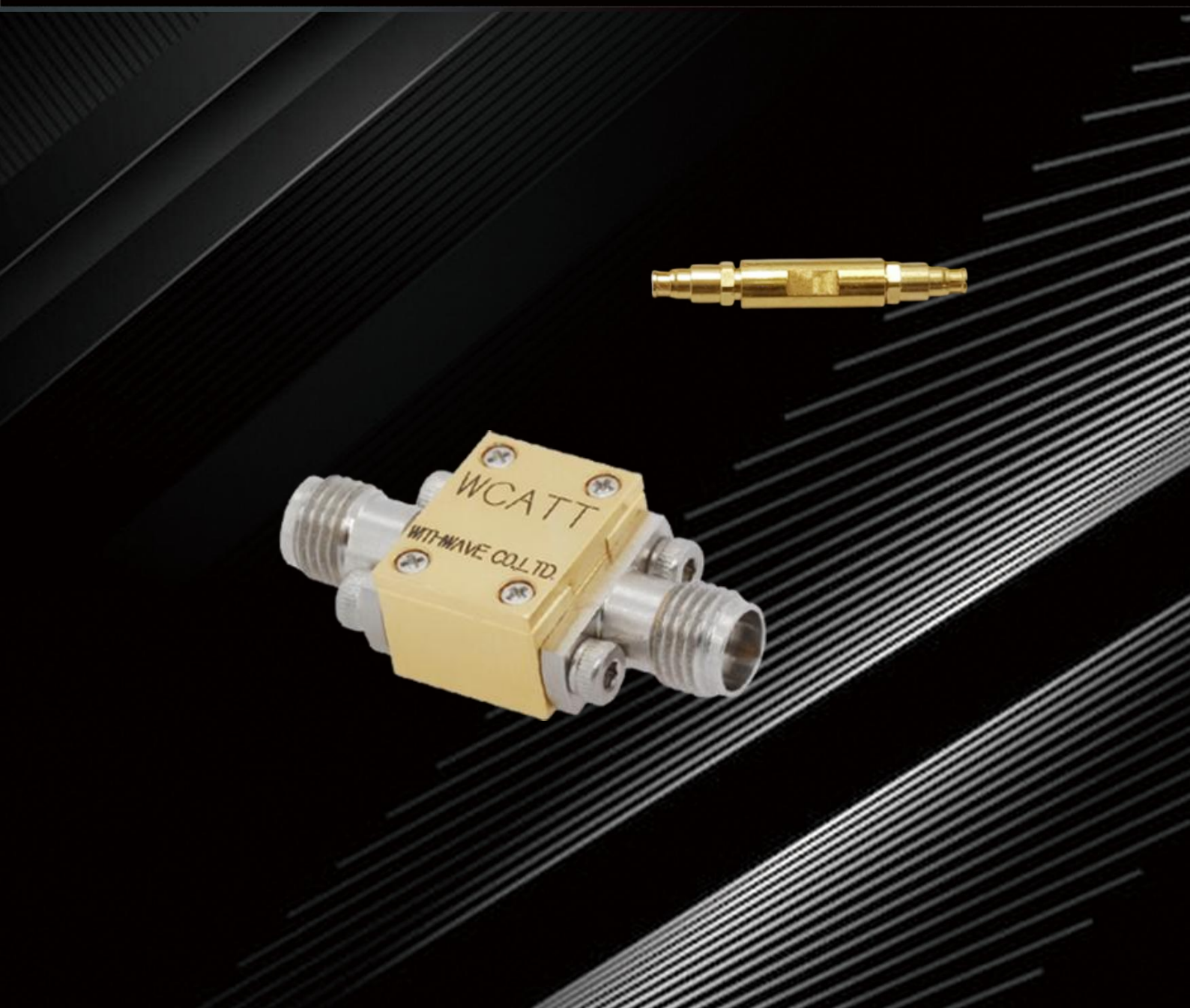
withwave
Next Generation Connectivity

Cryogenic Attenuator

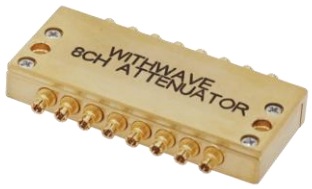


Cryogenic Attenuator

Withwave's Cryogenic RF attenuators(ATC-K01, S01) have been specifically designed to provide precise attenuation values over the frequency range of DC to 18 GHz at extreme low cryogenic temperatures. They offer excellent performance, making them ideal for quantum electrodynamics devices including quantum computing and other RF applications at cryogenic temperatures. Attenuators are thoroughly evaluated by using Withwave's 4 K cryogenic measurement system to ensure optimal reliability in cryogenic environments.

ATC-K01-xx
(Cryo-Attenuator, K connector)

ATC-S01-xx
(Cryo-Attenuator, SMPS)



ATC-S01-8C-xx
(SMPS 8-channel)

· Features

- Frequency : DC to 20GHz
- Minimal change in attenuation (temperature and frequency)
- Excellent RF matching : 50 ohm
- NiCr deposited on Quartz substrate
- OFHC body, Au plated without Ni (non-magnetic)

· Application

- Cryogenic quantum computing
- Superconducting electronics

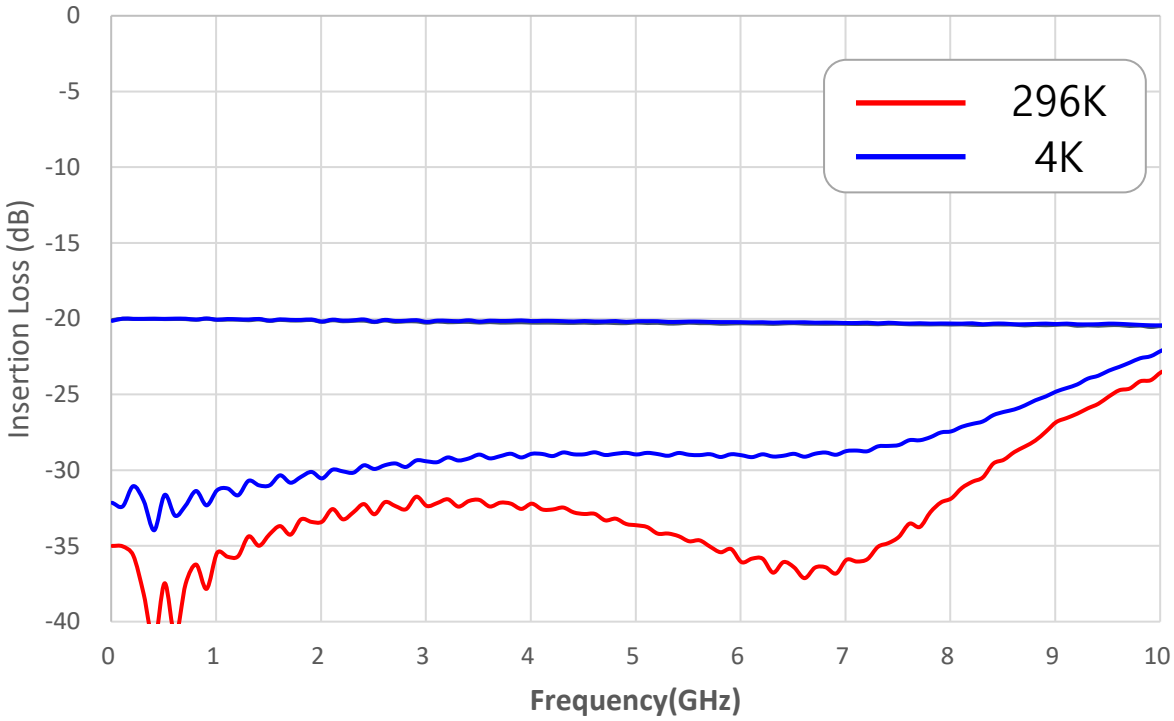
· Specification

Scope	Items		Specification
Electrical	Operation frequency		DC~20GHz
	Attenuation @4K	10dB	TBD
		20dB	-20.1dB@4GHz, / -20.4dB@8GHz
	Return Loss @ 4K	10dB	TBD
		20dB	18dB min @ 20GHz
	Power handling limit		100mW
Mechanical & Environmental	Dimensions (single unit)	2.92mm	29mm(L), 13mm(W), 8mm(H)
		SMPS	18.5 mm (L), 2.9 mm (Dia)
	Weight	2.92mm	12 g (Single)
		SMPS	0.6 g (Single), 8 g (8 channel)
	RF Connector 1	2.92mm	Female
		SMPS	Female (G3PO Compatible)
	RF Connector 2	2.92mm	Female/Male
		SMPS	Female (G3PO Compatible)
	Housing Material		OFHC with Au plating (Ni-less)
	Operating Temperature		10 mK ~ 300 K

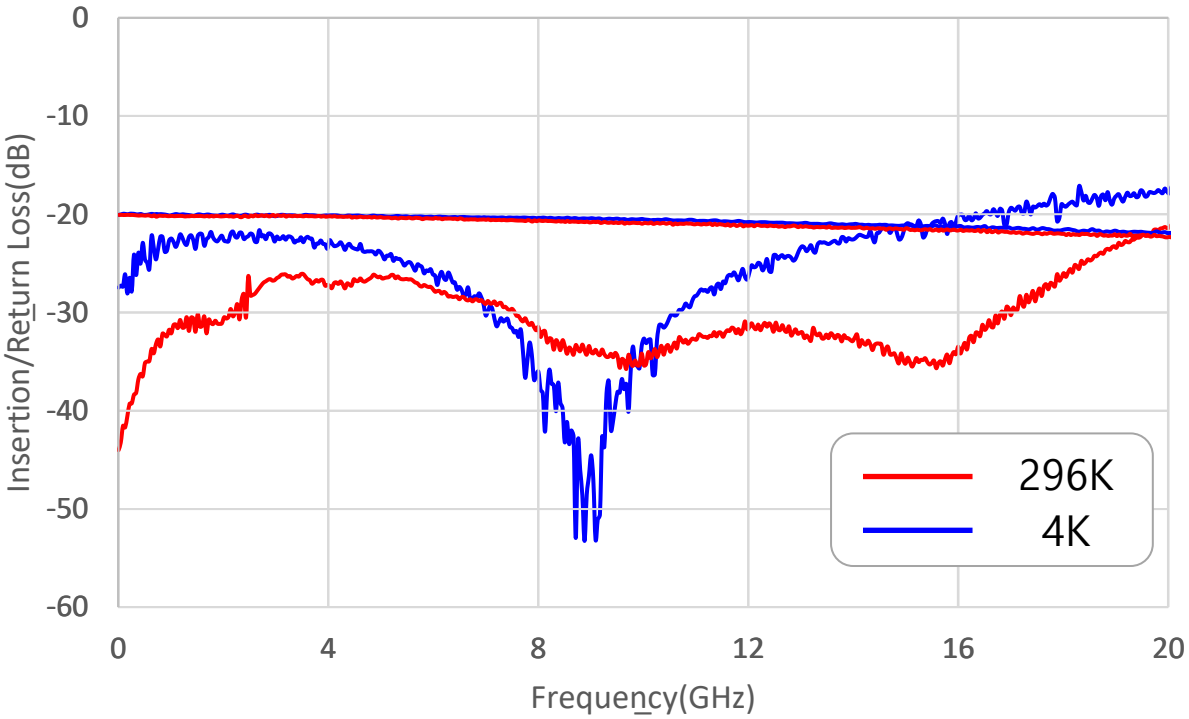
* This is a preliminary specification and is subject to change by WithWave depending on the development process

Measured S-parameters of Cryogenic Attenuator

- **2.92mm type (SMA compatible)**

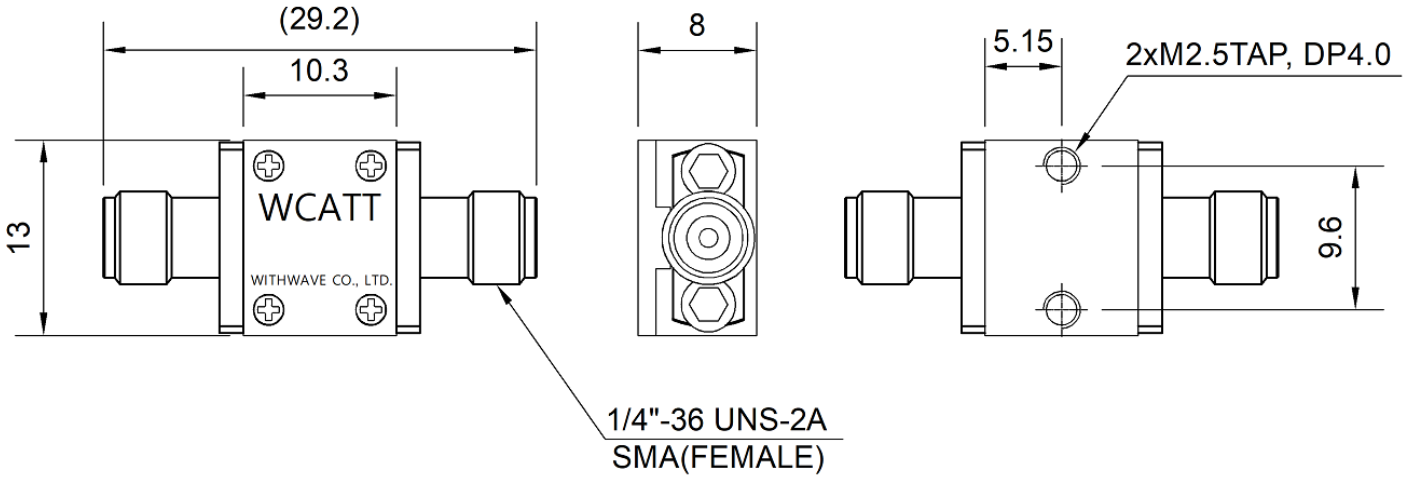


- **SMPS type**



▪ Drawing - Cryo-Attenuator, K connector

Units : millimeter



▪ Drawing - Cryo-Attenuator, SMPS

Units : millimeter