U1CLOCK

WAKEUP/WD	34	GND
CLK_OUT/GPIO7	33	R42 / 47 → CLK_OUT
OSC_OUT	31	
OSC_IN	30	→ VCXO_OUT

CLOCK
U1CLOCK

X1 / UEXT

VCC — C23 10u — GND

Pin	Signal	Signal	Pin	
RES →	3	3V3	GND	2	
	3	TXD	RXD	4	→ INT
	5	SCL	SDA	6	
SPI_MISO →	7	MISO	MOSI	8	→ SPI_MOSI
SPI_CLK →	9	SCK	SSEL	10	→ SPI_SEL

UEXT

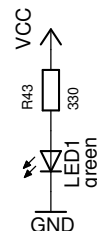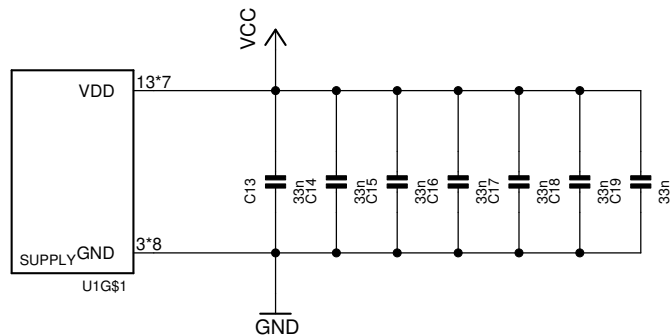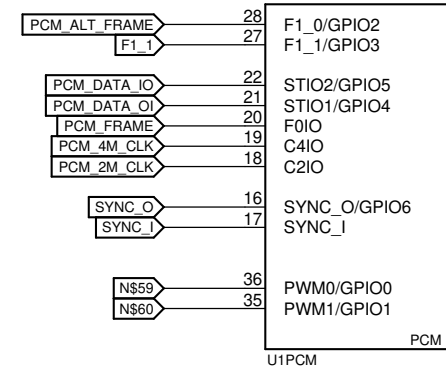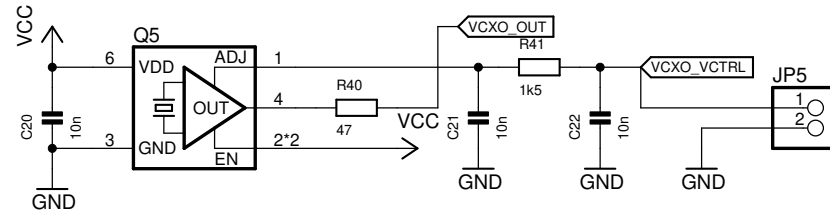UEXT is a "standard" pinout develoed by OLIMEX
for UART, SPI and I2C.
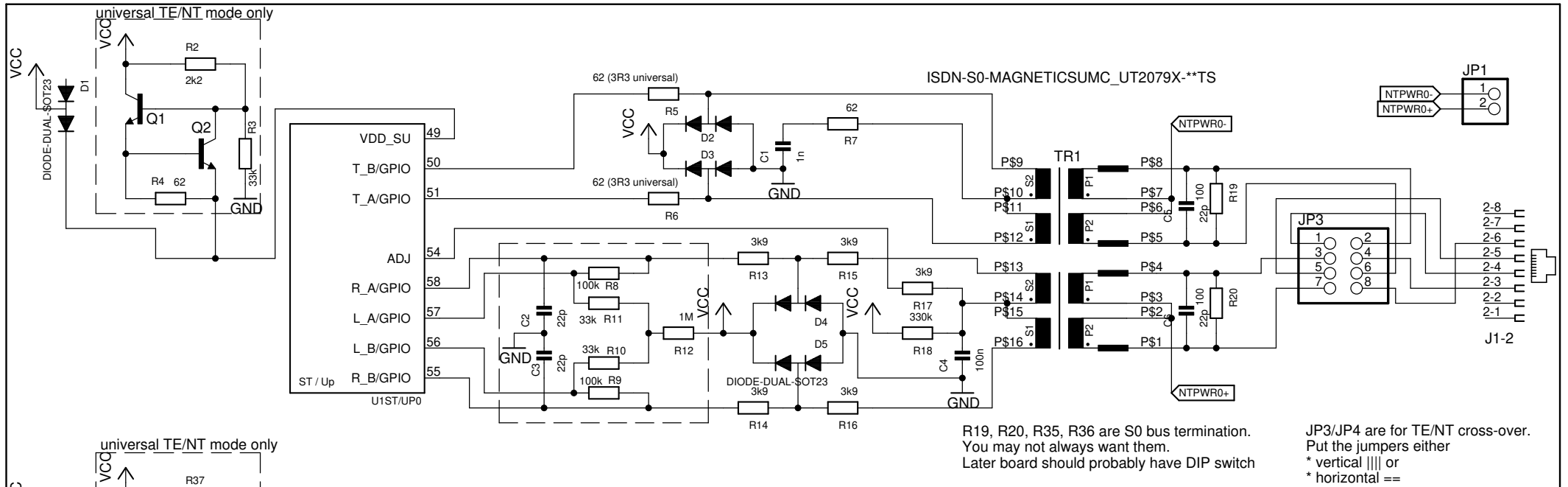They have plenty of uC boards and peripherals with UEXT
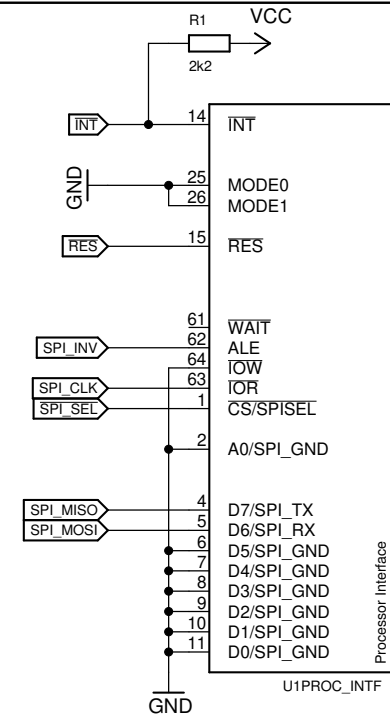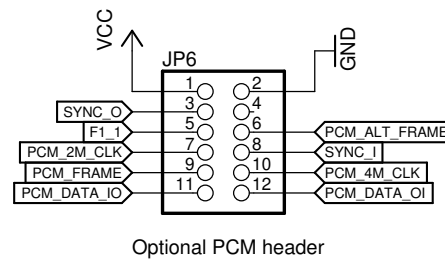
Power Supply (3V3) and SPI control provided by external uC board via UEXT header (X1)

Note there are NO PROTECTION circuits against
* polarity reversal
* overvoltage
* ESD

JP6 — Optional PCM header

VCC — GND

Signal	Left	Right	Signal
SYNC_O →	1	2	
	3	4	
F1_1 →	5	6	→ PCM_ALT_FRAME
PCM_2M_CLK →	7	8	→ SYNC_I
PCM_FRAME →	9	10	→ PCM_4M_CLK
PCM_DATA_IO →	11	12	→ PCM_DATA_OI

Optional PCM header

VCXO section

VCXO section, inspired by icE1usb.
JP5 to feed in external DAC or PWM for tuning.

Q5

VDD	6	ADJ / 1
OUT	4	
GND	3	EN / 2*2

C20 10n — GND

R40 47 — VCC

VCXO_OUT
R41 1k5
C21 10n — GND
C22 10n — GND
→ VCXO_VCTRL

JP5
1
2
GND

U1PROC_INTF — Processor Interface

R1 2k2 — VCC

Signal	Pin	Name
INT →	14	INT
GND →	25	MODE0
	26	MODE1
RES →	15	RES
	61	WAIT
SPI_INV →	62	ALE
	64	IOW
SPI_CLK →	63	IOR
SPI_SEL →	1	CS/SPISEL
	2	A0/SPI_GND
SPI_MISO →	4	D7/SPI_TX
SPI_MOSI →	5	D6/SPI_RX
	6	D5/SPI_GND
	7	D4/SPI_GND
	8	D3/SPI_GND
	9	D2/SPI_GND
	10	D1/SPI_GND
	11	D0/SPI_GND

U1PROC_INTF
GND

U1PCM — PCM

Signal	Pin	Name
PCM_ALT_FRAME →	28	F1_0/GPIO2
F1_1 →	27	F1_1/GPIO3
PCM_DATA_IO →	22	STIO2/GPIO5
PCM_DATA_OI →	21	STIO1/GPIO4
PCM_FRAME →	20	F0IO
PCM_4M_CLK →	19	C4IO
PCM_2M_CLK →	18	C2IO
SYNC_O →	16	SYNC_O/GPIO6
SYNC_I →	17	SYNC_I
N$59 →	36	PWM0/GPIO0
N$60 →	35	PWM1/GPIO1

PCM
U1PCM

U1G$1 — SUPPLY

VDD	13*7	VCC
GND	3*8	GND

SUPPLY
U1G$1

C13 33n, C14, C15, C16, C17, C18, C19 33n

VCC
R43 330
LED1 green
GND

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universal TE/NT mode only

VCC

VCC

R2
2k2

Q1

Q2

R4   62

R3
33k

GND

VCC

D1

DIODE-DUAL-$OT23

GND

62 (3R3 universal)   R5

ISDN-S0-MAGNETICSUMC_UT2079X-**TS

VCC

D2

D3

C1
1n

62
R7

GND

62 (3R3 universal)

R6

P$9   S2   TR1   P1   P$8

NTPWR0-

P$10
P$11   S1   P2   P$7
P$6
C11
22p   100   R19

P$12   S1   P2   P$5

VDD_SU   49

T_B/GPIO   50

T_A/GPIO   51

ADJ   54

R_A/GPIO   58

L_A/GPIO   57

L_B/GPIO   56

R_B/GPIO   55

ST / Up

U1ST/UP0

C2   22p

100k R8

33k R11

C3   22p

GND

33k R10

100k R9

1M
R12

VCC

3k9   3k9
R13   R15

D4   VCC

D5

DIODE-DUAL-$OT23

3k9   3k9
R14   R16

3k9
R17   330k
R18

C4
100n

GND

JP1

NTPWR0-   1
NTPWR0+   2

P$13   S2   P1   P$4

NTPWR1-

P$14
P$15   S1   P2   P$3
P$2
C   22p   100   R20

P$16   S1   P2   P$1

NTPWR0+

JP3

1   2
3   4
5   6
7   8

2-8
2-7
2-6
2-5
2-4
2-3
2-2
2-1

J1-2

R19, R20, R35, R36 are S0 bus termination.
You may not always want them.
Later board should probably have DIP switch

JP3/JP4 are for TE/NT cross-over.
Put the jumpers either
* vertical |||| or
* horizontal ==

universal TE/NT mode only

VCC

VCC

R37
2k2

Q3

Q4

62
R39

R38
33k

GND

VCC

D10

DIODE-DUAL-$OT23

GND

62 (3R3 universaal)   R21

ISDN-S0-MAGNETICSUMC_UT2079X-**TS

VCC

D6

D7

C7
1n

62
R23

GND

62 (3R3 universal)

R22

P$9   S2   TR2   P1   P$8

NTPWR1-

P$10
P$11   S1   P2   P$7
P$6
C11
22p   100   R35

P$12   S1   P2   P$5

VDD_SU   48

T_B/GPIO   47

T_A/GPIO   46

ADJ   43

R_A/GPIO   39

L_A/GPIO   40

L_B/GPIO   41

R_B/GPIO   42

ST / Up

U1ST/UP1

C8   22p

100k R24

33k R27

C9   22p

GND

33k R26

100k R25

1M
R28

VCC

3k9   3k9
R29   R31

D8   VCC

D9

3k9   3k9
R30   R32

3k9
R33   330k
R34

C10
100n

GND

JP2

NTPWR1-   1
NTPWR1+   2

P$13   S2   P1   P$4

NTPWR1-

P$14
P$15   S1   P2   P$3
P$2
C11   22p   100   R36

P$16   S1   P2   P$1

NTPWR1+

JP4

1   2
3   4
5   6
7   8

1-8
1-7
1-6
1-5
1-4
1-3
1-2
1-1

J1-1

VDD_SU biasing:
* populate only either D1/D10 or the dashed section
* D1/D10 is for NT-only mode
* dashed box is for universal TE/NT mode
* R5, R6, R21, R22 are 3.3Ohms in universal/TE mode

JP1/JP2 can be used for phantom power supply of the S0 bus.
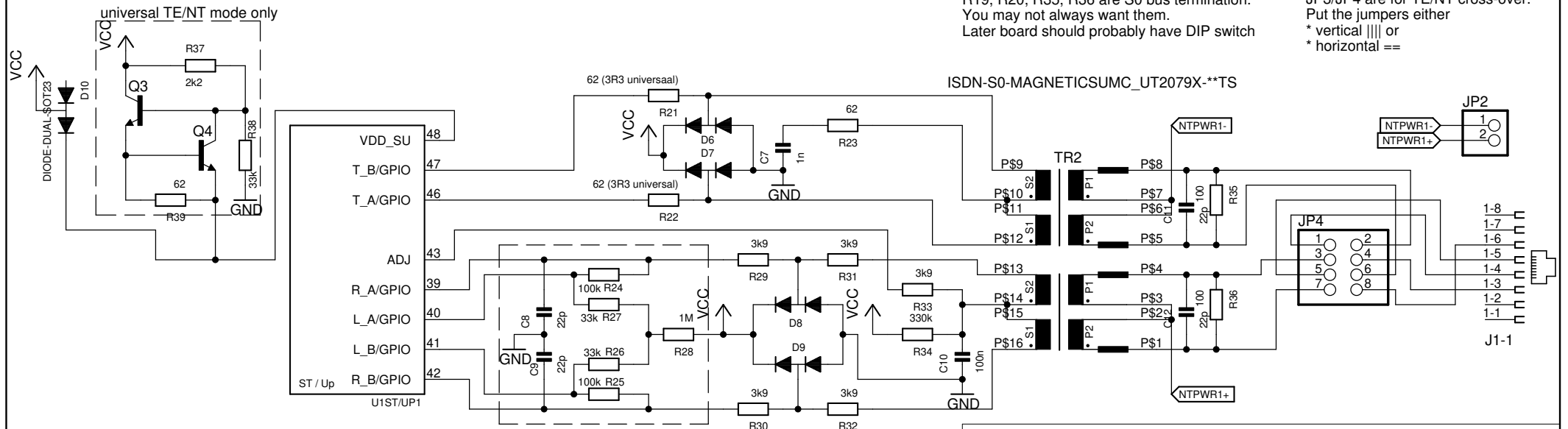
Osmocom XHFC-2SU Breakout Board (Dual ISDN BRI)
(C) 2022 by Harald Welte <laforge@osmocom.org>
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