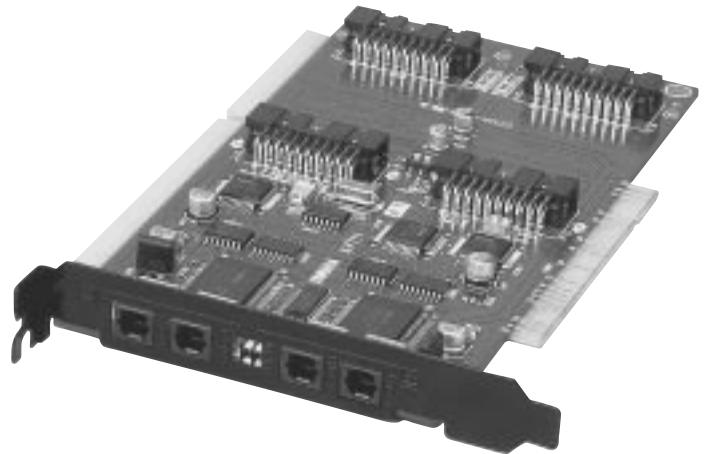


AUDIO EXPANSION CARD

AX16-AT

SERVICE MANUAL



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IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and changes in specification are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity you body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and /or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

■ SPECIFICATIONS

1. GENERAL SPECIFICATIONS

- PCI Raw Variable Height Short Card.

PCI Interface (for power supplement only)	Installable in any PCI-equipped computer.
ISA Interface (for power supplement only)	Installable in any ISA-equipped computer by replacing bracket.

- 2 lines ADAT Interface (Independent switch-selectable for THRU Interface).

ADAT Interface	ALESIS ADAT Proprietary Multi Channel Optical Digital Interface Format
IO, THEU Interface	YAMAHA DS2416 compatible format
Switch (on Rear Panel)	ADAT or THRU (A or B line is independent.)

2. DIGITAL AUDIO SIGNAL INPUT/OUTPUT CHARACTERISTICS

Terminals	I/O	Format	Format	Connector
<input type="checkbox"/> A IN <input type="checkbox"/> B IN	I	ALESIS ADAT Proprietary Multi Channel Optical Digital Interface Format	-	EIAJ fiber optical jack
<input type="checkbox"/> A OUT <input type="checkbox"/> B OUT	O	ALESIS ADAT Proprietary Multi Channel Optical Digital Interface Format	-	EIAJ fiber optical jack
IO-A IO-B THRU-A THRU-B	I/O	4ch or 8ch Digital Audio Inputs (2ch or 4ch/line, MSB first×2) 4ch or 8ch Digital Audio Outputs (2ch or 4ch/line, MSB first×2) Max. 32 bits/ch	5V CMOS	20P Connector MIL-Standard (MIL-C-83503)

3.CONNECTORS FOR IO-A,B,THRU-A,B(CN101,CN102,CN103,CN104)

Pin Assignment of 20P Connector(MIL-C-83503)

PIN No.	I/O		Name	Function	Logic (H: +5V, L: GND)
	IO	THRU			
1	O	I	AI0	Audio Data 0 (to IO)	-
2	-	-	GND	GND	-
3	O	I	AI1	Audio Data 1 (to IO)	-
4	I	O	/ID	Identity Flag	-
5	I	O	AO0	Audio Data 0 (from IO)	-
6	O	I	/SLV	Synchronous Property Flag (to IO)	L: Slave Only H: Master or Slave
7	I	O	AO1	Audio Data 1 (from IO)	-
8	O	I	/COM	Connection Flag	L: Connected, H: Disconnected
9	O	I	WCI	Word Clock (Fs, to IO)	-
10	O	I	EMPI	Emphasis Flag (to IO)	L: Normal, H: Emphasis
11	I	O	FSO	Word Clock (Fs, from IO)	-
12	I	O	EMPO	Emphasis Flag (from IO)	L: Normal, H: Emphasis
13	I	O	64FS	Bit Clock (64×Fs, from IO)	-
14	O	I	FMTI	Format Request Flag (to IO)	L: 2ch/line MSB first, H: 4ch/line MSB first
15	O	I	256WCI	System Clock (256×Fs, to IO)	-
16	-	-	GND	GND	-
17	I	O	256FSO	System Clock (256×Fs, from IO)	-
18	I	O	MUTE	Mute Control (from IO)	L: Release, H: Mute
19	I	O	/RES	Reset Control (from IO)	L: Reset, H: Operate
20	I	O	SYNC	Sync Clock (from IO)	-

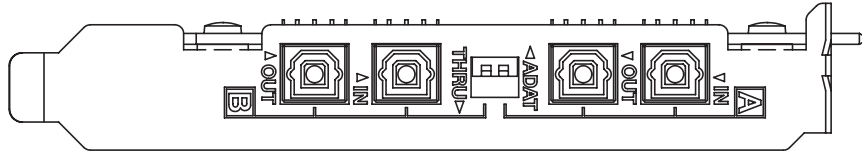
4.OTHERS

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
Sampling Frequency Range	External	40.013	-	50.880	kHz
Power Requirement	+5V	-	-	250	mA

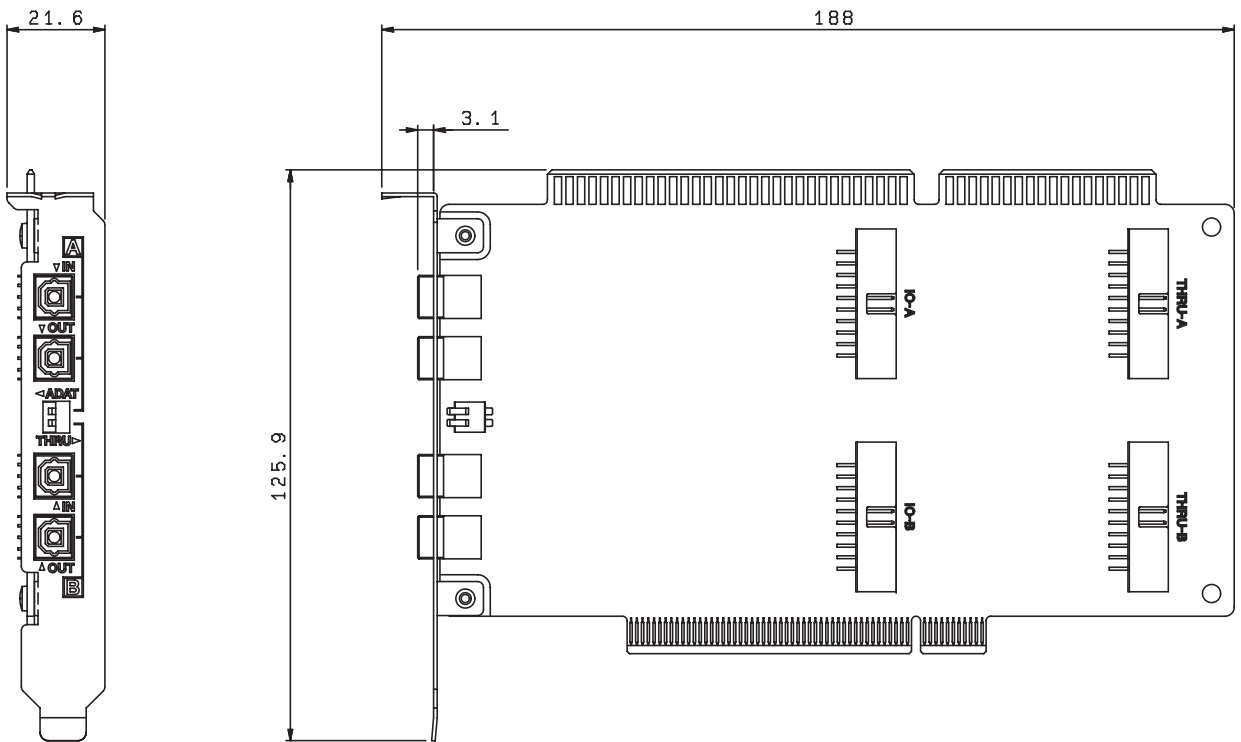
Environmental Temperature Operating Storage	+10°C ~ +35°C -20°C ~ +60°C
Mechanical Dimensions	Height: 125.9mm(PCI), 127.7mm(ISA) Length: 188mm Depth: 21.6mm
Net Weight	120g
Accessory	•Bracket for ISA×1 •20P Cable×2*1

NOTE*1 Connection for IO, THRU(Connector: MIL-C-83503)

PANEL LAYOUT



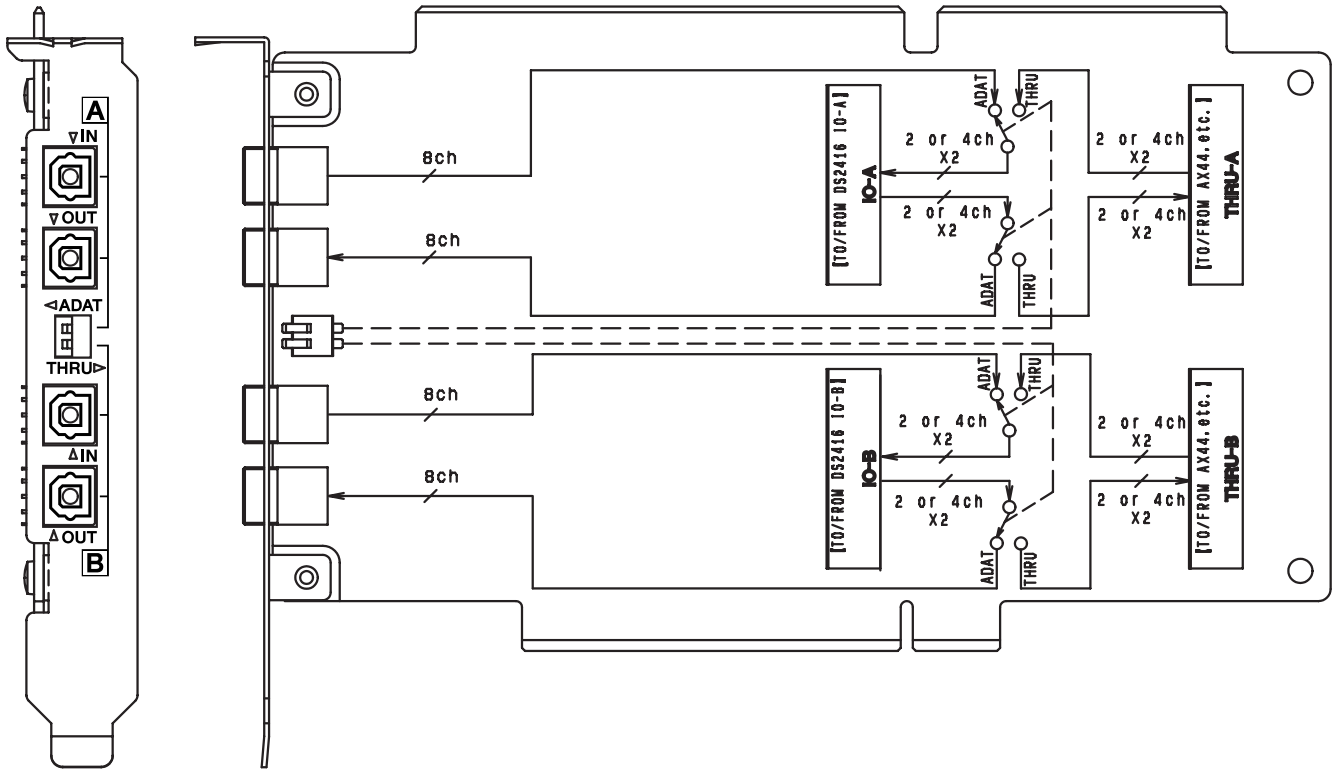
DIMENSIONS



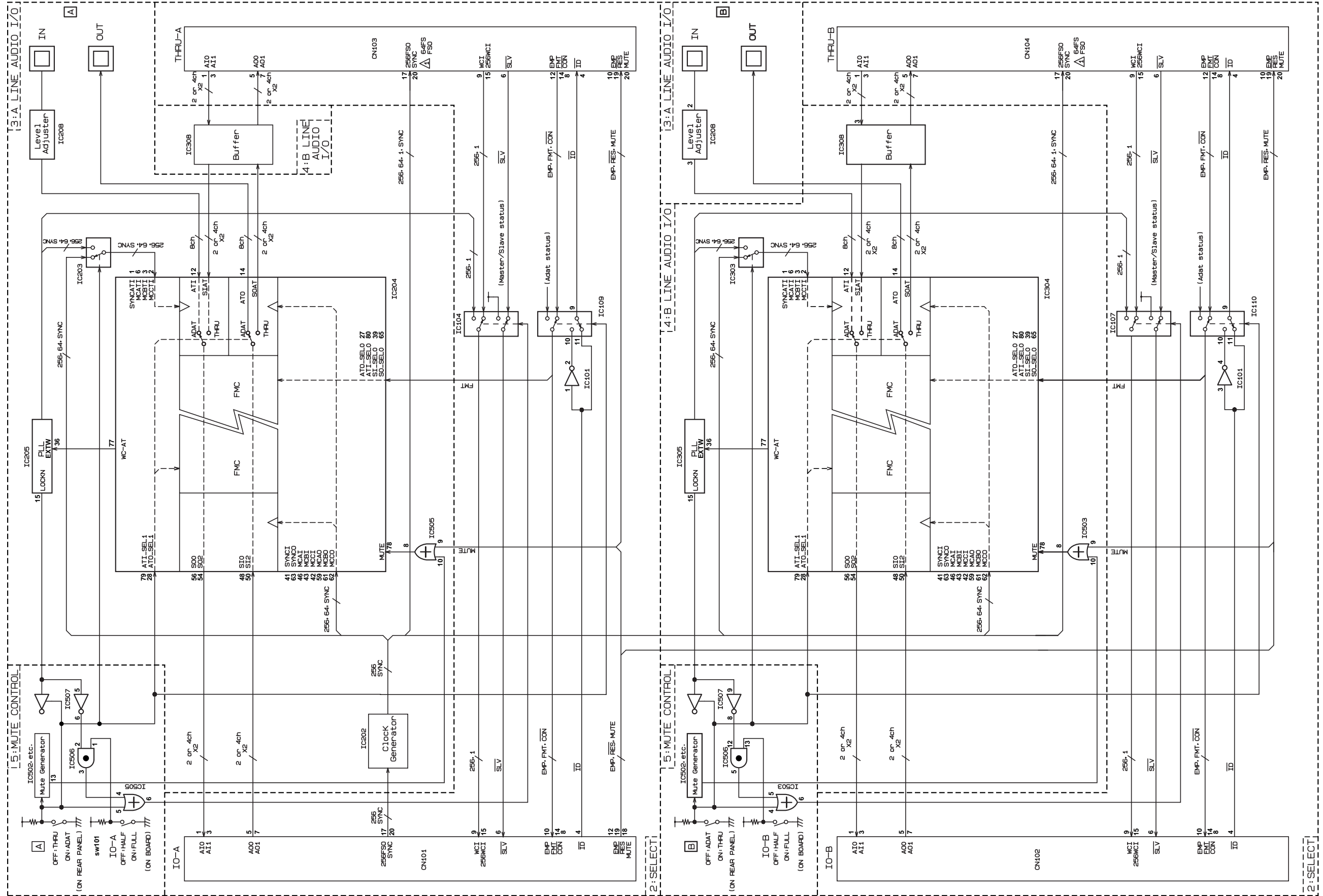
Unit : mm

■ BLOCK DIAGRAM

● Routing



Hardware



LSI PIN DESCRIPTION

SGH609080F-47F (XU235A00) ATSC

PIN No.	NAME	I/O	FUNCTION	PIN No.	NAME	I/O	FUNCTION
1	syncati	I	Synch. word input terminal for ati,siat3-0 input	41	synci	I	Synch. word input terminal for si3-0 input
2	mccti	I	64fs clock input terminal for ati, siat3-0 input	42	mcci	I	64fs clock input terminal for si3-0 input
3	mcbti	I	128fs clock input terminal for ati,siat3-0 input	43	mcbi	I	128fs clock input terminal for si3-0 input
4	VCC		Power supply (+5V)	44	VCC		Power supply (+5V)
5	GND		Ground	45	GND		ground
6	mcati	I	256fs clock input terminal for ati,siat3-0 input	46	mcai	I	256fs clock input terminal for si3-0 input
7	GND		Ground	47	GND		ground
8	siat0	I	serial data input terminal	48	si0	I	serial data input terminal
9	siat1	I		49	si1	I	
10	siat2	I		50	si2	I	
11	siat3	I		51	si3	I	
12	ati	I	optical input terminal	52	GND		ground
13	GND			53	so3	O	
14	ato	O	optical output terminal	54	so2	O	serial data output terminal
15	soat3	O	serial data output terminal	55	so1	O	
16	soat2	O		56	so0	O	
17	soat1	O		57	VCC		Power supply (+5V)
18	soat0	O	58	GND		ground	
19	VCC		Power supply (+5V)	59	mcao	I	256fs clock input terminal for so3-0 output
20	GND		Ground	60	GND		ground
21	mcato	I	256fs clock input terminal for ato,soat3-0 output	61	mcbo	I	128fs clock input terminal for so3-0 output
22	GND		ground	62	mcco	I	64fs clock input terminal for so3-0 output
23	mcbito	I	128fs clock input terminal for ato,soat3-0 output	63	synco	I	Synch. word input terminal for so3-0 output
24	mccto	I	64fs clock input terminal for ato,soat3-0 output	64	so-sel1	I	format select terminal for soat3-0 output
25	syncato	I	Synch. word input terminal for ato,soat3-0 output	65	so-sel0	I	format select terminal for soat3-0 output
26	clkssel	I	clock select terminal for ato,soat3-0 output 0:mcato,mcbito,mccto,syncato 1:mcai,mcbi,mcci,synci	66	uo3	O	u-bit output terminal for optical output
27	ato-sel0	I	format select terminal for ato, soat3-0 output	67	uo2	O	
28	ato-sel1	I	format select terminal for ato, soat3-0 output	68	uo1	O	
29	bitsel2	I	bit shift select terminal for the ato output	69	uo0	O	synch. detect output terminal 1
30	bitsel1	I		70	ext-sync1	O	
31	bitsel0	I		71	VCC		
32	VCC		72	GND		ground	
33	GND		ground	73	clk	I	clock input terminal for word clock extract
34	ext-sync2	O	synch. detect output terminal 2	74	GND		ground
35	ui0	I	u-bit input terminal for optical output	75	/res	I	system reset input terminal
36	ui1	I		76	GND		ground
37	ui2	I		77	wc-at	O	word clock output terminal
38	ui3	I	78	mute	I	data mute input terminal	
39	si-sel0	I	input format select terminal for si3-0	79	ati-sel1	I	input format select terminal for ati,siat3-0.
40	si-sel1	I	input format select terminal for si3-0i	80	ati-sel0	I	input format select terminal for ati,siat3-0.

0	1	ato	output format
0	0	soat0	(8ch/line)
0	1	soat2,0	(4ch/line)
0	0	soat3-0	(2ch/line)

si sel1	si sel0	input format
1	1	not enable to set
1	0	si0 (8ch/line)
0	1	si2,0 (4ch/line)
0	0	si3-0 (2ch/line)

so sel1	so sel0	input format
1	1	not enable to set
1	0	so0 (8ch/line)
0	1	so2,0 (4ch/line)
0	0	so3-0 (2ch/line)

ati sel1	ati sel0	input format
1	1	ati
1	0	ati0 (8ch/line)
0	1	ati2,0 (4ch/line)
0	0	ati3-0 (2ch/line)

YM3436 (XG948A00) DIR2 (Digital Format Interface)

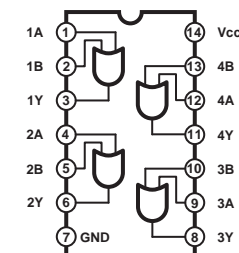
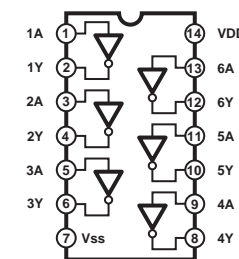
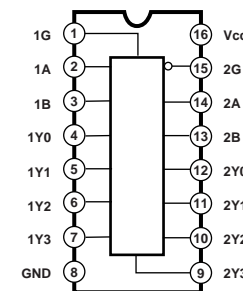
PIN No.	NAME	I/O	FUNCTION	PIN No.	NAME	I/O	FUNCTION
1	DAUX	I	Auxiliary input for audio data	23	RSTN	I	System reset input
2	HDLT	O	Asynchronous buffer operation flag	24	Vdda		VCO section power (+5V)
3	DOUT	O	Audio data output	25	CTLN	I	VCO control input N
4	VFL	O	Parity flag output	26	PCO	O	PLL phase comparison output
5	OPT	O	Fs × 1 Synchronous output signal for DAC	27	(NC)		VCO control input P
6	SYNC	O	Fs × 1 Synchronous output signal for DSP	28	CTLP	I	
7	MCC	O	Fs × 64 Bit clock output	29	Vssa		VCO section power (GND)
8	WC	O	Fs × 1 Word clock output	30	TSTN	I	Test terminal. Open for normal use
9	MCB	O	Fs × 128 Bit clock output	31	KM2	I	Clock mode switching input 2
10	MCA	O	Fs × 256 Bit clock output	32	KM0	I	Clock mode switching input 0
11	SKSY	I	Clock Synchronous control input	33	FS1	O	Channel status sampling frequency display output 1
12	XI	I	Crystal oscillator connection or external clock input	34	FS0	O	Channel status sampling frequency display output 0
13	XO	O	Crystal oscillator connector	35	CSM	I	Channel status output method selection
14	P256	O	VCO oscillating clock connection	36	EXTW	I	External synchronous auxiliary input word clock
15	LOCK	O	PLL lock flag	37	DDIN	I	EIAJ (AES/EBU) data input
16	Vss		Logic section power	38	LR	O	PLL word clock output
17	TC	O	PLL time constant switching output	39	Vdd		Logic section power (+5V)
18	DIM1	I	Data input mode selection	40	ERR	O	Data error flag output
19	DIM0	I	Data input mode selection	41	EMP	O	Channel status emphasis control code output
20	DOM1	I	Data output mode selection	42	CD0	O	3-wire type microcomputer interface data output
21	DOM0	I	Data output mode selection	43	CCK	I	3-wire type microcomputer interface clock input
22	KM1	I	Clock mode switching input 1	44	CLD	I	3-wire type microcomputer interface load input

IC BLOCK DIAGRAM

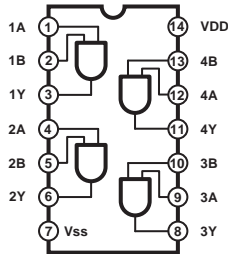
TC74VHC157F(EL) (XT475A00)
MULTIPLEXER
IC104,107,109,110,203,303

TC74HC04AF (XS993A00)
SN74HCU04NSR (XC723A00)
INVERTER
IC101,206,507

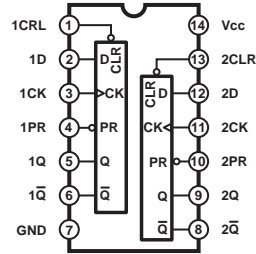
TC74VHC32F-TEL (XR337A00)
OR
IC503,505



- **SN74HC08NSR** (XD831A00)
AND
IC506

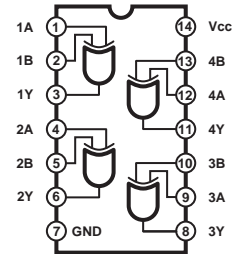


- **SN74HC74NSR** (XC726A00)
D-FF
IC207,307,504

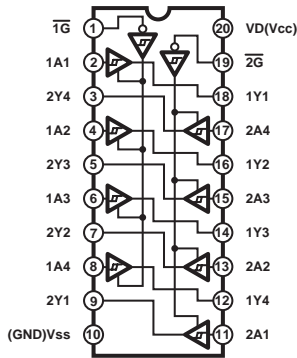


INPUTS				OUTPUTS	
PR	CLR	CLK	D	Q	Q
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H	H
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q _o	Q _o

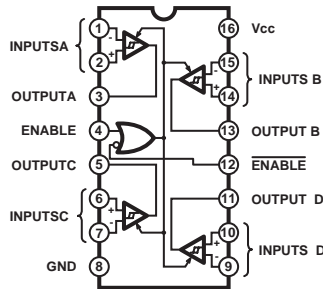
- **SN74HC86NSR** (XM022A00)
EX-OR
IC501



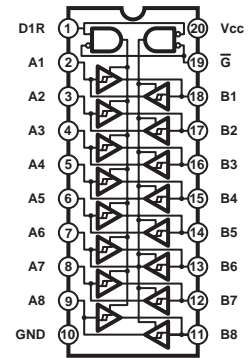
- **TC74VHC244F** (XT800A00)
BUS BUFFER
IC308



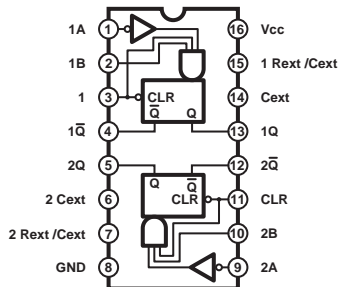
- **DS26C32ATMX** (XT475A00)
LINE RECEIV
IC208



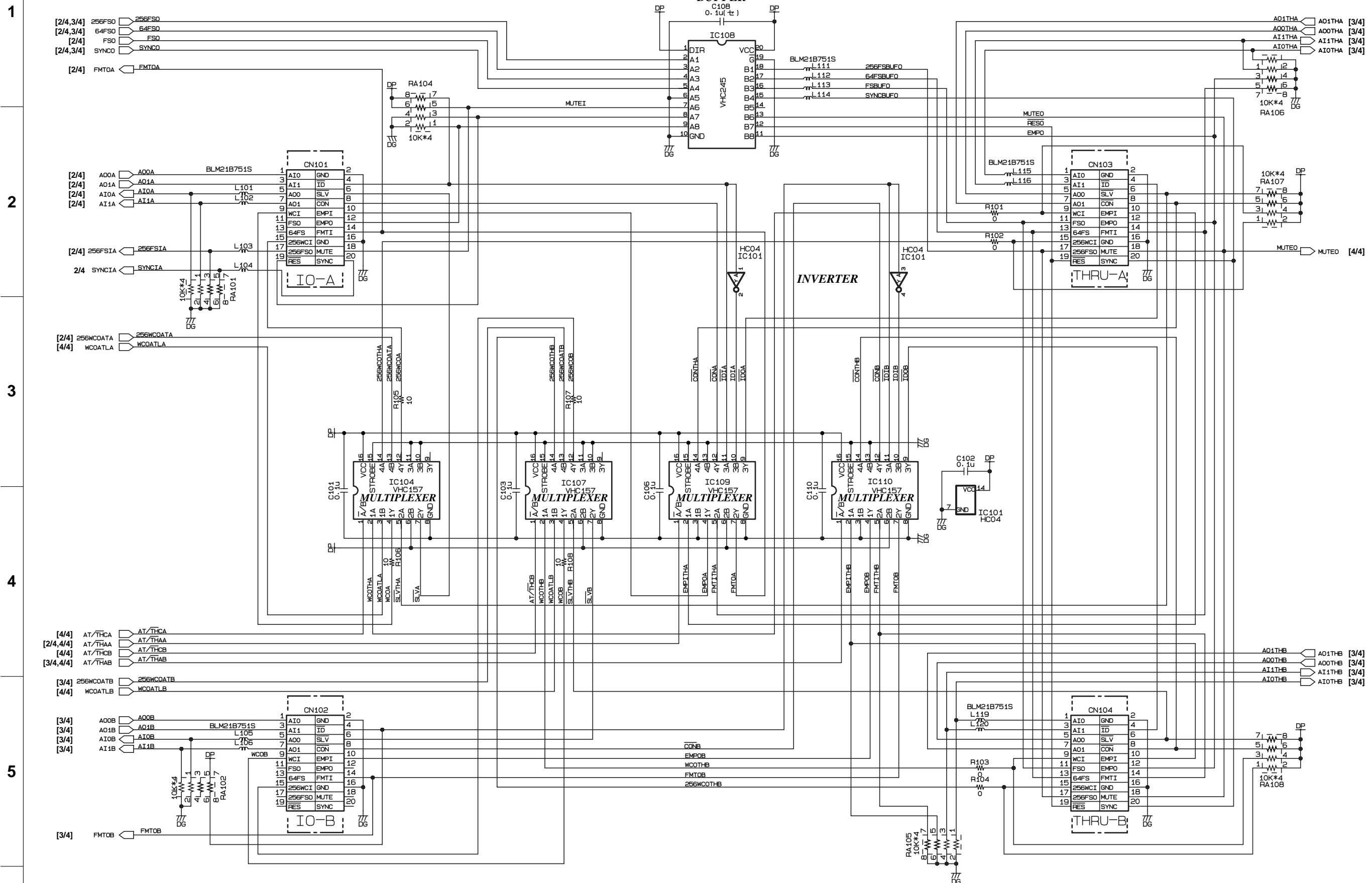
- **TC74VHC245F** (XT487A00)
LINE RECEIV
IC108



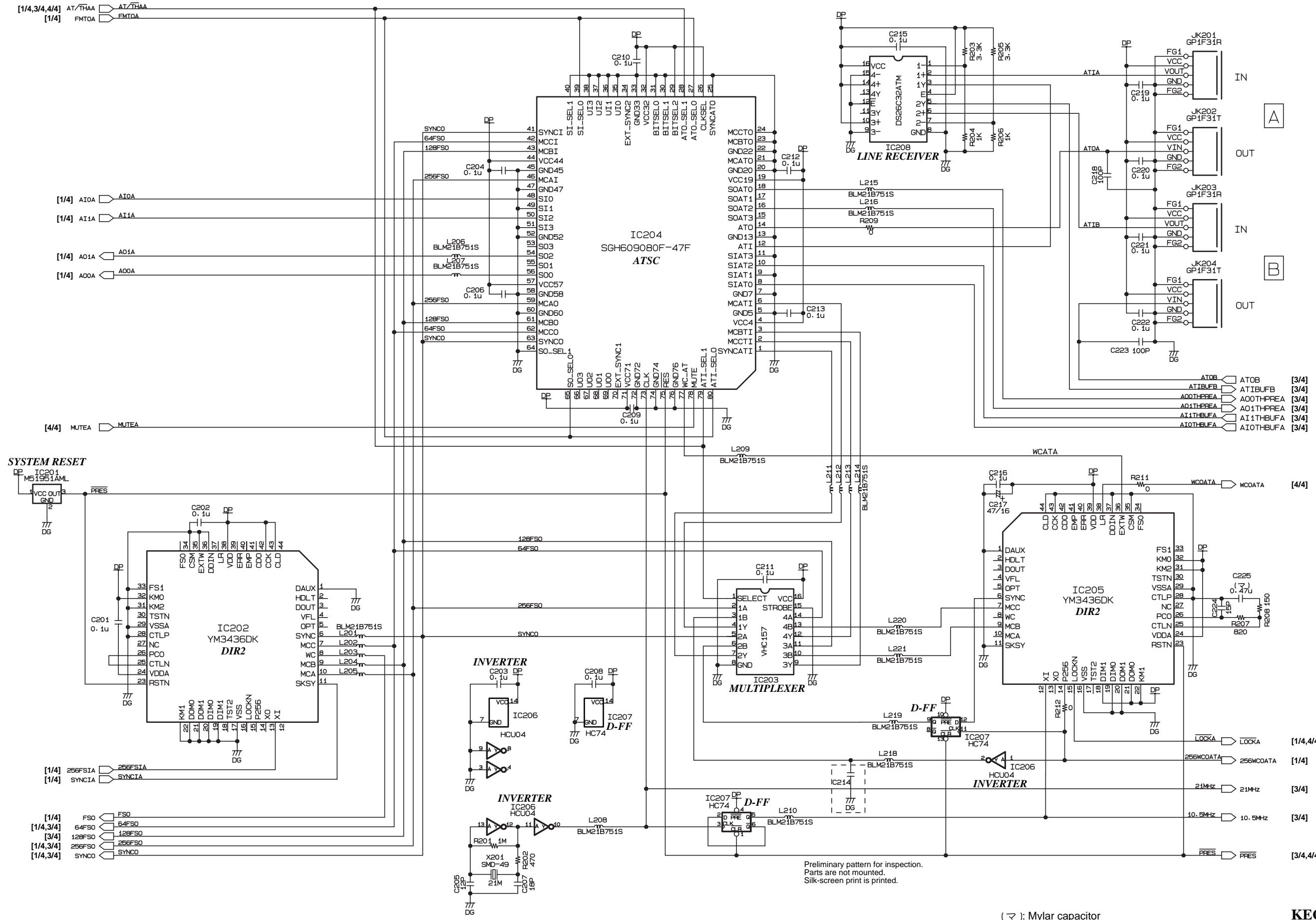
- **HD74HC123AFPTR** (XL106A00)
- **TC74HC123AF** (XN242A00)
SINGLE SHOT
IC502



OVERALL CIRCUIT DIAGRAM 1/4



OVERALL CIRCUIT DIAGARM 2/4



Preliminary pattern for inspection.
Parts are not mounted.
Silk-screen print is printed.

(M): Mylar capacitor

OVERALL CIRCUIT DIAGARM 3/4

1

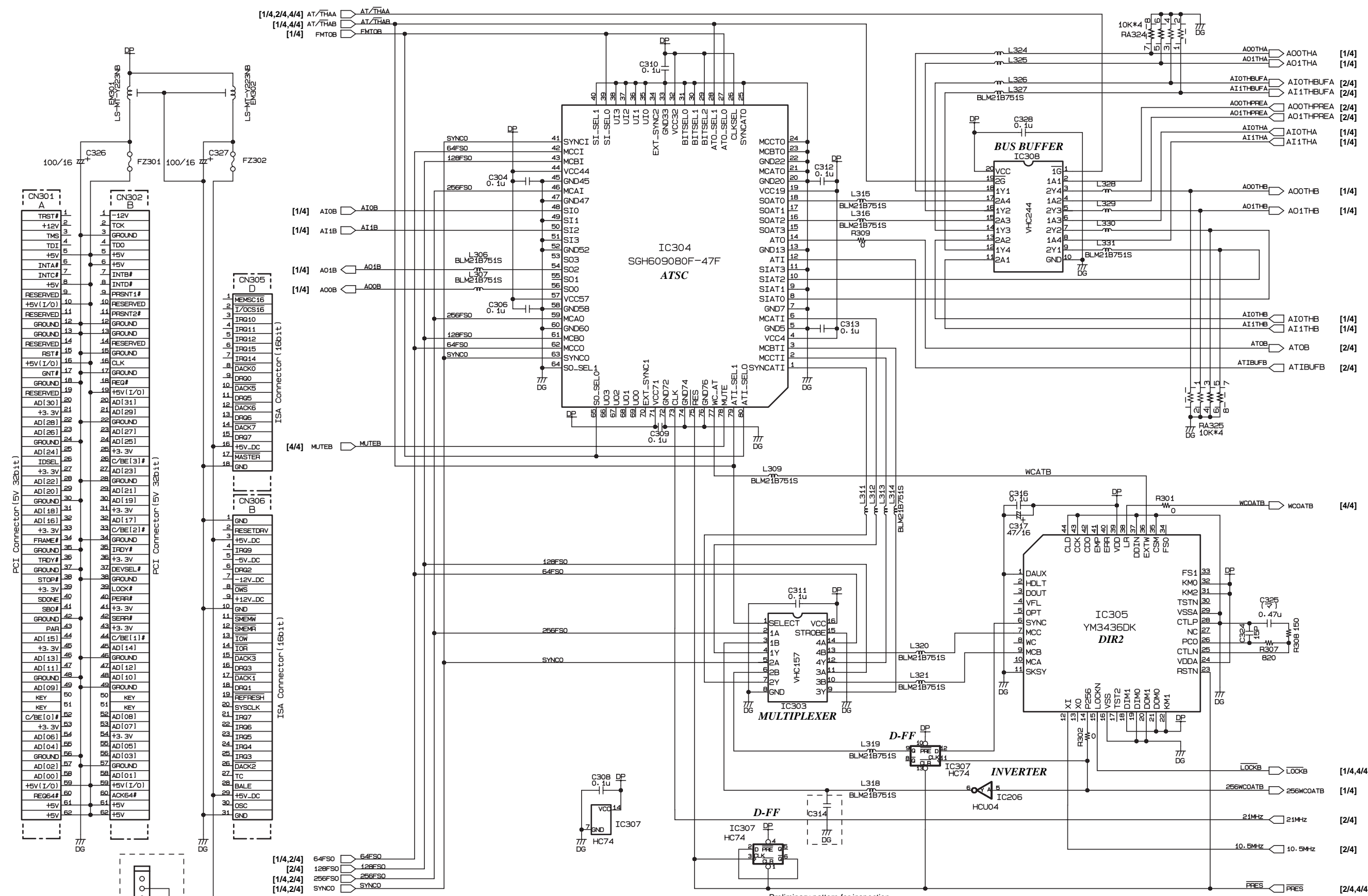
2

3

4

5

6

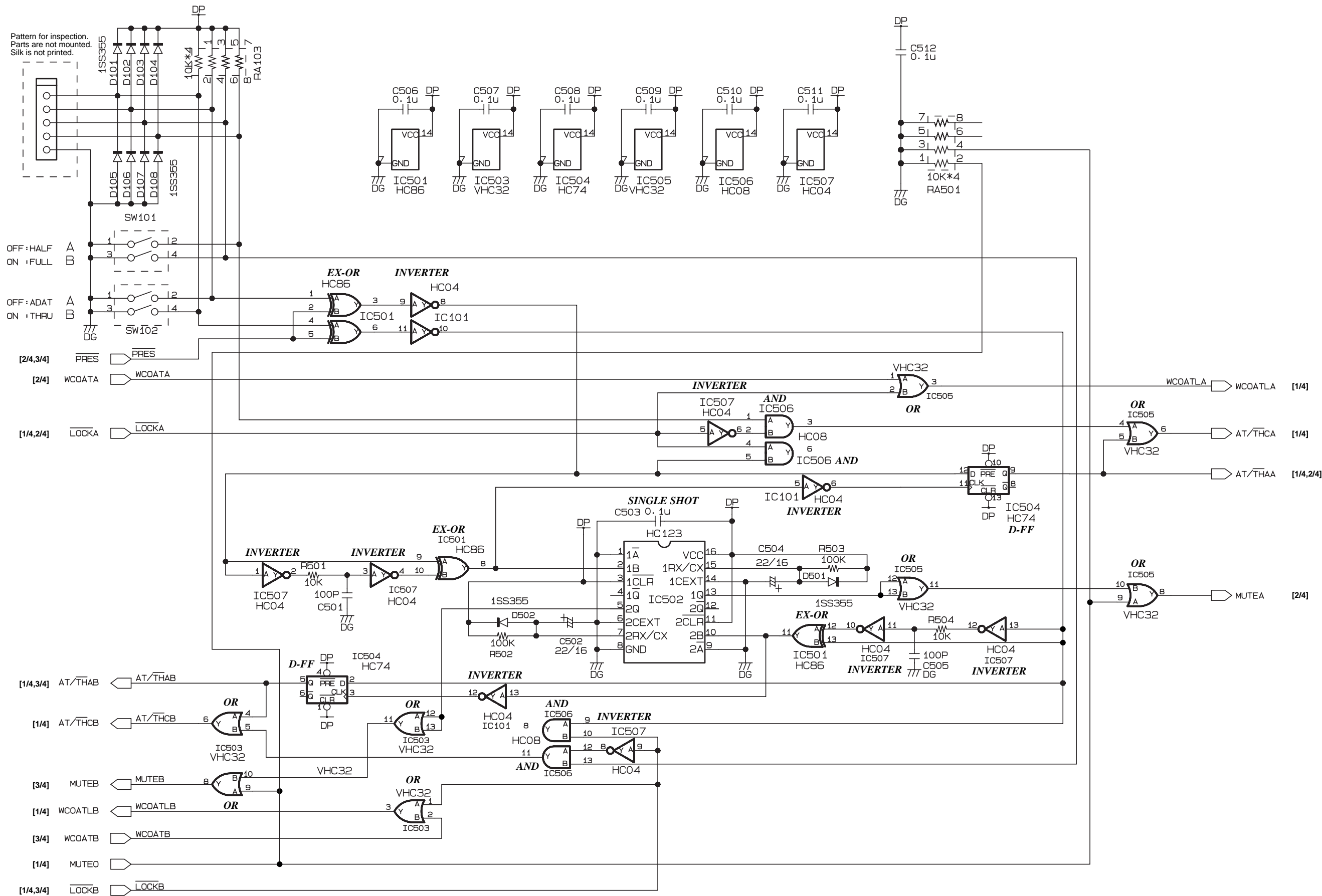


KEC-92372 Pattern for inspection. Parts are not mounted. Only 1 pin is printed on silk-screen print.

Preliminary pattern for inspection. Parts are not mounted. Silk-screen print is printed.

(M): Mylar capacitor

OVERALL CIRCUIT DIAGARM 4/4



AUDIO EXPANSION CARD

AX16-AT

PARTS LIST

■ CONTENTS


OVERALL ASSEMBLY	2
ELECTRICAL PARTS	3

Notes: DESTINATION ABBREVIATIONS

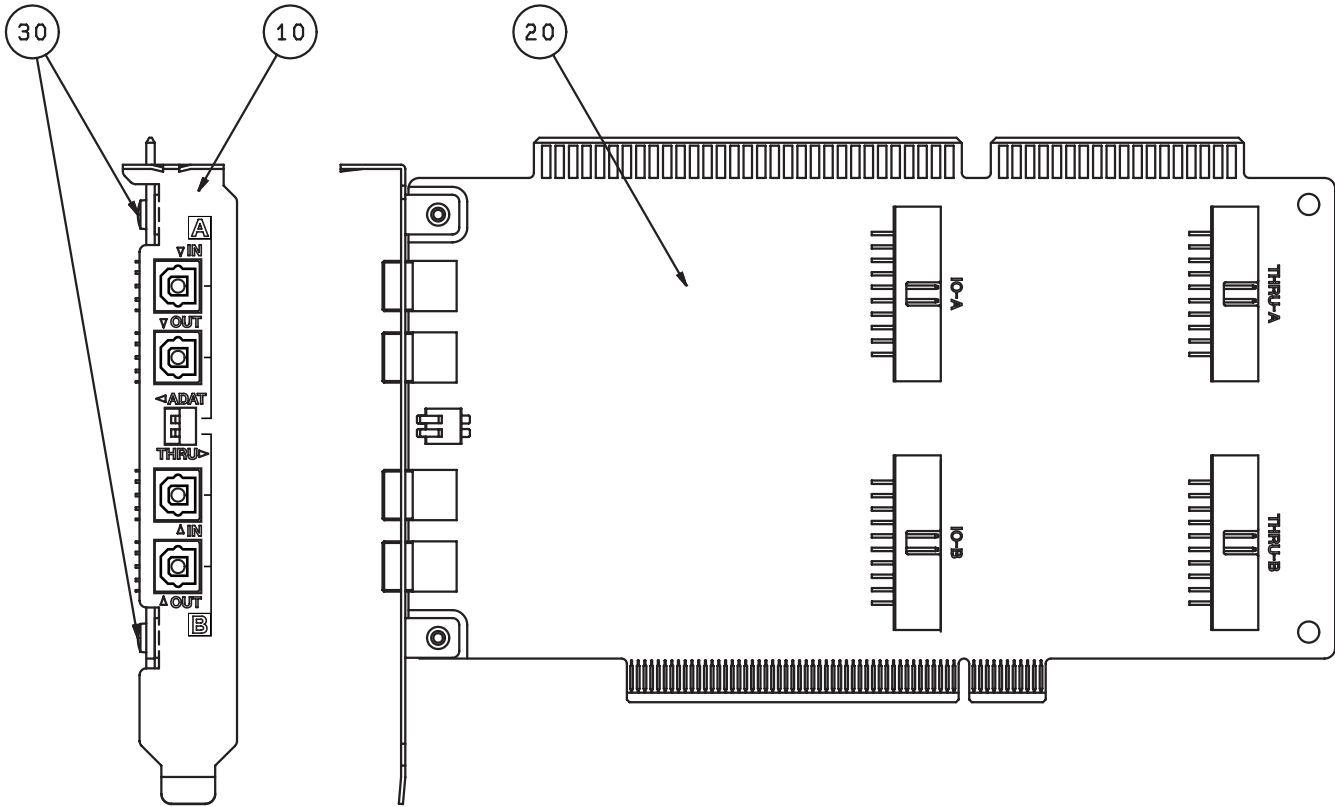
A : Australian model	J : Japanese model
B : British model	U : U.S. model
C : Canadian model	V : General export model (110V)
E : European model	W : General export model (220V)
H : North European model	X : General export model
I : Indonesian model	Y : Export model

- The numbers in "QTY" shows quantities for each unit.
- The parts with "--" in "Parts No." are not available as spare parts.
- The mark "}" in the remarks column indicates that these parts are interchangeable.

■ WARINIG

Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.

OVERALL ASSEMBLY



REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
	--	OVERALL ASSEMBLY	AX16-AT	AX16-AT (V327420)		
* 10	V3274500	Blacket				
* 20	V3231800	Circuit Board	AT	(XV711B0)		
* 30	EG320070	Bind Head Screw	2.6X6 MFZN2Y		2	01
		ACCESSORIES		AX16-AT		
*	V3274700	Blacket				
*	V2226400	Flat Cable Assembly	RXS20P-RXS20P 400L			09
*	V2590300	Ferrite Core	SSC-33.5-12			

ELECTRICAL PARTS

REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK
		ELECTRICAL PARTS	AX16-AT		
		Circuit Board	AT (XV711B0)		
* C101	V3231800	Monolithic Ceramic Cap.	F 0.100 25V Z		01
-103	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C106	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C108	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C110	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C201	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
-204	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C205	UB051120	Monolithic Ceramic Cap.	SL 12P 50V J		01
C206	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C207	UB051180	Monolithic Ceramic Cap.	SL 18P 50V J		01
C208	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
-213	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C215	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C216	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C217	UF037470	Electrolytic Cap. (chip)	47 16V		01
C217	UG037470	Electrolytic Cap. (chip)	47UF 16V		01
C218	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J		01
C219	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
-222	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C223	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J		01
C224	UB051150	Monolithic Ceramic Cap.	SL 15P 50V J		01
C225	VY846100	Mylar Cap. (chip)	0.4700 16V J		02
C304	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C306	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C308	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
-313	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C316	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C317	UF037470	Electrolytic Cap. (chip)	47 16V		01
C317	UG037470	Electrolytic Cap. (chip)	47UF 16V		01
C324	UB051150	Monolithic Ceramic Cap.	SL 15P 50V J		01
C325	VY846100	Mylar Cap. (chip)	0.4700 16V J		02
C326	UF038100	Electrolytic Cap.(chip)	100 16V		01
C326	UG038100	Electrolytic Cap.(chip)	100UF 16V		01
C327	UF038100	Electrolytic Cap.(chip)	100 16V		01
C327	UG038100	Electrolytic Cap.(chip)	100UF 16V		01
C328	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C501	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J		01
C502	UF037220	Electrolytic Cap.	22 16V		01
C502	UG037220	Electrolytic Cap.	22UF 16V		01
C503	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
C504	UF037220	Electrolytic Cap. (chip)	22 16V		01
C504	UG037220	Electrolytic Cap. (chip)	22UF 16V		01
C505	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J		01
C506	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
-511	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z		01
GN101	VZ197600	Header	9032B 20P SE		02
-104	VZ197600	Header	9032B 20P SE		02
D101	VT332900	Diode	1SS355 TE-17		01
-108	VT332900	Diode	1SS355 TE-17		01
D501	VT332900	Diode	1SS355 TE-17		01
D502	VT332900	Diode	1SS355 TE-17		01
EM301	FZ006970	LC Filter	LS MT Y223NB		02
EM302	FZ006970	LC Filter	LS MT Y223NB		02
* FZ301	V3260600	Poly-Switch	MINISMD035-2 SMD		
* FZ302	V3260600	Poly-Switch	MINISMD035-2 SMD		
IC101	XS993A00	IC	TC74HC04AF	INVERTER	01
IC104	XT475A00	IC	TC74VHC157F(EL)	MULTIPLEXER	02
IC107	XT475A00	IC	TC74VHC157F(EL)	MULTIPLEXER	02
IC108	XT487A00	IC	TC74VHC245F	BUFFER	03
IC109	XT475A00	IC	TC74VHC157F(EL)	MULTIPLEXER	02
IC110	XT475A00	IC	TC74VHC157F(EL)	MULTIPLEXER	02
IC201	XR063A00	IC	M51951AML	SYSTEM RESET	02
IC202	XG948E00	IC	YM3436DK	DIR2	11
IC203	XT475A00	IC	TC74VHC157F(EL)	MULTIPLEXER	02
IC204	XU235A00	IC	SGH609080F-47F	ATSC	10
IC205	XG948E00	IC	YM3436DK	DIR2	11
IC206	XC723A00	IC	SN74HCU04NSR	INVERTER	01
IC207	XC726A00	IC	SN74HC74NSR	D-FF	01

*: New parts

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REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK
IC208	XU815A00	C	DS26C32ATMX		06
IC303	XT475A00	IC	TC74VHC157F(EL)	LINE RECEIVER	02
IC304	XU235A00	IC	SGH609080F-47F	MULTIPLEXER	10
IC305	XG948E00	IC	YM3436DK	ATSC	11
IC307	XC726A00	IC	SN74HC74NSR	DIR2	01
* IC308	XT800A00	IC	TC74VHC244F	D-FF	
IC501	XM022A00	IC	SN74HC86NSR	BUS BUFFER	01
IC502	XL106A00	IC	HD74HC123AFPTR	EX-OR	02
IC502	XN242A00	IC	TC74HC123AF	} SINGLE SHOT	02
IC503	XR337A00	IC	TC74VHC32F-TEL		OR
IC504	XC726A00	IC	SN74HC74NSR	D-FF	01
IC505	XR337A00	IC	TC74VHC32F-TEL	OR	01
IC506	XD831A00	IC	SN74HC08NSR	AND	01
IC507	XS993A00	IC	TC74HC04AF	INVERTER	01
* JK201	V3176700	Optical Fiber	1P GP1F31R		
* -204	V3176600	Optical Fiber	1P GP1F31T		
L101	VS740100	Chip Inductance	BLM21B751S 2125		03
-106	VS740100	Chip Inductance	BLM21B751S 2125		03
L111	VS740100	Chip Inductance	BLM21B751S 2125		03
-116	VS740100	Chip Inductance	BLM21B751S 2125		03
L119	VS740100	Chip Inductance	BLM21B751S 2125		03
L120	VS740100	Chip Inductance	BLM21B751S 2125		03
L201	VS740100	Chip Inductance	BLM21B751S 2125		03
-216	VS740100	Chip Inductance	BLM21B751S 2125		03
L218	VS740100	Chip Inductance	BLM21B751S 2125		03
-221	VS740100	Chip Inductance	BLM21B751S 2125		03
L306	VS740100	Chip Inductance	BLM21B751S 2125		03
L307	VS740100	Chip Inductance	BLM21B751S 2125		03
L309	VS740100	Chip Inductance	BLM21B751S 2125		03
L311	VS740100	Chip Inductance	BLM21B751S 2125		03
-316	VS740100	Chip Inductance	BLM21B751S 2125		03
L318	VS740100	Chip Inductance	BLM21B751S 2125		03
-321	VS740100	Chip Inductance	BLM21B751S 2125		03
L324	VS740100	Chip Inductance	BLM21B751S 2125		03
-331	VS740100	Chip Inductance	BLM21B751S 2125		03
R101	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
-104	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R105	RD254100	Carbon Resistor (chip)	10.0 0.1 J		01
-108	RD254100	Carbon Resistor (chip)	10.0 0.1 J		01
R201	RD259100	Carbon Resistor (chip)	1.0M 0.1 J		01
R202	RD255470	Carbon Resistor (chip)	470.0 0.1 J		01
R203	RD256330	Carbon Resistor (chip)	3.3K 0.1 J		01
R204	RD256100	Carbon Resistor (chip)	1.0K 0.1 J		01
R205	RD256330	Carbon Resistor (chip)	3.3K 0.1 J		01
R206	RD256100	Carbon Resistor (chip)	1.0K 0.1 J		01
R207	RD255820	Carbon Resistor (chip)	820.0 0.1 J		01
R208	RD255150	Carbon Resistor (chip)	150.0 0.1 J		01
R209	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R211	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R212	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R301	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R302	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R307	RD255820	Carbon Resistor (chip)	820.0 0.1 J		01
R308	RD255150	Carbon Resistor (chip)	150.0 0.1 J		01
R309	RD250000	Carbon Resistor (chip)	0.0 0.0 J		01
R501	RD257100	Carbon Resistor (chip)	10.0K 0.1 J		01
R502	RD258100	Carbon Resistor (chip)	100.0K 0.1 J		01
R503	RD258100	Carbon Resistor (chip)	100.0K 0.1 J		01
R504	RD257100	Carbon Resistor (chip)	10.0K 0.1 J		01
RA101	RE047100	Resistor Array	10KX4		01
-108	RE047100	Resistor Array	10KX4		01
RA324	RE047100	Resistor Array	10KX4		01
RA325	RE047100	Resistor Array	10KX4		01
RA501	RE047100	Resistor Array	10KX4		01
* SW101	V3622100	Dip-Switch	SMS502-E		
* SW102	V3589300	Dip-Switch	DPS802		
* X201	V3232900	Quartz Crystal Unit	21M SMD-49 12PF		

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