TeraFlex
Terahertz source

General description

Teraflex is a complete solution for generation, test and measurement of terahertz and optics frequencies. It is an RF source based on optical photo mixing approach capable of generating any frequency between 0 to 2THz (5 THz is coming). The teraflex can also generate an ultra-narrow linewidth optical signal.

The patented optical feedback technology has solved two of the main problems associated with current optical source solutions, namely the frequency stability and the phase noise. This source can be coupled to a RF module for wireless communications, integrated into radars or THz active cameras via other modules.

The Teraflex can also incorporate an I/Q modulator, so if it is combined with an I/Q baseband generator, the instrument can be used to generate signals for all radio standards in both optics and RF frequency bands.

Applications

- High speed wireless communications (5G+, 6G …)
- High speed optical communication (fiber and free space)
- Radar
- Military and space communication
- Imaging
- Spectroscopy

Product highlights

- Fine tuning of the output frequency from 0 to 2 THz.
- Constant phase noise over the entire frequency range
- Only one device to meet all radio frequency bands.
- High-speed optical data encoding with standard modulation (QPSK, QAM, OFDM…)
- Well suitable to terahertz radar due to the source high stability and tunability. Terahertz radar is more effective than LiDAR in degraded visual environments (dust, sand, snow…).
- Excellent size, weight, power and cost factor (SWaP-C).
- Multiple output formats (fiber/RF connector) are available.

Specifications

Optical

Parameter	Condition	Min	Typ	Max	Unit
Laser center wavelength			1550		nm
Laser frequency step			1.47		GHz
Laser linear drift rate			1		Hz/s
Laser signal to noise ratio		80			dB
Laser unbalanced				1	dB
Output power • combined outputs • Isolated outputs	Any output		15 12		dBm

Frequency

Parameter	Condition	Min	Typ	Max	Unit
Coarse frequency step			1.47		GHz
Fine frequency step [1]			1		Hz
Difference frequency range		0		2	THz
Phase noise at 1Hz offset [2]	Fout = 66.15GHz			-90	dBc/Hz
Phase noise at 10KHz offset [2]	Fout = 66.15GHz			-110	dBc/Hz
Phase noise at 1MHz offset [2]	Fout = 66.15GHz			-120	dBc/Hz
Output power • RF high frequency [3] • RF high power [3]	 At 66.15Ghz At 10GHz		 7 22		dBm

Electrical

Parameter	Condition	Min	Typ	Max	Unit
Supply voltage		100		240	V
Supply voltage frequency		50		60	Hz
Average power consumption			20		W
Peak power consumption				30	W

Modulation [4]

Parameter	Condition	Min	Typ	Max	Unit
Modulation bandwidth	wavelength = 1550nm			20	GHz
Modulation data rate	wavelength = 1550nm			56	Gbaud
Frequency carrier offset	wavelength = 1550nm			20	GHz

Environmental conditions

Description	Specifications

Operating environment:
    Temperature
    Humidity
    Altitude
    Vibration
	
	+10°C to +40°C
	RH 20% to 80% (non-condensing)
	0 to 2000m
	0.1Grms max, 1Hz to 100Hz

(1) Available with fine tuning option
(2) Measures made by an independent laboratory (IEMN, Lille, France)
(3) Maximum RF output frequency and power depending on output option
(4) Available with modulation option