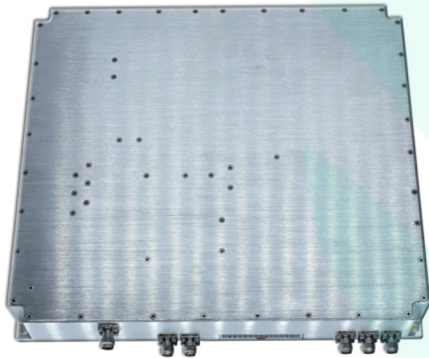


Ultra Wideband Signal Generators Module



Description:

Corech Microwave's Ultra-Wideband Signal Generators Module operates from 9kHz to 20GHz/40GHz, featured with ultra wideband, CW/Pulse mode, ultra low noise of $-105\text{dBc}/\text{Hz}@10\text{kHz}$, low spurious and low consumption. They are very rugged and stable to be integrated in various systems.

PN:

| PN | Description | Option |
|-------------|--|-------------|
| MSG9K40G | | |
| MSG9K40G-P | Pulse Modulation, Inter Pulse Generator | Option 1 |
| MSG9K40G-S | Sweep | Option 2 |
| MSG9K40G-PS | Pulse Modulation, Inter Pulse Generator, Sweep | Option 1, 2 |

Key Specifications:

- Frequency Range: 9kHz to 40GHz
- Frequency Steps: 0.001Hz
- Output Power: $-15\text{dBm} \sim +15\text{dBm}$
- Setting Time: 300us
- Spurious: 60dBc
- Phase Noise: $-105\text{dBc}/\text{Hz}@10\text{kHz}$ at 20GHz
- External Reference: 10MHz
- Internal Reference: 100MHz
- RF Output Waveform: Sine wave / pulse modulation
- External Pulse Input: LVTTTL

• Electrical Specifications

External Reference (50Ω)

| Parameter | Min. | Typ. | Max. | Note |
|-----------------|------|-------|-----------------|------|
| Input Frequency | | 10MHz | | |
| Input Power | 0dBm | | +5dBm | |
| Phase Noise | | | -150dBc/Hz@1kHz | |

Internal Reference (50Ω)

| Parameter | Min. | Typ. | Max. | Note |
|-----------------------|------|--------|-----------------|------|
| Frequency | | 100MHz | | |
| Frequency stability | | 0.1ppm | | |
| Temperature stability | | 0.1ppm | | |
| Phase Noise | | | -155dBc/Hz@1kHz | |

Reference Output

| Parameter | Min. | Typ. | Max. | Note |
|------------------|------|---------------|-----------------|--------|
| Output Frequency | | 10MHz, 100MHz | | |
| Output Power | 0dBm | | | 10MHz |
| | 0dBm | | | 100MHz |
| Phase Noise | | | -140dBc/Hz@1kHz | 10MHz |
| | | | -145dBc/Hz@1kHz | 100MHz |

● Electrical Specifications

| Parameter | Min. | Typ. | Max. | Note |
|--|--------|---------|--------|------|
| Frequency Range | 9kHz | | 40GHz | |
| Frequency Steps | | 0.001Hz | | |
| Output Power | -15dBm | | +15dBm | 25°C |
| Power Steps | | | 0.5dB | |
| Output Power Resolution | | | ±2dB | |
| Setting Time | | 300us | 500us | #1 |
| Harmonics | | | | |
| 1GHz | -50dBc | -40dBc | -20dBc | |
| 10GHz | -55dBc | -40dBc | -20dBc | |
| 20GHz | -45dBc | -40dBc | -20dBc | |
| 1/2 Harmonics | | | | |
| 1GHz | -90dBc | -80dBc | -60dBc | |
| 10GHz | -90dBc | -80dBc | -60dBc | |
| 20GHz | -85dBc | -80dBc | -60dBc | |
| 35GHz | -80dBc | -75dBc | -60dBc | |
| 40GHz | -80dBc | -75dBc | -60dBc | |
| Spurious (Frequency Offser ≥5kHz) | | | | |
| 1GHz | -85dBc | -80dBc | -60dBc | |
| 10GHz | -80dBc | -75dBc | -60dBc | |
| 20GHz | -74dBc | -70dBc | -60dBc | |
| 30GHz | -74dBc | -65dBc | -60dBc | |
| 40GHz | -68dBc | -63dBc | -60dBc | |

#1, Setting Time: 500ns (Excluding communication time)

● Electrical Specifications

SSB Phase Noise (Type)

| Parameters | 100Hz | 1kHz | 10kHz | 100kHz | 1MHz |
|--------------|-------|------|-------|--------|------|
| dBc/Hz@1GHz | -104 | -126 | -130 | -130 | -130 |
| dBc/Hz@10GHz | -85 | -106 | -110 | -110 | -111 |
| dBc/Hz@20GHz | -79 | -100 | -104 | -104 | -105 |
| dBc/Hz@30GHz | -75 | -96 | -100 | -100 | -101 |
| dBc/Hz@40GHz | -73 | -94 | -98 | -98 | -99 |

● Option 1 (Pulse Generator and Modulation)

Pulse Modulation

| Parameters | Min. | Typ. | Max. |
|------------------|------|--------|------|
| On/ Off Ratio | | -65dBc | |
| Min. Pulse Width | | 100ns | |
| Min. Period | | 110ns | |

External Pulse Input

| | | | |
|--------|--|-------|--|
| LVTTTL | | +3.3V | |
|--------|--|-------|--|

Internal Pulse Generator

| | | | |
|------------------------|-------|---------------|------------|
| Square Wave Speed Rate | 0.1Hz | | 10MHz |
| Period | 110ns | | 100s |
| Pulse Width | 100ns | | 99.999999s |
| Rise Time / Fall Time | | 25ns / 25ns | >100MHz |
| | | 150ns / 150ns | ≤100MHz |
| Resolution | | 100ns | |
| Delay | 20ns | | 100s |

- **Option 2 (Sweep)**

Sweep

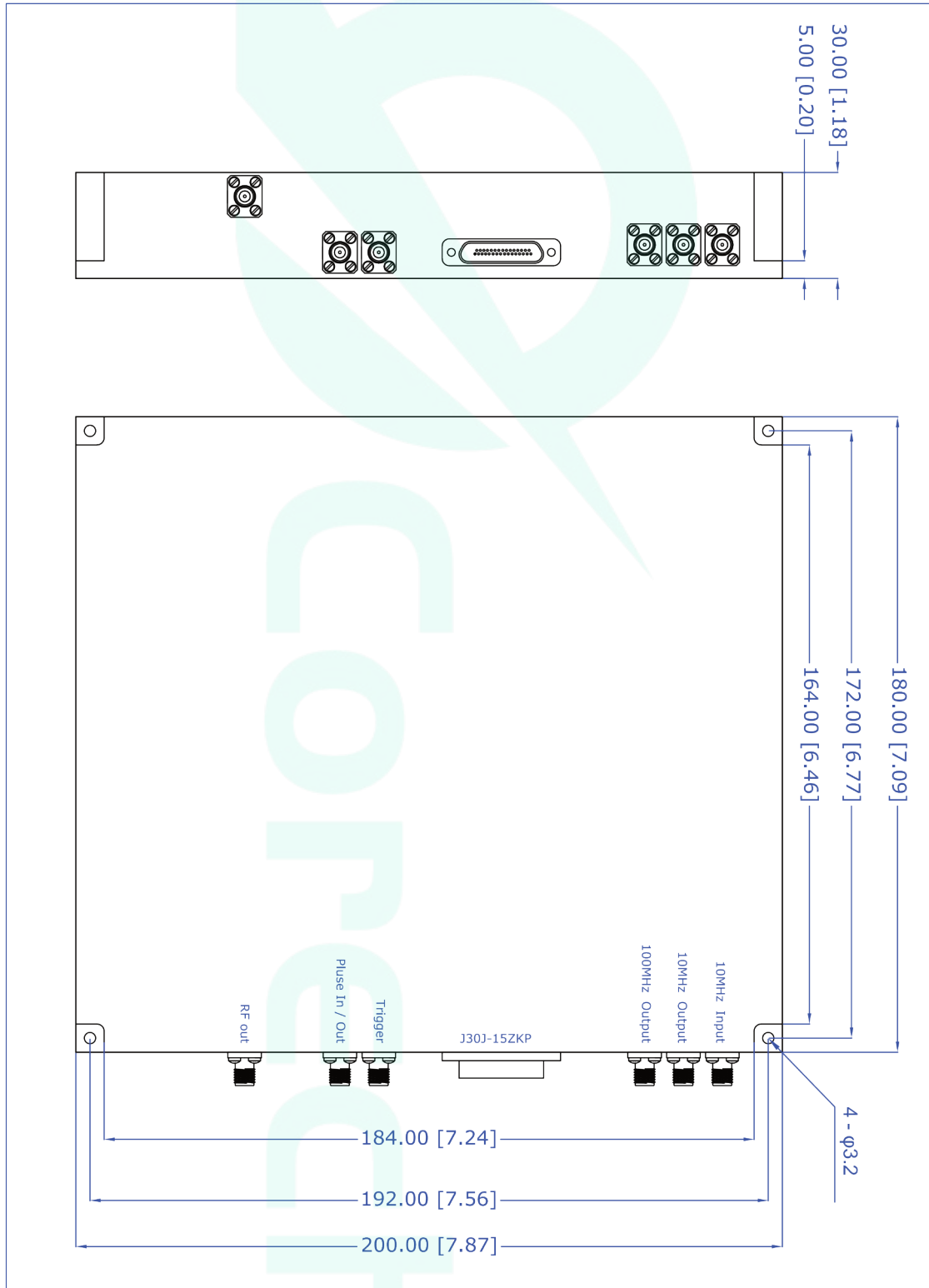
| Parameters | Min. | Typ. | Max. |
|-----------------|------------------------------|------|-------|
| Operating Mode | Step Sweep | | |
| Sweep Range | 9kHz | | 40GHz |
| Dwell Time | 10ms | | 10s |
| Time Resolution | | 1us | |
| Switching Speed | 300us typ. @ Internal Source | | |

- **General Specifications**

| Parameters | Min. | Typ. | Max. |
|-----------------------------|---------------------------|------|------|
| Supply Current (Vcc=+24V) | | | 2A |
| Communication | RS422, Baud Rate: 1Mbps * | | |
| RF Out Connector | 2.92mm-Female | | |
| Reference Input/Output | SMA-Female | | |
| Synchronization Signal | SMA-Female | | |
| Power and Control Interface | J30J-15ZP | | |
| Operating Temperature | -20 ~ +40 °C | | |
| Storage Temperature | -40 ~ +70 °C | | |

* Communication protocol will be discussed and agreed upon subsequently

● **Dimensions:**

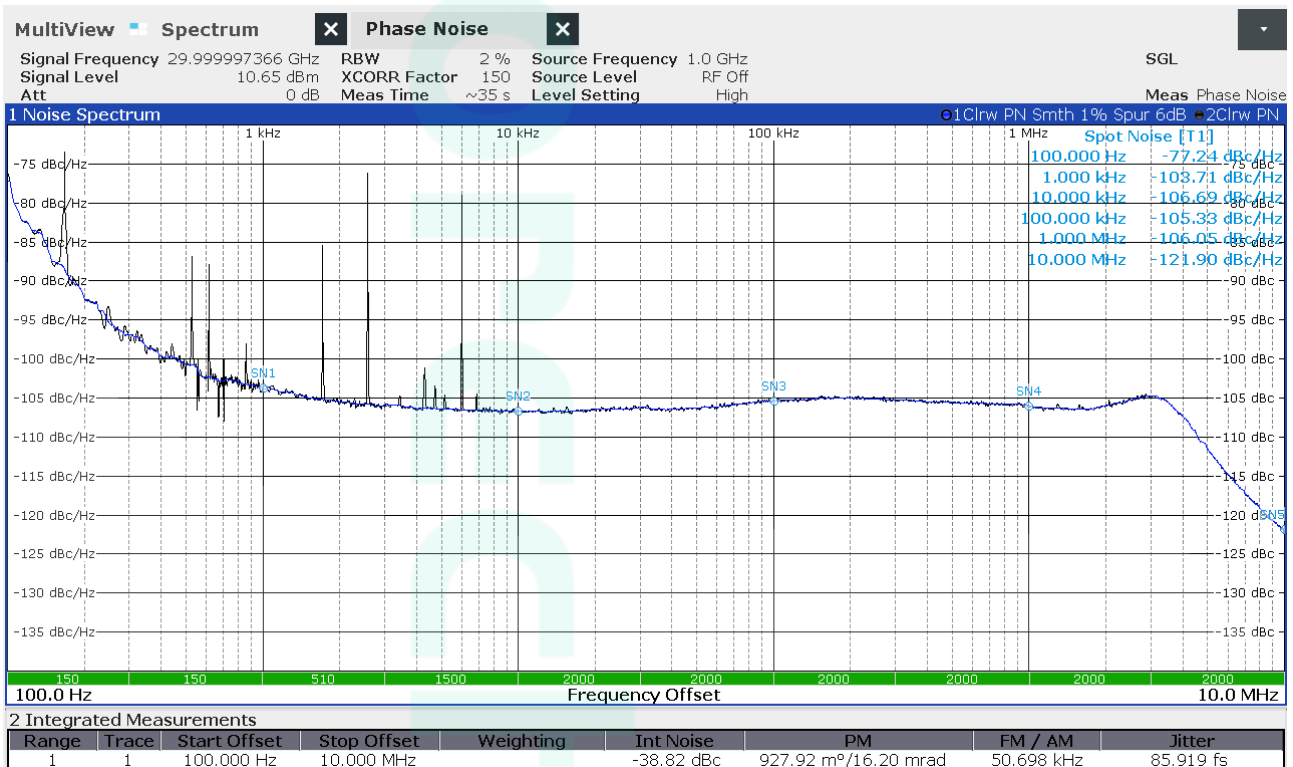
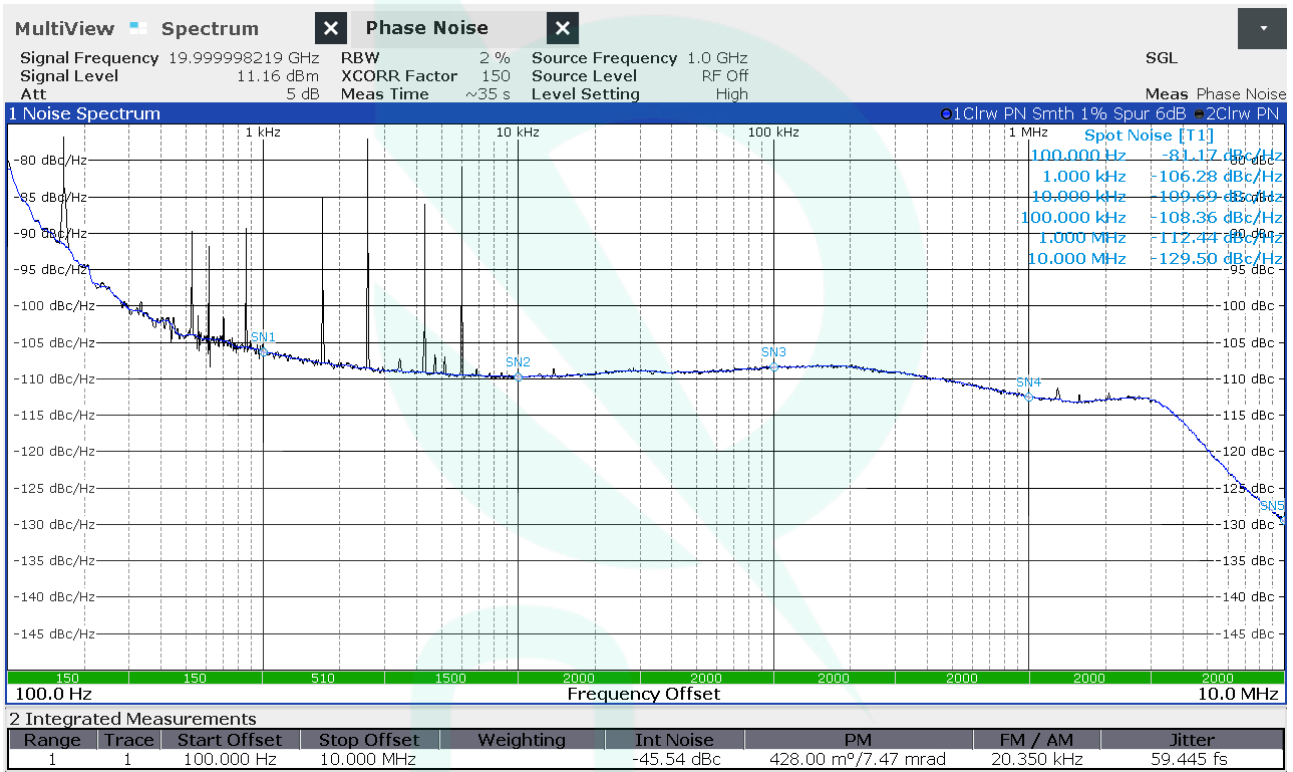


Dimensions:

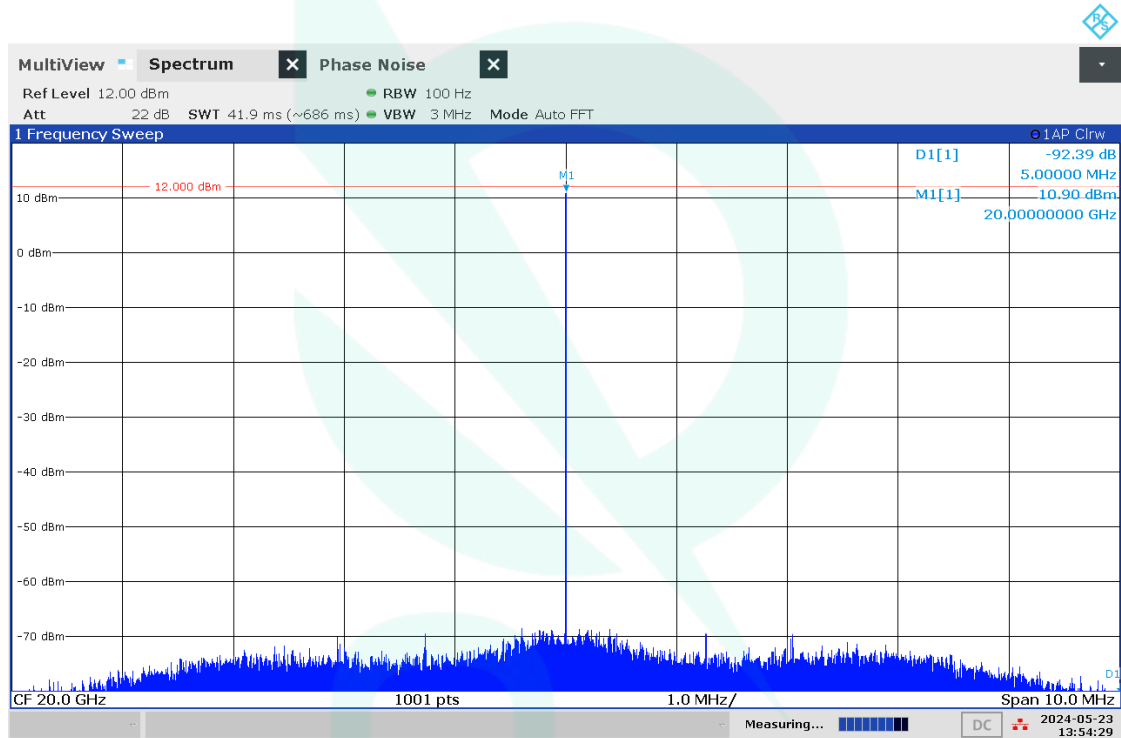
Table 1: J30J-15ZKP Interface Definition

| J30J Pin | Definition | J30J Pin | Definition |
|----------|------------|----------|------------|
| 1 | +24V | 9 | T+ |
| 2 | +24V | 10 | T- |
| 3 | +24V | 11 | R+ |
| 4 | +24V | 12 | R- |
| 5 | GND | 13 | NC |
| 6 | GND | 14 | NC |
| 7 | GND | 15 | NC |
| 8 | GND | | |

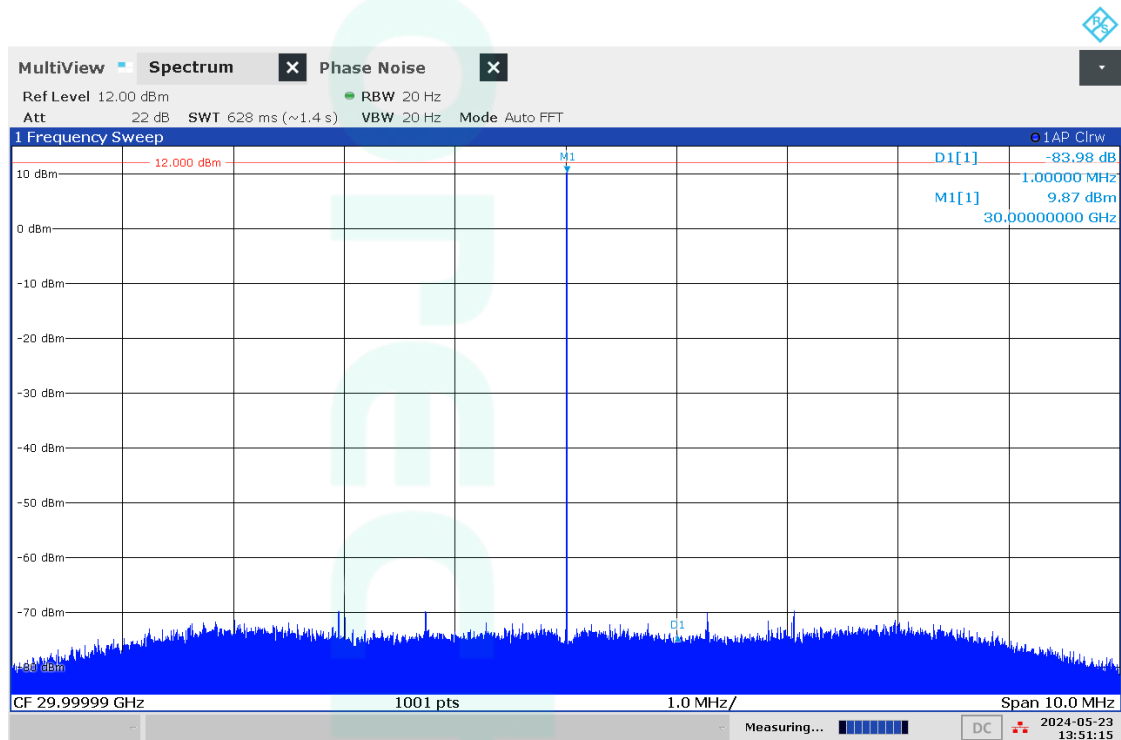
SSB Phase Noise (Typ.)



Spurious (Typ.)

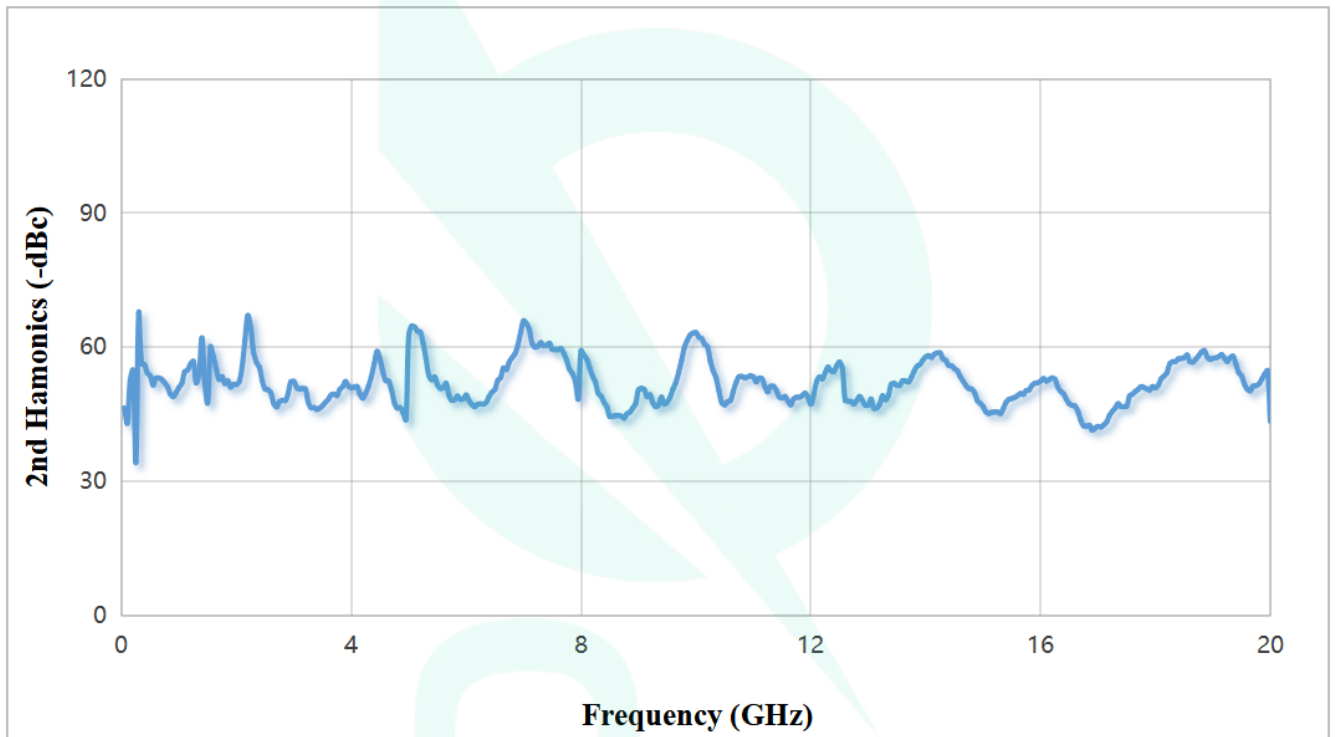


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Harmonics (Typ.)



1/2 Harmonics (Typ.)

