


Name: Böttcher, Jens	NXP Community question: usage of the PN5180 causes reset of the microcontroller		
Datum: 22.11.2016		Projekt:	Seite: - 1 -
Protokoll-Nr.: 161122-01			

question:

hello community,

i have a problem to use the PN5180. the situation is that i have developed a custom board with a microcontroller, the PN5180 and a pcb-antenna. when i put it into operation the microcontroller resets several times. my first guess was an influence of the electromagnetic field. so i put the different parts in spatially separated locations. the microcontroller gets his own supply and the transceiver with antenna gets his own supply too. only the data signals (MISO, MOSI, SCK, NSS, BUSY and RESET) and GND are connected from the microcontroller to the transceiver. to avoid conducted faults every line gets a 5 MHz low pass filter and the GND between filter and transceiver gets a choke. the SPI speed is 1 Mbps. the filter works fine.

the antenne has a distance of 36 cm and the transceiver of 30 cm to the microcontroller.

when i read and write registers or the eeprom everything is fine, but when i take the field on the microcontroller restarts. the field strength is on the lowest power level, i only use one gear. after a couple of restarts the microcontroller starts the provided operation. the actual operation is to read out the uid of ISO15693 and ISO14443A transponders and send it over a com port (UART) to the pc. but when the provided operation is active and i put a transponder in the field, the controller begins to restart again. in other applications with transceiver-chips of other manufacturer the microcontroller works fine, even in the middle of the pcb-antenna. the problem only exist with a matched antenna nearly 50 ohm. with other antennas (i tried a 400 ohm antenna for example) theres no restart but with this antenna the transceiver couldn't read out a transponder. the same result with no antenna connected. there's no considerable field strength measurable close to the microcontroller in the spatially separated setup. i try the same with the evaluation board (PNEV5180B V2.0) an the supplied antenna instead of my transceiver board and antenna, but the same result.

when i put another matched antenna close to the antenna of the transceiver the microcontroller stops to restart but in this situation i can't read transponders too.

my own suspicion is, that the transceiver trys to get to much power over the data lines and so the maximum current of the supported current of the microcontroller is exceeded. is there a similar case known?

at the moment i do not know what to change that the test setup works.

more data:

transceiver: line a: PN5180A; line b1: HHW731; line b2: Z.1 04; line c: NSD602C

antenna: pcb, 1 winding per layer, 2 layers, 65x40 mm, SWR at 13.56 MHz: 1.14; $Z = 45 + j9$ Ohm, $|Z| = 45$ Ohm; range (with other transceiver with std. TAGs): nearly 10 cm.

thanks for help

jens boettcher

nxp community forum post

Name: Böttcher, Jens	NXP Community question: usage of the PN5180 causes reset of the microcontroller	behrens elektronik	
Datum: 22.11.2016		Projekt: XXXXXXXXXX	Seite: - 2 -
Protokoll-Nr.: 161122-01			

test setup:

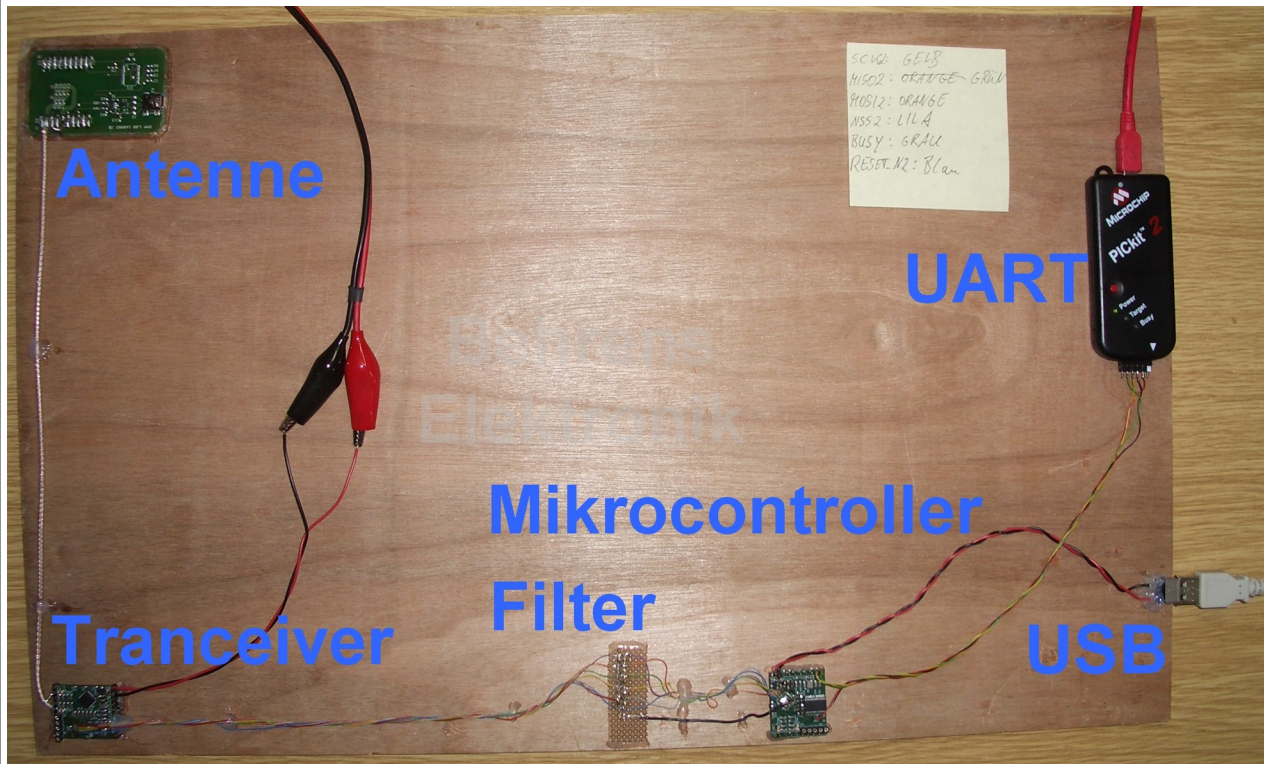


fig. 1: test setup

antenna:

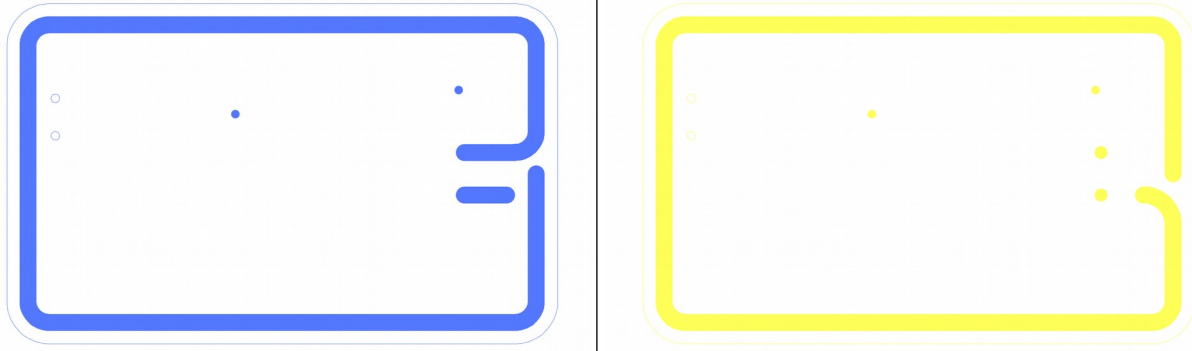


fig. 2: antenna layers

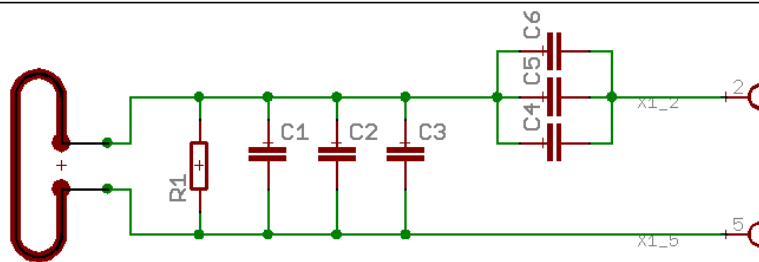


fig. 3: antenna schematic

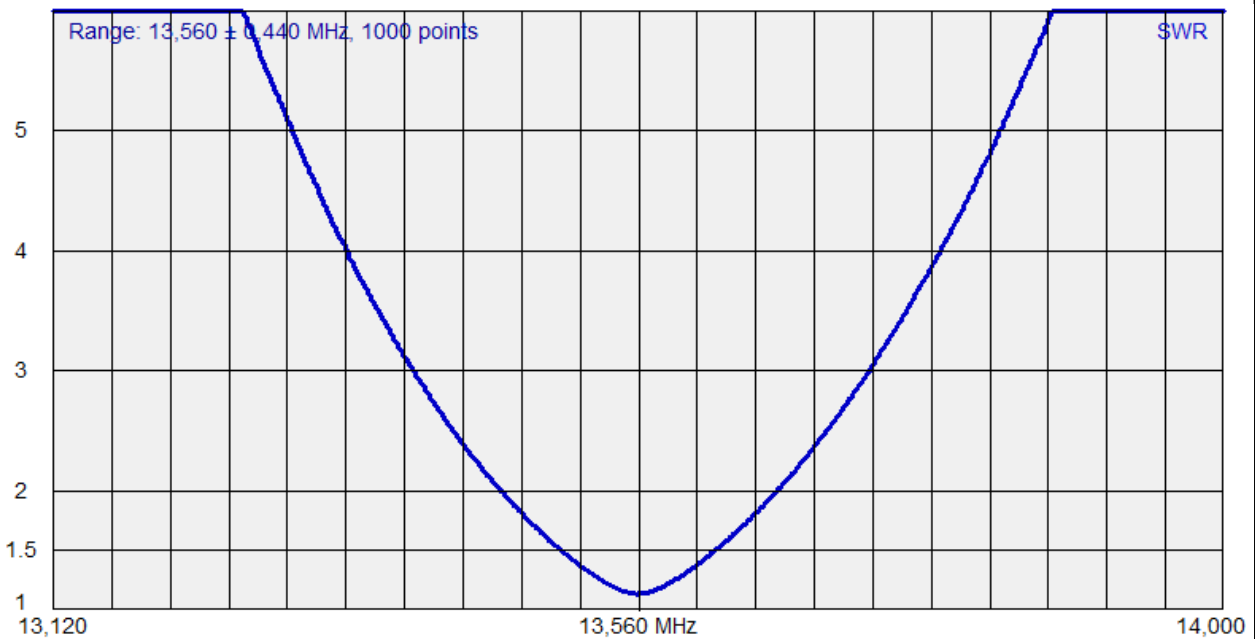


fig. 4: antenna standing wave ratio

Name:
Böttcher, Jens

Datum:
22.11.2016

Protokoll-Nr.:
161122-01

NXP Community question:
usage of the PN5180 causes reset of the microcontroller

Projekt: XXXXXXXXXX

Seite: - 4 -

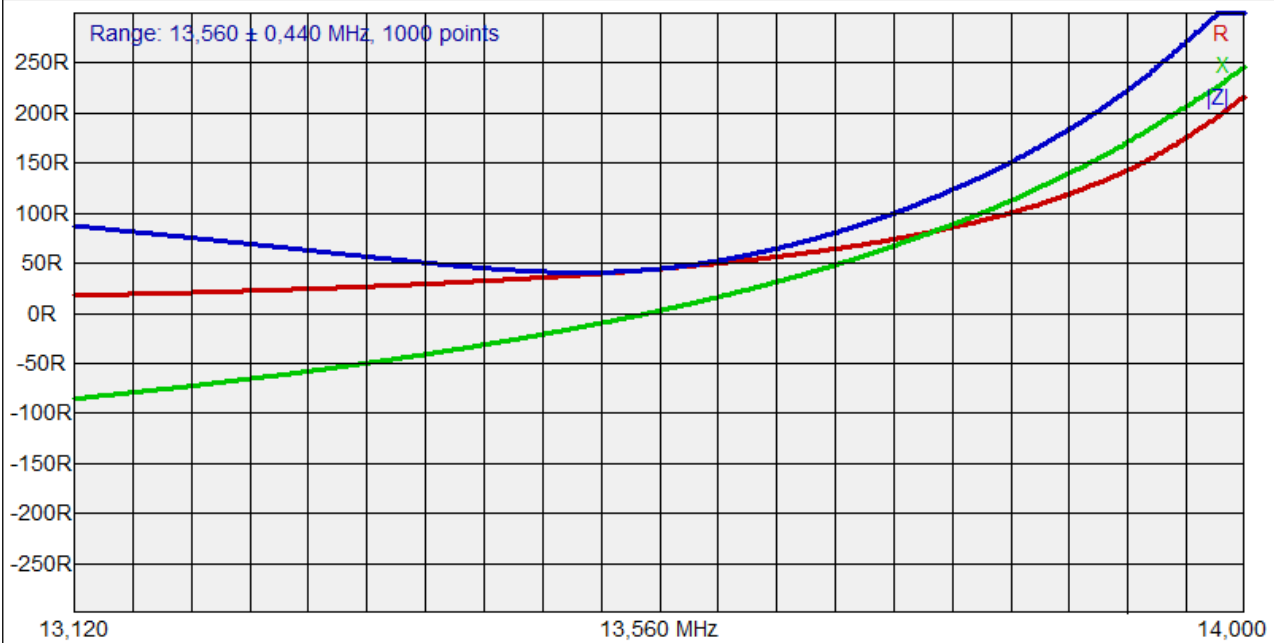


fig. 5: antenna impedance

tranceiver:

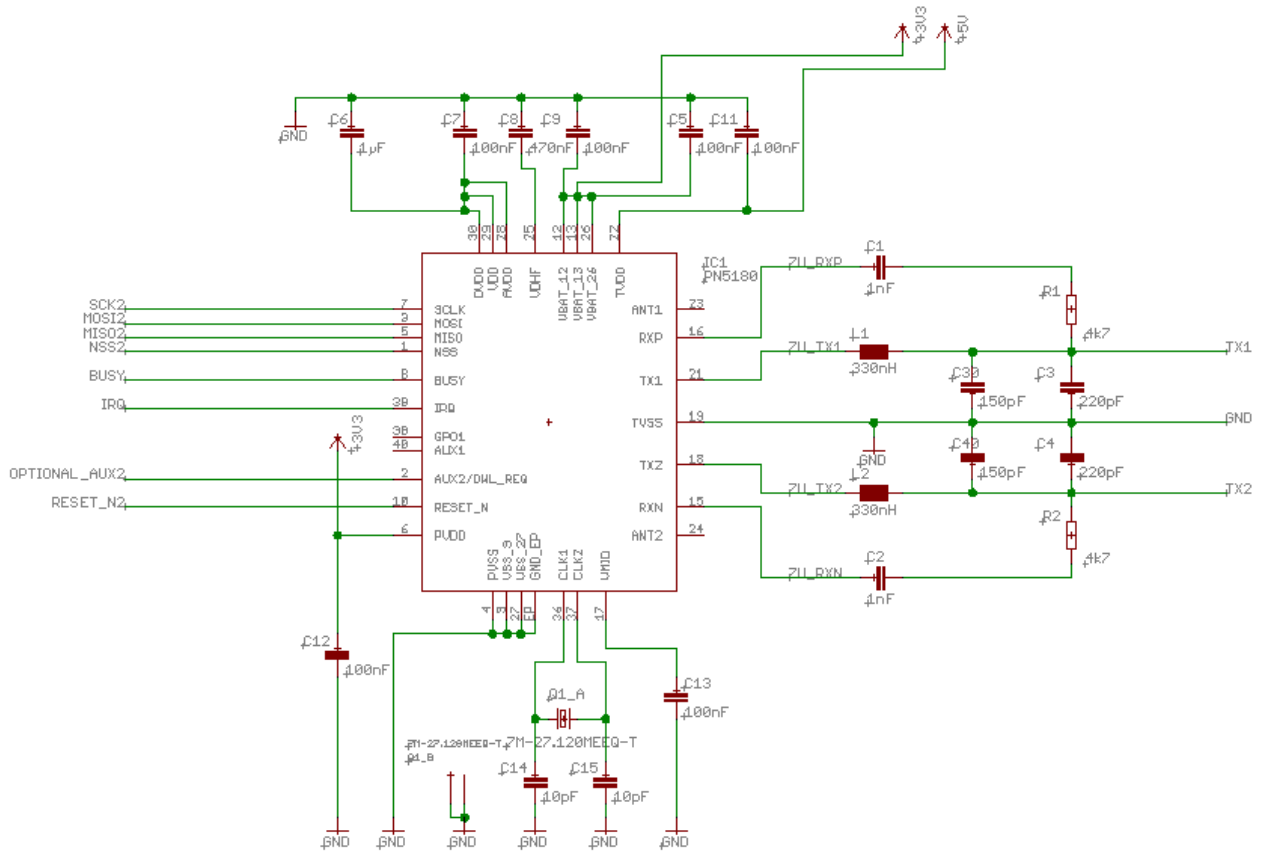


fig. 6: tranceiver schematic