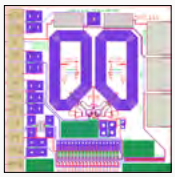
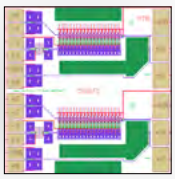
SQUID Sensors

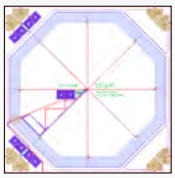
MAGNICON
physical research and instrumentation

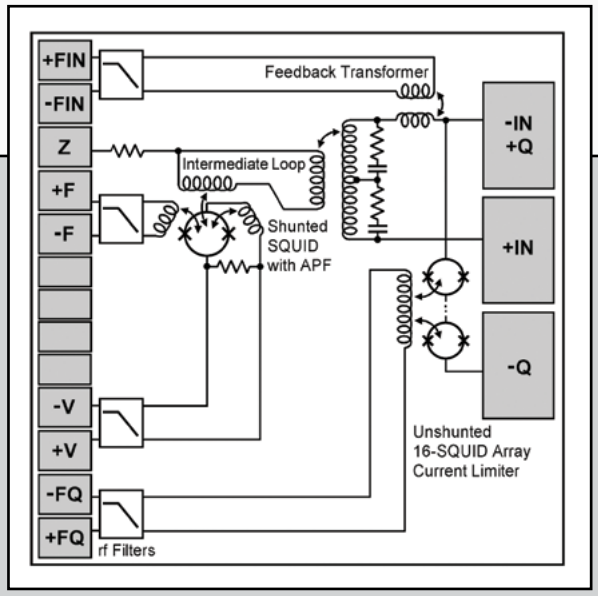
High-performance low-noise dc SQUID sensors

- Integrated two-stage current sensors, single-stage current sensors, series SQUID arrays, and magnetometers
- Input inductances from 1 nH to 1.8 µH
- Robust and easy-to-use
- Low noise and high dynamic performance
- Additional optimized versions for ultra-low temperatures << 4 K
- Built-in heating capability
- Available as bare chips or in sophisticated package
- SQUID products developed in collaboration with PTB Berlin

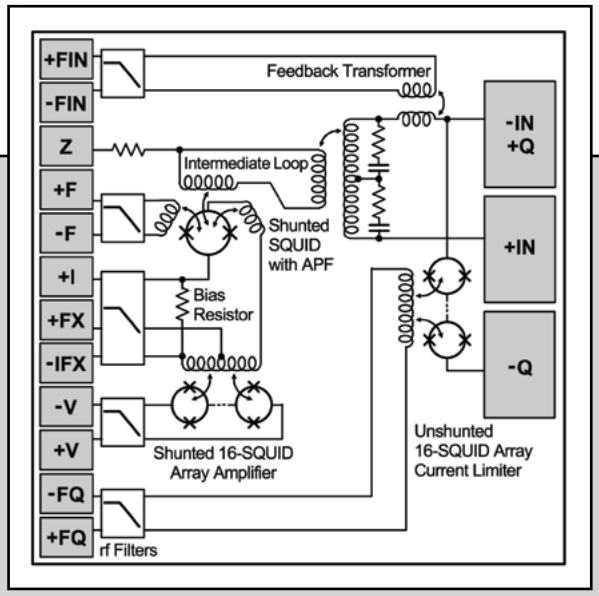








Schematic of single-stage device



Schematic of integrated two-stage device

Technical Data

General	chip size	3 x 3 x 0.38 mm³
	cooling field up to	60 µT
	built-in heating feature for de-fluxing	
	integrated rf filters	
	convenient operation with Magnicon SQUID electronics	
Single-stage current sensors	low-noise SQUID sensor for almost all applications	
	additional positive feedback (APF) for direct readout	
	sensors without APF also available	
	R-C shunt across input coil	
	optional current limiter (Q-spoiler) in series to input coil	
	optional feedback transformer in series to input coil	
	six input inductances available	24 nH to 1.8 µH
	input sensitivity	2.2 µA/Φ_0 to 0.225 µA/Φ_0
	typical flux noise @ 4 K	1.2 µΦ_0/√Hz
	typical energy resolution @ 4 K	100 h
	1/f corner frequency	≈ 3 Hz
Integrated two-stage current sensors	ideal sensor if ultimate noise performance is required	
	single sensor SQUID read out by 16-SQUID series array amplifier	
	single-SQUID-like overall V-Φ characteristics	
	same basic features as single-stage current sensors	
	typical flux noise @ 4 K	0.8 µΦ_0/√Hz
	typical energy resolution @ 4 K	45 h
	1/f corner frequency @ 4 K	≈ 4 Hz
	typical flux noise @ 0.3 K	0.25 µΦ_0/√Hz
Series SQUID arrays	optimized for readout of cryogenic detectors	
	integrated bias resistors for TES or two-stage applications	
	magnetically unshielded operation in Earth field possible	
	direct chip mounting to Cu block possible	
	two independent array channels per chip	
	input inductance	3 nH
	input sensitivity	23 µA/Φ_0
	current noise @ 4 K	< 10 pA/√Hz
	current noise @ 0.1 K	< 5 pA/√Hz
Field sensors	for direct field measurements	
	integrated multiloop (cartwheel) design	
	additional positive feedback (APF)	
	outer pickup-coil dimension (S,M)	1.7 mm, 2.8 mm
	flux noise @ 4 K	1.2 µΦ_0/√Hz
	flux densitiy noise @ 4 K (S, M)	8.4 fT/√Hz, 3.6 fT/√Hz
	1/f corner frequency	≈ 4 Hz
	multiloop gradiometer also available	
	PTB type W9L magnetometer on 7.2 x 7.2 mm² substrate also available	

All noise data obtained with XXF-1 electronics

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