

## TFS40-20 - Frequency synthesizer

The TFS40-20 Agile Frequency Synthesizer is a high-performance RF/microwave signal generator designed for applications requiring rapid frequency switching, wide bandwidth, and exceptional phase stability. It supports two frequency ranges: S40-10L/20L) further enhance performance for critical applications.



1250 MHz to 10 GHz (TFS40-10/10L) and 2500 MHz to 20 GHz (TFS40-20/20L), with an ultra-fast frequency hopping time of  $\leq 10 \mu\text{s}$ . Featuring a compact form factor (65×65×13 mm) and SPI control interface, this synthesizer delivers precise frequency agility and low phase noise, making it ideal for advanced radar, communication, and electronic warfare systems.

### 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

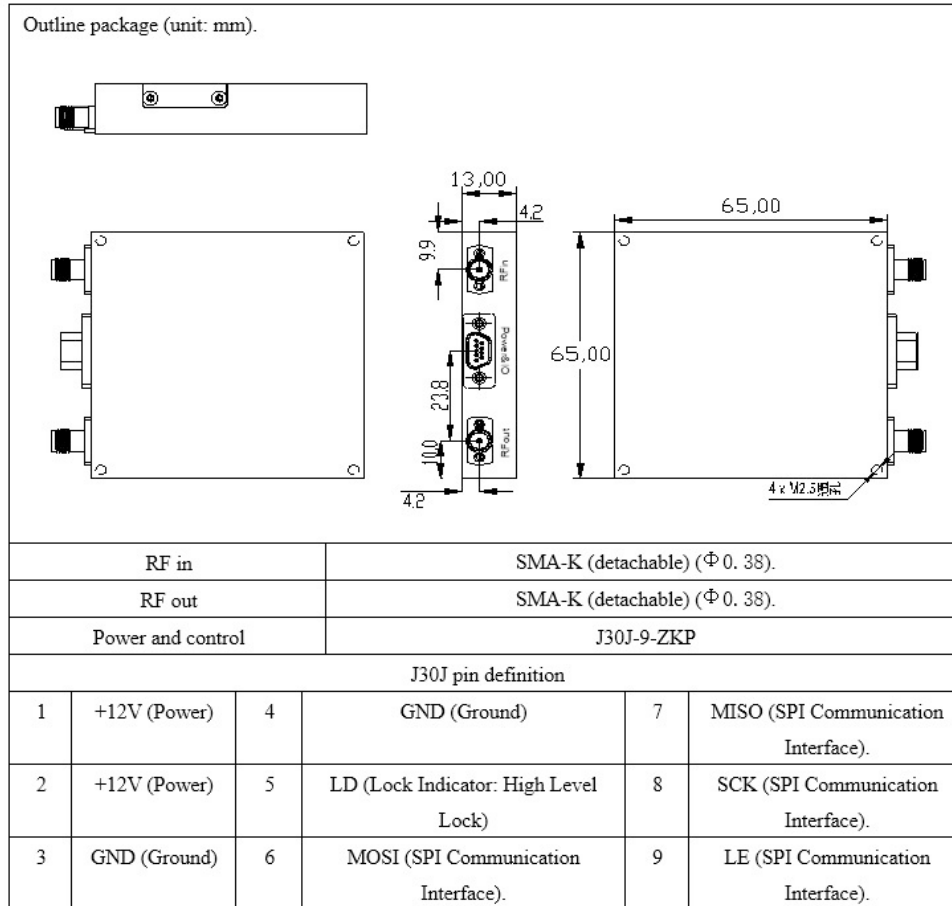
- Output frequency: 200MHz~15GHz;
- Frequency step: 1Hz;
- Small size: 38\*38\*10mm
- Control mode: SPI control;

## kTB Frequency synthesizer

Optional low-phase-noise variants (TFS40-10L/20L) further enhance performance for critical applications.

| Product Features:      | Specification name            |               | Indicator parameters                                               |                     | remark                             |
|------------------------|-------------------------------|---------------|--------------------------------------------------------------------|---------------------|------------------------------------|
| RF output              | Output frequency              |               | 1250~10000MHz<br>(TFS40-10/10L)<br>2500~20000MHz<br>(TFS40-20/20L) |                     |                                    |
|                        | Frequency stepping            |               | 0.1Hz                                                              |                     |                                    |
|                        | Frequency hopping time        |               | ≤10us                                                              |                     | Communication time is not included |
|                        | Output power                  |               | ≥5dBm                                                              |                     |                                    |
|                        | Frequency stability           |               | Synchronized with external references                              |                     |                                    |
|                        | Spurious                      |               | ≤-65dBc/-60dBc<br>(Typical/Maximum)                                |                     |                                    |
|                        | harmonic wave                 |               | ≤-5dBc                                                             |                     |                                    |
|                        | Phase noise                   | Frequency     | 1GHz<br>(Standard)                                                 | 1GHz<br>(Option L)  | 5GHz<br>(Standard)                 |
|                        |                               | dBc/Hz@100Hz  | ≤-95                                                               | ≤-105               | ≤-81                               |
|                        |                               | dBc/Hz@1kHz   | ≤-105                                                              | ≤-120               | ≤-91                               |
|                        |                               | dBc/Hz@10kHz  | ≤-115                                                              | ≤-125               | ≤-101                              |
|                        |                               | dBc/Hz@100kHz | ≤-115                                                              | ≤-125               | ≤-101                              |
|                        |                               | dBc/Hz@1MHz   | ≤-115                                                              | ≤-125               | ≤-101                              |
|                        |                               | Frequency     | 5GHz<br>(Option L)                                                 | 10GHz<br>(Standard) | 10GHz<br>(Option L)                |
|                        |                               | dBc/Hz@100Hz  | ≤-91                                                               | ≤-75                | ≤-85                               |
|                        |                               | dBc/Hz@1kHz   | ≤-106                                                              | ≤-85                | ≤-100                              |
|                        |                               | dBc/Hz@10kHz  | ≤-111                                                              | ≤-95                | ≤-105                              |
|                        |                               | dBc/Hz@100kHz | ≤-111                                                              | ≤-95                | ≤-105                              |
|                        |                               | dBc/Hz@1MHz   | ≤-111                                                              | ≤-95                | ≤-105                              |
|                        |                               | Frequency     | 20GHz<br>(Standard)                                                | 20GHz<br>(Option L) |                                    |
|                        |                               | dBc/Hz@100Hz  | ≤-69                                                               | ≤-79                |                                    |
|                        |                               | dBc/Hz@1kHz   | ≤-79                                                               | ≤-94                |                                    |
|                        |                               | dBc/Hz@10kHz  | ≤-89                                                               | ≤-99                |                                    |
|                        |                               | dBc/Hz@100kHz | ≤-89                                                               | ≤-99                |                                    |
|                        |                               | dBc/Hz@1MHz   | ≤-89                                                               | ≤-99                |                                    |
| RF input               | Enter the reference frequency |               | 100MHz                                                             |                     |                                    |
|                        | Phase noise                   | dBc/Hz@100Hz  | ≤-125                                                              |                     |                                    |
|                        |                               | dBc/Hz@1kHz   | ≤-153                                                              |                     |                                    |
|                        |                               | dBc/Hz@10kHz  | ≤-160                                                              |                     |                                    |
|                        |                               | dBc/Hz@100kHz | ≤-160                                                              |                     |                                    |
|                        |                               | dBc/Hz@1MHz   | ≤-165                                                              |                     |                                    |
|                        | Enter the reference power     |               | 7±3dBm                                                             |                     |                                    |
| Operating voltage      | Power supply                  |               | +12VDC ±0.5                                                        |                     |                                    |
|                        | Maximum voltage               |               | +15V                                                               |                     |                                    |
|                        | Operating current             |               | ≤1.5A (start)<br>≤0.8A (Stable)                                    |                     |                                    |
| Interface requirements | RF interface                  |               | SMA-K(Detachable) (Φ0.38)                                          |                     |                                    |
|                        | Refer to the input interface  |               | SMA-K(Detachable) (Φ0.38)                                          |                     |                                    |
|                        | Control and power interfaces  |               | J30J-09-ZKP                                                        |                     |                                    |
| structure              | Dimensions                    |               | 65×65×13mm                                                         |                     |                                    |
|                        | weight                        |               | ≤150g                                                              |                     |                                    |
| Ambient temperature    | Operating temperature         |               | -40~+70℃                                                           |                     |                                    |
|                        | Storage temperature           |               | -55~+85℃                                                           |                     |                                    |
| other                  | Control mode                  |               | SPI                                                                |                     |                                    |

### Dimensions:



### Selection List

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

| The product order number |                                                                     |
|--------------------------|---------------------------------------------------------------------|
| TFS40- 10                | Frequency transmission range: 1250~10000MHz                         |
| TFS40- 20                | Frequency transmission range: 2500~20000MHz                         |
| TFS40- 10L               | Frequency Transmission Range: 1250~10000MHz, Low Phase Noise Option |
| TFS40- 20L               | Frequency transmission range: 2500~20000MHz, low phase noise option |

### Deliverables:

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

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