

Datasheet

LNF-ISC4_12B and LNF-CIC4_12B

4-12 GHz Cryogenic Circulator/Isolator



LNF-CIC4_12B

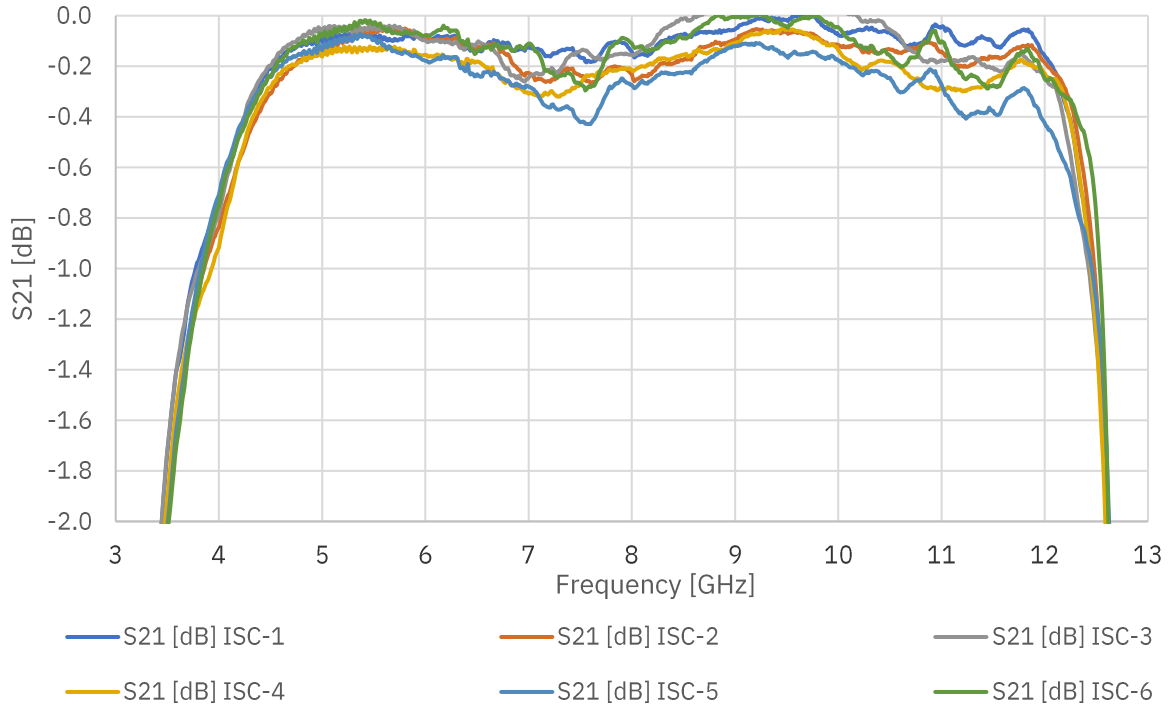
Product Features	
RF Bandwidth	4-12 GHz
Insertion Loss at 5 K	0.2 dB typical
Insertion Loss at 77 K	0.3 dB typical
Isolation at 5 K	20 dB typical
Port Match at 5 K	20 dB typical
RF Connectors	Female SMA

Absolute Maximum Ratings			Typical RF Characteristics at 77 K			
Parameter	Min	Max	Parameter	Condition	Value	Unit
Operating Temperature	0.01 K	100 K	Insertion Loss	4-12 GHz	0.3	dB
RF Drive Level		30 dBm	Isolation	4-12 GHz	20	dB
DC Voltage on RF Input and Output	-50 V	50 V	Port Match	4-12 GHz	20	dB

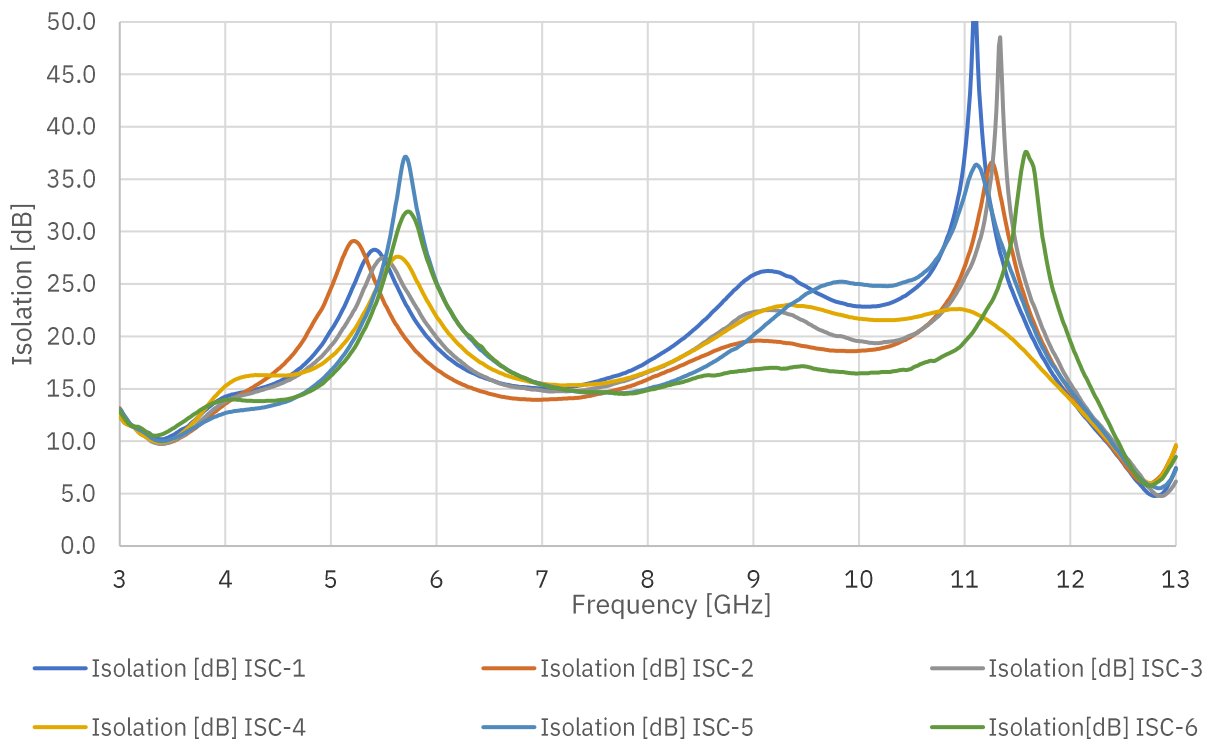
LNF-CIC4_12B is ultra-low insertion loss cryogenic circulators operating in the 4-12 GHz frequency range. It has been designed from ground up to meet the strict requirements of ultra-low temperature physics research. The gold plated OFHC copper body ensures minimum loss and that this loss reaches the 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 16x21.46x10.16 mm excluding the connectors.

Measured data, $T_{amb} = 77\text{ K}$

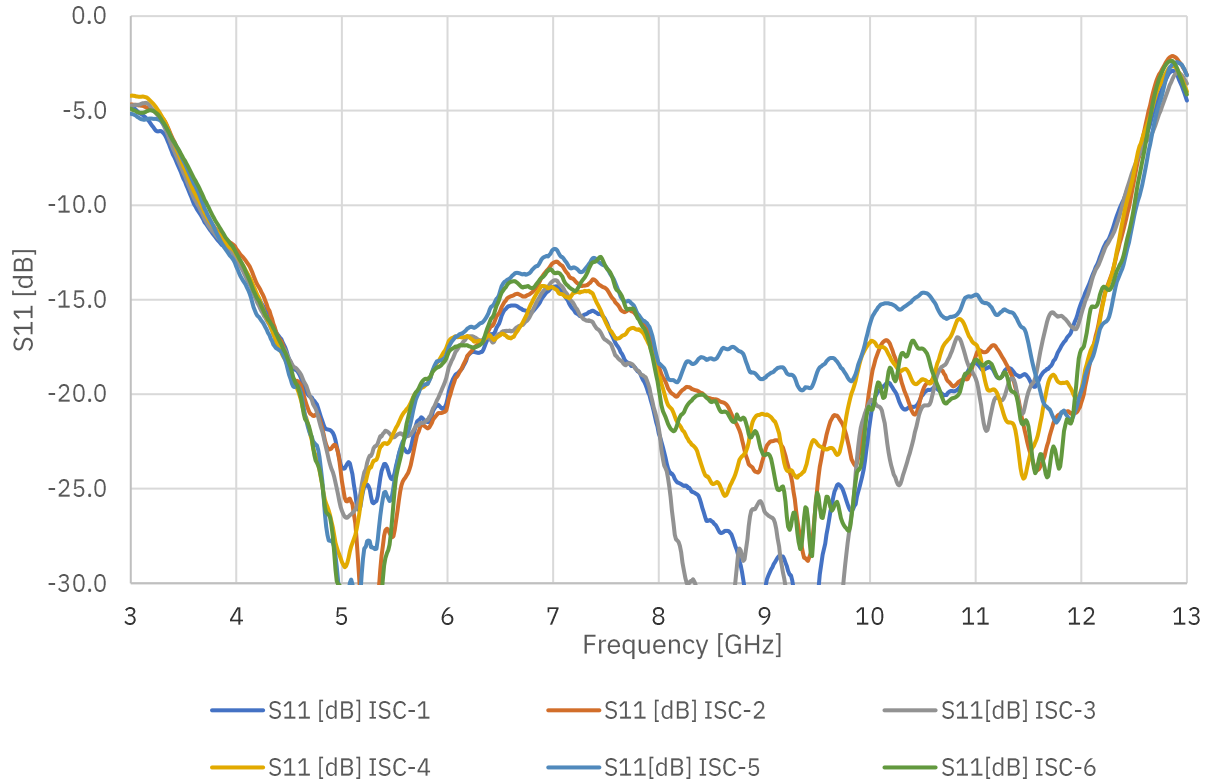
Insertion loss of 6 isolators at 77 K



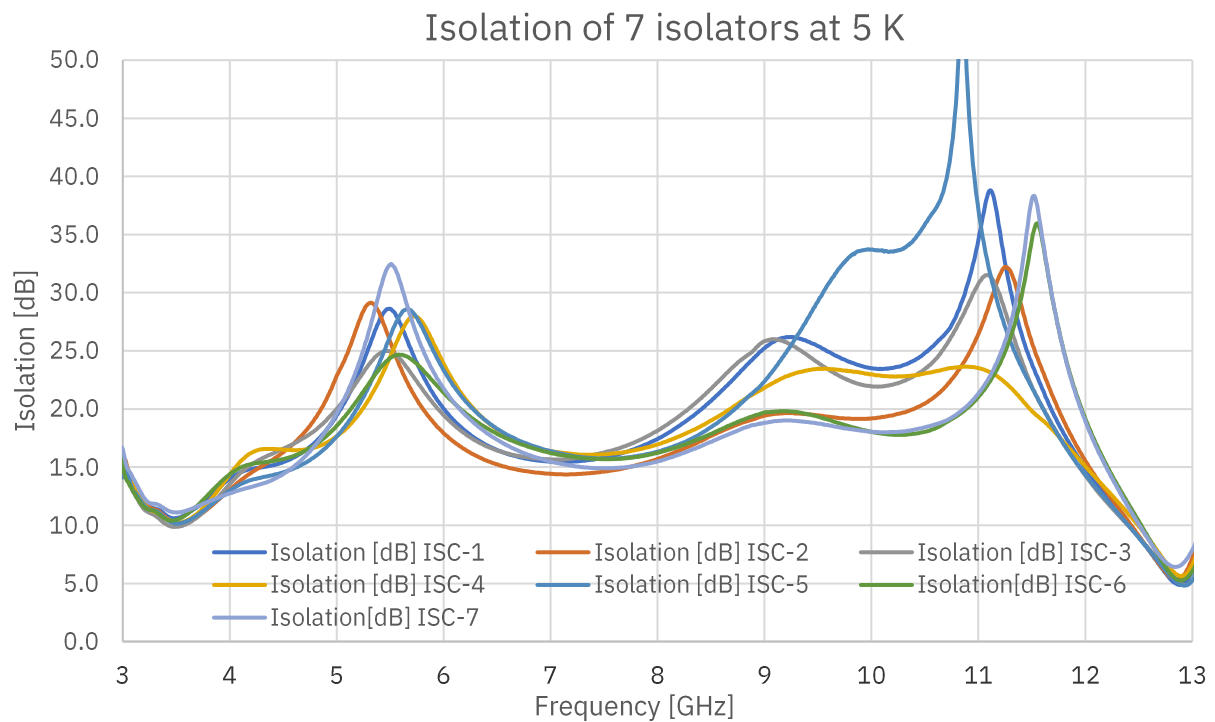
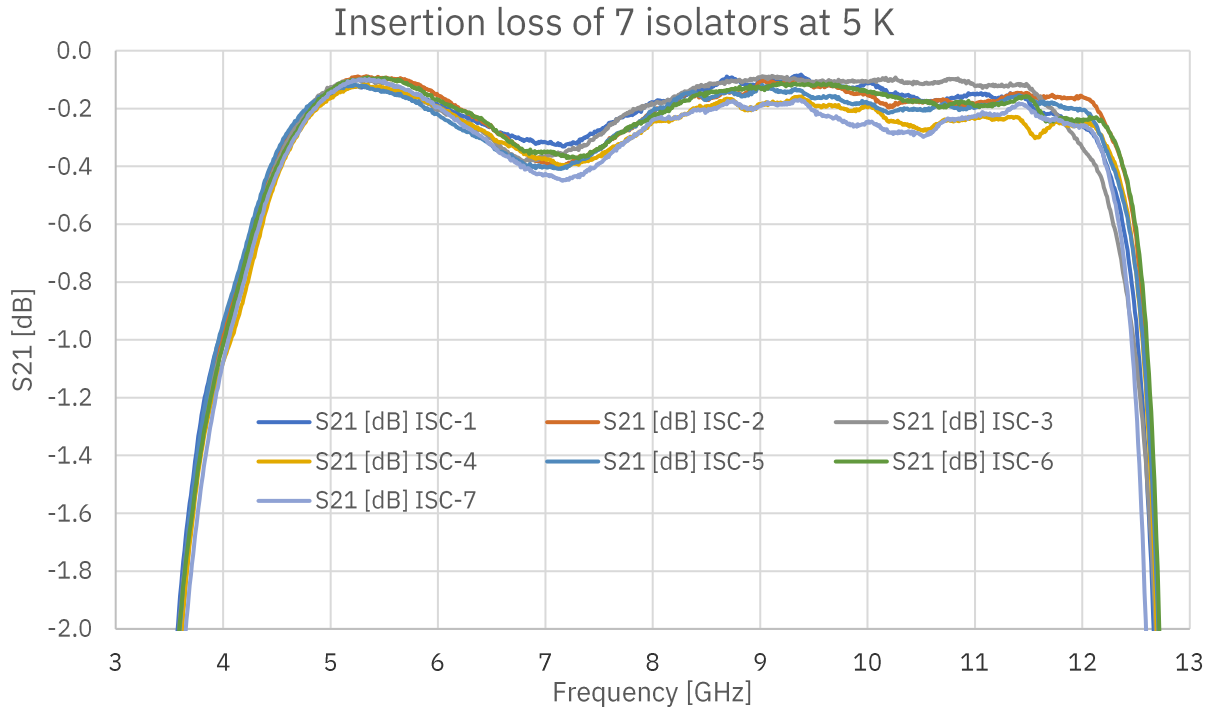
Isolation of 6 isolators at 77 K



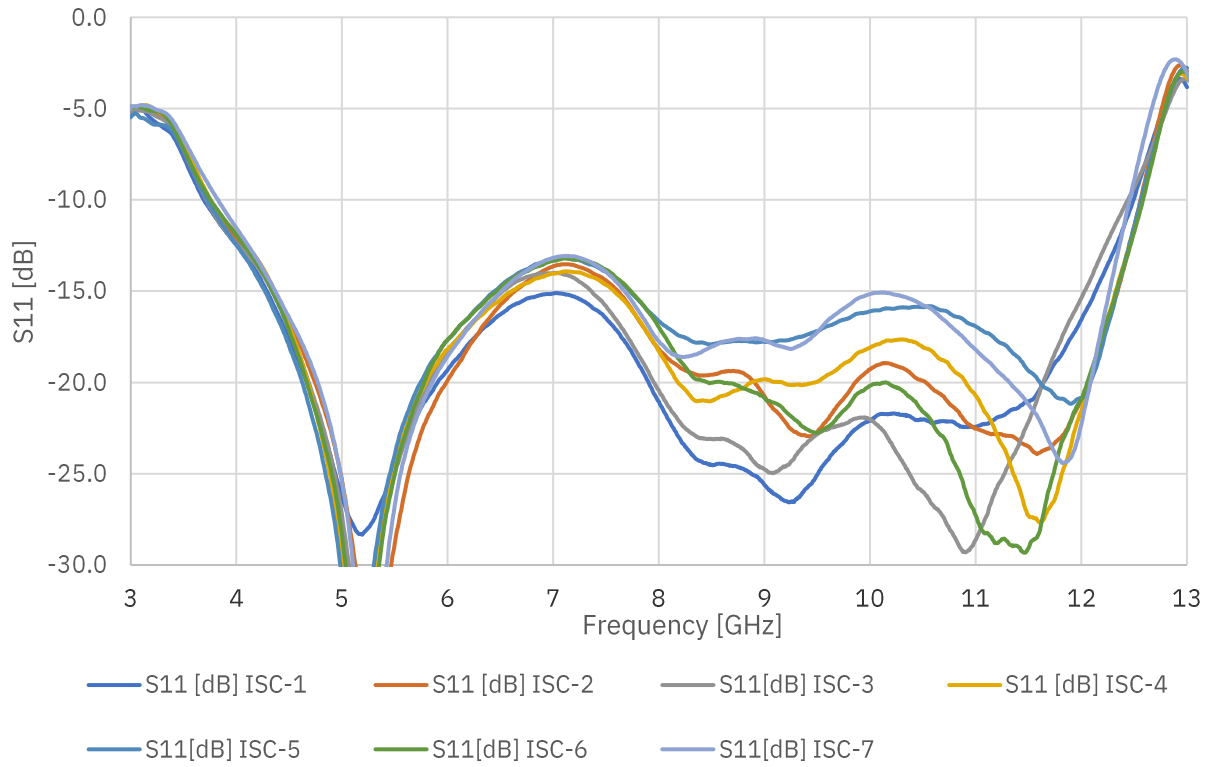
Port Match of 6 isolators at 77 K



Measured data, $T_{amb} = 5\text{ K}$



Port Match of 7 isolators at 5 K



Magnetic flux density generated by internal magnet

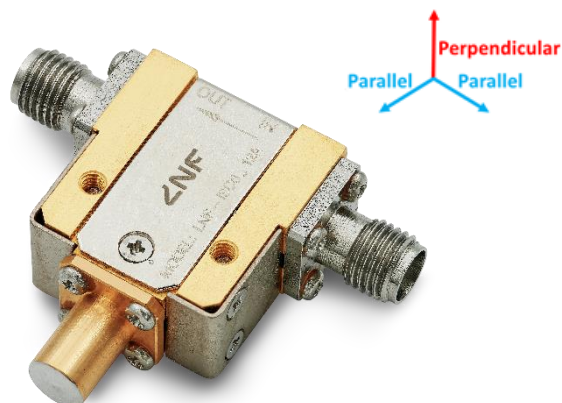
Parameter	Condition	Value	Unit
Magnetic flux density with standard shielding*	6 mm from chassis	< 4	Gauss

- 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

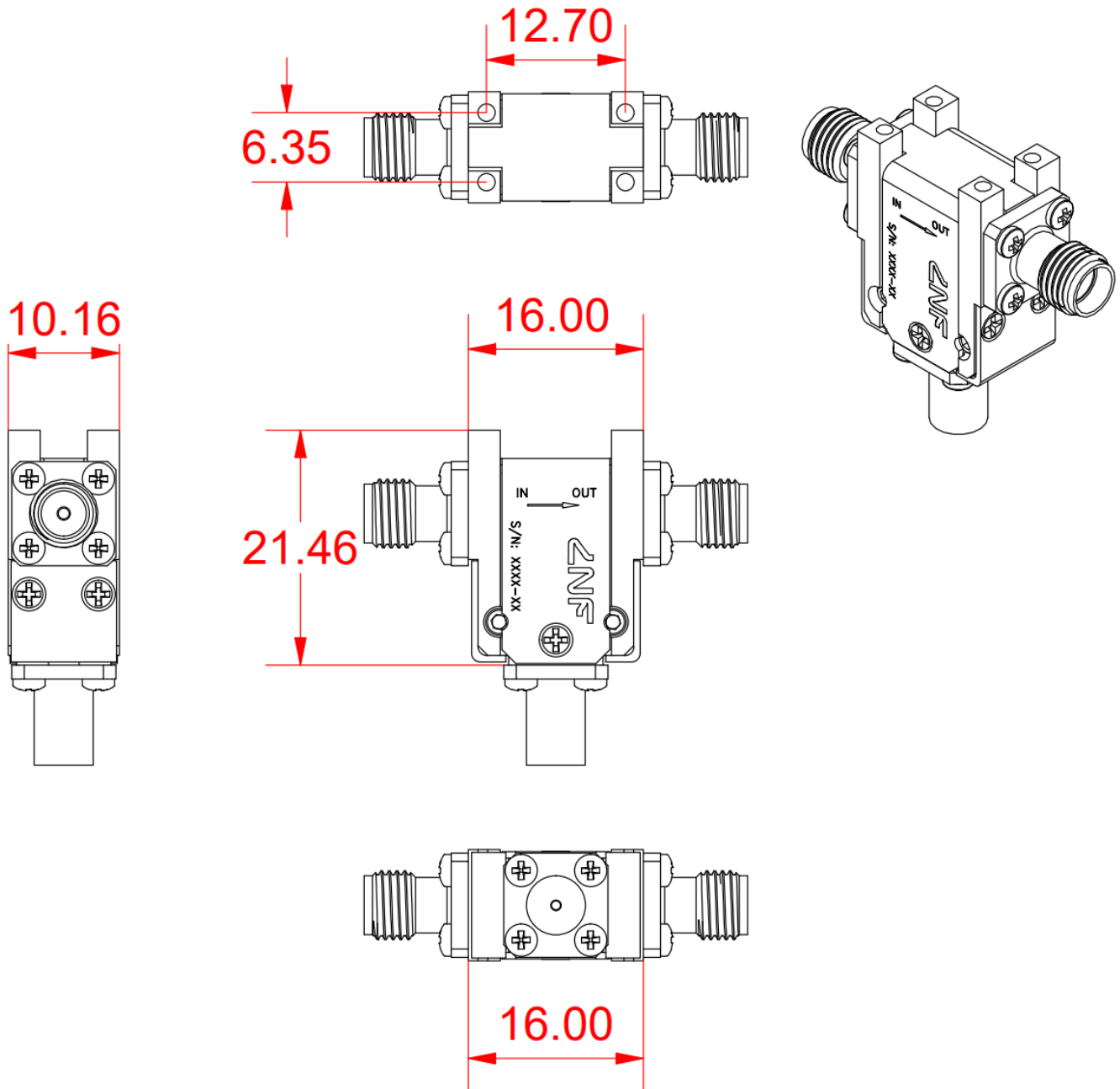
Parameter	Condition	Value	Unit
Maximum perpendicular external magnetic field	At chassis	650	Gauss
Maximum parallel external magnetic field	At chassis	1500	Gauss

- “Maximum field” means the field when the passband frequency edge has shifted 150 MHz, and insertion loss degradation becomes noticeable.

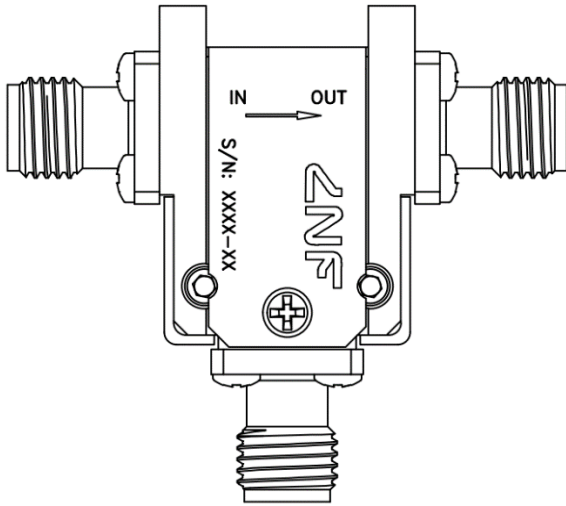


Dimensions without additional shielding

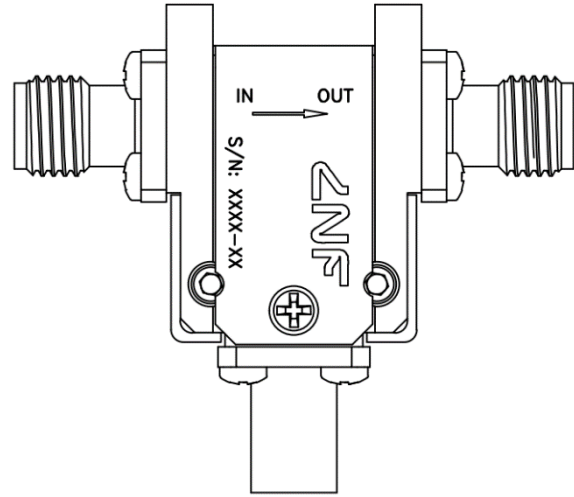
Units: mm



Model numbering



LNF-CIC4_12B



LNF-ISC4_12B

Version	Model number
Isolator	LNF-ISC4_12B
Circulator	LNF-CIC4_12B