

Phase-invariant cable assemblies

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HUBER+SUHNER provides state-of-the-art connectivity solutions for phase sensitive applications, ensuring reliable radio frequency connections over large temperature ranges. We deliver highly engineered solutions that raise system stability without compromising signal integrity.

Key Features and Benefits

Ultimate phase stability in the market

The signal phase changes by less than 300 ppm over broad temperature ranges, relaxing the need for any active compensation.

High performance

Our low-loss, flexible and stable RF performance cables, are based on technology that rigorously ensures reliable and durable connectivity of signal and power.

Frequency range

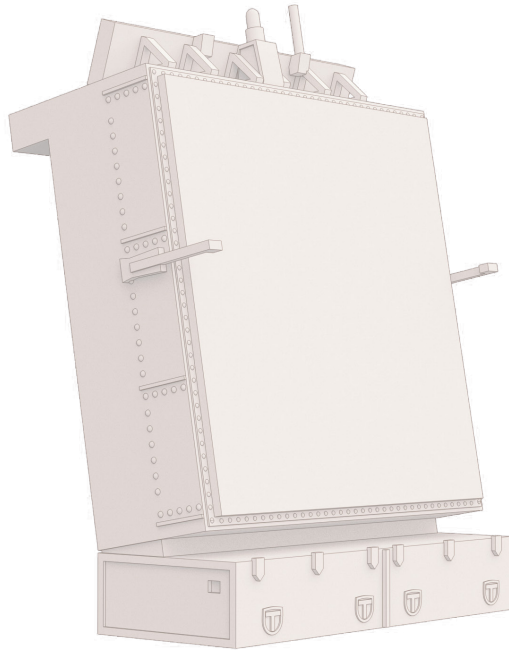
Our CT product family extends up to 40 GHz maintaining phase and insertion loss stability throughout.

Connectivity solutions

Regularly we combine products from our large portfolio into connectivity network architectures tuned to precisely meet the specificities of our customers.

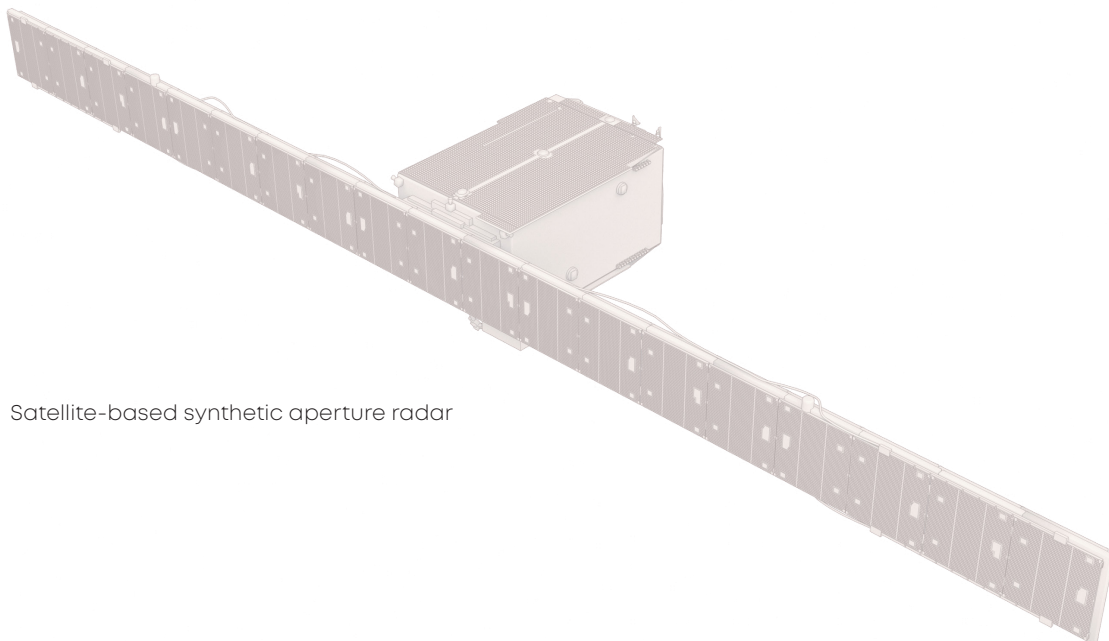
Exemplary applications that require precise phase stability and control

Phased arrays are used for multibeam communication and radar tracking systems. In antenna beamforming, the radiation from individual array elements is combined. Multiple high-gain patterns can be generated that permit tracking of a multitude of targets simultaneously, such as in military radar applications.



Ground radar

Space-bound radar interferometry is a technique for earth observation unaffected by weather or lighting conditions. Satellite-based synthetic aperture radar (SAR) enables centimeter resolution measurements of the ground surface topology in all three dimensions.

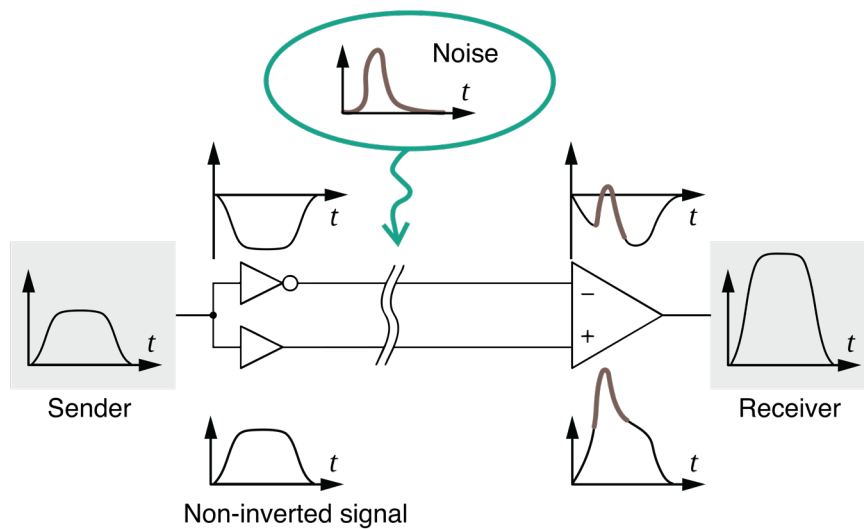


Satellite-based synthetic aperture radar

Phase stability is important

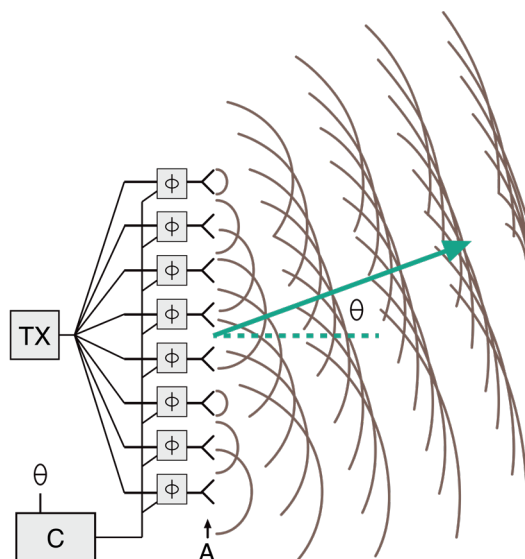
The differential pairs technique permits for superior noise elimination - if the relative signal phases remain stable

Two conductors carry voltage signals which are equal in magnitude, but of opposite polarity. The receiving circuit responds to the difference between the two signals, which results in a signal with a magnitude twice as large. The prerequisite is that the phase of the signals does not disperse during transmission.



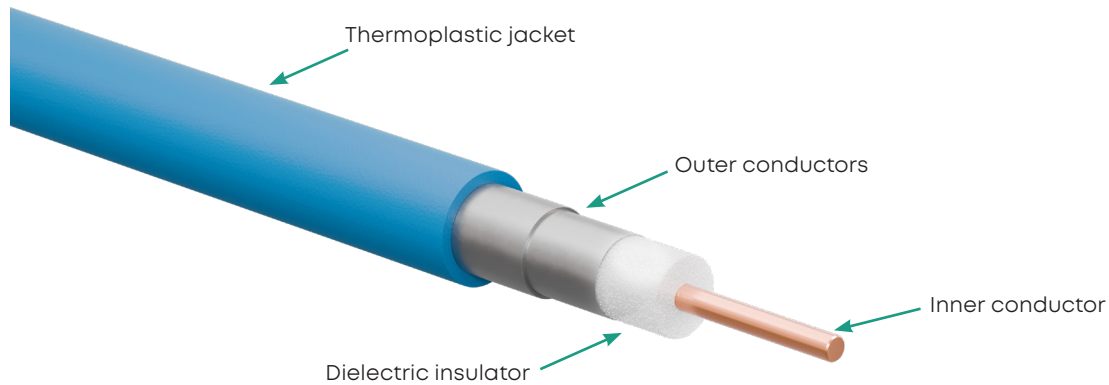
Phased array beam forming

Phased arrays combine the radiation from each antenna element such that by interference a highly directional beam is formed. The boresight direction of the pattern is determined by the amplitude and phase of each antenna element comprising the array. For this purpose, the phase of each radiating element must be tightly controlled.

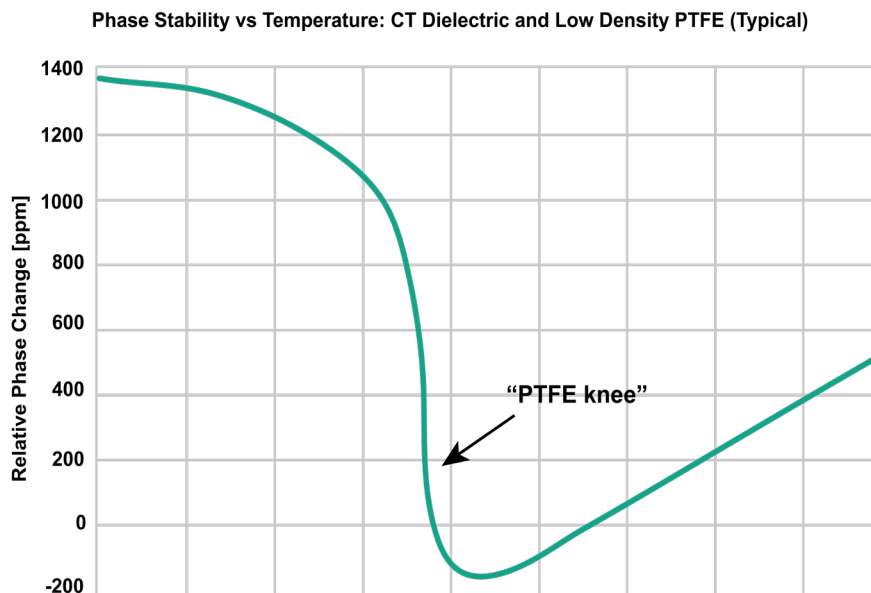


The choice of dielectric and cable construction is important

Cable dimensions and dielectric constant determine the signal attenuation and cut-off frequency. LD-PTFE is a typical material used in high-end coaxial cables due to its electrical and mechanical properties.



Yet, LD-PTFE displays an unfavorable phase transition of its crystal lattice around room temperature from hexagonal to triclinic. This changes the density of the material and hence ϵ_r abruptly – the “PTFE-knee” emerges.



By choice of alternative dielectrics with low ϵ_r that do not exhibit this phenomenon, and in combination with a cable construction that perfectly compensates the longitudinal and radial thermal expansion properties of the contributing materials, the “PTFE-knee” can be eliminated. That’s HUBER+SUHNER CT technology.

Multiflex CT cable assemblies

Multiflex CT stands for flexible high-performance microwave cables “Constant-over-Temperature”. Ideal for integration into applications where flexible cable routing, low loss and weight, and unparalleled phase performance are essential. Multiflex CT cable assemblies can be deployed in commercial and military RF microwave systems in land, air, and sea applications.

Description	Outer diameter [mm]	Maximum frequency [GHz]	Insertion loss ¹ at 18 GHz [dB/m]	Relative phase variation ² over -55...+125°C [ppm]	Connectors ³
Multiflex_141_CT-02	3.8	40	2.0	≤300	SK, SMA
Multiflex_210_CT	5.0	30	1.4	≤300	SK, SMA, N, TNC
Multiflex_318_CT	7.5	18	1.0	≤300	SMA, N, TNC

¹ At sea level and room temperature

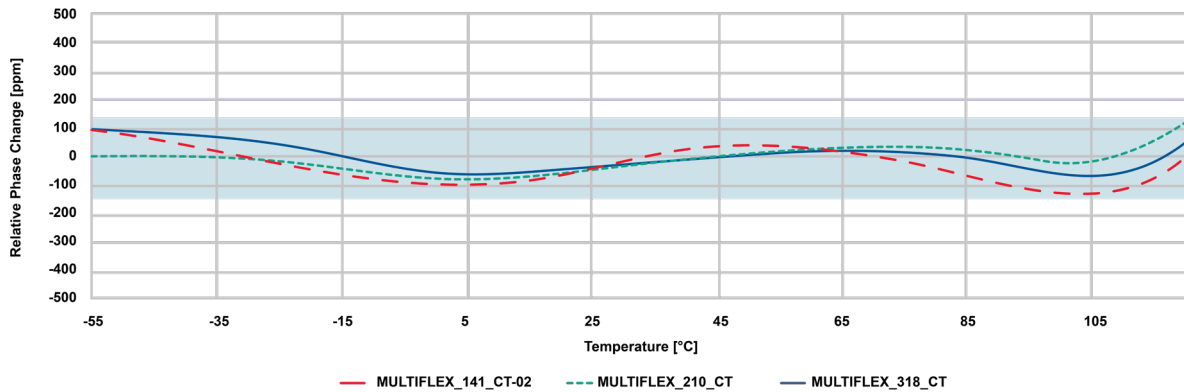
² Typical value

³ Straight cable plug

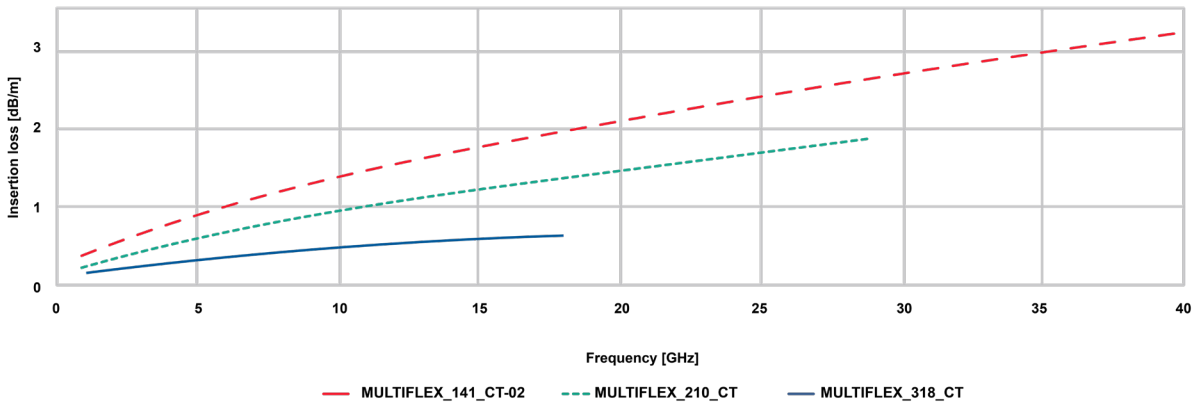
Right angle cable plug

Straight panel bulkhead cable jack

Phase Stability vs Temperature (Typical)



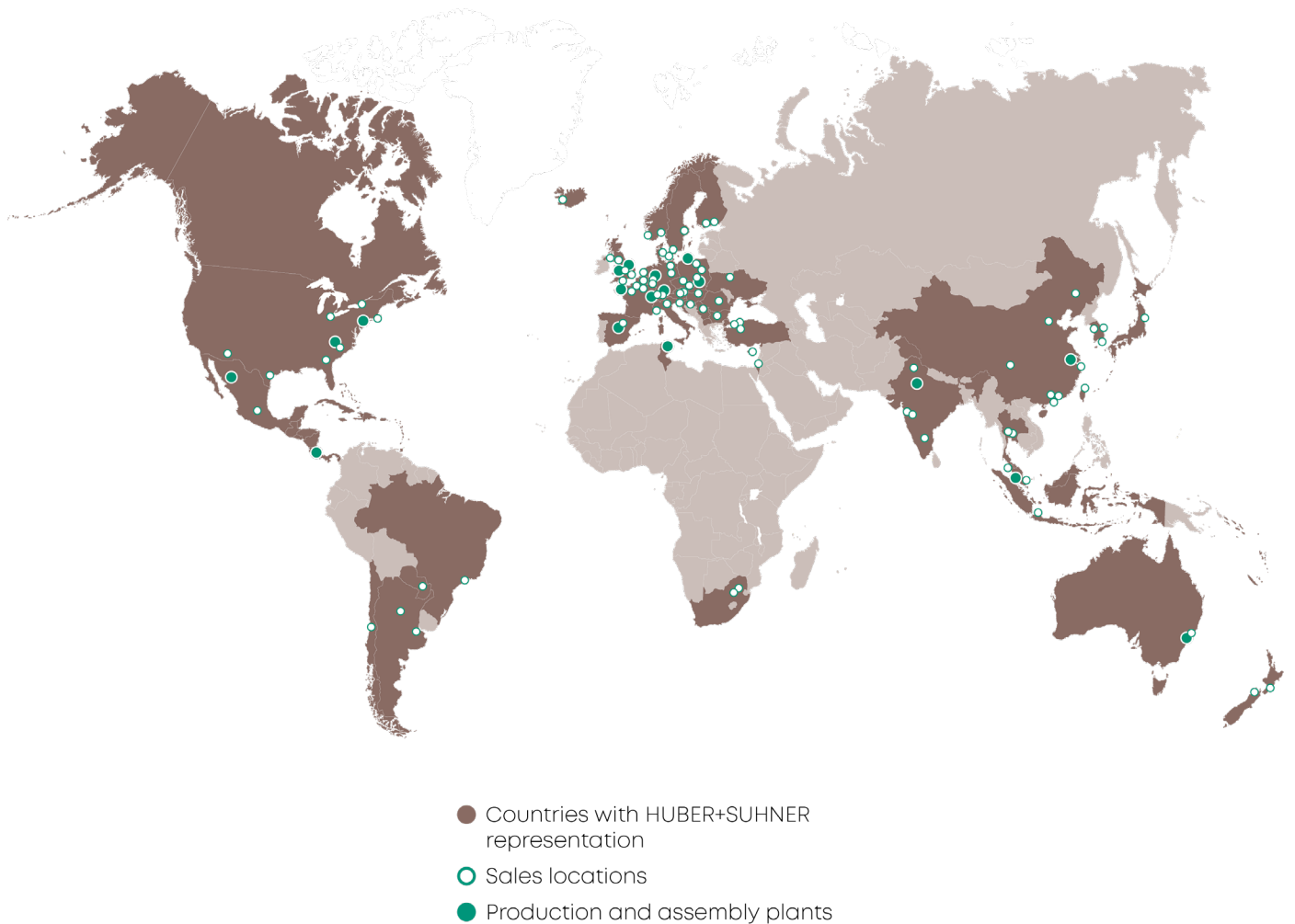
Loss Performance (Nominal)



Heritage

With a proven track record in aerospace, defense and civilian applications, HUBER+SUHNER is a trusted partner, backed by extensive engineering and testing resources. We take pride in our extensive heritage providing phase-stable connectivity to the most critical programs.

Headquartered in Herisau, Switzerland, we develop and produce products and solutions that excel in performance, quality, reliability and long service lives – even under the most demanding conditions. Through a global production network, combined with subsidiaries and representations in more than eighty countries, we are close to our customers worldwide.



Connecting – today and beyond

For more information, scan the QR code below:



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Waiver

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