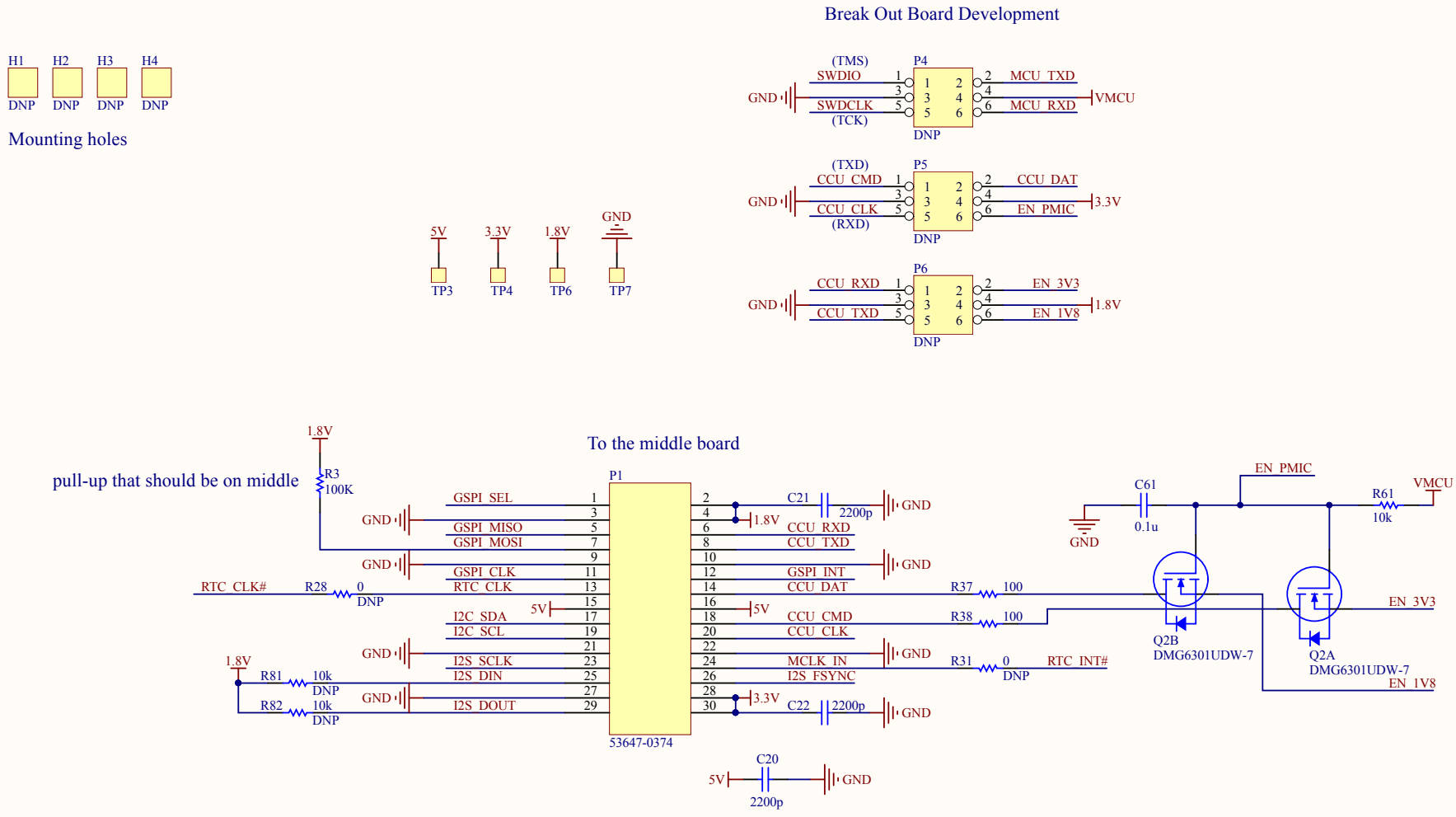
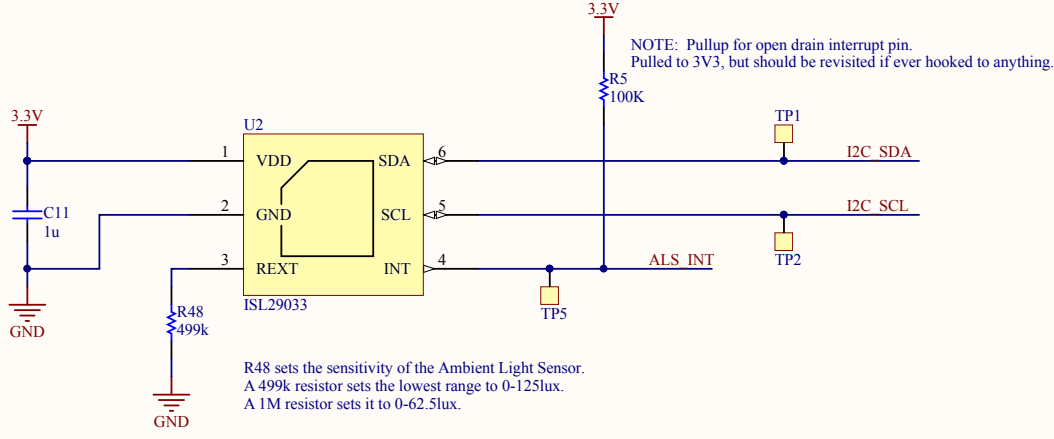
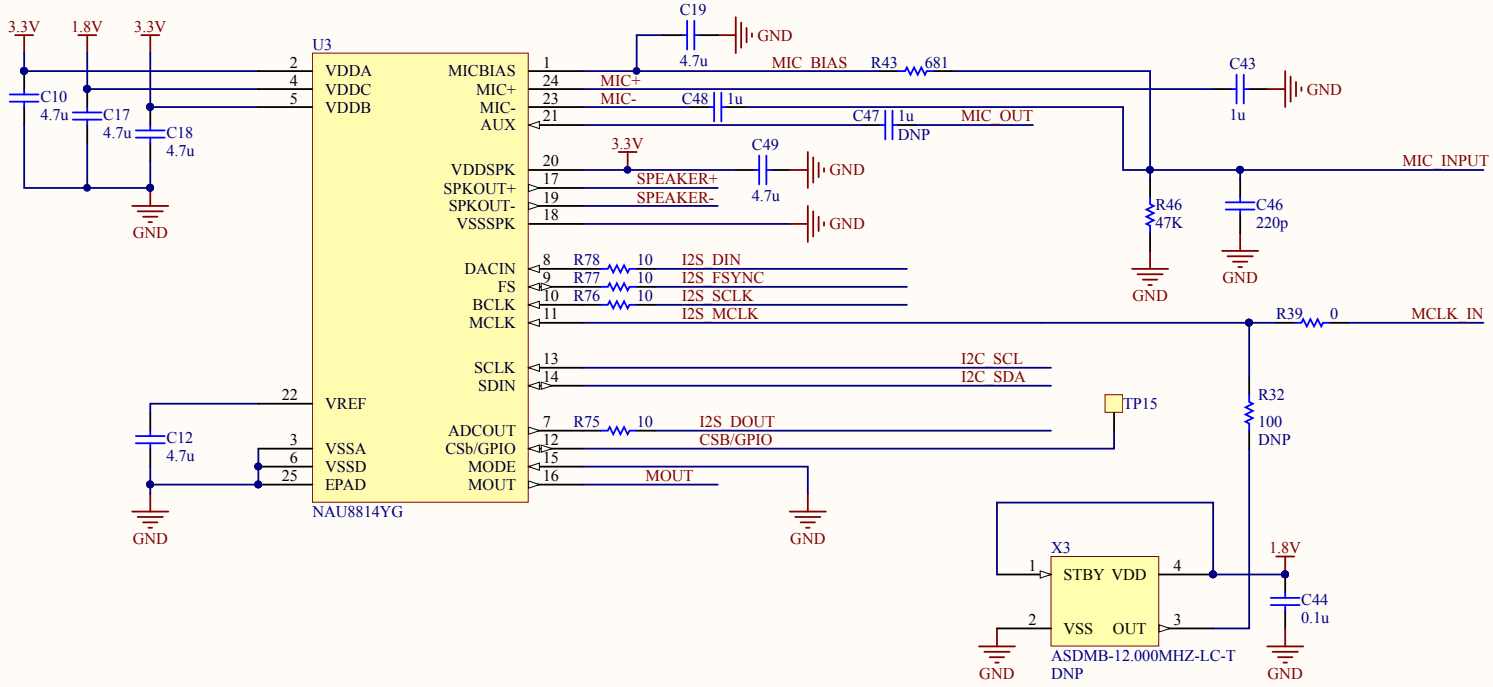

Mounting holes
H1 H2 H3 H4
DNP DNP DNP DNP
Break Out Board Development
5V 3.3V 1.8V GND
TP3 TP4 TP6 TP7
P4
(TMS)
SWDIO
SWDCLK
(TCK)
GND
MCU_TXD
MCU_RXD
VMCU
DNP
P5
(TXD)
CCU_CMD
CCU_CLK
(RXD)
CCU_DAT
EN_PMIC
3.3V
P6
CCU_RXD
CCU_TXD
EN_3V3
EN_1V8
1.8V
To the middle board
pull-up that should be on middle
R3 100K
P1
GSPI_SEL
GSPI_MISO
GSPI_MOSI
GSPI_CLK
RTC_CLK
I2C_SDA
I2C_SCL
I2S_SCLK
I2S_DIN
I2S_DOUT
RTC_CLK#
R28 0 DNP
R81 10k DNP
R82 10k DNP
C21 2200p
C22 2200p
C20 2200p
CCU_RXD
CCU_TXD
GSPI_INT
CCU_DAT
CCU_CMD
CCU_CLK
MCLK_IN
I2S_FSYNC
R37 100
R38 100
R31 0 DNP
RTC_INT#
53647-0374
C61 0.1u
R61 10k
EN_PMIC
VMCU
EN_3V3
EN_1V8
Q2B DMG6301UDW-7
Q2A DMG6301UDW-7
Hello
TITLE Morpheus top
REV DVT
DATE 11/13/2014
DRAWN BY D. Fusi
SHEET 1 OF 7



Hello

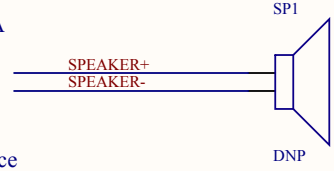
TITLE: ALS		REV: DVT
DATE: 11/13/2014	DRAWN BY: D. Fusi	SHEET 2 OF 7



Hello

TITLE: Codec	REV: DVT
DATE: 11/13/2014	DRAWN BY: D. Fusi
	SHEET 3 OF 7

max output current @ 5V = 15mA

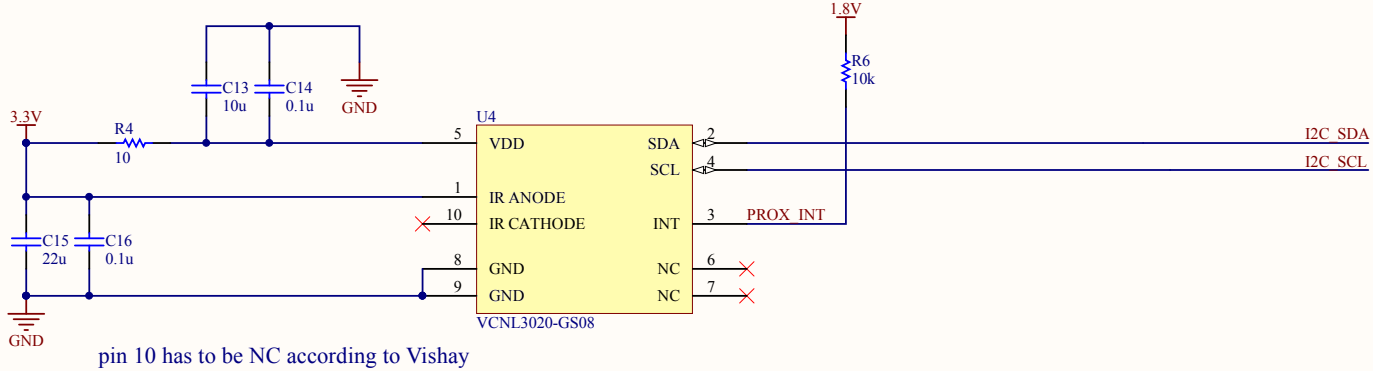


max speaker power = 500mW

max sp7.9 mA @ 8 ohm impedance

Hello

TITLE Speaker		REV DVT
DATE 10/10/2014	DRAWN BY D. Fusi	SHEET 4 OF 7

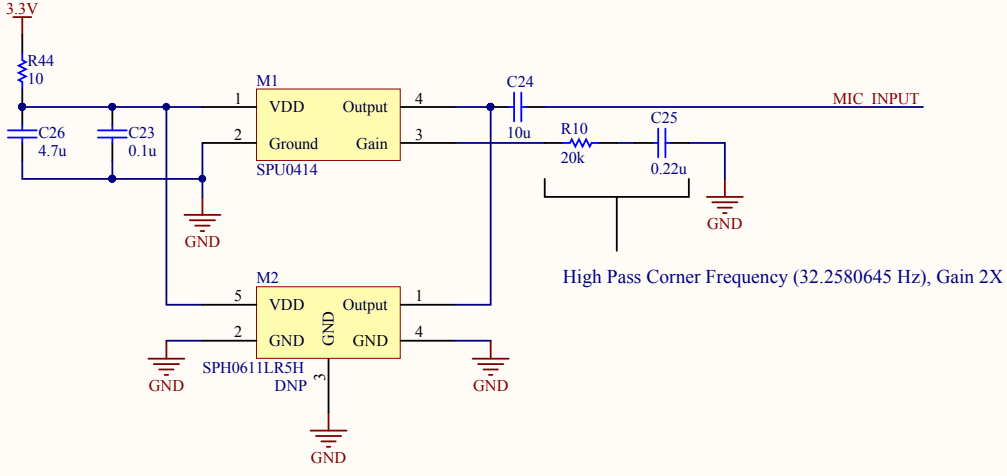


pin 10 has to be NC according to Vishay

Hello

TITLE: Proximity	REV: DVT
DATE: 11/13/2014	DRAWN BY: D. Fusi
	SHEET 5 OF 7

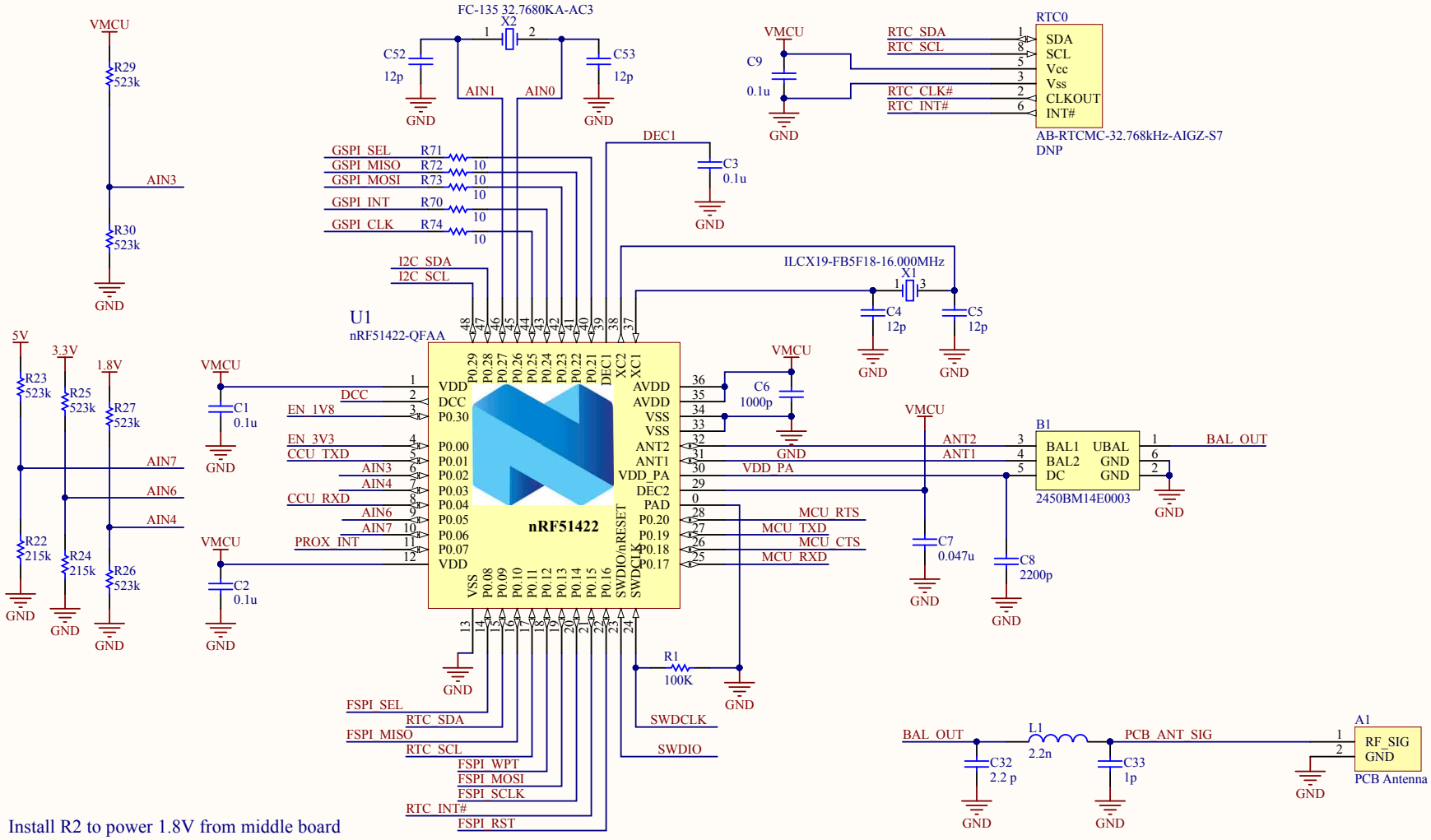
M1 is top port mic, M2 is bottom port mic. Only one can be installed at a time



High Pass Corner Frequency (32.2580645 Hz), Gain 2X

Hello

TITLE: Microphone		REV: DVT
DATE: 11/13/2014	DRAWN BY: D. Fusi	SHEET 6 OF 7

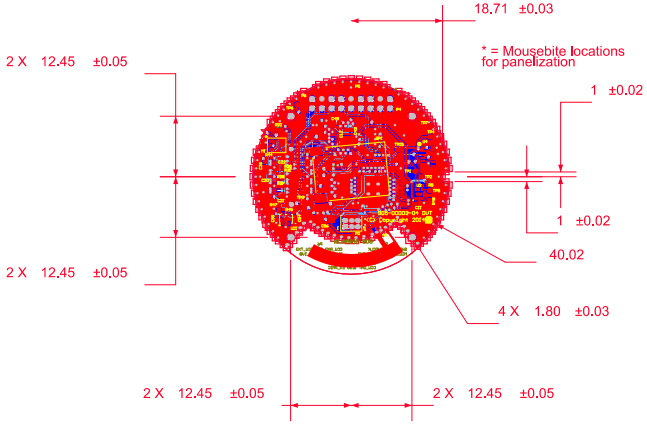

VMCU
R29
523k
AIN3
R30
523k
GND
FC-135 32.7680KA-AC3
X2
C52
12p
C53
12p
AIN1
AIN0
GSPI_SEL
GSPI_MISO
GSPI_MOSI
GSPI_INT
GSPI_CLK
R71
R72
R73
R70
R74
10
DEC1
C3
0.1u
I2C_SDA
I2C_SCL
U1
nRF51422-QFAA
nRF51422
VDD
DCC
P0.30
P0.00
P0.01
P0.02
P0.03
P0.04
P0.05
P0.06
P0.07
AVDD
VSS
ANT2
ANT1
VDD_PA
DEC2
PAD
P0.20
P0.19
P0.18
P0.17
SWDIO/nRESET
SWDCLK
XC2
XC1
C1
0.1u
C2
0.1u
EN_1V8
EN_3V3
CCU_TXD
CCU_RXD
AIN3
AIN4
AIN6
AIN7
PROX_INT
C6
1000p
ILCX19-FB5F18-16.000MHz
X1
C4
12p
C5
12p
MCU_RTS
MCU_TXD
MCU_CTS
MCU_RXD
C7
0.047u
C8
2200p
B1
BAL1
BAL2
DC
UBAL
GND
2450BM14E0003
BAL_OUT
5V
3.3V
1.8V
R23
523k
R25
523k
R27
523k
R22
215k
R24
215k
R26
523k
AIN7
AIN6
AIN4
R1
100K
SWDCLK
SWDIO
FSPI_SEL
FSPI_MISO
FSPI_WPT
FSPI_MOSI
FSPI_SCLK
RTC_INT#
FSPI_RST
RTC_SDA
RTC_SCL
C9
0.1u
RTC0
SDA
SCL
Vcc
Vss
CLKOUT
INT#
RTC_CLK#
RTC_INT#
AB-RTCMC-32.768kHz-AIGZ-S7
DNP
L1
2.2n
C32
2.2 p
C33
1p
PCB_ANT_SIG
A1
RF_SIG
GND
PCB Antenna
Install R2 to power 1.8V from middle board
R2
DNP
programming connector
P2
MHDR2X3
DNP
LDO to provide 1.8V rather than getting it from middle board
U11
TPS79718DCK
VIN
VOUT
NC
GND
RST
PON
C54
4.7u
C55
4.7u
10V
C56
100u
6.3V
1206
R45
523k
DNP
R47
931k
DNP
Option for adjustable regulator version to produce ~1.85V
Hello
TITLE
BLE MCU
REV
DVT
DATE
11/13/2014
DRAWN BY
D. Fusi
SHEET 7 OF 7

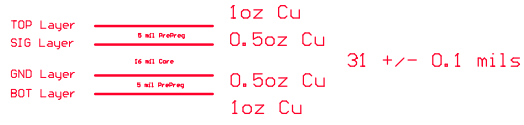
Fabrication / Assembly Notes

1. Material: Rigid FR-4, RoHS compliant: material should meet or exceed requirements of IPC 4101/129
2. Number of electrical layers: 4
3. Trace / Space minimum: 5mil (all layers)
4. Thickness: 0.786mm (finished)
5. Finish: ENIG plating on exposed copper
6. Soldermask: per IPC-SM-840, color matte black registration within +/- 50um of circuit layer
7. Silkscreen: do print silkscreen on top and bottom layers
8. Board must meet or exceed 94V-0
9. Board must be lead free process compatible and able to withstand minimum of 5 cycles at 250 degrees celsius
10. All Test/QA/QC markings to be made on back side of PCB
11. x mousebites shall be no larger than 0.05 mm
12. 0.25mm radius around sharp edges like the notch on the right side
13. All Dimensions are after plating/finishing
14. All components must be placed within +/- 0.10mm
15. This is a controlled impedence board between layers 3 and 4.
    0.45mm traces on Bottom (layer 4) are 50 Ohms +/- 5 Ohm controlled impedence traces referenced to layer 3.

Layer	Name	Material	Thickness	Constant	Board Layer Stack
1	Top Paste				
2	Top Overlay				
3	Top Solder	Solder Resist	0.010mm	3.5	
4	TOP	Copper	0.036mm		
5	Dielectric1	FR-4	0.127mm	4.2	
6	SIG	Copper	0.017mm		
7	Dielectric3	FR-4	0.406mm	4.2	
8	GND	Copper	0.017mm		
9	Dielectric2	FR-4	0.127mm	4.2	
10	BOT	Copper	0.036mm		
11	Bottom Solder	Solder Resist	0.010mm	3.5	
12	Bottom Overlay				
13	Bottom Paste				

Symbol	Hit Count	Finished Hole Size	Plated	Hole Type
○	1	0.325mm (12.80mil)	PTH	Round
●	1	0.700mm (27.56mil)	PTH	Round
▼	1	0.900mm (35.43mil)	PTH	Round
▽	4	0.381mm (15.00mil)	PTH	Round
◘	4	1.700mm (66.93mil)	PTH	Round
✡	6	0.600mm (23.62mil)	PTH	Round
⊠	18	0.813mm (32.00mil)	PTH	Round
❁	88	0.200mm (7.87mil)	PTH	Round
✱	189	0.305mm (12.01mil)	PTH	Round
	312 Total			





METRIC		DRAFTER	DATE	hello	
DIMENSIONS ARE IN MILLIMETERS TOLERANCES: 0 > - < 2 0.05 2 > - < 10 0.08 10 > - < 50 0.10 50 > - < 100 0.15 100 > - < 200 0.20 200 > - 0.20 ANGLES 1.00		DESIGNER rsb/dyke/dfusi	DATE 11/19/14	TITLE: Morpheus Top Board	
		PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF HELLO INC. ANY REPRODUCTION IN PART OR AS A WHOLEWITHOUT THE WRITTEN PERMISSION OF HELLO INC IS PROHIBITED.		SIZE B	DWG. NO. 201-00003-04
				SCALE: 2:1	WEIGHT:
				REV	SHEET 1 OF 1