## **Data Sheet**

## Hantek

Handheld Spectrum Analyzer

**HSA2000** Series



## **Feature**

- IP-51 rated. Three-in-one Handheld Spectrum Analyzer;
- Large 5.6 inch 64K Color LCD Display, High Resolution (640\*480);
- 7.4V/7800mAh Large-capacity Lithium Battery. Over 4 Hours Cruising Ability;
- It Supports to Use 6 PCS of 18650 Battery Pack to Replace the Lithium Battery;
- Rich Expansion Interface, USB 2.0 and LAN is optional;
- · Highest Sensitivity:-161dBm, Lowest DANL;
- Super Slim Design. Volume Light. Easy to Carry.



	Model		HSA2030A		HSA2030B		
_	Frequency range		100K~3GHz (tunable to 9KHz) AC Coupled	100K~3GHz (tunable to 9KHz)	AC Coupled	5M~3GHz TG	
Frequency	Frequency Resolution		1Hz		1Hz		
	Reference Freque	ncy	10MHz 10MHz				
<b>I</b> nternal	Frequency Readout Accuracy						
Reference	Internal 10MHz Aging Rate		±1ppm/year (0℃–50℃, Reference is C25℃)				
Frequency	Reference Accuracy Temperature stability				. 10000/1001		
			± 1ppm/year		± 1ppm/year		
	Marker Resolution		(frequency span)/(number of sweep points 1)				
Frequency	Counter Resolution Accuracy		1Hz				
Counter			± (marker frequency × frequency reference uncertainty + counter resolution)				
Frequency	Range		0 Hz (zero span), 100 Hz to 3.2 GHz				
Span	Resolution		0 Hz				
	Accuracy Carrier offset(20°C~ 10 KHz		± span/(sweep points-1) <-92dBc/Hz, Typical -95dBc/Hz				
SSB phase noise	30°C, 500MHz	30 KHz	<=93dBc/Hz, Typical =95dBc/Hz				
		100 KHz	<-95dBc/Hz, Typical -97dBc/Hz				
	central frequency)	1 MHz	<-117dBc/Hz,Typical -119dBc/Hz				
Resolution	-3dB bandwidth		10Hz to 1MHz,1-3-10 sequence				
Bandwidth	Accuracy		±5% RBW=10Hz~1MHz nominal				
	Resolution filter shape factor		<5:1, Nominal				
Video Bandwidth	-3dB bandwidth		1Hz to 1MHz, 1–3–10 sequence				
	Accuracy		± 10% VBW=1Hz~1MHz nominal				
Measurement		Preamp off	Displayed average noise level (DANL) to +10dB				
Range	2MHz~3 GHz Preamp on		Displayed average noise level (DANL) to +20dB				
	Input attenuator range Average continuous power		0 to 51dB,1dB steps +33dBm, 3 minutes maximum Input attenuator setting ≥ 20dB,2MHz~3.2 GHz				
Maximum Safe Input level	DC voltage		50 VDC, maximum input attenuator setting \$200B,2Winz~5.2 Griz				
pat.ovo.	100KHz~1MHz		- 108 dBm, typical - 127 dBm				
	1MHz~10MHz		- 128 dBm, typical - 146 dBm				
	10MHz~500MHz	Preamp off	- 142 dBm, typical - 146 dBm				
Displayed	500MHz~2.5GHz		−141 dBm, typical −145 dBm				
Average	2.5GHz~3GHz		– 140 dBm, typical – 144 dBm				
Noise level	100KHz~1MHz		- 131 dBm, typical - 150 dBm				
(normalized to1Hz)	1MHz~10MHz		−148 dBm, typical −163 dBm				
	10MHz~500MHz 500MHz~2.5GHz		−161 dBm, typical −164 dBm				
			- 159 dBm, typical - 162 dBm				
	2.5GHz~3GHz		- 158 dBm, typical - 161 dBm				
	Log scale and units		1 to 10 dB/divisions in 1, 2, 5, 10 dB steps, 10 divisions displayed				
	Linear scale and units		0 to 100%, 10 divisions displayed				
	Scale unit		dBm, dBmV, dB μ V, Watts, Volts				
Level	Sweep (trace) points		461				
Display	Number of markers		4				
Range	Detectors		Normal, Positive Peak, Sample, Negative Peak, RN	MS			
	Number of traces		4				
	Trace functions		Clear/write, maximum hold, minimum hold, average				
	Level measurement error		± 1.5dB (excluding input VSWR mismatch)	20~30℃, peak detector, preamplifier	off, input signal 0 c	IBm to 50 dBm	
Reference	Setting range		-100dBm to +30dBm, steps of 1dB				
Level	Setting Log scale resolution Linear scale		0.01dB Almost log(2.236 μ V to 7.07 V)				
RF Input VSWR	<del>-</del>	our soale					
(at tuned frequency)	10MHz to 3 GHz		<1.5:1, nominal Attenuator setting 10~20dB	3			
	Second harmonic distortion (SHI)		<65dBc,50MHz to 3GHz (Mixer level −30dBm, attenuator = 0dB, preamp off, 20~30°C)				
Spurious	Third – order 50~300MHz		Third-order intermodulation products: 2 x -20dBm; frequency separation 100KHz;				
Response	intermedulation		RF attenuation = 0dB; RF preamp off; 20~30℃				
Response	300MHz~3GHz		+10dBm				
	Input related spurious		<-75dBc (input mixer = -30dBm)				
	Inherent residual response		<-90dBm , typical –98dBm (Input terminated and 0 dB RF attenuation, preamplifier off)				
Sweep Time	Range Span>100Hz Span=0Hz		2ms to 1000s 600ns to 200s				
	Sweep mode		Continuous; single				
	Trigger source		Free run; video; external				
	Trigger slope		Selectable positive or negative edge				
	Trigger delay Span=0Hz		±12ms tp ±12s nominal				
RF Input	Connector and impedance		N female; 50 Ω				
- A Input	Reference input frequency						
10MHz			10MHz				
Reference/ External	Reference input amplitude		0-10dBm				
Trigger Input	Trigger voltage		5V TTL level				
mgger mput	General Pizzland		DC: 12~17V,maximum 2.8A input				
General Features	Display		5.6 inch,640*480 pixels resolution,64K color LCD d 260 mm x 220mm x 75mm; 2.9KG(include batte				

	n Model		HSA2016A	HSA2016B		
	Frequency range		100K~1.6 GHz (tunable to 9KHz)	100K~1.6GHz (tunable to 9KHz) 5M~1.6 GHz TC		
Frequency	Frequency Resolution		1Hz	1Hz		
	Reference Frequer	ncy	10MHz 10MHz			
Internal	Frequency Readout Accuracy		± (frequency indication*frequency reference uncertainty+1%*span+20%RBW+marker resolution+1Hz)			
Reference	Internal 10MHz Aging Rate		±1ppm/year (0°C–50°C, Reference is 25°C)			
Frequency	Reference Accuracy Temperature stability		±1ppm/year ±1ppm/year			
	l			± ippin/year		
	Marker Resolution		(frequency span)/(number of sweep points 1)			
Frequency	Counter Resolution		1Hz  ± (marker frequency × frequency reference uncertainty + counter resolution)			
Counter	Accuracy					
Frequency	Range Resolution		0 Hz (zero span), 100 Hz to 1.6 GHz 0 Hz (zero span), 100 Hz to 1.6 GHz			
Span	Accuracy		± span/(sweep points-1)			
SSB Phase	Carrier offset(20°C~ 10 KHz		<-92dBc/Hz, Typical -95dBc/Hz			
Noise	30°C, 500MHz	30 KHz 100 KHz	<-93dBc/Hz, Typical =96dBc/Hz			
Resolution	central frequency )	1 MHz	<-95dBc/Hz, Typical -97dBc/Hz <-117dBc/Hz, Typical -119dBc/Hz			
	-3dB bandwidth		10Hz to 1MHz, 1-3-10 sequence			
Bandwidth	Accuracy		±5% RBW=10Hz~1MHz nominal			
	Resolution filter shape factor		<5:1, Nominal			
Video	-3dB bandwidth		1Hz to 1MHz,1–3–10 sequence			
Bandwidth	Accuracy		± 10% VBW=1Hz~1MHz nominal			
Measurement	100KHz~2MHz Preamp off 2MHz~1.6 GHz Preamp on		Displayed average noise level (DANL) to +10dB Displayed average noise level (DANL) to +20dB			
Range	Input attenuator range		0 to 51dB,1dB steps			
Maximum Safe	Average continuous power		+33dBm, 3 minutes maximum Input attenuator setting ≥ 20dB,2MHz~3.2 GHz			
Input level	DC voltage		50 VDC,maximum			
	100KHz~1MHz		- 108 dBm, typical - 127 dBm			
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	10MHz~500MHz	Treampon .	- 142 dBm, typical - 146 dBm			
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	500MHz~1.6 GHz		- 159 dBm, typical - 162 dBm			
	Log scale and units		1 to 10 dB/divisions in 1, 2, 5, 10 dB steps, 10 divisions displayed			
	Linear scale and units		0 to 100%,10 divisions displayed			
Level	Scale unit		dBm, dBmV, dB μ V, Watts, Volts			
Display	Sweep (trace) points  Number of markers		461			
Range	Detectors		Normal, Positive Peak, Sample, Negative Peak, RMS			
	Number of traces		4			
į	Trace functions		Clear/write, maximum hold, minimum hold, average, check	ς,close		
	Level measurement error		± 1.5dB (excluding input VSWR mismatch) 20~30	0℃,peak detector, preamplifier off, input signal 0 dBm to 50 dBm		
Reference	Setting range		=100dBm to +30dBm, steps of 1dB			
Level	Setting Log scale resolution Linear scale		0.01dB			
RF Input VSWR			Almost log(2.236 μ V to 7.07 V)			
(at tuned frequency)	10MHz to1.6 GHz		<1.5:1, nominal Attenuator setting 10~20dB			
	Second harmonic distortion (SHI)		<65dBc,50MHz to 3.2GHz (Mixer level –30dBm, attenuato			
Spurious	Third – order 50~300MHz		Third–order intermodulation products: 2 x –20dBm; frequency separation 100KHz;			
Response	intermodulation 300MHz~1.6 GHz		RF attenuation = 0dB; RF preamp off; 20~30°C			
	Input related spurious		<-75dBc (input mixer = –30dBm)			
-	Inherent residual response		<-90dBm, typical –98dBm (Input terminated and 0 dB RF attenuation, preamplifier off)			
	Span>100Hz		2ms to 1000s			
Sweep	Span=uHz		600ns to 200s			
Time	Sweep mode Trigger source		Continuous; single			
	Trigger source Trigger slope		Free run; video; external Selectable positive or negative edge			
	Trigger delay   Span=0Hz		± 12ms tp ± 12s nominal			
RF Input						
	Connector and impedance		N female;50Ω			
10MHz Reference/ External Trigger Input	Reference input frequency Reference input amplitude		10MHz			
	Trigger voltage		0~10dBm 5V TTL level			
	Power supply		5V TTL level 100–120V ACRMS (±10%), 45Hz~440Hz, CAT II; 120~240V ACRMS(±10%), 45Hz~66Hz CAT II			
General	Display		7inch, 800*480 pixels resolution,64M color LCD display			
Features i	Dimensions and weight		313 mm x 108 mm x 142 mm; 2.9KG(include battery); 2.6KG(exclude battery)			