

Countering strategy for R&S FPC1000 Spectrum Analyzer

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Elaboration on basic competitive strategy

R&S FPC1000 spectrum analyzer is an economy spectrum analyzer and its frequency bandwidth starts from 1GHz. 2GHz, 3GHz, advanced measurement functions and EMI receiver are options. Tracking Generator(TG) is not available for the series. It is anticipated that the series will draw attention from production lines due to pricing and requirements such as simple power measurements and low frequency demands.

The new GSP-9300B should be used to counter FPC1000. Three advantages of GSP-9300B should be utilized:

- (1) FPC1000 does not provide TG option. The price of FPC 3GHz is higher than that of GSP-9300B + TG;
- (2) High frequency stability: 0.025ppm (1ppm for FPC1000);
- (3) All advanced functions are standard and there is no extra €490 cost.

Three advantages are:

1. Highlight that FPC1000 does not have TG applications. The elaboration and advertisement strategy are as follows:

	GSP-9300B	FPC1000	Advertisement strategy
Frequency	9k ~ 3GHz	5k~3GHz	1. Compile advertisement documents of TG application examples and value to highlight the shortcomings of FPC1000 without TG option.
Price	€2.999	€3.210	
With TG	€3.550	NA	

2. The frequency stability of GSP-9300B is 0.025ppm, which is 40 times more stable than FPC' s 1ppm. The elaboration is in the factsheet.

3. The advanced functions of GSP-9300B have more measurements than the FPC. The advanced functions of GSP-9300B are standard. Users must pay €490 extra to have FPC' s advanced functions. The elaboration is in the factsheet.

Option	Standard functions of GSP-9300B	FPC' s option, K55
Advanced measurement function	15 functionalities (ACPR, SEM, OCBW, CHPW, N-dB BW, Phase Jitter, Harmonic, TOI, CNR, CSO, CTB, P1dB, TDP, spectrogram. Topographic)	5 functionalities (ACPR, SEM, TOI, spur mission, spectrogram)
Price	0	€490
Total price	€2.999	€3.700

Comparisons between GSP-9300B and FPC with different options are explained below:

Use GSP-9330 to counter FPC if GSP-9300B has the lower hand.

From the following chart we know that FPC with EMI receiver mode and demodulation function is better than GSP-9300B. Therefore, we recommend GSP-9330 to counter FPC in this combination.

	GSP-9300B		FPC1000		GSP-9330	
	Price	Feature	Price	Feature	Price	Feature
Frequency bandwidth	€2.999	3GHz ✓	€ 1.530 +€840 +€840	1GHz, 3GHz (+€840) 2GHz (+€840)	€4.999	3.25GHz
TG	+€551 ✓	3GHz	-	N/A	+€1.200	3.25GHz
Pre-Amp	standard		+€350	Lower noise floor ✓	standard	
Advanced measurement	standard	15 functionalities ✓	+€490	5 functionalities	standard	15 functionalities ✓
Demodulation analysis	standard	AM/FM only	+€690 ✓	AM/FM/ASK/FSK	standard	AM/FM/ASK/FSK
EMI receiver	N/A		+€490 ✓		standard	EMI mode
EMI probe set	+€699	GKT-008 ✓	+€2000	HZ-15	+€699	GKT-008 ✓
Communications	standard	support 3G/4G USB Dongle	+€290	WiFi	standard	support 3G/4G USB Dongle

Countermeasures for all competitive combinations

FPC has various options. For different options, the countermeasures of GSP-9300 series are as follows:

1. FPC 1/2/3GHz without any option

FPC	Application	Suggested countermeasure
1/2GHz, no option	General RF measurement	<ol style="list-style-type: none"> 1. Recommend GSP-9300B. Emphasize the 3GHz's future applications are very extensive. For example, NBIoT will use 800~2600MHz. 2. Emphasize the importance of TG. FPC does not have TG option.
3GHz, no option	General RF measurement	<ol style="list-style-type: none"> 1. Emphasize the importance of TG. FPC does not have TG option. The price of GSP-9300B+TG is lower. 2. Emphasize the advantages of GSP-9300B: the high frequency stability and standard advanced functions.

2. Pre-Amp,

Model	GSP-9300B		FPC(3GHz)	
	off	on	off	on
Preamp	off	on	off	on
Noise floor	-122dBm(1M~2.7GHz)	-142dBm(1M~2.7GHz)	-144dBm(1~3GHz)	-163dBm(1~3GHz)
Total price	€2.999	€2.999	€3.210	€3.560

FPC has a lower noise floor. For noise floor requirement under -142dBm we do not have the advantage.

3. Advanced measurement,

Features	GSP-9300B	FPC-K55	GSP-9330
Advanced measurements	15 (ACPR, SEM, OCBW, CHPW, N-dB BW, Phase Jitter, Harmonic, TOI, CNR, CSO, CTB, P1dB, TDP, spectrogram. Topographic)	5 (ACPR, SEM, TOI, spur mission, spectrogram)	15 (ACPR, SEM, OCBW, CHPW, N-dB BW, Phase Jitter, Harmonic, TOI, CNR, CSO, CTB, P1dB, TDP, spectrogram. Topographic)
Price	0	€490	0

GSP-9300B has more measurement functions. GSP-9300B is superior to FPC in terms of price and functionality.

4. Demodulation analysis,

Features	GSP-9300B	FPC-K55	GSP-9330
Modulation Analysis	AM, FM	AM, FM, ASK, FSK	AM, FM, ASK, FSK
Price	0	€690	0
Total price	€2.999	€3.900	€4.999

While comparing with GSP-9300B, FPC has a better demodulation capability and the price of FPC demodulation is cheaper than that of GSP-9330. However, the demodulation function of GSP-9330 has preamble and sync length setting, which can verify the correctness of data communications.

5. EMI Receiver mode:

(1) GSP-9300B does not have the EMI function. Recommend GSP-9330 EMI pretest function. But the price is higher.

Model	GSP-9330, 3GHz complete	FPC, 3GHz complete
Price	€4.999	€5.230

(2). For FPC collocating with EMI probe the price of conventional probe HZ-15 is USD\$2,545. By comparing FPC+HZ-15 and GSP-9330+GKT-008, we know GKT-008 has strong advantages in terms of innovation, performance, usage convenience, and price. Comparison is as follows:

Model	GSP-9330, 3GHz	FPC, 3GHz
GSP-9330	€4.999	€4.740
EMI function	Standard	€490
Probe	€699	€2.000
Total	€5.698	€7.230

Functional comparison between GSP-9300B and FPC:

	 GSP-9300B	 R&S FPC1000
Frequency Range	9 kHz ~ 3 GHz	5 kHz ~ 1/2/3GHz *upgrade
Frequency Stability	0.025ppm , 1ppm/year	1ppm, 1ppm/year
RBW Range	1Hz to 1MHz in 1-3-10 sequence 200Hz, 9kHz, 120kHz, 1MHz for EMI Filter	1 Hz~3 MHz in 1-3-10 sequence 200 Hz, 9 kHz, 120 kHz, 1MHz for EMI Filter (Option, receiver mode)
VBW Range	1 Hz to 1 MHz in 1-3-10 sequence	1 Hz to 3 MHz , in 1-3-10 sequence
Phase Noise	-88 dBc/Hz @1 GHz, 10 kHz offset	-88 dBc/Hz @500MHz, 30 kHz offset
Noise Floor	-131 dBm/Hz @1GHz, pre-amp off -149 dBm/Hz @1GHz, pre-amp on	-142 dBm/Hz @1GHz, pre-amp off -158 dBm/Hz @1GHz, pre-amp on
Pre-amplifier	Built-in 18 dB internal standard	16dB internal (Option, PA) (*No standard spec, uses calculating.)
Measurement Function	SEM, ACPR, OCBW, CHPW, N-dB BW, Phase Jitter, Harmonic, TOI, CNR, CSO, CTB, P1dB, TDP	OCBW, CHPW (Option Adv. Meas)
Display Modes	Spectrogram, Topographic, Split-Window	Spectrogram (Option Adv. Meas.)
Other Function	Sequence, Limit Line, Correction Table	Limit Line
Display	8.4"(800*600) TFT LCD with SVGA	10.1" (1366*768) TFT LCD with WXGA
Tracking Generator	100 kHz ~ 3 GHz (optional), 0 ~ -50 dBm	N/A
Demodulator	Only AM / FM	AM/FM, ASK/FSK (Option Demod.)
Interface	USB, RS-232, GPIB(Opt), Lan, MicroSD	USB, Lan, WiFi(Option Wifi)
Trace Number	4	2
Wireless function	3G/4G LTE SIM	WiFi Connection (Option, WiFi)

Reference:

Please refer to the following documents for GSP-9300B's superior functionality and specifications, and the introduction of TG application.

1. GW Instek GSP-9300B vs. R&S FPC1000 competitive Fact Sheet ◦
2. Reasons why spectrum analyzer requires TG.