withwave
Next Generation Connectivity

Cryogenic Infrared Filters (SMPS type)

Cryogenic Infrared Filters (SMPS type)

WithWave's Cryogenic Infrared Filters (IRF-S01, 02), designed with advanced cryogenic technology, delivers low insertion loss in the passband and exceptional blocking characteristics in the optical range, making it ideal for applications such as quantum computing, Superconducting electronics. This filter is rigorously tested and verified using WithWave's 4 K cryogenic measurement system, ensuring reliable performance under extreme low-temperature conditions.

IRF-S01-S,-8C(Low cut-off single, 8-channel)

IRF-S02-S,-8C(High cut-off single, 6-channel)

· Features

- Impedance: 50 Ω
- Capable of operation : 10 mK
- Connector types: Female SMPS (Both)
- Body and Plating Material : Gold Plated OFHC Copper

· Application

- Cryogenic quantum computing
- Superconducting electronics

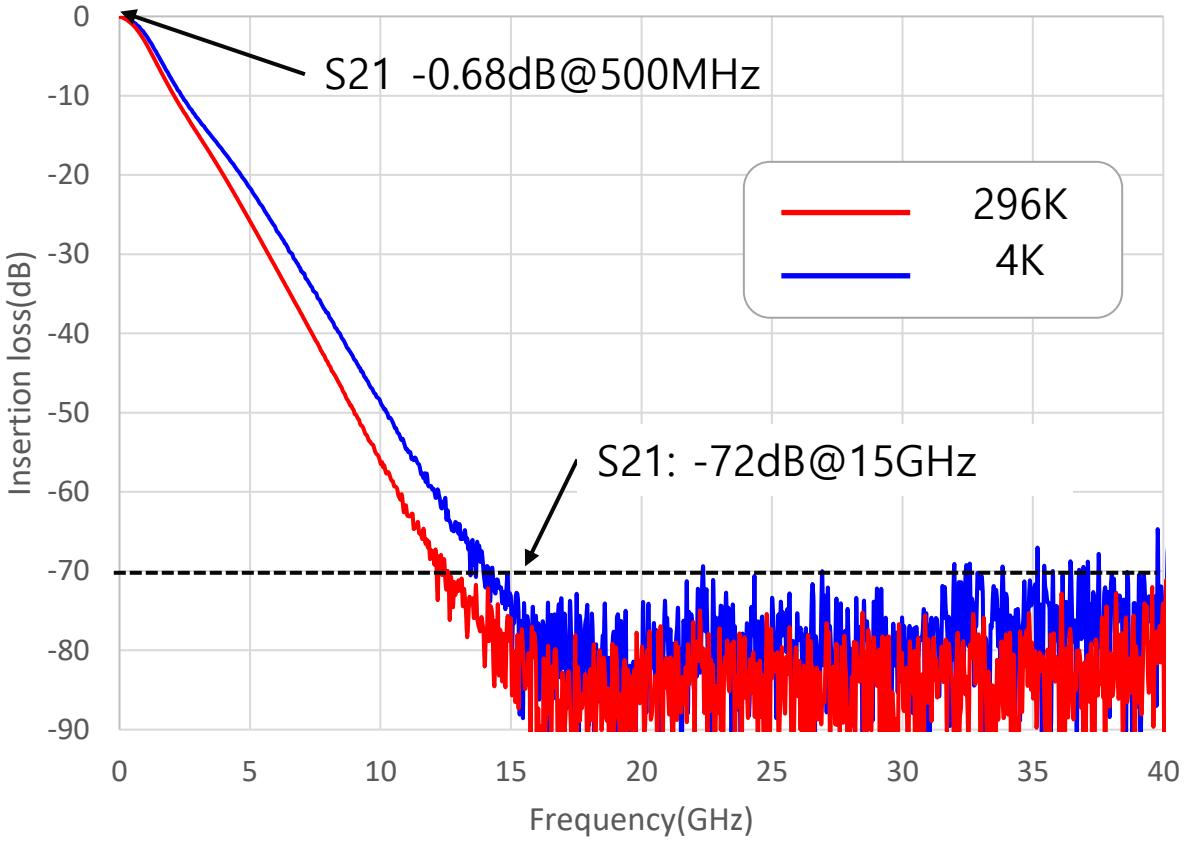
· Specification

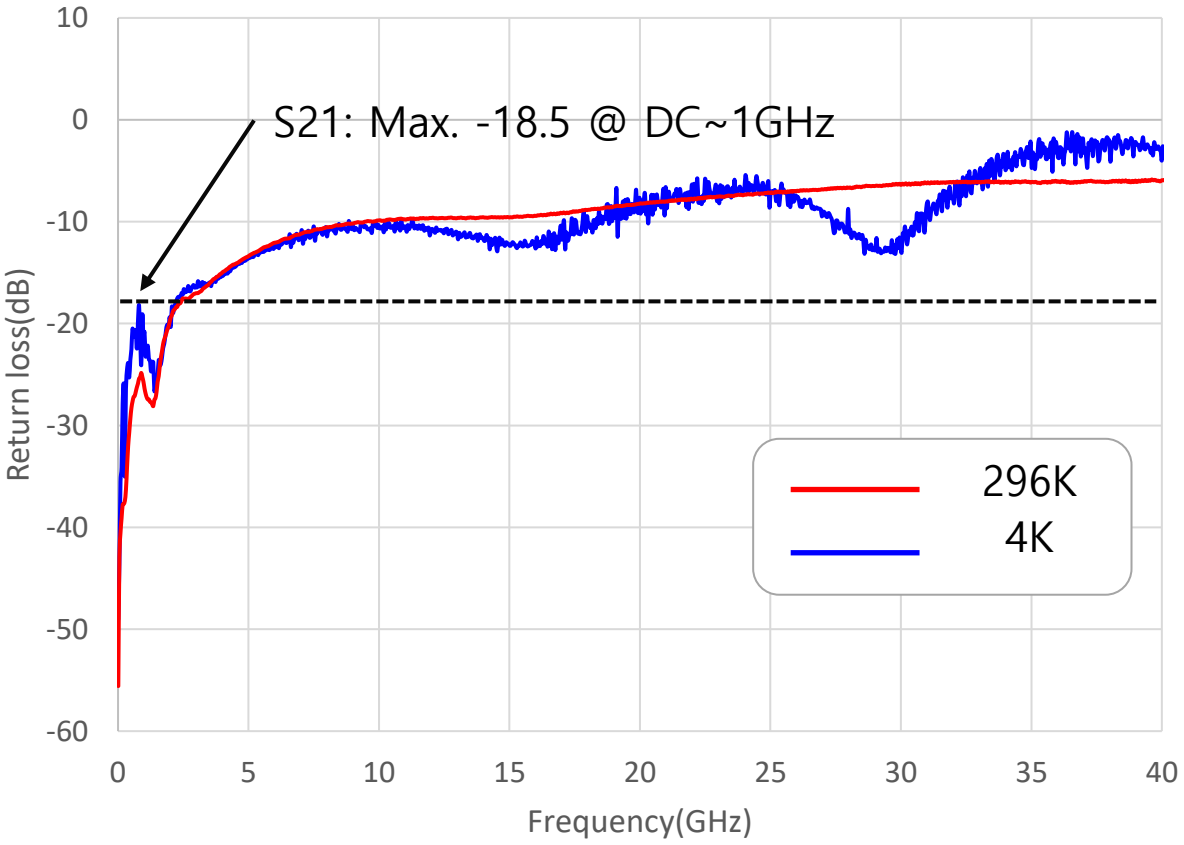
Scope	Items		Specification
Low cut-off	Cut-off frequency		1 GHz
	Insertion Loss @ 4K	Pass band	1dB max @ 500MHz
		Stop band	72dB min @ 15GHz
	Return Loss @ 4K	Pass band	18dB min @ 500MHz
		Stop band	10dB min @ 10GHz
	Dimensions (single unit)		26 mm (L), 2.9 mm (Dia)
	Weight		0.8 g (Single), 12 g (8 channel)
High cut-off	Cut-off frequency		10 GHz
	Insertion Loss @ 4K	Pass band	3dB max @ 10GHz
		Stop band	20dB min @ 30GHz, 40dB min @ 80GHz
	Return Loss @ 4K	Pass band	15dB min @ 10GHz
		Stop band	10dB min @ 30GHz
	Dimensions (single unit)		34 mm (L), 2.9 mm (Dia.)
	Weight		1.4 g (Single), 18 g (8 channel)
Common	RF Connector 1		SMPS Female (G3PO 호환)
	RF Connector 2		SMPS Female (G3PO 호환)
	Housing		OFHC with Au plating (Ni-less)
	Operating Temperature		10 mK ~ 300 K

* This is a preliminary specification and is subject to change by WithWave depending on the development process

▪ Measured S-parameters of Low cut-off IR filter (296K, 4K)

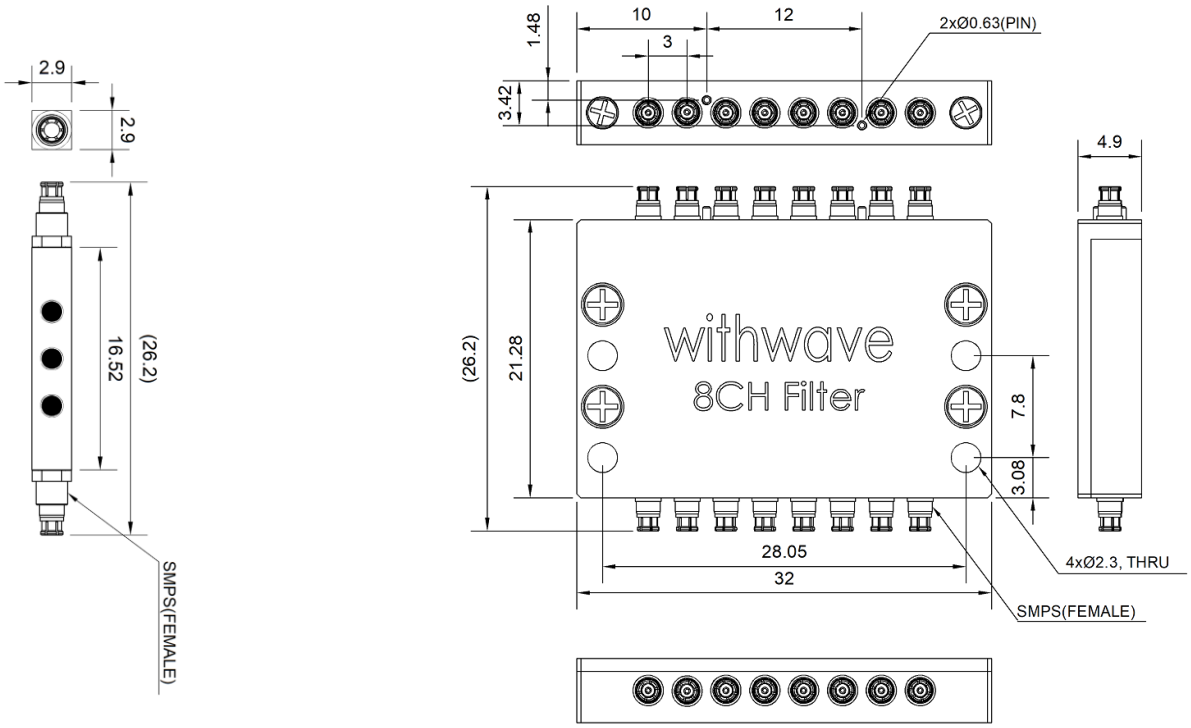
1. Test equipment: Anritsu MS4647B





▪ Drawing - Low cut-off IR Filter

Units : millimeter



▪ Drawing - High cut-off IR Filter

Units : millimeter