

TFS10-06 - Frequency synthesizer

The TFS10-06 Frequency Synthesizer is a compact, surface-mount (SMD) RF signal source designed for high-frequency precision and rapid frequency agility. Operating across a broad range of 50 MHz to 6 GHz with a minimum frequency step of 10 MHz, it integrates a digital phase-locked loop (PLL) for stable and flexible frequency control. communication and operates reliably across industrial temperature ranges (-40°C to +70°C), making it suitable for demanding RF environments.



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

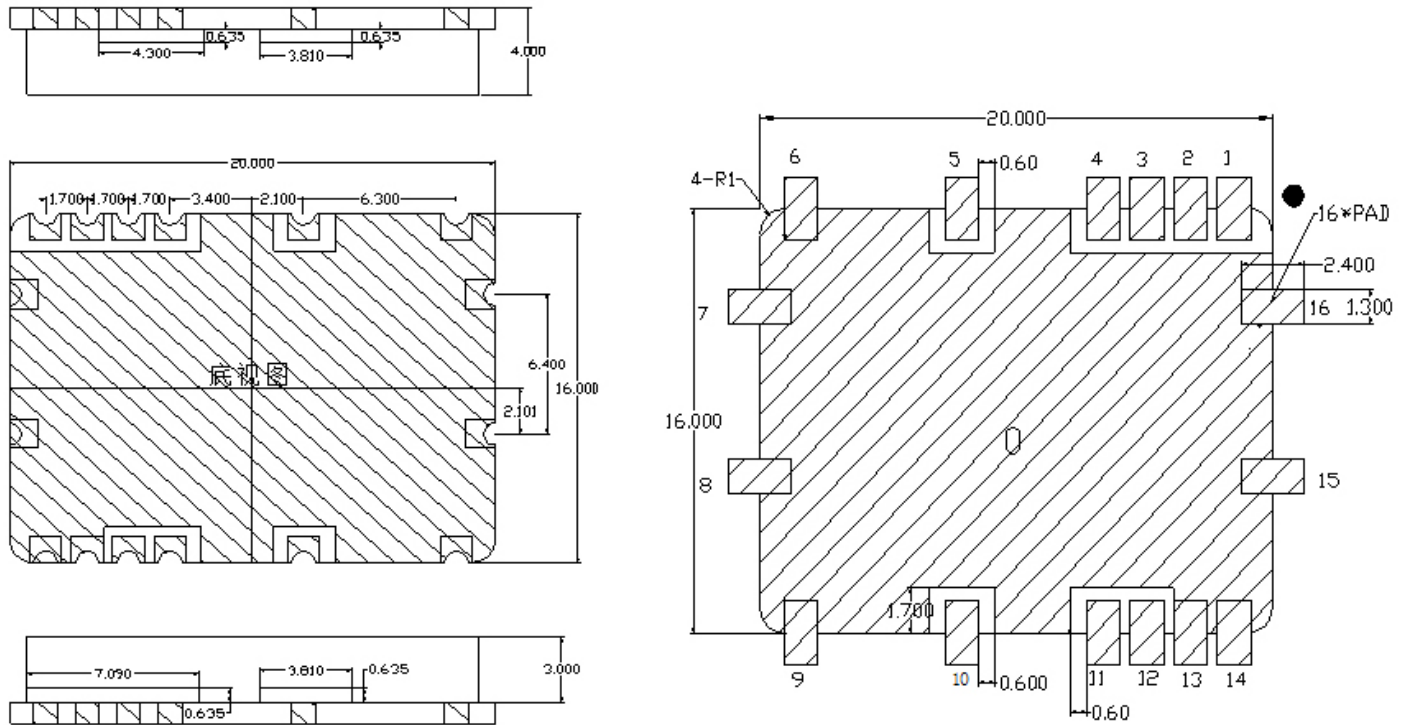
- Output frequency: 50MHz~6GHz;
- Frequency step: 10MHz;
- Small size: 20*16*4mm;
- Control mode: SPI control;

kTB Frequency synthesizer

The device features ultra-low phase noise (e.g., -106 dBc/Hz @1 kHz at 1 GHz) and robust spurious/harmonic suppression (≤ -65 dBc spurious, ≤ -5 dBc harmonic). With a miniature footprint (20×16×4 mm) and lightweight design (≤ 5 g), it is ideal for integration into space-

Product Features:	Specification name		Indicator parameters			remark
External references	Enter the frequency		100MHz			
	Input power		5±3dBm			
	Frequency stability		Synchronized with external references			
	Frequency accuracy		Synchronized with external reference synchronization accuracy 47Hz			
	Phase noise		-153dBc/Hz@1kHz			
	Input impedance		50Ω			
Frequency output	Output frequency		50~6000MHz			
	Frequencystepping		10MHz			
	Frequency hopping time		1ms			
	Phase noise	Frequency	1GHz	2GHz	4GHz	6GHz
		dBc/Hz@100Hz	≤-97	≤-91	≤-85	≤-82
		dBc/Hz@1kHz	≤-106	≤-98	≤-94	≤-92
		dBc/Hz@10kHz	≤-108	≤-102	≤-98	≤-98
		dBc/Hz@100kHz	≤-114	≤-106	≤-100	≤-98
		dBc/Hz@1MHz	≤-142	≤-134	≤-128	≤-124
	Spurious		-40dBc			
	harmonic wave		≤-5dBc			
Output power		3±3dBm				
Power supply requirements	Operating voltage		VCC1: 3.3V±0.1/10mA VCC2: 5.0±0.2V/260mA			
	Startup time		2s			
Temperature and environmental characteristics	Operating temperature		-40° to +70 C			
	Storage temperature		-55° to +85 C			
Exterior volume	volume		20×16×4mm			
	weight		≤ 5g			
Remark: (1) Frequency hopping time: Frequency hopping time is defined as the time interval between when TFS1006 receives the command and the frequency stability and the target frequency error less than 1MHz;						

Dimensions:



Installation Diagram The pad is recommended in shape

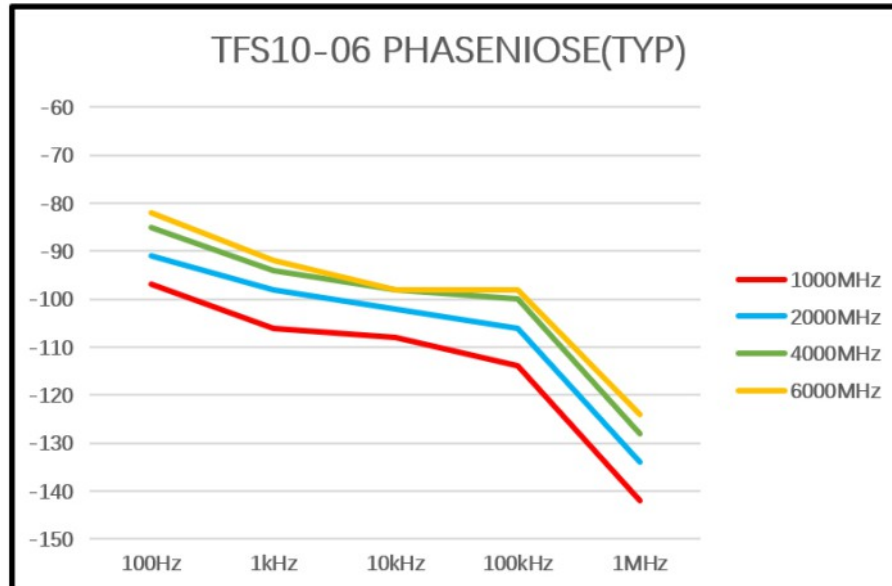
Pin Definition:

Pins	Pin name	Pin definition	Pins	Pin name	Pin definition
6, 7, 8, 9, 13, 14, 15, 16	GND	earth	4	LE	SPI communication enabled
5	RFOUT	RF output	3	DATA	SPI communication data input
11	REF IN	Reference inputs	2	SCK	SPI communication clock
12	VCC1	Digital power supply 3.3V/10mA	1	LD	Lock indication, TTLhigh lock
10	VCC2	Analog power supply 5.0V/260mA			

Warning: TFS10-06 is assembled with a solder paste with a melting point of 230°C, so the TFS10-06 should be assembled by hand or reflow soldering at a temperature of no more than 220°C.

Note: After powering on, it is necessary to delay for 1S before sending control commands to the frequency synthesizer to ensure that the phase-locked loop chip of the frequency synthesizer module and the single-chip microcomputer are initial Done.

Typical Test Curves:

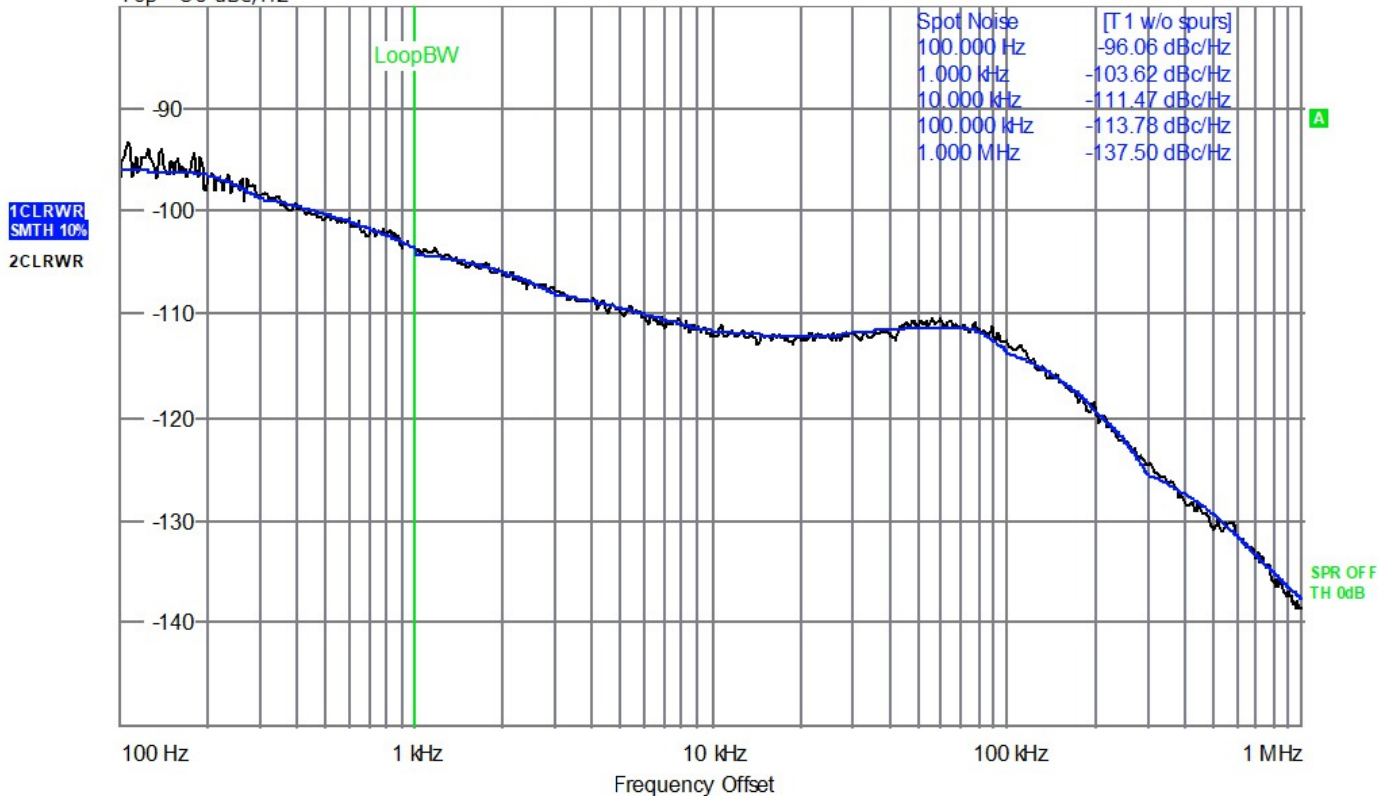


RS	R&S FSUP 26 Signal Source Analyzer			LOCKED			
	Settings	Residual Noise [T1 w/o spurs]		Phase Detector +20 dB			
Signal Frequency:	2.500000 GHz	Int PHN (100.0 .. 1.0 M) -59.2 dBc					
Signal Level:	3.14 dBm	Residual PM	88.596 m°				
Cross Corr Mode	Harmonic 1	Residual FM	234.188 Hz				
Internal Ref Tuned	Internal Phase Det	RMS Jitter	0.0984 ps				

Phase Noise [dBc/Hz]

RF Atten 5 dB

Top -80 dBc/Hz



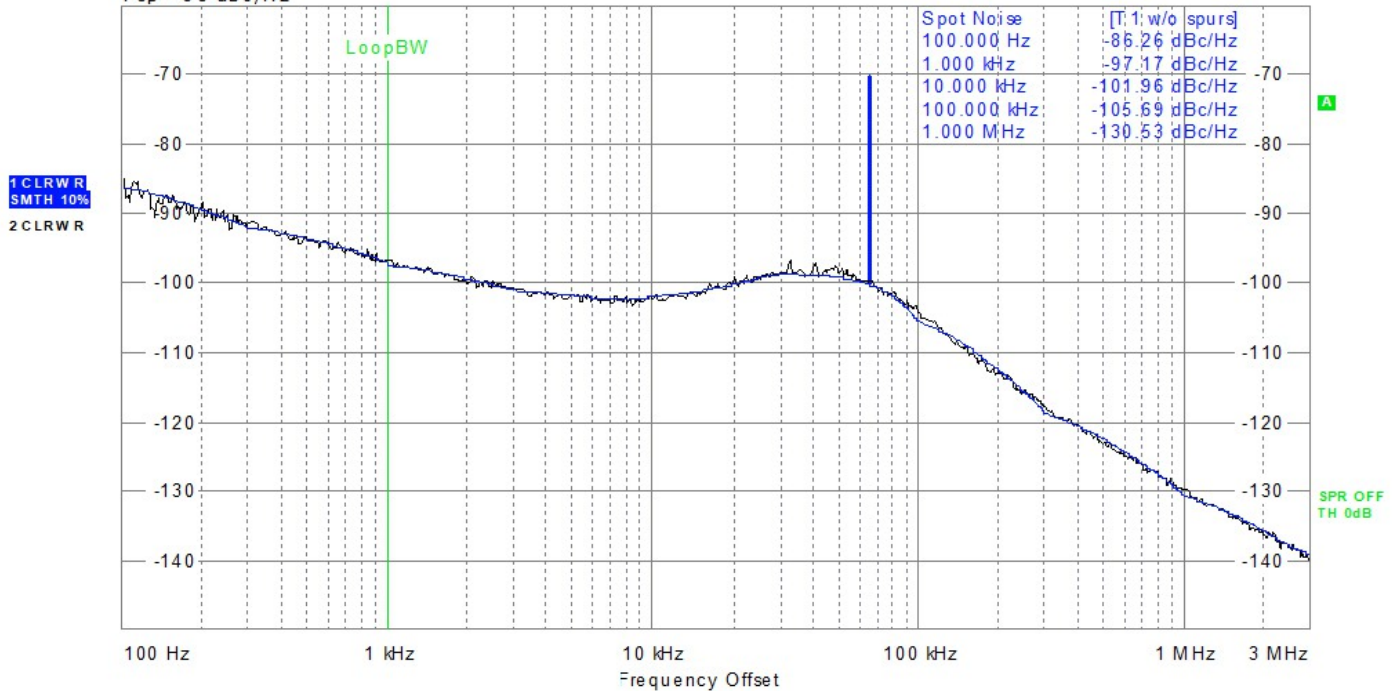
Typical Test Curves:

	Settings	Residual Noise [T1 w/o spurs]	Phase Detector +20 dB
Signal Frequency:	6.000002 GHz	Int PHN (100.0 .. 3.0 M) -49.4 dBc	
Signal Level:	1.2 dBm	Residual PM 0.273 °	
Cross Corr Mode	Harmonic 1	Residual FM 859.883 Hz	
Internal Ref Tuned	Internal Phase Det	RMS Jitter 0.1264 ps	

Phase Noise [dBc/Hz]

RF Atten 5 dB

Top -60 dBc/Hz



6GHz phase noise test graph

List Of Options:

The product order number

TFS10-06P-xxxx	The frequency is a fixed frequency output, and XXXX is the output frequency in MHz
TFS10-06-xxxx	Frequency output range: 50~6000MHz, XXXX is the default initial frequency

Deliverables:

No.	Attachments	Quantity	Remark
1	Factory inspection report	1	
2	Product Certificate	1	
3	Instruction manual for the product	1	Paper/electronic version