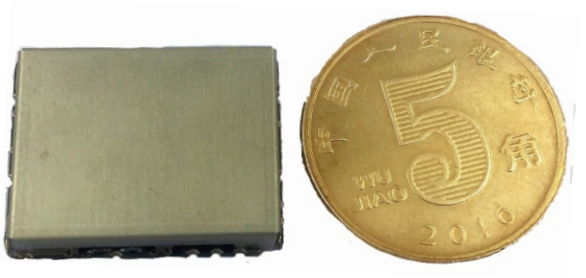
TFS10-15
SMT synthesizer



Features

- High frequency up to 15GHz
- SMT type , easy for use
- Compact size 20*16*4 (mm)
- Low cost

Specifications

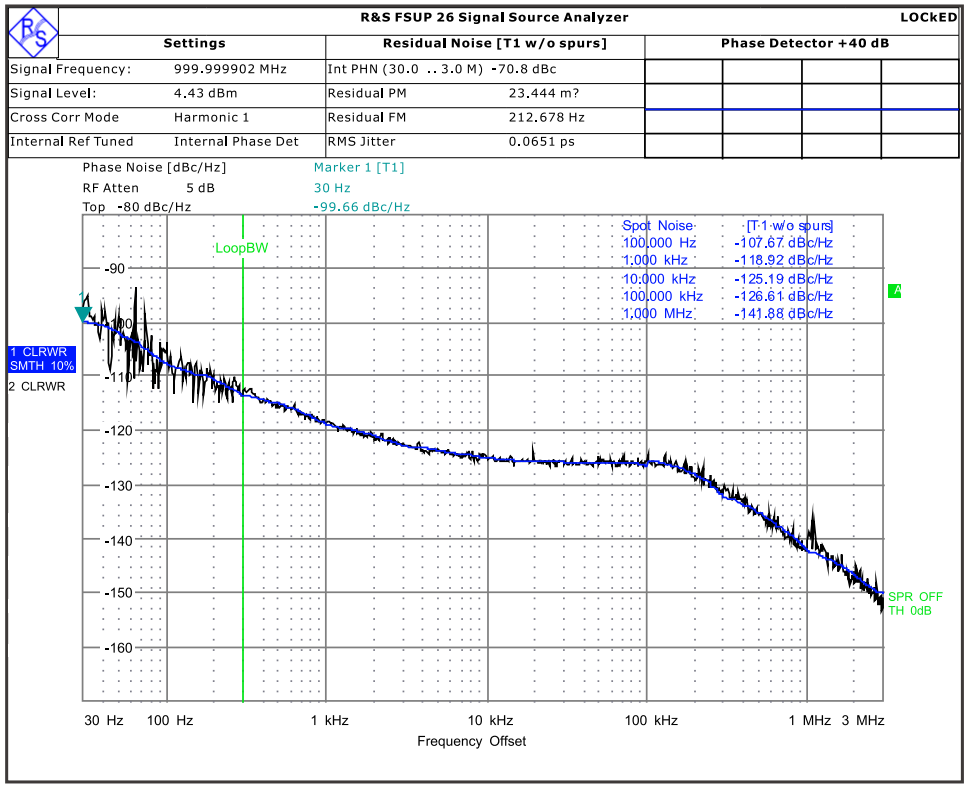
Model		TFS10-15
Frequency Range (MHz)		200 ~ 15000
Frequency Resolution (MHz) ★[1]		10
Frequency Switching Time (ms)		≤1
Power (dBm)		0±3
Frequency stability		Same as reference
Spur (dBc) ★[2]		≤-70
Harmonic (dBc)		≤-7
Ref input frequency (MHz)		100
Ref phase-noise Ref input power	dBc/Hz@100Hz	-125
	dBc/Hz@1kHz	-153
	dBc/Hz@10kHz	-160
	dBc/Hz@100kHz	-160
	dBc/Hz@1MHz	-165
Ref input power (dBm)		0 ~ +7dBm

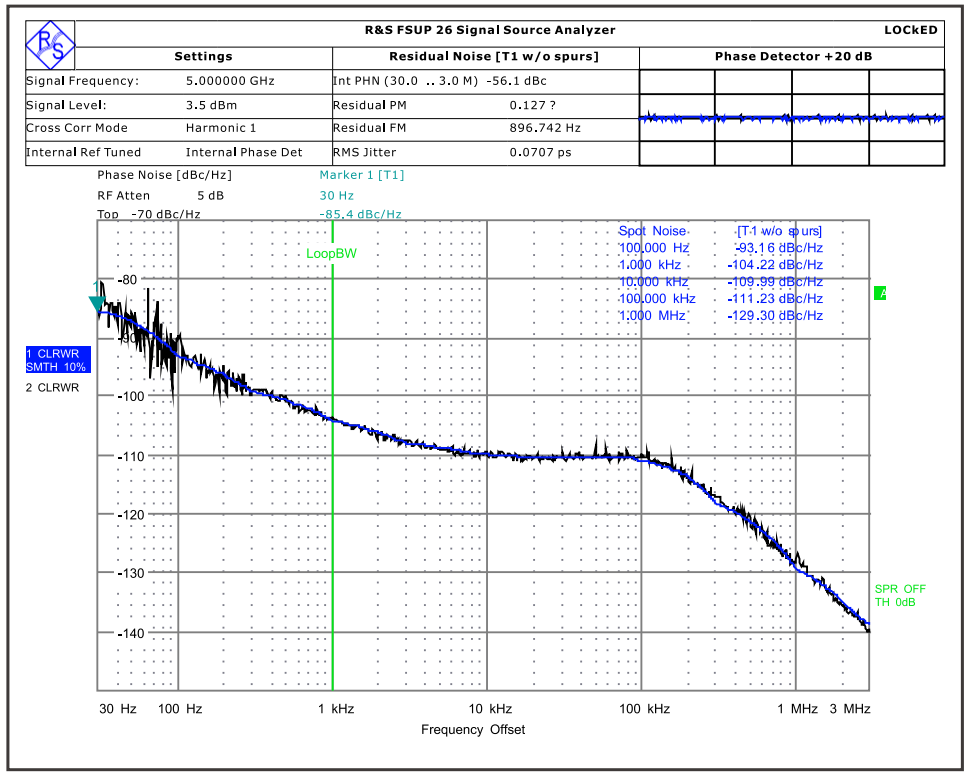
★ Notes: 1、spur and phase-noise can' t be meet when minimum frequency step is1MHz
2、spur is -50dBc when minimum frequency step is 1MHz

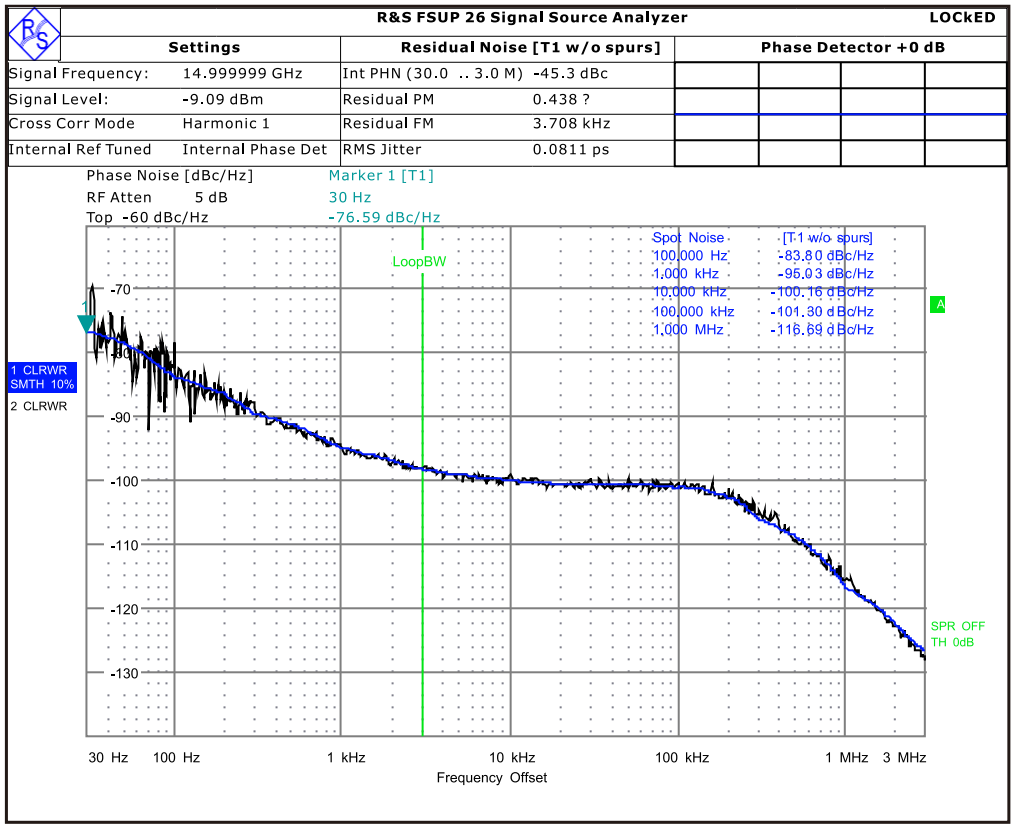
Phase noise

TFS10-15	Frequency				
Phase-noise	500MHz	1GHz	5GHz	10GHz	15GHz
dBc/Hz@100Hz	≤-109	≤-103	≤-88	≤-82	≤-80
dBc/Hz@1kHz	≤-120	≤-114	≤-99	≤-93	≤-92
dBc/Hz@10kHz	≤-127	≤-121	≤-105	≤-99	≤-95
dBc/Hz@100kHz	≤-128	≤-122	≤-106	≤-100	≤-95
dBc/Hz@1MHz	≤-144	≤-138	≤-124	≤-118	≤-113

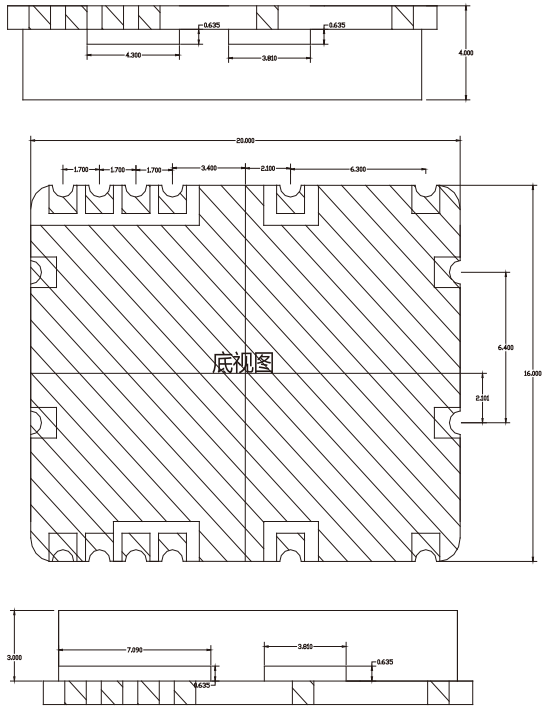
★ Notes:Phase-noise specification at 10 MHz frequency stepping, and is deteriorated by 3 dBc if the frequency step is 1 MHz.


R&S FSUP 26 Signal Source Analyzer
LOCkED
Settings
Residual Noise [T1 w/o spurs]
Phase Detector +40 dB
Signal Frequency: 999.999902 MHz
Int PHN (30.0 .. 3.0 M) -70.8 dBc
Signal Level: 4.43 dBm
Residual PM 23.444 m?
Cross Corr Mode Harmonic 1
Residual FM 212.678 Hz
Internal Ref Tuned Internal Phase Det
RMS Jitter 0.0651 ps
Phase Noise [dBc/Hz]
Marker 1 [T1]
RF Atten 5 dB
30 Hz
Top -80 dBc/Hz
-99.66 dBc/Hz
LoopBW
Spot Noise [T1 w/o spurs]
100.000 Hz -107.67 dBc/Hz
1.000 kHz -118.92 dBc/Hz
10.000 kHz -125.19 dBc/Hz
100.000 kHz -126.61 dBc/Hz
1.000 MHz -141.88 dBc/Hz
1 CLRWR SMTH 10%
2 CLRWR
SPR OFF TH 0dB
30 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz 3 MHz
Frequency Offset

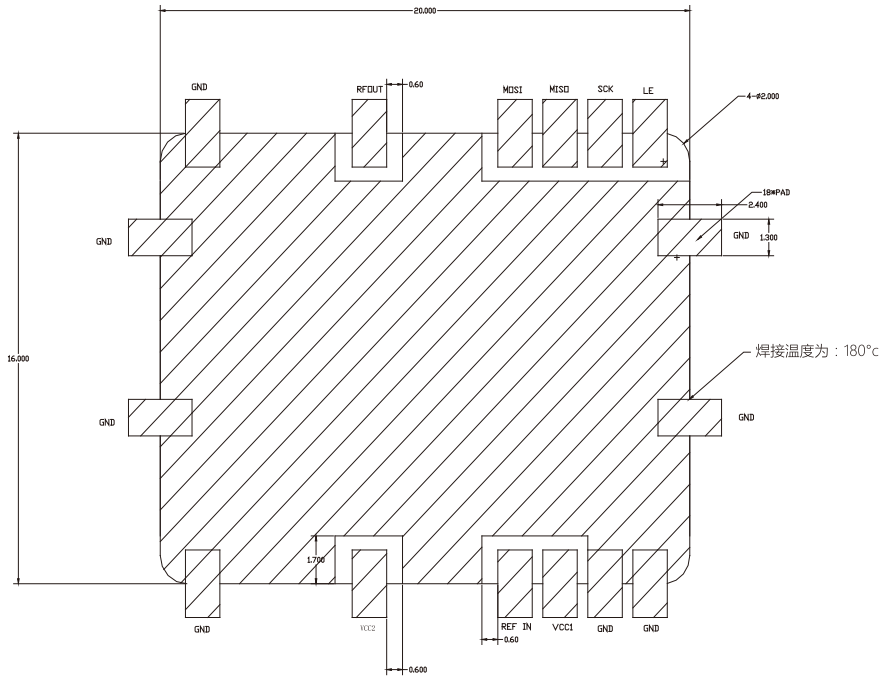

R&S FSUP 26 Signal Source Analyzer
LOCkED
Settings
Residual Noise [T1 w/o spurs]
Phase Detector +20 dB
Signal Frequency: 5.000000 GHz
Int PHN (30.0 .. 3.0 M) -56.1 dBc
Signal Level: 3.5 dBm
Residual PM 0.127 ?
Cross Corr Mode Harmonic 1
Residual FM 896.742 Hz
Internal Ref Tuned Internal Phase Det
RMS Jitter 0.0707 ps
Phase Noise [dBc/Hz]
Marker 1 [T1]
RF Atten 5 dB
30 Hz
Top -70 dBc/Hz
-85.4 dBc/Hz
LoopBW
Spot Noise [T1 w/o spurs]
100.000 Hz -93.16 dBc/Hz
1.000 kHz -104.22 dBc/Hz
10.000 kHz -109.99 dBc/Hz
100.000 kHz -111.23 dBc/Hz
1.000 MHz -129.30 dBc/Hz
1 CLRWR SMTH 10%
2 CLRWR
SPR OFF TH 0dB
30 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz 3 MHz
Frequency Offset



outline Drawing



PCB LAND PATTERN



Pin name	function	pin name	Function
GND	Gnd	MOSI	SPI communication data input
RFOUT	RF output	MISO	SPI communication data output（use as lock detect output in single frequency mode, TTL high when locked）
REFIN	Ref input	SCk	SPI communication clock
VCC1	Power of digital 3.3V/10mA	LE	SPI communication enable
VCC2	Power of analog 3.3V/340mA		

General & Environmental Specifications

power (V/A)	Power 1:+3.3V1/340mA (analog) Power2:+3.3V2/10mA(digital)
Control Interface	SPI
Temperature Range (operating/non-operating)	-40~+70/-55~+85
Size (mm)	20*16*4mm

Ordering Information

Part Number	Description
TFS10-15P-xxxx	For single frequency out, xxxx is output frequency in MHz unit
TFS10-15-xxxx	Frequency output range： xxx is the initial frequency