INTERCONNECT ADAPTER

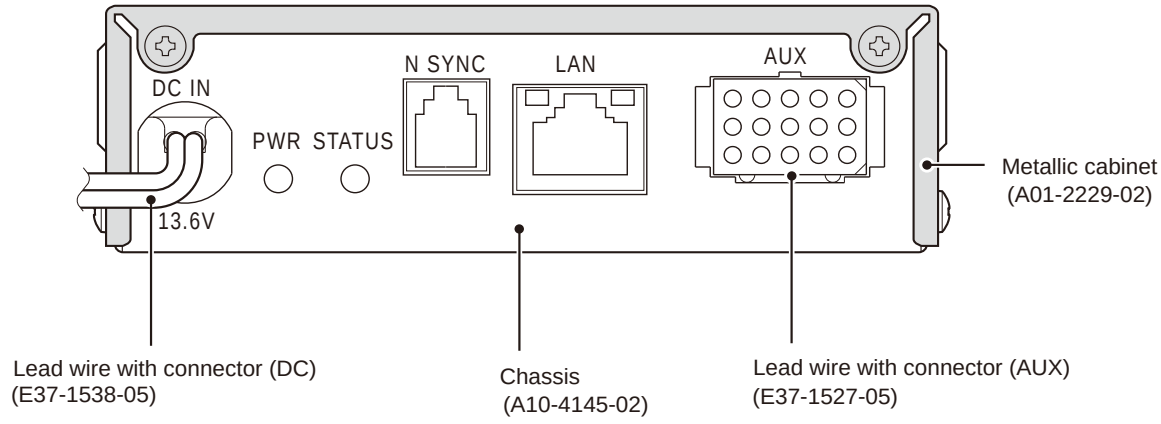
KTI-4

SERVICE MANUAL

KENWOOD

Kenwood Corporation

B51-8955-00 (Y) 414



CONTENTS

This product complies with the **RoHS** directive for the European market.

This product uses Lead Free solder.

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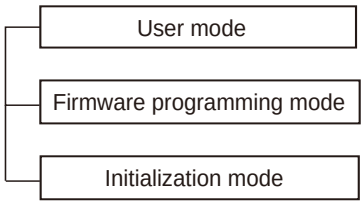
REALIGNMENT

1. Modes



Mode	Function
User mode	Use this mode for normal operation.
Firmware programming mode	Use when changing the firmware program of the flash memory by using the KPT-100 from the PC by way of Internet Protocol (IP).
Initialization mode	Use to initialize the setting when the IP address or Password is lost.

2. How to Enter Each Mode

Mode	Operation
User mode	Power ON
Firmware programming mode	Received IP commands from PC
Initialization mode	[AUX connector AUX _I1 port = Low] + Power ON

REALIGNMENT

3. Firmware Programming Mode

3-1. Preface

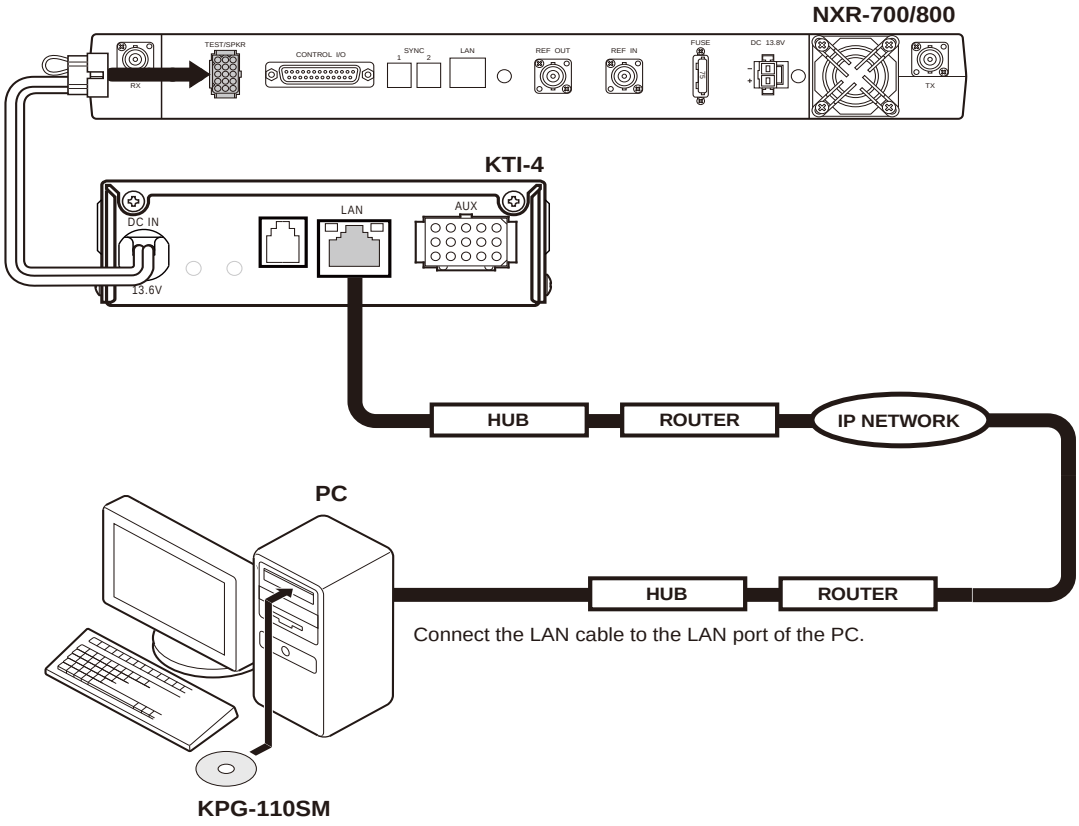
The firmware can be updated by using the KPT-100 attached to the KPG-110SM by way of the network.

3-2. Connection procedure

The following figures illustrate how to connect the KTI-4.

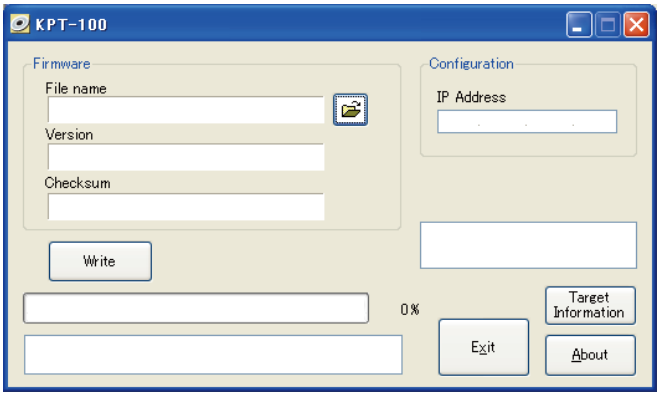
To receive the output of the power supply, the external source is connected. It is also possible to connect it with the TEST/SPKR 15-pin connector on the rear of the NXR-700/800.

Use it in the network setting environment that KPG-110SM normally operates within so that the KPT-100 may communicate with the KTI-4 by way of the network.



3-3. Programming

Select the written firmware file, specify the Internet Protocol address of the KTI-4 writing object, then press the Write button. When writing the firmware ends, the writing end message is displayed.



4. Initialization Mode

4-1. Initialization of Internet Protocol address

Set the Internet Protocol address so that it can be changed by using a PC browser. Initialize Internet Protocol address set to the KTI-4 according to the following procedures when you forget the setting.

Internet Protocol address is set by initializing it again as follows.

Start a PC browser connected with the KTI-4 on the network after it initializes, and change it to a necessary Internet Protocol address.

■ Initial value of Internet Protocol address

	Set value
IP Address	192.168.0.1
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.254

REALIGNMENT

4-2. Initialization method

For the KTI-4 to enter initialization mode, short pin 10 (AUX_I1) of the AUX 15-pin connector to GND then turn the power ON.

At this time, Internet Protocol address is temporarily set to the above mentioned default configuration for the KTI-4, and the password is not set.

The set Internet Protocol address is not changed at this stage.

Under these conditions, when accessing the KTI-4 from a browser, the following two buttons are displayed.

[Initialize Own IP Address]
When the Internet Protocol address is lost, press this button to set the Internet Protocol address to its initial value and reboot. The password is not cleared.
After reboot, it accesses an initial address from the browser, the password is input, and the setting screen opens, allowing you to change the Internet Protocol address.

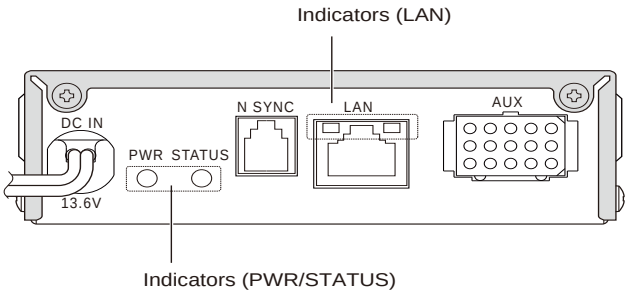
[Initialize All]
When the password is lost, press this button to reset all the settings to their initial values (including the Internet Protocol address and password) and reboot.
After reboot, it accesses an initial address from the browser, the setting screen opens, and you are able to enter a new password.

OPERATING FEATURES

1. Indicators (PWR/STATUS)

Mode	Indicator	Color	Meaning
User mode	PWR	Green	Lights while the power is ON.
	STATUS	Red	Blinks at 200ms cycle, when a communication problem with the DSP board occurs in user mode.
		Green	Lights during telephone calls. Blinks while communicating with the DSP board in user mode.
		Orange	Lights during Initialization mode.
Firmware programming mode	PWR	Orange	Lights during Firmware programming mode.
	STATUS	Red	Lights when firmware is successfully written.
		Green	Blinks when writing the firmware has failed.

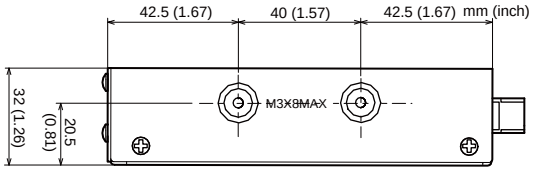
Rear Panel



2. Indicators (LAN)

Indicator	Color	Meaning
Full duplex (LAN : Right)	Green	Lights when in full duplex mode. Blinks when a collision status is detected in half duplex mode.
100Mbps (LAN : Left)	Green	Lights when in 100Base-TX mode.

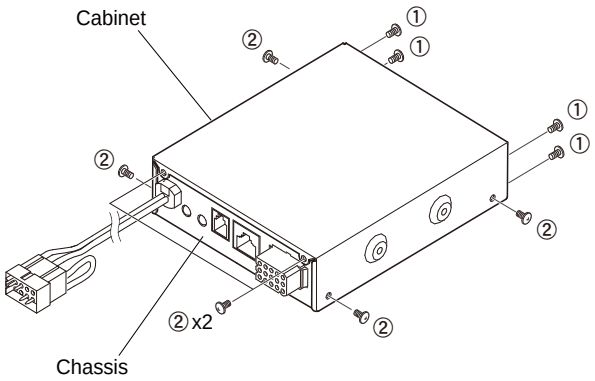
■ Reference drawing for mounting hardware



DISASSEMBLY FOR REPAIR

1. Remove the Cabinet from the Chassis

1. Remove 4 screws ① and 6 screws ②.
2. Remove the cabinet from the chassis.



CIRCUIT DESCRIPTION

1. Interface Unit (X46-337)

1.1 MPU circuit

The MPU (IC10) is a 32-bit microcontroller, and includes a 98K bytes on chip SRAM.

1.2. Memory circuit

The flash memory has a capacity of 8M-bit (IC11) and 32M-bit (IC12).

1.3. Power supply circuit

The Power supply circuit consists of IC3 and IC7.
IC3 is a DC/DC converter and is supplied with 3.3V.
IC7 supplies 5.0V.

1.4. LAN interface circuit

This circuit consists of IC6 and J20.
This interface circuit corresponds to 100Base-TX and 10Base-T.

2. Interface Unit (X46-338)

2.1 DSP circuit

The DSP (IC1) is a Fixed-Point Digital Signal Processor, and includes a 256K bytes on chip RAM.

2.2 Memory circuit

The flash memory (IC3) has a capacity of 32M-bit.

2.3 Power supply circuit

The Power supply circuit consists of IC2 and IC300. IC300 regulates the 3.3V (33AUD) from +B voltage for the Audio signal circuit. +B voltage is supplied from the interface unit (X46-337) via the CN300.

Another 3.3V Power source (33DC) for DSP I/O and Flash memory is supplied from the interface unit (X46-337). IC2 regulates the 1.3V (13DSP) from the 3.3V (33DC). This is supplied to the DSP Core.

2.4 Audio signal circuit

The Audio input signal is amplified by the OP AMP IC (IC301 A/4). The Amplified Audio signal is converted to a Digital signal by the CODEC IC (IC302). The Digital signal is transferred to the DSP from IC302 using the I2S interface bus.

The received digital data from the IP network is decoded in the DSP. That data is transferred to the CODEC IC from the DSP. The CODEC IC converts the digital data to an audio signal. The converted audio signal is filtered by the LPF (IC301 C/4), and amplified by the OP AMP IC (IC301 D/4). The audio signal is then output to the interface unit (X46-337) via CN300.

SEMICONDUCTOR DATA

MPU: LPC2460FBD208 (Interface unit IC10)

Pin No.	Name	I/O	Function
1	D12	I/O	Parallel interface flash memory data line 12
2	TDO	O	Not used
3	D3	I/O	Parallel interface flash memory data line 3
4	TDI	I	Not used
5	P3_28	O	Not used "L" output
6	TMS	I	Not used
7	D13	I/O	Parallel interface flash memory data line 13
8	/TRST	I	Not used
9	DBGEN	I	Not used
10	TCK	I	Not used
11	P3_29	O	Not used "L" output
12	RXD3	I	Not used
13	D4	I/O	Parallel interface flash memory data line 4
14	TXD3	O	Not used
15	VDD1	I	Power supply for the I/O ports
16	P0_24	O	Not used "L" output
17	D5	I/O	Parallel interface flash memory data line 5
18	AD0[0]	I	Not used
19	RTS1	O	Not used "L" output
20	VDDA1	I	Power supply for the analog pad
21	D14	I/O	Parallel interface flash memory data line 14
22	VSSA1	-	Analog ground
23	D6	I/O	Parallel interface flash memory data line 6
24	VREF	I	ADC reference
25	P3_31	O	Not used "L" output
26	VDDDCDC 1_1	I	Power supply for 3.3V DC/DC converter
27	D7	I/O	Parallel interface flash memory data line 7
28	D15	I/O	Parallel interface flash memory data line 15
29	/RSTOUT	O	Reset output signal
30	NC_1	-	No connection
31	P2_30	O	Not used "L" output
32	VSSCORE1	-	Digital ground
33	VSSIO1	-	Digital ground
34	RTCX1	I	Not used
35	/RESET	I	Reset input signal
36	RTCX2	O	Not used
37	ALARM	O	Not used
38	VBAT	I	Power supply for the RTC
39	P2_31	O	Not used "L" output
40	P1_31	O	Not used "L" output
41	P0_12	O	Not used "L" output
42	P1_30	O	Not used "L" output
43	P2_29	O	Not used "L" output
44	XTAL1	I	Input to the oscillator circuit
45	P0_13	O	Not used "L" output
46	XTAL2	O	Output to the oscillator circuit
47	P2_27	O	Not used "L" output
48	P0_28	O	Not used "L" output
49	P2_28	O	Not used "L" output
50	P0_27	O	Not used "L" output
51	P0_31	O	Not used "L" output
52	/USB_D-2	I/O	Not used
53	25_CK_SFT	O	25MHz X'tal for PHY frequency shift control "H"=Shift
54	12_CK_SFT	O	12MHz X'tal for MPU frequency shift control "H"=Shift
55	/485_RE1	O	Not used
56	485_DE1	O	Not used
57	/485_RE2	O	Not used
58	485_DE2	O	Not used
59	RY/BY	I	Parallel interface flash memory ready/busy signal input
60	VDD2	I	Power supply for the I/O ports
61	/WP_SF	O	Write protect signal for serial interface flash memory
62	P0_30	O	Not used "L" output
63	VSSIO2	-	Digital ground
64	BD1_DET	I	Not used
65	P3_23	O	Not used "L" output
66	P1_18	O	Not used "L" output
67	/STS_LEDG	O	Status LED (green) control signal : "L"=ON
68	/STS_LEDR	O	Status LED (red) control signal : "L"=ON
69	P0_14	O	Not used "L" output
70	SCK_SF	O	Serial clock for serial interface flash memory
71	VDD3	I	Power supply for the I/O ports
72	/CS_SF	O	Chip select signal for serial interface flash memory
73	/PWR_ LEDG	O	Power indicator LED (green) control signal : "L"=ON
74	/PWR_ LEDR	O	Power indicator LED (red) control signal : "L"=ON
75	A0	O	Not used "L" output
76	SDI_SF	I	Serial data input from serial interface flash memory
77	VSSIO3	-	Digital ground

SEMICONDUCTOR DATA

Pin No.	Name	I/O	Function
78	SDO_SF	O	Serial data output to serial interface flash memory
79	A1	O	Parallel interface flash memory address line 1
80	AUXO_1	O	AUX output 1 (AUX connector 7 pin)
81	AUXO_2	O	AUX output 2 (AUX connector 1 pin)
82	AUXI_1	I	AUX input 1 (AUX connector 10 pin)
83	A2	O	Parallel interface flash memory address line 2
84	VSSCORE2	-	Digital ground
85	AUXI_2	I	AUX input 2 (AUX connector 4 pin)
86	VDDDCDC 1_2	I	Power supply for 3.3 V DC/DC converter
87	/LD_MODE	I	Loader mode control signal input: "L"=Loader mode
88	HWV2	I	Hardware version 2
89	VDD4	I	Power supply for the I/O ports
90	HWV1	I	Hardware version 1
91	P2_14	O	Not used "L" output
92	HWV0	I	Hardware version 0
93	VSSIO4	-	Digital ground
94	P0_0	O	Not used "L" output
95	BD2_DET	I	Not used
96	DSP_RST	O	DSP reset "H"=Reset
97	A3	O	Parallel interface flash memory address line 3
98	TXD2	O	Not used
99	/ARM_INT	O	ARM interrupt
100	RXD2	I	Not used
101	A16	O	Parallel interface flash memory address line 16
102	/DSP_INT	I	DSP interrupt
103	A4	O	Parallel interface flash memory address line 4
104	A17	O	Parallel Interface flash memory address line 17
105	A18	O	Parallel interface flash memory address line 18
106	/PTT_IN	I	PTT signal input from AUX connector 13 pin
107	A5	O	Parallel interface flash memory address line 5
108	MII_INT	I	PHY MII_INT signal : Not used
109	A20	O	Parallel interface flash memory address line 20
110	ISP_MODE	I	Not used
111	A19	O	Parallel interface flash memory address line 19
112	VDD5	I	Power supply for the I/O ports

Pin No.	Name	I/O	Function
113	A6	O	Parallel interface flash memory address line 6
114	VSSIO5	-	Digital ground
115	A21	O	Not used
116	P0_22	O	Not used "L" output
117	NC_2	-	No connection
118	SQOUT	O	PTT signal output for AUX connector 11 pin "H"=PTT_OUT
119	/BLS0	O	Not used
120	PHY_PD	O	PHY power down signal : "H"=Power down
121	A7	O	Parallel interface flash memory address line 7
122	/PHY_RIP	I	PHY reset in progress indicator : "L"=Device reset is not complete
123	A22	O	Not used
124	P0_18	O	Not used "L" output
125	VDD6	I	Power supply for the I/O ports
126	P0_17	O	Not used "L" output
127	A8	O	Parallel interface flash memory address line 8
128	P0_15	O	Not used "L" output
129	A23	O	Not used
130	P0_16	O	Not used "L" output
131	A9	O	Parallel interface flash memory address line 9
132	P2_9	O	Not used "L" output
133	VSSIO6	-	Digital ground
134	P2_8	O	Not used "L" output
135	A10	O	Parallel interface flash memory address line 10
136	P2_7	O	Not used "L" output
137	TXD1	O	Transmitter output for UART
138	P2_6	O	Not used "L" output
139	/BLS1	O	Not used
140	P2_5	O	Not used "L" output
141	NC_3	-	No connection
142	P2_4	O	Not used "L" output
143	RXD1	I	Receiver input for UART
144	P2_3	O	Not used "L" output
145	A11	O	Parallel Interface flash memory address line 11
146	VDD7	I	Power supply for the I/O ports
147	PHY_RXDV	I	Ethernet receive data valid (MII interface)
148	VSSIO7	-	Digital ground
149	A12	O	Parallel interface flash memory address line 12
150	P2_2	O	Not used "L" output
151	CTS1	O	Not used "L" output

SEMICONDUCTOR DATA

Pin No.	Name	I/O	Function
152	P2_1	O	Not used "L" output
153	PHY_COL	I	Ethernet collision detect
154	P2_0	O	Not used "L" output
155	A13	O	Parallel interface flash memory address line 13
156	PHY_TXER	O	Ethernet transmit error
157	PHY_RXD3	I	Ethernet receive data 3
158	P0_9	O	Not used "L" output
159	A14	O	Parallel interface flash memory address line 14
160	P0_8	O	Not used "L" output
161	DCD1	O	Not used "L" output
162	P0_7	O	Not used "L" output
163	PHY_RXD2	I	Ethernet receive data 2
164	P0_6	O	Not used "L" output
165	VDD8	I	Power supply for the I/O ports
166	P0_5	O	Not used "L" output
167	DSR1	O	Not used "L" output
168	P0_4	O	Not used "L" output
169	VSSIO8	-	Digital ground
170	P4_28	O	Not used "L" output
171	PHY_TX-CLK	I	Ethernet transmit clock
172	VSSCORE3	-	Digital ground
173	A15	O	Parallel interface flash memory address line 15
174	VDDDCDC 1_3	I	Power supply for 3.3 V DC/DC converter
175	DTR1	O	Not used "L" output
176	P4_29	O	Not used "L" output
177	PHY_TXD3	O	Ethernet transmit data 3
178	PHY_MDIO	I/O	Ethernet MIIM data input and output
179	/WE	O	Parallel interface flash memory write enable signal
180	PHY_MDC	O	Ethernet MIIM clock
181	VDD9	I	Power supply for the I/O ports
182	PHY_RX-CLK	I	Ethernet receive clock (MII interface)

Pin No.	Name	I/O	Function
183	/OE	O	Parallel interface flash memory output enable signal
184	PHY_RXER	I	Ethernet receive error (RMII/MII interface)
185	PHY_TXD2	O	Ethernet transmit data 2
186	PHY_RXD1	I	Ethernet receive data 1
187	/CS0	O	Not used
188	PHY_RXD0	I	Ethernet receive data 0 (RMII/MII interface)
189	VSSIO9	-	Digital ground
190	PHY_CRS	I	Ethernet carrier sense (MII interface)
191	D8	I/O	Parallel interface flash memory data line 8
192	PHY_TXEN	O	Ethernet transmit data enable
193	/CS1	O	Parallel interface flash memory chip select signal 1
194	PHY_TXD1	O	Ethernet transmit data 1
195	RI1	O	Not used "L" output
196	PHY_TXD0	O	Ethernet transmit data 0 (RMII/MII interface)
197	D0	I/O	Parallel interface flash memory data line 0
198	VDD10	I	Power supply for the I/O ports
199	D9	I/O	Parallel interface flash memory data line 9
200	VSSIO10	-	Digital ground
201	D1	I/O	Parallel interface flash memory data line 1
202	TXD0	O	For boot loader
203	/PHY_RST	O	Reset signal to PHY IC : "L"=Reset
204	RXD0	I	For boot loader
205	D10	I/O	Parallel interface flash memory data line 10
206	RTCK	I/O	Not used
207	D2	I/O	Parallel interface flash memory data line 2
208	D11	I/O	Parallel interface flash memory data line 11

COMPONENTS DESCRIPTION

Interface unit (X46-3370-21)

Ref. No.	Part Name	Description
IC1,2	IC	RS-485 transceiver
IC3	IC	DC/DC converter
IC4	IC	Tri-state buffer
IC5	IC	RS-232C driver/receiver
IC6	IC	Ethernet transceiver
IC7	IC	Voltage regulator
IC8	IC	Voltage detector
IC10	IC	MPU
IC11	IC	Flash memory
IC12	IC	Flash memory
Q1	Transistor	DC switch (25M shift)
Q2	Transistor	DC switch (PTT_OUT)
Q3	Transistor	DC switch (25M shift)
Q4,5	Transistor	DC switch (12M shift)
Q6~9	Transistor	DC switch (LED)
D1	Varistor	Over current protection
D2	Zener diode	Protection of reverse connection
D4	Schottky diode	Catch diode (DC/DC converter)
D8	Diode	Reverse current protection
D9	Zener diode	Over voltage protection
D10	Schottky diode	Over voltage protection
D11,12	LED	Power/Status indicator
D13~18	Diode	Surge protection
D19~22	Varistor	Surge protection
D27~37	Varistor	Surge protection

Interface unit (X46-3380-20)

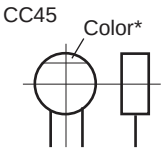
Ref. No.	Part Name	Description
IC1	IC	Digital signal processor
IC2	IC	Voltage regulator
IC3	IC	Flash memory
IC300	IC	Voltage regulator
IC301	IC	Operational amplifier
IC302	IC	CODEC
Q300	Transistor	DC switch (DSP_INT)
Q301	Transistor	DC switch (DSP_RST)
D300	Diode	GND level protection

PARTS LIST

CAPACITORS

C C	4 5	T H	1 H	2 2 0	J
1	2	3	4	5	6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, etc.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF

2 2 0 = 22pF
0 — Multiplier
2 — 2nd number
2 — 1st number

• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	–80	–150	–220	–330	–470	–750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = –470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 –20	+80 –20	+100 –0	More than 10 μF : –10~+50 Less than 4.7μF : –10~+75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	–
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	–
3	1000	1250	1600	2000	2500	2150	4000	5000	6300	8000	–

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

RESISTORS

• Chip resistor (Carbon)

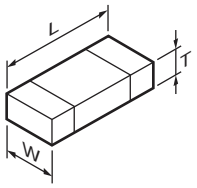
(EX) R D 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B, F)

• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

• Dimension



Chip capacitor

Code	L	W	T
Empty	5.6±0.5	5.0±0.5	Less than 2.0
A	4.5±0.5	3.2±0.4	Less than 2.0
B	4.5±0.5	2.0±0.3	Less than 2.0
C	4.5±0.5	1.25±0.2	Less than 1.25
D	3.2±0.4	2.5±0.3	Less than 1.5
E	3.2±0.2	1.6±0.2	Less than 1.25
F	2.0±0.3	1.25±0.2	Less than 1.25
G	1.6±0.2	0.8±0.2	Less than 1.0
H	1.0±0.05	0.5±0.05	0.5±0.05

Chip resistor

Code	L	W	T
E	3.2±0.2	1.6±0.2	1.0
F	2.0±0.3	1.25±0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1
H	1.0±0.05	0.5±0.05	0.35±0.05

• Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PARTS LIST

✻ New Parts. ⚠indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L : Scandinavia **K** : USA **P** : Canada
Y : PX (Far East, Hawaii) **T** : England **E** : Europe
C : China **X** : Australia **M** : Other Areas

KTI-4
INTERFACE UNIT (X46-3370-21)

Ref. No.	Address	New parts	Parts No.	Description	Destination
KTI-4					
1	1B		A01-2229-02	METALLIC CABINET	
2	3B		A10-4145-02	CHASSIS	
3	3A		B11-1889-04	FILTER(LED)	
5	1B	✻	B43-1653-04	BADGE	
6	2C	✻	B62-2325-00	INSTRUCTION MANUAL	
7	3B	✻	B72-2697-04	MODEL NAME-PLATE	
8	1C	✻	E30-7726-05	TRUNK CABLE ACCESSORY	
9	3A		E37-1527-05	LEAD WIRE WITH CONNECTOR(AUX)	
10	3A	✻	E37-1538-05	LEAD WIRE WITH CONNECTOR(DC)	
11	1B	✻	F10-3144-03	SHIELDING COVER	
12	2B		G11-4548-04	SHEET(CLAMP FILTER)	
13	2B		G13-2006-04	CUSHION(X46-338)	
14	3B		G13-2337-04	CUSHION(LED)	
15	2C		G13-2338-04	CUSHION(BOTOM) ACCESSORY	
17	2C		G13-2339-04	CUSHION ACCESSORY	
18	2B		G13-2349-04	CUSHION(CLAMP FILTER)	
19	1B	✻	G13-2362-04	CUSHION(SHIELDING COVER)	
20	2B		L92-0471-05	CLAMP FILTER	
A	1A,1B		N35-2605-43	BINDING HEAD MACHINE SCREW	
B	1B		N35-3005-43	BINDING HEAD MACHINE SCREW	
C	2B		N87-2606-48	BRAZIER HEAD TAPTITE SCREW	
INTERFACE UNIT (X46-3370-21)					
D11 ,12	2A		B30-2151-05	LED(RED/GREEN)	
C6 ,7			CC73HCH1H101J	CHIP C 100PF J	
C9 ,10			CC73HCH1H101J	CHIP C 100PF J	
C14			CC73HCH1H101J	CHIP C 100PF J	
C17 -21			CC73HCH1H101J	CHIP C 100PF J	
C22			CK73HB1A104K	CHIP C 0.10UF K	
C23			C92-0905-05	OS-CON 47UF 35WV	
C24			CC73HCH1H220J	CHIP C 22PF J	
C25			CK73GB1C104K	CHIP C 0.10UF K	
C26			C92-0905-05	OS-CON 47UF 35WV	
C27			CK73HB1A104K	CHIP C 0.10UF K	
C28			CK73HB1H102K	CHIP C 1000PF K	
C29			CK73GB1C104K	CHIP C 0.10UF K	
C30			CC73HCH1H220J	CHIP C 22PF J	
C31 ,32			CK73HB1H102K	CHIP C 1000PF K	
C33			C93-1810-05	CHIP C 4.7UF K	
C34			CC73HCH1H101J	CHIP C 100PF J	
C35			C93-1810-05	CHIP C 4.7UF K	
C36			CK73HB1H102K	CHIP C 1000PF K	
C37 ,38			CC73HCH1H101J	CHIP C 100PF J	
C39			CK73HB1H102K	CHIP C 1000PF K	

Ref. No.	Address	New parts	Parts No.	Description	Destination
C40 ,41			CC73HCH1H101J	CHIP C 100PF J	
C42			CK73HB1H681K	CHIP C 680PF K	
C43			CK73FB0J106K	CHIP C 10UF K	
C44			CK73EB1H474K	CHIP C 0.47UF K	
C45			CK73HB1A104K	CHIP C 0.10UF K	
C46			CC73HCH1H470J	CHIP C 47PF J	
C47			CK73HB1A104K	CHIP C 0.10UF K	
C48			CC73HCH1H470J	CHIP C 47PF J	
C49			CK73HB1A104K	CHIP C 0.10UF K	
C50			CC73HCH1H470J	CHIP C 47PF J	
C51			CK73HB1A104K	CHIP C 0.10UF K	
C52 ,53			CC73HCH1H470J	CHIP C 47PF J	
C54			CK73HB1A104K	CHIP C 0.10UF K	
C55			CK73FB0J106K	CHIP C 10UF K	
C57			CK73HB1H102K	CHIP C 1000PF K	
C58			CK73GB1C104K	CHIP C 0.10UF K	
C59			CK73HB1E103K	CHIP C 0.010UF K	
C60 ,61			C93-1827-05	CHIP C 22UF K	
C62 -64			CK73GB1C104K	CHIP C 0.10UF K	
C65			CC73HCH1H020B	CHIP C 2.0PF B	
C66			CC73HCH1H050B	CHIP C 5.0PF B	
C67			CE32BM1E470M	CHIP EL 47UF 25WV	
C68			CK73HB1E103K	CHIP C 0.010UF K	
C69			CK73HB1H102K	CHIP C 1000PF K	
C70			CK73HB1A104K	CHIP C 0.10UF K	
C71			CC73HCH1H050B	CHIP C 5.0PF B	
C72			CC73HCH1H020B	CHIP C 2.0PF B	
C73			CC73HCH1H470J	CHIP C 47PF J	
C74			CK73HB1E103K	CHIP C 0.010UF K	
C75			CK73HB1H102K	CHIP C 1000PF K	
C76 ,77			CK73HB1A104K	CHIP C 0.10UF K	
C78			CC73HCH1H470J	CHIP C 47PF J	
C79			CE32BM1E470M	CHIP EL 47UF 25WV	
C80			CK73HB1H102K	CHIP C 1000PF K	
C81			CC73HCH1H470J	CHIP C 47PF J	
C83			C93-1827-05	CHIP C 22UF K	
C84			CK73HB1A104K	CHIP C 0.10UF K	
C85 ,86			CC73HCH1H470J	CHIP C 47PF J	
C87			C93-1827-05	CHIP C 22UF K	
C90			CC73HCH1H470J	CHIP C 47PF J	
C91 ,92			CK73HB1A104K	CHIP C 0.10UF K	
C93			CC73HCH1H470J	CHIP C 47PF J	
C94			CK73HB1A104K	CHIP C 0.10UF K	
C95			CK73FB0J106K	CHIP C 10UF K	
C96			CK73HB1A104K	CHIP C 0.10UF K	
C97 ,98			CC73HCH1H470J	CHIP C 47PF J	
C99			CK73HB1A104K	CHIP C 0.10UF K	
C102			CC73HCH1H470J	CHIP C 47PF J	
C103			CK73HB1A104K	CHIP C 0.10UF K	
C104			CC73HCH1H470J	CHIP C 47PF J	
C105,106			CK73HB1A104K	CHIP C 0.10UF K	
C107			CK73FB0J106K	CHIP C 10UF K	
C108			CC73HCH1H470J	CHIP C 47PF J	
C109			CK73HB1A104K	CHIP C 0.10UF K	
C110			CC73HCH1H470J	CHIP C 47PF J	

PARTS LIST

INTERFACE UNIT (X46-3370-21)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C112			CK73HB1H102K	CHIP C 1000PF K	
C114			CC73HCH1H470J	CHIP C 47PF J	
C115			CK73HB1A104K	CHIP C 0.10UF K	
C116			CK73HB1E103K	CHIP C 0.010UF K	
C117			CK73HB1A104K	CHIP C 0.10UF K	
C118			CC73HCH1H220J	CHIP C 22PF J	
C119			CC73HCH1H470J	CHIP C 47PF J	
C120,121			CC73HCH1H100D	CHIP C 10PF D	
C122			CC73HCH1H220J	CHIP C 22PF J	
C123			CK73HB1E103K	CHIP C 0.010UF K	
C124-126			CC73HCH1H470J	CHIP C 47PF J	
C127-129			CK73HB1A104K	CHIP C 0.10UF K	
C132			CK73HB1A104K	CHIP C 0.10UF K	
C133			CC73HCH1H470J	CHIP C 47PF J	
C134			CK73HB1A105K	CHIP C 1.0UF K	
C135			CK73HB1H102K	CHIP C 1000PF K	
C137-139			CK73HB1H102K	CHIP C 1000PF K	
C141			CK73HB1H102K	CHIP C 1000PF K	
C142			CC73HCH1H101J	CHIP C 100PF J	
C143-150			CK73HB1H102K	CHIP C 1000PF K	
C153-157			CK73HB1H102K	CHIP C 1000PF K	
C158			CC73HCH1H101J	CHIP C 100PF J	
C159			CK73HB1H102K	CHIP C 1000PF K	
C160			CC73HCH1H101J	CHIP C 100PF J	
C161,162			CK73HB1H102K	CHIP C 1000PF K	
C164			CK73HB1H102K	CHIP C 1000PF K	
C166,167			CK73HB1H102K	CHIP C 1000PF K	
C168,169			CC73HCH1H101J	CHIP C 100PF J	
C172			CK73HB1H102K	CHIP C 1000PF K	
C182,183			CK73HB1H102K	CHIP C 1000PF K	
C185			CC73HCH1H470J	CHIP C 47PF J	
C186			CK73HB1A104K	CHIP C 0.10UF K	
C187			CC73HCH1H470J	CHIP C 47PF J	
C188			CK73HB1A104K	CHIP C 0.10UF K	
C189			CC73HCH1H470J	CHIP C 47PF J	
C190			CK73HB1A104K	CHIP C 0.10UF K	
C199,200			CK73HB1E103K	CHIP C 0.010UF K	
C203,204			CK73HB1H102K	CHIP C 1000PF K	
C206-211			CC73HCH1H101J	CHIP C 100PF J	
C216,217			CC73HCH1H101J	CHIP C 100PF J	
C218-220			CK73HB1H102K	CHIP C 1000PF K	
C221,222			CC73HCH1H180J	CHIP C 18PF J	
C223-225			CC73HCH1H101J	CHIP C 100PF J	
C227			CK73HB1H682K	CHIP C 6800PF K	
CN10	2A		E41-1732-05	PIN ASSY	
CN11			E40-6102-05	PIN ASSY	
CN12			E40-6357-05	PIN ASSY	
CN47			E23-1280-05	TERMINAL	
J20	3A	✻	E58-0544-05	MODULAR JACK	
J21	2A		E58-0533-05	MODULAR JACK	
L2 ,3			L33-1500-05	CHOKE COIL	
L4			L92-0639-05	CHIP FERRITE	
L5 ,6			L33-1500-05	CHOKE COIL	
L7			L92-0639-05	CHIP FERRITE	
L9			L92-0639-05	CHIP FERRITE	
L10			L33-1532-05	SMALL FIXED INDUCTOR(4.7UH)	
L11			L92-0639-05	CHIP FERRITE	
L12			L92-0467-05	CHIP FERRITE	
L13			L92-0639-05	CHIP FERRITE	

Ref. No.	Address	New parts	Parts No.	Description	Destination
L15 -17			L92-0467-05	CHIP FERRITE	
L19 -22			L92-0467-05	CHIP FERRITE	
L23 ,24			L92-0639-05	CHIP FERRITE	
L31			L92-0639-05	CHIP FERRITE	
L33 -35			L92-0467-05	CHIP FERRITE	
X2			L77-3067-05	CRYSTAL RESONATOR(25MHZ)	
X4			L77-2951-05	CRYSTAL RESONATOR(12MHZ)	
CP1		✻	RK74HB1J330J	CHIP-COM 33 J 1/16W	
CP3 -5		✻	RK74HB1J330J	CHIP-COM 33 J 1/16W	
CP12-15			RK74HB1J000J	CHIP-COM 0 J 1/16W	
CP16			RK74HB1J102J	CHIP-COM 1.0K J 1/16W	
CP22			RK74HA1J000J	CHIP-COM 0 J 1/16W	
CP24			RK74HA1J000J	CHIP-COM 0 J 1/16W	
CP25,26			RK74HA1J220J	CHIP-COM 22 J 1/16W	
CP27		✻	RK74HA1J330J	CHIP-COM 33 J 1/16W	
R1 ,2			RK73HB1J103J	CHIP R 10K J 1/16W	
R3			RK73HB1J000J	CHIP R 0 J 1/16W	
R5 -7			RK73HB1J000J	CHIP R 0 J 1/16W	
R8 -11			RK73EB2E101J	CHIP R 100 J 1/4W	
R13			RK73HB1J271J	CHIP R 270 J 1/16W	
R14 ,15			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R16			RK73HB1J101J	CHIP R 100 J 1/16W	
R17			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R18			RK73HB1J101J	CHIP R 100 J 1/16W	
R19			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R20 ,21			RK73HB1J101J	CHIP R 100 J 1/16W	
R22			RK73HB1J473J	CHIP R 47K J 1/16W	
R23			RK73GH2A49R9D	CHIP R 49.9 D 1/10W	
R24			RK73HB1J473J	CHIP R 47K J 1/16W	
R25			RK73HB1J000J	CHIP R 0 J 1/16W	
R26			RK73GH2A49R9D	CHIP R 49.9 D 1/10W	
R27 ,28			RK73HB1J473J	CHIP R 47K J 1/16W	
R29			RK73GH2A101D	CHIP R 100 D 1/10W	
R30			RK73HB1J684J	CHIP R 680K J 1/16W	
R31			RK73HB1J183J	CHIP R 18K J 1/16W	
R32 ,33			RK73HB1J473J	CHIP R 47K J 1/16W	
R34 ,35			RK73HB1J103J	CHIP R 10K J 1/16W	
R36			RK73HB1J563J	CHIP R 56K J 1/16W	
R37 ,38			RK73HB1J473J	CHIP R 47K J 1/16W	
R39			RK73HH1J4991D	CHIP R 4.99K D 1/16W	
R40			RK73HB1J103J	CHIP R 10K J 1/16W	
R41			RK73HB1J473J	CHIP R 47K J 1/16W	
R42			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R43			RK73HB1J271J	CHIP R 270 J 1/16W	
R44			RK73HH1J224D	CHIP R 220K D 1/16W	
R45			RK73HH1J683D	CHIP R 68K D 1/16W	
R46			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R47			RK73HB1J103J	CHIP R 10K J 1/16W	
R48 -54			RK73HB1J000J	CHIP R 0 J 1/16W	
R55			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R56 -58			RK73HB1J473J	CHIP R 47K J 1/16W	
R59 -61			RK73HB1J000J	CHIP R 0 J 1/16W	
R62 ,63			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R64			RK73HB1J105J	CHIP R 1.0M J 1/16W	
R65			RK73HB1J000J	CHIP R 0 J 1/16W	
R66			RK73HB1J103J	CHIP R 10K J 1/16W	
R70			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R72			RK73HB1J103J	CHIP R 10K J 1/16W	
R73			RK73HB1J473J	CHIP R 47K J 1/16W	

PARTS LIST

INTERFACE UNIT (X46-3370-21)
INTERFACE UNIT (X46-3380-20)

Ref. No.	Address	New parts	Parts No.	Description				Destination
R74			RK73HB1J103J	CHIP R	10K	J	1/16W	
R76			RK73HB1J000J	CHIP R	0	J	1/16W	
R79			RK73HB1J000J	CHIP R	0	J	1/16W	
R80 -83			RK73HB1J473J	CHIP R	47K	J	1/16W	
R84			RK73HB1J000J	CHIP R	0	J	1/16W	
R85 -90			RK73HB1J473J	CHIP R	47K	J	1/16W	
R91 -93			RK73HB1J000J	CHIP R	0	J	1/16W	
R94 ,95			RK73HB1J473J	CHIP R	47K	J	1/16W	
R96			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R97			RK73HB1J000J	CHIP R	0	J	1/16W	
R98			RK73HB1J473J	CHIP R	47K	J	1/16W	
R99 -101			RK73HB1J000J	CHIP R	0	J	1/16W	
R103			RK73HB1J103J	CHIP R	10K	J	1/16W	
R104			RK73HB1J472J	CHIP R	4.7K	J	1/16W	
R105			RK73HB1J473J	CHIP R	47K	J	1/16W	
R106,107			RK73HB1J000J	CHIP R	0	J	1/16W	
R108			RK73HB1J472J	CHIP R	4.7K	J	1/16W	
R109			RK73HB1J103J	CHIP R	10K	J	1/16W	
R110-115			RK73HB1J473J	CHIP R	47K	J	1/16W	
R118-120			RK73HB1J101J	CHIP R	100	J	1/16W	
R121			RK73HB1J473J	CHIP R	47K	J	1/16W	
R122			RK73HB1J121J	CHIP R	120	J	1/16W	
R123,124			RK73HB1J473J	CHIP R	47K	J	1/16W	
R125-128			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R130,131			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R132			RK73HB1J101J	CHIP R	100	J	1/16W	
R133			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R134			RK73HB1J101J	CHIP R	100	J	1/16W	
R135,136			RK73HB1J102J	CHIP R	1.0K	J	1/16W	
R139			RK73HB1J101J	CHIP R	100	J	1/16W	
R140			RK73HB1J121J	CHIP R	120	J	1/16W	
R141-144			RK73HB1J000J	CHIP R	0	J	1/16W	
R146,147			RK73HB1J000J	CHIP R	0	J	1/16W	
R148			RK73HB1J103J	CHIP R	10K	J	1/16W	
R149			RK73HB1J473J	CHIP R	47K	J	1/16W	
R151,152			RK73HB1J101J	CHIP R	100	J	1/16W	
R157,158			RK73HB1J101J	CHIP R	100	J	1/16W	
R159-162			RK73HB1J473J	CHIP R	47K	J	1/16W	
R164-166			RK73HB1J000J	CHIP R	0	J	1/16W	
R186-188			RK73HB1J473J	CHIP R	47K	J	1/16W	
R200			RK73HB1J473J	CHIP R	47K	J	1/16W	
R201-214			RK73HB1J000J	CHIP R	0	J	1/16W	
R215,216			RK73HB1J330J	CHIP R	33	J	1/16W	
R218			RK73HB1J472J	CHIP R	4.7K	J	1/16W	
R219			RK73HB1J473J	CHIP R	47K	J	1/16W	
R220			RK73HB1J000J	CHIP R	0	J	1/16W	
R221			RK73GB2A000J	CHIP R	0	J	1/10W	
R222,223			RK73HB1J000J	CHIP R	0	J	1/16W	
R245			RK73HB1J000J	CHIP R	0	J	1/16W	
D1			SMD030F	VARISTOR				
D2			KDZ36B	ZENER DIODE				
D4			RSX301L-30	DIODE				
D8			1SS355	DIODE				
D9			RKZ18B2KG	ZENER DIODE				
D10			1SS388F	DIODE				
D13 -18			DA204U	DIODE				
D19 -22			LXES15AAA1017	VARISTOR				
D27 -37			LXES15AAA1017	VARISTOR				
IC1 ,2			ISL8485EIBZ	MOS-IC				

Ref. No.	Address	New parts	Parts No.	Description	Destination
IC3			LT3685EMSE	ANALOGUE IC	
IC4			TC7WT125FUF	MOS-IC	
IC5			ADM101EARMZ	MOS-IC	
IC6			E-STE100P	MOS-IC	
IC7			NJM78M05DL1AZB	ANALOGUE IC	
IC8			XC6108N31BM-G	ANALOGUE IC	
IC10			LPC2460FBD208	MICROPROCESSOR IC	
IC11		*	W05-1650-00	ROM IC	
IC12			**Note 1**	ROM IC	
Q1			2SC4738F	TRANSISTOR	
Q2			2SD2114K(W)	TRANSISTOR	
Q3 -5			2SC4738F	TRANSISTOR	
Q6 -9			RT1P141M-T111	TRANSISTOR	

INTERFACE UNIT (X46-3380-20)

C1 -3			CK73HB1H102K	CHIP C	1000PF	K	
C4 ,5			CK73HB1A105K	CHIP C	1.0UF	K	
C6			CK73HB1A104K	CHIP C	0.10UF	K	
C7			CK73GB1C225K	CHIP C	2.2UF	K	
C8 ,9			CK73HB1E103K	CHIP C	0.010UF	K	
C10			CK73GB1C225K	CHIP C	2.2UF	K	
C13			CK73HB1A104K	CHIP C	0.10UF	K	
C14			CK73HB1A105K	CHIP C	1.0UF	K	
C15			CK73HB1E103K	CHIP C	0.010UF	K	
C16			CC73HCH1H470J	CHIP C	47PF	J	
C17			CK73HB1A105K	CHIP C	1.0UF	K	
C18			CK73HB1E103K	CHIP C	0.010UF	K	
C19			CC73HCH1H470J	CHIP C	47PF	J	
C20			CK73HB1A105K	CHIP C	1.0UF	K	
C21			CK73HB1E103K	CHIP C	0.010UF	K	
C22			CC73HCH1H470J	CHIP C	47PF	J	
C23			CK73HB1A105K	CHIP C	1.0UF	K	
C24			CK73HB1E103K	CHIP C	0.010UF	K	
C25			CC73HCH1H470J	CHIP C	47PF	J	
C26			CK73HB1A105K	CHIP C	1.0UF	K	
C27			CK73HB1E103K	CHIP C	0.010UF	K	
C28			CC73HCH1H470J	CHIP C	47PF	J	
C29 -41			CK73HB1A104K	CHIP C	0.10UF	K	
C42			CK73HB1A105K	CHIP C	1.0UF	K	
C43			CK73HB1E103K	CHIP C	0.010UF	K	
C44			CC73HCH1H470J	CHIP C	47PF	J	
C46 -48			CK73HB1A104K	CHIP C	0.10UF	K	
C49			CC73HCH1H120J	CHIP C	12PF	J	
C50			CC73HCH1H100D	CHIP C	10PF	D	
C51			CK73HB1A104K	CHIP C	0.10UF	K	
C52			CC73HCH1H470J	CHIP C	47PF	J	
C57			CK73HB1H102K	CHIP C	1000PF	K	
C300,301			CK73HB1E103K	CHIP C	0.010UF	K	
C302,303			CK73HB1H102K	CHIP C	1000PF	K	
C304			CK73EB1H475K	CHIP C	4.7UF	K	

Note 1: This part cannot be replaced. Therefore, this part is not supplied as a service part.

PARTS LIST

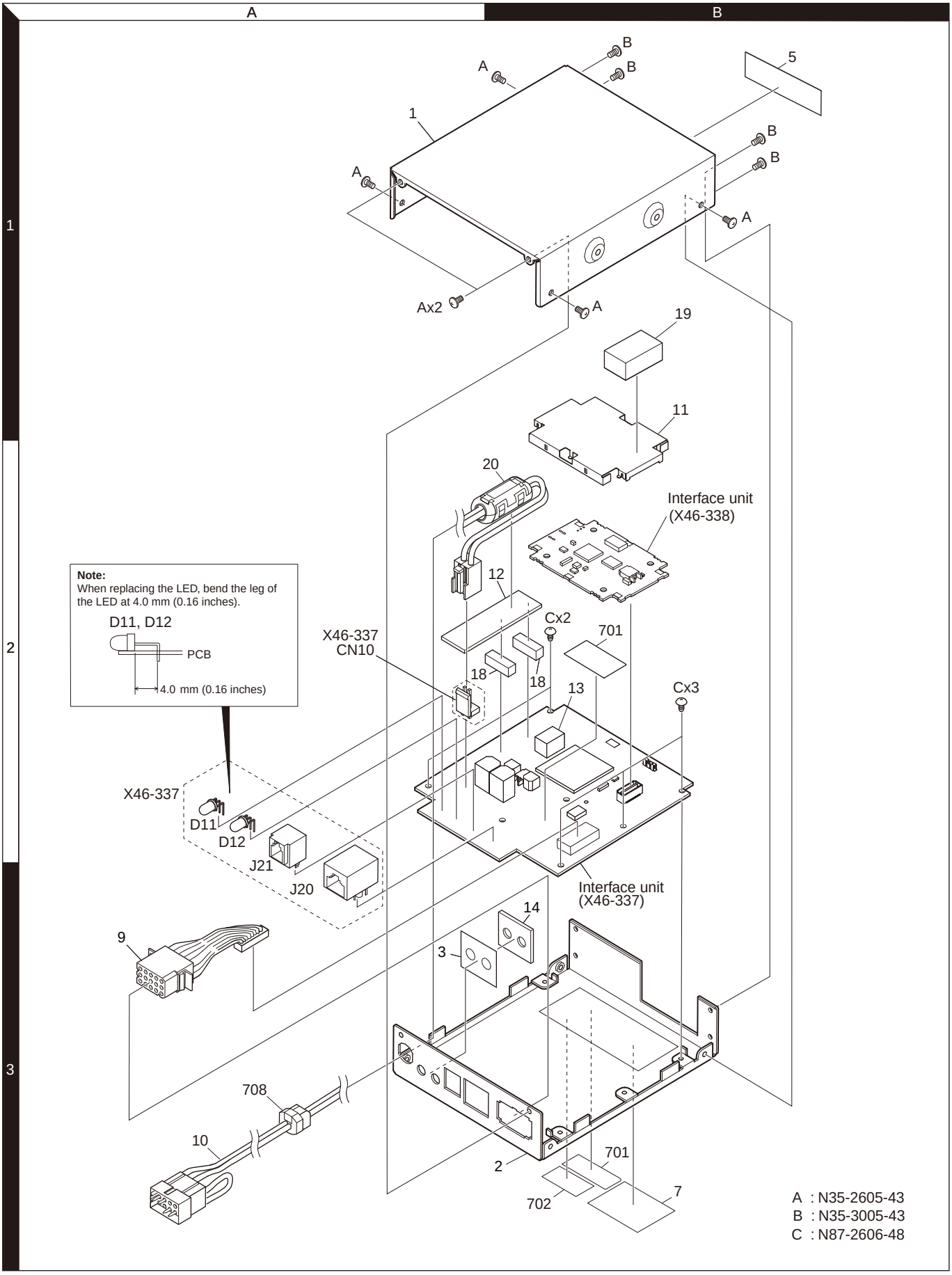
INTERFACE UNIT (X46-3380-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C305,306			CK73HB1H102K	CHIP C 1000PF K	
C307			CK73HB1E103K	CHIP C 0.010UF K	
C308			CK73HB1H102K	CHIP C 1000PF K	
C309,310			CC73HCH1H101J	CHIP C 100PF J	
C311			CK73HB1H102K	CHIP C 1000PF K	
C312			CK73HB1E103K	CHIP C 0.010UF K	
C313,314			CK73HB1H102K	CHIP C 1000PF K	
C315			CK73GB1C225K	CHIP C 2.2UF K	
C316,317			CK73HB1H102K	CHIP C 1000PF K	
C318,319			CC73HCH1H101J	CHIP C 100PF J	
C320			CK73HB1H102K	CHIP C 1000PF K	
C321,322			CK73HB1A105K	CHIP C 1.0UF K	
C324			CK73FB0J106K	CHIP C 10UF K	
C326			CC73HCH1H331J	CHIP C 330PF J	
C327			CK73HB1A105K	CHIP C 1.0UF K	
C328			CK73HB1H471K	CHIP C 470PF K	
C329			CC73HCH1H331J	CHIP C 330PF J	
C330			CK73HB1H152K	CHIP C 1500PF K	
C331			CK73FB0J106K	CHIP C 10UF K	
C332,333			CK73HB1A105K	CHIP C 1.0UF K	
C334,335			CK73HB1A104K	CHIP C 0.10UF K	
C336			CK73HB1H102K	CHIP C 1000PF K	
C345			CK73HB1H681K	CHIP C 680PF K	
C346			CK73HB1H122K	CHIP C 1200PF K	
CN300		✻	E40-6891-05	SOCKET FOR PIN ASSY	
L1 -3			L92-0467-05	CHIP FERRITE	
L300,301			L92-0639-05	CHIP FERRITE	
L302,303			L92-0467-05	CHIP FERRITE	
L304			L92-0162-05	BEADS CORE	
L305			L92-0467-05	CHIP FERRITE	
X1			L77-1802-05	CRYSTAL RESONATOR(32.768KHZ)	
R1			RK73HB1J103J	CHIP R 10K J 1/16W	
R2 ,3			RK73HB1J473J	CHIP R 47K J 1/16W	
R4			RK73HB1J000J	CHIP R 0 J 1/16W	
R6			RK73HB1J000J	CHIP R 0 J 1/16W	
R7			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R8			RK73HB1J103J	CHIP R 10K J 1/16W	
R9			RK73HB1J000J	CHIP R 0 J 1/16W	
R10 ,11			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R12 -14			RK73HB1J473J	CHIP R 47K J 1/16W	
R15			RK73HH1J103D	CHIP R 10K D 1/16W	
R18 ,19			RK73HB1J473J	CHIP R 47K J 1/16W	
R21 ,22			RK73HB1J220J	CHIP R 22 J 1/16W	
R23 -25			RK73HB1J473J	CHIP R 47K J 1/16W	
R26			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R31			RK73HB1J220J	CHIP R 22 J 1/16W	
R32			RK73HB1J000J	CHIP R 0 J 1/16W	
R34			RK73HB1J000J	CHIP R 0 J 1/16W	
R36			RK73HB1J473J	CHIP R 47K J 1/16W	
R37			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R38			RK73HB1J103J	CHIP R 10K J 1/16W	
R39 ,40			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R70 ,71			RK73HB1J473J	CHIP R 47K J 1/16W	
R300			RK73HB1J101J	CHIP R 100 J 1/16W	
R301			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R302			RK73HB1J101J	CHIP R 100 J 1/16W	
R303,304			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R305,306			RK73HB1J101J	CHIP R 100 J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R307			RK73HB1J473J	CHIP R 47K J 1/16W	
R308			RK73HB1J000J	CHIP R 0 J 1/16W	
R309-311			RK73HB1J104J	CHIP R 100K J 1/16W	
R312			RK73HB1J273J	CHIP R 27K J 1/16W	
R313			RK73HB1J223J	CHIP R 22K J 1/16W	
R314			RK73HB1J273J	CHIP R 27K J 1/16W	
R315			RK73HB1J123J	CHIP R 12K J 1/16W	
R316,317			RK73HB1J223J	CHIP R 22K J 1/16W	
R319,320			RK73HB1J473J	CHIP R 47K J 1/16W	
R321-325			RK73HB1J220J	CHIP R 22 J 1/16W	
R326			RK73HB1J473J	CHIP R 47K J 1/16W	
R327-337			RK73HB1J000J	CHIP R 0 J 1/16W	
R338,339			RK73HB1J470J	CHIP R 47 J 1/16W	
R340			RK73HB1J000J	CHIP R 0 J 1/16W	
R342-344			RK73HB1J000J	CHIP R 0 J 1/16W	
R345			RK73HB1J473J	CHIP R 47K J 1/16W	
R346			RK73HB1J123J	CHIP R 12K J 1/16W	
R347			RK73HB1J562J	CHIP R 5.6K J 1/16W	
R348			RK73HB1J123J	CHIP R 12K J 1/16W	
R349 -352			RK73HB1J473J	CHIP R 47K J 1/16W	
D300			DA204U	DIODE	
IC1			**Note 1**	MICROPROCESSOR IC	
IC2		✻	XC6206P132PRG	MOS-IC	
IC3			**Note 1**	ROM IC	
IC300		✻	XC6701D332JRG	MOS-IC	
IC301			NJM2734V	BI-POLAR IC	
IC302			AK4555VT	MOS-IC	
Q300			SSM3K15TE(F)	FET	
Q301			RT1N144M-T111	TRANSISTOR	

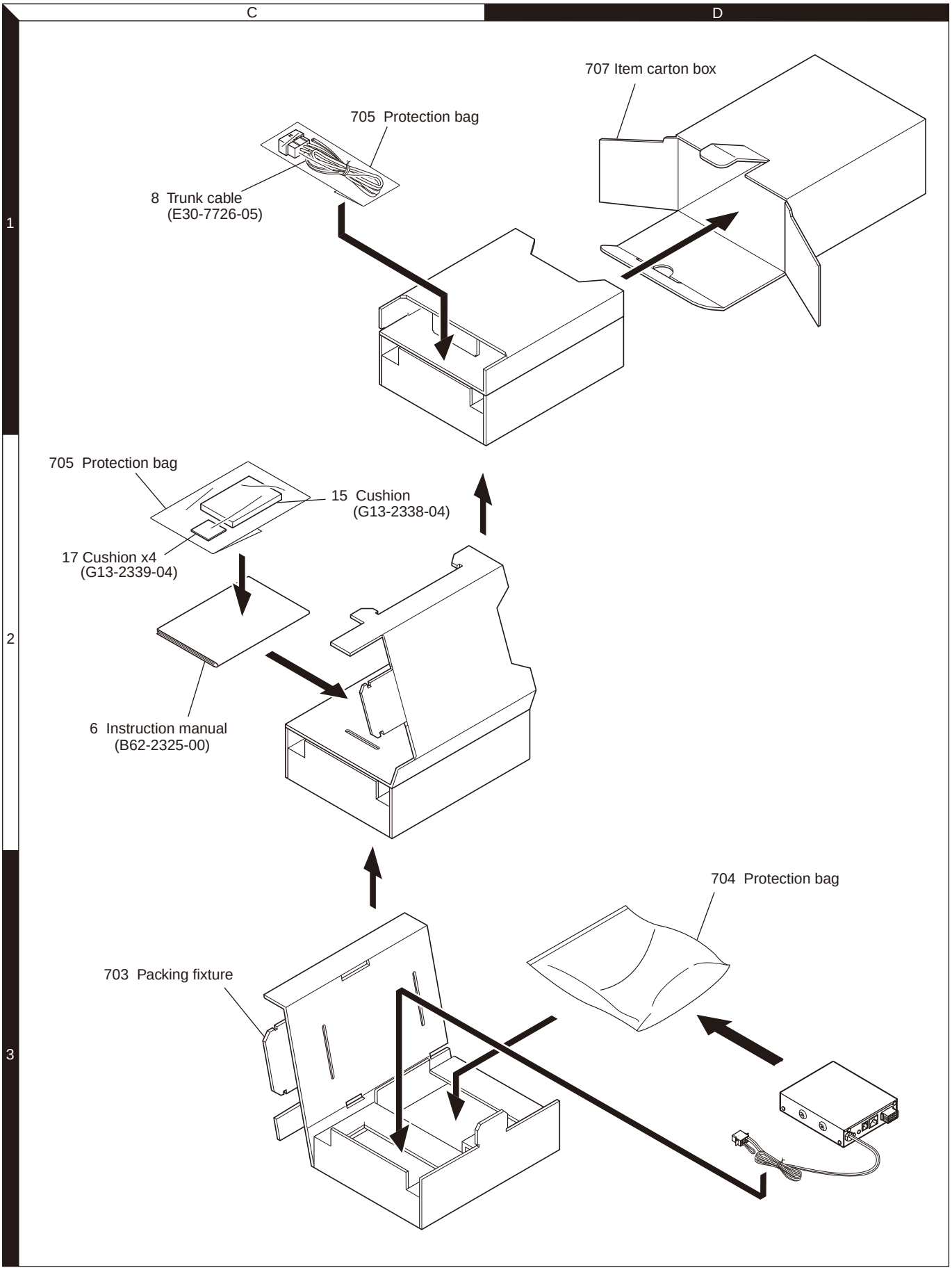
Note 1: This part cannot be replaced. Therefore, this part is not supplied as a service part.

EXPLODED VIEW



Parts with the exploded numbers larger than 700 are not supplied.

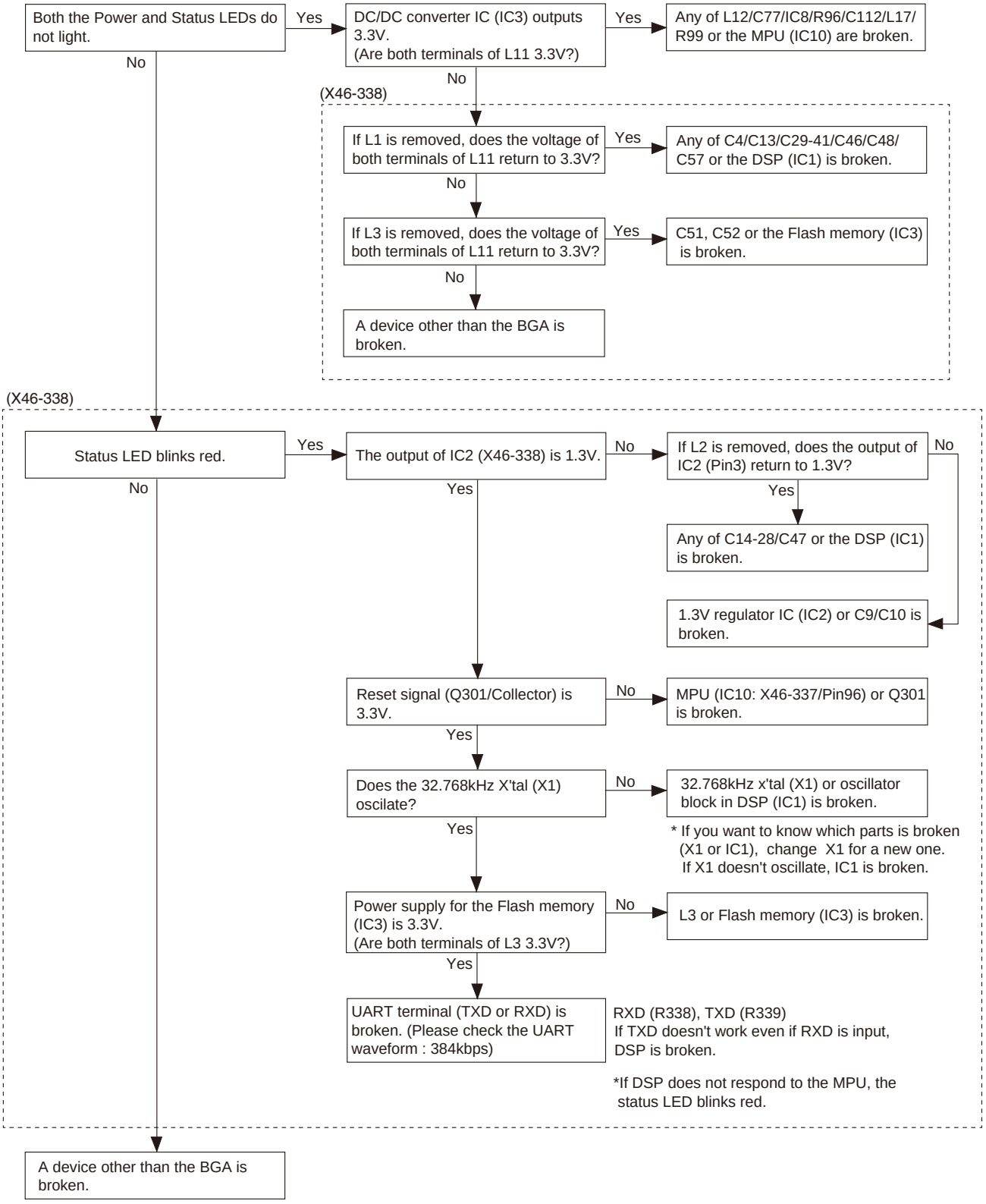
PACKING



Parts with the exploded numbers larger than 700 are not supplied.

TROUBLE SHOOTING

* The blocks surrounded by dotted lines are confirmation matter in the X46-338 unit. Other blocks are in the X46-337 unit.



Note: Readjust the audio level of the telephone patch after repairing the KTI-4.

TERMINAL FUNCTION

Interface unit (X46-3370-21)

Pin No.	Name	I/O	Function
CN10 (To DC power supply connector cable)			
1	GND	-	Ground
2	+B	I	Power supply input (+B)
CN11 (To AUX connector)			
1	AUD_IN	I	Audio signal input (voice)
2	AUX_O2	O	General output #2 : Not used
3	AGND	-	Ground (analog)
4	NC	-	No connection
5	AUD_OUT	O	Audio signal output (voice)
6	AUX_I2	I	General input #2 : Not used
7	AGND	-	Ground (analog)
8	NC	-	No connection
9	TXD0	O	UART TXD #0 (MPU to AUX)
10	AUX_O1	O	General output #1 : Not used
11	GND	-	Ground
12	NC	-	No connection
13	PTT_OUT	O	PTT signal output (open collector)
14	AUX_I1	I	General input #1 : Not used
15	LD_MOD	I	Loader mode selection
16	NC	-	No connection
17	GND	-	Ground
18	PTT_IN	I	PTT signal input
19	RXD0	I	UART RXD #0 (AUX to MPU)
20	NC	-	No connection
CN12 (To X46-338 CN300)			
1	33DC	O	Power supply (3.3V)
2	+B	O	Power supply (+B)
3	33DC	O	Power supply (3.3V)
4	+B	O	Power supply (+B)
5	NC	-	No connection
6	NC	-	No connection
7	GND	-	Ground
8	GND	-	Ground
9	BD1_DET	I	Board detection #1
10	AGND	-	Ground (analog)
11	BD2_DET	I	Board detection #2
12	AUD_IN	O	Audio signal output (voice)
13	/DSP_INT	I	Interrupt signal
14	AGND	-	Ground (analog)
15	DSP_RST	O	Reset signal for DSP
16	AUD_OUT	I	Audio signal input (voice)
17	/ARM_INT	O	Interrupt signal
18	AGND	-	Ground (analog)
19	TXD1	O	UART asynchronous send data #1
20	RTS_ACC	-	Not used
21	RXD1	I	UART asynchronous receive data #1
22	CTS_ACC	-	Not used
23	RTS1	O	Not used
24	TXD_ACC	-	Not used
25	CTS1	I	Not used
26	RXD_ACC	-	Not used
J20 (LAN connector - PCB side)			
1	TXP	O	TX signal + for Ethernet
2	TCT	-	TX signal center tap
3	TXN	O	TX signal - for Ethernet
4	RXP	I	RX signal + for Ethernet
5	RCT	-	RX signal center tap
6	RXN	I	RX signal - for Ethernet
7	NC	-	No connection
8	GND	-	Ground
9	LEDC_C	-	Full duplex mode LED (cathode)
10	LEDC_A	-	Full duplex mode LED (anode)
11	LEDS_C	-	100BaseTX mode LED (cathode)
12	LEDS_A	-	100BaseTX mode LED (anode)
13	CGND	-	Ground (chassis)
14	CGND	-	Ground (chassis)
J21 (N_SYNC connector - PCB side)			
1	N_SYNC2_A	I/O	N_SYNC signal #2 (noninverting) : Not used
2	N_SYNC2_B	I/O	N_SYNC signal #2 (inverting) : Not used
3	N_SYNC1_A	I/O	N_SYNC signal #1 (noninverting) : Not used
4	N_SYNC1_B	I/O	N_SYNC signal #1 (inverting) : Not used

TERMINAL FUNCTION

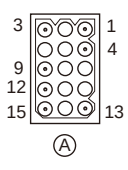
Interface unit (X46-3380-20)

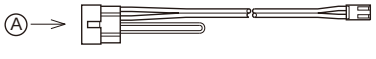
Pin No.	Name	I/O	Function
CN300 (To X46-337 CN12)			
1	33DC	I	Power supply (3.3V)
2	+B	I	Power supply (+B)
3	33DC	I	Power supply (3.3V)
4	+B	I	Power supply (+B)
5	NC	-	No connection
6	NC	-	No connection
7	GND	-	Ground
8	GND	-	Ground
9	BD1_DET	O	Board detection #1
10	AGND	-	Ground (analog)
11	NC	-	No connection
12	AUD_IN	I	Audio signal input (voice)
13	/DSP_INT	O	Interrupt signal
14	AGND	-	Ground (analog)

Pin No.	Name	I/O	Function
15	DSP_RST	I	Reset signal for DSP
16	AUD_OUT	O	Audio signal output (voice)
17	/ARM_INT	I	Interrupt signal
18	AGND	-	Ground (analog)
19	TXD1	I	UART asynchronous send data #1 (connected to RXD pin on DSP)
20	NC	-	No connection
21	RXD1	O	UART asynchronous receive data #1 (connected to TXD pin on DSP)
22	NC	-	No connection
23	NC	-	No connection
24	NC	-	No connection
25	NC	-	No connection
26	NC	-	No connection

DC power supply connector

Pin No.	Name	I/O	Signal Type	Modification	Description / Port Type	Specification	Min	Typ	Max	Unit	Remarks
1	+B	I	Power	No	Power supply	-	10.8	13.6	15.9	V	-
							-	-	200	mA	
2	NC	-	-	No	-	-	-	-	-	-	-
3	NC	-	-	No	-	-	-	-	-	-	-
4	GND	-	GND	No	GND	-	-	-	-	-	-
5	NC	-	-	No	-	-	-	-	-	-	-
6	NC	-	-	No	-	-	-	-	-	-	-
7	NC	-	-	No	-	-	-	-	-	-	-
8	NC	-	-	No	-	-	-	-	-	-	-
9	Jumper	-	-	No	Jumper Short to 12 pin	This pin is connected to SPI (NXR-700/800).	-	-	-	-	-
10	NC	-	-	No	-	-	-	-	-	-	-
11	NC	-	-	No	-	-	-	-	-	-	-
12	Jumper	-	-	No	Jumper Short to 9 pin	This pin is connected to SPO (NXR-700/800).	-	-	-	-	-
13	NC	-	-	No	-	-	-	-	-	-	-
14	NC	-	-	No	-	-	-	-	-	-	-
15	NC	-	-	No	-	-	-	-	-	-	-

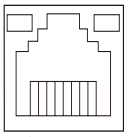




TERMINAL FUNCTION

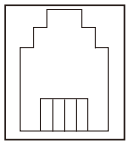
LAN connector

Pin No.	Name	I/O	Signal Type	Modification	Description/ Port Type	Specification	Min	Typ	Max	Unit	Remarks
1	TD+	O	Analog	No	TX signal +	-	0.95		1.05	V	Conform to IEEE802.3
2	TD-	O	Analog	No	TX signal -	-	0.95		1.05	V	Conform to IEEE802.3
3	RD+	I	Analog	No	RX signal +	-	-	-	-	-	Conform to IEEE802.3
4	NC	-	-	No	-	-	-	-	-	-	-
5	NC	-	-	No	-	-	-	-	-	-	-
6	RD-	I	Analog	No	RX signal -	-	-	-	-	-	Conform to IEEE802.3
7	NC	-	-	No	-	-	-	-	-	-	-
8	NC	-	-	No	-	-	-	-	-	-	-



N_SYNC connector

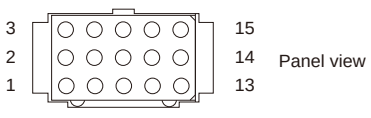
Pin No.	Name	I/O	Signal Type	Modification	Description / Port Type
1	N_SYNC2_A	I/O	Digital	No	N_SYNC signal #2 (noninverting) : Not used
2	N_SYNC2_B	I/O	Digital	No	N_SYNC sgnal #2 (inverting) : Not used
3	N_SYNC1_A	I/O	Digital	No	N_SYNC signal #1 (noninverting) : Not used
4	N_SYNC1_B	I/O	Digital	No	N_SYNC signal #1 (inverting) : Not used



TERMINAL FUNCTION

AUX connector

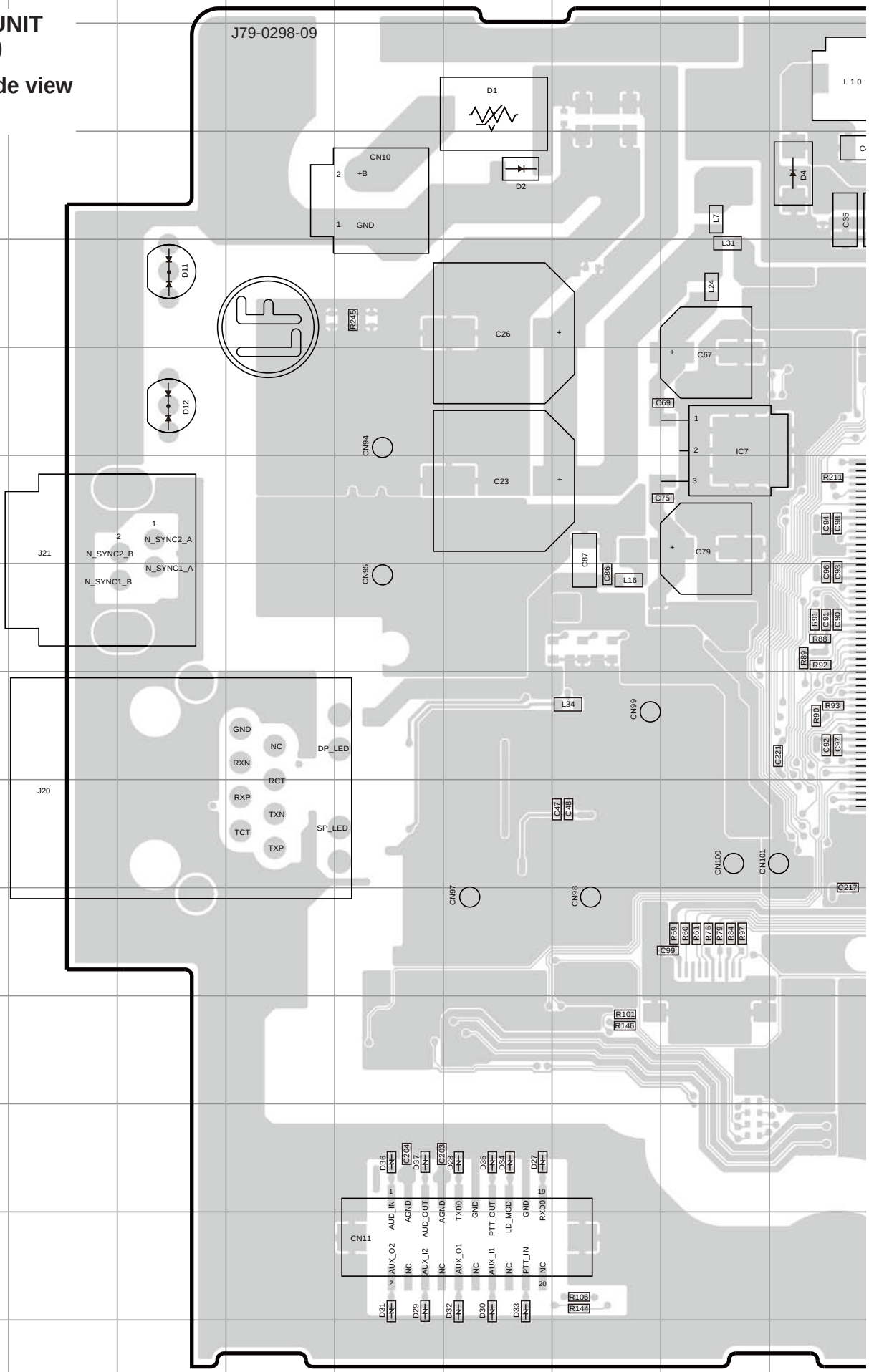
Pin No.	Name	I/O	Signal Type	Modification	Description / Port Type	Specification	Min	Typ	Max	Unit	Remarks
1	AUX_O2	O	Digital	No	General output #2 : Not used	VOH (IO=20μA)	4.4			V	
						VOL (IO=-20μA)			0.1	V	
2	AUD_IN	I	Analog	No	Audio signal input (voice)	Audio_Level	-40 (7.8m)	-	+6 (1.55)	dBm (Vrms)	
						Input impedance	10k			Ω	
3	AGND	-	AGND	No	Analog GND		-	-	-		
4	AUX_I2	I	Digital	No	General input #2 : Not used	VIH	2.0		5.5	V	
						VIL	0		0.8	V	
						Input impedance		47k		Ω	47kΩ PU to Vcc=5V±4%
5	AUD_OUT	O	Analog	No	Audio signal output (voice)	Audio_Level	-40 (7.8m)	-	+3 (1.1)	dBm (Vrms)	
						Output impedance	-	-	1k	Ω	
6	AGND	-	AGND	No	Analog GND		-	-	-		
7	AUX_O1	O	Digital	No	General output #1 : Not used	VOH (IO=20μA)	4.4			V	
						VOL (IO=-20μA)			0.1	V	
8	TXD0	O	Digital	No	Asynchronous send data #0		±3.5	±4.2		V	RL=3kΩ Conform to RS-232C
9	GND	-	GND	No	Digital GND						
10	AUX_I1	I	Digital	No	General input #1 : Not used	VIH	2.0		5.5	V	
						VIL	0		0.8	V	
						Input impedance		47k		Ω	47kΩ PU to Vcc=5V±4%
11	PTT_OUT	O	Digital	No	PTT signal output (open collector)	External voltage value			+B	V	
						Allowable current value			200	mA	
12	Load_mod	I	Digital	No	Loader mode select	VIH	2.0		5.5	V	
					L : loader	VIL	0		0.8	V	
					Hi-Z : normal	Input impedance		47k		Ω	47kΩ PU to Vcc=5V±4%
13	PTT_IN	I	Digital	No	PTT signal input	VIH	2.0		5.5	V	
						VIL	0		0.8	V	
						Input impedance		47k		Ω	47kΩ PU to Vcc=5V±4%
14	GND	-	GND	No	Digital GND		-	-	-		
15	RXD0	I	Digital	No	Asynchronous receive data #0		-15	-	+15	V	Conform to RS-232C



KTI-4 PC BOARD

INTERFACE UNIT (X46-3370-21)

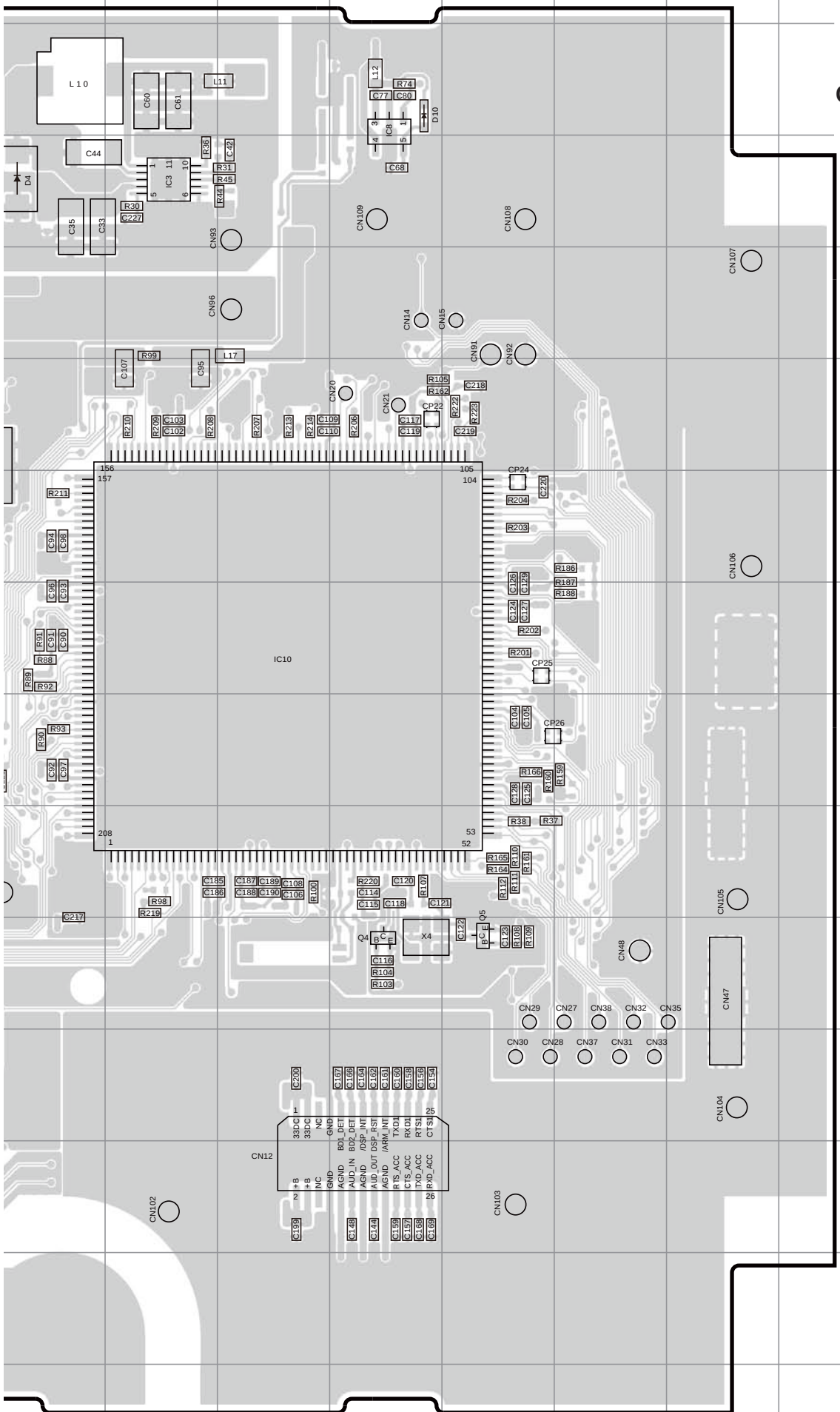
Component side view (J79-0298-09)



Ref. No.	Address
IC3	3K
IC7	5I
IC8	2M
IC10	7L
D1	2G
D2	3G
D4	3J
D10	2M
D11	4D
D12	5D

INTERFACE UNIT (X46-3370-21)

Component side view (J79-0298-09)

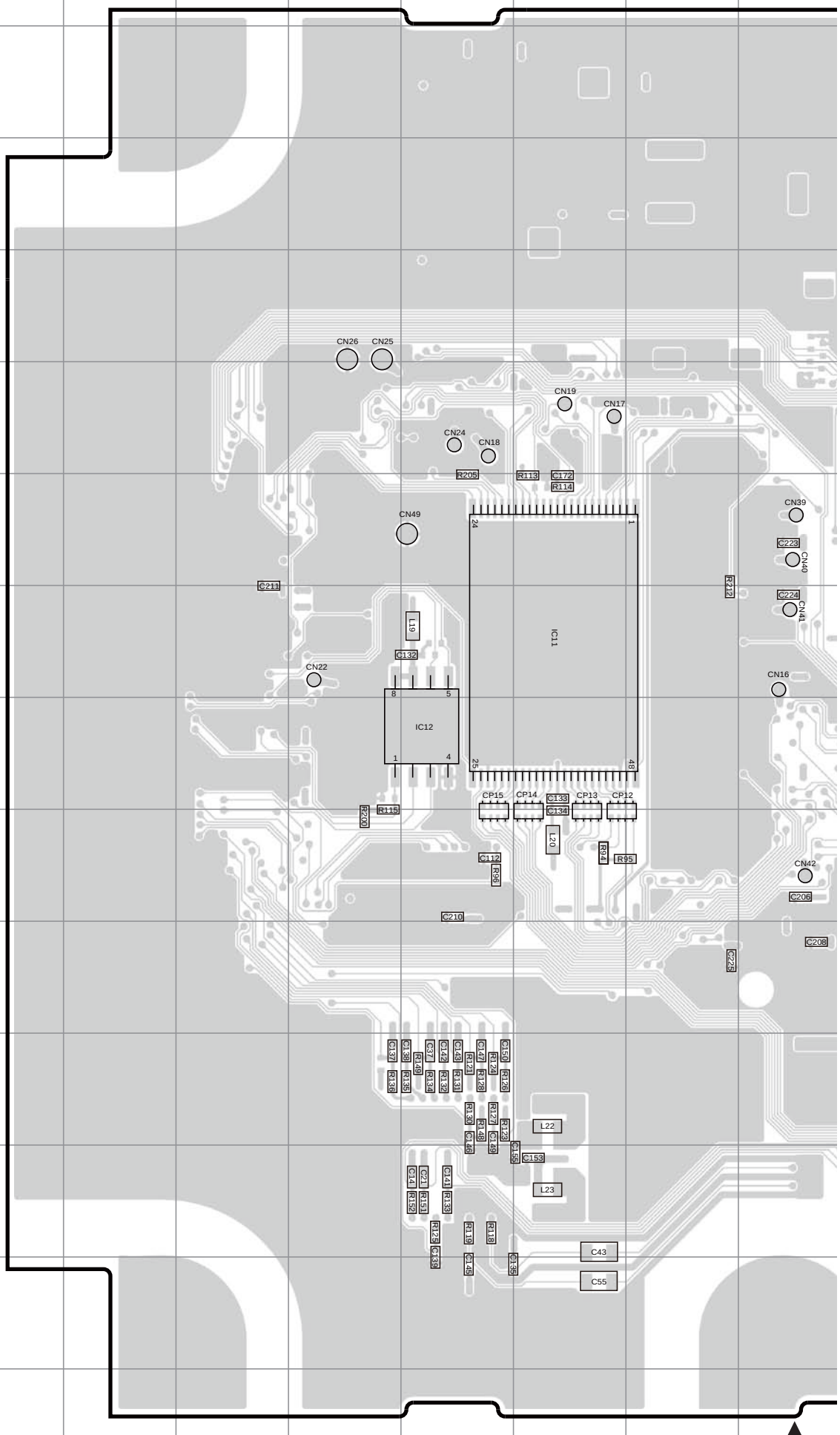


Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

KTI-4 PC BOARD

INTERFACE UNIT (X46-3370-21)

Foil side view (J79-0298-09)

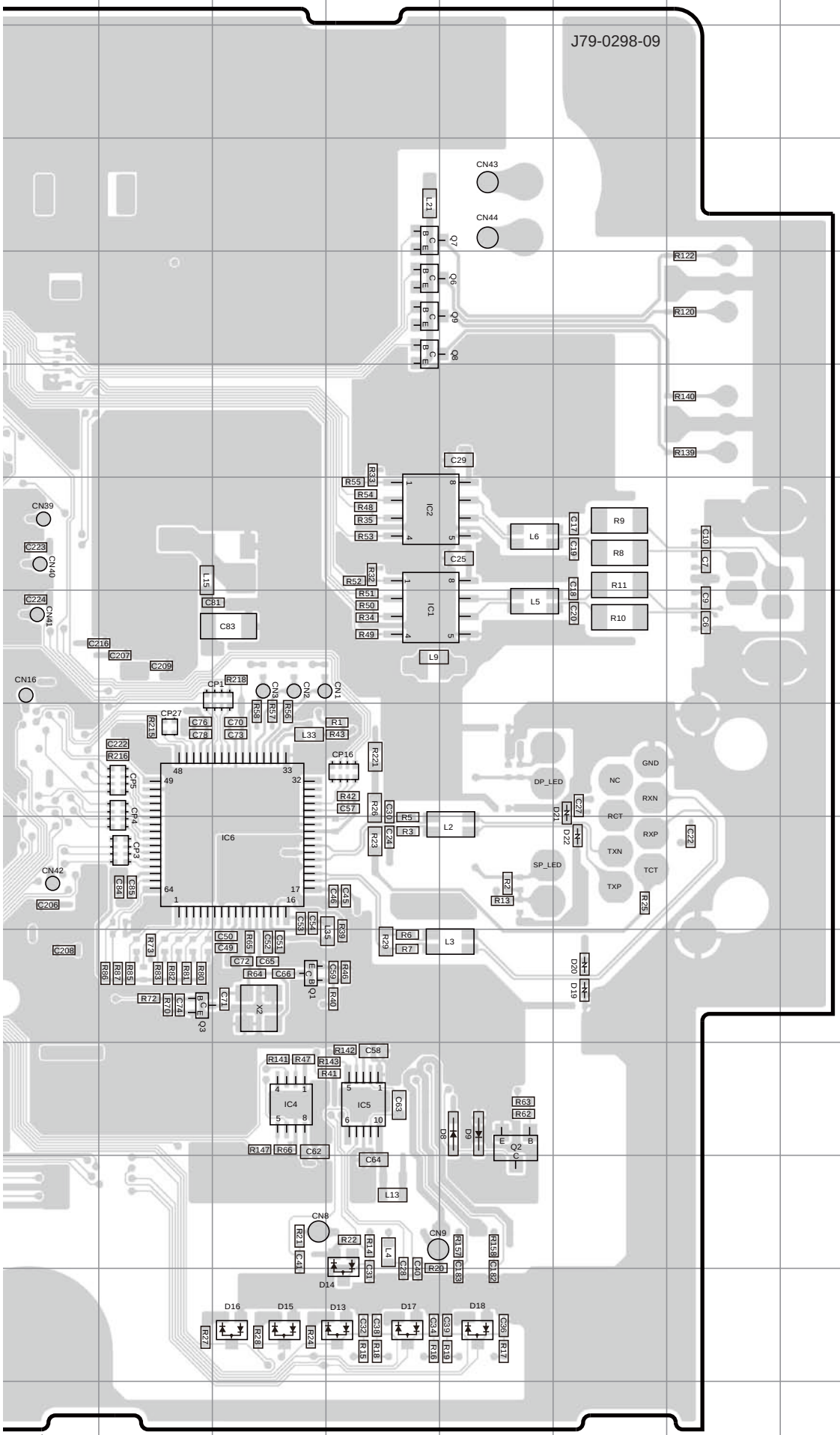


Ref. No.	Address
IC1	7M
IC2	6M
IC4	11L
IC5	11M
IC6	9L
IC11	7H
IC12	8G
D8	11N
D9	11N
D13	13M
D14	13M
D15	13L
D16	13L
D17	13M
D18	13N
D19	10O
D20	10O
D21	8O
D22	9O

PC BOARD KTI-4

INTERFACE UNIT (X46-3370-21)

Foil side view (J79-0298-09)



Component side

Layer 1

Layer 2

Layer 3

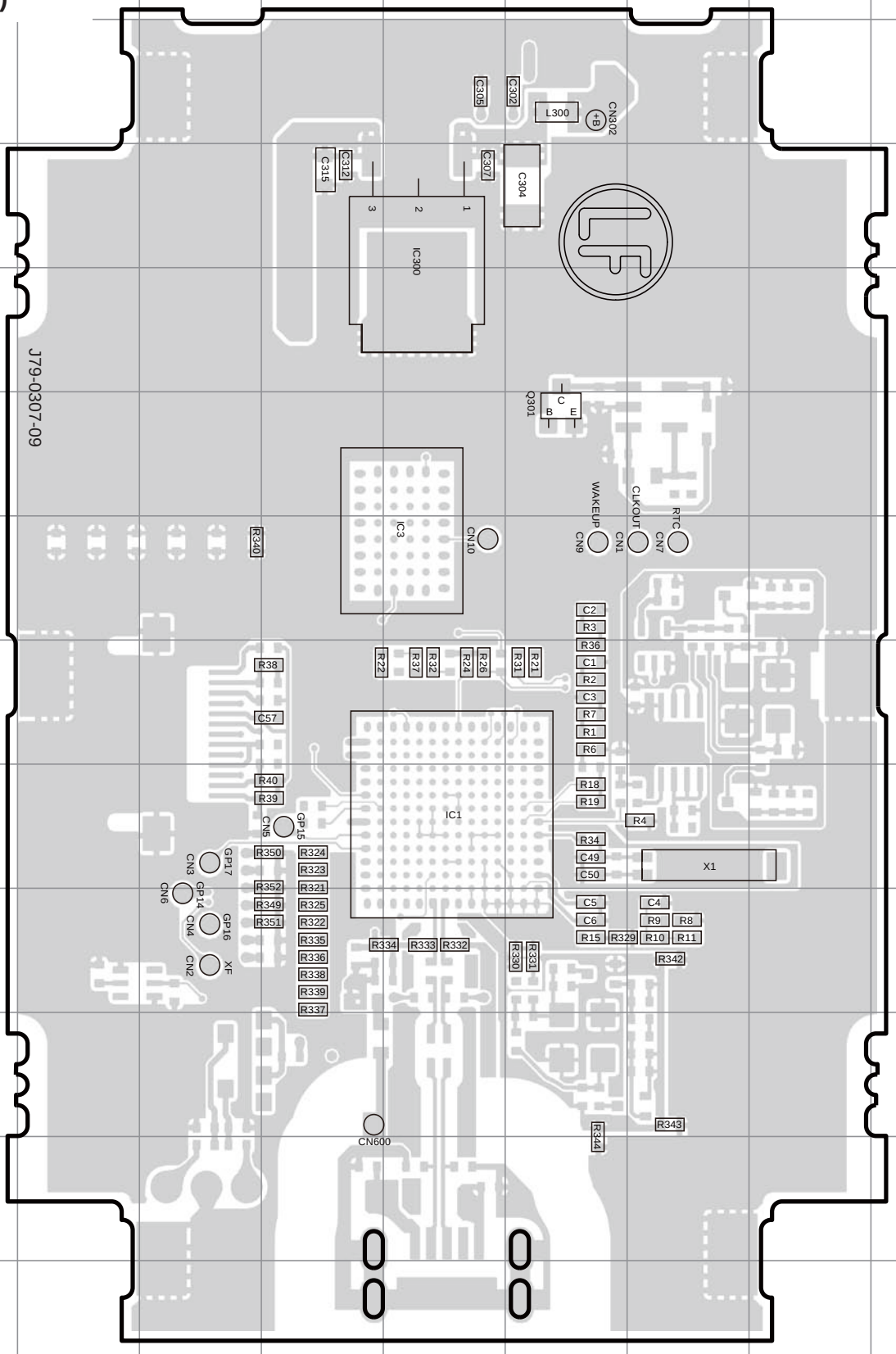
Layer 4

Foil side

KTI-4 PC BOARD

INTERFACE UNIT (X46-3380-20)

Component side view (J79-0307-09)



Ref. No.	Address
IC1	9F
IC3	7F
IC300	4F
Q301	6G

Component side

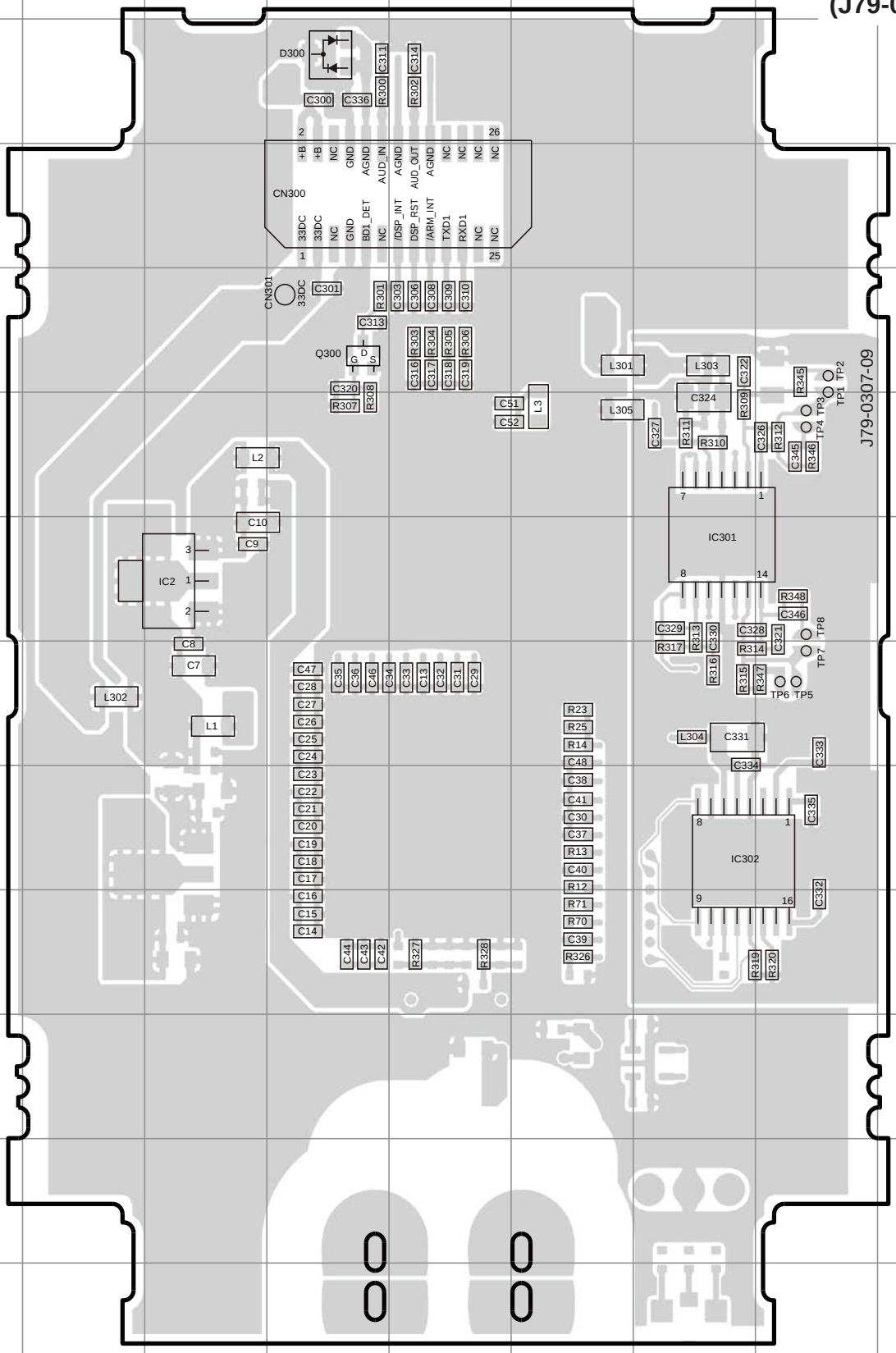
Layer 1	
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

Foil side

PC BOARD KTI-4

INTERFACE UNIT (X46-3380-20)

Foil side view (J79-0307-09)



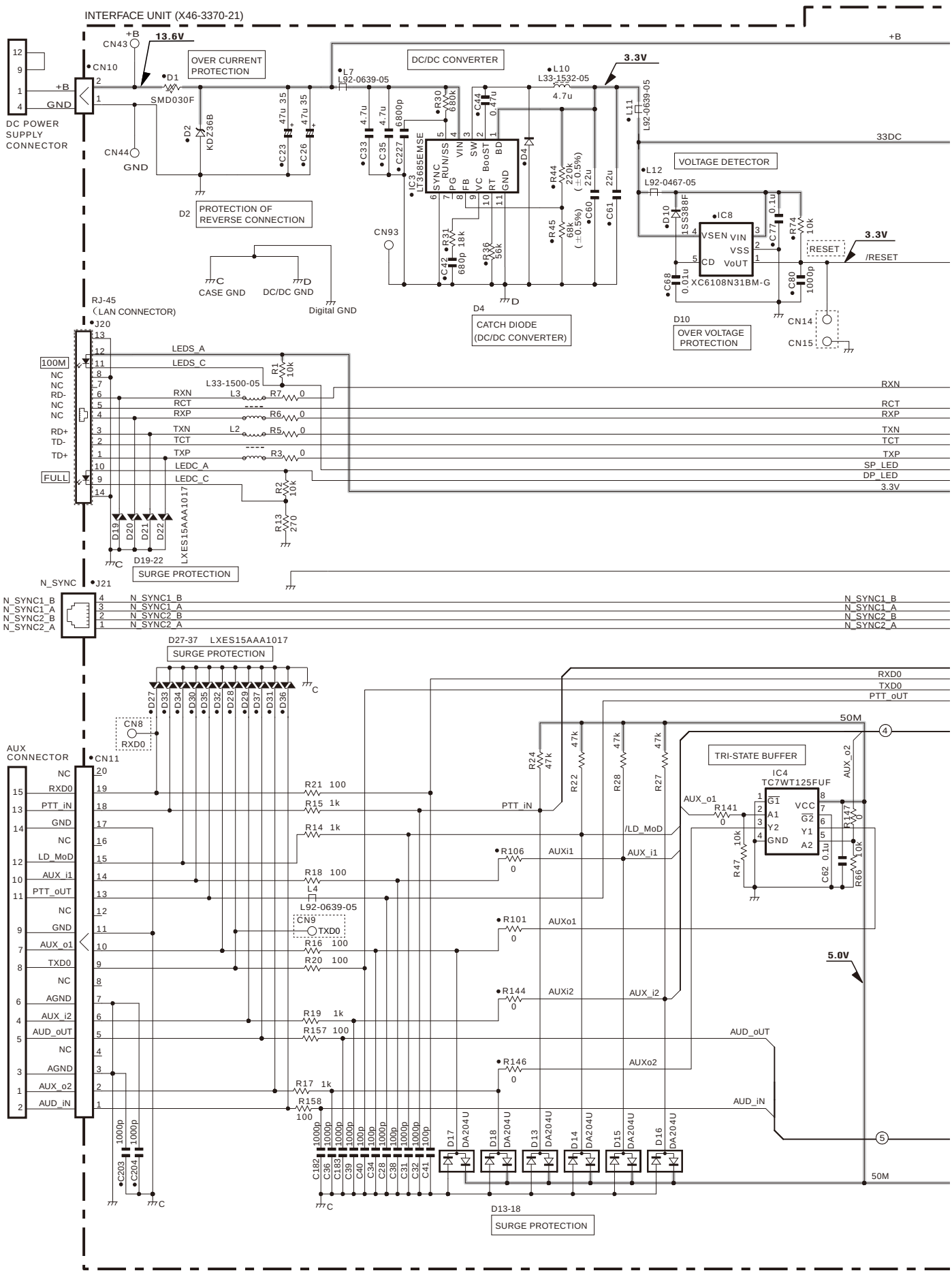
Ref. No.	Address
IC2	7C
IC301	7G
IC302	9G
Q300	5D
D300	3D

Component side

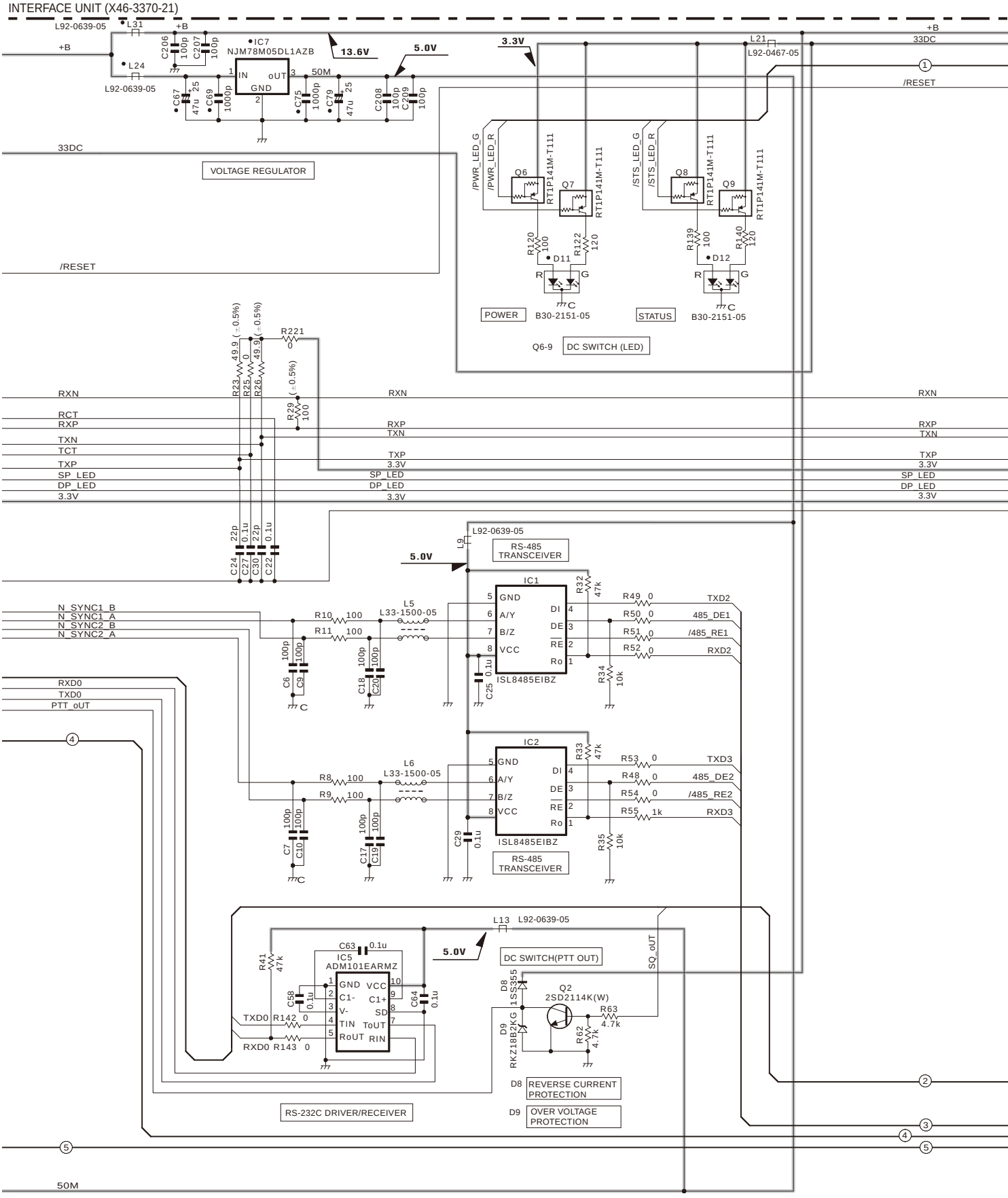
Layer 1
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6

Foil side

KTI-4 SCHEMATIC DIAGRAM

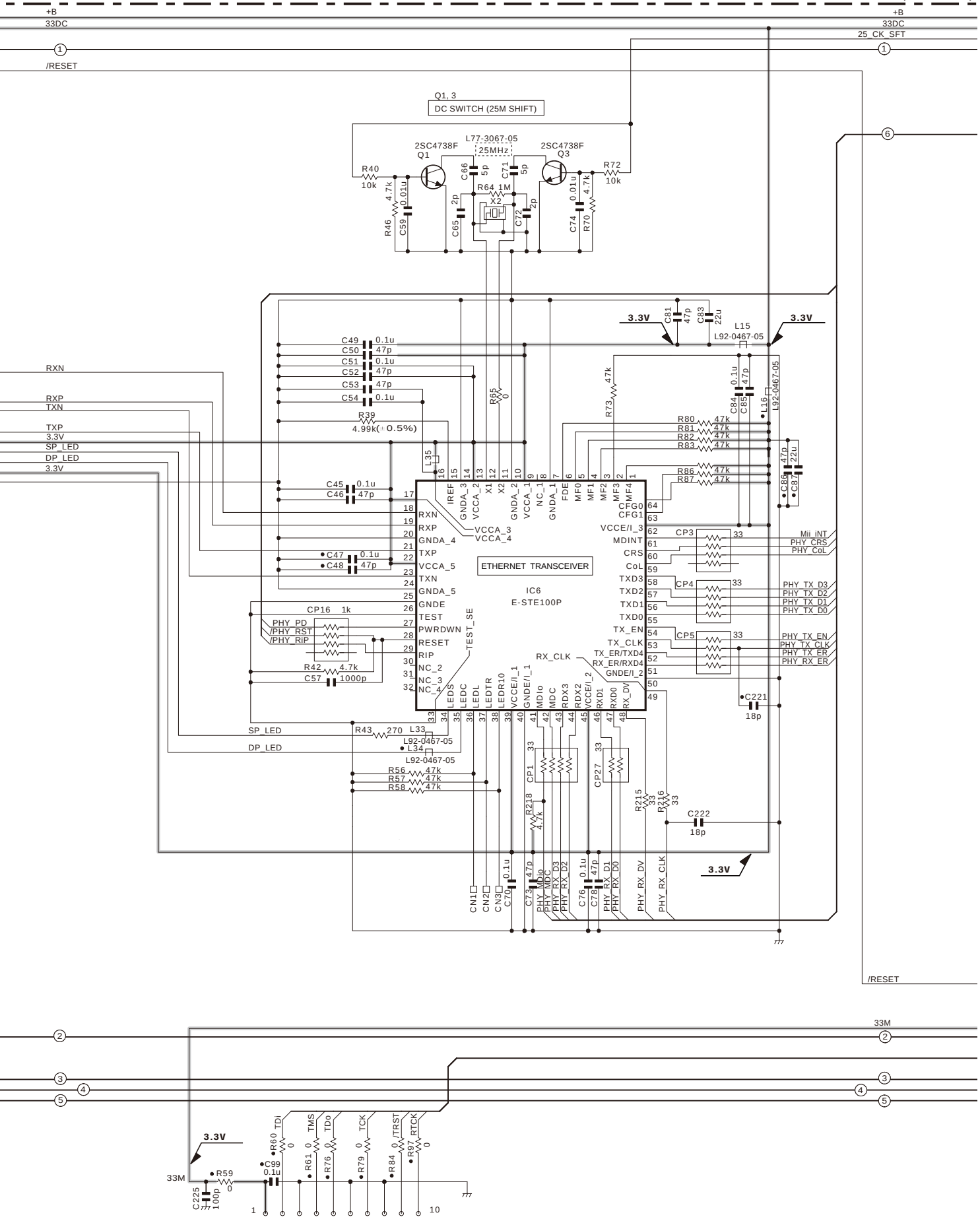


SCHEMATIC DIAGRAM KTI-4



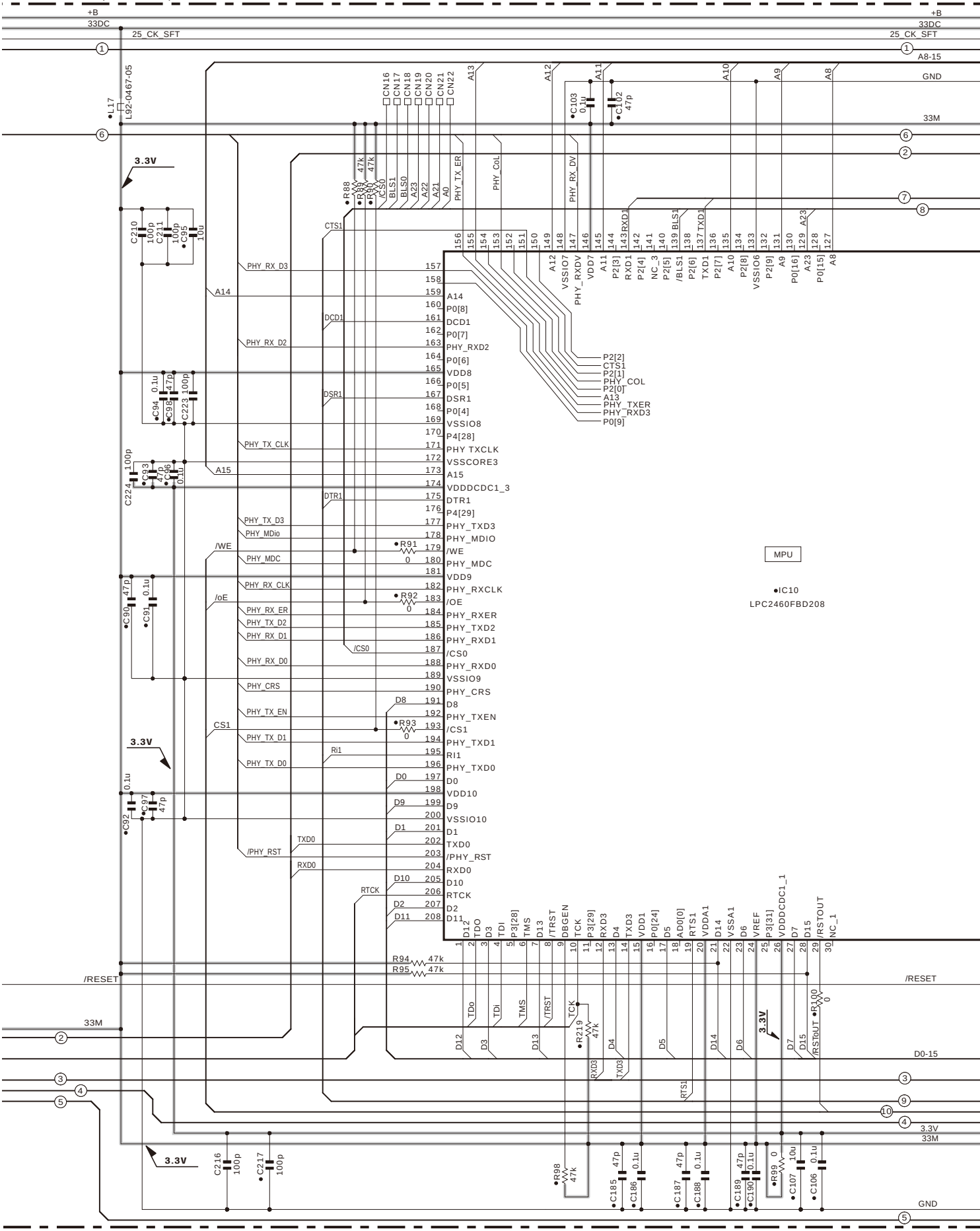
KTI-4 SCHEMATIC DIAGRAM

INTERFACE UNIT (X46-3370-21)



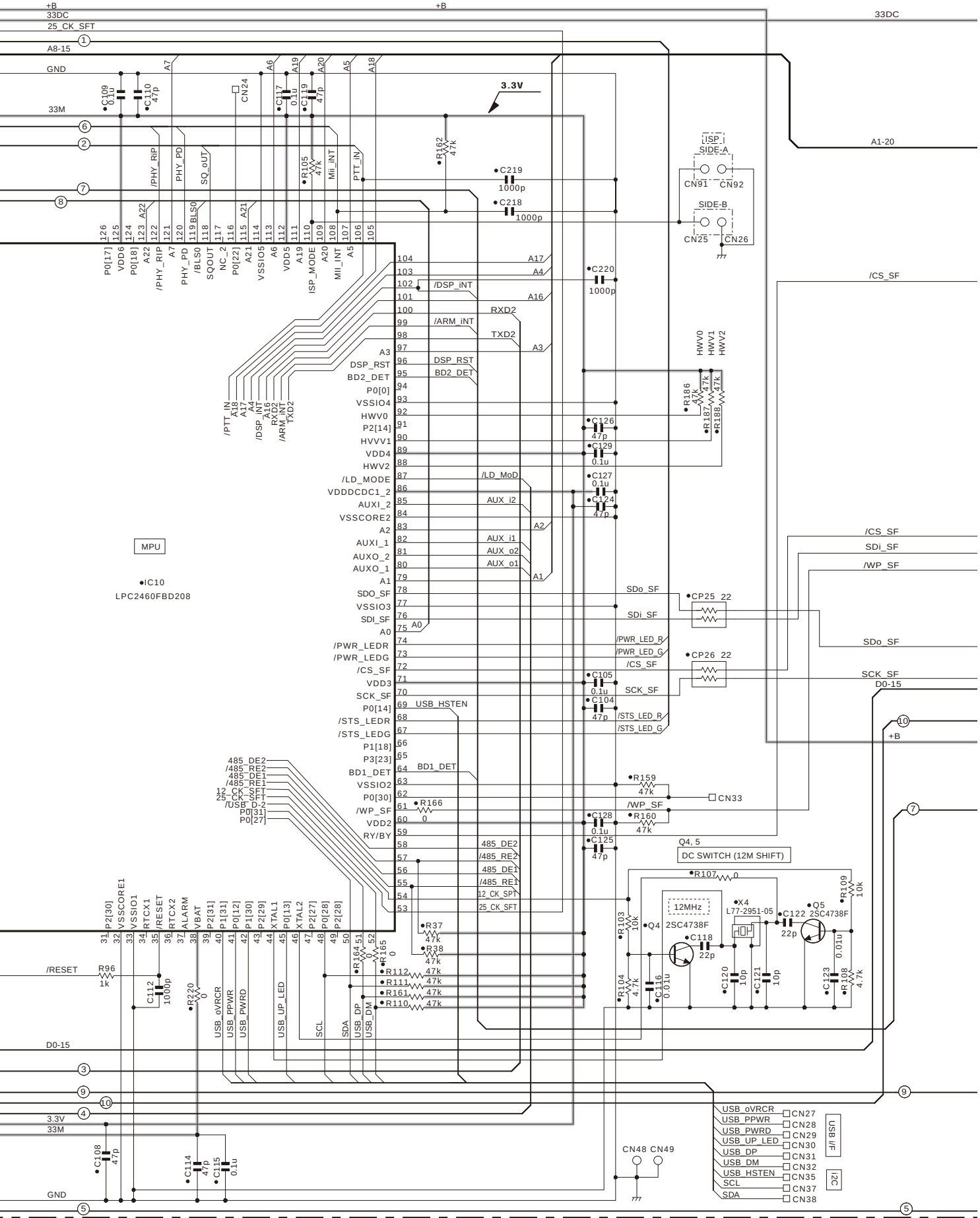
SCHEMATIC DIAGRAM KTI-4

INTERFACE UNIT (X46-3370-21)



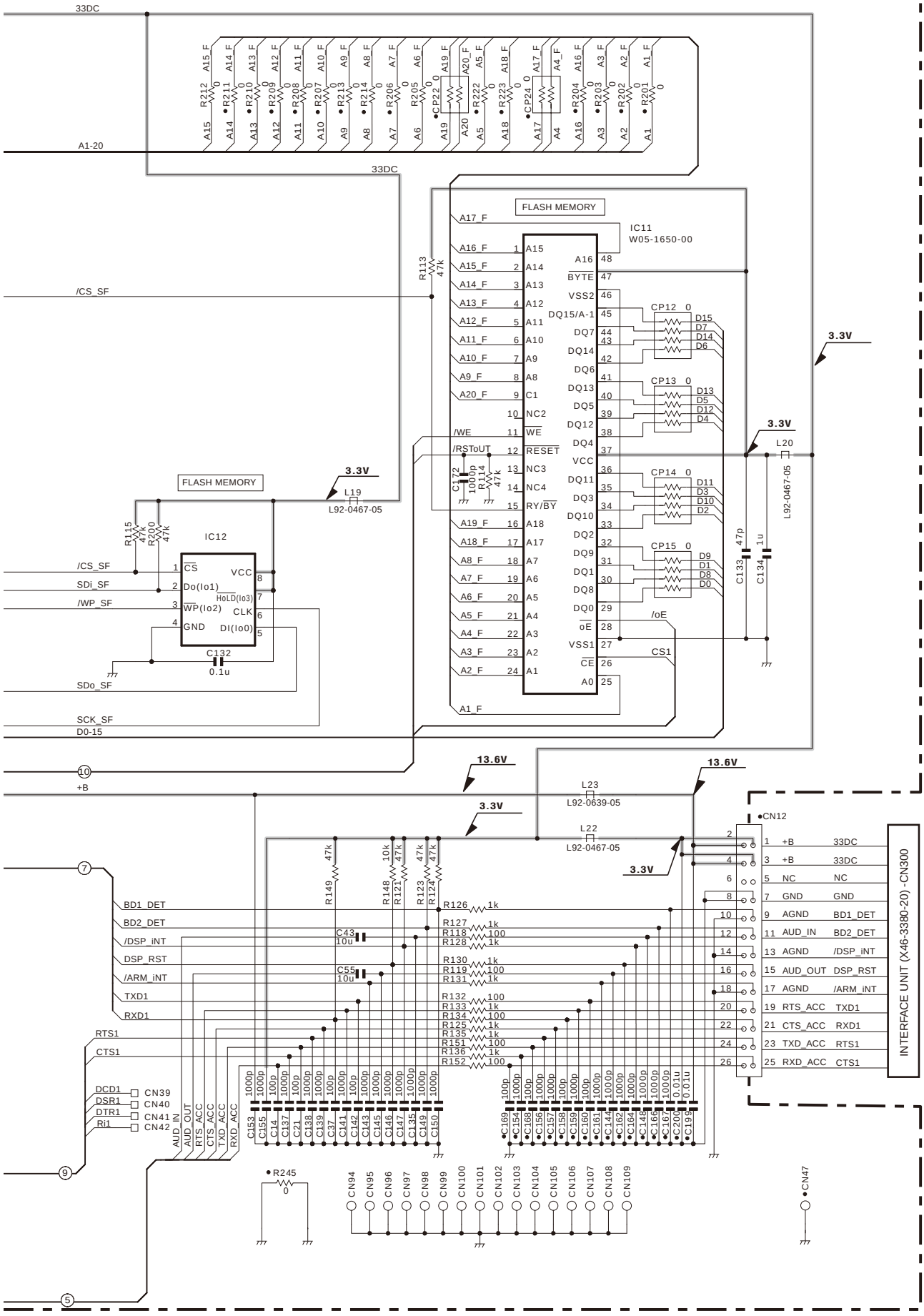
KTI-4 SCHEMATIC DIAGRAM

INTERFACE UNIT (X46-3370-21)



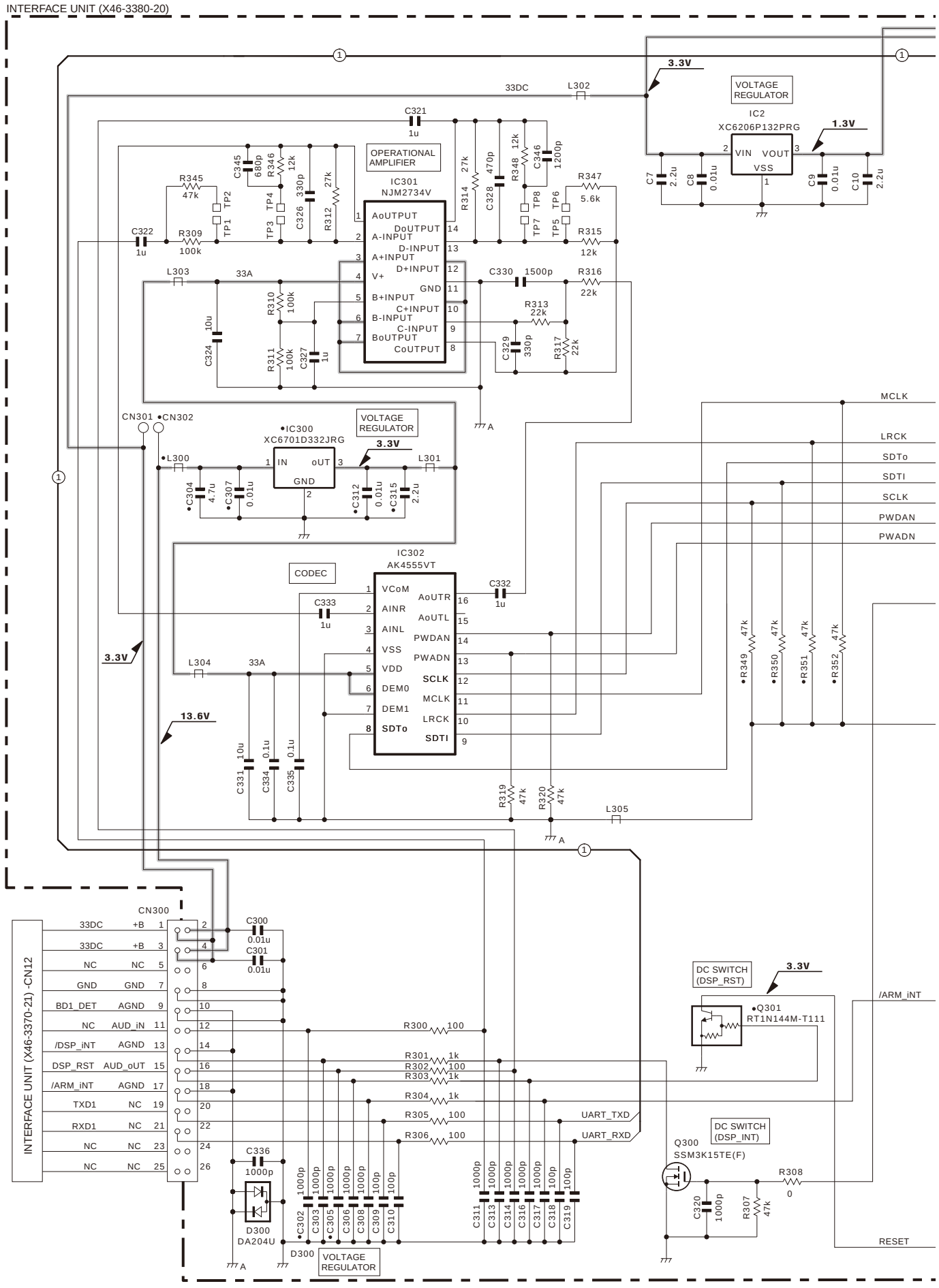
SCHEMATIC DIAGRAM KTI-4

INTERFACE UNIT (X46-3370-21)



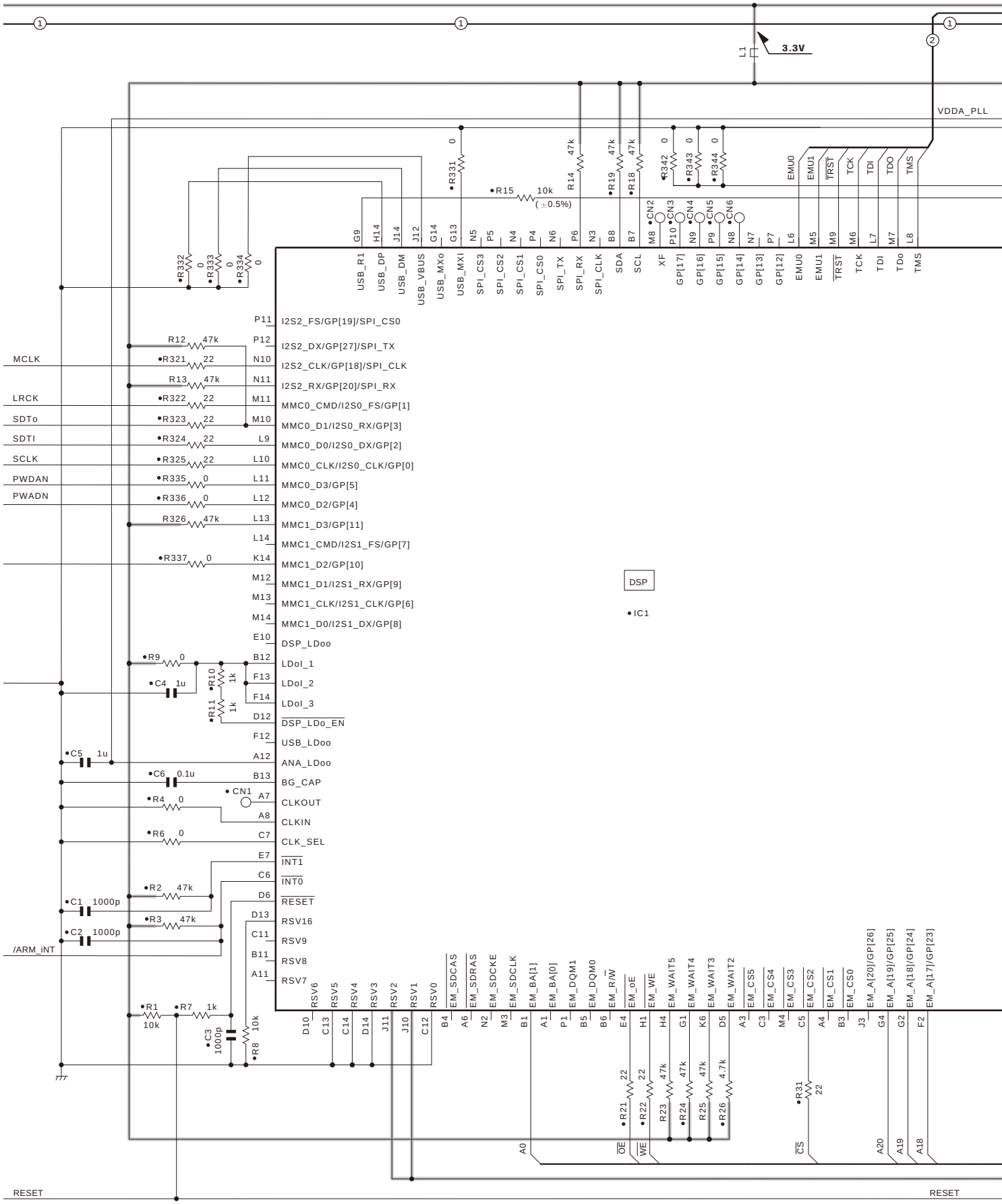
Note : The components marked with a dot (•) are parts of layer 1.

KTI-4 SCHEMATIC DIAGRAM



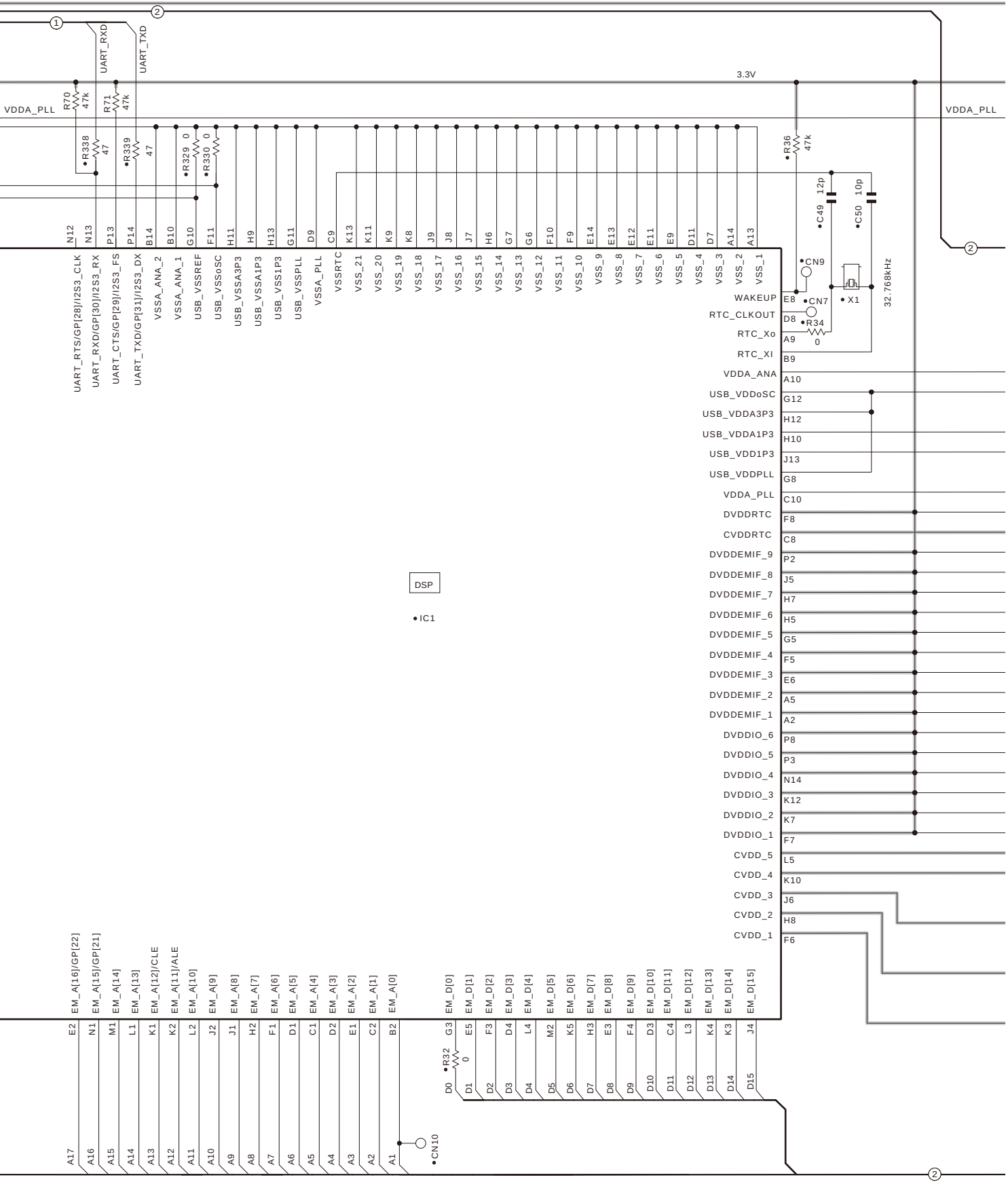
SCHEMATIC DIAGRAM KTI-4

INTERFACE UNIT (X46-3380-20)



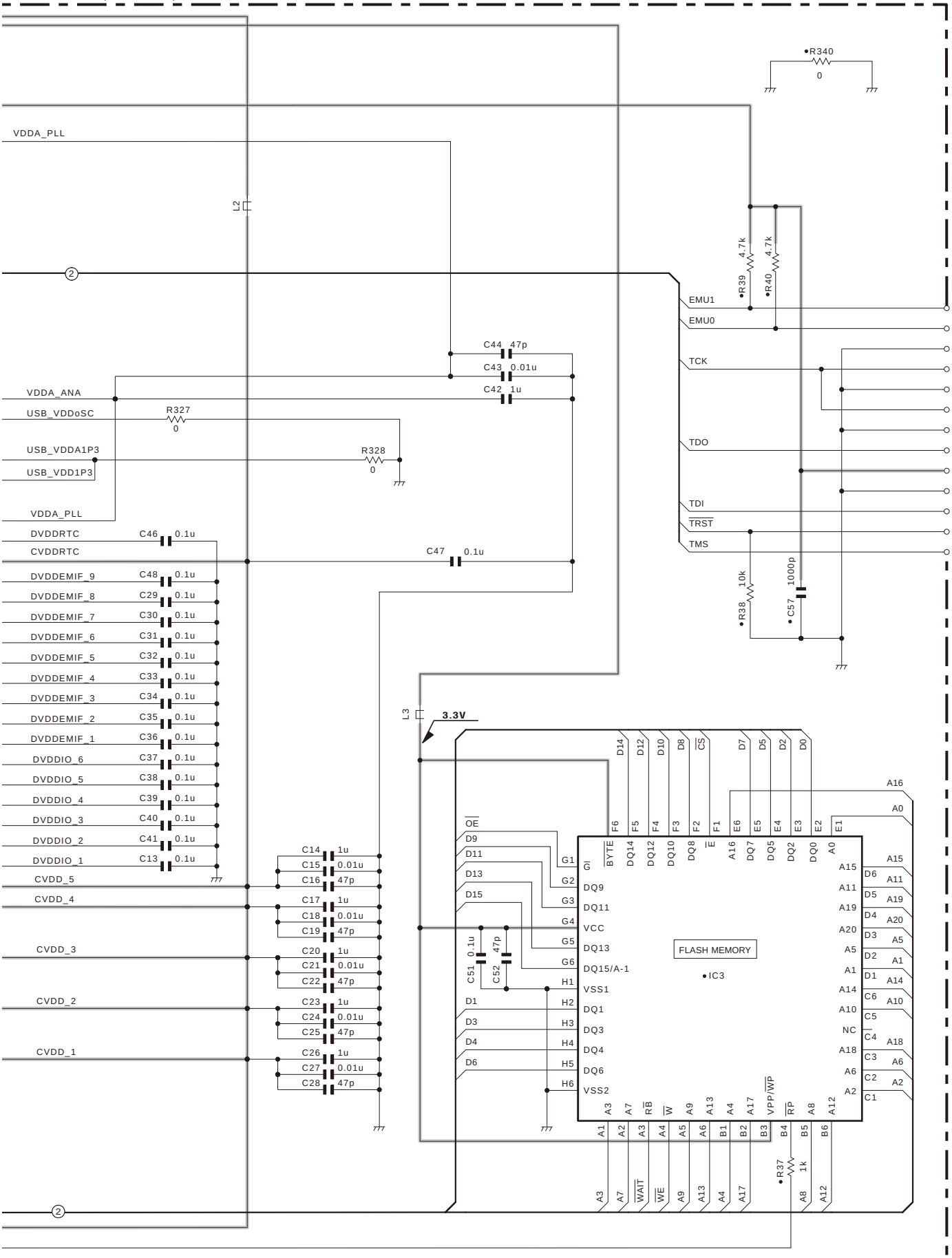
KTI-4 SCHEMATIC DIAGRAM

INTERFACE UNIT (X46-3380-20)

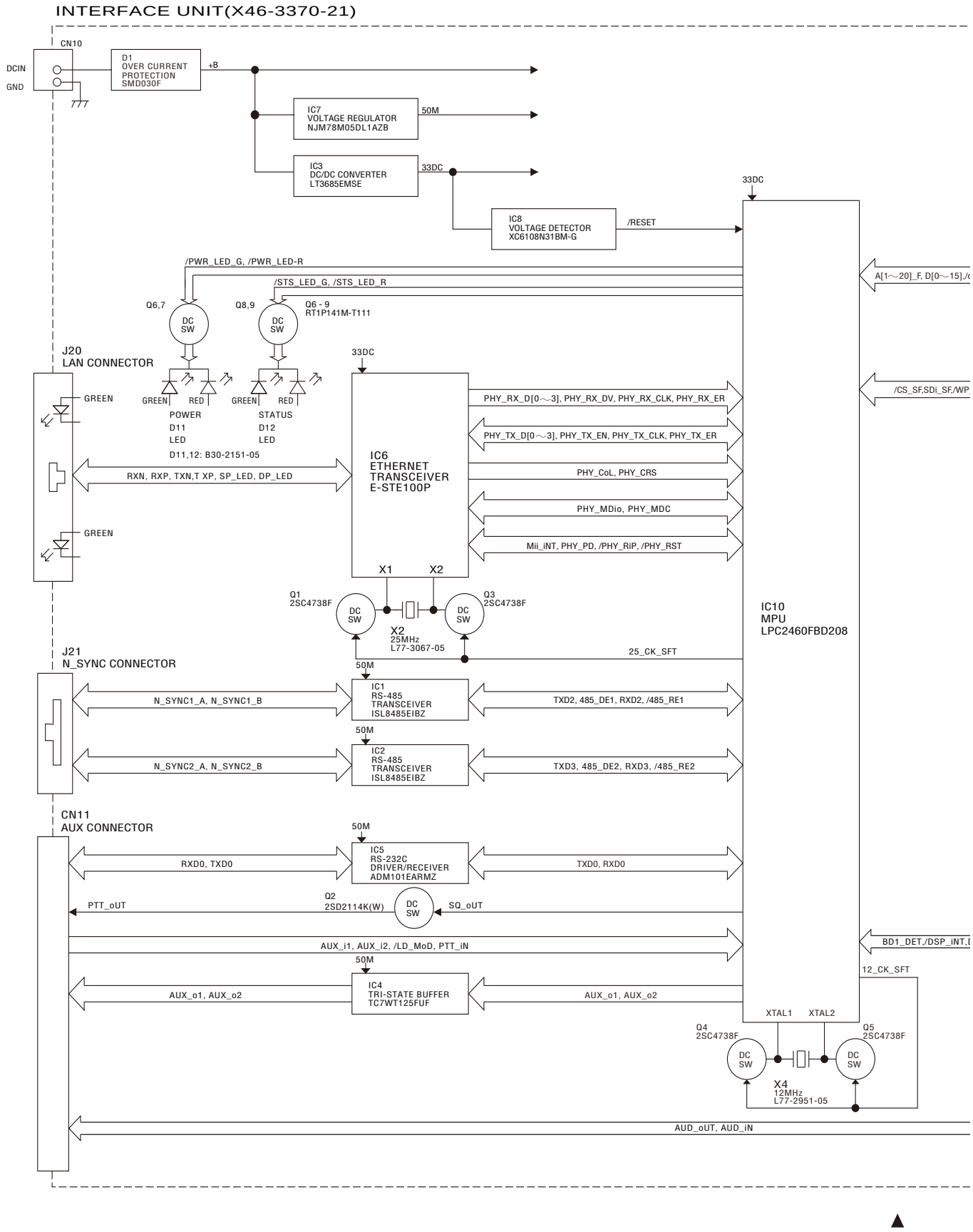


SCHEMATIC DIAGRAM KTI-4

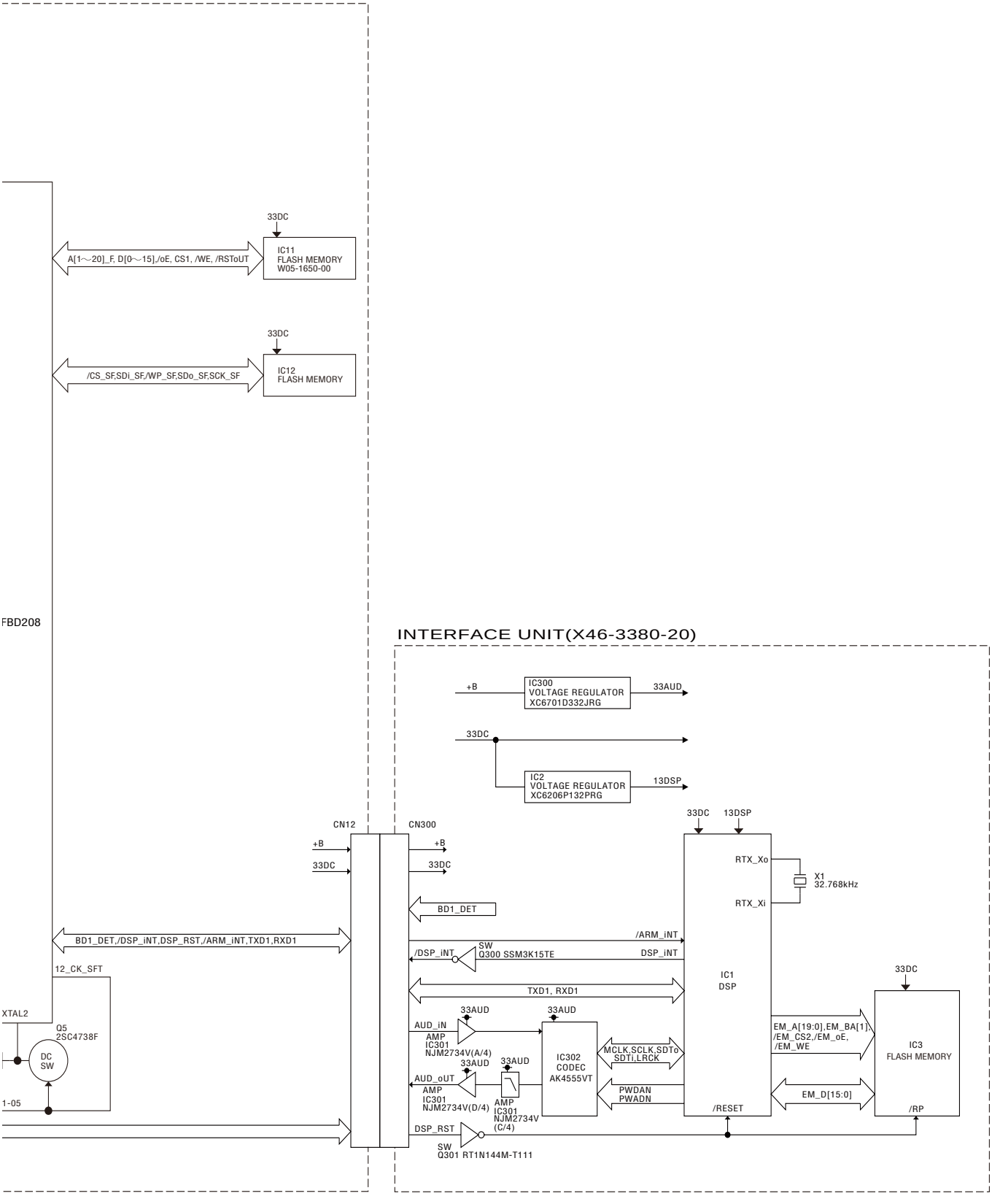
INTERFACE UNIT (X46-3380-20)



BLOCK DIAGRAM



BLOCK DIAGRAM



SPECIFICATIONS

Standard Input Voltage (Supplied from NXR-700/800)	13.6V DC negative ground
Current Drain	200mA Max
Temperature Range	–30°C ~ +60°C (–22°F ~ +140°F)
Dimensions (W x H x D, Dimensions not including protrusions)	106 (4.17) x 32 (1.26) x 125 (4.92) mm (in)
Weight	Approx. 560g (19.8oz)

Kenwood Corporation

2967-3, Ishikawa-machi, Hachioji-shi, Tokyo, 192-8525 Japan

Kenwood U.S.A. Corporation

P.O. BOX 22745, 2201 East Dominguez Street, Long Beach, CA 90801-5745, U.S.A.

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6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

Kenwood Electronics Deutschland GmbH

Rembrücker Str. 15, 63150 Heusenstamm, Germany

Kenwood Electronics Belgium N.V.

Leuvensesteenweg 248 J, 1800 Vilvoorde, Belgium

Kenwood Electronics France S.A.

L' Etoile Paris Nord 2, 50 Allée des Impressionnistes, Bp 58416 Villepinte, 95944 Roissy Ch De Gaulle Cedex

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Kenwood Ibérica, S.A.

Bolivia, 239-08020 Barcelona, Spain

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Talavera Business Park Building A, 4 Talavera Road, North Ryde NSW 2113 Australia

Kenwood Electronics (Hong Kong) Ltd.

Suite 2504, 25/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, New Territories, Hong Kong

Kenwood Electronics Singapore Pte Ltd

1 Ang Mo Kio Street 63, Singapore 569110

KTI-4 PC BOARD

PC BOARD KTI-4

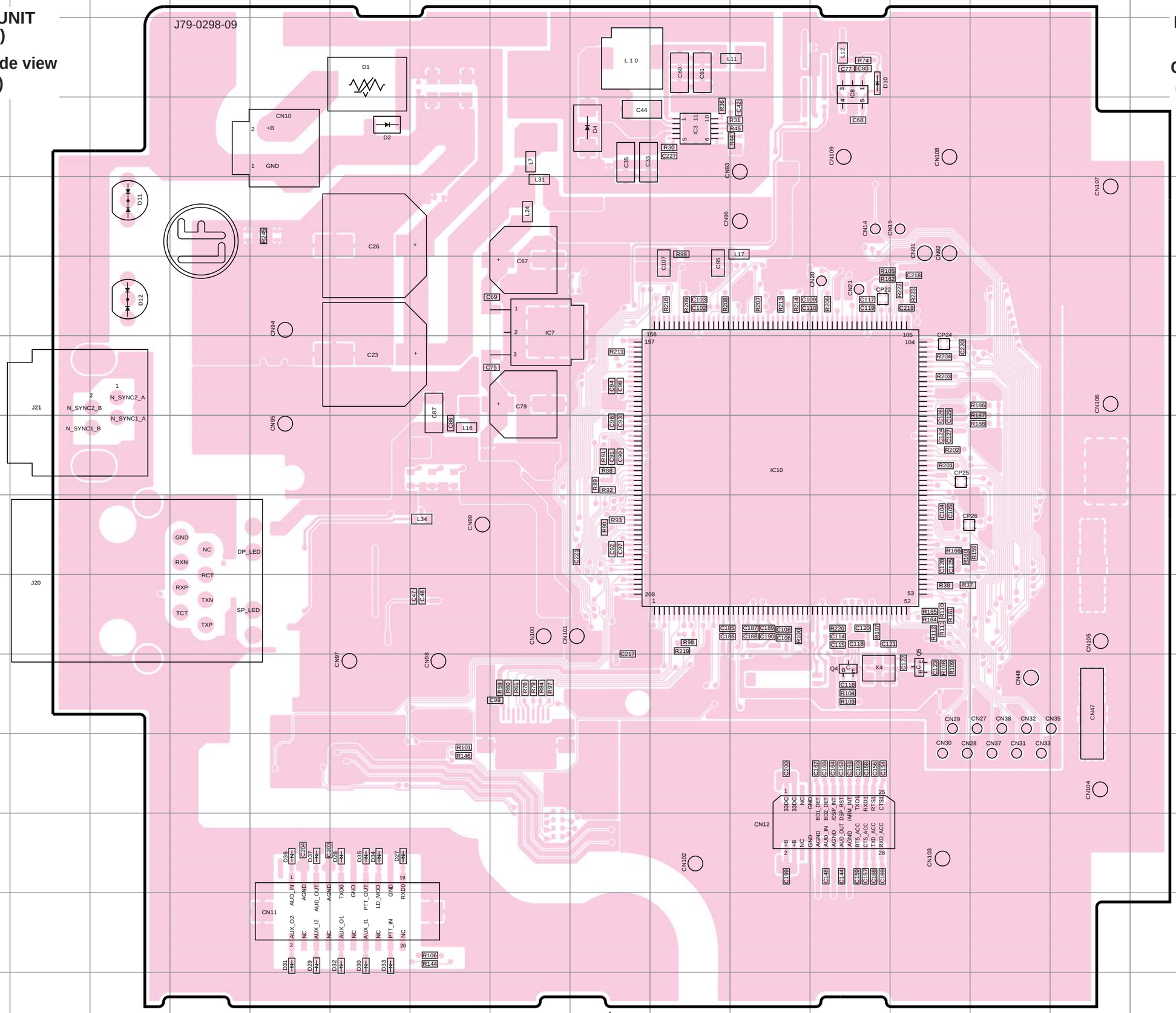
INTERFACE UNIT (X46-3370-21)

Component side view (J79-0298-09)

INTERFACE UNIT (X46-3370-21)

Component side view (J79-0298-09)

J79-0298-09



Ref. No.	Address
IC3	3K
IC7	5I
IC8	2M
IC10	7L
D1	2G
D2	3G
D4	3J
D10	2M
D11	4D
D12	5D

Component side

Layer 1

Layer 2

Layer 3

Layer 4

Foil side

KTI-4 PC BOARD

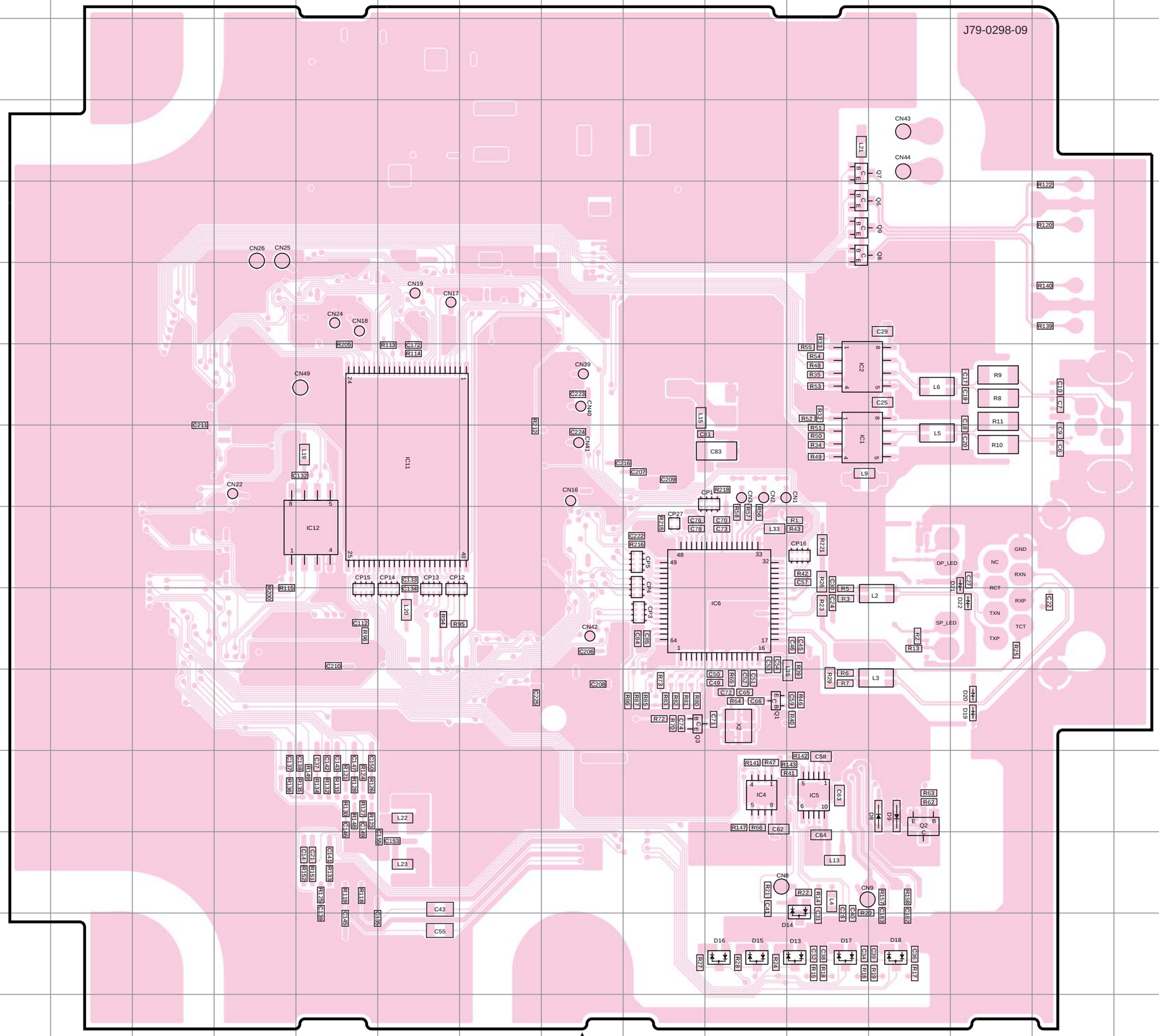
INTERFACE UNIT
(X46-3370-21)

Foil side view
(J79-0298-09)

PC BOARD KTI-4

INTERFACE UNIT
(X46-3370-21)

Foil side view
(J79-0298-09)



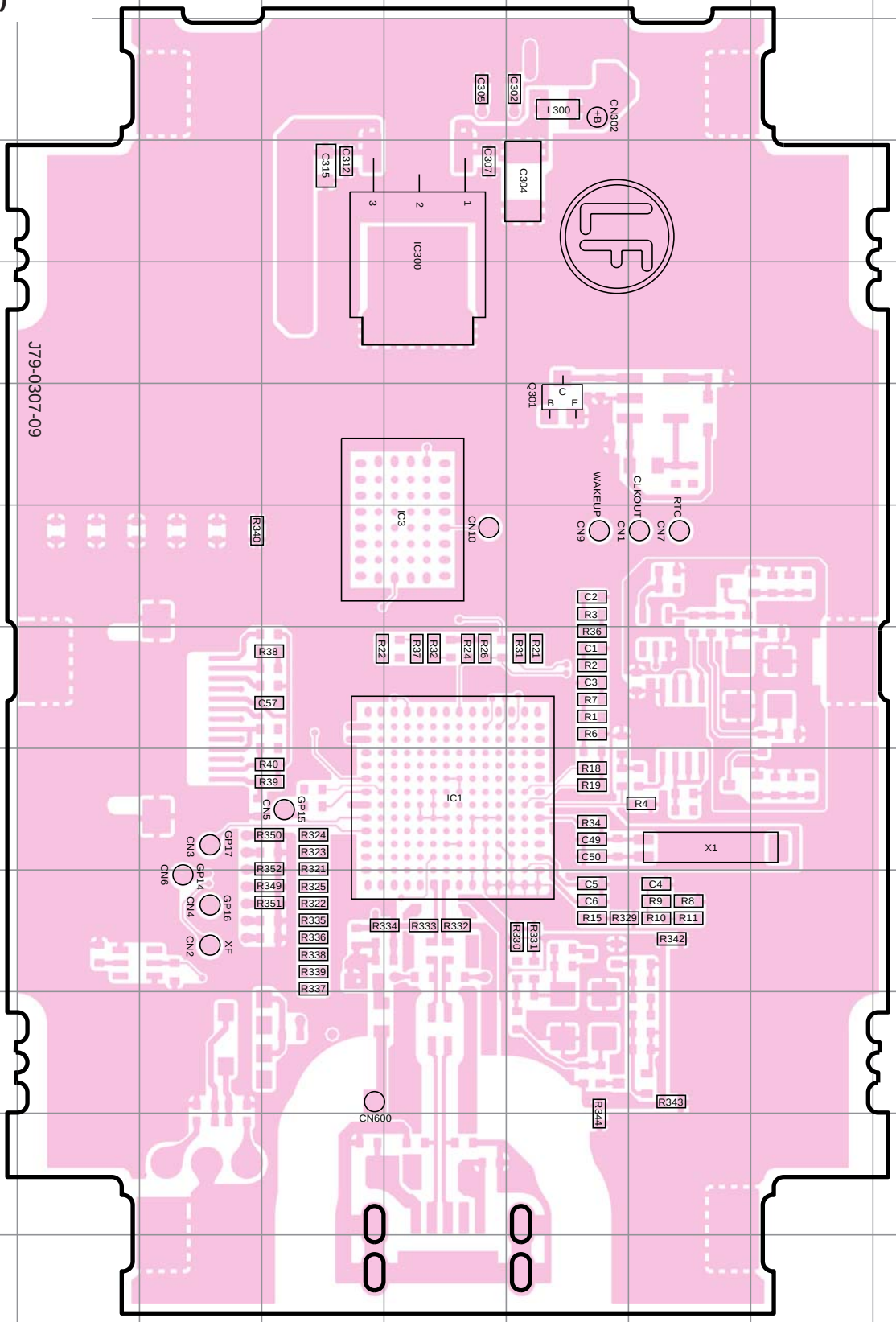
Ref. No.	Address
IC1	7M
IC2	6M
IC4	11L
IC5	11M
IC6	9L
IC11	7H
IC12	8G
D8	11N
D9	11N
D13	13M
D14	13M
D15	13L
D16	13L
D17	13M
D18	13N
D19	10O
D20	10O
D21	8O
D22	9O

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

KTI-4 PC BOARD

INTERFACE UNIT (X46-3380-20)

Component side view (J79-0307-09)



Ref. No.	Address
IC1	9F
IC3	7F
IC300	4F
Q301	6G

Component side

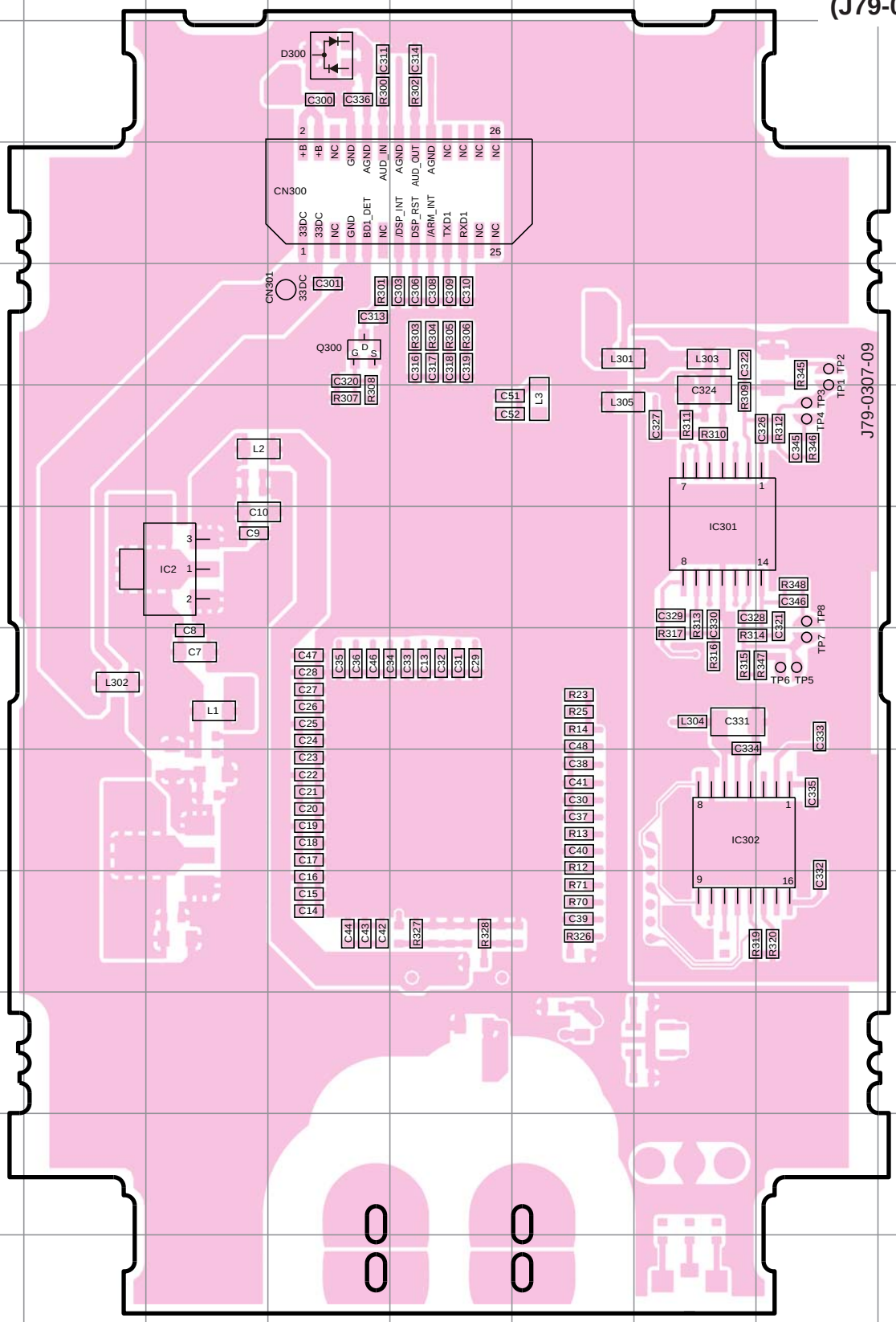
Layer 1	
Layer 2	
Layer 3	
Layer 4	
Layer 5	
Layer 6	

Foil side

PC BOARD KTI-4

INTERFACE UNIT (X46-3380-20)

Foil side view (J79-0307-09)



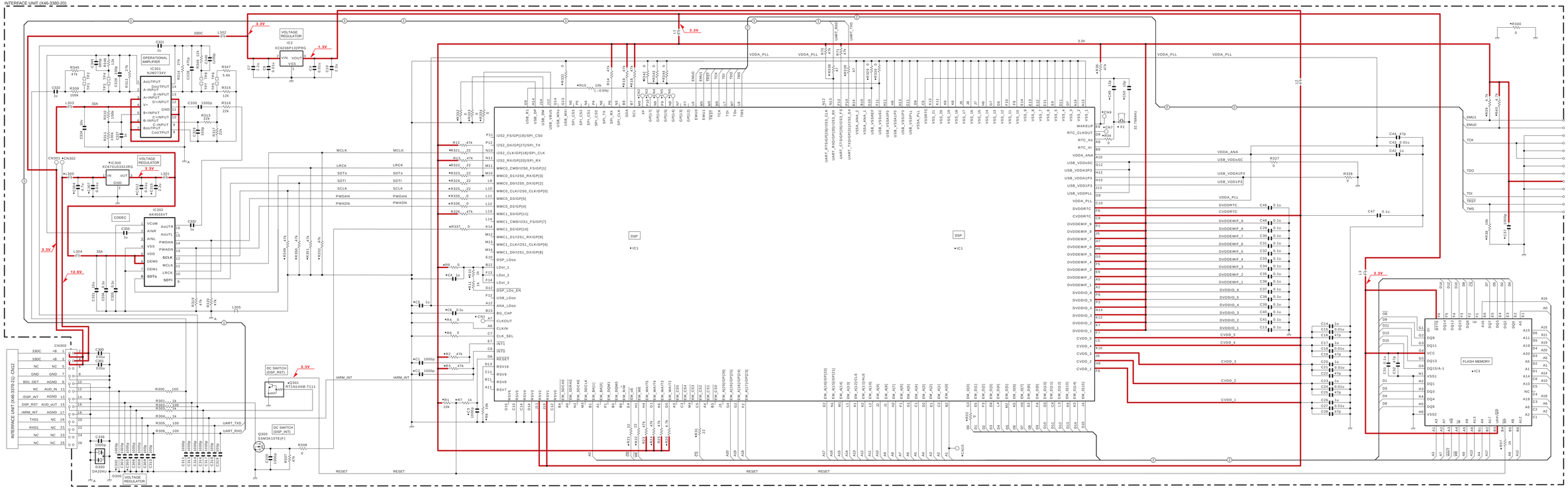
Ref. No.	Address
IC2	7C
IC301	7G
IC302	9G
Q300	5D
D300	3D

Component side

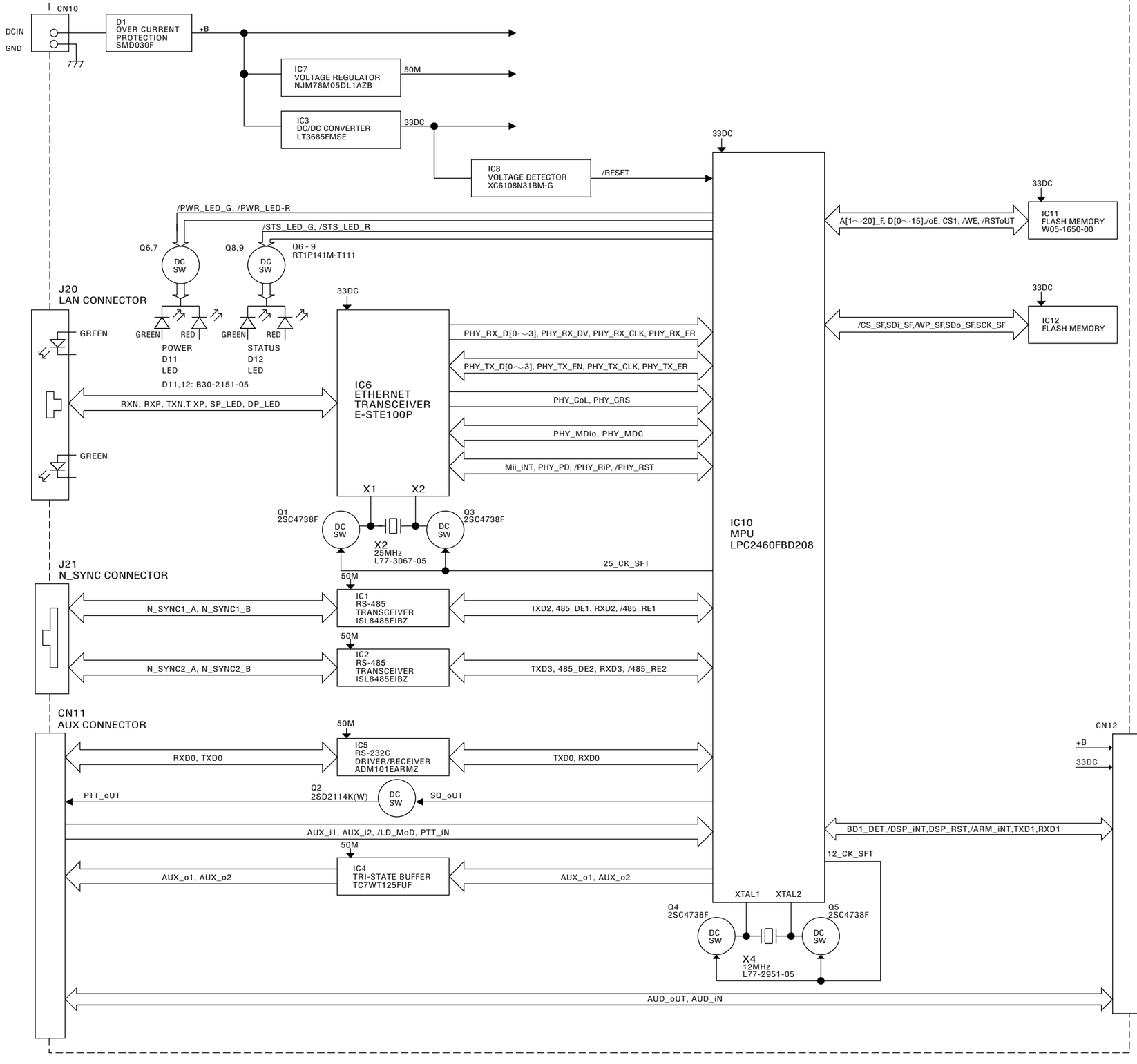
Layer 1
Layer 2
Layer 3
Layer 4
Layer 5
Layer 6

Foil side


INTERFACE UNIT (X46-3370-21)
DC POWER SUPPLY CONNECTOR
OVER CURRENT PROTECTION
PROTECTION OF REVERSE CONNECTION
DC/DC CONVERTER
CATCH DIODE (DC/DC CONVERTER)
VOLTAGE DETECTOR
OVER VOLTAGE PROTECTION
RESET
VOLTAGE REGULATOR
POWER
STATUS
DC SWITCH (LED)
CASE GND
DC/DC GND
Digital GND
RJ-45 (LAN CONNECTOR)
SURGE PROTECTION
RS-485 TRANSCEIVER
TRI-STATE BUFFER
AUX CONNECTOR
RS-232C DRIVER/RECEIVER
DC SWITCH(PTT OUT)
REVERSE CURRENT PROTECTION
DC SWITCH (25M SHIFT)
ETHERNET TRANSCEIVER
IC6 E-STE100P
MPU
IC10 LPC2460FBD208
ISP SIDE-A SIDE-B
FLASH MEMORY
IC11 W05-1650-00
IC12
DC SWITCH (12M SHIFT)
USB I/F
I2C
INTERFACE UNIT (X46-3380-20) -CN300
13.6V
5.0V
3.3V


INTERFACE UNIT (X46-3390-20)
INTERFACE UNIT (X46-3370-21) CN12
CODEC
DSP
FLASH MEMORY
OPERATIONAL AMPLIFIER
VOLTAGE REGULATOR
DC SWITCH (DISP_RST)
DC SWITCH (DISP_INT)
3.3V
1.3V
1.8V
13.6V
VDDA_PLL
RESET
IARM_INT
UART_TXD
UART_RXD
MCLK
LRCK
SDTo
SDTI
SCLK
PWDAN
PWADN

INTERFACE UNIT(X46-3370-21)



INTERFACE UNIT(X46-3380-20)