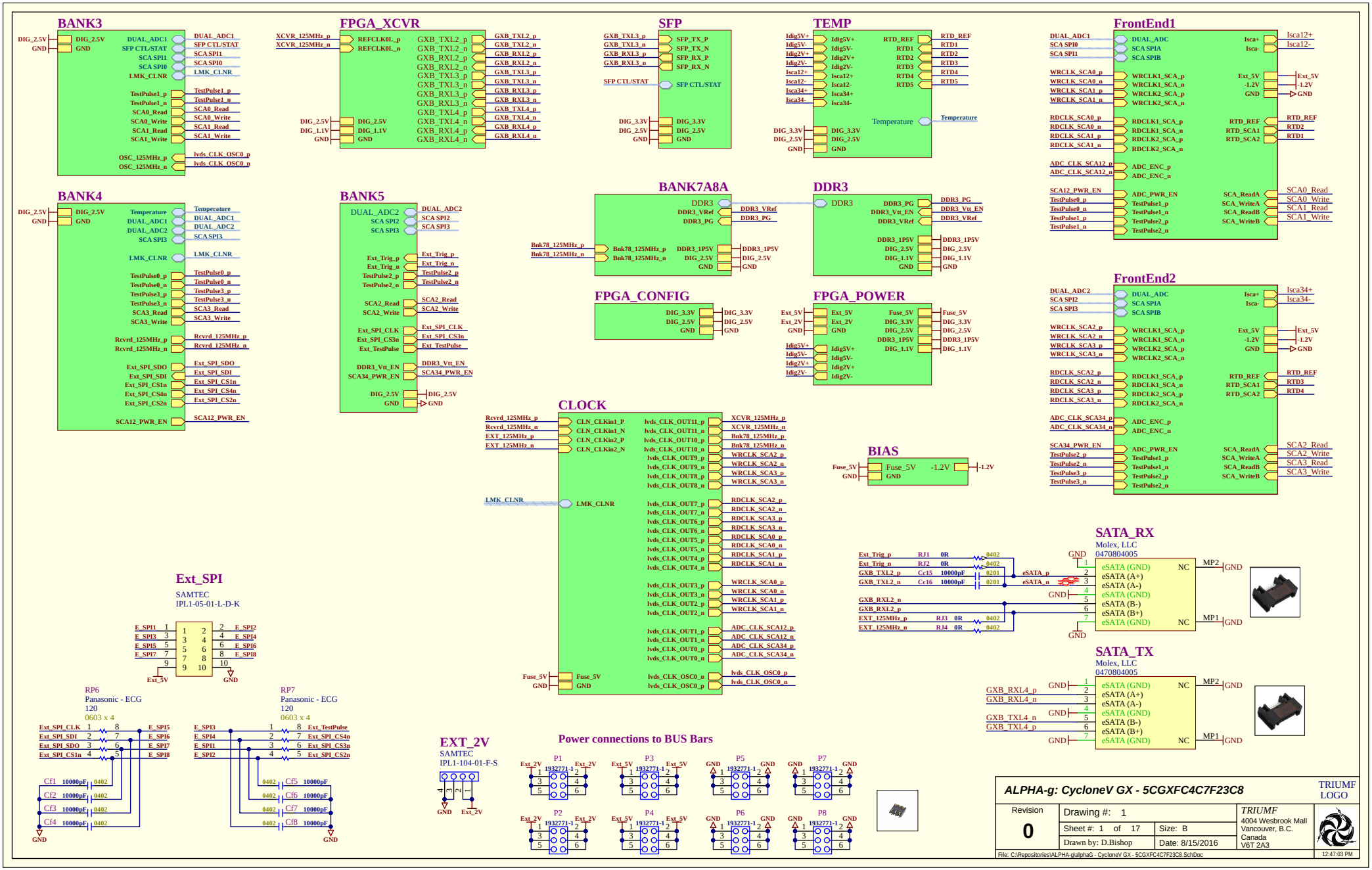
BANK3
FPGA_XCVR
SFP
TEMP
FrontEnd1
BANK4
BANK5
BANK7A8A
DDR3
FrontEnd2
FPGA_CONFIG
FPGA_POWER
CLOCK
BIAS
SATA_RX
Molex, LLC
0470804005
SATA_TX
Molex, LLC
0470804005
Ext_SPI
SAMTEC
IPL1-05-01-L-D-K
RP6
Panasonic - ECG
120
0603 x 4
RP7
Panasonic - ECG
120
0603 x 4
EXT_2V
SAMTEC
IPL1-104-01-F-S
Power connections to BUS Bars
ALPHA-g: CycloneV GX - 5CGXFC4C7F23C8
TRIUMF
LOGO
Revision
0
Drawing #: 1
Sheet #: 1 of 17
Size: B
Drawn by: D.Bishop
Date: 8/15/2016
TRIUMF
4004 Wesbrook Mall
Vancouver, B.C.
Canada
V6T 2A3
File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - 5CGXFC4C7F23C8.SchDoc
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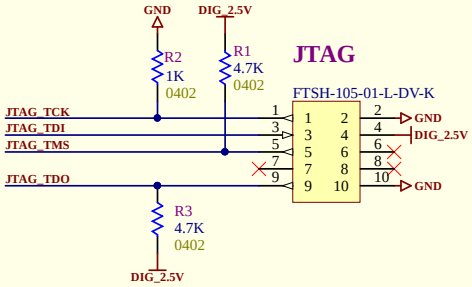

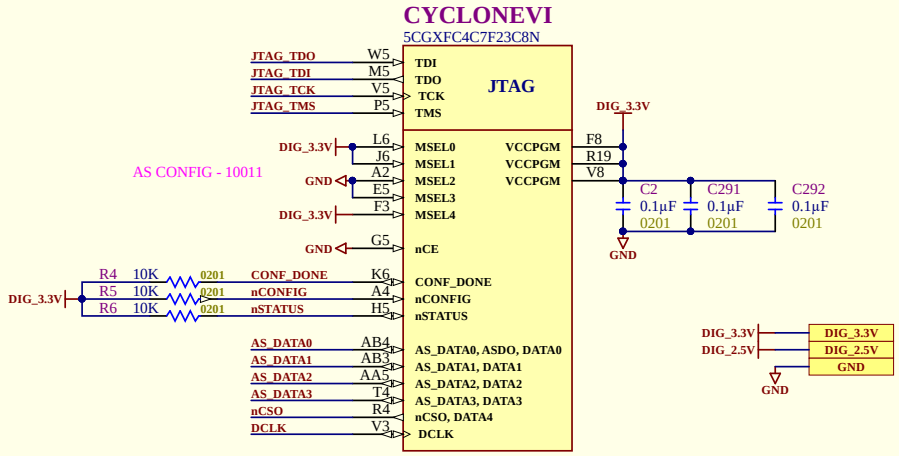

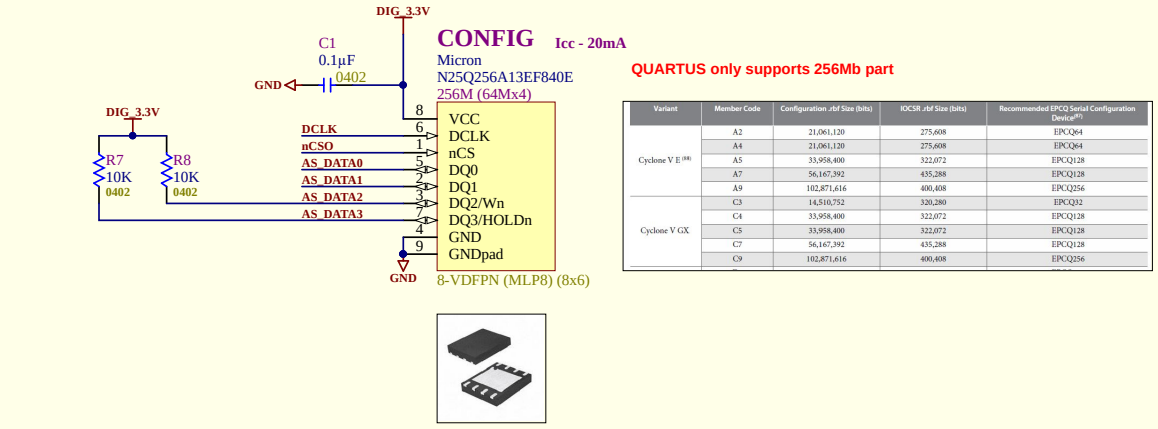

Variant	Member Code	Configuration .rbf Size (bits)	IOCSR .rbf Size (bits)	Recommended EPCQ Serial Configuration Device[#1]
Cyclone V E [##]	A2	21,061,120	275,608	EPCQ64
	A4	21,061,120	275,608	EPCQ64
	A5	33,958,400	322,072	EPCQ128
	A7	56,167,392	435,288	EPCQ128
	A9	102,871,616	400,408	EPCQ256
Cyclone V GX	C3	14,510,752	320,280	EPCQ32
	C4	33,958,400	322,072	EPCQ128
	C5	33,958,400	322,072	EPCQ128
	C7	56,167,392	435,288	EPCQ128
	C9	102,871,616	400,408	EPCQ256

ALPHA-g: CycloneV GX - FPGA Configuration

Revision	Drawing #: 2		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
0	Sheet #: 2 of 17	Size: A	
	Drawn by: D. Bishop	Date: 8/15/2016	

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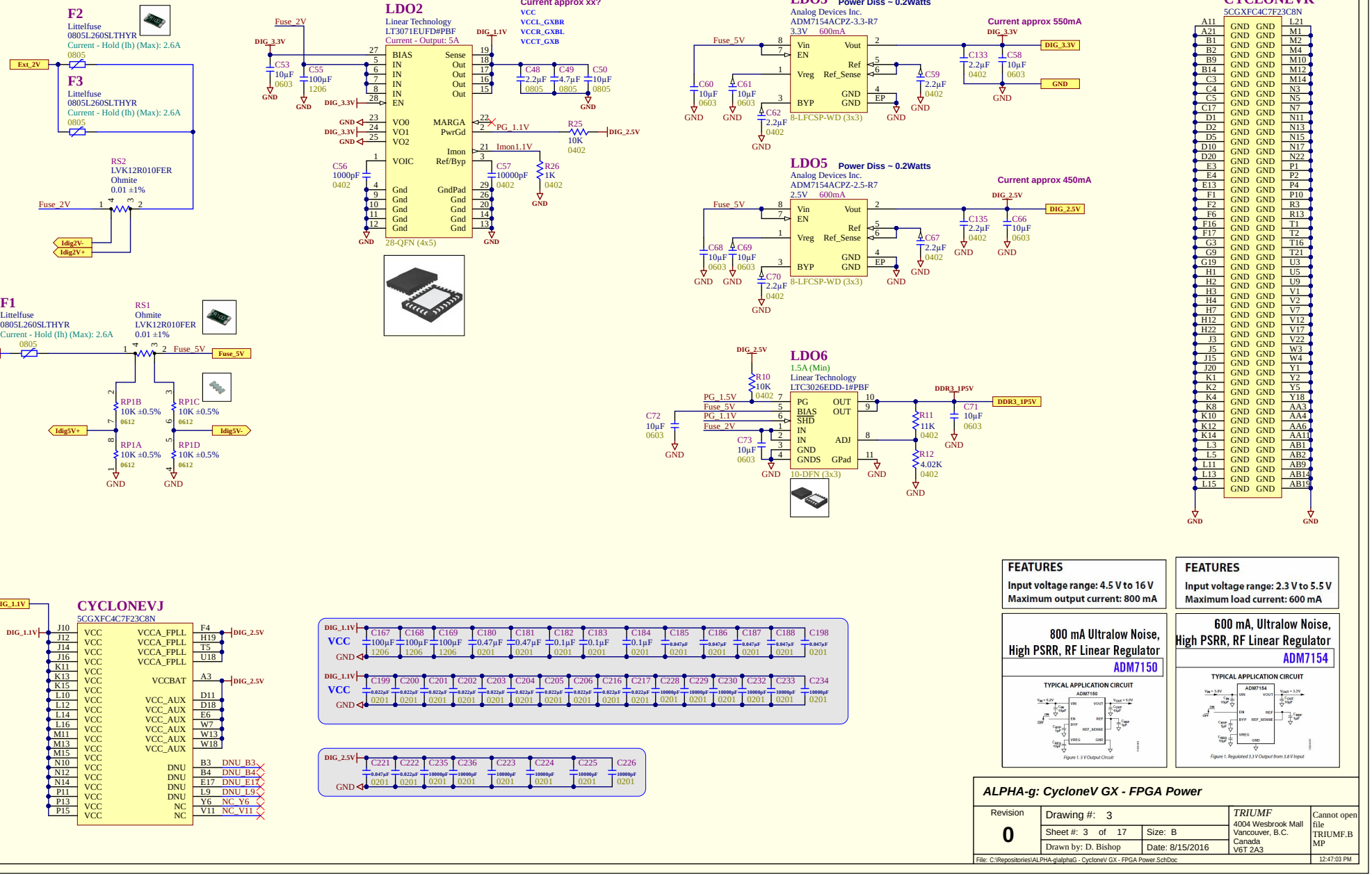
F2
Littelfuse
0805L260SLTHYR
Current - Hold (Ih) (Max): 2.6A
0805
F3
Littelfuse
0805L260SLTHYR
Current - Hold (Ih) (Max): 2.6A
0805
Ext_2V
RS2
LVK12R010FER
Ohmite
0.01 ±1%
Fuse_2V
Idig2V-
Idig2V+
LDO2
Linear Technology
LT3071EUFD#PBF
Current - Output: 5A
Power Diss ~ 1.8Watts
Current approx xx?
VCC
VCCL_GXBR
VCCR_GXBL
VCCT_GXB
28-QFN (4x5)
DIG_3.3V
DIG_1.1V
DIG_2.5V
PG_1.1V
Imon1.1V
LDO3
Power Diss ~ 0.2Watts
Analog Devices Inc.
ADM7154ACPZ-3.3-R7
3.3V 600mA
Current approx 550mA
8-LFCSP-WD (3x3)
LDO5
Power Diss ~ 0.2Watts
Analog Devices Inc.
ADM7154ACPZ-2.5-R7
2.5V 600mA
Current approx 450mA
8-LFCSP-WD (3x3)
F1
Littelfuse
0805L260SLTHYR
Current - Hold (Ih) (Max): 2.6A
0805
RS1
Ohmite
LVK12R010FER
0.01 ±1%
Ext_5V
Fuse_5V
RP1B 10K ±0.5% 0612
RP1C 10K ±0.5% 0612
RP1A 10K ±0.5% 0612
RP1D 10K ±0.5% 0612
Idig5V+
Idig5V-
LDO6
1.5A (Min)
Linear Technology
LTC3026EDD-1#PBF
10-DFN (3x3)
DDR3_1P5V
PG_1.5V
CYCLONEVK
5CGXFC4C7F23C8N
CYCLONEVJ
5CGXFC4C7F23C8N
VCC
GND
FEATURES
Input voltage range: 4.5 V to 16 V
Maximum output current: 800 mA
800 mA Ultralow Noise, High PSRR, RF Linear Regulator
ADM7150
TYPICAL APPLICATION CIRCUIT
FEATURES
Input voltage range: 2.3 V to 5.5 V
Maximum load current: 600 mA
600 mA, Ultralow Noise, High PSRR, RF Linear Regulator
ADM7154
TYPICAL APPLICATION CIRCUIT
ALPHA-g: CycloneV GX - FPGA Power
Revision
0
Drawing #: 3
Sheet #: 3 of 17
Size: B
Drawn by: D. Bishop
Date: 8/15/2016
TRIUMF
4004 Wesbrook Mall
Vancouver, B.C.
Canada
V6T 2A3
Cannot open file TRIUMF.BMP
File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - FPGA Power.SchDoc
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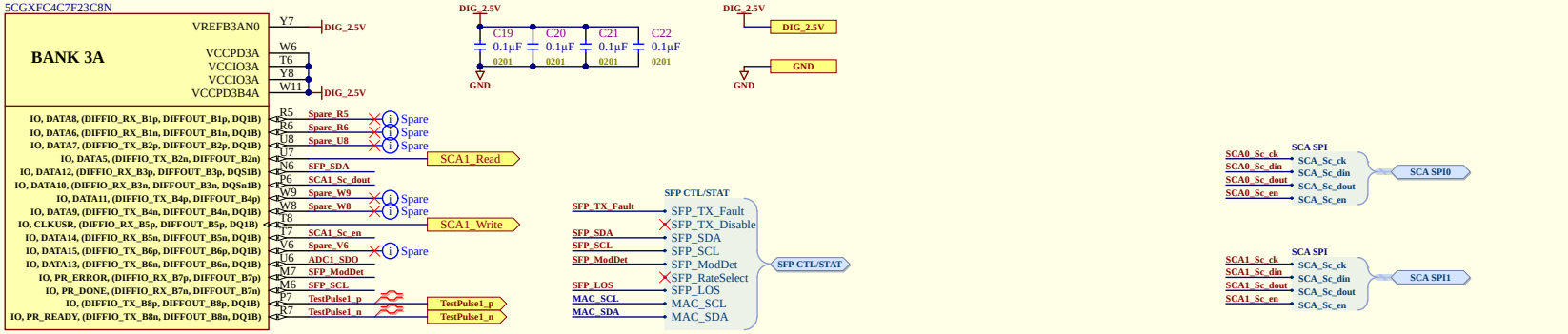
CYCLONEVA

5CGXFC4C7F23C8N



CYCLONEVB

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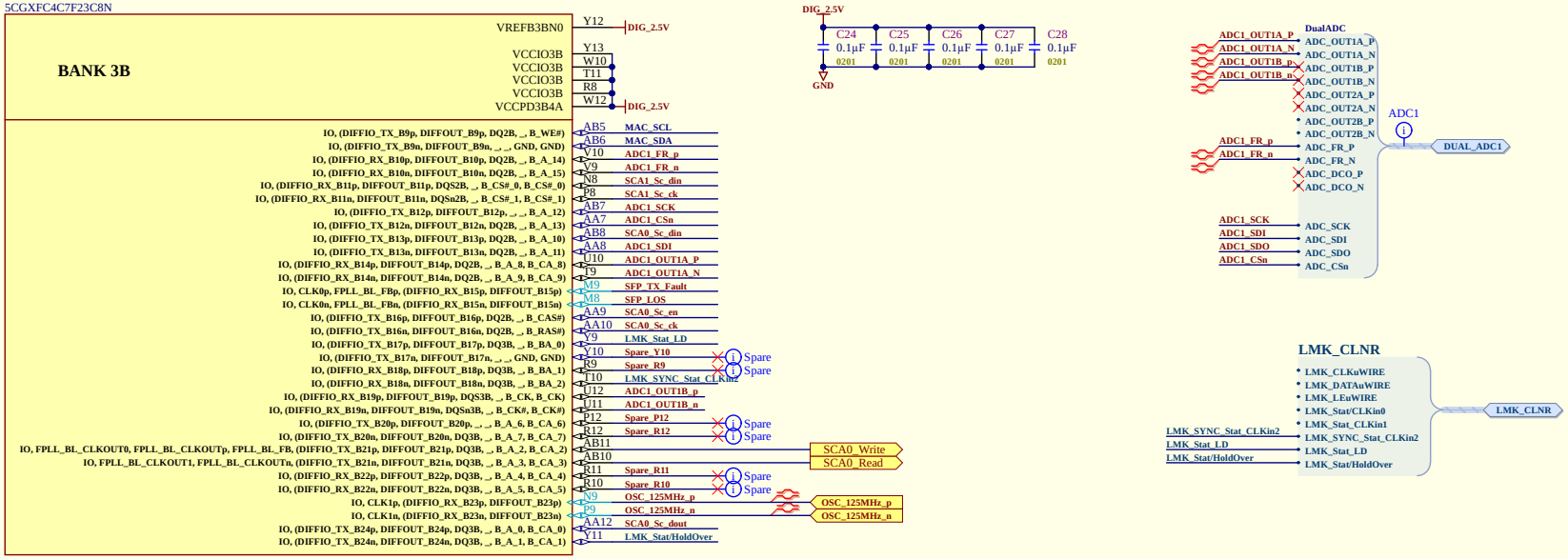

ALPHA-g: CycloneV GX - FPGA Bank4			
Revision **0**	Drawing #: 4		*TRIUMF* 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 4 of 17	Size: B	
	Drawn by: D. Bishop	Date: 8/15/2016	
File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - BANK3.SchDoc			12:47:03 PM

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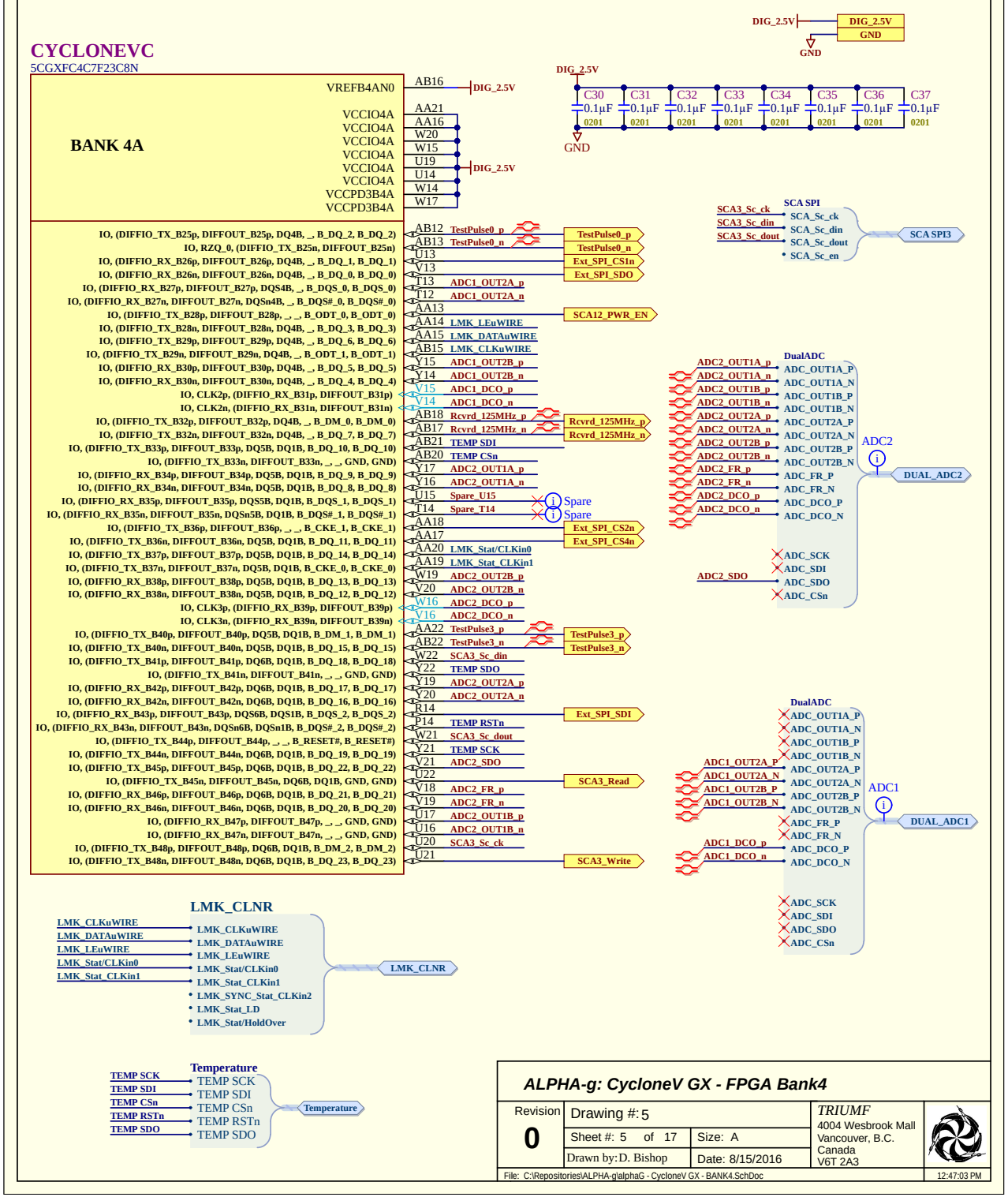
CYCLONEVC
5CGXFC4C7F23C8N
BANK 4A
VREFB4AN0
VCCIO4A
VCCPD3B4A
DIG_2.5V
GND
C30 C31 C32 C33 C34 C35 C36 C37
0.1µF
0201
IO, (DIFFIO_TX_B25p, DIFFOUT_B25p, DQ4B, _, B_DQ_2, B_DQ_2)
IO, RZQ_0, (DIFFIO_TX_B25n, DIFFOUT_B25n)
IO, (DIFFIO_RX_B26p, DIFFOUT_B26p, DQ4B, _, B_DQ_1, B_DQ_1)
IO, (DIFFIO_RX_B26n, DIFFOUT_B26n, DQ4B, _, B_DQ_0, B_DQ_0)
IO, (DIFFIO_RX_B27p, DIFFOUT_B27p, DQS4B, _, B_DQS_0, B_DQS_0)
IO, (DIFFIO_RX_B27n, DIFFOUT_B27n, DQSn4B, _, B_DQS#_0, B_DQS#_0)
IO, (DIFFIO_TX_B28p, DIFFOUT_B28p, _, _, B_ODT_0, B_ODT_0)
IO, (DIFFIO_TX_B28n, DIFFOUT_B28n, DQ4B, _, B_DQ_3, B_DQ_3)
IO, (DIFFIO_TX_B29p, DIFFOUT_B29p, DQ4B, _, B_DQ_6, B_DQ_6)
IO, (DIFFIO_TX_B29n, DIFFOUT_B29n, DQ4B, _, B_ODT_1, B_ODT_1)
IO, (DIFFIO_RX_B30p, DIFFOUT_B30p, DQ4B, _, B_DQ_5, B_DQ_5)
IO, (DIFFIO_RX_B30n, DIFFOUT_B30n, DQ4B, _, B_DQ_4, B_DQ_4)
IO, CLK2p, (DIFFIO_RX_B31p, DIFFOUT_B31p)
IO, CLK2n, (DIFFIO_RX_B31n, DIFFOUT_B31n)
IO, (DIFFIO_TX_B32p, DIFFOUT_B32p, DQ4B, _, B_DM_0, B_DM_0)
IO, (DIFFIO_TX_B32n, DIFFOUT_B32n, DQ4B, _, B_DQ_7, B_DQ_7)
IO, (DIFFIO_TX_B33p, DIFFOUT_B33p, DQ5B, DQ1B, B_DQ_10, B_DQ_10)
IO, (DIFFIO_TX_B33n, DIFFOUT_B33n, _, _, GND, GND)
IO, (DIFFIO_RX_B34p, DIFFOUT_B34p, DQ5B, DQ1B, B_DQ_9, B_DQ_9)
IO, (DIFFIO_RX_B34n, DIFFOUT_B34n, DQ5B, DQ1B, B_DQ_8, B_DQ_8)
IO, (DIFFIO_RX_B35p, DIFFOUT_B35p, DQS5B, DQ1B, B_DQS_1, B_DQS_1)
IO, (DIFFIO_RX_B35n, DIFFOUT_B35n, DQSn5B, DQ1B, B_DQS#_1, B_DQS#_1)
IO, (DIFFIO_TX_B36p, DIFFOUT_B36p, _, _, B_CKE_1, B_CKE_1)
IO, (DIFFIO_TX_B36n, DIFFOUT_B36n, DQ5B, DQ1B, B_DQ_11, B_DQ_11)
IO, (DIFFIO_TX_B37p, DIFFOUT_B37p, DQ5B, DQ1B, B_DQ_14, B_DQ_14)
IO, (DIFFIO_TX_B37n, DIFFOUT_B37n, DQ5B, DQ1B, B_CKE_0, B_CKE_0)
IO, (DIFFIO_RX_B38p, DIFFOUT_B38p, DQ5B, DQ1B, B_DQ_13, B_DQ_13)
IO, (DIFFIO_RX_B38n, DIFFOUT_B38n, DQ5B, DQ1B, B_DQ_12, B_DQ_12)
IO, CLK3p, (DIFFIO_RX_B39p, DIFFOUT_B39p)
IO, CLK3n, (DIFFIO_RX_B39n, DIFFOUT_B39n)
IO, (DIFFIO_TX_B40p, DIFFOUT_B40p, DQ5B, DQ1B, B_DM_1, B_DM_1)
IO, (DIFFIO_TX_B40n, DIFFOUT_B40n, DQ5B, DQ1B, B_DQ_15, B_DQ_15)
IO, (DIFFIO_TX_B41p, DIFFOUT_B41p, DQ6B, DQ1B, B_DQ_18, B_DQ_18)
IO, (DIFFIO_TX_B41n, DIFFOUT_B41n, _, _, GND, GND)
IO, (DIFFIO_RX_B42p, DIFFOUT_B42p, DQ6B, DQ1B, B_DQ_17, B_DQ_17)
IO, (DIFFIO_RX_B42n, DIFFOUT_B42n, DQ6B, DQ1B, B_DQ_16, B_DQ_16)
IO, (DIFFIO_RX_B43p, DIFFOUT_B43p, DQS6B, DQS1B, B_DQS_2, B_DQS_2)
IO, (DIFFIO_RX_B43n, DIFFOUT_B43n, DQSn6B, DQSn1B, B_DQS#_2, B_DQS#_2)
IO, (DIFFIO_TX_B44p, DIFFOUT_B44p, _, _, B_RESET#, B_RESET#)
IO, (DIFFIO_TX_B44n, DIFFOUT_B44n, DQ6B, DQ1B, B_DQ_19, B_DQ_19)
IO, (DIFFIO_TX_B45p, DIFFOUT_B45p, DQ6B, DQ1B, B_DQ_22, B_DQ_22)
IO, (DIFFIO_TX_B45n, DIFFOUT_B45n, DQ6B, DQ1B, GND, GND)
IO, (DIFFIO_RX_B46p, DIFFOUT_B46p, DQ6B, DQ1B, B_DQ_21, B_DQ_21)
IO, (DIFFIO_RX_B46n, DIFFOUT_B46n, DQ6B, DQ1B, B_DQ_20, B_DQ_20)
IO, (DIFFIO_RX_B47p, DIFFOUT_B47p, _, _, GND, GND)
IO, (DIFFIO_RX_B47n, DIFFOUT_B47n, _, _, GND, GND)
IO, (DIFFIO_TX_B48p, DIFFOUT_B48p, DQ6B, DQ1B, B_DM_2, B_DM_2)
IO, (DIFFIO_TX_B48n, DIFFOUT_B48n, DQ6B, DQ1B, B_DQ_23, B_DQ_23)
TestPulse0_p
TestPulse0_n
Ext_SPI_CS1n
Ext_SPI_SDO
ADC1_OUT2A_p
ADC1_OUT2A_n
SCA12_PWR_EN
LMK_LEuWIRE
LMK_DATAuWIRE
LMK_CLKuWIRE
ADC1_OUT2B_p
ADC1_OUT2B_n
ADC1_DCO_p
ADC1_DCO_n
Rcvrd_125MHz_p
Rcvrd_125MHz_n
TEMP SDI
TEMP CSn
ADC2_OUT1A_p
ADC2_OUT1A_n
Spare_U15
Spare_T14
Spare
Ext_SPI_CS2n
Ext_SPI_CS4n
LMK_Stat/CLKin0
LMK_Stat_CLKin1
ADC2_OUT2B_p
ADC2_OUT2B_n
ADC2_DCO_p
ADC2_DCO_n
TestPulse3_p
TestPulse3_n
SCA3_Sc_din
TEMP SDO
ADC2_OUT2A_p
ADC2_OUT2A_n
TEMP RSTn
SCA3_Sc_dout
TEMP SCK
ADC2_SDO
Ext_SPI_SDI
SCA3_Read
ADC2_FR_p
ADC2_FR_n
ADC2_OUT1B_p
ADC2_OUT1B_n
SCA3_Sc_ck
SCA3_Write
SCA SPI
SCA_Sc_ck
SCA_Sc_din
SCA_Sc_dout
SCA_Sc_en
SCA SPI3
DualADC
ADC_OUT1A_P
ADC_OUT1A_N
ADC_OUT1B_P
ADC_OUT1B_N
ADC_OUT2A_P
ADC_OUT2A_N
ADC_OUT2B_P
ADC_OUT2B_N
ADC_FR_P
ADC_FR_N
ADC_DCO_P
ADC_DCO_N
ADC_SCK
ADC_SDI
ADC_SDO
ADC_CSn
ADC2
DUAL_ADC2
ADC1
DUAL_ADC1
LMK_CLNR
LMK_SYNC_Stat_CLKin2
LMK_Stat_LD
LMK_Stat/HoldOver
Temperature
ALPHA-g: CycloneV GX - FPGA Bank4
Revision
0
Drawing #: 5
Sheet #: 5 of 17
Size: A
Drawn by: D. Bishop
Date: 8/15/2016
TRIUMF
4004 Wesbrook Mall
Vancouver, B.C.
Canada
V6T 2A3
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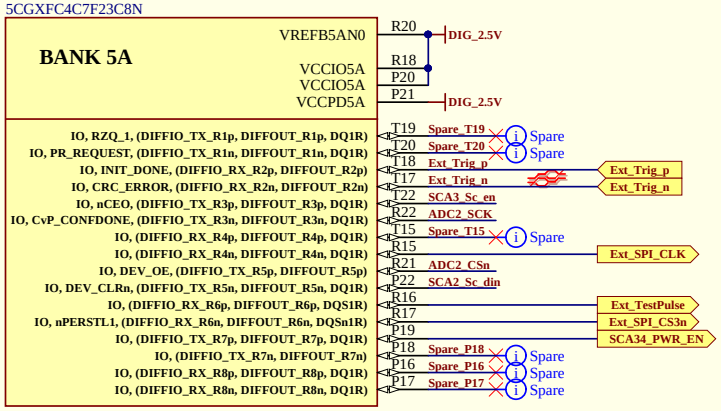
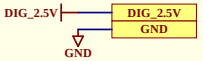
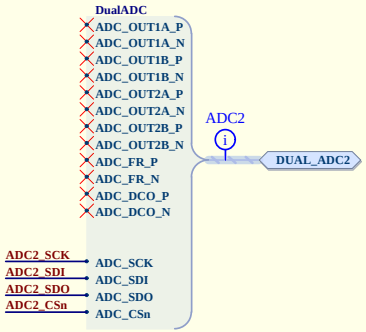
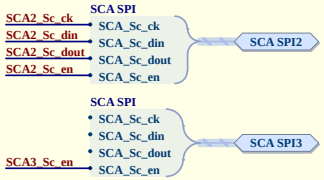
CYCLONEVD

5CGXFC4C7F23C8N









CYCLONEVE

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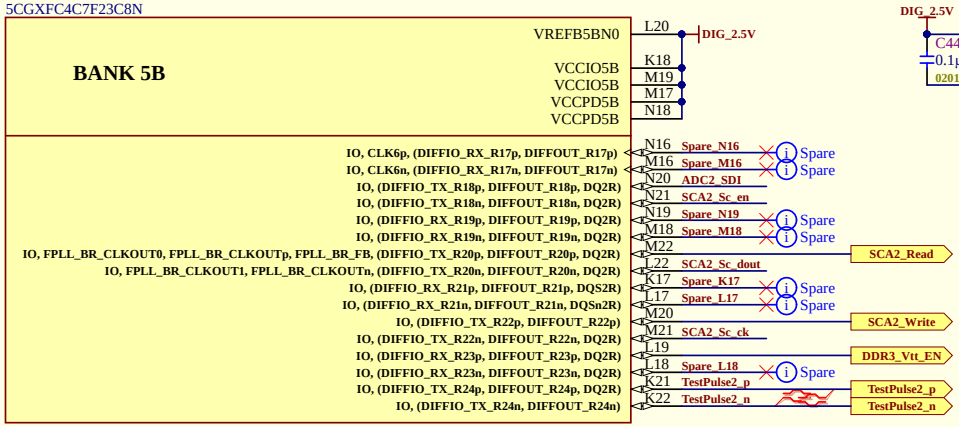

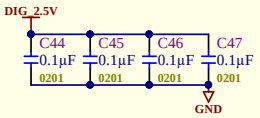

ALPHA-g: CycloneV GX - FPGA BANK5

Revision	Drawing #: 6		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
0	Sheet #: 6 of 17	Size: A	
	Drawn by: D. Bishop	Date: 8/15/2016	

File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - FPGA BANK5.SchDoc 12:47:04 PM

CYCLONEVG

5CGXFC4C7F23C8N

BANK 8A

VREFB8AN0 ← DDR3_VRef (B8) → DDR3_VRef; C74 0.1µF 0201 → GND

VCCIO8A (A6, C7, E8, G7) ← DDR3_1P5V

VCCPD7A8A (D14, D16, E11) ← DIG_2.5V

IO, CLK9p, (DIFFIO_RX_T41p, DIFFOUT_T41p)	G10	B8A_G10 → B8A_SPR_Clk
IO, CLK9n, (DIFFIO_RX_T41n, DIFFOUT_T41n)	E10	B8A_F10 → B8A_SPR_Clk
IO, (DIFFIO_TX_T42p, DIFFOUT_T42p, DQ6T, _, T_A_8, T_CA_8)	F7	DDR3_A0
IO, (DIFFIO_TX_T42n, DIFFOUT_T42n, DQ6T, _, T_A_1, T_CA_1)	K7	DDR3_A1
IO, (DIFFIO_RX_T43p, DIFFOUT_T43p, DQ6T, _, T_A_4, T_CA_4)	F7	DDR3_A4
IO, (DIFFIO_RX_T43n, DIFFOUT_T43n, DQ6T, _, T_A_5, T_CA_5)	J8	DDR3_A5
IO, FPLL_TL_CLKOUT0, FPLL_TL_CLKOUTp, FPLL_TL_FB, (DIFFIO_TX_T44p, DIFFOUT_T44p, DQ6T, _, T_A_2, T_CA_2)	H8	DDR3_A2
IO, FPLL_TL_CLKOUT1, FPLL_TL_CLKOUTn, (DIFFIO_TX_T44n, DIFFOUT_T44n, DQ6T, _, T_A_3, T_CA_3)	G8	DDR3_A3
IO, (DIFFIO_RX_T45p, DIFFOUT_T45p, DQS6T, _, T_CK, T_CK)	F9	DDR3_CK_p
IO, (DIFFIO_RX_T45n, DIFFOUT_T45n, DQSn6T, _, T_CK#, T_CK#)	H9	DDR3_CK_n
IO, (DIFFIO_TX_T46p, DIFFOUT_T46p, _, _, T_A_6, T_CA_6)	A10	DDR3_A6
IO, (DIFFIO_TX_T46n, DIFFOUT_T46n, DQ6T, _, T_A_7, T_CA_7)	A9	DDR3_A7
IO, (DIFFIO_RX_T47p, DIFFOUT_T47p, DQ6T, _, T_BA_1)	B10	DDR3_BA1
IO, (DIFFIO_RX_T47n, DIFFOUT_T47n, DQ6T, _, T_BA_2)	C9	DDR3_BA2
IO, (DIFFIO_TX_T48p, DIFFOUT_T48p, DQ6T, _, T_BA_0)	A8	DDR3_BA0
IO, (DIFFIO_TX_T48n, DIFFOUT_T48n, _, _, GND, GND)	B5	B8A_B5 → B8A_SPR
IO, CLK8p, FPLL_TL_FBp, (DIFFIO_RX_T49p, DIFFOUT_T49p)	E10	B8A_E10 → B8A_SPR_Clk
IO, CLK8n, FPLL_TL_FBn, (DIFFIO_RX_T49n, DIFFOUT_T49n)	F9	B8A_F9 → B8A_SPR_Clk
IO, (DIFFIO_TX_T50p, DIFFOUT_T50p, DQ7T, _, T_CAS#)	B6	DDR3_CASn
IO, (DIFFIO_TX_T50n, DIFFOUT_T50n, DQ7T, _, T_RAS#)	B7	DDR3_RASn
IO, (DIFFIO_RX_T51p, DIFFOUT_T51p, DQ7T, _, T_A_8, T_CA_8)	A8	DDR3_A8
IO, (DIFFIO_RX_T51n, DIFFOUT_T51n, DQ7T, _, T_A_9, T_CA_9)	A7	DDR3_A9
IO, (DIFFIO_TX_T52p, DIFFOUT_T52p, DQ7T, _, T_A_10)	A6	DDR3_A10
IO, (DIFFIO_TX_T52n, DIFFOUT_T52n, DQ7T, _, T_A_11)	D6	DDR3_A11
IO, (DIFFIO_RX_T53p, DIFFOUT_T53p, DQS7T, _, T_CS#_0, T_CS#_0)	E9	DDR3_CSn
IO, (DIFFIO_RX_T53n, DIFFOUT_T53n, DQSn7T, _, T_CS#_1, T_CS#_1)	D9	B8A_D9 → B8A_SPR
IO, (DIFFIO_TX_T54p, DIFFOUT_T54p, _, _, T_A_12)	B7	DDR3_A12
IO, (DIFFIO_TX_T54n, DIFFOUT_T54n, DQ7T, _, T_A_13)	E8	DDR3_A13
IO, (DIFFIO_RX_T55p, DIFFOUT_T55p, DQ7T, _, T_A_14)	G6	B8A_G6 → B8A_SPR
IO, (DIFFIO_RX_T55n, DIFFOUT_T55n, DQ7T, _, T_A_15)	H6	B8A_H6 → B8A_SPR
IO, (DIFFIO_TX_T56p, DIFFOUT_T56p, DQ7T, _, T_WE#)	F7	DDR3_WEn
IO, (DIFFIO_TX_T56n, DIFFOUT_T56n, _, _, GND, GND)	E7	B8A_E7 → B8A_SPR

DDR3_1P5V → DDR3_1P5V; DIG_2.5V → DIG_2.5V; GND → GND

Banks 7 and 8 set to 1.5V
Used for DDR3 hard memory controller

CYCLONEVF

5CGXFC4C7F23C8N

BANK 7A

VREFB7AN0 ← DDR3_VRef (C14); C75 0.1µF 0201 → GND

VCCIO7A (A16, B19, C12, C22, D15, E18, F11, F21, G14, H17) ← DDR3_1P5V

VCCPD7A8A (C10, D8) ← DIG_2.5V

IO, (DIFFIO_RX_T1p, DIFFOUT_T1p, _, _, GND, GND)	H21	B7A_H21
IO, (DIFFIO_RX_T1n, DIFFOUT_T1n, _, _, GND, GND)	G21	B7A_G21 → B7A_SPR
IO, (DIFFIO_TX_T2p, DIFFOUT_T2p, DQ1T, DQ1T, T_DM_4, T_DM_4)	E21	B7A_E21 → B7A_SPR
IO, (DIFFIO_TX_T2n, DIFFOUT_T2n, DQ1T, DQ1T, T_DQ_39, T_DQ_39)	F21	DDR3_PG
IO, (DIFFIO_RX_T3p, DIFFOUT_T3p, DQ1T, DQ1T, T_DQ_37, T_DQ_37)	E19	B7A_E19 → B7A_SPR
IO, (DIFFIO_RX_T3n, DIFFOUT_T3n, DQ1T, DQ1T, T_DQ_36, T_DQ_36)	D19	B7A_D19 → B7A_SPR
IO, (DIFFIO_TX_T4p, DIFFOUT_T4p, DQ1T, DQ1T, T_DQ_38, T_DQ_38)	C20	B7A_C20 → B7A_SPR
IO, (DIFFIO_TX_T4n, DIFFOUT_T4n, DQ1T, DQ1T, GND, GND)	B20	B7A_B20 → B7A_SPR
IO, (DIFFIO_RX_T5p, DIFFOUT_T5p, DQS1T, DQS1T, T_DQS_4, T_DQS_4)	J21	B7A_J21 → B7A_SPR
IO, (DIFFIO_RX_T5n, DIFFOUT_T5n, DQSn1T, DQSn1T, T_DQS#_4, T_DQS#_4)	J22	B7A_J22 → B7A_SPR
IO, (DIFFIO_TX_T6p, DIFFOUT_T6p, _, _, GND, GND)	B18	B7A_B18 → B7A_SPR
IO, (DIFFIO_TX_T6n, DIFFOUT_T6n, DQ1T, DQ1T, T_DQ_35, T_DQ_35)	B17	B7A_B17 → B7A_SPR
IO, (DIFFIO_RX_T7p, DIFFOUT_T7p, DQ1T, DQ1T, T_DQ_33, T_DQ_33)	C21	B7A_C21 → B7A_SPR
IO, (DIFFIO_RX_T7n, DIFFOUT_T7n, DQ1T, DQ1T, T_DQ_32, T_DQ_32)	B21	B7A_B21 → B7A_SPR
IO, (DIFFIO_TX_T8p, DIFFOUT_T8p, DQ1T, DQ1T, T_DQ_34, T_DQ_34)	G22	B7A_G22 → B7A_SPR
IO, (DIFFIO_TX_T8n, DIFFOUT_T8n, _, _, GND, GND)	F22	B7A_F22 → B7A_SPR
IO, (DIFFIO_RX_T9p, DIFFOUT_T9p, _, _, GND, GND)	G20	B7A_G20 → B7A_SPR
IO, (DIFFIO_RX_T9n, DIFFOUT_T9n, _, _, GND, GND)	H20	B7A_H20 → B7A_SPR
IO, (DIFFIO_TX_T10p, DIFFOUT_T10p, DQ2T, DQ1T, T_DM_3, T_DM_3)	D22	DDR3_DM3
IO, (DIFFIO_TX_T10n, DIFFOUT_T10n, DQ2T, DQ1T, T_DQ_31, T_DQ_31)	D22	DDR3_DQ31
IO, (DIFFIO_RX_T11p, DIFFOUT_T11p, DQ2T, DQ1T, T_DQ_29, T_DQ_29)	C19	DDR3_DQ29
IO, (DIFFIO_RX_T11n, DIFFOUT_T11n, DQ2T, DQ1T, T_DQ_28, T_DQ_28)	F18	DDR3_DQ28
IO, (DIFFIO_TX_T12p, DIFFOUT_T12p, DQ2T, DQ1T, T_DQ_30, T_DQ_30)	B22	DDR3_DQ30
IO, (DIFFIO_TX_T12n, DIFFOUT_T12n, DQ2T, DQ1T, GND, GND)	A22	B7A_A22 → B7A_SPR
IO, (DIFFIO_RX_T13p, DIFFOUT_T13p, DQS2T, DQ1T, T_DQS_3, T_DQS_3)	C19	DDR3_DQS3_p
IO, (DIFFIO_RX_T13n, DIFFOUT_T13n, DQSn2T, DQ1T, T_DQS#_3, T_DQS#_3)	F18	DDR3_DQS3_n
IO, (DIFFIO_TX_T14p, DIFFOUT_T14p, _, _, GND, GND)	E20	B7A_E20 → B7A_SPR
IO, (DIFFIO_TX_T14n, DIFFOUT_T14n, DQ2T, DQ1T, T_DQ_27, T_DQ_27)	C20	DDR3_DQ27
IO, (DIFFIO_RX_T15p, DIFFOUT_T15p, DQ2T, DQ1T, T_DQ_25, T_DQ_25)	F18	DDR3_DQ25
IO, (DIFFIO_RX_T15n, DIFFOUT_T15n, DQ2T, DQ1T, T_DQ_24, T_DQ_24)	F17	DDR3_DQ24
IO, (DIFFIO_TX_T16p, DIFFOUT_T16p, DQ2T, DQ1T, T_DQ_26, T_DQ_26)	A20	DDR3_DQ26
IO, (DIFFIO_TX_T16n, DIFFOUT_T16n, _, _, GND, GND)	A19	B7A_A19 → B7A_SPR
IO, (DIFFIO_RX_T17p, DIFFOUT_T17p, _, _, GND, GND)	K20	B7A_K20 → B7A_SPR
IO, (DIFFIO_RX_T17n, DIFFOUT_T17n, _, _, GND, GND)	K19	B7A_K19 → B7A_SPR
IO, (DIFFIO_TX_T18p, DIFFOUT_T18p, DQ3T, DQ2T, T_DM_2, T_DM_2)	B16	DDR3_DM2
IO, (DIFFIO_TX_T18n, DIFFOUT_T18n, DQ3T, DQ2T, T_DQ_23, T_DQ_23)	B16	DDR3_DQ23
IO, (DIFFIO_RX_T19p, DIFFOUT_T19p, DQ3T, DQ2T, T_DQ_21, T_DQ_21)	J17	DDR3_DQ21
IO, (DIFFIO_RX_T19n, DIFFOUT_T19n, DQ3T, DQ2T, T_DQ_20, T_DQ_20)	G16	DDR3_DQ20
IO, (DIFFIO_TX_T20p, DIFFOUT_T20p, DQ3T, DQ2T, T_DQ_22, T_DQ_22)	G17	DDR3_DQ22
IO, (DIFFIO_TX_T20n, DIFFOUT_T20n, DQ3T, DQ2T, GND, GND)	G16	B7A_G16 → B7A_SPR
IO, (DIFFIO_RX_T21p, DIFFOUT_T21p, DQS3T, DQS2T, T_DQS_2, T_DQS_2)	G18	DDR3_DQS2_p
IO, (DIFFIO_RX_T21n, DIFFOUT_T21n, DQSn3T, DQSn2T, T_DQS#_2, T_DQS#_2)	H18	DDR3_DQS2_n
IO, (DIFFIO_TX_T22p, DIFFOUT_T22p, _, _, T_RESET#, T_RESET#)	J19	DDR3_ResetN
IO, (DIFFIO_TX_T22n, DIFFOUT_T22n, DQ3T, DQ2T, T_DQ_19, T_DQ_19)	J18	DDR3_DQ19
IO, (DIFFIO_RX_T23p, DIFFOUT_T23p, DQ3T, DQ2T, T_DQ_17, T_DQ_17)	K15	DDR3_DQ17
IO, (DIFFIO_RX_T23n, DIFFOUT_T23n, DQ3T, DQ2T, T_DQ_16, T_DQ_16)	L15	DDR3_DQ16
IO, (DIFFIO_TX_T24p, DIFFOUT_T24p, DQ3T, DQ2T, T_DQ_18, T_DQ_18)	K15	DDR3_DQ18
IO, (DIFFIO_TX_T24n, DIFFOUT_T24n, _, _, GND, GND)	K14	B7A_A14 → B7A_SPR
IO, CLK11p, (DIFFIO_RX_T25p, DIFFOUT_T25p)	K16	Bnk7B_125MHz_p → Bnk7B_125MHz_p
IO, CLK11n, (DIFFIO_RX_T25n, DIFFOUT_T25n)	L15	Bnk7B_125MHz_n → Bnk7B_125MHz_n
IO, (DIFFIO_TX_T26p, DIFFOUT_T26p, DQ4T, DQ2T, T_DM_1, T_DM_1)	H17	DDR3_DM1
IO, (DIFFIO_TX_T26n, DIFFOUT_T26n, DQ4T, DQ2T, T_DQ_15, T_DQ_15)	K16	DDR3_DQ15
IO, (DIFFIO_RX_T27p, DIFFOUT_T27p, DQ4T, DQ2T, T_DQ_13, T_DQ_13)	K15	DDR3_DQ13
IO, (DIFFIO_RX_T27n, DIFFOUT_T27n, DQ4T, DQ2T, T_DQ_12, T_DQ_12)	L15	DDR3_DQ12
IO, (DIFFIO_TX_T28p, DIFFOUT_T28p, DQ4T, DQ2T, T_DQ_14, T_DQ_14)	K15	DDR3_DQ14
IO, (DIFFIO_TX_T28n, DIFFOUT_T28n, DQ4T, DQ2T, T_CKE_0, T_CKE_0)	F14	DDR3_CKE
IO, (DIFFIO_RX_T29p, DIFFOUT_T29p, DQS4T, DQ2T, T_DQS_1, T_DQS_1)	J14	DDR3_DQS1_p
IO, (DIFFIO_RX_T29n, DIFFOUT_T29n, DQSn4T, DQ2T, T_DQS#_1, T_DQS#_1)	J13	DDR3_DQS1_n
IO, (DIFFIO_TX_T30p, DIFFOUT_T30p, _, _, T_CKE_1, T_CKE_1)	B13	B7A_B13 → B7A_SPR
IO, (DIFFIO_TX_T30n, DIFFOUT_T30n, DQ4T, DQ2T, T_DQ_11, T_DQ_11)	A13	DDR3_DQ11
IO, (DIFFIO_RX_T31p, DIFFOUT_T31p, DQ4T, DQ2T, T_DQ_9, T_DQ_9)	K14	DDR3_DQ9
IO, (DIFFIO_RX_T31n, DIFFOUT_T31n, DQ4T, DQ2T, T_DQ_8, T_DQ_8)	F13	DDR3_DQ8
IO, (DIFFIO_TX_T32p, DIFFOUT_T32p, DQ4T, DQ2T, T_DQ_10, T_DQ_10)	J11	DDR3_DQ10
IO, (DIFFIO_TX_T32n, DIFFOUT_T32n, _, _, GND, GND)	H10	B7A_H10 → B7A_SPR
IO, CLK10p, (DIFFIO_RX_T33p, DIFFOUT_T33p)	H13	B7A_H13 → B7A_SPR
IO, CLK10n, (DIFFIO_RX_T33n, DIFFOUT_T33n)	G13	B7A_G13 → B7A_SPR_Clk
IO, (DIFFIO_TX_T34p, DIFFOUT_T34p, DQ5T, _, T_DM_0, T_DM_0)	K11	DDR3_DM0
IO, (DIFFIO_TX_T34n, DIFFOUT_T34n, DQ5T, _, T_DQ_7, T_DQ_7)	K12	DDR3_DQ7
IO, (DIFFIO_RX_T35p, DIFFOUT_T35p, DQ5T, _, T_DQ_5, T_DQ_5)	J13	DDR3_DQ5
IO, (DIFFIO_RX_T35n, DIFFOUT_T35n, DQ5T, _, T_DQ_4, T_DQ_4)	K13	DDR3_DQ4
IO, (DIFFIO_TX_T36p, DIFFOUT_T36p, DQ5T, _, T_DQ_6, T_DQ_6)	K12	DDR3_DQ6
IO, (DIFFIO_TX_T36n, DIFFOUT_T36n, DQ5T, _, T_ODT_1, T_ODT_1)	K12	B7A_A12 → B7A_SPR
IO, (DIFFIO_RX_T37p, DIFFOUT_T37p, DQS5T, _, T_DQS_0, T_DQS_0)	H11	DDR3_DQS0_p
IO, (DIFFIO_RX_T37n, DIFFOUT_T37n, DQSn5T, _, T_DQS#_0, T_DQS#_0)	K12	DDR3_DQS0_n
IO, (DIFFIO_TX_T38p, DIFFOUT_T38p, _, _, T_ODT_0, T_ODT_0)	L8	DDR3_ODT
IO, (DIFFIO_TX_T38n, DIFFOUT_T38n, DQ5T, _, T_DQ_3, T_DQ_3)	K9	DDR3_DQ3
IO, (DIFFIO_RX_T39p, DIFFOUT_T39p, DQ5T, _, T_DQ_1, T_DQ_1)	J12	DDR3_DQ1
IO, (DIFFIO_RX_T39n, DIFFOUT_T39n, DQ5T, _, T_DQ_0, T_DQ_0)	K12	DDR3_DQ0
IO, (DIFFIO_TX_T40p, DIFFOUT_T40p, DQ5T, _, T_DQ_2, T_DQ_2)	K11	DDR3_DQ2
IO, RZQ_2, (DIFFIO_TX_T40n, DIFFOUT_T40n)	K11	DDR3_OCT_RZQ → Rzq2 240 0201 → GND

DDR3 (DDR3_A[13..0], DDR3_DQ[31..0], DDR3_BA[2..0], DDR3_CK_p, DDR3_CK_n, DDR3_CKE, DDR3_WEn, DDR3_RASn, DDR3_CASn, DDR3_CSn, DDR3_ODT, DDR3_DQS0_p, DDR3_DQS0_n, DDR3_DQS1_p, DDR3_DQS1_n, DDR3_DQS2_p, DDR3_DQS2_n, DDR3_DQS3_p, DDR3_DQS3_n, DDR3_DM0, DDR3_DM1, DDR3_DM2, DDR3_DM3, DDR3_ResetN) → DDR3

Revision	Drawing #: 7		
0	Sheet #: 7 of 17	Size: B	TRIUMF, 4004 Wesbrook Mall, Vancouver, B.C., Canada V6T 2A3
	Drawn by:*	Date: 8/15/2016	

ALPHA-g: CycloneV GX - BANK7A,8A - 5CGXFC4C7F23C8

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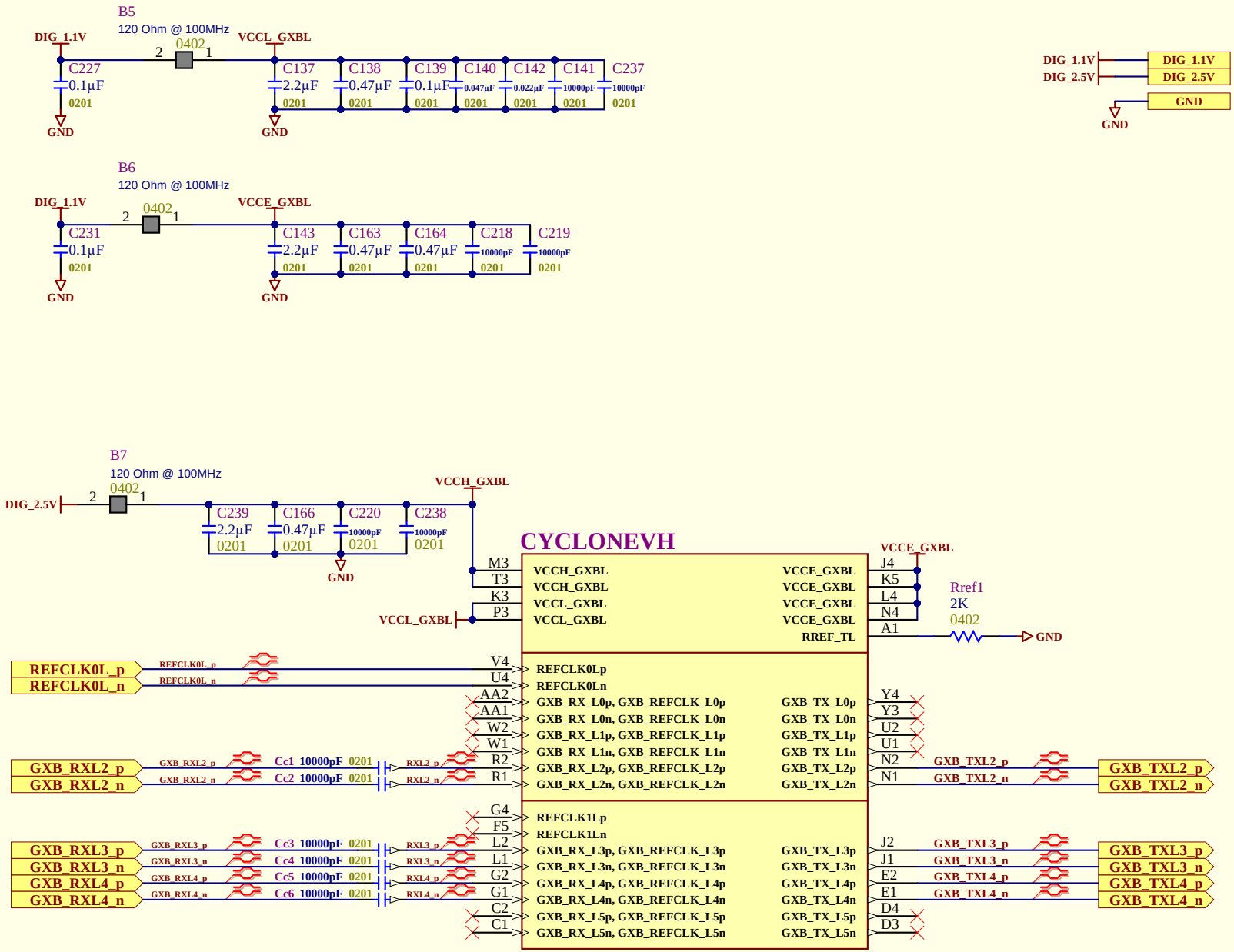

ALPHA-g: CycloneV GX - Transceivers

Revision	Drawing #: 8		TRIUMF
0	Sheet #: 8 of 17	Size: A	4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Drawn by: D. Bishop	Date: 8/15/2016	

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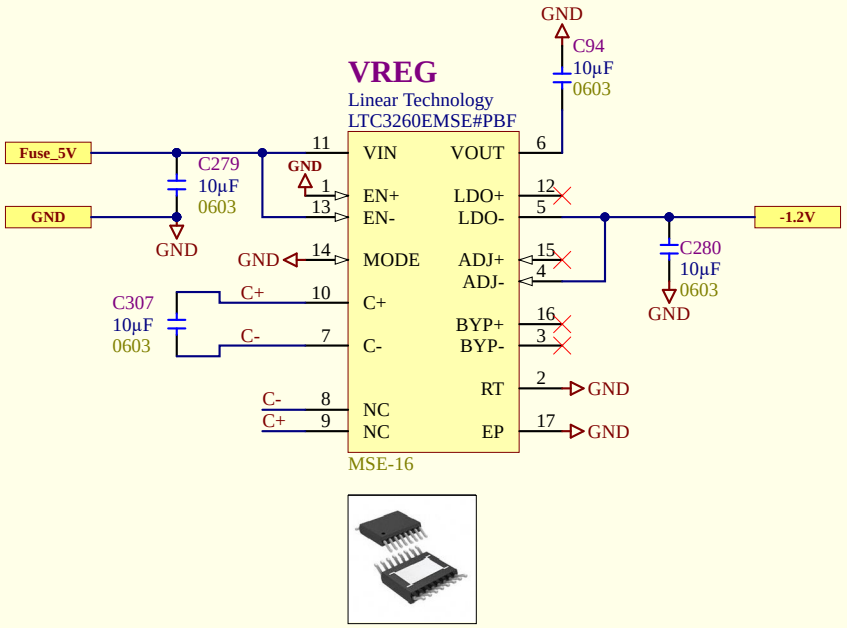

ALPHA-g: CycloneV GX - BIAS Regulator

Revision	Drawing #: 9		TRIUMF
0	Sheet #: 9 of 17	Size: A	4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Drawn by: D.Bishop	Date: 8/15/2016	

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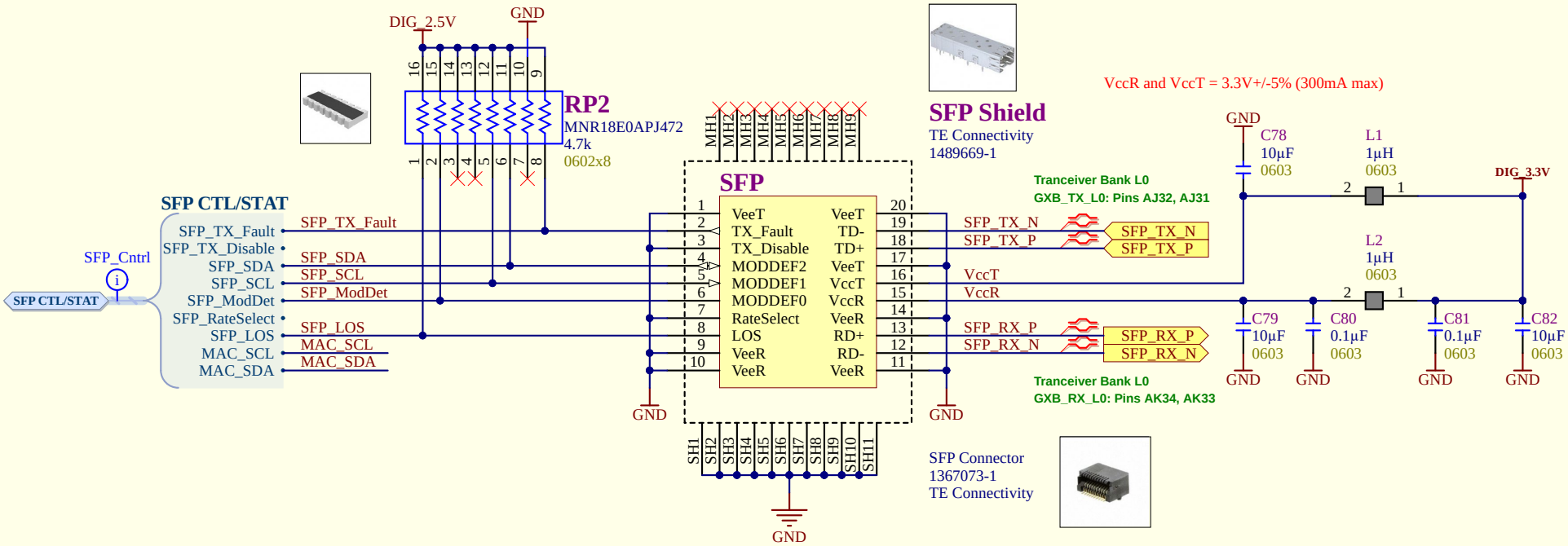

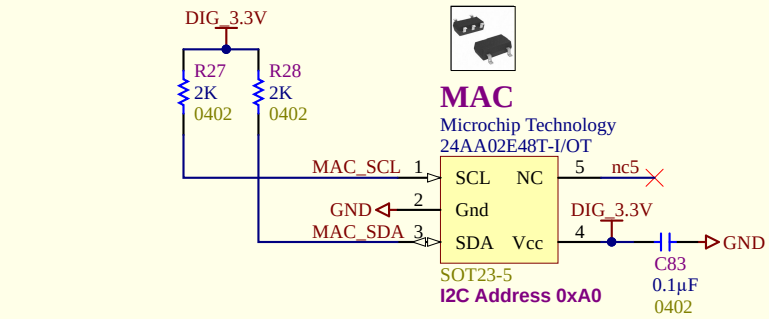

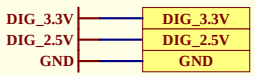

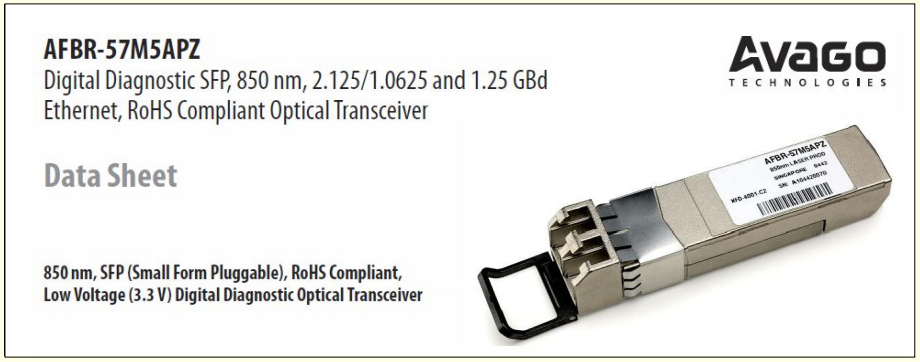

Digital Diagnostic Interface and Serial Identification

The 2-wire serial interface is based on ATMEL AT24C01A series EEPROM protocol and signaling detail. Conventional EEPROM memory, bytes 0-255 at memory address 0xA0, is organized in compliance with SFF-8074i. New digital diagnostic information, bytes 0-255 at memory address 0xA2, is compliant to SFF-8472. The new diagnostic information provides the opportunity for Predictive Failure Identification, Compliance Prediction, Fault Isolation and Component Monitoring.

ALPHA-g: CycloneV GX - SFP Link - MAC Address

Revision	Drawing #: 9		TRIUMF
0	Sheet #: 9 of 17	Size: A	4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Drawn by: D.Bishop	Date: 8/15/2016	

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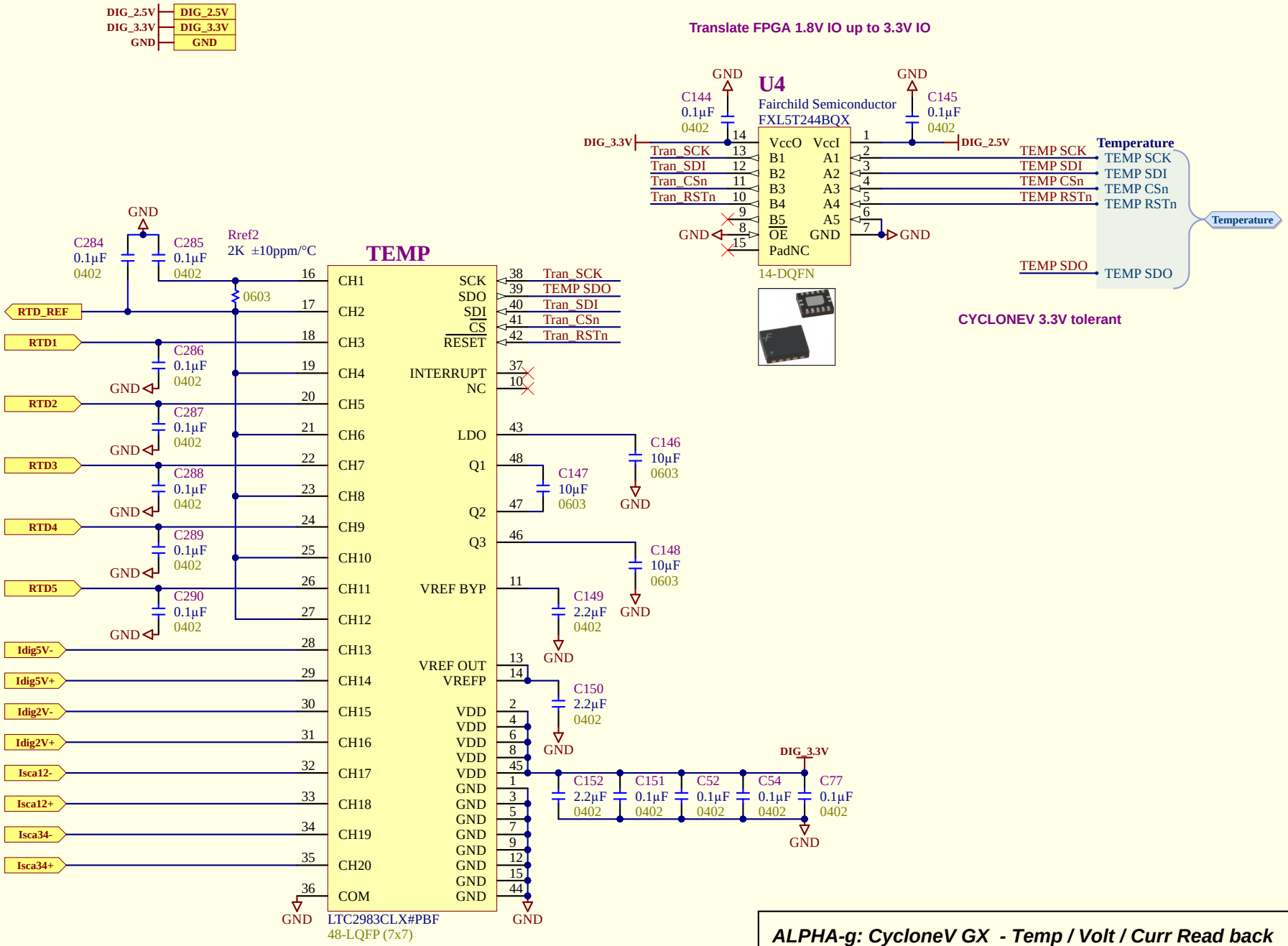

ALPHA-g: CycloneV GX - Temp / Volt / Curr Read back			
Revision **0**	Drawing #: 10		*TRIUMF* 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 10 of 17	Size: A	
	Drawn by: D.Bishop	Date: 8/15/2016	
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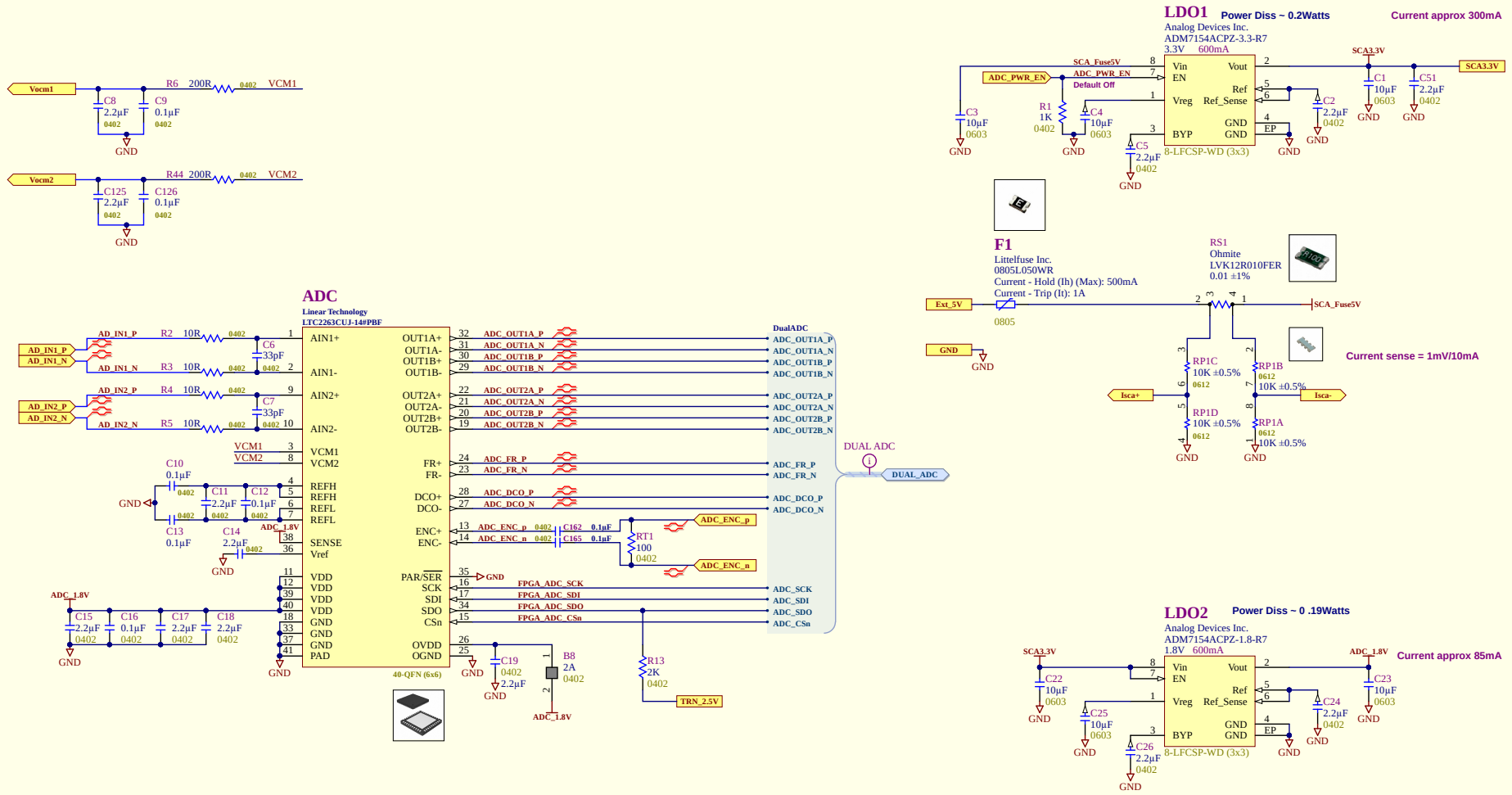
LDO1
Power Diss ~ 0.2Watts
Current approx 300mA
Analog Devices Inc.
ADM7154ACPZ-3.3-R7
3.3V 600mA
SCA_Fuse5V
ADC_PWR_EN
Default Off
SCA3.3V
8-LFCSP-WD (3x3)
F1
Littelfuse Inc.
0805L050WR
Current - Hold (Ih) (Max): 500mA
Current - Trip (It): 1A
RS1
Ohmite
LVK12R010FER
0.01 ±1%
Ext_5V
Current sense = 1mV/10mA
Isca+
Isca-
ADC
Linear Technology
LTC2263CUJ-14#PBF
40-QFN (6x6)
DualADC
DUAL ADC
DUAL_ADC
Vocm1
Vocm2
VCM1
VCM2
ADC_1.8V
LDO2
Power Diss ~ 0 .19Watts
Current approx 85mA
Analog Devices Inc.
ADM7154ACPZ-1.8-R7
1.8V 600mA
TRN_2.5V
ALPHA-g: CycloneV GX - DUAL ADC
TRIUMF LOGO
Revision 0
Drawing #: 11
Sheet #: 11 of 17
Size: B
Drawn by: D.Bishop
Date: 8/15/2016
TRIUMF
4004 Wesbrook Mall
Vancouver, B.C.
Canada
V6T 2A3
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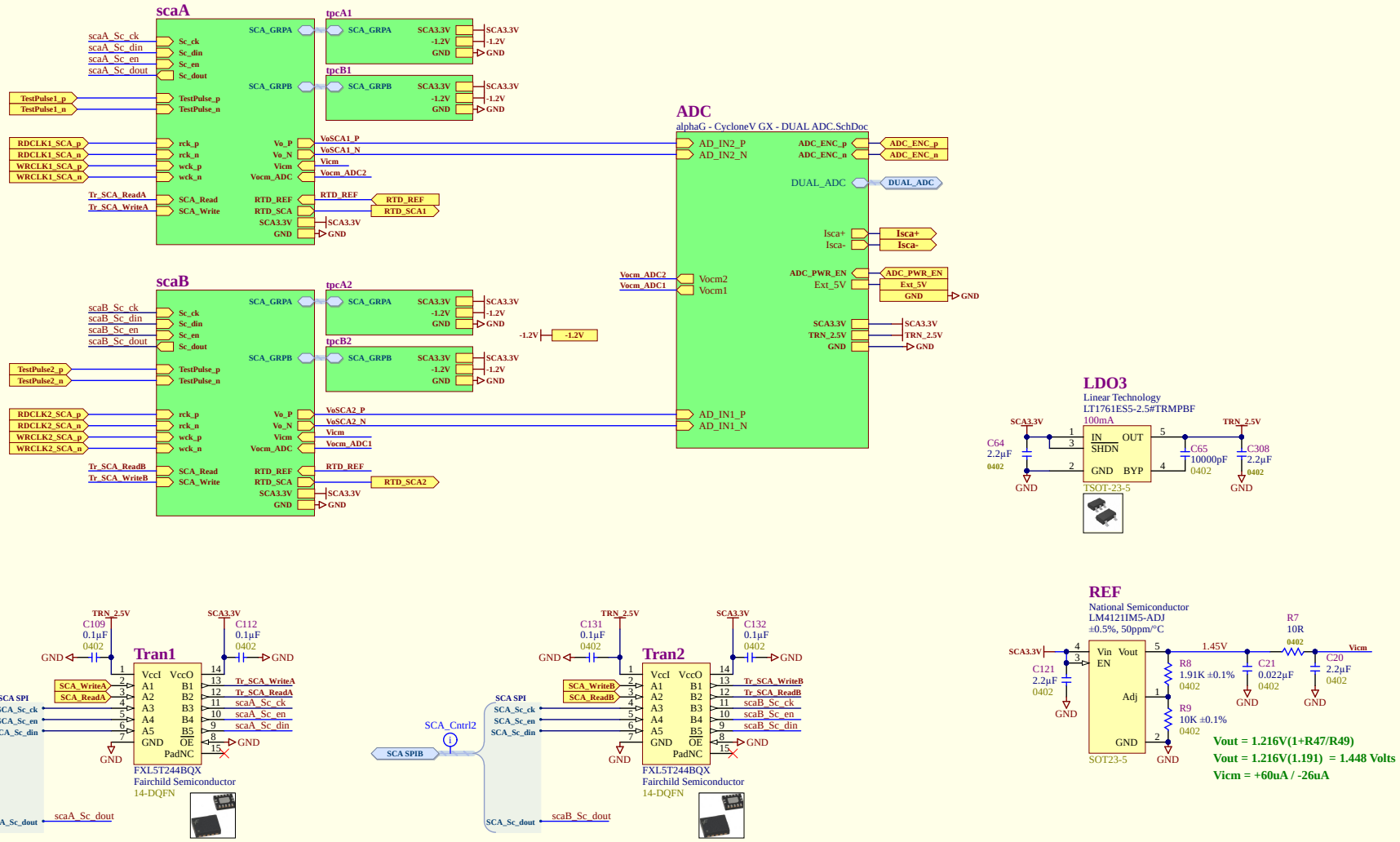

ALPHA-g: CycloneV GX - SCA Interface

Revision 0	Drawing #: 12		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 12 of 17	Size: B	
	Drawn by: D.Bishop	Date: 8/15/2016	

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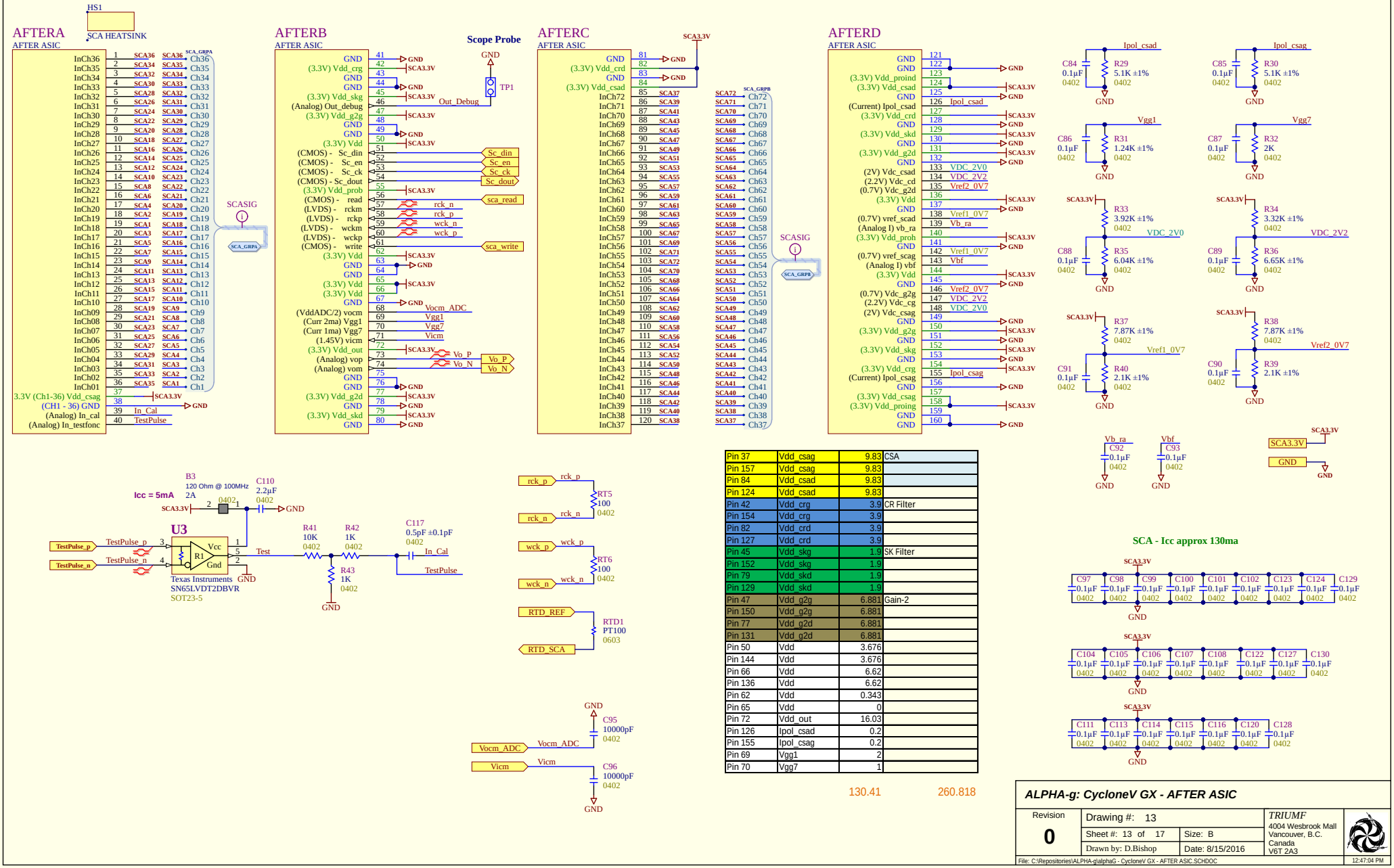

Pin 37	Vdd_csag	9.83	CSA
Pin 157	Vdd_csag	9.83	
Pin 84	Vdd_csad	9.83	
Pin 124	Vdd_csad	9.83	
Pin 42	Vdd_crg	3.9	CR Filter
Pin 154	Vdd_crg	3.9	
Pin 82	Vdd_crd	3.9	
Pin 127	Vdd_crd	3.9	
Pin 45	Vdd_skg	1.9	SK Filter
Pin 152	Vdd_skg	1.9	
Pin 79	Vdd_skd	1.9	
Pin 129	Vdd_skd	1.9	
Pin 47	Vdd_g2g	6.881	Gain-2
Pin 150	Vdd_g2g	6.881	
Pin 77	Vdd_g2d	6.881	
Pin 131	Vdd_g2d	6.881	
Pin 50	Vdd	3.676	
Pin 144	Vdd	3.676	
Pin 66	Vdd	6.62	
Pin 136	Vdd	6.62	
Pin 62	Vdd	0.343	
Pin 65	Vdd	0	
Pin 72	Vdd_out	16.03	
Pin 126	Ipol_csad	0.2	
Pin 155	Ipol_csag	0.2	
Pin 69	Vgg1	2	
Pin 70	Vgg7	1	

130.41 260.818

ALPHA-g: CycloneV GX - AFTER ASIC

Revision	Drawing #: 13		TRIUMF
0	Sheet #: 13 of 17	Size: B	4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Drawn by: D.Bishop	Date: 8/15/2016	

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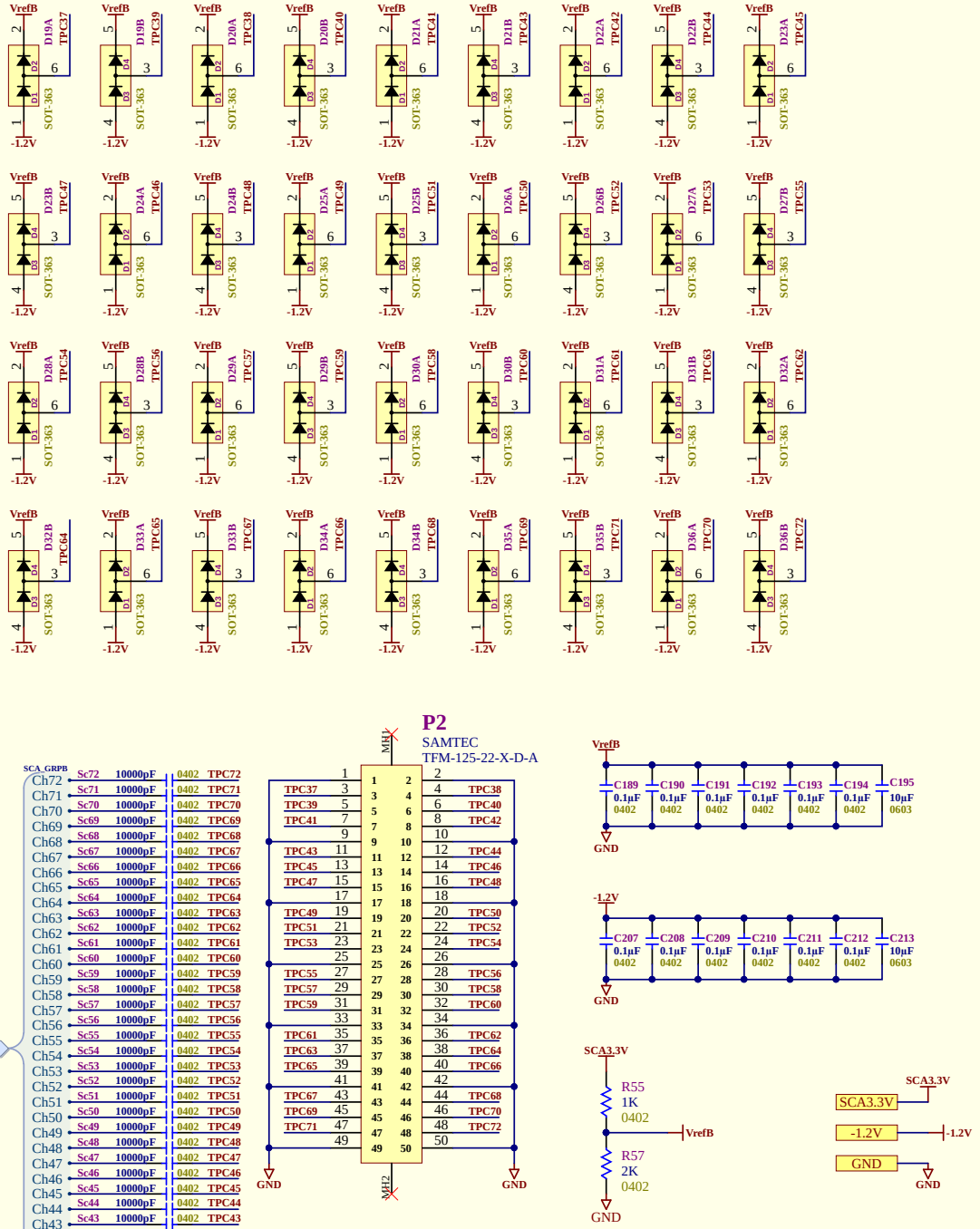
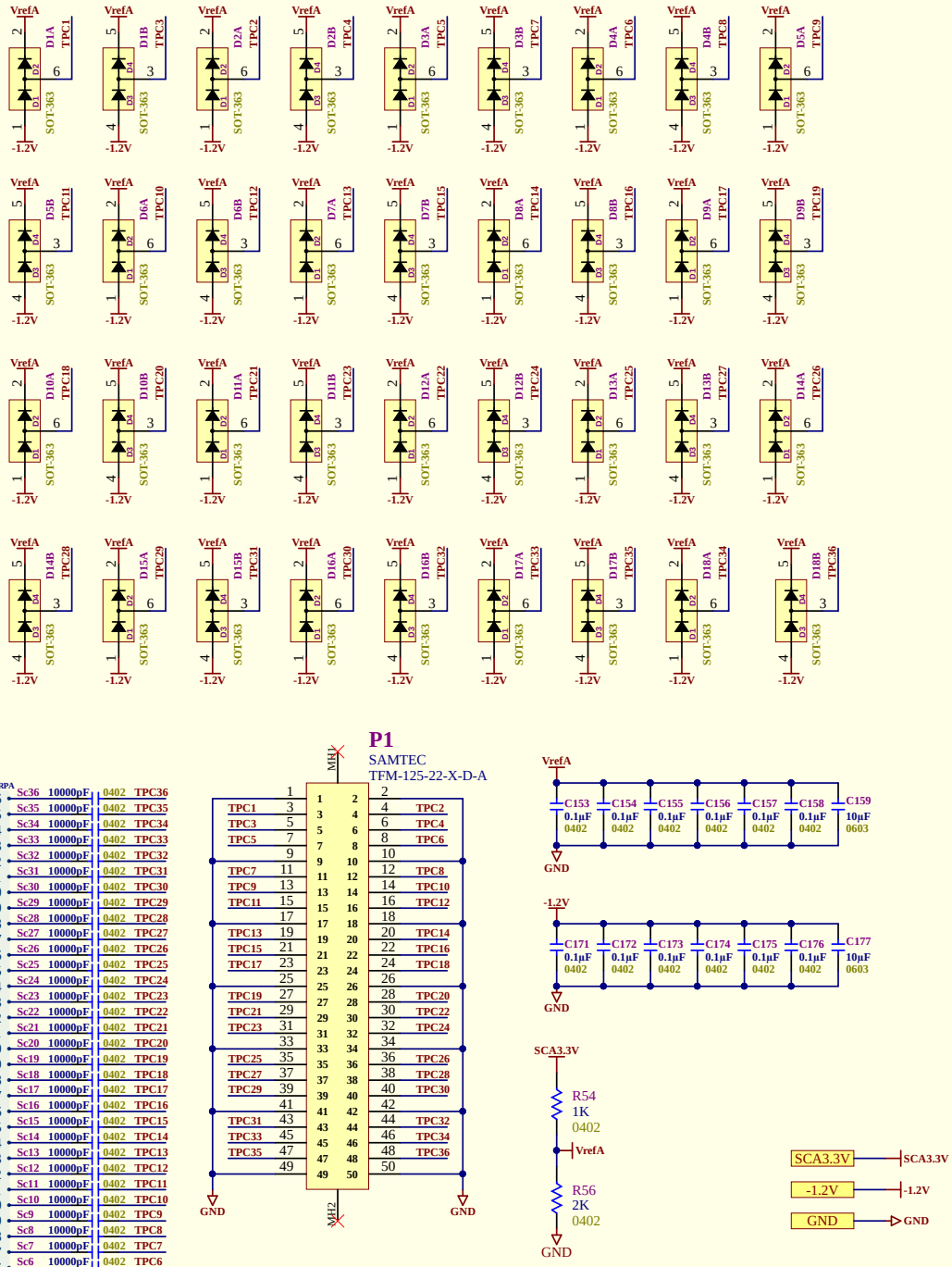


ALPHA-g: CycloneV GX - TPC Connectors2

Revision 0	Drawing #: 14		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 14 of 17	Size: A	
	Drawn by: D.Bishop	Date: 8/15/2016	
File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - TPC Connector2.SchDoc		12:47:04 PM	



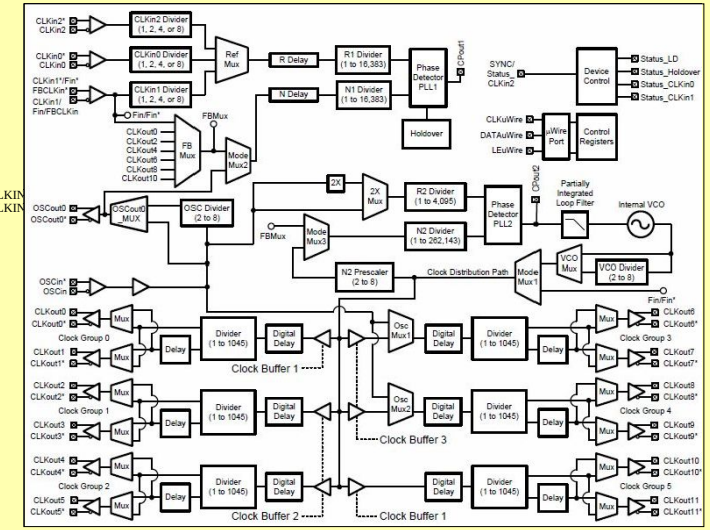
ALPHA-g: CycloneV GX - TPC Connectors1

Revision 0	Drawing #: 15		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 15 of 17	Size: A	
	Drawn by: D.Bishop	Date: 8/15/2016	
File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - TPC Connector1.SchDoc		12:47:05 PM	

CLEANER

Texas Instruments
LMK04816BISQE/NOPB
Clock distribution fanout - 15 channel
64-WQFN (9x9)

LMK04816



LMK_CLNR

LMK_CLNR	LMK_CLKuWIRE	45	CLKuWIRE
	LMK_DATAuWIRE	46	DATAuWIRE
	LMK_LEuWIRE	44	LEuWIRE
	LMK_Stat/CLKin0	62	Status_Clkin0
	LMK_Stat_CLKin1	63	Status_Clkin1
	LMK_SYNC_Stat_CLKin2	6	SYNC/Status CLKin2
	LMK_Stat_LD	33	Staus_LD
	LMK_Stat/HoldOver	27	Status_Holdover
		5	NC5
		7	NC7
		8	NC8
		9	NC9
		28	CLKIN0p
		29	CLKIN0n
CLN_CLKin1_P	Rt3 100 0402		CLKIN1p/FINp/FBCLKIN
CLN_CLKin1_N	Cc10 0.1µF 0402	26	CLKIN1n/FINn/FBCLKIN
CLN_CLKin2_P	Rt4 100 0402	31	CLKIN2p
CLN_CLKin2_N	Cc12 0.1µF 0402	32	CLKIN2n
	Rt7 100 0402	36	OSC_INp
	Cc14 0.1µF 0402	37	OSC_INn
lvds_CLK_OSC0_p		39	OSC_Out0p
lvds_CLK_OSC0_n		40	OSC_Out0n
lvds_CLK_OUT0_p		1	CLK_OUT0p
lvds_CLK_OUT0_n		2	CLK_OUT0n
lvds_CLK_OUT1_p		4	CLK_OUT1p
lvds_CLK_OUT1_n		3	CLK_OUT1n
lvds_CLK_OUT2_p		13	CLK_OUT2p
lvds_CLK_OUT2_n		14	CLK_OUT2n
lvds_CLK_OUT3_p		16	CLK_OUT3p
lvds_CLK_OUT3_n		15	CLK_OUT3n
lvds_CLK_OUT4_p		19	CLK_OUT4p
lvds_CLK_OUT4_n		20	CLK_OUT4n
lvds_CLK_OUT5_p		22	CLK_OUT5p
lvds_CLK_OUT5_n		21	CLK_OUT5n

Vcc1 VCO LDO		10	+3.3V_VCC1,4,5,7,9
Vcc2 (Clk2,3)		17	+3.3V_VCC2
Vcc3 (Clk4,5)		18	+3.3V_VCC3
Vcc4 (Dig)		24	+3.3V_VCC1,4,5,7,9
Vcc5 (Clk IN)		30	+3.3V_VCC1,4,5,7,9
Vcc6 (PLL1)		35	+3.3V_VCC6
Vcc7 (OSC IN)		38	+3.3V_VCC1,4,5,7,9
Vcc8_OSCin		41	+3.3V_VCC8
Vcc9 (PLL2)		43	+3.3V_VCC1,4,5,7,9
Vcc10 (Clk6,7)		47	+3.3V_VCC10
Vcc11 (Clk8,9)		52	+3.3V_VCC11
Vcc12 (Clk10,11		57	+3.3V_VCC12
Vcc13 (Clk0,1)		64	+3.3V_VCC13
LDObyp1		11	LDO_Byp1
LDObyp2		12	LDO_Byp2
CPout1		34	ChargePump1
CPout2		42	ChargePump2
GND		23	GND
DAP		65	GND
CLK_OUT10p		58	lvds_CLK_OUT10_p
CLK_OUT10n		59	lvds_CLK_OUT10_n
CLK_OUT11p		61	lvds_CLK_OUT11_p
CLK_OUT11n		60	lvds_CLK_OUT11_n
CLK_OUT8p		53	lvds_CLK_OUT8_p
CLK_OUT8n		54	lvds_CLK_OUT8_n
CLK_OUT9p		56	lvds_CLK_OUT9_p
CLK_OUT9n		55	lvds_CLK_OUT9_n
CLK_OUT6p		48	lvds_CLK_OUT6_p
CLK_OUT6n		49	lvds_CLK_OUT6_n
CLK_OUT7p		51	lvds_CLK_OUT7_p
CLK_OUT7n		50	lvds_CLK_OUT7_n

Filter for PLL1

Cfil1 1000pF 0402 — GND
Cfil2 4700pF 0402
Rfil2 120K 0402 — GND

Filter for PLL2

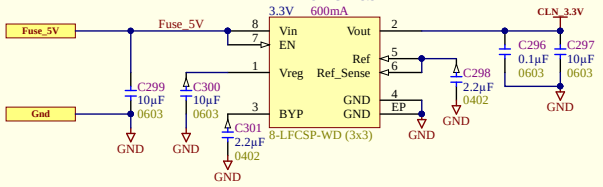
Cfil3 47pF 0402 — GND
Cfil4 3900pF 0402
Rfil4 680 0402 — GND

GND — C29 10µF 0603 — C38 0.1µF 0402

LDO_CLN

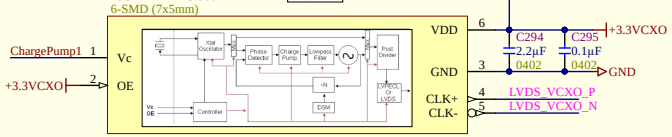
Analog Devices Inc.
ADM7154ACPZ-3.3-R7
3.3V 600mA

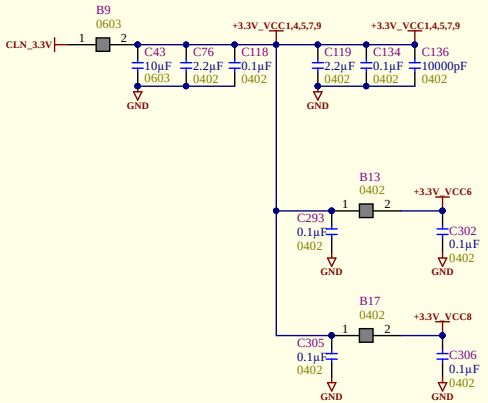
Current approx 550mA

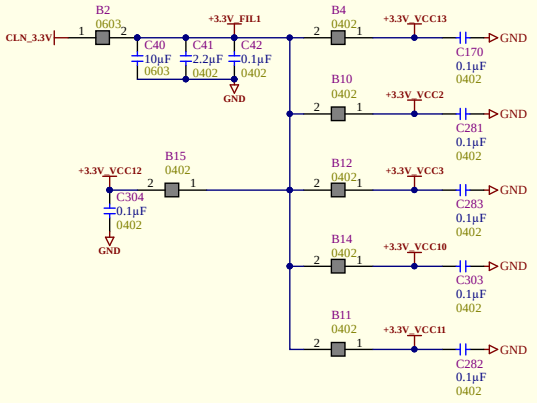


VCXO

Abracon Corporation
ASG-D-V-A-125.000MHZ
6-SMD (7x5mm)







ALPHA-g: CycloneV GX - Clock Cleaner - LMK04816

Revision 0	Drawing #: 16		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 16 of 17	Size: B	
	Drawn by: D.Bishop	Date: 8/15/2016	
File: C:\Repositories\ALPHA-g\alphaG - Cyclone GX - LMK04816.SchDoc			12:47:05 PM

DDR1A

Micron Technology Inc.
MT41J128M16JT-125:K TR

DDR2A

Micron Technology Inc.
MT41J128M16JT-125:K TR

DDR1B

Micron Technology Inc.
MT41J128M16JT-125:K TR

DDR2B

Micron Technology Inc.
MT41J128M16JT-125:K TR

+1.5V Idd Max = 2 x 250mA

Alternate Part Number:
IS43TR16128AL-125KBL
ISSI, Integrated Silicon Solution Inc
IC DDR3 SDRAM 2GBIT 96FBGA
DDR3-1600

DDR1C

Micron Technology Inc.
MT41J128M16JT-125:K TR

(A14 on 4Gb part)

DDR2C

Micron Technology Inc.
MT41J128M16JT-125:K TR

(A14 on 4Gb part)

RP3

EXB-2HV560JV

RP4

EXB-2HV560JV

RP5

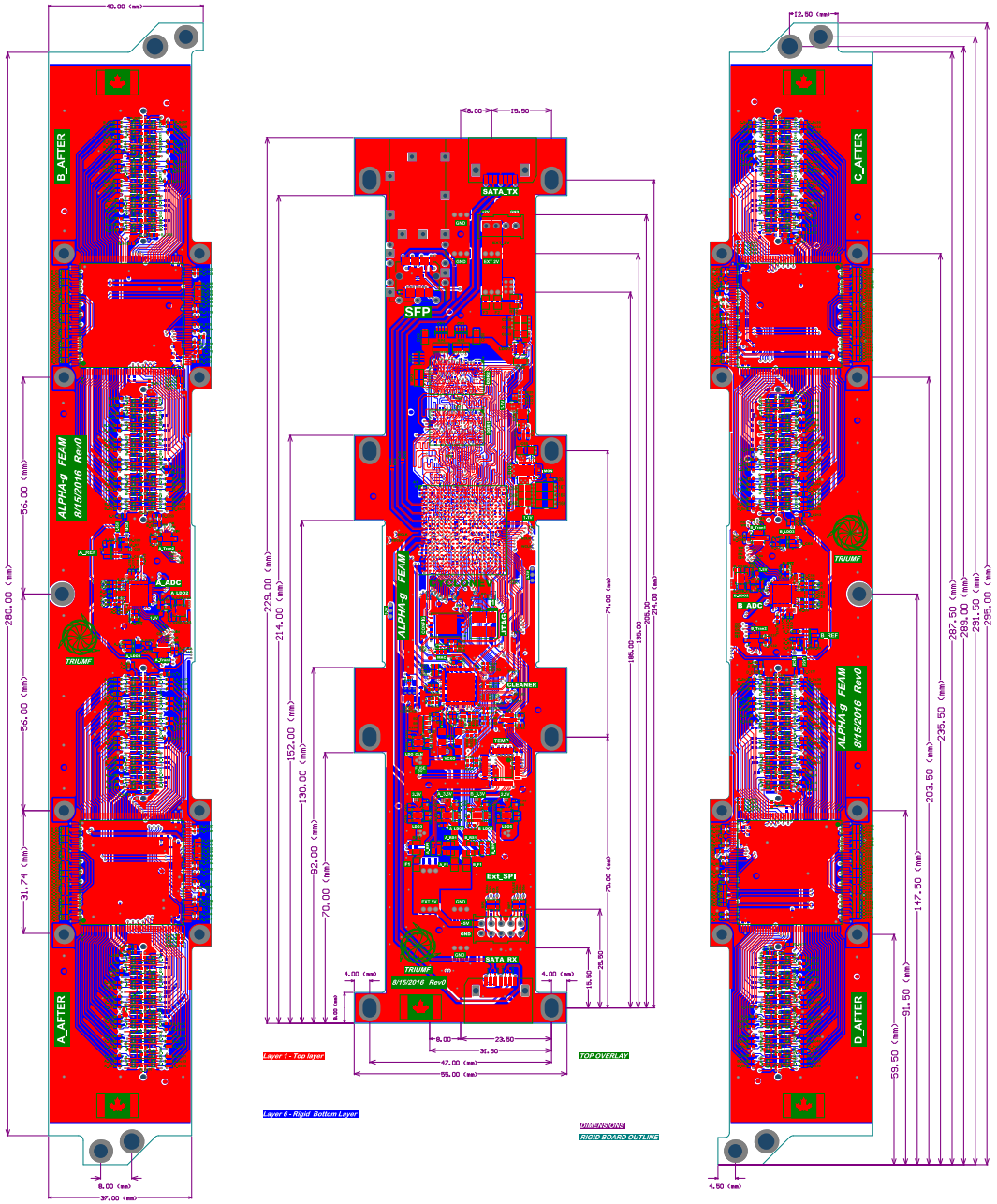
EXB-2HV560JV

LDO7

Texas Instruments
TPS51200DRCT

10-SON (3x3)

ALPHA-g: CycloneV GX - DDR3 Memory			
Revision **0**	Drawing #: 17		*TRIUMF* 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 17 of 17	Size: B	
	Drawn by: D.Bishop	Date: 8/15/2016	
File: C:\Repositories\ALPHA-g\alphaG - CycloneV GX - DDR3.SchDoc			12:47:05 PM


B_AFTER
ALPHA-g FEAM
8/15/2016 Rev0
A_ADC
TRIUMF
A_AFTER
SATA_TX
SFP
CLEANER
Ext_SPI
SATA_RX
Layer 1 - Top layer
Layer 6 - Rigid Bottom Layer
TOP OVERLAY
DIMENSIONS
RIGID BOARD OUTLINE
C_AFTER
B_ADC
D_AFTER
40.00 (mm)
280.00 (mm)
56.00 (mm)
31.74 (mm)
37.00 (mm)
229.00 (mm)
214.00 (mm)
152.00 (mm)
130.00 (mm)
92.00 (mm)
70.00 (mm)
55.00 (mm)
47.00 (mm)
295.00 (mm)
291.00 (mm)
287.50 (mm)
235.50 (mm)
203.50 (mm)
147.50 (mm)
91.50 (mm)
59.50 (mm)
4.50 (mm)

Bill Of Materials

TRIUMF

Project: alphaG.PrjPcb
Variant: None

Report Date: 7/21/2016 6:14:12 PM
Print Date: 15-Aug-16 12:47:22 PM

#	Manufacturer	Part Number	Digi-Key	Description	Package	Value	Designator	Cost	Quantity
1	Abracon Corporation	ASG-D-V-A-100.000MHZ	535-11855-ND	OSC VCXO 100.000MHZ LVDS SMD	6-SMD (7x5mm)		VCXO	12.02820	1
2	AFTER	AFTER ASIC	AFTER ASIC	T2K Swithhed Capacitor Array	TQFP160		A_AFTER, B_AFTER, C_AFTER, D_AFTER		4
3	Altera	5CGXFC4C7F23C8N	544-3173-ND	IC FPGA 240 I/O 484FBGA			CYCLONEV		1
4	Analog Devices Inc.	ADM7154ACPZ-1.8-R7	ADM7154ACPZ-1.8-R7CT-ND	IC REG LDO 1.8V 0.6A 8LFCSP	8-LFCSP-WD (3x3)		A_LDO2, B_LDO2	6.81970	2
5	Analog Devices Inc.	ADM7154ACPZ-2.5-R7	ADM7154ACPZ-2.5-R7CT-ND	IC REG LDO 2.5V 0.6A 8LFCSP	8-LFCSP-WD (3x3)		LDO5	6.81970	1
6	Analog Devices Inc.	ADM7154ACPZ-3.3-R7	ADM7154ACPZ-3.3-R7CT-ND	IC REG LDO 3.3V 0.6A 8LFCSP	8-LFCSP-WD (3x3)		A_LDO1, B_LDO1, LDO3, LDO_CLN	6.81970	4
7	AVX Corporation	JMK105BJ225MV-F	478-7885-2-ND	2.2µF 6.3V Ceramic Capacitor X5R 0402	0402	2.2µF	A_C2, A_C5, A_C8, A_C11, A_C14, A_C15, A_C17, A_C18, A_C19, A_C20, A_C24, A_C26, A_C51, A_C64, A_C110, A_C121, A_C125, A_C308, B_C2, B_C5, B_C8, B_C11, B_C14, B_C15, B_C17, B_C18, B_C19, B_C20, B_C24, B_C26, B_C51, B_C64, B_C110, B_C121, B_C125, B_C308, C41, C59, C62, C67, C70, C76, C119, C133, C135, C149, C150, C152, C162, C239, C294, C298, C301, C_C110, D_C110	0.02121	55
8	Fairchild Semiconductor	FXL5T244BQX	FXL5T244BQXDKR-ND	TRANSLATOR 5BIT DUAL LV 14DQFN	14-DQFN		A_ADC_Trn, A_Tran1, A_Tran2, B_ADC_Trn, B_Tran1, B_Tran2, U4	1.63290	7
9	Infineon Technologies	BAV99SH6327	BAV 99S H6327TR-ND	DIODE ARRAY GP 80V 200MA SOT363	SOT-363		A_D1, A_D2, A_D3, A_D4, A_D5, A_D6, A_D7, A_D8, A_D9, A_D10, A_D11, A_D12, A_D13, A_D14, A_D15, A_D16, A_D17, A_D18, A_D19, A_D20, A_D21, A_D22, A_D23, A_D24, A_D25, A_D26, A_D27, A_D28, A_D29, A_D30, A_D31, A_D32, A_D33, A_D34, A_D35, A_D36, B_D1, B_D2, B_D3, B_D4, B_D5, B_D6, B_D7, B_D8, B_D9, B_D10, B_D11, B_D12, B_D13, B_D14, B_D15, B_D16, B_D17, B_D18, B_D19, B_D20, B_D21, B_D22, B_D23, B_D24, B_D25, B_D26, B_D27, B_D28, B_D29, B_D30, B_D31, B_D32, B_D33, B_D34, B_D35, B_D36, C_D1, C_D2, C_D3, C_D4, C_D5, C_D6, C_D7, C_D8, C_D9, C_D10, C_D11, C_D12, C_D13, C_D14, C_D15, C_D16, C_D17, C_D18, C_D19, C_D20, C_D21, C_D22, C_D23, C_D24, C_D25, C_D26, C_D27, C_D28, C_D29, C_D30, C_D31, C_D32, C_D33, C_D34, C_D35, C_D36, D_D1, D_D2, D_D3, D_D4, D_D5, D_D6, D_D7, D_D8, D_D9, D_D10, D_D11, D_D12, D_D13, D_D14, D_D15, D_D16, D_D17, D_D18, D_D19, D_D20, D_D21, D_D22, D_D23, D_D24, D_D25, D_D26, D_D27, D_D28, D_D29, D_D30, D_D31, D_D32, D_D33, D_D34, D_D35, D_D36	0.10265	144
10	Kemet	C0603C104K8RACTU	399-1095-2-ND	CAP CER 0.1UF 10V 10% X7R 0603	0603	0.1µF	C80, C81	0.00537	2
11	Linear Technology	LT1761ES5-2.5#TRMPBF	LT1761ES5-2.5#TRMPBFCT-ND	IC REG LDO 2.5V 0.1A TSOT23-5	TSOT-23-5		A_LDO3, B_LDO3	2.75690	2
12	Linear Technology	LT3071EUFD#PBF	LT3071EUFD#PBF-ND	IC REG LDO ADJ 5A 28QFN	28-QFN (4x5)		LDO2	7.31500	1
13	Linear Technology	LTC2263CUJ-14#PBF	LTC2263CUJ-14#PBF-ND	IC ADC 14BIT SER/PAR 25M 40-QFN	40-QFN (6x6)		A_ADC, B_ADC	37.88010	2
14	Linear Technology	LTC2983CLX#PBF	LTC2983CLX#PBF-ND	IC SENSOR THERMAL	48-LQFP (7x7)		TEMP	33.95020	1
15	Linear Technology	LTC3026EDD-1#PBF	LTC3026EDD-1#PBF-ND	IC REG LDO ADJ 1.5A 10DFN	10-DFN (3x3)		LDO6	3.71490	1
16	Linear Technology	LTC3260EMSE#PBF	LTC3260EMSE#PBF-ND	Low Noise Dual Supply Inverting Charge Pump, 4.5 to 32 V Vin, Adjustable Vout, 16-pin SOP (MSE-16-EDP), -40 to 125 degC, Pb-Free			VREG	6.818	1
17	Littelfuse	0805L260SLTHYR	F5781CT-ND	PTC RESET 6V LO RHO 0805 2.60A	0805	2.6A	F1, F2, F3	1.90190	3
18	Littelfuse Inc.	0805L050WR	F2772CT-ND	PTC RESETTABLE 6V .500A SMD 0805	0805		A_F1, B_F1	0.64000	2
19	Microchip Technology	24AA02E48T-I/OT	24AA02E48T-I/OTCT-ND	IC EEPROM 2KBIT 400KHZ SOT23-5	SOT23-5		MAC		1
20	Micron	N25Q256A13EF840E	557-1569-ND	IC FLASH 256MBIT 108MHZ 8VDFN	8-VDFPN (MLP8) (8x6)		CONFIG		1
21	Micron Technology Inc.	MT41J128M16JT-125:K TR	557-1611-6-ND	IC DDR3 SDRAM 2GBIT 96FBGA	96-FBGA (9x14)		DDR1, DDR2	6.32910	2
22	Molex, LLC	0470804005	WM19112CT-ND	CONN PLUG 7POS SERIAL ATA 15GOLD	SATA - 7-pin R/A		SATA_RX, SATA_TX		2
23	Murata	GRM31CR60J107ME39L	490-4539-1-ND	CAP CER 100UF 6.3V 20% X5R 1206	1206	100µF	C55, C167, C168, C169	0.58348	4
24	Murata Electronics North America	BLM15PX121SN1D	490-9656-2-ND	FERRITE BEAD 120 OHM 0402 1LN	0402		A_B3, A_B8, B4, B5, B6, B7, B10, B11, B12, B13, B14, B15, B16, B17, B_B3, B_B8, C_B3, D_B3	0.04723	18
25	Murata Electronics North America	BLM18KG121TN1D	240-2378-2-ND	FERRITE CHIP 120 OHM 3000MA 0603	0603		B2, B9	0.02295	2
26	Murata Electronics North America	GRM155R71E103KA01D	490-1312-2-ND	CAP CER 10000PF 25V 10% X7R 0402	0402	10000pF	A_C65, A_C95, A_C96, A_Sc1, A_Sc2, A_Sc3, A_Sc4, A_Sc5, A_Sc6, A_Sc7, A_Sc8, A_Sc9, A_Sc10, A_Sc11, A_Sc12, A_Sc13, A_Sc14, A_Sc15, A_Sc16, A_Sc17, A_Sc18, A_Sc19, A_Sc20, A_Sc21, A_Sc22, A_Sc23, A_Sc24, A_Sc25, A_Sc26, A_Sc27, A_Sc28, A_Sc29, A_Sc30, A_Sc31, A_Sc32, A_Sc33, A_Sc34, A_Sc35, A_Sc36, A_Sc37, A_Sc38, A_Sc39, A_Sc40, A_Sc41, A_Sc42, A_Sc43, A_Sc44, A_Sc45, A_Sc46, A_Sc47, A_Sc48, A_Sc49, A_Sc50, A_Sc51, A_Sc52, A_Sc53, A_Sc54, A_Sc55, A_Sc56, A_Sc57, A_Sc58, A_Sc59, A_Sc60, A_Sc61, A_Sc62, A_Sc63, A_Sc64, A_Sc65, A_Sc66, A_Sc67, A_Sc68, A_Sc69, A_Sc70, A_Sc71, A_Sc72, B_C65, B_C95, B_C96, B_Sc1, B_Sc2, B_Sc3, B_Sc4, B_Sc5, B_Sc6, B_Sc7, B_Sc8, B_Sc9, B_Sc10, B_Sc11, B_Sc12, B_Sc13, B_Sc14, B_Sc15, B_Sc16, B_Sc17, B_Sc18, B_Sc19, B_Sc20, B_Sc21, B_Sc22, B_Sc23, B_Sc24, B_Sc25, B_Sc26, B_Sc27, B_Sc28, B_Sc29, B_Sc30, B_Sc31, B_Sc32, B_Sc33, B_Sc34, B_Sc35, B_Sc36, B_Sc37, B_Sc38, B_Sc39, B_Sc40, B_Sc41, B_Sc42, B_Sc43, B_Sc44, B_Sc45, B_Sc46, B_Sc47, B_Sc48, B_Sc49, B_Sc50, B_Sc51, B_Sc52, B_Sc53, B_Sc54, B_Sc55, B_Sc56, B_Sc57, B_Sc58, B_Sc59, B_Sc60, B_Sc61, B_Sc62, B_Sc63, B_Sc64, B_Sc65, B_Sc66, B_Sc67, B_Sc68, B_Sc69, B_Sc70, B_Sc71, B_Sc72, C57, C136, C218, C219, C220, C228, C229, C230, C232, C233, C234, C235, C236, C237, C238, C244, C269, C270, C276, C277, C278, C_C95, C_C96, C_Sc1, C_Sc2, C_Sc3, C_Sc4, C_Sc5, C_Sc6, C_Sc7, C_Sc8, C_Sc9, C_Sc10, C_Sc11, C_Sc12, C_Sc13, C_Sc14, C_Sc15, C_Sc16, C_Sc17, C_Sc18, C_Sc19, C_Sc20, C_Sc21, C_Sc22, C_Sc23, C_Sc24, C_Sc25, C_Sc26, C_Sc27, C_Sc28, C_Sc29, C_Sc30, C_Sc31, C_Sc32, C_Sc33, C_Sc34, C_Sc35, C_Sc36, C_Sc37, C_Sc38, C_Sc39, C_Sc40, C_Sc41, C_Sc42, C_Sc43, C_Sc44, C_Sc45, C_Sc46, C_Sc47, C_Sc48, C_Sc49, C_Sc50, C_Sc51, C_Sc52, C_Sc53, C_Sc54, C_Sc55, C_Sc56, C_Sc57, C_Sc58, C_Sc59, C_Sc60, C_Sc61, C_Sc62, C_Sc63, C_Sc64, C_Sc65, C_Sc66, C_Sc67, C_Sc68, C_Sc69, C_Sc70, C_Sc71, C_Sc72, Cf1, Cf2, Cf3, Cf4, Cf5, Cf6, Cf7, Cf8, D_C95, D_C96, D_Sc1, D_Sc2, D_Sc3, D_Sc4, D_Sc5, D_Sc6, D_Sc7, D_Sc8, D_Sc9, D_Sc10, D_Sc11, D_Sc12, D_Sc13, D_Sc14, D_Sc15, D_Sc16, D_Sc17, D_Sc18, D_Sc19, D_Sc20, D_Sc21, D_Sc22, D_Sc23, D_Sc24, D_Sc25, D_Sc26, D_Sc27, D_Sc28, D_Sc29, D_Sc30, D_Sc31, D_Sc32, D_Sc33, D_Sc34, D_Sc35, D_Sc36, D_Sc37, D_Sc38, D_Sc39, D_Sc40, D_Sc41, D_Sc42, D_Sc43, D_Sc44, D_Sc45, D_Sc46, D_Sc47, D_Sc48, D_Sc49, D_Sc50, D_Sc51, D_Sc52, D_Sc53, D_Sc54, D_Sc55, D_Sc56, D_Sc57, D_Sc58, D_Sc59, D_Sc60, D_Sc61, D_Sc62, D_Sc63, D_Sc64, D_Sc65, D_Sc66, D_Sc67, D_Sc68, D_Sc69, D_Sc70, D_Sc71, D_Sc72	0.00265	327
27	Murata Electronics North America	GRM155R71H102KA01D	490-1303-2-ND	1000pF 50V Ceramic Capacitor X7R 0402	0402	1000pF	C56	0.00250	1
28	Murata Electronics North America	GRM188R60J106ME47D	490-3896-2-ND	10µF 6.3V Ceramic Capacitor X5R 0603	0603	10µF	A_C1, A_C3, A_C4, A_C22, A_C23, A_C25, A_C159, A_C177, A_C195, A_C213, B_C1, B_C3, B_C4, B_C22, B_C23, B_C25, B_C159, B_C177, B_C195, B_C213, C29, C40, C43, C53, C58, C60, C61, C66, C68, C69, C71, C72, C73, C78, C79, C82, C94, C146, C147, C148, C279, C280, C297, C299, C300, C307, C_C159, C_C177, C_C195, C_C213, D_C159, D_C177, D_C195, D_C213	0.03167	54
29	Murata Electronics North America	GRM21BR61A106KE19L	490-1709-2-ND	CAP CER 10UF 10V 10% X5R 0805	0805	10µF	C50	0.04279	1
30	Murata Electronics North America	GRM21BR61E475KA12L	490-3335-2-ND	CAP CER 4.7UF 25V 10% X5R 0805	0805	4.7µF	C49	0.06246	1
31	National Semiconductor	LM4121IM5-ADJ	LM4121IM5-ADJCT-ND	IC REF PREC MICROPWR SOT23-5	SOT23-5	±0.5%, 50ppm/°C	A_REF, B_REF		2
32	Ohmite	LVK12R010FER	LVK12R010FERCT-ND	RES .01 OHM 1/2W 1% 4-TERM 1206	1206	0.01 ±1%	A_RS1, B_RS1, RS1, RS2		4
33	Panasonic - ECG	ERJ-2RKF1002X	P10.0KLTR-ND	RES SMD 10K OHM 1% 1/10W 0402	0402	10K	A_R41, B_R41, C_R41, D_R41		4
34	Panasonic - ECG	ERJ-2RKF1241X	P1.24KLTR-ND	RES SMD 1.24K OHM 1% 1/10W 0402	0402	1.24K ±1%	A_R31, B_R31, C_R31, D_R31		4
35	Panasonic - ECG	ERJ-2RKF2001X	P2.00KLTR-ND	RES SMD 2K OHM 1% 1/10W 0402	0402	2K ±1%	A_R32, B_R32, C_R32, D_R32		4
36	Panasonic - ECG	ERJ-2RKF2101X	P2.10KLTR-ND	RES SMD 2.1K OHM 1% 1/10W 0402	0402	2.1K ±1%	A_R39, A_R40, B_R39, B_R40, C_R39, C_R40, D_R39, D_R40		8
37	Panasonic - ECG	ERJ-2RKF3321X	P3.32KLTR-ND	RES SMD 3.32K OHM 1% 1/10W 0402	0402	3.32K ±1%	A_R34, B_R34, C_R34, D_R34		4
38	Panasonic - ECG	ERJ-2RKF3921X	P3.92KLTR-ND	RES SMD 3.92K OHM 1% 1/10W 0402	0402	3.92K ±1%	A_R33, B_R33, C_R33, D_R33		4
39	Panasonic - ECG	ERJ-2RKF5101X	P5.10KLTR-ND	RES SMD 5.1K OHM 1% 1/10W 0402	0402	5.1K ±1%	A_R29, A_R30, B_R29, B_R30, C_R29, C_R30, D_R29, D_R30		8
40	Panasonic - ECG	ERJ-2RKF6041X	P6.04KLTR-ND	RES SMD 6.04K OHM 1% 1/10W 0402	0402	6.04K ±1%	A_R35, B_R35, C_R35, D_R35		4
41	Panasonic - ECG	ERJ-2RKF6651X	P6.65KLTR-ND	RES SMD 6.65K OHM 1% 1/10W 0402	0402	6.65K ±1%	A_R36, B_R36, C_R36, D_R36		4
42	Panasonic - ECG	ERJ-2RKF7871X	P7.87KLTR-ND	RES SMD 7.87K OHM 1% 1/10W 0402	0402	7.87K ±1%	A_R37, A_R38, B_R37, B_R38, C_R37, C_R38, D_R37, D_R38		8
43	Panasonic - ECG	EXB-38V121JV	Y9121CT-ND	RES ARRAY 4 RES 120 OHM 1206	0603 x 4	120	RP6, RP7		2
44	Panasonic - ECG	RC0402FR-07100RL	311-100LRTR-ND	RES 100 OHM 1/16W 1% 0402 SMD	0402	100	A_RT5, A_RT6, B_RT5, B_RT6, C_RT5, C_RT6, D_RT5, D_RT6, Rt2, Rt3, Rt4, Rt7	0.00176	12
45	Panasonic Electronic Components	ERJ-2RKF1001X	P1.00KLTR-ND	RES SMD 1K OHM 1% 1/10W 0402	0402	1K	A_R1, A_R42, A_R43, A_R54, A_R55, B_R1, B_R42, B_R43, B_R54, B_R55, C_R42, C_R43, C_R54, C_R55, D_R42, D_R43, D_R54, D_R55, R2, R26	0.00419	20
46	Panasonic Electronic Components	ERJ-2RKF1102X	P11.0KLTR-ND	RES SMD 11K OHM 1% 1/10W 0402	0402	11K	R11	0.00421	1
47	Panasonic Electronic Components	ERJ-2RKF2000X	P200LTR-ND	RES SMD 200 OHM 1% 1/10W 0402	0402	200R	A_R6, A_R44, B_R6, B_R44	0.00419	4
48	Panasonic Electronic Components	ERJ-2RKF4021X	P4.02KLTR-ND	RES SMD 4.02K OHM 1% 1/10W 0402	0402	4.02K	R12	0.00421	1
49	Panasonic Electronic Components	EXB-2HV560JV	Y1560DKR-ND	RES ARRAY 56 OHM 8 RES 1506	EXB-2HV560JV	56	RP3, RP4, RP5	0.18200	3
50	Rohm Semiconductor	MNR18E0APJ472	MNR18472CT-ND	RES ARRAY 4.7K OHM 8 RES 1506	0602x8	4.7k	RP2	0.11200	1
51	Rohm Semiconductor	RC1005F222CS	1276-4046-2-ND	RES 2.2K OHM 1/16W 1% 0402	0402	2.2K	R27, R28	0.00170	2
52	Samsung	CL05B333KP5NNNC	1276-1556-2-ND	CAP CER 0.033UF 10V X7R 0402	0402	0.033µF	C252, C258	0.00621	2
53	Samsung Electro-Mechanics America, Inc	CL05B473KP5NNNC	1276-1573-2-ND	CAP CER 0.047UF 10V X7R 0402	0402	0.047µF	C140, C141, C185, C186, C187, C188, C198, C221, C251, C257	0.00361	10
54	Samsung Electro-Mechanics America, Inc	CL21B225KOFNNNE	1276-1162-2-ND	CAP CER 2.2UF 16V 10% X7R 0805	0805	2.2µF	C48	0.00	1
55	Samsung Electro-Mechanics America, Inc	RC1005F103CS	1276-3431-2-ND	RES SMD 10K OHM 1% 1/16W 0402	0402	10K	R4, R5, R6, R7, R8, R10, R25, R51, R59, R60, R61	0.00205	11
56	Samsung Electro-Mechanics America, Inc	RC1005F202CS	1276-3448-6-ND	RES 2K OHM 1/16W 1% 0402	0402	2K	Rref1	0.02008	1
57	Samsung Electro-Mechanics America, Inc	RC1005F241CS	1276-3965-2-ND	RES 240 OHM 1/16W 1% 0402	0402	240	R52, R58, Rzq2	0.00170	3
58	Samsung Electro-Mechanics America, Inc	RC1005F472CS	1276-3466-2-ND	RES 4.7K OHM 1/16W 1% 0402	0402	4.7K	R1, R3	0.00170	2
59	Samsung Electro-Mechanics America, Inc.	RC1005J000CS	1276-3480-2-ND	RES SMD 0.0OHM JUMPER 1/16W 0402	0402	0R	RJ1, RJ2, RJ3, RJ4	0.00150	4
60	Samsung Electro-Mechanics America, Inc.	CL05A475MQ5NQNC	1276-1483-2-ND	CAP CER 4.7UF 6.3V X5R 0402	0402	4.7µF	C137, C143	0.02921	2
61	Samsung Electro-Mechanics America, Inc.	CL05B104KO5NNWC	1276-1509-2-ND	0.10µF 16V Ceramic Capacitor X7R 0402	0402	0.1µF	A_C9, A_C10, A_C12, A_C13, A_C16, A_C39, A_C63, A_C84, A_C85, A_C86, A_C87, A_C88, A_C89, A_C90, A_C91, A_C92, A_C93, A_C97, A_C98, A_C99, A_C100, A_C101, A_C102, A_C104, A_C105, A_C106, A_C107, A_C108, A_C109, A_C111, A_C112, A_C113, A_C114, A_C115, A_C116, A_C120, A_C122, A_C123, A_C124, A_C126, A_C127, A_C128, A_C129, A_C130, A_C131, A_C132, A_C153, A_C154, A_C155, A_C156, A_C157, A_C158, A_C171, A_C172, A_C173, A_C174, A_C175, A_C176, A_C189, A_C190, A_C191, A_C192, A_C193, A_C194, A_C207, A_C208, A_C209, A_C210, A_C211, A_C212, B_C9, B_C10, B_C12, B_C13, B_C16, B_C39, B_C63, B_C84, B_C85, B_C86, B_C87, B_C88, B_C89, B_C90, B_C91, B_C92, B_C93, B_C97, B_C98, B_C99, B_C100, B_C101, B_C102, B_C104, B_C105, B_C106, B_C107, B_C108, B_C109, B_C111, B_C112, B_C113, B_C114, B_C115, B_C116, B_C120, B_C122, B_C123, B_C124, B_C126, B_C127, B_C128, B_C129, B_C130, B_C131, B_C132, B_C153, B_C154, B_C155, B_C156, B_C157, B_C158, B_C171, B_C172, B_C173, B_C174, B_C175, B_C176, B_C189, B_C190, B_C191, B_C192, B_C193, B_C194, B_C207, B_C208, B_C209, B_C210, B_C211, B_C212, C1, C2, C19, C20, C21, C22, C24, C25, C26, C27, C28, C30, C31, C32, C33, C34, C35, C36, C37, C38, C42, C44, C45, C46, C47, C52, C54, C74, C75, C77, C83, C118, C134, C139, C144, C145, C151, C170, C182, C183, C184, C227, C231, C242, C261, C265, C266, C273, C274, C281, C282, C283, C284, C285, C286, C287, C288, C289, C290, C291, C292, C293, C295, C302, C303, C304, C305, C306, C_C84, C_C85, C_C86, C_C87, C_C88, C_C89, C_C90, C_C91, C_C92, C_C93, C_C97, C_C98, C_C99, C_C100, C_C101, C_C102, C_C104, C_C105, C_C106, C_C107, C_C108, C_C111, C_C113, C_C114, C_C115, C_C116, C_C120, C_C122, C_C123, C_C124, C_C127, C_C128, C_C129, C_C130, C_C153, C_C154, C_C155, C_C156, C_C157, C_C158, C_C171, C_C172, C_C173, C_C174, C_C175, C_C176, C_C189, C_C190, C_C191, C_C192, C_C193, C_C194, C_C207, C_C208, C_C209, C_C210, C_C211, C_C212, Cc9, Cc10, Cc11, Cc12, Cc13, Cc14, D_C84, D_C85, D_C86, D_C87, D_C88, D_C89, D_C90, D_C91, D_C92, D_C93, D_C97, D_C98, D_C99, D_C100, D_C101, D_C102, D_C104, D_C105, D_C106, D_C107, D_C108, D_C111, D_C113, D_C114, D_C115, D_C116, D_C120, D_C122, D_C123, D_C124, D_C127, D_C128, D_C129, D_C130, D_C153, D_C154, D_C155, D_C156, D_C157, D_C158, D_C171, D_C172, D_C173, D_C174, D_C175, D_C176, D_C189, D_C190, D_C191, D_C192, D_C193, D_C194, D_C207, D_C208, D_C209, D_C210, D_C211, D_C212	0.00289	330
62	Samsung Electro-Mechanics America, Inc.	CL05B222MP5NNNC	1276-1535-2-ND	CAP CER 2200PF 10V X7R 0402	0402	2200pF	C225, C226	0.00340	2
63	Samsung Electro-Mechanics America, Inc.	CL05B223KP5NNNC	1276-1538-2-ND	CAP CER 0.022UF 10V X7R 0402	0402	0.022µF	A_C21, B_C21, C142, C199, C200, C201, C202, C203, C204, C205, C206, C216, C217, C222, C259, C260, C262		17
64	Samsung Electro-Mechanics America, Inc.	CL05C330JB5NNNC	1276-1272-2-ND	33pF 50V Ceramic Capacitor C0G, NP0 0402	0402	33pF	A_C6, A_C7, B_C6, B_C7	0.00312	4
65	Samsung Electro-Mechanics America, Inc.	CL10B225KP8NNNC	1276-1134-6-ND	2.2µF 10V Ceramic Capacitor X7R 0603	0603	2.2µF	C296	0.07104	1
66	Samsung Electro-Mechanics America, Inc.	CL31B104KACNBNC	1276-2741-2-ND	CAP ARRAY 0.1UF 25V X7R 1206	1206	0.1µF	CP1, CP2, CP3	0.07141	3
67	Samsung Electro-Mechanics America, Inc.	GRM155R61A472KA01D	490-8254-2-ND	CAP CER 4700PF 10V X5R 0402	0402	4700pF	C223, C224	0.00572	2
68	Samsung Electro-Mechanics America, Inc.	RC1005F202CS	1276-3448-2-ND	RES SMD 2K OHM 1% 1/16W 0402	0402	2K	A_R56, A_R57, B_R56, B_R57, C_R56, C_R57, D_R56, D_R57	0.00205	8
69	Samtec	FTSH-105-01-L-DV-K	FTSH-105-01-L-DV-K	CONN HEADER 10 POS DUAL .05" SMD			JTAG		1
70	SAMTEC	IPL1-05-01-L-D-K	IPL1-05-01-L-D-K	CONN Vertical HEADER 10POS .100	IPL1-05-01-L-D-K		Ext_SPI		1
71	SAMTEC	IPL1-104-01-F-S	IPL1-104-01-F-S	4-pin Connector 0.1" pitch vertical			EXT_2V	0	1
72	SAMTEC	TFM-125-22-X-D-A	TFM-125-22-X-D-A	SAMTEC - Dual row connector 50mil pitch			A_P1, A_P2, B_P1, B_P2, C_P1, C_P2, D_P1, D_P2		8
73	Susumu	RG16N2.0KWCT-ND	RG16N2.0KWCT-ND	RES SMD 2K OHM 0.05% 1/10W 0603	0603	2K ±10ppm/°C	Rref2	0.86280	1
74	Taiyo Yuden	JMK105B7224KV-F	587-2475-2-ND	CAP CER 0.22UF 6.3V 10% X7R 0402	0402	0.22µF	C181	0.00	1
75	Taiyo Yuden	JMK105B7474KVHF	587-3765-6-ND	0.47µF 6.3V Ceramic Capacitor X7R 0402	0402	0.47µF	C138, C163, C164, C166, C180, C263	0.04672	6
76	Taiyo Yuden	LMK212AB7106MG-T	587-3417-2-ND	CAP CER 10UF 10V 20% X7R 0805	0805	10uF	C243, C245, C246, C248, C249, C250	0.00	6
77	TDK Corporation	C0402C0G1C0R5B	445-7153-6-ND	CAP CER 0.5PF 16V C0G 01005	0402	0.5pF ±0.1pF	A_C117, B_C117, C_C117, D_C117		4
78	TDK Corporation	C0603X7R1A103K030BA	445-6843-2-ND	CAP CER 10000PF 10V 10% X7R 0201	0201	10000pF	C165, C240, C241, C247, C253, C254, C255, C256, C264, C267, C268, C271, C272, C275, Cc1, Cc2, Cc3, Cc4, Cc5, Cc6, Cc15, Cc16	0.01094	22
79	TE Connectivity	1367073-1	1367073-1	Small Form-Factor Pluggable (SFP) Connector, 20-pin			SFP	0.00	1
80	TE Connectivity	1489669-1	1489669-1	Small Form-Factor Pluggable (SFP) Cage			SFP Shield	0.00	1
81	TE Connectivity AMP Connectors	1932771-1	A118087CT-ND	6 PINS 1.6P 1.65H BTOB CONNECTOR	1932771-1		P1, P2, P3, P4, P5, P6, P7, P8	0.61546	8
82	TE Connectivity AMP Connectors	7-1879214-0	A102700DKR-ND	RES SMD 1.91KOHM 0.1% 1/16W 0402	0402	1.91K ±0.1%	A_R8, B_R8		2
83	Texas Instruments	LMK04816BISQE/NOPB	LMK04816BISQE/NOPBCT-ND	IC CLOCK DUAL PLL 64-WQFN	64-WQFN (9x9)		CLEANER	21.34	1
84	Texas Instruments	SN65LVDT2DBVR	296-6896-1-ND	IC DIFF LINE RECEIVER SOT-23-5	SOT23-5		A_U3, B_U3, C_U3, D_U3		4
85	Texas Instruments	TPS51200DRCT	296-26978-1-ND	Sink/Source DDR Termination Regulator	10-SON (3x3)		LDO7	2.12030	1
86	Vishay - Beyschlag	ACASA100221002P100	ACASA-10K/10K-2CT-ND	RES ARRAY 4 RES 10K OHM 1206	0612	10K ±0.5%	A_RP1, B_RP1, RP1	0.34400	3
87	Vishay Beyschlag	PTS060301B100RP100	PTS0603100CT-ND	TEMP SENSOR RTD 100 OHM 0603	0603	PT100	A_RTD1, B_RTD1, C_RTD1, D_RTD1	2.32690	4
88	Wurth Electronics Inc	74479763210	732-3433-1-ND	INDUCTOR 1.0UH 750MA MULTI 0603	0603		L1, L2	0.00	2
89	Yageo	CC0402JRNPO9BN470	311-1021-2-ND	CAP CER 47PF 50V NPO 0402	0402	47pF	Cfil3	0.02295	1
90	Yageo	CC0402KRX7R8BB392	311-1038-2-ND	CAP CER 3900PF 25V X7R 0402	0402	3900pF	Cfil4	0.02295	1
91	Yageo	CC0402KRX7R8BB472	311-1039-2-ND	CAP CER 4700PF 25V X7R 0402	0402	4700pF	Cfil2	0.02295	1
92	Yageo	CC0402KRX7R9BB102	311-1036-2-ND	CAP CER 1000PF 50V X7R 0402	0402	1000pF	Cfil1	0.02295	1
93	Yageo	RC0402FR-0710RL	311-10.0LRTR-ND	RES SMD 10 OHM 1% 1/16W 0402	0402	10R	A_R2, A_R3, A_R4, A_R5, A_R7, B_R2, B_R3, B_R4, B_R5, B_R7		10
94	Yageo	RC0402FR-07120KL	311-120KLRTR-ND	RES SMD 120K OHM 1% 1/16W 0402	0402	120K	Rfil2	0.02295	1
95	Yageo	RC0402FR-07680RL	311-680LRTR-ND	RES SMD 680 OHM 1% 1/16W 0402	0402	680	Rfil4	0.02295	1
96	Yageo	RT0402BRE0710KL	YAG2305DKR-ND	RES SMD 10K OHM 0.1% 1/16W 0402	0402	10K ±0.1%	A_R9, B_R9		2
								1251	