

Go/No Go Test Script Specification, HVC

Applicable for Z1010

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1 General

1.1 About this document

This document contains the test requirements for the E-GSM900, GSM1800, GSM1900 and WCDMA pocket transceivers for use with RF adapter. This test should be used as an arrival and verification test for a quick test of the radio functionality.

All requirements in this document refer to phase 2 of the GSM specification and 3GPP specification.

Tests are done in signalling mode, i.e. a call has been established to the test equipment. The transceiver unit is controlled by the Test set via the air interface. RF performance is measured with a RF-adapter and RF cable.

1.2 Requirements

1. The test should be designed in such manner that it is possible to perform accurate testing without demands on users system expertise.
2. The measurements should run automatically, though a certain amount of manual work is included (and mandatory), such as call setup (i.e. dialling number).
3. It should be possible to print or store the measurement results.
4. It should be possible to change the channels used in testing due to possible local radio interference.
5. The attenuation factors should be loaded every time the script is initialised. It must be possible to use different attenuation factors for RX and TX. It must also be possible to use various attenuation factors for different channels in each band.
6. Some parameters should be possible to change for the user and some should not be possible to change:

<u>Parameter:</u>	<u>Possible to change:</u>
Attenuation factors	Yes *
Channel allocations table	Yes, within specified range *
Powerlevel allocation table	No
Measurement flow	No
Measurement limits	No

* All functions and settings should be protected in such manner that the end-user cannot directly change them. (For example a password or an encrypted settings file.)

All other set-ups than the one stated in this document must be discussed and exempted by SonyEricsson Mobile Communication AB to be approved.

1.3 General definitions

1.3.1 Channel allocation table

Band	Ch definition	Any ARFCN of:
E-GSM900	Low	975-979
E-GSM900	Mid	34-38
E-GSM900	High	120-124
GSM1800	Low	512-516
GSM1800	Mid	698-702
GSM1800	High	881-885
WCDMA	Mid	9750

1.3.2 Power level allocation table

Band	PL definition	Powerlevel (PL)
E-GSM900	Low	19
E-GSM900	Mid	12
E-GSM900	High	5
GSM1800	Low	15
GSM1800	Mid	8
GSM1800	High	0
WCDMA		Power Class3 (+24dBm (+1/-3))

1.3.3 Test limits

The test limits for each measurement is specified in the Sequence tables. Since the coupler introduces higher measurement inaccuracy, some measurements have wider limits than stated in the GSM specifications and 3GPP specifications.

1.4 Test conditions

1.4.1 General

Attenuation factors

All functions and settings, except channel setting change, should be protected in such manner that the end-user cannot directly change them. (For example a password or an encrypted settings file.)

The different scripts must be configured with the correct attenuation factors and named after the product that it is designed to test. The attenuation factors to be used are stated in *chapter 4*.

1.5 Scripts

General scripts for the different system combinations shall be developed. No handover is necessary if not stated, however, SonyEricsson mobile phones are capable with handover between E-GSM900/1800 and might therefore be used in order to decrease test time. Possible system combinations are listed below:

E-GSM900
GSM1800
E-GSM900/GSM1800

WCDMA requires an UMTS test set and a special developed script.

2 Test sequence GSM using cable connection

2.1 INITIALISING and call setup

Parameter	Value	Unit
BCCH	Mid	Ch
TCH	Low	Ch
TX power level	High	PL
RF output power	-50	dBm
System	GSM 1800	

2.1.1 Sequence

1. Initialise Test set
2. Insert a test-SIM and a fully charged standard battery. It's very important that a fully charged battery is used otherwise there is a risk for wrong test results. An antenna adapter and RF-holder together with RF-cable is used for Go/No-Go test. A dummy battery according to the equipment list can be used instead of original battery. (Fig.1 and Fig1.1)
3. Set up a call to the Test set or let the test instrument call the phone.



Fig.1 Slide the holder against the RF adapter.



Fig.1.1

2.2 Measurement group ALLMEAS LCH 1800

Parameter	Value	Unit
TCH	Low	Ch
TX power level	High	PL
RF output power	-68	dBm
System	GSM 1800	

2.2.1 Sequence

Measurement	Test limits	Unit
TX power	+/-2	dB
RMS Phase error	0 – 5	deg
Rx Level	36-48	Units
Rx Quality	0-3	Units

2.3 Measurement group ALLMEAS MCH 1800

Parameter	Value	Unit
TCH	Mid	Ch
TX power level	Mid	PL
RF output power	-102	dBm
System	GSM 1800	

2.3.1 Sequence

Measurement	Test limits	Unit
TX power	+/- 3	dB
RMS Phase error	0-5	deg
Peak Phase error	0-20	deg
Freq error	+/- 180	Hz
Rx Level	4-12	Units
Rx Quality	0-3	Units

2.4 Measurement group ALLMEAS HCH 1800

Parameter	Value	Unit
TCH	High	Ch
TX power level	Low	PL
RF output power	-68	dBm
System	GSM 1800	

2.4.1 Sequence

Measurement	Test limits	Unit
TX power	+/- 5	dB
RMS Phase error	0 – 5	deg

2.5 Measurement group ALLMEAS LCH 900

Parameter	Value	Unit
TCH	Low	Ch
TX power level	High	PL
RF output power	-68	dBm
System	E-GSM 900	

2.5.1 Sequence

Measurement	Test limits	Unit
TX power	+/- 2	dB
RMS Phase error	0 – 5	deg
Rx Level	36-48	Units
Rx Quality	0-3	Units

2.6 Measurement group ALLMEAS MCH 900

Parameter	Value	Unit
TCH	Mid	Ch
TX power level	Mid	PL
RF output power	-102	dBm
System	E-GSM 900	

2.6.1 Sequence

Measurement	Test limits	Unit
TX power	+/-3	dB
RMS Phase error	0 – 5	deg
Peak Phase error	0 – 20	deg
Freq error	+/- 90	Hz
Rx Level	4-12	Units
Rx Quality	0-3	Units

2.7 Measurement group ALLMEAS HCH 900

Parameter	Value	Unit
TCH	High	Ch
TX power level	Low	PL
RF output power	-68	dBm
System	E-GSM 900	

2.7.1 Sequence

Measurement	Test limits	Unit
TX power	+/-5	dB
RMS Phase error	0 – 5	deg

2.8 Call Termination

Parameter	Value	Unit
TCH	High	Ch
TX power level	Mid	PL
RF output power	-68	dBm
System	Discretionary	

2.8.1 Sequence

1. Call is disconnected. (By the phone or the Test set)
2. Turn off the phone.
3. Remove the test SIM-card.

3 Test Sequence using an RF Shield Box and Coupler

3.1 Initializing and Call Setup

Parameter	Value	Unit
BCCH	Mid	Ch
TCH	Mid	Ch
TX power level	High	PL
RF output power	-40	dBm
System	GSM 900	

3.1.1 Sequence

1. Initialize instrument
2. Insert a test-USIM and attach a fully charged standard battery to the mobile.
It's very important that a fully charged battery is used otherwise there is a high risk for incorrect test results.
3. Position the mobile in the coupler according to the picture. **Special attention to the correct orientation of the mobile in the coupler's cradle should be observed.**



4. Turn on the mobile and wait for registration.
5. Set up a call to the instrument or let the instrument call the MS.
6. Close the lid on the shielding box.

3.2 Audio Loopback

1. Set power level to high.
2. Activate audio loopback in the instrument.
3. Operator must acknowledge passed or failed before the test is continued.

3.3 Measurement Group ALLMEAS LCH 900

Parameter	Value	Unit
TCH	Low	Ch
TX power level	High	PL
RF output power	-68	dBm
System	GSM 900	

3.3.1 Sequence

Measurement	Test limits	Unit
TX power	33 +/-4	dB
RMS Phase error	0 +/-5	deg
Rx Level	34-50	dB
Rx Quality	0-3	Units

3.4 Measurement Group ALLMEAS MCH 900

Parameter	Value	Unit
TCH	Mid	Ch
TX power level	Mid	PL
RF output power	-102	dBm
System	GSM 900	

3.4.1 Sequence

Measurement	Test limits	Unit
TX power	19 +/-5	dB
RMS Phase error	0 +/-5	deg
Peak Phase error	0 +/-20	deg
Freq error	+/-0.1 ppm	Hz
Rx Level	2-14	dB
Rx Quality	0-3	Units

3.5 Measurement Group ALLMEAS HCH 900

Parameter	Value	Unit
TCH	High	Ch
TX power level	Low	PL
RF output power	-68	dBm
System	GSM 900	

3.5.1 Sequence

Measurement	Test limits	Unit
TX power	5 +/-7	dB
RMS Phase error	0 +/-5	deg

3.6 Measurement Group ALLMEAS LCH 1800

Parameter	Value	Unit
TCH	Low	Ch
TX power level	High	PL
RF output power	-68	dBm
System	GSM 1800	

3.6.1 Sequence

Measurement	Test limits	Unit
TX power	30 +/-4	dB
RMS Phase Error	0 +/-5	deg
Rx Level	34-50	dB
RX Quality	0-3	Units

3.7 Measurement Group ALLMEAS MCH 1800

Parameter	Value	Unit
TCH	Mid	Ch
TX power level	Mid	PL
RF output power	-102	dBm
System	GSM 1800	

3.7.1 Sequence

Measurement	Test limits	Unit
TX power	14 +/-5	dB
RMS Phase error	0 +/-5	deg
Peak Phase error	0 +/-20	deg
Freq. error	+/-0.1 ppm	Hz
Rx Level	2-14	dB
Rx Quality	0-3	Units

3.8 Measurement Group ALLMEAS HCH 1800

Parameter	Value	Unit
TCH	High	Ch
TX power level	Low	PL
RF output power	-68	dBm
System	GSM 1800	

3.8.1 Sequence

Measurement	Test limits	Unit
TX power	0 +/-7	dB
RMS Phase error	0 +/-5	deg

3.9 Measurement Group ALLMEAS LCH 1900

Parameter	Value	Unit
TCH	Low	Ch
TX power level	Low	PL
RF output power	-68	dBm
System	GSM 1900	

3.9.1 Sequence

Measurement	Test limits	Unit
TX power	0 +/-7	dB
RMS Phase Error	0 +/-5	deg
Rx Level	34-50	dB
RX Quality	0-3	Units

3.10 Measurement Group ALLMEAS MCH 1900

Parameter	Value	Unit
TCH	Mid	Ch
TX power level	Mid	PL
RF output power	-102	dBm
System	GSM 1900	

3.10.1 Sequence

Measurement	Test limits	Unit
TX power	14 +/-5	dB
RMS Phase error	0 +/-5	deg
Peak Phase error	0 +/-20	deg
Freq. error	+/-0.1 ppm	Hz
Rx Level	2-14	dB
Rx Quality	0-3	Units

3.11 Measurement Group ALLMEAS HCH 1900

Parameter	Value	Unit
TCH	High	Ch
TX power level	High	PL
RF output power	-68	dBm
System	GSM 1900	

3.11.1 Sequence

Measurement	Test limits	Unit
TX power	30 +/-4	dB
RMS Phase error	0 +/-5	deg

3.11.2 Call Disconnect Sequence

1. Disconnect call.
2. End test.

4 Test sequence WCDMA

4.1 Sequence

1. Initialise Test set
2. Insert a test-USIM and a fully charged standard battery. It's very important that a fully charged battery is used otherwise there is a risk for wrong test results. An antenna adapter and RF-holder together with RF-cable is used for Go/No-Go test. A dummy battery according to the equipment list can be used instead of original battery. (see chapter 2.1.1 Fig.1 and Fig1.1)
3. Set up a call to the Test set or let the test instrument call the phone

4.2 Measurement group WCDMA Mid Channel

Parameter	Value	Unit
Uplink channel (TX)	9750	ch
Downlink channel (RX)	10700	ch
Downlink power	-55.0	dBm
Downlink power in max output power test	-65.0	dBm
Downlink power in min output power test	-65.0	dBm
Downlink power in frequency error test	-65.0	dBm
Downlink power in EVM rms(1) test	-65.0	dBm
Downlink power in EVM rms(2) test	-65.0	dBm
Downlink power in sensitivity test(BER)	-80.0	dBm
Downlink power in max input(BER)	-25.0	dBm
System	WCDMA	

4.2.1 Sequence

Measurement	Test limits	Unit
Maximum output power	19.0 – 25.0	dBm
Minimum output power	-49.0 or less	dBm
Frequency error	+/- 0.10 or less	ppm
EVM rms (1)	17.5% or less	%
EVM rms (2)	17.5% or less	%
Sensitivity (BER)	0.10% or less	%
Maximum input (BER)	0.10% or less	%

5 Attenuation factors for Sony Ericsson Z1010

5.1 Attenuation factors for RF-holder

These values shall be used when testing the SonyEricsson Z1010 with RF-holder and antenna adapter with RF-cable RPM 119 855. For WCDMA testing shall RF-cable RPM 119 855 and N-TNC adapter be used.

Band	Channel*	Attenuation	
		RX	TX
EGSM 900	All	0.8	0.8
GSM 1800	All	1.3	1.3
WCDMA	All	1.3	1.2

*See Channel allocation table.

5.2 Using the Rohde & Schwarz RF Shield Box and Coupler

The following values shall be used when testing the Sony Ericsson Z1010 in the Rohde & Schwarz RF shield box (**R&S part # 1150.1008.02**) using the Rohde & Schwarz coupler (**R&S part # 1150.0801.02**) and SEMC RF-cable (**SEMC part # RPM 119 855**). A precision type N Male to SMA Female adapter is required to connect the cable to the RF shield box and a precision type TNC Male to N Female adapter is required to connect the cable to the VC100 tester.

Band	Channel*	Attenuation	
		RX	TX
GSM 900	Low	6,11	5,74
	Mid	6,55	4,49
	High	7,94	5,42
GSM 1800	Low	18,44	29,74
	Mid	17,50	25,00
	High	14,00	20,11
WCDMA	Low	N/A	N/A
	Mid	15.1	15.1
	High	N/A	N/A

* See Channel Allocation Table

6 Yokogawa VC100

Depending on the software version in the VC100 instrument it might not be possible to download the Testprofile file to the VC100. In these cases please use the file UMTS_Europe which is supplied with the VC100 as a template and fill in the values as stated in section 5.1 for Z1010 and R&S Antenna coupler and 5.2 for Z1010 and direct cable connection.

For instructions how to download the Test profile files and how to edit the UMTS_Europe file please refer to the VC100 Users Manual.

6.1 Yokogawa VC100 Settings R&S Coupler

Z1010_RS_Coupler

1 Information of UE				
1.1 Protocol Data	: Profile_01			
1.2 Power Class	: Class3 +24(+1/-3)dBm			
1.3 Control	: Non			
1.4 RF Connection	: Antenna Coupler			
1.5 Comment	: Z1010 RS Coupler			
2 Selection of Test Items				
Call Setup and Release from NW		*		
Call Setup and Release from UE		*		
Speech Test		*	Call by MS	Delay Time : 0.5 sec
Loop-back Mode-1(Radio Characteristics Test and Current Measurement)		*		
	Maximum Output Power	*	Measurement Times : 1 times	
	Minimum Output Power	*	Measurement Times : 1 times	
	Settable Output Power	*	Measurement Times : 1 times	
	Frequency Error	*	Measurement Times : 1 times	
	Mod Accuracy EVM(1)	*	Measurement Times : 1 times	
	Mod Accuracy EVM(2)	*	Measurement Times : 1 times	
	Reference Sensitivity(BER)	*	Measurement Time : 1 sec	
	Maximum Input(BER)	*	Measurement Time : 1 sec	
	Current in Connected	-	Measurement Time : 1.0 sec	Waiting Time : 0 sec

Current in Idle	-	Measurement Time : 5.0 sec	Waiting Time : 0 sec
3 W-CDMA			
3.1 Compensation value for Downlink Power	Setting Value : 15.1 dB		
3.2 Compensation value for Uplink Power	Setting Value : 15.1 dB		
3.3 Downlink Power	Setting Value : -65.0 dBm		
3.4 Frequency Channel Number for Downlink	Setting Value : 10688		
3.5 Frequency Channel Number for Uplink	UARFCN = (Frequency Channel Number for Downlink - 950)		
3.6 Maximum Output Power	DL Tx Power : -65.0 dBm	Upper Limit : 25.0 dBm	
	Lower Limit : 19.0 dBm		
3.7 Minimum Output Power	DL Tx Power : -65.0 dBm	Upper Limit : -49.0 dBm	
3.8 Settable Output Power	DL Tx Power : -65.0 dBm	Upper Limit : -19.0 dBm	
	Lower Limit : -21.0 dBm		
3.9 Frequency Error	DL Tx Power : -65.0 dBm	Upper Limit +/- : 0.100 ppm	
3.10 Mod Accuracy EVM(1)	DL Tx Power : -65.0 dBm	Upper Limit : 17.5 %	
3.11 Mod Accuracy EVM(2)	DL Tx Power : -65.0 dBm	UL Tx Power : -20.0 dBm	
	Upper Limit : 17.5 %		
3.12 Reference Sensitivity(BER)	DL Power Setting Ior^ : -106.7 dBm	Upper Limit : 0.1000 %	
3.13 Maximum Input(BER)	DL Power Setting Ior^ : -25.0 dBm	Upper Limit : 0.1000 %	
3.14 Power Supply	Setting Value : 4.3 V		
3.15 Current Consumption in idle	Peak Upperlimit : 600 mA	RMS Upperlimit : 100 mA	
3.16 Current Consumption in connected	UL Tx power : -20.0 dBm	Peak Upper limit : 500 mA	
	RMS Upper limit : 400 mA		

6.2 Yokogawa VC100 Settings Cableconnection

Z1010_Cable

1 Information of UE				
1.1 Protocol Data	: Profile_01			
1.2 Power Class	: Class3 +24(+1/-3)dBm			
1.3 Control	: Non			
1.4 RF Connection	: Coaxial Cable			
1.5 Comment	: Z1010 Cable			
2 Selection of Test Items				
Call Setup and Release from NW			*	
Call Setup and Release from UE			*	
Speech Test			*	Call by MS Delay Time : 0.5 sec
Loop-back Mode-1(Radio Characteristics Test and Current Measurement)			*	
	Maximum Output Power	*	Measurement Times : 1 times	
	Minimum Output Power	*	Measurement Times : 1 times	
	Settable Output Power	*	Measurement Times : 1 times	
	Frequency Error	*	Measurement Times : 1 times	
	Mod Accuracy EVM(1)	*	Measurement Times : 1 times	
	Mod Accuracy EVM(2)	*	Measurement Times : 1 times	
	Reference Sensitivity(BER)	*	Measurement Time : 1 sec	
	Maximum Input(BER)	*	Measurement Time : 1 sec	
	Current in Connected	-	Measurement Time : 1.0 sec	Waiting Time : 0 sec

Current in Idle	-	Measurement Time : 5.0 sec	Waiting Time : 0 sec
3 W-CDMA			
3.1 Compensation value for Downlink Power	Setting Value : 1.2 dB		
3.2 Compensation value for Uplink Power	Setting Value : 1.3 dB		
3.3 Downlink Power	Setting Value : -65.0 dBm		
3.4 Frequency Channel Number for Downlink	Setting Value : 10688		
3.5 Frequency Channel Number for Uplink	UARFCN = (Frequency Channel Number for Downlink – 950)		
3.6 Maximum Output Power	DL Tx Power : -65.0 dBm	Upper Limit : 25.0 dBm	
	Lower Limit : 19.0 dBm		
3.7 Minimum Output Power	DL Tx Power : -65.0 dBm	Upper Limit : -49.0 dBm	
3.8 Settable Output Power	DL Tx Power : -65.0 dBm	Upper Limit : -19.0 dBm	
	Lower Limit : -21.0 dBm		
3.9 Frequency Error	DL Tx Power : -65.0 dBm	Upper Limit +/- : 0.100 ppm	
3.10 Mod Accuracy EVM(1)	DL Tx Power : -65.0 dBm	Upper Limit : 17.5 %	
3.11 Mod Accuracy EVM(2)	DL Tx Power : -65.0 dBm	UL Tx Power : -20.0 dBm	
	Upper Limit : 17.5 %		
3.12 Reference Sensitivity(BER)	DL Power Setting Ior^ : -106.7 dBm	Upper Limit : 0.1000 %	
3.13 Maximum Input(BER)	DL Power Setting Ior^ : -25.0 dBm	Upper Limit : 0.1000 %	
3.14 Power Supply	Setting Value : 4.3 V		
3.15 Current Consumption in idle	Peak Upperlimit : 600 mA	RMS Upperlimit : 100 mA	
3.16 Current Consumption in connected	UL Tx power : -20.0 dBm	Peak Upper limit : 500 mA	
	RMS Upper limit : 400 mA		

7 Revision history

Rev.	Date	Changes / Comments
A	2004-07-13	First Release