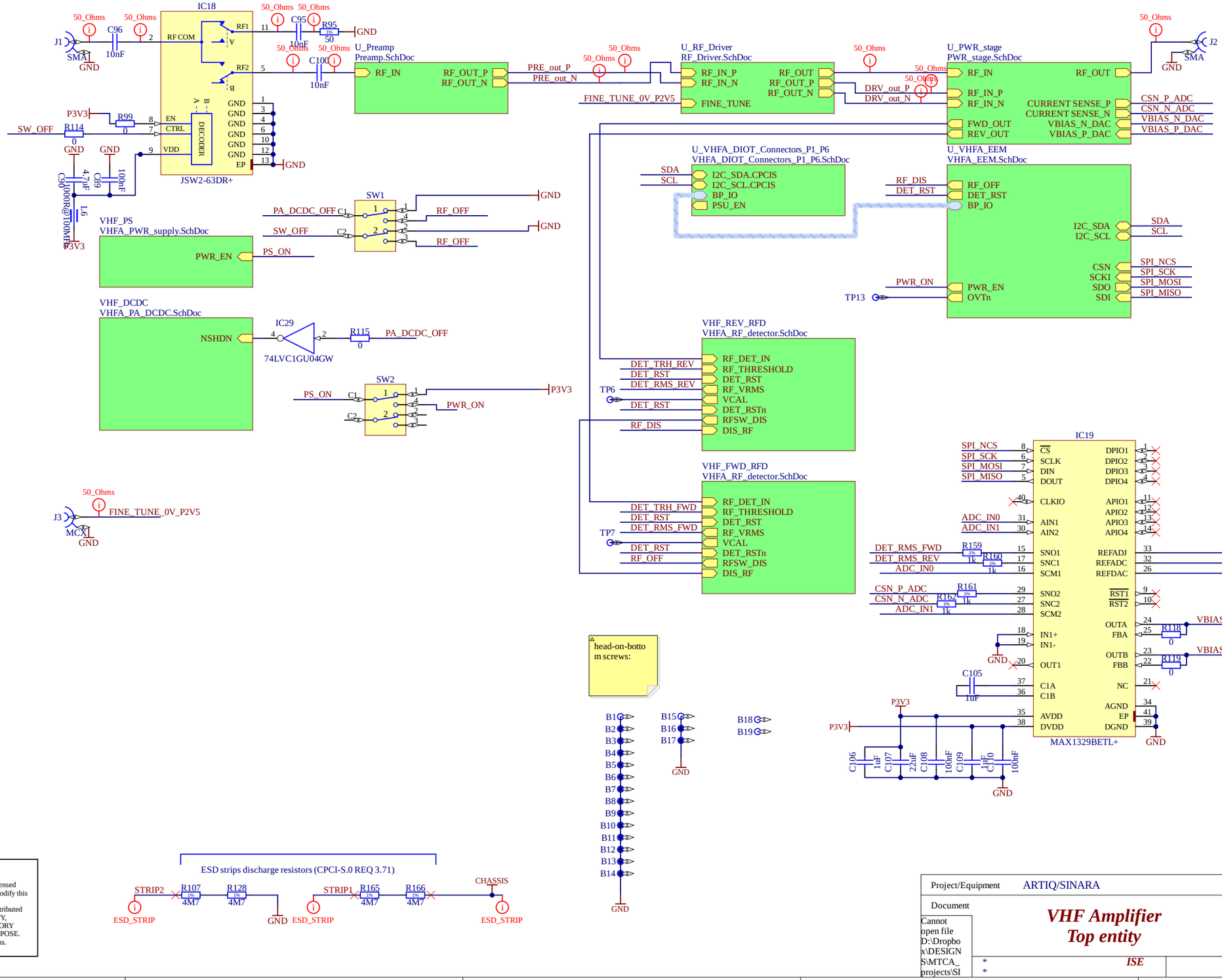

Project/Equipment	ARTIQ/SINARA
Document	VHF Amplifier Top entity
Designer	shanasz
Drawn by	*
Check.by	*
Last Mod.	-
File	VHF_AMP_top.SchDoc
Print Date	24.03.2024 23:17:53
Sheet	1 of 9
Size	A3
Rev	*

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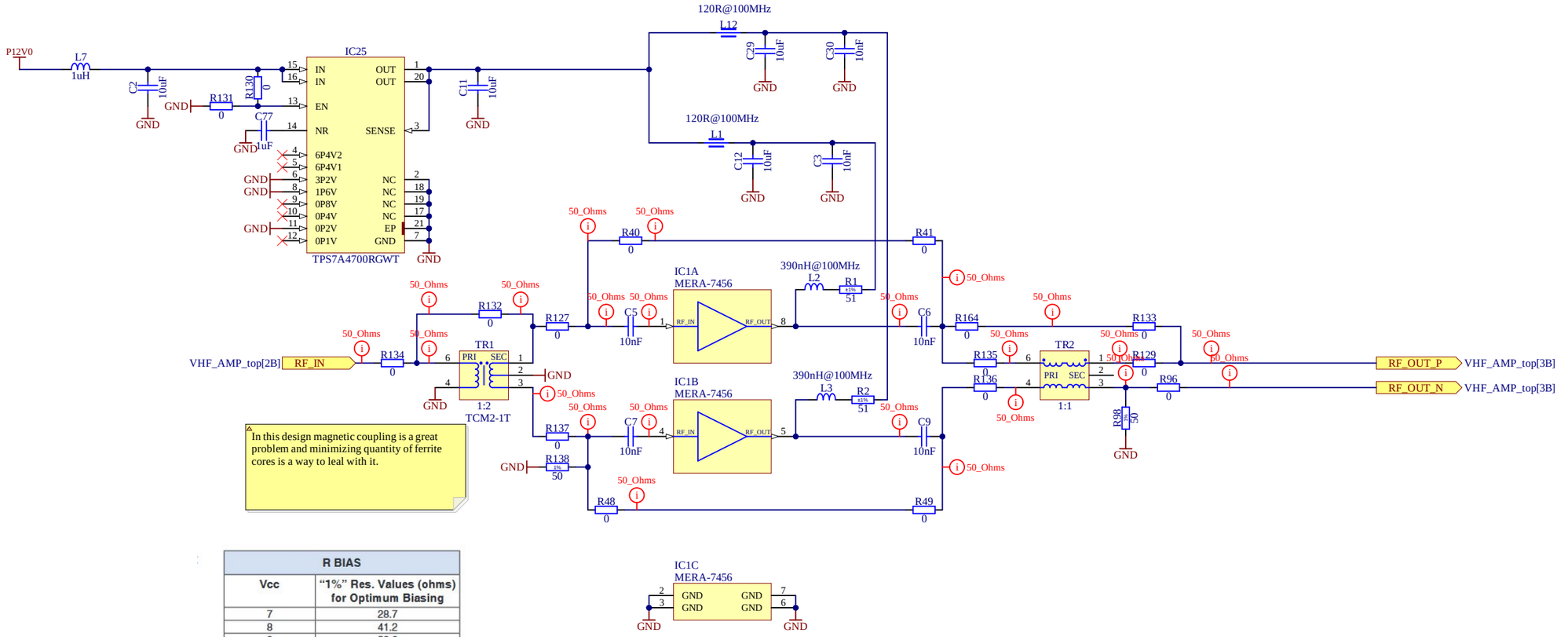
ISE

ARTIQ



R BIAS	
Vcc	"1%" Res. Values (ohms) for Optimum Biasing
7	28.7
8	41.2
9	53.6
10	66.5
11	78.7
12	90.9
13	102
14	115
15	127

Project/Equipment ARTIQ/SINARA

Document

VHF Amplifier Preamplifier

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ISE

Designer	shanasz
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Last Mod.	-
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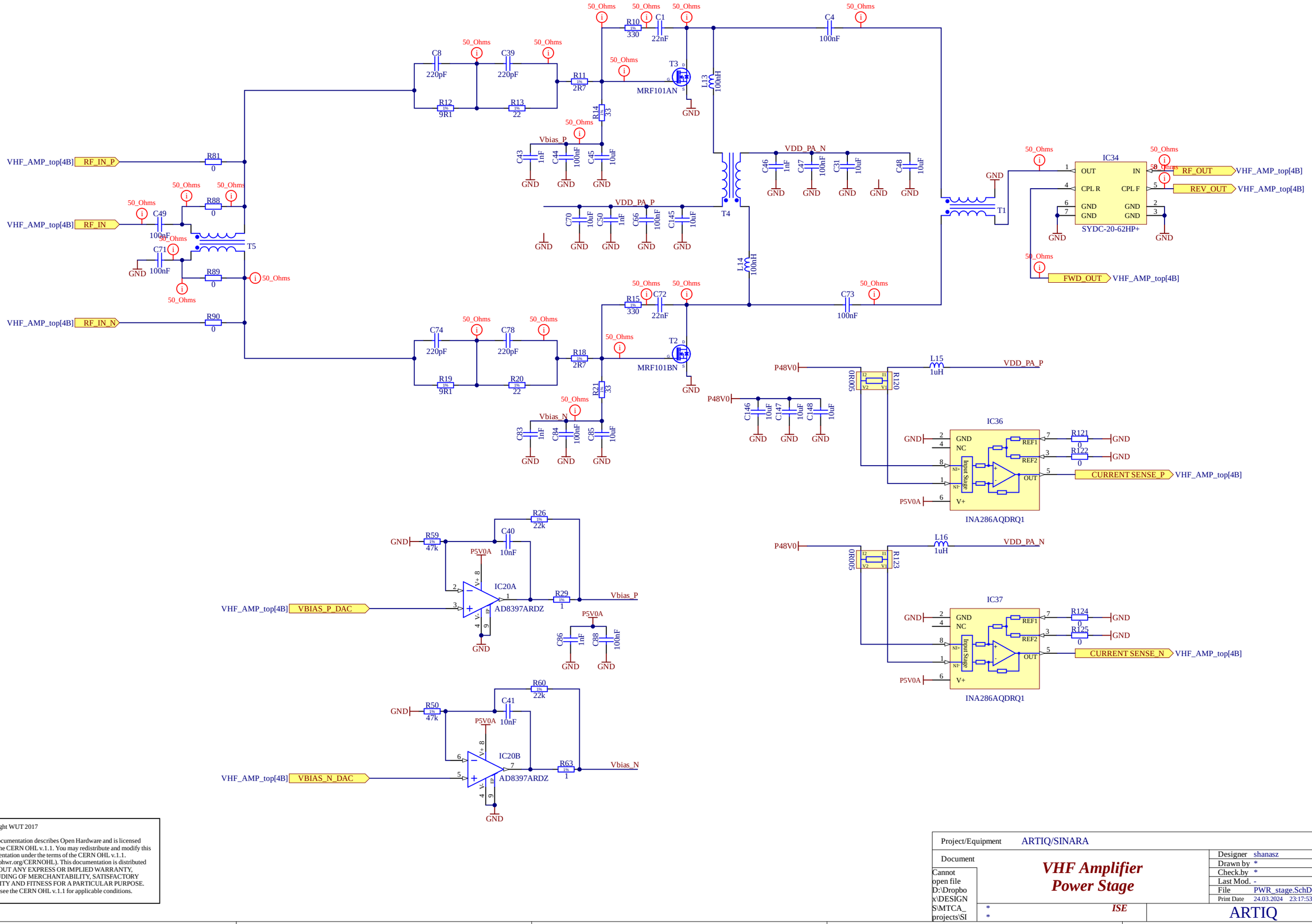
Sheet	2 of 9
Size	A3
Rev	*

ARTIQ



Project/Equipment ARTIQ/SINARA

Document

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VHF Amplifier Power Stage

Designer	shanasz
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Last Mod.	-
File	PWR_stage.SchDoc
Print Date	24.03.2024 23:17:53
Sheet	3 of 9
Size	A3
Rev	*

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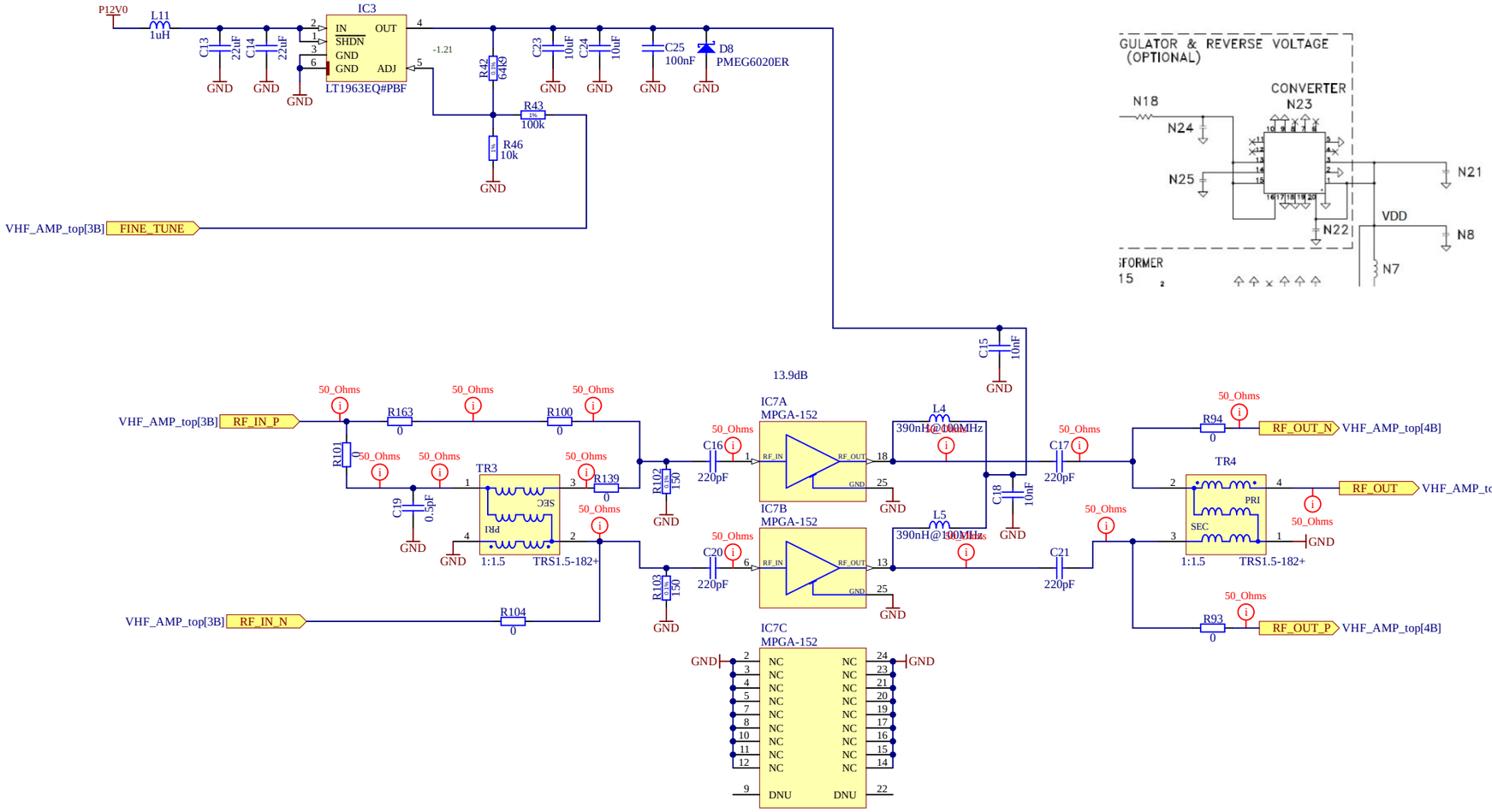
10.03.2024

ISE

ARTIQ



Project/Equipment ARTIQ/SINARA

Document

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VHF Amplifier
Driver Amplifier

ISE

Designer	shanasz
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Check.by	*
Last Mod.	-
File	RF_Driver.SchDoc
Print Date	24.03.2024 23:17:53
Sheet	4 of 9
Size	A3
Rev	*

ARTIQ

P1 connector

BP_IO.LVDS_P[0..7]
BP_IO.LVDS_N[0..7]

P12V0_BP
Parameter Set
PWR
J13A
P1
GND

This design uses new revision of backplane assignments. MGT Rx is no longer shared with LVDS 15.

BP_I2C.SCL
BP_I2C.SDA
RST
D2
BAT165
22
R142
SERVMOD_3V3
R85
200
D4
PRTR5V0U2X
P3V3
J13B

BP_IO.LVDS_P1
BP_IO.LVDS_N1
BP_IO.GA0
BP_IO.LVDS_P0
BP_IO.LVDS_N0
BP_IO.GA1
BP_IO.GA2
BP_IO.GA3
R140
R141
R143
R144
D3B
D3A
D3D
D3C
J13C

BP_IO.LVDS_P2
BP_IO.LVDS_N2
BP_IO.LVDS_P4
BP_IO.LVDS_N4
BP_IO.LVDS_P3
BP_IO.LVDS_N3
J13D

BP_IO.LVDS_P6
BP_IO.LVDS_N6
BP_IO.LVDS_P5
BP_IO.LVDS_N5
J13E

BP_IO.LVDS_P7
BP_IO.LVDS_N7
J13F

P3V3_CPCIS
IC14A
IC14B
IC14C
IC14D
74HC4066PW
BP_I2C.SDA
BP_I2C.SCL
SERVMOD_3V3
J2C_SDA.CPCIS
J2C_SCL.CPCIS
I2C_SDA.CPCIS
I2C_SCL.CPCIS
VHF_AMP_top[3B]
C22
100nF

VHF_AMP_top[3B], VHFA_EEM[3B]
BP_IO
EEM_LVDS
LVDS_P[0..7]
LVDS_N[0..7]

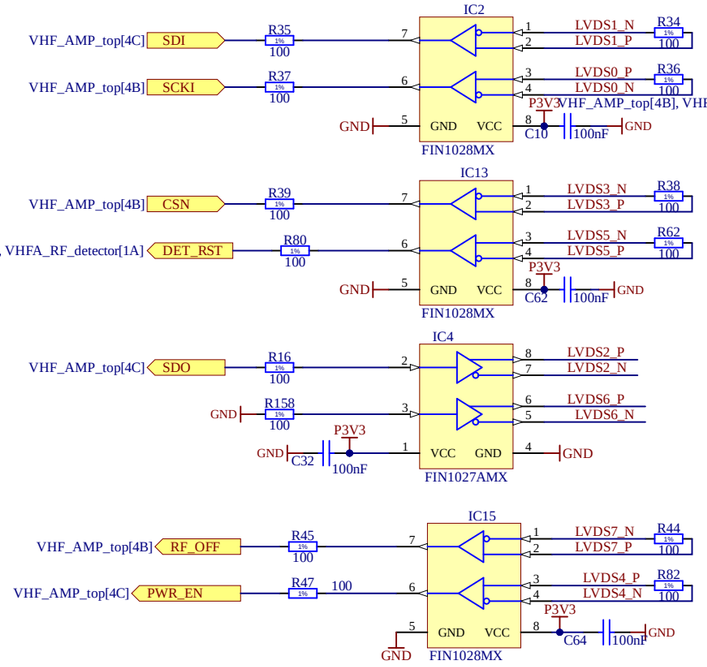
IC32A
IC32B
IC32C
IC32D
BP_IO.GA0
BP_IO.GA1
BP_IO.GA2
BP_IO.GA3
PWR_GA0
PWR_GA1
PWR_GA2
PWR_GA3
C142
100nF

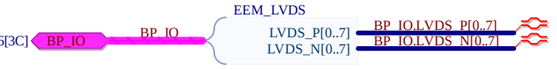
PWR_GA3
PWR_GA2
PWR_GA1
PWR_GA0
R145
10k
R146
R147
R148
R149
R150
R151
R152
1k6
R154
0
IC35
TLC555ID
RESET
DISCH
THRES
TRIG
CONT
OUT
VDD
GND
C138
22uF
R155
10k
C140
1uF
C141
100nF
C139
100nF
R156
10k
T8
BSH103
R153
0
PSU_EN
VHF_AMP_top[3B]
RST

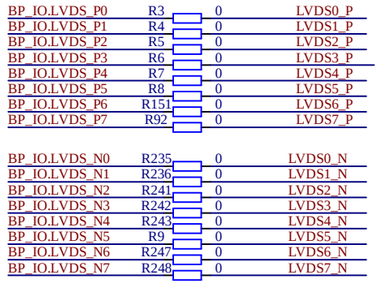
This circuit delays startup by 20-40 ms, depending on GA pins.

Project/Equipment	VHF_AMP.PrjPcb
Document	**VHF Amplifier DIOT connectors**
Designer	G.Kasprowicz
Drawn by	G.Kasprowicz
Check.by	-
Last Mod.	- 13.03.2024
File	VHFA_DIOT_Connectors_P1_P6.SchDoc
Print Date	24.03.2024 23:17:54 Sheet 5 of 9
PW ISE WUT ISE	Contact gkasprow@gmail.com Size A3 Rev 2

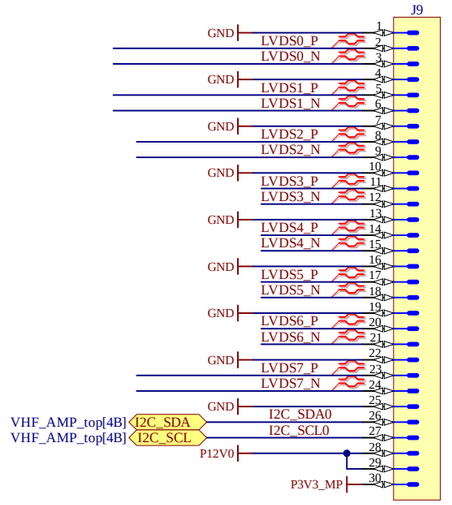
Reversed direction option



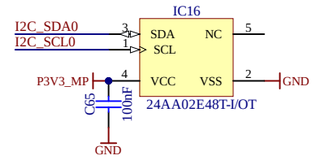


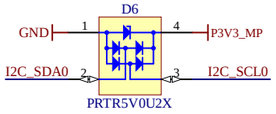


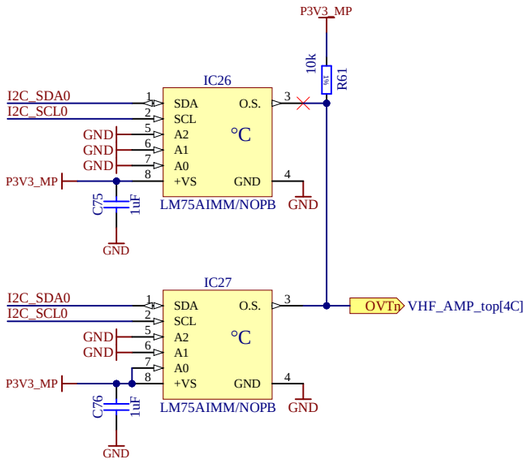
EEM connector: IO are LVDS, I2C is 3V3 LVCMOS, P3V3_MP up to 20mA, P12V up to 1A



EEM connector: IO are LVDS, I2C is 3V3 LVCMOS, P3V3_MP up to 20mA, P12V up to 1A







Project/Equipment ARTIQ/SINARA

Document

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VHF Amplifier EEM connectors

Designer	G.Kasprowicz
Drawn by	G.Kasprowicz
Check.by	-
Last Mod.	- 13.03.2024
File	VHFA_EEM.SchDoc
Print Date	24.03.2024 23:17:54 Sheet 6 of 9

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Nowowiejska 15/19 00-665 Warsaw

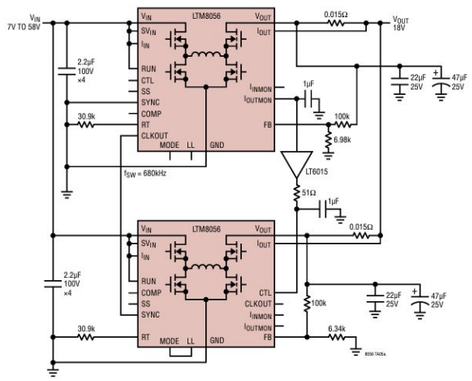
ARTIQ

Size A3 Rev 2

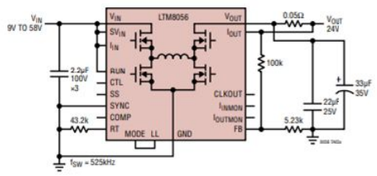
P12V0
highPower
IC21
LTM8056IY#PBF
C118 2.2uF
C119 2.2uF
C120 2.2uF
C121 2.2uF
C122 Undefined
C91 10uF
C92 10uF
C94 10uF
C115 10uF
C116 10uF
C117 10uF
R64 0R01
P48V0
VHF_AMP_top[2C]
NSHDN
R126 0
R66 0
R67 200K
R70 6k98
R71 0
C133 Undefined
R69 42k2
R73 Undefined
R74 Undefined
R75 51
C135 1uF
IC23A
AD8397ARDZ
C137 1uF
IC23B
AD8397ARDZ
C129 2.2uF
C130 2.2uF
C131 2.2uF
C132 2.2uF
C123 10uF
C124 10uF
C125 10uF
C126 10uF
C127 10uF
C128 10uF
R65 0R01
C111 Undefined
R84 0
C136 Undefined
R78 42k2
R86 Undefined
R87 Undefined
R76 0
R77 200K
R79 6k34
IC22
LTM8056IY#PBF

Switching freq: 500kHz
MODE: forced continous mode (low EMI)

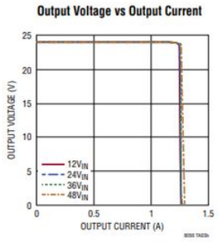
Two LTM8056s Paralleled to Get More Output Current. The Two µModules Are Synchronized and Switching 180° Out Of Phase



24V$_{OUT}$ from 9V$_{IN}$ to 58V$_{IN}$ with 1.1A Accurate Current Limit



Output Voltage vs Output Current



Project/Equipment ARTIQ/SINARA

Document

VHF Amplifier Power Stage Supply

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Designer	G.Kasprowicz
Drawn by	G.Kasprowicz
Check.by	
Last Mod.	- 29.01.2024
File	VHFA_PA_DCDC.SchDoc
Print Date	24.03.2024 23:17:54 Sheet 7 of 9

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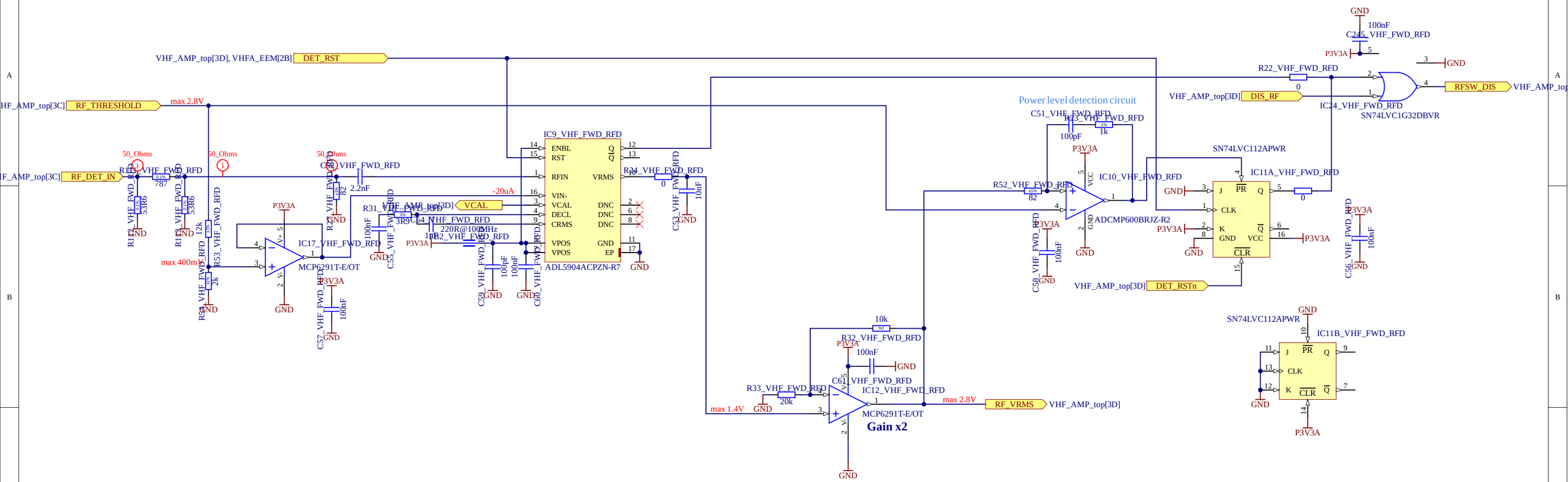
Nowowiejska 15/19 00-665 Warsaw

ARTIQ Size A3 Rev 2



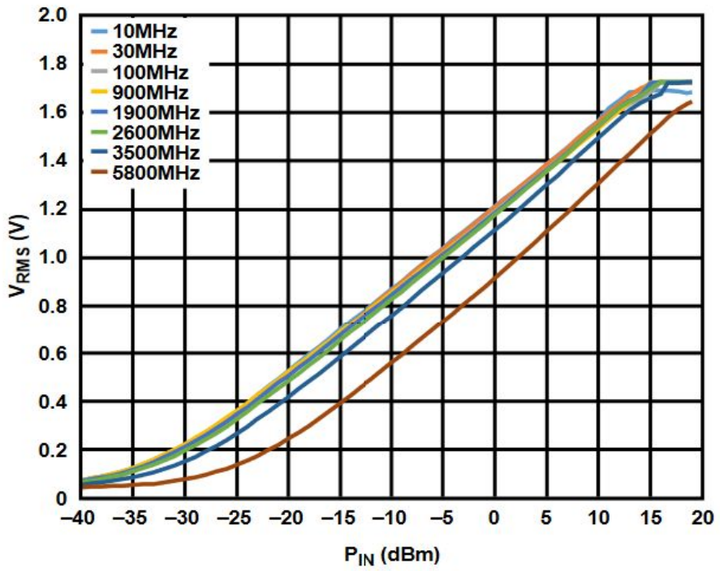


Figure 3. V_{RMS} vs. Input Level (P_{IN}) for Various Frequencies (30 MHz to 6 GHz) at 25°C

13838-003

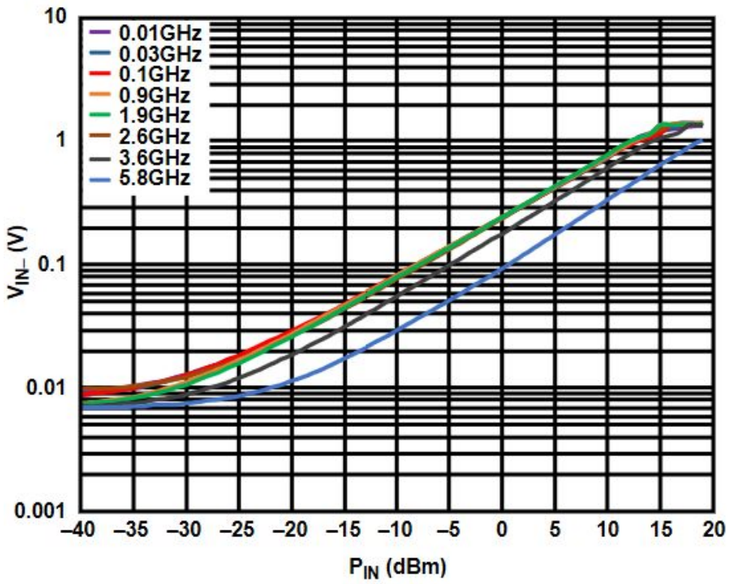
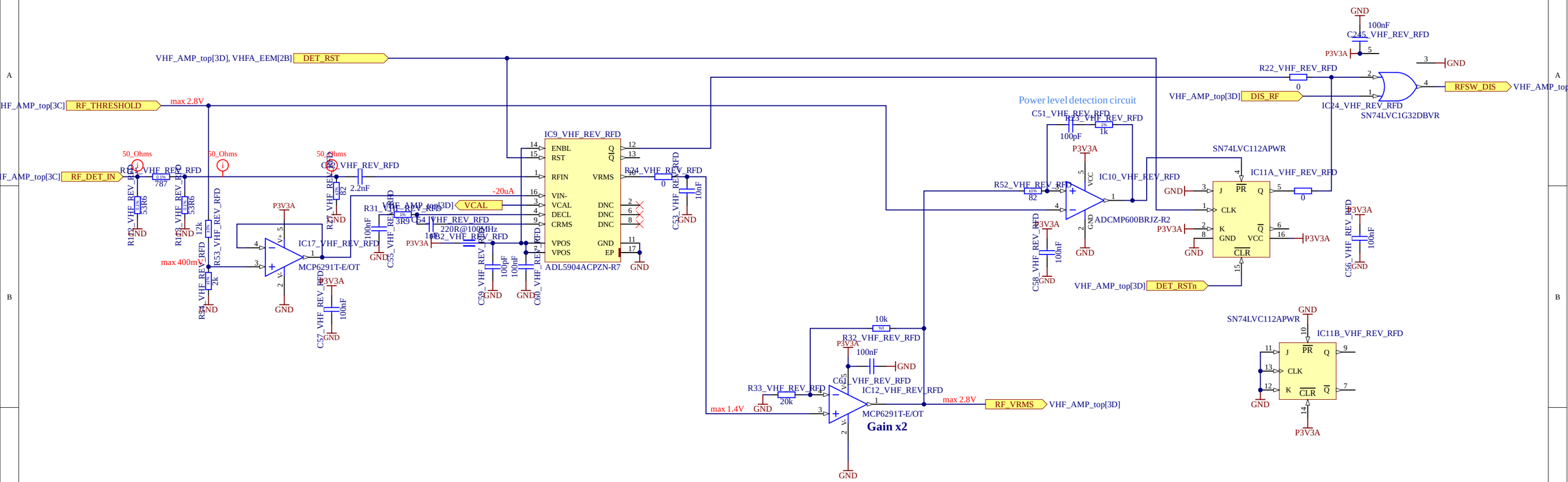


Figure 39. V_{IN-} vs. P_{IN} at Various Frequencies

Project/Equipment	Sampler		
Document	***VHF Amplifier Power detector & protection***	Designer G.Kasprowicz	
Cannot open file D:\Dropbox\DESIGNS\MTCA_projects\SI		Drawn by G.Kasprowicz	
		Check.by	-
		Last Mod. -	25.02.2024
		File VHFA_RF_detector.SchDoc	
		Print Date 24.03.2024 23:17:54	Sheet 8 of 9
PW ISE *WUT ISE* *Nowowiejska 15/19 00-665 Warsaw*	ARTIQ	Size A3	Rev 2



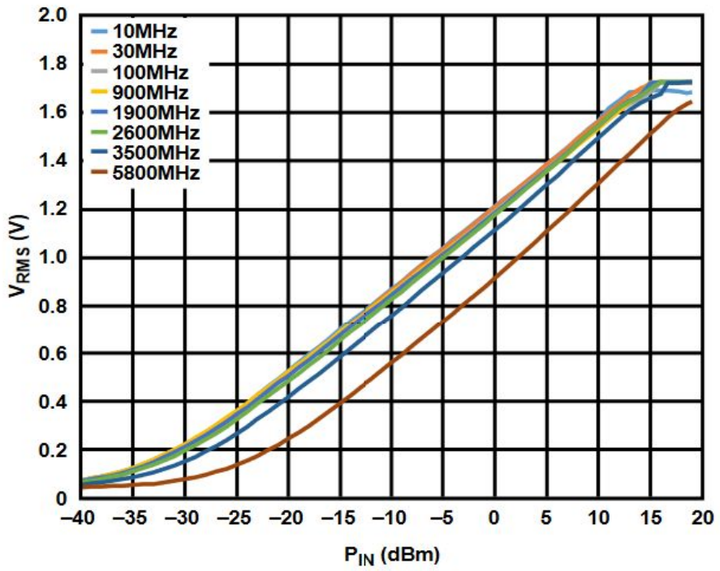


Figure 3. V_{RMS} vs. Input Level (P_{IN}) for Various Frequencies (30 MHz to 6 GHz) at 25°C

13838-003

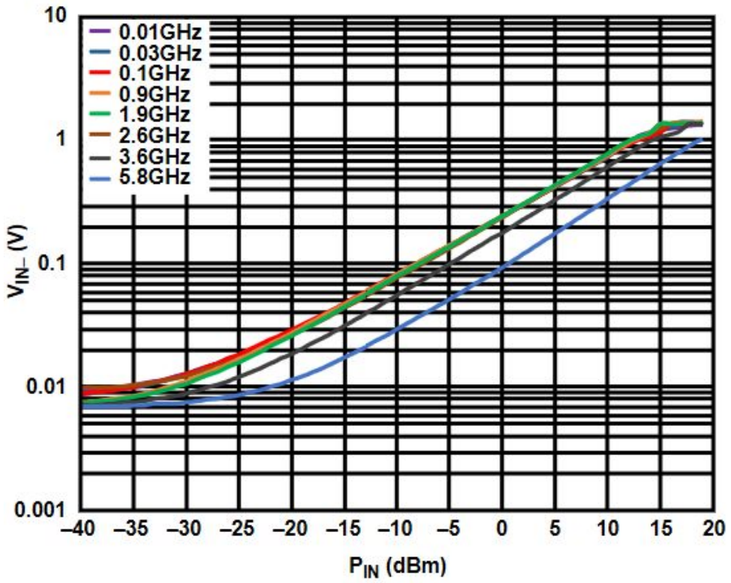


Figure 39. V_{IN-} vs. P_{IN} at Various Frequencies

Project/Equipment	Sampler		
Document	**VHF Amplifier Power detector & protection**	Designer G.Kasprowicz	
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		Check.by	-
		Last Mod. -	25.02.2024
		File VHFA_RF_detector.SchDoc	
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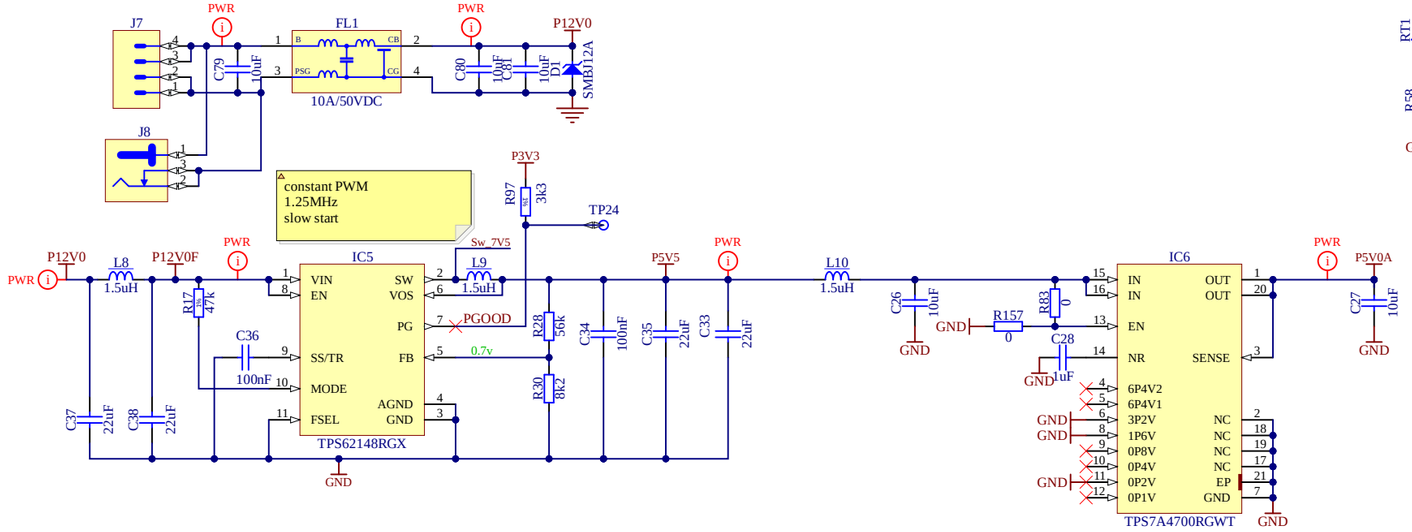
PW ISE WUT ISE Nowowiejska 15/19 00-665 Warsaw	ARTIQ	Size A3	Rev 2



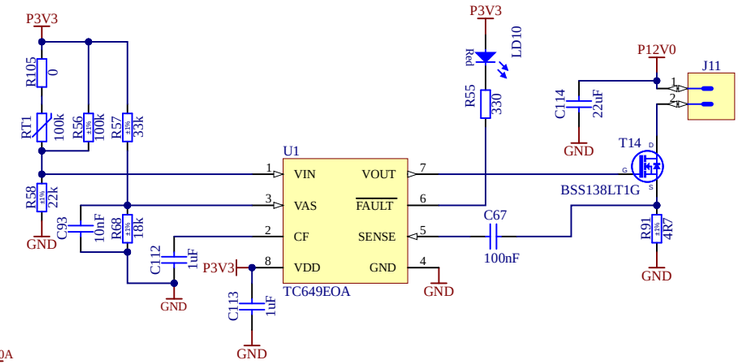
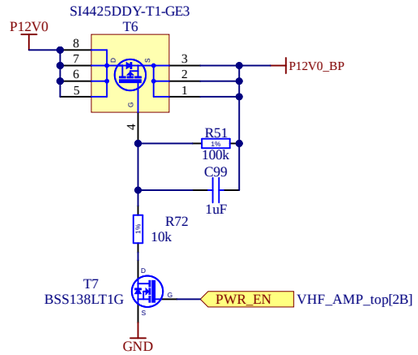
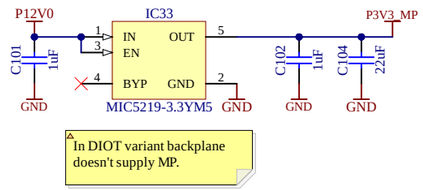
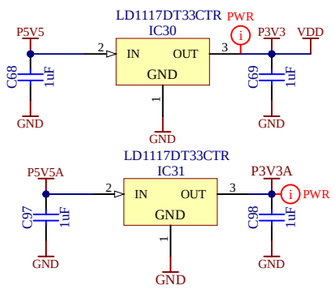


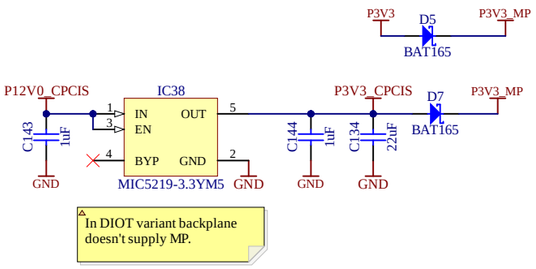
TABLE 5-1: R_{SENSE} VS. FAN CURRENT

Nominal Fan Current (mA)	R_{SENSE} (Ω)
50	9.1
100	4.7
150	3.0
200	2.4
250	2.0
300	1.8
350	1.5
400	1.3
450	1.2
500	1.0

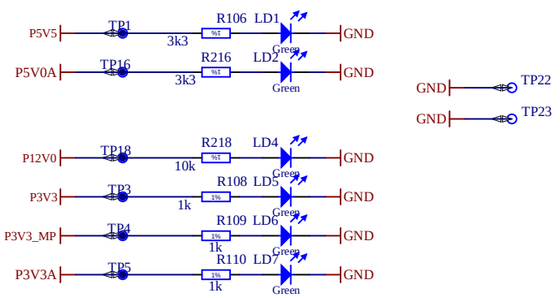








ADL5536 210mA
PHA-1+ 360mA



Project/Equipment ARTIQ/SINARA

Document

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VHF Amplifier Power supply & fan

Designer	G.Kasprowicz
Drawn by	G.Kasprowicz
Check.by	-
Last Mod.	- 19.03.2024
File	VHFA_PWR_Supply.SchDoc
Print Date	24.03.2024 23:17:55 Sheet 9 of 9

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ARTIQ

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