Page	Description
1	Note Page
2	Block Diagram
3	DIE Diagram
4	Clock Diagram
5	Power Diagram
6	I2C and SPI Diagram RF PLL
7	PS Configuration. JTAG
8	PL Configuration
9	PS: 500-502
10	PS: 504 (DDR4)
11	PS: MGT (GTR)
12	PL: Banks 84, 87 (SYZYGY)
13	PL: Banks 67-69 (DDR4)
14	PL: Banks 64-66 (PMOD)
15	PL: Bank 64 and GTY (UNUSED)
16	RF: ADC
17	RF: DAC
18	RF, PS and PL: POWER Pins
19	RF, PS and PL: GND Pins
20	CLOCK 1: SYS, RAM, FMC, GTY, GTR
21	CLOCK 2: RF Clock Jitter Cleaner
22	CLOCK 3: RF PLL1
23	CLOCK 4: RF PLL2
24	I2C Switch
25	SPI bridges
26	SD socket and 1-Wire EEPROM
27	USB to UART/JTAG
28	USB1 3.0 Type-A, 2 Ports (HUB)

Page	Description
29	USB1 2.0 ULPI Transceiver
30	USB0 3.0 Micro AB Slave
31	Ethernet 1Gbit
32	Display Port
33	1PPS (GPS sync.)
34	PMOD Headers
35	SYZYGY Header
36	DDR4 Components 1-3 (PS)
37	DDR4 Components 4 (PS)
38	DDR4 Components 1-3 (PL)
39	DDR4 Components 4 (PL)
40	PWR IN, User IO, LEDs
41	PWR 1: 0.85V
42	PWR 2: 1.8V and 3.3V
43	PWR 3: RF DC/DC and 5V
44	PWR 4: DDR4
45	PWR 5: RF LDO
46	PWR 6: SYZYGY
47	Current Monitor
48	Sequencer
49	CAPs

I2C address see on page 6

FINAL VERSION REV. 1.1

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HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:
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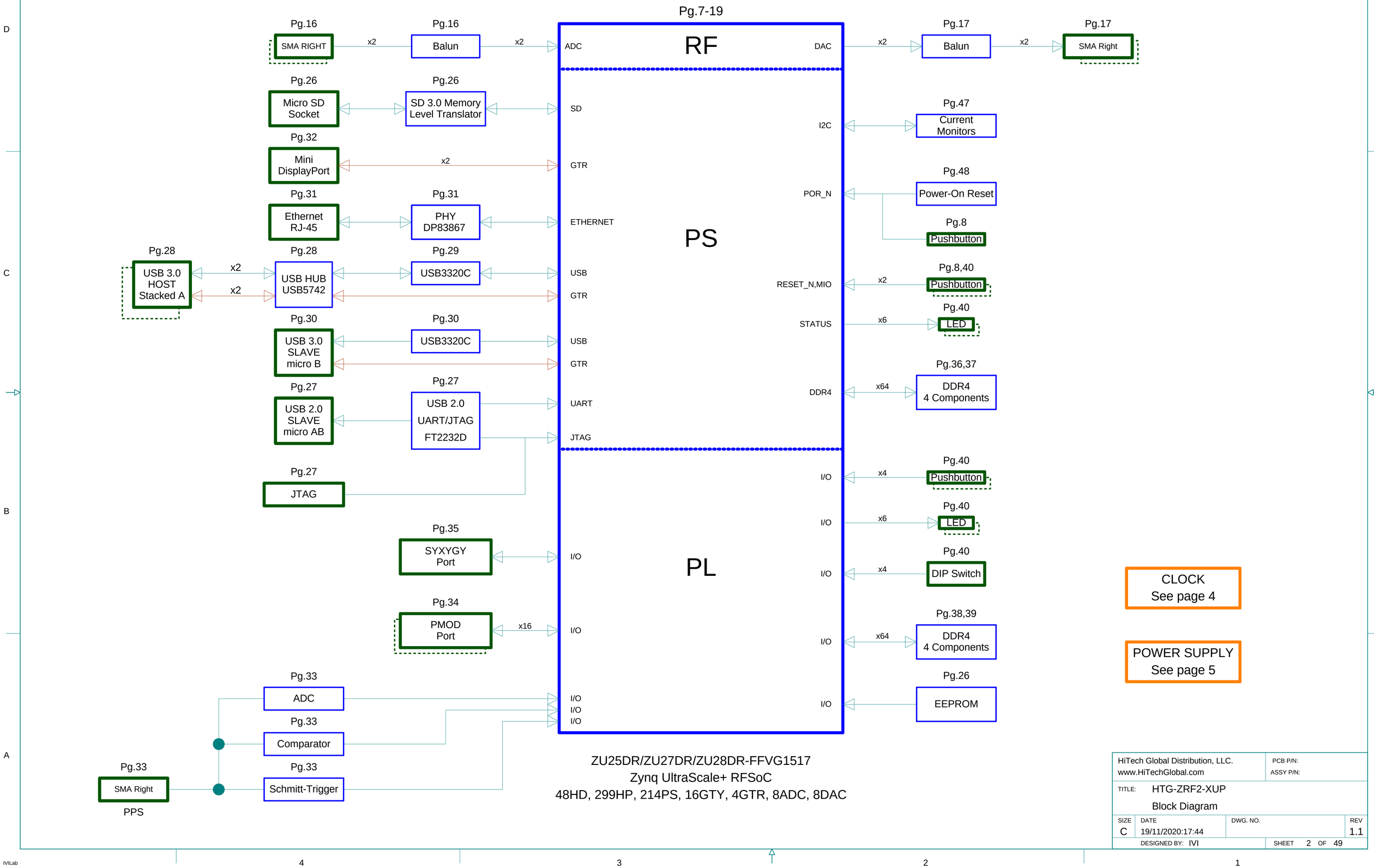
DWG. NO.	REV: 1.1
DESIGNED BY: IVI	SHEET 1 OF 49



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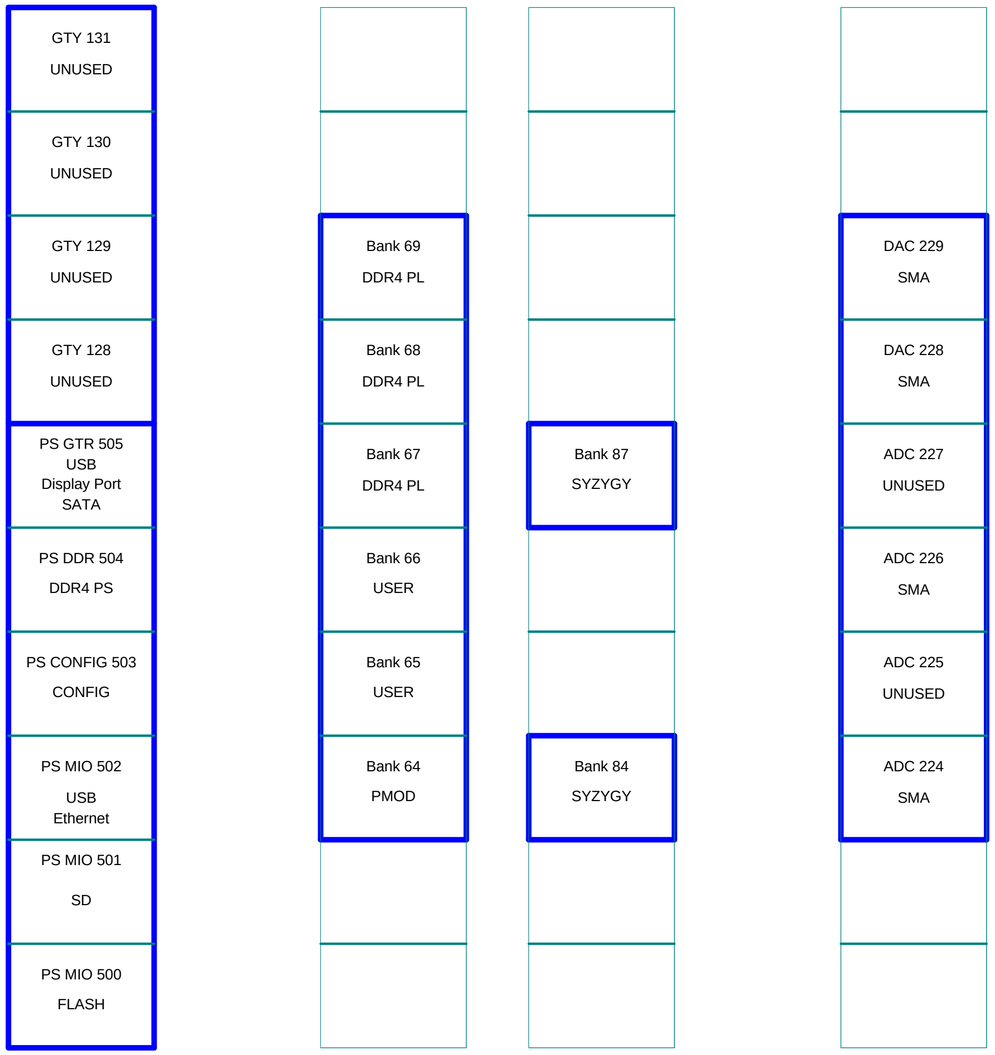
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 2 OF 49	



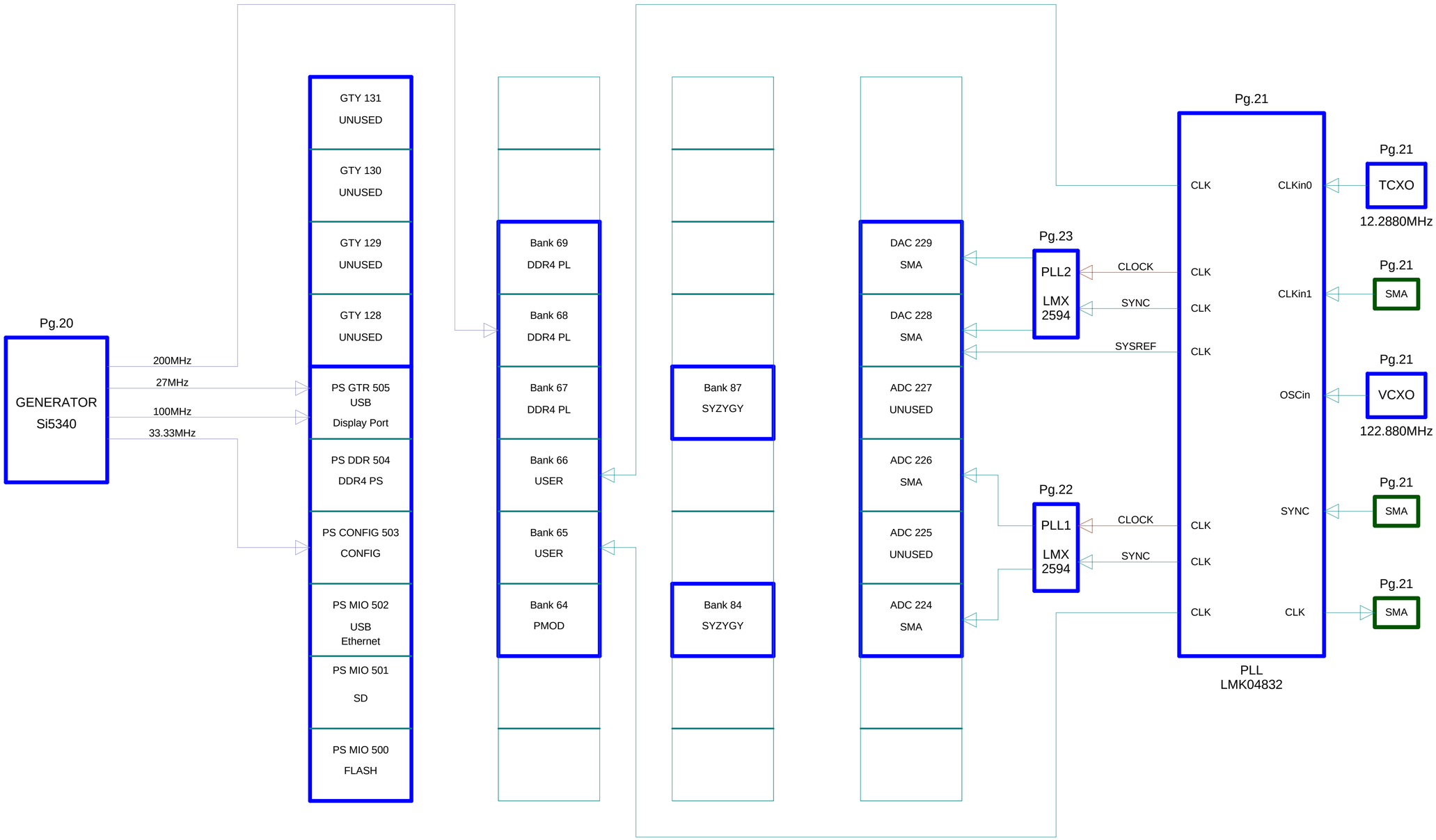
ZU25DR/ZU27DR/ZU28DR-FFVG1517

Zynq UltraScale+ RFSoC

48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC

DIE VIEW

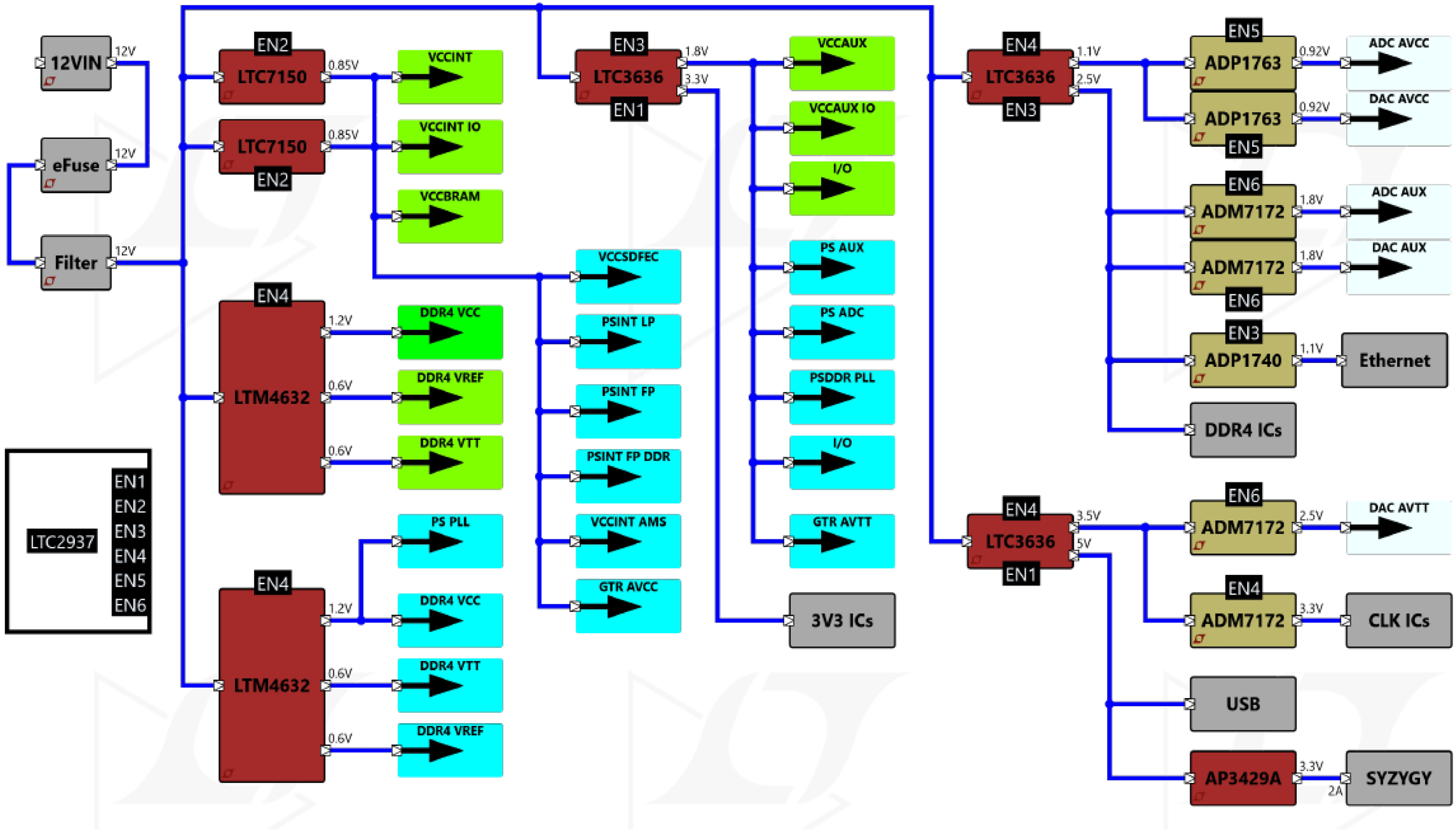
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP DIE Diagram			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 3 OF 49	



DIE VIEW

Zynq UltraScale+ RFSoC
ZU25DR/ZU27DR/ZU28DR-FFVG1517
48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC

HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP Clock Diagram			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 4 OF 49	



HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP Power Diagram			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
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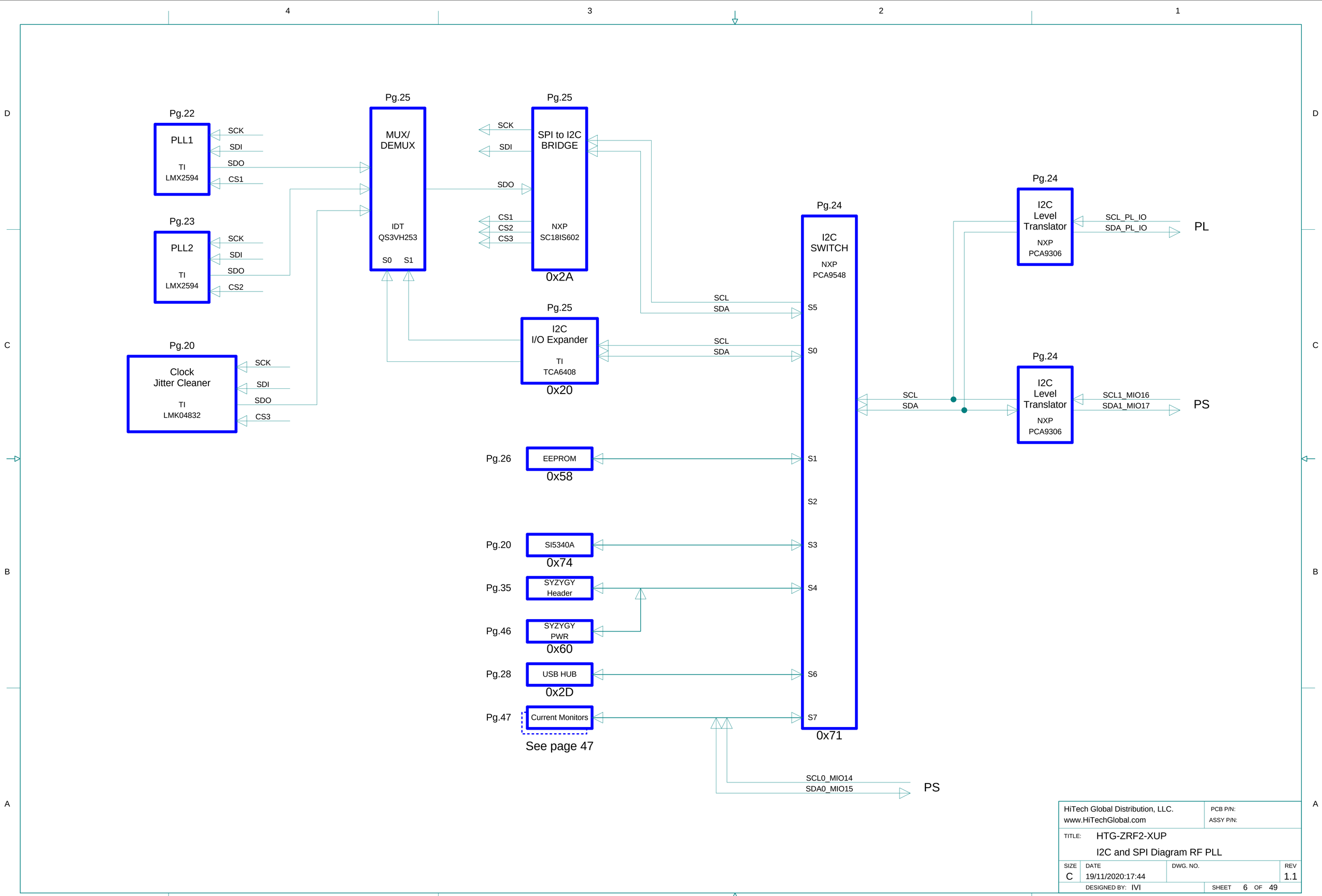

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TITLE:	HTG-ZRF2-XUP I2C and SPI Diagram RF PLL		
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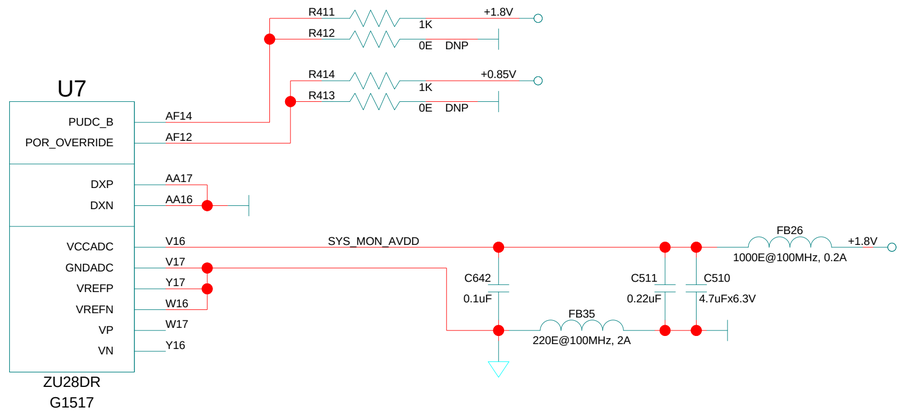
DESIGNED BY: IVI		SHEET 6 OF 49	



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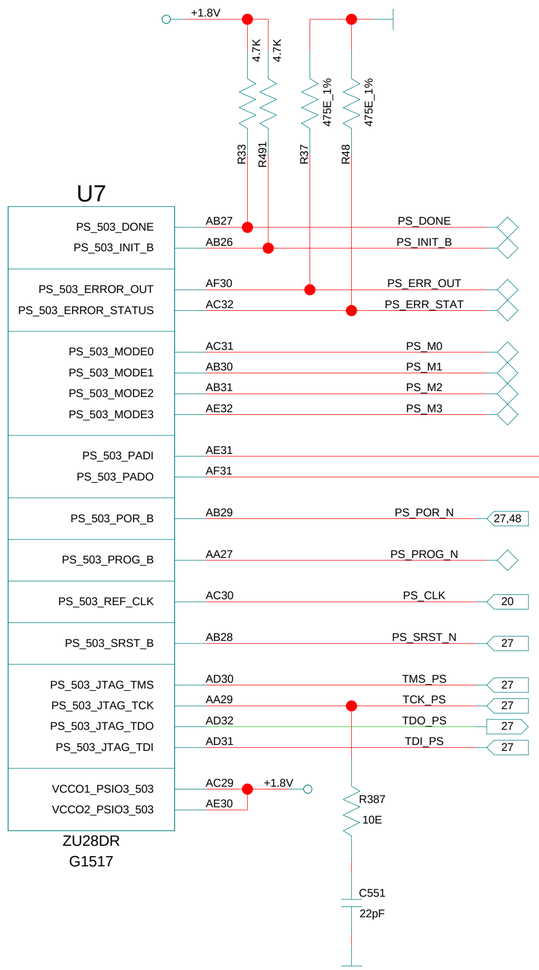
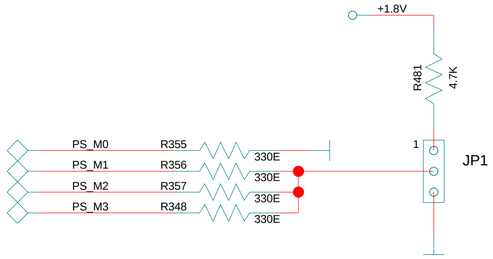
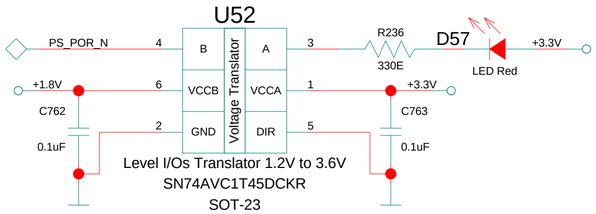
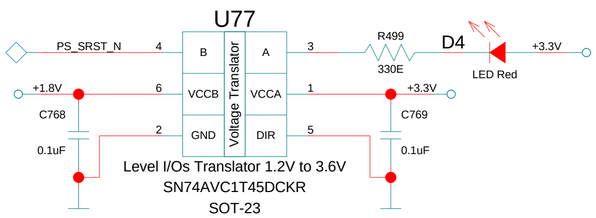
TITLE: HTG-ZRF2-XUP PL Config			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI		SHEET 7 OF 49

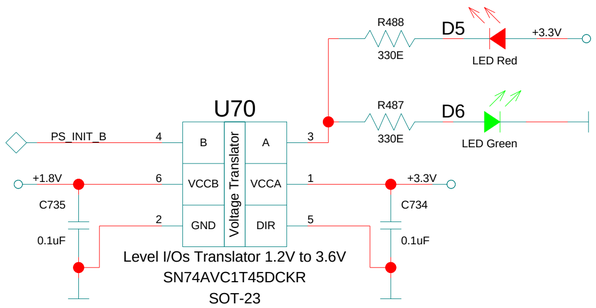


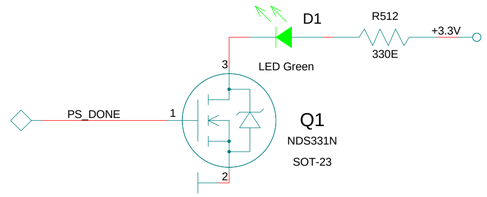


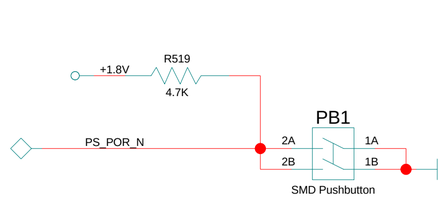
BOOT	M3	M2	M1	M0
JTAG	L	L	L	L
SD1-LS	H	H	H	L











HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PS 503 Config			
SIZE C	DATE 26/11/2020:16:51	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 8 OF 49	

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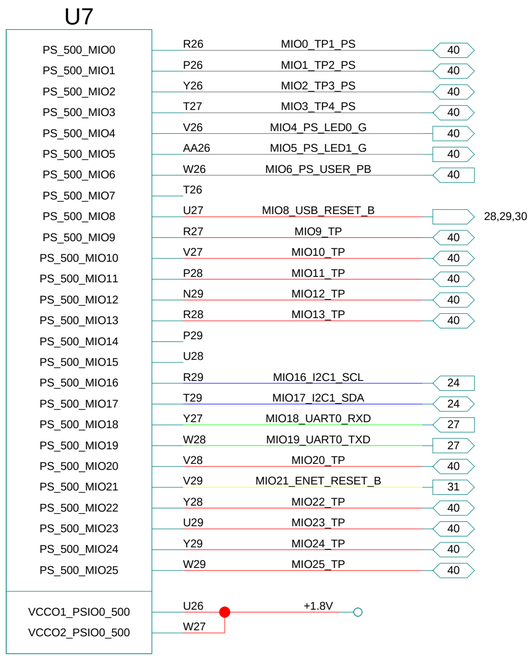
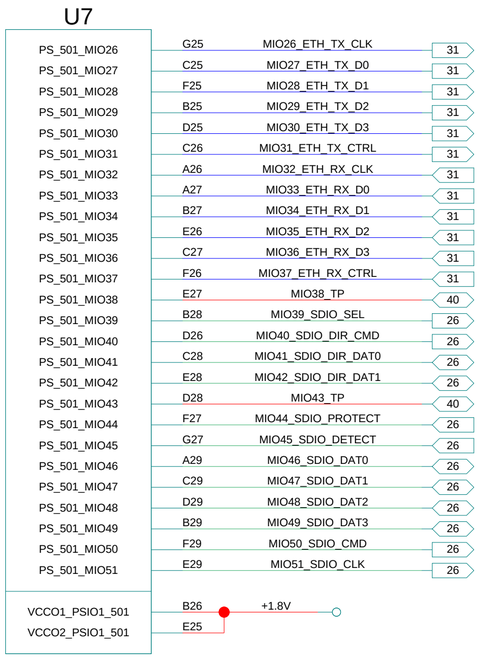
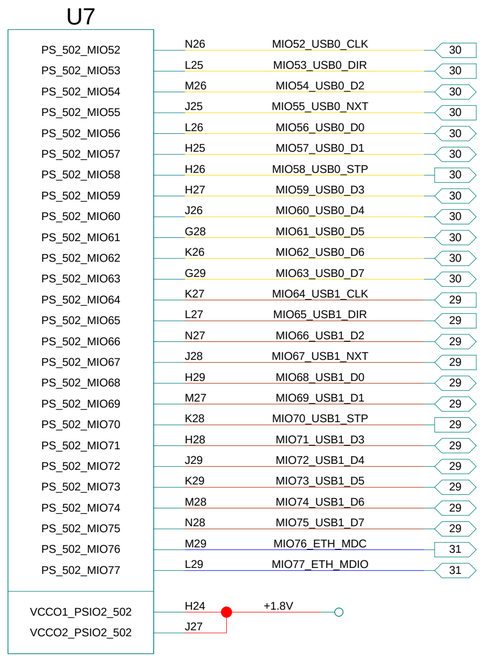


Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517



Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517



Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517

HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PS 500-502			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 9 OF 49	

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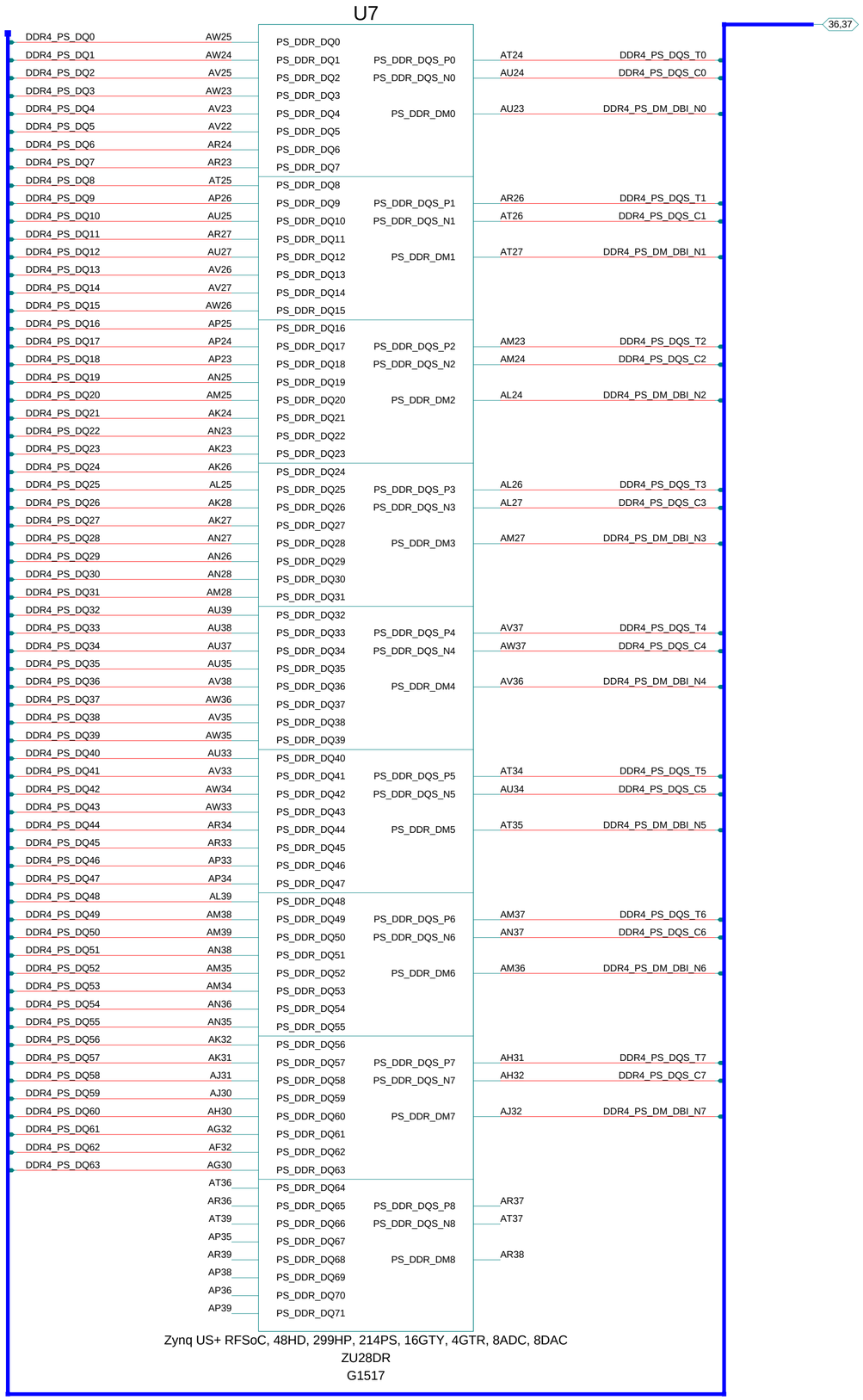

HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:	
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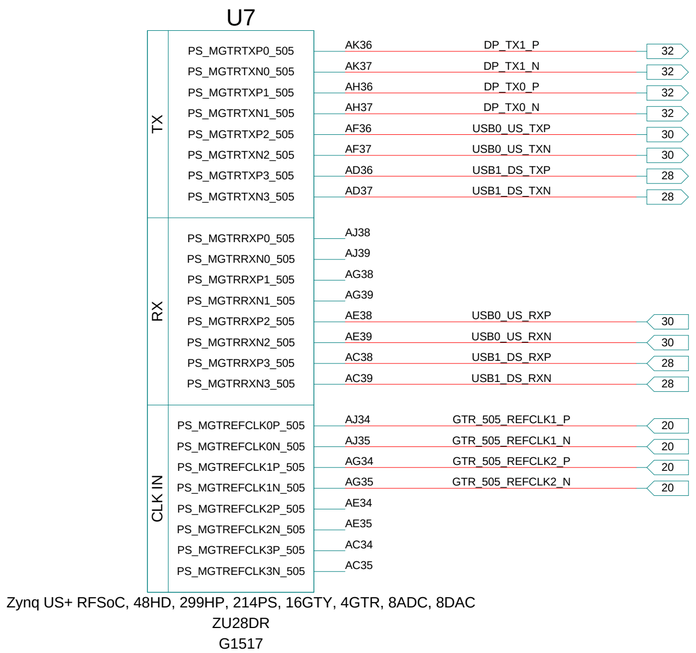
REV: 1.1	DESIGNED BY: IVI	SHEET 10 OF 49



Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517

HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
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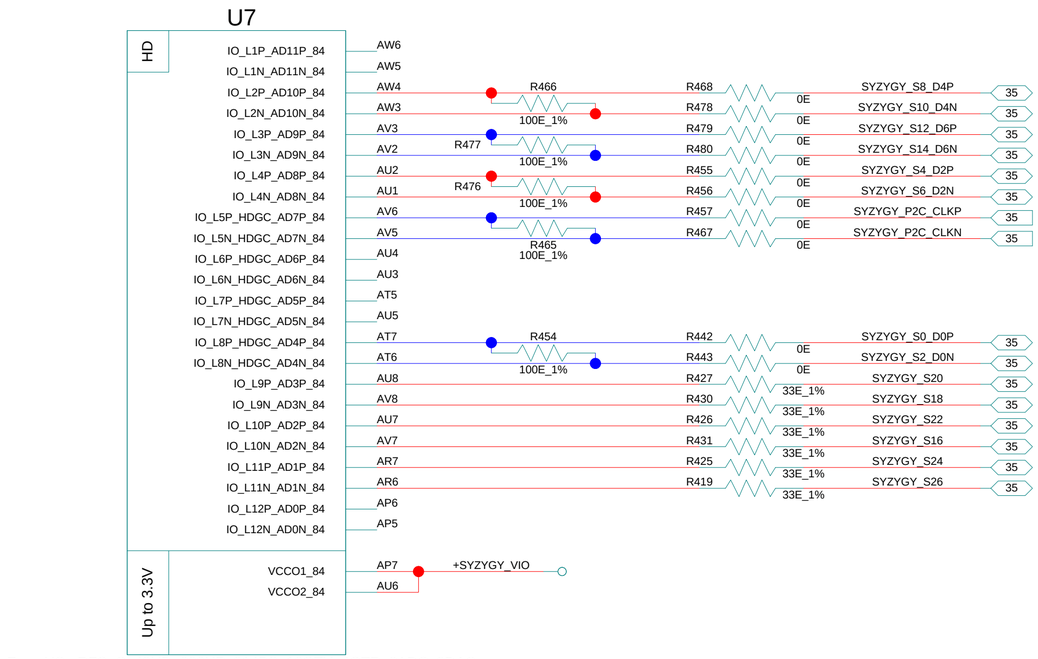
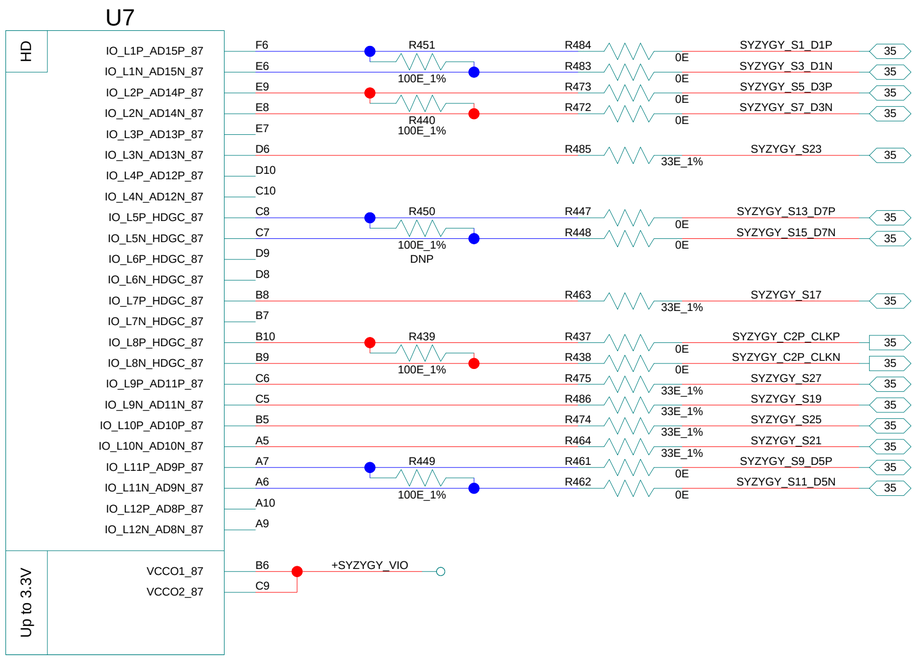
DESIGNED BY: IVI		SHEET 11 OF 49	



Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517



Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517

HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PL 84 and 87 SYZYGY			
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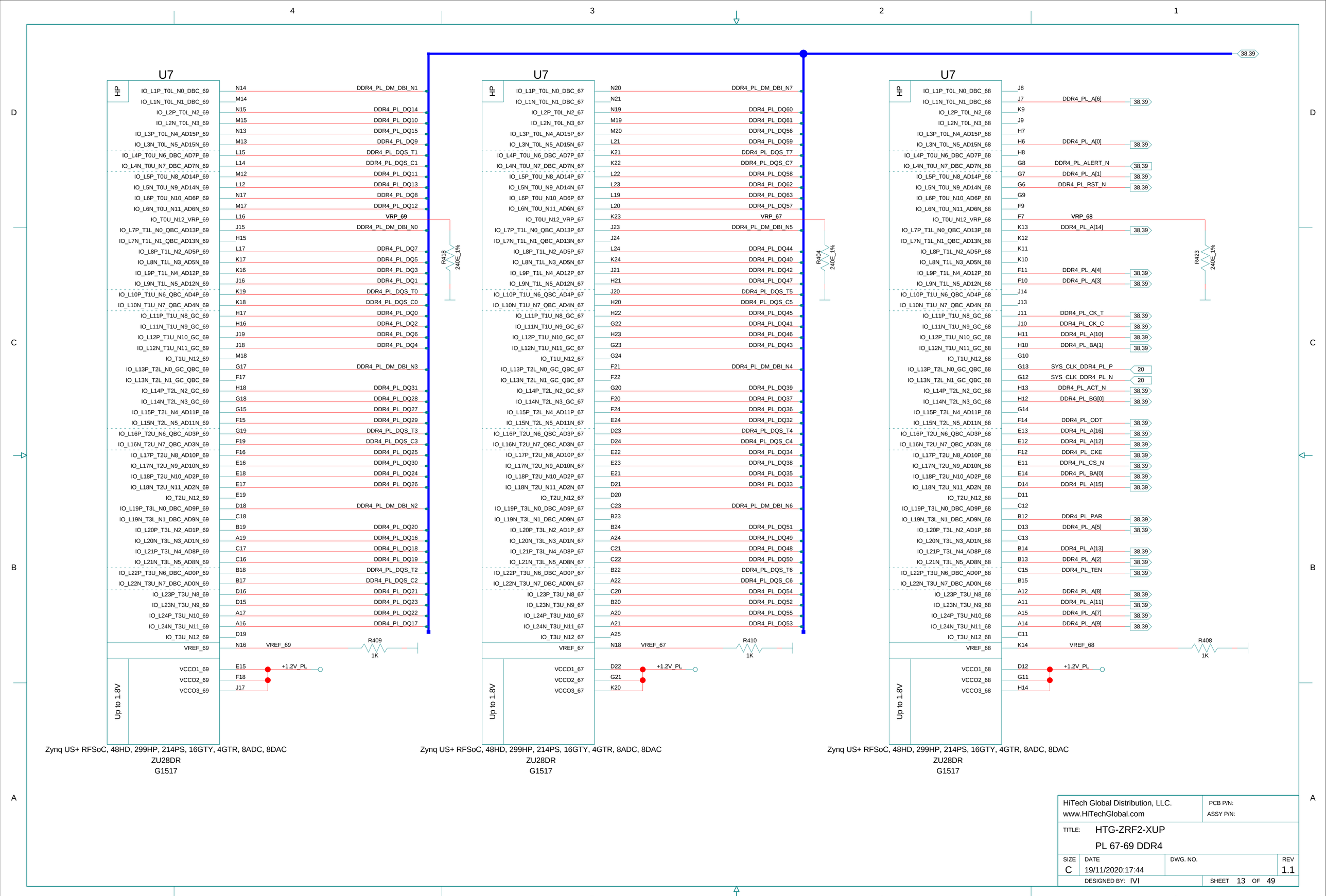
DESIGNED BY: IVI		SHEET 12 OF 49	

IVILab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Up to 1.8V
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VCCO2_69 F18
VCCO3_69 J17
R418 240E_1%
Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517
U7
HP
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IO_L12N_T1U_N11_GC_67 G23 DDR4_PL_DQ43
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IO_L13P_T2L_N0_GC_QBC_67 F21 DDR4_PL_DM_DBI_N4
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IO_L14N_T2L_N3_GC_67 F20 DDR4_PL_DQ37
IO_L15P_T2L_N4_AD11P_67 F24 DDR4_PL_DQ36
IO_L15N_T2L_N5_AD11N_67 E24 DDR4_PL_DQ32
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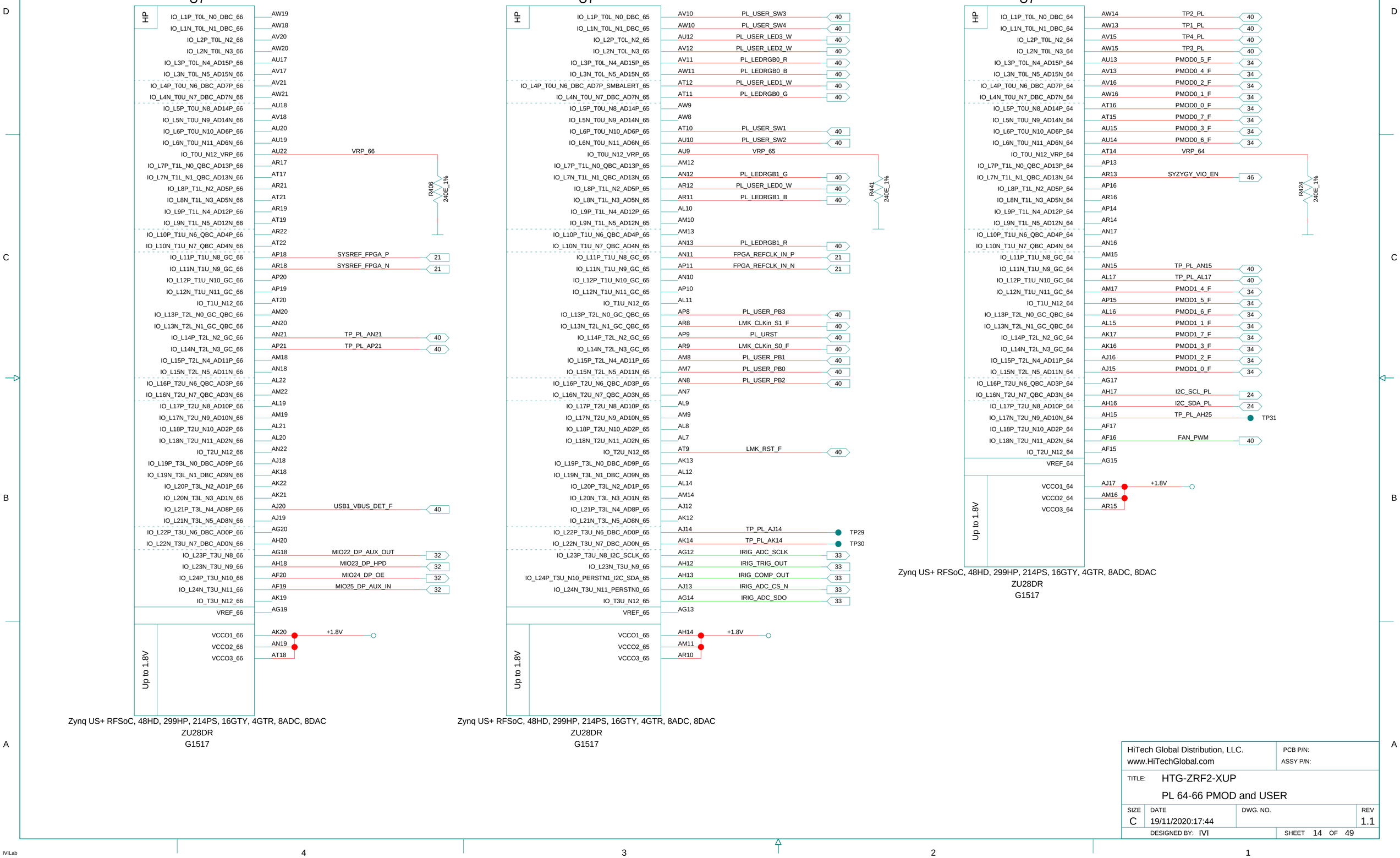
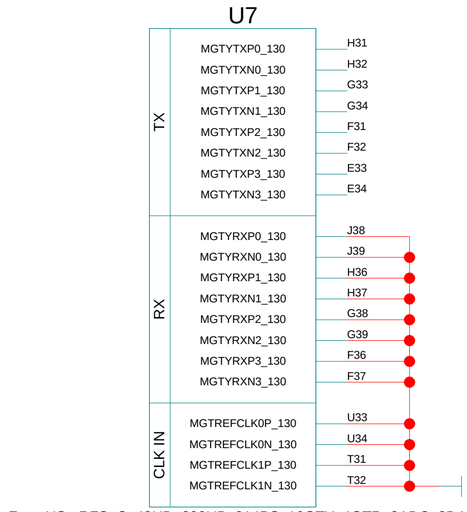
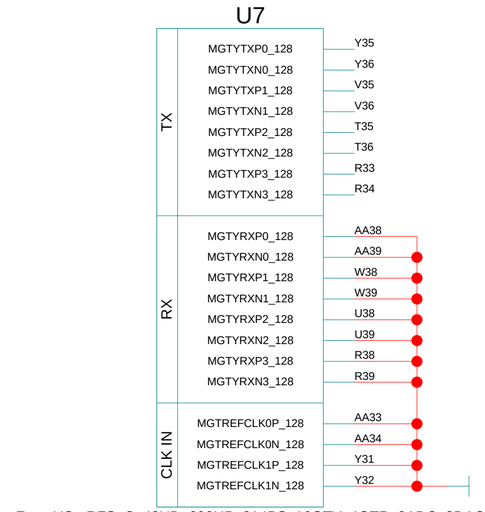
IO_L23N_T3U_N9_67 B20 DDR4_PL_DQ52
IO_L24P_T3U_N10_67 A20 DDR4_PL_DQ55
IO_L24N_T3U_N11_67 A21 DDR4_PL_DQ53
IO_T3U_N12_67 A25
VREF_67 N18 VREF_67
R410 1K
Up to 1.8V
VCCO1_67 D22 +1.2V_PL
VCCO2_67 G21
VCCO3_67 K20
R404 240E_1%
Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517
38,39
U7
HP
IO_L1P_T0L_N0_DBC_68 J8
IO_L1N_T0L_N1_DBC_68 J7 DDR4_PL_A[6] 38,39
IO_L2P_T0L_N2_68 K9
IO_L2N_T0L_N3_68 J9
IO_L3P_T0L_N4_AD15P_68 H7
IO_L3N_T0L_N5_AD15N_68 H6 DDR4_PL_A[0] 38,39
IO_L4P_T0U_N6_DBC_AD7P_68 H8
IO_L4N_T0U_N7_DBC_AD7N_68 G8 DDR4_PL_ALERT_N 38,39
IO_L5P_T0U_N8_AD14P_68 G7 DDR4_PL_A[1] 38,39
IO_L5N_T0U_N9_AD14N_68 G6 DDR4_PL_RST_N 38,39
IO_L6P_T0U_N10_AD6P_68 G9
IO_L6N_T0U_N11_AD6N_68 F9
IO_T0U_N12_VRP_68 F7 VRP_68
IO_L7P_T1L_N0_QBC_AD13P_68 K13 DDR4_PL_A[14] 38,39
IO_L7N_T1L_N1_QBC_AD13N_68 K12
IO_L8P_T1L_N2_AD5P_68 K11
IO_L8N_T1L_N3_AD5N_68 K10
IO_L9P_T1L_N4_AD12P_68 F11 DDR4_PL_A[4] 38,39
IO_L9N_T1L_N5_AD12N_68 F10 DDR4_PL_A[3] 38,39
IO_L10P_T1U_N6_QBC_AD4P_68 J14
IO_L10N_T1U_N7_QBC_AD4N_68 J13
IO_L11P_T1U_N8_GC_68 J11 DDR4_PL_CK_T 38,39
IO_L11N_T1U_N9_GC_68 J10 DDR4_PL_CK_C 38,39
IO_L12P_T1U_N10_GC_68 H11 DDR4_PL_A[10] 38,39
IO_L12N_T1U_N11_GC_68 H10 DDR4_PL_BA[1] 38,39
IO_T1U_N12_68 G10
IO_L13P_T2L_N0_GC_QBC_68 G13 SYS_CLK_DDR4_PL_P 20
IO_L13N_T2L_N1_GC_QBC_68 G12 SYS_CLK_DDR4_PL_N 20
IO_L14P_T2L_N2_GC_68 H13 DDR4_PL_ACT_N 38,39
IO_L14N_T2L_N3_GC_68 H12 DDR4_PL_BG[0] 38,39
IO_L15P_T2L_N4_AD11P_68 G14
IO_L15N_T2L_N5_AD11N_68 F14 DDR4_PL_ODT 38,39
IO_L16P_T2U_N6_QBC_AD3P_68 E13 DDR4_PL_A[16] 38,39
IO_L16N_T2U_N7_QBC_AD3N_68 E12 DDR4_PL_A[12] 38,39
IO_L17P_T2U_N8_AD10P_68 F12 DDR4_PL_CKE 38,39
IO_L17N_T2U_N9_AD10N_68 E11 DDR4_PL_CS_N 38,39
IO_L18P_T2U_N10_AD2P_68 E14 DDR4_PL_BA[0] 38,39
IO_L18N_T2U_N11_AD2N_68 D14 DDR4_PL_A[15] 38,39
IO_T2U_N12_68 D11
IO_L19P_T3L_N0_DBC_AD9P_68 C12
IO_L19N_T3L_N1_DBC_AD9N_68 B12 DDR4_PL_PAR 38,39
IO_L20P_T3L_N2_AD1P_68 D13 DDR4_PL_A[5] 38,39
IO_L20N_T3L_N3_AD1N_68 C13
IO_L21P_T3L_N4_AD8P_68 B14 DDR4_PL_A[13] 38,39
IO_L21N_T3L_N5_AD8N_68 B13 DDR4_PL_A[2] 38,39
IO_L22P_T3U_N6_DBC_AD0P_68 C15 DDR4_PL_TEN 38,39
IO_L22N_T3U_N7_DBC_AD0N_68 B15
IO_L23P_T3U_N8_68 A12 DDR4_PL_A[8] 38,39
IO_L23N_T3U_N9_68 A11 DDR4_PL_A[11] 38,39
IO_L24P_T3U_N10_68 A15 DDR4_PL_A[7] 38,39
IO_L24N_T3U_N11_68 A14 DDR4_PL_A[9] 38,39
IO_T3U_N12_68 C11
VREF_68 K14 VREF_68
R408 1K
Up to 1.8V
VCCO1_68 D12 +1.2V_PL
VCCO2_68 G11
VCCO3_68 H14
R423 240E_1%
Zynq US+ RFSoC, 48HD, 299HP, 214PS, 16GTY, 4GTR, 8ADC, 8DAC
ZU28DR
G1517
HiTech Global Distribution, LLC.
www.HiTechGlobal.com
PCB P/N:
ASSY P/N:
TITLE: HTG-ZRF2-XUP
PL 67-69 DDR4
SIZE C
DATE 19/11/2020:17:44
DWG. NO.
REV 1.1
DESIGNED BY: IVI
SHEET 13 OF 49
IVILab

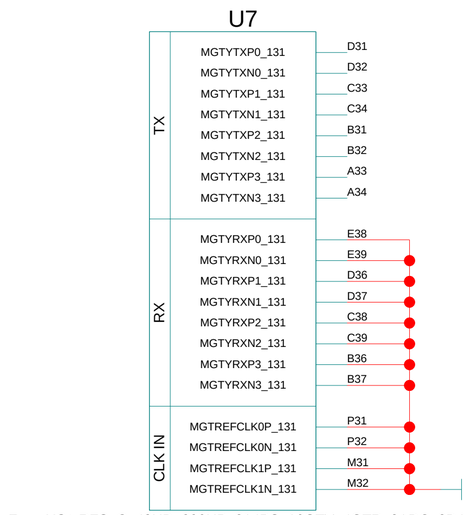


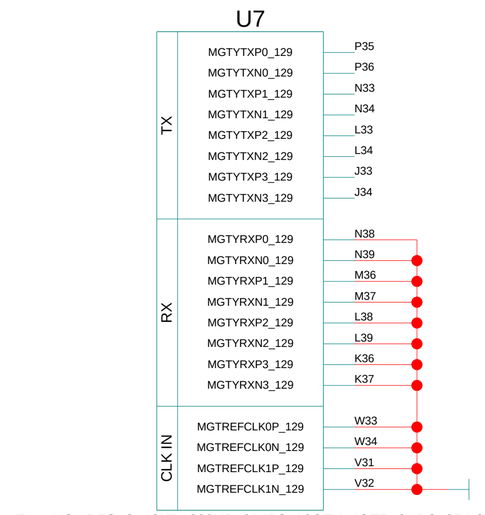
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE:	HTG-ZRF2-XUP PL 64-66 PMOD and USER		
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 14 OF 49	

IVILab



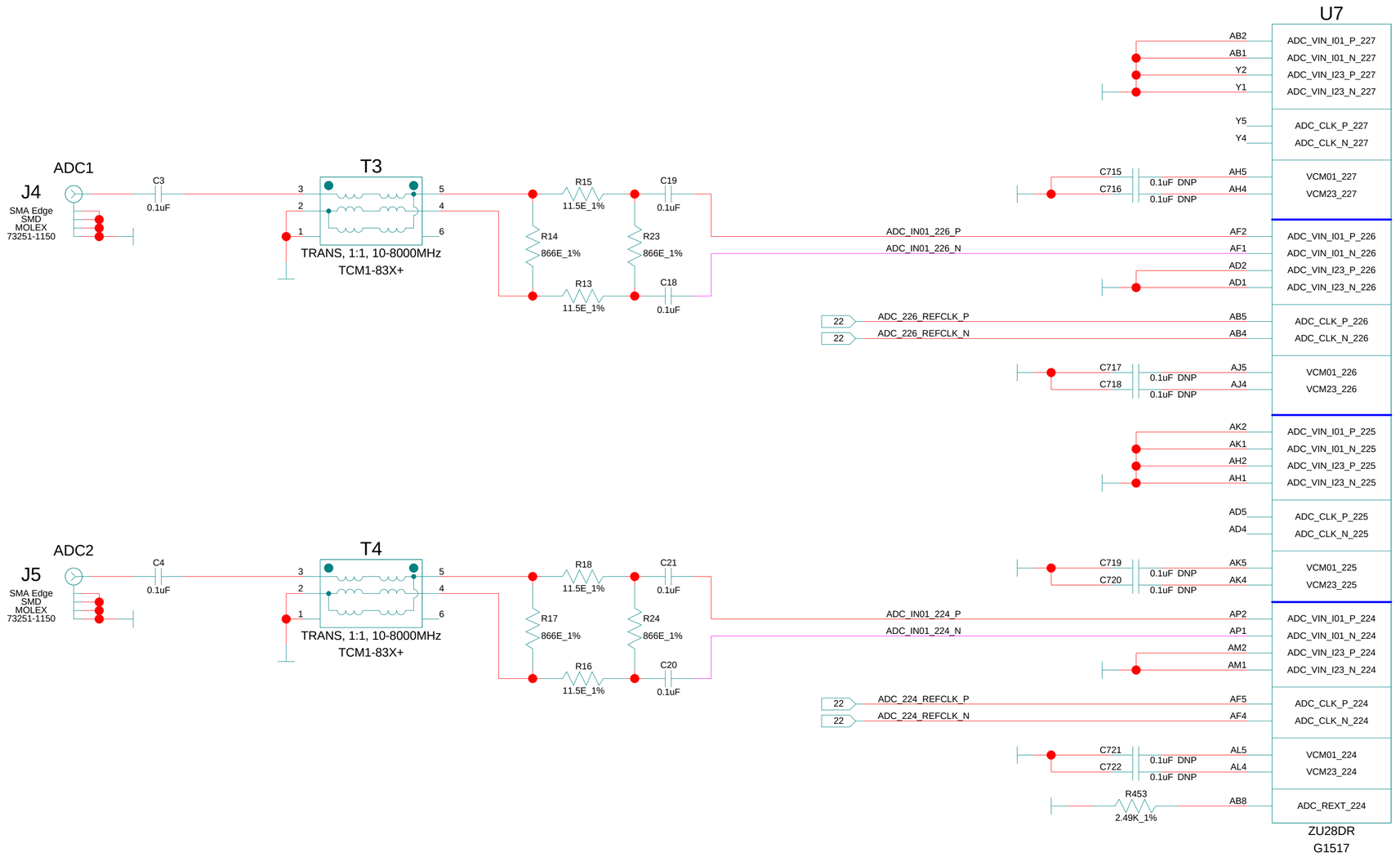


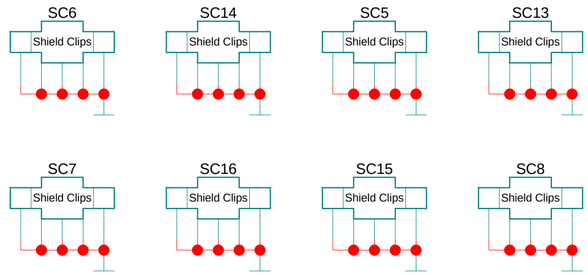




HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PL UNUSER GTY			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 15 OF 49	

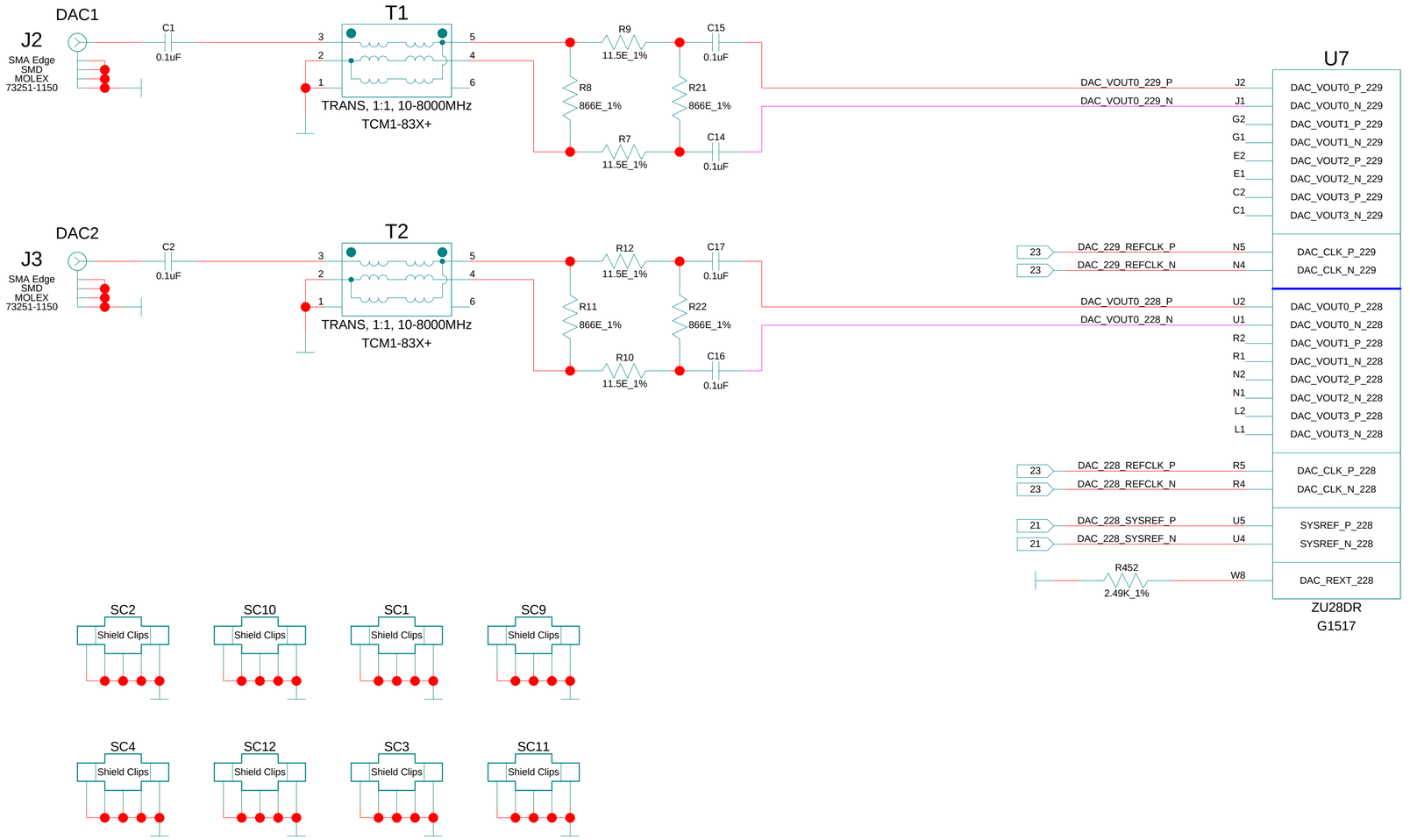
IVILab





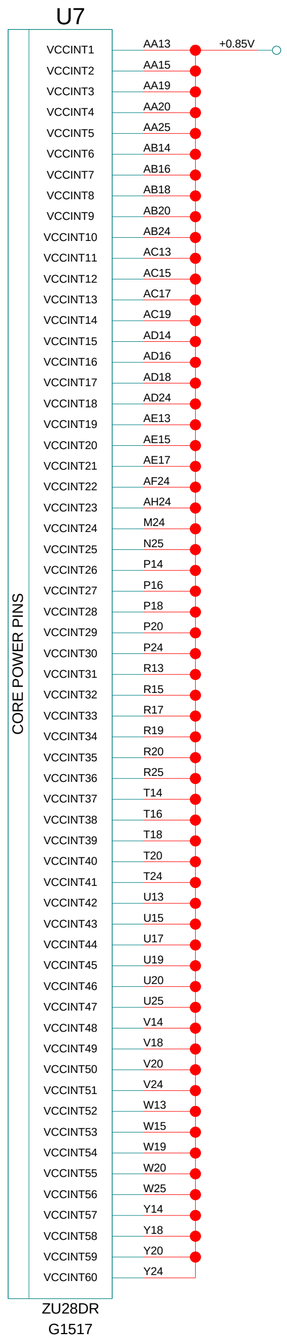
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP RF ADC			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 16 OF 49	

IVILab



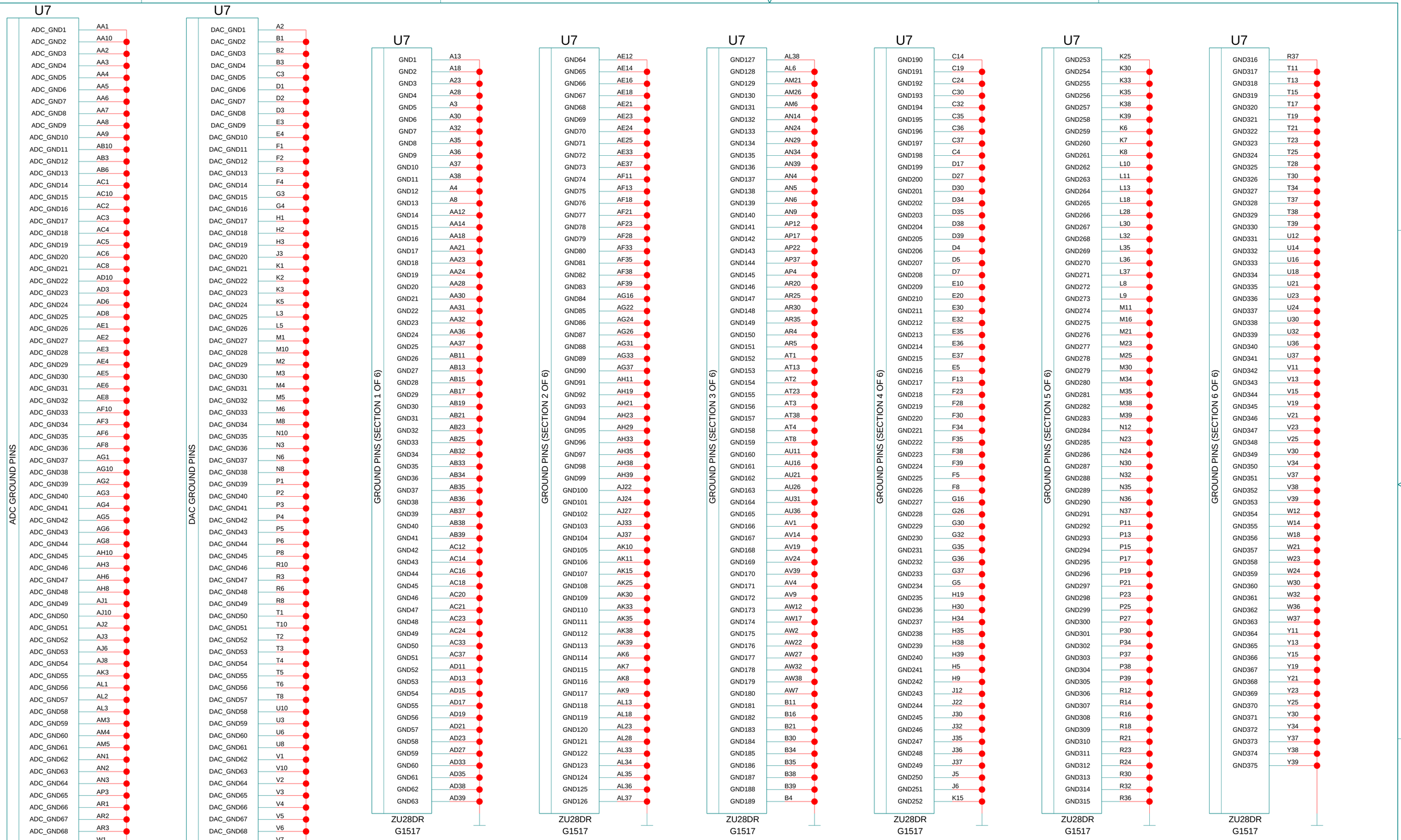
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP RF DAC			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 17 OF 49	

IVILab

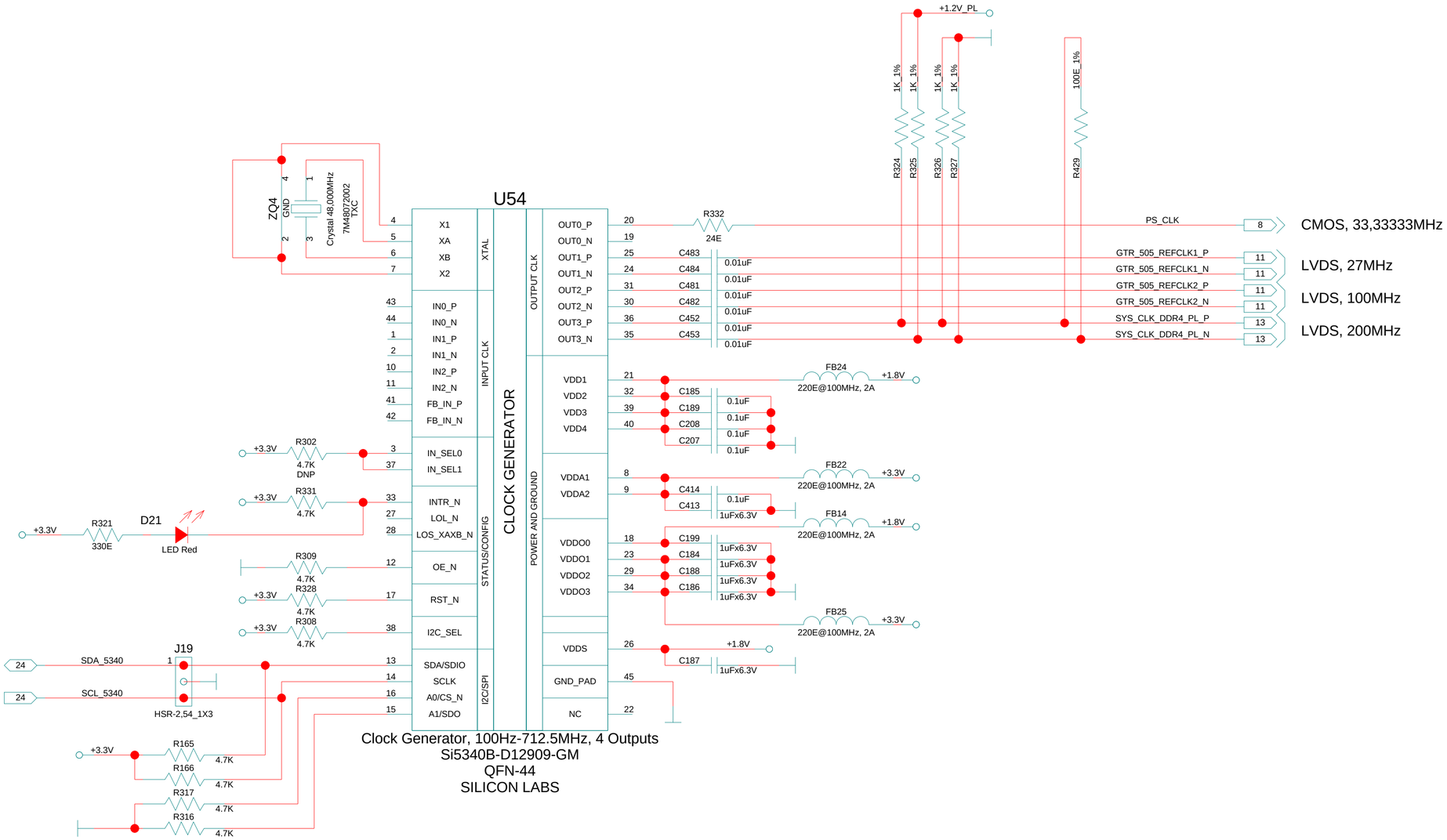


HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE:	HTG-ZRF2-XUP PWR Banks		
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 18 OF 49	

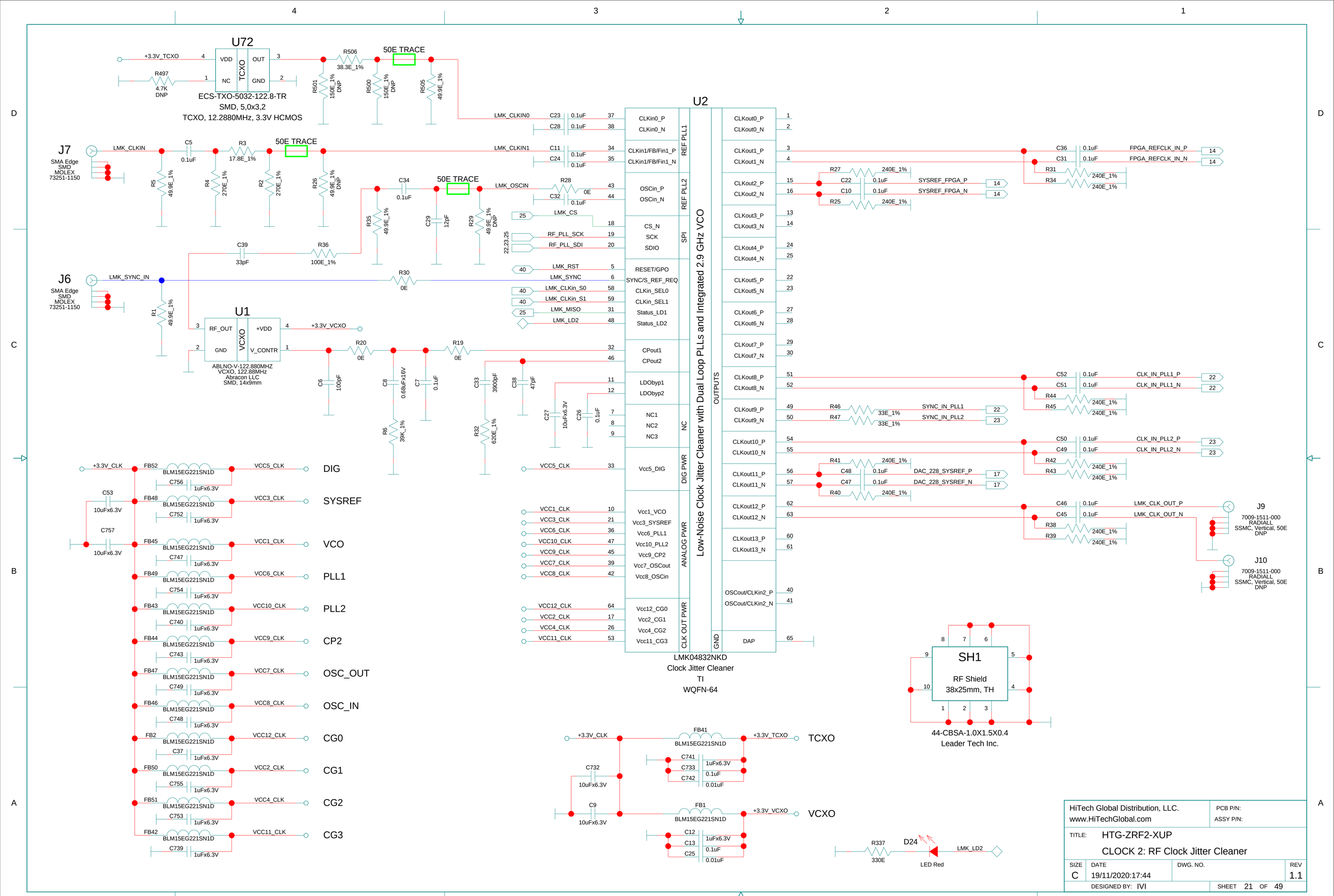
IVILab

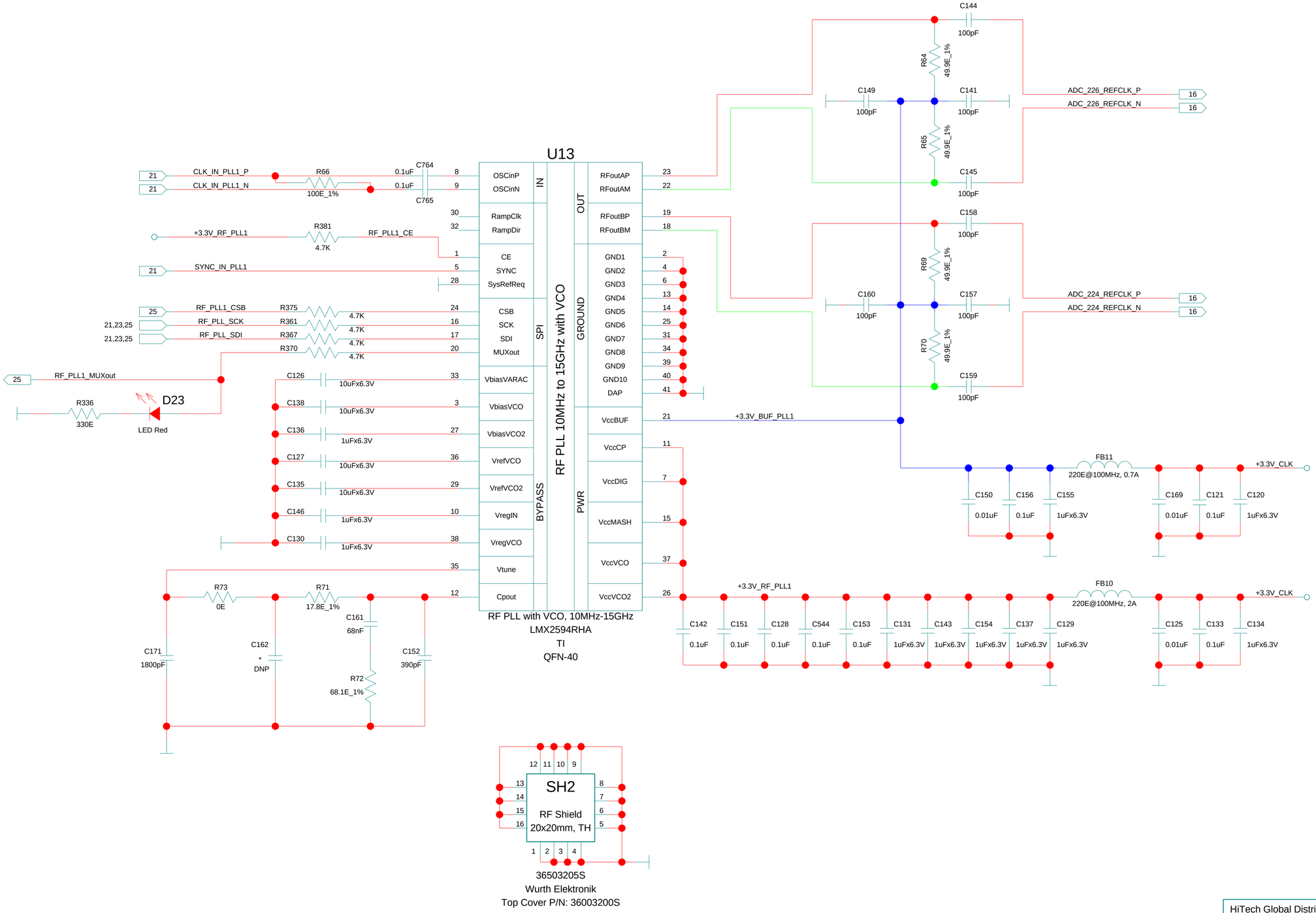


HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP GND Banks			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 19 OF 49	



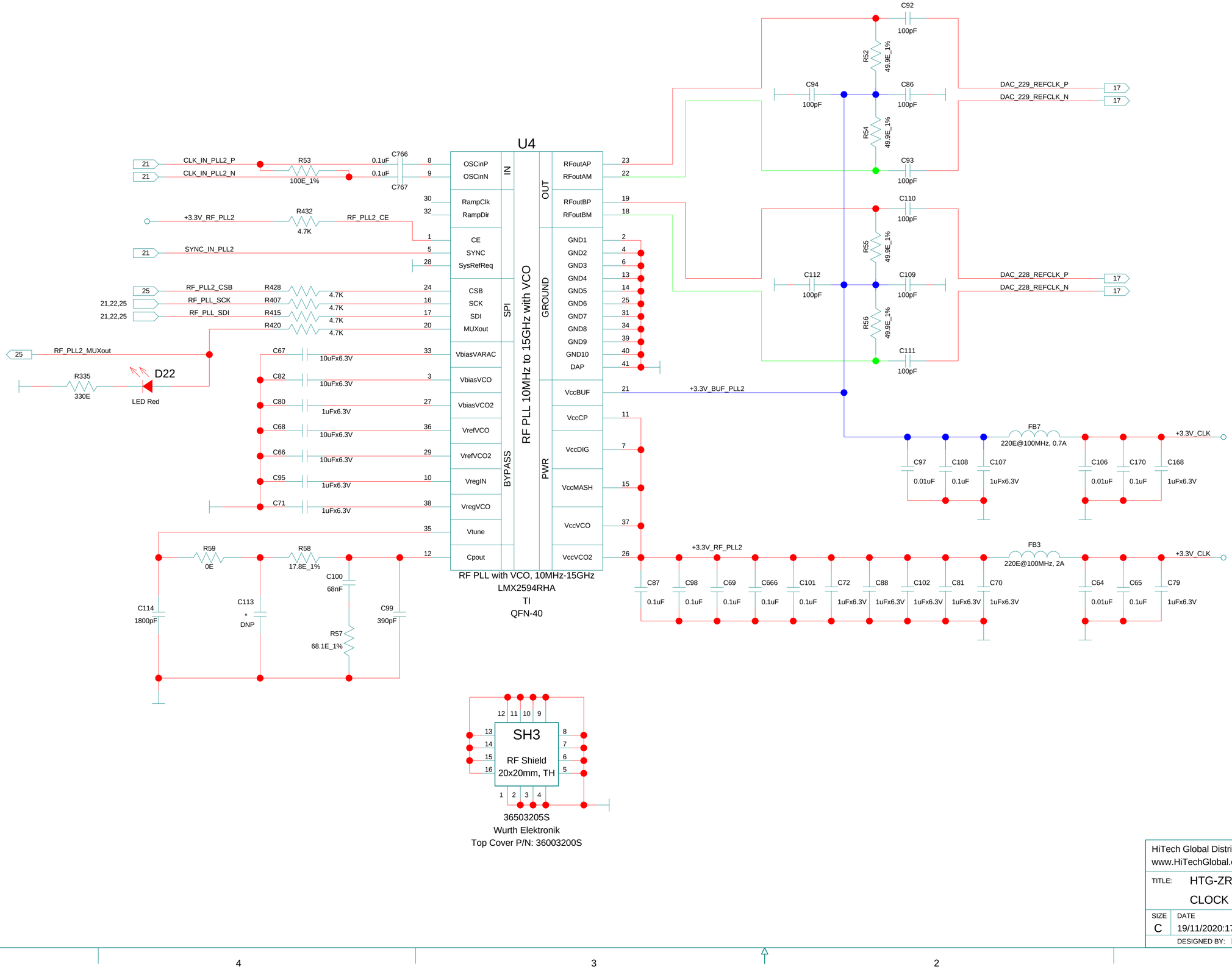
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP CLOCK 1: SYS DDR4 GTR and USER			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 20 OF 49	


U72
+3.3V_TCXO
VDD
OUT
NC
GND
TCXO
R497
4.7K
DNP
ECS-TXO-5032-122.8-TR
SMD, 5,0x3,2
TCXO, 12.2880MHz, 3.3V HCMOS
R506
38.3E_1%
50E TRACE
R501
150E_1%
DNP
R500
150E_1%
DNP
R505
49.9E_1%
U2
LMK04832NKD
Clock Jitter Cleaner
TI
WQFN-64
Low-Noise Clock Jitter Cleaner with Dual Loop PLLs and Integrated 2.9 GHz VCO
REF PLL1
REF PLL2
SPI
NC
DIG PWR
ANALOG PWR
CLK OUT PWR
OUTPUTS
GND
CLKin0_P
CLKin0_N
CLKin1/FB/Fin1_P
CLKin1/FB/Fin1_N
OSCin_P
OSCin_N
CS_N
SCK
SDIO
RESET/GPO
SYNC/S_REF_REQ
CLKin_SEL0
CLKin_SEL1
Status_LD1
Status_LD2
CPout1
CPout2
LDObyp1
LDObyp2
NC1
NC2
NC3
Vcc5_DIG
Vcc1_VCO
Vcc3_SYSREF
Vcc6_PLL1
Vcc10_PLL2
Vcc9_CP2
Vcc7_OSCout
Vcc8_OSCin
Vcc12_CG0
Vcc2_CG1
Vcc4_CG2
Vcc11_CG3
CLKout0_P
CLKout0_N
CLKout1_P
CLKout1_N
CLKout2_P
CLKout2_N
CLKout3_P
CLKout3_N
CLKout4_P
CLKout4_N
CLKout5_P
CLKout5_N
CLKout6_P
CLKout6_N
CLKout7_P
CLKout7_N
CLKout8_P
CLKout8_N
CLKout9_P
CLKout9_N
CLKout10_P
CLKout10_N
CLKout11_P
CLKout11_N
CLKout12_P
CLKout12_N
CLKout13_P
CLKout13_N
OSCout/CLKin2_P
OSCout/CLKin2_N
DAP
LMK_CLKIN0
LMK_CLKIN1
LMK_OSCIN
LMK_CS
RF_PLL_SCK
RF_PLL_SDI
LMK_RST
LMK_SYNC
LMK_CLKin_S0
LMK_CLKin_S1
LMK_MISO
LMK_LD2
VCC5_CLK
VCC1_CLK
VCC3_CLK
VCC6_CLK
VCC10_CLK
VCC9_CLK
VCC7_CLK
VCC8_CLK
VCC12_CLK
VCC2_CLK
VCC4_CLK
VCC11_CLK
J7
SMA Edge
SMD
MOLEX
73251-1150
LMK_CLKIN
LMK_SYNC_IN
J6
SMA Edge
SMD
MOLEX
73251-1150
U1
RF_OUT
+VDD
GND
V_CONTR
VCXO
+3.3V_VCXO
ABLNO-V-122.880MHZ
VCXO, 122.88MHz
Abracon LLC
SMD, 14x9mm
FPGA_REFCLK_IN_P
FPGA_REFCLK_IN_N
SYSREF_FPGA_P
SYSREF_FPGA_N
SYNC_IN_PLL1
SYNC_IN_PLL2
CLK_IN_PLL1_P
CLK_IN_PLL1_N
CLK_IN_PLL2_P
CLK_IN_PLL2_N
DAC_228_SYSREF_P
DAC_228_SYSREF_N
LMK_CLK_OUT_P
LMK_CLK_OUT_N
J9
7009-1511-000
RADIALL
SSMC, Vertical, 50E
DNP
J10
7009-1511-000
RADIALL
SSMC, Vertical, 50E
DNP
+3.3V_CLK
DIG
SYSREF
VCO
PLL1
PLL2
CP2
OSC_OUT
OSC_IN
CG0
CG1
CG2
CG3
BLM15EG221SN1D
1uFx6.3V
SH1
RF Shield
38x25mm, TH
44-CBSA-1.0X1.5X0.4
Leader Tech Inc.
TCXO
VCXO
D24
LED Red
R337
330E
HiTech Global Distribution, LLC.
www.HiTechGlobal.com
PCB P/N:
ASSY P/N:
TITLE: HTG-ZRF2-XUP
CLOCK 2: RF Clock Jitter Cleaner
SIZE C
DATE 19/11/2020:17:44
DWG. NO.
REV 1.1
DESIGNED BY: IVI
SHEET 21 OF 49
IVILab



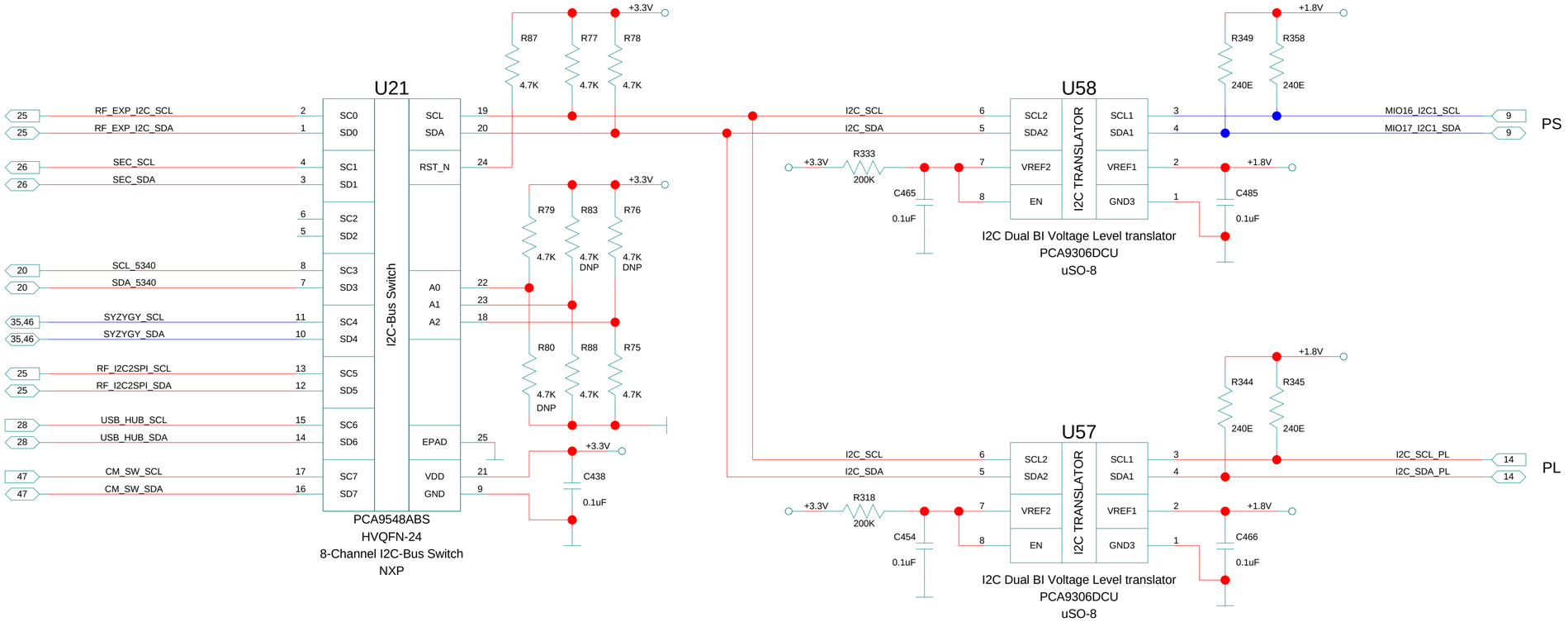
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE:	HTG-ZRF2-XUP CLOCK 3: RF PLL1		
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 22 OF 49	

IVILab



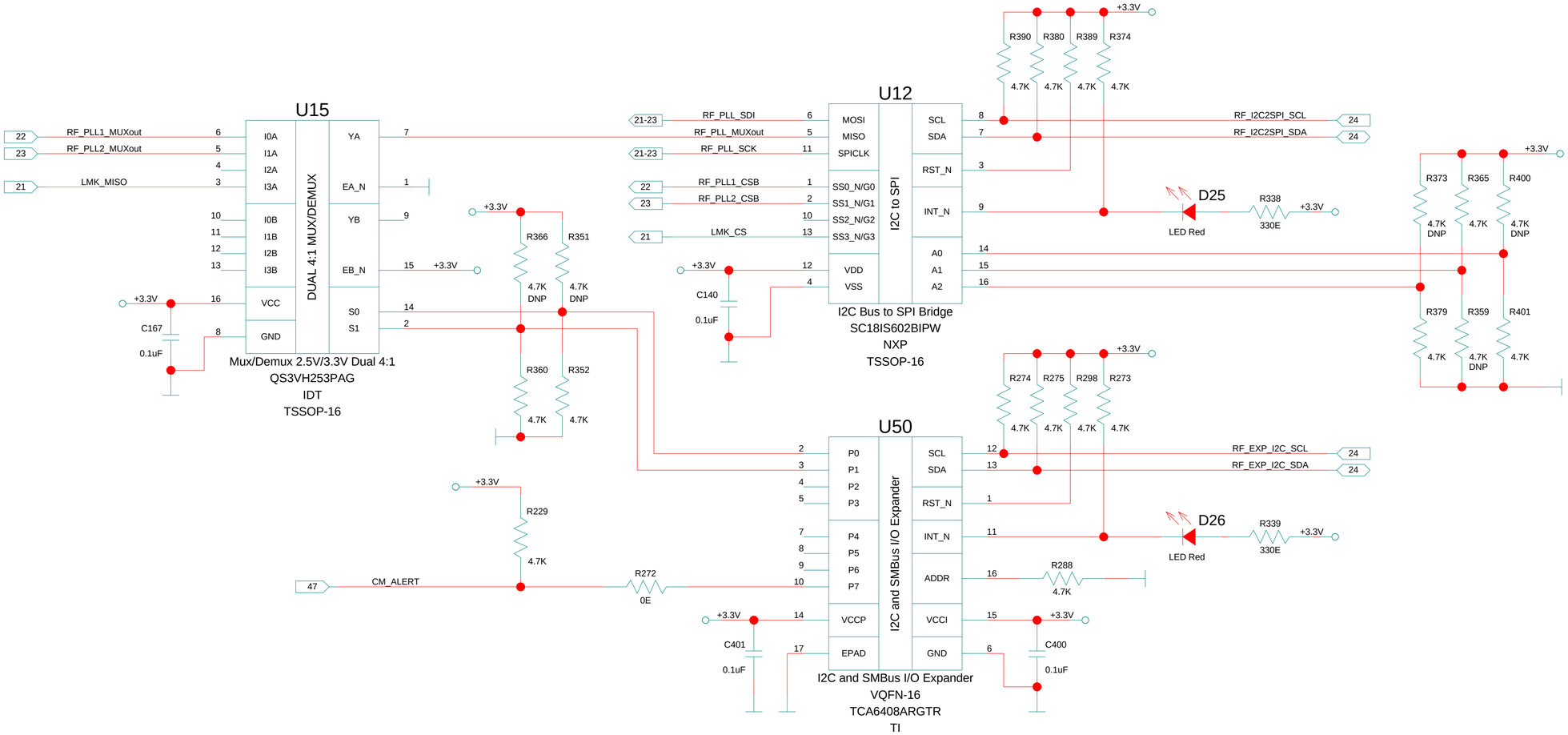
HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP CLOCK 4: RF PLL2	
SIZE: C	DATE: 19/11/2020:17:44
DWG. NO.	REV: 1.1
DESIGNED BY: IVI	SHEET 23 OF 49

IVILab

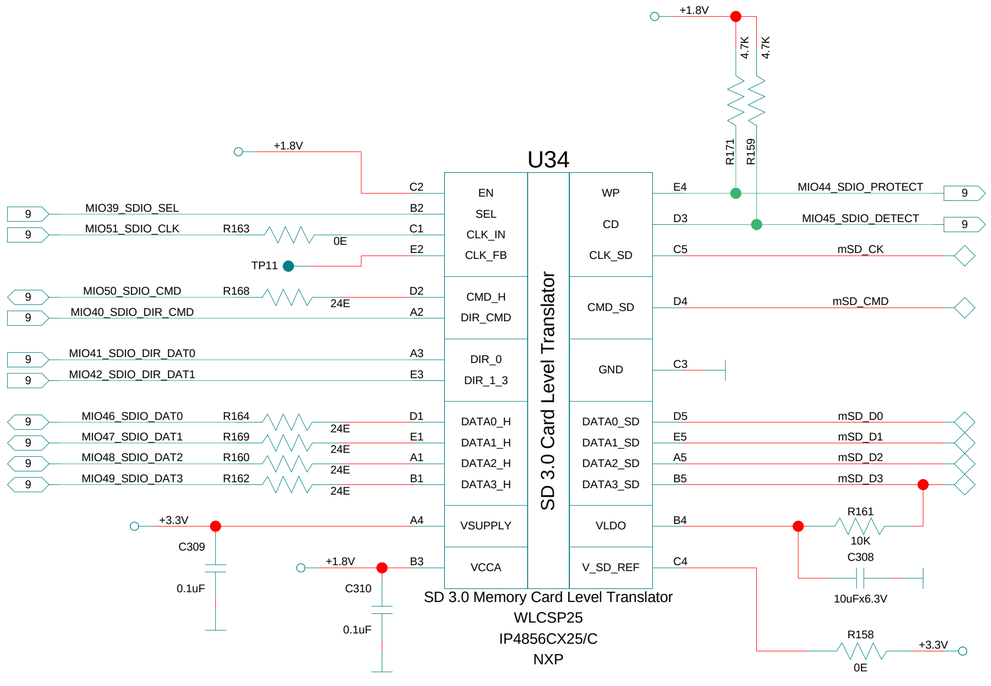


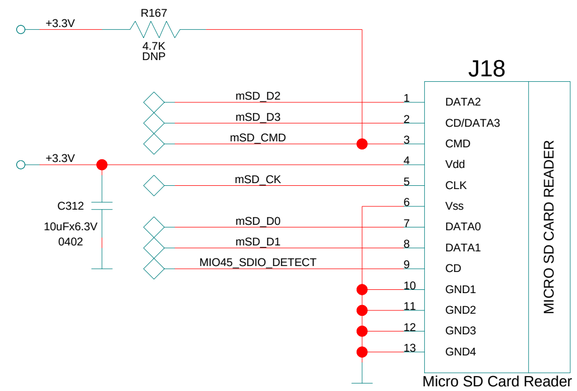
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP I2C Switch			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI	SHEET 24 OF 49	

IVILab

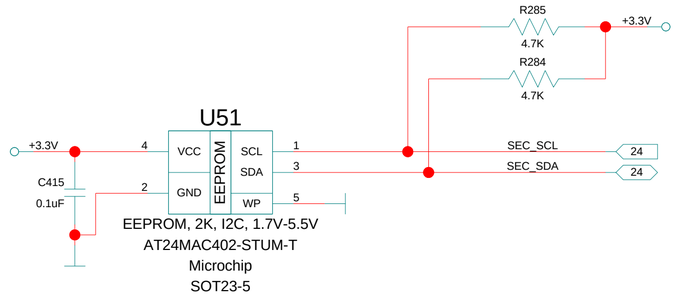


HiTech Global Distribution, LLC. www.HiTechGlobal.com			PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP SPI bridges			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI		SHEET 25 OF 49





SEL	VSD_REF	VLDO
H	X	1.8V
L	< 1V	2.9V
L	> 1.5V	VSD_REF



HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP Micro SD and EEPROM	
SIZE: C	DATE: 19/11/2020:17:44
DWG. NO.	REV: 1.1
DESIGNED BY: IVI	SHEET 26 OF 49

Odd pins of JTAG Header is oriented towards the edge of the PCB.

U5

FB8 220E@100MHz, 2A

C116 4.7uFx10V, C117 0.1uF, C118 22uFx25V, C103 22uFx25V

IN LDO OUT GND TAB

SOT-223
TL1963A-33DCYR
LDO, 1A, Vout 3.3V
TI

+USB_JTAG_VCCIO

C115 0.1uF

D11 SP1003-01ETG

D10 SP3031-01ETG

D9 SP3031-01ETG

J8

GND1	1
VREF	2
GND2	3
PROG/TMS	4
GND3	5
CCLK/TCK	6
GND4	7
DONE/TDO	8
GND5	9
DIN/TDI	10
GND6	11
NC	12
GND7	13
INIT/NC	14

Xilinx JTAG Header, 14 pins
Pitch 2.00mm, SMD
87832-1420
Molex

+3.3V, C73 47uFx6.3V

R434 10K +3.3V

R445 10K +3.3V

TMS_JTAG
TCK_JTAG
TDO_JTAG
TDI_JTAG

U69

+3.3V, C729 0.1uF

A B VCCA VCCB DIR GND Voltage Translator

TDO_PS → 8

+1.8V, C730 0.1uF

Level I/Os Translator 1.2V to 3.6V
SN74AVC1T45DCKR
SOT-23

J11

VBUS	1
D-	2
D+	3
NC	4
GND	5
SHIELD1	6
SHIELD2	7
SHIELD3	8
SHIELD4	9

USB 2.0 Micro, R/A
Type AB, SMD
629105150921

FB4 220E@100MHz, 2A

FB33 220E@100MHz, 2A

C572 0.01uF

U62

USB_UART_DN → DM
USB_UART_DP → DP

+USB_JTAG_VCCIO, R393 10K → RESET_N

PWREN_N

SUSPEND_N

C667 27pF, ZQ7 Crystal 12.000MHz, R421 1M_1%, C651 27pF → OSCI / OSCO

EECS, EEDATA, EECK → EECS / EEDATA / EECLK

VPLL / VPHY

VCCIO1 VCCIO2 VCCIO3 VCCIO4 VREGIN

C96 C630 C74 C682 0.1uF, 4.7uFx6.3V 0402 → VCCCORE1 VCCCORE2 VCCCORE3 VREGOUT

GND1 GND2 GND3 GND4 GND5 GND6 GND7 GND8 AGND

Dual USB to Serial UART/FIFO

AD0/TXD/TCK
AD1/RXD/TDI
AD2/RTS_N/TDO
AD3/CTS_N/TMS
AD4/DTR_N/GP_L0
AD5/DSR_N/GP_L1
AD6/DCD_N/GP_L2 → JTAG_PS_POR_N
AD7/RI_N/GP_L3 → JTAG_SRST_N

AC0/TXDEN/GP_H0
AC1/GP_H1
AC2/GP_H2
AC3/RXLED_N/GP_H3
AC4/TXLED_N/GP_H4
AC5/GP_H5
AC6/GP_H6
AC7/GP_H7

BD0/TXD/TCK → UART0_FT2Z_TXD
BD1/RXD/TDI → UART0_FT2Z_RXD
BD2/RTS_N/TDO
BD3/CTS_N/TMS
BD4/DTR_N/GP_L0
BD5/DSR_N/GP_L1
BD6/DCD_N/GP_L2
BD7/RI_N/GP_L3

BC0/TXDEN/GP_H0
BC1/GP_H1
BC2/GP_H2
BC3/RXLED_N/GP_H3
BC4/TXLED_N/GP_H4
BC5/GP_H5
BC6/GP_H6
BC7/PWRSAV/GP_H7

TEST

REF → R416 12.0K_1%

Dual USB to Serial UART/FIFO
FT2232HL-REEL
FTDI Chip
LQFP-64

TDO R396 10E
TCK R394 10E
TDI R395 10E
TMS R397 10E

R398 10E, R422 10E

D8 LED Green, R51 330E +3.3V

D7 LED Green, R49 330E +3.3V

U64

4 5 6 7 → 1A1 1A2 2A1 2A2

R459 0E, +3.3V, C724 0.1uF

1DIR 2DIR VCCA GND1 — VOLTAGE TRANSLATION — 1B1 1B2 2B1 2B2 1OE_N 2OE_N VCCB GND2

13 TCK_PS → 8
12 TDI_PS → 8
11 TMS_PS → 8
10 MIO18_UART0_RXD → 9

R460 0E, +1.8V, C709 0.1uF

Level I/Os Translator 1.2V to 3.6V
SN74AVC4T245PW
TSSOP-16

U3

A B VCCA VCCB DIR GND Voltage Translator

+3.3V, C76 0.1uF

MIO19_UART0_TXD → 9

+1.8V, C75 0.1uF

Level I/Os Translator 1.2V to 3.6V
SN74AVC1T45DCKR
SOT-23

U61

JTAG_PS_POR_N → A1 → Y1 → R515 0E → PS_POR_N → 8,48

JTAG_SRST_N → A2 → Y2 → R492 0E → PS_SRST_N → 8

+USB_JTAG_VCCIO → VCC, C563 0.1uF, GND

Buffer with Open Drain
NC7WZ07P6X
TSSOP-6

U67

+USB_JTAG_VCCIO, C736 0.1uF

NC ORG VCC GND — SPI EEPROM — CS DI DO CLK

R489 10K, R494 10K, R493 10K → +USB_JTAG_VCCIO

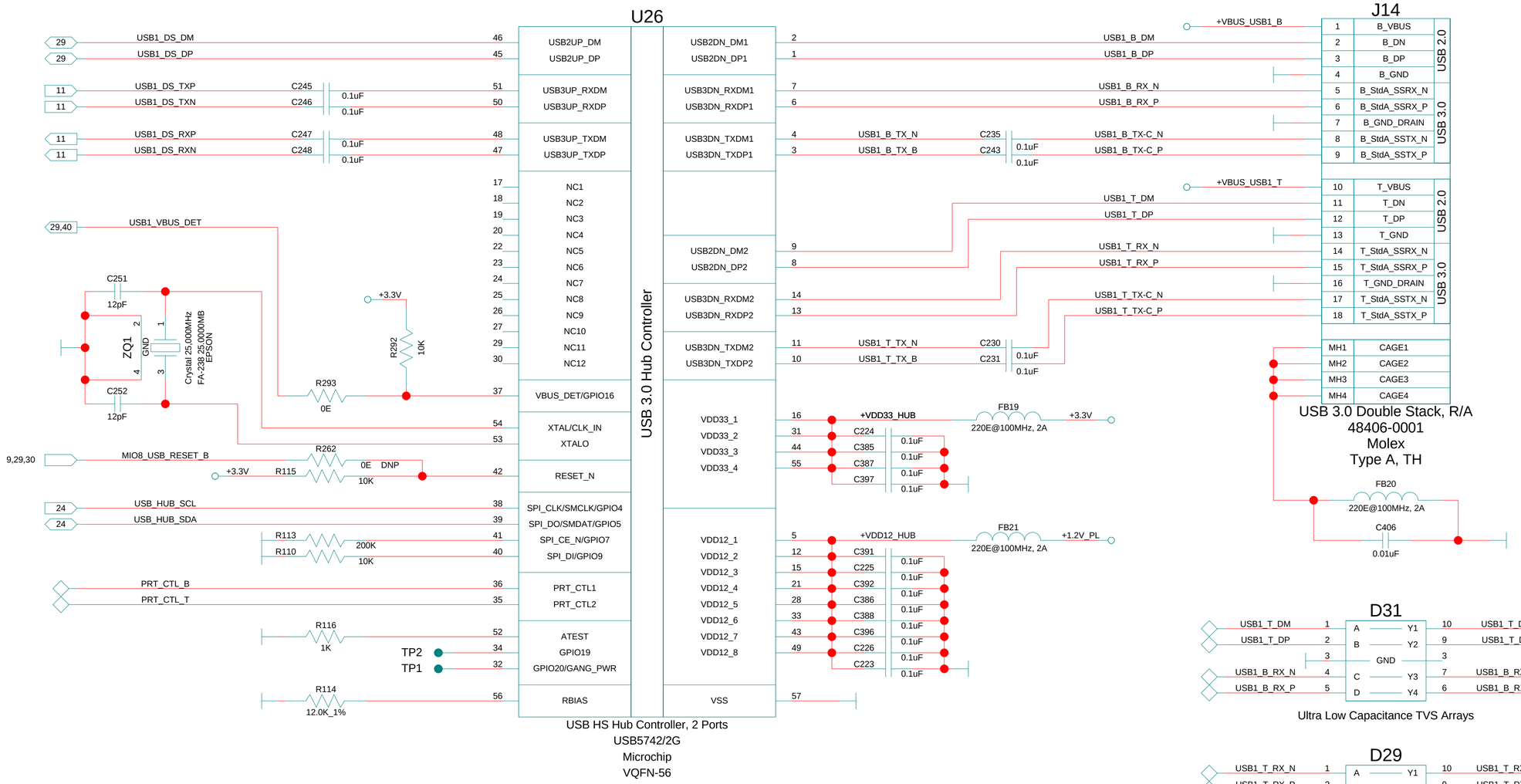
R446 2K_1%

EECS, EEDATA, EECK

EEPROM, 2K, SPI, 2.5V-5.5V
93LC56B-I/ST
Microchip Technology Inc.
TSSOP-8

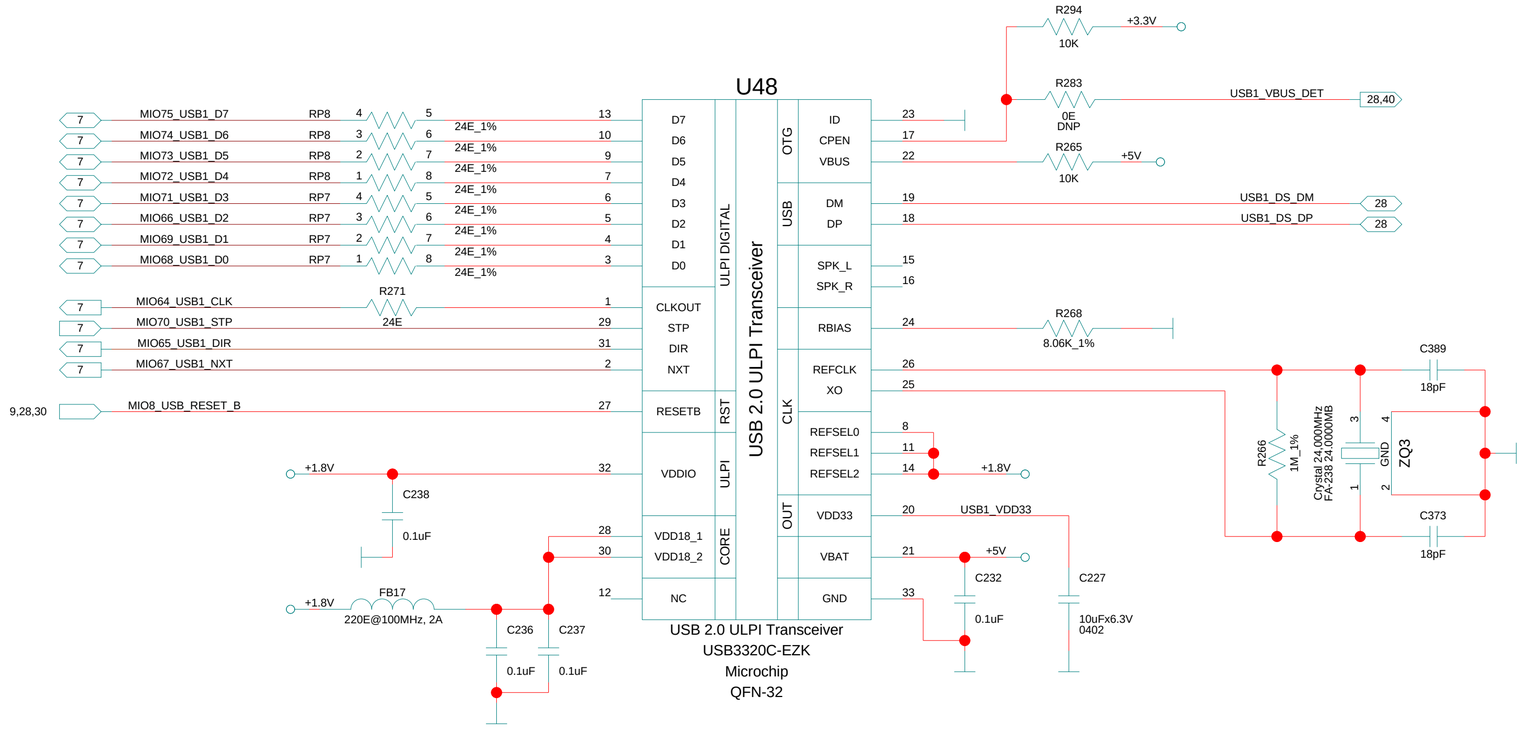
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP USB to UART/JTAG			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 27 OF 49	

IVILab



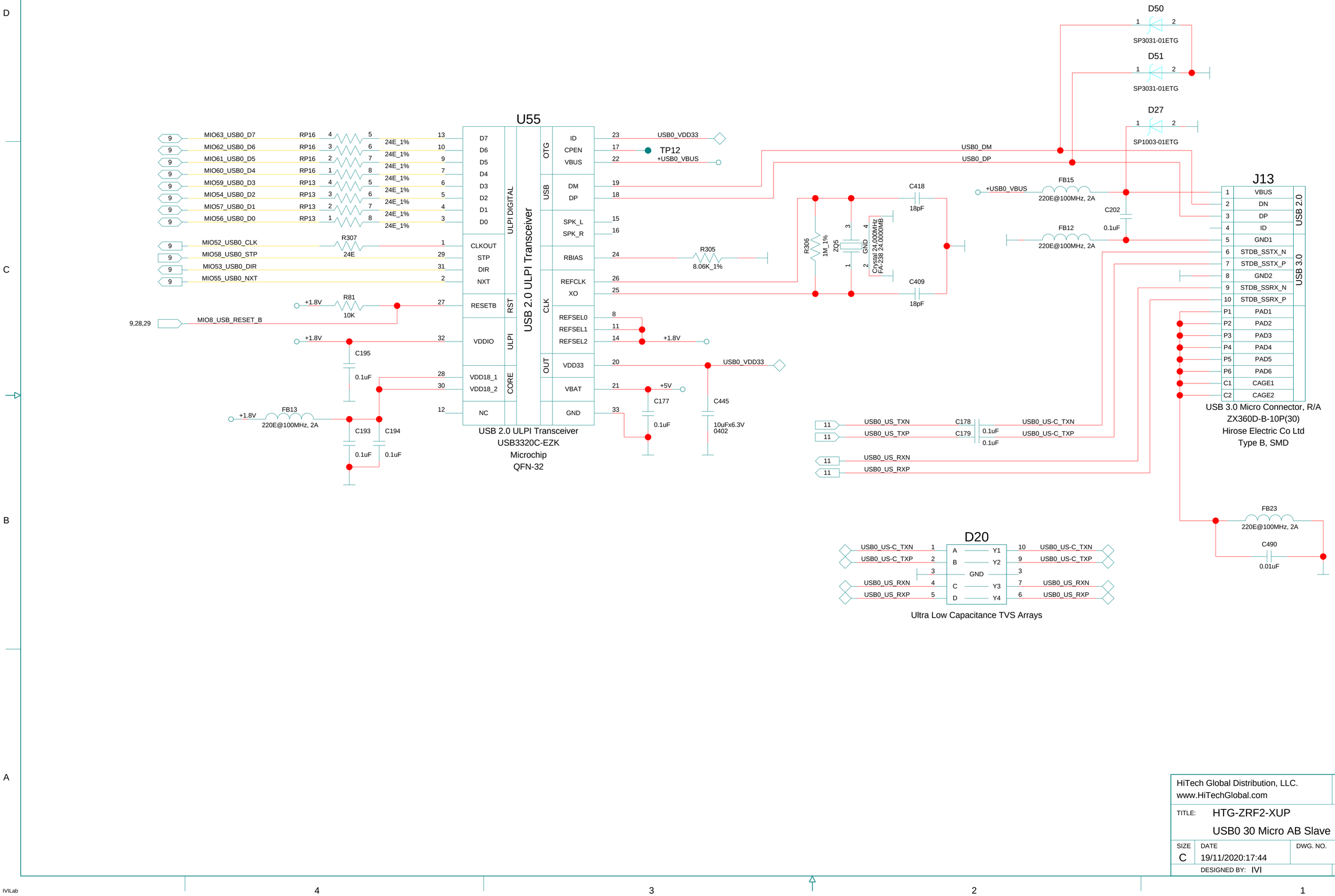
HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP USB1 30 Typy-A 2 ports	
SIZE: C	DATE: 19/11/2020:17:44
DWG. NO.	REV: 1.1
DESIGNED BY: IVI	SHEET 28 OF 49

IVILab



HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP USB1 20 ULPI Transceiver			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 29 OF 49	

IVILab



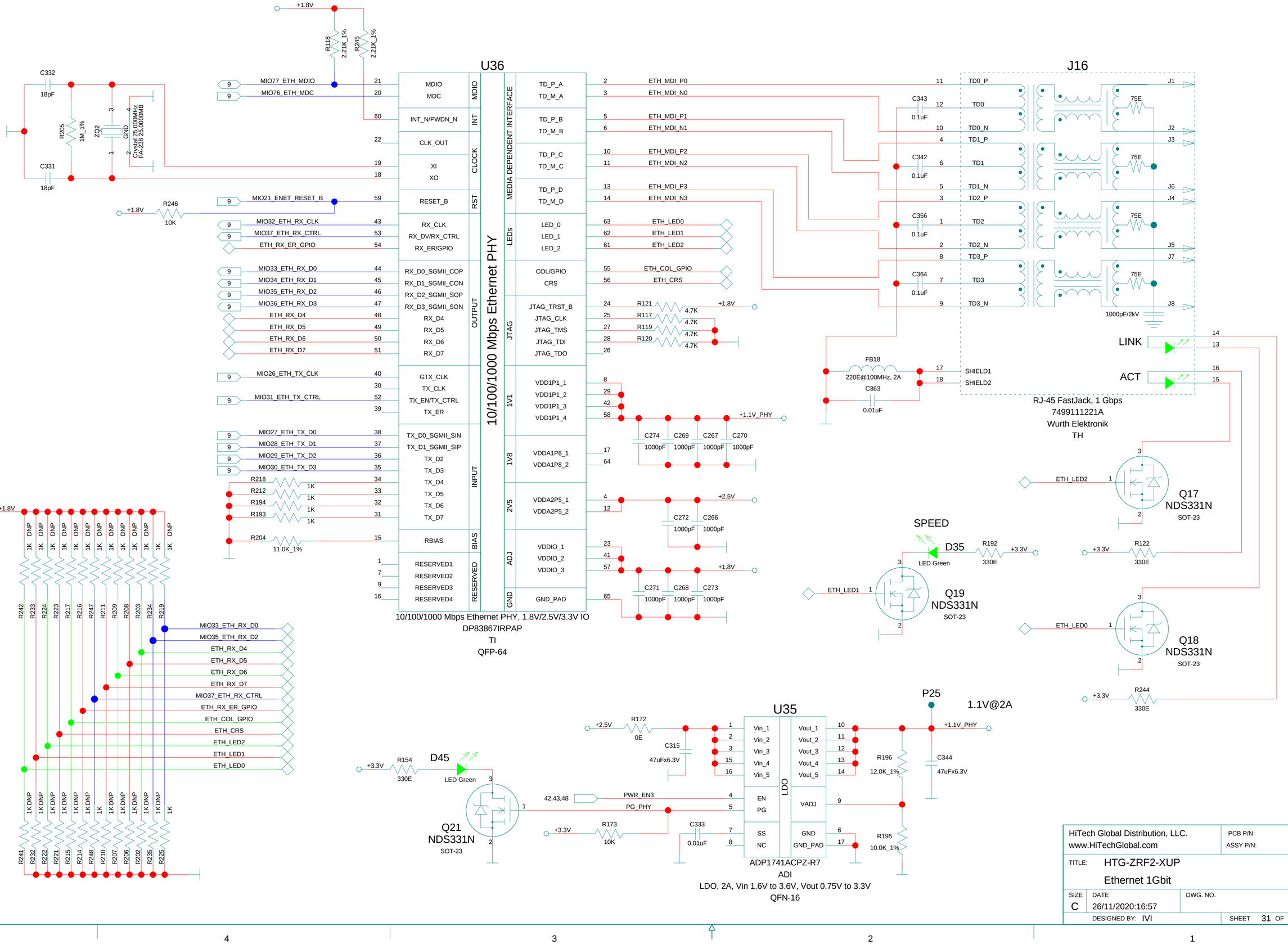
USB 2.0 ULPI Transceiver
USB3320C-EZK
Microchip
QFN-32

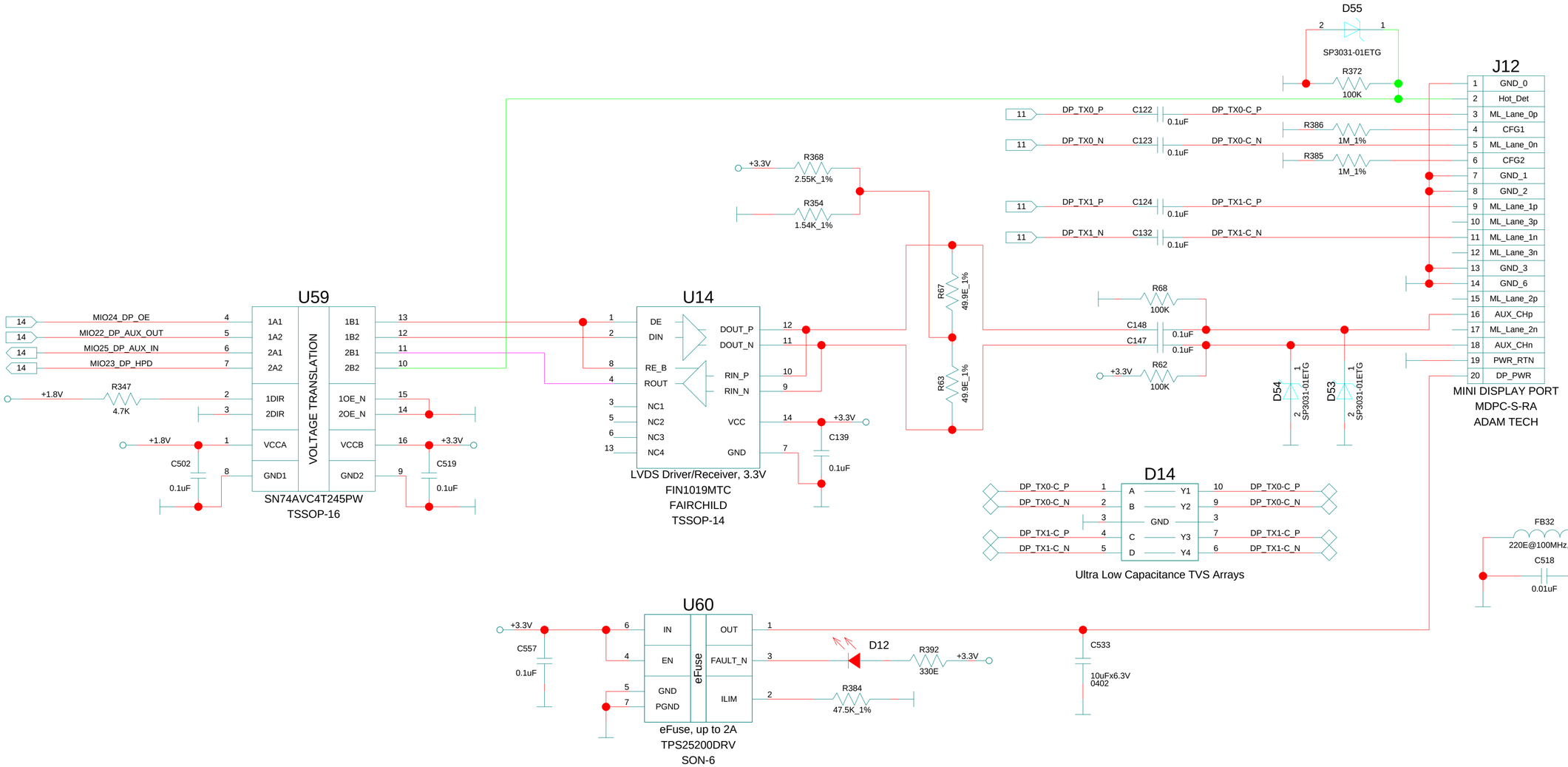
USB 3.0 Micro Connector, R/A
ZX360D-B-10P(30)
Hirose Electric Co Ltd
Type B, SMD

Ultra Low Capacitance TVS Arrays

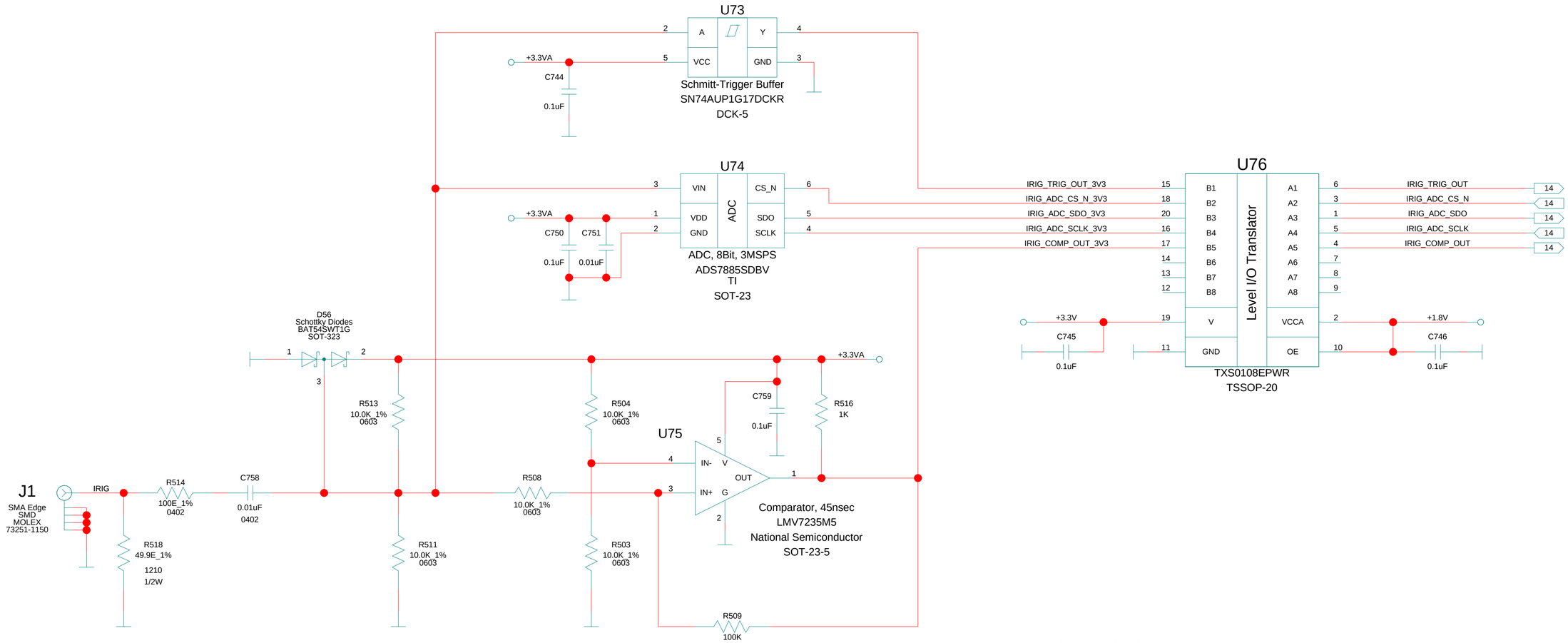
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE:	HTG-ZRF2-XUP USB0 30 Micro AB Slave		
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI	SHEET 30 OF 49	

IVILab

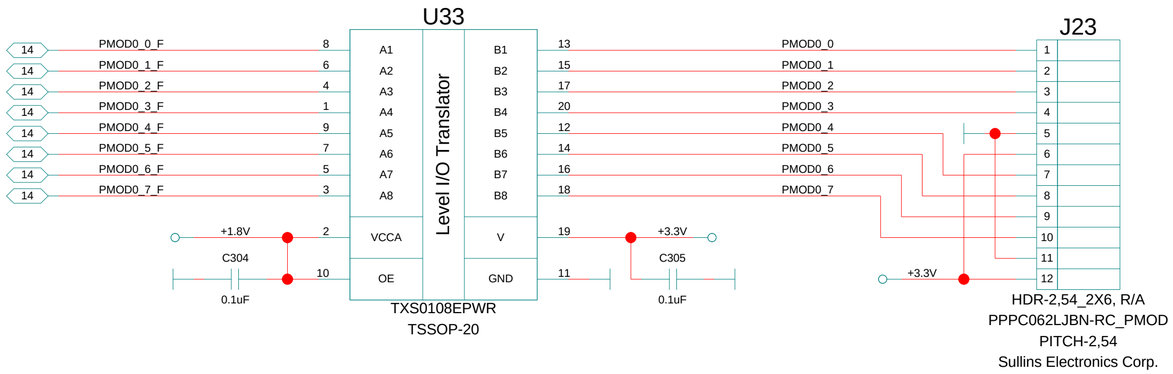

U36
10/100/1000 Mbps Ethernet PHY
MDIO
INT
CLOCK
RST
OUTPUT
INPUT
BIAS
RESERVED
MEDIA DEPENDENT INTERFACE
LEDs
JTAG
1V1
1V8
2V5
ADJ
GND
MDIO
MDC
INT_N/PWDN_N
CLK_OUT
XI
XO
RESET_B
RX_CLK
RX_DV/RX_CTRL
RX_ER/GPIO
RX_D0_SGMII_COP
RX_D1_SGMII_CON
RX_D2_SGMII_SOP
RX_D3_SGMII_SON
RX_D4
RX_D5
RX_D6
RX_D7
GTX_CLK
TX_CLK
TX_EN/TX_CTRL
TX_ER
TX_D0_SGMII_SIN
TX_D1_SGMII_SIP
TX_D2
TX_D3
TX_D4
TX_D5
TX_D6
TX_D7
RBIAS
RESERVED1
RESERVED2
RESERVED3
RESERVED4
TD_P_A
TD_M_A
TD_P_B
TD_M_B
TD_P_C
TD_M_C
TD_P_D
TD_M_D
LED_0
LED_1
LED_2
COL/GPIO
CRS
JTAG_TRST_B
JTAG_CLK
JTAG_TMS
JTAG_TDI
JTAG_TDO
VDD1P1_1
VDD1P1_2
VDD1P1_3
VDD1P1_4
VDDA1P8_1
VDDA1P8_2
VDDA2P5_1
VDDA2P5_2
VDDIO_1
VDDIO_2
VDDIO_3
GND_PAD
10/100/1000 Mbps Ethernet PHY, 1.8V/2.5V/3.3V IO
DP83867IRPAP
TI
QFP-64
+1.8V
R118 2.21K_1%
R245 2.21K_1%
C332 18pF
C331 18pF
R205 1M_1%
ZQ2
GND
Crystal 25.000MHz
FA-238 25.0000MB
R246 10K
MIO77_ETH_MDIO
MIO76_ETH_MDC
MIO21_ENET_RESET_B
MIO32_ETH_RX_CLK
MIO37_ETH_RX_CTRL
ETH_RX_ER_GPIO
MIO33_ETH_RX_D0
MIO34_ETH_RX_D1
MIO35_ETH_RX_D2
MIO36_ETH_RX_D3
ETH_RX_D4
ETH_RX_D5
ETH_RX_D6
ETH_RX_D7
MIO26_ETH_TX_CLK
MIO31_ETH_TX_CTRL
MIO27_ETH_TX_D0
MIO28_ETH_TX_D1
MIO29_ETH_TX_D2
MIO30_ETH_TX_D3
R218 1K
R212 1K
R194 1K
R193 1K
R204 11.0K_1%
ETH_MDI_P0
ETH_MDI_N0
ETH_MDI_P1
ETH_MDI_N1
ETH_MDI_P2
ETH_MDI_N2
ETH_MDI_P3
ETH_MDI_N3
ETH_LED0
ETH_LED1
ETH_LED2
ETH_COL_GPIO
ETH_CRS
R121 4.7K
R117 4.7K
R119 4.7K
R120 4.7K
+1.1V_PHY
C274 1000pF
C269 1000pF
C267 1000pF
C270 1000pF
+2.5V
C272 1000pF
C266 1000pF
C271 1000pF
C268 1000pF
C273 1000pF
J16
RJ-45 FastJack, 1 Gbps
7499111221A
Wurth Elektronik
TH
TD0_P
TD0
TD0_N
TD1_P
TD1
TD1_N
TD2_P
TD2
TD2_N
TD3_P
TD3
TD3_N
SHIELD1
SHIELD2
C343 0.1uF
C342 0.1uF
C356 0.1uF
C364 0.1uF
FB18
220E@100MHz, 2A
C363 0.01uF
75E
1000pF/2kV
LINK
ACT
Q17
NDS331N
SOT-23
Q19
NDS331N
SOT-23
Q18
NDS331N
SOT-23
SPEED
D35
LED Green
R192 330E
R122 330E
R244 330E
+3.3V
+1.8V
DNP
1K
R242
R233
R224
R223
R217
R216
R247
R211
R209
R208
R203
R234
R219
R241
R232
R222
R221
R215
R214
R248
R210
R207
R206
R202
R235
R225
P25
1.1V@2A
U35
ADP1741ACPZ-R7
ADI
LDO, 2A, Vin 1.6V to 3.6V, Vout 0.75V to 3.3V
QFN-16
Vin_1
Vin_2
Vin_3
Vin_4
Vin_5
Vout_1
Vout_2
Vout_3
Vout_4
Vout_5
EN
PG
SS
NC
VADJ
GND
GND_PAD
LDO
+2.5V
R172 0E
C315 47uFx6.3V
R196 12.0K_1%
R195 10.0K_1%
C344 47uFx6.3V
PWR_EN3
PG_PHY
R173 10K
C333 0.01uF
42,43,48
D45
LED Green
R154 330E
Q21
NDS331N
SOT-23
HiTech Global Distribution, LLC.
www.HiTechGlobal.com
PCB P/N:
ASSY P/N:
TITLE: HTG-ZRF2-XUP
Ethernet 1Gbit
SIZE C
DATE 26/11/2020:16:57
DWG. NO.
REV 1.1
DESIGNED BY: IVI
SHEET 31 OF 49
IVILab



HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP Display Port			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 32 OF 49	

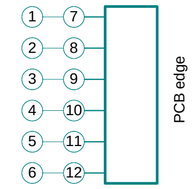


HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PPS			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI		SHEET 33 OF 49

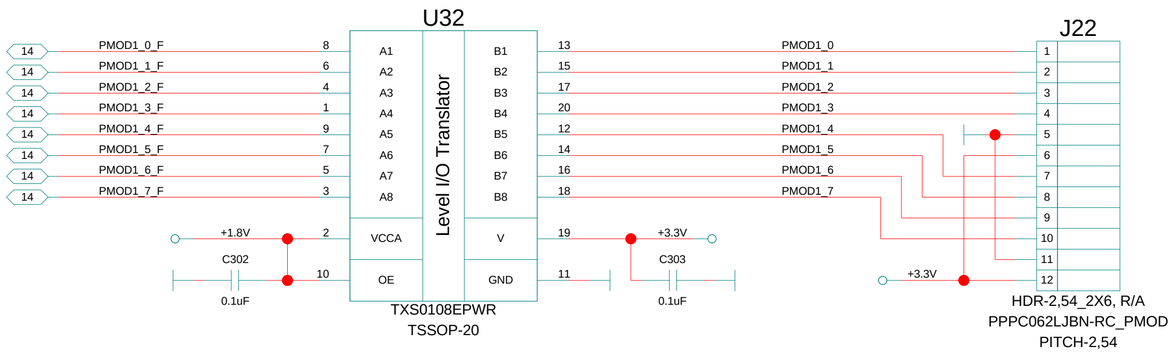


TXS0108EPWR
TSSOP-20

HDR-2,54_2X6, R/A
PPPC062LJBN-RC_PMOD
PITCH-2,54
Sullins Electronics Corp.

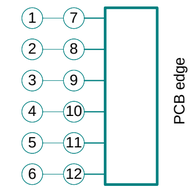


Pin Number and Orientation



TXS0108EPWR
TSSOP-20

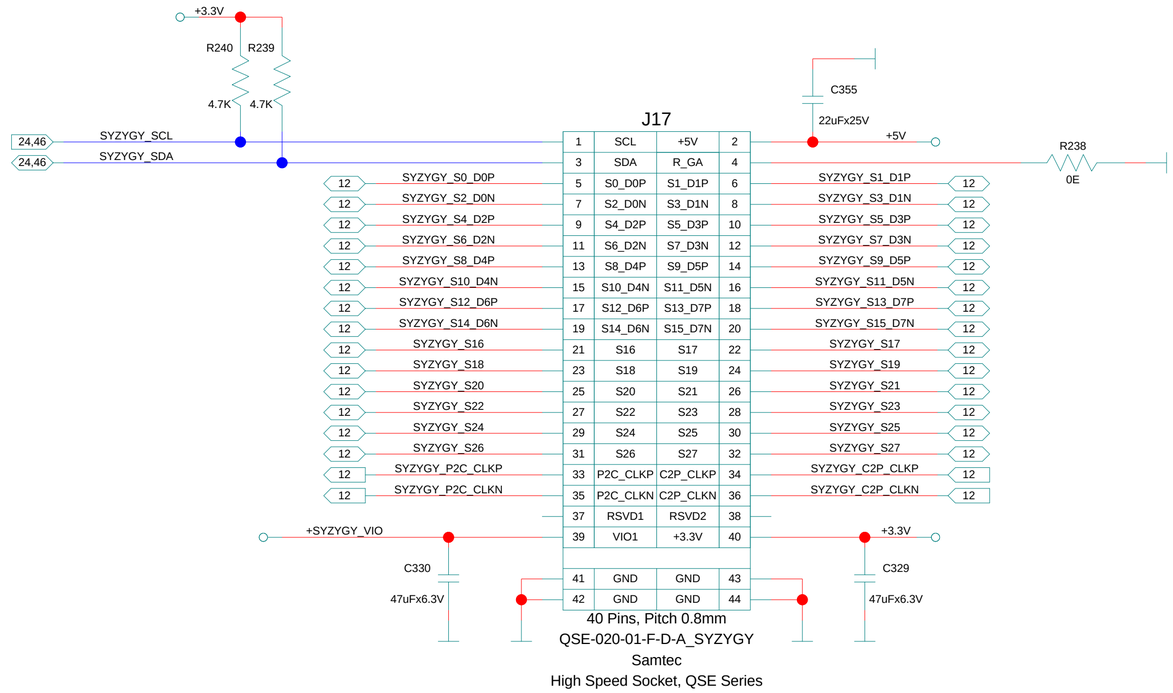
HDR-2,54_2X6, R/A
PPPC062LJBN-RC_PMOD
PITCH-2,54
Sullins Electronics Corp.



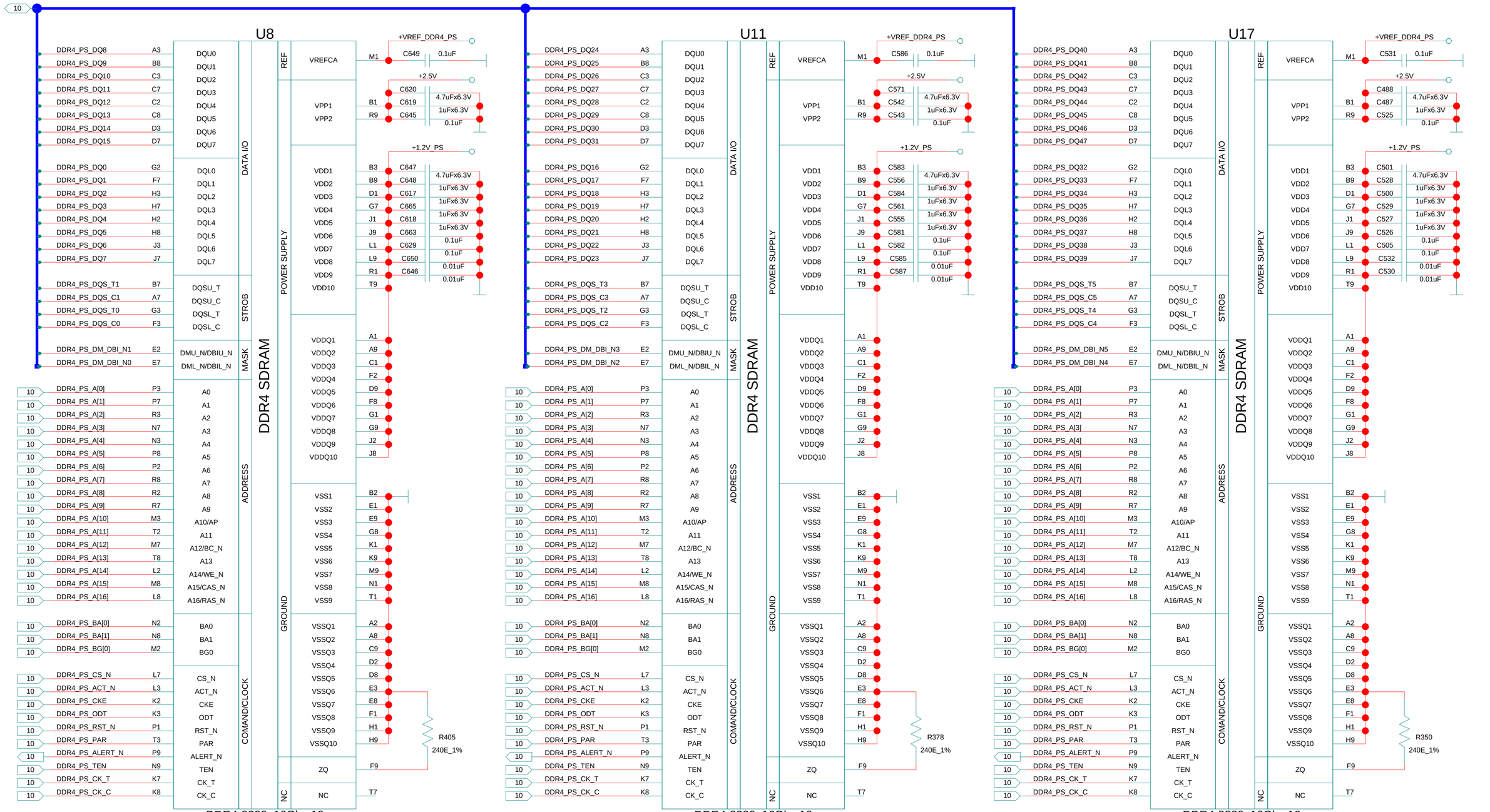
Pin Number and Orientation

HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP PMOD Headers		
SIZE C	DATE 19/11/2020:17:44	DWG. NO. REV 1.1
DESIGNED BY: IVI		SHEET 34 OF 49

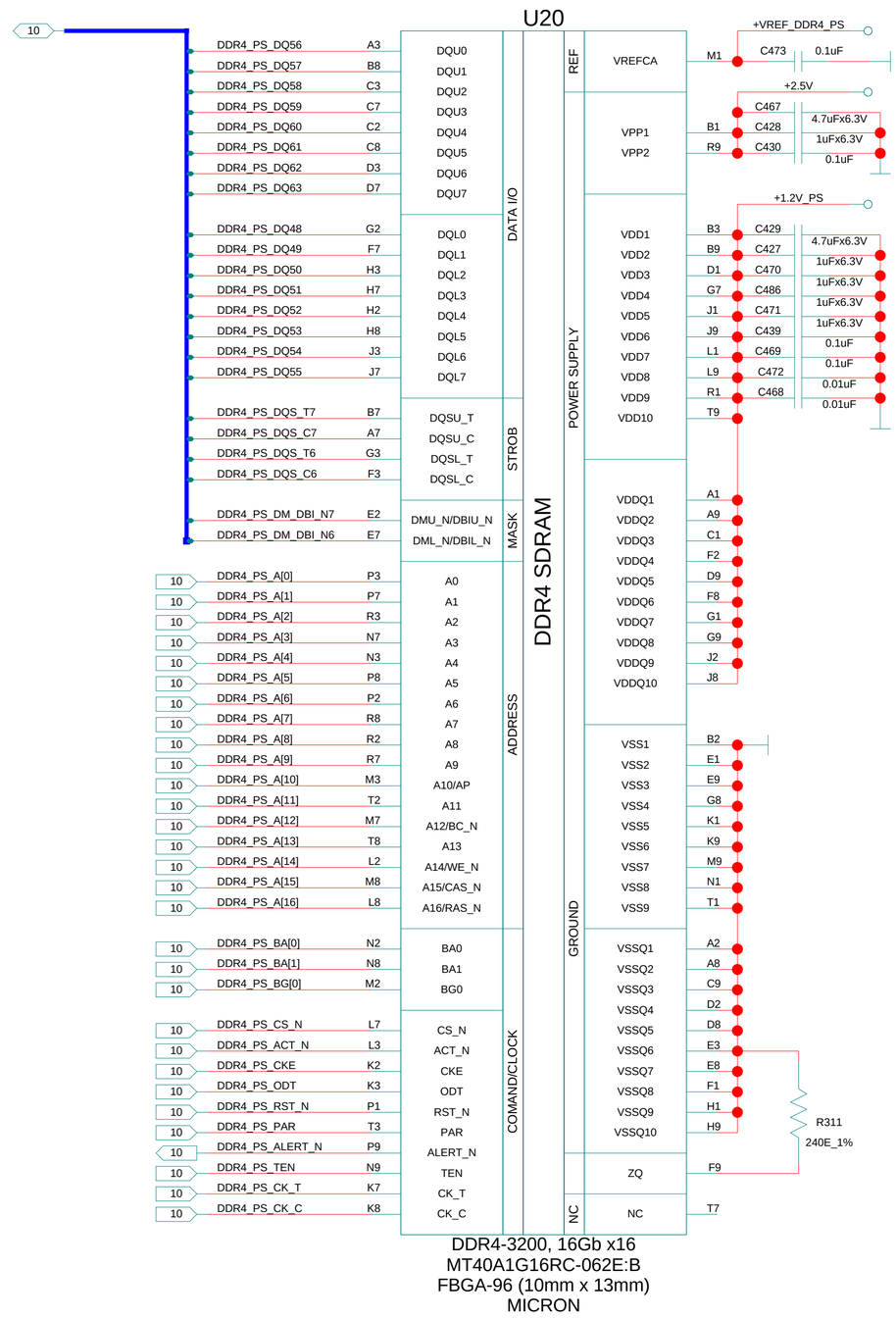
IVILab

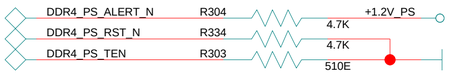


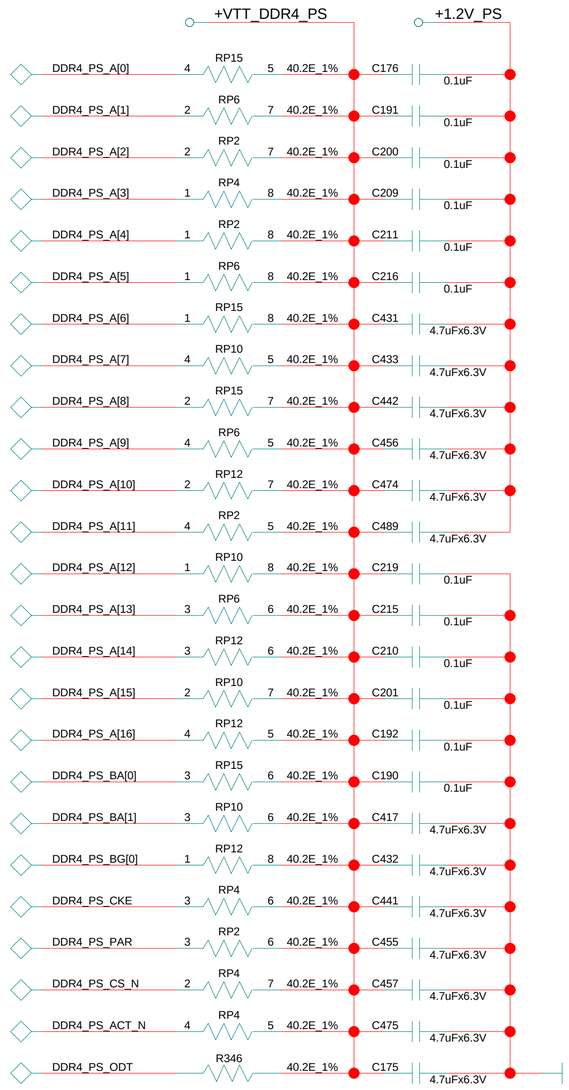
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP SYZYGY Header			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 35 OF 49	

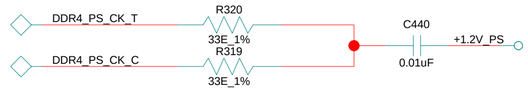


HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:
TITLE:	HTG-ZRF2-XUP DDR4 PS Components 1-3	
SIZE C	DATE 19/11/2020:17:44	DWG. NO.
REV 1.1		
DESIGNED BY: IVI		SHEET 36 OF 49



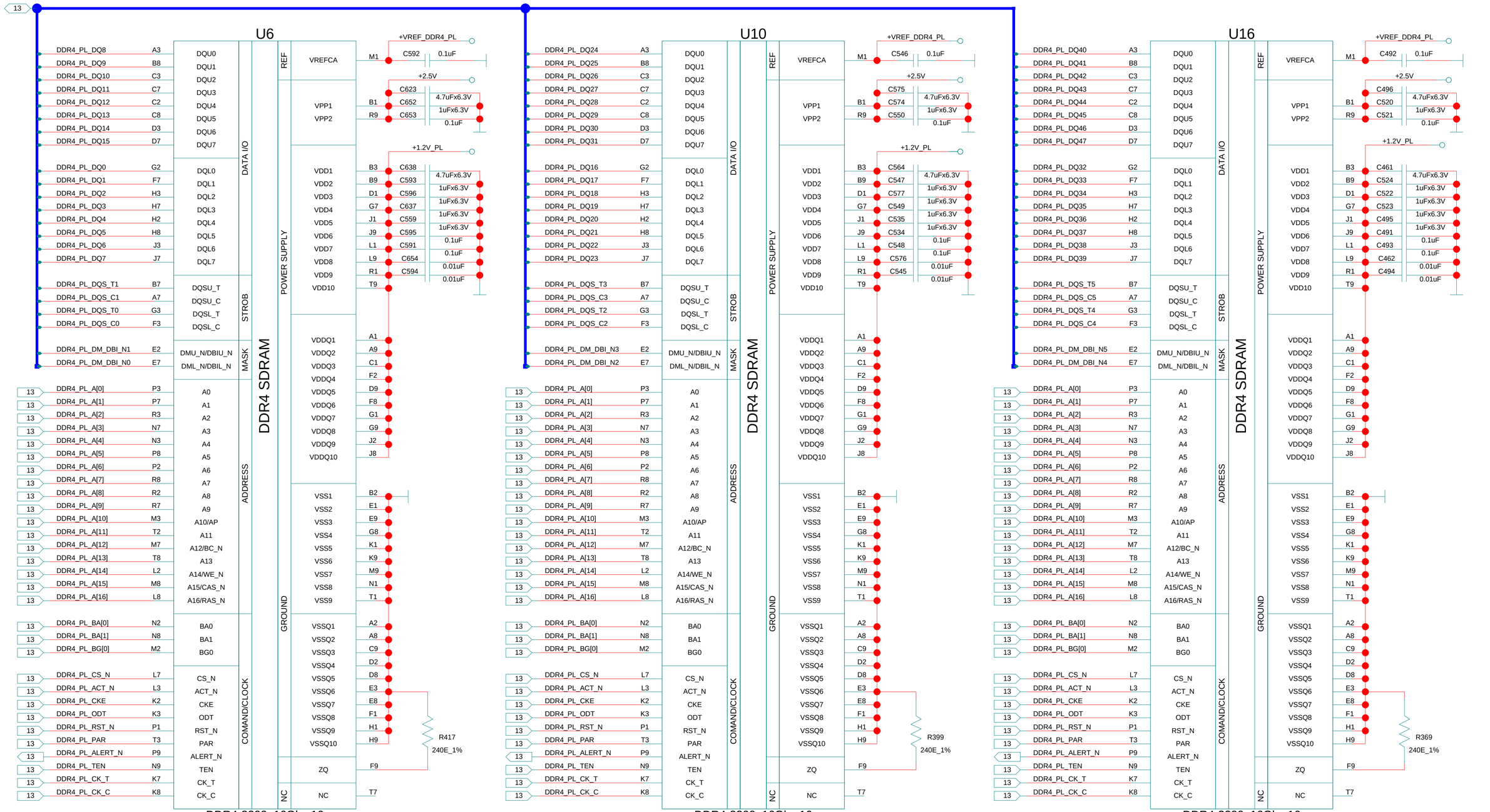




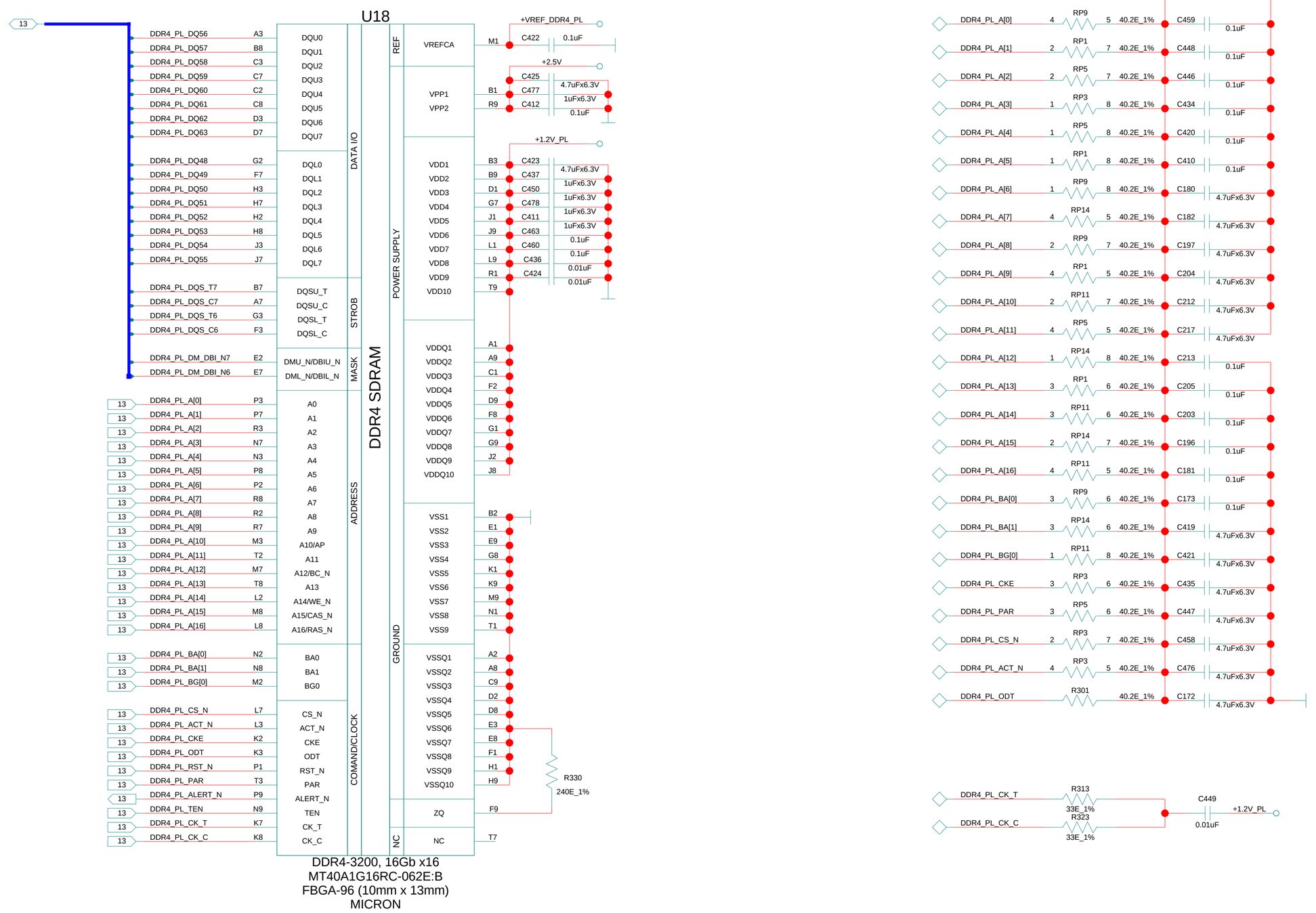


HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP DDR4 PS Components 4			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 37 OF 49	

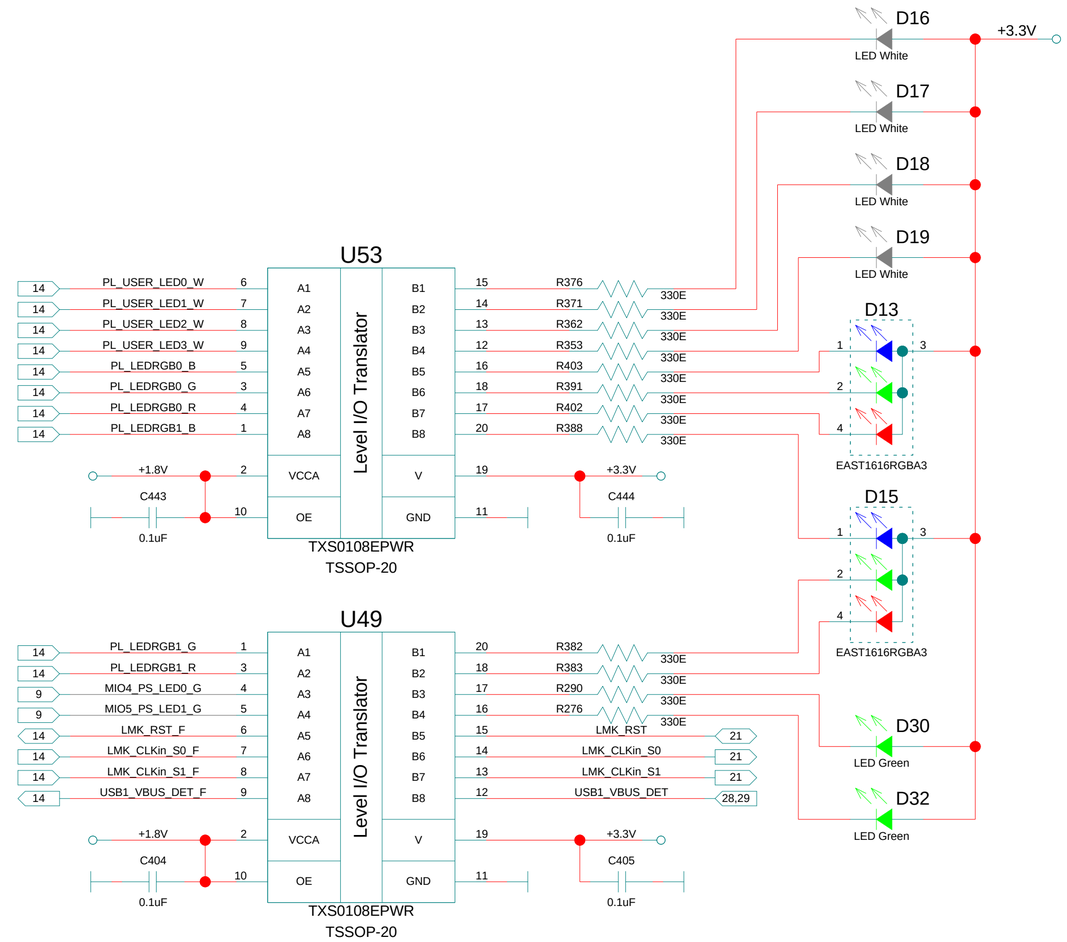
IVILab

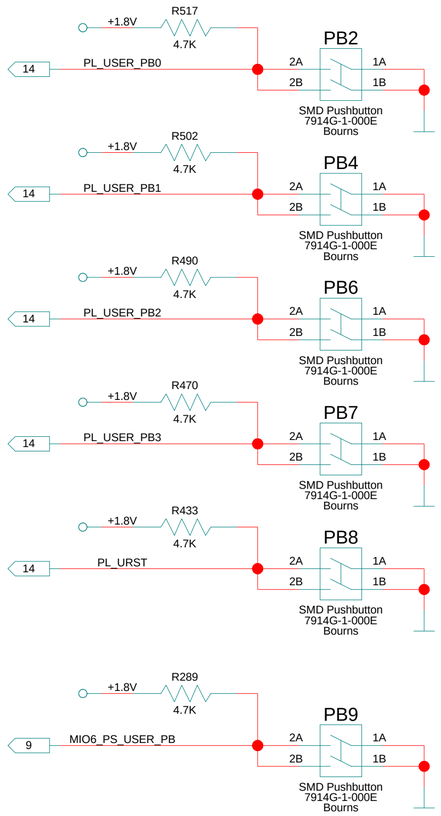


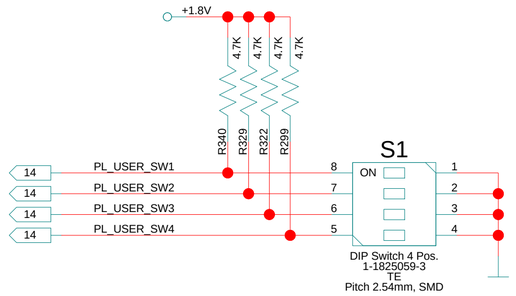
HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP DDR4 PL Components 1-3	
SIZE: C	DATE: 19/11/2020:17:44
DWG. NO.	REV: 1.1
DESIGNED BY: IVI	SHEET 38 OF 49

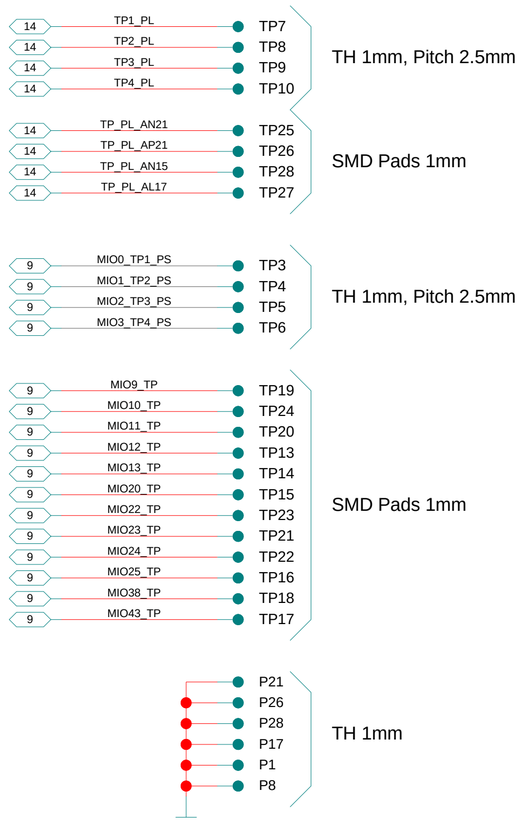


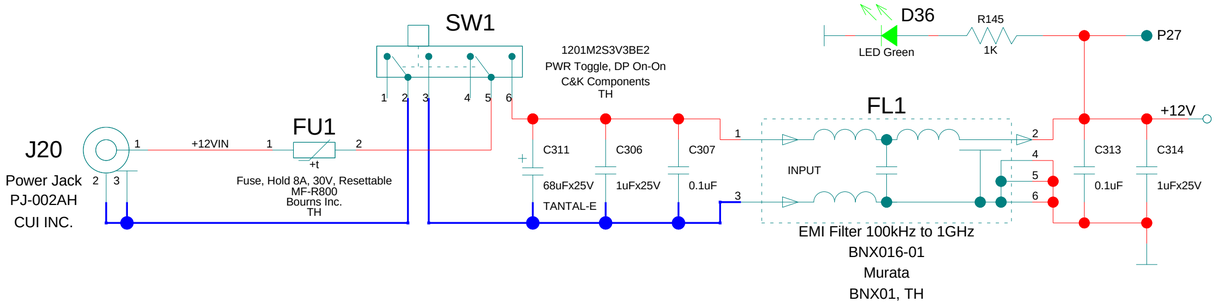
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP DDR4 PL Component 4			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 39 OF 49	

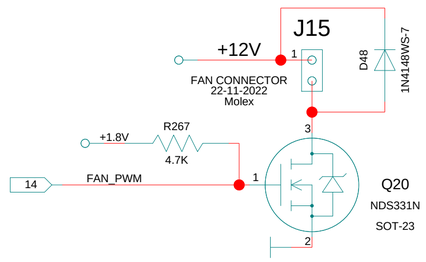




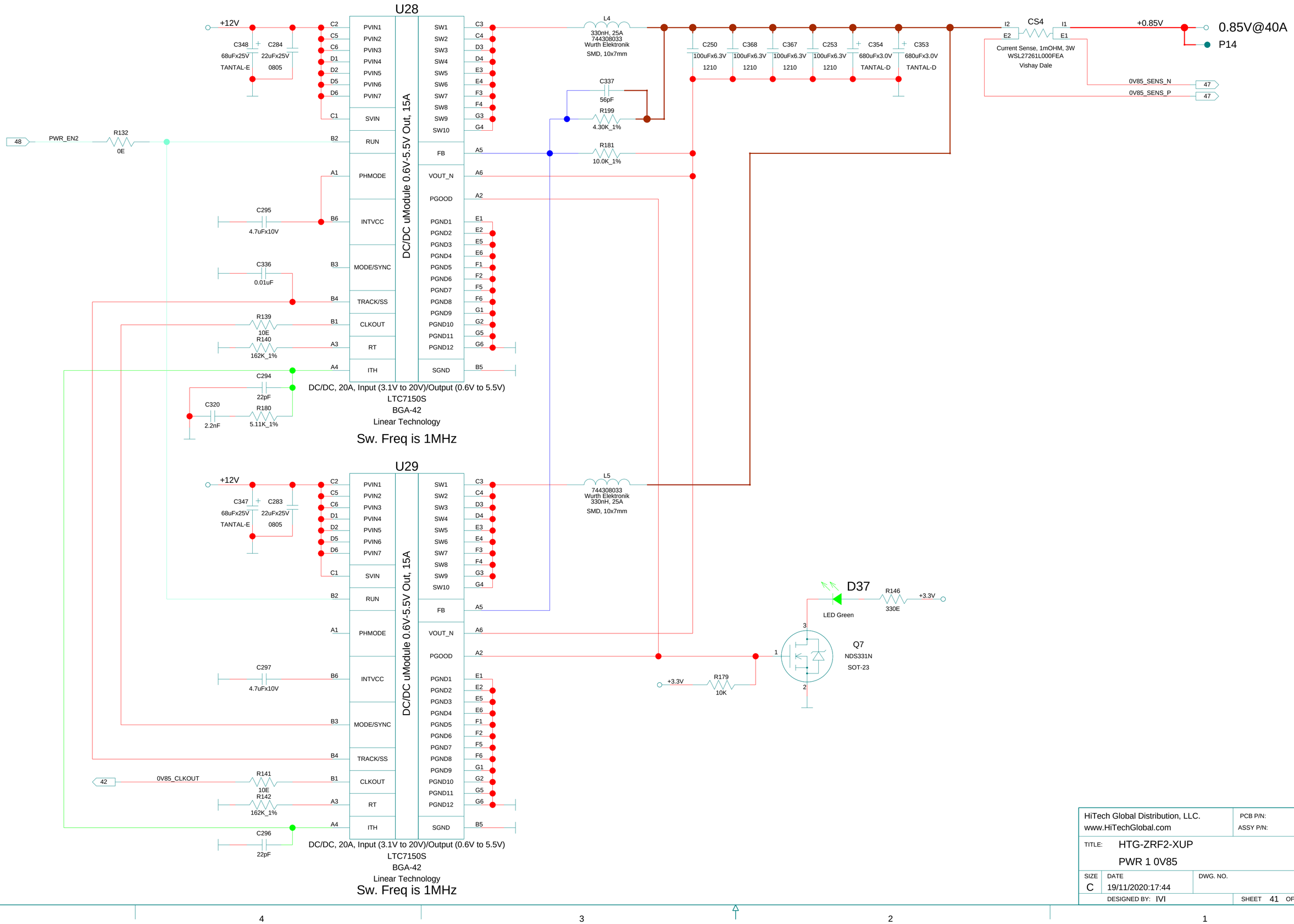








HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PWR IN USER APP			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 40 OF 49	



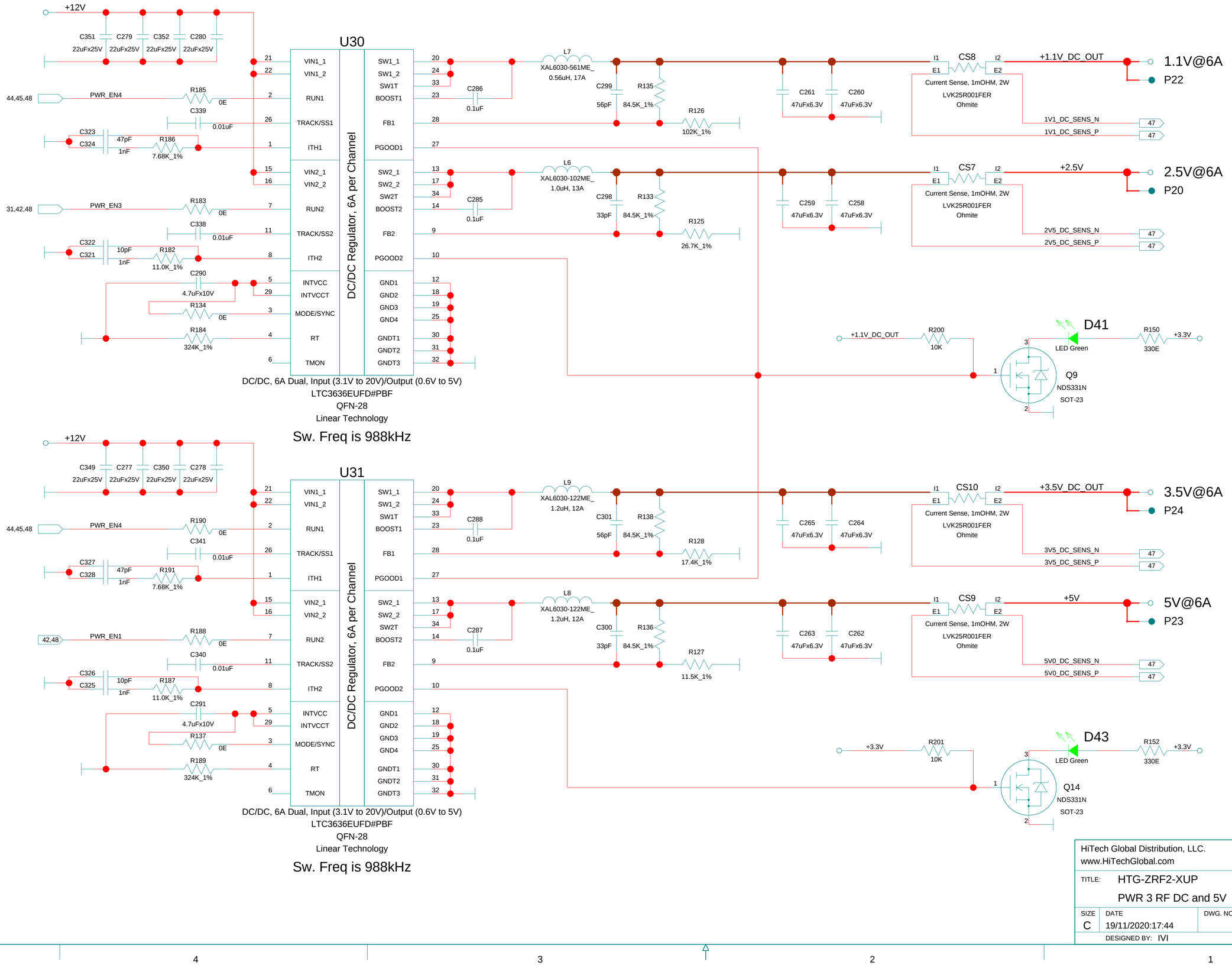
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PWR 1 0V85			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 41 OF 49	

DC/DC, 6A Dual, Input (3.1V to 20V)/Output (0.6V to 5V)
LTC3636EUFD#PBF
QFN-28
Linear Technology

Sw. Freq is 988kHz

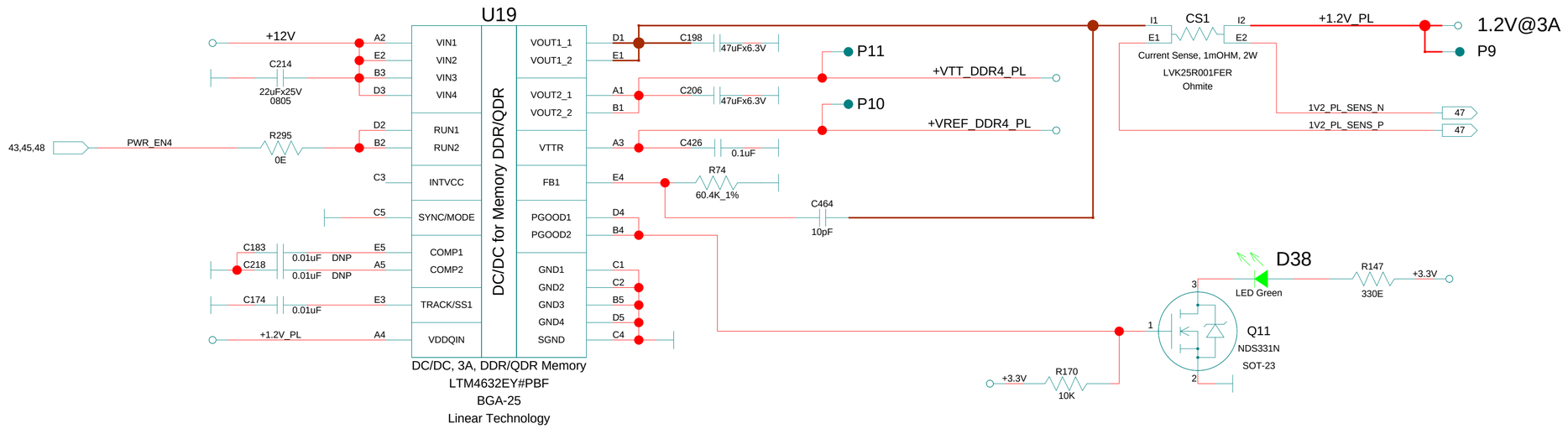
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PWR 2 1V8 and 3V3			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 42 OF 49	

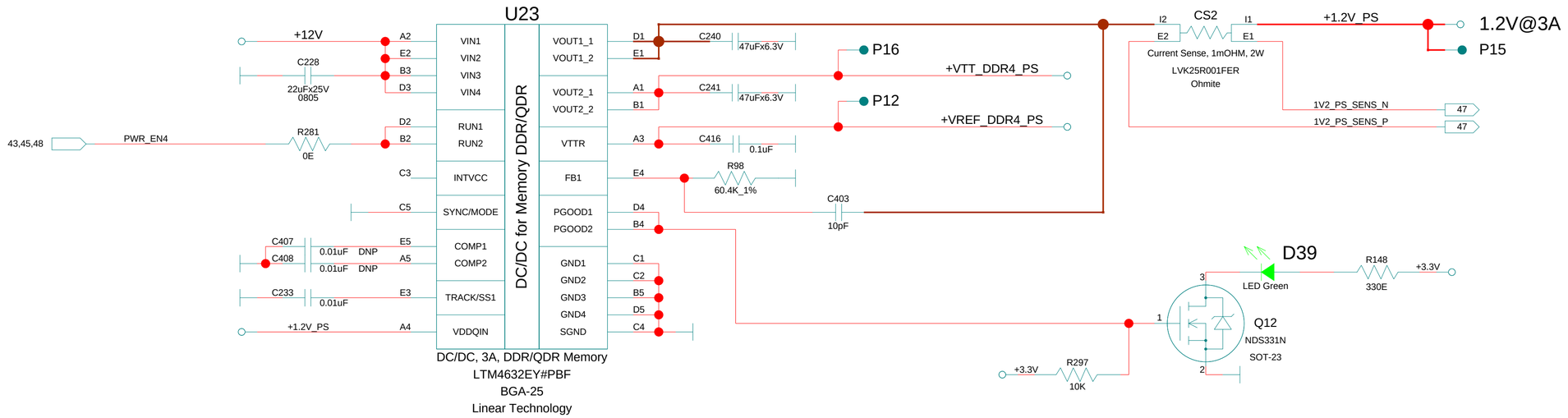
IVILab



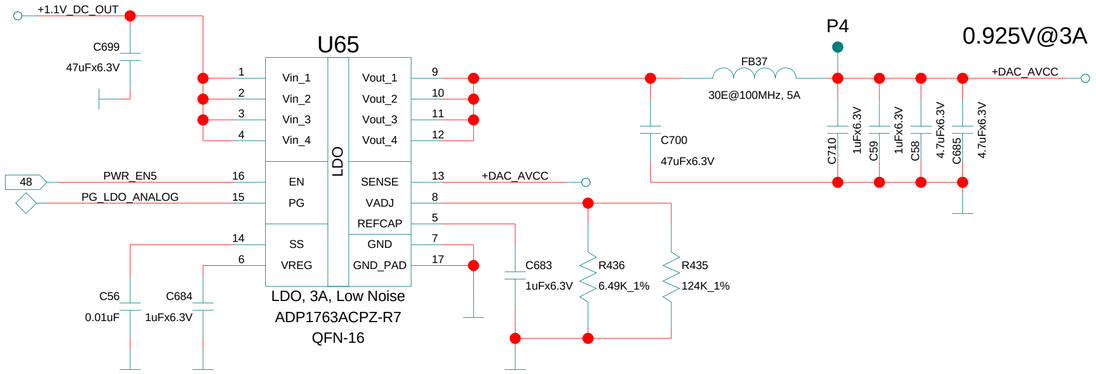
HiTech Global Distribution, LLC. www.HiTechGlobal.com	PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PWR 3 RF DC and 5V		
SIZE: C	DATE: 19/11/2020:17:44	DWG. NO.
REV: 1.1	DESIGNED BY: IVI	SHEET 43 OF 49

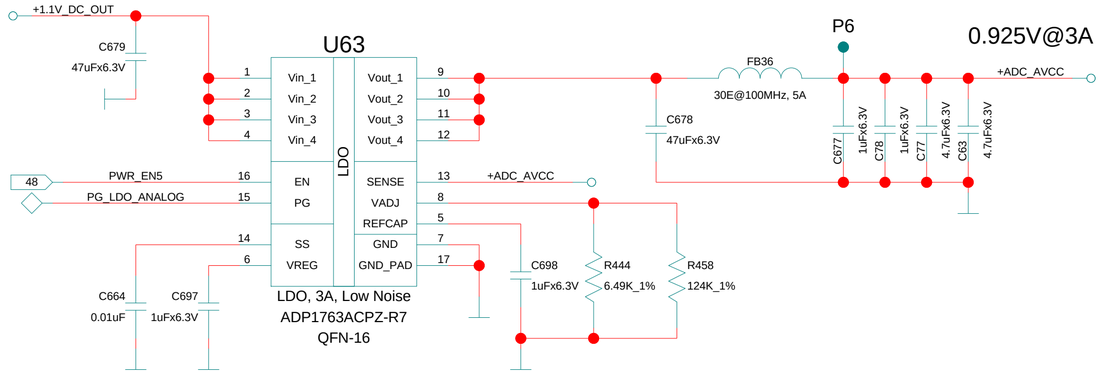
IVILab

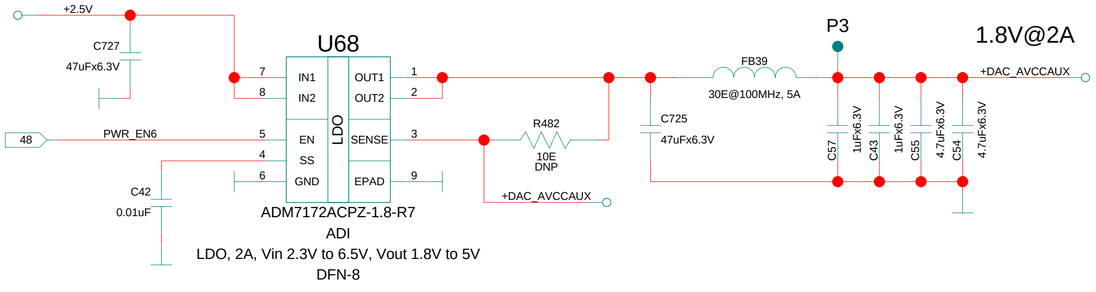


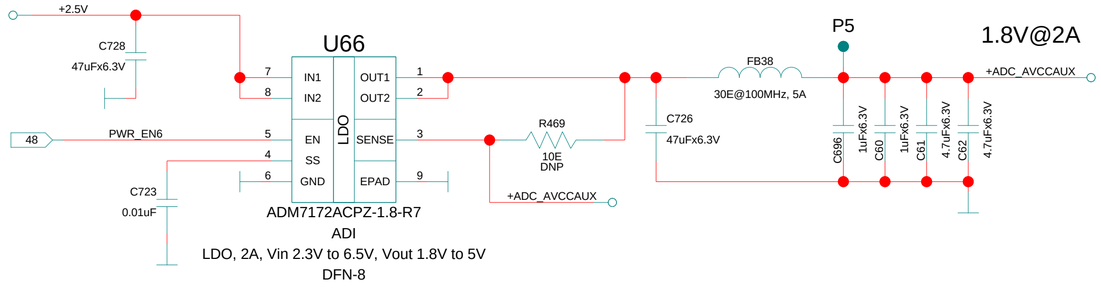


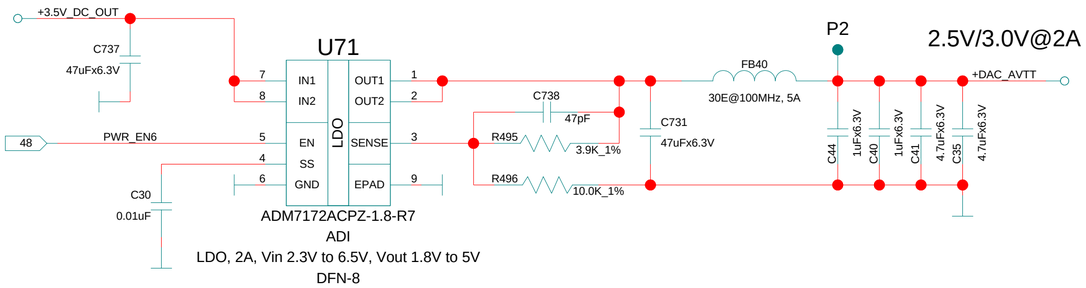
HiTech Global Distribution, LLC. www.HiTechGlobal.com			PCB P/N: ASSY P/N:
TITLE:	HTG-ZRF2-XUP PWR 4 DDR4		
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI		SHEET 44 OF 49

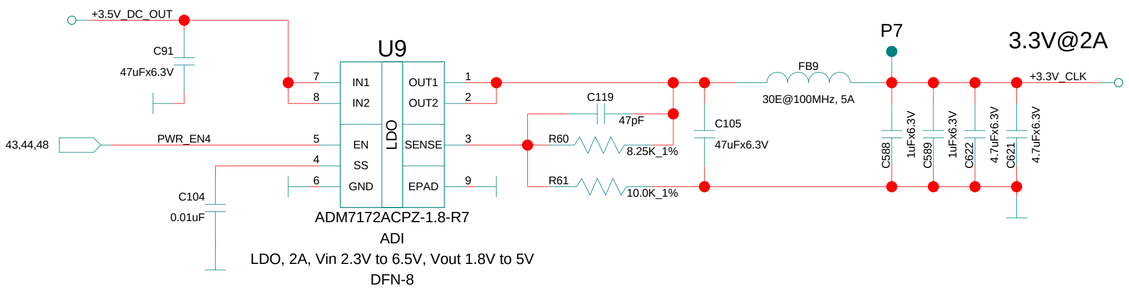


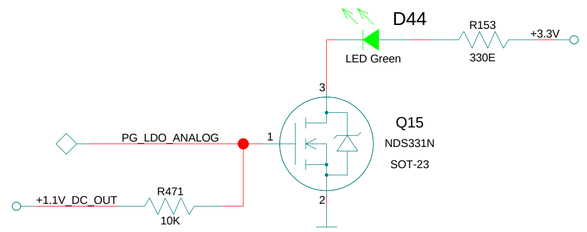




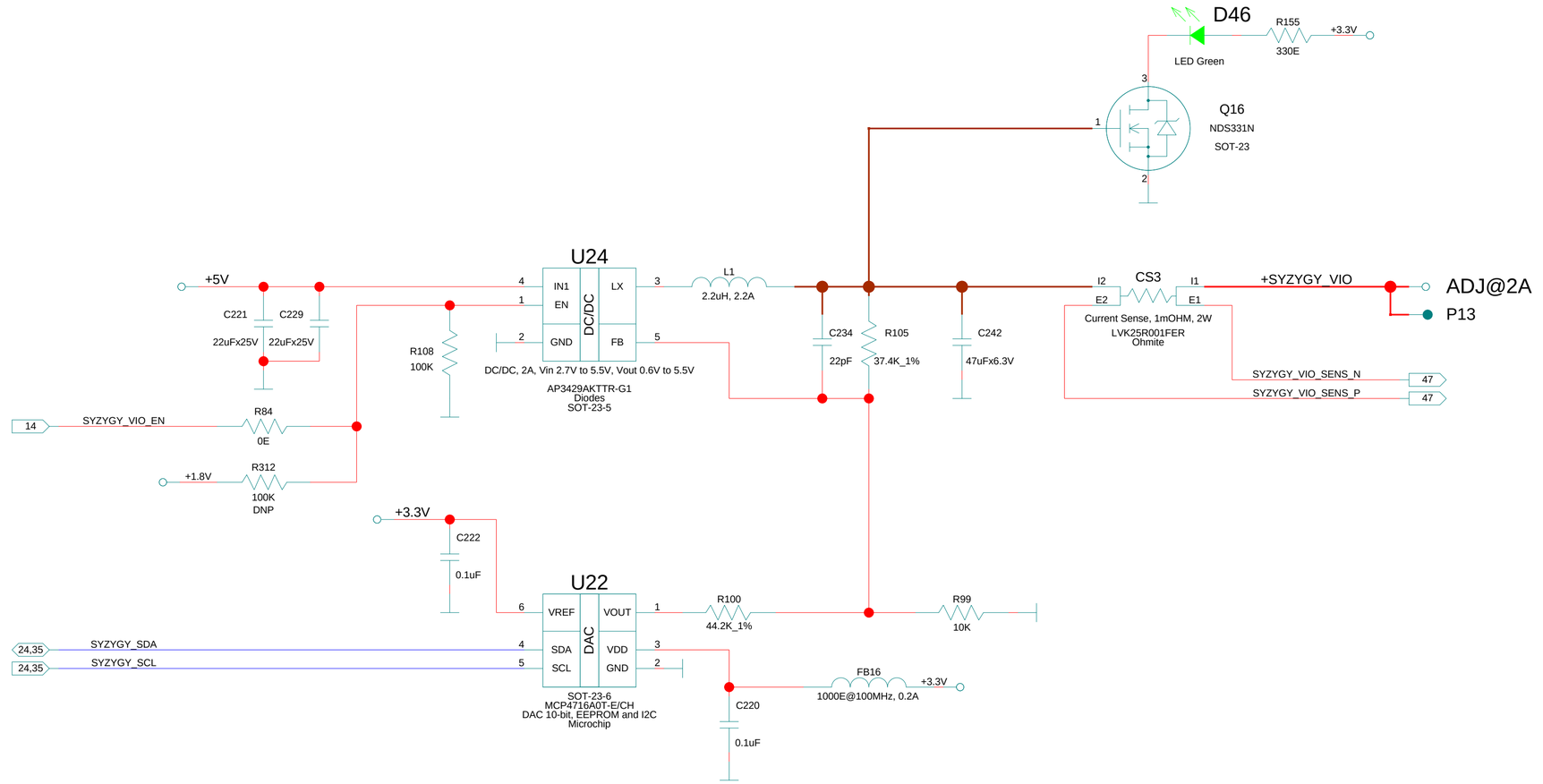






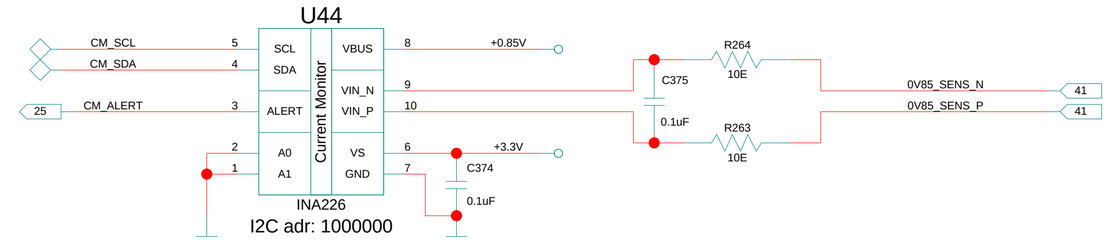


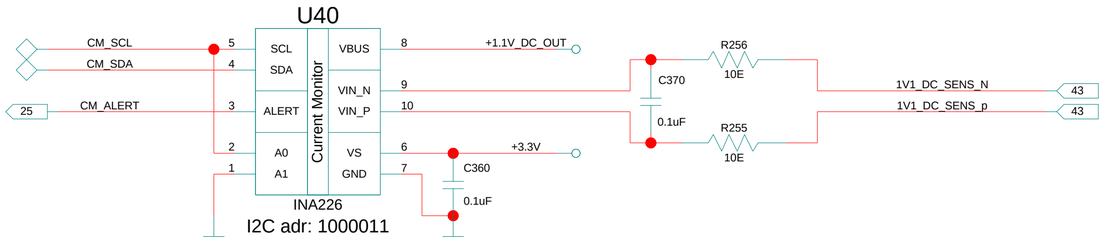
HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP PWR 5 RF LDO			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 45 OF 49	

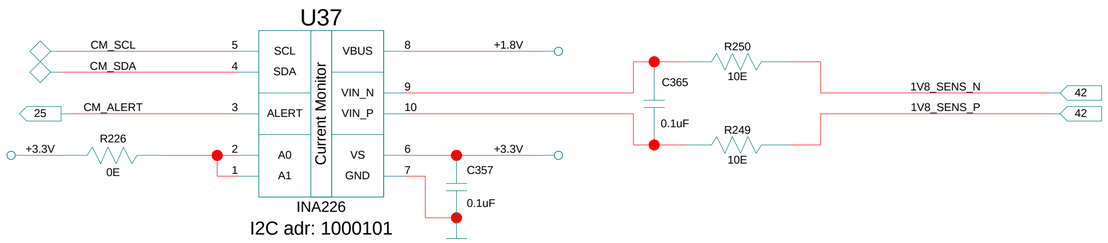


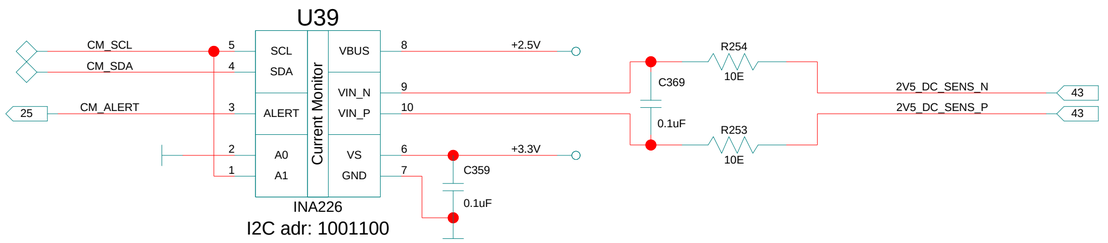
VOUT	DAC Code	DAC Voltage
3.3V	18	0.058V
2.5V	312	1.005V
1.8V	569	1.833V
1.2V	789	2.542V

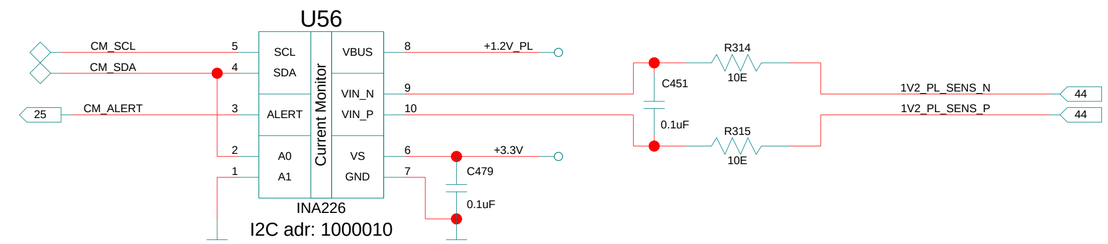
HiTech Global Distribution, LLC. www.HiTechGlobal.com			PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP PWR 6 SYZYGY			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI		SHEET 46 OF 49

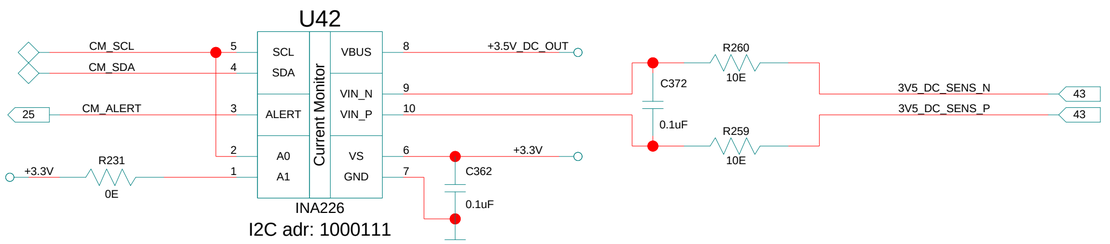


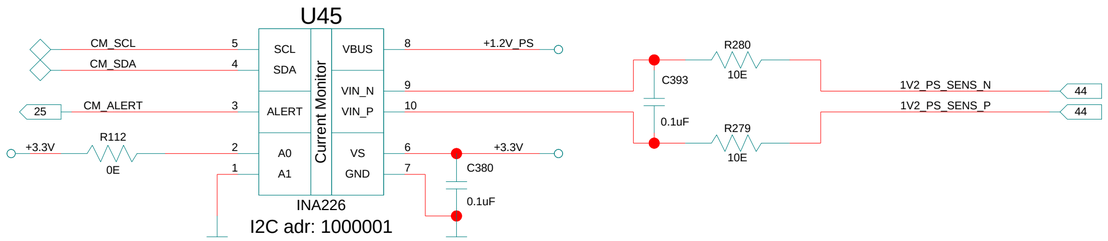


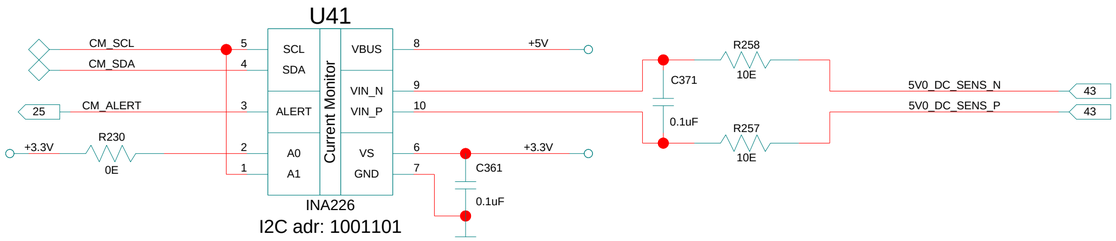


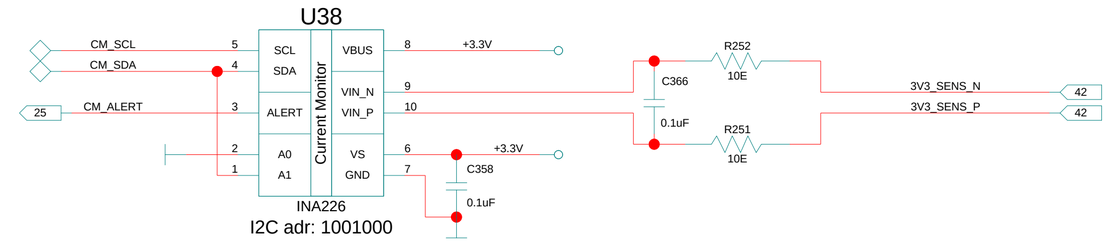


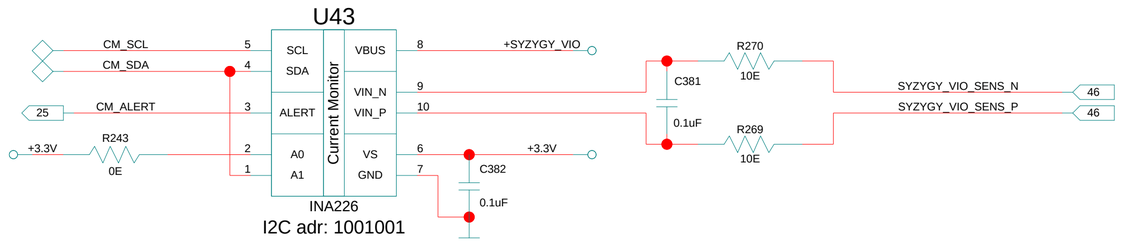


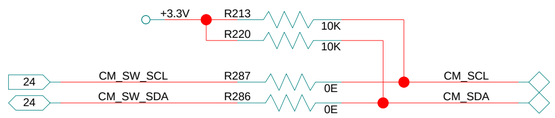




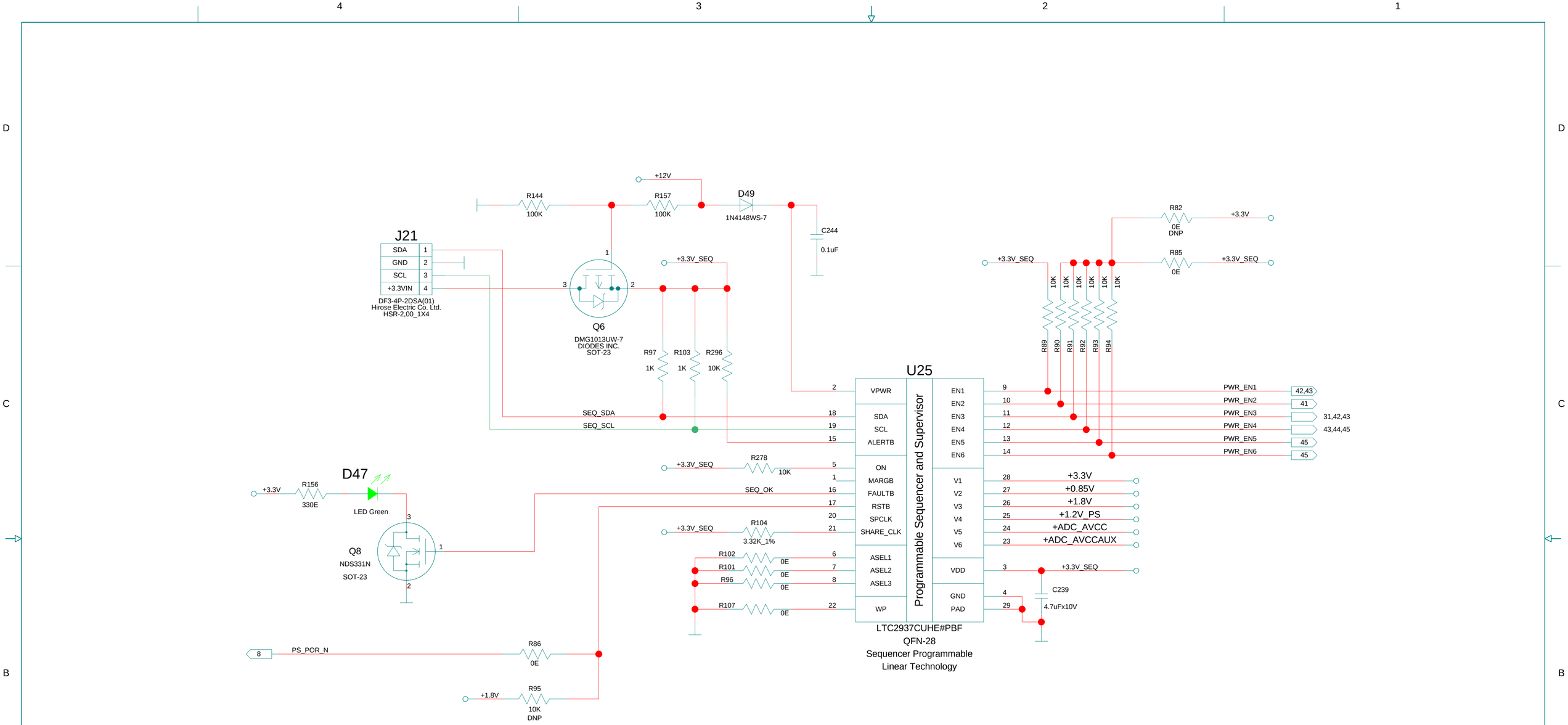






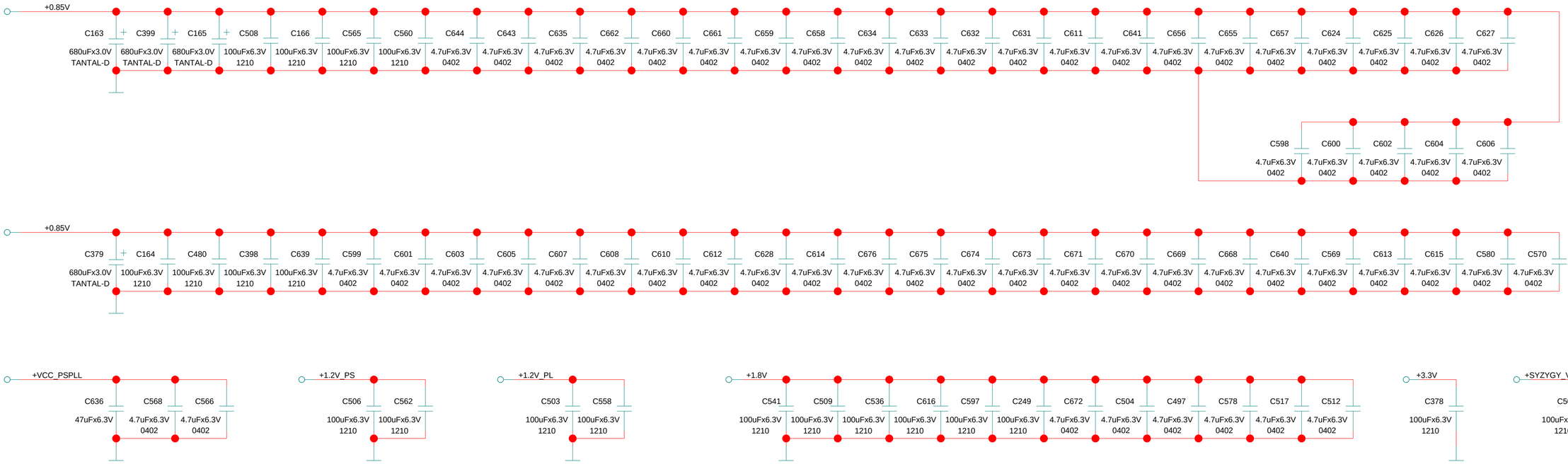


HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP Current Monitor			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 47 OF 49	



HiTech Global Distribution, LLC. www.HiTechGlobal.com		PCB P/N: ASSY P/N:	
TITLE: HTG-ZRF2-XUP Sequencer			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
DESIGNED BY: IVI		SHEET 48 OF 49	

IVILab



HiTech Global Distribution, LLC. www.HiTechGlobal.com			PCB P/N: ASSY P/N:
TITLE: HTG-ZRF2-XUP CAPs			
SIZE C	DATE 19/11/2020:17:44	DWG. NO.	REV 1.1
	DESIGNED BY: IVI		SHEET 49 OF 49