

TFS20-15 - Frequency synthesizer

The TFS20-15 Low Phase Noise Frequency Synthesizer is a high-performance RF signal generator designed for applications demanding ultra-fine frequency resolution and exceptional spectral purity. Operating across a 200 MHz to 15 GHz range with a 0.1 Hz minimum step size (0.04 Hz without accuracy constraints)



It leverages multi-loop architecture to achieve industry-leading phase noise performance, such as -107 dBc/Hz@1 kHz at 10 GHz.

Applications Include:

Wireless Communication Systems:

Local oscillators for 5G/6G transceivers, satellite modems, and microwave links.

Defense & Aerospace:

Radar systems, electronic warfare (EW), and frequency-hopping applications.

Consumer Electronics:

High-frequency modules for drones, automotive radar, and smart home devices.

Test & Measurement Equipment:

Signal sources for spectrum analyzers, vector network analyzers, and RF test benches.

Embedded RF Solutions:

Integration into IoT devices, wireless sensors, and compact digital acquisition systems.

Research & Prototyping:

Precision frequency synthesis in RF circuit

General Specifications

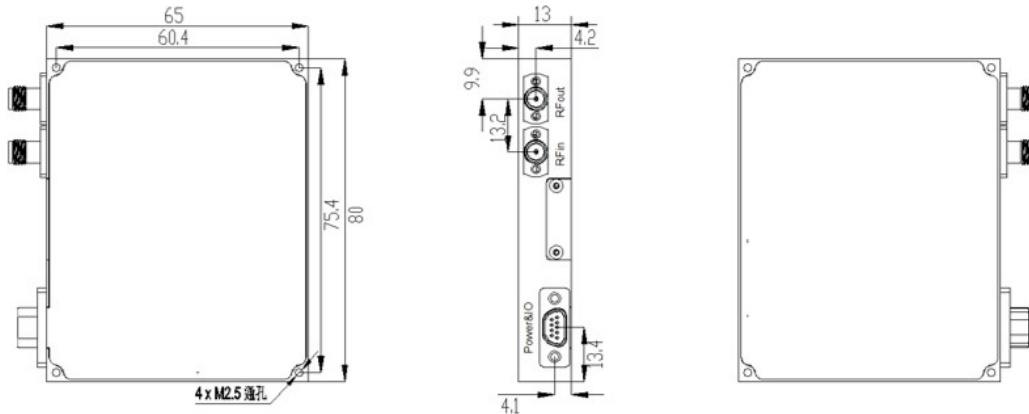
- Output frequency: 200MHz~15GHz;
- Frequency step: 1Hz;
- Small size: 38*38*10mm
- Control mode: SPI control;

kTB Frequency synthesizer

The compact, lightweight design (80×65×13 mm, ≤160 g) ensures seamless integration into space-constrained RF systems. With robust spurious suppression (≤-70 dBc typical) and SPI control compatibility, the TFS20-15 is engineered for precision and reliability in the most demanding environments.

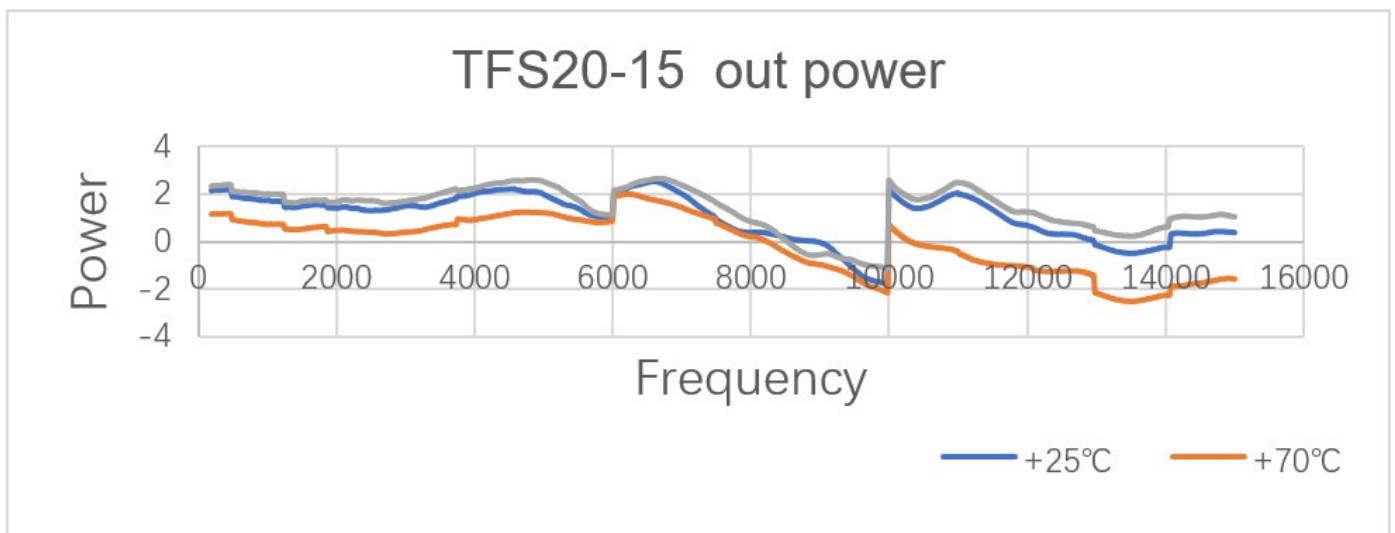
Product Features:	Specification name		Indicator parameters				Remark
External references	Enter the frequency		100MHz				
	Input power		$7 \pm 3\text{dBm}$				
	Frequency stability		Synchronized with external references				
	Frequency accuracy		Synchronized with external references				
	Phase noise		$\leq -155\text{dBc/Hz@1kHz}$				
	Input impedance		50 Ω				
Frequency output	Output frequency		200~15000MHz				
	Output power		$0 \pm 4\text{dBm}$				
	Frequency stepping		0.1Hz				
	Frequency hopping time		200us				
	Phase noise	Frequency	1GHz	5GHz	10GHz	15GHz	
		dBc/Hz@100Hz	-105	-91	-85	-81	
		dBc/Hz@1kHz	-127	-113	-107	-105	
		dBc/Hz@10kHz	-135	-122	-116	-114	
		dBc/Hz@100kHz	-135	-122	-116	-114	
		dBc/Hz@1MHz	-135	-122	-116	-114	
	Spurious		$-70\text{dBc (TYP)} / -65\text{dBc (MAX)}$				
	harmonic wave		$\leq -5 \text{ dBc}$				
Power supply requirements	Operating voltage		$+12 \pm 0.5\text{V}$				
	Maximum voltage		+15V				
	Operating current		0.75A (TYP)				
Temperature and environmental characteristics	Operating temperature		-40° to $+70^{\circ} \text{C}$				
	Storage temperature		$-55^{\circ}\text{C} \sim +85^{\circ}\text{C}$				
Exterior volume	volume		$80 \times 65 \times 13\text{mm}$				
	weight		$\leq 160\text{g}$				

Dimensions:



Connector definition					
RF in	SMA-K (Detachable)				
RF out	SMA-K (Detachable)				
Power and control	J30J-9-ZKP				
J30J interface definition					
1	+12V (Power)	4	GND (Ground)	7	MISO (SPI Communication Interface).
2	+12V (Power)	5	LD (Lock Indicator: High Level Lock)	8	SCK (SPI Communication Interface).
3	GND (Ground)	6	MOSI (SPI Communication Interface).	9	LE (SPI Communication Interface).

Typical Test Curves:

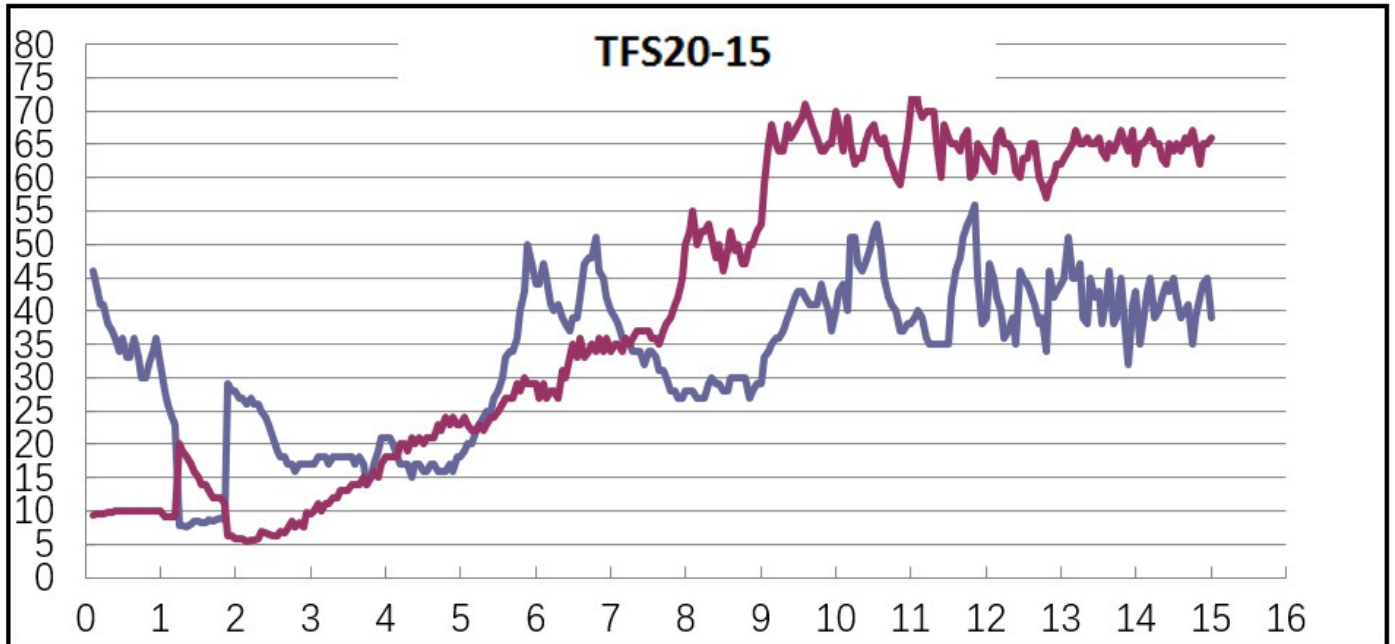


Remark:

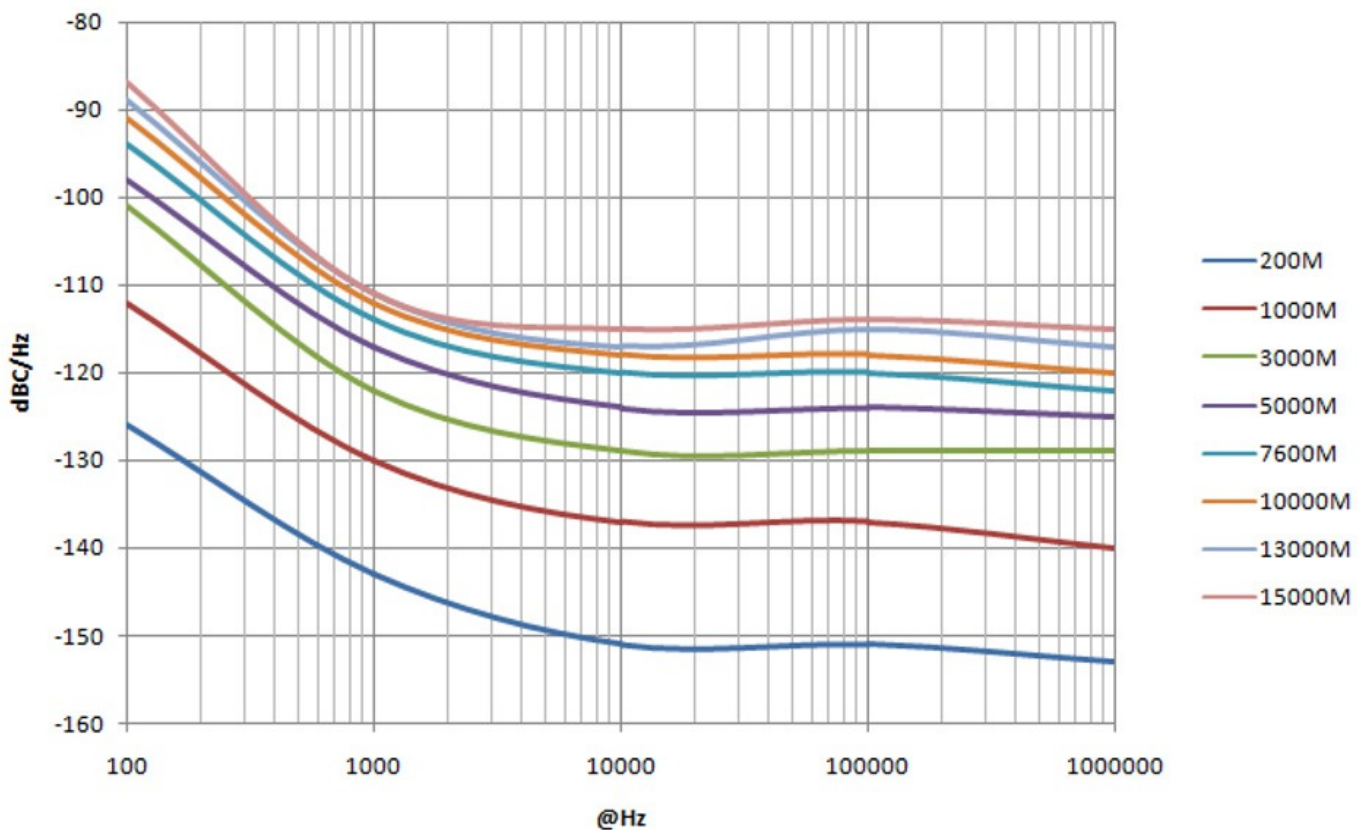
Frequency hopping time: The frequency hopping time is defined as the time interval between the start of the TFS20-15 command and the time when the frequency stabilizes to the error from the target frequency to less than 1MHz;

Spurious: If the user only needs one of the frequencies, the spurs can be optimized, and the detailed indicators are based on the actual frequency;

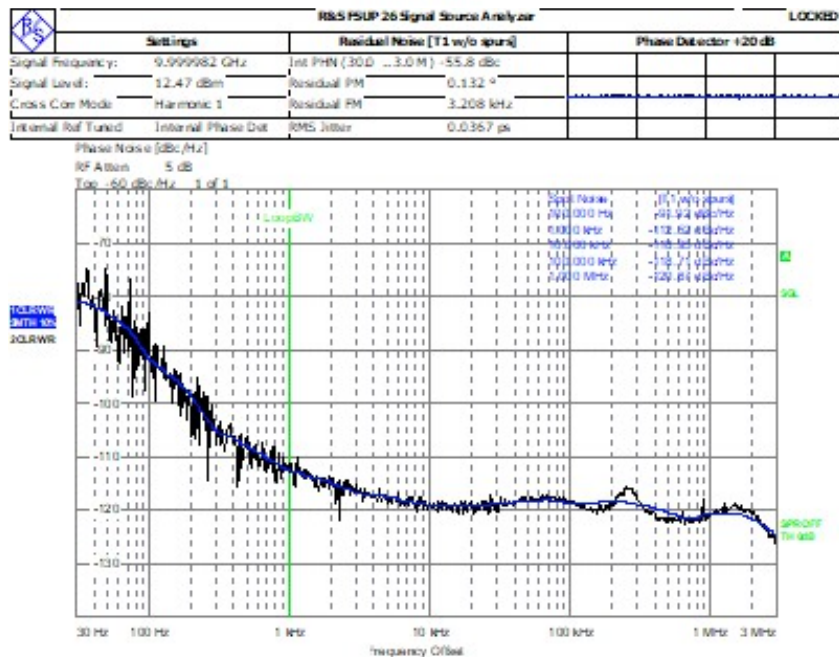
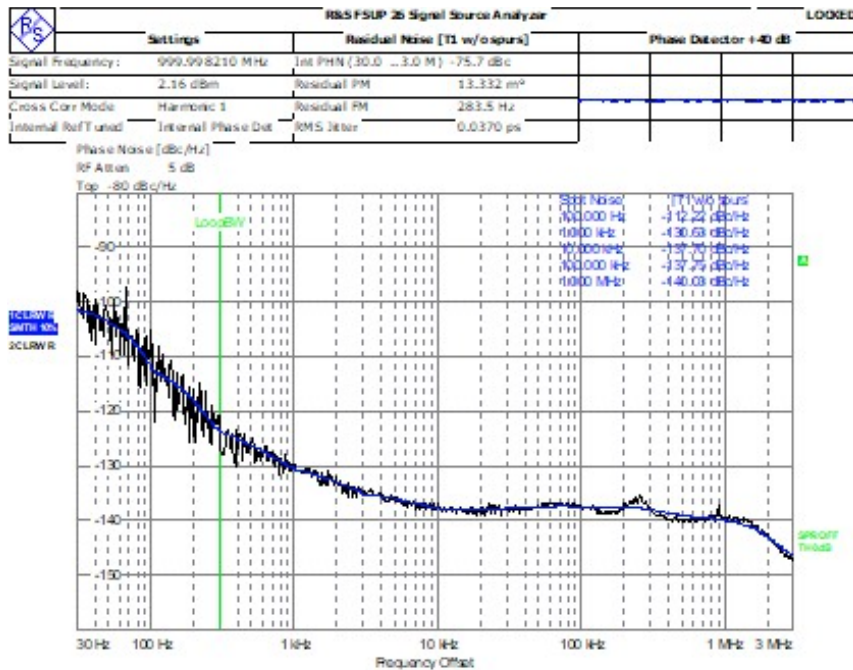
TFS20-15 harmonic curve:



TFS20-15 PHASENIOSE (TYP)



1GHz phase noise test graph:



10GHz phase noise test graph:

Deliverables

When the product is delivered, the documents specified in the following table will be provided:

serial number	Attachments	quantity	remark
1	Factory inspection report	1	
2	Product Certificate	1	
3	Instruction manual for the product	1	Paper/electronic version