Signal Generation

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Signal Generators SMG, SMH, Power Signal Generator SMGL

SMG: 0.1 to 1 GHz SMH: 0.1 to 2 GHz SMGL: 9 kHz to 1 GHz High-end general-purpose generators, SMGL with output level up to +36 dBm



Brief description of SMG, SMH

SMG and SMH are fast, high-resolution synthesizers featuring great ease of operation as well as versatile modulation and sweep capabilities. High spectral purity and short setting times make the SMG and SMH ideal signal generators for communications systems, EMC/EMS measuring systems, IF components of satellite transmission as well as radar, avionics and navigation equipment.

Brief description of SMGL

SMGL is a versatile power signal generator with built-in broadband power amplifier and ideal for driving power stages, frequency multipliers, power semiconductors and high-level mixers.

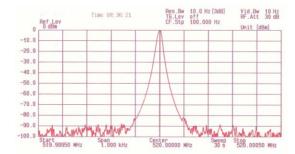
Typical measurement applications

- Antenna patterns
- Overload capabilities of receivers
- Intermodulation, crossmodulation
- Electromagnetic compatibility
- Linearity of amplifiers
- Shielding effectiveness

Main features

- Short frequency setting time of 15 ms, fast sweep, high measurement rate in automatic test systems
- RF and AF sweep without level transients; phase-continuous frequency steps
- Spectral purity, excellent weighted and unweighted S/N ratio, low spurious FM
- Excellent RF shielding allowing accurate measurements even on the smallest of signal levels

- Non-interrupting level variation within a range of 20 dB
- Modulation generator with 8 fixed frequencies
- AM, FM AC and FM DC, phase and pulse modulation; two-tone modulation possible
- Great ease of operation: nonvolatile storage of 50 instrument setups, memory sequence, level and frequency offset adjustable



Signal quality close to carrier at 520 MHz, 10 dB and 100 Hz/division

Overview of options

Designation, functions	Option
OCXO Reference Oscillator: aging <1 x10 ⁻⁹ /day	SMG-B1
AF Synthesizer: frequency range 10 Hz to 100 kHz	SMG-B2
X Output: for control of oscilloscopes and recorders	SMG-B3

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Specifications in brief											FM EXT FM INT	40/1 1/3/	10 Hz (DC) to100 40/150/300/400 1/3/6/15 kHz ±33							
Freque Range SMC					100 kHz to 1000 MHz							FM IN Frequenc carrier fre	10 Hz to 100 kHz							
SMI SMC Resolu	H GL					100 kHz to 2000 MHz 9 kHz to 1000 MHz 1 Hz							switching for f _{carrier}	1% of	1% of deviation + 1					
Setting Freque	g time ency drif			5 MHz		 <15 ms <0.5 x 10⁻⁹ + error of reference standard I OCXO oscillator 							Phase ma Modulation		INT, E	INT, EXT AC, two-to				
	nce freq		· .		,								f <	31.25	62.5	125	250	500	100	
Tempe	(after 3 rature e	ffect			on)	2 x 10 ⁻⁶ /year 2.5 x 10 ⁻⁶ / 0 to 50°C <1 x 10 ⁻⁹ /day <2 x 10 ⁻⁹ /°C					у	Max. dev Phase ma	10	20 40 80						
	output to al refere					5 or10 MHz, selectable							1 kHz an Modulatie		<0.5% (typ. 0.1%)					
Level Range						–140 to +13 dBm (SMG, SMH) –118 to +30 dBm (SMGL)							φΜΕΧ φΜΙΝ	40/1 1/3/	10 Hz to 10 kHz 40/150/300/400 1/3/6 kHz ±3%					
	range a ut guara					-140 to +16 dBm (SMG, SMH)							φM IN Pulse mo	Γ with op [.] dulation	tion SM0	G-B2	10 Hz	10 Hz to 10 kHz		
>-12	acy for l 27 dBm 18 dBm	(SMC	G, SN	۸H)		-130 to +36 dBm (SMGL)							Mode On/off ro Rise/fall t		external >70 dB (typ. >80 d					
Freque at 0 d	ency res Bm outp cteristic	pons ut lev	e vel			±1.5 dB 1 dB (typ. 0.3 dB)							f _c > 200 Pulse rep Modulatio	Ó to 1	typ. 20 ns 0 to10 MHz TTL levels					
VSWR	ł	mpe	suund	e		50 Ω <1.5 for level ≤0 dBm (SMG, SMH) <1.5 for level ≤16 dBm (SMGL)						۸H)	AF Synth Frequenc	10 H:	10 Hz to 100 kHz					
	nterrupti					<25 ms 0 to 20 dB							Readout Frequenc	3 digi	3 digits <4 x 10 ⁻⁵					
	oad prot ssible RF			aximum		50 W							Level erro	<3%	<3% (typ. 1%) <0.1% (typ. 0.03%					
Spurio	al purity ous signo												Distortion Phase-cor response	e,	<10 ms					
Sub	monics harmoni					<–30 dBc (SMGL: level ≤27 dBm)						ר)	command and frequency change			<10 r				
SMI						none <–40 dBc (f≥1 GHz)							RF sweep, AF sweep (AF sweep with option SMG-B2)					digital start-stop swo steps		
Nonho	al AM,	spur	ious		(Hz)	<0.02%							Modes					automatic following single-shot, manual		
Residu	kHz fror ial FM, r to 3 kH	rms				see line a in table below see line b in table below							Sweep range					wheel, linear or log user-selectable over		
SSB pl	hase noi r offset 2	ise,											Step size					range user-selectable		
	andwic			I		see line c in table below							Time per step					10 ms to 10 s		
f <	31.25	62	2.5	125	25	250 500 1000 2000 MHz							X output (with option SMG-B3) X output					0 to 10 V		
a < b <	-70 2	-8 1	30 I	-80 1		80 1	-76 2	-70 4)	-64 8		dBc Hz						ase ramp 1000 st		
с	-139	-1	48	-142	-1	36	-130	-12	4	-118	I	dBc	Remote c	ontrol			IEC 62	25-1 (IEE	E488	
Amplit	tude mo	dulai	tion										General o				100/	100/00	0/24	
Modes INT, E							NT, EXT AC, EXT DC, two-tone) to 99%					Power su	47 to	100/120/220/24 47 to 440 Hz max. 130 VA (SMG						
	stortion 30% A		kHz,			<1%								consumpt				250 VA		
Modulation frequency AM EXT AC (DC) 10 Hz (DC) to 50 kHz											Dimensio SMG, SN		ч х Dj			nm x 14				
AM INT 40/15						0/150/300/400 Hz /3/6/15 kHz ±3%					SMGL Weight for fully equipped unit					435 mm x 147 mm 17 kg (SMG, SMH)				
AM	INT wit	h opi	tion S	MG-B2		10 H	z to 100 z to 50) kHz (SN		H)		Orderi	ng inf	ormat	ion				
Frequency modulation Modes						INT, EXT AC, EXT DC, two-tone							Signal Ge	SMG	SMG					
f <	31.	.25	62.	5 12	5 2	250	500	100	0	2000	٨	٨Hz	•	ignal Generator			SMH SMGL			
Max.	dev. 20	00	50	10	0	200	400	800)	1600		kHz	Options	,						
FM distortion at 1 kHz and 50% of maximum deviation <0.5% (typ. 0.1%) Modulation frequency FM distortion at 1 kHz and CONTROL OCXO AF Synthesizer X Output											C	SMG-B1 SMG-B2 SMG-B3								

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C) to 100 kHz 300/400 Hz/ 5 kHz ±3% 100 kHz

riation + 1 x 10⁻⁶ x f_{carrier}

AC, two-tone

							2000	
dev.	20	5	10	20	40	80	160	rad

10 kHz '300/400 Hz/ Iz ±3% 10 kHz

yp. >80 dB)

100 kHz . 1%) /p. 0.03%)

rt-stop sweep in discrete following ramp function, t, manual control via spinear or logarithmic

able over entire frequency able 0 s

/220/240 V ±10%) Hz) Hz) VA (SMG, SMH)) VA (SMGL)

x 147 mm x 460 mm x 147 mm x 570 mm MG, SMH), 22 kg (SMGL)

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f <	31.25	62.5	125	250	500	1000	2000	MHz
م م ^ ^	-70 2	-80 1	-80 1	-80 1	-76 2	-70 4 -124	-64 8	dBc Hz
с	-139	-148	-142	-136	-130	-124	-118	dBc

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