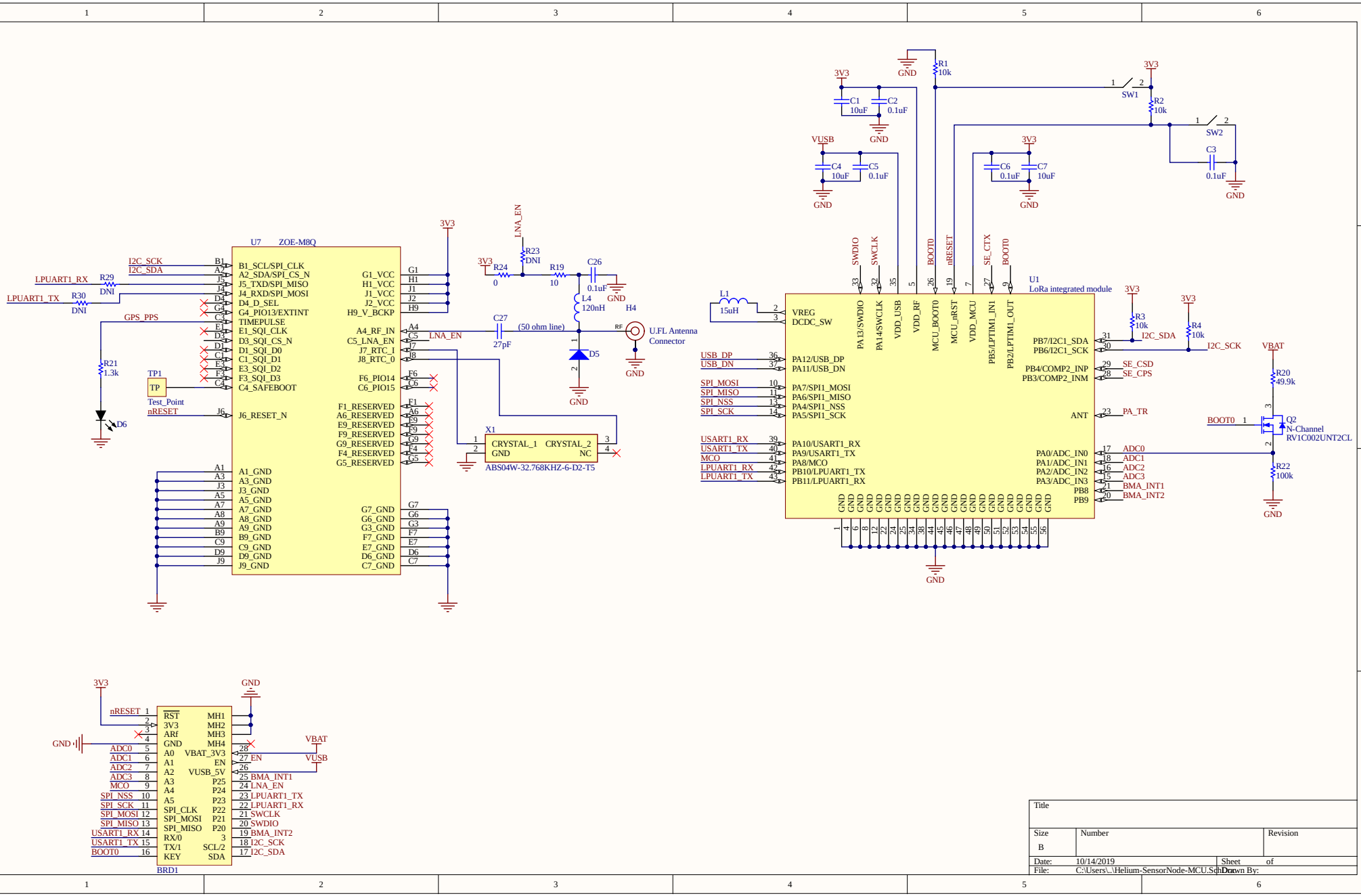
U7 ZOE-M8Q
B1_SCL/SPI_CLK
A2_SDA/SPI_CS_N
J5_TXD/SPI_MISO
J4_RXD/SPI_MOSI
D4_D_SEL
G4_PIO13/EXTINT
C3_TIMEPULSE
E1_SQI_CLK
D3_SQI_CS_N
D1_SQI_D0
C1_SQI_D1
E3_SQI_D2
F3_SQI_D3
C4_SAFEBOOT
J6_RESET_N
A1_GND
A3_GND
J3_GND
A5_GND
A7_GND
A8_GND
A9_GND
B9_GND
C9_GND
D9_GND
J9_GND
G1_VCC
H1_VCC
J1_VCC
J2_VCC
H9_V_BCKP
A4_RF_IN
C5_LNA_EN
J7_RTC_I
J8_RTC_0
F6_PIO14
C6_PIO15
F1_RESERVED
A6_RESERVED
E9_RESERVED
F9_RESERVED
G9_RESERVED
F4_RESERVED
G5_RESERVED
G7_GND
G6_GND
G3_GND
F7_GND
E7_GND
D6_GND
C7_GND
I2C_SCK
I2C_SDA
LPUART1_RX
LPUART1_TX
GPS_PPS
nRESET
R29 DNI
R30 DNI
R21 1.3k
TP1 TP Test_Point
D6
3V3
LNA_EN
R23 DNI
R24 0
R19 10
C26 0.1uF
L4 120nH
H4
C27 27pF
(50 ohm line)
RF
U.FL Antenna Connector
D5
GND
X1
CRYSTAL_1
CRYSTAL_2
GND
NC
ABS04W-32.768KHZ-6-D2-T5
U1
LoRa integrated module
L1 15uH
VREG
DCDC_SW
PA13/SWDIO
PA14/SWCLK
VDD_USB
VDD_RF
MCU_BOOT0
MCU_nRST
VDD_MCU
PB5/LPTIM1_IN1
PB2/LPTIM1_OUT
PA12/USB_DP
PA11/USB_DN
PA7/SPI1_MOSI
PA6/SPI1_MISO
PA4/SPI1_NSS
PA5/SPI1_SCK
PA10/USART1_RX
PA9/USART1_TX
PA8/MCO
PB10/LPUART1_TX
PB11/LPUART1_RX
PB7/I2C1_SDA
PB6/I2C1_SCK
PB4/COMP2_INP
PB3/COMP2_INM
ANT
PA0/ADC_IN0
PA1/ADC_IN1
PA2/ADC_IN2
PA3/ADC_IN3
PB8
PB9
SWDIO
SWCLK
BOOT0
nRESET
SE_CTX
SE_CSD
SE_CPS
PA_TR
ADC0
ADC1
ADC2
ADC3
BMA_INT1
BMA_INT2
USB_DP
USB_DN
SPI_MOSI
SPI_MISO
SPI_NSS
SPI_SCK
USART1_RX
USART1_TX
MCO
LPUART1_RX
LPUART1_TX
R1 10k
R2 10k
R3 10k
R4 10k
R20 49.9k
R22 100k
C1 10uF
C2 0.1uF
C3 0.1uF
C4 10uF
C5 0.1uF
C6 0.1uF
C7 10uF
SW1
SW2
VUSB
VBAT
Q2 N-Channel RV1C002UNT2CL
BRD1
nRESET
ADC0
ADC1
ADC2
ADC3
MCO
SPI_NSS
SPI_SCK
SPI_MOSI
SPI_MISO
USART1_RX
USART1_TX
BOOT0
VBAT_3V3
VUSB_5V
EN
BMA_INT1
LNA_EN
LPUART1_TX
LPUART1_RX
SWCLK
SWDIO
BMA_INT2
I2C_SCK
I2C_SDA
Title
Size B
Number
Revision
Date: 10/14/2019
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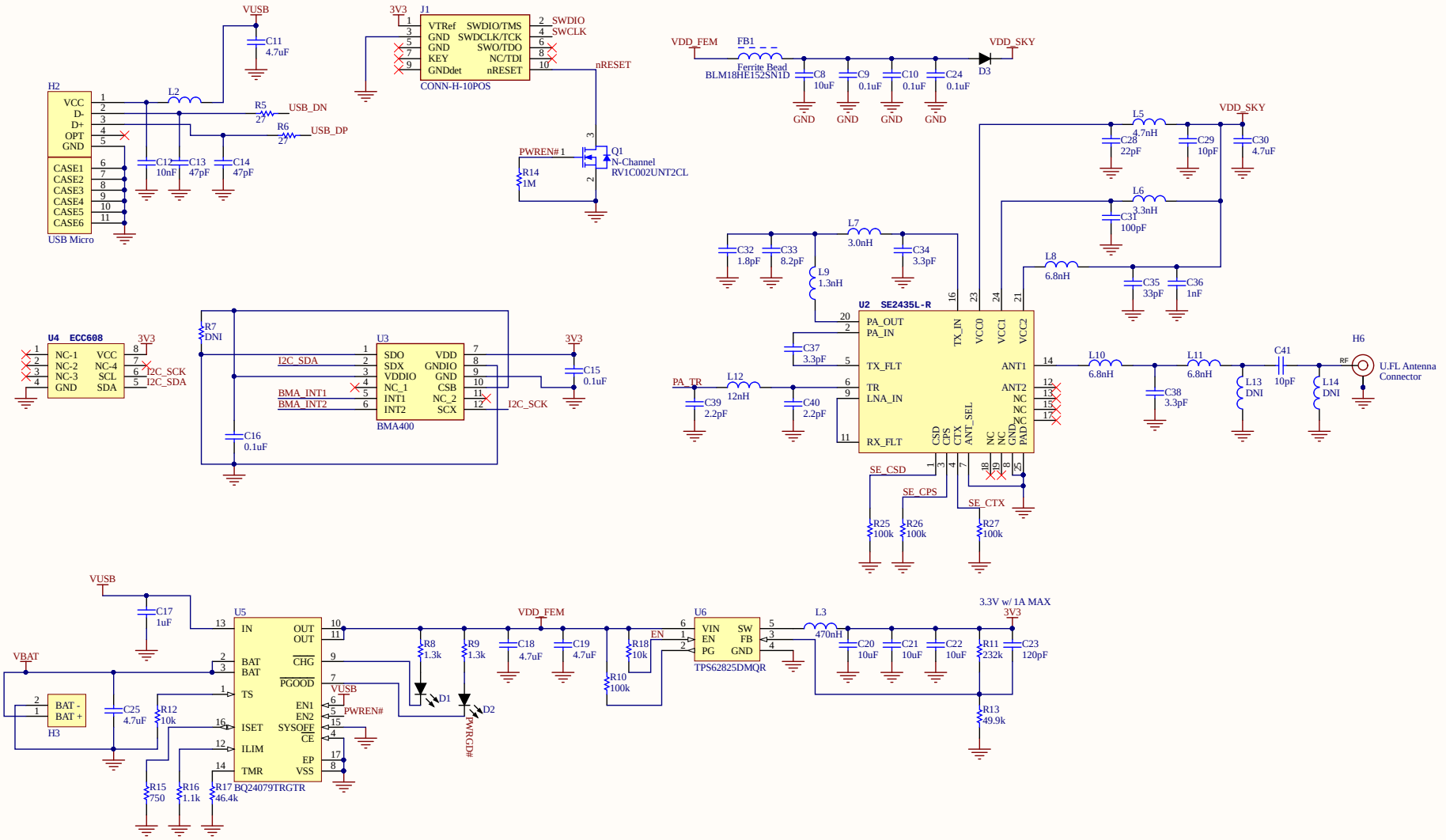
VUSB
C11 4.7uF
H2
VCC
D-
D+
OPT
GND
CASE1
CASE2
CASE3
CASE4
CASE5
CASE6
USB Micro
L2
R5 27
R6 27
USB_DN
USB_DP
C12 10nF
C13 47pF
C14 47pF
3V3
J1
VTRef
GND
GND
KEY
GNDdet
SWDIO/TMS
SWDCLK/TCK
SWO/TDO
NC/TDI
nRESET
2_SWDIO
4_SWCLK
6
8
10
nRESET
CONN-H-10POS
PWREN#1
R14 1M
Q1
N-Channel
RV1C002UNT2CL
VDD_FEM
FB1
Ferrite Bead
BLM18HE152SN1D
C8 10uF
C9 0.1uF
C10 0.1uF
C24 0.1uF
D3
VDD_SKY
GND
L5 4.7nH
C28 22pF
C29 10pF
C30 4.7uF
L6 3.3nH
C31 100pF
L7 3.0nH
C32 1.8pF
C33 8.2pF
C34 3.3pF
L9 1.3nH
L8 6.8nH
C35 33pF
C36 1nF
U2 SE2435L-R
PA_OUT
PA_IN
TX_FLT
TR
LNA_IN
RX_FLT
TX_IN
VCC0
VCC1
VCC2
ANT1
ANT2
CSD
CPS
CTX
ANT_SEL
NC
GND
PAD
C37 3.3pF
C39 2.2pF
C40 2.2pF
L12 12nH
PA_TR
L10 6.8nH
L11 6.8nH
C38 3.3pF
C41 10pF
L13 DNI
L14 DNI
H6
RF
U.FL Antenna Connector
SE_CSD
SE_CPS
SE_CTX
R25 100k
R26 100k
R27 100k
U4 ECC608
NC-1
NC-2
NC-3
GND
VCC
NC-4
SCL
SDA
I2C_SCK
I2C_SDA
R7 DNI
C16 0.1uF
U3
SDO
SDX
VDDIO
NC_1
INT1
INT2
VDD
GNDIO
GND
CSB
NC_2
SCX
BMA_INT1
BMA_INT2
BMA400
C15 0.1uF
VUSB
C17 1uF
U5
IN
BAT
BAT
TS
ISET
ILIM
TMR
OUT
OUT
CHG
PGOOD
EN1
EN2
SYSOFF
CE
EP
VSS
VBAT
H3
BAT -
BAT +
C25 4.7uF
R12 10k
R15 750
R16 1.1k
R17 46.4k
BQ24079TRGTR
R8 1.3k
R9 1.3k
D1
D2
#PWRGD#
PWREN#
C18 4.7uF
C19 4.7uF
VDD_FEM
R18 10k
R10 100k
EN
U6
VIN
EN
PG
SW
FB
GND
TPS62825DMQR
L3 470nH
C20 10uF
C21 10uF
C22 10uF
3.3V w/ 1A MAX
3V3
R11 232k
C23 120pF
R13 49.9k
RISET = KISET / ICHG
KISET = 890 AΩ from the electrical characteristics table.
RISET = 890 AΩ / 0.8 A = 1.1125 kΩ
RILIM = KILIM / II_MAX
KILIM = 1550 AΩ from the electrical characteristics table.
RISET = 1550 AΩ / 1.3 A = 1.192 kΩ
RTMR = tMAXCHG / (10 × KTMR)
KTMR = 48 s/kΩ from the electrical characteristics table.
RTMR = (6.25 hr × 3600 s/hr) / (10 × 48 s/kΩ) = 46.8 kΩ
TMR = VSS Disable safety timers.
Title
Size
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Number
Revision
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1. ALL DIMENSIONS ARE IN INCHES, UNLESS

2. THE PWB SHALL BE FABRICATED TO IPC–6012, CLASS 2 AND WORKMANSHIP SHALL CONFORM TO IPC–A–600, CLASS 2. CURRENT REVISIONS.

3. BOARD MATERIAL SHALL BE FR4 with Dk <= 4.2 OR EQUIVALENT, RoHS COMPLIANT AND LEAD FREE ASSEMBLY CAPABLE. BOARD MATERIAL SHALL MEET OR EXCEED IPC–4101B. COLOR: NATURAL.

4. BOARD MATERIAL & CONSTRUCTION TO BE U.L. APPROVED AND MARKED ON THE FINISHED BOARD.

5. MINIMUM COPPER WALL THICKNESS OF PLATED–THRU HOLES TO BE .001 INCH, WITH A MINIMUM

6. OVERALL BOARD THICKNESS TO BE .062 +/– 10% AND APPLIES AFTER ALL LAMINATION AND PLATING PROCESSES, MEASURED FROM COPPER TO COPPER.

7. MAX. WARP & TWIST TO BE .0075 INCHES PER INCH.

8. BOARD MUST BE ELECTRICALLY TESTED USING

9. FINISHED PCB SHALL REFLECT GERBER ARTWORK. COPPER MODIFICATION WITHIN THE OUTLINE IS NOT ALLOWED WITHOUT WRITTEN PERMISSION EXCEPT AS NOTED IN THIS DRAWING OR TO MEET CONTROLLED IMPEDANCE TARGETS. WHEN REQUESTING CHANGES, VENDOR SHALL SUPPLY GERBERS FOR COMPARISSON SHOWING EXPECTED FINISHED PRODUCT ACCEPTANCE CRITERIA, NOT PRE–ETCHED FILMS.

10. TRACES .011" WIDE ON LAYER 1 SHALL MEASURE TO BE

Approximately 0.011" width with 0.010" spacing or as needed to be modified by fabricator.

FINISHED AS SMOOTH WALL BY VENDOR.

PROCESS NOTES:

1. PLATE ALL EXPOSED AREAS WITH ELECTROLESS IMMERSION GOLD, NICKEL 150 MICROINCHES THK MIN GOLD 2–5 MICROINCHES THK MIN.

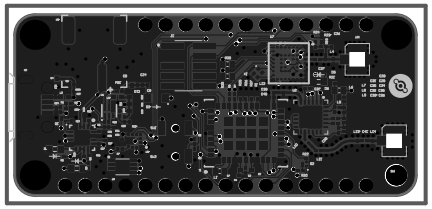
2. APPLY LPI SOLDERMASK OVER BARE COPPER (SMOBC), COLOR: BLACK. SOLDERMASK SHALL CONFIRM TO IPC–SM–840. CLASS H. CURRENT REV.

3. SOLDERMASK ARTWORK HAS ZERO (0) OVERSIZED PADS. FABRICATION VENDOR IS ALLOWED TO ADJUST THE COMPONENT SOLDERMASK PADS TO MEET THEIR TOOLING REQUIREMENTS.

4. APPLY LPI SILKSCREEN OR EQUIVALENT PER THE ARTWORK. COLOR: WHITE

Board Layer Stack

Number	Name	Type	Material	Thickness (mil)	Weight (oz)	Dk	Orientation
	Top Overlay	Overlay					
	Top Solder	Solder Mask	Solder Resist	0.6		3.5	
1	Top Layer	Signal		1.9	1		Top
	Top Prepreg	Prepreg		6		4.2	
2	Mid Layer 1	Signal		2.5	2		Not allowed
	Bottom Core	Core		39		4.2	
3	Mid Layer 2	Signal		2.5	2		Not allowed
	Bottom Prepreg	Prepreg		6		4.2	
4	Bottom Layer	Signal		1.9	1		Bottom
	Bottom Solder	Solder Mask	Solder Resist	0.6		3.5	
	Bottom Overlay	Overlay					



Comment	Manufacturer Par	Description	Designator	Foo
10uF	GRM155R60G10	Capacitor	C1, C4, C7, C8, C20,	040
0.1uF	GRM033R61A104	Capacitor	C2, C3, C5, C6, C9, C	020
4.7uF	GRM035R60J475	Capacitor	C11, C18, C19, C25, (	020
10nF	GRM033R61E103	Capacitor	C12	020
47pF	GRM0335C1E47(	Capacitor	C13, C14	020
1uF	GRM033R60J105	Capacitor	C17	020
120pF	GRM0335C1H121	Capacitor	C23	020
27pF	GRM0335C1E270	Capacitor	C27	020
22pF	GRM0335C1H22(	Capacitor	C28	020
10pF	GRM0335C1E100	Capacitor	C29, C41	020
100pF	GRM0335C1H101	Capacitor	C31	020
1.8pF	GRM0335C1H1R8	Capacitor	C32	020
8.2pF	GRM0335C1H8R2	Capacitor	C33	020
3.3pF	GRM0335C1H3R3	Capacitor	C34, C37, C38	020
33pF	GRM0335C1H33(	Capacitor	C35	020
1nF	GRM033R71E102	Capacitor	C36	020
2.2pF	GRM0335C1H2R2	Capacitor	C39, C40	020
LED RED DIFFUSED (	LTST-C191KRKT	LED 0603	D1, D2	060
Schottky Diode	BAT30F4	DIODE SCHOTTKY 30	D3	SOD
DiodeESD	PESD5V0R1BSFY	SMD ESD Diode 0201	D5	020
LED BLUE DIFFUSED	LB Q39G-L2OO-3	LED 0603	D6	060
Ferrite Bead	BLM18HE152SN1D		FB1	020
USB Micro	1050170001	CONN USB Micro-B 1	H2	CON
CONN HEADER SMD	S2B-PH-SM4-TB(	CONN HEADER SMD	H3	CON
U.FL Connector	0734120110	U.FL Connector	H4, H6	U.FL
CONN-H-10POS	FTSH-105-01-F-D	Connector	J1	FTS
15uH	BRL1608T150M	Inductor	L1	060
1.5k @ 250mA	CIM05J152NC	Inductor	L2	040
470nH	LQB15NNR47J10	Inductor	L3	040
120nH	LQP03TNR12J02D	Inductor	L4	020
4.7nH	LQP03TN4N7H02	Inductor	L5	020
3.3nH	LQP03TN3N3B02	Inductor	L6	060
3.0nH	LQP03TN3N0B02	Inductor	L7	020
6.8nH	LQP03TN6N8J02D	Inductor	L8, L10, L11	020
1.3nH	LQP03TN1N3B02	Inductor	L9	020
12nH	LQP03TN12NH02	Inductor	L12	020