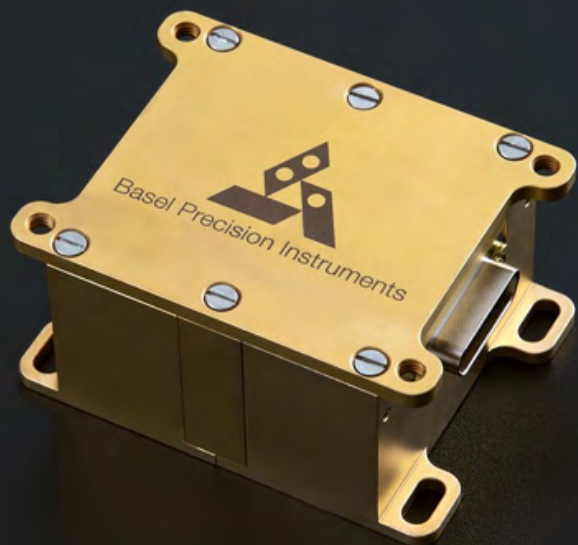




Basel Precision Instruments



Cryogenic Microwave Filter & Thermalizer (MFT)

High attenuation, low cutoff frequency, strong thermalization

- 25 filtered lines in a compact non-magnetic box
- Easy to mount at 10 mK
- **Exponentially strong attenuation**, free of resonances (plot on next page)
- More than 100 dB attenuation above ~100 MHz
- **Strong thermalization** (filter wire embedded in silver epoxy)
- Ultra-low resistance for high current applications: **~25 mΩ @ 4K**
- Ultra-low capacitance, reduced noise in current measurements: **2.5 nF**
- Resistance to ground > 1 TΩ; **negligible RF leakage current**

2-pole RC filtering available on request, bandwidth down to kHz, integrated into the same compact box



Single Filter Models		MFT-100Ω	πMFT-100Ω	MFT-25mΩ	πMFT-25mΩ
		Resistive for optimum thermalization		Ultra-low (mΩ) resistance for high-current applications	
Connector type		SMA, MCX, or customized SMP, etc.			
Dimensions (not including connector)		Length ~ 25 mm, Diameter ~ 6 mm			
Capacitance	300 K / 4.2 K	≲ 2.5 nF	≲ 12 nF	≲ 2.5 nF	≲ 12 nF
Resistance	T = 300 K	≲ 100 Ω		≲ 2.5 Ω	
	T = 4.2 K	≲ 100 Ω		≲ 25 mΩ	
Attenuation	3 dB cutoff *	~ 1.3 MHz **	~ 0.2 MHz **	~ 2 MHz	~ 0.5 MHz
	20 dB cutoff *	~ 10 MHz **	~ 1.2 MHz **	~ 20 MHz	~ 3 MHz
	100 dB cutoff *	~ 180 MHz	~ 45 MHz	~ 240 MHz	~ 70 MHz
Maximum applied voltage		100 V			
Maximum applied current	300 K	10 mA		30 mA	
	10 mK	0.2 mA***		10 mA***	
Resistance to ground		> 1 TΩ			

Table shows typical specs; * Variations of up to ±20% in cutoff frequencies can be expected; ** Extracted from measurements with 1 MΩ input impedance; all other cutoff frequencies are extracted with 50 Ω input impedance (typical spectra plotted below); *** Maximum current at 10 mK for dissipation below 10 μW.

Filter Box Models	MFT25-100Ω	MFT25-25mΩ
Number of filters per box	25	
Filter type	MFT-100Ω	MFT-25mΩ
Connector type	Micro-D connector	
Dimensions and weight	30 x 56 x 68 mm, 400 gr	

Figure shows the typical attenuation characteristics of individual MFT filters. A vector network analyzer with 50 Ω input was used. For 100 Ω filters (red curves), a spectrum analyzer with 1 MΩ input impedance was used below 20 MHz. Disclaimer: measurement results depend on the total setup and load impedance (real and imaginary). The jump observed (yellow circles) is caused by switching the input impedance from 1 MΩ to 50 Ω.

