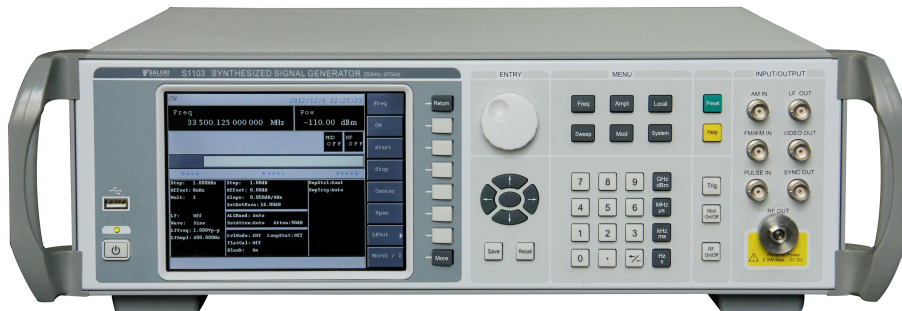




# S1103 Series Synthesized Sweep Generator

(250kHz - 20GHz / 40GHz / 50GHz / 67GHz)

## Datasheet



Saluki Technology Inc.

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## 1. Overview

Saluki S1103 is a series of microwave synthesized Synthesized Sweep Generators with top-level performance. Integrated with a dual-channel internal modulation Synthesized Sweep Generator and pulse generator, S1103 can also provide AM, FM, ØM and pulse modulation.

Saluki S1103 is designed for comprehensive performance evaluation of electronic systems. Meanwhile, it can also be used as a local oscillator for transmitters and receivers. S1103 is widely used in aviation, spaceflight, radar, communication, navigation equipment etc.

## 2. Description

### General

Product data applies under the following conditions:

1. Two hours storage at ambient temperature followed by 30 minutes warm-up operation
2. Specified environmental conditions met
3. The specifications include measurement uncertainty.

### Typical data (typ.)

Typical describes additional product performance information that is not covered by the product warranty. It is performance beyond specifications that 80 percent of the units exhibit with a 95 percent confidence level over the temperature range 20 to 30 °C. Typical performance does not include measurement uncertainty.

### Nominal values (nom.)

Nominal values indicate expected performance, or describe product performance that is useful in the application of the product, but are not covered by the product warranty.

### 3. Specifications

#### Frequency and Time Specification

Frequency Range			
S1103A	S1103B	S1103C	S1103D
250kHz - 20GHz	250kHz - 40GHz	250kHz - 50GHz	250kHz - 67GHz
Frequency Resolution			
0.001Hz			
Timebase Aging Rate (Typ.)			
5 x 10 <sup>-10</sup> /day (powered 30days or more)			
Sweep Modes			
Step Sweep / List Sweep / Analogue Ramp Sweep / Power Sweep			
Max. Analogue Sweep Speed			
Frequency		Value	
250kHz ≤ f ≤ 500MHz		25MHz/ms	
500MHz ≤ f ≤ 1GHz		50MHz/ms	
1GHz < f ≤ 2GHz		100MHz/ms	
2GHz < f ≤ 3.2GHz		200MHz/ms	
3.2GHz < f		400MHz/ms	
Analogue Sweep Accuracy			
0.05% x Span			

#### Amplitude Accuracy and Range Specification

- Output Power Range (25 ± 10 °C)

Model	Standard	With Programmable Step Attenuator (Optional)
S1103A	-20dBm - +13dBm	-120dBm - +11dBm
S1103B	-20dBm - +10dBm	-120dBm - +8dBm
S1103C	-20dBm - +6dBm	-90dBm - +3dBm
S1103D	-20dBm - +6dBm	-90dBm - +3dBm

● Output Power Accuracy ( $25 \pm 10^\circ\text{C}$ )

Without Programmable Step Attenuator				
	> +10 dBm	+10~-10dBm	-10~-20dBm	
250kHz ≤ f ≤ 2GHz	±1.0dB	±1.0dB	±2.0dB (typ.)	
2GHz < f ≤ 20GHz	±1.2dB	±1.0dB	±2.0dB(typ.)	
20GHz < f ≤ 40GHz	/	±1.2dB	±2.2dB(typ.)	
40GHz < f ≤ 50GHz	/	±1.5dB	±2.2dB(typ.)	
50GHz < f ≤ 67GHz	/	±1.8dB	±2.5dB(typ.)	
With Programmable Step Attenuator (Optional)				
	> +10 dBm	+10~-10dBm	-10~ -60dBm	-60~-90dBm
250kHz ≤ f ≤ 2GHz	±1.0dB	±1.0dB	±1.5dB	±1.8dB(typ.)
2GHz < f ≤ 20GHz	±1.2dB	±1.0dB	±1.5dB	±2.0dB(typ.)
20GHz < f ≤ 40GHz	/	±1.2dB	±1.8dB	±2.5dB(typ.)
40GHz < f ≤ 50GHz	/	±1.5dB	±2.0dB	±2.5dB(typ.)
50GHz < f ≤ 67GHz	/	±1.8dB	±2.5dB	±3.0dB(typ.)

## Spectral Purity Specifications

- SSB Phase Noise (dBc/Hz)

Carrier Frequency \ Offset	100Hz	1kHz	10kHz	100kHz
250kHz $\leq$ f $\leq$ 250MHz	-101	-121	-130	-130
250MHz < f $\leq$ 500MHz	-108	-126	-132	-132
500MHz < f $\leq$ 1GHz	-101	-121	-130	-130
1GHz < f $\leq$ 2 GHz	-96	-115	-124	-124
2GHz < f $\leq$ 3.2GHz	-92	-111	-120	-120
3.2GHz < f $\leq$ 10GHz	-81	-101	-110	-110
10GHz < f $\leq$ 20GHz	-75	-95	-104	-104
20GHz < f $\leq$ 40GHz	-69	-89	-98	-98
40GHz < f $\leq$ 67GHz	-64	-83	-92	-92

- Harmonic

250kHz $\leq$ f $\leq$ 10MHz	-28dBc (Typ.)
10MHz < f $\leq$ 2GHz	-28dBc
2GHz < f $\leq$ 20GHz	-55dBc
20GHz < f $\leq$ 40GHz	-50dBc

- Sub-Harmonic

250kHz $\leq$ f $\leq$ 10GHz	None
10GHz < f $\leq$ 20GHz	-55dBc
20GHz < f $\leq$ 67GHz	-50dBc

- Non-Harmonic

$250\text{kHz} \leq f \leq 2\text{GHz}$	-65dBc
$2\text{GHz} \leq f \leq 20\text{GHz}$	-56dBc
$20\text{GHz} < f \leq 40\text{GHz}$	-50dBc
$40\text{GHz} < f \leq 67\text{GHz}$	-44dBc

## Modulation Specification

- Frequency Band

Frequency	N (Internal YO harmonic)
$250\text{kHz} \leq f \leq 250\text{MHz}$	1/8
$250\text{MHz} < f \leq 500\text{MHz}$	1/16
$500\text{MHz} < f \leq 1\text{GHz}$	1/8
$1\text{GHz} < f \leq 2\text{GHz}$	1/4
$2\text{GHz} < f \leq 3.2\text{GHz}$	1/2
$3.2\text{GHz} < f \leq 10\text{GHz}$	1
$10\text{GHz} < f \leq 20\text{GHz}$	2
$20\text{GHz} < f \leq 40\text{GHz}$	4
$40\text{GHz} < f \leq 67\text{GHz}$	8

- Internal Modulation Signal Generator

Modulation Type	amplitude modulation, frequency modulation, phase modulation
Waveform	Sine, square, triangle, ramp, noise, double sine, swept sine
Frequency Range	Sine wave, double sine, swept sine: 1Hz - 1MHz; Square, triangle wave, sawtooth 1Hz - 100KHz
Frequency Resolution	1Hz
Pulse Modulation Signal	Pulse width: 20ns - (42s-10ns) Pulse cycle: 100ns - 42s, Resolution: 10ns

- Pulse Modulation

500MHz ≤ f ≤ 67GHz	Pulse modulation on/ off ratio	>80dB
	Pulse modulation rise/fall time	<20ns
	Min. pulse width (internally leveled)	1μs
	Min. pulse width (level hold, ALC off with power search)	0.1μs

- Amplitude Modulation

10MHz < f ≤ 50GHz	Modulation depth	>90%
	AM width	(3dB, 30% modulation depth): DC - 100kHz
	AM Accuracy	<±3% (1KHz Modulation Rate, 30% modulation depth)
	AM distortion	<2% (1KHz Modulation Rate, 30% modulation depth)



● Phase Modulation

10MHz<f≤50GHzv	Max. Phase Deviation	$N \times 160\text{rad}$ ( N is Internal YO harmonic, see table above)
	Accuracy (1KHz rate 300Hz ~ 3KHz demodulation bandwidth, 1 rad <skew <N × 80rad, Modulation Bandwidth: 100kHz residual PM removed)	$<\pm (5\% \times \text{offset} + 0.01\text{rad})$
	Modulation rate (3dB bandwidth)	Modulation Bandwidth 100kHz: DC - 100kHz Modulation Bandwidth 1MHz: 100kHz~1MHz (Typ.)
	Distortion (1KHz rate, 1kHz <skew <N × 800kHz, Total harmonic distortion)	<2%

● Frequency Modulation

10MHz<f≤50GHz	Max. Frequency Deviation	$N \times 16\text{MHz}$ ( N is the number of YO harmonics, see table above )		
	Accuracy (1KHz rate, 300Hz~3KHz Demodulation bandwidth, 1kHz<offset<N×800KHz, residual FM removed)	$<\pm (5\% \times \text{offset} + 20\text{Hz})$		
	Modulation rate (3dB Bandwidth)	Internal DC	DC~ 100KHz	
		Internal AC	100KHz~ 1MHz	
		External DC	DC~ 100KHz	
External AC		100KHz~ 10MHz		
Distortion (1KHz rate, 1kHz<offset<N×800KHz, Total harmonic distortion)	<2%			

General Specification

RF Output Interface	S1103A	S1103B	S1103C	S1103D
	3.5mm(male)	2.4mm(male)	2.4mm(male)	1.85mm(male)
Screen	TFT-LCD			
Dimension	Standard: 426×133×510mm ( without handles, feed pad and feed )			
	Max. 482×152×582mm			
Weight	Approx. 20Kg			
Operating Temp.	0~ +40 °C			
Max.Power	300W			
Power Supply	220V AC			

**Contact Information:**

Service Tel:	886.2.2175 2930
Website:	<a href="http://www.salukitec.com">www.salukitec.com</a>
Email:	<a href="mailto:info@salukitec.com">info@salukitec.com</a>
Address:	No. 367 Fuxing N Road, Taipei 105 Taiwan (R.O.C.)