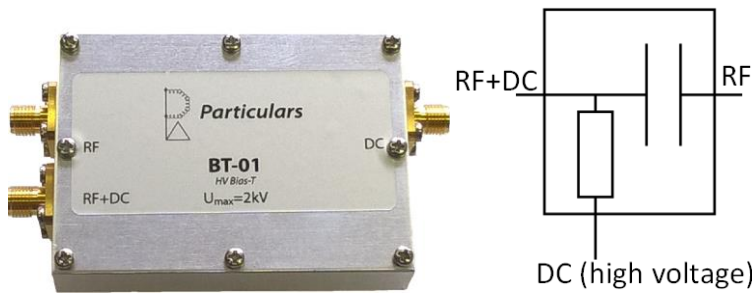# Particulars Bias-T

Introduction

Particulars Bias-T is a decoupling circuitry which enables the connection of high voltage to the readout side. It can stand DC voltages of up to 2 kV (depending on the model).

Connections

DC – high voltage connection

RF – signal transient (RF) usually connected to the amplifier

RF+DC – line connecting the detector and readout electronics. The possible appearance of reflections in the signal at time (tr) after the initial appearance of the signal can be pushed away in time by using a longer cable (tc); tr=2*tc.

Specifications

max applied voltage		1-2kV (depends on version)
leakage		<500 nA @ 1 kV
frequency range	low end	<100 kHz
	hi end	>2000 MHz
input impendance		~50 Ω
output impendance		~50 Ω
Physical measures[cm]	(LxWxD)	7x5x1.5

Response function of the amplifier – S parameters

The response of the amplifier as measured with the network analyser are as follows.

a1 - input signal
b1 - reflected signal
b2 - output signal

$$\begin{pmatrix} b_1 \\ b_2 \end{pmatrix} = \begin{pmatrix} S_{11} & S_{12} \\ S_{21} & S_{22} \end{pmatrix} \begin{pmatrix} a_1 \\ a_2 \end{pmatrix}$$

S21 – transient line

Comparison with other vendor

Comparable performance has been observed on standard silicon samples.