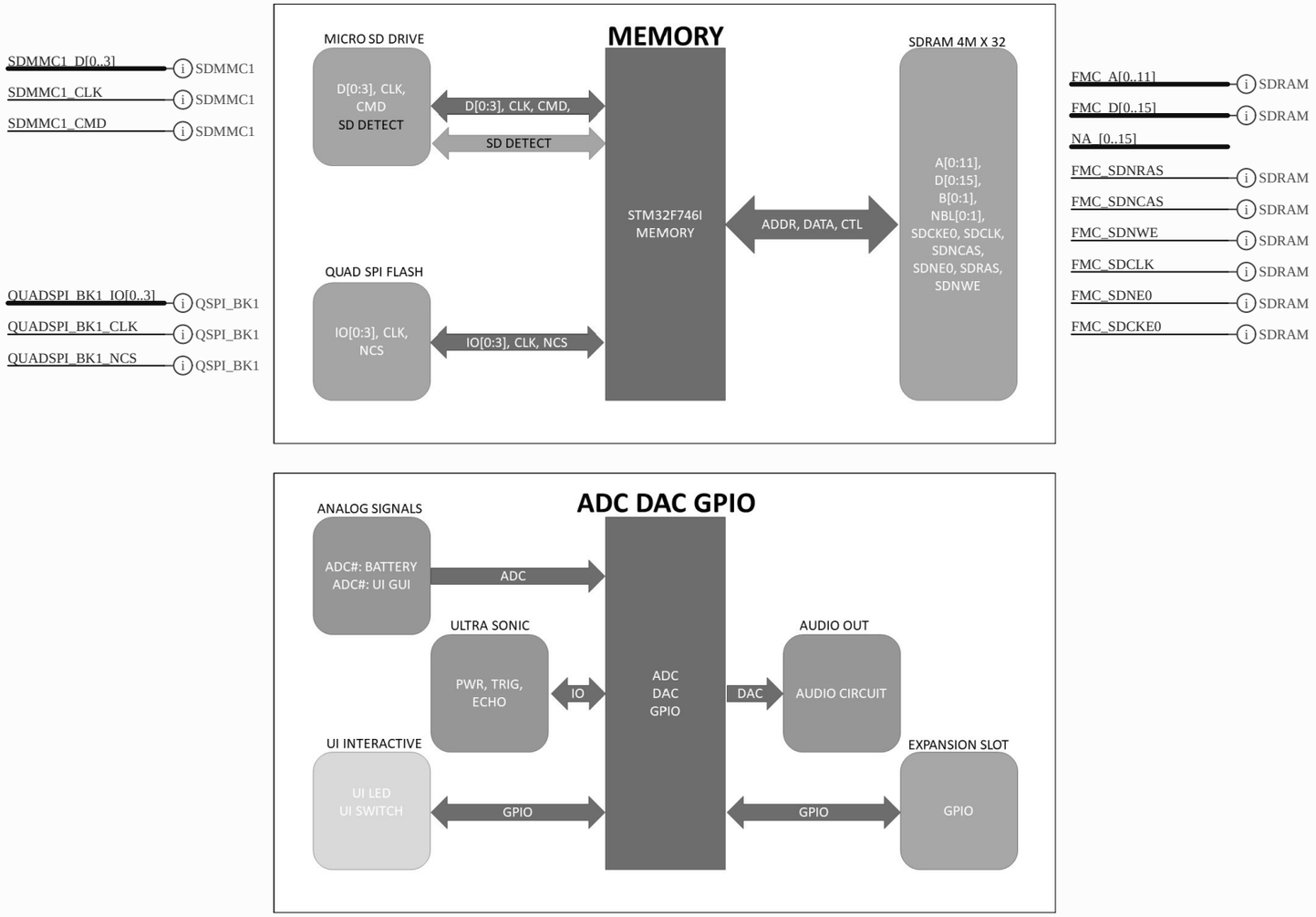
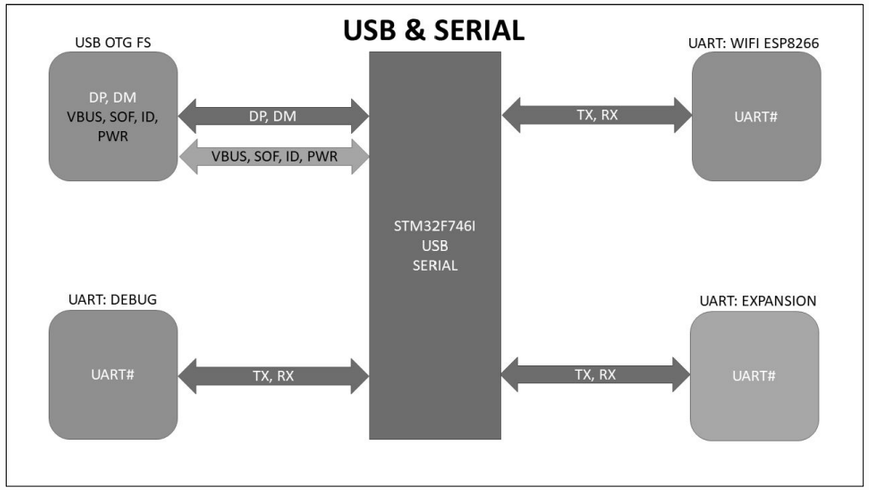
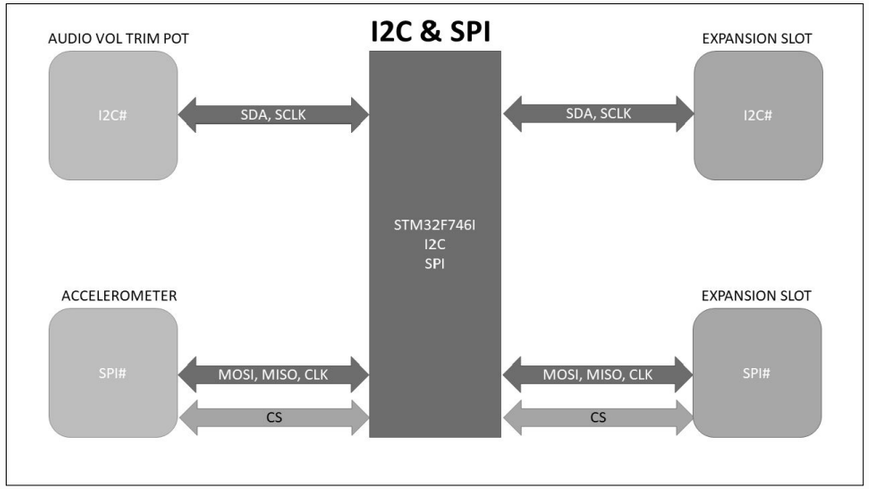
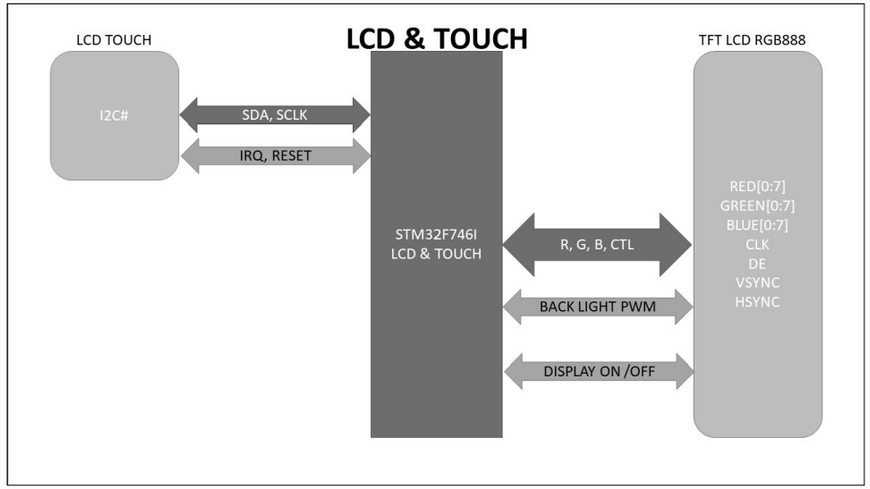


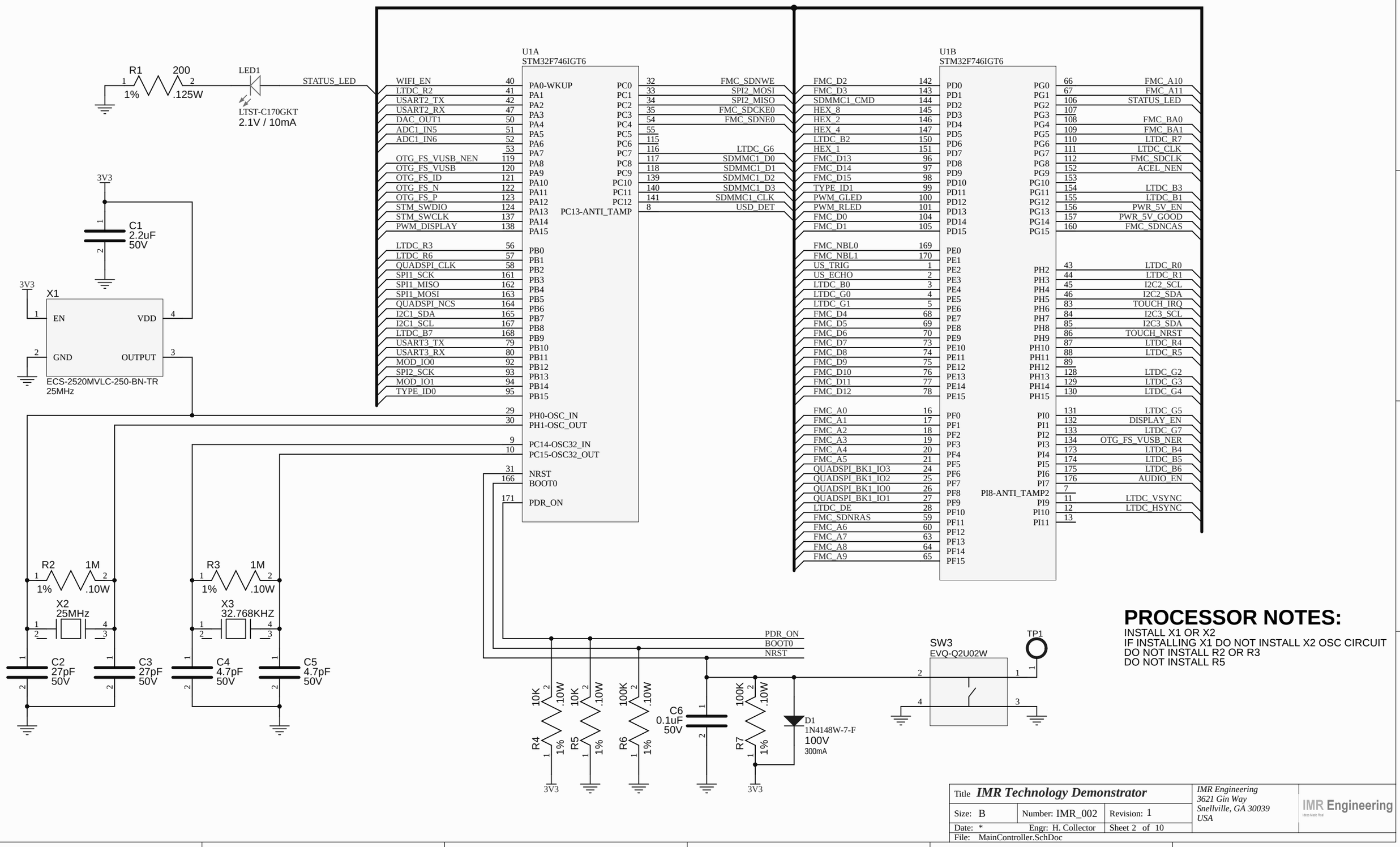






Title	***IMR Technology Demonstrator***		*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020	Engr: H. Collector	Sheet 1 of 10	
File: TitleBlock.SchDoc			

IMR Engineering
Ideas Made Real

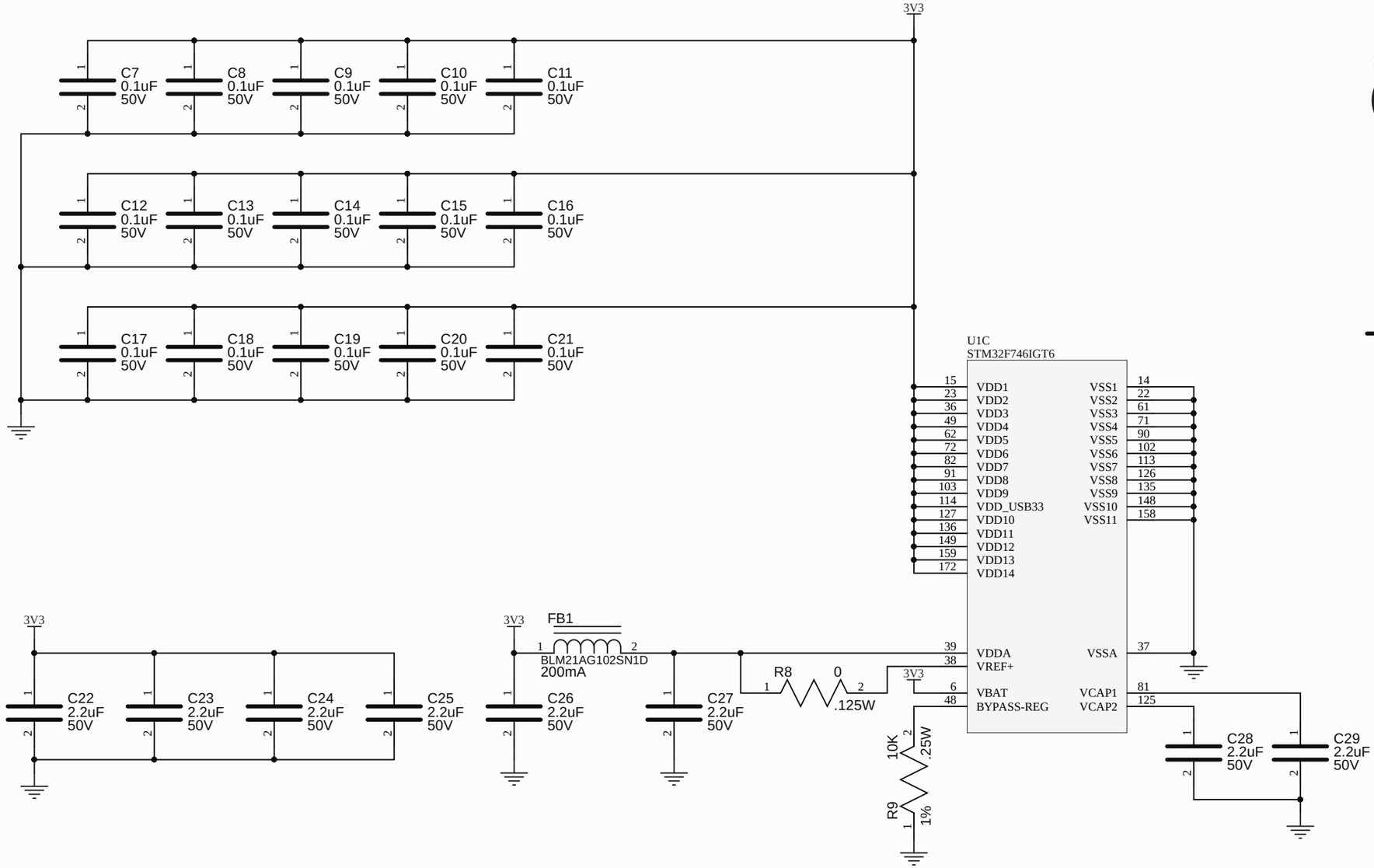


PROCESSOR NOTES:

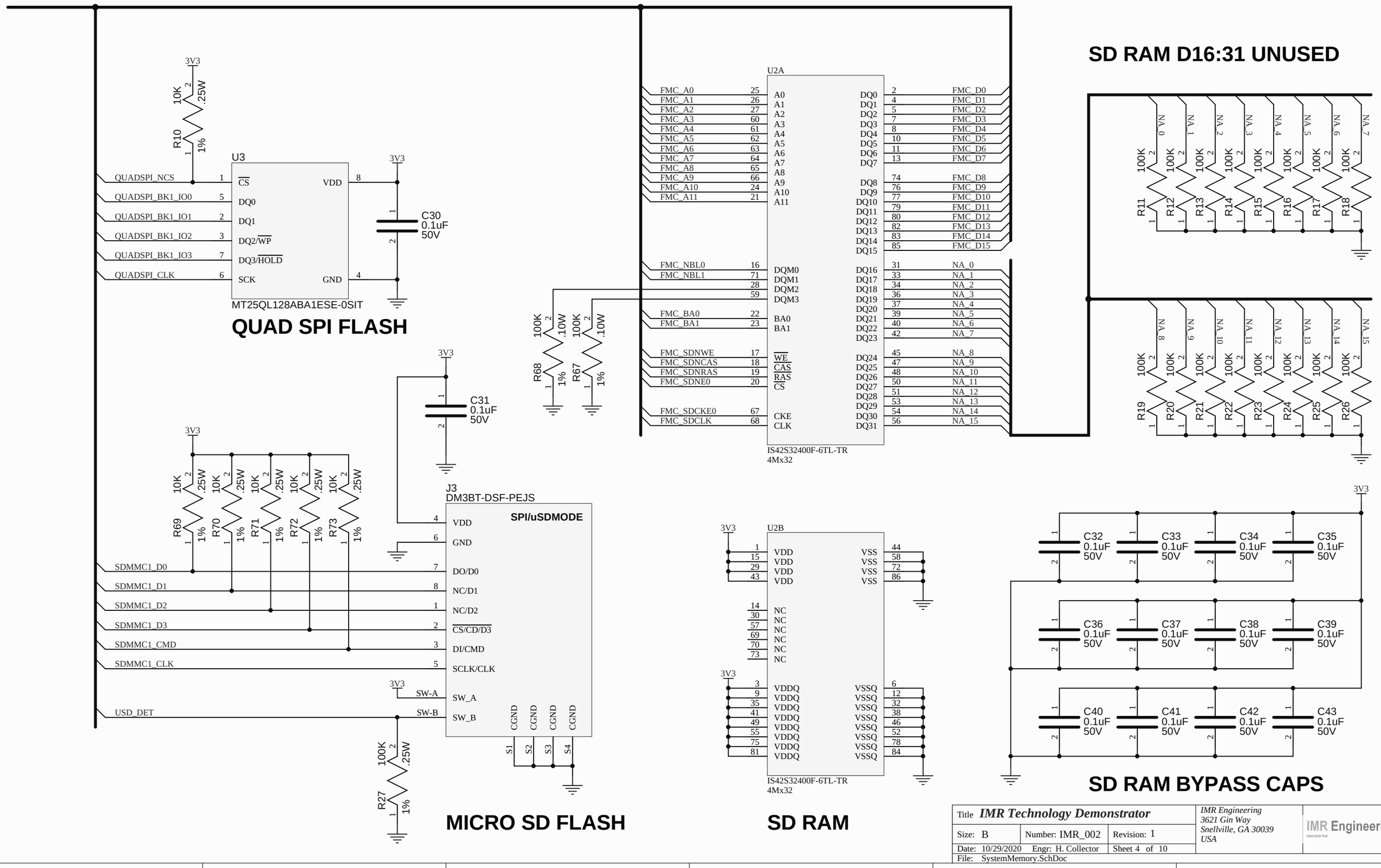
INSTALL X1 OR X2
IF INSTALLING X1 DO NOT INSTALL X2 OSC CIRCUIT
DO NOT INSTALL R2 OR R3
DO NOT INSTALL R5

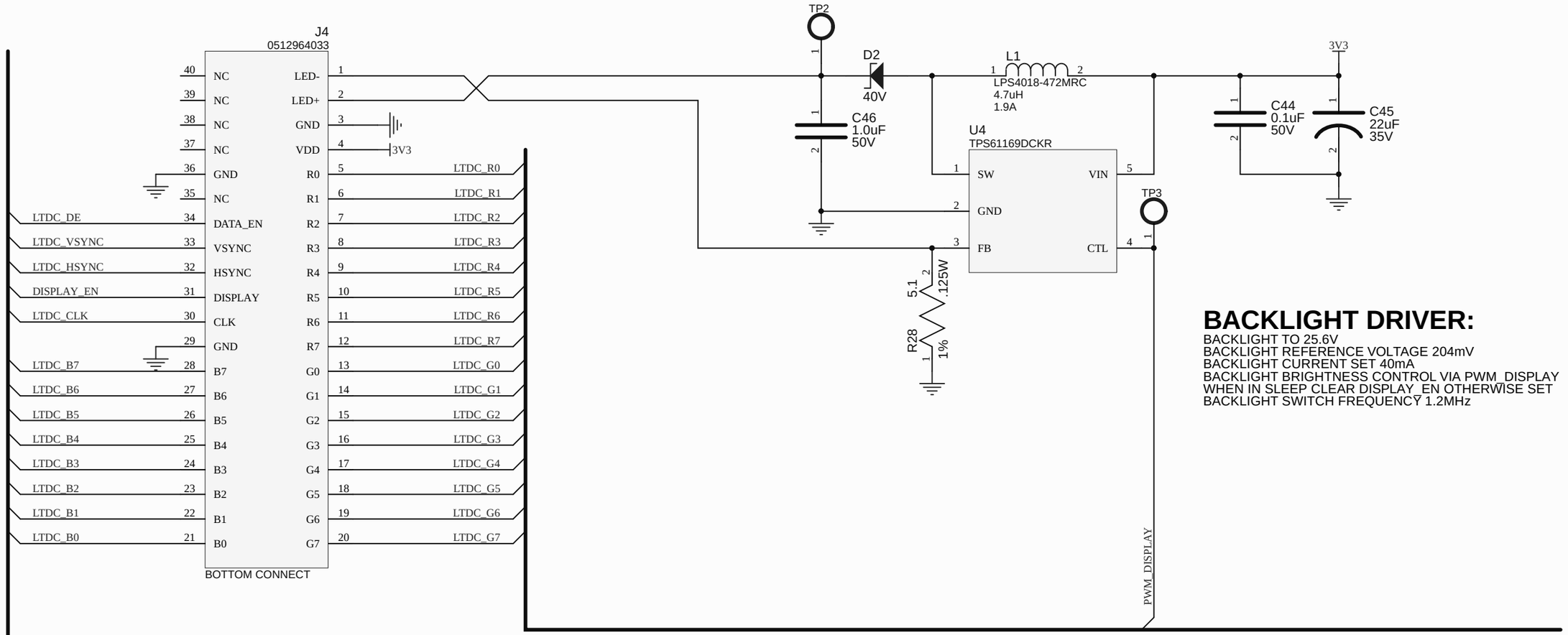
Title *IMR Technology Demonstrator*			*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: *	Engr: H. Collector	Sheet 2 of 10	
File: MainController.SchDoc			

IMR Engineering
Ideas Made Real



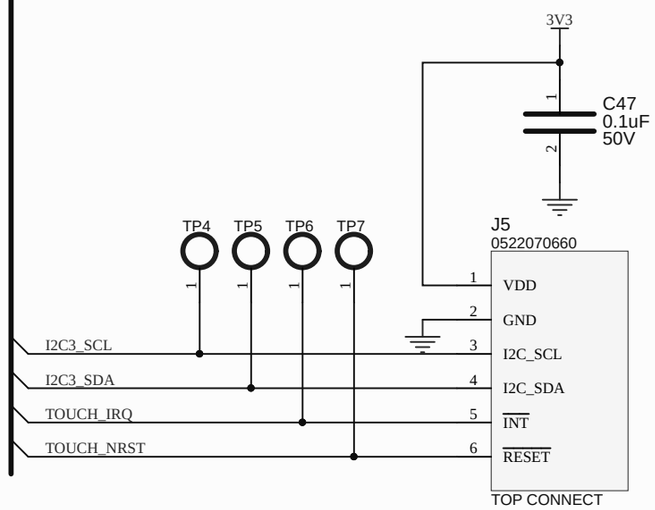
Title *IMR Technology Demonstrator*		*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1
Date: *	Engr: H. Collector	Sheet 3 of 10
File: MainControllerPower.SchDoc		

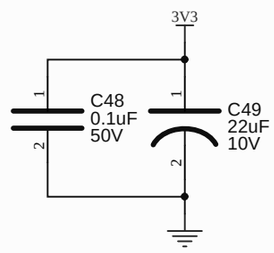

SD RAM D16:31 UNUSED
3V3
10K
.25W
R10
1%
U3
QUADSPI_NCS
QUADSPI_BK1_IO0
QUADSPI_BK1_IO1
QUADSPI_BK1_IO2
QUADSPI_BK1_IO3
QUADSPI_CLK
CS
DQ0
DQ1
DQ2/WP
DQ3/HOLD
SCK
VDD
GND
C30
0.1uF
50V
MT25QL128ABA1ESE-0SIT
QUAD SPI FLASH
U2A
FMC_A0
FMC_A1
FMC_A2
FMC_A3
FMC_A4
FMC_A5
FMC_A6
FMC_A7
FMC_A8
FMC_A9
FMC_A10
FMC_A11
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
FMC_NBL0
FMC_NBL1
DQM0
DQM1
DQM2
DQM3
FMC_BA0
FMC_BA1
BA0
BA1
FMC_SDNWE
FMC_SDNCAS
FMC_SDNRAS
FMC_SDNE0
WE
CAS
RAS
CS
FMC_SDCKE0
FMC_SDCLK
CKE
CLK
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
DQ16
DQ17
DQ18
DQ19
DQ20
DQ21
DQ22
DQ23
DQ24
DQ25
DQ26
DQ27
DQ28
DQ29
DQ30
DQ31
FMC_D0
FMC_D1
FMC_D2
FMC_D3
FMC_D4
FMC_D5
FMC_D6
FMC_D7
FMC_D8
FMC_D9
FMC_D10
FMC_D11
FMC_D12
FMC_D13
FMC_D14
FMC_D15
NA_0
NA_1
NA_2
NA_3
NA_4
NA_5
NA_6
NA_7
NA_8
NA_9
NA_10
NA_11
NA_12
NA_13
NA_14
NA_15
IS42S32400F-6TL-TR
4Mx32
R68
R67
100K
.10W
1%
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
C31
0.1uF
50V
J3
DM3BT-DSF-PEJS
SPI/uSDMODE
VDD
GND
DO/D0
NC/D1
NC/D2
CS/CD/D3
DI/CMD
SCLK/CLK
SW_A
SW_B
CGND
S1
S2
S3
S4
SDMMC1_D0
SDMMC1_D1
SDMMC1_D2
SDMMC1_D3
SDMMC1_CMD
SDMMC1_CLK
USD_DET
SW-A
SW-B
R69
R70
R71
R72
R73
R27
MICRO SD FLASH
U2B
VDD
VSS
NC
VDDQ
VSSQ
SD RAM
C32
C33
C34
C35
C36
C37
C38
C39
C40
C41
C42
C43
SD RAM BYPASS CAPS
Title IMR Technology Demonstrator
Size: B
Number: IMR_002
Revision: 1
Date: 10/29/2020
Engr: H. Collector
Sheet 4 of 10
File: SystemMemory.SchDoc
IMR Engineering
3621 Gin Way
Snellville, GA 30039
USA
IMR Engineering
Ideas Made Real



BACKLIGHT DRIVER:

BACKLIGHT TO 25.6V
BACKLIGHT REFERENCE VOLTAGE 204mV
BACKLIGHT CURRENT SET 40mA
BACKLIGHT BRIGHTNESS CONTROL VIA PWM_DISPLAY
WHEN IN SLEEP CLEAR DISPLAY_EN OTHERWISE SET
BACKLIGHT SWITCH FREQUENCY 1.2MHz



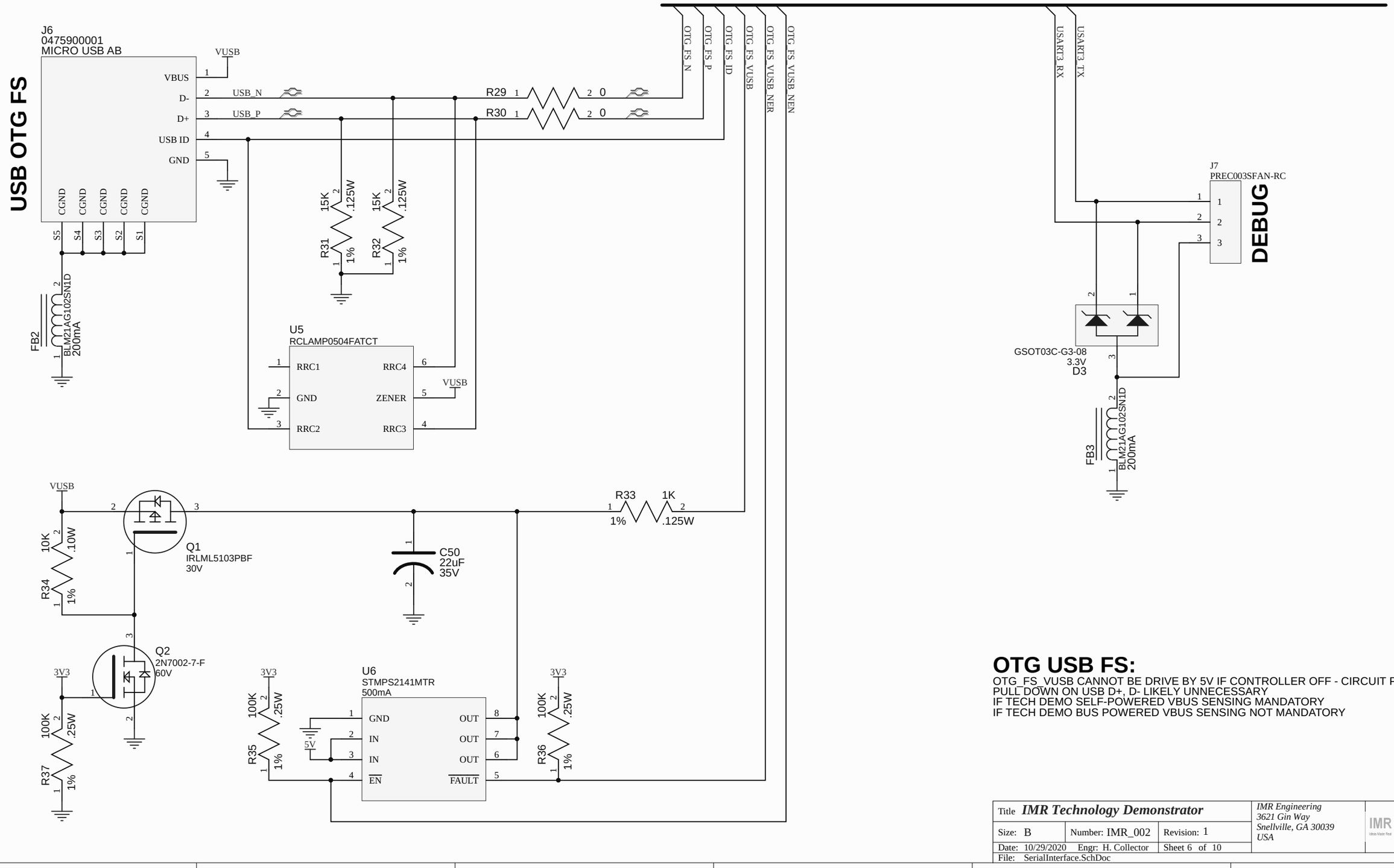


DISPLAY BYPASS

DISP1

NHD-4.3-480272EF-ASXV#-CTP
480x272 24 Bit

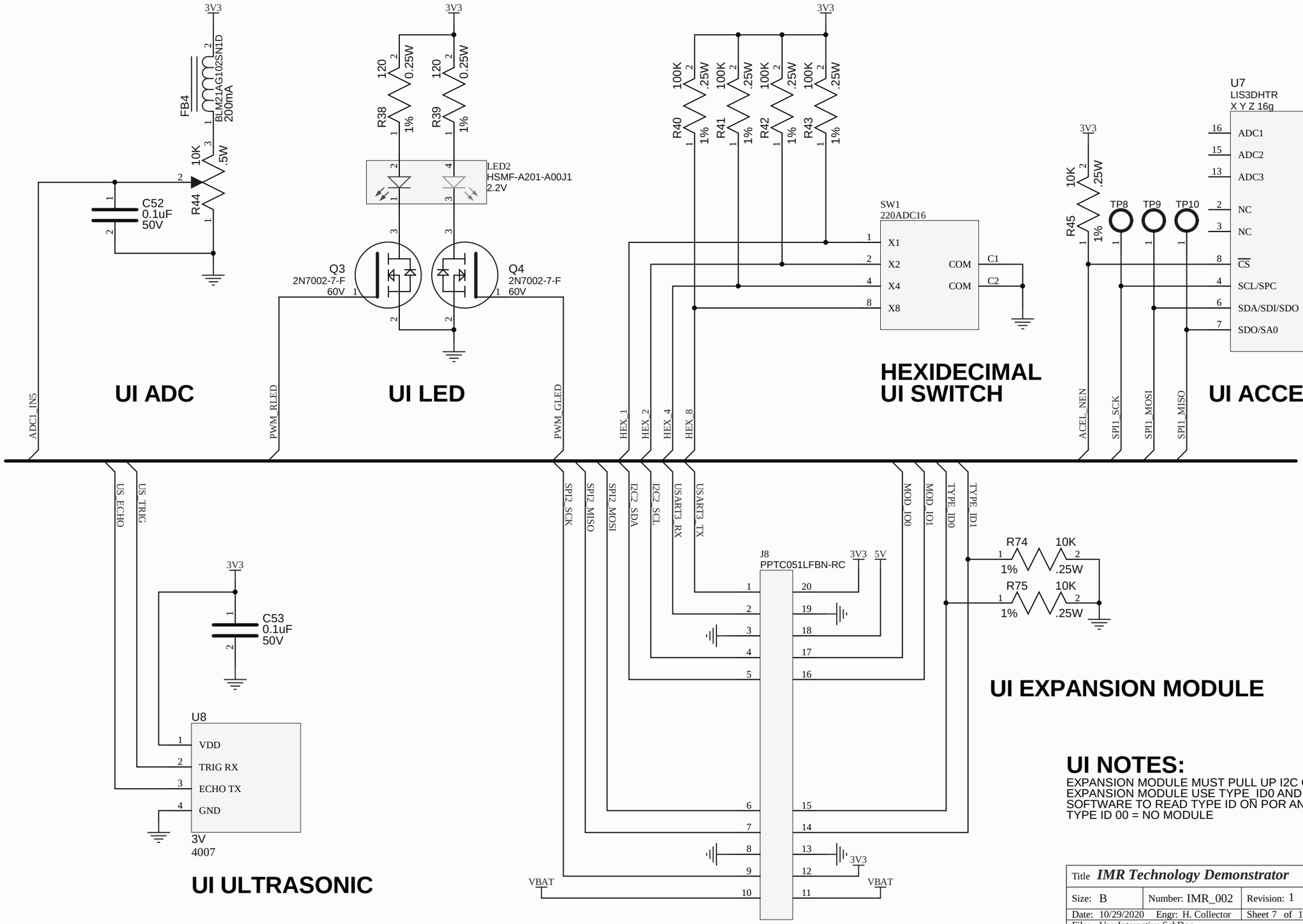
Title: *IMR Technology Demonstrator*			*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020 Engr: H. Collector		Sheet 5 of 10	
File: LCD_TouchBackLight.SchDoc			



OTG USB FS:

OTG_FS_VUSB CANNOT BE DRIVE BY 5V IF CONTROLLER OFF - CIRCUIT PROTECTS
PULL DOWN ON USB D+, D- LIKELY UNNECESSARY
IF TECH DEMO SELF-POWERED VBUS SENSING MANDATORY
IF TECH DEMO BUS POWERED VBUS SENSING NOT MANDATORY

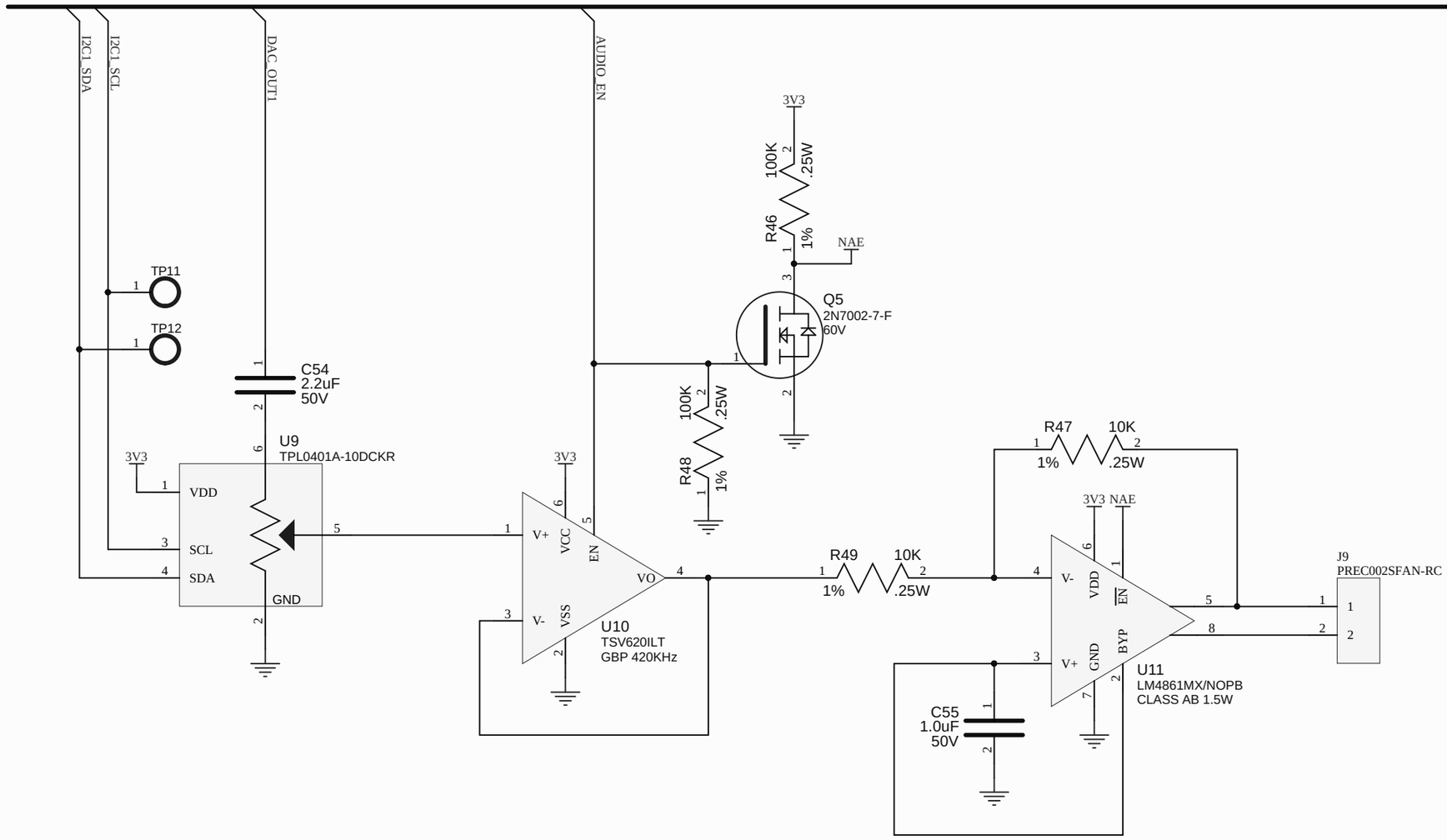
Title *IMR Technology Demonstrator*			*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020 Engr: H. Collector		Sheet 6 of 10	
File: SerialInterface.SchDoc			



UI NOTES:

EXPANSION MODULE MUST PULL UP I2C OR ENABLE PULL-UP
EXPANSION MODULE USE TYPE_ID0 AND TYPE_ID1 TO SET MODULE TYPE
SOFTWARE TO READ TYPE ID ON POR AND CONFIGURE ACCORDINGLY
TYPE ID 00 = NO MODULE

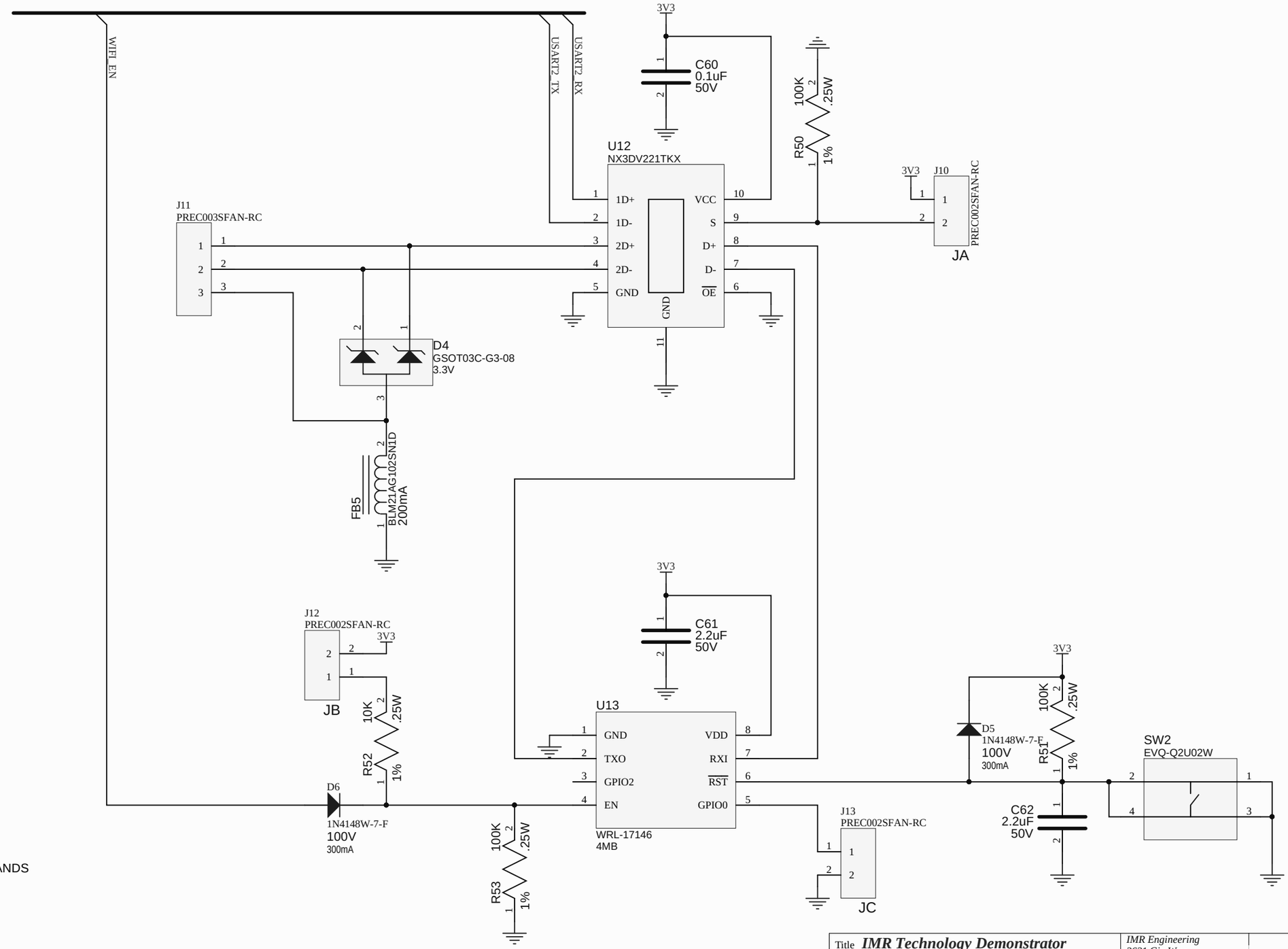
Title *IMR Technology Demonstrator*			*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020 Engr: H. Collector		Sheet 7 of 10	
File: UserInteractive.SchDoc			



AUDIO NOTES:

AUDIO BYPASS CAPS
AUDIO OUTPUT AT 1.5W INTO 8 OHM
INTENDED SPEAKER: PUI AUDIO, ASE02808MR-LW150-R
AUDIO POT IS LINEAR FIRMWARE MUST CONVER TO LOG VOLUME
AUDIO POT I2C PULL-UP BY FIRMWARE

Title *IMR Technology Demonstrator*			*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020 Engr: H. Collector		Sheet 8 of 10	
File: AudioAmp.SchDoc			



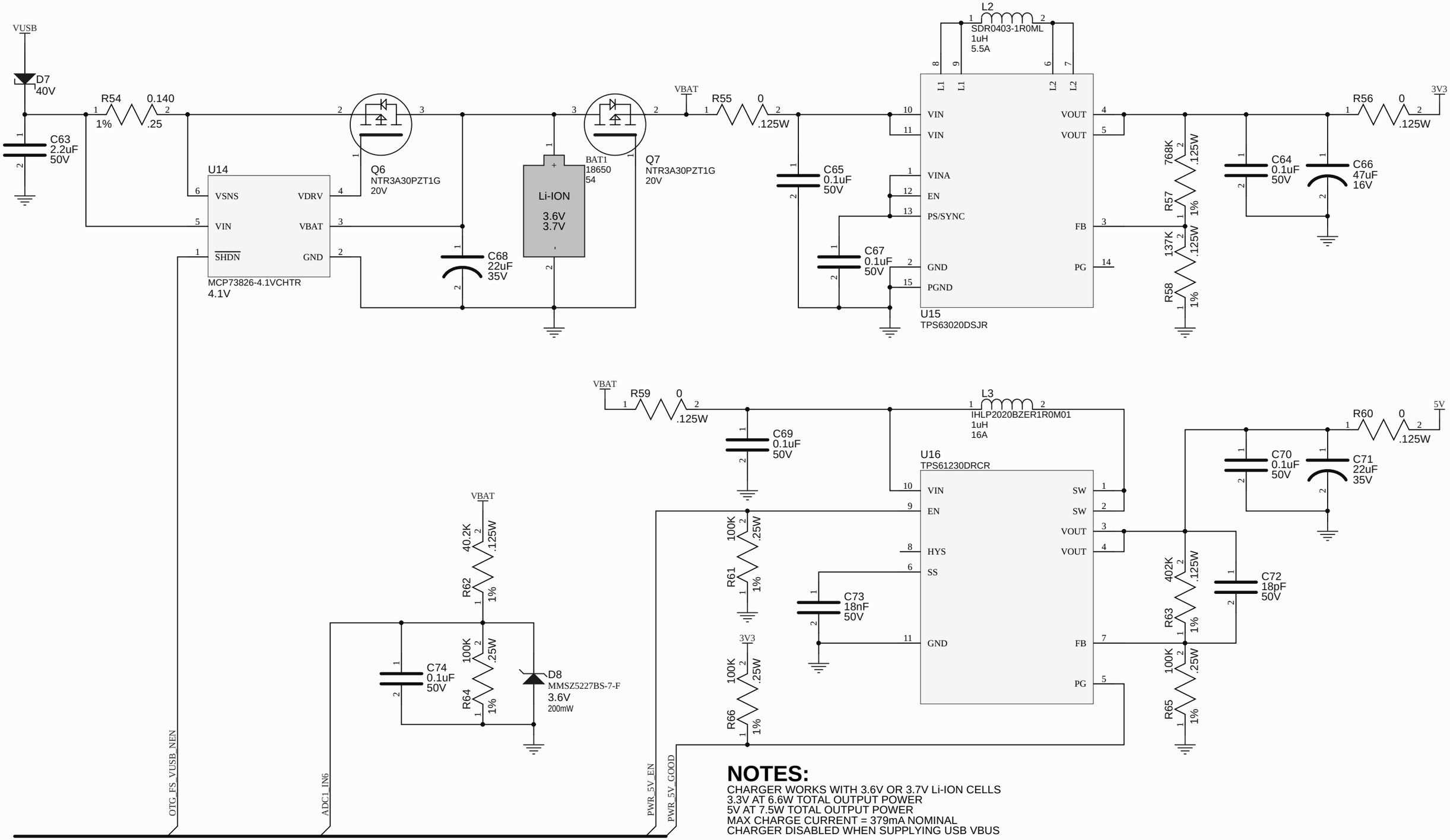
WIFI ACCESS NOTES:

SYSTEM ACCESS:
- DO NOT INSTALL JUMPER JA, JB, JC
- DO NOT RESET VIA SW#

EXTERNAL UART ACCESS:
- RESET VIA SW#
- INSTALL JUMPER JA AND JB FOR AT COMMANDS
- INSTALL JUMPER JC TO PROGRAM

Title	***IMR Technology Demonstrator***		*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020	Engr: H. Collector	Sheet 9 of 10	
File: Wifi.SchDoc			

IMR Engineering
Ideas Made Real

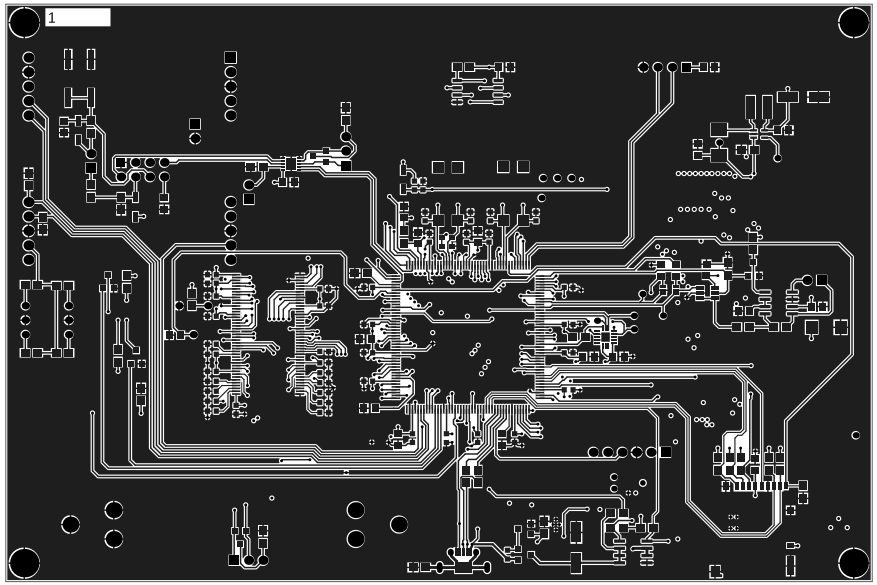


NOTES:

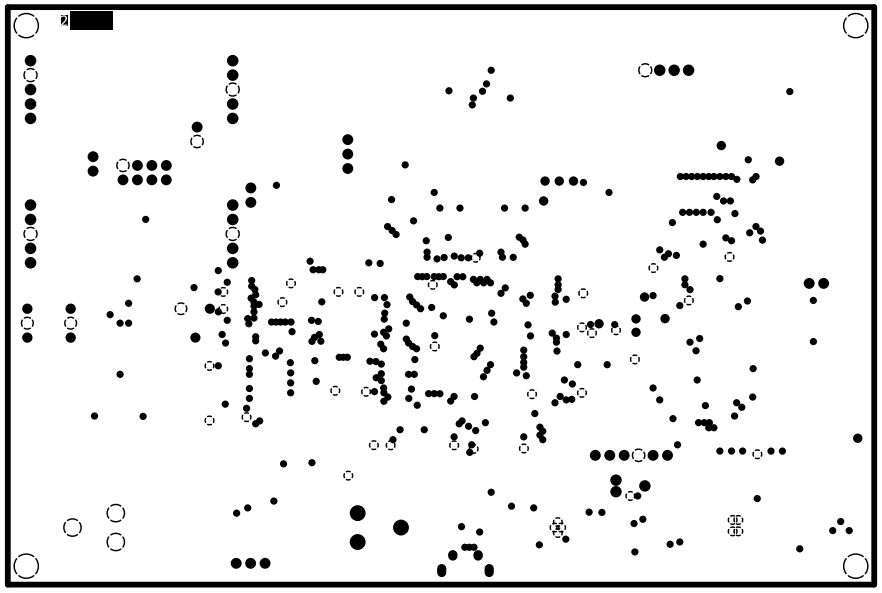
CHARGER WORKS WITH 3.6V OR 3.7V Li-ION CELLS
3.3V AT 6.6W TOTAL OUTPUT POWER
5V AT 7.5W TOTAL OUTPUT POWER
MAX CHARGE CURRENT = 379mA NOMINAL
CHARGER DISABLED WHEN SUPPLYING USB VBUS

Title *IMR Technology Demonstrator*			*IMR Engineering* *3621 Gin Way* *Snellville, GA 30039* *USA*
Size: B	Number: IMR_002	Revision: 1	
Date: 10/29/2020 Engr: H. Collector		Sheet 10 of 10	
File: Power.SchDoc			

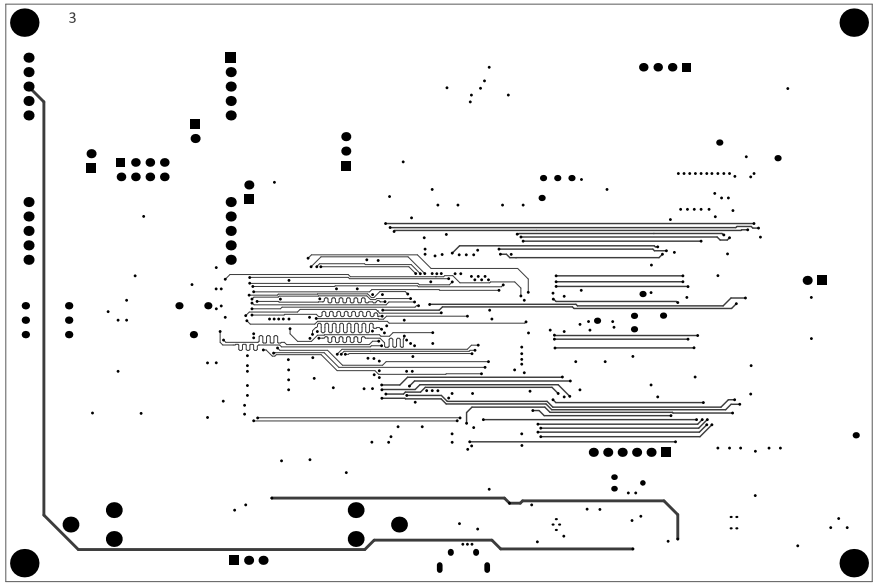
IMR Engineering
Ideas Made Real



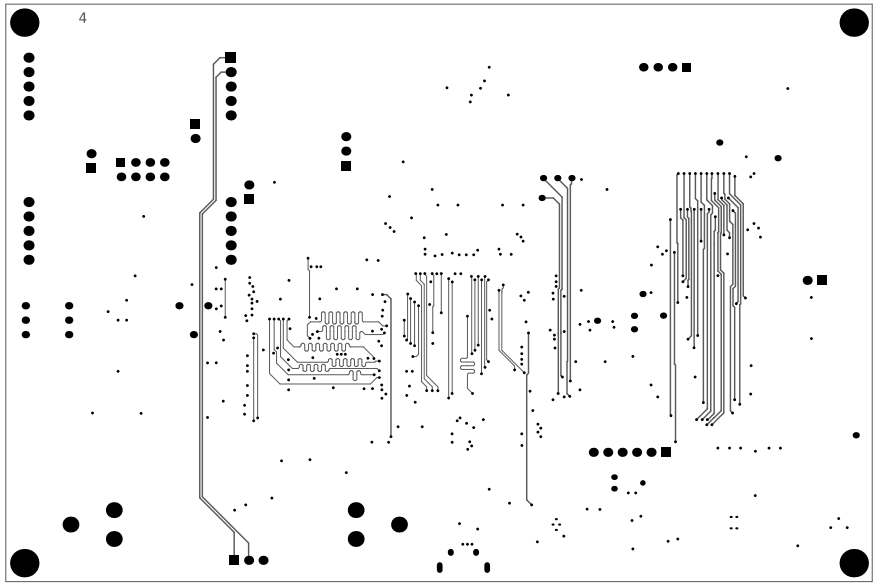
TOP



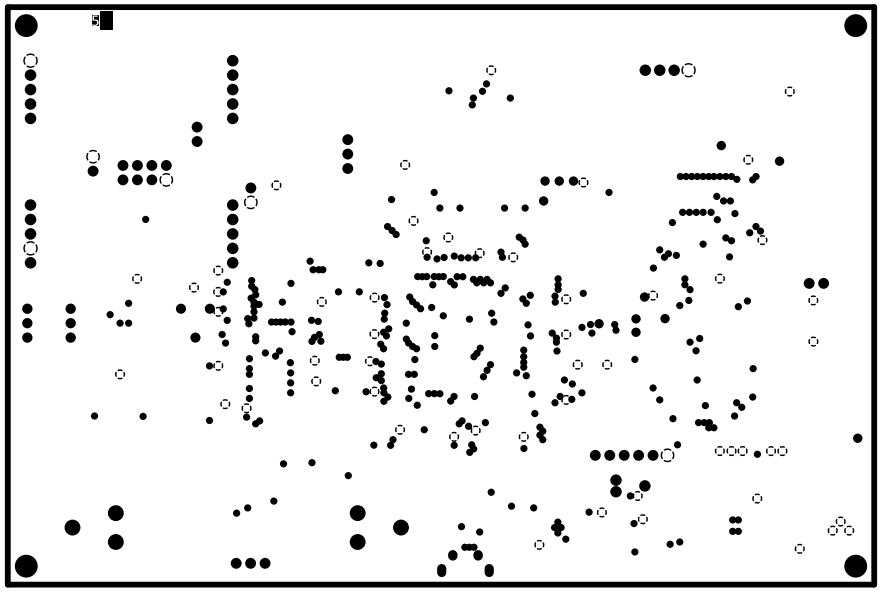
GND PLANE



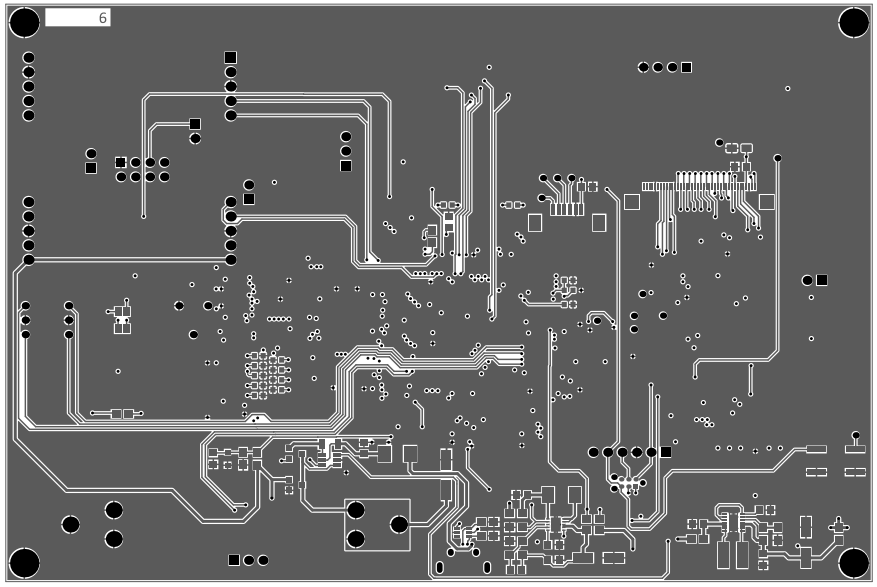
INNER SIGNAL 2



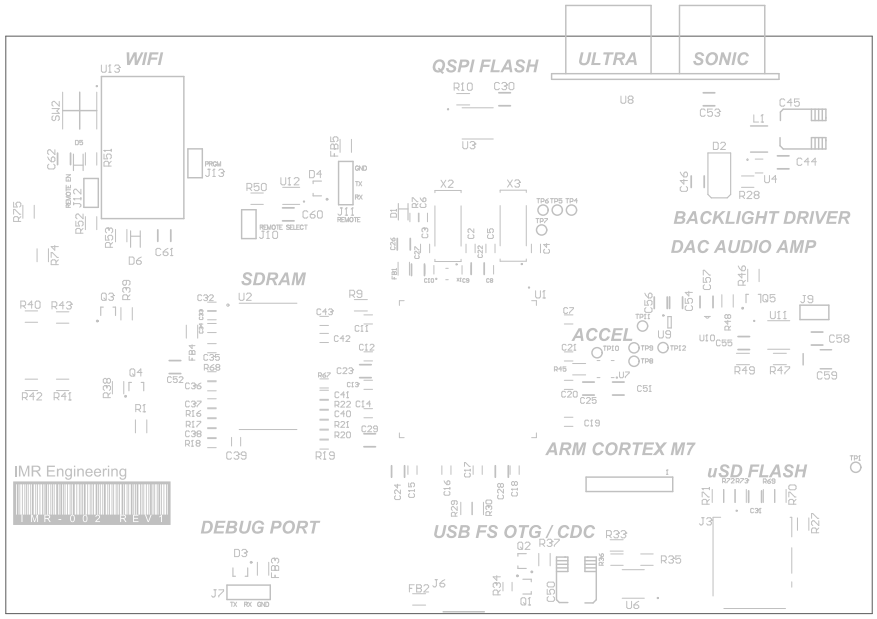
INNER SIGNAL 3



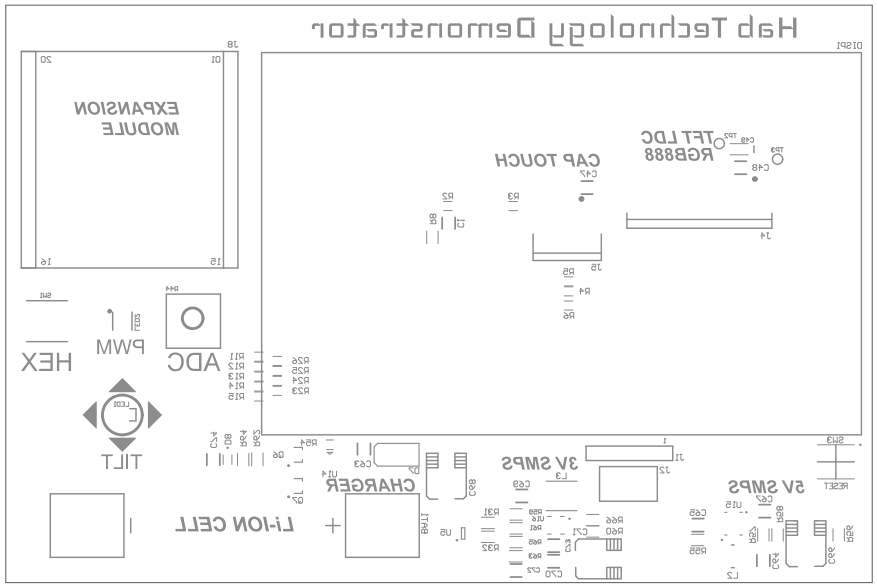
PWR PLANE



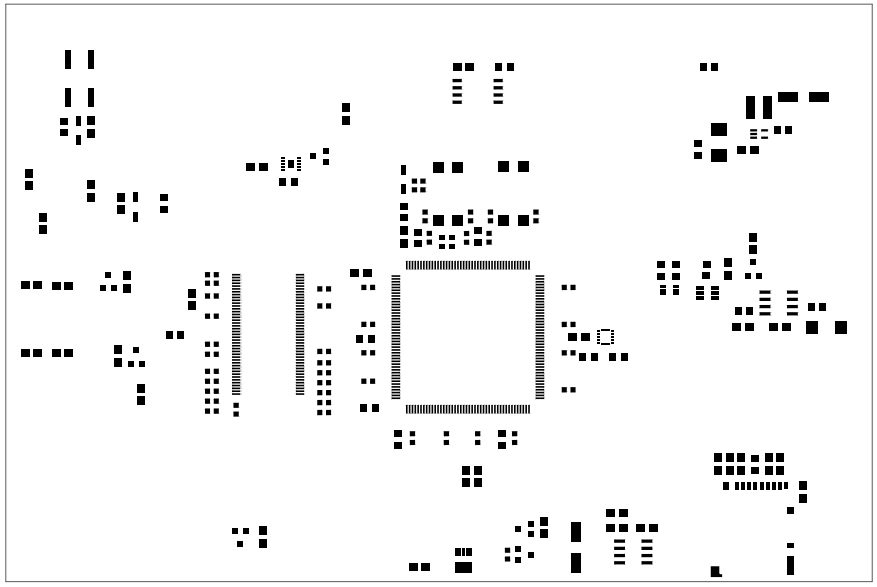
BOTTOM SIGNAL


WIFI
QSPI FLASH
ULTRA
SONIC
BACKLIGHT DRIVER
DAC AUDIO AMP
SDRAM
ACCEL
ARM CORTEX M7
uSD FLASH
DEBUG PORT
USB FS OTG / CDC
IMR Engineering
IMR-002 REV1

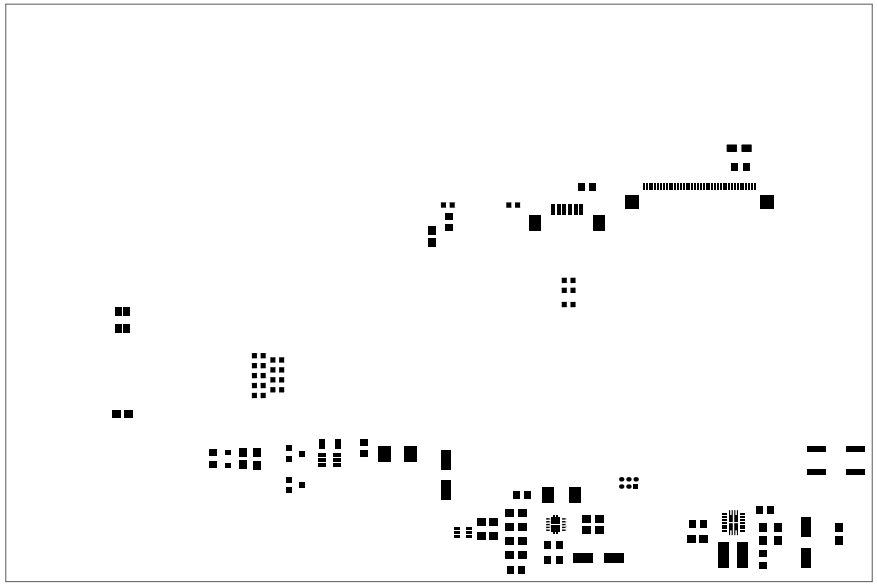
TOP SILK



BOTTOM OVERLAY

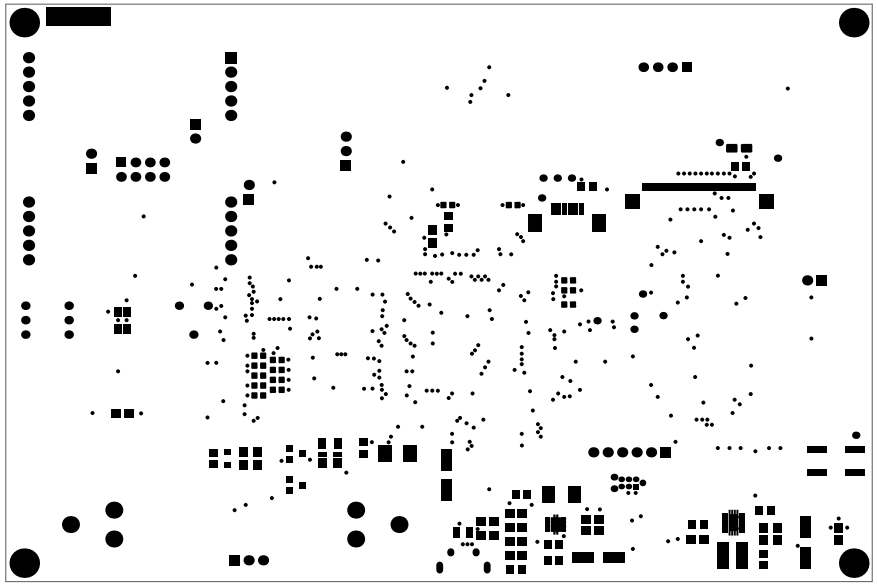


TOP PM



BOTTOM PM

TOP SM

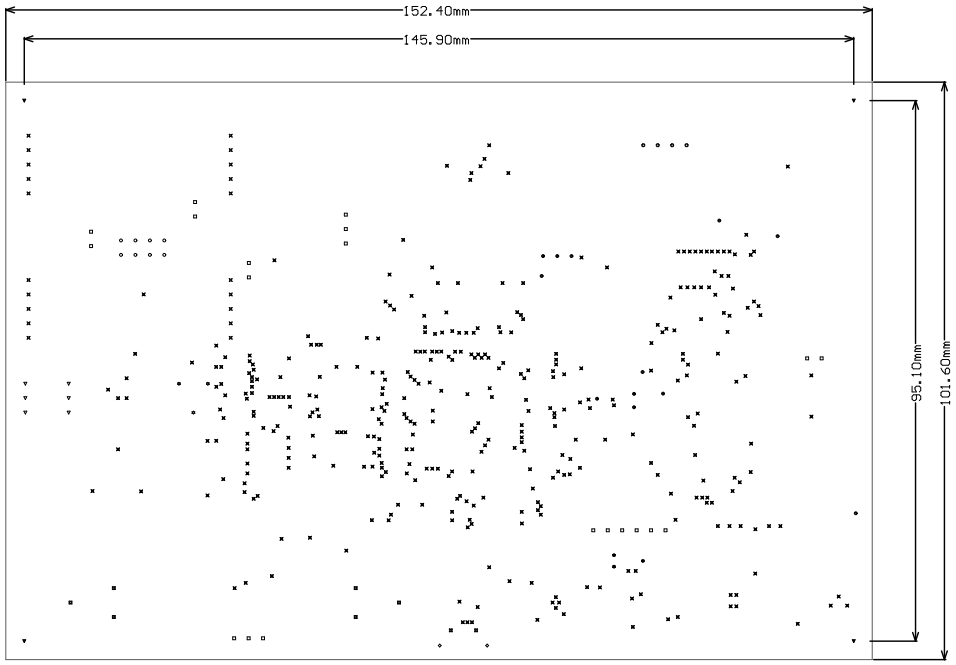


BOTTOM SM

Symbol	Count	Hole Size	Plated	Hole Type	Drill Layer Pair	Via/Pad	Pad Shape	Template	Hole Tolerance (+)	Hole Tolerance (-)
✖	370	10.00mil (0.254mm)	PTH	Round	Top Layer - Bottom Layer	(Mixed)	Rounded	(Mixed)		
◇	2	23.62mil (0.600mm)	PTH	Slot	Top Layer - Bottom Layer	Pad	Rounded	r100_190h60_130r100		
◎	12	25.00mil (0.635mm)	PTH	Round	Top Layer - Bottom Layer	Pad	Rounded	c110h64		
⊠	2	25.59mil (0.650mm)	PTH	Slot	Top Layer - Bottom Layer	Pad	Rounded	r105_125h65_85r100		
☼	3	30.00mil (0.762mm)	PTH	Round	Top Layer - Bottom Layer	Pad	Rounded	c127h76		
▽	6	31.50mil (0.800mm)	PTH	Round	Top Layer - Bottom Layer	Pad	Rounded	c130h80		
○	8	35.00mil (0.889mm)	PTH	Round	Top Layer - Bottom Layer	Pad	(Mixed)	(Mixed)		
□	20	35.43mil (0.900mm)	PTH	Round	Top Layer - Bottom Layer	Pad	(Mixed)	(Mixed)		
✱	3	39.37mil (1.000mm)	NPTH	Round	Top Layer - Bottom Layer	Pad	Rounded	(Mixed)		
✪	4	39.37mil (1.000mm)	PTH	Round	Top Layer - Bottom Layer	Pad	(Mixed)	(Mixed)		
⊠	20	40.00mil (1.016mm)	PTH	Round	Top Layer - Bottom Layer	Pad	(Mixed)	(Mixed)		
◙	6	70.00mil (1.778mm)	PTH	Round	Top Layer - Bottom Layer	Pad	Rounded	c279h178		
▽	4	118.11mil (3.000mm)	PTH	Round	Top Layer - Bottom Layer	Pad	Rounded	c500h300		
	460 Total									

Slot definitions : **Routed Path Length** = Calculated from tool start centre position to tool end centre position.
Hole Length = Routed Path Length + Tool Size = Slot length as defined in the PCB layout

Layer	Name	Material	Thickness	Constant	Board Layer Stack	Board Layer Stack
1	Top Overlay					
2	Top Solder	SM-001	1.00mil	4		
3	Top Layer	Copper	1.38mil			
4	Dielectric 1	PP-006	2.80mil	4.1		
5	Dielectric 2	PP-006	2.80mil	4.1		
6	GND_Plane	Copper	1.38mil			
7	Dielectric 3	Core-035	18.00mil	4.7		
8	Int2 (Sign)	Copper	1.38mil			
9	Dielectric 4	PP-006	2.80mil	4.1		
10	Dielectric 5	PP-006	2.80mil	4.1		
11	Int3 (Sign)	Copper	1.38mil			
12	Dielectric 6	Core-035	18.00mil	4.7		
13	PWR_Plane	Copper	1.38mil			
14	Dielectric 7	PP-006	2.80mil	4.1		
15	Dielectric 8	PP-006	2.80mil	4.1		
16	Bottom Layer	Copper	1.38mil			
17	Bottom Solder	SM-001	1.00mil	4		
18	Bottom Overlay					



FAB & DRILL DWG

PCB FABRICATION NOTES:

MATERIAL:
FR4 (GF per MIL-P-13949) MIN UL 94V0

Cu WEIGHT:
OUTER LAYER: 1oz
INNER LAYER: STANDARD (SEE LAYER STACK)

SOLDER MASK:
TYPE: LPI (LIQUID PHOTO-IMAGE)
COVER: SMOBC (SOLDER MASK OVER BARE Cu)
COLOR: RED

OVERALL PCB THICKNESS:
PCB: 63MIL (SEE LAYER STACK)
TOLERANCE: 7MIL

PCB ELECTRICAL TEST
TESTED TO GERBER DATA
PURCHASE ORDER TO OVERRIDE

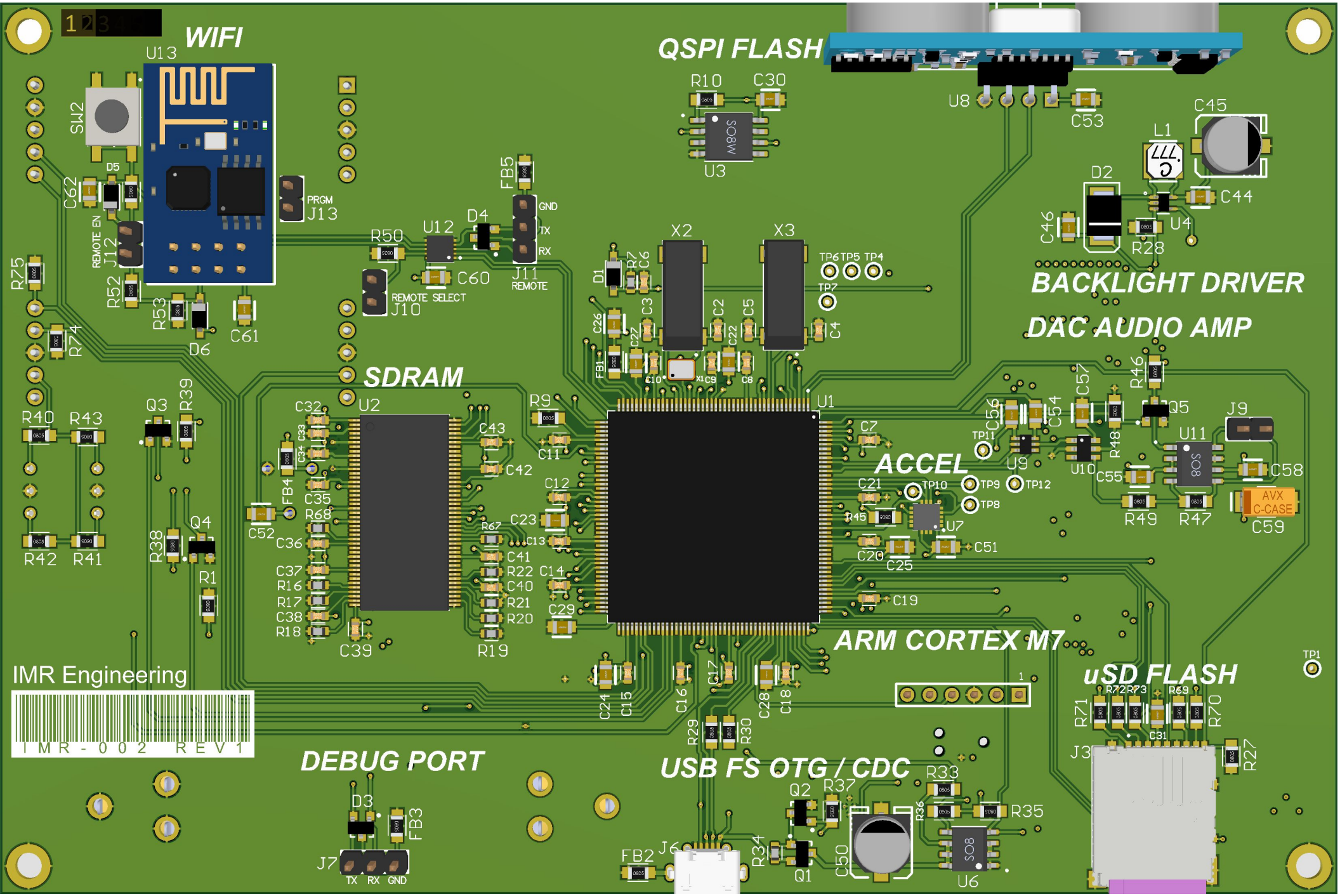
HOLE DIAMETER TOLERANCE:
PLATED HOLE TOLERANCE: 3MIL
NON PLATED HOLE TOLERANCE: 3MIL

SILK SCREEN
SIDES: TOP AND BOTTOM
COLOR: WHITE

ACCEPTABILITY:
STANDARD: IPC-A-600 (LATEST REV)
MFG TO ADD: DATE CODE, UL FLAME CODE

SURFACE FINISH:
PROTOTYPE: HASL OR EING
PRODUCTION: ENIG (PER PO)

IMR Engineering, LLC	REV 1	ENGG:
IMR-002	12/18/2020	Hab Collector


WIFI
QSPI FLASH
BACKLIGHT DRIVER
DAC AUDIO AMP
SDRAM
ACCEL
ARM CORTEX M7
uSD FLASH
DEBUG PORT
USB FS OTG / CDC
IMR Engineering
IMR-002 REV1
U13
SW2
D5
C62
REMOTE EN
J12
R75
R74
R52
R53
D6
C61
PRGM
J13
R50
U12
C60
REMOTE SELECT
J10
D4
FB5
GND
TX
RX
J11
REMOTE
R10
C30
U3
U8
C53
C45
L1
D2
C44
C46
U4
R28
D1
R7
C6
C3
C26
C27
X2
X3
C2
C5
C22
C4
TP6
TP5
TP4
TP7
FB1
C10
X1
C9
C8
U1
R9
C11
C7
C32
C33
C34
FB4
C35
C52
R68
C36
C37
R16
R17
C38
R18
C39
C43
C42
C12
C23
C13
C41
R22
C40
R21
R20
R19
C29
C14
C21
TP10
TP9
TP12
TP8
R45
U7
C20
C25
C51
C19
C56
C54
C57
R46
TP11
U9
U10
R48
Q5
U11
J9
C55
C58
R49
R47
AVX
C-CASE
C59
Q3
R39
R40
R43
R42
R41
Q4
R38
R1
C24
C15
C16
C17
C28
C18
R29
R30
1
TP1
R72
R73
R69
R71
R70
C31
J3
R27
J7
TX
RX
GND
D3
FB3
FB2
J6
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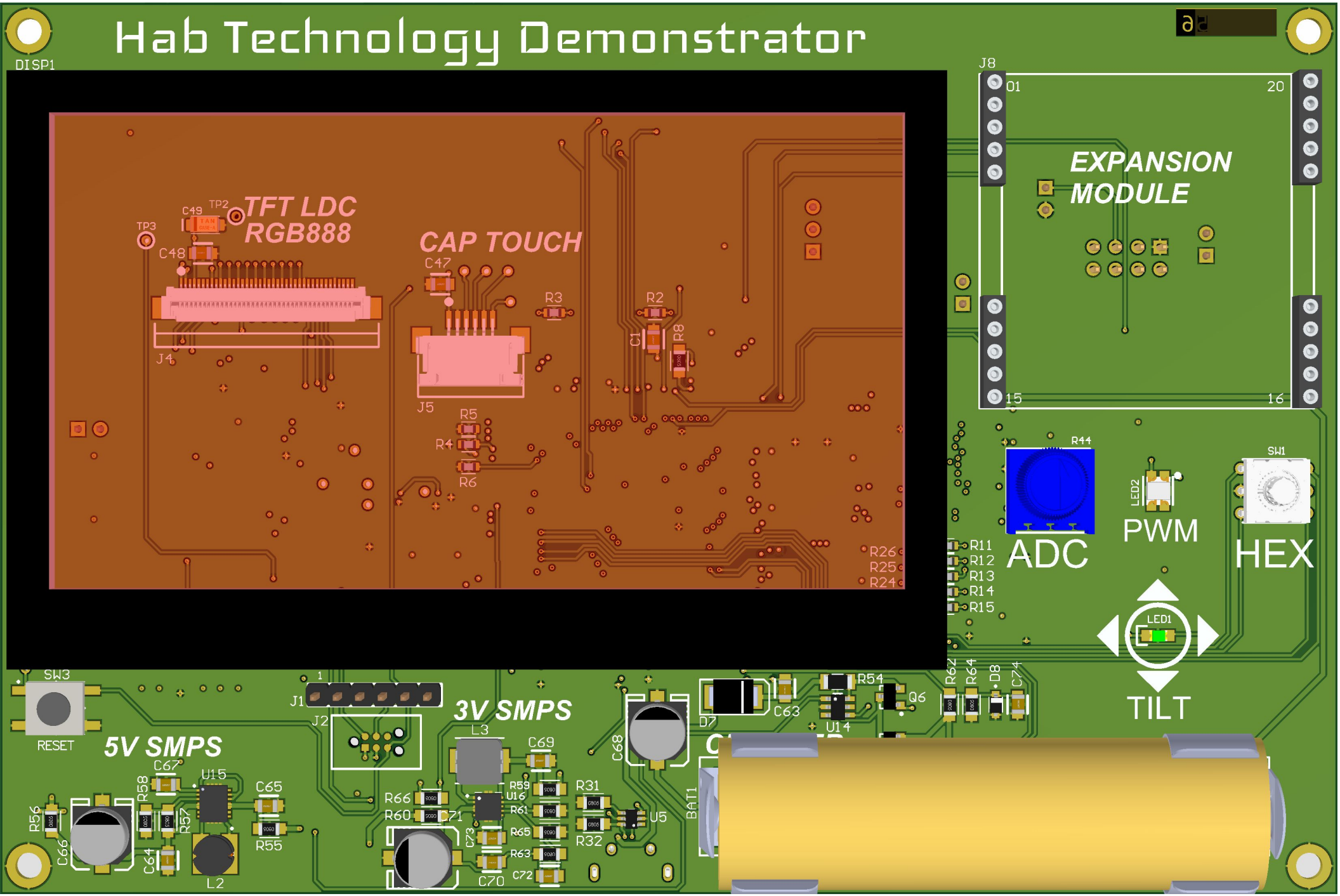
Q1
Q2
R37
R33
R36
R35
C50
U6


Hab Technology Demonstrator
DISP1
TFT LDC
RGB888
CAP TOUCH
EXPANSION
MODULE
J8
01
20
15
16
J4
J5
C47
C48
C49
TP2
TP3
R2
R3
R4
R5
R6
C1
R8
R26
R25
R24
R44
ADC
PWM
HEX
SW1
LED2
R11
R12
R13
R14
R15
LED1
TILT
SW3
RESET
5V SMPS
3V SMPS
J1
J2
L2
L3
C67
C65
C66
C64
C69
C68
C63
C70
C72
C73
C71
U15
U16
U14
U5
Q6
D7
D8
R54
R55
R56
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R60
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R62
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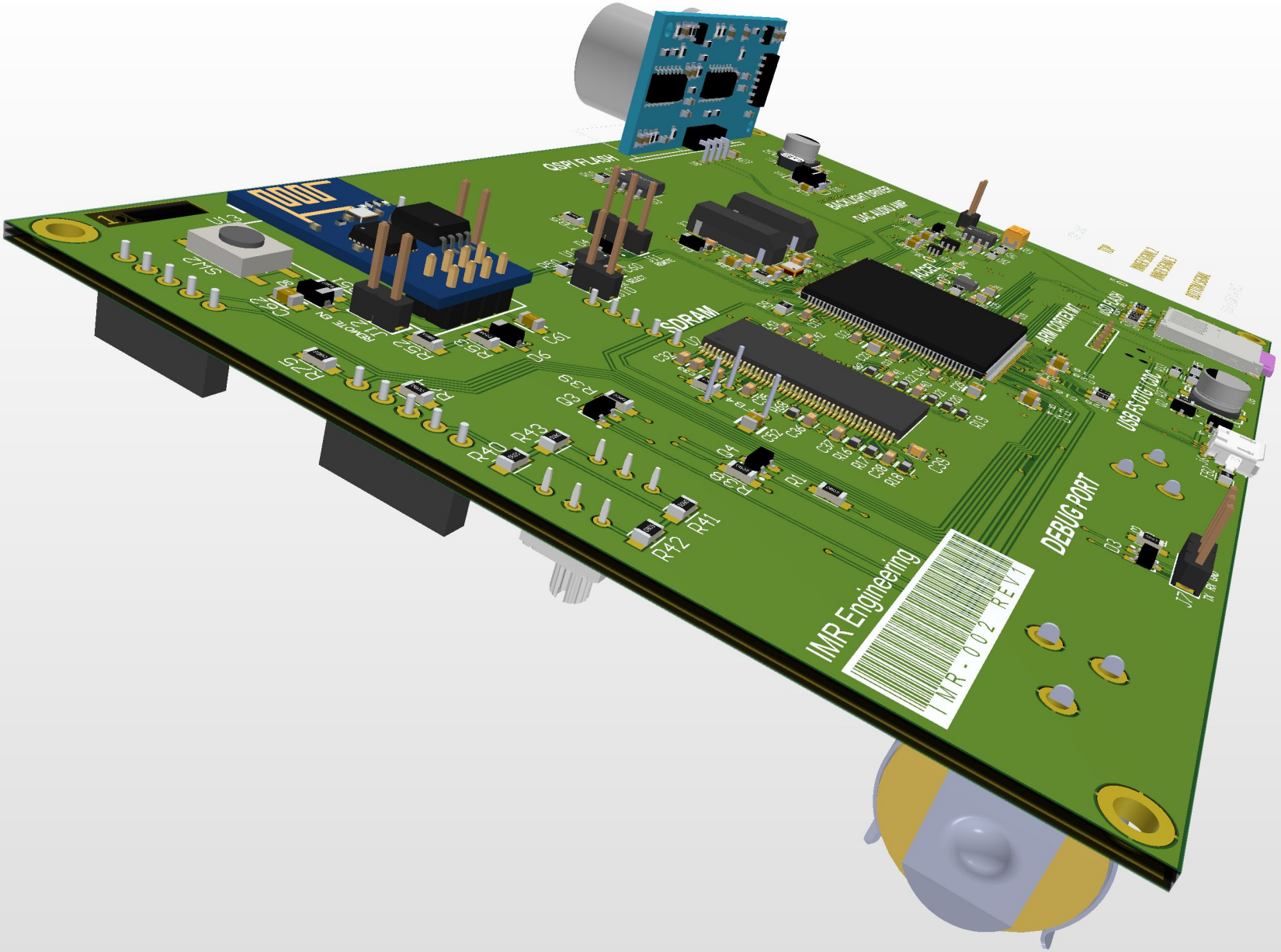
R65
R66
R31
R32
BAT1
C74


QSPI FLASH
SDRAM
DEBUG PORT
IMR Engineering
IMR.002 REV1