Schemaic diagram

U1 — EM78P451SAQJ(COB

Pin	Signal
1	ID_BTM/WHA → P90
2	LVD# → P91
3	SPI_CLK → SDI/P92
4	SPI_MOSI → SDO/P93
5	RF_CS → SCK/P94
6	PKT_FLAG → SS/P95
7	C3 → P50
8	C4 → P51
9	C5 → P52
10	C6 → P53
11	C7 → P54

Top pins: IIC_SCL(44), IIC_SDA/WHC(43), VCC(42), GND(41), OSCO(40), OSCI(39), VDD(38), NC(37), NC(36), NC(35), SPI_MISO(34)
CLK, DATA, INT, VSS, OSCO, R-OSCI, VDD, NC, NC, NC, P70

Right pins: P71(33)→C2, P72(32)→C1, P67(31)→R7, P66(30)→R6, P65(29)→R5, P64(28)→R4, P63(27)→R3, P62(26)→R2, P61(25) R1→R1, P60(24)→R0, P87(23)→C17

Bottom pins: P55(12), P56(13), P57(14), P80(15), P81(16), NC(17), P82(18), P83(19), P84(20), P85(21), P86(22)
C14, C13, C12, C11, C15, C10, C8, C9, C0, C16

VCC R2 33K ID_BTM/WHA

OSCI — Y1 4MHz — OSCO

VCC — C4 104

VCC — R13 150K — SPI_MISO

VBAT 1.5V*2 — C18 0.1uF — C8 10uF — VCC

LVD# — R10 100K — VCC

U2 24C02(SOT-23-5)
1 A0	VCC 8
2 A1	WP 7
3 A2	SCL 6 → IIC_SCL
4 VSS	SDA 5 → IIC_SDA/WHC

VCC — R3 10K, R4 10K

VCC — C7 10uF

VCC — R8 150K — C6 0.1uF — RF_RST

ANT — L2 1.0NH — ANT 2.4G
CF1 1.0pF

VCC — R7 150K — RF_CS

U3 — EM198810

C16 30PF, C15 30PF, Y2 12M, R12 680K
R11 560R, +1.8V, C10 0.1uF, TVCC, C9 0.1uF

+1.8V — C14 0.1uF, C17 2.2uF

Left pins:
1 XTALI
2 PLL_VDD
3 VCO_VDD
4 ANT
5 GND
6 RF_VDD

Top pins: XTALO(24), VDD_IN(23), GND(22), CKPHA(21), LDO_VOUT(20), VDD_IO(19)

Right pins:
18 SPI_MISO → SPI_MISO
17 RESET_n → RF_RST
16 SPI_CLK → SPI_CLK
15 SPI_MOSI → SPI_MOSI
14 SPI_SS → RF_CS
13 DIG_VDD → +1.8V

Bottom pins: IF_VDD(6), AMS_VDD(7), FIFO_FLAG(8), RXCLK(9), PKT_FLAG(10), GND(11), GND(12)

+1.8V — C20 0.1uF
+1.8V — C13 0.1uF, C12 10nF
C19 0.1uF, C11 10nF
PKT_FLAG