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Model 2800 RF Power Analyzer
Release Note

Introduction

The latest firmware revision incorporates operation enhancements for the Model 2800. This Release Note documents these enhancements and includes the latest instrument specifications. The information in this Release Note pertains to units that have the following revision levels or higher:

A05 A06

Where: A05 is the main board ROM revision
A06 is DSP board ROM revision

The firmware revision is displayed during the power-up sequence. Example display message for A05 firmware: REV A05 A01.

This Release Note affects the Model 2800 User's Manual and the Model 2800 Reference Manual.

Release note topics

Operation enhancements

Averaging and external triggering

The following explains how repeat averaging operates with the external trigger source.

Repeat averaging

For External triggering, the instrument must receive N number of triggers to yield a single averaged reading (where N is the averaging count). For example, assume the Model 2800 is configured to measure the primary channel only, and the averaging count (N) is set to 10. Each received trigger will cause a measurement to occur and temporarily store it in an averaging stack (buffer). After the stack fills (10 readings stored), they are averaged to yield a single displayed averaged reading.

Now modify the above example so that the primary channel, upper adjacent channel, lower adjacent channel, upper alternate channel, and lower alternate channel are measured. The process is the same except that an averaged reading is yielded for every channel.

Reference Details on averaging and External trigger are provided in the following manuals:

- Section 2 of the User's Manual (see "Averaging").
- Section 3 of the Reference Manual (see "Triggering").

Cable compensation

The following note applies when using the Level trigger source with cable correction:

NOTE When using the Level trigger source and cable correction is enabled, the level trigger level will be detected on the cable corrected measured value.

Reference Details on cable correction are provided in Section 3 of the User's Manual (see "Cable compensation").

Delta frequency measurements

The following notes pertain to delta frequency (ΔF) measurements, which are covered in Section 3 of the User's Manual (see "ΔF measurements"):

NOTE Before selecting the ΔF function, make sure the instrument is displaying a valid power reading for the desired standard. The instrument cannot be in an overrange condition.

NOTE The minimum amplitude that can be detected by the Model 2800 for a ΔF measurement is -35dBm.

Reference Details on the ΔF function are provided in Section 3 of the User's Manual (see "ΔF measurements").

Functionality verification – noise floor

The noise floor specification has changed for some of the CDMA2000 1X band classes. Use the following new table in place of Table 4-2 of the Reference Manual. The noise floor specifications that have changed are highlighted by bold type.

Table 4-2
Noise floor test parameters

CDMA2000	Frequency Range [1] (MHz)	Noise floor [2] @ 1.23MHz BW	dBm/Hz
Band Class 0 (1x)	824.04 to 848.97	≤**-77.5dBm**	**-137.5dBm**
Band Class 1 (1x)	1850.00 to 1909.95	≤**-80.0dBm**	**-140.0dBm**
Band Class 4 (1x)	1750.00 to 1779.95	≤-78.0dBm	-138.0dBm
Band Class 6 (1x)	1920.00 to 1979.95	≤**-73.6dBm**	**-133.6dBm**
Band Class 8 (1x)	1710.00 to 1784.95	≤-78.0dBm	-138.0dBm
Band Class 9 (1x)	880.00 to 914.95	≤-75.0dBm	-135.0dBm

1. Center frequency of the primary channel depends on the selected channel.
2. Noise floor measured for the primary channel.

GSM standard - band classes

A new band class has been added for the GSM standard: US850 cellular band.

Reference Details on GSM measurements are provided in Section 4 of the User's Manual (see "GSM measurements").

Front panel operation

The following procedure to select the band class for the GSM standard has been modified to include the US850 cellular band.

1. Press the **Standard** key to display the standard menu.
2. Using the **PREV** and **NEXT** keys, select **GSM**, then press **Enter**.
3. Select either the **CELL**, **DCS**, **PCS,** or **US850** band, then press **Enter**.

NOTE In the included Specifications update, the CELL band for GSM is identified as the "GSM 900 Cellular Band".

Remote programming

The following command to select the band class for the GSM standard has been modified to include the parameter for US850:

SENS:GSM:TYPE <name>

<name> = CELL GSM 950 cellular band
= PCS GSM PCS 1900 band
= DCS GSM DCS 1800 band
= US850 GSM 850 cellular band

Example: SENS:GSM:TYPE US850 ' Select the 850 cellular band for GSM.

List mode – concurrent sweeping

The list mode has been enhanced to allow concurrent sweeping of a frequency list and an attenuator list. When the sweep is run, both lists (frequency and attenuator) are swept at the same time. The FREQ, ATT parameter has been added for the command to select sweep list type. The following command to select the sweep list type includes the new parameter:

```
SENS:LIST:CONT  <name>              ' Select sweep type.

<name>  =  FREQuency        Select frequency sweep list.
        =  ATTenuation      Select attenuator sweep list.
        =  FREQ, ATT        Select frequency and attenuator sweep list (concurrent sweep).

Example:        SENS:LIST:CONT  FREQ, ATT       ' Select frequency and attenuator sweep list.
```

Reference Details on list mode are provided in the following manuals:

- Section 3 of the User's Manual (see "List mode").
- Section 2 of the Reference Manual. In Table 2-5, follow the "Ref" link for the :LIST command.

NADC standard – primary channel bandwidth

The primary channel bandwidth for NADC is no longer fixed at 30kHz. It can now be set to 100kHz, which is the default setting.

Reference Details on NADC measurements are provided in Section 4 of the User's Manual (see "NADC measurements").

Front panel operation

After selecting the NADC standard and desired band class, the primary channel bandwidth can be changed by pressing **MEAS BW** and then selecting 30kHz or 100kHz.

Remote programming

The following command has been added to select the primary channel bandwidth for NADC:

```
SENS:PRIM:BAND  <NRf>

<NRf>  =  30e3        30kHz primary channel BW
       =  100e3       100kHz primary channel BW

Example:    SENS:PRIM:BAND  30e3      ' Set NADC primary channel measurement BW to 30kHz.
```

Power-on setup – *RST

The *RST defaults has been added as a front panel option for selection as a power-on setup. From the front panel, the instrument can now power-on to the FACTORY defaults, a USER SETUP (LOC 0, LOC1, or LOC2) or the *RST defaults.

Front panel operation

Perform the following steps to configure the Model 2800 to power-on to the *RST defaults:

1. Press **Menu** to display main menu items.
2. Use the **PREV** and/or **NEXT** key to place the blinking cursor on **SETUP**, and press **Enter**.
3. Use the **PREV** and/or **NEXT** key to place the blinking cursor on **POWER-ON**, and press **Enter**.
4. Use the **PREV** and/or **NEXT** key to place the blinking cursor on ***RST** and press **Enter**.

Reference Details on power-on setups are provided in Section 1 of the User's Manual (see "Saving and restoring setups").

Read commands

The READ? and MEASure? commands can now be used with the EXTernal and LEVel trigger sources selected. They can now also be used with the List Mode selected. Disregard all notes in the manuals that indicate otherwise.

The following commands are used to used to trigger and perform measurements:

READ?	This command performs an INIT and a FETch?
MEAS?	This command performs an INIT and a FETch?
INIT;:FETch?	This command sequence performs an INIT and a FETch?

The INIT command triggers one or more measurements, and FETch? requests the readings. The readings are sent to the computer after the Model 2800 is addressed to talk.

Reference Details on read commands are provided in Section 1 of the User's Manual (see "Summary of read commands").

Temperature compensation – acquire temperature

With temperature compensation enabled, the Model 2800 measures temperature as part of its measurement process. These temperature measurements are then factored into the algorithm to calculate a measured reading. With temperature compensation disabled, temperature is not routinely measured. Therefore, if the ambient temperature drifts, the measured readings will also drift.

For remote programming, an action command has been added to force (acquire) a temperature measurement while temperature compensation is disabled. The latest temperature reading is then used in the algorithm to calculate subsequent readings.

The following command acquires temperature and uses it to calculate subsequent readings.

SENS:TEMP:OCOM:ACQ

NOTE If using an instrument setup (user or power-on) that has temperature compensation disabled, you can use the above command to update the temperature for the algorithm to calculate measured readings.

Reference Details on temperature compensation are provided in the User's Manual:

- Section 1 – See "Temperature compensation" for details on the feature.
- Section 3 – See "Global instrument settings, Temperature compensation" for information to disable or enable temperature compensation.

Timestamp

The Model 2800 can use a system timestamp for returned readings. The timer for the timestamp starts at zero seconds when the instrument is turned on.

For remote programming, the following commands were added for the system timestamp:

```
SYST:TIME:RESet        ' Reset system timestamp to zero seconds.
SYST:TIME?             ' Query timestamp value.
```

Reference Details on the system timestamp are provided in Section 2 of the Reference Manual. In Table 2-3, follow the "Ref" link for the :ELEMents command.

Triggering – trigger timeout

A command has been added to control the timeout period for the Level and External trigger control sources. With the Level trigger source selected, a measurement is triggered when the specified input level is detected. With the External trigger source selected, a measurement is triggered when an input trigger from an external device is received.

After the instrument is taken out of idle (e.g., INIT, READ? or MEAS? sent), it waits for the Level or External trigger to occur. However, If the specified trigger timeout period expires before the trigger occurs, a timeout error (+703, Trigger Timeout Error) occurs and the Model 2800 returns to the idle state.

New command to control trigger timeout. Note that the default trigger timeout is five seconds:

TRIGger[:SEQuence[1]]:TimeOUT <n>

<n> = 1 to 300 (seconds)

Example: TRIG:TOUT 36 ‘ Set the trigger timeout to 36 seconds.

Reference Details on triggering are provided in Section 3 of the Reference Manual (see “Trigger model operation”).

Specifications update

This release note contains the latest Model 2800 specifications. Refer to www.keithley.com for specification updates.

Model 2800 RF Power Analyzer Specifications

FREQUENCY RANGE: 824 - 849MHz, 880 - 915MHz, 1710 – 1785MHz, 1850 - 1980MHz

FREQUENCY SETTINGS:

Cellular Standard	Channel number, N	Center Frequency, MHz	Frequency Band, MHz
CDMAOne Cellular Band	1 – 777 1013 – 1023	825.000 + 0.030*N 825.000+0.030*(N-1023)	824.7MHz – 848.31MHz
CDMAOne PCS Band	0 – 1199	1850.000 + 0.050*N	1850.00MHz – 1909.95MHz
North American Digital Cellular (NADC) Cellular Band	1 – 799 990 – 1023	825.000+ 0.030*N 825.000+0.030*(N-1023)	824.01MHz – 848.97MHz
North American Digital Cellular (NADC) PCS Band	1 – 1999	1849.980+0.030*N	1850.01MHz – 1909.95MHz
AMPS	1 – 799 990 – 1023	825.000+0.030*N 825.000+0.030*(N-1023)	824.01MHz – 848.97MHz
GSM 850 Cellular Band	128 – 251	824.200+0.2*(N-128)	824.200MHz – 848.800MHz
GSM 900 Cellular Band	0 – 124 975 – 1023	890.0 + 0.2*N 890.0 + 0.2*(N-1024)	880.2MHz – 914.8MHz
GSM DCS 1800 Band	512 – 885	1710.2 + 0.2*(N-512)	1710.2MHz – 1784.8MHz
GSM PCS 1900 Band	512 – 810	1850.2 + 0.2*(N-512)	1850.2MHz – 1909.8MHz
CDMA2000 Band Class 0	1 – 799 991 – 1023	825.000+0.030*N 825.000+0.030*(N-1023)	824.04MHz – 848.97MHz
CDMA2000 Band Class 1	0 – 1199	1850.000+0.050*N	1850.00MHz – 1909.95MHz
CDMA2000 Band Class 4	0 – 599	1750.000+0.050*N	1750.00MHz – 1779.95MHz
CDMA2000 Band Class 6	0 – 1199	1920.000+0.050*N	1920.00MHz – 1979.95MHz
CDMA2000 Band Class 8	0 – 1499	1710.000 +0.050*N	1710.00MHz – 1784.95MHz
CDMA2000 Band Class 9	0 – 699	880.000 + 0.050*N	880.00MHz – 914.95MHz
WCDMA Operating Band 1	9612 – 9888	0.2*N	1922.4MHz – 1977.6MHz
WCDMA Operating Band 2	9262 – 9538 12, 37, 62, 87, 112, 137, 162, 187, 212, 237, 262, 287	0.2*N 1850.1+0.2*N	1852.4MHz – 1907.6MHz
WCDMA Operating Band 3	8562 – 8913	0.2*N	1712.4MHz – 1782.6MHz

INTERNAL REFERENCE OSCILLATOR REFERENCE:
Aging per year: 1ppm
Temperature Drift: (5 to 40°C): 0.5ppm

EXTERNAL FREQUENCY REFERENCE INPUT:
Frequency: 10MHz ± 5ppm
Power: ≥2dBm
Input Impedance: 50Ω, nominal

INPUT:
Connector: Type N Female
Impedance: 50Ω
Maximum Overload Value: 24dBm, continuous
VSWR: <1.2:1 with input attenuator > 4dB
<1.3:1 with input attenuator ≤ 4dB

Model 2800 RF Power Analyzer Specifications

PRIMARY CHANNEL: MEASUREMENT RANGES

	CDMAOne	NADC	AMPS	GSM	CDMA2000 1X	CDMA2000 3X	WCDMA
Measurement Bandwidth[9]	1.23MHz	100kHz	30kHz	400kHz	1.23MHz	3.69MHz	3.84MHz
Repeatability: Mod.[3]	± 0.1dB	± 0.1dB	± 0.1dB	± 0.1dB	± 0.1dB	± 0.1dB	± 0.1dB
CW[12]	±0.05dB	±0.05dB	±0.05dB	±0.05dB	±0.05dB	±0.05dB	±0.05dB
Noise Floor[19]:					Band Class 0 ≤-77.5dBm	Band Class 0 ≤-72.7dBm	
Cellular Band	≤-77.5dBm	≤-88.6dBm		≤-82.4dBm	Band Class 1 ≤-80.0dBm	Band Class 1 ≤-75.2dBm	Operating Band 1 ≤-68.7dBm
DCS Band			≤-89.0dBm	≤-82.9dBm	Band Class 4,8 ≤-78.0dBm	Band Class 4,8 ≤-73.2dBm	Operating Band 2 ≤-75.1dBm
PCS Band	≤-80.0dBm	≤-91.0dBm		≤-84.9dBm	Band Class 6 ≤-73.6dBm	Band Class 6 ≤-68.8dBm	Operating Band 3 ≤-73.1dBm
					Band Class 9 ≤-75.0dBm	Band Class 9 ≤-70.2dBm	

Accuracy (23ºC ± 5ºC)[1]:

	CDMAOne Cell	NADC Cell	AMPS	GSM Cell	CDMA2000 1x BC0	CDMA2000 1x BC1	CDMA2000 1x BC4	CDMA2000 1x BC6	CDMA2000 1x BC8	CDMA2000 1x BC9
20 dBm to -40dBm	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB
-40.01 dBm to -50dBm	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB	± 0.5 dB
-50.01dBm to -60dBm	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB	± 0.73 dB
-60.01 dBm to -70dBm[2]	± 1.07 dB	± 0.94 dB	± 0.94 dB	± 0.94 dB	± 1.07 dB	± 0.94 dB	± 1.02 dB		± 1.02 dB	± 1.65 dB

	CDMAOne PCS	NADC PCS	GSM PCS	GSM DCS	CDMA2000 3x BC0	CDMA2000 3x BC1	CDMA2000 3x BC4	CDMA2000 3x BC6	CDMA2000 3x BC8	CDMA2000 3x BC9
20 dBm to -40dBm	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB	± 0.35 dB
-40.01 dBm to -50dBm	± 0.5 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB	± 0.4 dB
-50.01dBm to -60dBm	± 0.73 dB	± 0.6 dB	± 0.6 dB	± 0.6 dB	± 0.6 dB[2]	± 0.6 dB[2]	± 0.6 dB[2]	± 0.72 dB[2]	± 0.6 dB[2]	± 0.6 dB[2]
-60.01 dBm to -70dBm[2]	± 0.94 dB	± 0.94 dB	± 0.94 dB	± 0.94 dB						

	WCDMA OB1	WCDMA OB2	WCDMA OB3
20 dBm to -40dBm	± 0.35 dB	± 0.35 dB	± 0.35 dB
-40.01 dBm to -50dBm	± 0.4 dB	± 0.4 dB	± 0.4 dB
-50.01dBm to -60dBm[2]	± 0.73 dB	± 0.6 dB	± 0.6 dB

ADJACENT CHANNEL: (PRIMARY CHANNEL INPUT SIGNAL IN RANGE 5dBm TO 20dBm)

	CDMAOne	NADC	GSM	CDMA2000 1X	CDMA2000 3X	WCDMA
Measurement Bandwidth[9]	30kHz	25kHz	30kHz	30kHz	30kHz	3.84MHz
Offset from Center Frequency: Cellular	± 885kHz, ± 900kHz	± 30kHz	±200kHz	± 885kHz, ± 900kHz		
DCS , PCS	± 900kHz, ± 1250kHz	± 30kHz	±200kHz	± 900kHz, ± 1250kHz	± 2.65MHz	± 5MHz
Range at Specified Accuracy[15]	>55dBc	>36dBc	>40dBc	>55dBc	>55dBc	>33dBc
Accuracy (23ºC ± 5ºC)[1] Relative to primary channel	± 1.0dB	± 1.0dB	± 1.0dB	Band Classes 0,1,4,8,9: ± 1.0dB Band Class 6: 1.5dB	Band Classes 0,1,4,8,9: ± 1.0dB Band Class 6: 1.5dB	± 2.0dB[2]
Repeatability[3,12]: CW	± 0.5dB[4]	± 0.5dB[11]	± 0.5dB[11]	± 0.5dB[4]	± 0.5dB[4]	± 1.0dB[2]

ALTERNATE CHANNEL: (PRIMARY CHANNEL INPUT SIGNAL IN RANGE 5dBm TO 20dBm)

	CDMAOne	NADC	GSM	CDMA2000 1X	CDMA2000 3X	WCDMA
Measurement Bandwidth[9]	30kHz	25kHz	30kHz	30kHz	30kHz	3.84MHz
Offset from Center Frequency: Cellular	± 1.98MHz	± 60kHz	± 400kHz	± 1.98MHz		
DCS , PCS	± 1.98MHz	± 60kHz	± 400kHz	± 1.98MHz	± 3.10MHz	± 10MHz
Range at Specified Accuracy[15]	>55dBc	>48dBc	>60dBc	>55dBc	>55dBc	>43dBc
Accuracy (23ºC ± 5ºC)[1] Relative to primary channel	± 1.0dB	± 1.0dB	± 1.0dB	Band Classes 0,1,4,8,9: ± 1.0dB Band Class 6: 1.5dB	Band Classes 0,1,4,8,9: ± 1.0dB Band Class 6: 1.5dB	± 2.0dB[2]
Repeatability[3,12]: CW	± 0.5dB[4]	± 0.5dB[11]	± 0.5dB[11]	± 0.5dB[4]	± 0.5dB[4]	± 1.0dB[2]

Model 2800 RF Power Analyzer Specifications

OTHER MEASUREMENTS

UPPER SIDEBAND POWER (AMPS STANDARD ONLY):

MEASUREMENT OF POWER RELATIVE TO CARRIER @ 10KHZ OFFSET
Frequency Range: 824 - 849MHz
Carrier Measurement Bandwidth: 1kHz
Level: 20dBm to –40dBm
Accuracy: ± 0.5dB
Dynamic Range: 28dB

FREQUENCY: RANGE[16]: 824 - 849MHz, 880 - 915MHz, 1710 – 1785MHz, 1850 - 1980MHz
Resolution: 50Hz
Displayed Value: Difference between measured frequency and entered center frequency
Measurement Window: ± 90kHz, nominal, from entered channel number or center frequency
Level: 20dBm to –35dBm
Accuracy: ±50Hz (with external reference)

PEAK FUNCTION: Computes power level and frequency of 5 highest power components in primary channel power spectrum
Range: 824 - 849MHz, 880 - 915MHz, 1710 – 1785MHz, 1850 - 1980MHz
Frequency Resolution: 5kHz
Displayed Values: Power in dBm, Frequency in MHz
Measurement Window: ±1.82MHz from entered channel number or center frequency
Level: 20dBm to –40dBm
Level Resolution: ±0.01dBm
Level Accuracy: ±0.5dBm[18]

TRIGGER METHODS:

	Latency
Level	3us
External Trigger	100us
IEEE-488 Bus Command	2.5ms

MEASUREMENT PARAMETERS

	CDMAOne	NADC	GSM	CDMA2000 1X	CDMA2000 3X	WCDMA
Trigger Delay: Range	0 – 999.999ms	0 – 12.790ms	0 – 3.990ms	0 – 999.999ms	0 – 999.999ms	0 – 999.999ms
Resolution	1µs	3µs	1µs	1µs	1µs	1µs
Acquisition Time:						
Primary Channel	200µs	100µs – 12.790ms	100µs – 3.990ms	200µs	200µs	200µs
Adjacent/Alternate Channel	100µs – 999.999ms	100µs – 12.790ms	100µs – 3.990ms	100µs – 999.999ms	100µs – 999.999ms	200µs
Resolution	4µs	3µs	1µs	4µs	4µs	
Number of Averages:	1 - 100	1 - 100	1 - 100	1 - 100	1 - 100	1 - 100

MEASUREMENT TIME (TYPICAL)[7]:

	CDMAOne	NADC[11]	AMPS	GSM[11]	CDMA2000 1X	CDMA2000 3X	WCDMA
Primary Channel Power Measurement [5]	6ms	11ms[13]	40ms	4ms[13]	6ms	7ms	7ms
Primary Channel Power Measurement, Two Adjacent Channel Power Measurements, and Two Alternate Channel Power Measurements[5]	26ms[6]	16ms[10, 13]	N/A	10ms[10, 13]	26ms[6]	26ms[6]	88ms[17]
Time to complete 10 different power measurements at a single frequency[5,8,14]	75ms	141ms[13]	450ms	81ms[13]	75ms	80ms	90ms
Time to complete 10 power measurements of a single power level at different frequencies[5,14]	190ms	371ms[13]	690ms	325ms[13]	190ms	190ms	235ms[17]

Model 2800 RF Power Analyzer Specifications

GENERAL

PROGRAMMABILITY: IEEE-488.2 (SCPI – 1995.0), 3 user-definable power-up states plus factory default and *RST

MEMORY BUFFER: 2500 SETS OF 5 READINGS – primary channel power, upper and lower adjacent channel power, upper and lower alternate channel power, with time stamp, peak reading, average reading, and standard deviation

DIGITAL INTERFACE:
Digital I/O: 1 – TTL digital input, 4 – digital outputs with 250mA sink capability, maximum clamp voltage: $30V_{DC}$, 5V@100mA DC Source

REAR CONNECTIONS: RF Input – Type N connector, External Trigger, Meter Complete, External Reference In, Cal Output – BNC connector, Digital I/O – DB9 connector, IEEE-488 – 24-Pin EMI-shielded receptacle, Power – Power Switch/Line Entry Module with DPDT switch, 2 fuses, and IEC 320 plug

POWER SUPPLY: 100V/120V/220V/240V

LINE FREQUENCY: 50Hz to 60Hz

POWER CONSUMPTION: 100VA

ENVIRONMENT:
Operating: 5° to 40°C, 70%R.H., non-condensing, up to 35° C
Storage: 0° to 50°C

WARRANTY: 1year

SAFETY: Complies with European Union Directive 73/23/EEC, EN61010-1

EMC: Complies with European Union Directive 89/336/EEC, EN61326-1

VIBRATION: MIL-PRF-28800F Class 3 Random

WARM-UP: 1-hour to rated accuracy

DIMENSIONS:
Bench configuration (with handle and feet): 104mm highx485mm widex478mm deep (4.125in x19in x18.75in)
Rack Mounting: 89mm highx485mm widex478mm deep (3.5in x19in x18.75in)

WEIGHT:
Net Weight: 13.14 kg (28.9 lbs)
Shipping Weight: 14.5kg (32lbs)

ACCESSORIES SUPPLIED: Hardcopy User's manual, RF Product Information CD-ROM, rack mount kit, bench assembly kit.

Notes:

1. Based on measurements of NIST traceable CW signals, and locked to the source reference. Exclusive of input mismatch. Derate by ± 0.05dB/°C beyond 23°C ± 5°C.
2. Based on an average of 6 measurements.
3. Defined as 2 standard deviations of 100 consecutive readings while measuring a modulated signal.
4. Measurement acquisition time: 10ms.
5. Range: 20dBm to –60dBm (except CDMA2000 3X and WCDMA which are for 20dBm to –50dBm), averaging off, display off, input protection off, temperature compensation off, binary transfer, and 488.1 protocol. For measurements of only the primary channel, the adjacent channel measurements and the alternate channel measurements are disabled.
6. Adjacent channel power and alternate channel power acquisition time: 10ms.
7. Times are defined at specified repeatability and include IEEE-488 transfer times.
8. Includes time required to make two attenuator changes.
9. Bandwidths are designed to conform to definitions in cellular standards.
10. Measurement times include 3 measurements: primary channel power measurements and upper and lower adjacent channel power measurements.
11. Acquisition time is one time slot: NADC = 6.67ms, GSM = 577us. Level trigger is used.
12. Defined as 2 standard deviations of 100 consecutive measurements spaced evenly over an 8 hour period with ambient temperature of 23±1°C.
13. Pulse measurement times are defined from the time the rising edge of each power pulse is detected to the completion of the data transfer.
14. Times are exclusive of DUT settling times.
15. The range is defined as the maximum detectable difference between the primary channel power and the adjacent (or alternate) channel power for the specified accuracy and specified measurement bandwidth.
16. Defined for measurements on un-modulated carrier waveforms.
17. Times are based on measurements in Operating Band One.
18. Defined for signals whose carrier is at the programmed center frequency or offset by an integer multiple of 5kHz.
19. Defined with 0dB programmed attenuation, 23°C ± 5°C, input terminated with 50Ω, and 100 readings averaged.