

FREQUENCY SYNTHESIZER



200 MHz to 15 GHz

Frequency Synthesizer
SPI control
1 Hz frequency step
Switching time: 500 μ s typical; 1000 μ s maximum
38 × 38 × 10 mm package

The OTFS14-15 is a frequency synthesizer with an output frequency range of 200 MHz to 15 GHz. Control interface: SPI. Reference frequency: 100 MHz. The frequency step is 1 Hz. Frequency switching time: 500 μ s typical; 1000 μ s maximum. Output power: 1 $\pm$ 6 dBm. Dimensions: 38 × 38 × 10 mm. Operating temperature: -40 to +70 °C.

TECHNICAL INFORMATION

OTFS14-15

Property	Value
Output frequency range	200 MHz-15 GHz
Frequency step	1 Hz
Frequency switching time	500 μ s typical; 1000 μ s maximum
Output power	1 $\pm$ 6 dBm
Spurious level	-65 dBc typical; $\leq$ -60 dBc maximum
Harmonic level	$\leq$ -5 dBc
Reference frequency	100 MHz
Reference input power	7 $\pm$ 3 dBm
Reference phase noise	-125 dBc/Hz at 100 Hz offset; -153 dBc/Hz at 1 kHz offset; -160 dBc/Hz at 10 kHz offset; -160 dBc/Hz at 100 kHz offset; -165 dBc/Hz at 1 MHz offset
Supply voltage	+3.3 V $\pm$ 0.1 V; maximum +3.4 V
Supply current	0.68 A
Control interface	SPI
Operating temperature	-40 to +70 °C
Storage temperature	-55 to +85 °C
Dimensions	38 × 38 × 10 mm
RF/reference connectors	Removable SMA-K
Startup time	$\leq$ 2 s
Frequency stability	Tracks the external reference

Specification Notes

The spurious specification covers far-out spurs. Internal optimization can achieve 70 dBc suppression of close-in spurs. Above 11 GHz, an appropriate absorptive high-pass filter is recommended for improved spurious suppression. Additional filtering may be selected for the operating band according to the spur distribution.

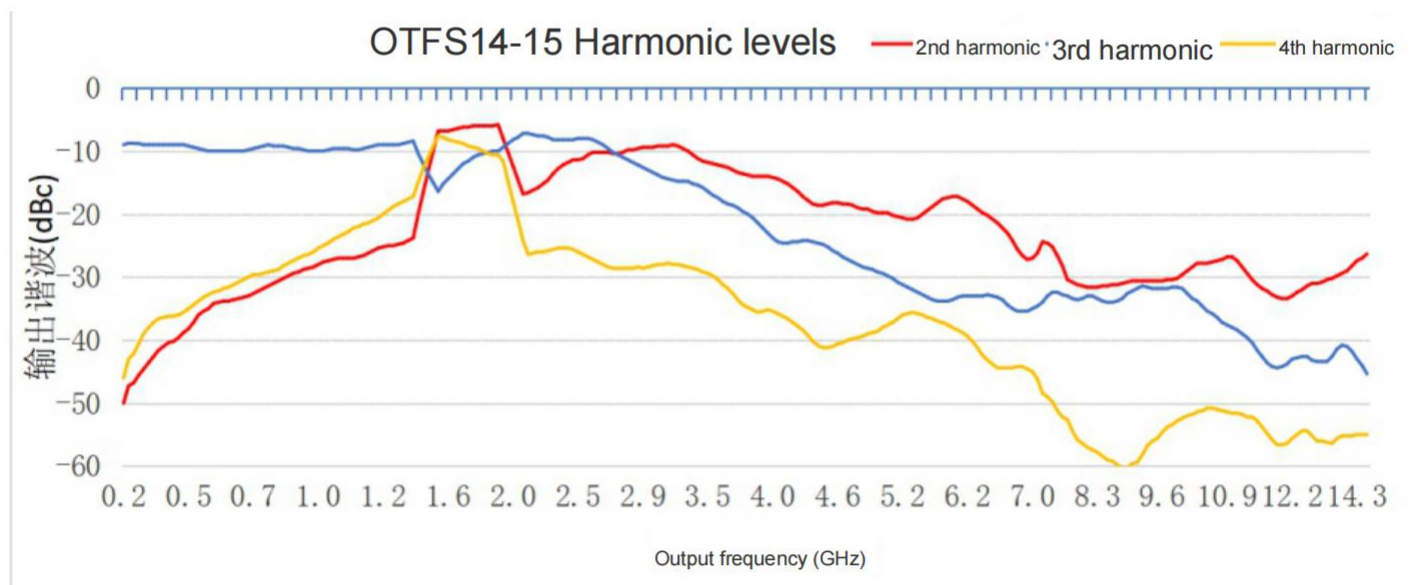
TECHNICAL INFORMATION

OTFS14-15 | Phase Noise (dBc/Hz)

Output Frequency	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz
0.5 GHz	≤-100	≤-111	≤-118	≤-120	≤-136
1 GHz	≤-94	≤-105	≤-112	≤-114	≤-130
5 GHz	≤-80	≤-91	≤-98	≤-100	≤-116
10 GHz	≤-74	≤-85	≤-92	≤-94	≤-110
15 GHz	≤-70	≤-81	≤-88	≤-90	≤-106

Column headings specify frequency offset from the carrier. Output frequency is listed in the first column. Values and limit signs follow the source tables.

Harmonic Levels



Source measurement example. Curves represent the illustrated test conditions.

MEASUREMENT CURVES

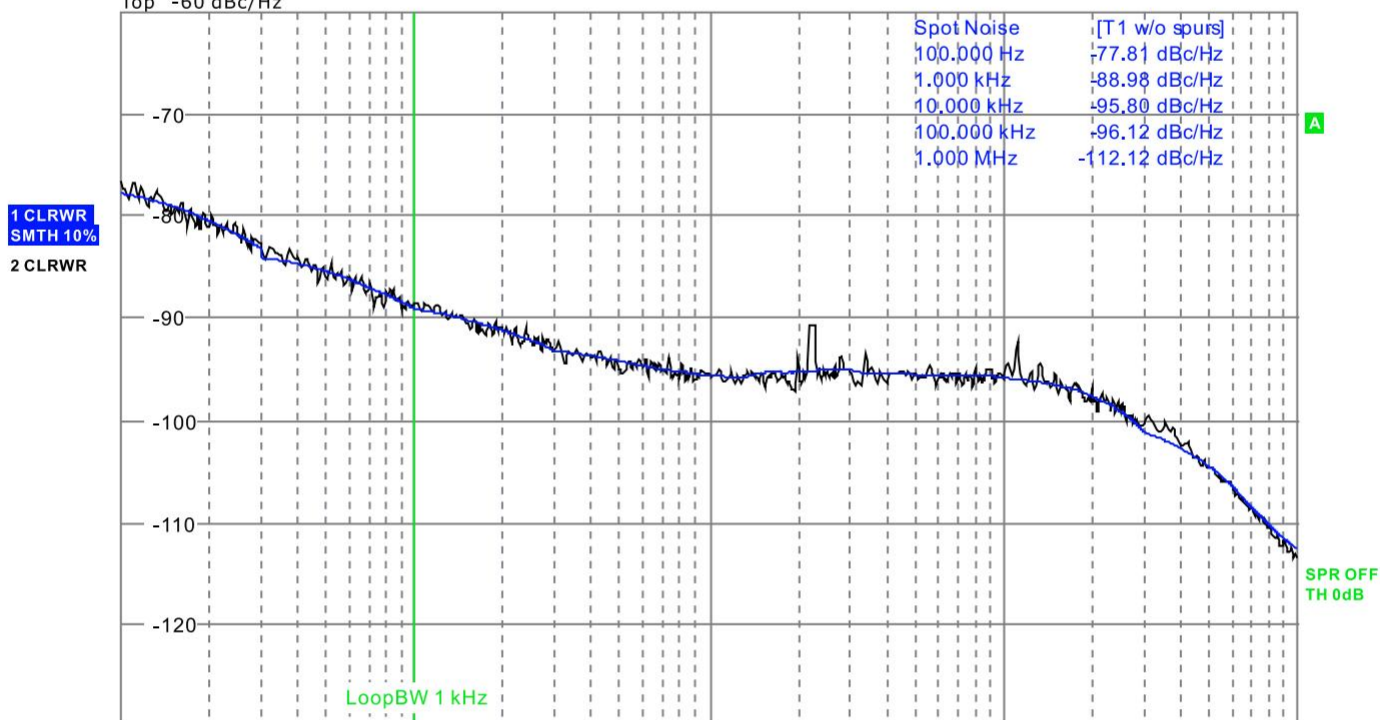
10 GHz Phase Noise Measurement

	R&S FSUP 50 Signal Source Analyzer					LOCKED	
	Settings		Residual Noise [T1 w/o spurs]		Phase Detector +0 dB		
Signal Frequency:	9.999999 GHz		Int PHN (100.0 .. 1.0 M) -40.7 dBc				
Signal Level:	-2.8 dBm		Residual PM	0.750 °			
Cross Corr Mode	Harmonic 1		Residual FM	3.635 kHz			
Internal Ref Tuned	Internal Phase Det		RMS Jitter	0.2082 ps			

Phase Noise [dBc/Hz]

RF Atten 5 dB

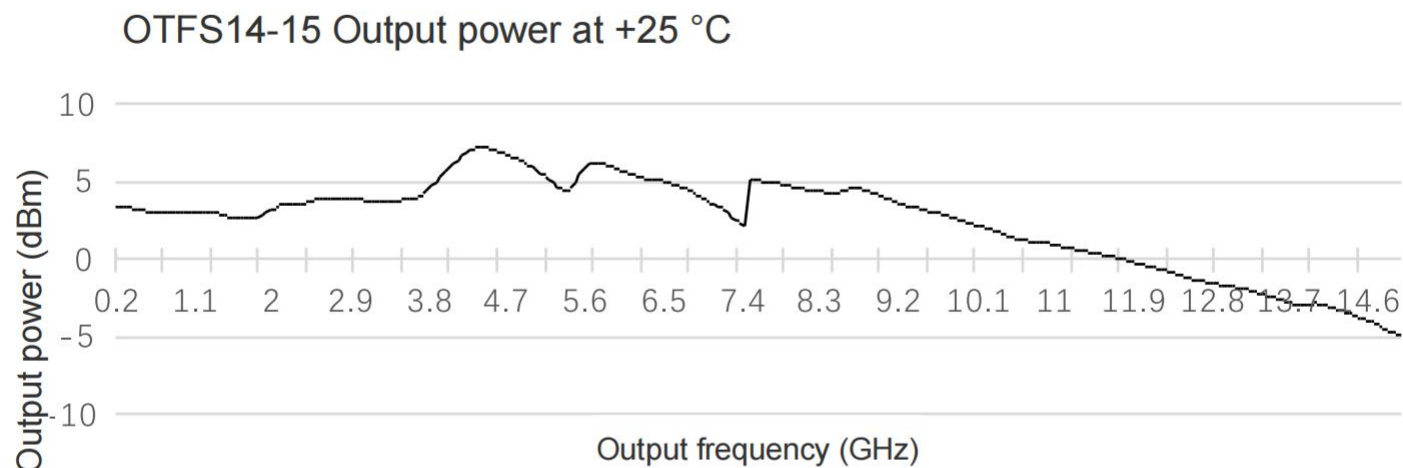
Top -60 dBc/Hz



Source measurement example. Curves represent the illustrated test conditions.

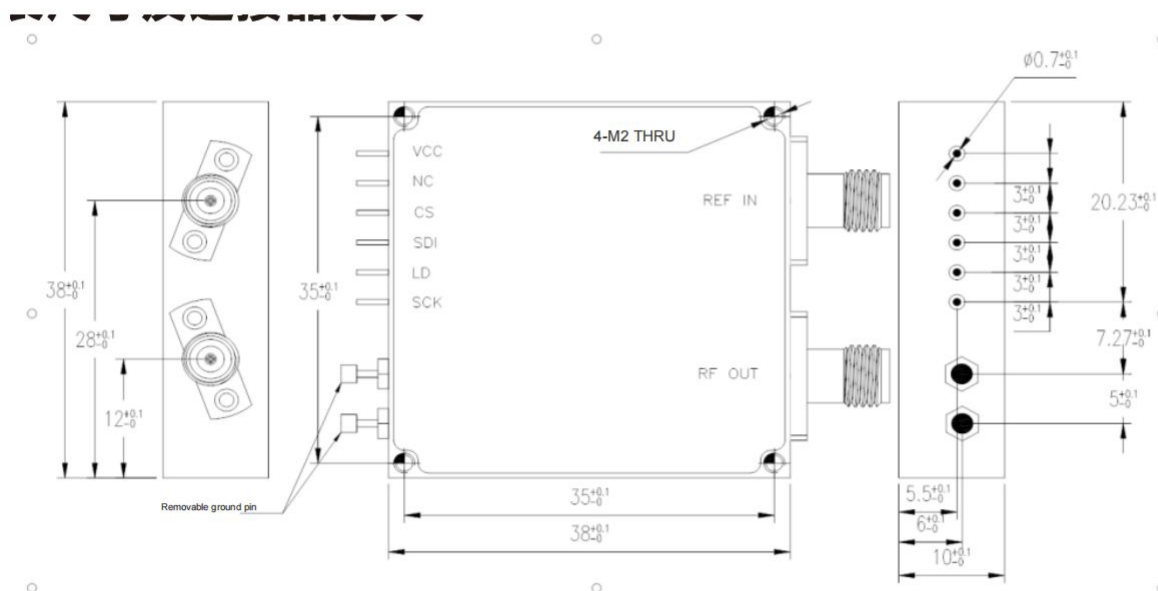
TECHNICAL INFORMATION

Output Power at +25 °C



Source measurement example. Curves represent the illustrated test conditions.

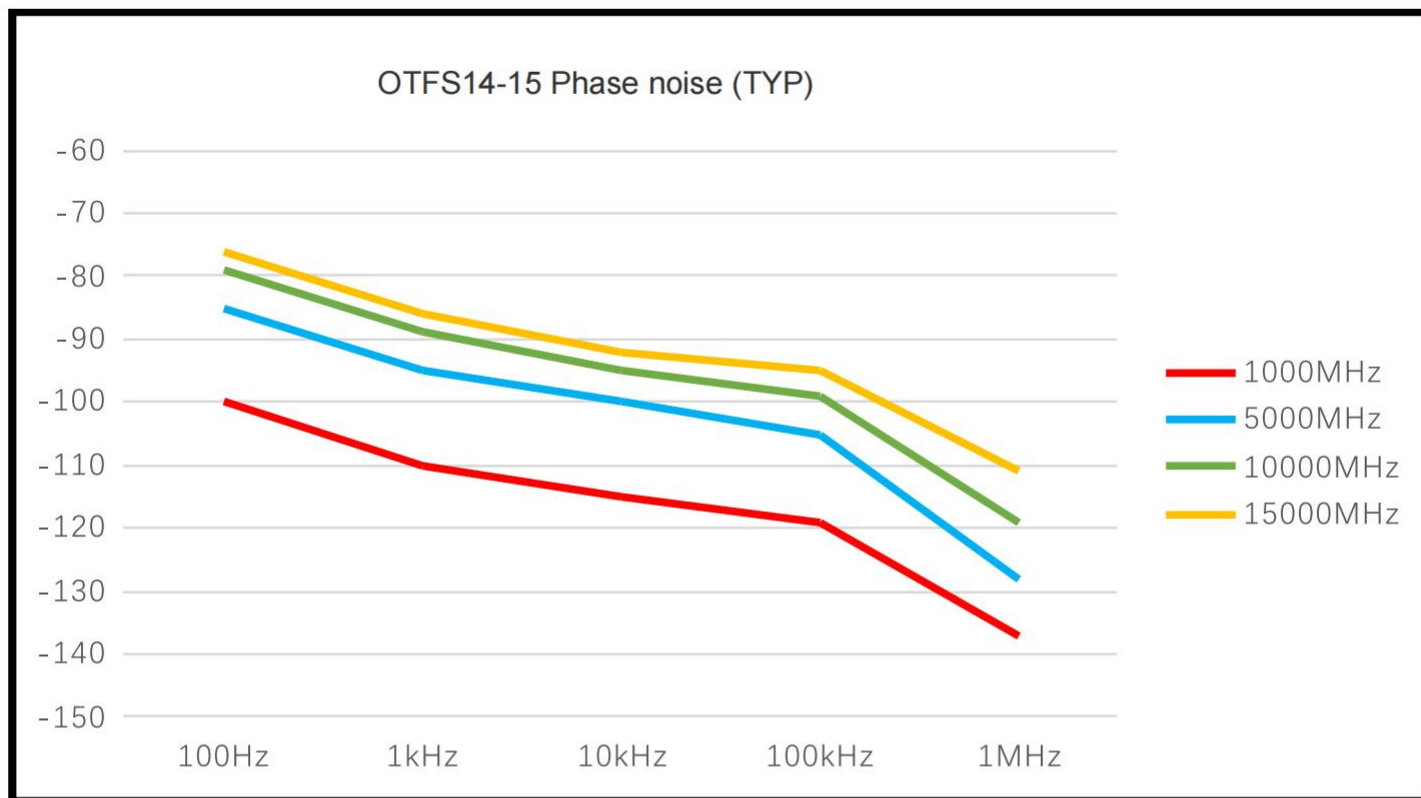
Mounting Dimensions



Dimensions in mm.

MEASUREMENT CURVES

Typical Phase Noise Curves

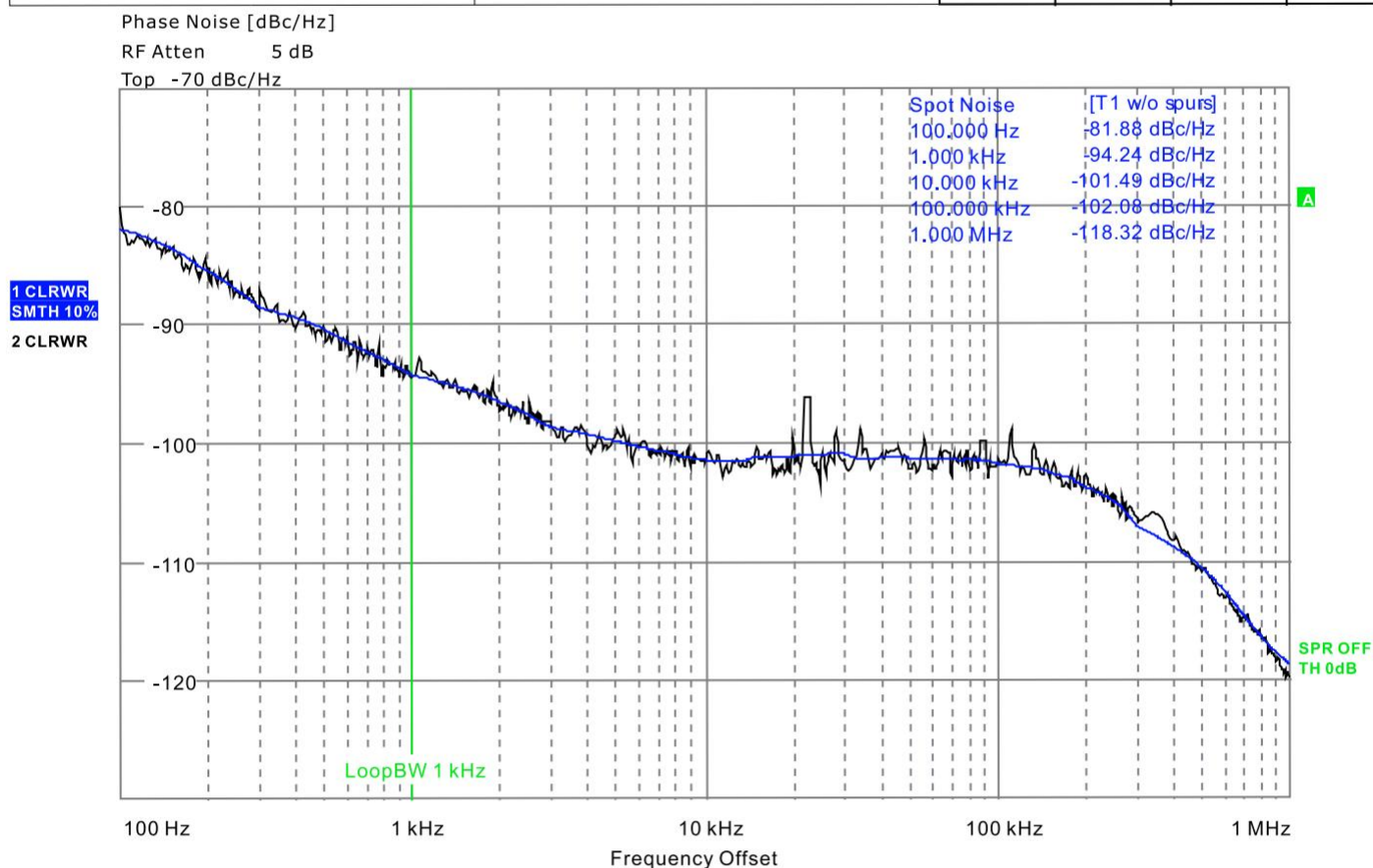


Source measurement example. Curves represent the illustrated test conditions.

MEASUREMENT CURVES

5 GHz Phase Noise Measurement

RS	R&S FSUP 50 Signal Source Analyzer				LOCKED			
	Settings		Residual Noise [T1 w/o spurs]		Phase Detector +20 dB			
Signal Frequency:	5.000000 GHz		Int PHN (100.0 .. 1.0 M) -46.7 dBc					
Signal Level:	1.45 dBm		Residual PM 0.377 °					
Cross Corr Mode	Harmonic 1		Residual FM 1.786 kHz					
Internal Ref Tuned	Internal Phase Det		RMS Jitter 0.2093 ps					



Source measurement example. Curves represent the illustrated test conditions.

INTERFACES & PIN ASSIGNMENTS

Connector / Feedthrough Definitions

Pin	Definition
RF in	Removable SMA-K; pin diameter 0.38 mm
RF out	Removable SMA-K; pin diameter 0.38 mm
VCC	+3.3 V; pin diameter 0.7 mm
NC	Insulated feedthrough; diameter 0.7 mm
CS	Insulated feedthrough; diameter 0.7 mm
SDI	Insulated feedthrough; diameter 0.7 mm
LD-out	Insulated feedthrough; diameter 0.7 mm
SCK	Insulated feedthrough; diameter 0.7 mm