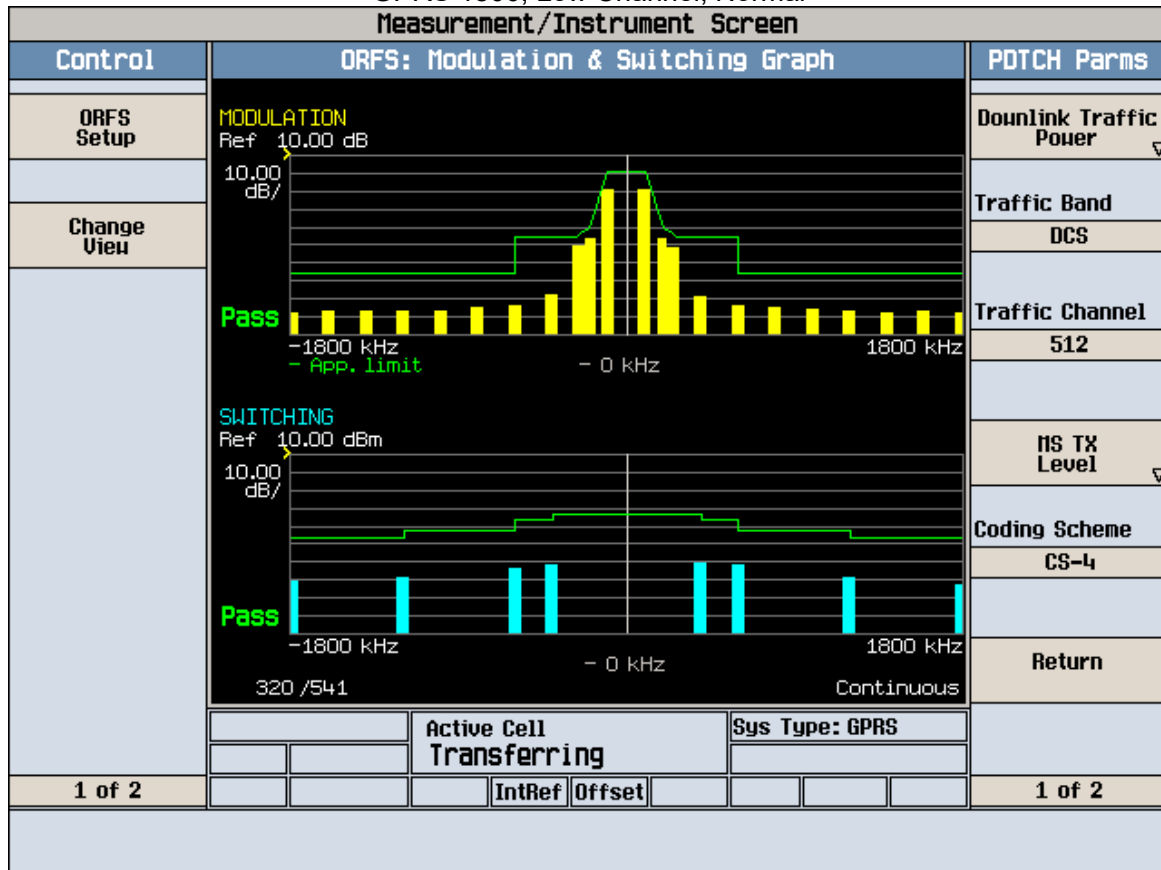
GPRS 900, High Channel, THVL



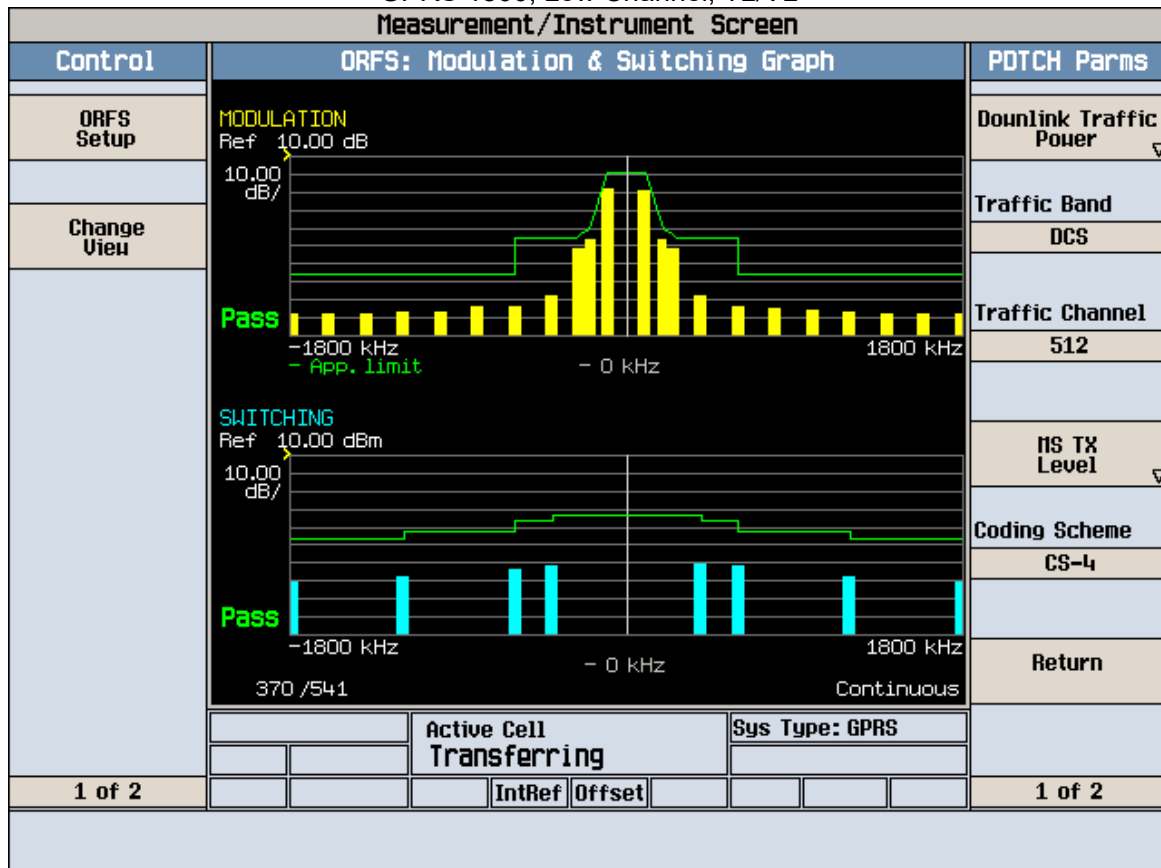
GPRS 900, High Channel, THVH



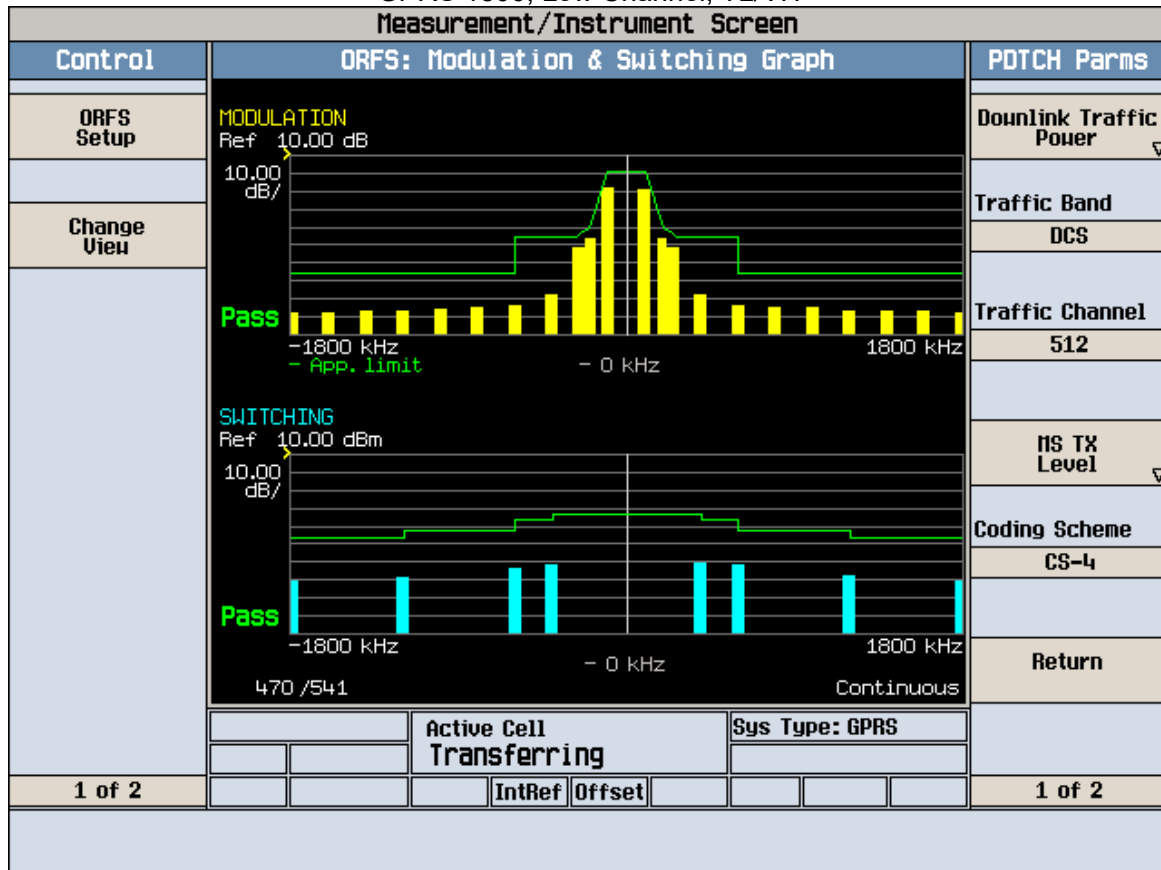
GPRS 1800, Low Channel, Normal



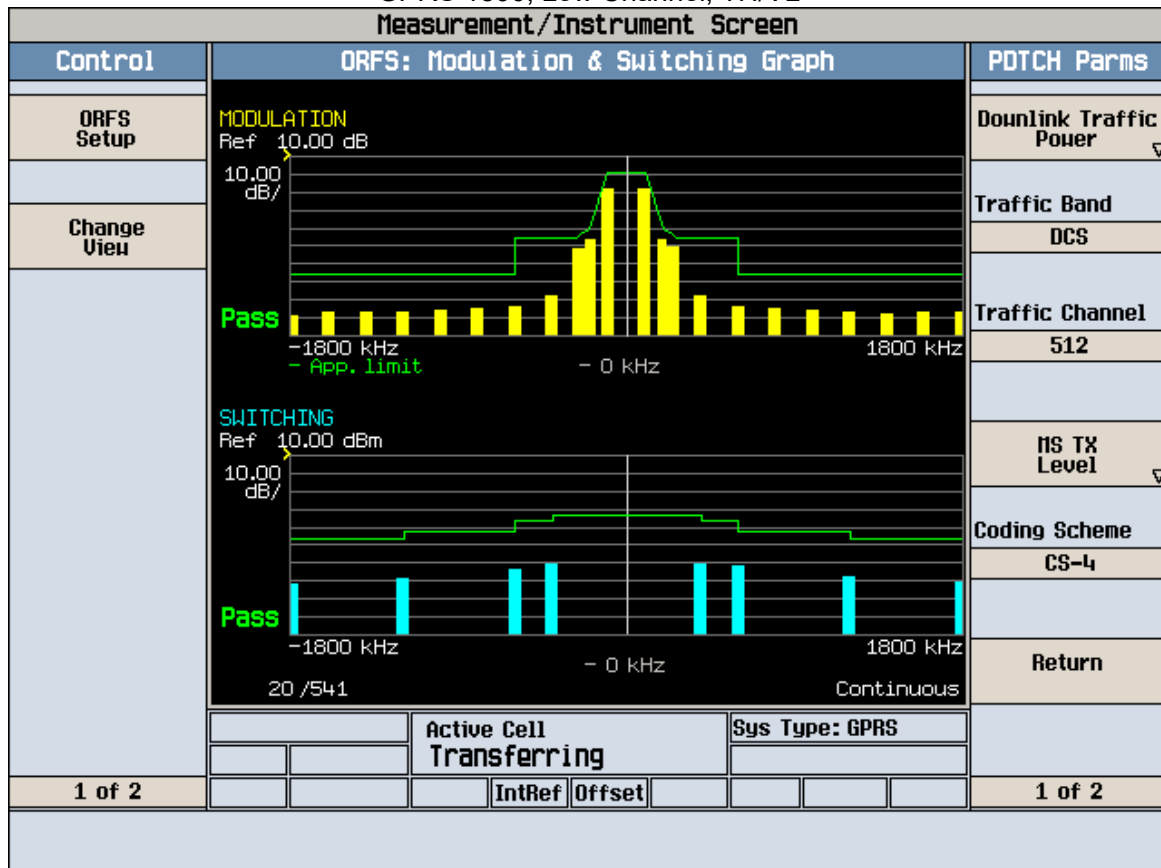
GPRS 1800, Low Channel, TL/VL



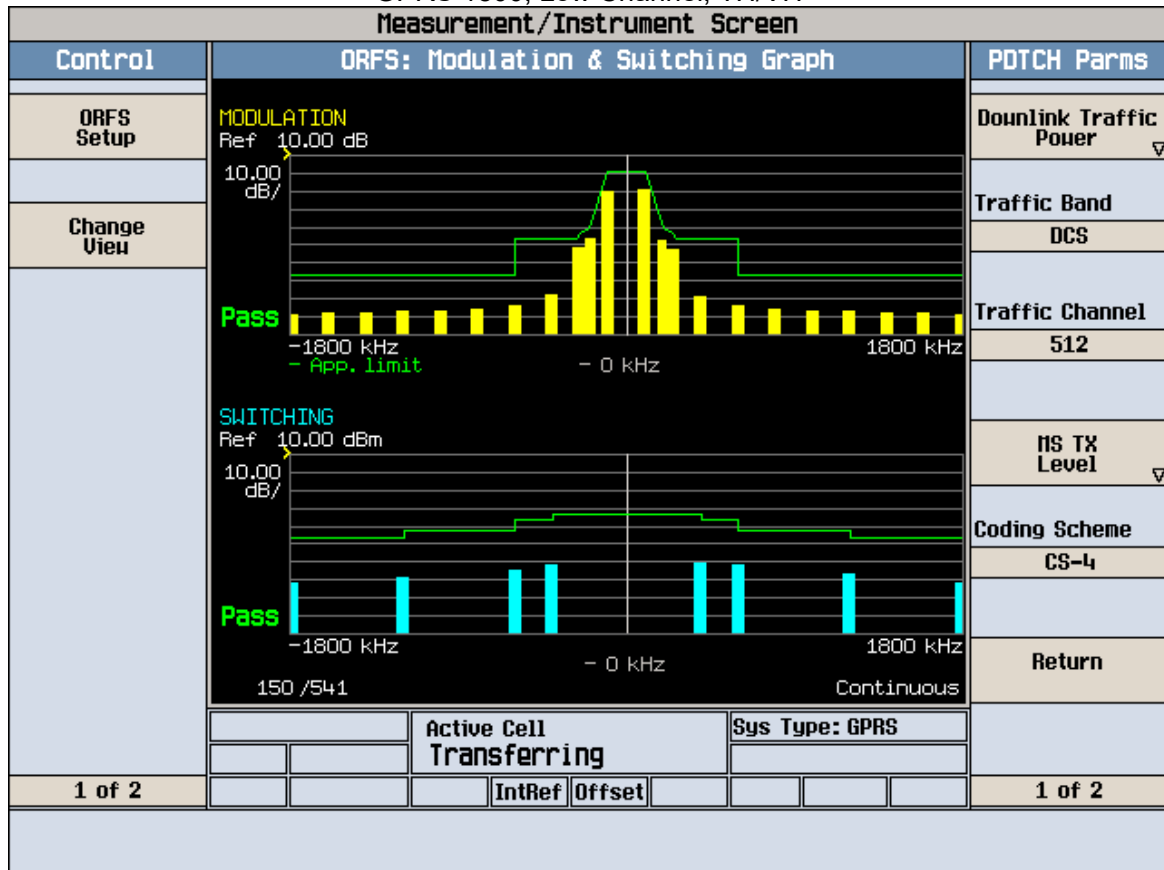
GPRS 1800, Low Channel, TL/VH



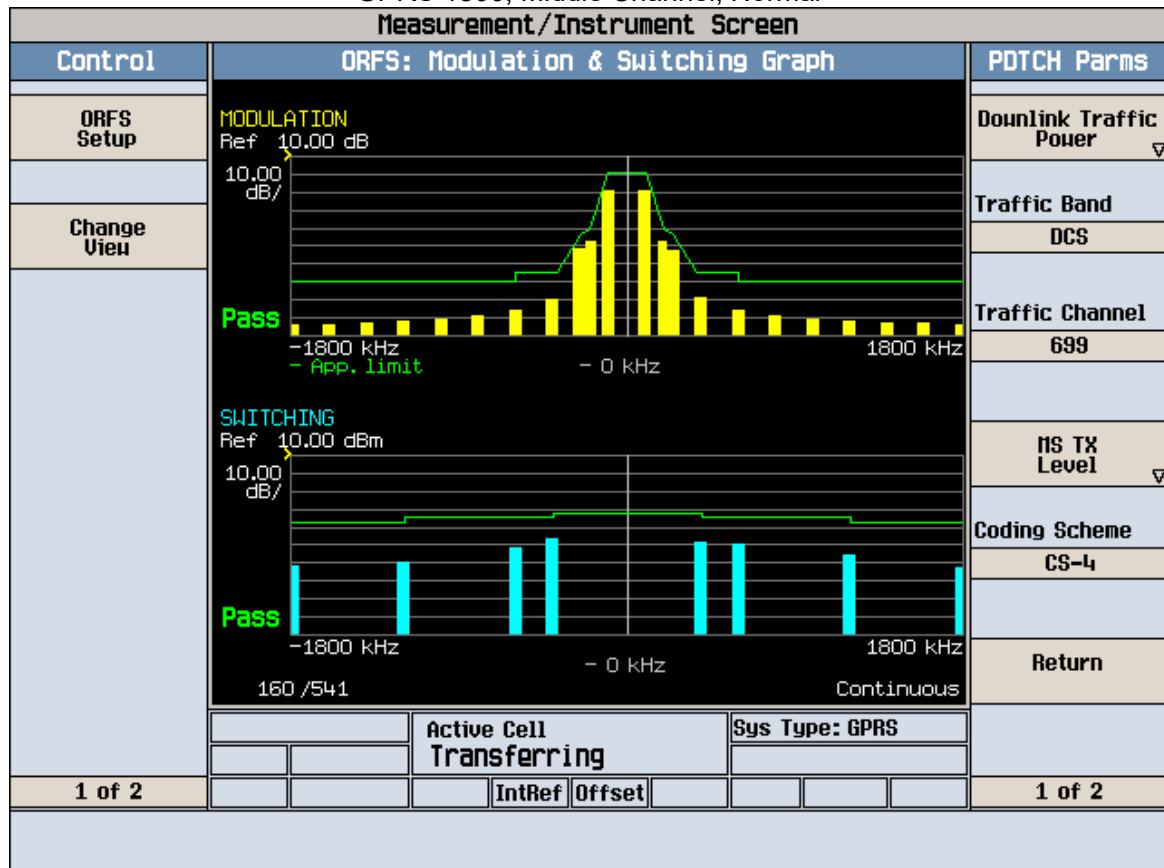
GPRS 1800, Low Channel, TH/VL



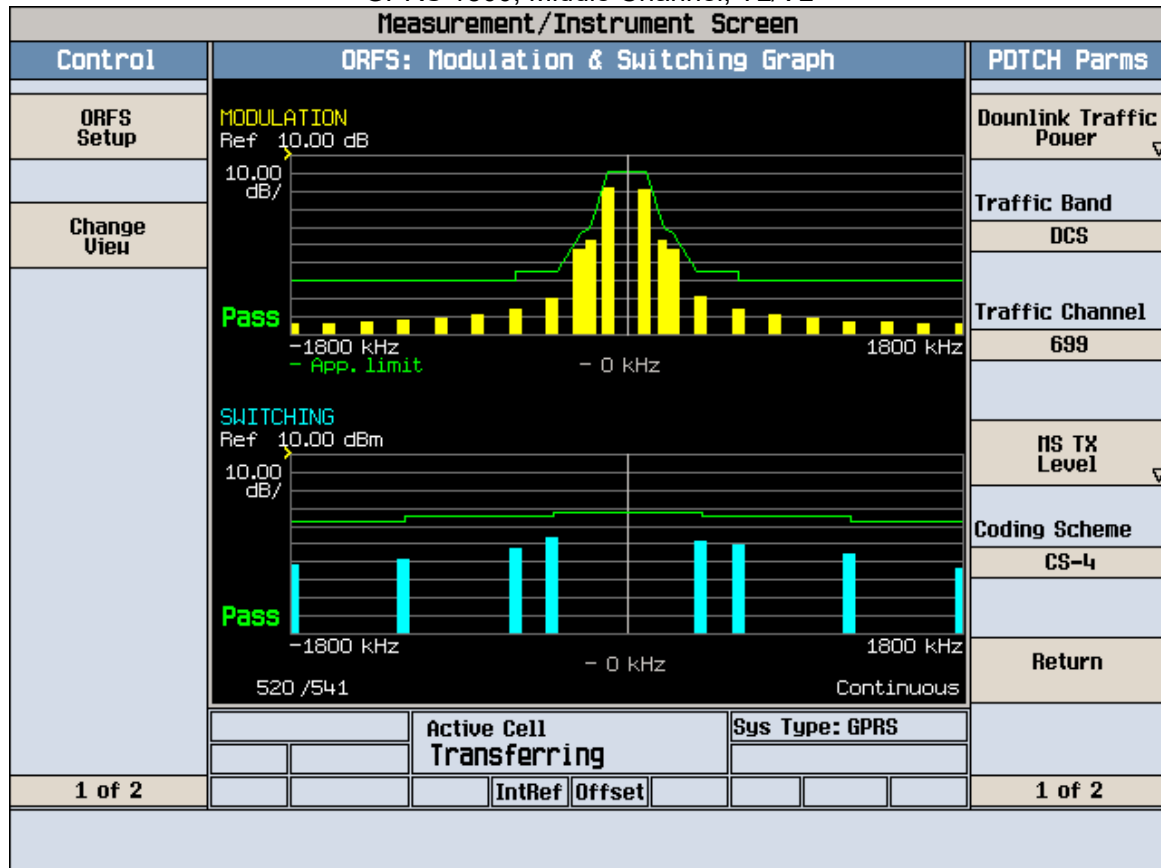
GPRS 1800, Low Channel, TH/VH



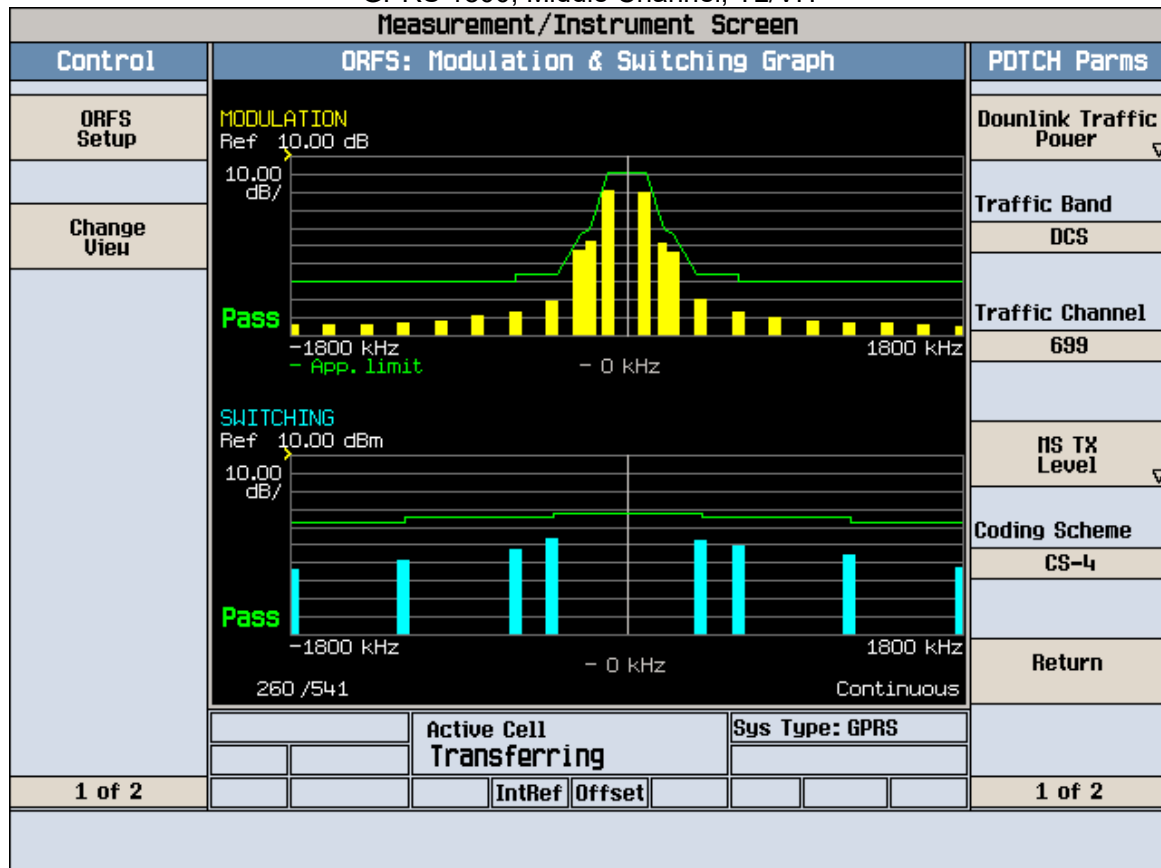
GPRS 1800, Middle Channel, Normal



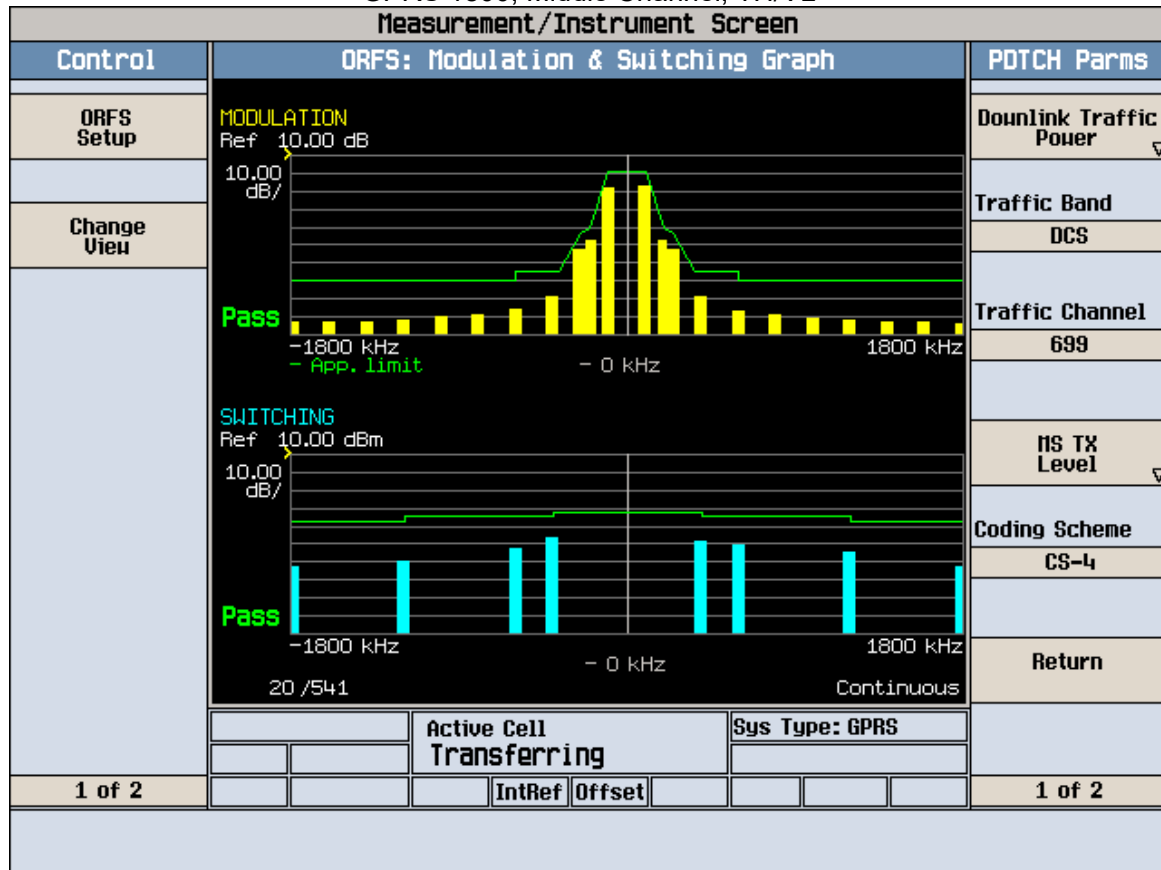
GPRS 1800, Middle Channel, TL/VL



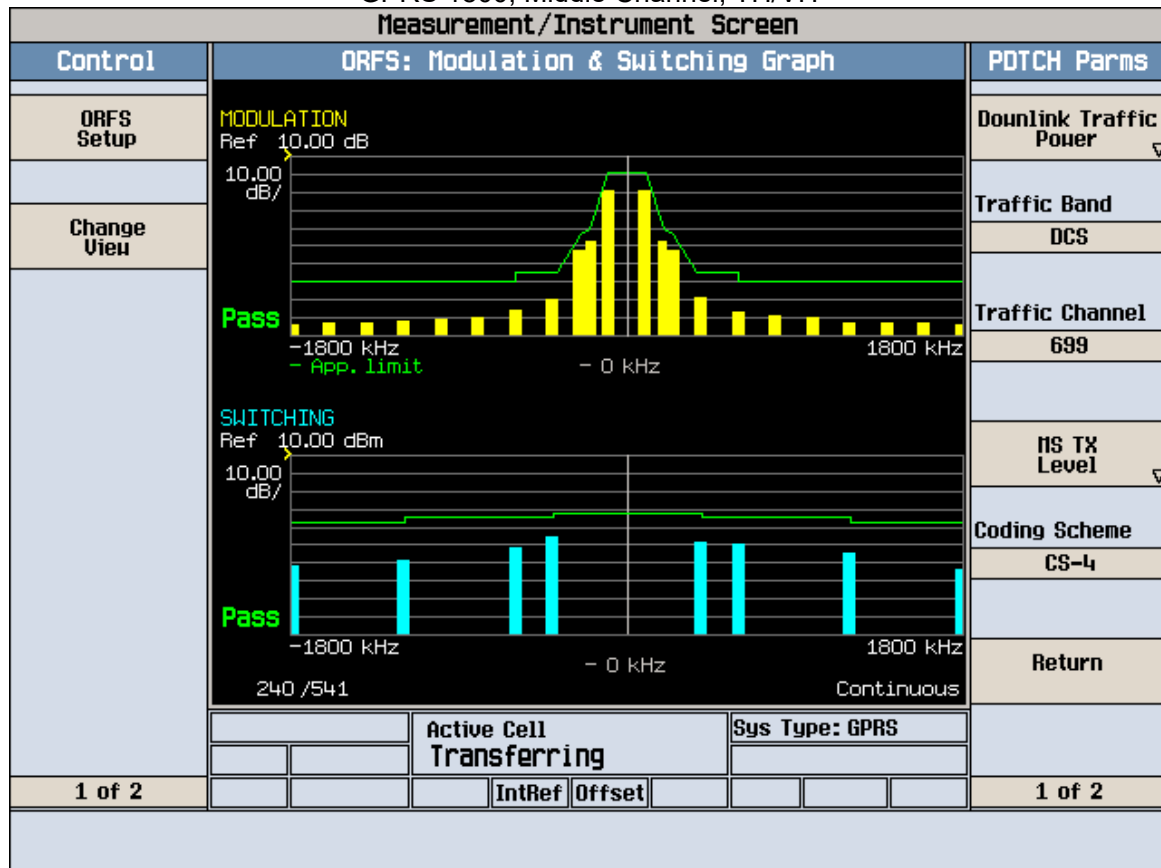
GPRS 1800, Middle Channel, TL/VH



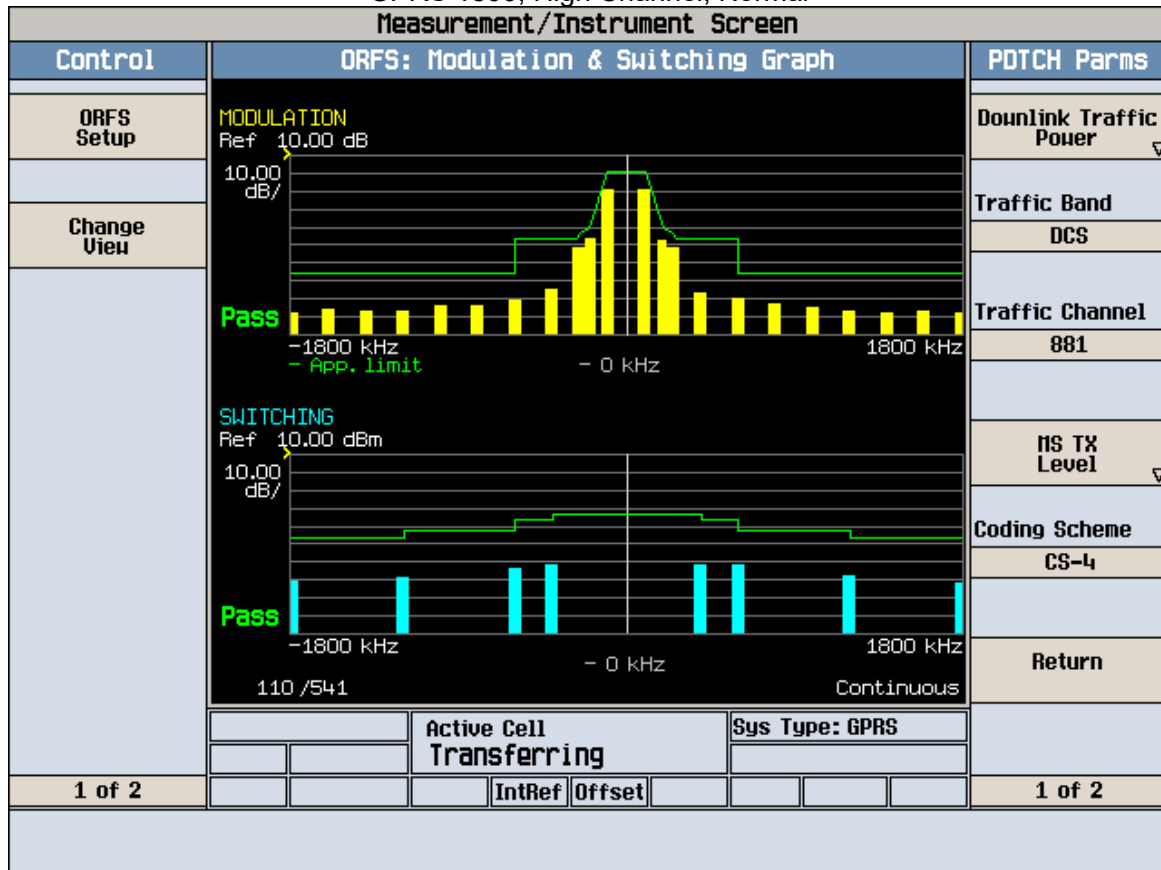
GPRS 1800, Middle Channel, TH/VL



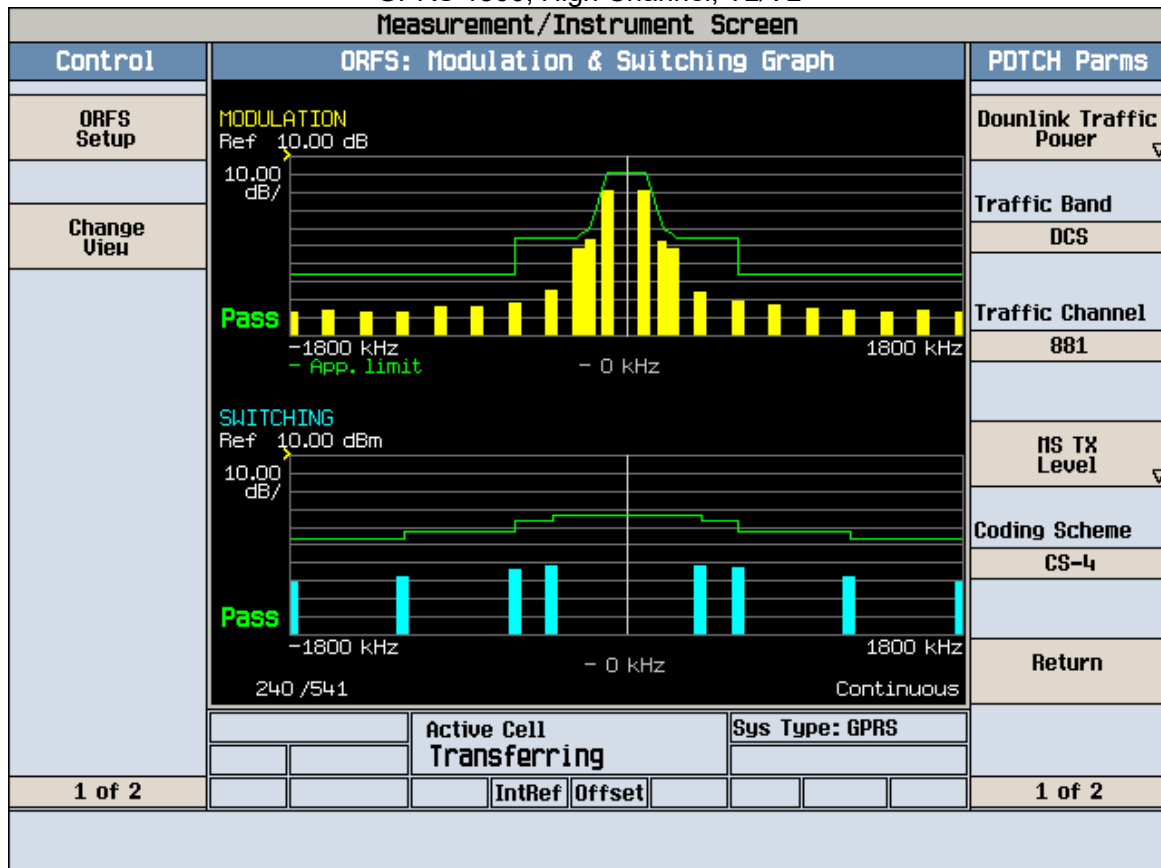
GPRS 1800, Middle Channel, TH/VH



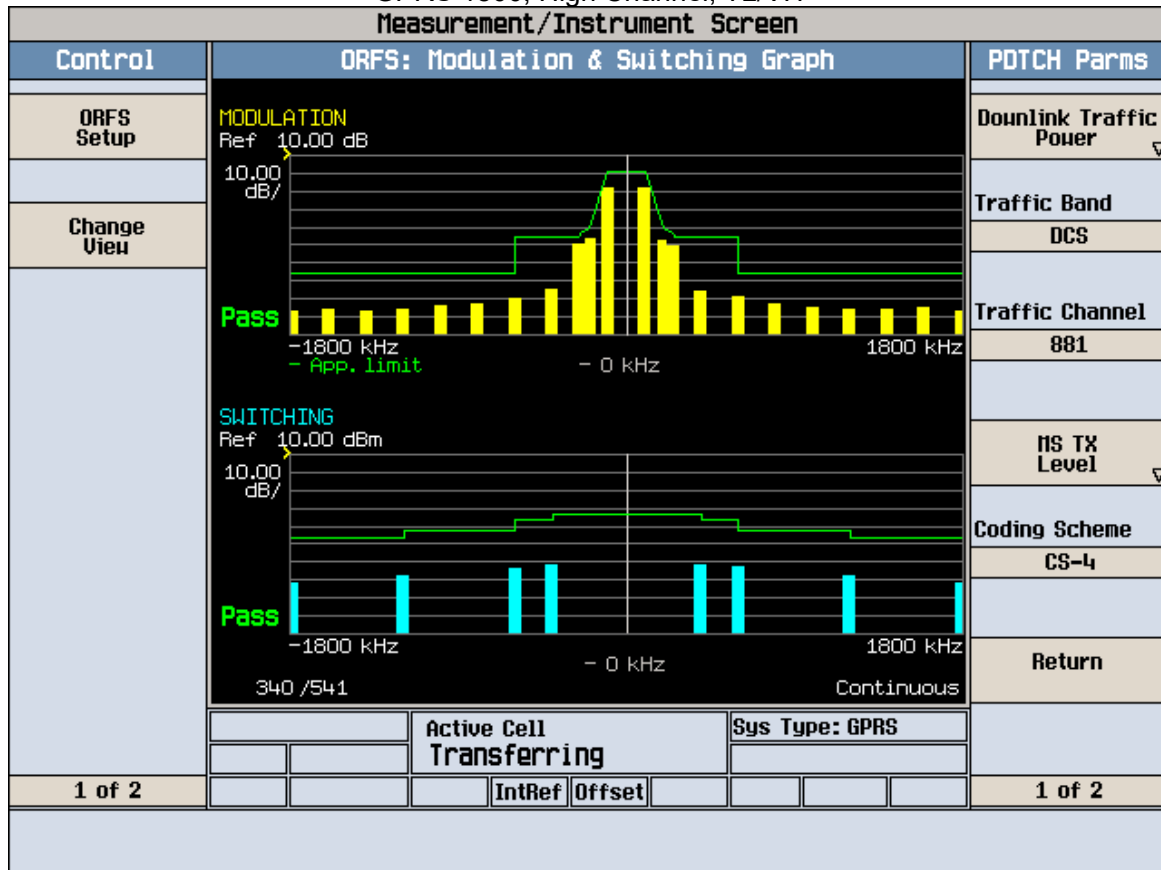
GPRS 1800, High Channel, Normal



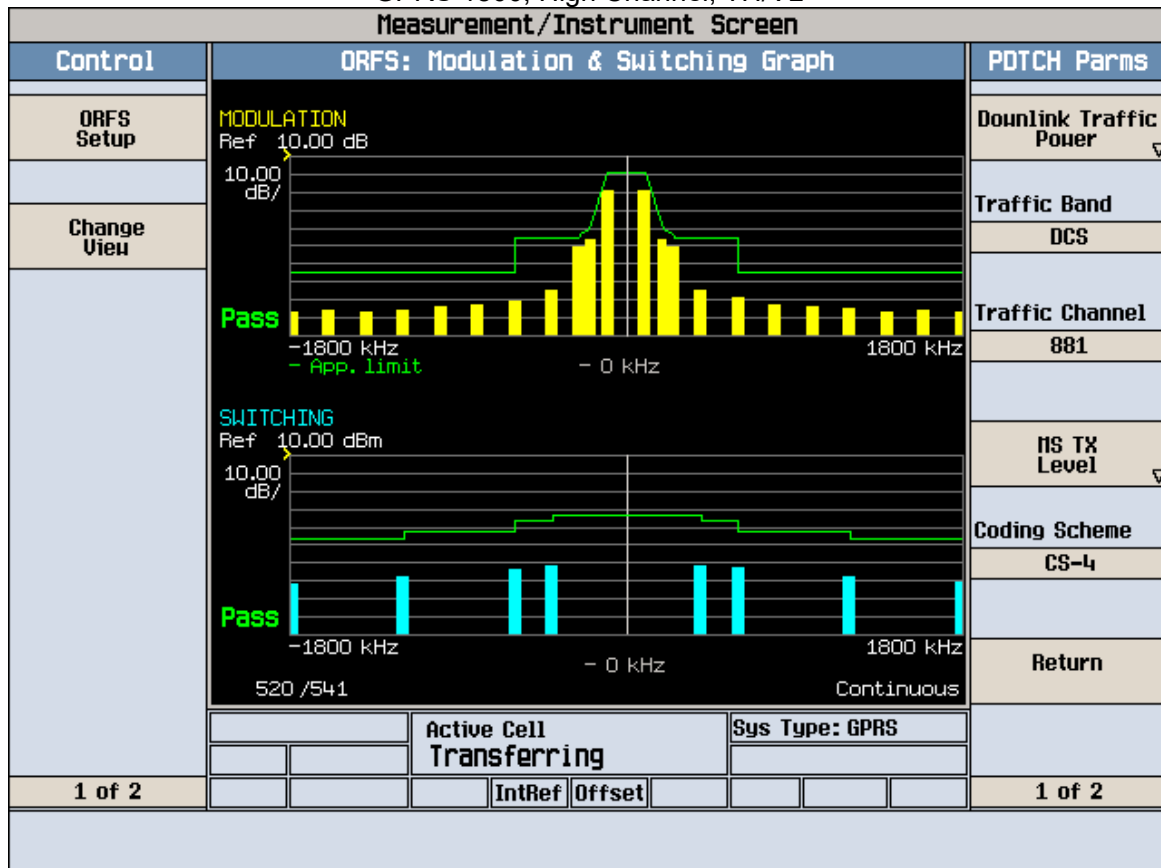
GPRS 1800, High Channel, TL/VL



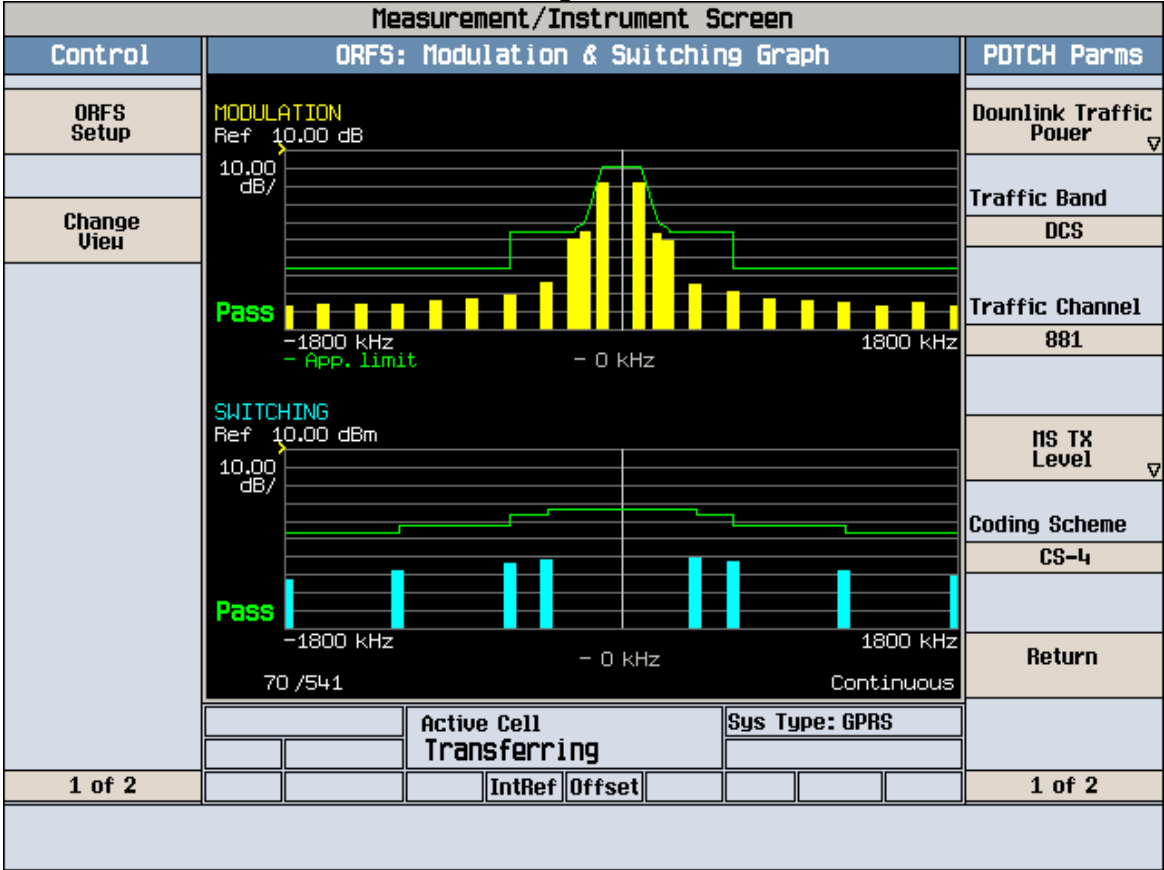
GPRS 1800, High Channel, TL/VH



GPRS 1800, High Channel, TH/VL



GPRS 1800, High Channel, TH/VH
Measurement/Instrument Screen



4.8. Conducted spurious emissions-MS allocated a channel

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.12.

Limits

According to clause 12.1.10 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1,12.1.10.2

Table 4-5

Frequency range	Power level in dBm		
	GSM 400, GSM 700, T-GSM 810 GSM 850, GSM 900	DCS 1 800	PCS 1 900
9 kHz to 1 GHz	-36	-36	-36
1 GHz to 12,75 GHz	-30		-30
1 GHz to 1 710 MHz		-30	
1 710 MHz to 1 785 MHz		-36	
1 785 MHz to 12,75 GHz		-30	

Test procedure

- 1) Measurements are made in the frequency range 100kHz to 12,75GHz. Spurious emissions are measured at the connector of the transceiver, as the power level of any discrete signal, higher than requirement in table 4-5 minus 6dB, delivered into a 50Ω load.
- 2) The measurement bandwidth based on a 5 pole synchronously tuned filter is according to table 4-6.The power indication is the peak power detected by the measuring system.
- 3) The measurement on any frequency shall be performed for at least one TDMA frame period with the exception of the idle frame.

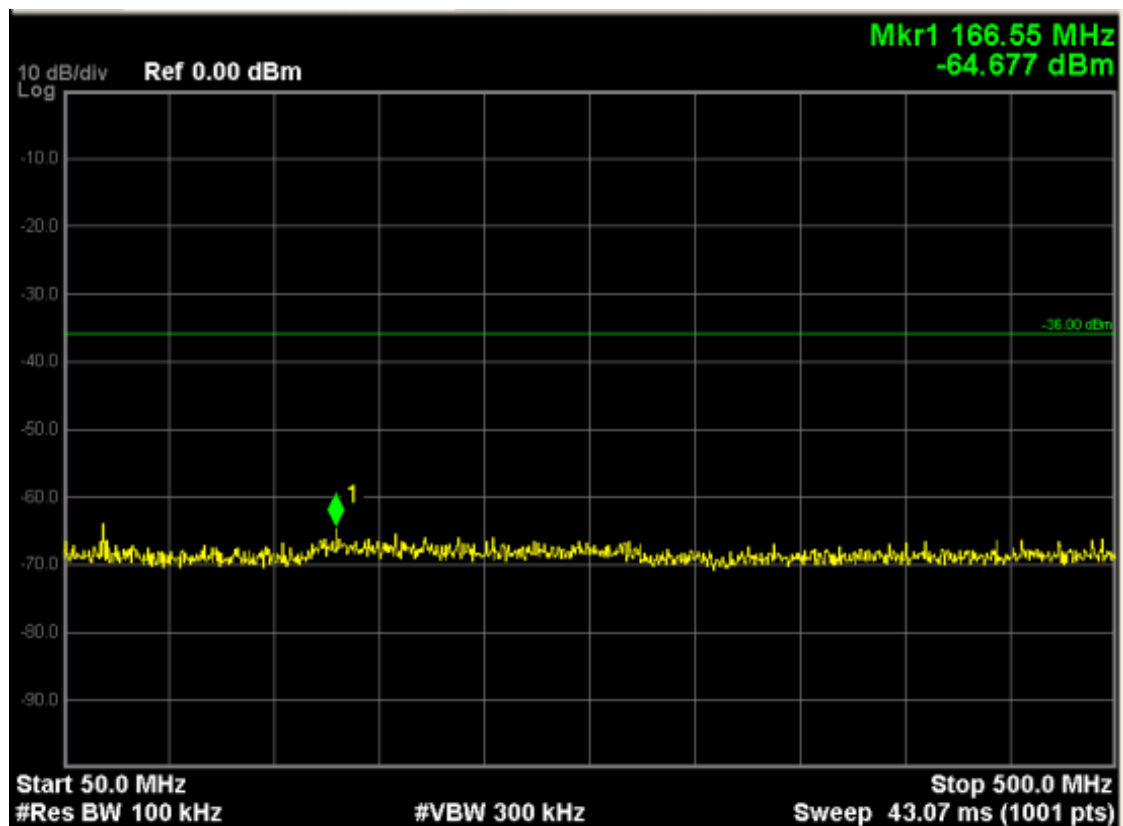
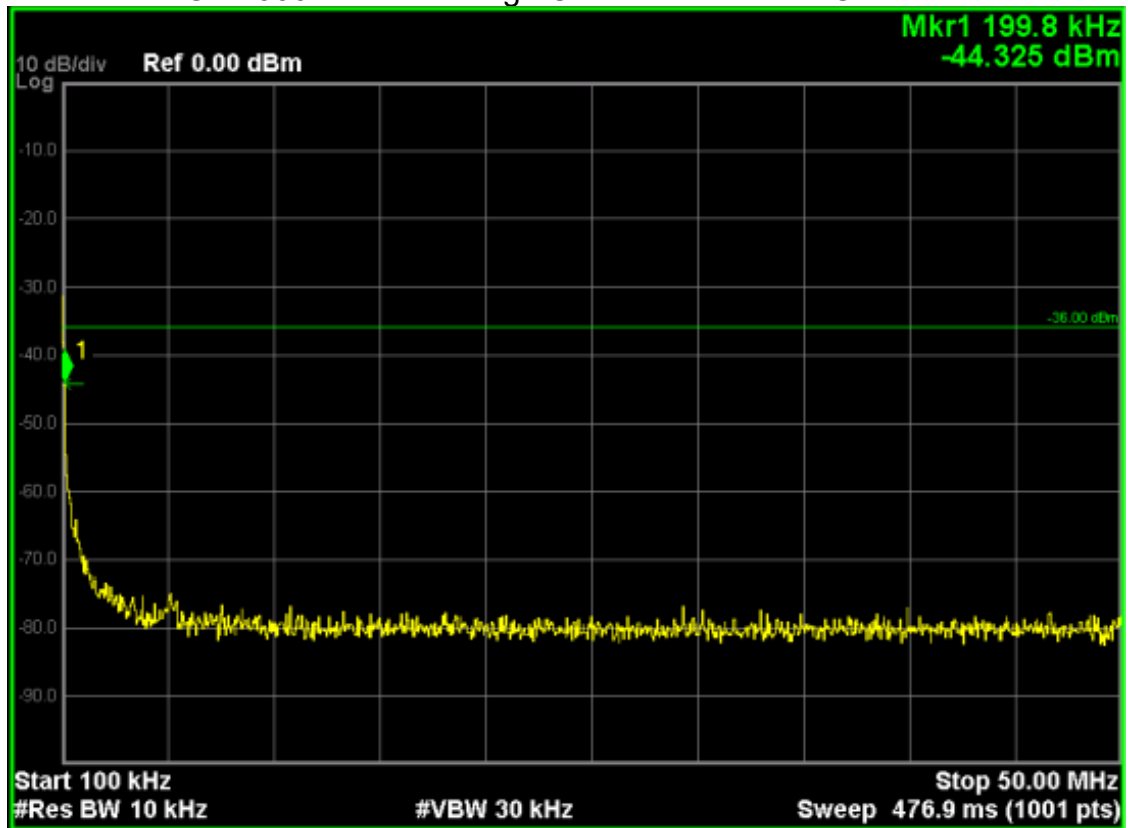
Table 4-6

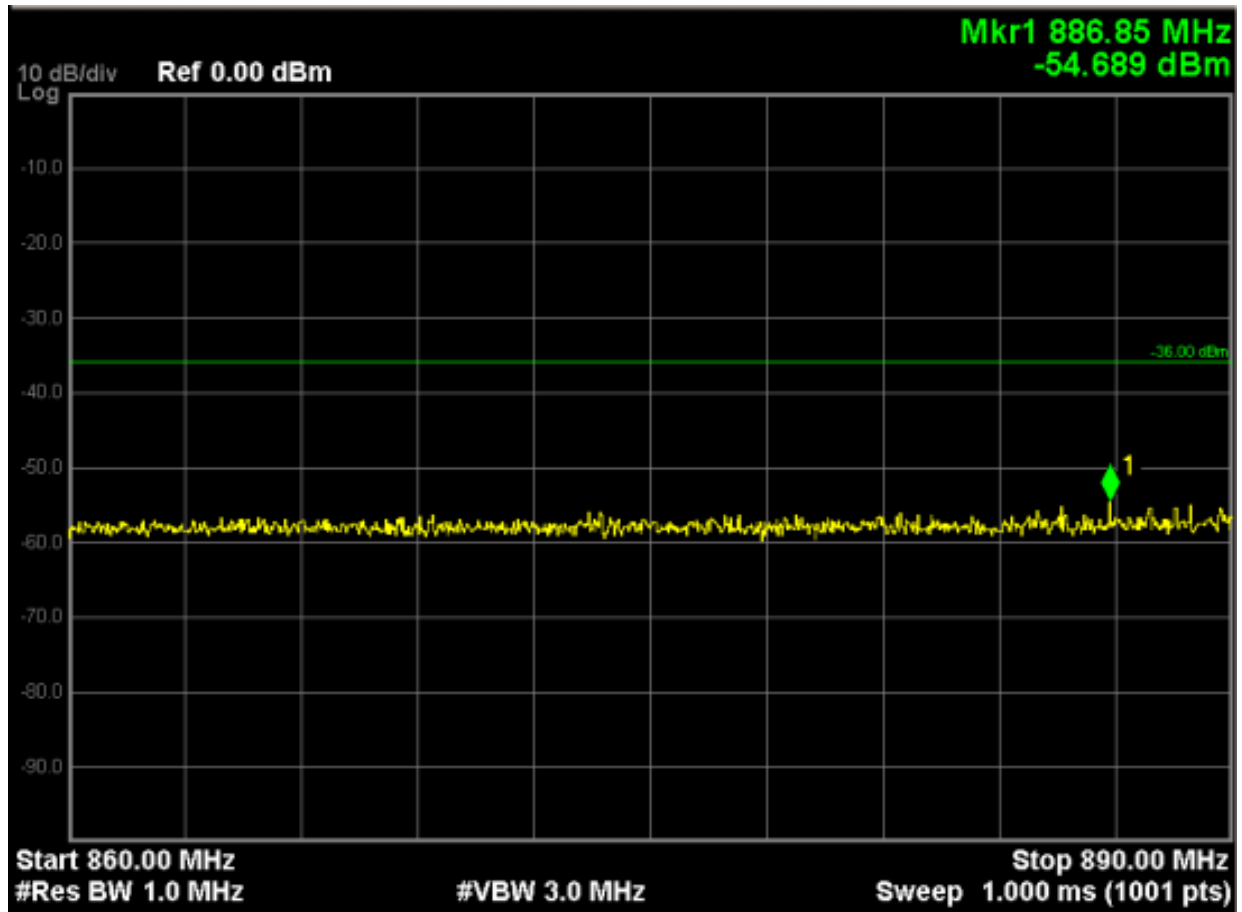
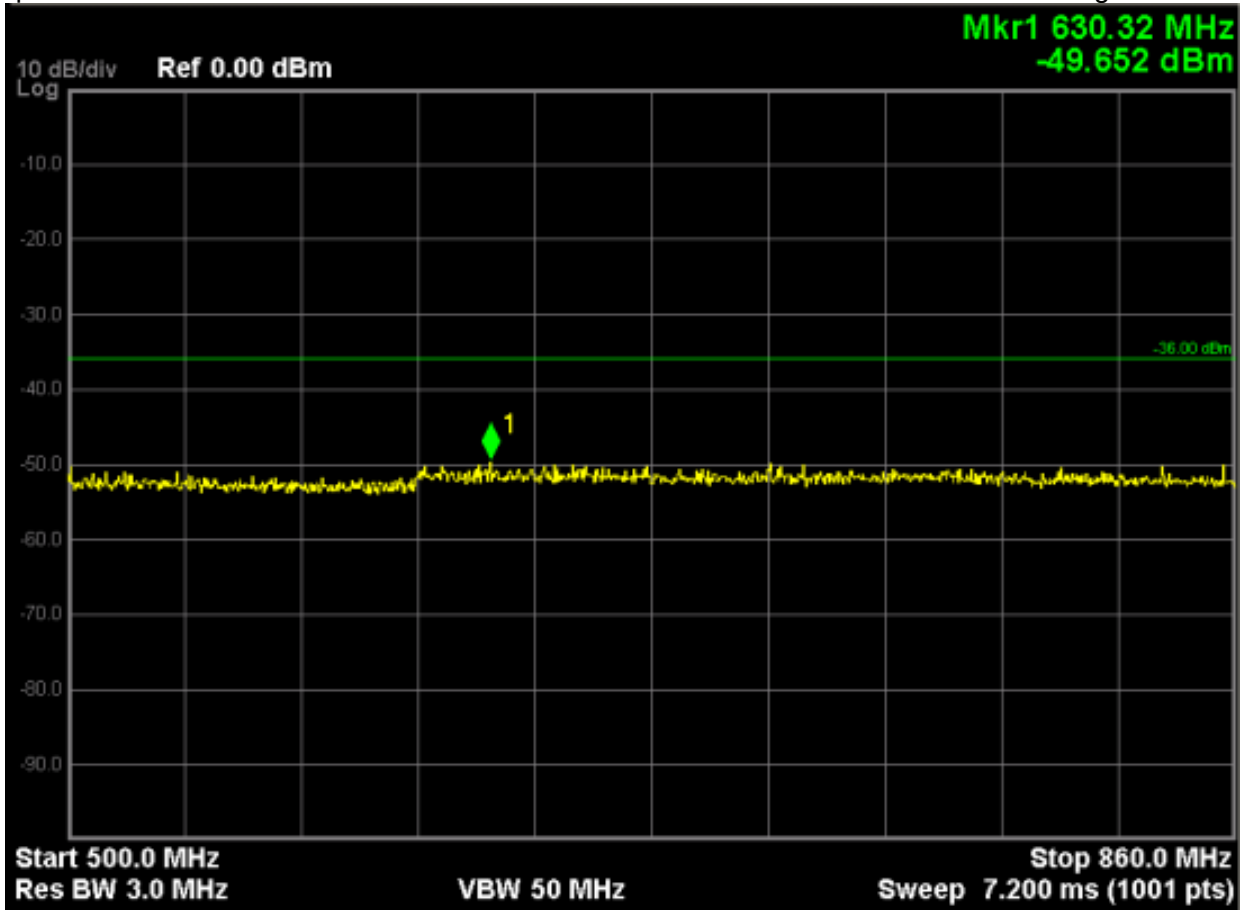
Frequency range	Frequency offset	Filter bandwidth	Approx video bandwidth
100 kHz to 50 MHz	-	10 kHz	30 kHz
50 MHz to 500 MHz excl. relevant TX band: GSM 450: 450,4 MHz to 457,6 MHz; GSM 480: 478,8 MHz to 486 MHz, and the RX bands: For GSM 400 MS: 460,4 MHz to 467,6 MHz; 488,8 MHz to 496 MHz.	-	100 kHz	300 kHz
500 MHz to 12,75 GHz, excl. relevant TX band: GSM 710: 698 MHz to 716 MHz GSM 750: 777 MHz to 793 MHz T-GSM 810: 806 MHz to 821 MHz; GSM 850: 824 MHz to 849 MHz; P-GSM: 890 MHz to 915 MHz; E-GSM: 880 MHz to 915 MHz; DCS: 1 710 MHz to 1 785 MHz, PCS 1 900: 1 850 MHz to 1 910 MHz; and the RX bands: For GSM 400 MS, GSM 900 MS and DCS 1 800 MS: 925 MHz to 960 MHz; 1 805 MHz to 1 880 MHz. For GSM 710, GSM 750, T-GSM 810, GSM 850 MS and PCS 1 900 MS: 728 MHz to 746 MHz; 747 MHz to 763 MHz; 851 MHz to 866 MHz 869 MHz to 894 MHz; 1 930 MHz to 1 990 MHz	0 to 10 MHz ≥ 10 MHz ≥ 20 MHz ≥ 30 MHz (offset from edge of relevant TX band)	100 kHz 300 kHz 1 MHz 3 MHz 3 MHz	300 kHz 1 MHz 3 MHz 3 MHz
relevant TX band: GSM 450: 450,4 MHz to 457,6 MHz GSM 480: 478,8 MHz to 486 MHz GSM 710: 698 MHz to 716 MHz GSM 750: 777 MHz to 793 MHz T-GSM 810: 806 MHz to 821 MHz; GSM 850: 824 MHz to 849 MHz P-GSM: 890 MHz to 915 MHz E-GSM: 880 MHz to 915 MHz DCS: 1 710 MHz to 1 785 MHz PCS 1 900: 1 850 MHz to 1 910 MHz	1,8 to 6,0 MHz > 6,0 MHz (offset from carrier)	30 kHz 100 kHz	100 kHz 300 kHz
NOTE 1: The excluded RX bands are tested in subclause 13.4. NOTE 2: The filter and video bandwidths, and frequency offsets are only correct for measurements on an MS transmitting on a channel in the Mid ARFCN range. NOTE 3: Due to practical implementation, the video bandwidth is restricted to a maximum of 3 MHz.			

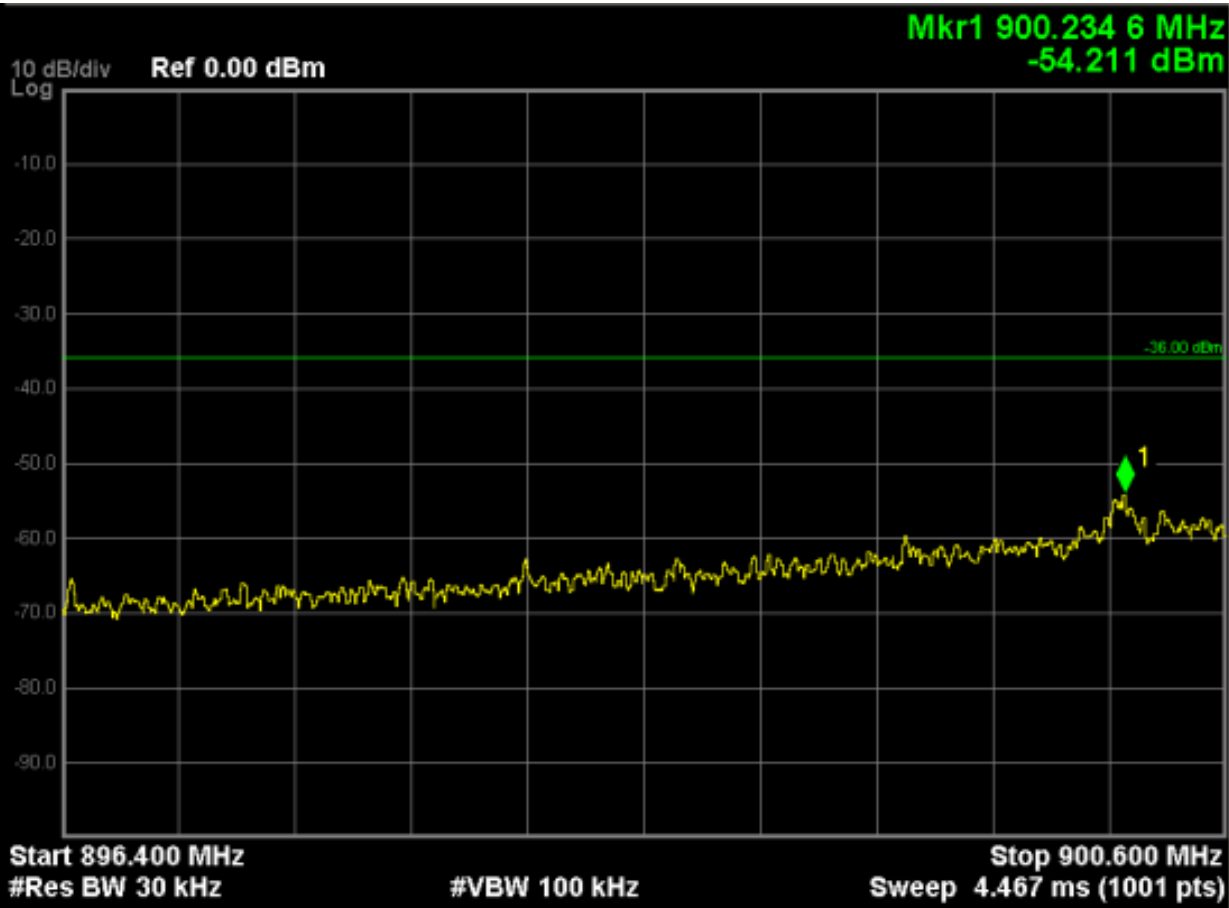
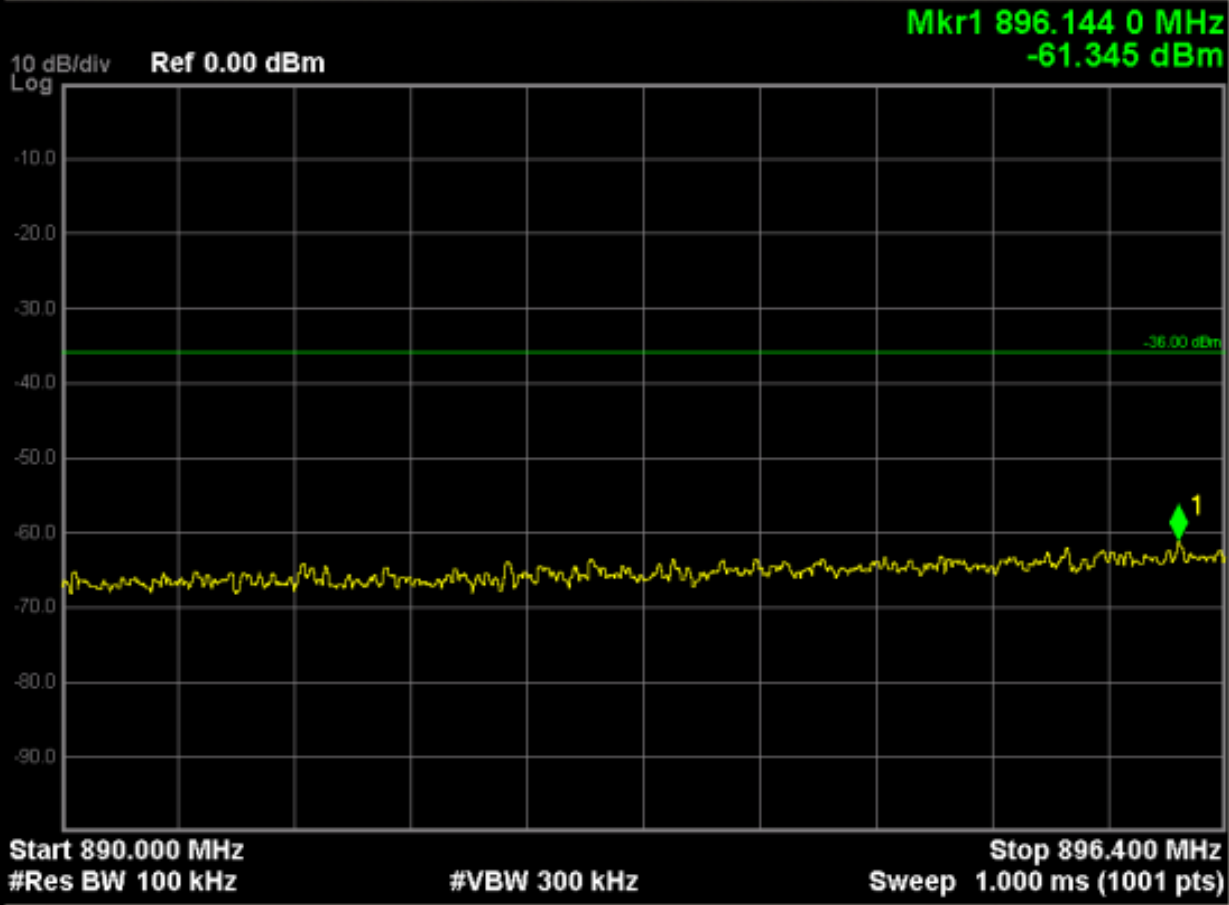
PASS

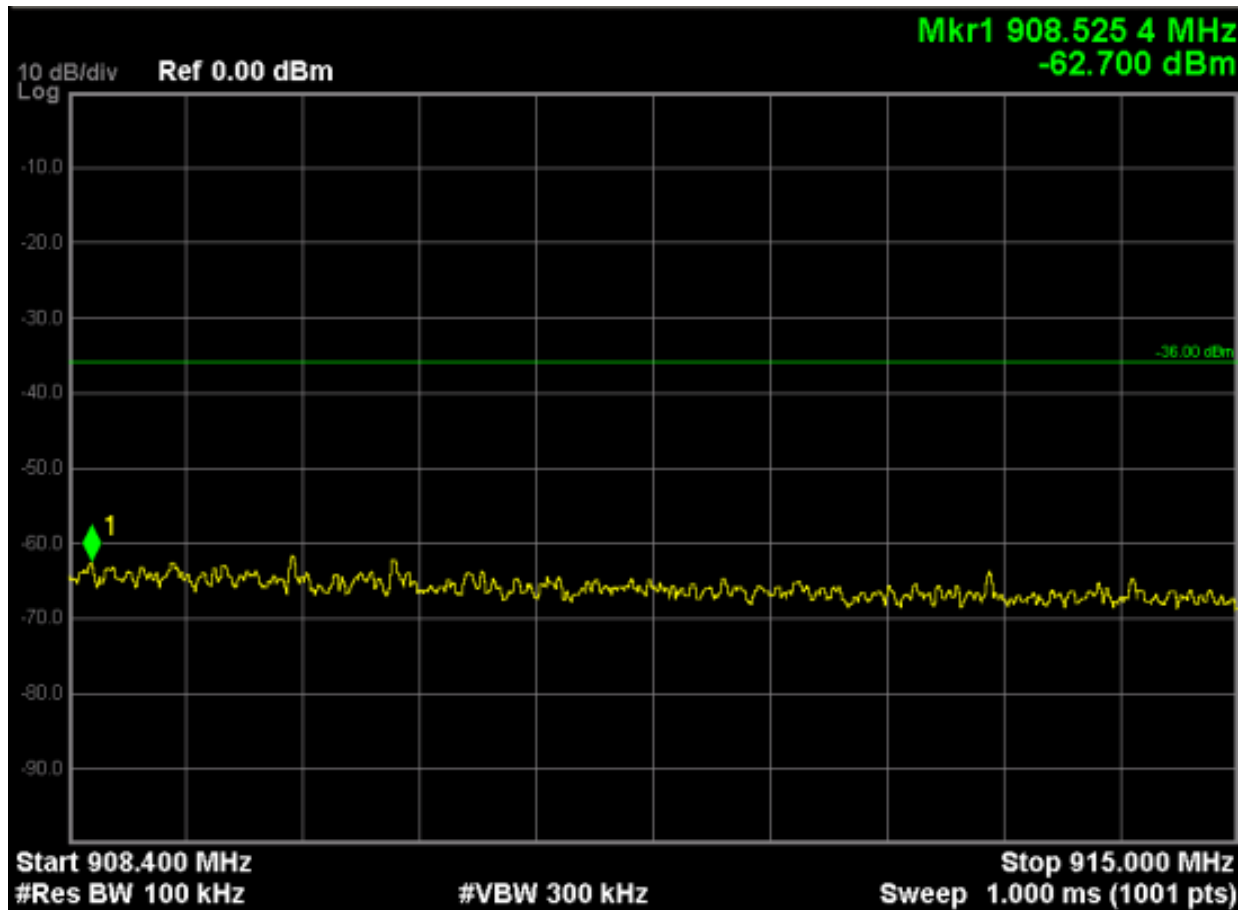
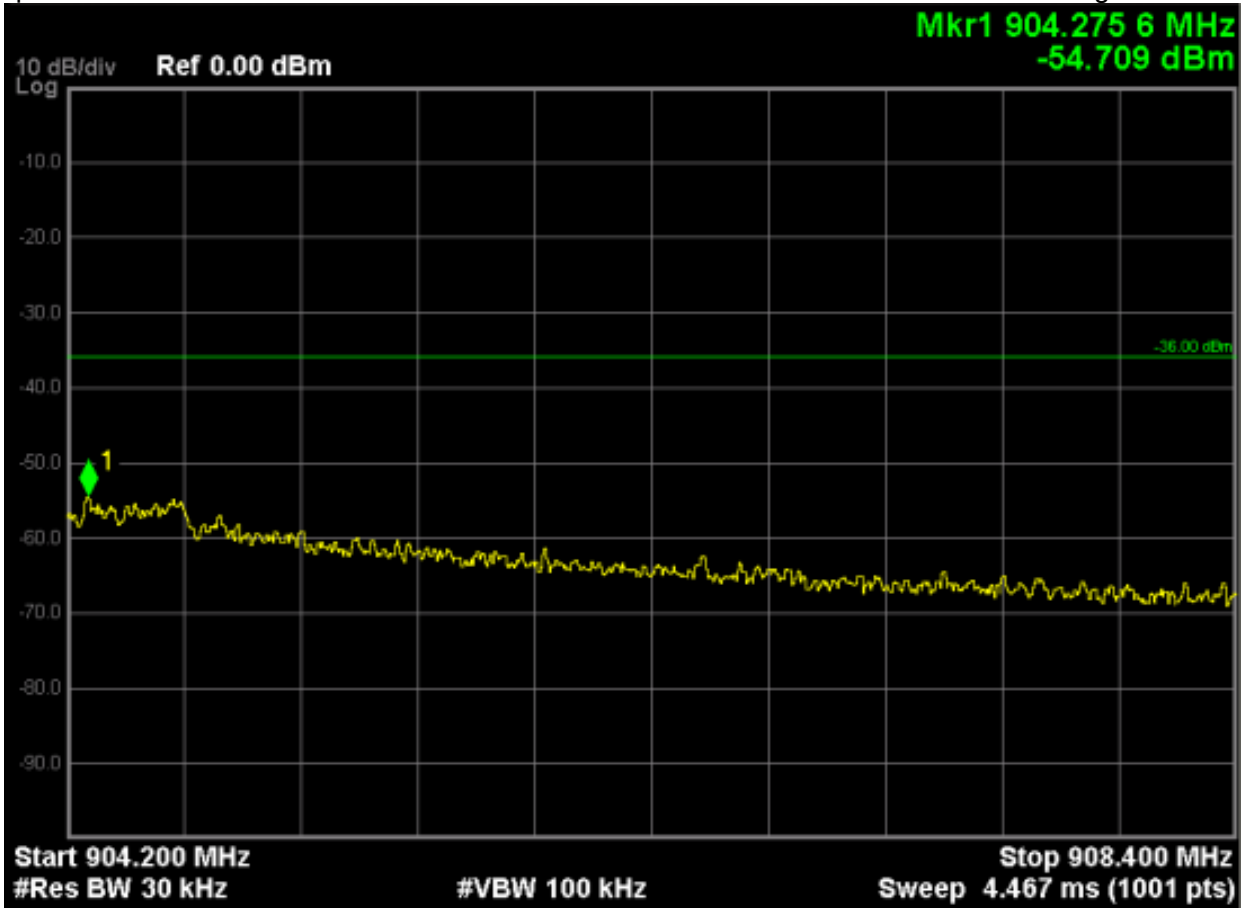
Please refer to following worst case data plots.

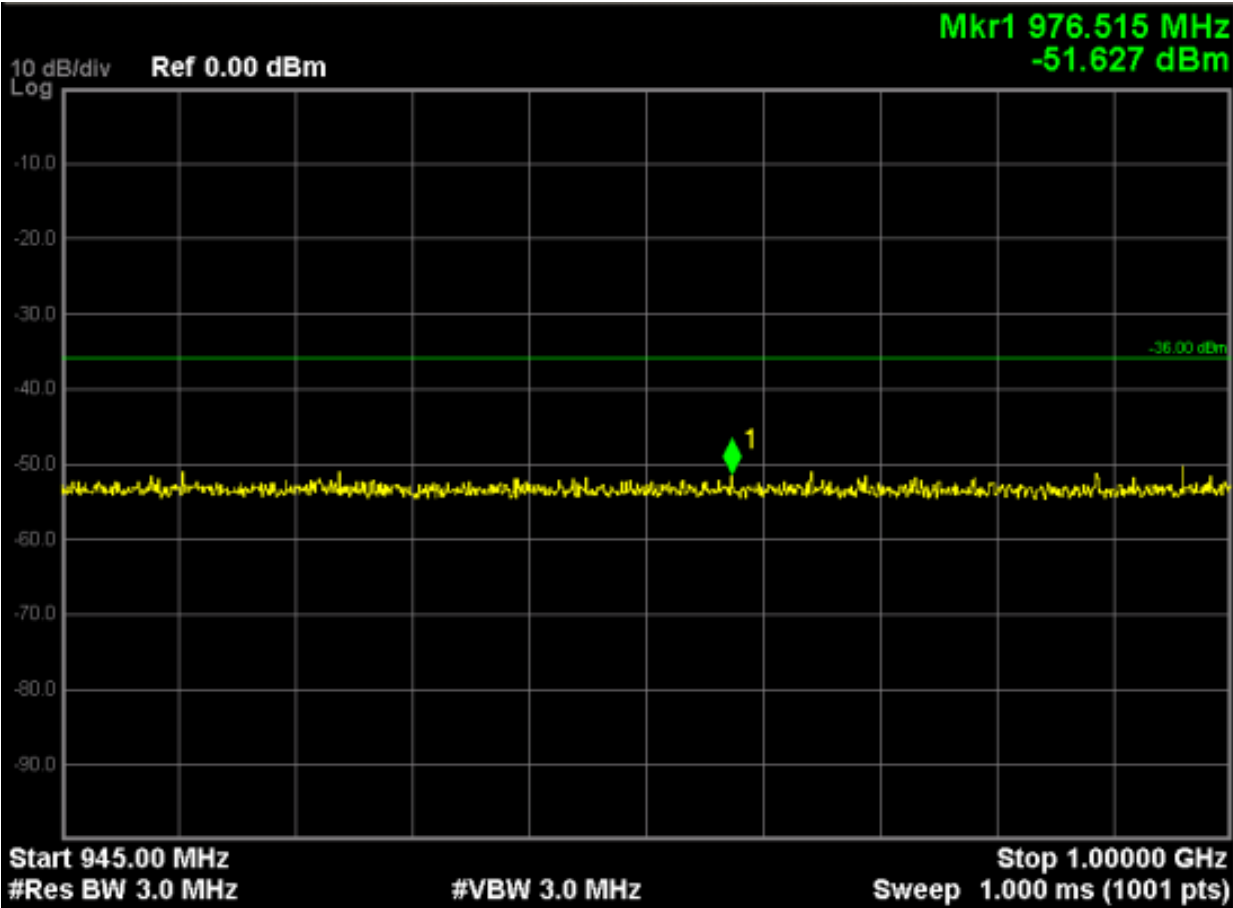
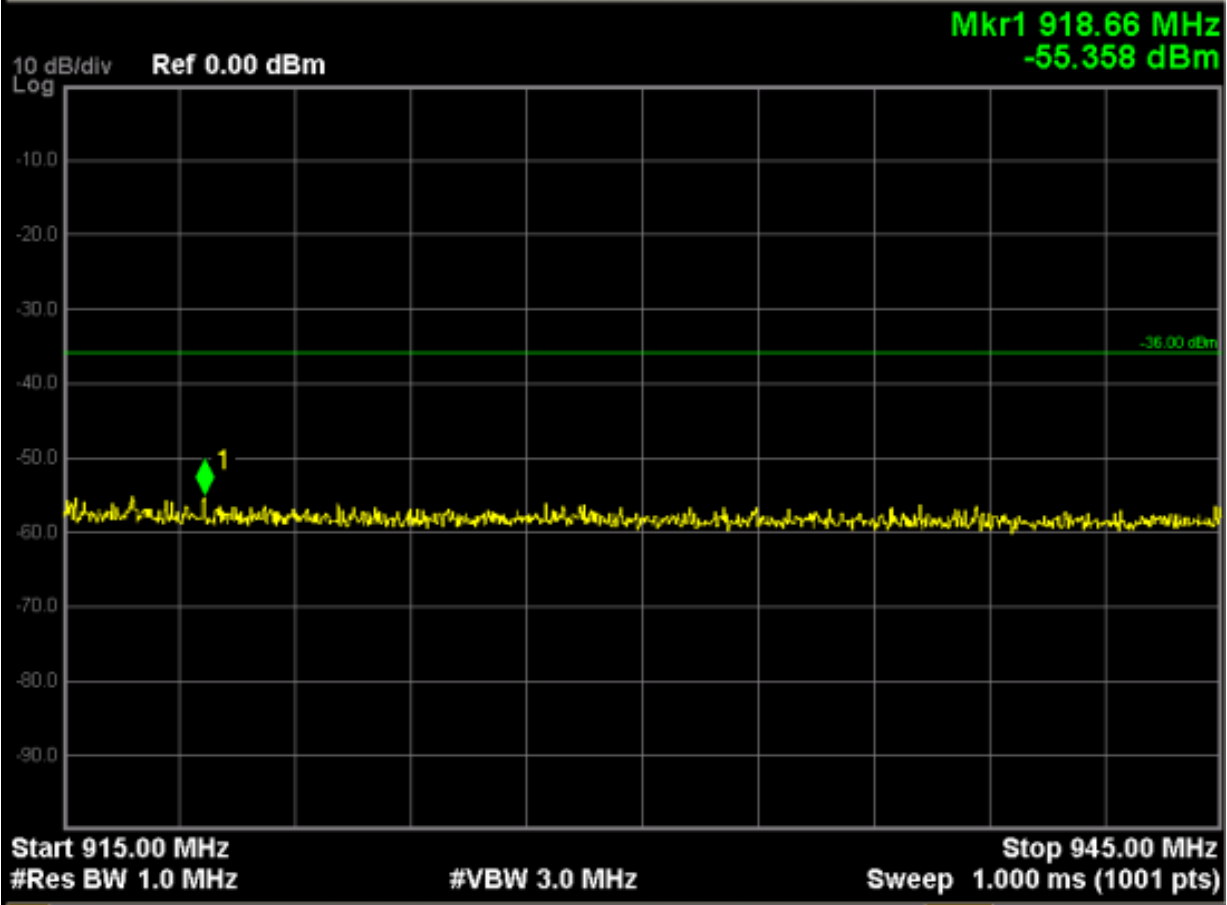
GSM900 Normal Voltage Condition at Middle Channel

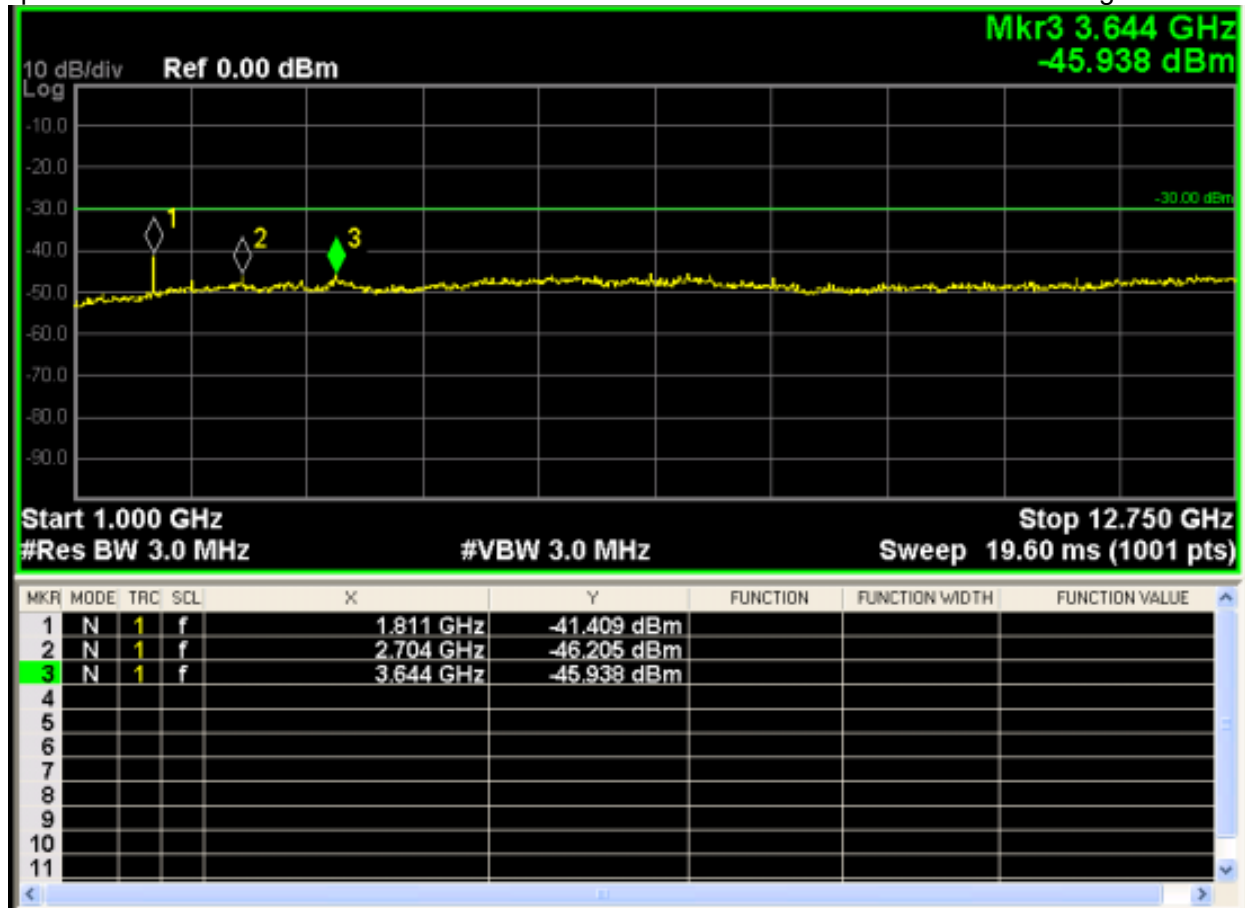




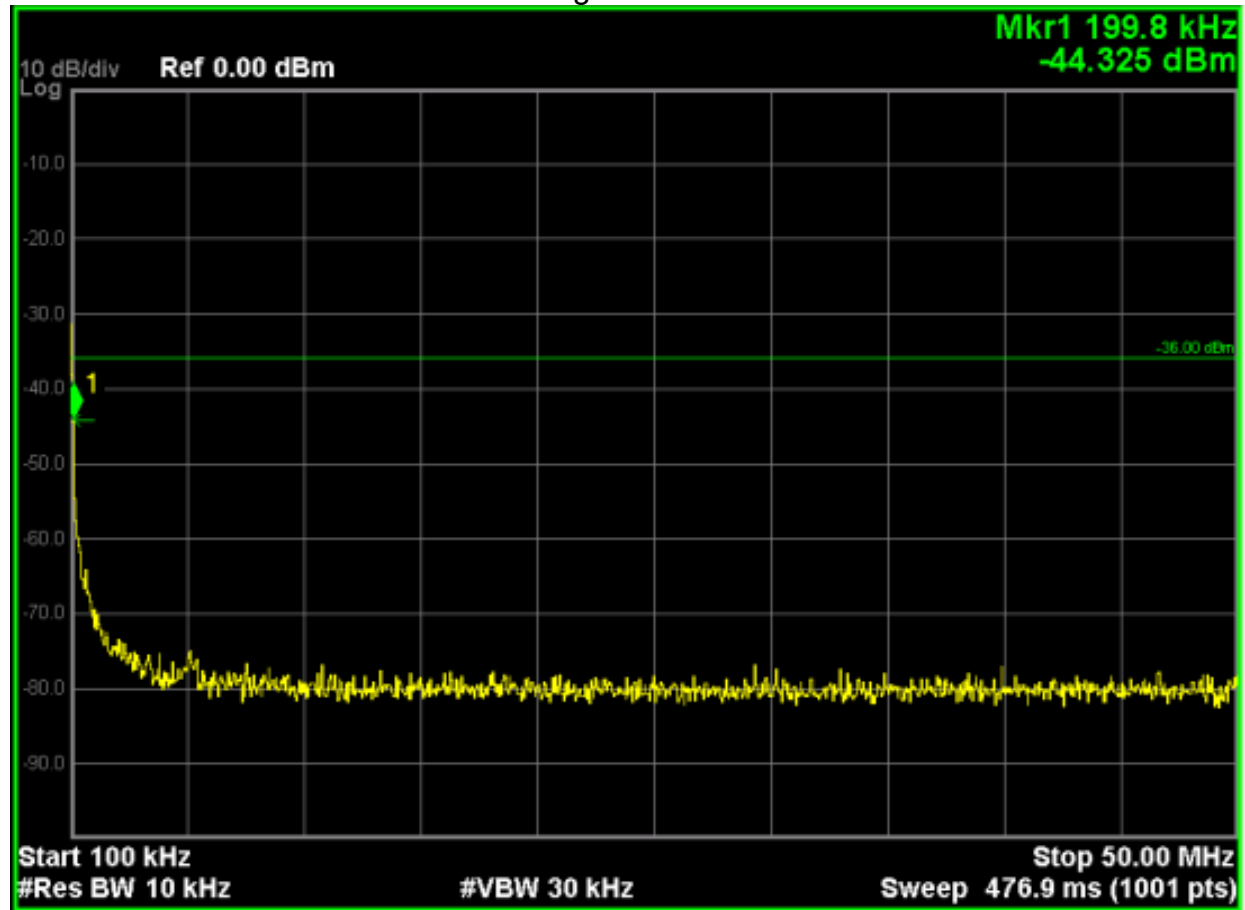


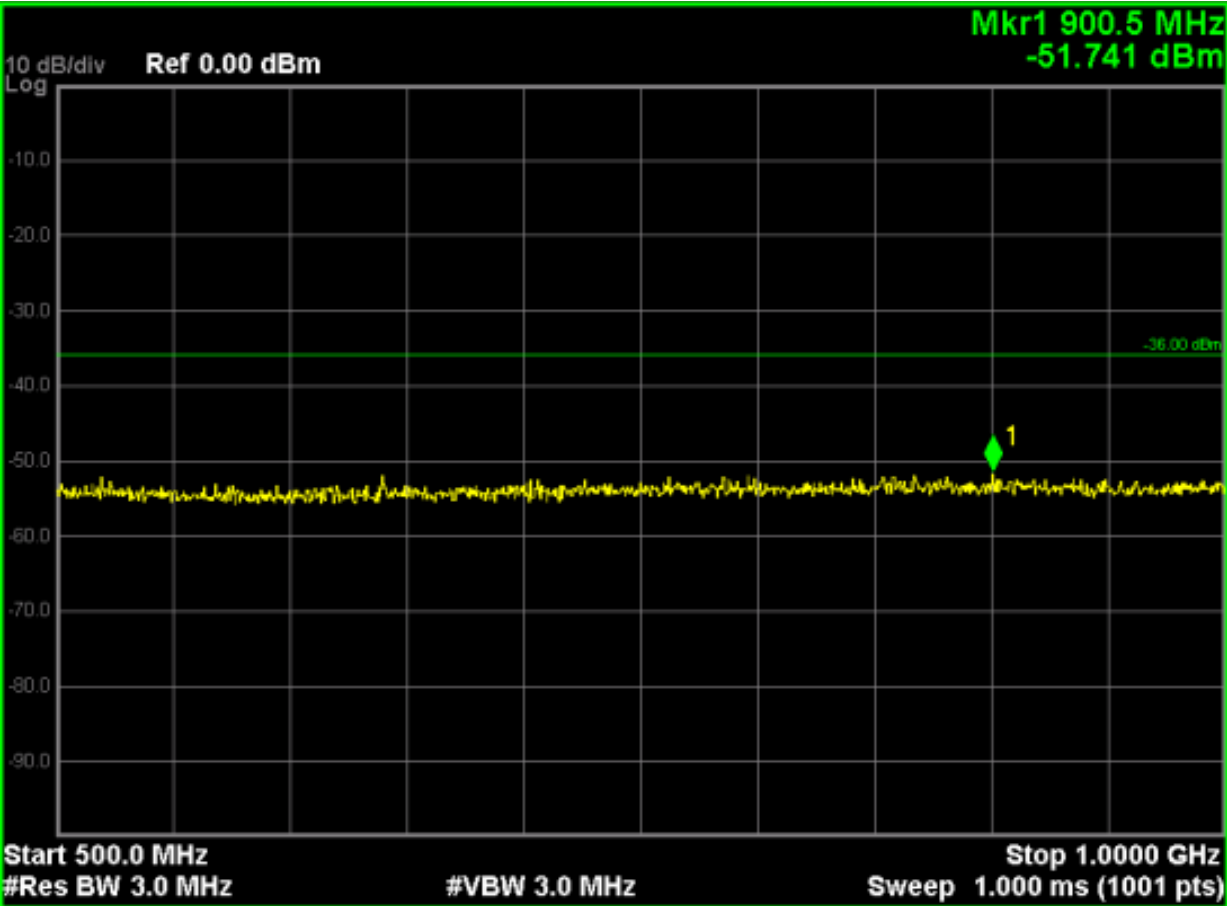
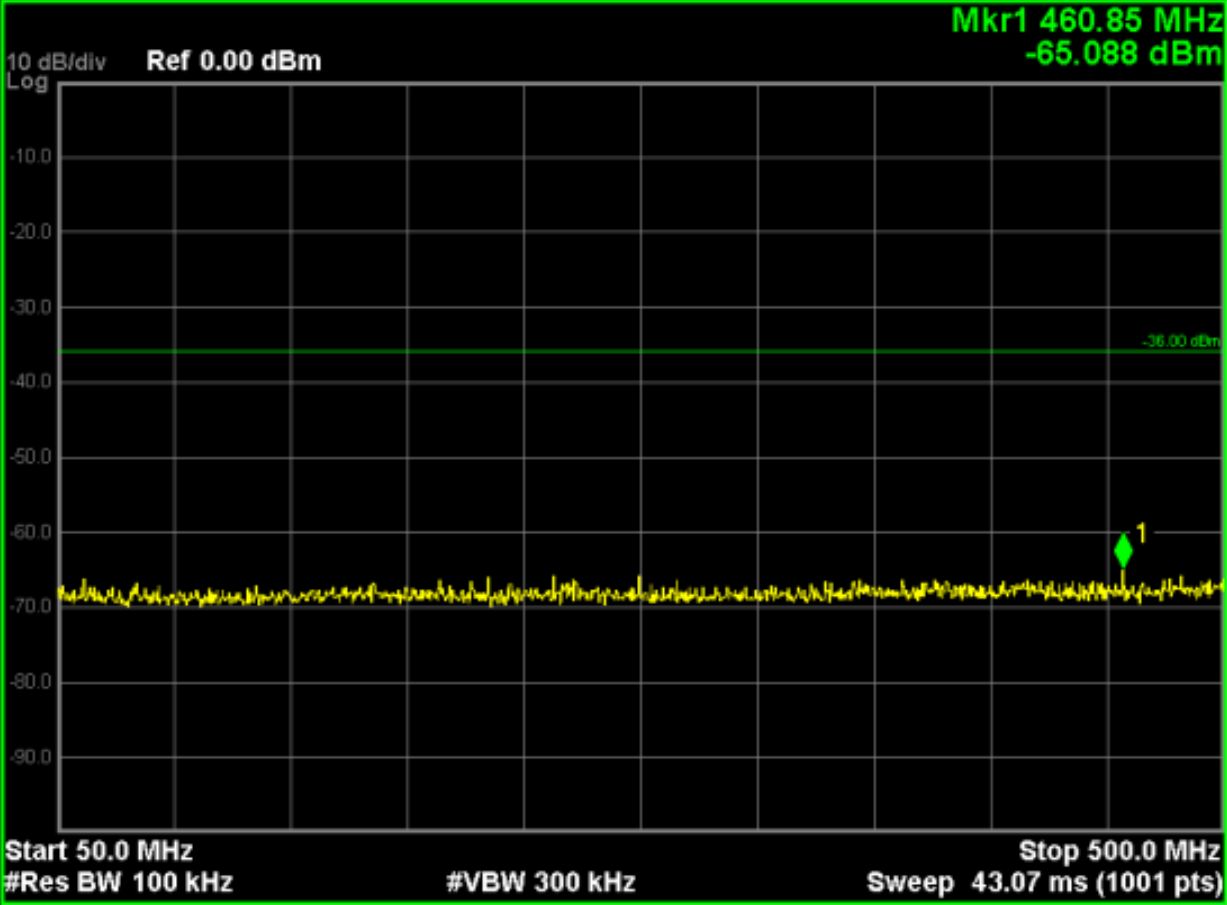


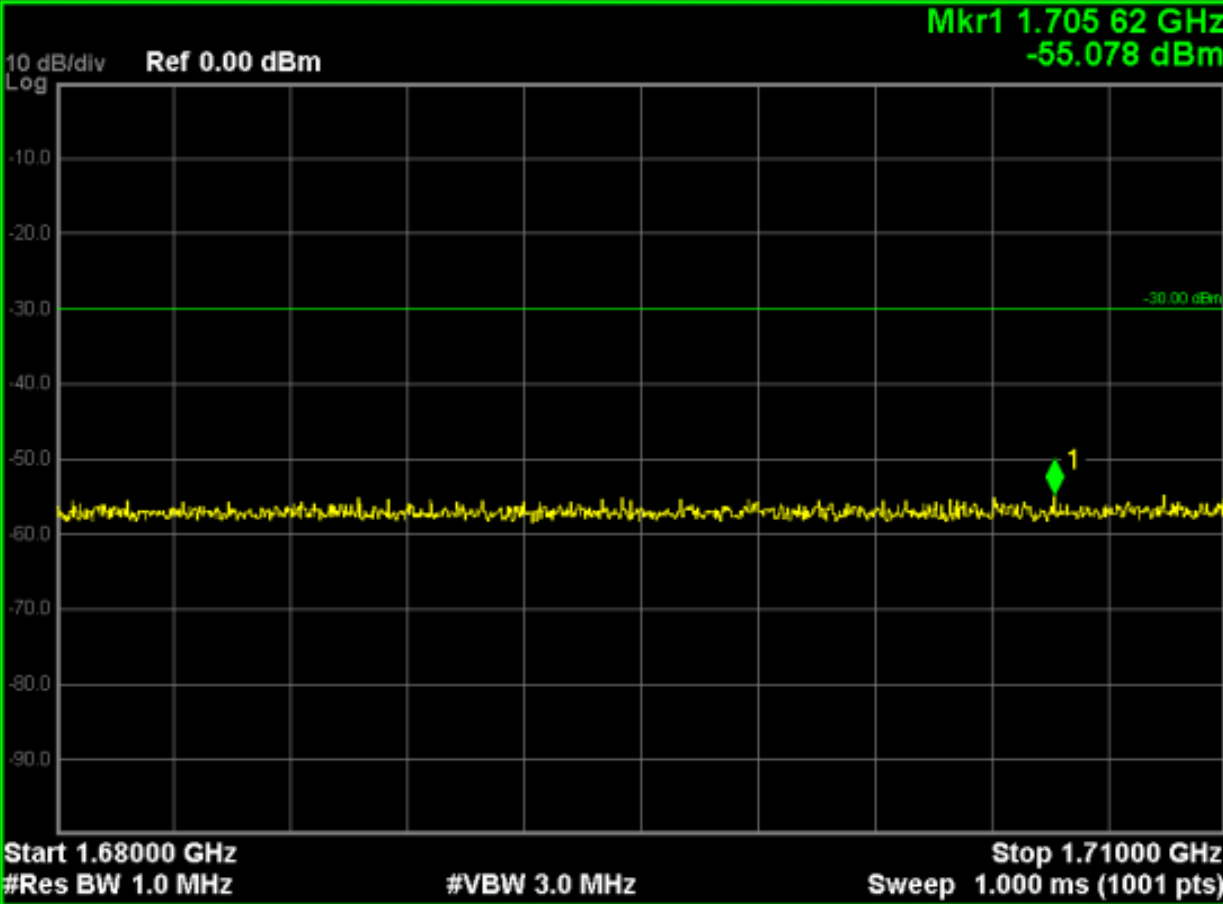
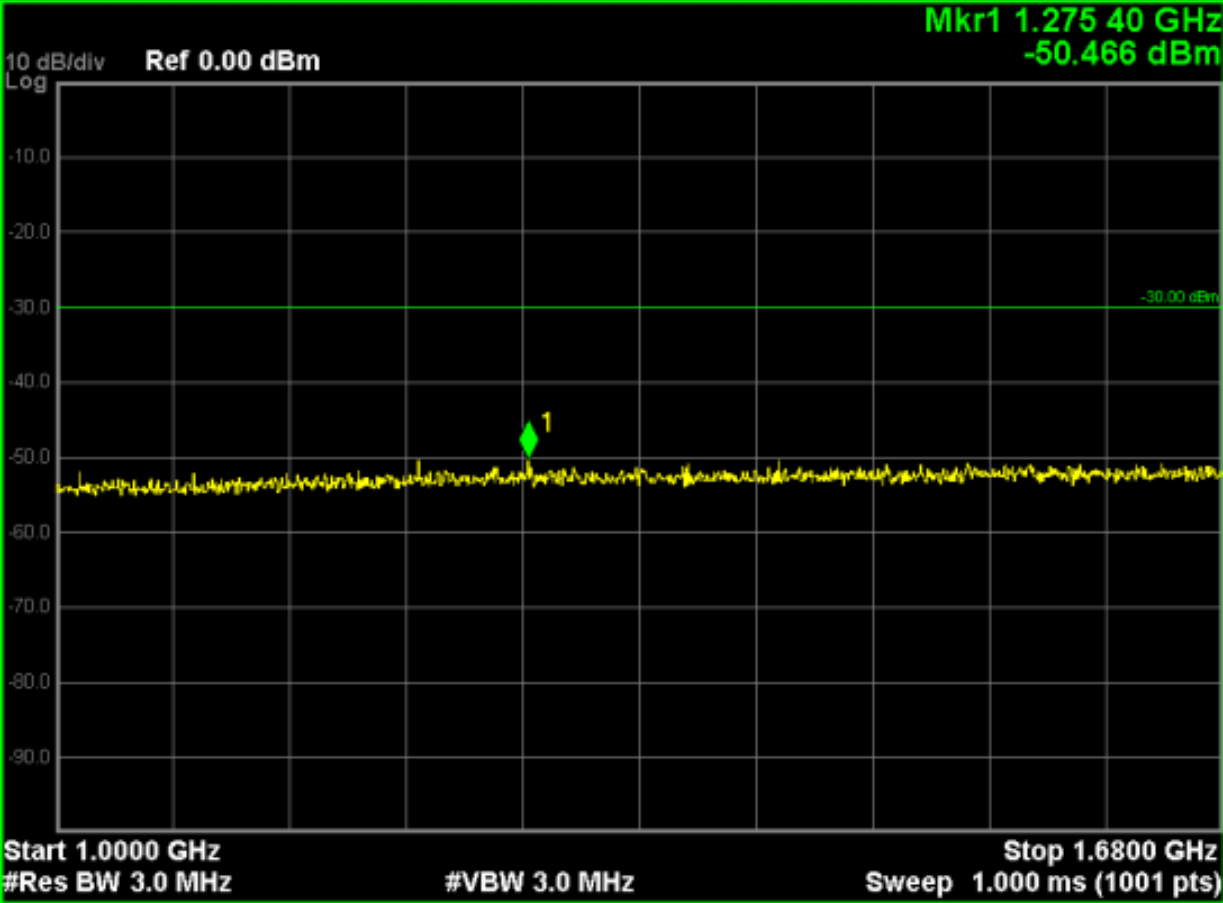


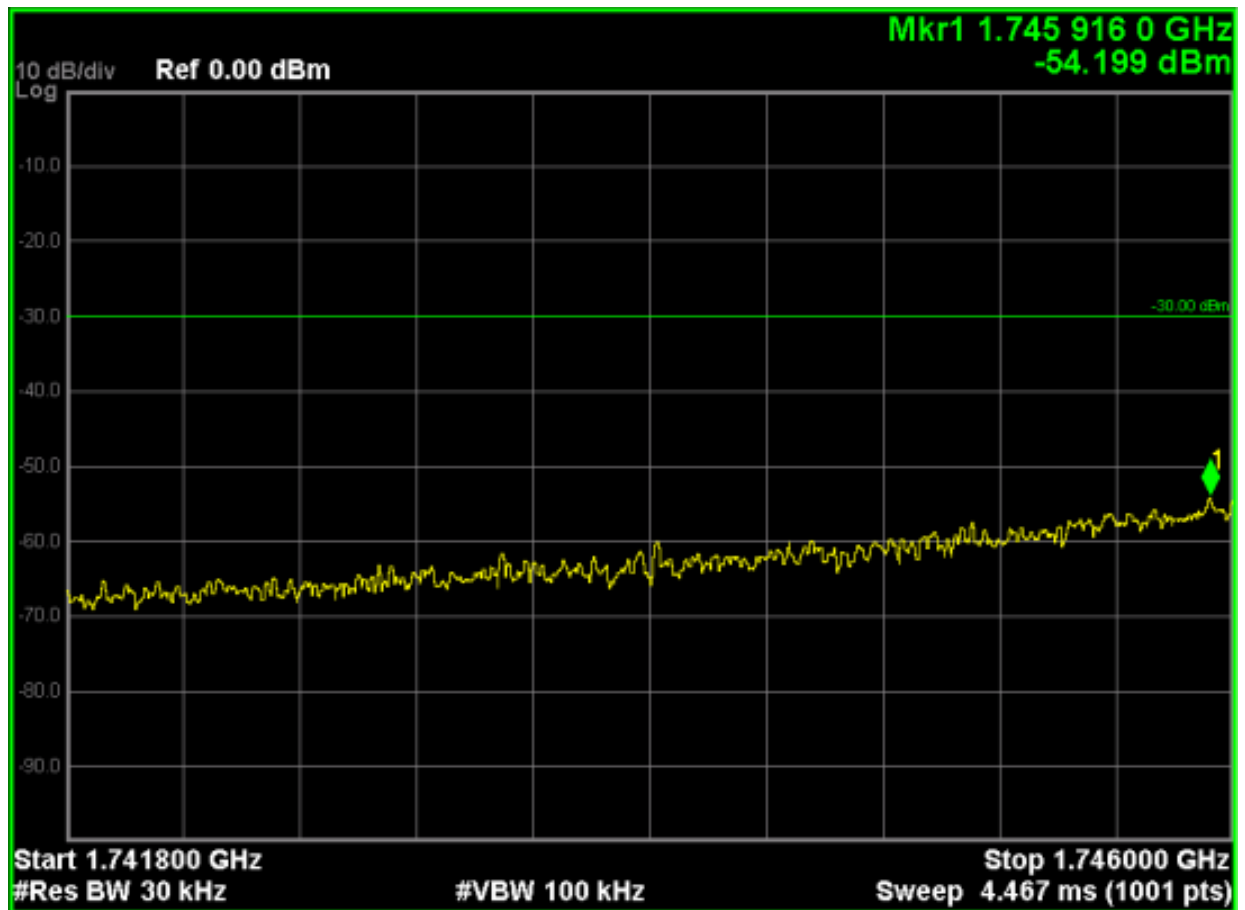
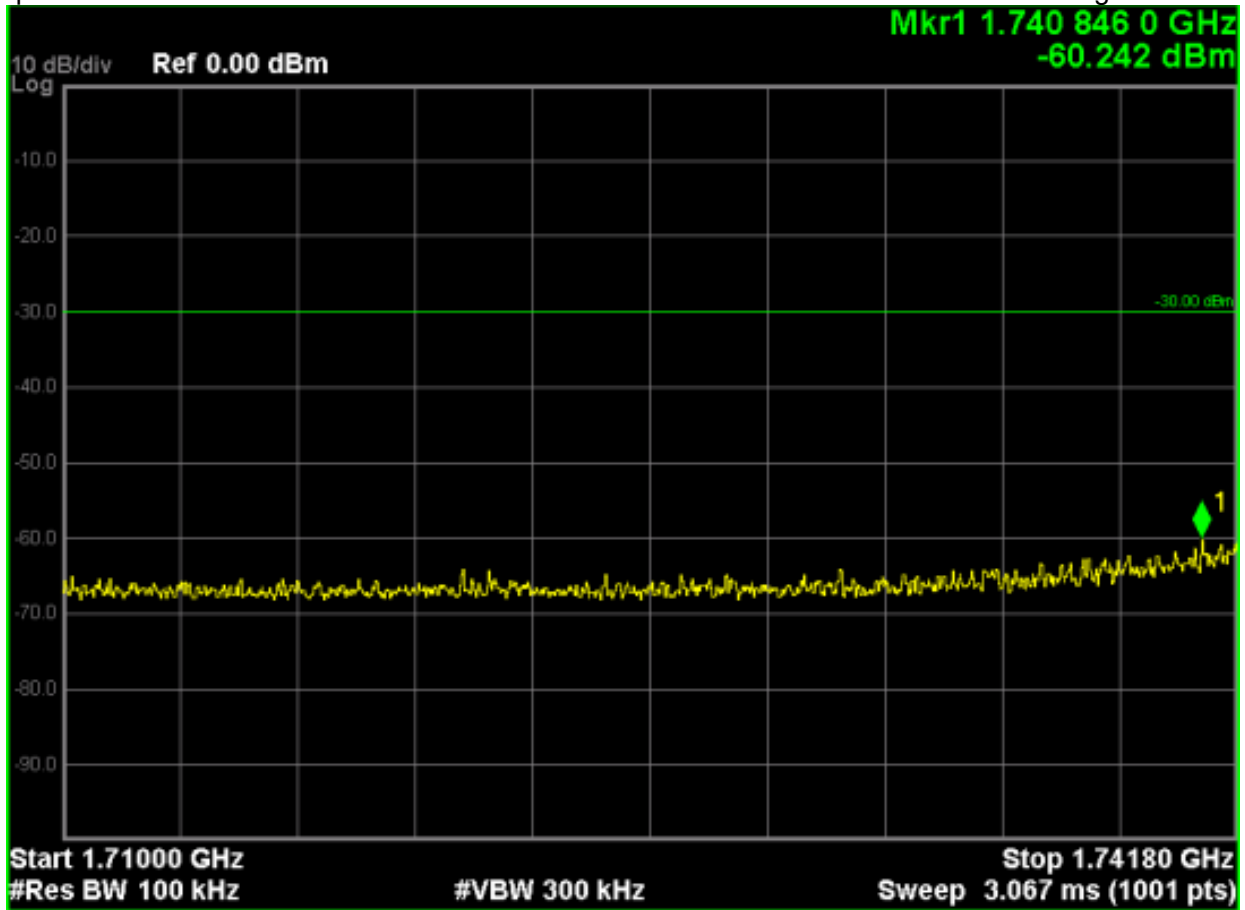


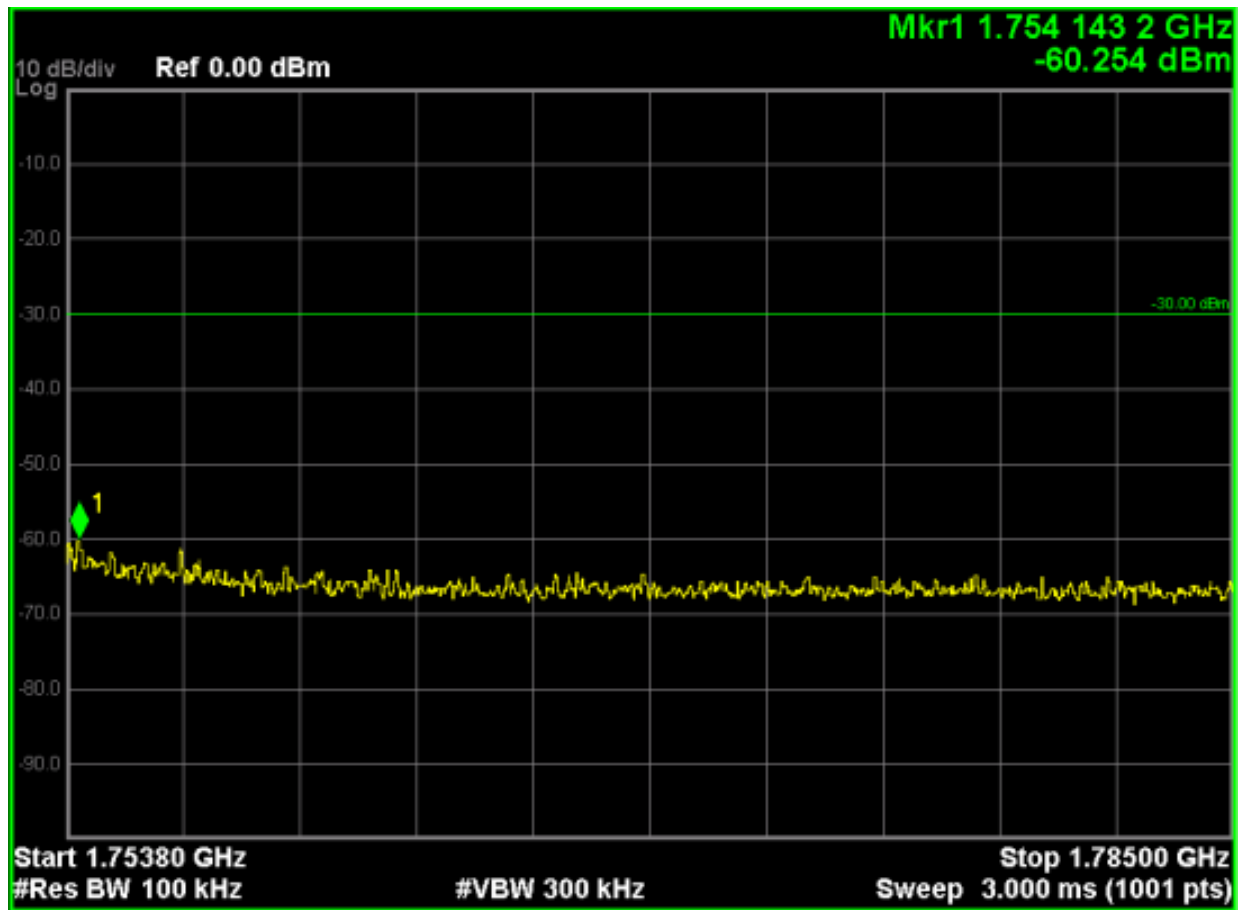
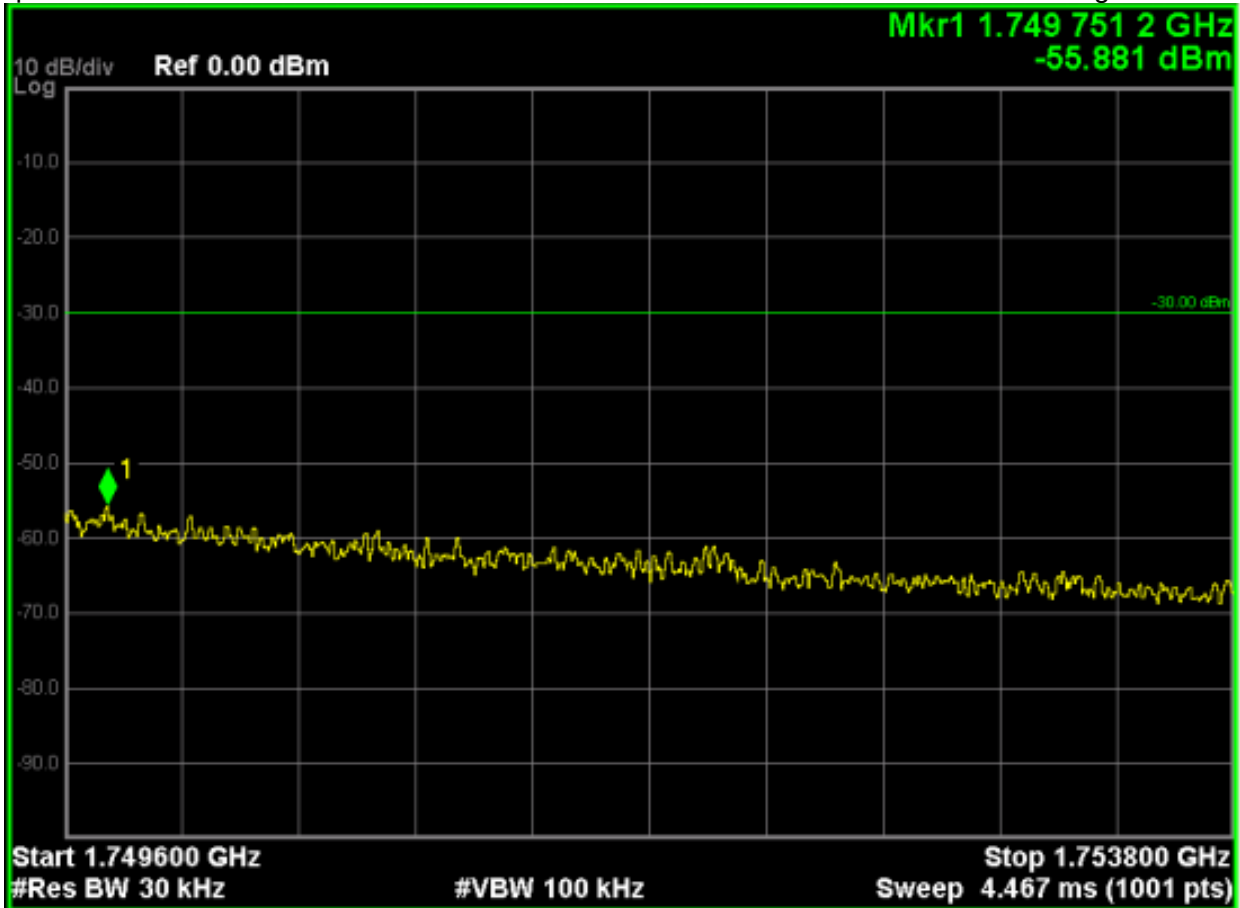
GSM1800 Normal Voltage Condition at Middle Channel

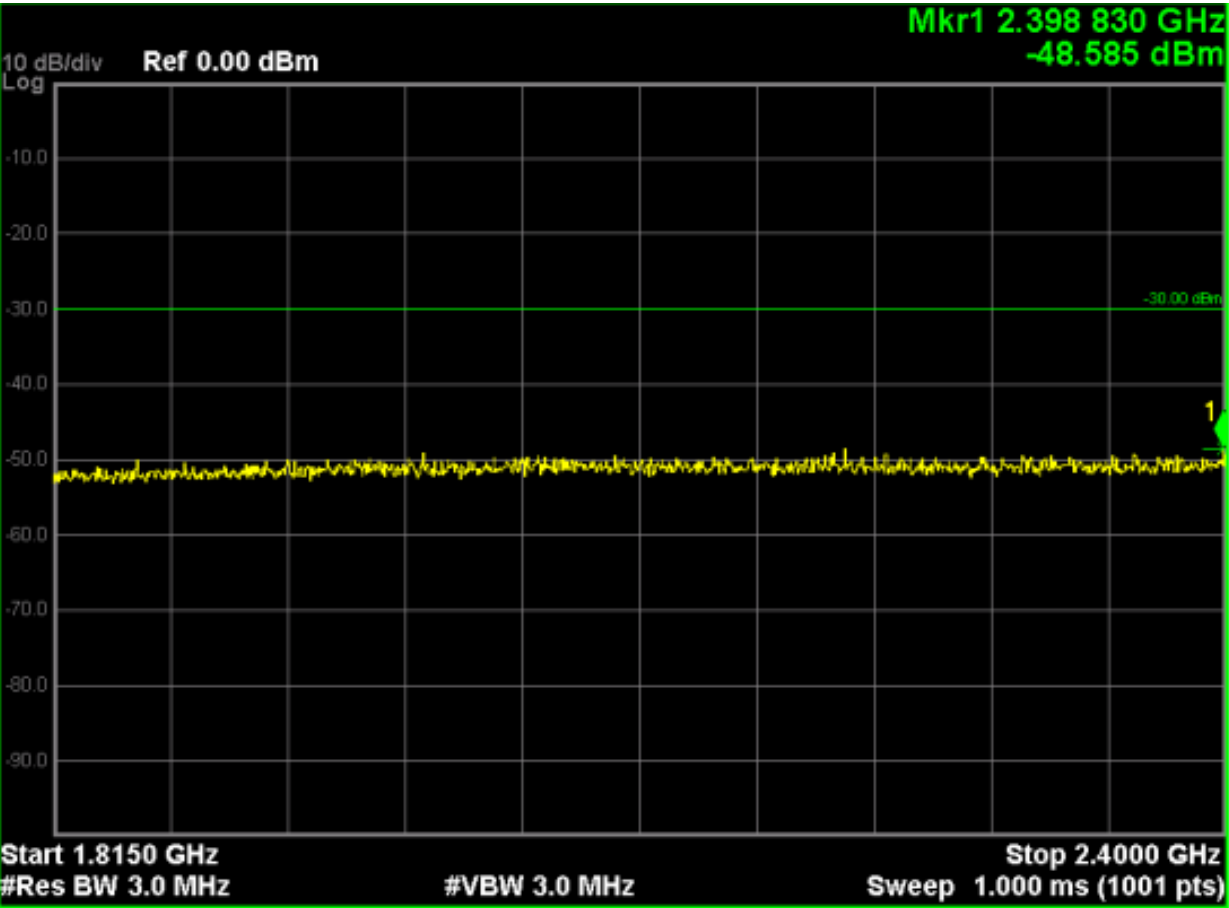
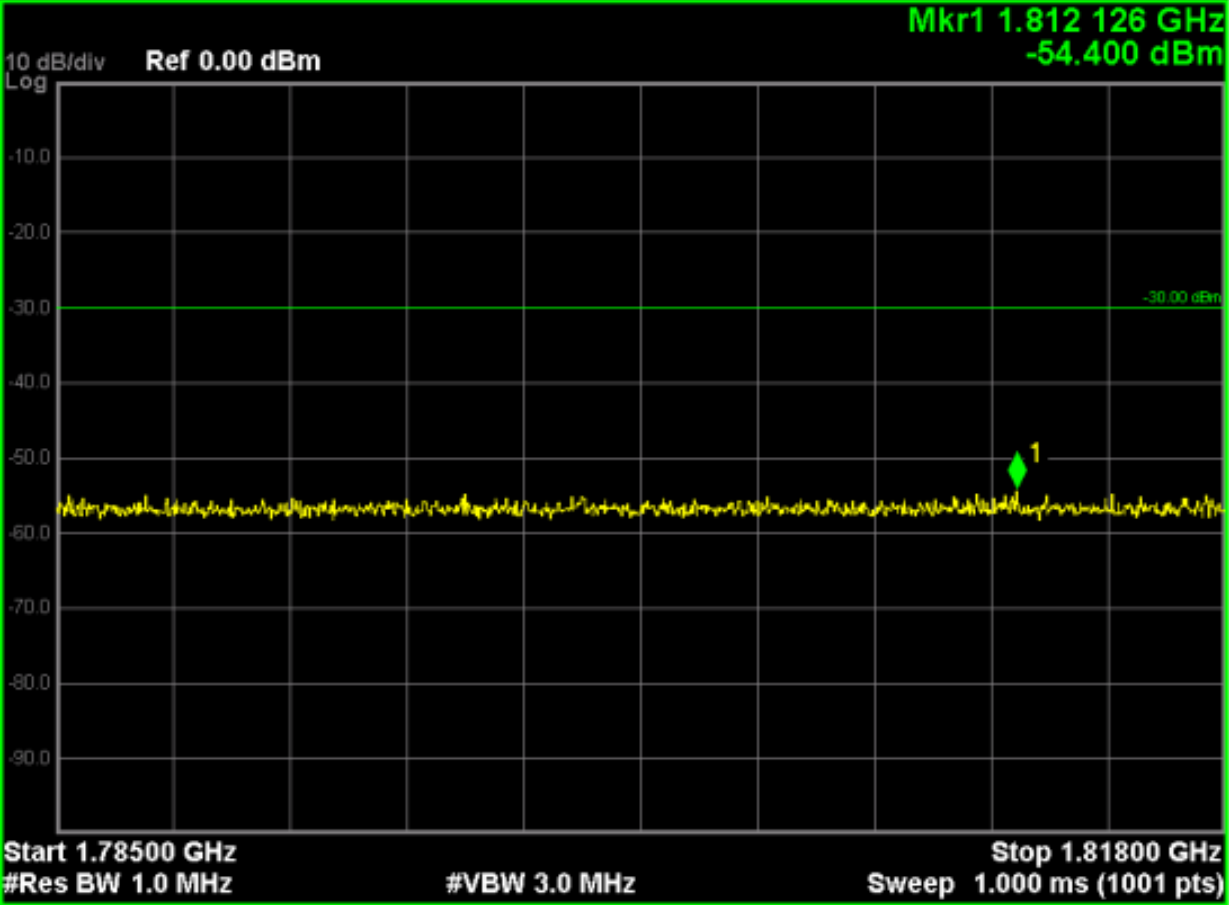


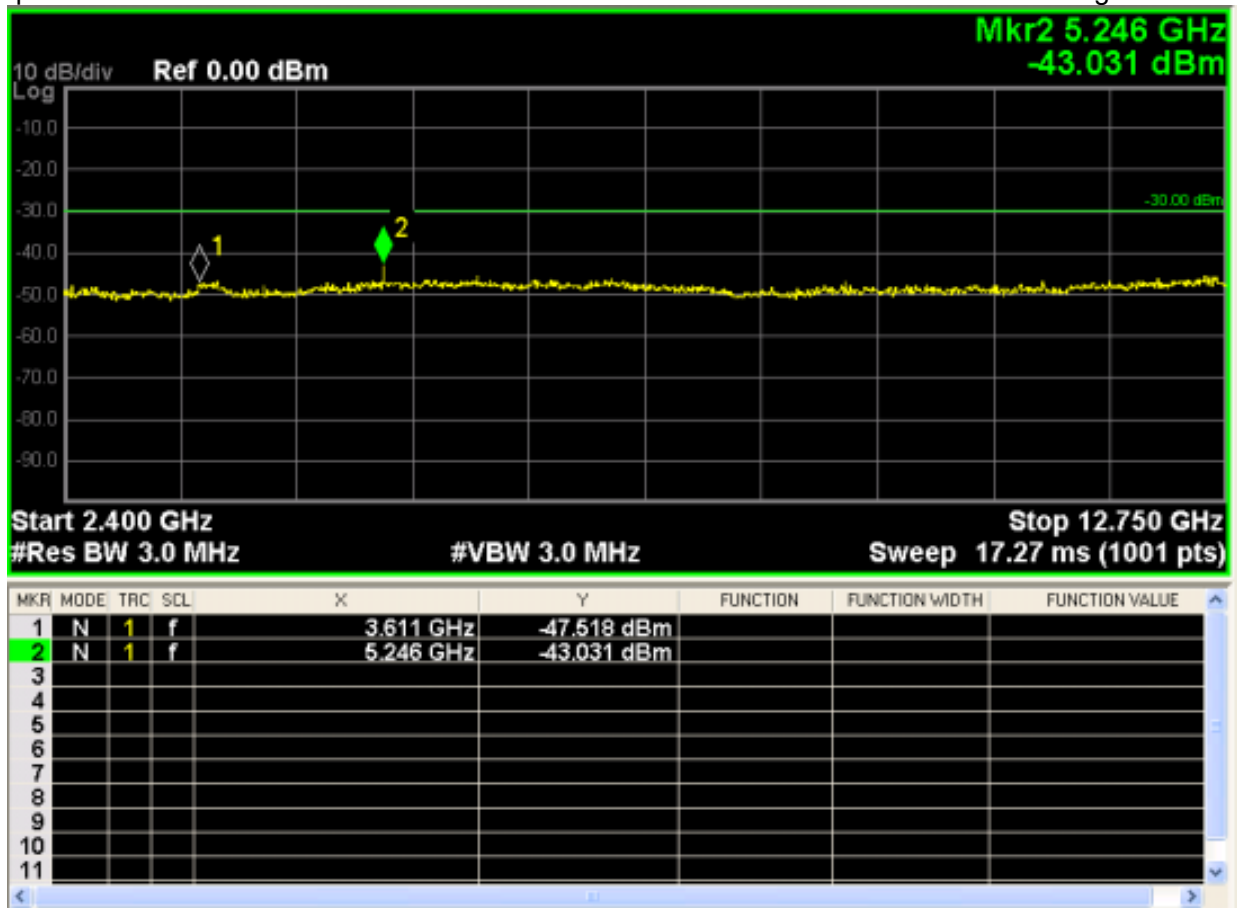












4.9. Conducted spurious emissions-MS in idle mode

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.13

Limits

According to clause 12.1.2 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1,12.1.2.2

Table 4-7

Frequency range		Power level in dBm	
		GSM 400, T-GSM 810 GSM 900, DCS 1 800	GSM 700, GSM 850, PCS 1 900
9 kHz to	880 MHz	-57	-57
880 MHz to	915 MHz	-59	-57
915 MHz to	1000 MHz	-57	-57
1 GHz to	1 710 MHz	-47	
1 710 MHz to	1 785 MHz	-53	
1 785 MHz to	12,75 GHz	-47	
1 GHz to	1 850 MHz		-47
1 850 MHz to	1 910 MHz		-53
1 910 MHz to	12,75 GHz		-47

Test procedure

- 1) Measurements are made in the frequency range 100 kHz to 12,75GHz. Spurious emissions are measured as the power level of any discrete signal, higher than requirement in table 4-7 minus 6dB, delivered into a 50Ω load.
- 2) The measurement bandwidth based on a 5 pole synchronously tuned filter is according to table 4-8.The power indication is the peak power detected by the measuring system.
- 3) The measurement time on any frequency shall be such that it includes the time during which the MS receives a TDMA frame containing the paging channel.

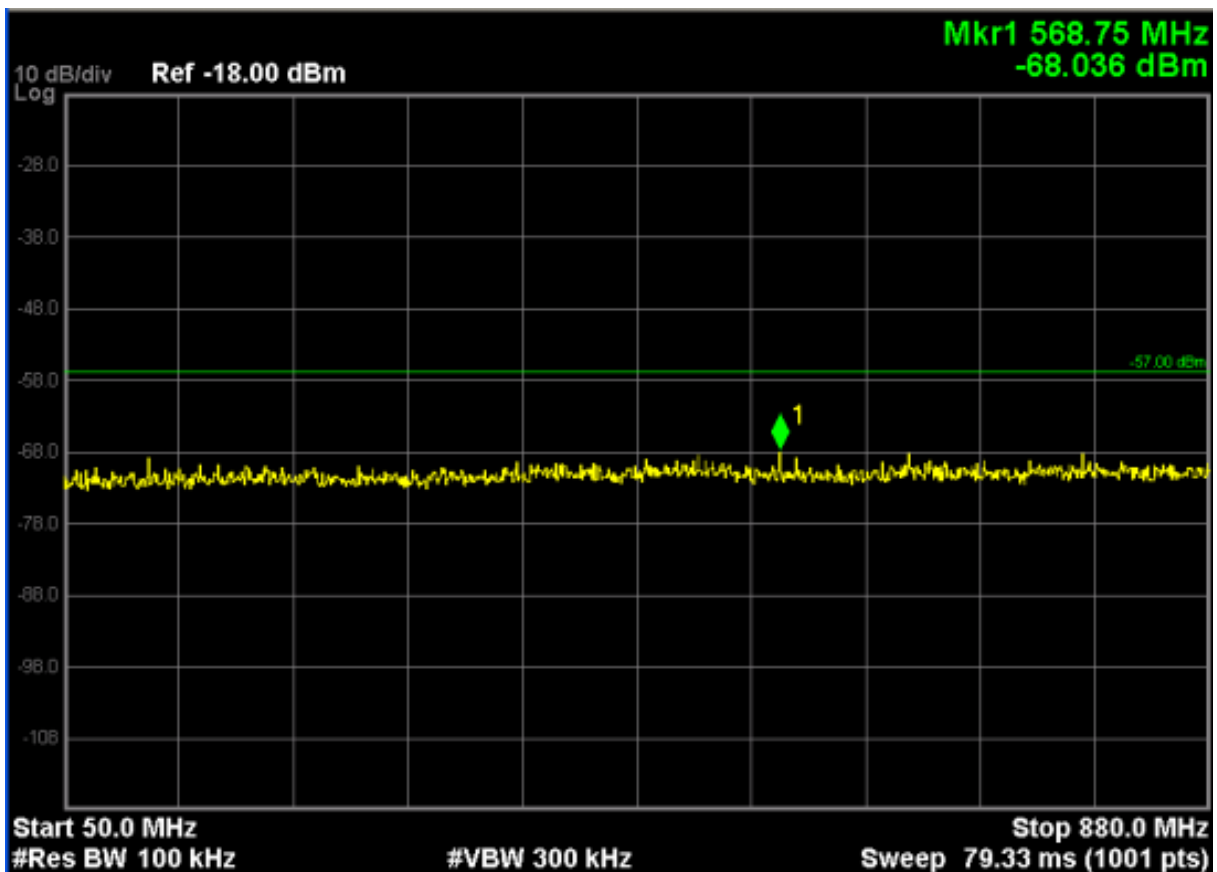
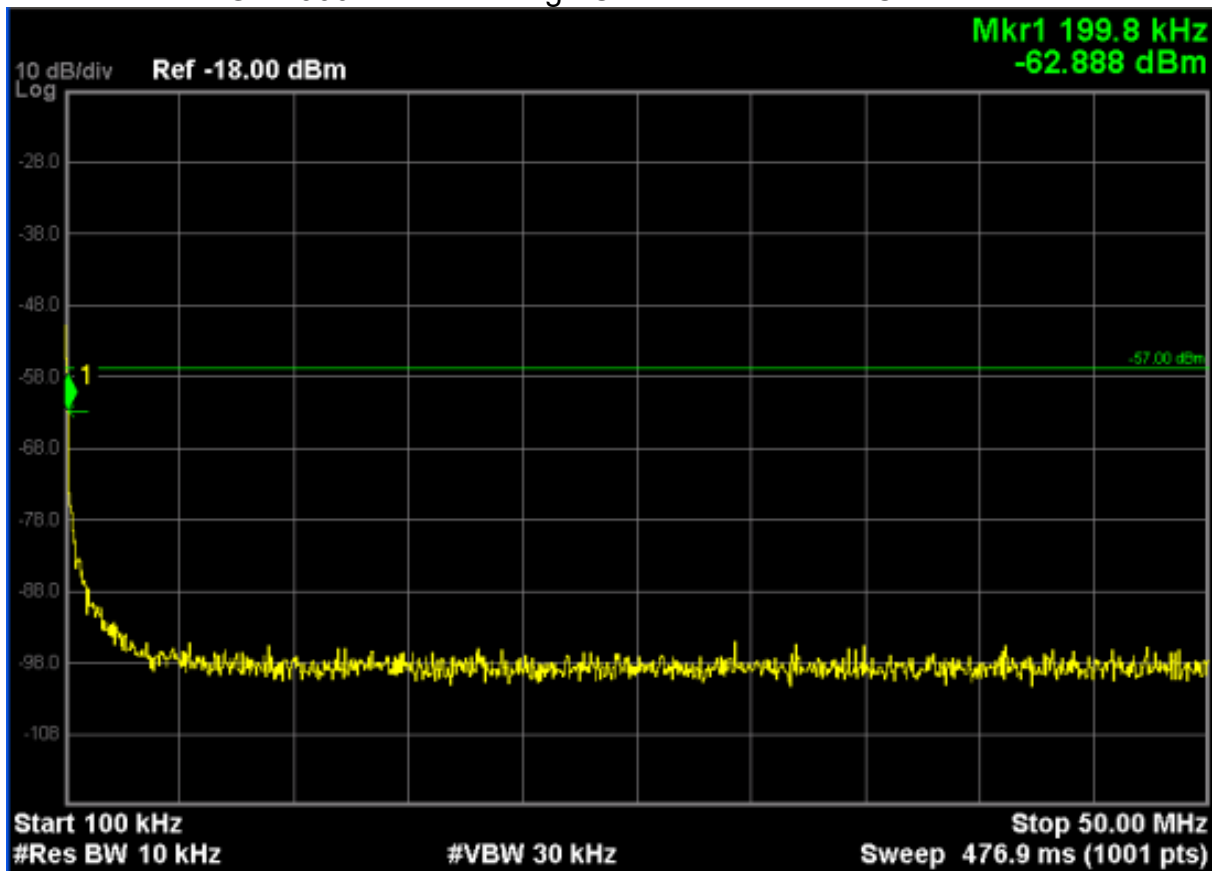
table 4-8

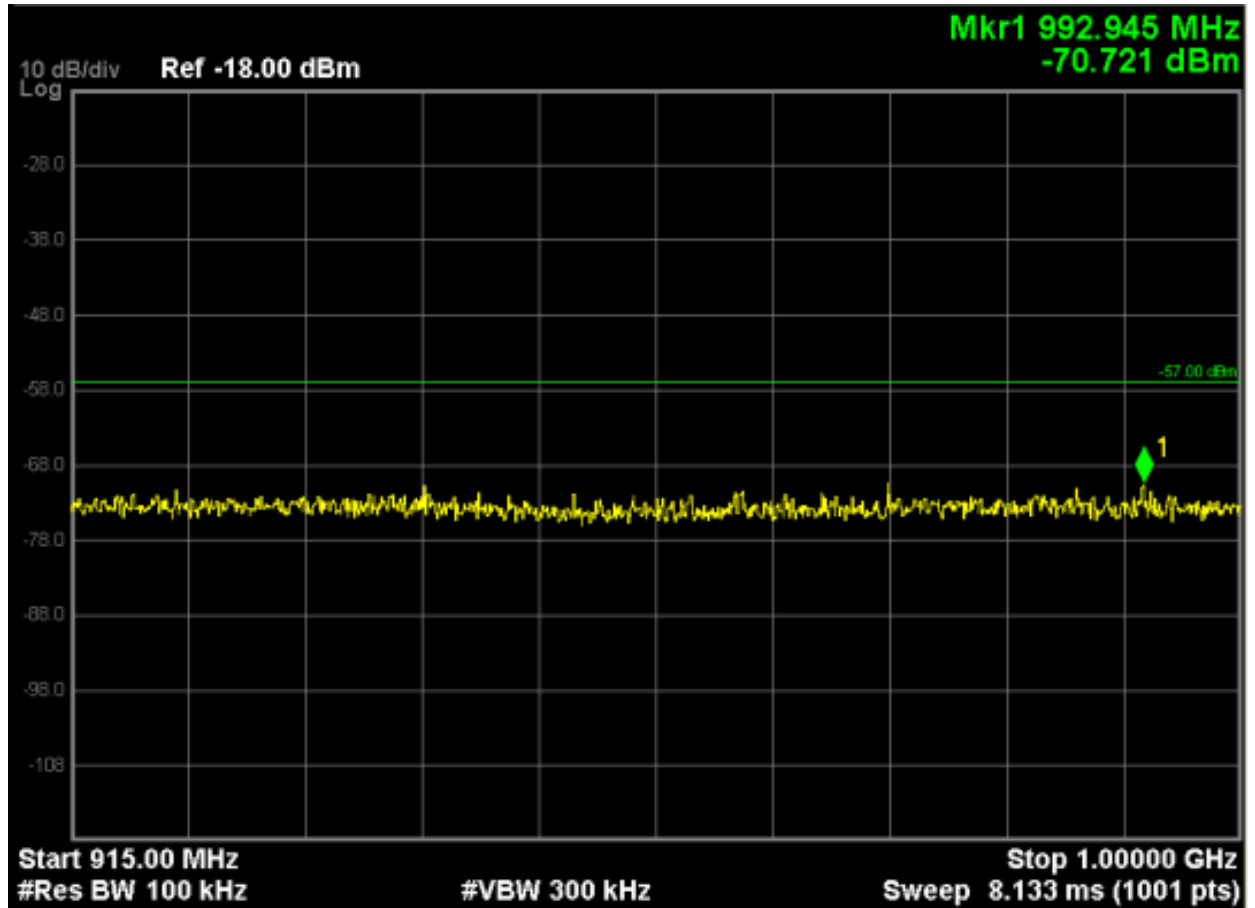
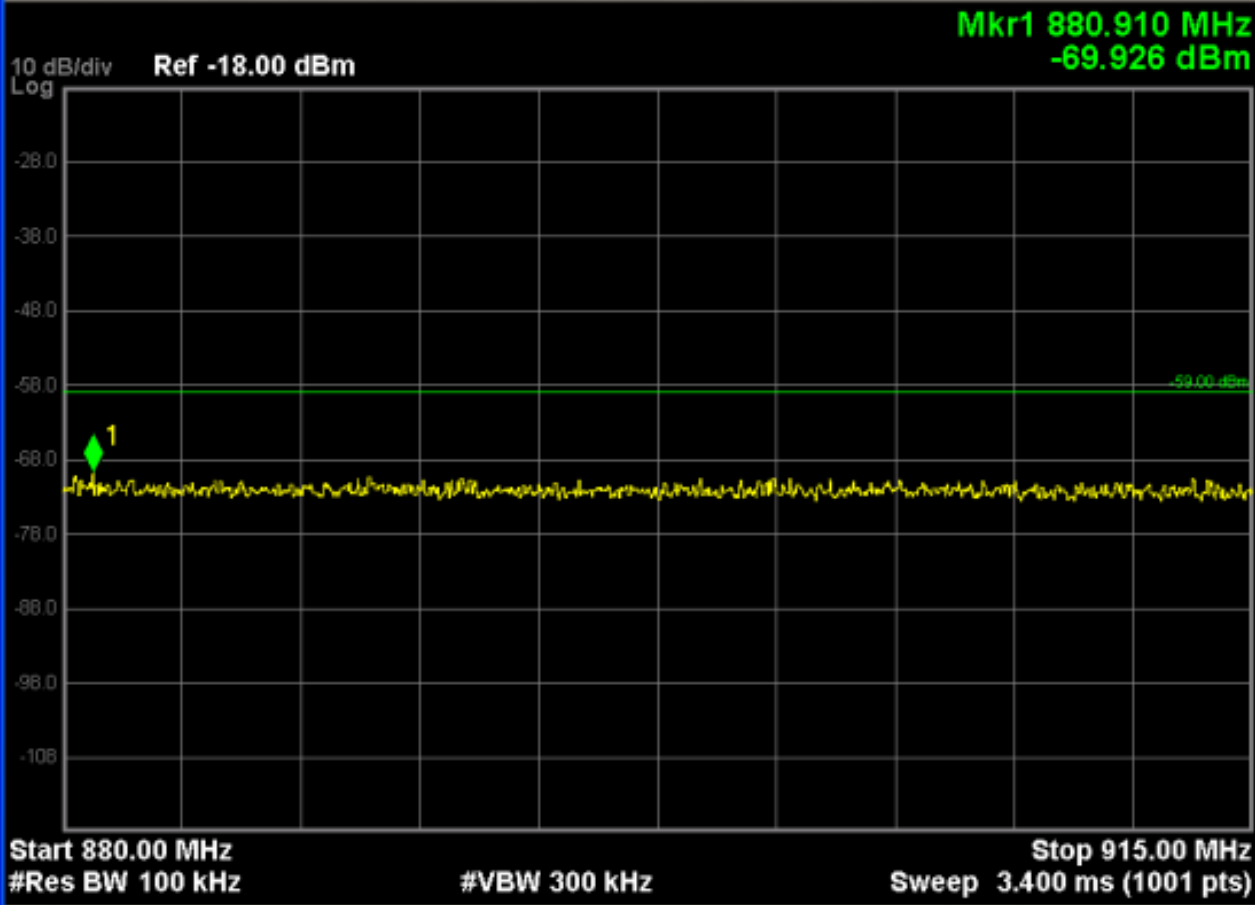
Frequency range	Filter bandwidth	Video bandwidth
100 kHz to 50 MHz	10 kHz	30 kHz
50 MHz to 12,75 GHz	100 kHz	300 kHz

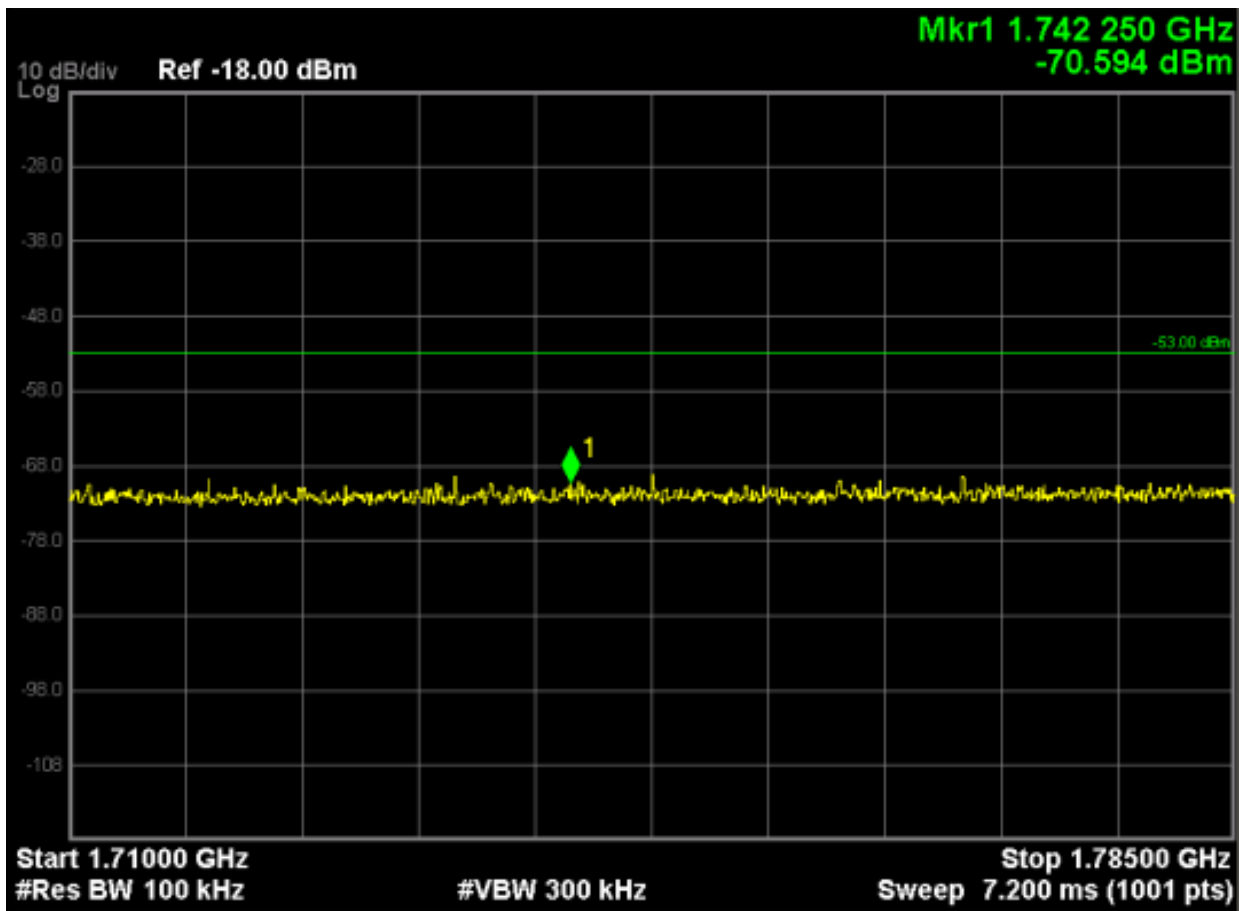
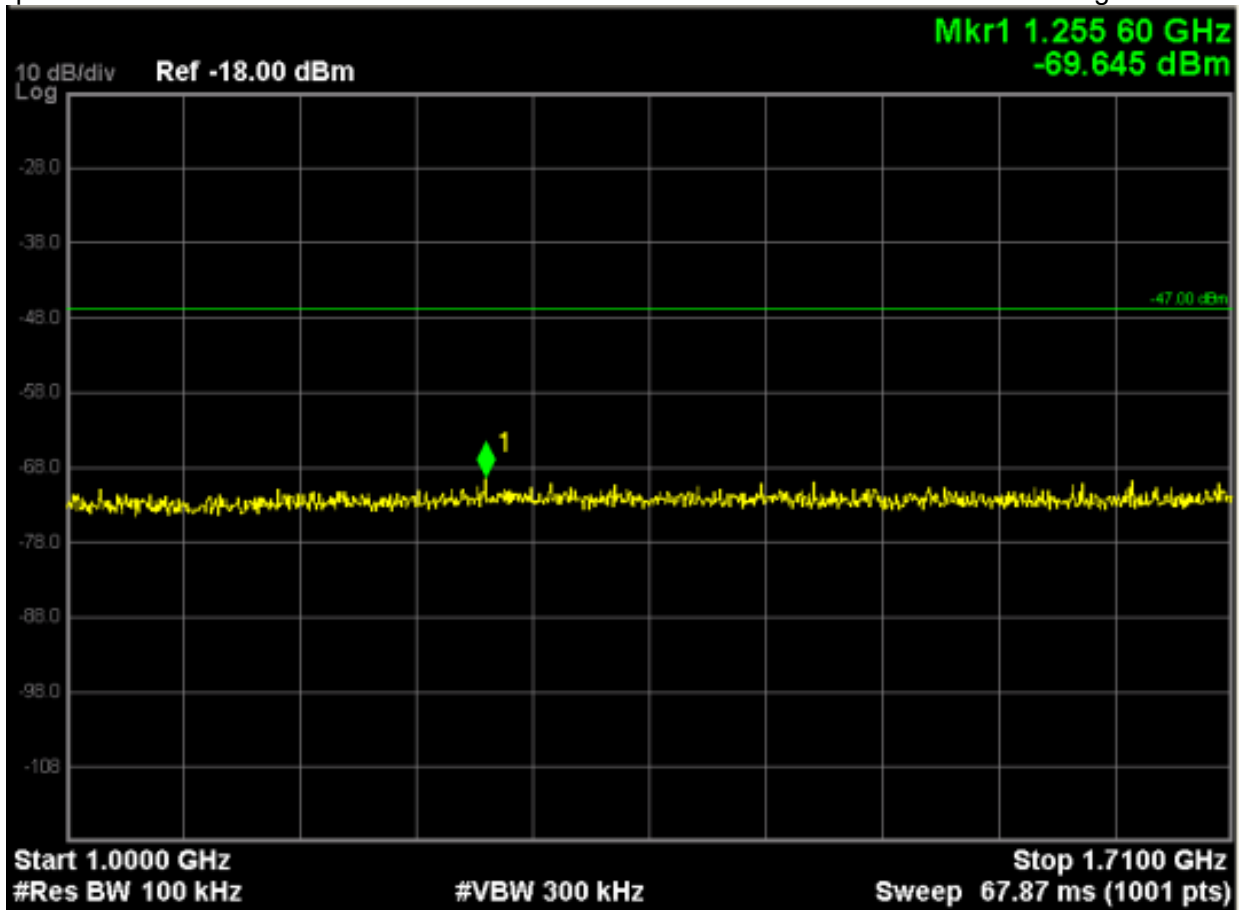
Test Result

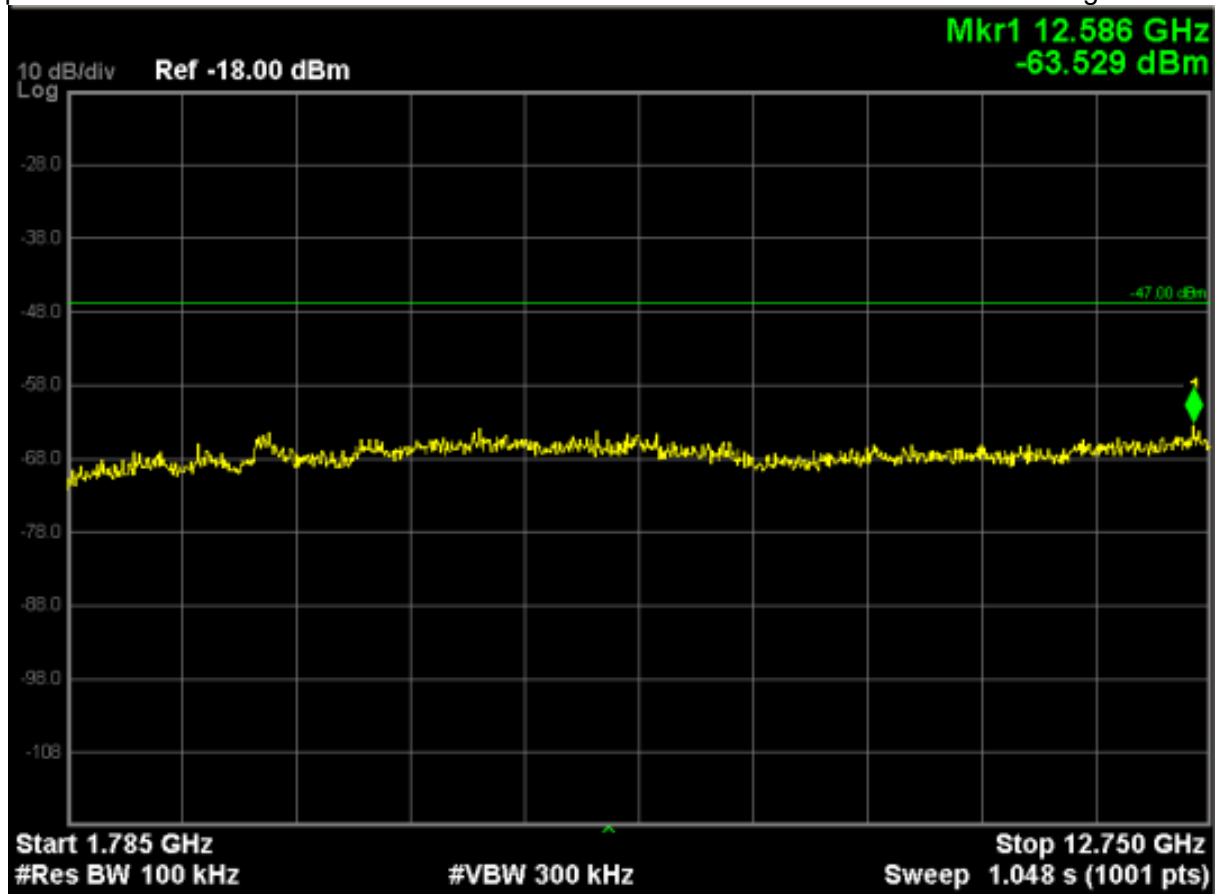
PASS

GSM900 Normal Voltage Condition at Middle Channel

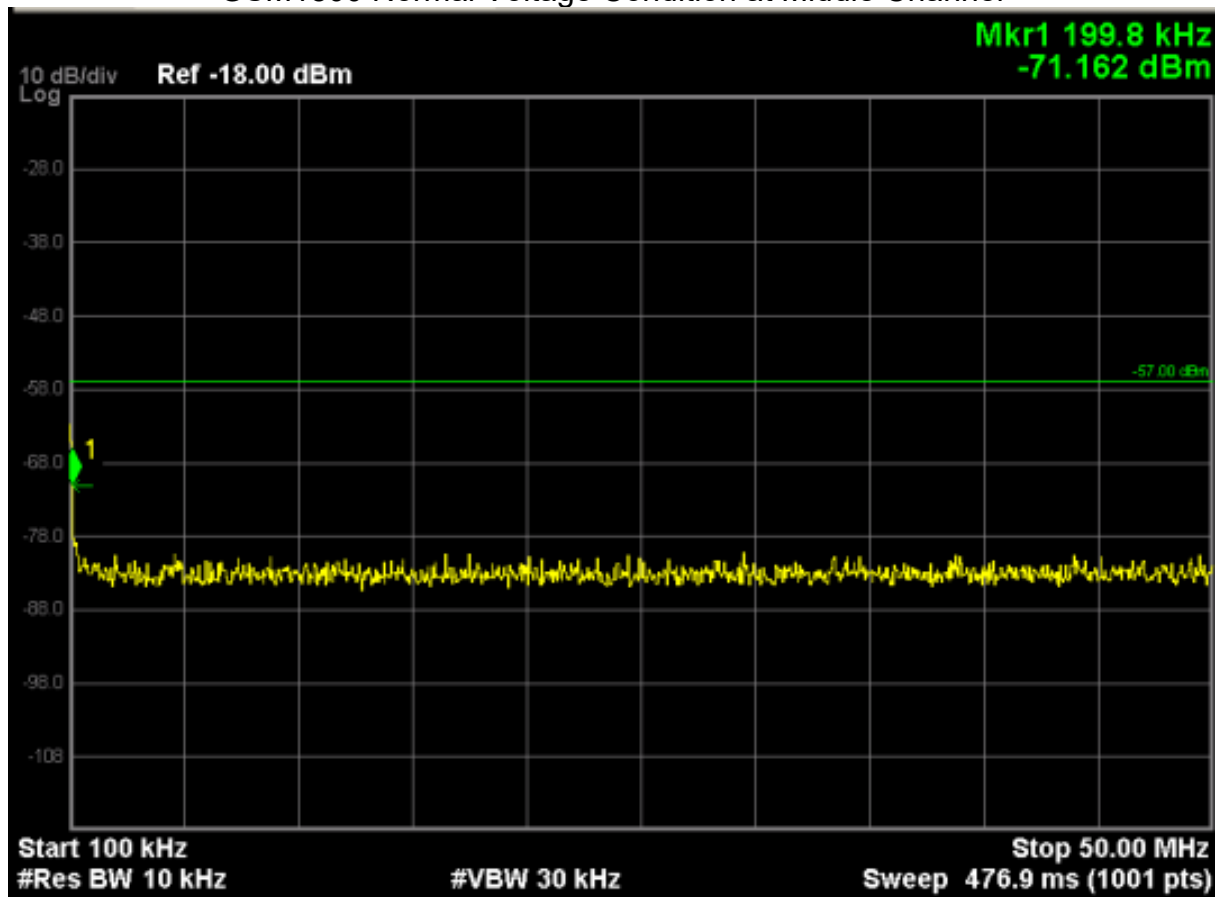


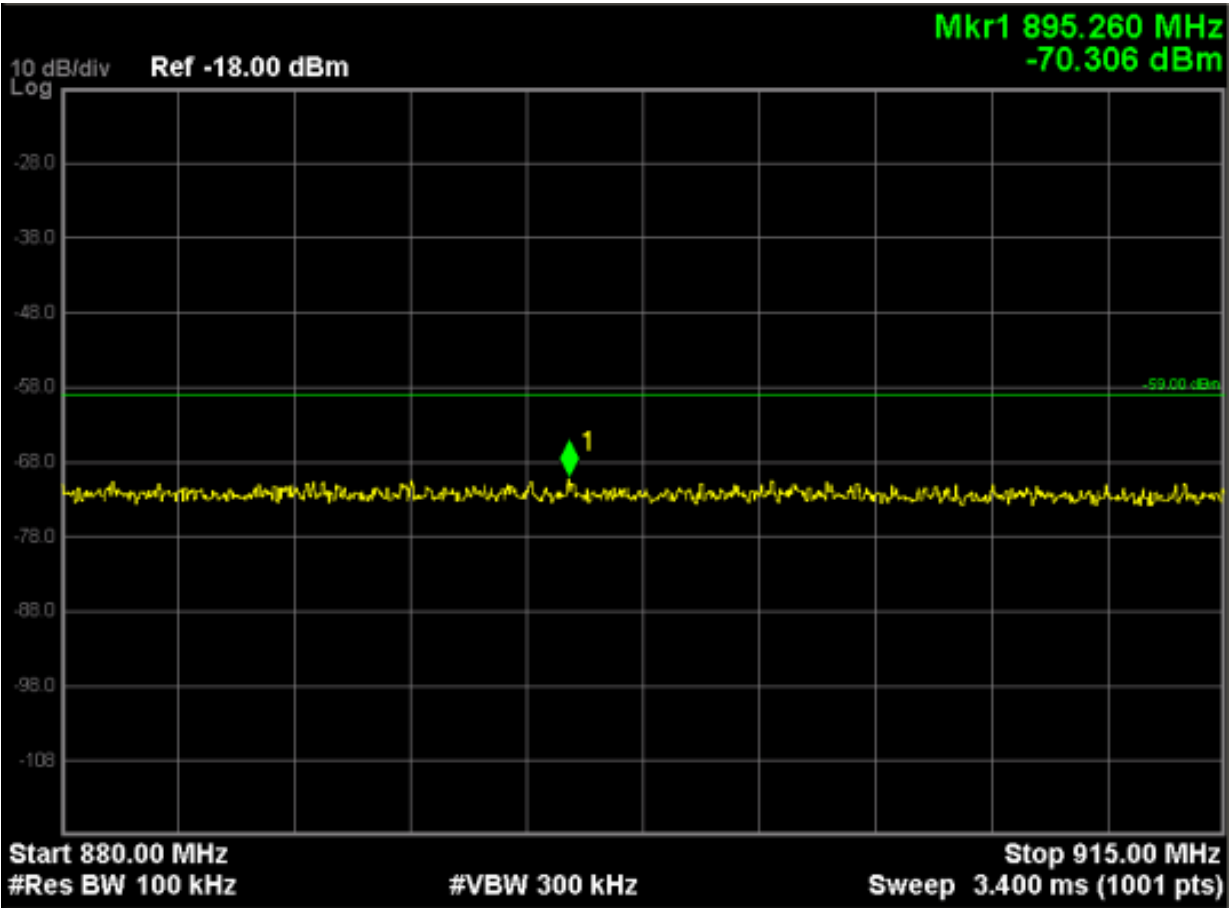
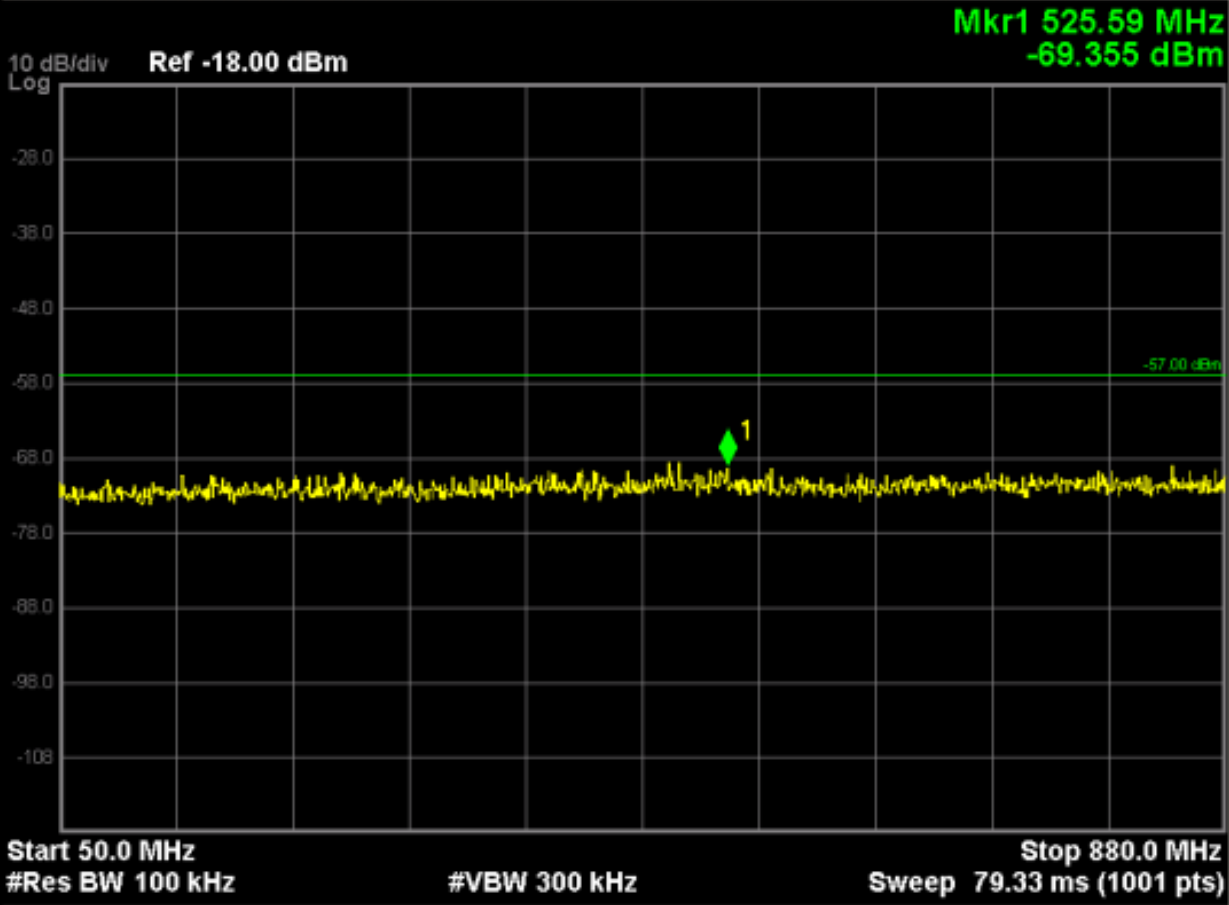


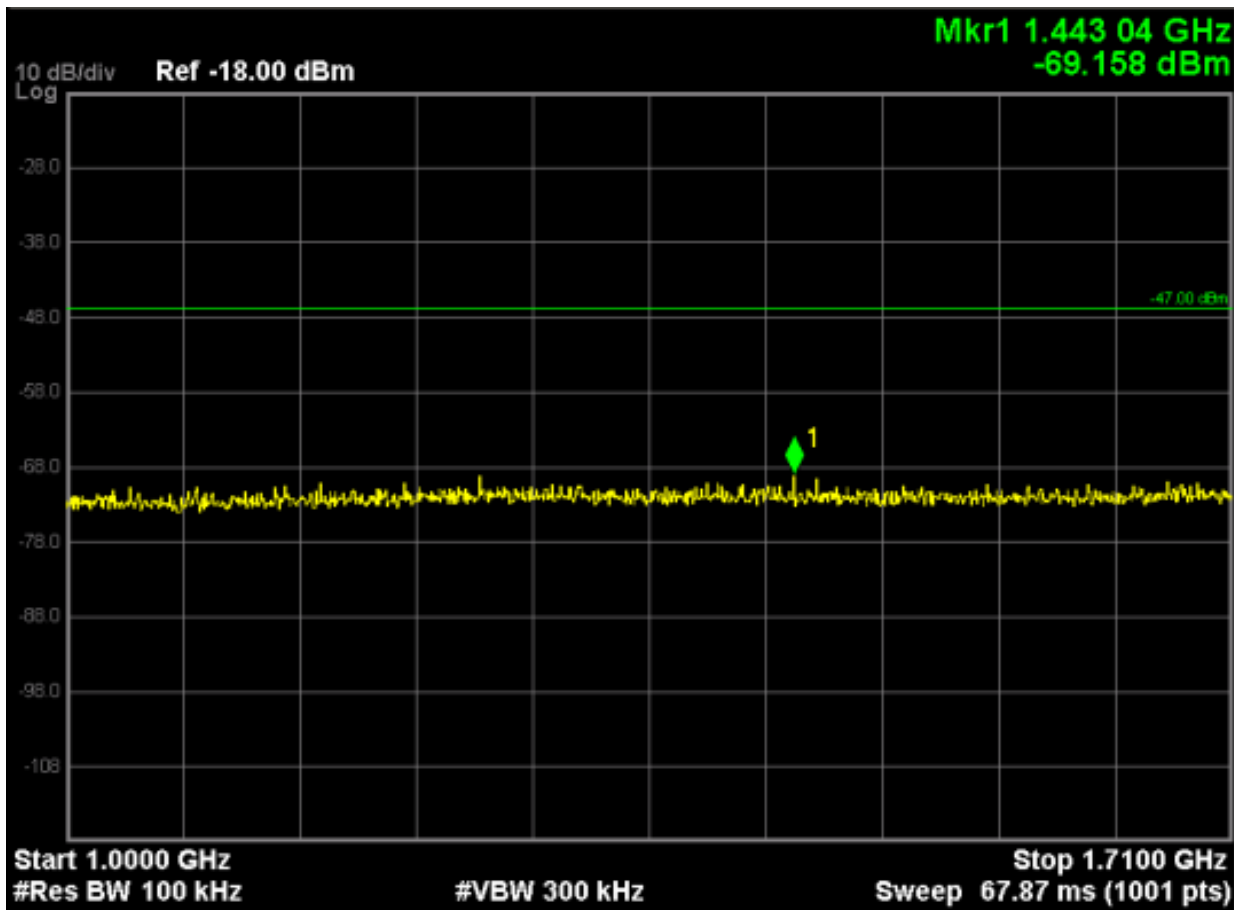
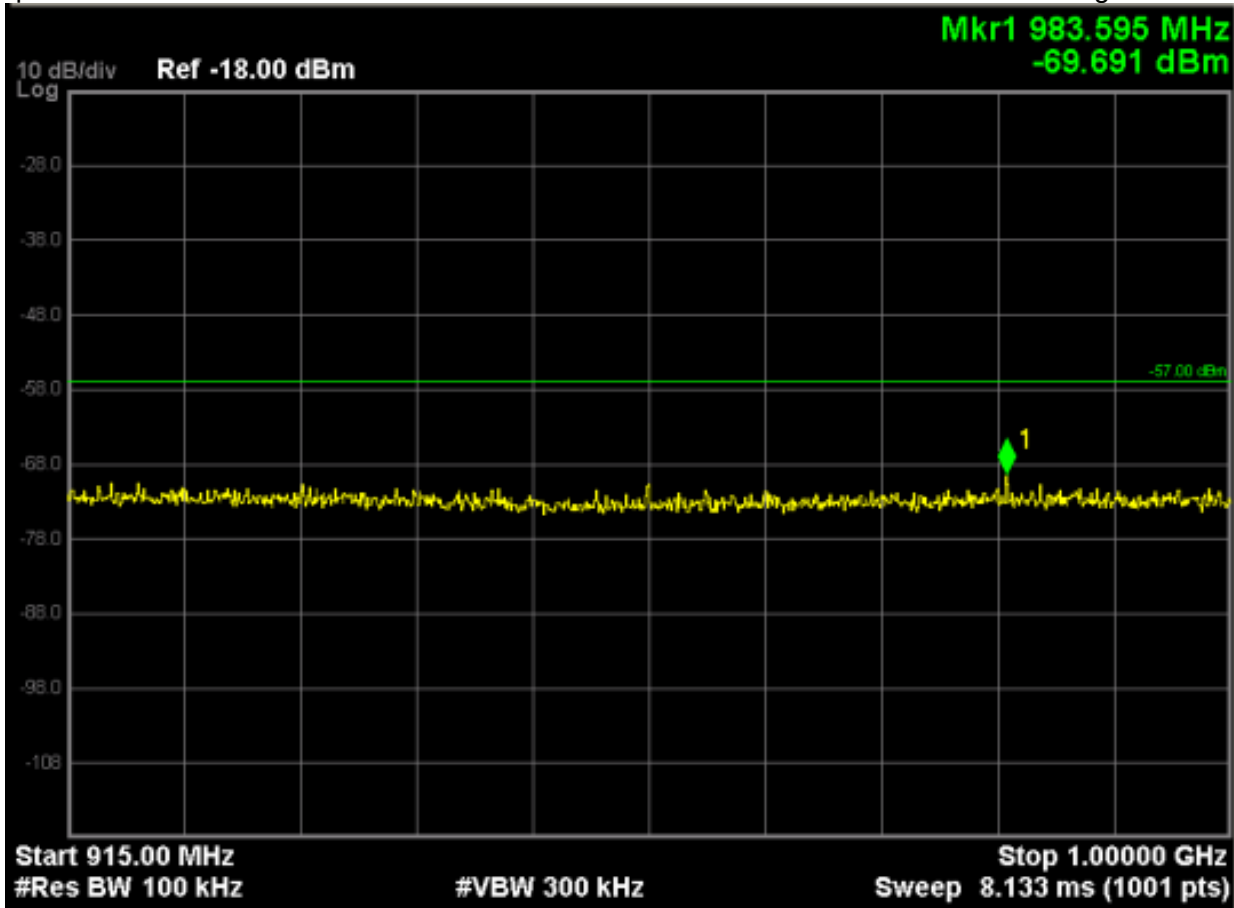


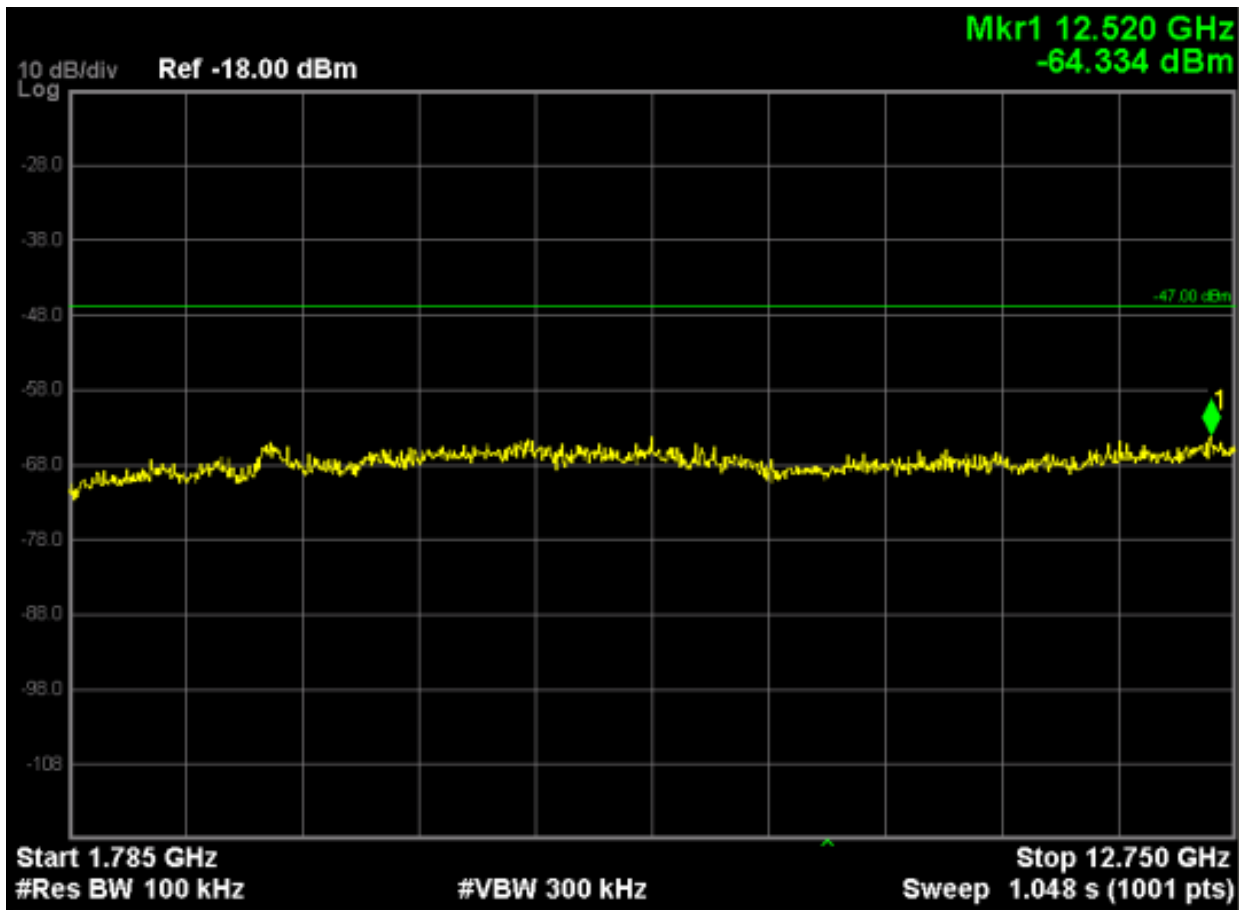
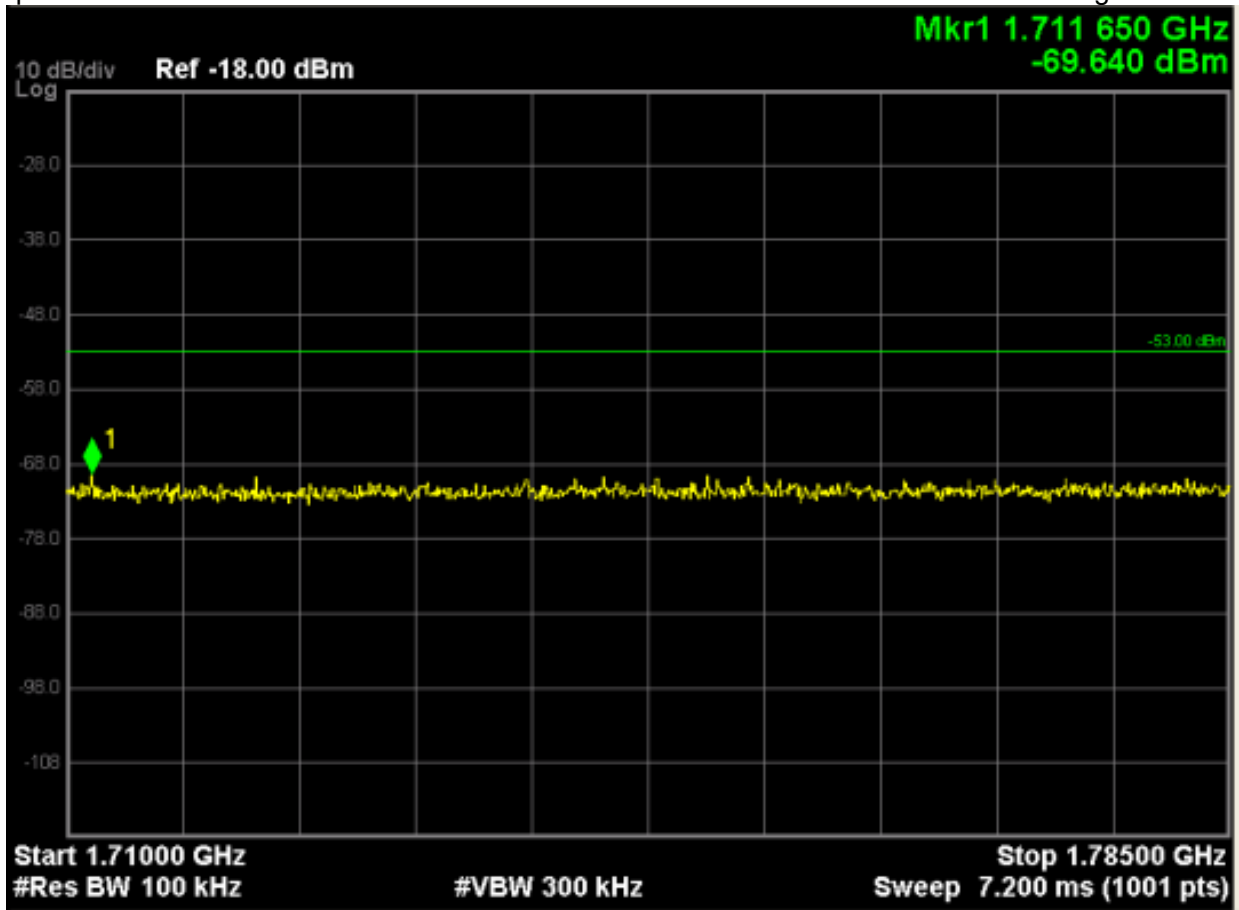


GSM1800 Normal Voltage Condition at Middle Channel









4.10. Radiated spurious emissions-MS allocated a channel

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.16

Limits

According to clause 12.2.1 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1,12.2.1.2

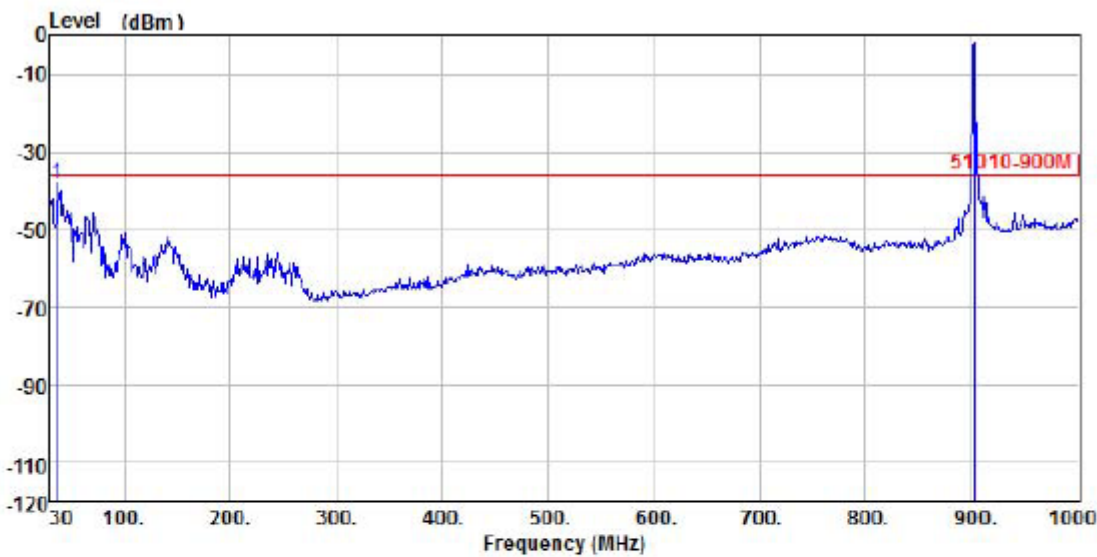
Table 4-1

Frequency range		Power level in dBm		
		GSM 400, GSM 700, T-GSM 810, GSM 850, GSM 900	DCS 1 800	PCS 1 900
30 MHz to	1 GHz	-36	-36	-36
1 GHz to	4 GHz	-30		-30
1 GHz to	1 710 MHz		-30	
1 710 MHz to	1 785 MHz		-36	
1 785 MHz to	4 GHz		-30	

Test procedure

- 1) Initially the test antenna is closely coupled to the MS and any spurious emission radiated by the MS is detected by the test antenna and receiver in the range 30MHz to 4GHz.
- 2) The test antenna separation is set to the appropriate measurement distance and at each frequency which an emission has been detected, the MS shall be rotated to obtain maximum response and the effective radiated power of the mission determined by a substitution measurement. In case of an anechoic shielded chamber pre-calibration may be used instead of a substitution measurement.
- 3) The measurement bandwidth, based on a 5 pole synchronously tuned filter, is set according to table 4.2.The power indication is the peak power detected by the measuring system.
- 4) The measurements are repeated with the test antenna in the orthogonal polarization plane.

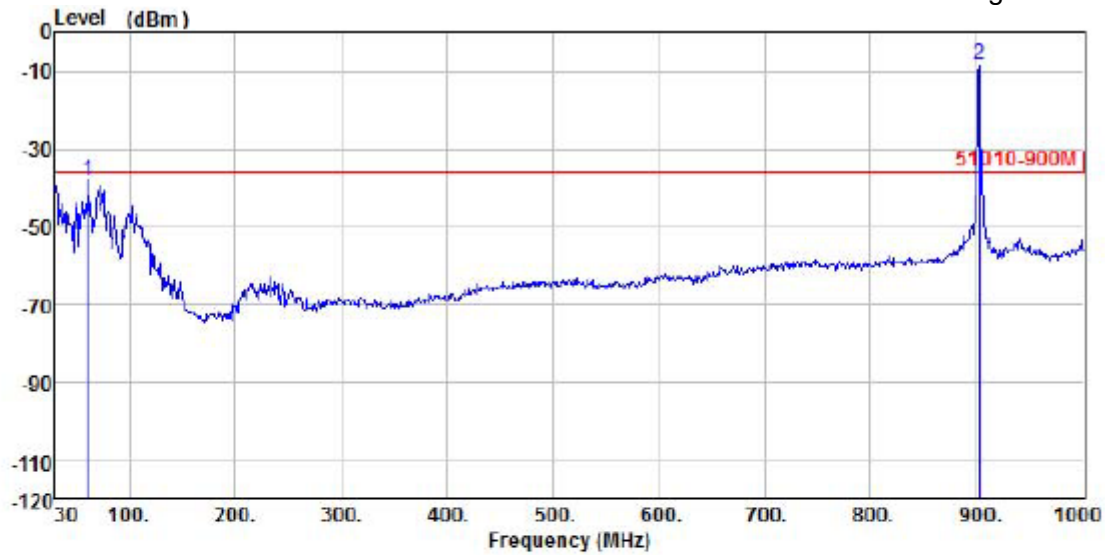
GSM900 Normal Voltage Condition at Middle Channel



Site : chamber
Condition : 51010-900M 3m VULB9160(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900
Memo :

	Read	Antenna	Cable	Preamp	Limit	Over	
	Freq	Level	Factor	Loss	Factor	Level	Line
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m
1	36.79	-63.26	24.30	0.77	0.00	-38.19	-35.99
2 pp	903.00	-47.59	41.65	4.07	0.00	-1.87	-35.99

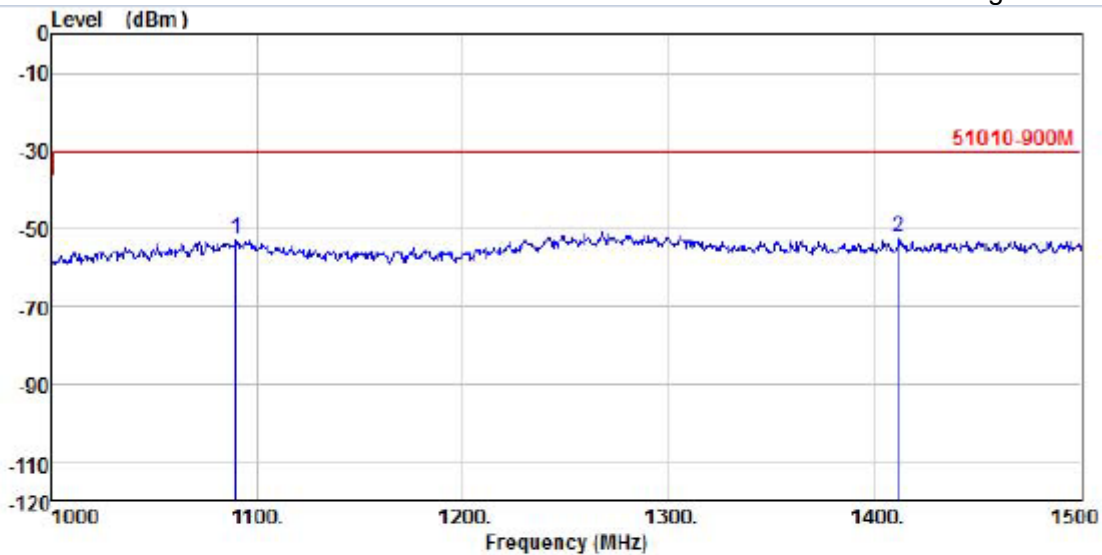
Note: the mark 2 is carrier.



Site : chamber
Condition : 51010-900M 3m VULB9160(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900
Memo :

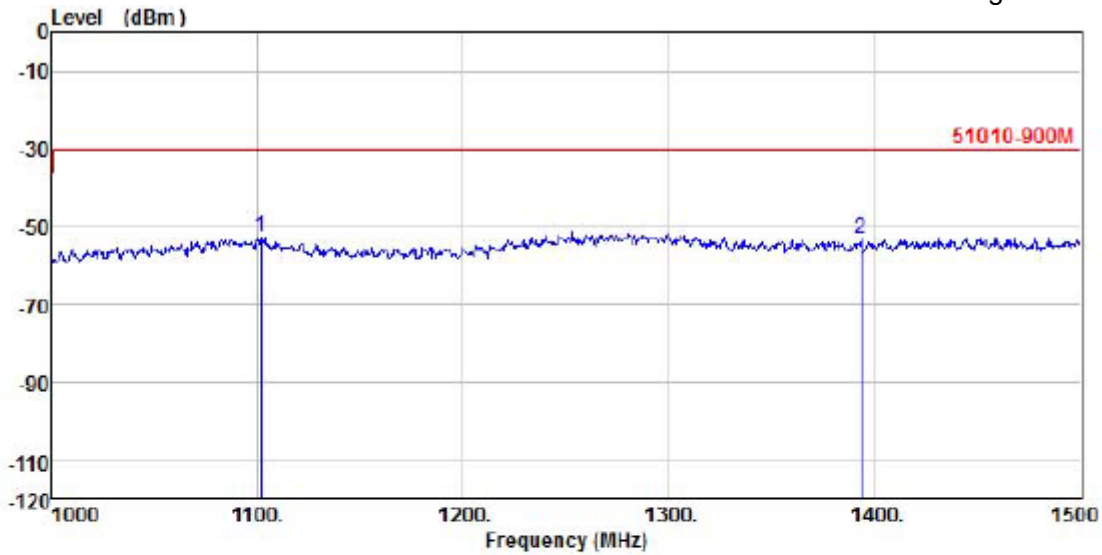
		ReadAntenna		Cable Preamp		Limit		Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark		
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB			
1	60.07 -64.25	25.04	1.05	0.00	-38.16	-35.99	-2.17	Peak		
2	pp 903.00 -47.04	34.58	4.07	0.00	-8.39	-35.99	27.60	Peak		

Note: the mark 2 is carrier.



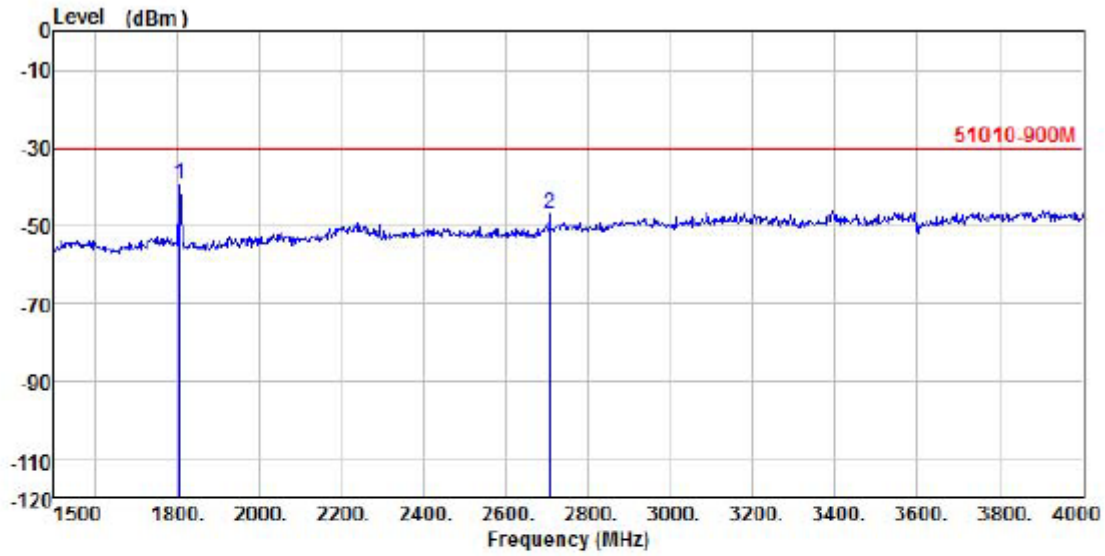
Site : chamber
Condition : 51010-900M 3m BBHA9120D(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900
Memo :

		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss Factor	Level	Line	Limit	Remark		
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1	1089.50	-57.51	38.71	4.72	38.61	-52.69	-29.99	-22.70	Peak
2	pp 1412.50	-56.23	37.26	5.33	38.64	-52.28	-29.99	-22.29	Peak



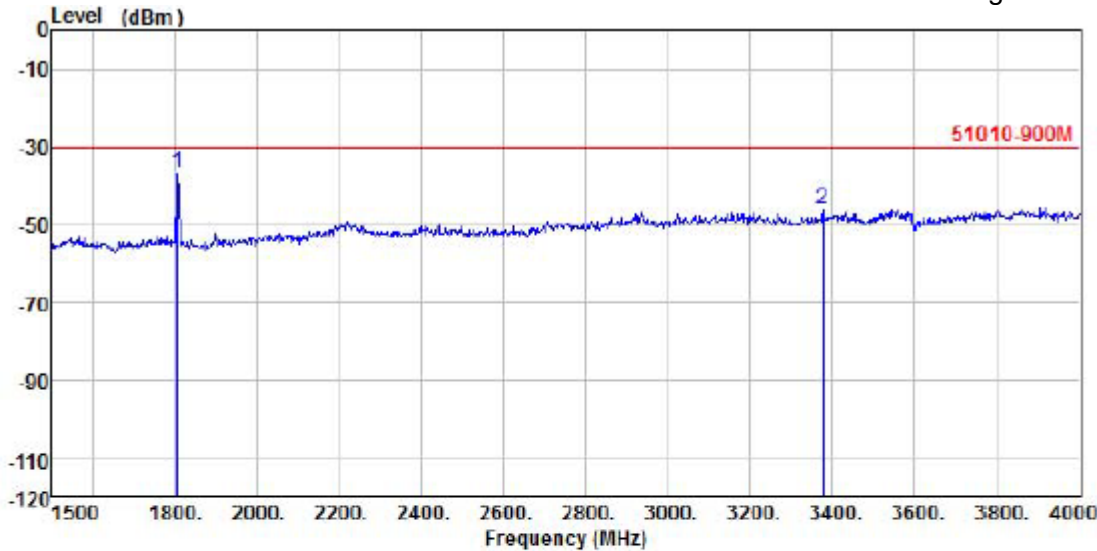
Site : chamber
Condition : 51010-900M 3m BBHA9120D(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900
Memo :

		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp	1101.50	-58.67	39.62	4.80	38.61	-52.86	-29.99	-22.87	Peak
2	1394.00	-57.33	37.31	5.34	38.64	-53.32	-29.99	-23.33	Peak



Site : chamber
Condition : 51010-900M 3m BBHA9120D(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900
Memo :

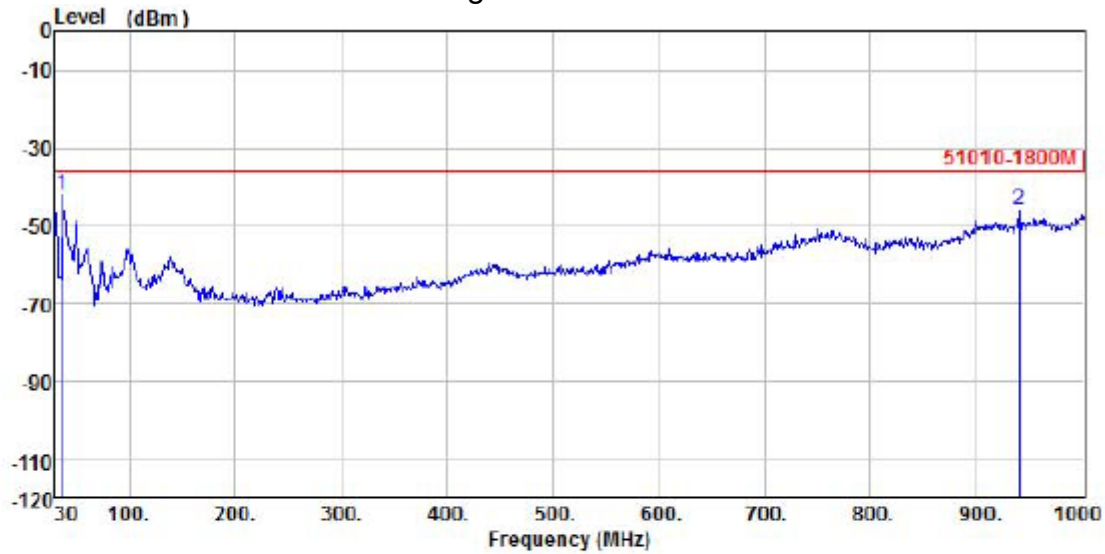
		ReadAntenna		Cable Preamp		Limit		Over	
Freq		Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp 1805.00	-43.95	37.11	6.20	38.67	-39.31	-29.99	-9.32	Peak	
2 2707.50	-54.86	38.50	7.63	38.42	-47.15	-29.99	-17.16	Peak	



Site : chamber
Condition : 51010-900M 3m BEHA9120D(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900
Memo :

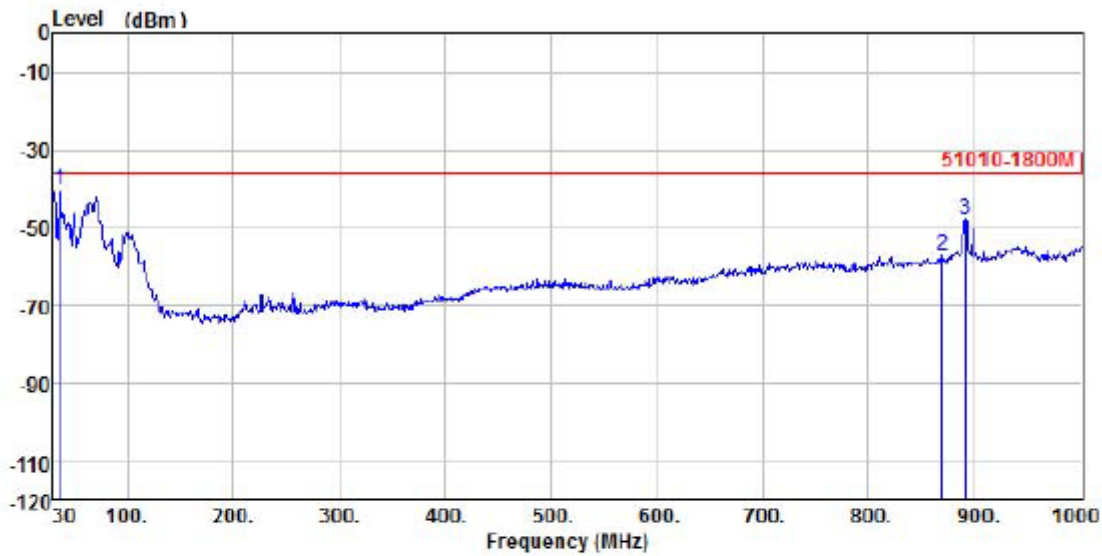
		ReadAntenna		Cable Preamp		Limit		Over	
Freq		Level	Factor	Loss Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp 1805.00	-41.45	37.11	6.20	38.67	-36.81	-29.99	-6.82	Peak	
2 3377.50	-56.30	39.86	8.54	38.03	-45.93	-29.99	-15.94	Peak	

DCS1800 Normal Voltage Condition at Middle Channel



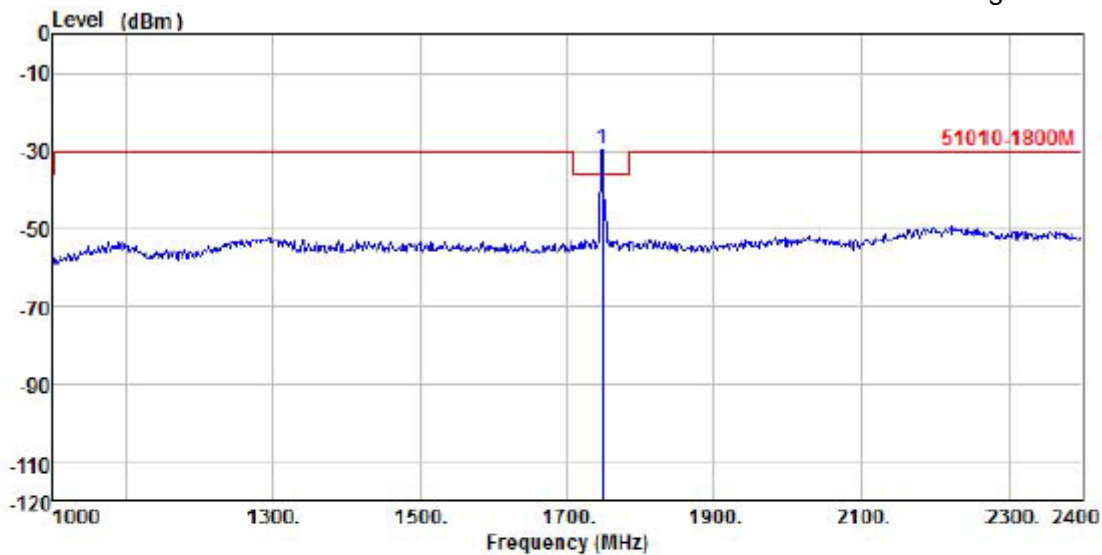
Site : chamber
Condition : 51010-1800M 3m VULB9160(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800
Memo :

	ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1 pp	36.79	-67.22	24.30	0.77	0.00	-42.15	-35.99	-6.16 Peak
2	938.89	-92.18	42.08	4.13	0.00	-45.97	-35.99	-9.98 Peak



Site : chamber
Condition : 51010-1800M 3m VULB9160(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800
Memo :

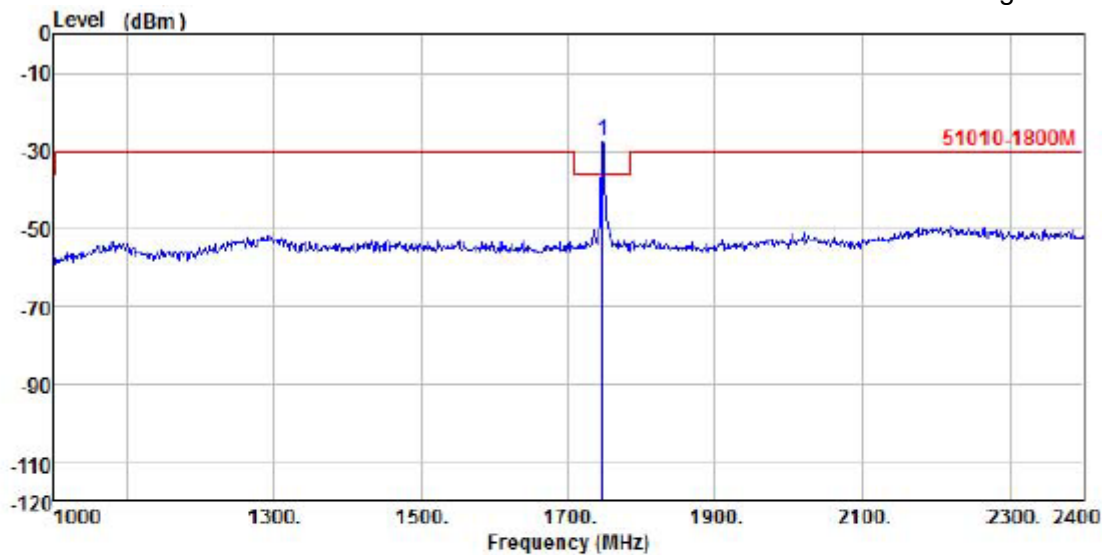
		ReadAntenna		Cable Preamp		Limit		Over	Remark
Freq	Level	Factor	Loss	Factor	Level	Line	Limit		
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp	36.79 -59.57	18.58	0.77	0.00	-40.22 -35.99	-4.23	Peak		
2	870.02 -95.11	34.13	4.01	0.00	-56.97 -35.99	-20.98	Peak		
3	891.36 -87.47	35.61	4.05	0.00	-47.81 -35.99	-11.82	Peak		



Site : chamber
Condition : 51010-1800M 3m BBHA9120D (RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800
Memo :

		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp 1749.00	-33.81	36.83	6.03	38.66	-29.61	-35.99	6.38	Peak	

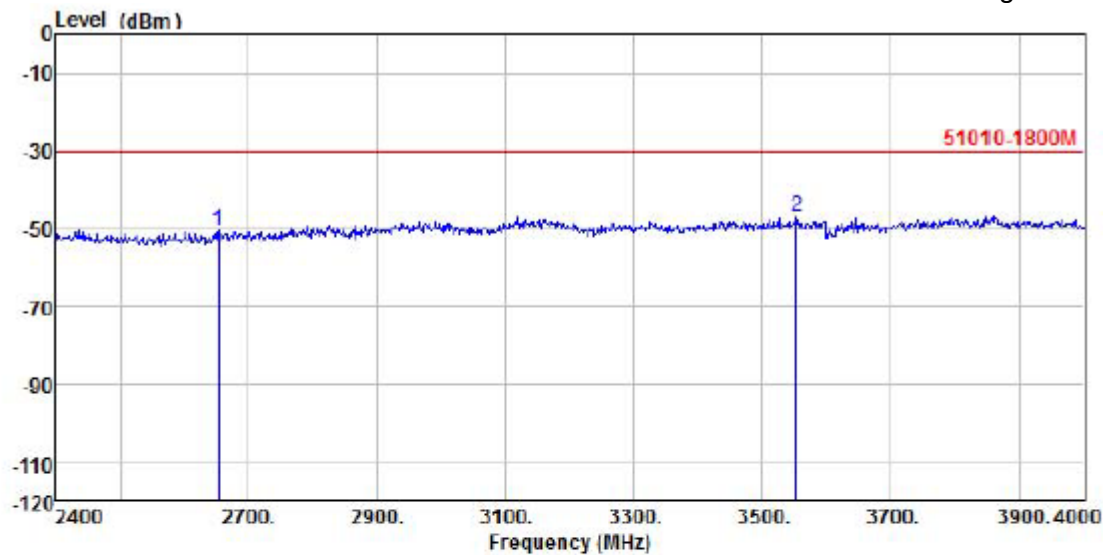
Note: the mark 1 is carrier.



Site : chamber
Condition : 51010-1800M 3m BBHA9120D (RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800
Memo :

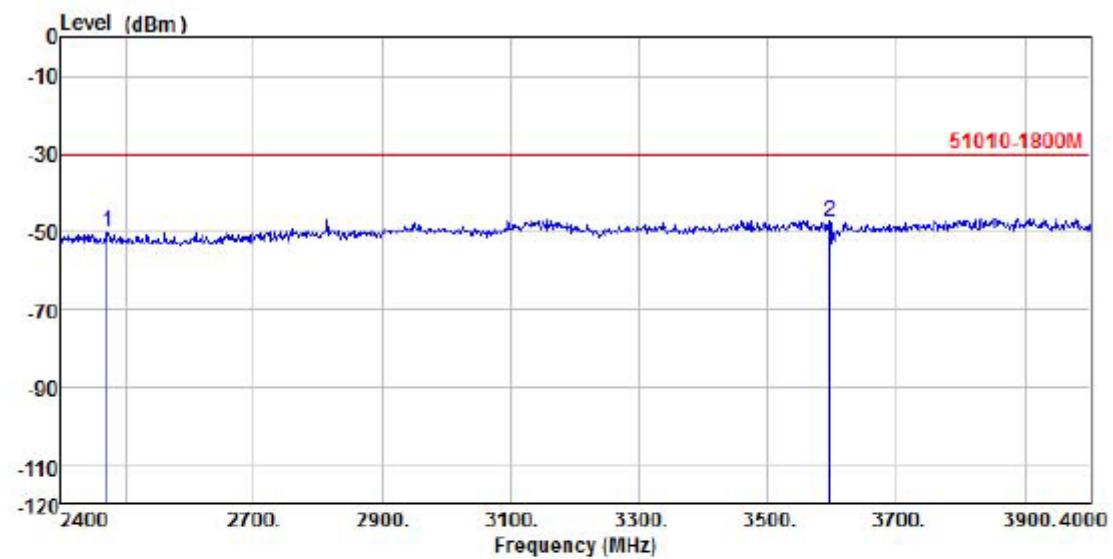
		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp 1747.60	-31.85	36.83	6.03	38.66	-27.65	-35.99	8.34	Peak	

Note: the mark 1 is carrier.



Site : chamber
Condition : 51010-1800M 3m BBHA9120D (RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800
Memo :

		ReadAntenna		Cable Preamp		Limit		Over			
Freq		Level	Factor	Loss	Factor	Level	Line	Limit	Remark		
MHz		dBm	dB/m	dB	dB	dBm/m	dBm/m	dB			
1	2652.80	-57.83	38.18	7.42	38.44	-50.67	-29.99	-20.68	Peak		
2	3555.20	-58.50	40.61	8.82	37.90	-46.97	-29.99	-16.98	Peak		



Site : chamber
Condition : 51010-1800M 3m BBHA9120D (RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800
Memo :

		ReadAntenna		Cable Preamp		Limit		Over			
		Freq	Level	Factor	Loss Factor	Level	Line	Limit	Remark		
		MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1	2472.00	-57.15	38.38	7.41	38.50	-49.86	-29.99	-19.87	Peak		
2	pp 3596.80	-59.07	40.92	8.65	37.87	-47.37	-29.99	-17.38	Peak		

4.11. Radiated spurious emission Ms in idle mode

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.17

Limits

According to clause 12.2.2 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1,12.2.2.2

Table 4-3

Frequency range		Power level in dBm	
		GSM 400, T-GSM 810, GSM 900, DCS 1 800	GSM 700, GSM 850, PCS 1 900
30 MHz to	880 MHz	-57	-57
880 MHz to	915 MHz	-59	-57
915 MHz to	1 000 MHz	-57	-57
1 GHz to	1 710 MHz	-47	
1 710 MHz to	1 785 MHz	-53	
1 785 MHz to	4GHz	-47	
1 GHz to	1 850 MHz		-47
1 850 MHz to	1 910 MHz		-53
1 910 MHz to	4GHz		-47

Test procedure

- 1) Initially the test antenna is closely coupled to the MS and any spurious emission radiated by the MS is detected by the test antenna and receiver in the range 30MHz to4GHz.
- 2) The test antenna separation is set to the appropriate measurement distance and at each frequency at which a spurious emission has been detected the MS is rotated to obtain a maximum response. The effective radiated power of the emission is determined by a substitution measurement. In case of an anechoic shielded chamber pre-calibration may be used instead of a substitution measurement.
- 3) The measurement bandwidth based on a 5 pole synchronously tuned filter shall be according to table 4.4.The power indication is the peak power detected by the measuring system.
- 4) .The measurements are repeated with the test antenna in the orthogonal polarization plane.

Table 4-4

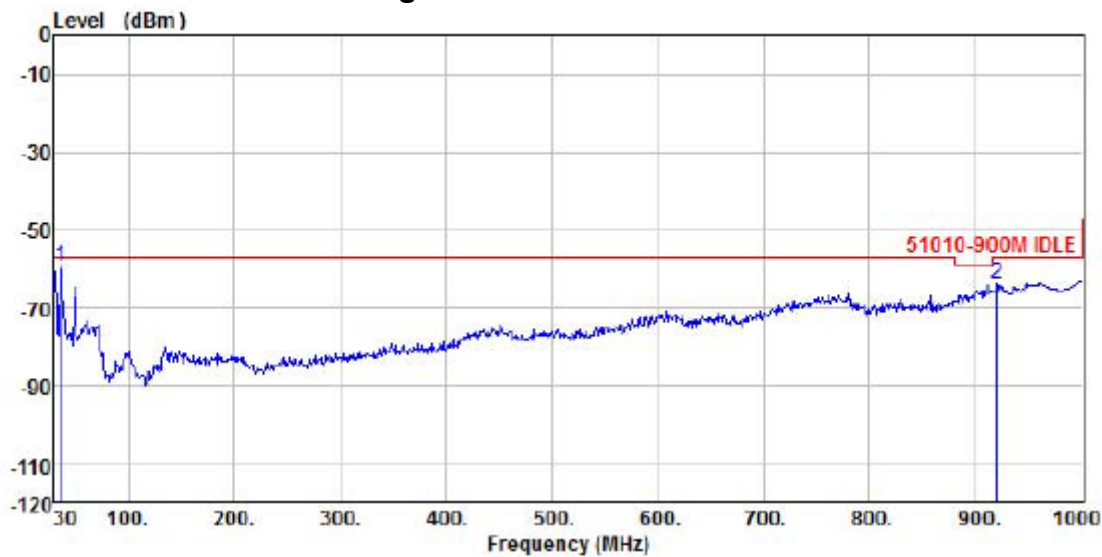
Frequency range	Filter bandwidth	Video bandwidth
30 MHz to 50 MHz	10 kHz	30 kHz
50 MHz to 4 GHz	100 kHz	300 kHz

Test Result

PASS

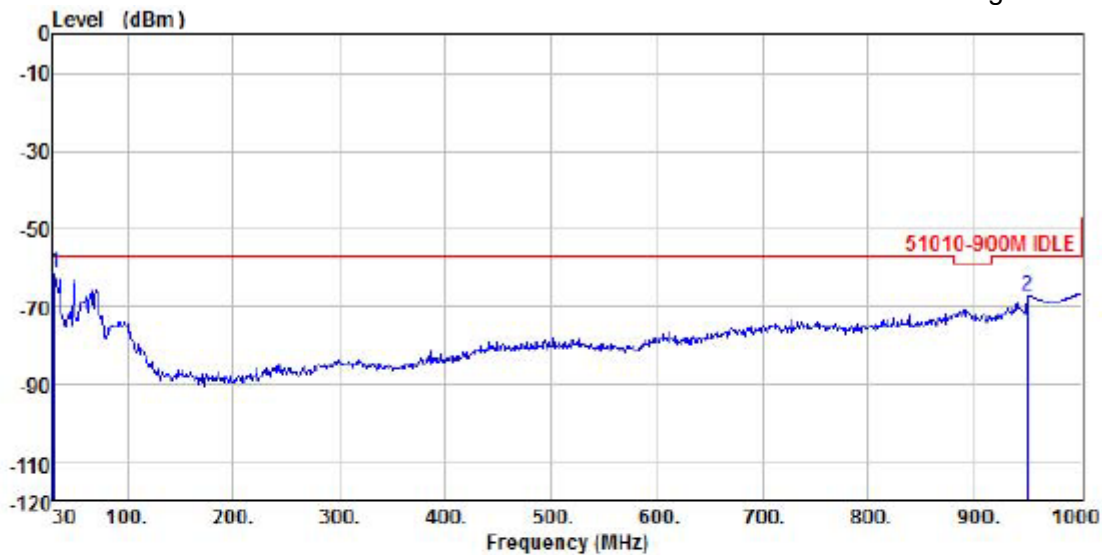
Please refer to following data plots

GSM900 Normal Voltage Condition at Middle Channel (idle)



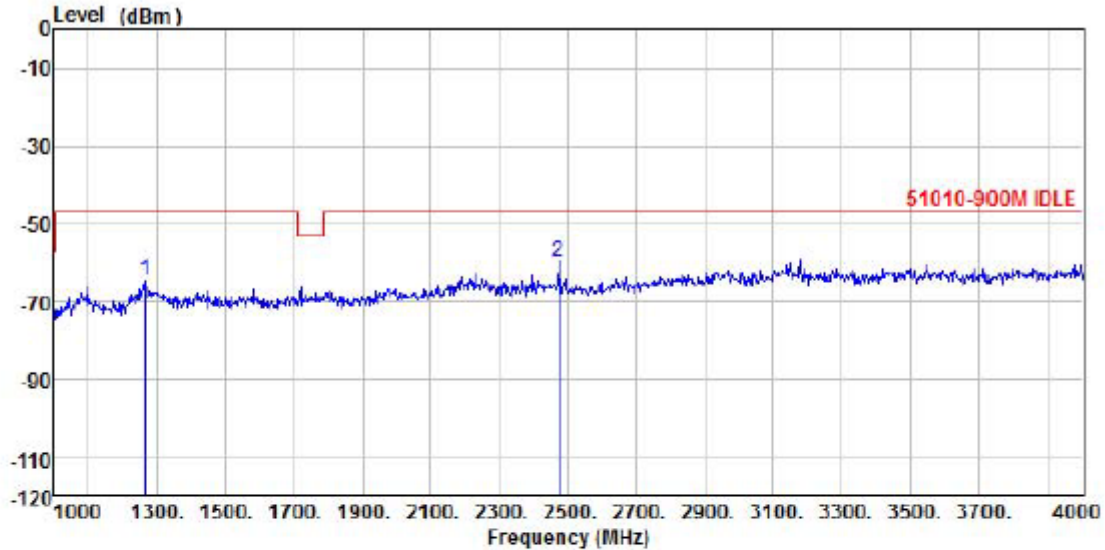
Site : chamber
Condition : 51010-900M IDLE 3m VULB9160(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900 IDLE
Memo :

	Read	Antenna	Cable	Preamp	Limit	Over	
	Freq	Level	Factor	Loss	Factor	Level	Line
	Limit	Remark					
	MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m
1	pp	35.82-84.60	24.50	0.76	0.00	-59.34	-56.99
2		918.52-110.73	42.66	4.09	0.00	-63.98	-56.99



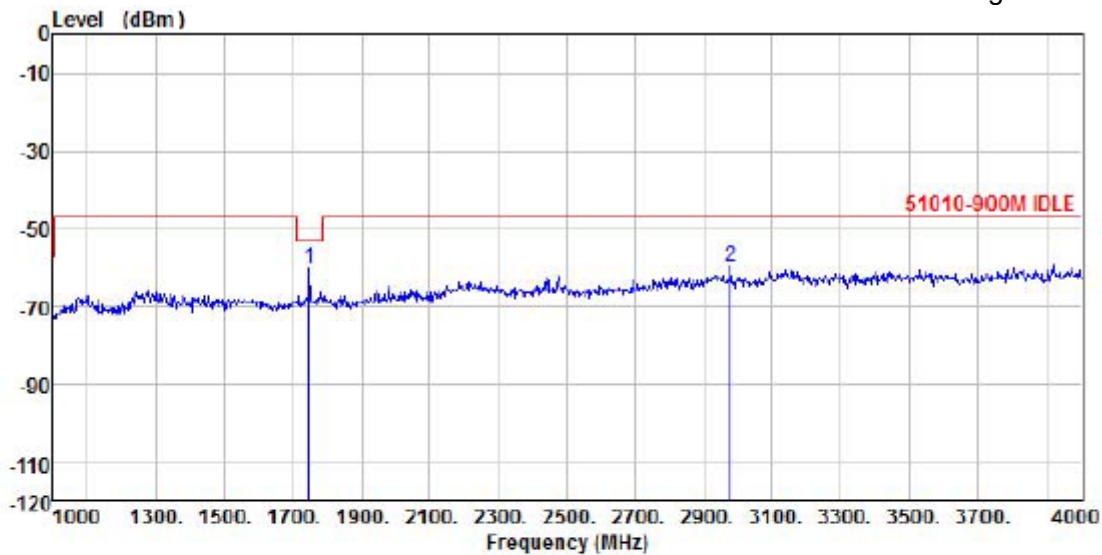
Site : chamber
Condition : 51010-900M IDLE 3m VULB9160(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900 IDLE
Memo :

		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss Factor	Level	Line	Limit	Remark		
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp	30.97-79.96	17.82	0.68	0.00	-61.46	-56.99	-4.47	Peak	
2	948.59-106.99	35.75	4.15	0.00	-67.09	-56.99	-10.10	Peak	



Site : chamber
Condition : 51010-900M IDLE 3m BBHA9120D(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900 IDLE
Memo :

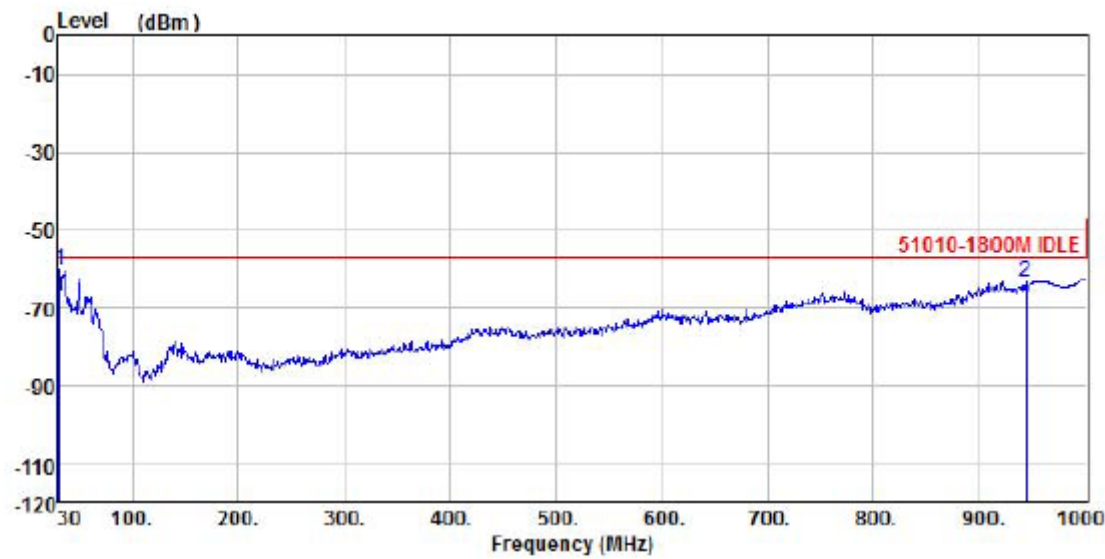
		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1	1264.00	-70.64	39.33	5.14	38.63	-64.80	-46.99	Peak	
2	2473.00	-67.29	38.38	7.41	38.50	-60.00	-46.99	Peak	



Site : chamber
Condition : 51010-900M IDLE 3m BBHA9120D(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM900 IDLE
Memo :

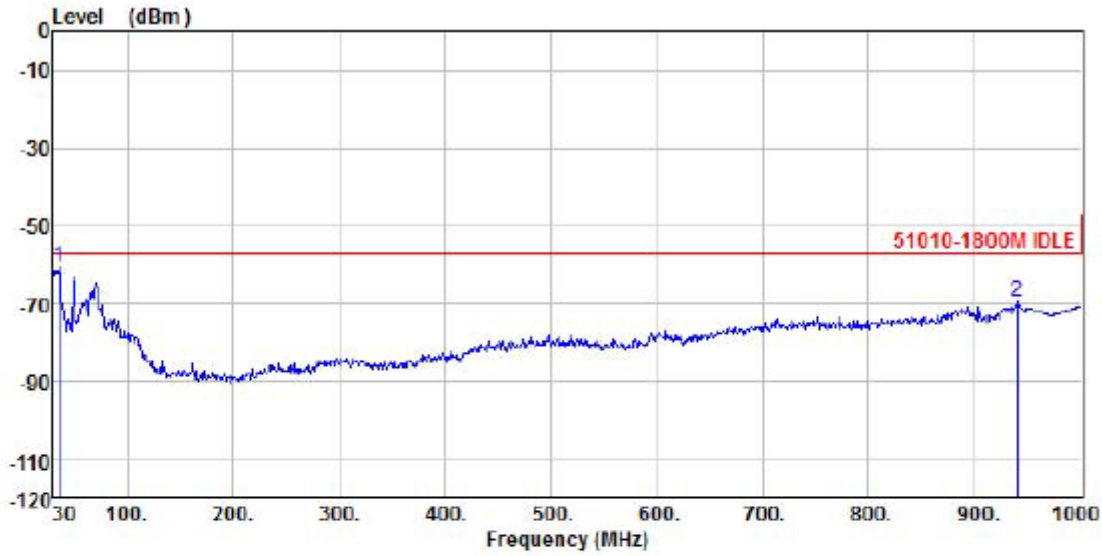
		ReadAntenna		Cable Preamp		Limit		Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark		
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB			
1 pp 1747.00	-64.53	36.83	6.03	38.66	-60.33	-52.99	-7.34	Peak		
2 2980.00	-69.84	40.23	8.04	38.34	-59.91	-46.99	-12.92	Peak		

GSM1800 Normal Voltage Condition at Middle Channel (idle)



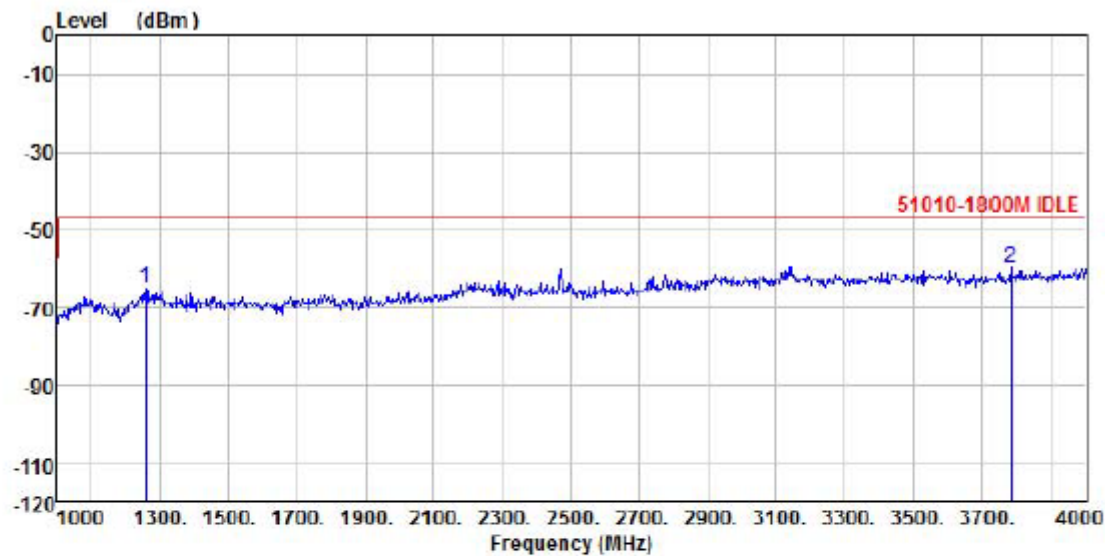
Site : chamber
Condition : 51010-1800M IDLE 3m VULB9160(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800 IDLE
Memo :

	ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB	
1 pp	30.97	-85.56	24.69	0.68	0.00	-60.19	-56.99	-3.20 Peak
2	941.80	-109.99	42.35	4.14	0.00	-63.50	-56.99	-6.51 Peak



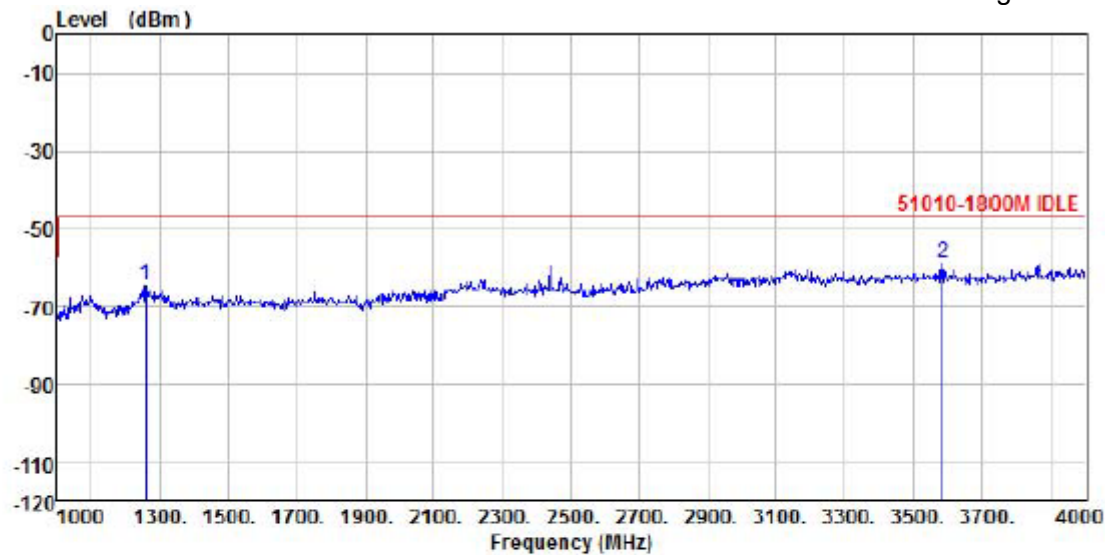
Site : chamber
Condition : 51010-1800M IDLE 3m VULB9160(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800 IDLE
Memo :

		ReadAntenna		Cable Preamp		Limit		Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1 pp	34.85-79.79	18.59	0.74	0.00	-60.46	-56.99	-3.47	Peak	
2	938.89-110.17	36.43	4.13	0.00	-69.61	-56.99	-12.62	Peak	



Site : chamber
Condition : 51010-1800M IDLE 3m BBHA9120D(RSE-H) HORIZONTAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800 IDLE
Memo :

	ReadAntenna		Cable Preampl		Limit		Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBm	dB/m	dB	dB	dBm/m	dBm/m	dB		
1	1258.00	-70.89	39.31	5.09	38.63	-65.12	-46.99	-18.13 Peak	
2	pp 3781.00	-72.03	40.80	8.98	37.74	-59.99	-46.99	-13.00 Peak	



Site : chamber
Condition : 51010-1800M IDLE 3m BBHA9120D(RSE-V) VERTICAL
EUT :
Model Name : SIM800
Temp/Humi : 20℃ /56 %
Power Rating:
Mode : GSM1800 IDLE
Memo :

		ReadAntenna		Cable Preamp		Limit		Over			
Freq		Level	Factor	Loss	Factor	Level	Line	Limit	Remark		
MHz		dBm	dB/m	dB	dB	dBm/m	dBm/m	dB			
1	1258.00	-70.54	39.31	5.09	38.63	-64.77	-46.99	-17.78	Peak		
2	pp 3586.00	-70.67	40.82	8.71	37.88	-59.02	-46.99	-12.03	Peak		

4.12. Receiver blocking and spurious response- speech channels

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.20

Limits

According to clause 14.7.1 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1, 14.7.1

Table 4-29a: Statistical test limits for blocking performance

Channel	bits per s	Orig. RBER requirement	Derived test limit	Target number of samples	Target test time (s)	Target test time (hh:mm:ss)
TCH/FS Class II	3900	0,020000	0,025020	16107	4	00:00:04

Table 4-29c: Limits for blocking

Channel	Type of measurement	Test limit error rate %	Minimum number of samples
TCH/FS Class II	RBER	2,439	8 200

Test procedure

- 1.A call is set up according to the generic call set up except the BCCH frequency list shall be empty, on a TCH with an arbitrary ARFCN in the range supported by the MS.
- 2.The power control level is set to maximum power.
- 3.The ARFN of the BCCH shall be the same- or at an offset of +/-2 channels, than that of the ARFCN for the TCH.
- 4.The SS transmits Standard Test signal C1 on the traffic channel.
- 5.The SS commands the MS to create traffic channel loop back signaling erased frames.

Test Result

PASS

4.13.Intermodulation rejection - speech channels

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.32

Limits

According to clause 14.6.1 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1, 14.6.1

Table 14-25: Limits for intermodulation rejection

Channel	Propagation conditions	Type of measurement	Test limit error rate %	Minimum No. of samples
TCH/FS Class II	Static	RBER	2,439	8 200

Test procedure

- 1.The amplitude of the wanted signal is set to 4 dB above the reference sensitivity level (see table 14-24).
- 2.The SS commands the MS to create the loop back facility signalling erased frames.
- 3.The SS produces a static wanted signal, and two static interfering (unwanted) signals at the same time.
There is no correlation in the modulation between the signals.
The first interfering signal is on a frequency equal to the centre frequency of an ARFCN four above that of the receiver. This signal is static and unmodulated.
The second interfering signal is on an ARFCN eight above that of the receiver. This signal is static, continuous and modulated by random data.
- 4.The amplitude of both the interfering signals is set according to table 14-24.
The SS compares the data of the signal that it sends to the MS with the signal which is looped back from the receiver after demodulation and decoding, and checks the frame erasure indication.
- 5.The SS tests the RBER compliance of class II bits by examining at least the minimum number of samples of consecutive bits. Bits only taken from those frames which do not signal frame erasure.
The number of error events is recorded.
- 6.The measurement of step 4) is repeated with the two unwanted signals having frequencies corresponding to ARFCN four and eight below the ARFCN of the wanted signal.
- 7.Steps 2) to 5), are repeated but with the receiver operating on an ARFCN in the Low ARFCN range.
- 8.Steps 5) to 5), are repeated but with the receiver operating on an ARFCN in the High ARFCN range.
- 9.Steps 1) to 7) are repeated under extreme test conditions.

Test Result

PASS

4.14.AM suppression - speech channels

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.35

Limits

According to clause 14.8.1 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1, 14.8.1

Table 14-33: Limits for AM suppression

Channel	Propagation conditions	Type of measurement	Test limit error rate %	Minimum No. of samples
TCH/FS Class II	Static	RBER	2,439	8 200

Test procedure

- 1.The SS produces a static wanted signal with an amplitude 4 dB above reference sensitivity level.
- 2.The SS produces an interfering signal as described below:
 - static fading profile;
 - at an in band frequency greater than 6 MHz separated from FR and separated by at least two ARFCNs from any spurious responses.
- 3.The SS compares the data of the signal that it sends to the MS with the signal which is looped back from the receiver after demodulation and decoding, and checks the frame erasure indication.
- 4.The SS tests the RBER compliance of class II bits by examining at least the minimum number of samples of consecutive bits. Bits only taken from those frames which do not signal frame erasure. The number of error events is recorded.

Test Result

PASS

4.15.Adjacent channel rejection - speech channels (TCH/FS)

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.38

Limits

According to clause 14.5.1.1 of TS 151 010-1[2]

Reference to 3GPP TS 51 010-1, 14.5.1.1

Table 14-22: Limits for adjacent channel electivity

			GSM 400, GSM 700, T-GSM 810, GSM 850 and GSM 900		DCS 1 800 and PCS 1 900	
Interference at	Channel	Type of measurement	Test limit error rate %	Minimum No. of samples	Test limit error rate %	Minimum No. of samples
200 kHz	TCH/FS class Ib class II	FER	$6,742 \cdot \alpha$	8 900	$3,371 \cdot \alpha$	17 800
		RBER	$0,420/\alpha$	1 000 000	$0,270/\alpha$	2 000 000
		RBER	8,333	600 000	8,333	1 200 000
400 kHz Interferer TUhigh	TCH/FS class Ib class II	FER	$6,742 \cdot \alpha$	8 900	$3,371 \cdot \alpha$	17 800
		RBER	$0,420/\alpha$	1 000 000	$0,270/\alpha$	2 000 000
		RBER	8,333	600 000	8,333	1 200 000
400 kHz Interferer Static	TCH/FS class Ib class II	FER	$11,461 \cdot \alpha$	8 900	$5,714 \cdot \alpha$	10 500
		RBER	$0,756/\alpha$	1 000 000	$0,483/\alpha$	1 200 000
		RBER	9,167	600 000	9,167	720 000

Test procedure

- 1.In addition to the wanted signal, the SS transmits an independent, uncorrelated interfering signal, Standard Test Signal I1 (unwanted signal). The SS produces an interfering signal as described below:
The unwanted signal is continuous and has no fixed relationship with the bit transitions of the wanted signal.
The fading characteristic of the wanted and the unwanted signal is set to TUhigh.
The unwanted signal is transmitted at a nominal frequency 200 kHz above the nominal frequency of the wanted signal.
- 2.The SS compares the data of the signal that it sends to the MS with the signal which is looped back from the receiver after demodulation and decoding, and checks the frame erasure indication.
- 3.The SS tests the frame erasure compliance for the TCH/FS by examining at least the minimum number of samples of consecutive frames. The number of frame erasure events is recorded.
- 4.The SS determines the number of residual bit error events for the bits of the class Ib and class II, by examining sequences of at least the minimum number of samples of consecutive bits of class Ib and class II, Bits are only taken from those frames for which no bad frame indication was given.
- 5.The measurement of steps 3) and 4) is repeated with the unwanted signal on a frequency at the same displacement from, but below, the frequency of the wanted signal.
- 6.The measurement of steps 3) to 5) shall be repeated for a displacement of the unwanted signal of 400 kHz, and with the amplitude of the unwanted signal 41 dB above the level of the wanted input signal, The fading characteristic of the wanted and the unwanted signal is set to TUhigh. If a system simulator does not support the faded interferer, a static adjacent interferer may be used.
- 7.Steps 3) to 6) are repeated for class II BER under extreme test conditions.

Test Result

PASS

4.16.Minimum Input level for Reference Performance - GPRS

Standard Applicable

According to ETSI EN 301 511 V12.5.1 §4.2.44

Limits

According to clause 14.16.1 of TS 151 010-1[2]
Reference to 3GPP TS 51 010-1, 14.16.1.5

Test procedure

The following operating conditions were made in accordance with the ETSI EN 301 511 Clause 4.2.44.

Test Result

PASS

APPENDIX A. Test SetUp Photographs

Please refer to the file named “RF Test Setup Photos”.

APPENDIX B. EUT Photographs

Please refer to the file named “EUT Photos”.

----End of the report----