



TECHNICAL DOCUMENTATION

COMMERCIAL CODE: PCSU200

PRODUCT NAME:
USB PC scope and generator

DATE: 20/03/2012

REVISION: 01

MANUFACTURED BY

Velleman NV
Legen Heirweg 33
9890 Gavere
Belgium

PREPARED BY	APPROVED BY
Stephan Santens	/
Date:20/03/2012	Date:

PRODUCT DESCRIPTION:

A complete USB-powered lab-in-a-box!

Feature-packed PCLab200 two channel oscilloscope, spectrum analyzer, recorder, function generator and Bode plotter. Integrated signal wave editor and automated sequence generator, using file or external input.

General information

- markers for amplitude/voltage and frequency/time
- input coupling: DC, AC and GND
- 8 bit resolution
- storage of display and data
- supply from USB port (500mA)*
- dimensions: 100x100x35mm / 3,9x3,9x1.4"

Spectrum analyser:

- frequency range: 0 .. 120Hz to 12MHz
- linear or logarithmic timescale
- operating principle: FFT (Fast Fourier Transform)
- FFT resolution: 2048 lines
- FFT input channel: CH1 or CH2

Transient recorder:

- timescale: 20ms/Div to 2000s/Div
- automatic recording for more than 1 year
- max. number of samples: 100/s
- min. number of samples: 1 sample/20s

Function generator:

- frequency range: sine from 0.5Hz to 1MHz
- square and triangle from 0.5Hz to 500kHz
- extended waveform library
- amplitude range: 200mVpp to 8Vpp @ 1kHz// output impedance: 50ohm

Oscilloscope:

- bandwidth: two channels DC to 12 MHz \pm 3dB
- input impedance: 1 Mohm / 30pF
- maximum input voltage: 30V (AC + DC)
- time base: 0.1 μ s to 500ms per division
- input range: 10mV to 3V/division
- readouts: True RMS, dBV, dBm, p to p, Duty cycle, Frequency...
- record length: 4K samples / channel
- sampling frequency: 250Hz to 25MHz
- sample history and digital grab function

Bode plotter

- Automated sync between oscilloscope and generator
- Frequency range: 1kHz , 10kHz, 100kHz, 1MHz
- Frequency start: 1Hz, 10Hz, 100Hz, 1kHz, 10kHz

PRODUCT PICTURE:



APPLICABLE NORMATIONS

EMC

APP	STANDARDS	DESCRIPTION
x	EN55022	Radiated disturbance field, CISPR22 limits
	EN55014	Conducted disturbance at mains port, CISPR14 limits
	EN61000-4-2	Electrostatic discharge level (IEC801/2)
	EN61000-4-3	Radiated immunity level (IEC801/3)
	EN61000-4-4	Electrostatic fast transient / burst requirements (IEC801/4)
	EN61000-4-5	Surge immunity requirements (IEC801/5)
	ETS300683	EMC standard for short range device 9Khz -25GHz

LOW VOLTAGE / SAFETY

APP	STANDARDS	DESCRIPTION
	IEC60669-2-1	Electronic switches and associated extension units for household and similar fixed electrical installations.
	IEC60065	Audio, Video and similar apparatus, safety requirements
(*)	IEC1010-1	Safety requirements for measurement, control and laboratory use

SPECTRUM

APP	STANDARDS	DESCRIPTION
	ETS300-220	Electromagnetic compatibility and Radio spectrum matters

REMARKS / OTHER STANDARDS:

(*)

Product input voltage is limited to 30Vac+dc

Product operating voltage is 5V USB



Declaration of Conformity

We, Manufacturer

**Velleman Components
Legen Heirweg 33
9890 Gavere
Belgium**

declare that the product

PCSU200 USB PC Scope and generator

if used according the instructions included with the unit meet the directives
in accordance with 89/336/EEC-EMC Directive
and

EN 55022 Limits and methods of measurement of radio interference
characteristics of information technology equipment (CISPR22
limits)

For the manufacturer

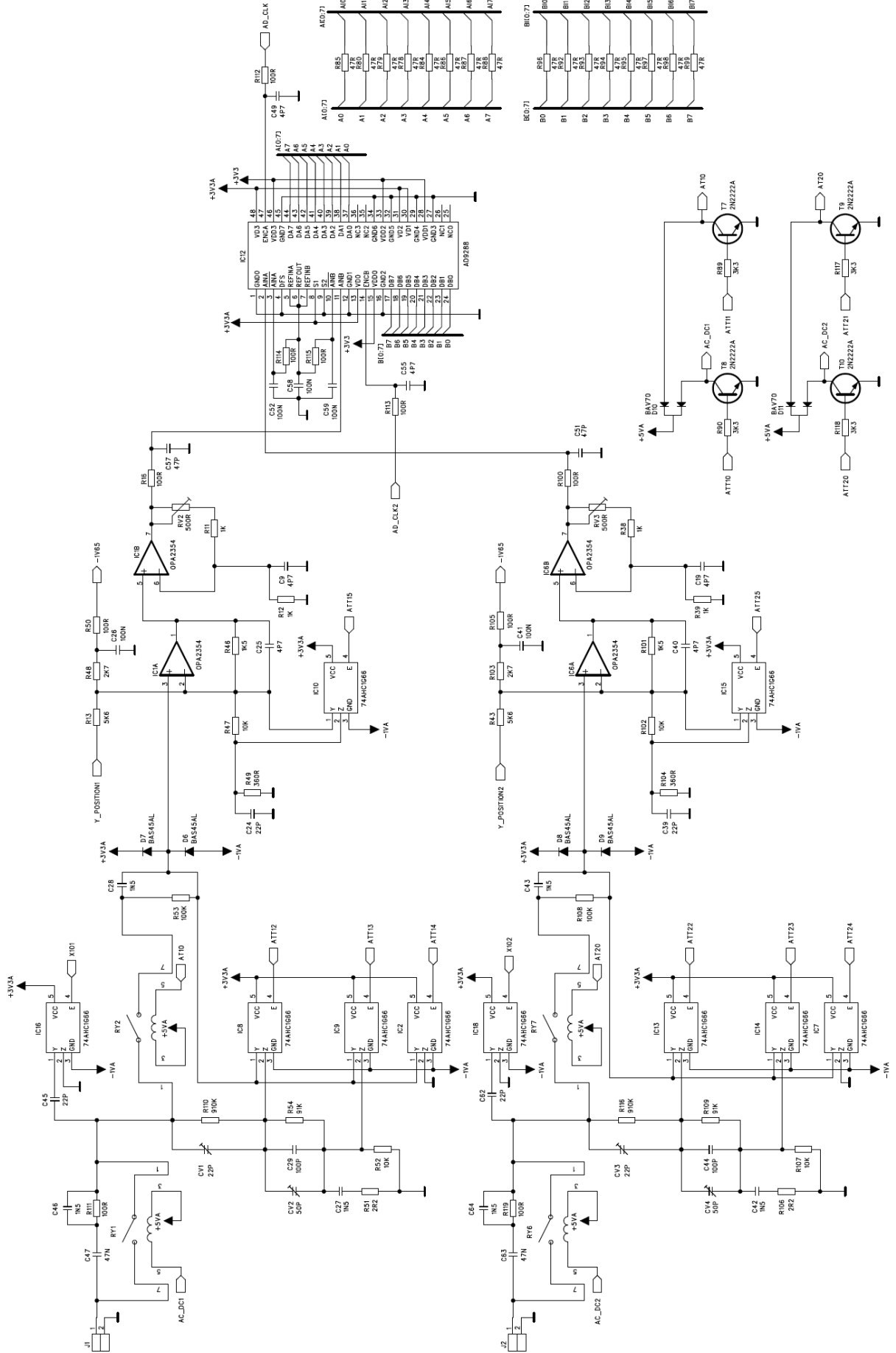
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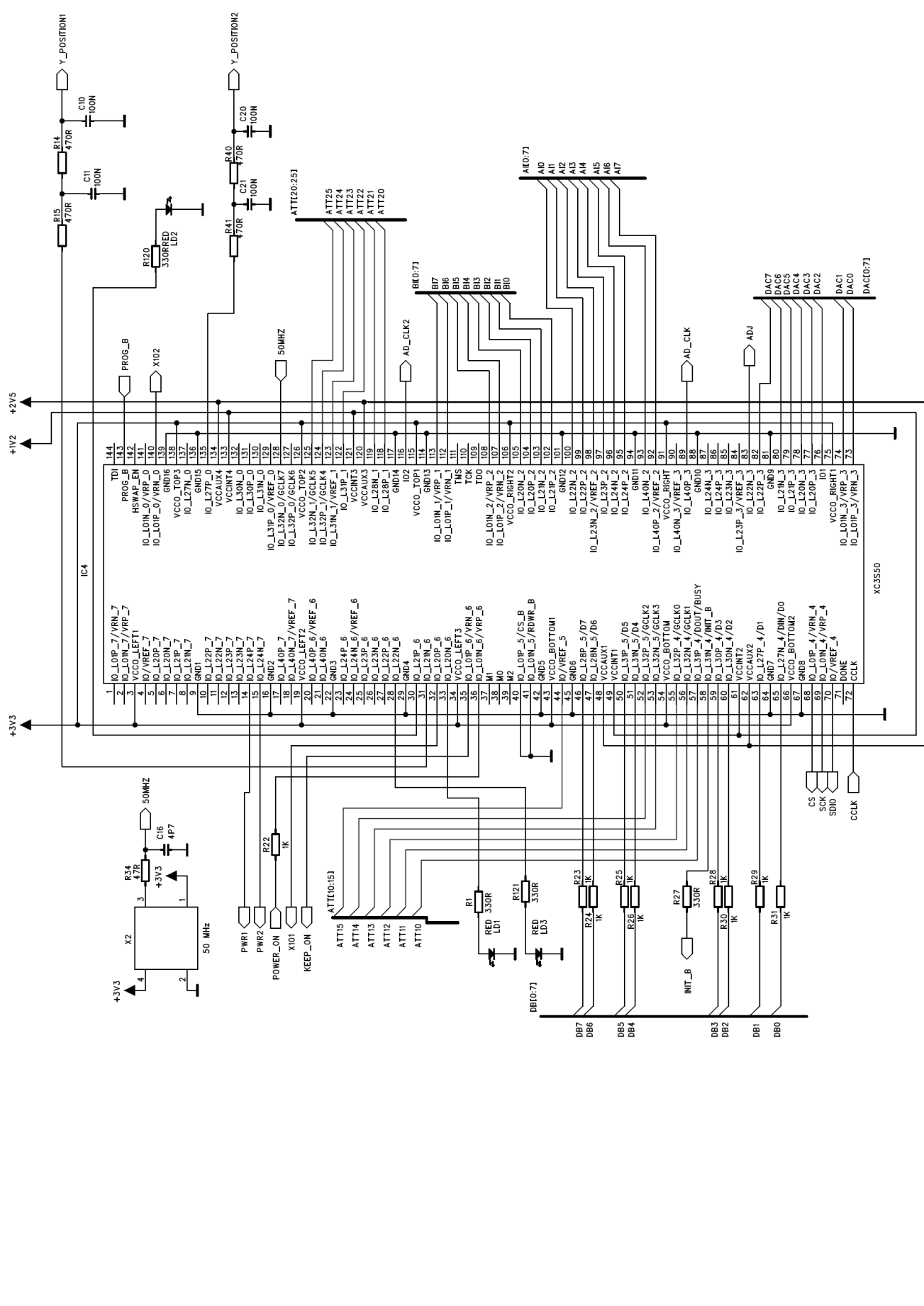
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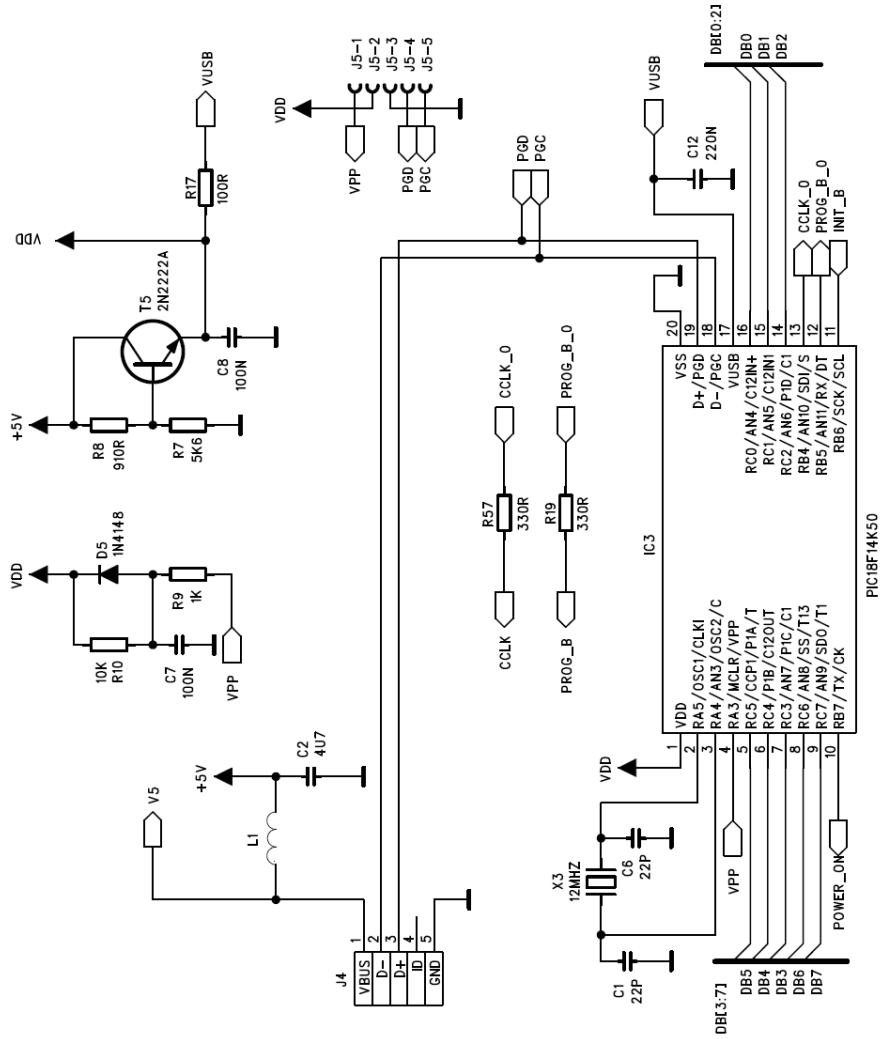
Name: Stephan Santens
Technical Director

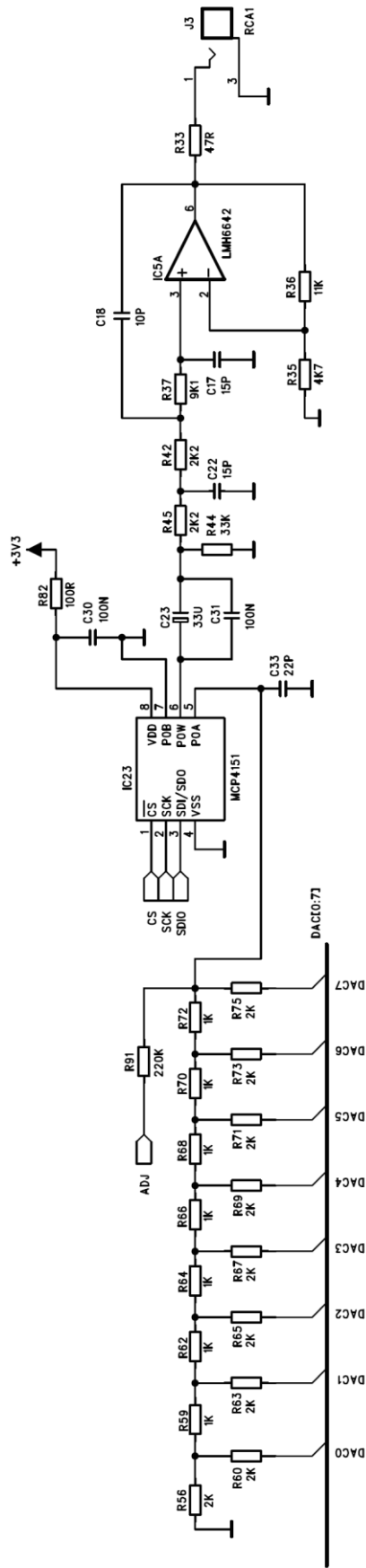
DIAGRAMS
PCB
PARTSLIST
AND
MEASUREMENT RESULTS

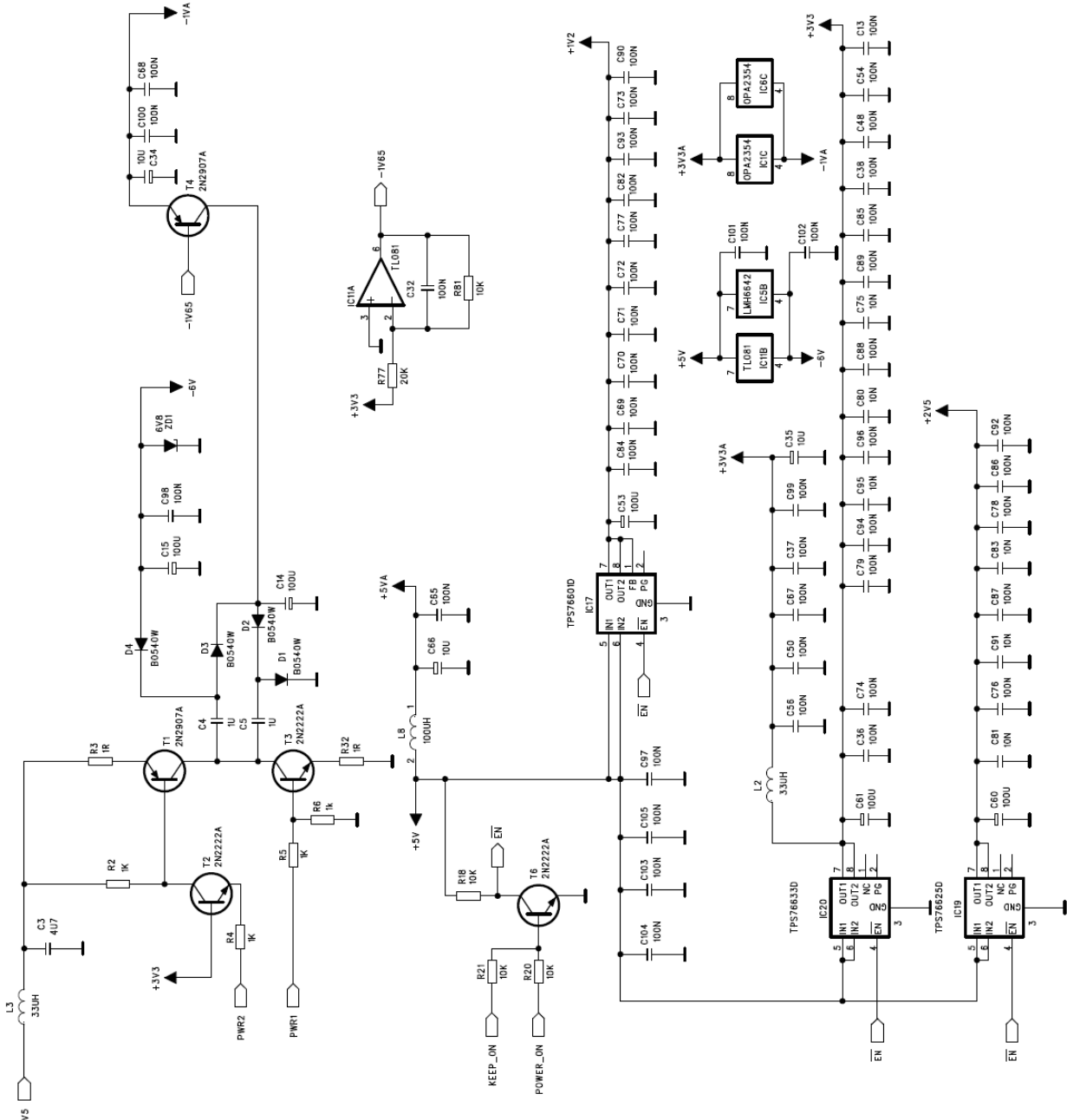
GIAGRAM



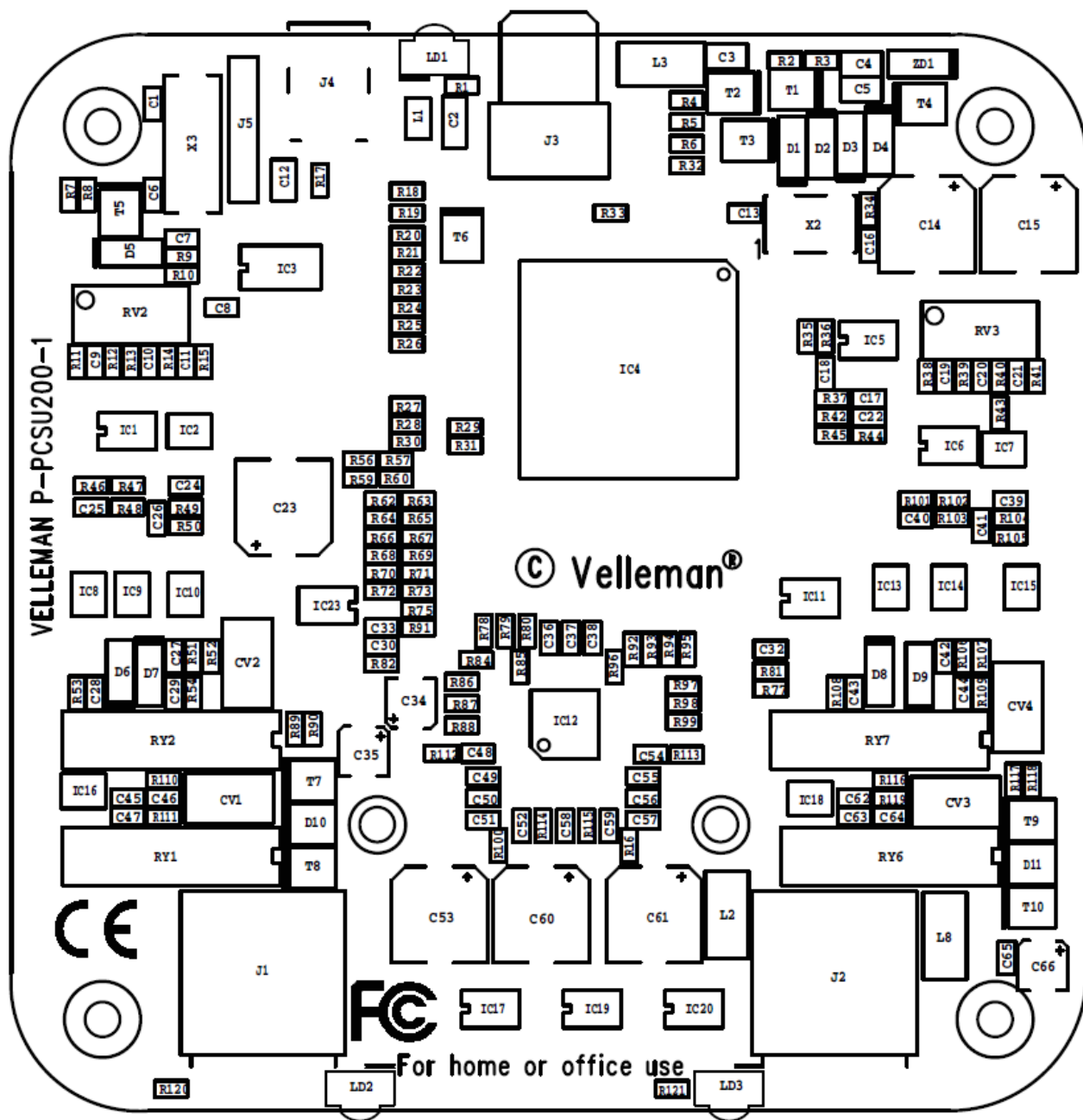








ASSEMBLY



PARTS

ELCO'S

10U	C34-35 C66	SMD elco 10 μ /16V
100U	C14-15 C53 C60-61	SMD elco 100 μ /16V
33U	C23	SMD elco 33 μ /16V

CAPACITORS

10p	C18	smd capacitor 10p/50V
100p	C29 C44	smd capacitor 100p/50V
10n	C75 C80-81 C83 C91 C95	smd capacitor 10n/50V
100n	C7-8 C10-11 C13 C20-21 C26 C30 C32 C36-38 C41 C48 C50 C52 C54 C56 C58-59 C65	smd capacitor 100n/50V
	C31 C67-74 C76-79 C82 C84-90 C92- 94 C96-105	
1u	C4-5	smd ceramic capacitor 1u/25V X5R
15p	C17 C22	smd capacitor 15p/50V
1n5	C27 C28 C42 C43 C46 C64	smd capacitor 1n5/ 50V
22p	C1 C6 C24 C33 C39 C45 C62	smd capacitor 22p/50V
220n	C12	smd capacitor 220n/ 25V X7R
4p7	C9 C16 C19 C25 C40 C49 C55	smd capacitor 4p7/50V
47p	C51 C57	smd capacitor 47p/50V
47n	C47 C63	smd capacitor 47n / 50V
4u7	C2-3	smd ceramic capacitor 4u7/16V X5R

TRIM. CAPACITORS

20p	CV1 CV3	SMD TRIM CAPACITOR
50p	CV2 CV4	SMD TRIM CAPACITOR

RESISTORS

1R	R3 R32	SMD-RESISTOR 1R
100R	R16 R17 R50 R82 R100 R105 R111- 115 R119	SMD-RESISTOR 100R
1k	R2 R4-6 R9 R11-12 R22-26 R28-31 R38-39 R59 R62 R64 R66 R68 R70 R72	SMD-RESISTOR 1k 1%
10K	R10 R18 R20-21 R52 R81 R107 R47 R102	SMD-RESISTOR 10K 1%
11K	R36	SMD-RESISTOR 11K 1%
100K	R53 R108	SMD-RESISTOR 100K
33K	R44	SMD-RESISTOR 33K
1K5	R46 R101	SMD-RESISTOR 1K5 1%
2K0	R56 R60 R63 R65 R67 R69 R71 R73 R75	SMD-RESISTOR 2K0 1%
2K2	R42 R45	SMD-RESISTOR 2K2
2R2	R51 R106	SMD-RESISTOR 2R2
2K7	R48 R103	SMD-RESISTOR 2K7 1%
20K	R77	SMD-RESISTOR 20K 1%

220K	R91	SMD-RESISTOR 220K
3K3	R89-90 R117-118	SMD-RESISTOR 3K3
330R	R1 R19 R27 R57 R120-121	SMD-RESISTOR 330R
360R	R49 R104	SMD-RESISTOR 360R 1%
47R	R33-34 R78-80 R84-88 R92-99	SMD-RESISTOR 47R
470R	R14-15 R40-41	SMD-RESISTOR 470R 1%
4K7	R35	SMD-RESISTOR 4K7 1%
5K6	R7 R13 R43	SMD-RESISTOR 5K6 1%
9K1	R37	SMD-RESISTOR 9K1 1%
91K	R54 R109	SMD-RESISTOR 91K 1%
910R	R8	SMD-RESISTOR 910R 1%
910K	R110 R116	SMD-RESISTOR 910K 1%
TRIM RESISTORS		
500R	RV2 RV3	10 turn resistor trimmer 500R
TRANSISTORS		
PMBT2222A	T2-3 T5-10	NPN switching transistor
PMBT2907A	T1 T4	PNP switching transistor
DIODE / LED		
BAS45AL	D6-9	Low-leakage diode
BAV70	D10-11	double diode
IN4148	D5	diode
B0540		
MBR0540	D1-4	0.5A 40V SMD SCHOTTKY RECTIFIER
MBR0540T		
BZV55-C6V8	ZD1	zener diode 6V8
KPA-3010SECK	LD1-3	3.0mmx1.0 mm RIGHT ANGLE SMD CHIP LED
IC'S		
PIC18LF14K50.I/SS	IC3	PIC micro + ICSP PROGRAMMING
OPA2354AIDDA	IC1 IC6	dual op amp (0.95€)
TL081CDR	IC11	op amp
LMH6642MA	IC5	op amp
AD9288BST-40	IC12	8-bit dual AD converter (2.63€)
74AHC1G66GW	IC2 IC7-10 IC13-16 IC18	Bilateral switch
XC3S50-4TQG144C	IC4	FPGA (4.55€)
MCP4151-502E/SN	IC23	8-Bit Single SPI Digital POT
TPS76633D	IC20	Voltage regulator 3.3V/250mA
TPS76625D	IC19	Voltage regulator 2.5V/250mA
TPS76601D	IC17	Voltage regulator 1.2V/250mA
MISC.		
Choke	L1	SMD CHOKE 500mA, 600ohm @100MHz
12MHz	X3	12MHZ CRYSTAL
XO50	X2	50MHZ CRYSTAL OSCILLATOR
REEDRELAY SIP	RY1-2 RY6-7	Reed Relay 1formA

BNCCONNECTOR PCB	J1-2	BNC INPUT CONNECTOR BLACK
MJ-526G	J3	RCA Jack, Metal, Right Angle, PCB Mount GOLD
Mini USB CONNECTOR	J4	USB MINI-B RECEPTACLE (same like HPS50)
Pin header	J5	Pin header, 5 pin for ICSP
PPCSU200-1	PCB version 1	2 - Layer PCB for PCSU200
Inductor	L2 L3	SMD INDUCTOR 33uH, 0.16A, Rdc=4ohm max.
Inductor	L8	SMD INDUCTOR 100uH, 0.1A, Rdc=10ohm max.

Radiation test measurement: WORST POSITION TEST PROBE

50081-1 Radiated Emission 30-1000MHz

Peak QPeak Sweep

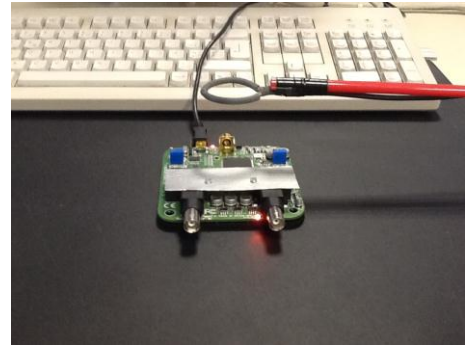
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Unit: dB(μ V/m) Distance from DUT: .05m 50081-1 Radiated Emission 30 - 1000MHz

Notes:

Velleman instruments
PCSU200 USB scope generator
Worst position

EN55022 Field strenght
Start: 30MHz
Stop: 1GHz

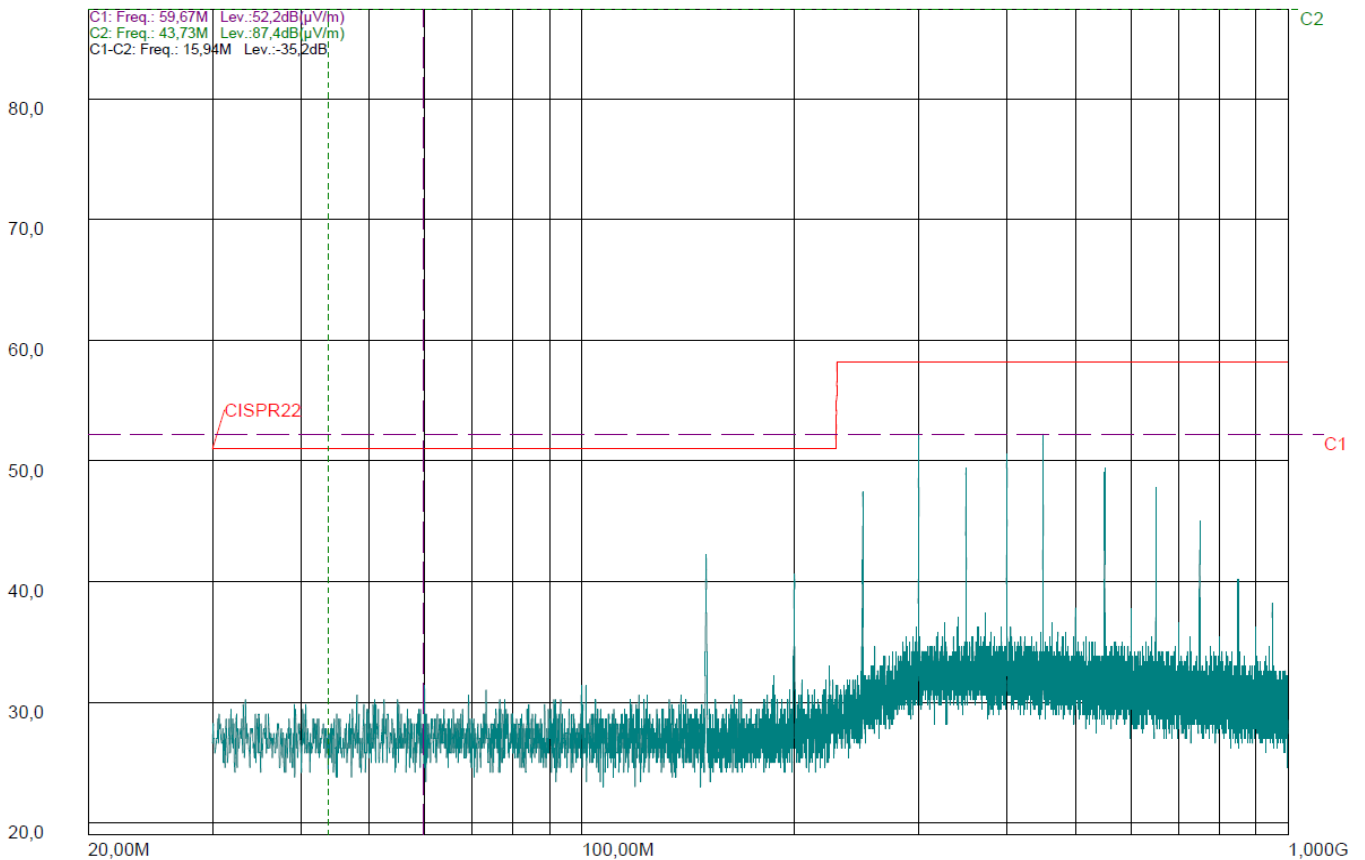


50081-1 Radiated Emission 30-1000MHz

Peak QPeak Sweep RBW: 120kHz

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Unit: dB(μ V/m) Distance from DUT: .05m 50081-1 Radiated Emission 30 - 1000MHz



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