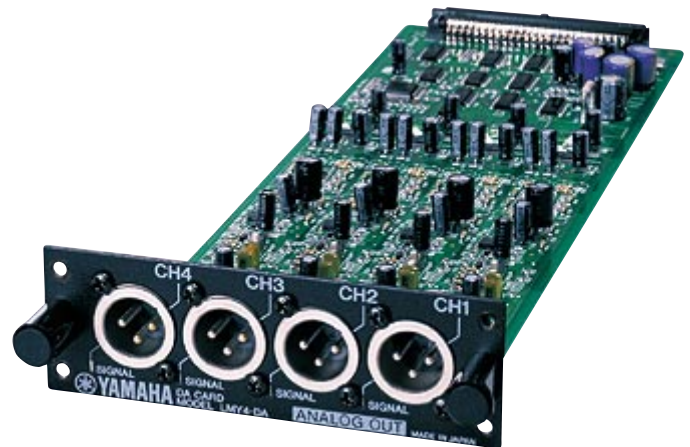


# DA CARD LMY4-DA

## SERVICE MANUAL



### ■ CONTENT

NOTICE OF CHANGES IN LMY4-DA S/M .....	3
SPECIFICATIONS .....	4
PANEL LAYOUT .....	4
DIMENSIONS .....	4
BLOCK DIAGRAM .....	5
LSI PIN DESCRIPTION .....	6
IC BLOCK DIAGRAM .....	7
CIRCUIT BOARD .....	8
TEST PROGRAM .....	10
PARTS LIST	
OVERALL CIRCUIT BOARD	

### 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 your body may have accumulated by grounding yourself to the ground bus in the unit (heavy gauge black wires connect to this bus).

**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.

## ■ NOTICE OF CHANGES IN LMY4-DA S/M

### ● IC BLOCK DIAGRAM

Logic IC HD74LV245AFPEL (IS024500) is changed to Logic IC 74VHC245SJX (XY874A00)

### TEST PROGRAM

- Test program is newly provided. (Page 10)

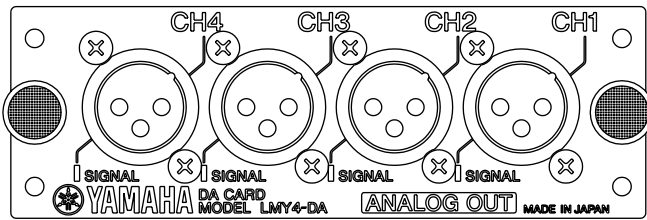
## ■ SPECIFICATIONS

Output Terminals	GAIN switch	Actual Source Impedance	For Use With Nominal	Output Level		Connector
				Nominal	Maximum. Before Clip	
CH 1-4	+24 dB	150ohm	600ohm Lines	+10 dB (2.45 V)*	+24 dB (12.3 V)*	XLR-3-32 type (Balanced)**
	+18 dB			+4 dB (1.23 V)*	+18 dB (6.16 V)*	
	+15 dB			+1 dB (870 mV)*	+15 dB (4.36 V)*	

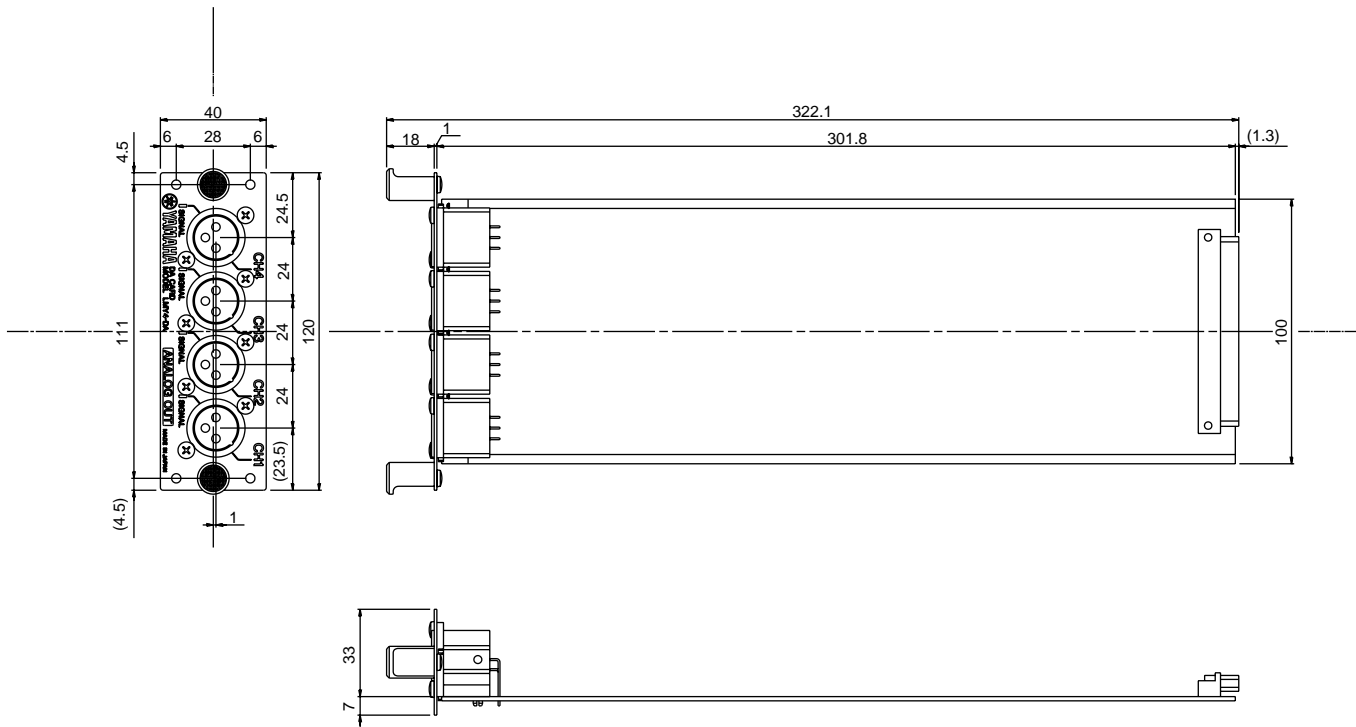
\* 0 dB is referenced to 0.775 Vrms.

\*\* 1=GND, 2=HOT, 3=COLD

## ■ PANEL LAYOUT

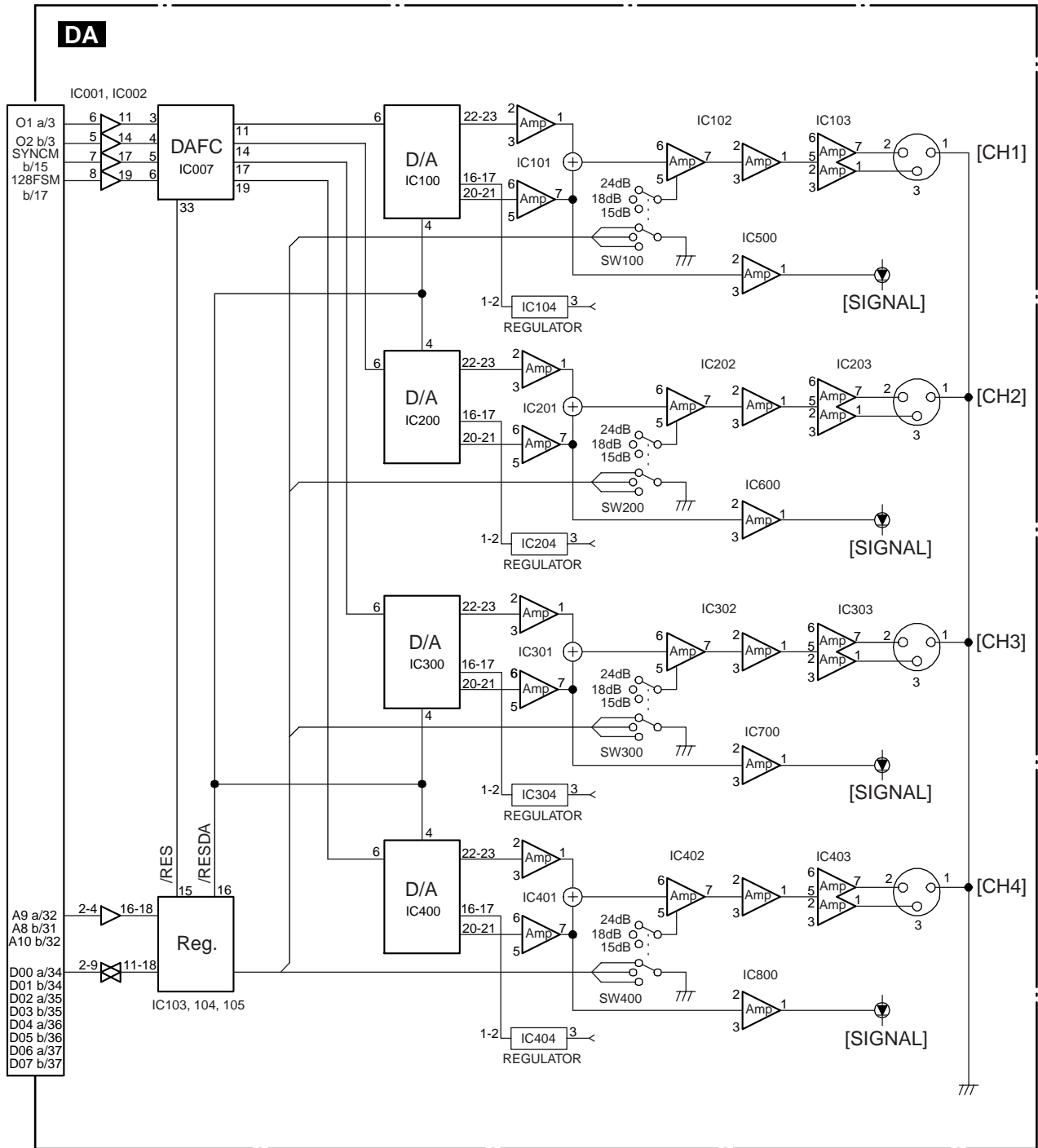


## ■ DIMENSIONS



Unit: mm

# ■ BLOCK DIAGRAM



## LSI PIN DESCRIPTION

### AK4393-VF-E2 (XW029A00) D/A CONVERTER

DA: IC100,200,300,400

PIN No.	NAME	I/O	FUNCTION	PIN No.	NAME	I/O	FUNCTION
1	DVSS	-	Digital Ground Pin	15	BVSS	I	Substrate Ground Pin, 0V
2	DVDD	-	Digital Power Supply Pin, 3.3V or 5.0V	16	VREFL	I	Low Level Voltage Reference Input Pin
3	MCLK	I	Master Clock Input Pin	17	VREFH	-	High Level Voltage Reference Input Pin
4	PD	I	Power-Down Mode Pin When at "L", the Ak4393 is in power-down mode and is held in reset. The AK4393 should always be reset upon power-up.	18	AVDD	-	Analog Power Supply Pin, 5V
5	BICK	I	Audio Serial Data Clock Pin The clock of 64fs or more than is recommended to be input on this pin.	19	AVSS	O	Analog Ground Pin, 0V
6	SDATA	I	Audio Serial Data Input Pin 2's complement MSB-first data is input on this pin.	20	AOUTR-	O	Rch Negative analog output Pin
7	LRCK	I	L/R Clock Pin	21	AOUTR+	O	Rch Positive analog output Pin
8	SMUTE	I	Soft Mute Pin When this pin goes "H", soft mute cycle is initiated. When returning "L", the output mute releases.	22	AOUTL-	O	Lch Negative analog output Pin
9	$\overline{CS}$	I	Chip Select Pin in serial mode	23	AOUTL+	O	Lch Positive analog output Pin
	DFS	I	Double speed sampling mode Pin (Internal pull-down pin) "L": Normal Speed, "H": Double Speed	24	VCOM	O	Common Voltage Output Pin, 2.6V
10	DEM0	I	De-emphasis Enable pin	25	P/ $\overline{S}$	I	Parallel/Serial Select Pin (Internal pull-up pin) "L": Serial control mode, "H": Parallel control mode
	CCLK	I	Control Data Clock Pin in serial mode	26	CKS0	I	Master Clock Select Pin
11	DEM1	I	De-emphasis Enable pin	27	CKS1	I	
	CDTI	I	Control Data Input Pin in serial mode	28	CKS2	I	
12	DIF0	I	Digital Input Format Pin				
13	DIF1	I					
14	DIF2	I					

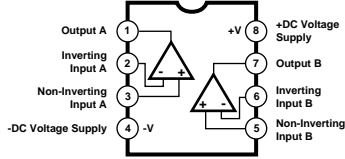
### YSZ914B-F (XY080A00) DAFC

DA: IC007

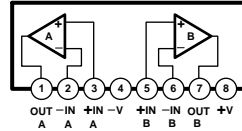
PIN No.	NAME	I/O	FUNCTION	PIN No.	NAME	I/O	FUNCTION
1	VDD		System power supply 5v/3.3V	23	MUTE3	O	ch3 Hi level mute output
2	VSS		System ground	24	VDD		System power supply 5v/3.3V
3	SI1	I	Serial input (ch2, 3)	25	VSS		System ground
4	SI0	I	Serial input (ch0, 1)	26	FIX	I	Cross fade ON/OFF
5	SYNC/LR	I	Synchronous input	27	KM1	I	BCKI phase selection
6	BCKI	I	Bit clock input (system lock)	28	TEST	I	Normally not yet connected 0: test
7	128Fs	I	128Fs input	29	KM0	I	Setting of frame synchronization
8	VSS		IO ground	30	ISM	I	Setting of a number of channels for one input line
9	VDD		IO power supply 5v/3.3V	31	PRO	I	Setting of probit
10	MUTE0	O	ch0 Hi level mute output	32	LENG	I	Setting of word length for probit
11	SO0	O	ch0 serial output	33	RESET	I	Reset
12	VDD		System power supply 5v/3.3V	34	VSS		System ground
13	VSS		System ground	35	VDD		System power supply 5v/3.3v
14	SO1	O	ch1 serial output	36	IMOD0	I	Setting of input format
15	MUTE1	O	ch1 Hi level mute output	37	IMOD1	I	
16	MUTE2	O	ch2 Hi level mute output	38	IMOD2	I	
17	SO2	O	ch2 serial output	39	FS0	I	Setting of sampling rate
18	WCKO	O	Word clock of serial output	40	FS1	I	
19	SO3	O	ch3 serial output	41	GSEL0	I	Setting of floating gain
20	BCKO	O	Bit clock of serial output	42	GSEL1	I	
21	VSS		IO ground	43	OMOD0	I	Setting of output format
22	VDD		IO power supply 5v/3.3V	44	OMOD1	I	

## ■ IC BLOCK DIAGRAM

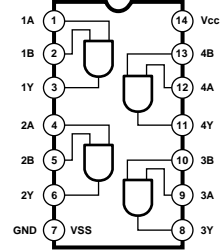
- **NJM2068MD-T1** (XJ553A00)  
Dual Operational Amplifier  
DA: IC101, 102, 201, 202, 301, 302, 401, 402, 500, 600, 700, 800



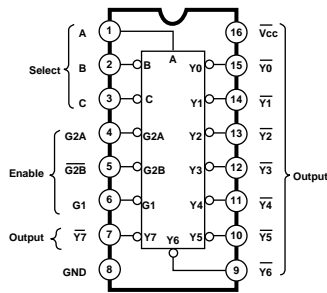
- **NJM4556AL** (XP844A00)  
Dual Operational Amplifier  
DA: IC103, 203, 303, 403



- **HD74LV08AFPEL** (IS000800)  
Quad 2 Input AND  
DA: IC010

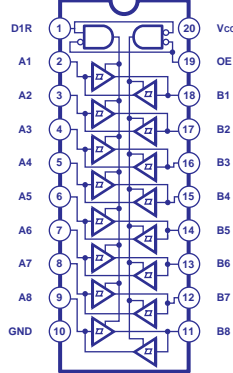


- **SN74LV138ANSR** (IS013810)  
DECODER  
DA: IC003

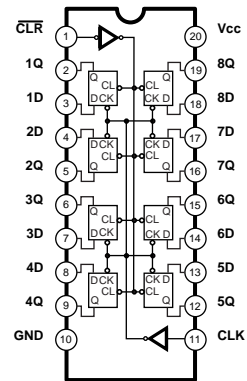


ENABLE INPUTS			SELECT INPUTS			OUTPUTS							
G1	G2A	G2B	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	X	H	H	H	H	H	H	H	H
X	X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	L	H	H	H	H	H	H
H	L	L	L	L	H	H	H	L	H	H	H	H	H
H	L	L	L	L	H	H	H	H	L	H	H	H	H
H	L	L	L	L	H	H	H	H	H	L	H	H	H
H	L	L	L	L	H	H	H	H	H	H	L	H	H
H	L	L	L	L	H	H	H	H	H	H	H	L	H
H	L	L	L	L	H	H	H	H	H	H	H	H	L

- **74VHC245SJX** (XY874A00)  
Octal 3-State Bus Buffer  
DA: IC001, 002, 004, 005, 008, 009



- **HD74LV273AFPEL** (IS027300)  
Octal 3-State D-Type Flip Flop  
DA: IC006

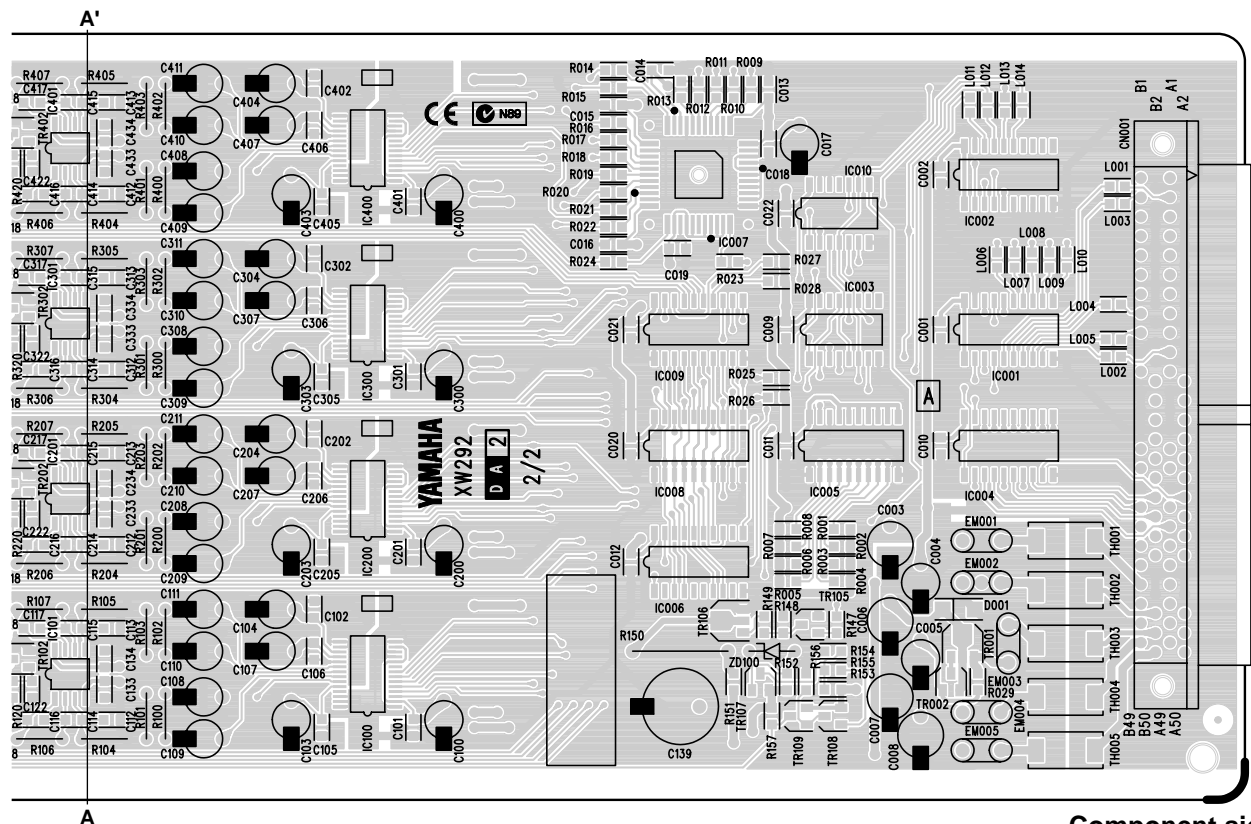
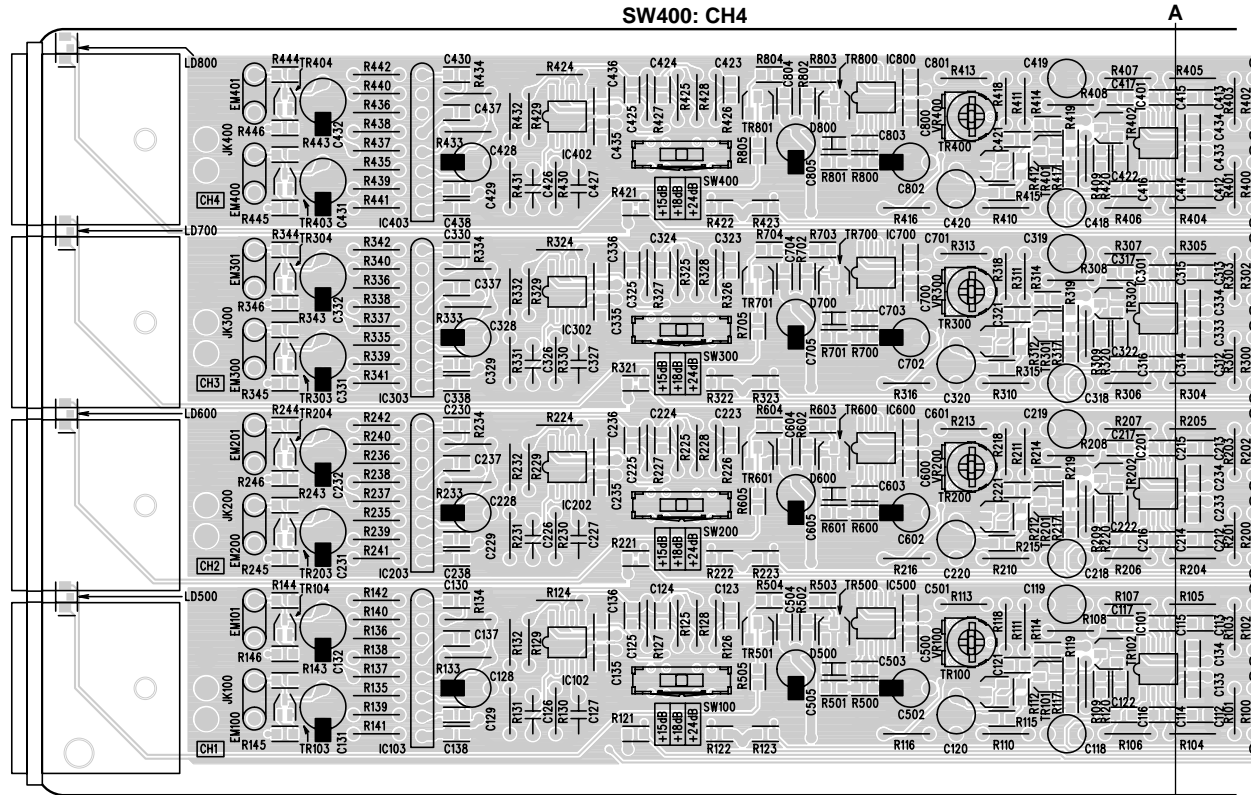


# CIRCUIT BOARD

## ● DA Circuit Board

### GAIN SWITCH

- SW100: CH1
- SW200: CH2
- SW300: CH3
- SW400: CH4

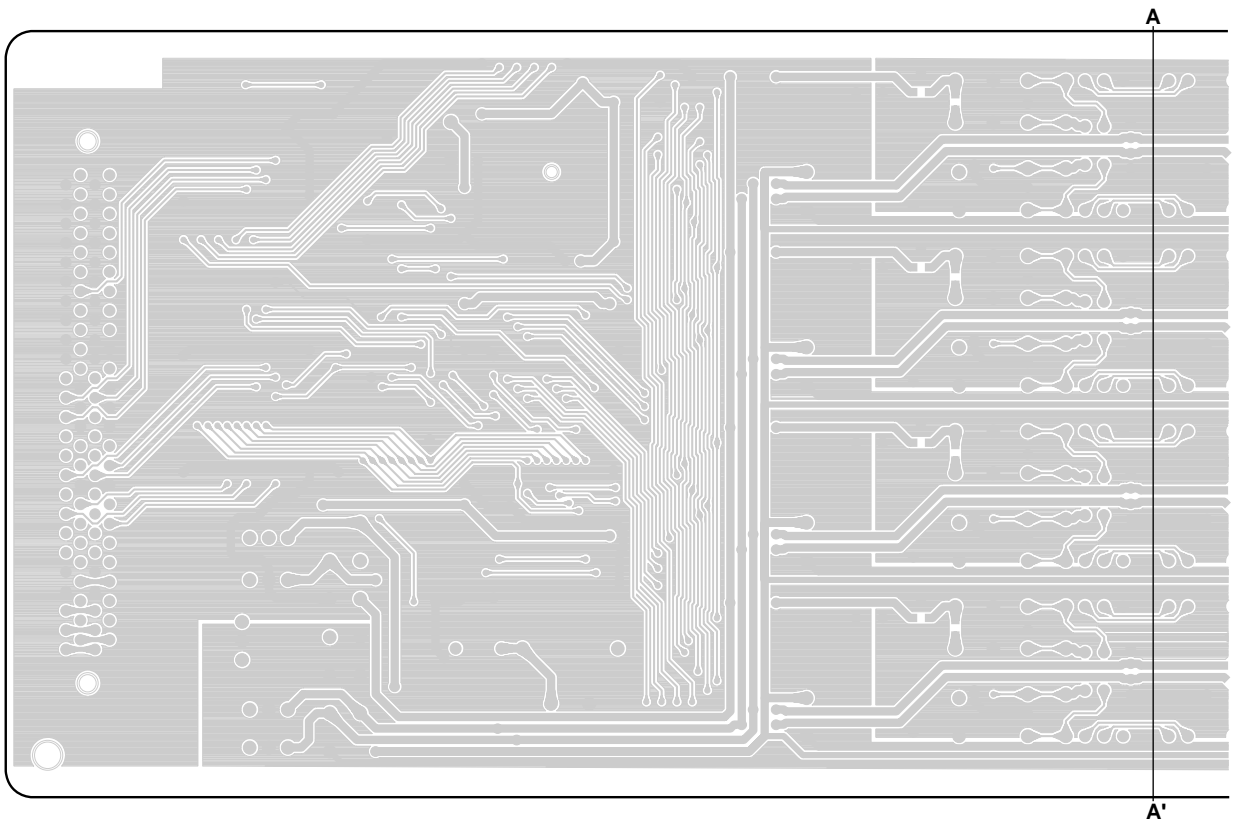
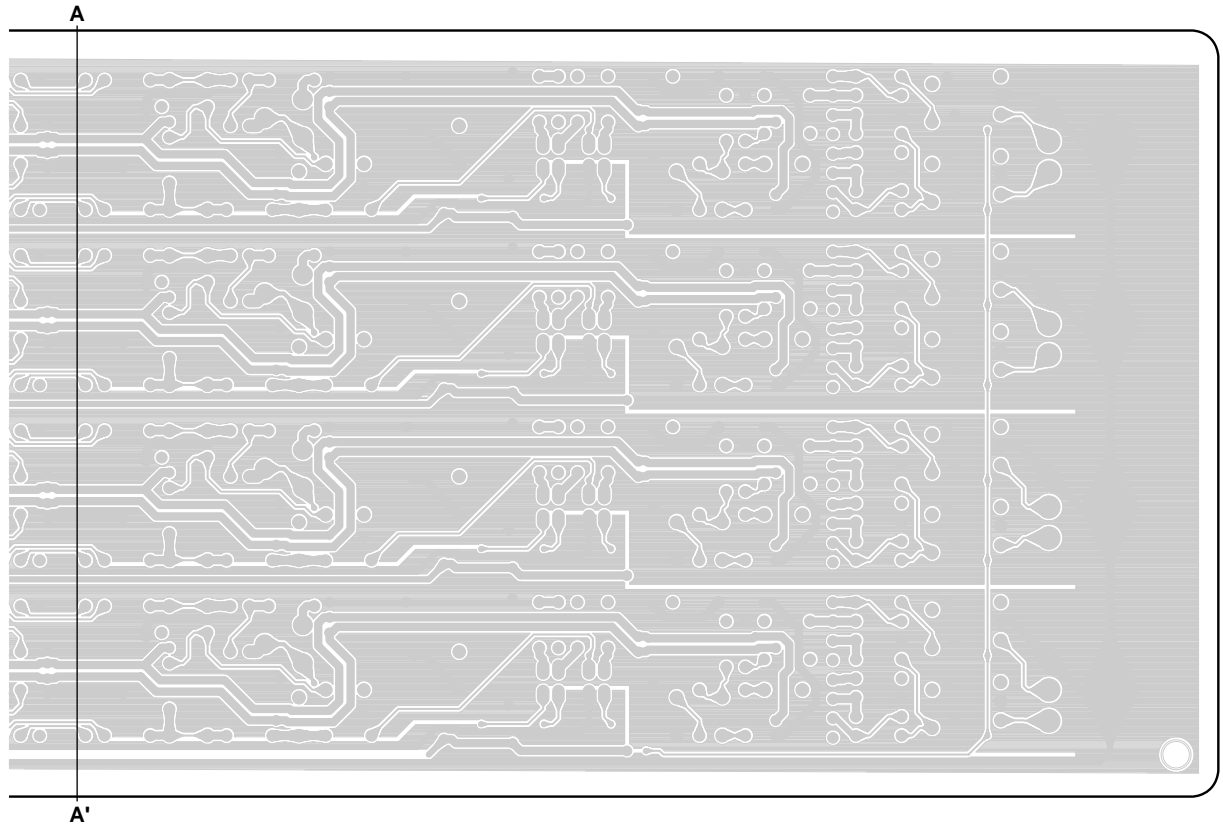


Component side

DA: V412960



●DA Circuit Board



Pattern side

DA: V412960

## ■ TEST PROGRAM

### 1. Scope of Application

This specification shall apply to LMY4-DA.

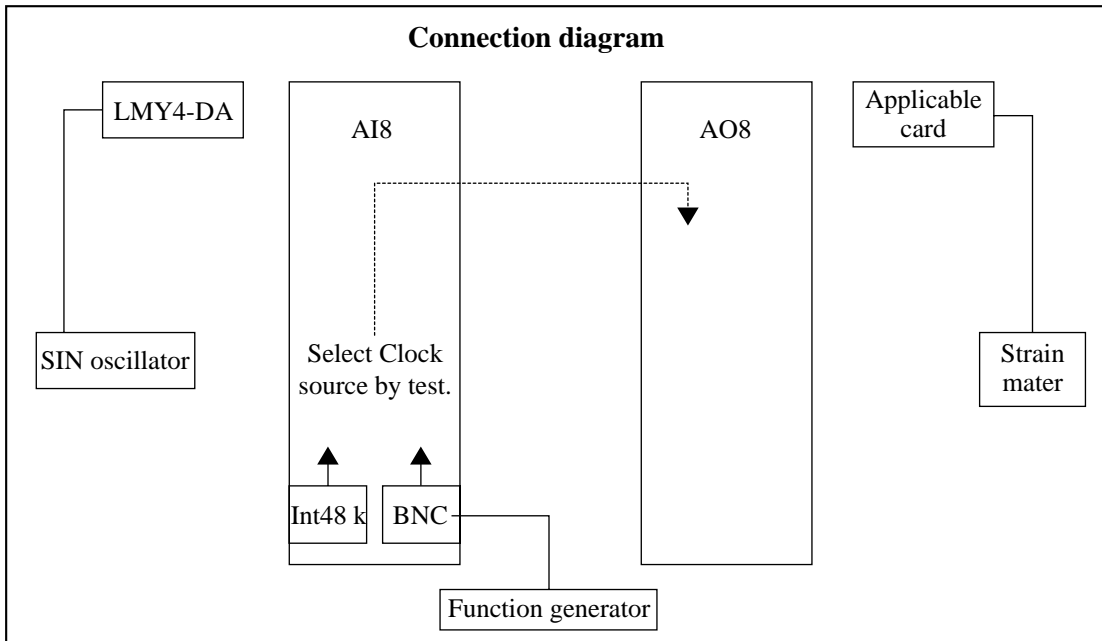
### 2. Preparations

#### 2-1. Conditions

- ◇ Set LMY4-DA (product) on AO8 and carry out test.
- ◇ Unless otherwise indicated, the following conditions shall apply.
  - 0 dBu=0.775 Vrms
  - Output impedance shall be 150 ohm.
  - Input impedance of the oscilloscope, level gauge, etc. shall be 100 kohm or more.
  - Noise measurement shall be corrected with LPF at 12.7 kHz, -6 dB/OCT.  
(To be measured not by effective value but by mean value)
  - Unless otherwise indicated, WORD CLOCK of AI8 shall be INT48 k.  
For testing of Fs operation range, supply shall be made via BNC from Function generator.
  - WORD CLOCK of AO8 shall be supplied via INPUT A port.
  - LMY4-DA analog output load shall be 600 ohm.
  - Unless otherwise indicated in each test item, LMY4-DA gain changeover switch shall be +24 dB.

#### 2-2. Test program

Test program is activated by setting DIP SW of AI8/ AO8 in debug mode and then turning power ON. For setting procedure, refer to Section 5.



3. Test

3-1. OPTION CARD ID

After inserting the card, carry out ID checking when power is ON. Display on 7-segment LED in front of AI8: left place = (slot No.) and right place = (card type). Display is made of 8 slots each in order. Thus, visually ensure that they are recognized as LMY4-DA.

3-2. Read check in GAIN status

After 3-1., check whether the current GAIN setting can be read correctly. In this case, GAIN requiring checking shall be preset with DIP SW on UNC and DIP SW for entire applicable test card (same setting for 4CH as well). (DIP SW setting will be described later.) Results of check shall be displayed on 7-segment LED. Slot No. shall be displayed in order starting with 1 and as soon as an abnormal slot (abnormal response or non-insertion of slot) is found,  $\bar{L}$  (G) shall be displayed in the right-hand place and the test be stopped. Therefore, the card shall be stuck into the slot having a lower number than SLOT1. For checking, "Change setting to Turn on power again" shall be repeated to cover +24 dB,+18 dB, and +15 dB. Also visually check as required after this test because currently locked WordClock is displayed.

Turn power ON in debug mode.



Display 8 slots each per second.



Display 8 slots each per second until abnormal response or non-insertion is found.



Display currently locked clock source (real time).

* Display of 7-segment LED according to card type			
Recognized as LMY4-ML	$\bar{1}L$ (1L) to		$\bar{0}L$ (8L)
Recognized as LMY4-AD	$\bar{1}A$ (1A) to		$\bar{8}A$ (8A)
Recognized as LMY4-DA	$\bar{1}D$ (1D) to		$\bar{8}D$ (8D)
Others	$\bar{1}$ (1) to		$\bar{8}$ (8)

* Display of 7-segment LED at Read check of GAIN status.			
Normal	$\bar{1}$ (1) to		$\bar{8}$ (8)
Abnormal or non-insertion	$\bar{1}\bar{G}$ (1G) to		$\bar{8}\bar{G}$ (8G)
[ As soon as abnormal response or non-insertion is found, this test is stopped and clock source is displayed. ]			

* Display of 7-segment LED according to clock source (Ref. 5.)			
Int 48 kHz	$\bar{4}\bar{8}$ (48)	from Port A	$\bar{P}\bar{A}$ (PA)
Int 44.1 kHz	$\bar{4}\bar{4}$ (44)	from Port B	$\bar{P}\bar{b}$ (Pb)
Int 39 kHz	$\bar{3}\bar{9}$ (39)	from Port C	$\bar{P}\bar{C}$ (PC)
from BNC	-- (--)	UNLOCK	$\bar{U}\bar{A}$ (UL blinking)

3-3. Gain, frequency characteristic, distortion rate (ch1 to 4)

Input terminal	Output terminal	Input level	Onput level			THD	
			1 kHz	20 Hz <sup>(*1)</sup>	20 kHz <sup>(*1)</sup>	1 kHz	
AI8 (LMY4-AD)	AO8 (LMY4-DA)	Gain setting At + 18 dB	+23 dBu	+17+/-1.0 dBu	-2.0 to+1.0 dB	-2.0 to+1.0 dB	0.007% or less
			-7 dBu <sup>(*2)</sup>	-30+/-0.4 dBu	-30 +/- 0.4 dB <sup>(*1)</sup>	-30 +/- 0.4 dB <sup>(*1)</sup>	0.005% or less
		Gain setting At + 24 dB	+23 dBu	+23+/-1.0 dBu	-2.0 to+1.0 dB	-2.0 to+1.0 dB	0.007% or less
			-7 dBu <sup>(*2)</sup>	-30+/-0.4 dBu	-30 +/- 0.4 dB	-30 +/- 0.4 dB	0.005% or less
		Gain setting At + 15 dB	+23 dBu <sup>(*2)</sup>	+14+/-1.0 dBu	-2.0 to+1.0 dB <sup>(*1)</sup>	-2.0 to+1.0 dB <sup>(*1)</sup>	0.007% or less
			-7 dBu	-30+/-0.4 dBu	-30 +/- 0.4 dB	-30 +/- 0.4 dB	0.005% or less

\* For output at -7 dBu input, the level at +23 dBu input shall be set as standard for each gain setting.

(\*1): Standard at 1kHz input

(\*2): Standard at +23 dBu for output level under this condition

3-4. Difference in level between ch's

Gain difference measured in 3-3. shall be specified as follows.

Tolerance
1 dB or less

3-5. FIN (LPF: 12.7 kHz)

Input terminal	Output terminal	Condition	Residual noise
AI8 (LMY4-AD)	AO8 (LMY4-DA) (Set at +24 dB)	Input 150 ohm shorted	-96 dB or more

3-6. Crosstalk (1 kHz)

Input terminal	Output terminal	Condition	Crosstalk
AI8 (LMY4-AD)	AO8 (LMY4-DA) (Set at +24 dB)	Input 150 ohm shorted CH (N) to CH(N-1) or CH(N+1)	90 dB or more

3-7 Signal LED lightening level (2 SIGNAL LEDs)

Input terminal	Output terminal	Input level
AI8 (LMY4-AD)	AO8 (LMY4-DA) (Set at +24 dB)	Light up at -10 +/-2 dBu or more.

3-8. Fs operation range

Supply CLOCK from BNC of AI8. (48 kHz+6.5%, 44.1 kHz-10%)  
Set UNC card so as to change CLOCK of AI8 over to BNC.

- ① Fs=51.12 kHz (48 kHz+6.5%)
  - Set Function Generator at 51.12 kHz.
  - Output level as listed below shall be obtained for each ch.

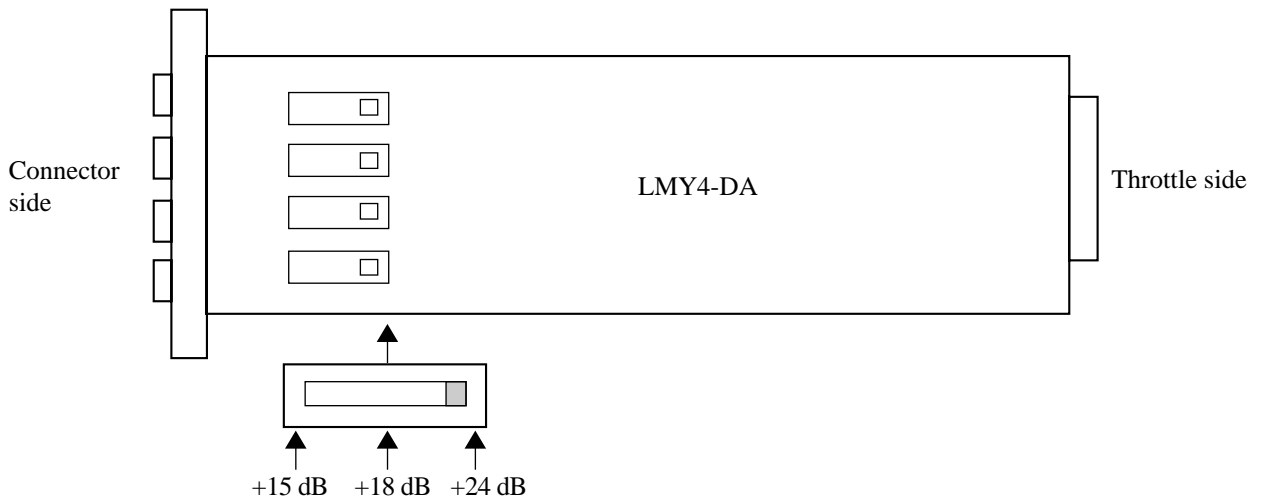
Input terminal	Input frequency	Input level	Output terminal	Tolerance
AI8 (LMY4-AD)	1 kHz	+23 dBu	AO8 (LMY4-DA) (Set at +24 dB)	+23 +/-1.0 dBu

- ② Fs=39.69 kHz (44.1 kHz-10%)
  - Set Function generator at 39.69 kHz.
  - When tested in the same way as in ①, the same output level shall be achieved.

\* All CHs shall be tested for 3-3. to 3-8.

**4. Ex-factory Setting**

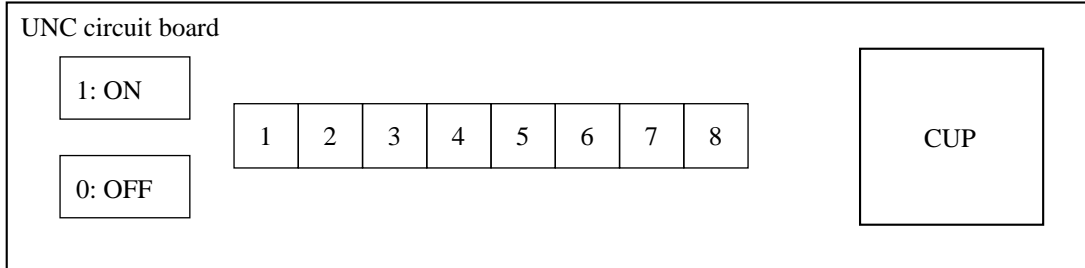
Gain setting shall be +24 dB for all CHs.



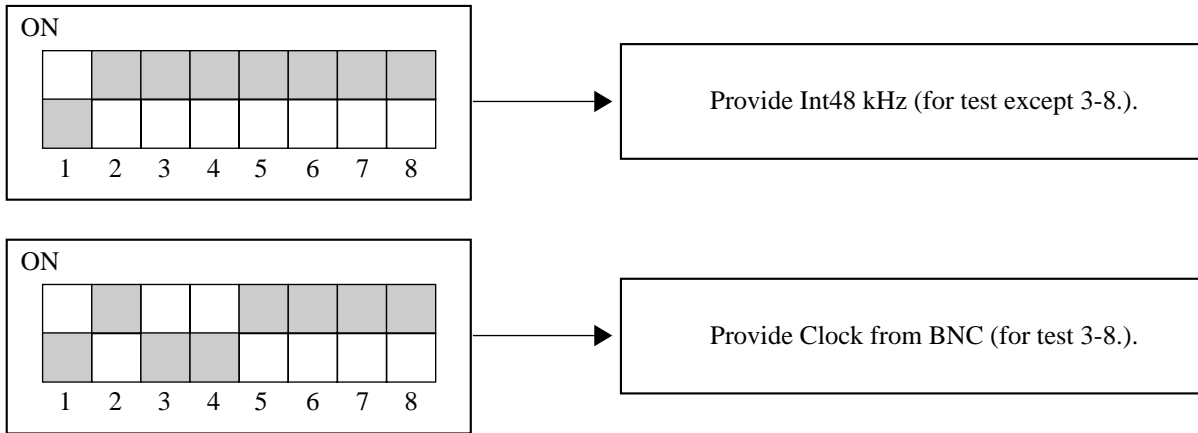
**5. Setting DIP SW for AI8/ AO8**

UNC circuit board configuration is the same for both AI8 and AO8, though each DIP SW has a different meaning.

The following shows the setting, though DipSW 8 is not used in any case (invalid)



\* AI8 DIP SW setting [1: ON (=GND) 0: OFF (= +5 V)]



For details of AI8 DipSW, refer to SPECIFICATION FOR OVERALL TEST ON LMY4-AD.

\* AO8 DIP SW setting [1: ON (=GND) 0: OFF (= +5 V)]

1	Operation mode	1: Operation				0: Debug			
In order of <u>2, 3, 4</u>	WC Sel mode	1, 1, 1 Int 48 kHz	0, 1, 1 Int 44.1 kHz	1, 0, 1 Int 39 kHz	0, 0, 1 WC (INPUT A)	1, 1, 0 WC (INPUT B)	0, 1, 0 no use	1, 0, 0 BNC	0, 0, 0 no use
In order of <u>5, 6</u>	GAIN Read Check mode	1.1 +24 dB		0.1 +18 dB		1.0 +15 dB		0.0 +Not Used	
7	no use								

# DA-CARD

# LMY4-DA

# PARTS LIST

## ■ CONTENT

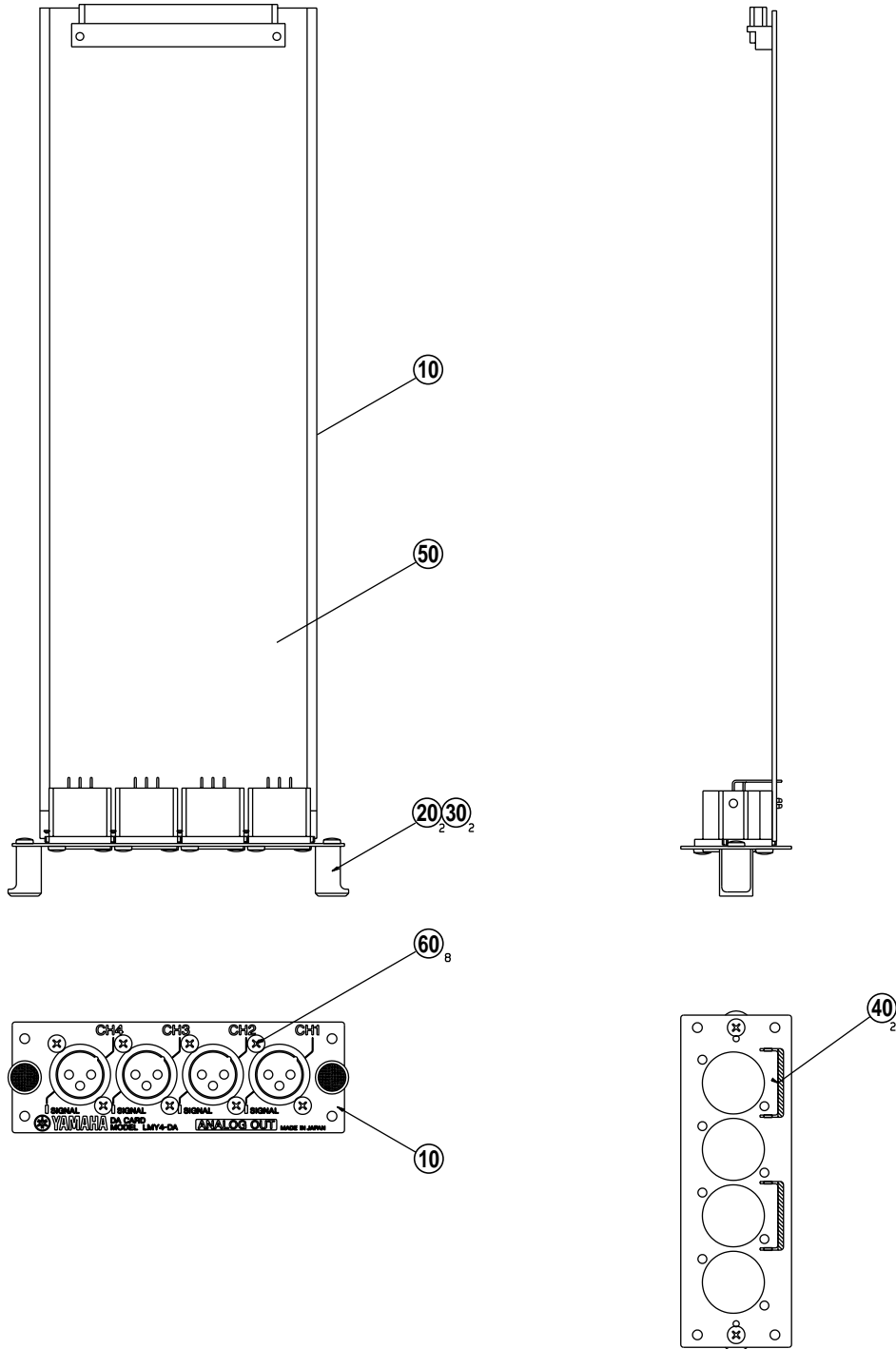
OVERALL ASSEMBLY .....	2
ELECTRICAL PARTS .....	3

### 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.
- The second letter of the shaded ( ■ ) part number is I, not one.

OVERALL ASSEMBLY



REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK
		OVERALL ASSEMBLY	LMY4-DA		
	--	Overall Assembly	(V451650)		
10	V4102700	Panel			
20	VV441000	Knob	ABS	2	01
30	EP600190	Bind Head Tapping Screw-B	3.0X8 MFZN2BL	2	01
40	V4238900	Lans		2	
50	V4129600	Circuit Board	DA		
60	VS863000	Bonding Head Screw	3.0X6 MFZN2BL	8	01

\*: New parts

RANK: Japan only



■ ELECTRICAL PARTS

REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK
		ELECTRICAL PARTS	LMY4-DA		
			(XW292A0)		
C003	V4129600	Circuit Board	DA		
C004	UR858100	Electrolytic Cap.	100.00 35.0V		01
C006	V5829300	Capacitor	100 16V 16SG100M+T		01
C007	V5829300	Capacitor	100 16V 16SG100M+T		01
C008	V5829200	Capacitor	100 20V 20SG100M+T		01
C017	UR847220	Electrolytic Cap.	22.00 25.0V		01
C100	UR867100	Electrolytic Cap.	10.00 50.0V		01
C103	UR867100	Electrolytic Cap.	10.00 50.0V		01
C104	UR867100	Electrolytic Cap.	10.00 50.0V		01
C107	UR867100	Electrolytic Cap.	10.00 50.0V		01
C120	UN838100	Electrolytic Cap.-BP	100.00 16.0V		01
C128	UR867100	Electrolytic Cap.	10.00 50.0V		01
C131	V5618000	Electrolytic Cap.	100.00 16.0V		01
C132	V5618000	Electrolytic Cap.	100.00 16.0V		01
C139	UR848470	Electrolytic Cap.	470.00 25.0V		01
C200	UR867100	Electrolytic Cap.	10.00 50.0V		01
C203	UR867100	Electrolytic Cap.	10.00 50.0V		01
C204	UR867100	Electrolytic Cap.	10.00 50.0V		01
C207	UR867100	Electrolytic Cap.	10.00 50.0V		01
C220	UN838100	Electrolytic Cap.-BP	100.00 16.0V		01
C228	UR867100	Electrolytic Cap.	10.00 50.0V		01
C231	V5618000	Electrolytic Cap.	100.00 16.0V		01
C232	V5618000	Electrolytic Cap.	100.00 16.0V		01
C300	UR867100	Electrolytic Cap.	10.00 50.0V		01
C303	UR867100	Electrolytic Cap.	10.00 50.0V		01
C304	UR867100	Electrolytic Cap.	10.00 50.0V		01
C307	UR867100	Electrolytic Cap.	10.00 50.0V		01
C320	UN838100	Electrolytic Cap.-BP	100.00 16.0V		01
C328	UR867100	Electrolytic Cap.	10.00 50.0V		01
C331	V5618000	Electrolytic Cap.	100.00 16.0V		01
C332	V5618000	Electrolytic Cap.	100.00 16.0V		01
C400	UR867100	Electrolytic Cap.	10.00 50.0V		01
C403	UR867100	Electrolytic Cap.	10.00 50.0V		01
C404	UR867100	Electrolytic Cap.	10.00 50.0V		01
C407	UR867100	Electrolytic Cap.	10.00 50.0V		01
C420	UN838100	Electrolytic Cap.-BP	100.00 16.0V		01
C428	UR867100	Electrolytic Cap.	10.00 50.0V		01
C431	V5618000	Electrolytic Cap.	100.00 16.0V		01
C432	V5618000	Electrolytic Cap.	100.00 16.0V		01
C502	UR847100	Electrolytic Cap.	10.00 25.0V		01
C505	UR847100	Electrolytic Cap.	10.00 25.0V		01
C602	UR847100	Electrolytic Cap.	10.00 25.0V		01
C605	UR847100	Electrolytic Cap.	10.00 25.0V		01
C702	UR847100	Electrolytic Cap.	10.00 25.0V		01
C705	UR847100	Electrolytic Cap.	10.00 25.0V		01
C802	UR847100	Electrolytic Cap.	10.00 25.0V		01
C805	UR847100	Electrolytic Cap.	10.00 25.0V		01
CN001	VT640300	Receptacle	PHEC 100P SE		04
D500	VT332900	Diode	1SS355 TE-17		01
D600	VT332900	Diode	1SS355 TE-17		01
D700	VT332900	Diode	1SS355 TE-17		01
D800	VT332900	Diode	1SS355 TE-17		01
EM001	FZ006920	LC Filter	LS MT B271KB		01
-005	FZ006920	LC Filter	LS MT B271KB		01
EM100	FZ006920	LC Filter	LS MT B271KB		01
EM101	FZ006920	LC Filter	LS MT B271KB		01
EM200	FZ006920	LC Filter	LS MT B271KB		01
EM201	FZ006920	LC Filter	LS MT B271KB		01
EM300	FZ006920	LC Filter	LS MT B271KB		01
EM301	FZ006920	LC Filter	LS MT B271KB		01
EM400	FZ006920	LC Filter	LS MT B271KB		01
EM401	FZ006920	LC Filter	LS MT B271KB		01
IC001	XY874A00	IC	74VHC245SJX	BUFFER	
IC002	XY874A00	IC	74VHC245SJX	BUFFER	
IC003	IS013810	IC	SN74LV138ANSR	DECODER	
IC004	XY874A00	IC	74VHC245SJX	BUFFER	
IC005	XY874A00	IC	74VHC245SJX	BUFFER	
IC006	IS027300	IC	HD74LV273AFPEL	D-FF	
IC007	XY080A00	IC	YSZ914B-F	DAFC	
IC008	XY874A00	IC	74VHC245SJX	BUFFER	
IC009	XY874A00	IC	74VHC245SJX	BUFFER	
IC010	IS000800	IC	HD74LV08AFPEL	AND2	
IC100	XW029A00	IC	AK4393-VF-E2	D/A CONVERTOR	

\*: New parts

RANK: Japan only

REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK
IC101	XJ553A00	IC	NJM2068MD-T1		02
IC102	XJ553A00	IC	NJM2068MD-T1		02
IC103	XP844A00	IC	NJM4556AL		02
IC104	XJ596A00	IC	NJM78L05UA	REGULATOR +5V	
IC200	XW029A00	IC	AK4393-VF-E2	D/A CONVERTOR	
IC201	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC202	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC203	XP844A00	IC	NJM4556AL	OP AMP	02
IC204	XJ596A00	IC	NJM78L05UA	REGULATOR +5V	
IC300	XW029A00	IC	AK4393-VF-E2	D/A CONVERTOR	
IC301	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC302	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC303	XP844A00	IC	NJM4556AL	OP AMP	02
IC304	XJ596A00	IC	NJM78L05UA	REGULATOR +5V	
IC400	XW029A00	IC	AK4393-VF-E2	D/A CONVERTOR	
IC401	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC402	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC403	XP844A00	IC	NJM4556AL	OP AMP	02
IC404	XJ596A00	IC	NJM78L05UA	REGULATOR +5V	
IC500	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC600	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC700	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
IC800	XJ553A00	IC	NJM2068MD-T1	OP AMP	02
JK100	VL958700	XLM Connector	XLM-3-32PCV		07
JK200	VL958700	XLM Connector	XLM-3-32PCV		07
JK300	VL958700	XLM Connector	XLM-3-32PCV		07
JK400	VL958700	XLM Connector	XLM-3-32PCV		07
L006	V2589800	Chip Inductance	BK2125LM751 2		
-14	V2589800	Chip Inductance	BK2125LM751 2		
LD500	V5074100	LED (Chip)	PG1101F-TR		
-800	V5074100	LED (Chip)	PG1101F-TR		
R100	VC327800	Metal Film Resistor	3.9K 1/4 F		
-103	VC327800	Metal Film Resistor	3.9K 1/4 F		
R104	VC329400	Metal Film Resistor	18.0K 1/4 F		01
-107	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R108	V5099700	Metal Film Resistor	300K 1/4 F		
R109	VC331000	Metal Film Resistor	82.0K 1/4 F		
R110	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R111	VC330900	Metal Film Resistor	75.0K 1/4 F		
R116	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R118	VC329100	Metal Film Resistor	13.0K 1/4 F		01
R124	VC324900	Metal Film Resistor	220.0 1/4 F		
R125	VC328100	Metal Film Resistor	5.1K 1/4 F		01
R126	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R127	VC327800	Metal Film Resistor	3.9K 1/4 F		
R128	VC325700	Metal Film Resistor	470.0 1/4 F		
R129	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R130	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R131	VC322700	Metal Film Resistor	39.00 1/4 F		
R133	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R134	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R135	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R136	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R137	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R138	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R139	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R140	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R141	HF754750	Carbon Resistor	75.0 1/4 J		01
R142	HF754750	Carbon Resistor	75.0 1/4 J		01
R143	HF758100	Carbon Resistor	100.0K 1/4 J		01
R144	HF758100	Carbon Resistor	100.0K 1/4 J		01
R150	VC744200	Metal Oxide Film Resistor	47.0 1W J		01
R200	VC327800	Metal Film Resistor	3.9K 1/4 F		
R203	VC327800	Metal Film Resistor	3.9K 1/4 F		
R204	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R207	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R208	V5099700	Metal Film Resistor	300K 1/4 F		
R209	VC331000	Metal Film Resistor	82.0K 1/4 F		
R210	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R211	VC330900	Metal Film Resistor	75.0K 1/4 F		
R216	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R218	VC329100	Metal Film Resistor	13.0K 1/4 F		01
R224	VC324900	Metal Film Resistor	220.0 1/4 F		
R225	VC328100	Metal Film Resistor	5.1K 1/4 F		01
R226	VC328900	Metal Film Resistor	11.0K 1/4 F		01

\*: New parts

RANK: Japan only

REF NO.	PART NO.	DESCRIPTION	REMARKS	QTY	RANK
R227	VC327800	Metal Film Resistor	3.9K 1/4 F		
R228	VC325700	Metal Film Resistor	470.0 1/4 F		
R229	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R230	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R231	VC322700	Metal Film Resistor	39.00 1/4 F		
R233	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R234	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R235	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R236	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R237	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R238	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R239	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R240	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R241	HF754750	Carbon Resistor	75.0 1/4 J		01
R242	HF754750	Carbon Resistor	75.0 1/4 J		01
R243	HF758100	Carbon Resistor	100.0K 1/4 J		01
R244	HF758100	Carbon Resistor	100.0K 1/4 J		01
R300	VC327800	Metal Film Resistor	3.9K 1/4 F		
R303	VC327800	Metal Film Resistor	3.9K 1/4 F		
R304	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R307	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R308	V5099700	Metal Film Resistor	300K 1/4 F		
R309	VC331000	Metal Film Resistor	82.0K 1/4 F		
R310	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R311	VC330900	Metal Film Resistor	75.0K 1/4 F		
R316	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R318	VC329100	Metal Film Resistor	13.0K 1/4 F		01
R324	VC324900	Metal Film Resistor	220.0 1/4 F		
R325	VC328100	Metal Film Resistor	5.1K 1/4 F		01
R326	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R327	VC327800	Metal Film Resistor	3.9K 1/4 F		
R328	VC325700	Metal Film Resistor	470.0 1/4 F		
R329	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R330	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R331	VC322700	Metal Film Resistor	39.00 1/4 F		
R333	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R334	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R335	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R336	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R337	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R338	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R339	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R340	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R341	HF754750	Carbon Resistor	75.0 1/4 J		01
R342	HF754750	Carbon Resistor	75.0 1/4 J		01
R343	HF758100	Carbon Resistor	100.0K 1/4 J		01
R344	HF758100	Carbon Resistor	100.0K 1/4 J		01
R400	VC327800	Metal Film Resistor	3.9K 1/4 F		
R403	VC327800	Metal Film Resistor	3.9K 1/4 F		
R404	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R407	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R408	V5099700	Metal Film Resistor	300K 1/4 F		
R409	VC331000	Metal Film Resistor	82.0K 1/4 F		
R410	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R411	VC330900	Metal Film Resistor	75.0K 1/4 F		
R416	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R418	VC329100	Metal Film Resistor	13.0K 1/4 F		01
R424	VC324900	Metal Film Resistor	220.0 1/4 F		
R425	VC328100	Metal Film Resistor	5.1K 1/4 F		01
R426	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R427	VC327800	Metal Film Resistor	3.9K 1/4 F		
R428	VC325700	Metal Film Resistor	470.0 1/4 F		
R429	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R430	VC326500	Metal Film Resistor	1.0K 1/4 F		01
R431	VC322700	Metal Film Resistor	39.00 1/4 F		
R433	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R434	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R435	VC328900	Metal Film Resistor	11.0K 1/4 F		01
R436	VC328800	Metal Film Resistor	10.0K 1/4 F		01
R437	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R438	VC329500	Metal Film Resistor	20.0K 1/4 F		01
R439	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R440	VC329400	Metal Film Resistor	18.0K 1/4 F		01
R441	HF754750	Carbon Resistor	75.0 1/4 J		01
R442	HF754750	Carbon Resistor	75.0 1/4 J		01

\*: New parts

RANK: Japan only

REF NO.	PART NO.	DESCRIPTION		REMARKS	QTY	RANK
R443	HF758100	Carbon Resistor	100.0K 1/4 J			01
R444	HF758100	Carbon Resistor	100.0K 1/4 J			01
R500	VI200000	Carbon Resistor (chip)	100.0K 1/10 D			01
R600	VI200000	Carbon Resistor (chip)	100.0K 1/10 D			01
R700	VI200000	Carbon Resistor (chip)	100.0K 1/10 D			01
R800	VI200000	Carbon Resistor (chip)	100.0K 1/10 D			01
SW100	VN316400	Slide Switch	SSSS2-23-01	GAIN SWITCH CH1		02
SW200	VN316400	Slide Switch	SSSS2-23-01	GAIN SWITCH CH2		02
SW300	VN316400	Slide Switch	SSSS2-23-01	GAIN SWITCH CH3		02
SW400	VN316400	Slide Switch	SSSS2-23-01	GAIN SWITCH CH4		02
TH001	VV111400	Poly Switch	SMD075-2 SMD	} for current limitation		
TH002	VV111400	Poly Switch	SMD075-2 SMD			
TH003	VV111700	Poly Switch	SMD125-2 SMD			
TH004	VV111400	Poly Switch	SMD075-2 SMD			
TH005	VV111400	Poly Switch	SMD075-2 SMD			
TR100	VD303700	Transistor	2SC3326 A,B TE85R			01
TR101	VJ927200	Transistor	2SA1162 O,Y			01
TR102	VV925400	Transistor	2SC2SC2712 GR			01
TR103	V2993500	Transistor	2SD1979 S,T			01
TR104	V2993500	Transistor	2SD1979 S,T			01
TR105	VV556400	Transistor	2SC2412K Q,R,S			01
TR106	VG013400	Transistor	2SD1664 82-390			01
TR107	VV556400	Transistor	2SC2412K Q,R,S			01
TR108	VV556500	Transistor	2SA1037K Q,R,S			01
TR109	VV556500	Transistor	2SA1037K Q,R,S			01
TR200	VD303700	Transistor	2SC3326 A,B TE85R			01
TR201	VJ927200	Transistor	2SA1162 O,Y			01
TR202	VV925400	Transistor	2SC2SC2712 GR			01
TR203	V2993500	Transistor	2SD1979 S,T			01
TR204	V2993500	Transistor	2SD1979 S,T			01
TR300	VD303700	Transistor	2SC3326 A,B TE85R			01
TR301	VJ927200	Transistor	2SA1162 O,Y			01
TR302	VV925400	Transistor	2SC2SC2712 GR			01
TR303	V2993500	Transistor	2SD1979 S,T			01
TR304	V2993500	Transistor	2SD1979 S,T			01
TR400	VD303700	Transistor	2SC3326 A,B TE85R			01
TR401	VJ927200	Transistor	2SA1162 O,Y			01
TR402	VV925400	Transistor	2SC2SC2712 GR			01
TR403	V2993500	Transistor	2SD1979 S,T			01
TR404	V2993500	Transistor	2SD1979 S,T			01
TR500	VV556400	Transistor	2SC2412K Q,R,S			01
TR501	VV556500	Transistor	2SA1037K Q,R,S			01
TR600	VV556400	Transistor	2SC2412K Q,R,S			01
TR601	VV556500	Transistor	2SA1037K Q,R,S			01
TR700	VV556400	Transistor	2SC2412K Q,R,S			01
TR701	VV556500	Transistor	2SA1037K Q,R,S			01
TR800	VV556400	Transistor	2SC2412K Q,R,S			01
TR801	VV556500	Transistor	2SA1037K Q,R,S			01
ZD100	VQ557500	Zener Diode	MTZJ24B 24.0V			01
	RD250000	Carbon Resistor (chip)	0.0 0.0 J			
	RD254100	Carbon Resistor (chip)	10.0 0.1 J			01
	RD255390	Carbon Resistor (chip)	390.0 0.1 J			01
	RD257100	Carbon Resistor (chip)	10.0K 0.1 J			01
	RD257220	Carbon Resistor (chip)	22.0K 0.1 J			01
	RD257470	Carbon Resistor (chip)	47.0K 0.1 J			01
	RD258100	Carbon Resistor (chip)	100.0K 0.1 J			01
	RD256100	Carbon Resistor (chip)	1.0K 0.1 J			01
	RD256220	Carbon Resistor (chip)	2.2K 0.1 J			01
	RD256470	Carbon Resistor (chip)	4.7K 0.1 J			01
	UA353300	Mylar Capacitor	3000P 50V J			01
	UA353680	Mylar Capacitor	6800P 50V J			01
	UB044100	Monolithic Ceramic Cap.	F 0.010 50V Z			01
	UB051100	Monolithic Ceramic Cap.	SL 10P 50V D			01
	UB051330	Monolithic Ceramic Cap.	SL 33P 50V J			01
	UB051560	Monolithic Ceramic Cap.	SL 56P 50V J			01
	UB052100	Monolithic Ceramic Cap.	SL 100P 50V J			01
	UB052180	Monolithic Ceramic Cap.	SL 180P 50V J			01
	UB052220	Monolithic Ceramic Cap.	SL 220P 50V J			01
	UB245100	Monolithic Ceramic Cap.	F 0.100 25V Z			01

\*: New parts

RANK: Japan only