

Quantum circuits and Quantum Processors are sensitive to high energy infrared photons propagating as TEM, TM, or TE modes on coaxial cables in a dilution refrigerator measurement system. Quantum Microwave offers a line of Infrared filters to offer various degrees of protection against infrared radiation.

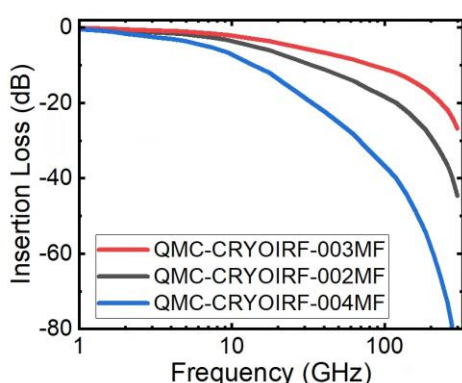


Model	QMC-CRYOIRF 001MF	QMC-CRYOIRF 003MF	QMC-CRYOIRF 002MF	QMC-CRYOIRF 004MF
Cut-off frequency	700 MHz	10 GHz	10 GHz	10 GHz
Insertion Loss	3 dB @ 700 MHz 40 dB @ 10 GHz	1 dB @ 10 GHz 6 dB @ 30 GHz	2 dB @ 10 GHz 10 dB @ 30 GHz	5 dB @ 10 GHz 20 dB @ 30 GHz
Return Loss	>12 dB to 700 MHz	>20 dB to 9 GHz	>20 dB to 12 GHz	>20 dB to 10 GHz
Length of Absorber Region	1 cm	0.6 cm	1 cm	2 cm

QMC-CRYOIRF Infrared filters are based on ECCOSORB® Magnetically Loaded dielectric Absorber.



All Filter Models available as a bulkhead mount



Insertion loss above 40 GHz is estimated from ECCOSORB® absorption measurements:

- [1] EPJ Quantum Technol 9, 1 (2022)
- [2] Prog Elec Res B 33, 277 (2011)
- [3] App Optics 25, 565 (1986)
- [4] Int J. Inf Millimeter Waves 5, 1507 (1984)

QMC-CRYOIRF filters are designed to protect sensitive quantum circuits from Infrared radiation.

QMC-002MF **1** and QMC-004MF **2** offer more attenuation at high frequencies and are used on signal and control lines.

QMC-003MF **3** offers lower attenuation in the < 10 GHz range for readout applications where high SNR of the readout is desired while maintaining a degree of protection against infrared radiation.

