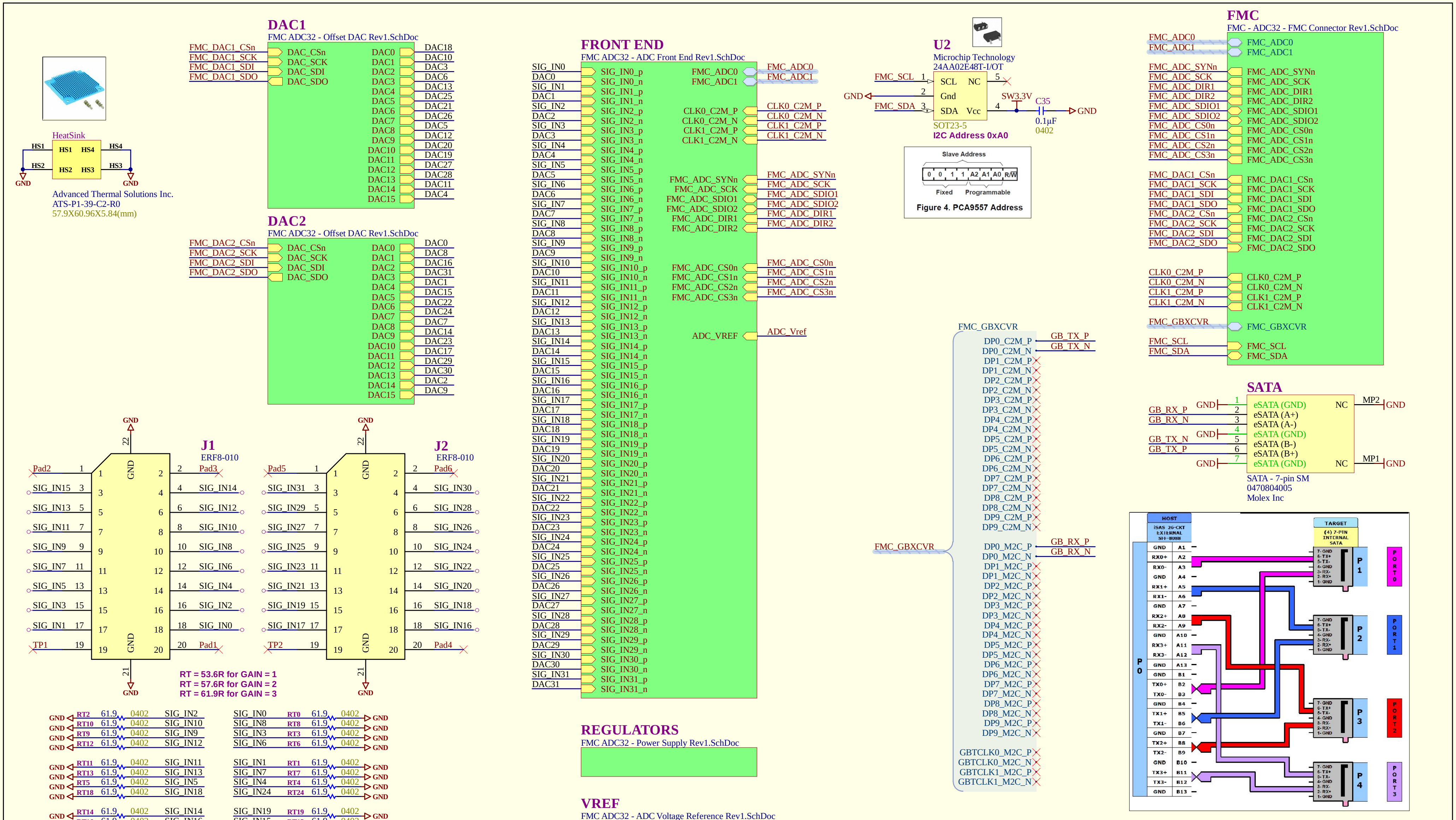

FMC ADC32 - 32 Channel ADC 65Msps

TRIUMF LOGO

Revision	Drawing #: 1		TRIUMF
1	Sheet #: 1 of 8	Size: B	4004 Wesbrook Mall, Vancouver, B.C. Canada V6T 2A3
	Drawn by: D. Bishop	Date: 3/10/2018	GRIFFIN
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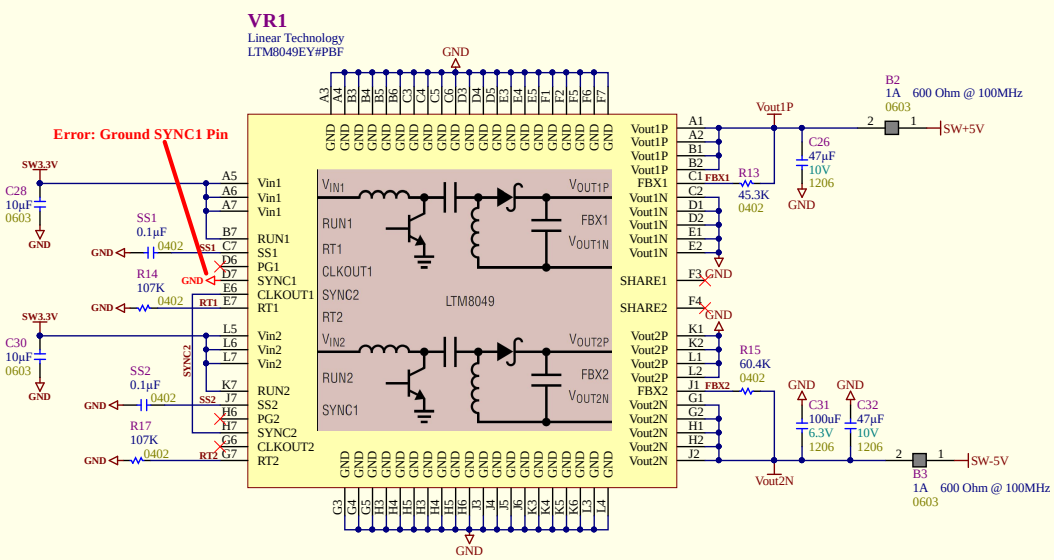

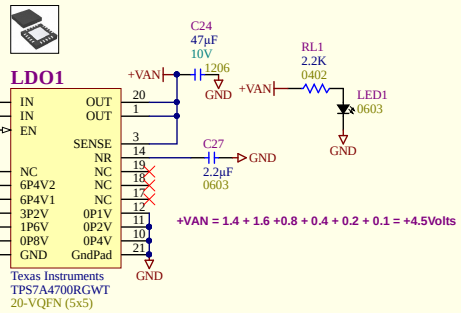

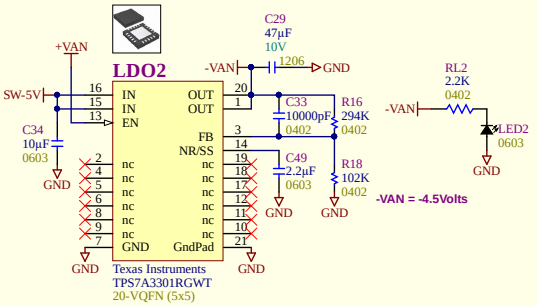

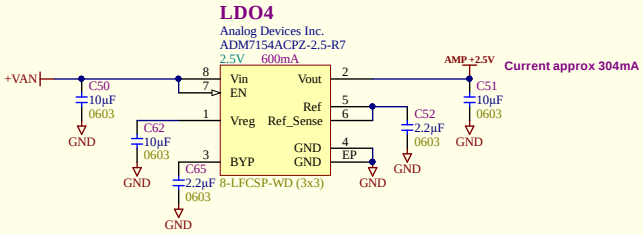

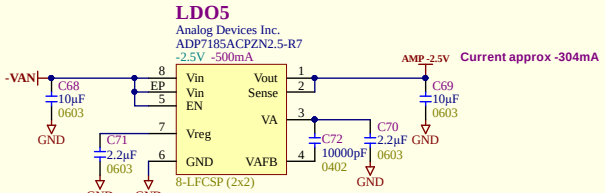

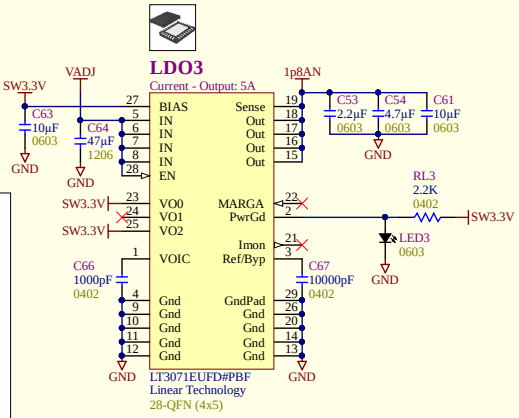

Table 1: V_{O2} to V_{O0} Settings vs Output Voltage

V_{O2}	V_{O1}	V_{O0}	$V_{OUT(NOM)}$	V_{O2}	V_{O1}	V_{O0}	$V_{OUT(NOM)}$
0	0	0	0.80V	Z	0	1	1.35V
0	0	Z	0.85V	Z	Z	0	1.40V
0	0	1	0.90V	Z	Z	Z	1.45V
0	Z	0	0.95V	Z	Z	1	1.50V
0	Z	Z	1.00V	Z	1	0	1.55V
0	Z	1	1.05V	Z	1	Z	1.60V
0	1	0	1.10V	Z	1	1	1.65V
0	1	Z	1.15V	1	X	0	1.70V
0	1	1	1.20V	1	X	Z	1.75V
Z	0	0	1.25V	1	X	1	1.80V
Z	0	Z	1.30V				

X = Don't Care, 0 = Low, Z = Float, 1 = High

The input logic *low* threshold is less than 250mV referenced to GND and the logic *high* threshold is greater than V_{BIAS} – 250mV. The range between these two thresholds as set by a window comparator defines the logic *Hi-Z* state.

FMC ADC32 - Power Regulators

Revision	Drawing #: 2		*TRIUMF*
1	Sheet #: 2 of 8	Size: B	4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Drawn by: D.Bishop	Date: 3/10/2018	

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MPM (Divider)

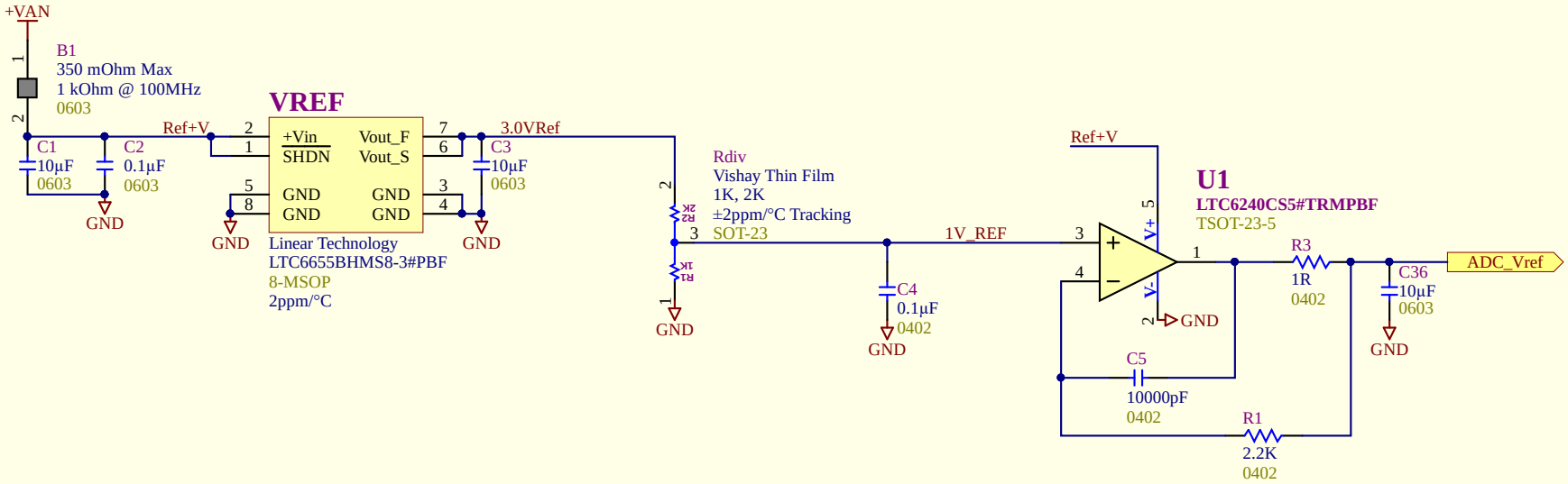
Vishay Dale Thin Film

, Surface Mount Divider Network

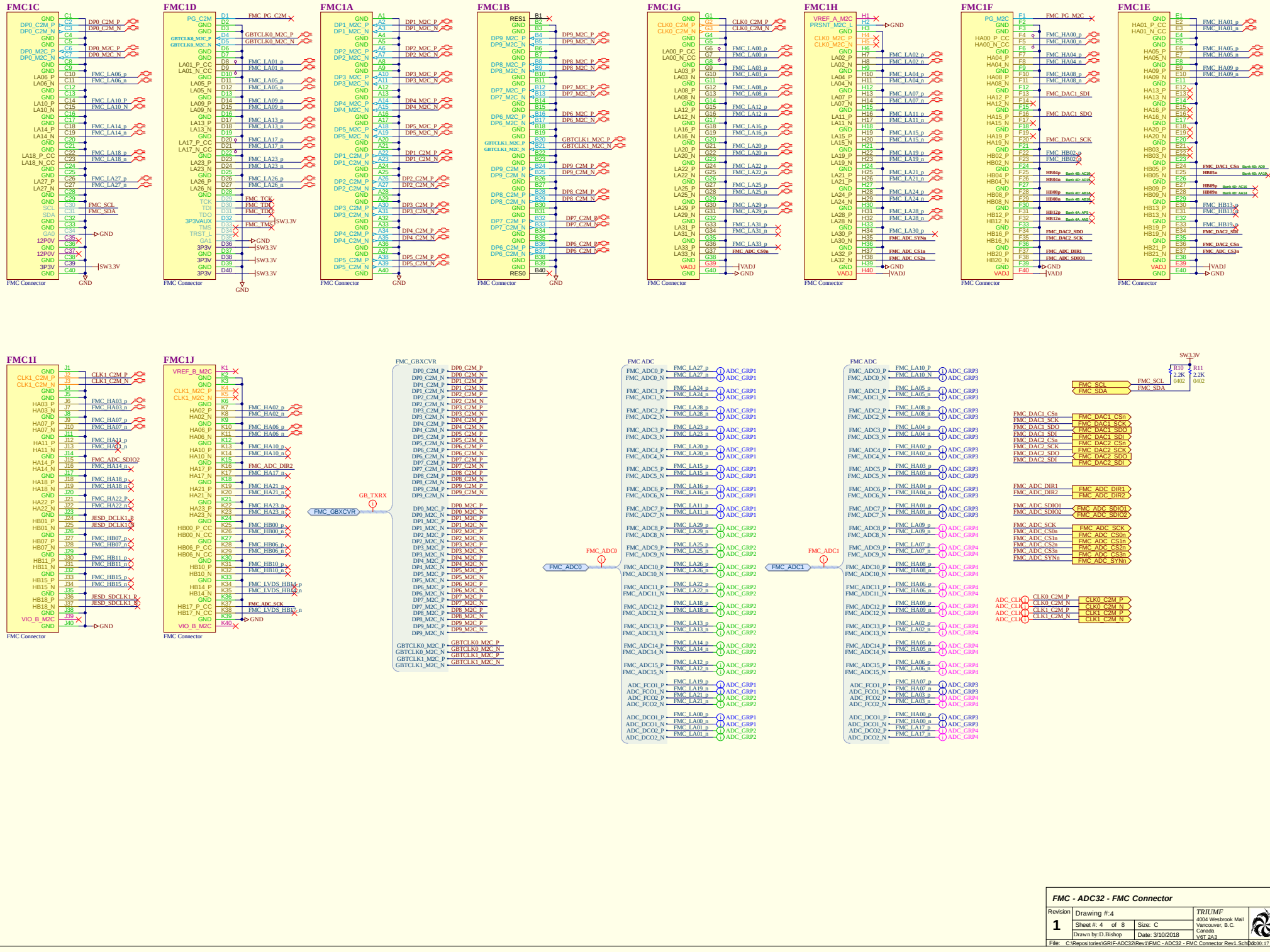
FEATURES

- Excellent long term ratio stability (ΔR ± 0.015 %, 2000 h, + 70 °C)
- Ratio tolerances to ± 0.01 %
- Low TCR tracking ± 2 ppm
- Standard JEDEC TO-236 package variation AB
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free RoHS* Available HALOGEN FREE

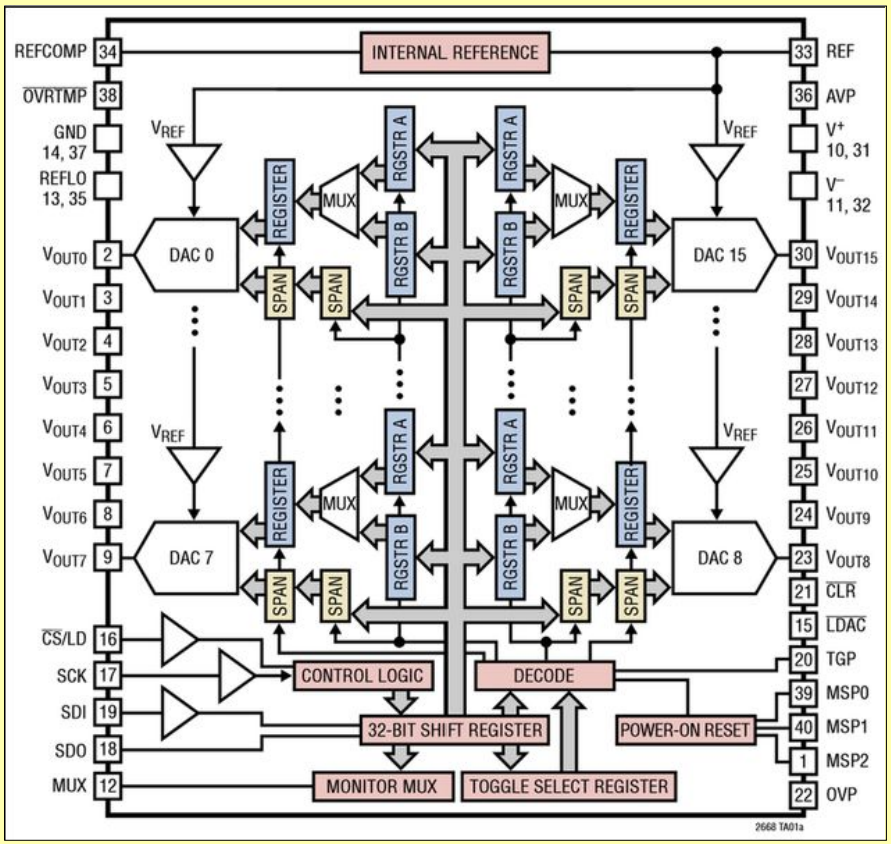


FMC ADC32 - ADC Voltage Reference			
Revision **1**	Drawing #: 3		*TRIUMF* 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 3 of 8	Size: A	
	Drawn by: D.Bishop	Date: 3/10/2018	
File: C:\Repositories\GRIF-ADC32\Rev1\FMC ADC32 - ADC Voltage Reference Rev1.SchDoc			GRIFFIN 7:00:17 PM


FMC1C
FMC1D
FMC1A
FMC1B
FMC1G
FMC1H
FMC1F
FMC1E
FMC1I
FMC1J
FMC_GBXCVR
FMC ADC
FMC_ADC0
FMC_ADC1
SW3.3V
FMC - ADC32 - FMC Connector
TRIUMF
4004 Westbrook Mall
Vancouver, B.C.
Canada
V6T 2A3
Revision
1
Drawing #:4
Sheet #: 4 of 8
Size: C
Drawn by:D.Bishop
Date: 3/10/2018
File: C:\Repositories\GRIF-ADC32\Rev1\FMC - ADC32 - FMC Connector Rev1.SchDoc

DAC

Linear Technology
LTC2668CUJ-12#PBF
16 Channel 12-bit bipolar DAC



40-QFN (6x6)

C41 0.1µF 0402
GND 34 REFCOMP
Use Internal REF
38 OTEMP
GND 14 GND
GND 37 GND
GND 13 REFLO
GND 35 REFLO
DAC0 DAC0 2 VOUT0
DAC1 DAC1 3 VOUT1
DAC2 DAC2 4 VOUT2
DAC3 DAC3 5 VOUT3
DAC4 DAC4 6 VOUT4
DAC5 DAC5 7 VOUT5
DAC6 DAC6 8 VOUT6
DAC7 DAC7 9 VOUT7

SPI interface (Vadj)
DAC_CSn 16 CS/LD
DAC_SCK 17 SCK
DAC_SDI 19 SDI
DAC_SDO 18 SD0
12 MUX

Use Internal REF
GND C42 0.1µF 0402
33 REF
AVP 36 +VAN
OVP 22 VADJ
V+ 10 +VAN
V+ 31
V- 11 -VAN
V- 32
PAD V- 41
VOUT15 30 DAC15 DAC15
VOUT14 29 DAC14 DAC14
VOUT13 28 DAC13 DAC13
VOUT12 27 DAC12 DAC12
VOUT11 26 DAC11 DAC11
VOUT10 25 DAC10 DAC10
VOUT9 24 DAC9 DAC9
VOUT8 23 DAC8 DAC8
CLR 21 VADJ
LDAC 15 VADJ
TGP 20 GND
MSP0 39 GND
MSP1 40 +VAN
MSP2 1 GND

VADJ: C39 2.2µF 0402, C40 0.1µF 0402, GND
+VAN: C43 2.2µF 0402, C44 0.1µF 0402, GND
+VAN: C45 2.2µF 0402, C46 0.1µF 0402, GND
-VAN: C47 2.2µF 0402, C48 0.1µF 0402, GND

DAC updates via SPI interface

Not using toggle operation

Manual Span +/- 2.5V Mid Scale

The device has a precision 2.5V integrated reference with a typical temperature drift of 2ppm/°C. To use the internal reference, the REFCOMP pin should be left floating (no DC path to ground). In addition, the RD bit in the config register must have a value of 0. This value is reset to 0 at power-up, or it can be reset using the *Config* command, 0111b. Figure 9 shows the command syntax.

Manual Span Operation

Multiple output ranges are not needed in all applications. By tying the MSPAN pins (MSP2, MSP1 and MSP0) to GND and/or AVP, any output range can be hardware-configured without additional operational overhead. Zero-scale and mid-scale reset options are also available for the unipolar modes (see Table 4).

Table 4. MSPAN Pin Configurations

MSP2	MSP1	MSP0	OUTPUT RANGE	RESET CODE	MANUAL SPAN	SOFT-SPAN
0	0	0	±10V	Mid-Scale	X	
0	0	AVP	±5V	Mid-Scale	X	
0	AVP	0	±2.5V	Mid-Scale	X	
0	AVP	AVP	0V to 10V	Zero-Scale	X	
AVP	0	0	0V to 10V	Mid-Scale	X	
AVP	0	AVP	0V to 5V	Zero-Scale	X	
AVP	AVP	0	0V to 5V	Mid-Scale	X	
AVP	AVP	AVP	0V to 5V	Zero-Scale		X

FMC ADC32 - Offset DAC (LTC2668)

Revision	Drawing #: 5		TRIUMF
1	Sheet #: 5 of 8	Size: A	4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Drawn by: D.Bishop	Date: 3/10/2018	

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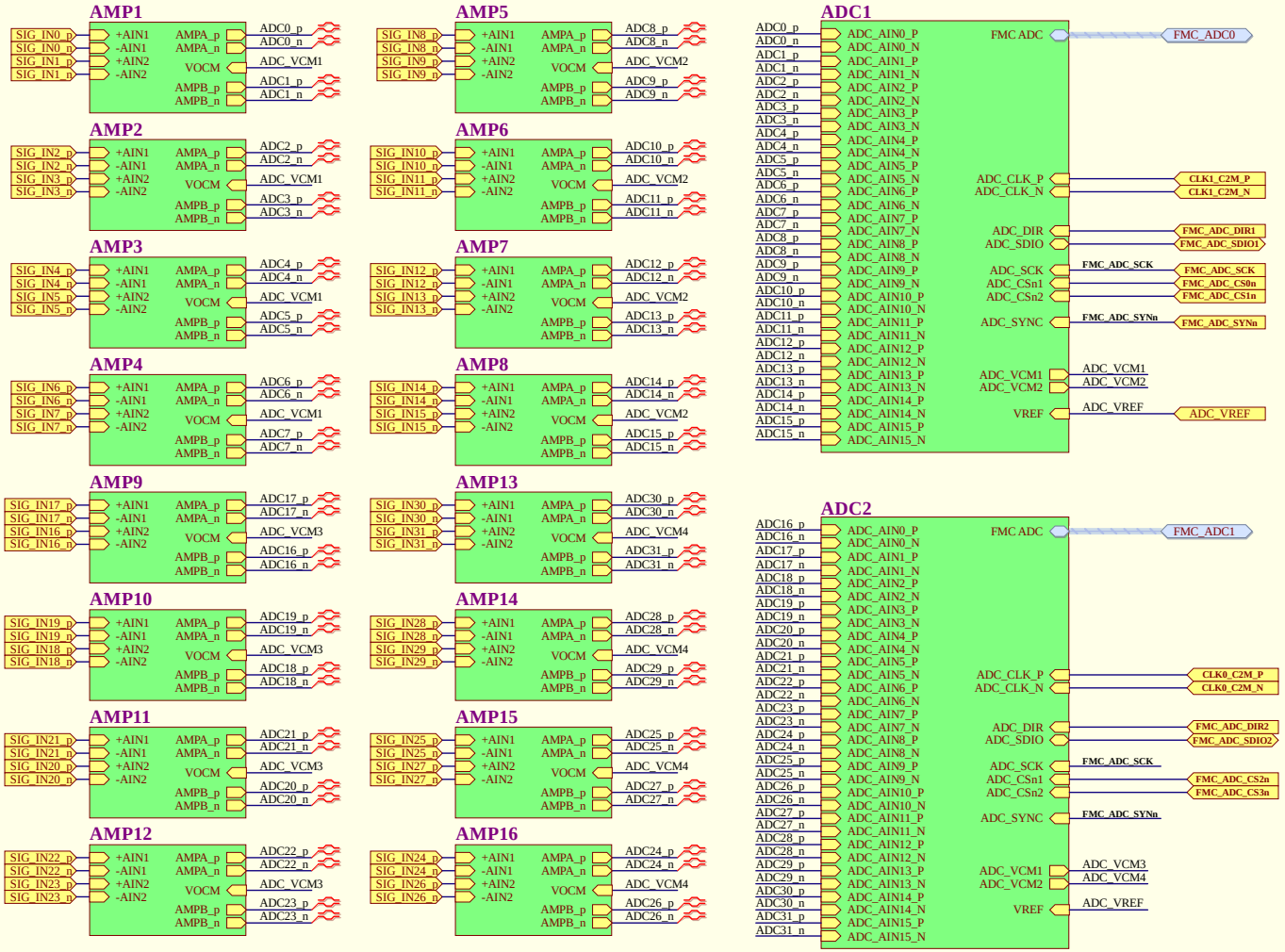

FMC ADC32 - ADC Front End

Revision 1	Drawing #: 6		TRIUMF 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 6 of 8	Size: B	
	Drawn by: D.Bishop	Date: 3/10/2018	
File: C:\Repositories\GRIF-ADC32Rev1\FMC ADC32 - ADC Front End Rev1.SchDoc			7:00:18 PM

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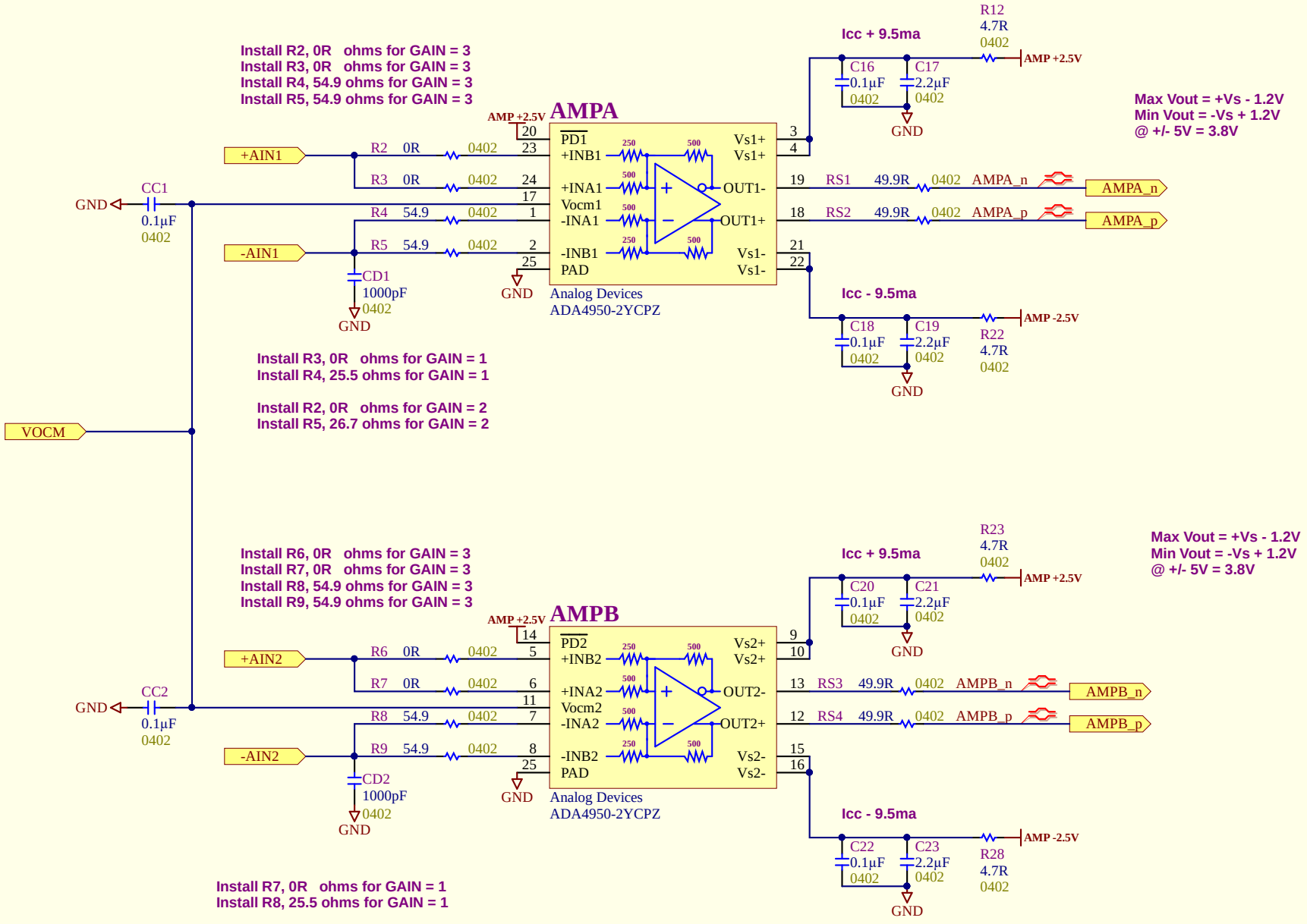

FMC ADC32 - Dual Amp - ADA4950-2YCPZ			
Revision **1**	Drawing #: 7		*TRIUMF* 4004 Wesbrook Mall Vancouver, B.C. Canada V6T 2A3
	Sheet #: 7 of 8	Size: A	
	Drawn by: D.Bishop	Date: 3/10/2018	
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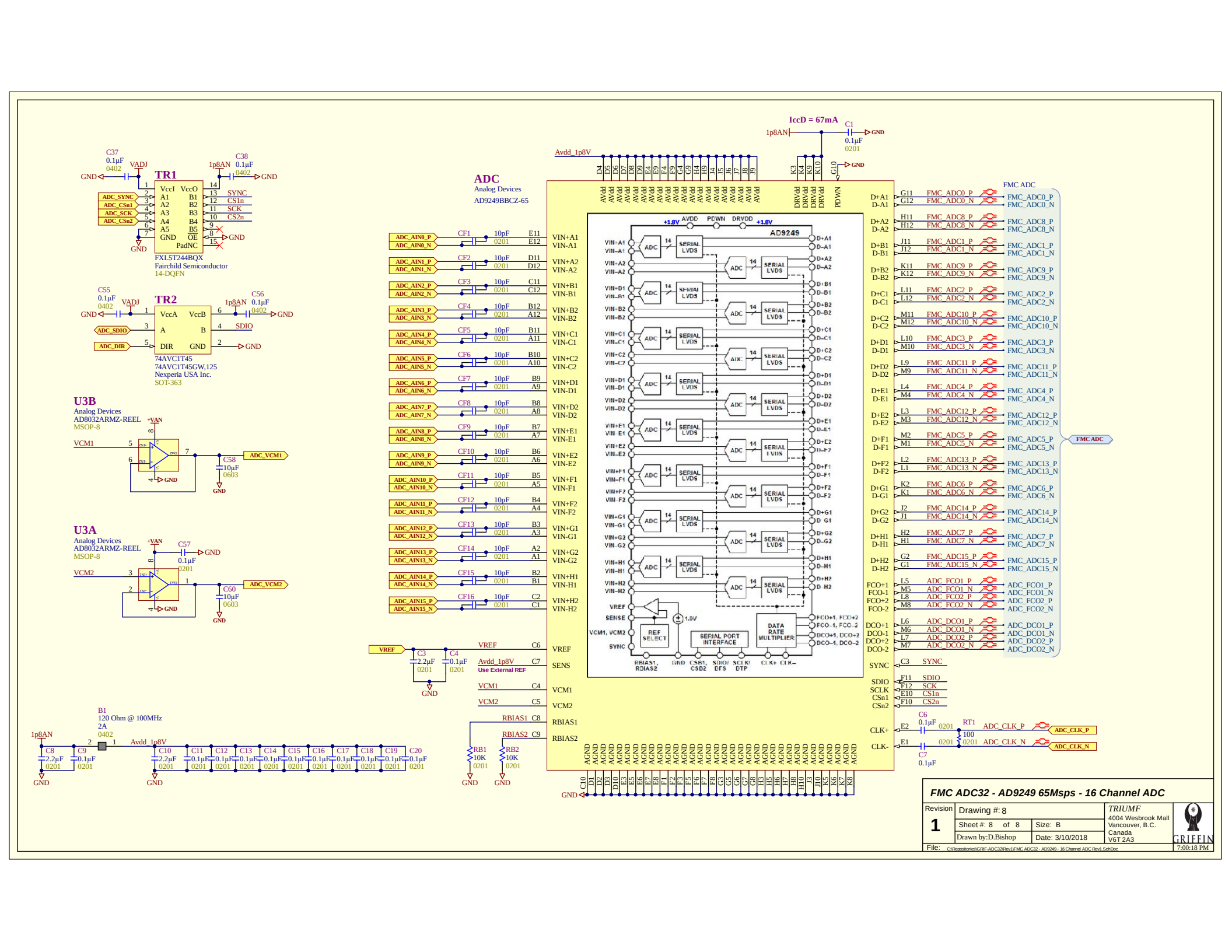
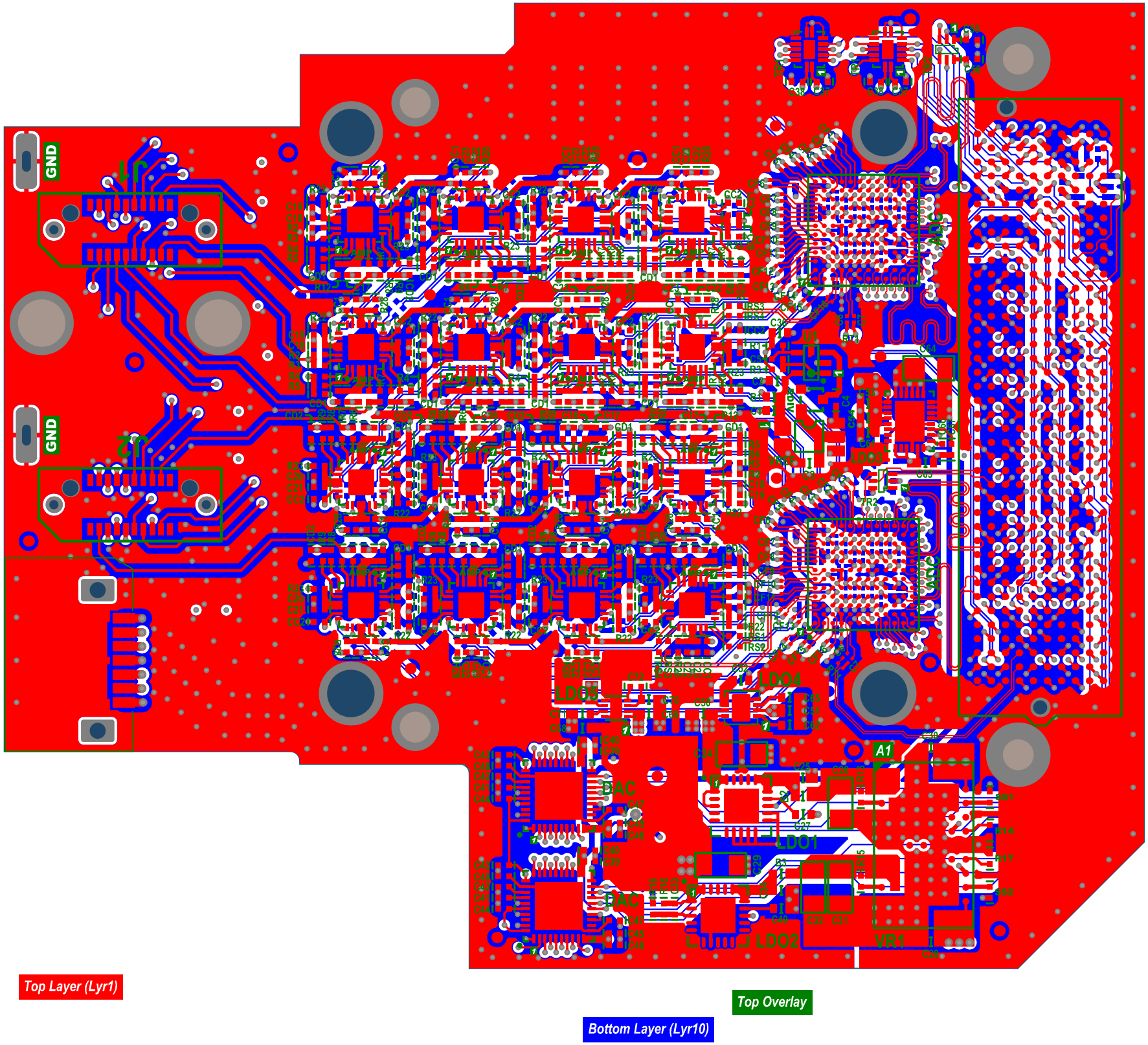

IccD = 67mA
ADC
Analog Devices
AD9249BBCZ-65
TR1
FXL5T244BQX
Fairchild Semiconductor
14-DQFN
TR2
74AVC1T45
74AVC1T45GW,125
Nexperia USA Inc.
SOT-363
U3B
Analog Devices
AD8032ARMZ-REEL
MSOP-8
U3A
Analog Devices
AD8032ARMZ-REEL
MSOP-8
B1
120 Ohm @ 100MHz
2A
Use External REF
FMC ADC
FMC ADC32 - AD9249 65Msps - 16 Channel ADC
Revision
1
Drawing #: 8
Sheet #: 8 of 8
Size: B
Drawn by:D.Bishop
Date: 3/10/2018
TRIUMF
4004 Wesbrook Mall
Vancouver, B.C.
Canada
V6T 2A3
GRIFFIN
7:00:18 PM


GND
GND
LDO3
LDO4
LDO5
DAC
DAC
LDO1
LDO2
VR1
A1
Top Layer (Lyr1)
Top Overlay
Bottom Layer (Lyr10)

Manufacturer	Description	Value	Part Number	Digi-Key	Designator	Quantity
Advanced Thermal Solutions Inc.	HEATSINK 57.9X60.96X5.84MM T766		ATS-P1-39-C2-R0	ATS1584-ND	HeatSink	1
Analog Devices	IC ADC 14BIT 65MSPS 144CSPBGA		AD9249BBCZ-65	AD9249BBCZ-65-ND	ADC_ADC1, ADC_ADC2	2
Analog Devices	IC OPAMP DIFF 750MHZ 24LFCSP		ADA4950-2YCPZ	ADA4950-2YCPZ-R7CT-ND	AMP_AMP1, AMP_AMP2, AMP_AMP3, AMP_AMP4, AMP_AMP5, AMP_AMP6, AMP_AMP7, AMP_AMP8, AMP_AMP9, AMP_AMP10, AMP_AMP11, AMP_AMP12, AMP_AMP13, AMP_AMP14, AMP_AMP15, AMP_AMP16	16
Analog Devices	IC OPAMP VFB 80MHZ RRO 8MSOP		AD8032ARMZ-REEL	AD8032ARMZ-REELCT-ND	U3_ADC1, U3_ADC2	2
Analog Devices Inc.	IC REG LDO 2.5V 0.6A 8LFCSP		ADM7154ACPZ-2.5-R7	ADM7154ACPZ-2.5-R7CT-ND	LDO4	1
Analog Devices Inc.	IC REG LINEAR 500MA 8LFCSP		ADP7185ACPZN2.5-R7	ADP7185ACPZN2.5-R7CT-ND	LDO5	1
Fairchild Semiconductor	TRANSLATOR 5BIT DUAL LV 14DQFN		FXL5T244BQX	FXL5T244BQXDKR-ND	TR1_ADC1, TR1_ADC2	2
Kemet	CAP CER 0.1UF 10V 10% X7R 0603	0.1µF	C0603C104K8RACTU	399-1095-2-ND	C2	1
Kemet	CAP CER 1000PF 50V 5% NP0 0402	1000pF	C0402C102J5GACTU	399-10034-1-ND	C66, CD1_AMP1, CD1_AMP2, CD1_AMP3, CD1_AMP4, CD1_AMP5, CD1_AMP6, CD1_AMP7, CD1_AMP8, CD1_AMP9, CD1_AMP10, CD1_AMP11, CD1_AMP12, CD1_AMP13, CD1_AMP14, CD1_AMP15, CD1_AMP16, CD2_AMP1, CD2_AMP2, CD2_AMP3, CD2_AMP4, CD2_AMP5, CD2_AMP6, CD2_AMP7, CD2_AMP8, CD2_AMP9, CD2_AMP10, CD2_AMP11, CD2_AMP12, CD2_AMP13, CD2_AMP14, CD2_AMP15, CD2_AMP16	33
Kemet	CAP CER 47UF 10V 20% X5R 1206	47µF	C1206C476M8PACTU	399-5508-1-ND	C24, C26, C29, C32, C64	5
Linear Technology	IC DAC 12BIT 16CH 40QFN		LTC2668CUJ-12#PBF	LTC2668CUJ-12#PBF-ND	DAC_DAC1, DAC_DAC2	2
Linear Technology	IC OP AMP SINGLE R-R TSOT23-5		LTC6240CS5#TRMPBF	LTC6240CS5#TRMPBFCT-ND	U1	1
Linear Technology	IC REG LDO ADJ 5A 28QFN		LT3071EUFD#PBF	LT3071EUFD#PBF-ND	LDO3	1
Linear Technology	IC REG MULT CONFIG INV 77BGA		LTM8049EY#PBF	LTM8049EY#PBF-ND	VR1	1
Linear Technology	IC VREF SERIES 3.0V 8MSOP		LTC6655BHMS8-3#PBF	LTC6655BHMS8-3#PBF	VREF	1
Microchip Technology	IC EEPROM 2KBIT 400KHZ SOT23-5		24AA02E48T-I/OT	24AA02E48T-I/OTCT-ND	U2	1
Molex Inc	CONN PLUG 7POS SERIAL ATA 15GOLD		0470804005	WM19112CT-ND	SATA	1
Murata	CAP CER 10PF 25V C0G/NP0 0201	10pF	GRM0335C1E100JA01D	490-8607-2-ND	CF1_ADC1, CF1_ADC2, CF2_ADC1, CF2_ADC2, CF3_ADC1, CF3_ADC2, CF4_ADC1, CF4_ADC2, CF5_ADC1, CF5_ADC2, CF6_ADC1, CF6_ADC2, CF7_ADC1, CF7_ADC2, CF8_ADC1, CF8_ADC2, CF9_ADC1, CF9_ADC2, CF10_ADC1, CF10_ADC2, CF11_ADC1, CF11_ADC2, CF12_ADC1, CF12_ADC2, CF13_ADC1, CF13_ADC2, CF14_ADC1, CF14_ADC2, CF15_ADC1, CF15_ADC2, CF16_ADC1, CF16_ADC2	32
Murata Electronics North America	CAP CER 100UF 6.3V X5R 1206	100uF	GRM31CR60J107ME39L	490-4539-1-ND	C31	1
Murata Electronics North America	CAP CER 10UF 16V X5R 0603	10µF	GRT188R61C106KE13D	490-12317-1-ND	C25, C28, C30, C34, C50, C51, C61, C62, C63, C68, C69	11
Murata Electronics North America	CAP CER 10UF 6.3V 20% X5R 0603	10µF	GRM188R60J106ME47D	587-3238-2-ND	C1, C3, C36, C58_ADC1, C58_ADC2, C60_ADC1, C60_ADC2	7
Murata Electronics North America	CAP CER 2.2UF 10V 20% X5R 0402	2.2µF	GRM155R61A225ME95D	490-10452-6-ND	C17_AMP1, C17_AMP2, C17_AMP3, C17_AMP4, C17_AMP5, C17_AMP6, C17_AMP7, C17_AMP8, C17_AMP9, C17_AMP10, C17_AMP11, C17_AMP12, C17_AMP13, C17_AMP14, C17_AMP15, C17_AMP16, C19_AMP1, C19_AMP2, C19_AMP3, C19_AMP4, C19_AMP5, C19_AMP6, C19_AMP7, C19_AMP8, C19_AMP9, C19_AMP10, C19_AMP11, C19_AMP12, C19_AMP13, C19_AMP14, C19_AMP15, C19_AMP16, C21_AMP1, C21_AMP2, C21_AMP3, C21_AMP4, C21_AMP5, C21_AMP6, C21_AMP7, C21_AMP8, C21_AMP9, C21_AMP10, C21_AMP11, C21_AMP12, C21_AMP13, C21_AMP14, C21_AMP15, C21_AMP16, C23_AMP1, C23_AMP2, C23_AMP3, C23_AMP4, C23_AMP5, C23_AMP6, C23_AMP7, C23_AMP8, C23_AMP9, C23_AMP10, C23_AMP11, C23_AMP12, C23_AMP13, C23_AMP14, C23_AMP15, C23_AMP16, C39_DAC1, C39_DAC2, C43_DAC1, C43_DAC2, C45_DAC1, C45_DAC2, C47_DAC1, C47_DAC2	72
Murata Electronics North America	FERRITE BEAD 120 OHM 0402 1LN		BLM15PX121SN1D	490-9656-2-ND	B1_ADC1, B1_ADC2	2
Nexperia USA Inc.	Voltage Level Translator Bidirectional 1 Circuit 1 Channel 500Mbps 6-TSSOP		74AVC1T45GW,125	1727-6031-2-ND	TR2_ADC1, TR2_ADC2	2
Panasonic	LED RED HIGH BRIGHT ESS SMD		LNJ237W82RA	LNJ237W82RACT-ND	LED1, LED2, LED3	3
Panasonic	RES SMD 294K OHM 1% 1/10W 0402	294K	ERJ-2RKF2943X	P294KLCT-N	R16	1
Panasonic Electronic Components	RES SMD 0.0 OHM JUMPER 1/10W	0R	ERJ-2GE0R00X	ERJ-2GE0R00X	R2_AMP1, R2_AMP2, R2_AMP3, R2_AMP4, R2_AMP5, R2_AMP6, R2_AMP7, R2_AMP8, R2_AMP9, R2_AMP10, R2_AMP11, R2_AMP12, R2_AMP13, R2_AMP14, R2_AMP15, R2_AMP16, R3_AMP1, R3_AMP2, R3_AMP3, R3_AMP4, R3_AMP5, R3_AMP6, R3_AMP7, R3_AMP8, R3_AMP9, R3_AMP10, R3_AMP11, R3_AMP12, R3_AMP13, R3_AMP14, R3_AMP15, R3_AMP16, R6_AMP1, R6_AMP2, R6_AMP3, R6_AMP4, R6_AMP5, R6_AMP6, R6_AMP7, R6_AMP8, R6_AMP9, R6_AMP10, R6_AMP11, R6_AMP12, R6_AMP13, R6_AMP14, R6_AMP15, R6_AMP16, R7_AMP1, R7_AMP2, R7_AMP3, R7_AMP4, R7_AMP5, R7_AMP6, R7_AMP7, R7_AMP8, R7_AMP9, R7_AMP10, R7_AMP11, R7_AMP12, R7_AMP13, R7_AMP14, R7_AMP15, R7_AMP16	64
Panasonic Electronic Components	RES SMD 1 OHM 5% 1/10W 0402	1R	ERJ-2GEJ1R0X	P1.0JCT-ND	R3	1
Panasonic Electronic Components	RES SMD 100 OHM 1% 1/20W 0201	100	ERJ-1GEF1000C	P100ABTR-ND	RT1_ADC1, RT1_ADC2	2
Panasonic Electronic Components	RES SMD 10K OHM 1% 1/20W 0201	10K	ERJ-1GEF1002C	P10.0KABTR-ND	RB1_ADC1, RB1_ADC2, RB2_ADC1, RB2_ADC2	4
Panasonic Electronic Components	RES SMD 45.3K OHM 1% 1/10W 0402	45.3K	ERJ-2RKF4532X	P45.3KLCT-ND	R13	1
Panasonic Electronic Components	RES SMD 60.4K OHM 1% 1/10W 0402	60.4K	ERJ-2RKF6042X	P60.4KLCT-ND	R15	1
Panasonic Electronic Components	RES SMD 61.9 OHM 1% 1/10W 0402	61.9	ERJ-2RKF61R9X	P61.9LTR-ND	RT0, RT1, RT2, RT3, RT4, RT5, RT6, RT7, RT8, RT9, RT10, RT11, RT12, RT13, RT14, RT15, RT16, RT17, RT18, RT19, RT20, RT21, RT22, RT23, RT24, RT25, RT26, RT27, RT28, RT29, RT30, RT31	32
Samsung	RES 102K OHM 1/16W 1% 0402	102K	RC1005F1023CS	1276-4202-6-ND	R18	1
Samsung Electro-Mechanics	CAP CER 2.2UF 10V X5R 0201	2.2µF	CL03A225MP3CRNC	1276-6829-2-ND	C3_ADC1, C3_ADC2, C8_ADC1, C8_ADC2, C10_ADC1, C10_ADC2	6
Samsung Electro-Mechanics	CAP CER 4.7UF 6.3V X7R 0603	4.7µF	CL10B475KQ8NQNC	1276-2087-1-ND	C54	1
Samtec	CONN RCPT 20POS 0.8MM GOLD SMD		ERF8-010-05.0-L-DV-L-K-TR	SAM8618CT-ND	J1, J2	2
SAMTEC	FMC Mezzanine connector		ASP-134488-01	ASP-134488-01	FMC1	1
Stackpole Electronics	RES SMD 4.7 OHM 1% 1/16W 0402	4.7R	RMCF0402FT4R70	RMCF0402FT4R70DKR-ND	R12_AMP1, R12_AMP2, R12_AMP3, R12_AMP4, R12_AMP5, R12_AMP6, R12_AMP7, R12_AMP8, R12_AMP9, R12_AMP10, R12_AMP11, R12_AMP12, R12_AMP13, R12_AMP14, R12_AMP15, R12_AMP16, R22_AMP1, R22_AMP2, R22_AMP3, R22_AMP4, R22_AMP5, R22_AMP6, R22_AMP7, R22_AMP8, R22_AMP9, R22_AMP10, R22_AMP11, R22_AMP12, R22_AMP13, R22_AMP14, R22_AMP15, R22_AMP16, R23_AMP1, R23_AMP2, R23_AMP3, R23_AMP4, R23_AMP5, R23_AMP6, R23_AMP7, R23_AMP8, R23_AMP9, R23_AMP10, R23_AMP11, R23_AMP12, R23_AMP13, R23_AMP14, R23_AMP15, R23_AMP16, R28_AMP1, R28_AMP2, R28_AMP3, R28_AMP4, R28_AMP5, R28_AMP6, R28_AMP7, R28_AMP8, R28_AMP9, R28_AMP10, R28_AMP11, R28_AMP12, R28_AMP13, R28_AMP14, R28_AMP15, R28_AMP16	64
Taiyo Yuden	CAP CER 2.2UF 10V 10% X7R 0603	2.2µF	LMK107B7225KA-T	587-2983-1-ND	C27, C49, C52, C53, C65, C70, C71	7
Taiyo Yuden	FERRITE BEAD 1000 OHM 0603		FBMH1608HM102-T	587-1739-2-ND	B1	1
TDK Corporation	FERRITE CHIP BEAD 600 OHM SMD		MPZ1608S601ATA00	445-2205-1-ND	B2, B3	2
Texas Instruments	IC REG LDO ADJ 1A 20VQFN	1A	TPS7A4700RGWT	296-34769-1-ND	LDO1	1
Texas Instruments	IC REG LDO NEG ADJ 1A 20VQFN	1A	TPS7A3301RGWT	296-34830-2-ND	LDO2	1
Vishay Dale	RES SMD 49.9 OHM 1% 1/16W 0402	49.9R	RC0402FR-0749R9L	311-49.9LRTR-ND	RS1_AMP1, RS1_AMP2, RS1_AMP3, RS1_AMP4, RS1_AMP5, RS1_AMP6, RS1_AMP7, RS1_AMP8, RS1_AMP9, RS1_AMP10, RS1_AMP11, RS1_AMP12, RS1_AMP13, RS1_AMP14, RS1_AMP15, RS1_AMP16, RS2_AMP1, RS2_AMP2, RS2_AMP3, RS2_AMP4, RS2_AMP5, RS2_AMP6, RS2_AMP7, RS2_AMP8, RS2_AMP9, RS2_AMP10, RS2_AMP11, RS2_AMP12, RS2_AMP13, RS2_AMP14, RS2_AMP15, RS2_AMP16, RS3_AMP1, RS3_AMP2, RS3_AMP3, RS3_AMP4, RS3_AMP5, RS3_AMP6, RS3_AMP7, RS3_AMP8, RS3_AMP9, RS3_AMP10, RS3_AMP11, RS3_AMP12, RS3_AMP13, RS3_AMP14, RS3_AMP15, RS3_AMP16, RS4_AMP1, RS4_AMP2, RS4_AMP3, RS4_AMP4, RS4_AMP5, RS4_AMP6, RS4_AMP7, RS4_AMP8, RS4_AMP9, RS4_AMP10, RS4_AMP11, RS4_AMP12, RS4_AMP13, RS4_AMP14, RS4_AMP15, RS4_AMP16	64
Vishay Thin Film	RES NET MULT OHM 2 RES TO236-3	1K, 2K	MPMT10012001AT1	MPMT-1K/2KCT-ND	Rdiv	1
Yageo	0.10µF 16V Ceramic Capacitor X7R 0402	0.1µF	CC0402KRX7R7BB104	311-1338-2-ND	C4, C16_AMP1, C16_AMP2, C16_AMP3, C16_AMP4, C16_AMP5, C16_AMP6, C16_AMP7, C16_AMP8, C16_AMP9, C16_AMP10, C16_AMP11, C16_AMP12, C16_AMP13, C16_AMP14, C16_AMP15, C16_AMP16, C18_AMP1, C18_AMP2, C18_AMP3, C18_AMP4, C18_AMP5, C18_AMP6, C18_AMP7, C18_AMP8, C18_AMP9, C18_AMP10, C18_AMP11, C18_AMP12, C18_AMP13, C18_AMP14, C18_AMP15, C18_AMP16, C20_AMP1, C20_AMP2, C20_AMP3, C20_AMP4, C20_AMP5, C20_AMP6, C20_AMP7, C20_AMP8, C20_AMP9, C20_AMP10, C20_AMP11, C20_AMP12, C20_AMP13, C20_AMP14, C20_AMP15, C20_AMP16, C22_AMP1, C22_AMP2, C22_AMP3, C22_AMP4, C22_AMP5, C22_AMP6, C22_AMP7, C22_AMP8, C22_AMP9, C22_AMP10, C22_AMP11, C22_AMP12, C22_AMP13, C22_AMP14, C22_AMP15, C22_AMP16, C35, C37_ADC1, C37_ADC2, C38_ADC1, C38_ADC2, C40_DAC1, C40_DAC2, C41_DAC1, C41_DAC2, C42_DAC1, C42_DAC2, C44_DAC1, C44_DAC2, C46_DAC1, C46_DAC2, C48_DAC1, C48_DAC2, C55_ADC1, C55_ADC2, C56_ADC1, C56_ADC2, CC1_AMP1, CC1_AMP2, CC1_AMP3, CC1_AMP4, CC1_AMP5, CC1_AMP6, CC1_AMP7, CC1_AMP8, CC1_AMP9, CC1_AMP10, CC1_AMP11, CC1_AMP12, CC1_AMP13, CC1_AMP14, CC1_AMP15, CC1_AMP16, CC2_AMP1, CC2_AMP2, CC2_AMP3, CC2_AMP4, CC2_AMP5, CC2_AMP6, CC2_AMP7, CC2_AMP8, CC2_AMP9, CC2_AMP10, CC2_AMP11, CC2_AMP12, CC2_AMP13, CC2_AMP14, CC2_AMP15, CC2_AMP16, SS1, SS2	120
Yageo	CAP CER 0.1UF 10V X5R 0201	0.1µF	Murata Electronics North America	490-5881-2-ND	C1_ADC1, C1_ADC2, C4_ADC1, C4_ADC2, C6_ADC1, C6_ADC2, C7_ADC1, C7_ADC2, C9_ADC1, C9_ADC2, C11_ADC1, C11_ADC2, C12_ADC1, C12_ADC2, C13_ADC1, C13_ADC2, C14_ADC1, C14_ADC2, C15_ADC1, C15_ADC2, C16_ADC1, C16_ADC2, C17_ADC1, C17_ADC2, C18_ADC1, C18_ADC2, C19_ADC1, C19_ADC2, C20_ADC1, C20_ADC2, C57_ADC1, C57_ADC2	32
Yageo	CAP CER 10000PF 50V 10% X7R 0402	10000pF	CC0402KRX7R9BB103	311-1349-2-ND	C5, C33, C67, C72	4
Yageo	RES SMD 107K OHM 1% 1/16W 0402	107K	RC0402FR-07107KL	YAG2948TR-ND	R14, R17	2
Yageo	RES SMD 2.2K OHM 1% 1/16W 0402	2.2K	RC0402FR-072K2L	311-2.20KLRTR-ND	R1, R10, R11, RL1, RL2, RL3	6
Yageo	RES SMD 54.9 OHM 1% 1/16W 0402	54.9	RC0402FR-0754R9L	311-54.9LRTR-ND	R4_AMP1, R4_AMP2, R4_AMP3, R4_AMP4, R4_AMP5, R4_AMP6, R4_AMP7, R4_AMP8, R4_AMP9, R4_AMP10, R4_AMP11, R4_AMP12, R4_AMP13, R4_AMP14, R4_AMP15, R4_AMP16, R5_AMP1, R5_AMP2, R5_AMP3, R5_AMP4, R5_AMP5, R5_AMP6, R5_AMP7, R5_AMP8, R5_AMP9, R5_AMP10, R5_AMP11, R5_AMP12, R5_AMP13, R5_AMP14, R5_AMP15, R5_AMP16, R8_AMP1, R8_AMP2, R8_AMP3, R8_AMP4, R8_AMP5, R8_AMP6, R8_AMP7, R8_AMP8, R8_AMP9, R8_AMP10, R8_AMP11, R8_AMP12, R8_AMP13, R8_AMP14, R8_AMP15, R8_AMP16, R9_AMP1, R9_AMP2, R9_AMP3, R9_AMP4, R9_AMP5, R9_AMP6, R9_AMP7, R9_AMP8, R9_AMP9, R9_AMP10, R9_AMP11, R9_AMP12, R9_AMP13, R9_AMP14, R9_AMP15, R9_AMP16	64