

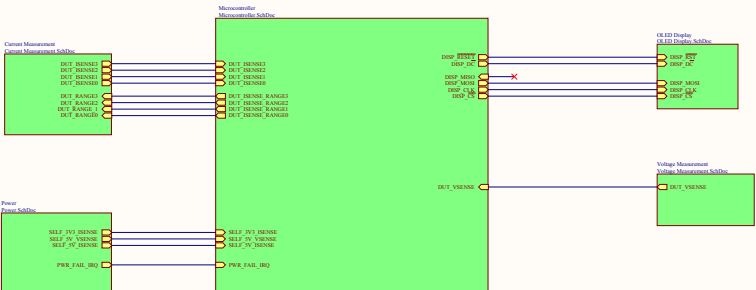
Current Measurement

Power

Voltage Measurement

Connectives

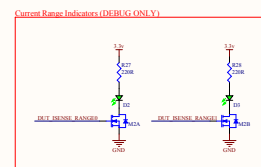
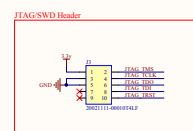
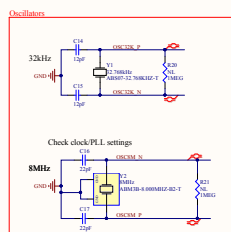
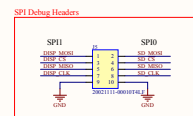
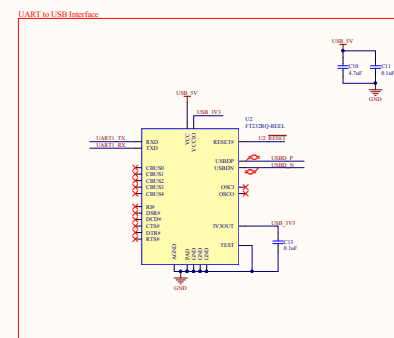
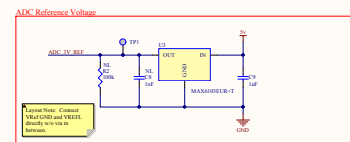
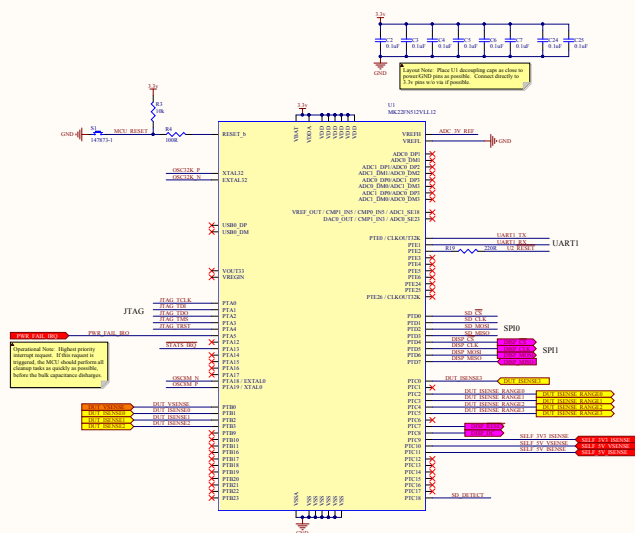
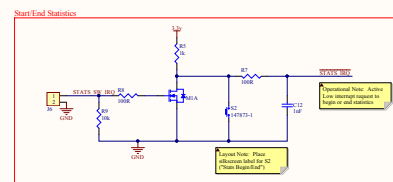
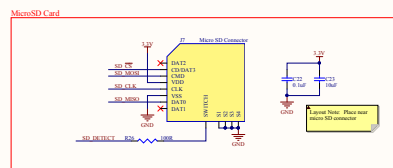
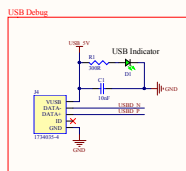
OLED Display



Title		Revision	
Microcontroller SubSys		Rev. 1.0	
Date		Author	
10/10/2023		A.	
File		Microcontroller SubSys	



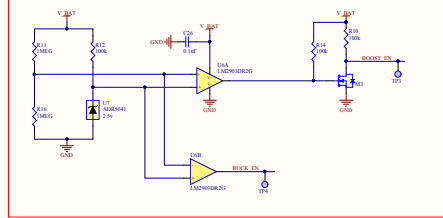
1	2	3	4	5	6	7	8
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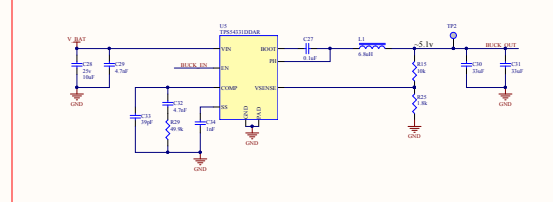
Title		Microcontroller SchDoc		Ron Harvey	
Size	Number			Revision	
D				A	
Date:	10/26/2015			Sheet 2 of 7	
File:	C:\Users\Ron\Documents\Microcontroller SchDoc	Design By:		Ron Harvey	

Current Measurement
Voltage Measurement
Power
Voltage Measurement
Connectives
OLED Display

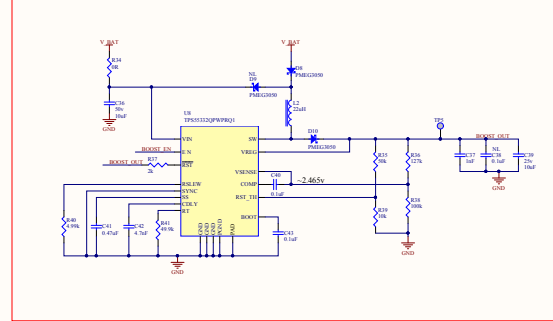
### Converter Selection Controls



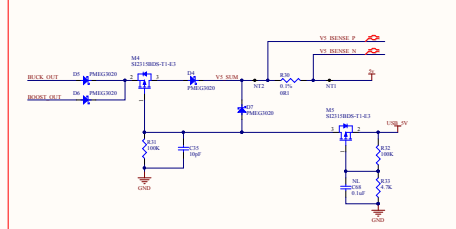
### Buck Converter



### Boost Converter

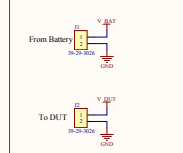


### USB Auto Switchover

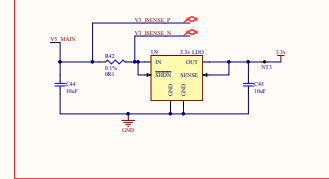


Note: Boost, Out and Buck, Out are the TV outputs from the switching converter. The USB auto-switchover circuit enables the TV rail from the existing converter output to the TV LDO with auto-switch (low current only).

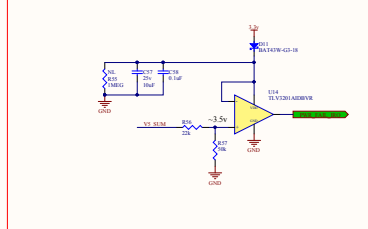
### Power Connection



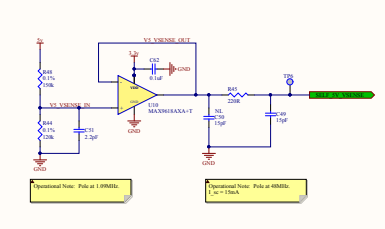
### 3.3V LDO



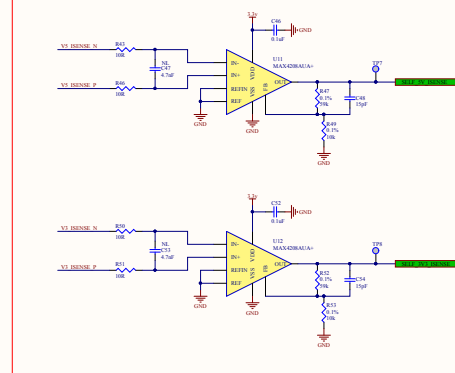
### Power Failure Indicator



### Vr Rail Measurement



### Isense Measurement



Power SubDoc	JB-AB001
Rev	Number
Rev	Number
Rev	Number
Rev	Number

Current Measurement

Microcontroller

Power

Voltage Measurement

Connectors

OLED Display

Firmware Note: Compensate for the DUT\_GND/GND offset.

Operational Note: Pole at 602kHz.  
0.216v < DUT\_VSENSE\_IN < 2.88v

Operational Note: Pole at 48MHz.  
I\_sc = 15mA

Title		Voltage Measurement.SchDoc		Ross Harvey	
Size	B	Number		Revision	
Date:		10/26/2015		Sheet 5 of 7	
File:		C:\Users\...\Voltage Measurement.SchDoc		Drawn By: Ross Harvey	

Current Measurement

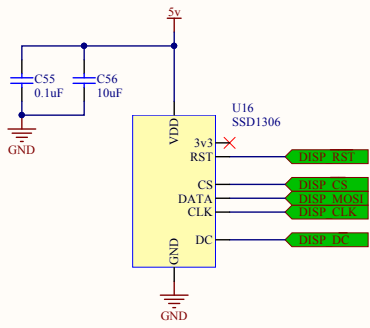
Microcontroller

Power

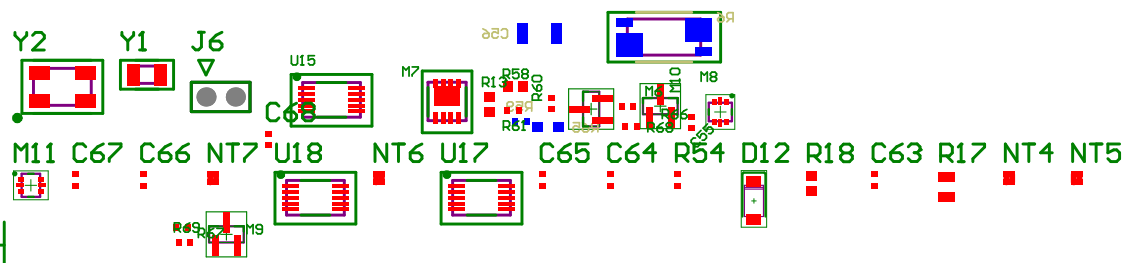
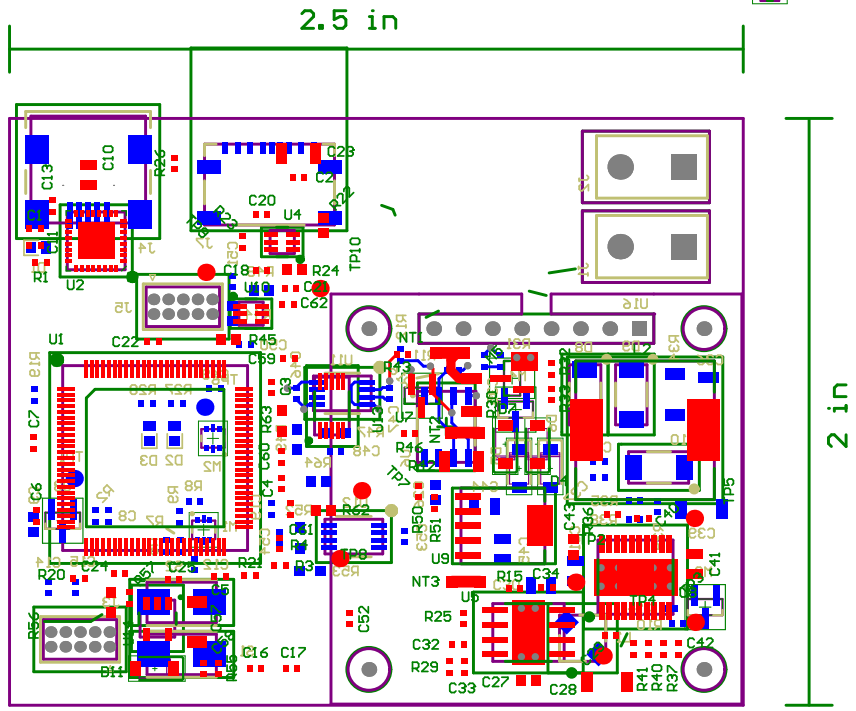
Voltage Measurement

Connectors

OLED Display



Title				OLED Display.SchDoc		*	
Size	Number			Revision			
B				*			
Date:	10/26/2015					Sheet 7 of	7
File:	C:\Users\...OLED Display.SchDoc					Drawn By:	*



Comment	Description	Designator	Footprint	LibRef	Quantity
10nF		C1	CAP0402R	10nF (0402)	1
0.1uF		C2, C3, C4, C5, C6, C7, C11, C13, C18, C22, C24, C25, C18, C40, C46, C52, C55, C58, C59, C60, C62, C64, C65, C68	CAP0402R	0.1uF (0402)	24
		C8, C12, C38, C37, C61, C63, C66, C67	CAP0402R	1nF (0402)	8
1nF		C9	CAP0603R	1uF	1
1uF		C10	CAP0805R	4.7uF (0805)	1
4.7uF		C14, C15	CAP0402R	12pF (0402)	2
12pF		C16, C17	CAP0402R	22pF (0402)	2
22pF		C19, C20, C48, C49, C50, C54	CAP0402R	15pF (0402)	6
15pF		C21, C35	CAP0402R	10pF (0402)	2
10pF		C23, C36, C56	CAP1206R	10uF, 10uF 50V (L206), 10uF	3
10uF		C26, C27, C43	CAP0603R	0.1uF 50V (0603)	3
0.1uF		C28, C39, C57	CAP1206W	10uF (L206), 4.7uF, 4.7uF, 4.7nF (0402), 4.7nF (0402), 4.7nF (0402)	3
4.7nF		C29, C32, C42, C47, C53	CAP0402R	13uF (0805)	5
13uF		C30, C31	CAP0805R	Generic Ceramic Capacitor	2
39pF		C33	CAP0402R	0.47uF (0805)	1
0.47uF		C41	CAP0805R	Generic Ceramic Capacitor	1
10uF		C44, C45	CAP0805R	2.2pF (0402)	2
2.2pF		C51	CAP0402R	LED Green 0603	1
1TST-5270KGT		D1, D2, D3	LED Green 0603	LED Green 0603	3
PMEG3020	Schottky Diode - 2A	D4, D5, D6, D7	SOD-123	PMEG3020ER.115	4
PMEG3050		D8, D9, D10	SOD128	PMEG3050BEP	3
BAT43W-G1-18		D11	SOD-123	BAT43	1
BZT52H-C18-115	19.1v Zener Diode	D12	SOD-123	BZT52H-C18	1
39-29-3026	1x2 MicroFit	J1, J2	1x2 MicroFit	1x2 Microfit	2
20021111-00010T4LF	2x5 JTAG Header TH (1.27mm)	J3, J5	2x5 Header (1.27mm)	2x5 JTAG Header TH	2
1734035-4	USB Mini B Female	J4	USB MINI-B 1734035-4	USB Mini-B Female	1
1x2 Header	1x2 Header, 2.53mm pitch	J6	1x2 Header	1x2 Header	1
Micro SD Connector	Micro SD Connector	J7	MICROSD_1050270001	MICRO_SD 1050270001	1
6.8uH	6.8uH Shielded Power Inductor	L1	CDRH3028NP-68BNC	6.8uH Power Inductor	1
22uH		L2	Bourns_SRR1210	22uH_SRR1210	1
NG3020NAKV.115	NFET_DUAL_200mA_30V	M1, M2, M8, M11	SOT666-6N	NG3020NAKV	4
2N7002P.215	NFET_SINGLE_300mA_50V	M3	SOT23-3M	2N7002	1
512315BDS-TL-E3		M4, M5	SOT23-3M	Generic PFET	2
DMP3056L-7	PFET_SINGLE_4.3A_30V	M6, M8, M10	SOT23-3M	DMP3056L	3
515527DN-T1-G43	PFET_SINGLE_50A_30V	M7	PowerPAK-1212-8	515527DN	1
Net Tie	Net Tie Testpoint w/ Hook	NT1, NT2, NT3	Net Tie	Net Tie	3
300R		R1	RES0402R	300R (0402)	1
100k		R2, R10, R12, R14, R31, R32, R38	RES0402R	100k (0402), 100k (0402), 100k (0402), Generic Resistor, Generic Resistor, 100k (0402)	7
10k		R3, R9, R15, R39, R59, R61, R68, R69	RES0402R	10k (0402)	8
100R		R4, R7, R8, R26, R54, R60, R66, R67	RES0402R	100R (0402)	6
1k	10nR Current Sense - 4 Terminal	R5	RES0402R	1k (0402)	1
10m		R6	2512 4 Terminal	10m 0.5% (2512 4-Terminal)	1
1MEG		R11, R16, R20, R21, R55	RES0402R	1MEG (0402)	5
10k		R13, R18, R62, R64	RES0603R	10K (0603)	4
1R		R17	RES0805R	1R 0.25% (0805)	1
220R		R19, R27, R28	RES0402R	220R (0402)	3
220k		R22	RES0603R	220k 0.1% (0603)	1
0R		R23	RES0402R	0R (0402)	1
30k		R24	RES0603R	30k 0.1% (0603)	1
1.8k		R25	RES0402R	1.8k (0402)	1
49.9k		R29, R41	RES0402R	49.9k (0402)	2
0R1		R30, R42	RES1206R	100m 0.1% (L206)	2
4.7k		R33	RES0402R	Generic Resistor	1
0R	0R, 1206	R34	RES1206W	0R (L206)	1
50k		R35, R57	RES0402R	50k (0402)	2
127k		R36	RES0402R	127k (0402)	1
2k		R37	RES0402R	2k (0402)	1
4.99k		R40	RES0402R	4.99k (0402)	1
10R		R43, R46, R50, R51	RES0402R	10R (0402)	4
120k		R44	RES0603R	120k 0.1% (0603)	1
220R		R45, R58	RES0603R	220R (0603)	2
59k		R47, R52	RES0603W	59k 0.1% (0603)	2
150k		R48	RES0603R	150k 0.1% (0603)	1
10k		R49, R53	RES0603W	10k 0.1% (0603)	2
22k		R56	RES0603W	22k (0603)	1
100R		R63	RES0603W	100R 0.1% (0603)	1
1k		R65	RES0603W	1k 0.1% (0603)	1
147873-1	Micro SPST Momentary Switch	S1, S2	TECONN_14783-1	SPST Momentary Micro	2
NC0ME	1.5mm Testpoint	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10	TESTPOINT - 1.5mm Round Pad	Testpoint 1.5mm SMD	10
MK22FN512VLL12	32-bit ARM Cortex-M43 Microcontroller	U1	LCQFP100 0.5mm 14mmx14mm	MK22FN512VLL12	1
FT232RLQ-REEL	UART Interface/Bridge	U2	QFN32	FT232RLQ-REEL	1
MAX6101EUR+T	Precision 3v Reference	U3	SOT23-3M	MAX6101EUR+T	1
MAX9618AXA+T	Op Amp - 1 Channel Zero Drift	U4, U10	SC70	MAX9618AXA	2
TP554311DOAR	Buck Converter - Adj. Output - 3A Max	U5	HSOP-8	TP554311	1
LM2903DR2G	Dual Comparator - Open Collector	U6	SOIC-8	LM2903DR2G	1
ADR5041	Precision 5v Reference	U7	SOT23-3M	ADR5040AKSZ	1
TP55132QPWPRQ1	Boost Converter - Wide Input Voltage	U8	HTSSOP-20	TP551322QPWPRQ1	1
FNAME7	3.3v LDO	U9	SOT-223-6	TP57A4533DCQR	1
MAX4208AUJA+	Instrumentation Amplifier	U11, U12	uMAX8	MAX4208	2
MAX9923TEUB+	Ultra-Precision High Side Current Shunt Amp	U13, U15, U17, U18	uMAX10	MAX9923TEUB+	4
TLV1201AID8VR	High Speed Analog Comparator	U14	SOT23-5	TLV1201AID8VR	1
SSD1306	OLED Display	U16	SSD1306	SSD1306	1
32.768kHz	32kHz Crystal	Y1	ABSS07-32.768KHZ-T	32kHz Crystal	1
8MHz	8.0MHz Crystal	Y2	ABMM2-8.000MHZ-82-T	8.0MHz Crystal 18pF 20k	1