Data sheet

Cri/oFlex® CF2

Tackle your cryogenic cabling challenge!

Cri/oFlex® cabling combines the robustness and compatibility of standard SMA and SMP connectors with the versatility of an in-house developed transmission line platform on flexible substrates. Cri/oFlex® is specifically designed for cryogenic environments where thermal load, microwave performance, small form factor and phase stability are critical. Cri/oFlex® comes as a standardized cable setup (CF2) as described below, but can be highly customized upon request. Cri/oFlex® CF2 products are ideally suited for very compact and densely packed cryogenic environments. Providing very sturdy cables that can be bend countless times, Cri/oFlex® solves your cryogenic cabling challenges!

Features

- Extremely flexible
- Excellent phase stability
- Small form factor
- Optional filtering & signal conditioning
- Countless bending and straightening cycles
- Low thermal load

General Properties	
Connector	
Connector Type	SMA, SMP, SMPM (all male)
Connector Configuration	Straight and Right-angle
Flex	
Length	10 to 1200 mm
Width	3 mm
Thickness	0.3 mm
Materials	Polyimide & Silver (Ag)
Transmission-line type	Stripline

Thermal Properties	
Operating Temperature	10^{-3} K → 400 K
Heat Load @ 4k (ΔT: 4 - 40 K), L = 0.4m	< 18 µW
Expected Heat Load @ 10 mK (ΔT: 10 - 350 mK), L = 0.2m	~ 5 nW
Thermal Cycles	> 50

(Static) Mechanical Properties	
Min. Bending Radius	1 mm
Required Length for Longitudinal Rotation	2.5 cm / rotation
Max. Tensile Force	50 N

Electrical Properties	
Impedance	50 Ω (± 2 Ω) (Customizable on Request)
Operating Frequency	DC to 18 GHz
Isolation	-60 dB, flex to flex, for connector data contact us

	Frequency	300 K	77K	4 K
Attenuation [dB/dm]	2 GHz	1.25	0.4	0.25
	6 GHz	1.8	0.88	0.55
	10 GHz	2.4	1.15	0.85
	14 GHz	3.7	2.36	1.75

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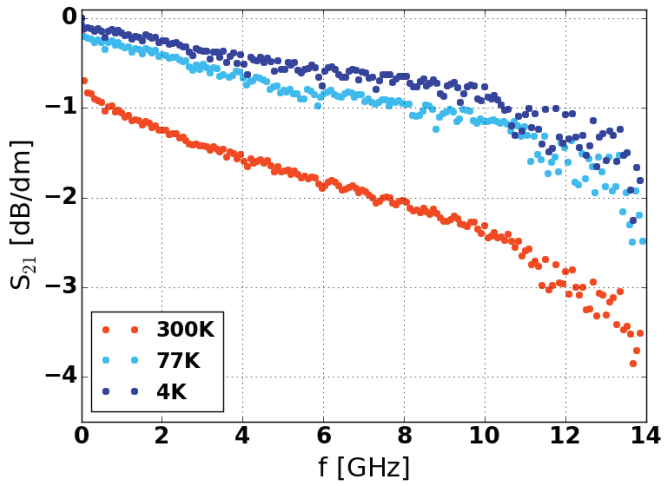
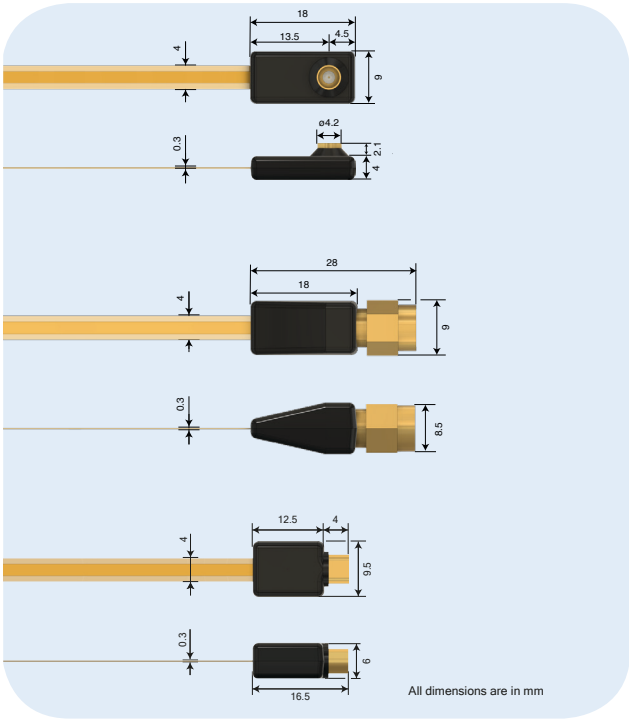
Signal Properties — Cri/oFlex® CF2



The figure on the left handside shows the roll-off (S21) of a typical DC-10 GHz bandwidth flex cable. Depending on connector type the available frequency bandwidth can go up to 18 GHz, while a bandwidth up to 26.5 GHz is actively being developed. The return loss (-S11) depends on the connector type but typically varies between 18 and 22 dB, for more information visit our website.

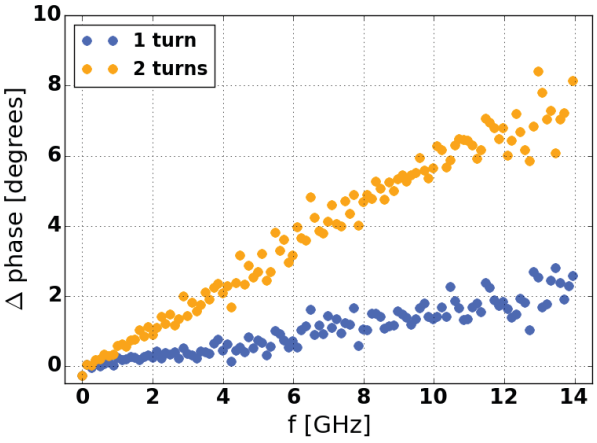
In the table below we show the available connector options and frequency bandwidths; ✓ readily available, ✓ available upon request, ✗ under development. The flex cables can be configured with different connectors at each end, for example an SMA-SMP hybrid. In the figure on the right the dimensions are shown for the 3 readily available connector types, see the table below for the respective bandwidth options.

Connector Type	0-2 GHz	0-6 GHz	0-12 GHz	0-18 GHz
SMP right-angle	✓	✓	✓	✓
SMA straight	✓	✓	✓	✗
SMP straight	✓	✓	✓	✓



Phase Stability — Cri/oFlex® CF2

In many cryogenic applications phase stability is essential. Cri/oFlex® shows exceptional phase stability, on par with excellent phase stable cables for room temperature. This is demonstrated in the right figure, where the resulting phase difference upon winding a CF2 once or twice around a pencil is measured, as shown in the image below.



For more information please consult our website: http://www.delft-circuits.com/

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