

LNF-ISC4_8A



LNF-CIC4_8A



Product features

- RF bandwidth: 4-8 GHz
- Insertion loss: 0.17 dB typical
- Isolation: 22 dB typical
- Port match: 22 dB typical
- RF-connectors: SMA

Product description

The LNF-ISC4_8A and LNF-CIC4_8A are ultra-low insertion loss cryogenic isolators and circulators operating in the 4-8 GHz frequency range. They have been designed from ground up to meet the strict requirements of ultra-low temperature physics research. The gold plated OFHC copper body ensures minimum loss and that this loss reaches the lowest possible temperature to minimize thermal noise. The isolator/circulator is packaged in a slim coaxial module using industry standard SMA connectors. The module measures 22.3*24.6*10.2 mm excluding the connectors.

Absolute maximum ratings

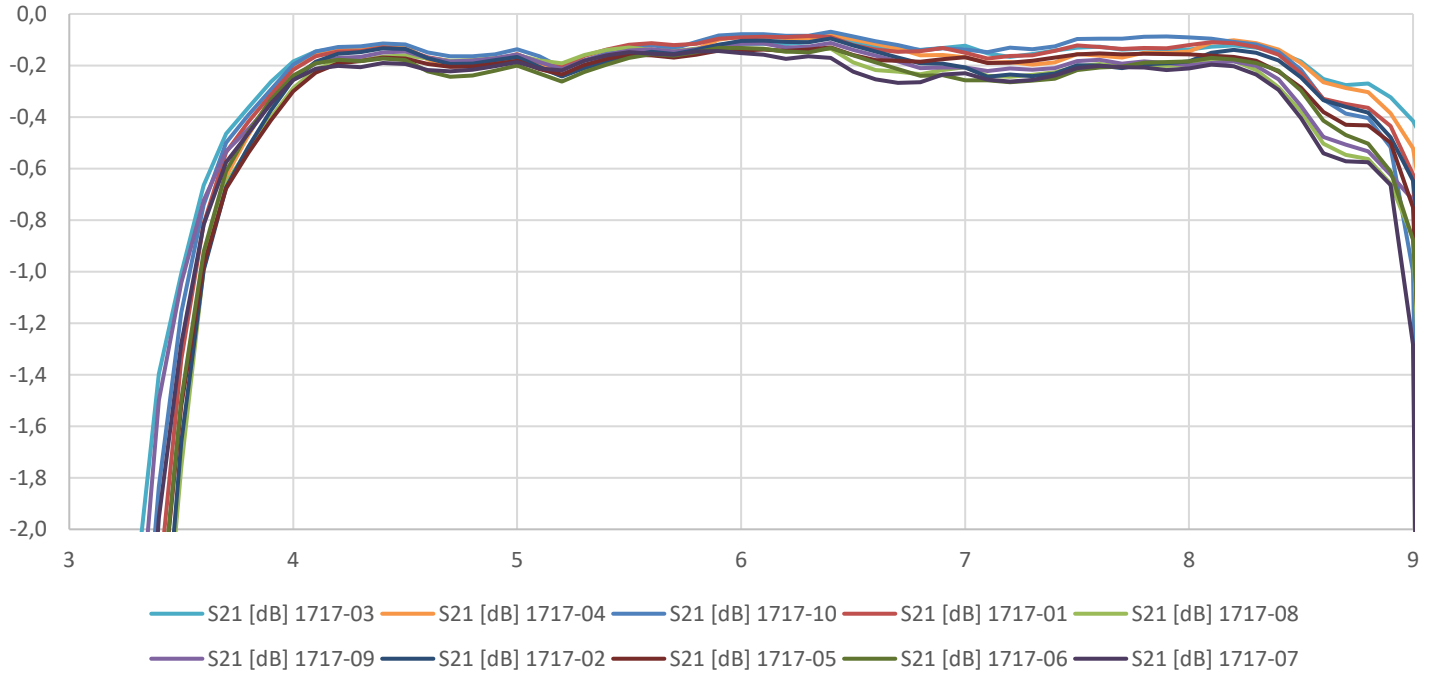
Parameter	Min	Max
RF drive level		30 dBm
DC voltage on RF input and output	-50V	50V

Typical RF Characteristics at 3 K

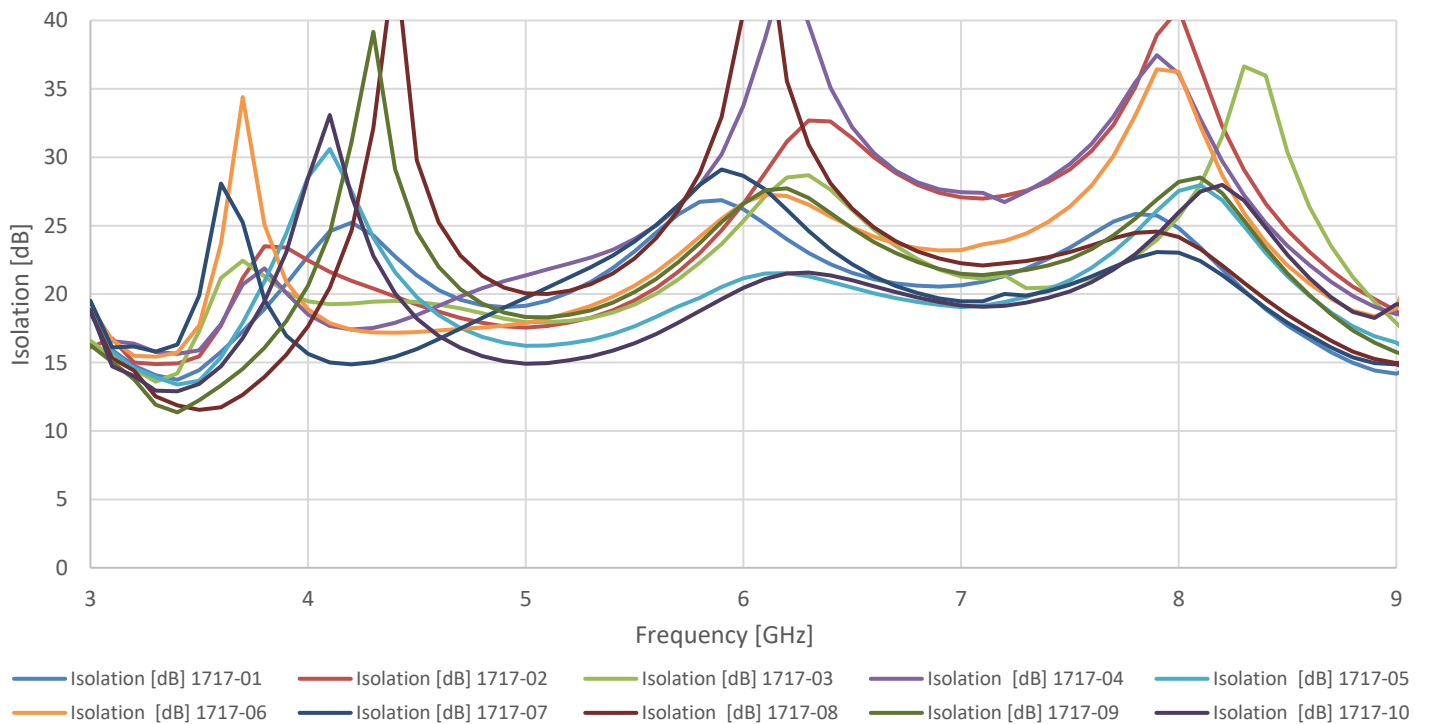
Parameter	Condition	Value	Unit
Insertion loss	4-8 GHz	0.17	dB
Isolation	4-8 GHz	22	dB
Port match	4-8 GHz	22	dB

Measured typical data $T_{amb}=3\text{ K}$

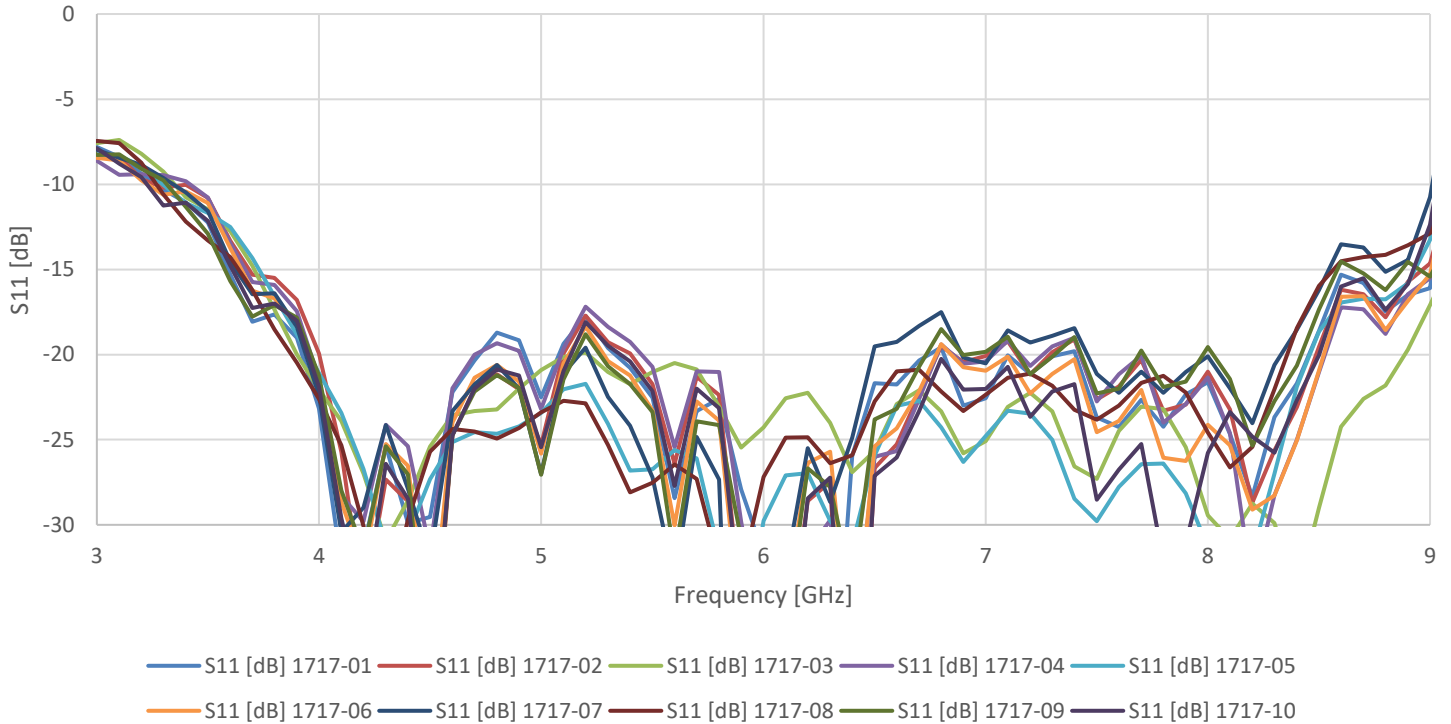
S21 of 10 units @3K



Isolation of 10 units at 3K

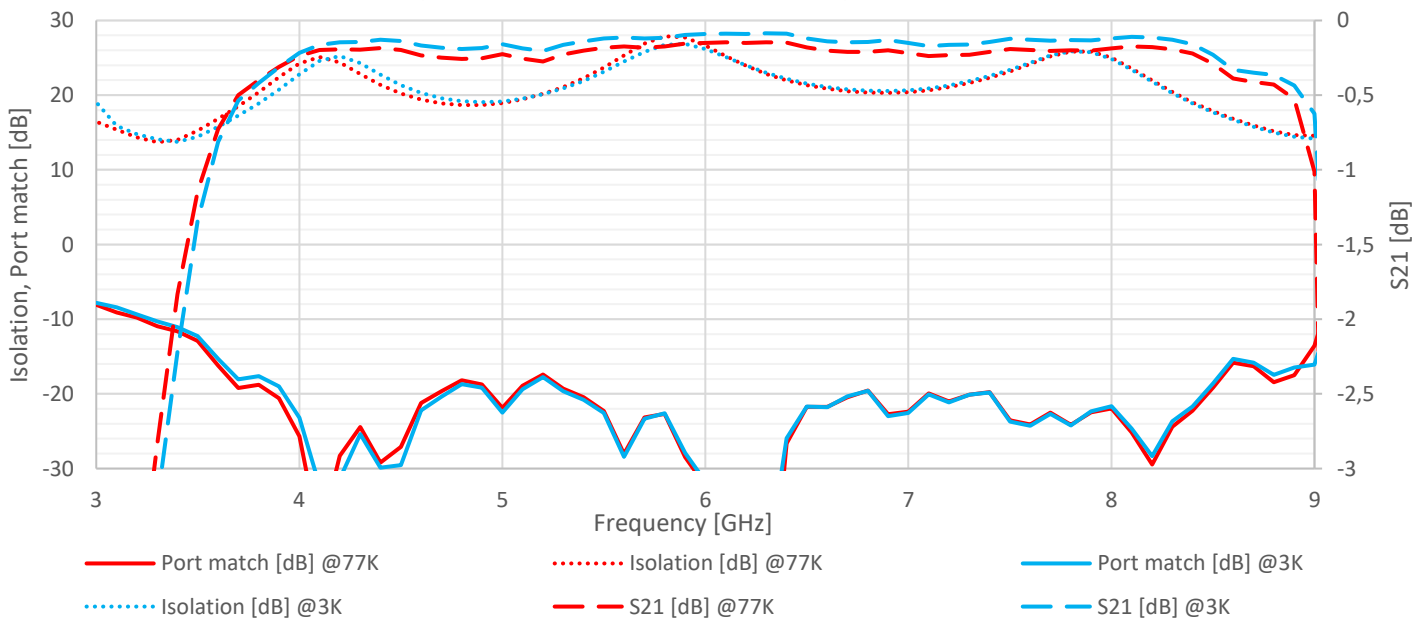


Port match of 10 units @3K



77K vs 3K performance

Comparison between 77 and 3K performance



Insertion loss improves with 0.07dB when cooled from 77 to 3K

Magnetic flux density generated by internal magnet

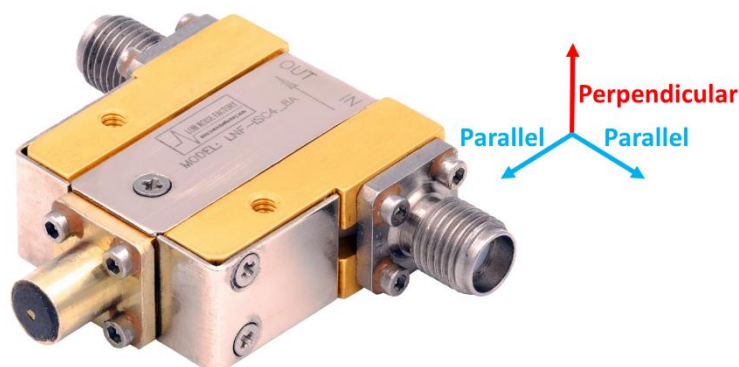
Parameter	Condition	Value	Unit
Magnetic flux density with standard shielding*	6 mm from chassis	<4	Gauss
Magnetic flux density with optional shielding	6 mm from chassis	<0.1	Gauss

- This is the magnetic field generated by the internal magnet inside the isolator/circulator chassis, which potentially may influence nearby components.
- Two isolators/circulators can be placed 3.3 mm apart without interfering with each other.

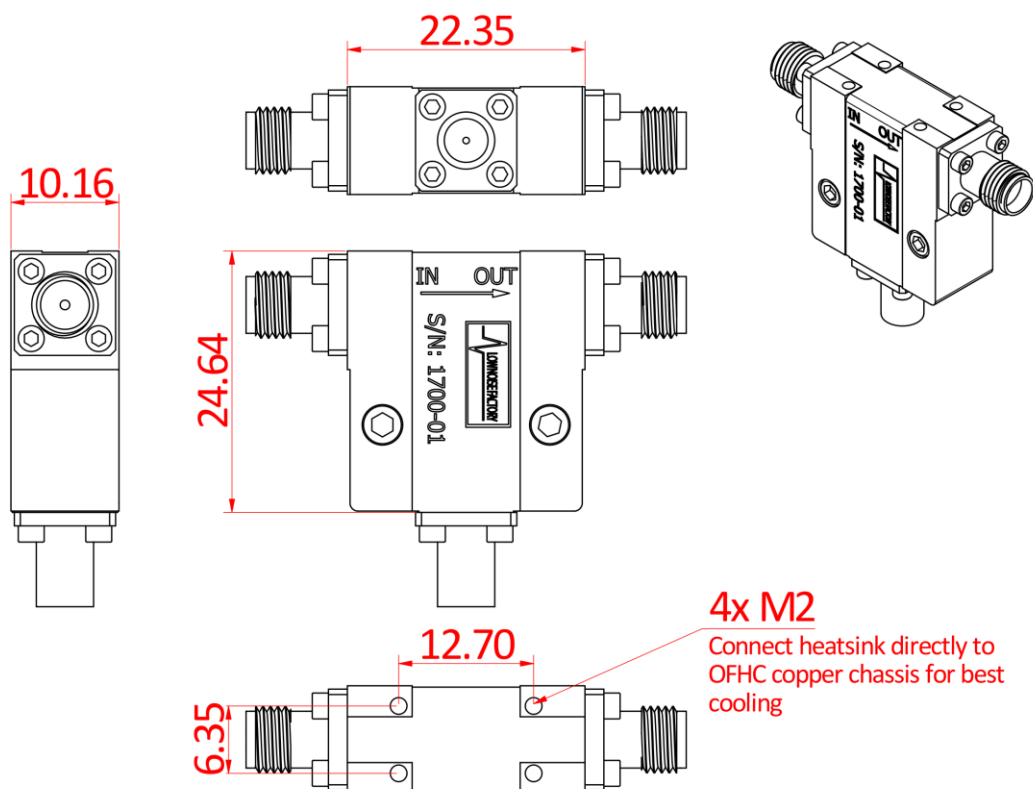
Maximum external magnetic field imposed on the isolator

Parameter	Condition	Value	Unit
Maximum perpendicular external magnetic field	At chassis	650	Gauss
Maximum parallel external magnetic field	At chassis	1000	Gauss

- “Maximum field” means the field when the passband frequency edge has shifted 150 MHz, and insertion loss degradation becomes noticeable.
- The optional MuMetal shield improves the maximum external magnetic field very little. MuMetal alloys are good at shielding very low level “stray” magnetic fields, however the material saturates quickly and doesn’t shield well against high field external sources

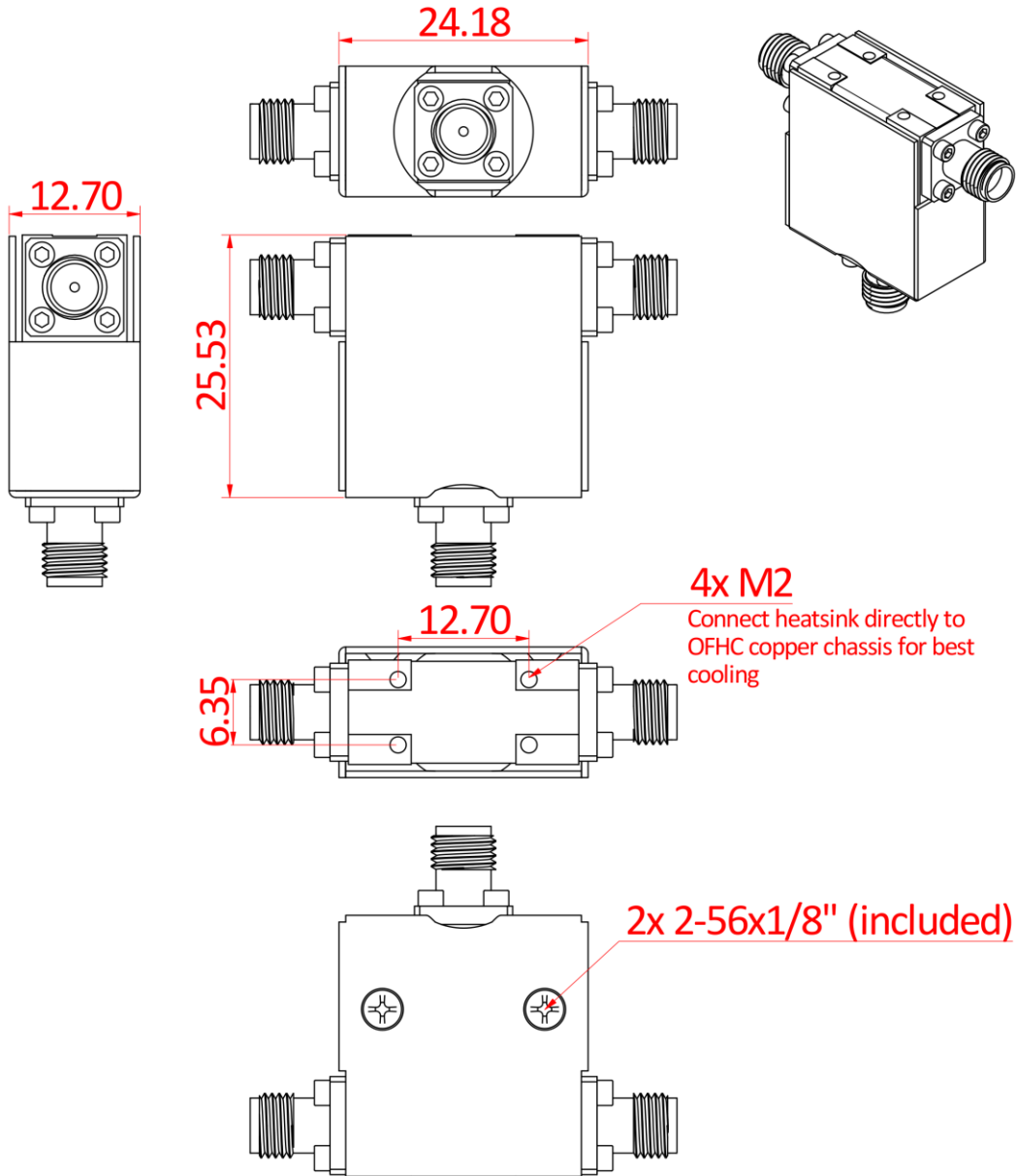


Drawing without additional shielding



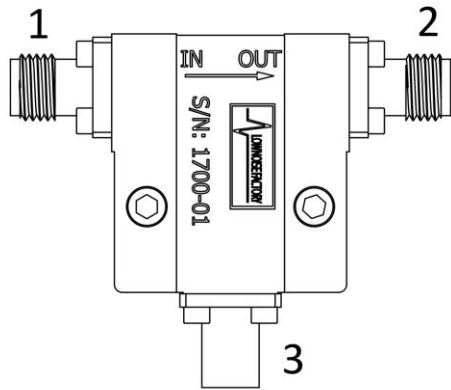
Dimensions are in millimeters

Drawing with additional shielding

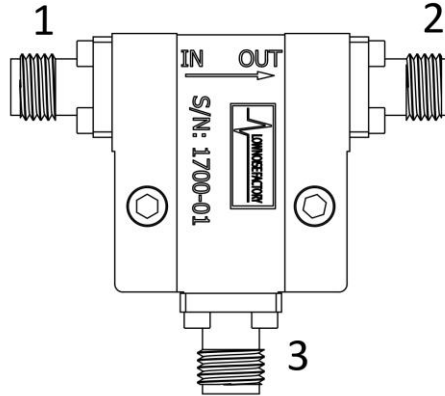


Dimensions are in millimeters

Model numbering



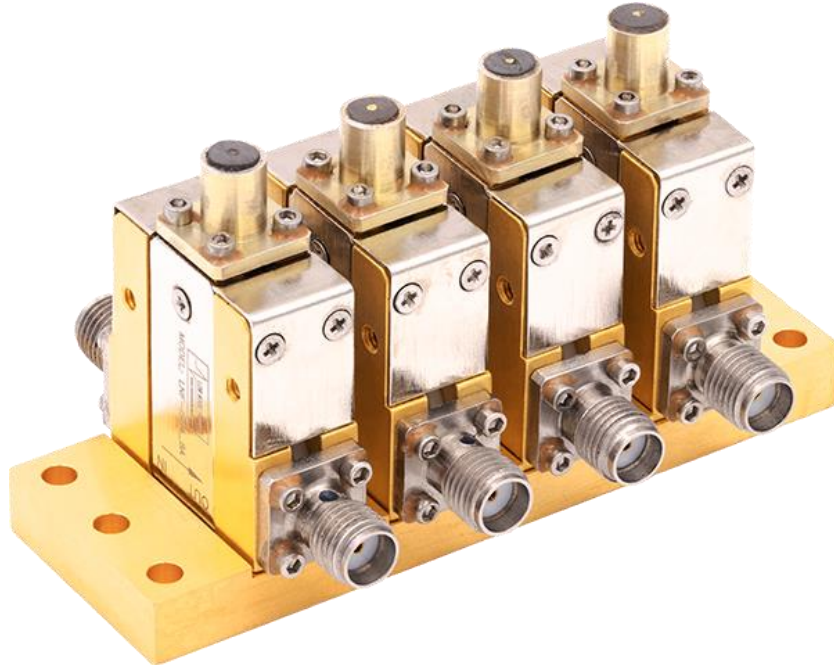
LNF-ISC4_8A
Single Junction Isolator
Port 1: Female SMA
Port 2: Female SMA
Port 3: Termination



LNF-CIC4_8A
Single Junction Circulator
Port 1: Female SMA
Port 2: Female SMA
Port 3: Female SMA

Version	Model number
Isolator	LNF-ISC4_8A
Circulator	LNF-CIC4_8A
Extra shield	LNF-SHIELD4_8_SJ

Array



Please consult with factory for array options