

# Microwave Generator SMP – top-class performance to customer's benefit



FIG 1 Microwave Generator SMP, successful symbiosis of superb microwave technology and ergonomic computer design Photo 42 447

They have been on the market for about two years now – the microwave generators of the SMP family for the frequency range up to 40 GHz. Thanks to their excellent technical characteristics such as high output power, extremely high spectral purity, an intelligent operating concept and, last but not least, an especially attractive purchase price, the generators established themselves in this critical market segment straight away.

The qualities of SMP are reflected by its external design (FIG 1): a large-size LCD display normally provided only on high-grade notebook computers is simply an invitation for you to make an entry. Next you discover that operation is just as easy as it looks: **all settings can be made with a few keystrokes.**

No need to consult a manual. It is obvious that designers were at work here who knew all about practical operation. All functions have been packed into clear-cut, straightforward menus. Multifunction keys and cryptic special functions are really a thing of the past. And should the user some time or other wish additional information: help texts are available at a keystroke. The benefits for the user are evident. The feeling when working with SMP can best be described by the – slightly modified – slogan of a Bavarian automobile manufacturer: *measure with pleasure.*

But the merits of SMP are not restricted to its outside. Just take a look at FIG 2, which shows the typical **output power** versus frequency for the various SMP models. Levels of +16 dBm at 27 GHz (SMP03) and +11 dBm at 40 GHz (SMP04) are unparalleled on the market. Not to forget SMP22, which with about +29 dBm at 2 GHz and notable +23 dBm at 20 GHz puts quite a few competitors in their places. The advantages for the customer are obvious here too: the high output power makes all SMP models ideal for use in automatic test systems. "Power killers" such as long connecting cables, waveguide adapters, power dividers or relay matrices become harmless even at 40 GHz. In short, SMP users have

got it made. They need no expensive booster amplifiers. The modules shown in FIG 3 guarantee high output power and a wide frequency range.

And yet, what would the user-friendliest and most powerful signal generator be without a high-quality **frequency synthesizer**? SMP users need not worry about this. The state-of-the-art concept of SMP based on direct digital synthesis with a resolution of 0.1 Hz up into the 40-GHz range, excellent frequency stability, fast settling and extremely low SSB phase noise (FIG 4) leaves nothing to be desired.

Naturally, the **modulation characteristics** are every bit as good as the other data offered by generators of the SMP family. For example, AM ranges from DC to 100 kHz. Scan modulation with a wide dynamic range is possible for simulating antenna rotation in radar applications and for similar effects. FM ranges from DC to 5 MHz (typ. 7 MHz) for max. 10 MHz deviation and carrier frequencies up to 20 GHz (or max. 20 MHz deviation for frequencies above 20 GHz). On top of this, SMP is the first microwave generator worldwide to provide phase modulation from DC to 100 kHz. And not to forget pulse modulation, the classic type of modulation performed by microwave genera-

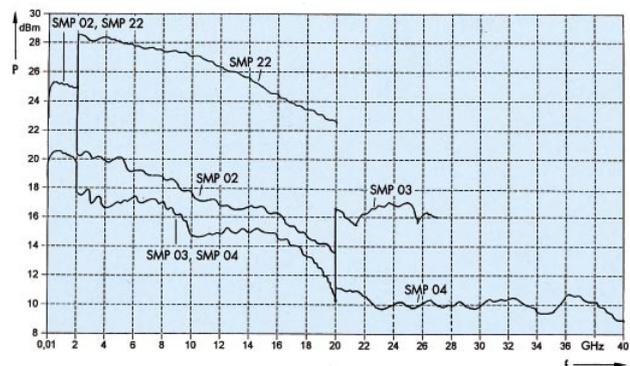


FIG 2 Typical maximum output power of Microwave Generators SMP

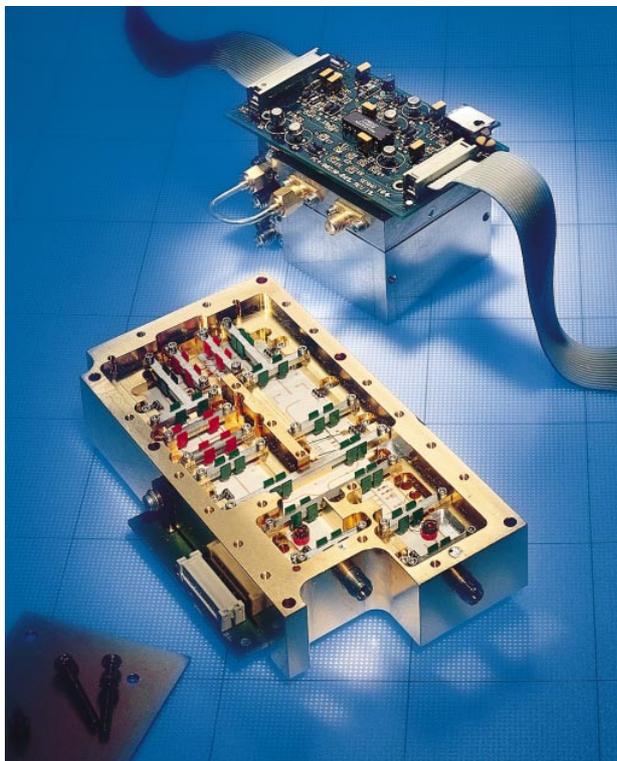


FIG 3 The YFO (YIG filter oscillator), the core of SMP (background), features space-tested technology for high output power, extremely high spectral purity and reliability. In the 40-GHz frequency doubler (front), patented thin-film technology does the trick: output power that sets new standards worldwide. Photo 42 444

tors, where SMP features rise and fall times typically shorter than 5ns, pulse widths below 10 ns and an on/off ratio better than 80 dB.

One problem frequently encountered in microwave measurements is that signal sources and EUTs have to be connected to one another via cables that are long compared with the wavelength, which means high attenuation as well as high frequency response. So it is difficult to feed the EUT with defined RF power. The signal generators of the SMP family offer four functions to solve this problem:

1. **User correction** to obtain a user-selectable frequency-response characteristic of the RF level. Correction values can be entered manually or via the IEC/IEEE bus. With an external power meter (NRVS or NRVD) connected, SMP determines correction values automatically at a keystroke.
2. **Memory sequence**, programmable sequence with complete instrument setups.
3. **List mode**, programmable sequence with up to 2003 frequency and level pairs.
4. **External level control** using external level meter.

At this point the inclined reader may be wondering if so much high tech is affordable. Well, the SMP family was designed not only for excellent technical performance but for **high economy and future-proofness** too. The result is an instrument the user can tailor to his requirements by choosing from a wide range of options the components he really needs. Should a subsequent extension or adaptation be necessary to handle new measurement tasks – no problem, SMP can easily be retrofitted as required. Built-in diagnostic functions and computer-aided measurement functions ensure fast and uncomplicated servicing. Calibration is required every three years at the earliest. The unit need not be opened for calibration, nor do any mechanical adjustments have to be made.

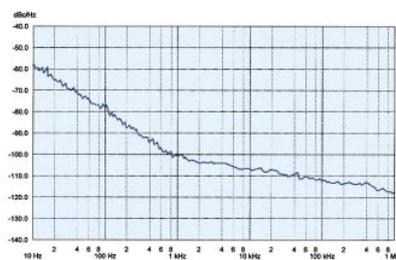


FIG 4 SSB phase noise of Microwave Generators SMP at 10 GHz

Which member of the SMP family is the right one for you? Take your choice from the versions listed in the blue box. Wilhelm Kraemer

Model	Frequency range	Output power
SMP02	10 MHz/2 to 20 GHz	> +11.5 dBm
SMP22	10 MHz/2 to 20 GHz	> +20 dBm
SMP03	10 MHz/2 to 27 GHz	> +13 dBm
SMP04	10 MHz/2 to 40 GHz	> +10 dBm

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