

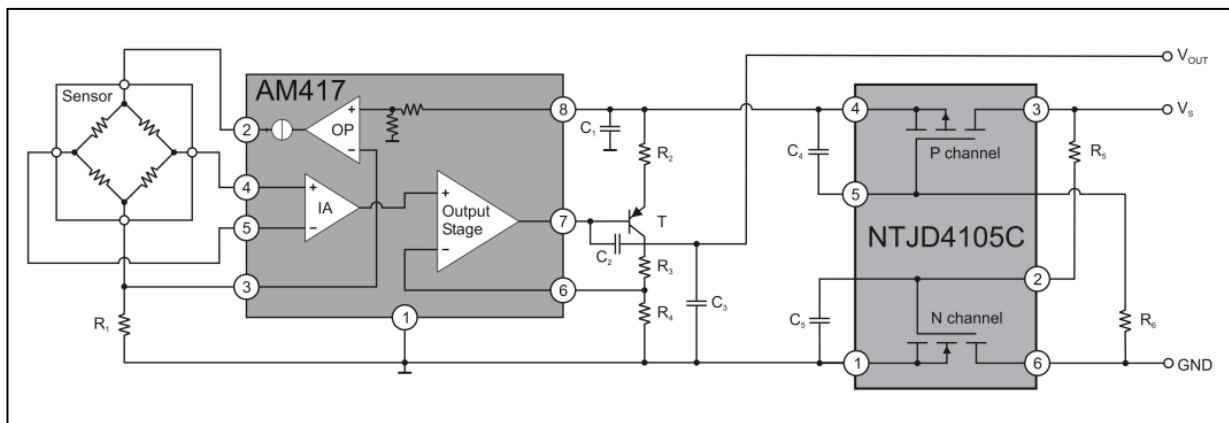
# AM417 AN01

## Reverse polarity protection for ratiometric ICs like AM417

The complementary MOSFET NTJD4105C enables a simple reverse polarity protection for ratiometric applications. With its small SOT-363 package NTJD4105C allows a compact and inexpensive protective solution, which can be used to protect Analog Microelectronics' ratiometric ICs like AM417 against reverse polarity.

AM417 is a low-cost, ratiometric instrumentation amplifier IC without protection functions. The IC is suitable for sensor signal-conditioning of Wheatstone bridge signals. If protection against reverse polarity is required, Analog Microelectronics proposes the combination of AM417 and the complementary MOSFET NTJD4105C as a simple and inexpensive solution.

A complete protected sensor system is shown in *Figure 1*.



**Figure 1: Reverse polarity protection circuit for AM417**

In this application the following additional components have to be used:

Name	Component	Value	Notes
NTJD4105C	Complementary MOSFET		P and N channel MOSFET
R <sub>5</sub> , R <sub>6</sub>	SMD resistors	10 kΩ	tolerance 1 .. 5 %
C <sub>4</sub> , C <sub>5</sub>	SMD capacitors	10 pF	ceramic

NTJD4105C is a complementary N- and P-channel dual MOSFET with  $R_{DS(ON)} < 1.5 \Omega$ , causes a negligible voltage drop in correct polarity. For reversed polarity the complementary MOSFETs allow no current flow into the connected circuit (e.g. AM417), so that it cannot be destroyed.

The circuit protected by NTJD4105C also profits from the MOSFET's integrated ESD protection. A further positive effect is that grid-bound high frequency disturbances are also suppressed by the complementary MOSFET.

### References:

- 1.) AM417's data sheet (see <http://www.analogmicro.de>)
- 2.) NTJD4105C's data sheet (see <http://www.onsemi.com>)