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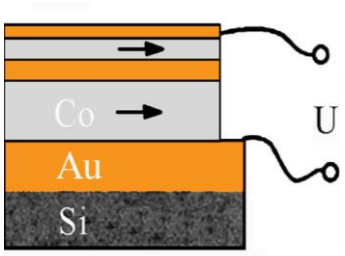
SENSORS OF MAGNETIC FIELD BASED ON METAL SPIN-VALVE

Sensors based on the spin-valve film structures can be an alternative to conventional magnetic field sensor based on the Hall effect. The main elements of a spin-valve type are different magnetic layers with different magnetic characteristics, which are separated by nonmagnetic conductive layer.

Proposed forming a functional element in the magnetic field sensor form a multilayer film structure Au (5) / Co (6) / Cu (8) / Co (20) / Au (40) / Cr (5) / P (P - substrate in brackets contains thickness of the individual layers in nm) by thermal vacuum deposition on a substrate of a single crystal silicon wafer 5 × 5 mm2. Performance characteristics of the sensor at the proposed functional element in the table.



Schematic imege of the functional element of the magnetic field sensor based on the spin-valve

Table - Performance of the magnetic sensor

Range of fields, mT	Sensitivity $S_B \cdot 10^4$, %/mT			Operating Temperature Range, ^{0}C
	$t = 20^0$ C	$t = 300^0$ C	$t = 450^0$ C	
400	4,5	5,1	7,6	-40…+450

Functional element is located in a cylindrical housing or universal housing to any design. The sensor works by measuring the proportional change in the input and output voltages.