Conforming to GSM-05-05/J-STD-007 Standard Test

Gate In & EXT Trigger

GSM-BTS
Frame Sync

ATT *1

Tx OUT
(sub-emission
measurement
: Rx)

GSM-MS

RF IN
*2

Application
software

Spectrum Analyzer U3641

*1 : Unnecessary for spurious measurement.
*2 : When spurious measurement, a filter for
carrier cut is required.

Detector   ATT *1   Converter

EXT PC

(BTS (base station) measurement)
(MS   (mobile station) measurement)
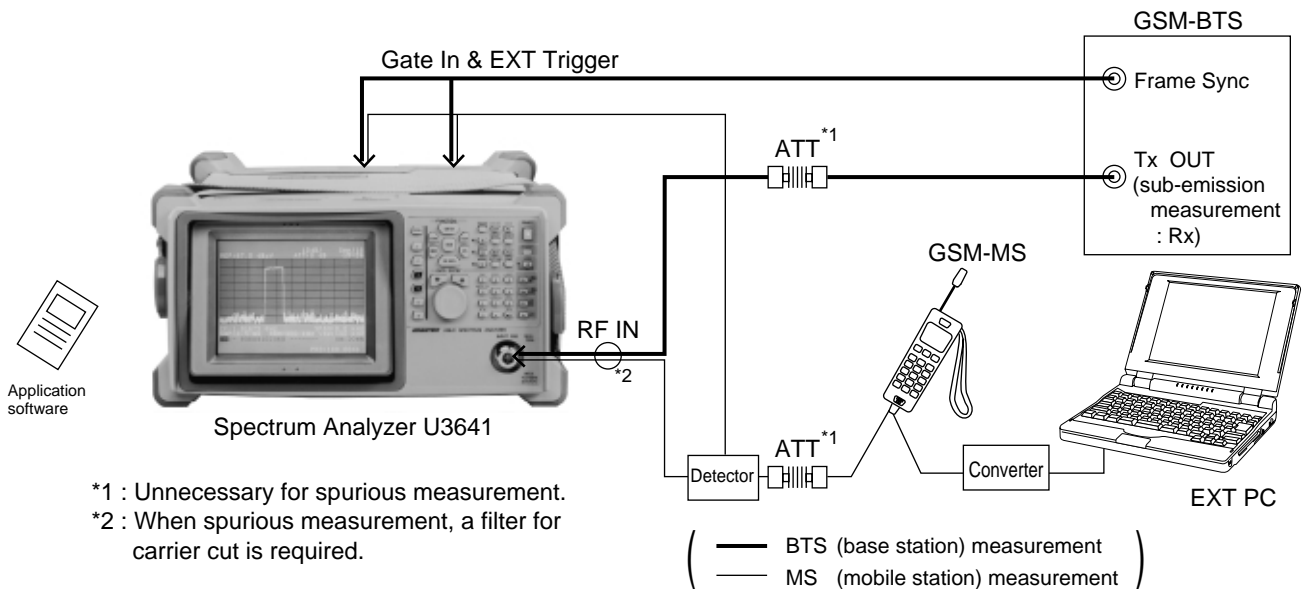
■ Overview

Many measurement items in the test of the GSM/DCS1800 /DCS1900 transmission characteristics regard the relative value (dBc) evaluation against the "Carrier Power."

The Spectrum Analyzer U3641 can be combined with the GSM/DCS1800/DCS1900 measurement software to easily perform the transmission characteristics tests conforming to GSM-05-05/J-STD-007.

Unnecessary to execute complicated operations after power measurement, including limit line setting and setting condition changes for each measurement, as for conventional spectrum analyzers.

■ Main Features

● GSM/DCS standard measurement and judgment can be done by one button.

● Selectable the measurement way in step by step or sequential.

● Possible to save the setting condition or measurement result into memory card.

● Print out of measurement result is possible.

■ Measurement Items

Measurement items (GSM/DCS)	Details
Output Power	・ Carrier Power ・ Tx Band Peak Power ・ Tx Band Total Power
Output RF Spectrum due to the Modulation	・ Modulation Swept up to 1.8MHz ・ Modulation Multiple up to 1.8MHz ・ Modulation Single up to 1.8MHz ・ Modulation Swept from 1.8MHz ・ Modulation Multiple from 1.8MHz ・ Modulation Single from 1.8MHz
Output RF Spectrum due to Transients	・ Transients Swept ・ Transients Multiple ・ Transients Single
Spurious Emissions (∼3GHz)	・ Trm/Rcv TX Band Excluded ・ Trm/Rcv TX Band ・ RX Band
Output Level Dynamic Operation	Power vs Time ・ Frame ・ Time Slot

GSM/DCS1800/DCS1900 •——————

■ 4 Types of Application Software for Respective Standards

Model	Description
PU36410300-IC	GSM/DCS1800-MS Software
PU36410310-IC	GSM/DCS1800-BS Software
PU36410500-IC	DCS1900-MS Measurement Software
PU36410510-IC	DCS1900-BS Measurement Software

Note : The above software can be operated in the manual (master) mode only.

<Applicable System>

● **Spectrum Analyzer**
   U3641+15

Operation of these four types of software requires the controller option (OPT. 15) .

■ Easy Parameter Setting in Menu Form (Set Parameter Save/Recall Function to Accommodate Various Settings)

```
Power Class   =   8
Time Slot     =   0
TDMA struct.  = 156.25

DUT id        =    DUT 001
```

Power Class .... Power class setting

Time Slot..................... Time slot setting

```
Nb Bursts   =     1

ARFCN       =     1
Carrier F   =  935.20 Mz

Trg Source  =     EXT
Trg Delay   =   0.005  ms
Trg Level   =    40 %
Trg Level   =   2.5 V

Ext Att     =   30.0 dB
```

ARFCH........................ Measurement channel setting

Carrier F..................... Carrier frequency setting

Trg Source................... Trigger selection of internal Level trigger or external EXT trigger

Ext Att....................... Input the external attenuator value (Add this value to measured power as correction factor)

```
MoMlFr start  =    935 Mz
MoMlFr Stop   =    940 Mz

Freq Offset   =    800 Kz

Lim 6dB Flag  =      OFF
Filter Flag   =      OFF
Filters Nb    =    0
Stop Filter1  =    0.00  Mz
Stop Filter2  =    0.00  Mz
Stop Filter3  =    0.00  Mz
Stop Filter4  =    0.00  Mz
Stop Filter5  =    0.00  Mz
BTS Mode      =    Trmttr
```

MoMlFr start............... ⎫ Measurement range setting for
MoMlFr stop .... ⎭ Modulation Multiple from 1.8MHz

Freq offset.................... Measurement frequency setting for Modulation/Transients/Single measurements

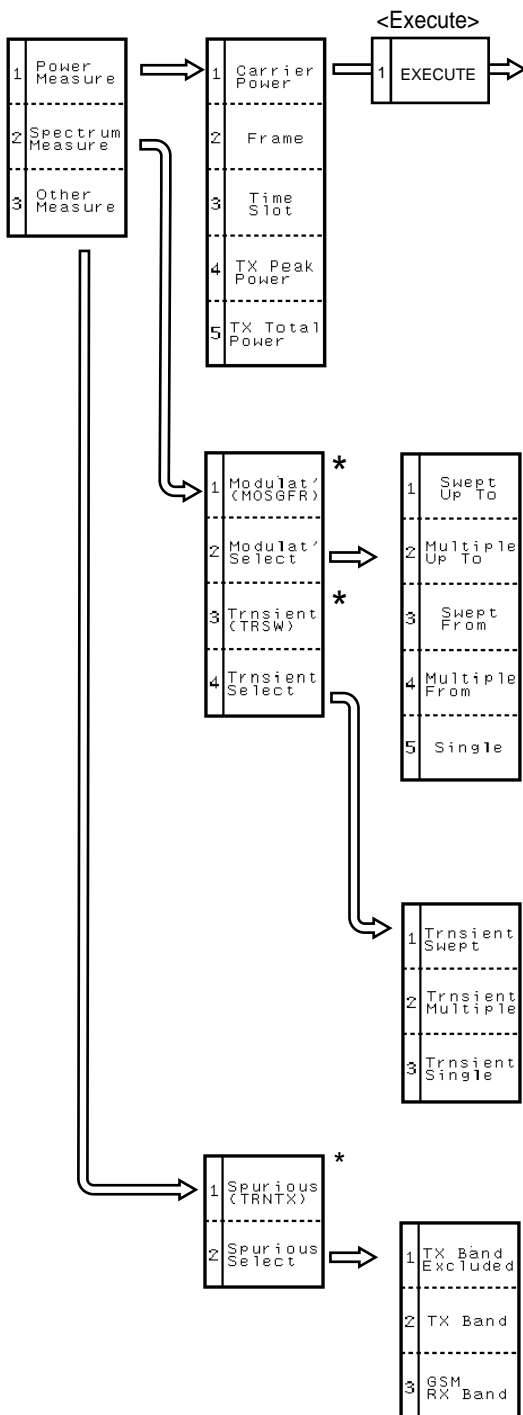Lim 6dB Flag............... Measurement type selection for spurious emission measurement; FAIL point only or up to 6dB below from the Limit value

Filter Flag .... Sweep stop at the filter change timing during spurious emission measurement

■ Precise Measurement for Each Measurement Items
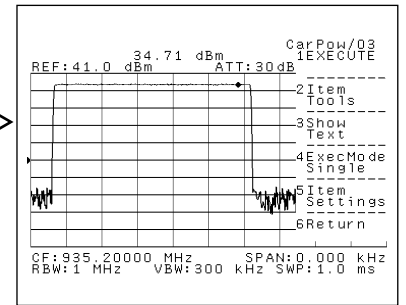
<Measurement Item Selection>

<Example of Carrier Power Measurement>

<Execute>

```
Carrier Power              CarPow/03
-----------------------------1EXECUTE
         1997/07/03 22:09:59
         VERDICT : PASS
                   ----------2Item
Carrier Power  =    34.89 dB  Tools
                   ----------
Nominal Power  =    34.00 dB 3Show
Maximum        =    37.00 dB  Wave
Minimum        =    34.00 dB ----------
                             4ExecMode
                               Single
                             ----------
                             5Item
                               Settings
                             ----------
                             6Return
```

<Example of Measurement Result>

```
                             CarPow/03
              34.71 dBm        1EXECUTE
REF:41.0 dBm          ATT:30dB
                             ----------
                             2Item
                               Tools
                             ----------
                             3Show
                               Text
                             ----------
                             4ExecMode
                               Single
                             ----------
                             5Item
                               Settings
                             ----------
                             6Return

CF:935.20000 MHz      SPAN:0.000 kHz
RBW:1 MHz   VBW:300 kHz SWP:1.0 ms
```

<Example Display of "Show Wave">

```
Package: GSM-900 Base Station vB00
Printed ON Day: 1997/07/04 at Time: 09:29:51
Session Parameters :
--------------------

Power Class   =  8
Time Slot     =  0
TDMA struct. = 156.25
DUT id        =    DUT 001

****************
***   CarPow  ***
****************

Item Configuration Parameters :
-------------------------------

Nb Bursts   =     1
ARFCN       =     1
Carrier F   =  935.20 Mz
Trg Source  =     EXT
Trg Delay   =    0.005 ms
Trg Level   =    40 %
Trg Level   =    2.5 V
Ext Att     =    30.0 dB

Item Results :
--------------

1997/07/04 09:29:43
VERDICT : PASS
Carrier Power =    34.96 dBm
Nominal Power =    34.00 dBm
Maximum       =    37.00 dBm
Minimum       =    34.00 dBm
```
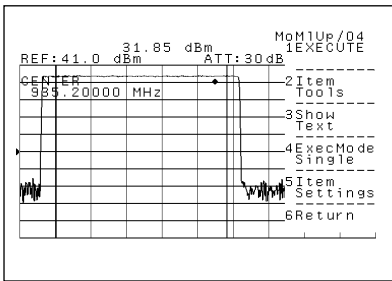
<Example Printout>

● Measurement results can be saved/recalled (not available for waveform).

* Frequently-used measurement items can be registered in soft keys for the Modulation/Transients /Spurious measurements.

GSM/DCS1800/DCS1900 Application Software

■ "Multiple" Measurement Conforming to Standards Measurement, "Swept" and "Single" Measurements with Priority to Speed

<Example of Modulation Multiple Measurement>

<Example Resulty>

■ Registration of Optional Measurement Procedure and Auto Execution with "Auto Sequence" Function

● The Record function of "Auto Sequence" can be used to register a measurement procedure operated only once. The Play function automatically executes the registered measurement sequence. It is also possible to save/recall the sequence and print

<Example of Printout by Auto Sequence>