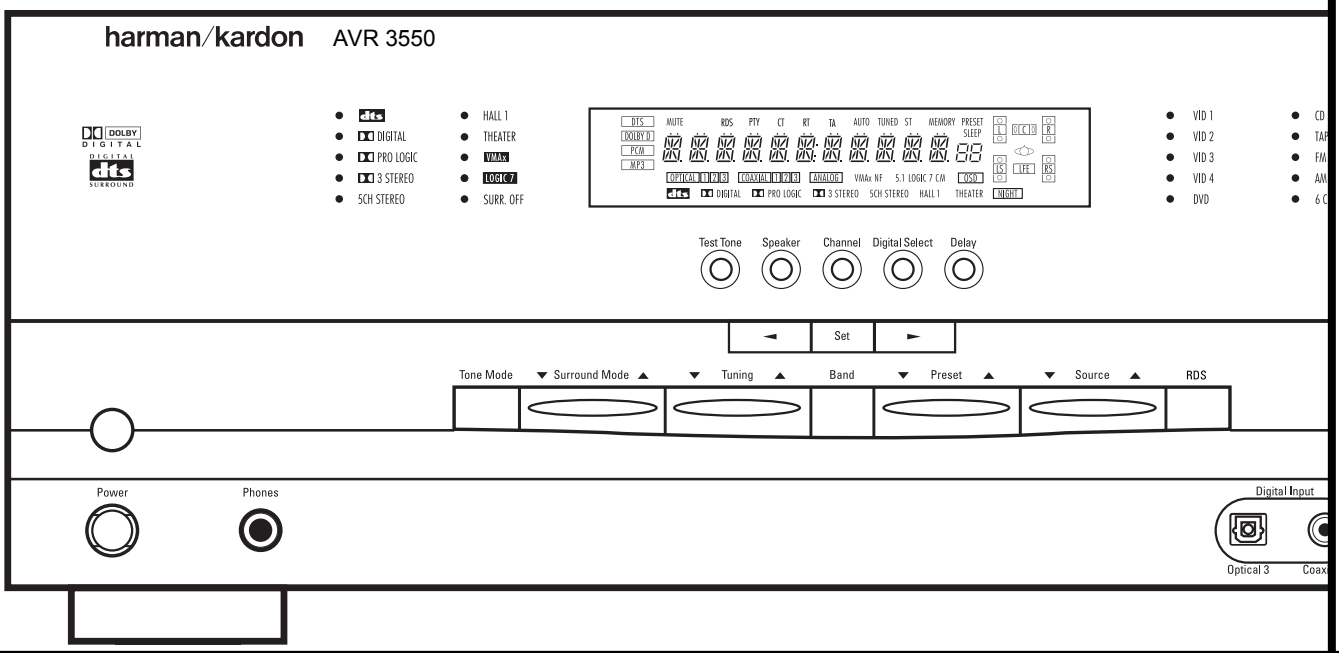
AVR 3550 Audio/Video Receiver

Service Manual



harman/kardon®

Power for the Digital Revolution™

Technical Specifications

Audio Section

Stereo Mode

Continuous Average Power (FTC)

65 Watts per channel, 20Hz–20kHz,
@ < 0.07% THD, both channels driven into 8 ohms

Five-Channel Surround Modes

Power Per Individual Channel

Front L&R channels:
55 Watts per channel,
@ < 0.07% THD, 20Hz–20kHz into 8 ohms

Center channel:
55 Watts, @ < 0.07% THD, 20Hz–20kHz into 8 ohms

Surround channels:
55 Watts per channel,
@ < 0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance	
Linear (High Level)	200mV/47kohms
Signal-to-Noise Ratio (IHF-A)	95dB
Surround System Adjacent Channel Separation	
Analog Decoding (Pro Logic II, etc.)	40dB
Dolby Digital (AC-3)	55dB
DTS	55dB
Frequency Response	
@ 1W (+0dB, –3dB)	10Hz–100kHz
High Instantaneous Current Capability (HCC)	±28 Amps
Transient Intermodulation Distortion (TIM)	Unmeasurable
Rise Time	16 µsec
Slew Rate	40V/µsec

FM Tuner Section

Frequency Range	87.5–108MHz
Usable Sensitivity	IHF 1.3 µV/13.2dBf
Signal-to-Noise Ratio	Mono/Stereo: 70/65dB (DIN)
Distortion	Mono/Stereo: 0.15/0.3%
Stereo Separation	35dB @ 1kHz
Selectivity	±300kHz: 65dB
Image Rejection	80dB
IF Rejection	90dB

AM Tuner Section

Frequency Range	522–1620kHz
Signal-to-Noise Ratio	45dB
Usable Sensitivity	Loop: 500µV
Distortion	1kHz, 50% Mod: 0.8%
Selectivity	±9kHz: 30dB

Video Section

Video Format	PAL/NTSC
Input Level/Impedance	1Vp-p/75 ohms
Output Level/Impedance	1Vp-p/75 ohms
Video Frequency Response	10Hz–8MHz (–3dB)

General

Power Requirement	AC 220-240V/50Hz
Power Consumption	72W idle, 580W maximum (2 channels driven)
Dimensions (Max)	
Width	440mm
Height	168mm
Depth	390mm
Weight	12.0 kg

Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.
All features and specifications are subject to change without notice.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Unit does not function when Main Power Switch is pushed	• No AC Power	• Make certain AC power cord is plugged into a live outlet • Check to see whether outlet is switch-controlled
Display lights, but no sound or picture	• Intermittent input connections • **Mute** is on • Volume control is down	• Make certain that all input and speaker connections are secure • Press **Mute** button • Turn up volume control
Unit turns on, but front-panel display does not light up	• Display brightness is turned off	• Follow the instructions in the Display Brightness section on page 30 so that the display is set to **VFD FULL**
No sound from any speaker; light around power switch is red	• Amplifier is in protection mode due to possible short • Amplifier is in protection mode due to internal problems	• Check speaker wire connections for shorts at receiver and speaker ends • Contact your local Harman Kardon service center, which you can locate by visiting our Web site at www.harmankardon.com
No sound from surround or center speakers	• Incorrect surround mode • Input is monaural • Incorrect configuration • Stereo or Mono program material	• Select a mode other than Stereo or Dolby 3 Stereo • There is no surround information from mono sources • Check speaker mode configuratioin • The surround decoder may not create center- or rear-channel information from nonencoded programs
Unit does not respond to remote commands	• Weak batteries in remote • Wrong device selected • Remote sensor is obscured	• Change remote batteries • Press the AVR selector • Make certain front-panel sensor is visible to remote or connect remote sensor
Intermittent buzzing in tuner	• Local interference	• Move unit or antenna away from computers, fluorescent lights, motors or other electrical appliances
Letters flash in the channel indicator display and digital audio stops	• Digital audio feed paused	• Resume play for DVD • Check that Digital Input is selected

AMPLIFIER SECTION BIAS ADJUSTMENT

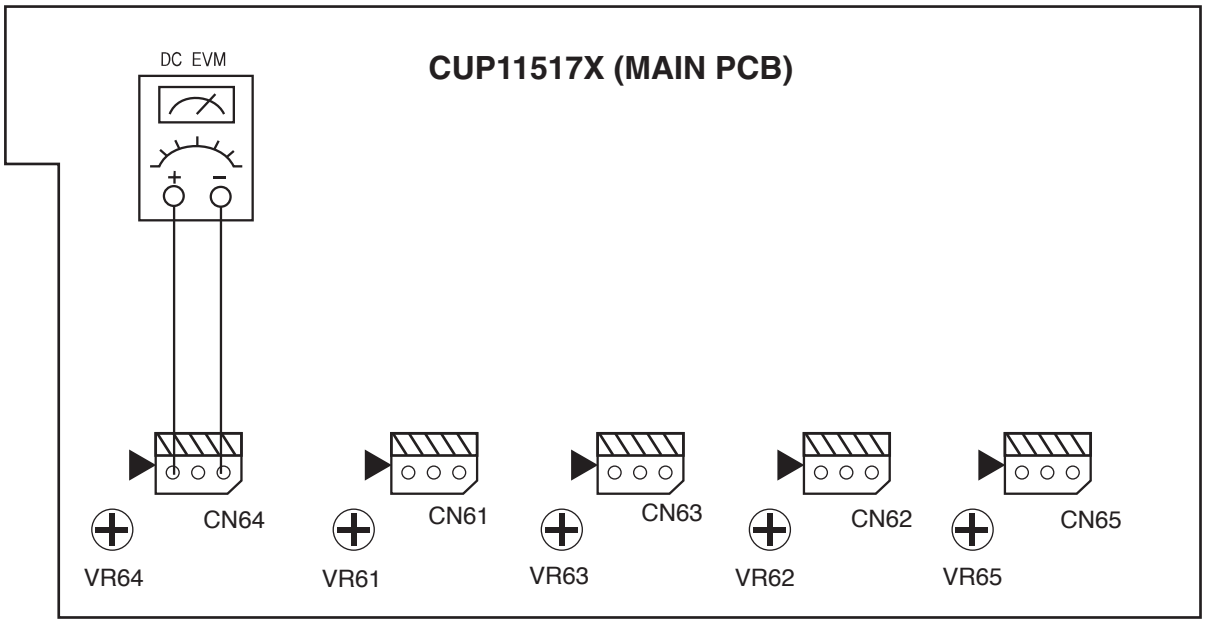
Measurement condition

. No input signal or volume position is minimum.

Standard value.

. Ideal current = 48mA (± 5%)

. Ideal DC Voltage = 21.12mV (± 5%)

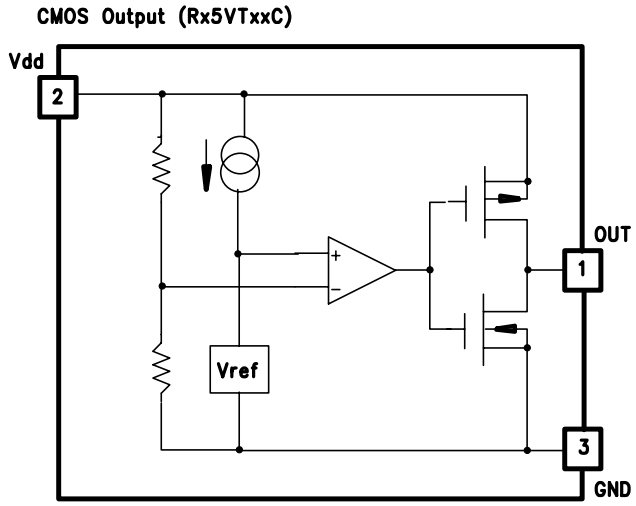


DC VOLTMETER.....Connect to CN61, CN62, CN63, CN64, CN65

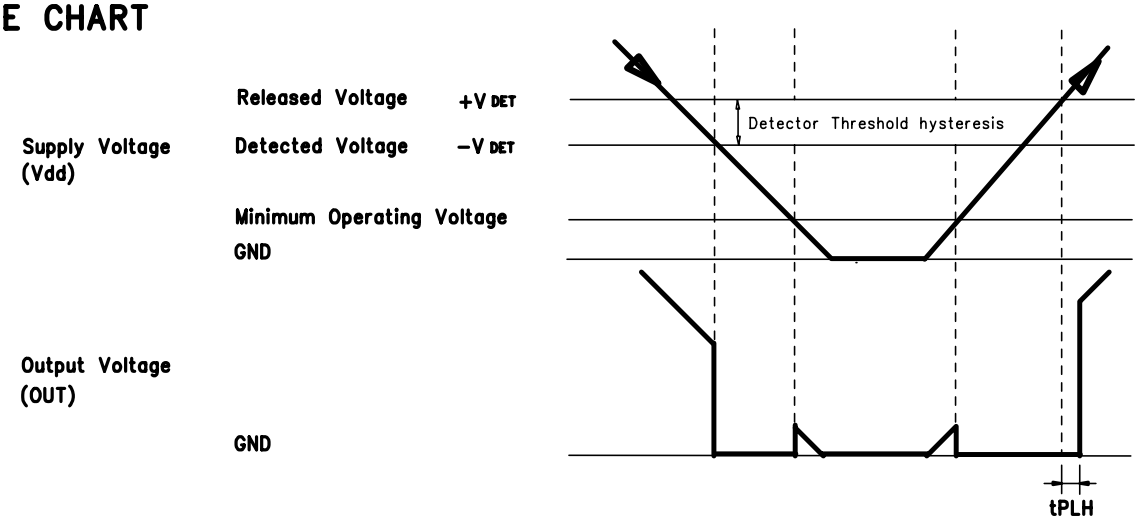
NO.	Channel	Adjust for	Adjustment
1	Front Left	21.12mV (±5%)	VR61
2	Front Right	21.12mV (±5%)	VR62
3	Center	21.12mV (±5%)	VR63
4	Surround Left	21.12mV (±5%)	VR64
5	Surround Right	21.12mV (±5%)	VR65

RE5VT15CATZ (VOLTAGE DETECTOR : IC85)

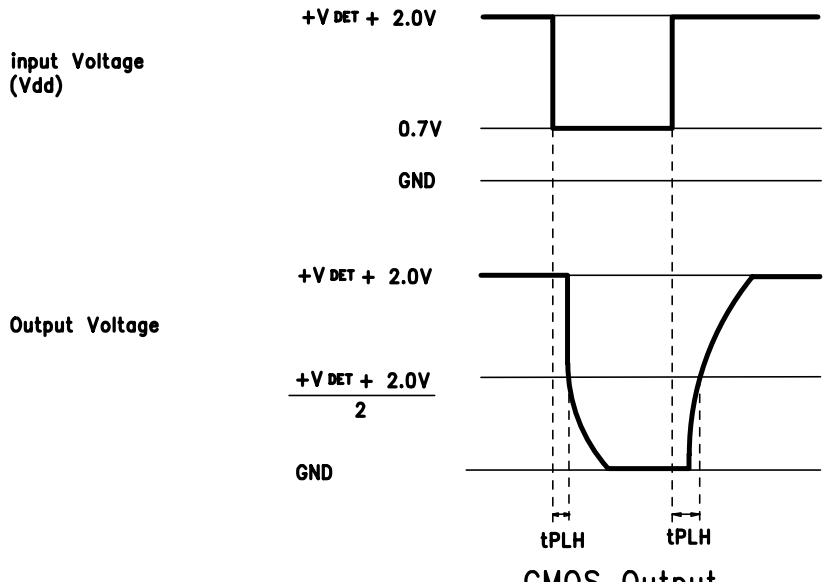
BLOCK DIAGRAM



TIME CHART

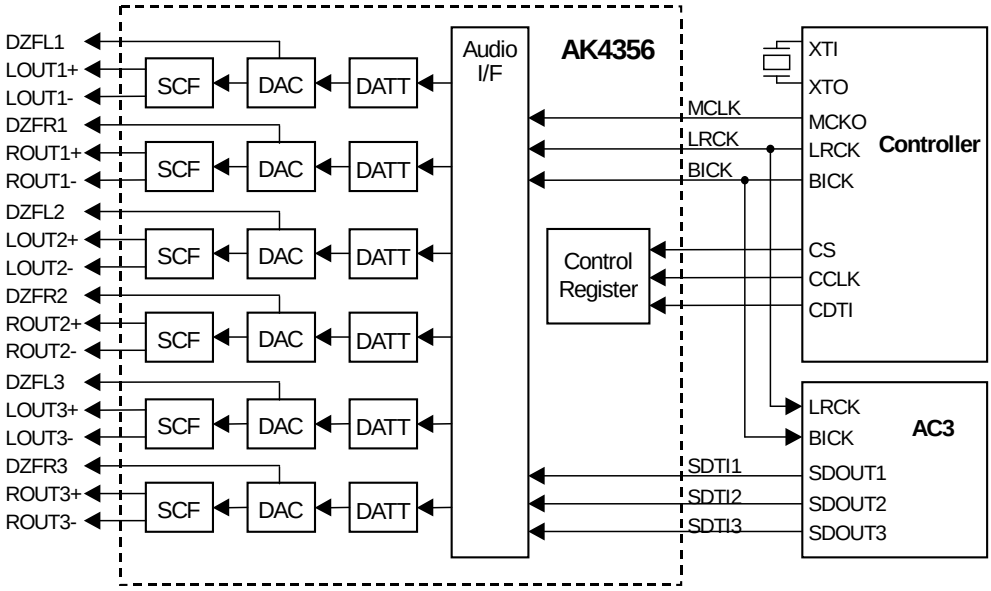


DEFINITION OF OUTPUT DELAY TIME tPLH



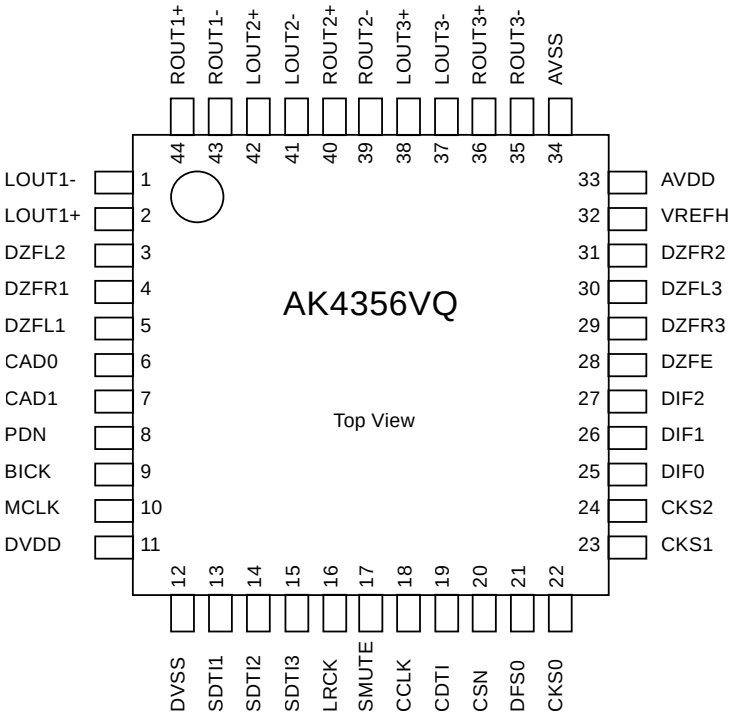
CMOS Output

■ Block Diagram



D/A CONVERTER IC PIN ASSIGNMENT & BLOCK DIAGRAM

PIN ASSIGNMENT (TOP VIEW)



D/A CONVERTER IC PIN FUNCTION (AK4356VQ) : IC78

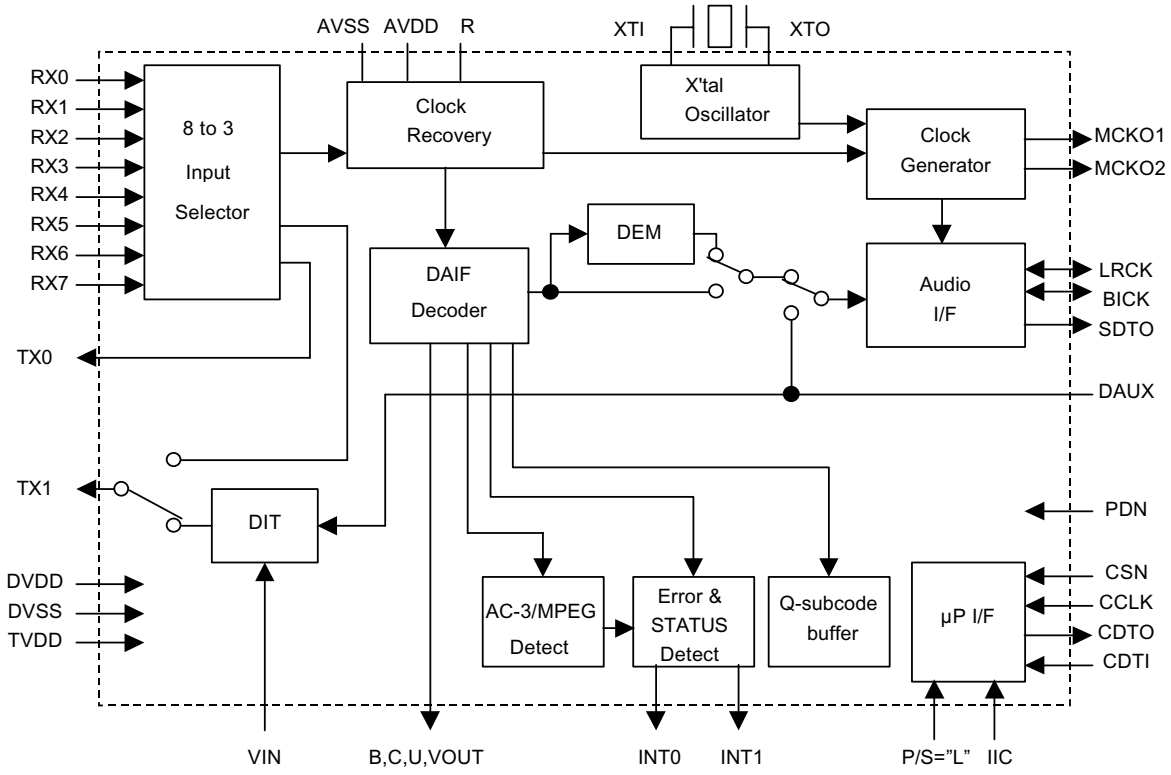
PIN/FUNCTION

No.	Pin Name	I/O	Function
1	LOUT1-	O	DAC1 Lch Negative Analog Output Pin
2	LOUT1+	O	DAC1 Lch Positive Analog Output Pin
3	DZFL2	O	DAC2 Lch Zero Input Detect Pin
4	DZFR1	O	DAC1 Rch Zero Input Detect Pin
5	DZFL1	O	DAC1 Lch Zero Input Detect Pin
6	CAD0	I	Chip Address 0 Pin
7	CAD1	I	Chip Address 1 Pin
8	PDN	I	Power-Down & Reset Pin When "L", the AK4356 is powered-down and the control registers are reset to default state. If the state of CAD0-1 changes, then the AK4356 must be reset by PDN.
9	BICK	I	Audio Serial Data Clock Pin
10	MCLK	I	Master Clock Input Pin
11	DVDD	-	Digital Power Supply Pin, +4.75~+5.25V
12	DVSS	-	Digital Ground Pin
13	SDTI1	I	DAC1 Audio Serial Data Input Pin
14	SDTI2	I	DAC2 Audio Serial Data Input Pin
15	SDTI3	I	DAC3 Audio Serial Data Input Pin
16	LRCK	I	Audio Input Channel Clock Pin
17	SMUTE	I	Soft Mute Pin (Note) When this pin goes to "H", soft mute cycle is initialized. When returning to "L", the output mute releases.
18	CCLK	I	Control Data Clock Pin
19	CDTI	I	Control Data Input Pin
20	CSN	I	Chip Select Pin This pin should be held to "H" except for access.

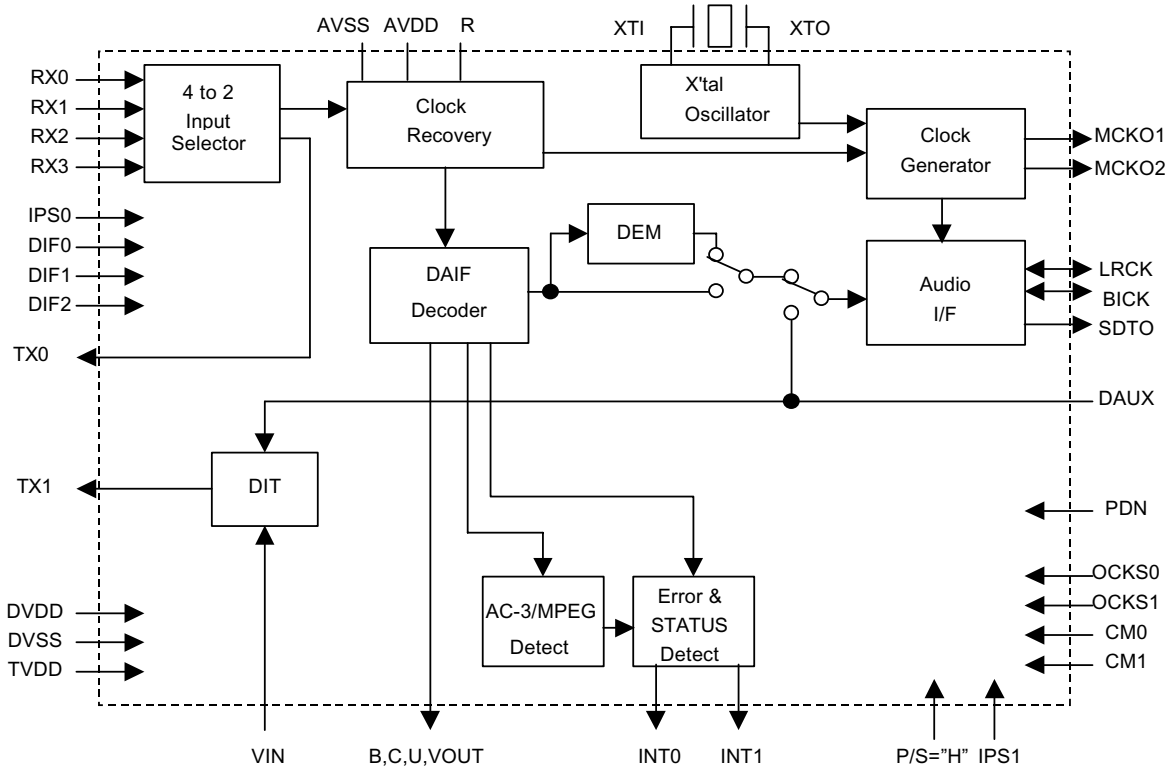
No.	Pin Name	I/O	Function
21	DFS0	I	Double Speed Sampling Mode 0 Pin (Note) "L": Normal Speed, "H": Double Speed at DFS1 bit = "0".
22	CKS0	I	Input Clock Select 0 Pin (Note)
23	CKS1	I	Input Clock Select 1 Pin (Note)
24	CKS2	I	Input Clock Select 2 Pin (Note)
25	DIF0	I	Audio Data Interface Format 0 Pin (Note)
26	DIF1	I	Audio Data Interface Format 1 Pin (Note)
27	DIF2	I	Audio Data Interface Format 2 Pin (Note)
28	DZFE	I	Zero Input Detect Enable Pin (Note)
29	DZFR3	O	DAC3 Rch Zero Input Detect Pin
30	DZFL3	O	DAC3 Lch Zero Input Detect Pin
31	DZFR2	O	DAC2 Rch Zero Input Detect Pin
32	VREFH	I	Positive Voltage Reference Input Pin, AVDD
33	AVDD	-	Analog Power Supply Pin
34	AVSS	-	Analog Ground Pin, +4.75~+5.25V
35	ROUT3-	O	DAC3 Rch Negative Analog Output Pin
36	ROUT3+	O	DAC3 Rch Positive Analog Output Pin
37	LOUT3-	O	DAC3 Lch Negative Analog Output Pin
38	LOUT3+	O	DAC3 Lch Positive Analog Output Pin
39	ROUT2-	O	DAC2 Rch Negative Analog Output Pin
40	ROUT2+	O	DAC2 Rch Positive Analog Output Pin
41	LOUT2-	O	DAC2 Lch Negative Analog Output Pin
42	LOUT2+	O	DAC2 Lch Positive Analog Output Pin
43	ROUT1-	O	DAC1 Rch Negative Analog Output Pin
44	ROUT1+	O	DAC1 Rch Positive Analog Output Pin

Note: SMUTE, DFS0, CKS0, CKS1, CKS2, DIF0, DIF1, DIF2, DZFE pins are ORed with serial control register.

BLOCK DIAGRAM



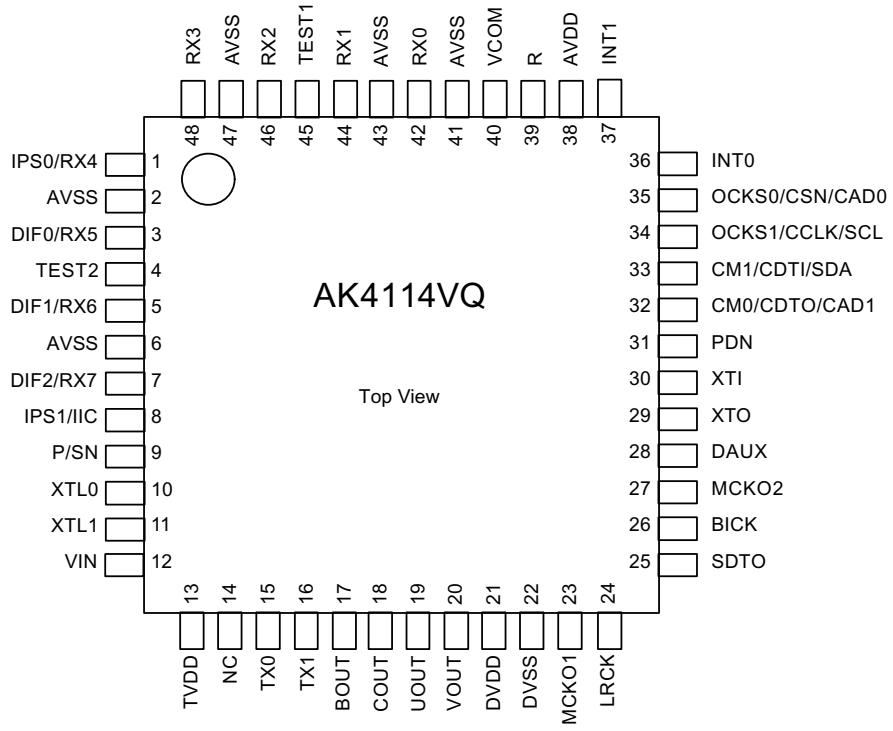
Serial Control Mode



Parallel Control Mode

DIR IC PIN ASSIGNMENT & BLOCK DIAGRAM

PIN ASSIGNMENT (TOP VIEW)



DIR IC PIN FUNCTION (AK4114VQ) : IC75

PIN/FUNCTION

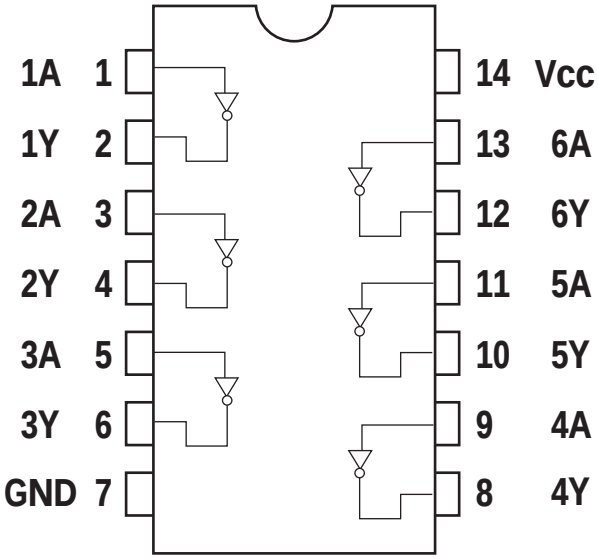
No.	Pin Name	I/O	Function
1	IPS0	I	Input Channel Select 0 Pin in Parallel Mode
	RX4	I	Receiver Channel 4 Pin in Serial Mode (Internal biased pin)
2	NC(AVSS)	I	No Connect No internal bonding. This pin should be connected to AVSS.
3	DIF0	I	Audio Data Interface Format 0 Pin in Parallel Mode
	RX5	I	Receiver Channel 5 Pin in Serial Mode (Internal biased pin)
4	TEST2	I	TEST 2 pin This pin should be connect to AVSS.
5	DIF1	I	Audio Data Interface Format 1 Pin in Parallel Mode
	RX6	I	Receiver Channel 6 Pin in Serial Mode (Internal biased pin)
6	NC(AVSS)	I	No Connect No internal bonding. This pin should be connected to AVSS.
7	DIF2	I	Audio Data Interface Format 2 Pin in Parallel Mode
	RX7	I	Receiver Channel 7 Pin in Serial Mode (Internal biased pin)
8	IPS1	I	Input Channel Select 1 Pin in Parallel Mode
	IIC	I	IIC Select Pin in Serial Mode. “L”: 4-wire Serial, “H”: IIC
9	P/SN	I	Parallel/Serial Select Pin “L”: Serial Mode, “H”: Parallel Mode
10	XTL0	I	X’tal Frequency Select 0 Pin
11	XTL1	I	X’tal Frequency Select 1 Pin
12	VIN	I	V-bit Input Pin for Transmitter Output
13	TVDD	I	Input Buffer Power Supply Pin, 3.3V or 5V
14	NC	I	No Connect No internal bonding. This pin should be open or connected to DVSS.
15	TX0	O	Transmit Channel (Through Data) Output 0 Pin
16	TX1	O	When TX bit = “0”, Transmit Channel (Through Data) Output 1 Pin. When TX bit = “1”, Transmit Channel (DAUX Data) Output Pin (Default).
17	BOUT	O	Block-Start Output Pin for Receiver Input “H” during first 40 flames.
18	COUT	O	C-bit Output Pin for Receiver Input
19	UOUT	O	U-bit Output Pin for Receiver Input
20	VOUT	O	V-bit Output Pin for Receiver Input
21	DVDD	I	Digital Power Supply Pin, 3.3V
22	DVSS	I	Digital Ground Pin
23	MCKO1	O	Master Clock Output 1 Pin
24	LRCK	I/O	Channel Clock Pin
25	SDTO	O	Audio Serial Data Output Pin
26	BICK	I/O	Audio Serial Data Clock Pin
27	MCKO2	O	Master Clock Output 2 Pin
28	DAUX	I	Auxiliary Audio Data Input Pin
29	XTO	O	X'tal Output Pin
30	XTI	I	X'tal Input Pin

PIN/FUNCTION (Continued)

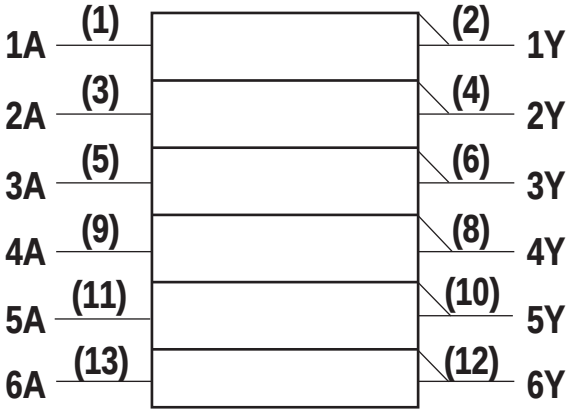
No.	Pin Name	I/O	Function
31	PDN	I	Power-Down Mode Pin When “L”, the AK4114 is powered-down and reset.
32	CM0	I	Master Clock Operation Mode 0 Pin in Parallel Mode
	CDTO	O	Control Data Output Pin in Serial Mode, IIC= “L”.
	CAD1	I	Chip Address 1 Pin in Serial Mode, IIC= “H”.
33	CM1	I	Master Clock Operation Mode 1 Pin in Parallel Mode
	CDTI	I	Control Data Input Pin in Serial Mode, IIC= “L”.
	SDA	I/O	Control Data Pin in Serial Mode, IIC= “H”.
34	OCKS1	I	Output Clock Select 1 Pin in Parallel Mode
	CCLK	I	Control Data Clock Pin in Serial Mode, IIC= “L”
	SCL	I	Control Data Clock Pin in Serial Mode, IIC= “H”
35	OCKS0	I	Output Clock Select 0 Pin in Parallel Mode
	CSN	I	Chip Select Pin in Serial Mode, IIC=”L”.
	CAD0	I	Chip Address 0 Pin in Serial Mode, IIC= “H”.
36	INT0	O	Interrupt 0 Pin
37	INT1	O	Interrupt 1 Pin
38	AVDD	I	Analog Power Supply Pin, 3.3V
39	R	-	External Resistor Pin 18kΩ +/-1% resistor should be connected to AVSS externally.
40	VCOM	-	Common Voltage Output Pin 0.47μF capacitor should be connected to AVSS externally.
41	AVSS	I	Analog Ground Pin
42	RX0	I	Receiver Channel 0 Pin (Internal biased pin) This channel is default in serial mode.
43	NC(AVSS)	I	No Connect No internal bonding. This pin should be connected to AVSS.
44	RX1	I	Receiver Channel 1 Pin (Internal biased pin)
45	TEST1	I	TEST 1 pin. This pin should be connected to AVSS.
46	RX2	I	Receiver Channel 2 Pin (Internal biased pin)
47	NC(AVSS)	I	No Connect No internal bonding. This pin should be connected to AVSS.
48	RX3	I	Receiver Channel 3 Pin (Internal biased pin)

Note 1. All input pins except internal biased pins should not be left floating.

■ PIN ASSIGNMENT (74HCU04AFN : IC71,72)



■ LOGIC SYMBOL



■ TRUTH TABLE

A	Y
L	H
H	L

August 1984
Revised January 2000

Quad Analog Switch (74HC4066D) : IC42

General Description

The MM74HC4066 devices are digitally controlled analog switches utilizing advanced silicon-gate CMOS technology. These switches have low “ON” resistance and low “OFF” leakages. They are bidirectional switches, thus any analog input may be used as an output and visa-versa. Also the MM74HC4066 switches contain linearization circuitry which lowers the “ON” resistance and increases switch linearity. The MM74HC4066 devices allow control of up to 12V (peak) analog signals with digital control signals of the same range. Each switch has its own control input which disables each switch when LOW. All analog inputs and outputs and digital inputs are protected from electrostatic damage by diodes to V_{CC} and ground.

Features

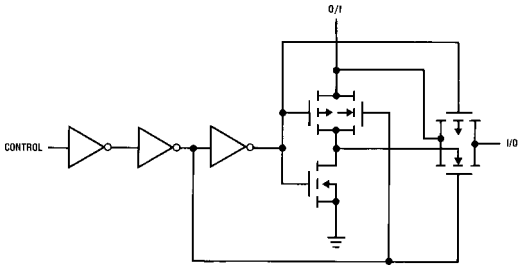
- Typical switch enable time: 15 ns
- Wide analog input voltage range: 0–12V
- Low “ON” resistance: 30 typ. (MM74HC4066)
- Low quiescent current: 80 µA maximum (74HC)
- Matched switch characteristics
- Individual switch controls

Ordering Code:

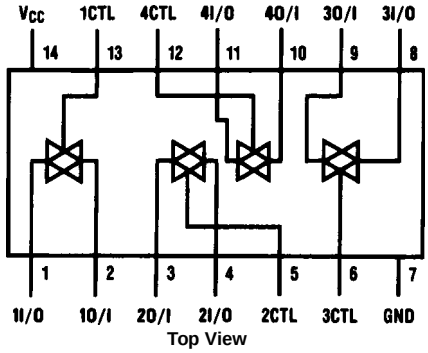
Order Number	Package Number	Package Description
MM74HC4066M	M14A	14-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-120, 0.150” Narrow
MM74HC4066SJ	M14D	14-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
MM74HC4066MTC	MTC14	14-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
MM74HC4066N	N14A	14-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300” Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter “X” to the ordering code.

Schematic Diagram



Connection Diagram



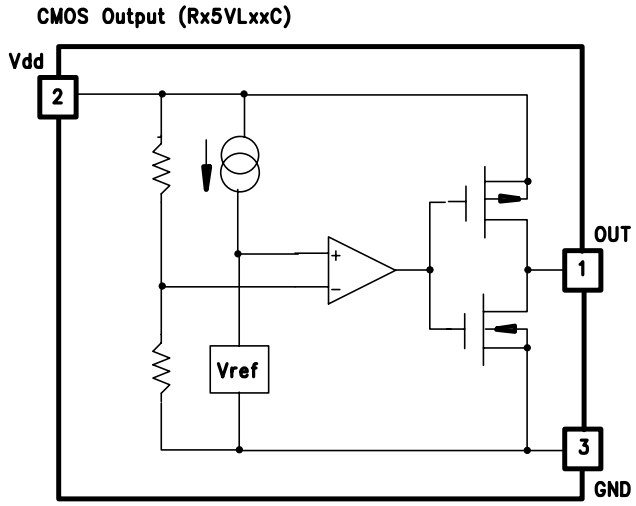
Top View

Truth Table

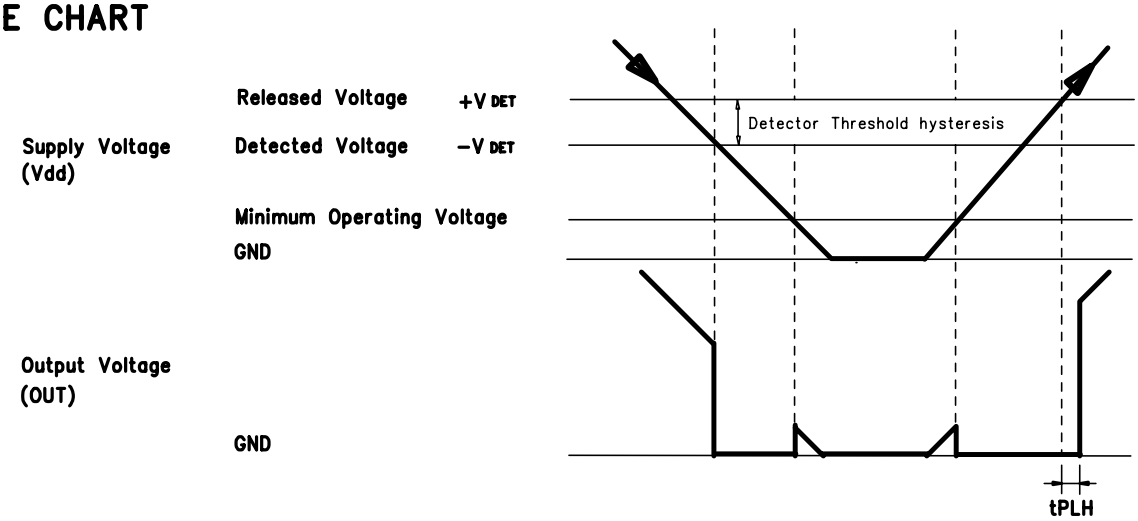
Input	Switch
CTL	I/O–O/I
L	“OFF”
H	“ON”

RE5VL28CATZ (VOLTAGE DETECTOR : IC87)

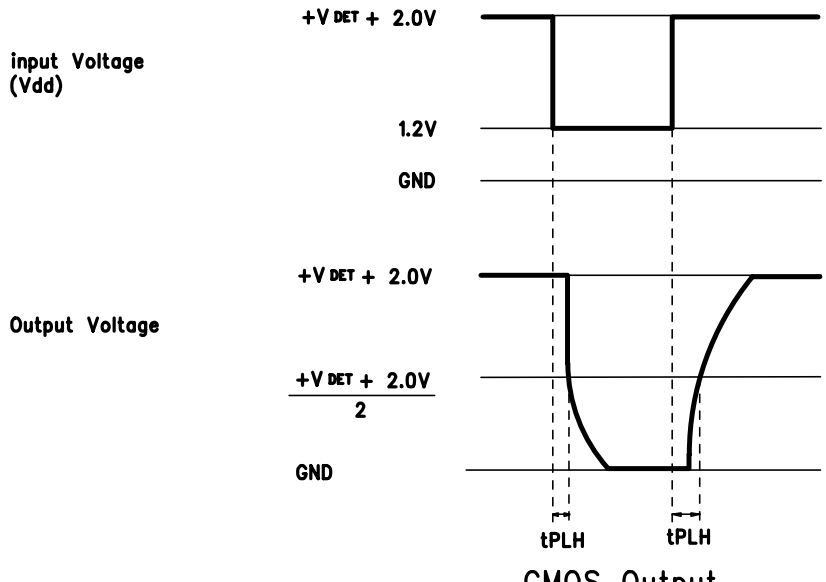
BLOCK DIAGRAM



TIME CHART

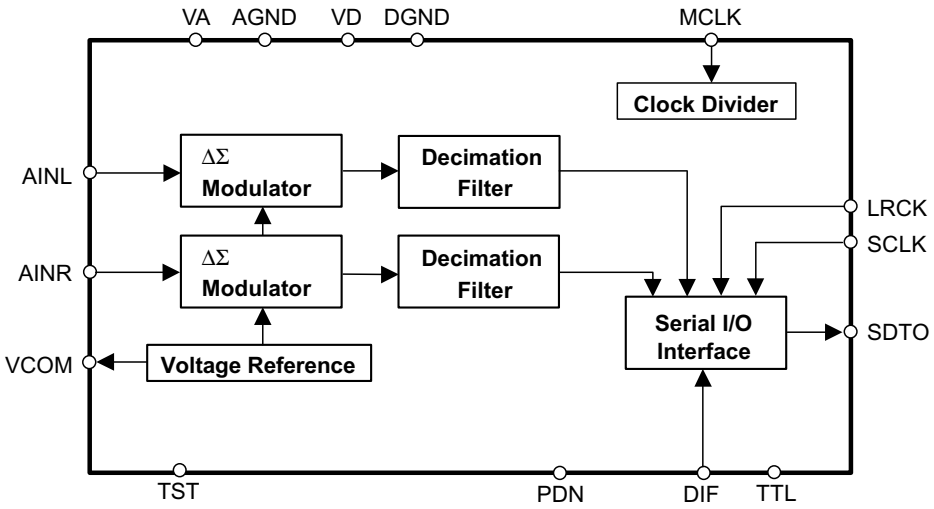


DEFINITION OF OUTPUT DELAY TIME tPLH

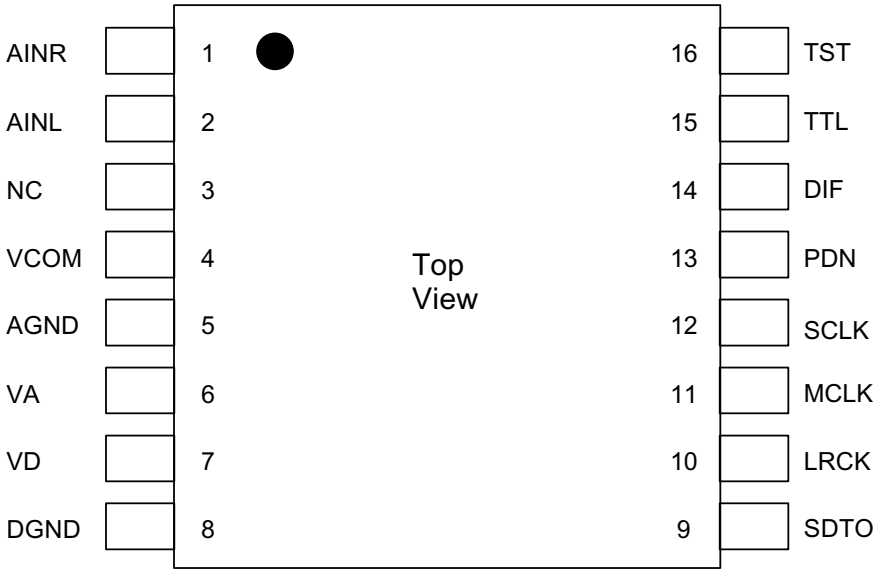


CMOS Output

A/D CONVERTER IC (AK5380VT) : IC77



PIN ASSIGNMENT (TOP VIEW)



A/D CONVERTER IC PINouts (AK5380VT) : IC77

A/D CONVERTER IC PIN FUNCTION (AK5380VT) : IC77

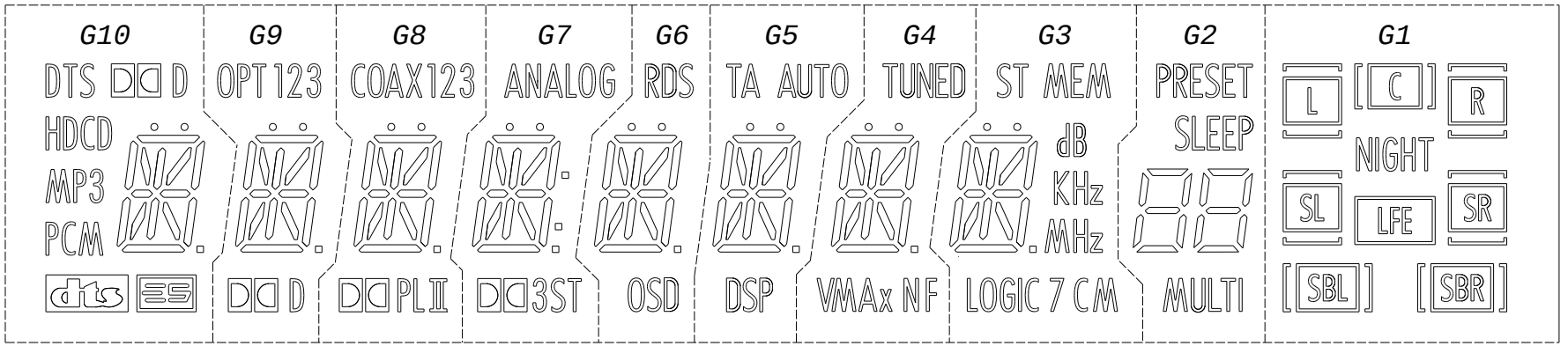
PIN/FUNCTION

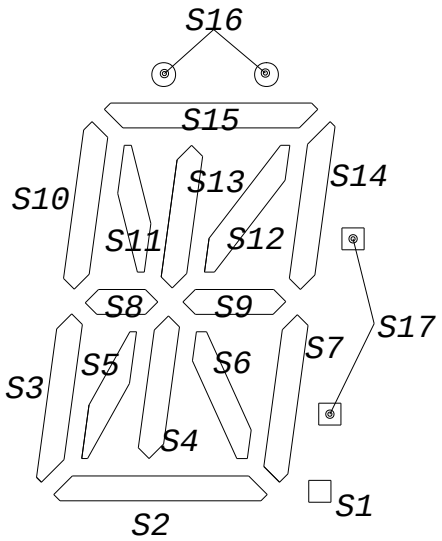
No.	Pin Name	I/O	Description
1	AINR	I	Rch Analog Input Pin
2	AINL	I	Lch Analog Input Pin
3	NC	-	NC Pin No internal bonding.
4	VCOM	O	Common Voltage Output Pin Normally connected to AGND with a 0.1μF ceramic capacitor in parallel with an electrolytic capacitor less than 2.2μF.
5	AGND	-	Analog Ground Pin, 0V
6	VA	-	Analog Power Supply Pin, +4.5~+5.5V
7	VD	-	Digital Power Supply Pin, +2.7~+5.5V(fs=48kHz), +4.5~+5.5V(fs=96kHz)
8	DGND	-	Digital Ground Pin, 0V
9	SDTO	O	Serial Data Output Pin Data bits are presented MSB first, in 2's complement format. This pin is "L" in the power-down mode.
10	LRCK	I	Left/Right Channel Select Pin The fs clock is input to this pin.
11	MCLK	I	Master Clock Input Pin
12	SCLK	I	Serial Data Input Pin Output data is clocked out on the falling edge of SCLK.
13	PDN	I	Power-Down Pin When "L", the circuit is in power-down mode. The AK5380 should always be reset upon power-up.
14	DIF	I	Serial Interface Format Pin "L": MSB justified, "H": I^2S
15	TTL	I	Digital Input Level Select Pin "L": CMOS level (VD=2.7~5.5V), "H": TTL level (VD=4.5~5.5V)
16	TST	I	Test Pin (Internal pull-down pin) This pin should be left open.

Note: All input pins except pull-down pins should not be left floating.

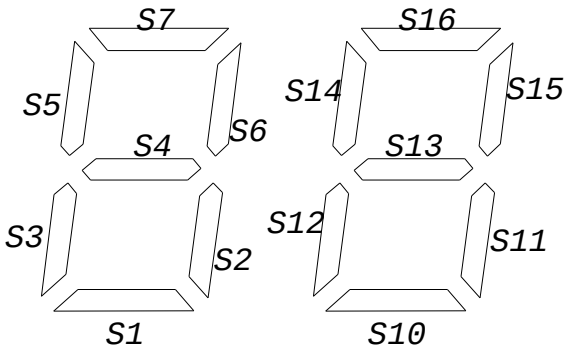
Ise Electronics Corporation
Scale 3:1
Unit : mm

CM2054C:Grid Assignment

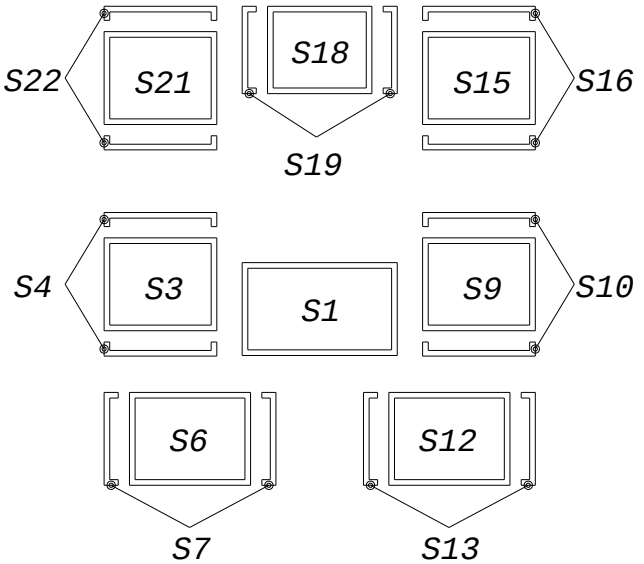




G3-G10



G2



G1

CM2054C :Anode & Grid Assignment

Ise Electronics Corporation

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
S1	S1	S1	S1	S1	S1	S1	S1	S1	S1	S1
S2	LFE	S2	S2	S2	S2	S2	S2	S2	S2	S2
S3	S3	S3	S3	S3	S3	S3	S3	S3	S3	S3
S4	S4	S4	S4	S4	S4	S4	S4	S4	S4	S4
S5	SL	S5	S5	S5	S5	S5	S5	S5	S5	S5
S6	S6	S6	S6	S6	S6	S6	S6	S6	S6	S6
S7	S7	S7	S7	S7	S7	S7	S7	S7	S7	S7
S8	SBL		S8	S8	S8	S8	S8	S8	S8	S8
S9	S9		S9	S9	S9	S9	S9	S9	S9	S9
S10	S10	S10	S10	S10	S10	S10	S10	S10	S10	S10
S11	SR	S11	S11	S11	S11	S11	S11	S11	S11	S11
S12	S12	S12	S12	S12	S12	S12	S12	S12	S12	S12
S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
S14	SBR	S14	S14	S14	S14	S14	S14	S14	S14	S14
S15	S15	S15	S15	S15	S15	S15	S15	S15	S15	S15
S16	S16	S16	S16	S16	S16	S16	S16	S16	S16	S16
S17	R		dB				S17			
S18	S18	PRESET	ST	TUNED	TA	RDS	ANALOG	COAX	OPT	DTS
S19	S19	SLEEP	MEM	VMAx	AUTO	OSD	DD 3	1	1	DD D
S20	C	MULTI	KHz	N	DSP		ST	2	2	HDCD
S21	S21		MHz	F				3	3	MP3
S22	S22		LOGIC 7					DD PL	DD D	PCM
S23	L		C					Ⅱ		dts
S24	NIGHT		M							ES

PIN ASSIGNMENT

Pin No.	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
Assignment	NL (F2)	F2	NP	NL	S24	S23	S22	S21	S20	S19	S18	S17	S16	S15	S14	S13	S12	S11	S10	S9	S8	S7	S6	S5	S4	S3	S2

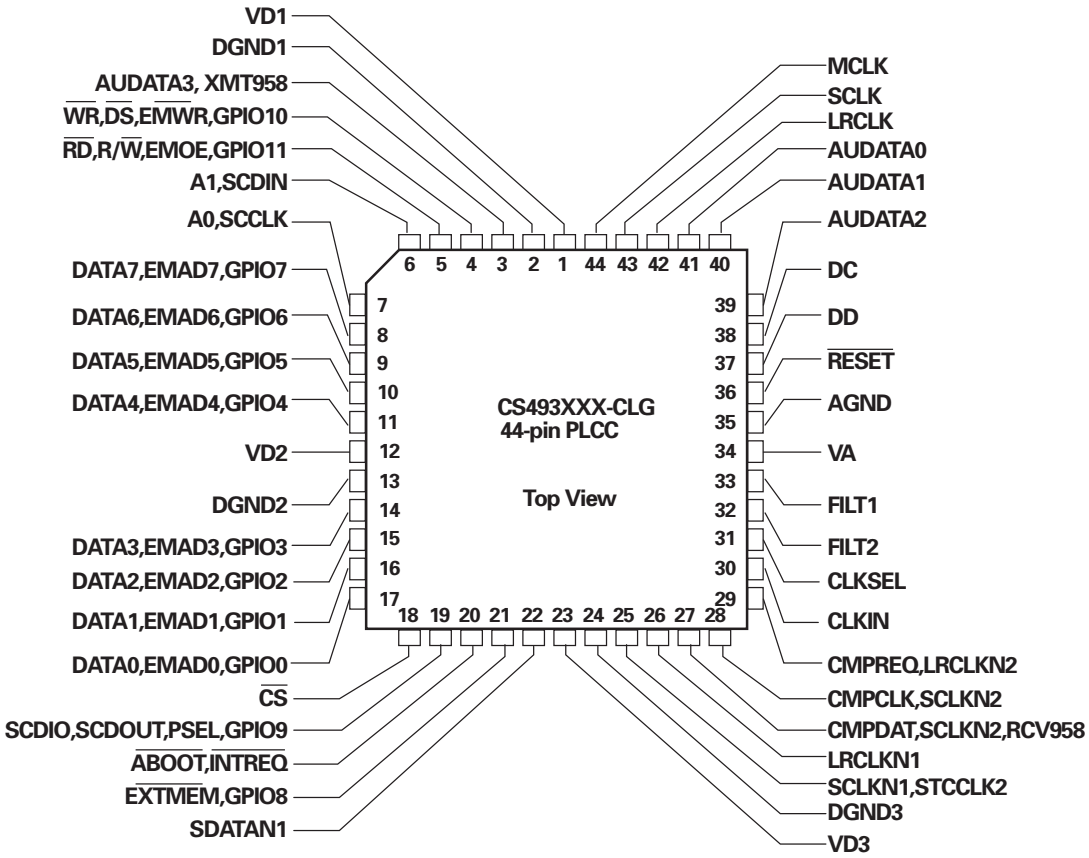
Pin No.	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Assignment	S1	NL	NL	NL	NL	G10	G9	G8	G7	G6	G5	G4	G3	G2	G1	NL	NP	F1	NL (F1)

F1,F2:Filament G1-G10:Grid S1-S24:Anode NP:No Pin NL:No Lead

AUDIO DSP (CS493263 - CLG : IC79)

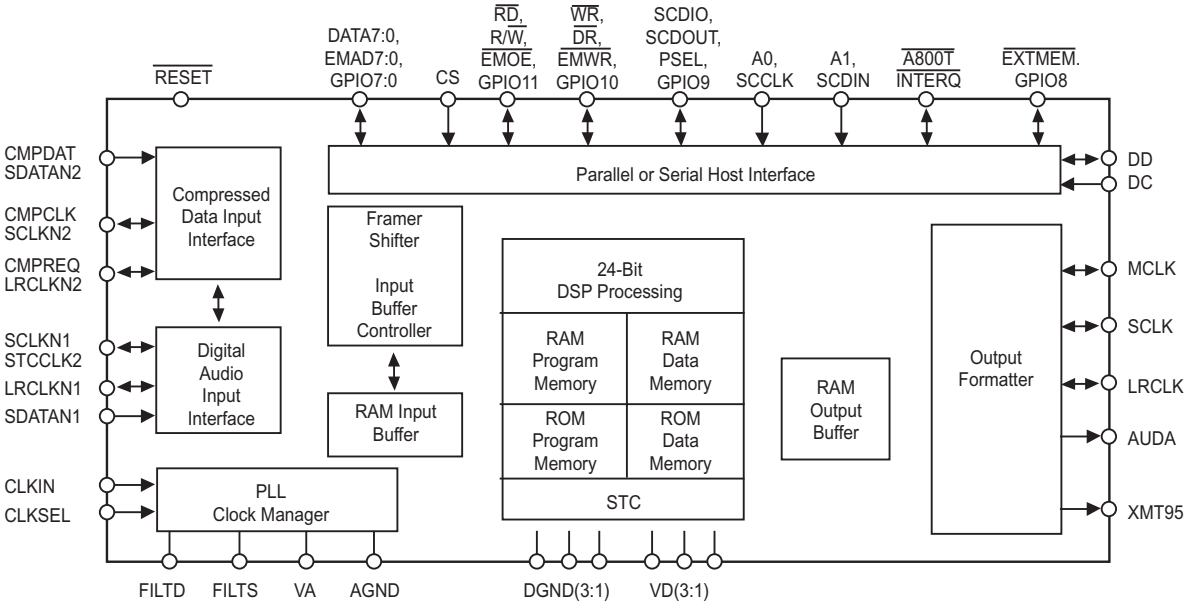
PIN No.	Pin Name	I/O	Function
1,12,23	+VD1	-	Digital Power supply. Normally +2.5v
2,13,24	DGND	-	Digital Ground
3	AUD3	O	SPDIF transmitter output/Digital audio output(N.C)
4	WR	I	Host write strobe pin(connected to GND with an external resistor)
5	RD	I	Host parallel output enable pin(pulled up with an external resistor)
6	CS_DA	I	SPI Serial data input pin
7	CS_CK	I	Serial control clock input pin
8	EMAD7	I/O	Serial data IN/OUTPUT pins(pulled up with an external resistor)
9	EMAD6	I/O	
10	EMAD5	I/O	
11	EMAD4	I/O	
14	EMAD3	I/O	
15	EMAD2	I/O	
16	EMAD1	I/O	
17	EMAD0	I/O	
18	CS_CE	I	Host parallel chip select pin
19	SCDIO(AK_DOUT)	O	Serial control port data ouput pin
20	INTREQ	O	Control port interrupt request output pin
21	EXTMEM	I/O	External Memory Chip Selector(pulled up with an external resistor)
22	SDATAN1(SDI)	I	PCM audio data input number 1 pin
25	SCLKN1(BICK)	I	PCM audio input bit clock pin
26	LRCLKN1(LRCK)	I	PCM audio input sample rate clock pin
27	CMPDAT(SDI)	I	PCM audio data input number 2 pin
28	CMPCLK(BICK)	I	PCM audio input bit clock pin
29	CREQ(LRCK)	I	PCM audio input sample rate clock pin
30	CLKIN(XIN)	I	Master clock input(used external clock)
31	CLKSEL(GND)	I	DSP clock mode select pin: connect the GND
32	FILT1		Connects to an external filter for the on-chip phase-locked loop
33	FILT1		Connects to an external filter for the on-chip phase-locked loop
34	+2.5V	-	Analog Power supply for clock generator . Normally +2.5V
35	AGND	-	Analog ground supply for clock generator PLL.
36	RESET(CS_RST)	I	Master reset input pin
37	DBDATA	-	Reserved pin and should be pulled up with an external resistor.
38	DBCLK	-	Reserved pin and should be pulled up with an external resistor.
39	AUD2(SDO2)	O	PCM multi-format digital-audio data ouput2 pin
40	AUD1(SDO1)	O	PCM multi-format digital-audio data ouput1 pin
41	AUD0(SDO0)	O	PCM multi-format digital-audio data ouput0 pin
42	LRCLK	I	Audio output sample rate clock pin
43	SCLK(BICK)	I	Audio ouput bit clock pin
44	MCLK	I	Audio master clock output pin

■ PIN ASSIGNMENT.(CS493263)



(TOP VIEW)

BIOCK DIAGRAM(CS493263)



Ordering number : *EN5039

CMOS IC

LC74763, 74763M

On-Screen Display LSI

Preliminary

Overview

The LC74763 and LC74763M are on-screen display CMOS LSIs that superimpose text and low-level graphics onto a TV screen (video signal) under the control of a microcontroller. The display characters have a 12 by 18 dots structure, and 128 characters are provided.

Features

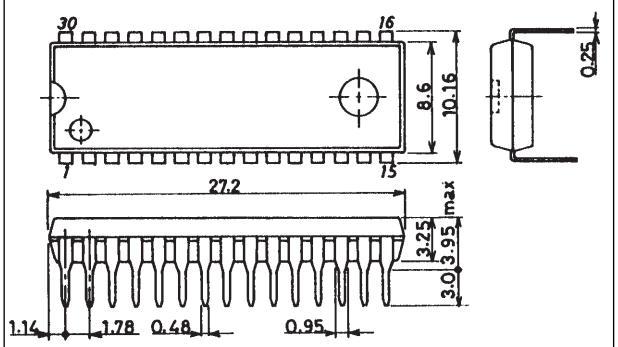
- Display structure: 12 lines by 24 characters (up to 288 characters)
- Maximum character display: Up to 288 characters
- Character configuration: 12 (W) by 18 (H) dots structure
- Number of characters: 128 characters (128 plus space 2 fonts)
- Character sizes: Three sizes (normal, double, and triple sizes)
- Display starting positions: 64 horizontal and 64 vertical locations
- Reverse video function: Characters can be inverted on a per character basis.
- Flashing types: Two types with periods of 0.5 and 1.0 second on a per character basis (duty fixed at 50%)
- Background color: One of eight colors (when internal synchronization used)
- External control input: Serial data input in 8-bit units
- Built-in horizontal/vertical sync separation circuit, AFC circuit, and synchronization detector
- Video output: Composite video signal output in NTSC, PAL, PAL-M, PAL-N, PAL60, NTSC4.43, or SECAM format

Package Dimensions

unit: mm

3196-DIP30SD

[LC74763]

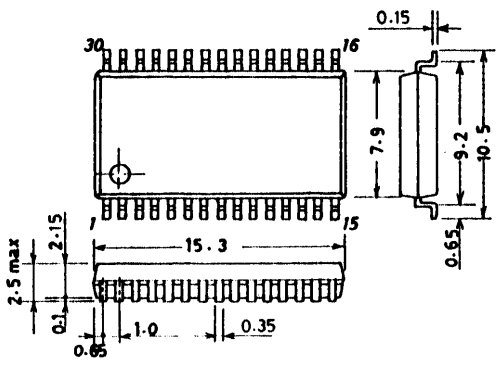


SANYO: DIP30SD

unit: mm

3216A-MFP30S

[LC74763M]



SANYO: MFP30S

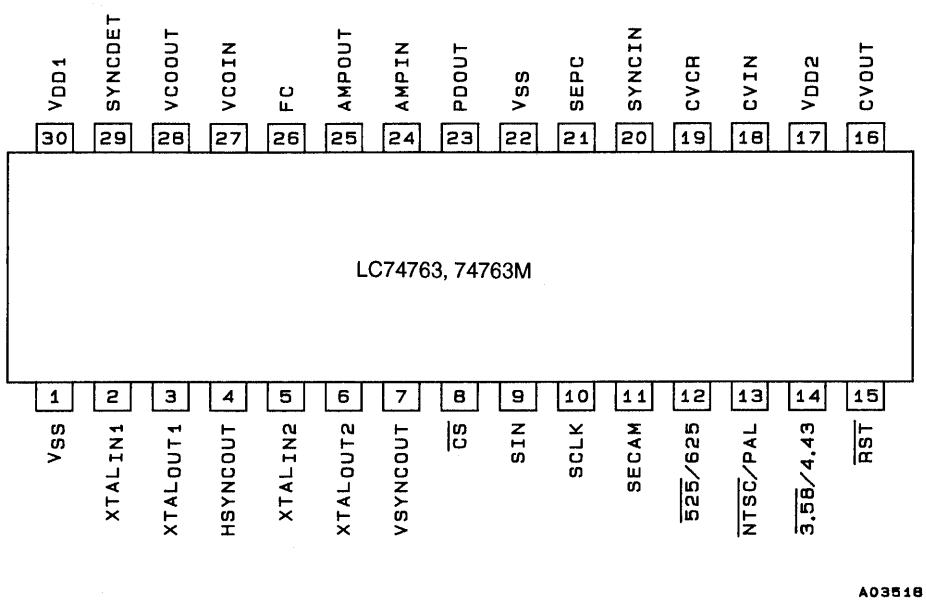
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquarters

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

Pin Functions

Pin No.	Symbol	Function	Description
1	V_{SS}	Ground	Ground connection
2	$Xtal_{IN1}$	Crystal oscillator connection	Connection for the crystal and capacitor used to form the crystal oscillator that generates the internal synchronization signal. The oscillator can be selected with a command switch.
3	$Xtal_{OUT1}$		
4	$HSYNC_{OUT}$	Horizontal synchronization output	Outputs the horizontal synchronization signal (AFC). The output polarity can be selected (metal option). Also functions as general output port (command switch).
5	$Xtal_{IN2}$	Crystal oscillator connection	Connection for the crystal and capacitor used to form the crystal oscillator that generates the internal synchronization signal.
6	$Xtal_{OUT2}$		
7	$VSYNC_{OUT}$	Vertical synchronization output	Outputs the vertical synchronization signal. The output polarity can be selected (metal option). Also functions as general output port (command switch).
8	$\overline{CS}$	Enable input	Enables/disables serial data input. Serial data is enabled when this pin is low (hysteresis input). Pull-up resistor built in (metal option).
9	SIN	Data input	Serial data input (hysteresis input). Pull-up resistor built in (metal option).
10	SCLK	Clock input	Clock input for serial data input (hysteresis input). Pull-up resistor built in (metal option).
11	SECAM	SECAM mode switch input/ output (command switch)	During input, switches between SECAM and other modes. During output, functions as general output port or internal V output (command switch). Low = other modes, high = SECAM mode
12	$\overline{525}$/625	525/625 switch input/output (command switch)	During input, switches between 525 scan lines and 625 scan lines. During output, functions as general output port or character data output (command switch). Low = 525 lines, high = 625 lines
13	$\overline{NTSC}$/PAL	NTSC/PAL switch input/output (command switch)	Switches the color mode between NTSC and PAL. During output, functions as general output port or frame data output (command switch). Low = NTSC, high = PAL
14	$\overline{3.58}$/4.43	3.58/4.43 switch input/output (command switch)	Switch FSC between 3.58 MHz and 4.43 MHz. During output, functions as general output port or halftone output (command switch). Low = 3.58, high = 4.43
15	$\overline{RST}$	Reset input	System reset input pin, low is active (hysteresis input). Pull-up resistor built in (metal option).
16	CV_{OUT}	Video signal output	Composite video output
17	V_{DD2}	Power supply connection	Power supply connection for composite video signal level generation
18	CV_{IN}	Video signal input	Composite video input
19	CV_{CR}	Video signal input	SECAM chroma signal input
20	$SYNC_{IN}$	Sync separator circuit input	Built-in sync separator circuit video signal input
21	SEP_{C}	Sync separator circuit	Built-in sync separator circuit
22	V_{SS}	Ground	Ground connection
23	PD_{OUT}	Control voltage output	AFC control voltage output
24	AMP_{IN}	AFC filter connection	Filter connection
25	AMP_{OUT}		
26	FC	Control voltage input	AFC control voltage input
27	VCO_{IN}	LC oscillator connection	VCO LC oscillator circuit coil and capacitor connection
28	VCO_{OUT}		
29	$SYNC_{DET}$	External synchronization signal detection output	Outputs the exclusive NOR of the horizontal synchronization signal (AFC) and CSYNC (sync separator). The output polarity can be selected (metal option). Also functions as general output port (command switch).
30	V_{DD1}	Power supply connection	Power supply connection (+5 V: digital system power supply)

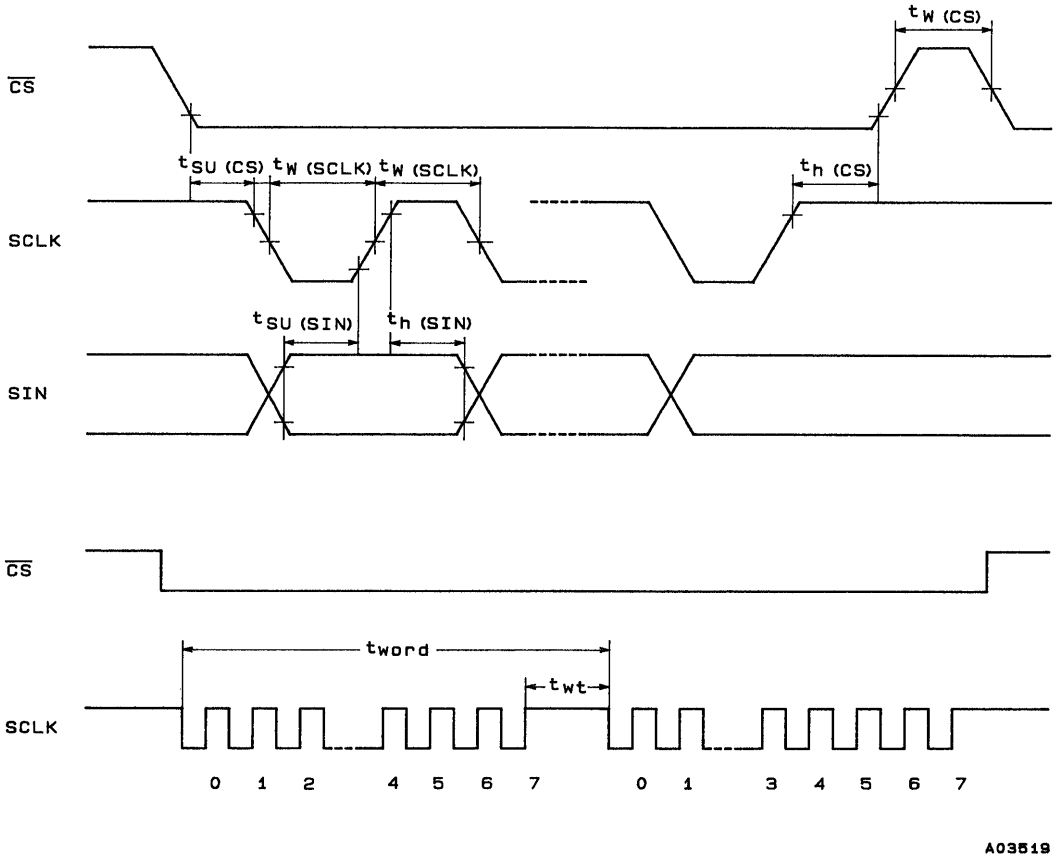
Pin Assignment



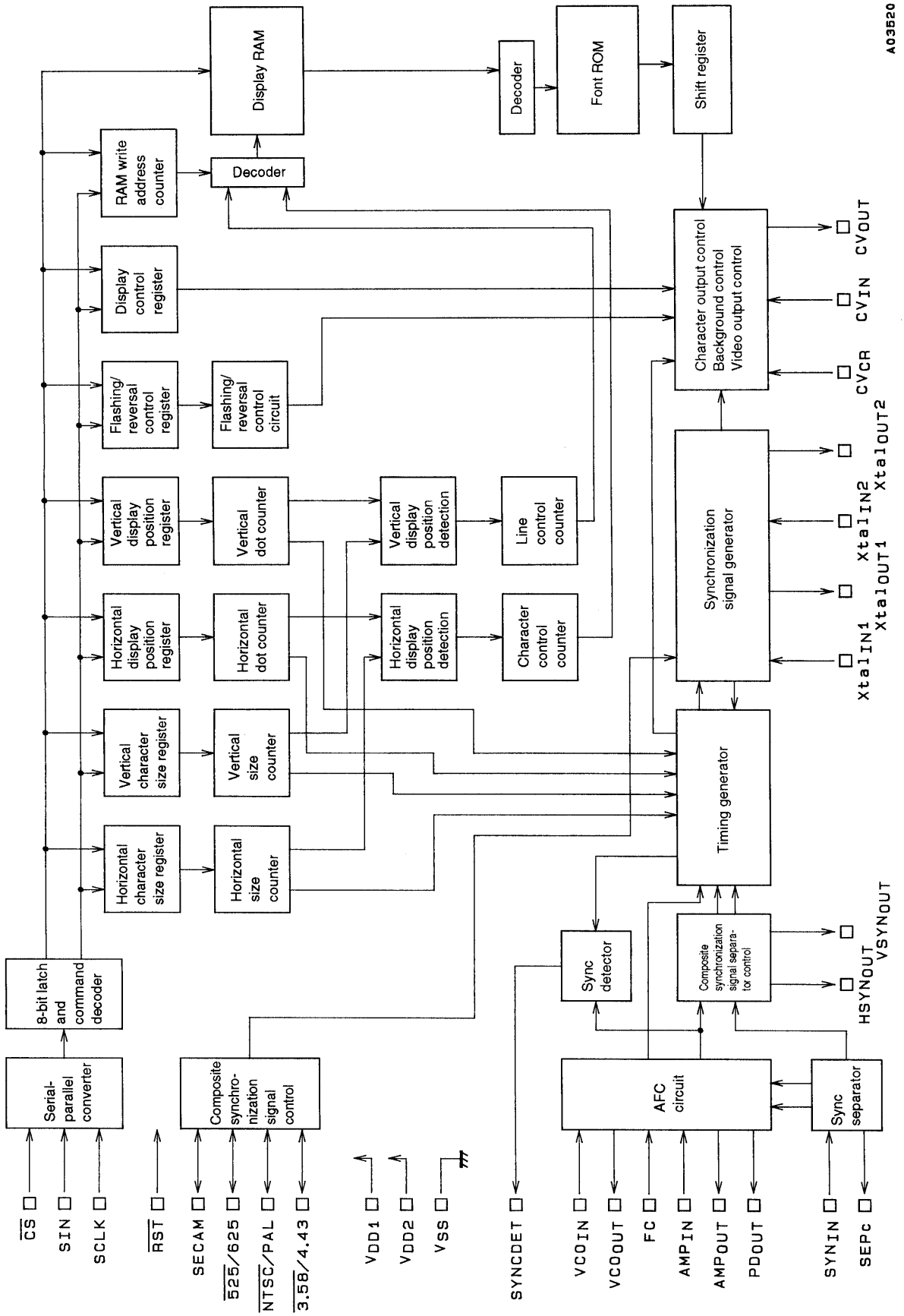
Top View

Top view

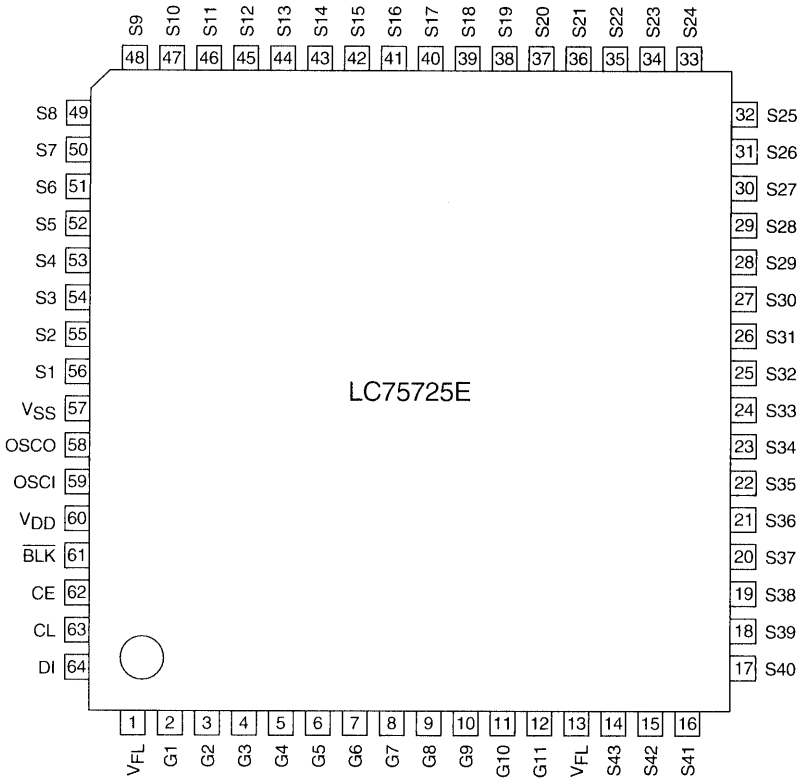
Serial Data Input Timing



System Block Diagram



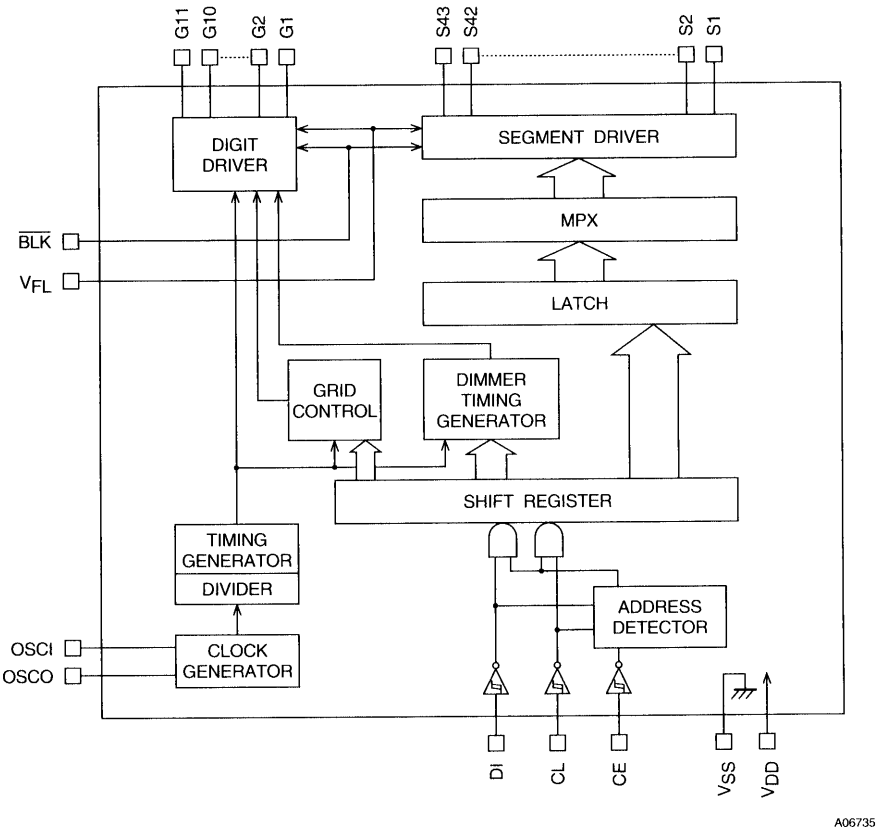
PIN ASSIGNMENT (TOP VIEW)



Top view

A06732

BLOCK DIAGRAM



VFD DRIVER IC PIN FUNCTION (LC75725E) : IC74

Pin	Pin No.	Function	I/O	Handling when unused
V_{FL}	1, 13	Driver block power supply connection. (Both pins must be connected.)	—	—
V_{DD}	60	Logic block power supply connection. Provide a voltage between 4.5 and 5.5 V.	—	—
V_{SS}	57	Power supply connection. Connect to the ground.	—	—
OSCI	59	Oscillator connection. An oscillator circuit is formed by connecting an external resistor and capacitor to these pins.	I	GND
OSCO	58		O	OPEN
$\overline{BLK}$	61	Display off control input. $\overline{BLK}$ = Low (V_{SS}) ... Display off. (S1 to S43 and G1 to G11 at V_{FL} level.) $\overline{BLK}$ = High (V_{DD}) ... Display on. Note that serial data can be transferred while the display is turned off.	I	GND
CL	63	Serial data transfer inputs. These pins must be connected to the system microcontroller. CL: Synchronization clock DI: Transfer data CE: Chip enable	I	GND
DI	64			
CE	62			
G1 to G11	2 to 12	Digit outputs. These pins are P-channel open drain outputs with pull-down resistors.	O	OPEN
S1 to S43	56 to 14	Segment outputs for displaying the display data transferred by serial data input. These pins are P-channel open drain outputs with pull-down resistors.	O	OPEN

BLOCK DIAGRAM

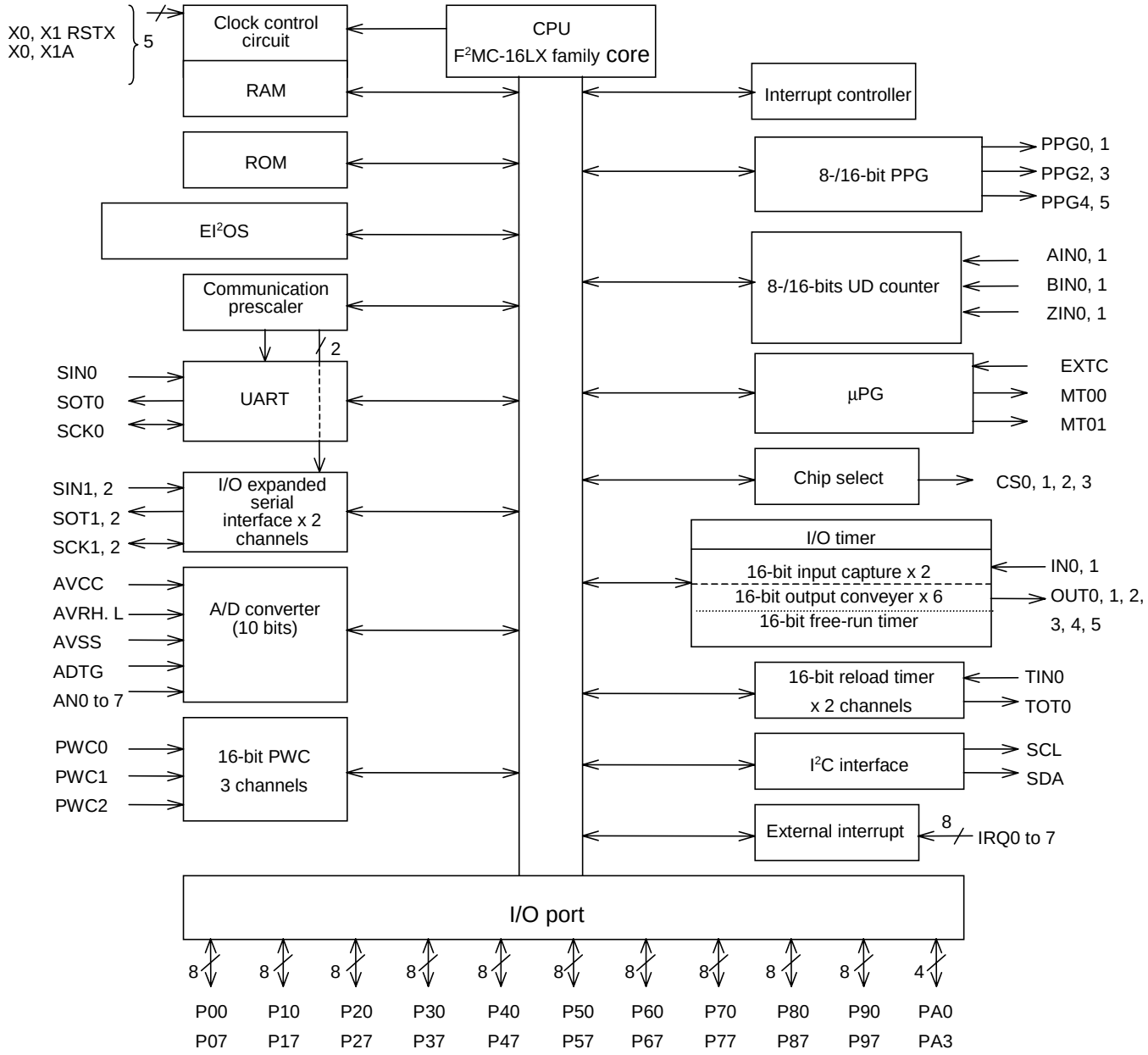


Fig. 1.1 Block Diagram (MB90470)

P00 to P07 (8): Provided with input pull-up resistor setting register

P10 to P17 (8): Provided with input pull-up resistor setting register

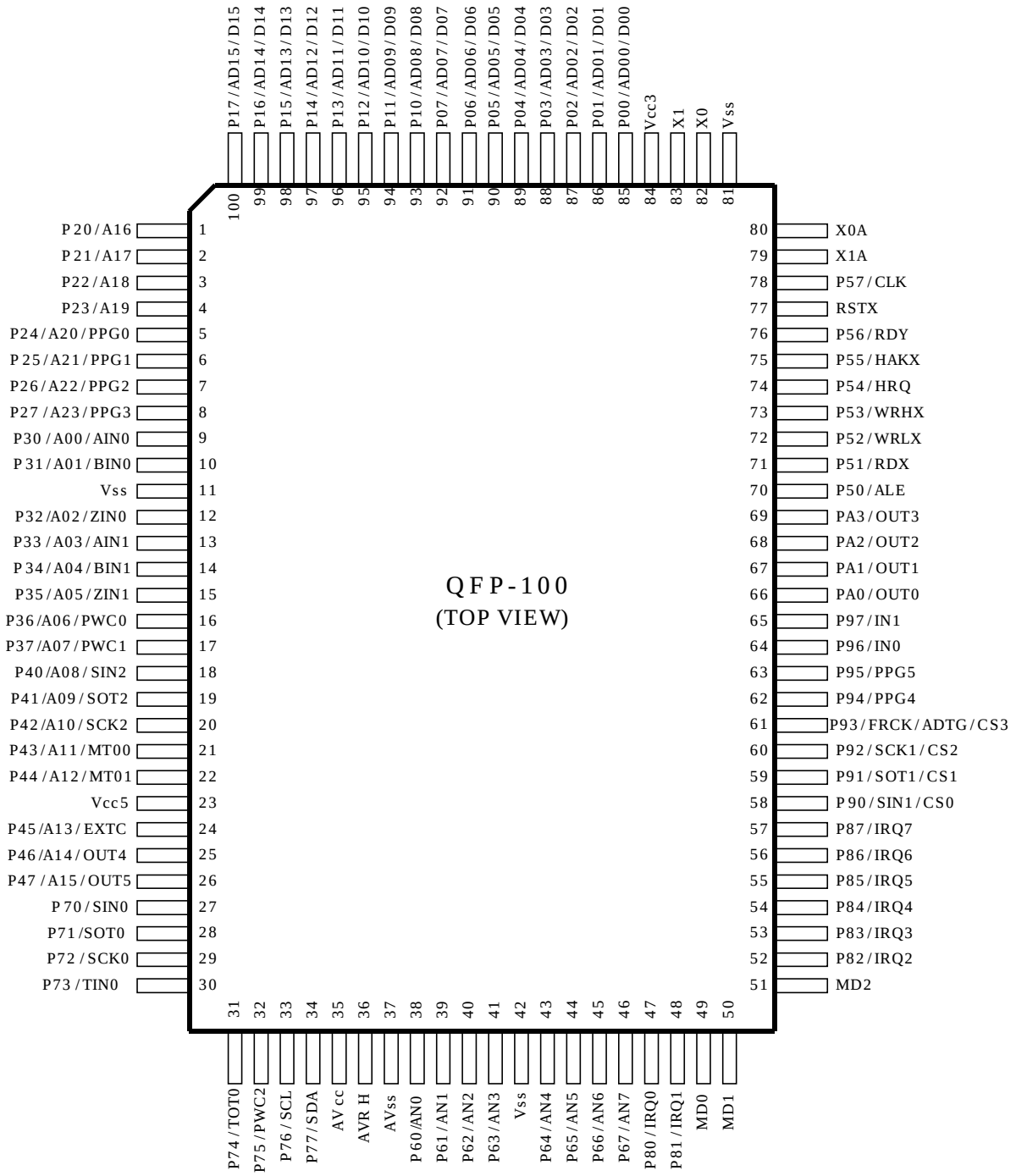
P40 to P47 (8): Provided with open-drain setting register

P70 to P75 (6): Provided with open-drain setting register

P76 to P77 (2): Open-drain

Note: In the figure above, the I/O port shares the pins with each internal functional block. When the pins are used as internal module pins, they cannot be used as I/O port pins.

M-COM IC PIN ASSIGNMENT & BLOCK DIAGRAM □
PIN ASSIGNMENT (TOP VIEW)



P20-27/P30-37/P40-47/P70-77: 5 V-I/F

FUJITSU

IC PIN FUNCTION (M-COM : MB90F476APFG) : IC72

LQFP	QFP	Pin Name	Circuit Type	Function
80	82	X0	A	Oscillator pin
81	83	X1	A	Oscillator pin
78	80	X0A	A	32 kMHz Oscillator pin
77	79	X1A	A	32 kMHz Oscillator pin
75	77	RSTX	B	Reset input pin
83 to 90	85 to 92	P00 to P07	C (CMOS)	General-purpose I/O ports A pull-up resistor can be attached using the pull-up resistor setting register (RDR0) (RD07 to RD00 = 1). (Invalid when set to output)
		AD00 to AD07		In the multiplex mode, the pins function as external address/data bus lower I/O pins.
		D00 to D07		In the non-multiplex mode, they function as external data bus lower output pins.
91 to 98	93 to 100	P10 to P17	C (CMOS)	General-purpose I/O ports A pull-up resistor can be attached using the pull-up resistor setting register (RDR1) (RD17 to RD10 = 1). (Invalid when set to output)
		AD08 to AD15		In the multiplex mode, the pins function as external address/data bus upper I/O pins.
		D08 to D15		In the non-multiplex mode, they function as external data upper output pins.
99 100 1 and 2	1 to 4	P20 to P23	E (CMOS/H)	General-purpose I/O ports When the corresponding bit of the HACR register is 0, the pins function as address upper output pins (A20 to A23).
		A16 to A19		When the multiplex mode is enabled and the corresponding bit of the HACR register is 1, the pins function as general-perpose I/O port.
		A16 to A19		In the non-multiplex mode, they function as external address upper output pins.
3 to 6	5 to 8	P24 to P27	E (CMOS/H)	General-purpose I/O ports When the corresponding bit of the HACR register is 0, the pins function as address upper output pins (A20 to A23).
		A20 to A23		When the multiplex mode is enabled and the corresponding bit of the HACR register is 1, the pins function as general-perpose I/O port.
		A20 to A23		In the non-multiplex mode, they function as external address upper output pins.
		PPG0 to 3		The pins function as PPG timer output pin.

LQFP	QFP	Pin Name	Circuit Type	Function
7	9	P30	E (CMOS/H)	General-purpose I/O ports
		A00		In the external bus mode, the pin functions as an external address pin.
		AIN0		The pin is an 8-/16-bit up-and-down timer input pin (ch0).
8	10	P31	E (CMOS/H)	General-purpose I/O port
		A01		In the external bus mode, the pin functions as an external address pin.
		BIN1		The pin is the 8-/16-bit up-and-down timer input pin (ch0).
10	12	P32	E (CMOS/H)	General-purpose I/O port
		A02		In the external bus mode, the pin functions as an external address pin.
		ZIN0		The pin is an 8-/16-bit up-and-down timer input pin (ch0).
11	13	P33	E (CMOS/H)	General-purpose I/O port
		A03		In the external bus mode, the pin functions as an external address pin.
		AIN1		The pin is an 8-/16-bit up-and-down timer input pin (ch1).
12	14	P34	E (CMOS/H)	General-purpose I/O port
		A04		In the external bus mode, the pin functions as an external address pin.
		BIN1		The pin is an 8-/16-bit up-and-down timer input pin (ch1).
13	15	P35	E (CMOS/H)	General-purpose I/O port
		A05		In the external bus mode, the pin functions as an external address pin.
		ZIN1		The pin is an 8-/16-bit up-and-down timer input pin (ch1).
14 and 15	16 and 17	P36, P37	E (CMOS/H)	General-purpose I/O port
		A06, A07		In the external bus mode, the pins function as external address pins.
		PWC0, PWC1		This pin functions as PWC input pin.
16	18	P40	G (CMOS/H)	General-purpose I/O port
		A08		In the external bus mode, the pin functions as an external address pin.
		SIN2		Simple serial I/O input pin
17	19	P41	F (CMOS/H)	General-purpose I/O port
		A09		In the external bus mode, the pin functions as an external address pin.
		SOT2		SCI Output pin
18	20	P42	G (CMOS)	General-purpose I/O port
		A10		In the external bus mode, the pin functions as an external address pin.
		SCK2		SCI Clock I/O pin
19 and 20	21 and 22	P43, P44	F (CMOS)	General-purpose I/O port
		A11, A12		In the external bus mode, the pins function as external address pins.
		MT00, MT01		µPG Output pins
22	24	P45	G (CMOS)	General-purpose I/O port
		A13		In the external bus mode, the pin functions as an external address pin.
		EXTC		µPG Input pin
23 and 24	25 and 26	P46,P47	D (CMOS)	General-purpose I/O ports
		A14, A15		In the external bus mode, the pins function as external address pins.
		OUT4/ OUT5		The pins are captured as output-compare event output pins.

LQFP	QFP	Pin Name	Circuit Type	Function
68	70	P50	D (CMOS)	General-purpose I/O port In the external bus mode, the pin functions as ALE pin.
		ALE		In the external bus mode, the pin functions as an address capture enable signal (ALE) pin.
69	71	P51	D (CMOS)	General-purpose I/O port In the external bus mode, the pin functions as the RDX pin.
		RDX		When the external bus mode is enabled, the pin functions as the read strobe output (RDX) pin.
70	72	P52	D (CMOS)	General-purpose I/O port When the external bus mode is enabled and the WRE bit of the EPCR register is 1, the pin functions as the WRLX pin
		WRLX		When the external bus mode is enabled, the pin functions as the lower-order side data write strobe output (WRLX) pin. When the WRE bit of the EPCR register is 0, the pin functions as a general-purpose I/O port.
71	73	P53	D (CMOS)	General-purpose I/O port When the external bus mode is enabled (the bus is 16-bits long) and the WRE bit of the EPCR register is 1, the pin functions as the WRHX pin.
		WRHX		When the external bus mode is enabled (the bus is 16-bits long), the pin functions as the higher-order side data write strobe output (WRHX) pin. When the WRE bit of the EPCR register is 0, the pin functions as a general-purpose I/O port.
72	74	P54	D (CMOS)	General-purpose I/O port When the external bus mode is enabled and the HDE bit of the EPCR register is 1, the pin functions as the HRQ pin.
		HRQ		When the external bus mode is enabled, the pin functions as the hold request input (HRQ) pin. When the HDE bit of the EPCR register is 0, the pin functions as a general-purpose I/O port.
73	75	P55	D (CMOS)	General-purpose I/O port When the external bus mode is enabled and the HDE bit of the EPCR register is 1, the pin functions as the HAKX pin.
		HAKX		When the external bus mode is enabled, the pin functions as the hold acknowledge output (HAKX) pin. When the HDE bit of the EPCR register is 0, the pin functions as a general-purpose I/O port.
74	76	P56	D (CMOS)	General-purpose I/O port When the external bus mode is enabled and the RYE bit of the EPCR register is 1, the pin functions as the RDY pin.
		RDY		When the external bus mode is enabled, the pin functions as the external ready input (RDY) pin. When the RYE bit of the EPCR register is 0, the pin functions as a general-purpose I/O port.
76	78	P57	D (CMOS)	General-purpose I/O port When the external bus mode is enabled and the CKE bit of the EPCR register is 1, the pin functions as the CLK pin.
		CLK		When the external bus mode is enabled, the pin functions as the machine cycle clock output (CLK) pin. When the CKE bit of the EPCR register is 0, the pin functions as a general-purpose I/O port.
36 to 39	38 to 41	P60 to P63	H (CMOS)	General-purpose I/O port
		AN0 to AN3		The pins function as analog input pins.
41 to 44	43 to 46	P64 to P67	H (CMOS)	General-purpose I/O port
		AN4 to AN7		The pins function as analog input pins.
25	27	P70	G (CMOS/H)	General-purpose I/O port
		SIN0		The pin functions as an UART data input pin.

LQFP	QFP	Pin Name	Circuit Type	Function
26	28	P71	F (CMOS)	General-purpose I/O port
		SOT0		The pin functions as an UART data output pin.
27	29	P72	G (CMOS/H)	General-purpose I/O port
		SCK0		The pin functions as an UART clock I/O pin.
28	30	P73	G (CMOS/H)	General-purpose I/O port
		TIN0		The pin functions as the event input pin of the 16-bit reload timer.
29	31	P74	F (CMOS/H)	General-purpose I/O port
		TOT0		The pin functions as the output pin of the 16-bit reload timer.
30	32	P75	G (CMOS/H)	General-purpose I/O port
		PWC2		The pin functions as a PWC input pin.
31	33	P76	I (NMOS/H)	General-purpose I/O port
		SCL		The pin functions as the I^2C interface data I/O pin. While the I^2C interface is operating, set the port output to Hi-Z.
32	34	P77	I (NMOS/H)	General-purpose I/O port
		SDA		The pin functions as the I^2C interface clock I/O pin. While the I^2C interface is operating, set the port output to Hi-Z.
45	47	P80, P81	E (CMOS/H)	General-purpose I/O port
46	48	IRQ0, IRQ1		The pins function as external interrupt input pins.
50 to 55	52 to 57	P82 to P87	E (CMOS/H)	General-purpose I/O port
		IRQ2 to IRQ7		The pins function as external interrupt input pins.
56	58	P90	E (CMOS/H)	General-purpose I/O port
		SIN1		The pin functions as the simple serial I/O data input pin.
		CS0		Chip select 0
57	59	P91	D (CMOS)	General-purpose I/O port
		SOT1		The pin functions as the I/O clock I/O pins.
		CS1		Chip Select 1
58	60	P92	E (CMOS/H)	General-purpose I/O port
		SCK1		The pin functions as the SCI clock I/O pin.
		CS2		Chip Select 2
59	61	P93	E (CMOS/H)	General-purpose I/O port
		FRCK		The pin functions as the external clock input pin while the free-running timer is in use.
		ADTG		The pin functions as the external trigger input pin while the A/D converter is in use.
		CS3		Chip Select 3
60	62	P94	D (CMOS/H)	General-purpose I/O port
		PPG4		The pin functions as a PPG timer output pin.
61	63	P95	D (CMOS)	General-purpose I/O port
		PPG5		The pin functions as a PPG timer output pin.
62	64	P96	E (CMOS/H)	General-purpose I/O port
		IN0		The pin is captured as the input capture ch0 trigger input pin.
63	65	P97	E (CMOS/H)	General-purpose I/O port
		IN1		The pin is captured as the input capture ch1 trigger input pin.
64 to 67	66 to 69	PA0 to PA3	D (CMOS)	General-purpose I/O port
		OUT0 to OUT3		The pins are captured as the output-compare event output pins.
33	35	AVCC	-	Pin for power supply to A/D converter
34	36	AVRH	-	Pin for external reference power supply to A/D converter
35	37	AVSS	-	Pin for power supply to A/D converter
47 to 49	49 to 51	MD0 to MD2	J (CMOS/H)	Input pins for selecting operation mode
82	84	VCC3	-	Pin for power supply 3.3 V ± 0.3 V (VCC3)
21	23	VCC5	-	Amphibious pin for power supply 3.3 V ± 0.3 V/5.0 V ± 0.5 (VCC5)
9 40 79	11 42 81	VSS	-	Pins for input for power (GND)

NJM4556AM : IC86

JRC

NJM4556A

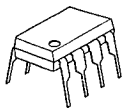
DUAL HIGH CURRENT OPERATIONAL AMPLIFIER

■ GENERAL DESCRIPTION

The NJM4556A integrated circuit is a high-gain, high output current dual operational amplifier capable of driving ±70mA into 150 Ω loads (±10.5V output voltage), and operating low supply voltage (V^+/V^-=±2V~).

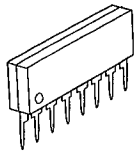
The NJM4556A combines many of the fetures of the popular NJM4558 as well as having the capability of driving 150Ω loads. In addition, the wide band-width, low noise, high slew rate and low distortion of the NJM4556A make it ideal for many audio, telecommunications and instrumentation applications.

■ PACKAGE OUTLINE

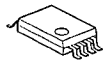


NJM4556AD

NJM4556AM



NJM4556AL

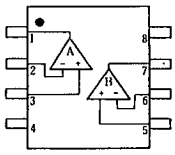


NJM4556AV

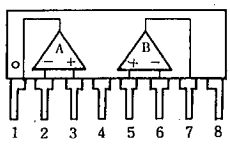
■ FEATURES

- Operating Voltage (±2V~±18V)
- High Output Current (Io=70mA)
- Slew Rate (3V/μs typ.)
- Gain Band Width Product (8MHz typ.)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

■ PIN CONFIGURATION



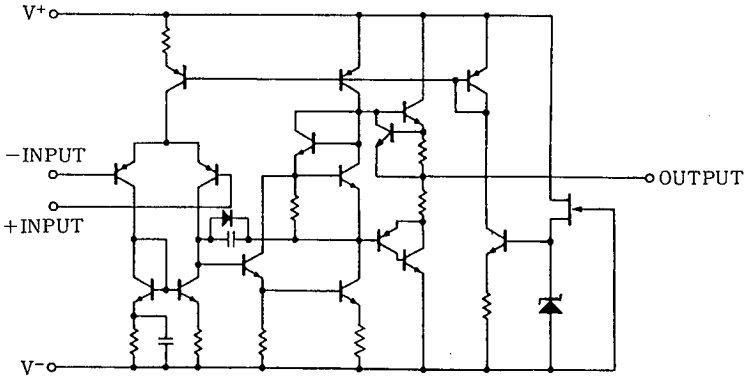
NJM4556AD
NJM4556AM
NJM4556AV



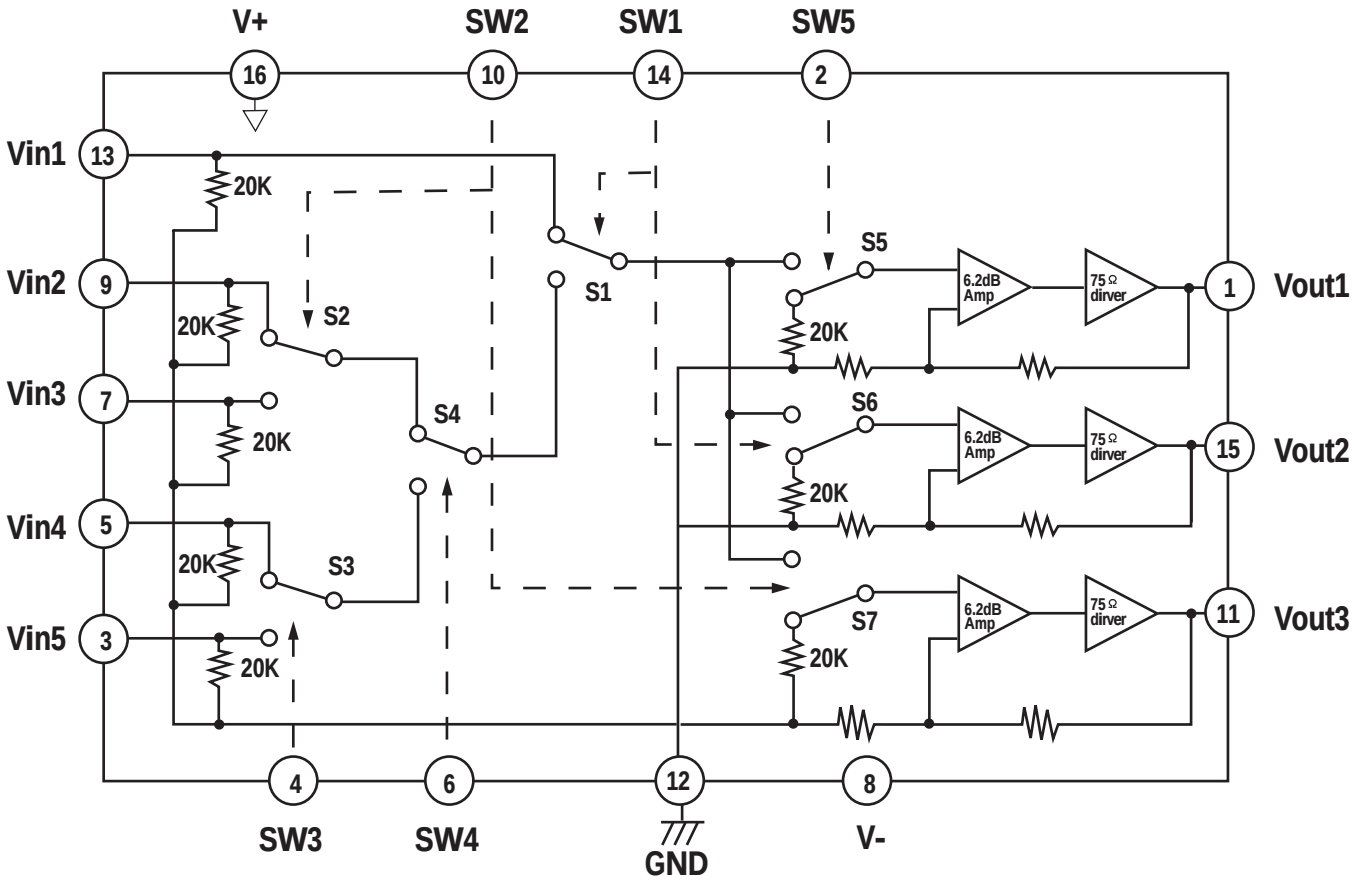
NJM4556AL

PIN FUNCTION
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

■ EQUIVALENT CIRCUIT (1/2 Shown)



■ BLOCK DIAGAM (NJM2296M) : IC41, 43, 44



∗ **Normally mute**

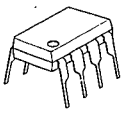
Above circuits show that the switches are set at low.

LOW-NOISE DUAL OPERATIONAL AMPLIFIER

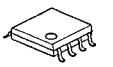
■ GENERAL DESCRIPTION

The NJM2068 is a high performance, low noise dual operational amplifier. This amplifier features popular pin-out, superior noise performance, and superior total harmonic distortion. This amplifier also features guaranteed noise performance with substantially higher gain-bandwidth product and slew rate which far exceeds that of the 4558 type amplifier. The specially designed low noise input transistors allow the NJM2068 to be used in very low noise signal processing applications such as audio preamplifiers and servo error amplifier.

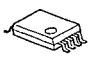
■ PACKAGE OUTLINE



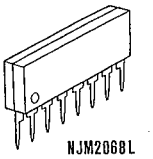
NJM2068D



NJM2068M



NJM2068V

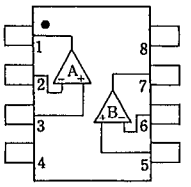


NJM2068L

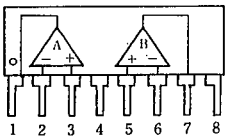
■ FEATURES

- Operating Voltage (±4V~±18V)
- Low Total Harmonic Distortion (0.001% typ.)
- Low Noise Voltage (FLAT+JISA, 0.56 μV typ.)
- High Slew Rate (6V/μs typ.)
- Unity Gain Bandwidth (27MHz @f=10kHz)
- Package Outline DIP8, DMP8, SIP8, SSOP8
- Bipolar Technology

■ PIN CONFIGURATION



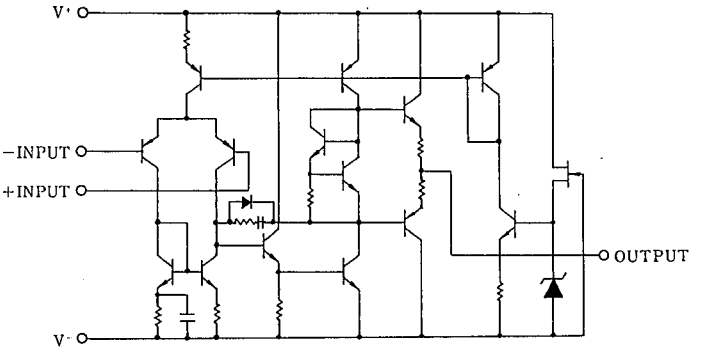
NJM2068D
NJM2068M
NJM2068V



NJM2068L

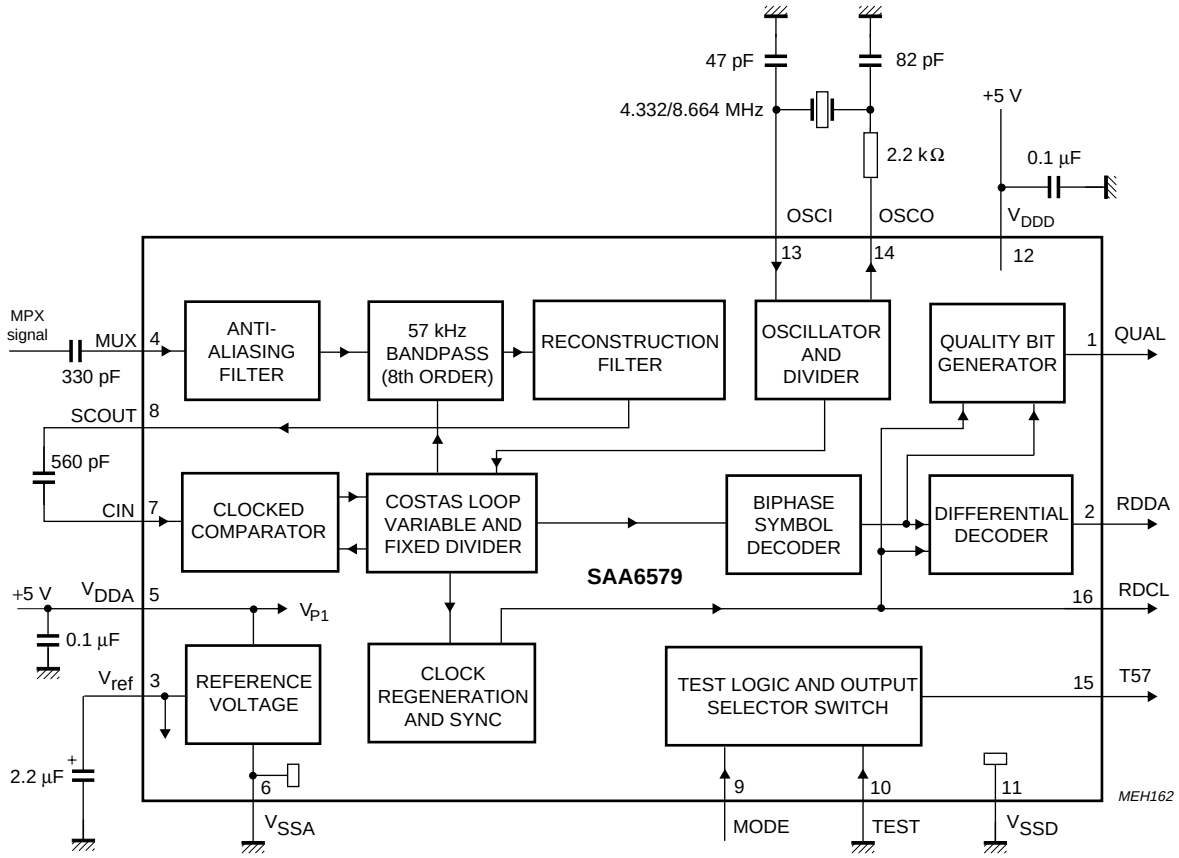
PIN FUNCITON
1. A OUTPUT
2. A−INPUT
3. A+INPUT
4. V⁻
5. B+INPUT
6. B−INPUT
7. B OUTPUT
8. V⁺

■ EQUIVALENT CIRCUIT (1/2 Shown)



RDS demodulator (SAA6579TV1) : IC71

BLOCK DIAGRAM



Via pin MODE two different crystal frequencies can be used.

MODE	CRYSTAL CLOCK
LOW	4.332 MHz
HIGH	8.664 MHz

Fig.1 Block diagram and application circuit.

PIN FUNCTION & PIN ASSIGNMENT

PINNING

SYMBOL	PIN	DESCRIPTION
QUAL	1	quality indication output
RDDA	2	RDS data output
V_{ref}	3	reference voltage output ($0.5V_{DDA}$)
MUX	4	multiplex signal input
V_{DDA}	5	+5 V supply voltage for analog part
V_{SSA}	6	ground for analog part (0 V)
CIN	7	subcarrier input to comparator
SCOUT	8	subcarrier output of reconstruction filter
MODE	9	oscillator mode/test control input
TEST	10	test enable input
V_{SSD}	11	ground for digital part (0 V)
V_{DDD}	12	+5 V supply voltage for digital part
OSCI	13	oscillator input
OSCO	14	oscillator output
T57	15	57 kHz clock signal output
RDCL	16	RDS clock output

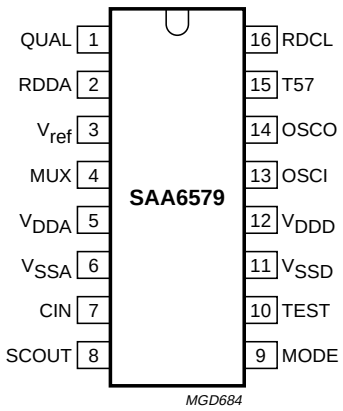


Fig.2 Pin configuration.

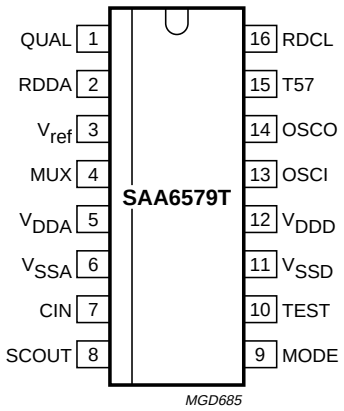
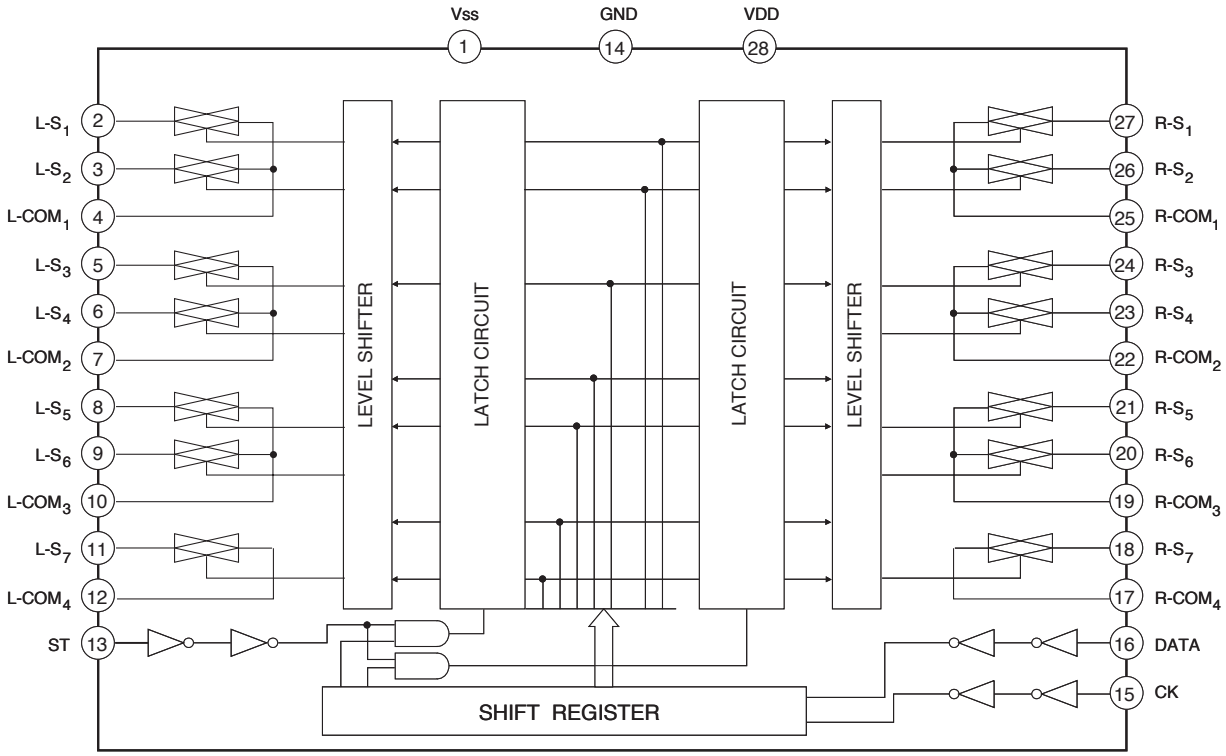


Fig.3 Pin configuration.

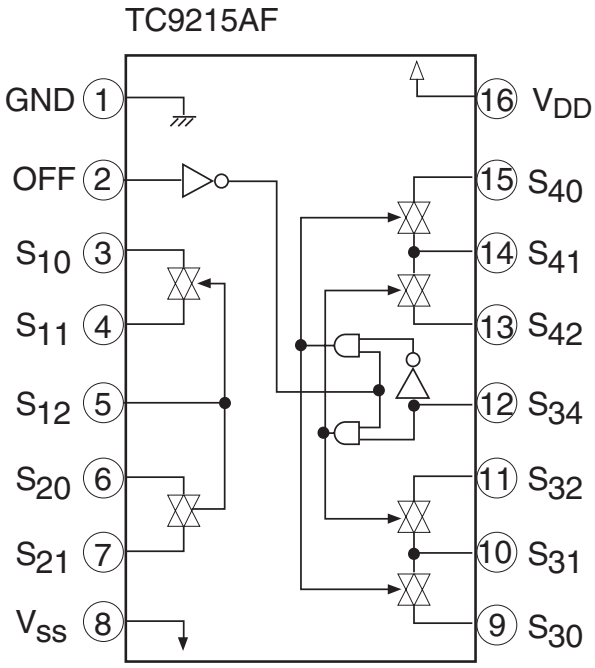
TC9162AF (FUNCTION/INPUT : IC30)

■ BLOCK DIAGRAM



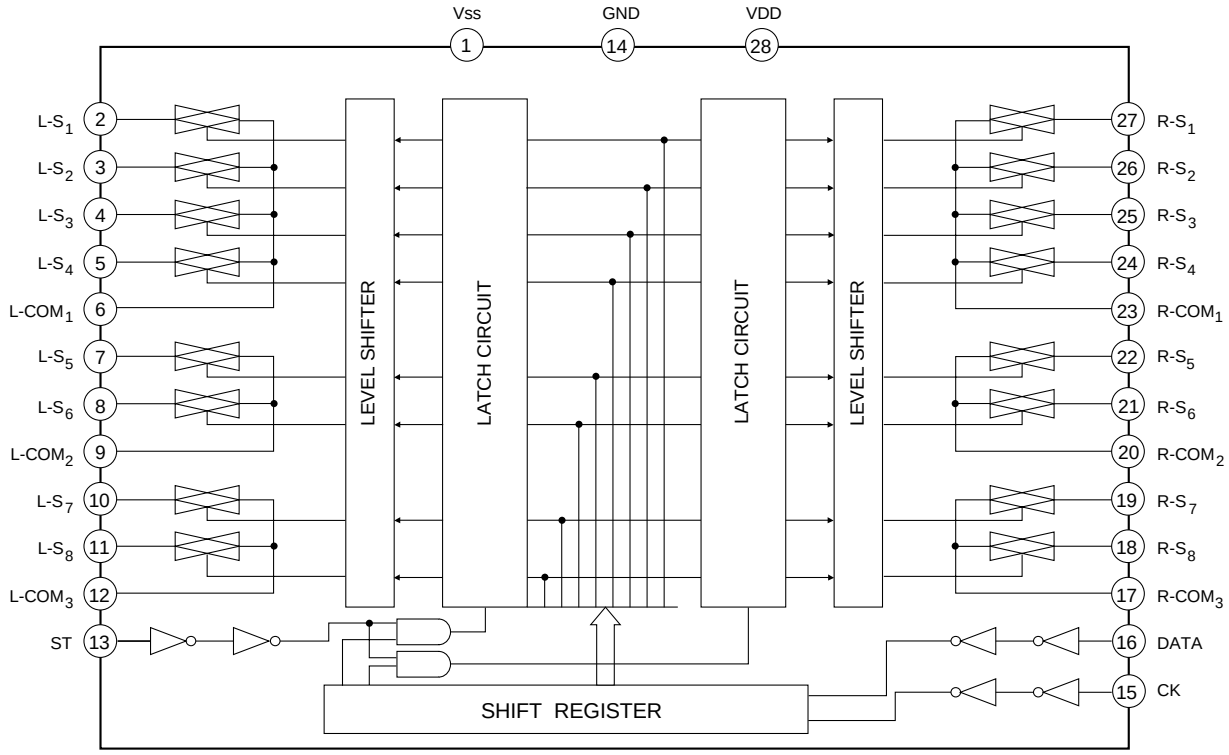
TC9215AF (TONE CONTROL : IC80)

■ BLOCK DIAGRAM



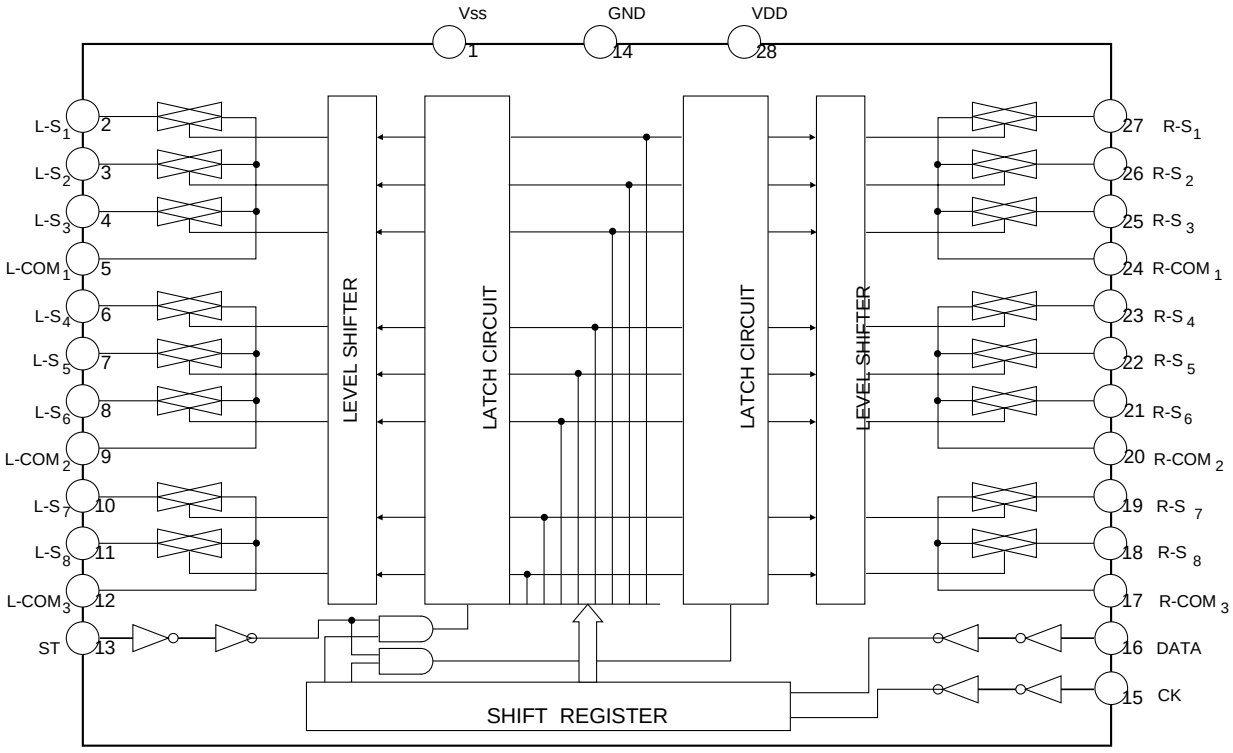
TC9164AF (FUNCTION/INPUT) : IC22

■ BLOCK DIAGRAM

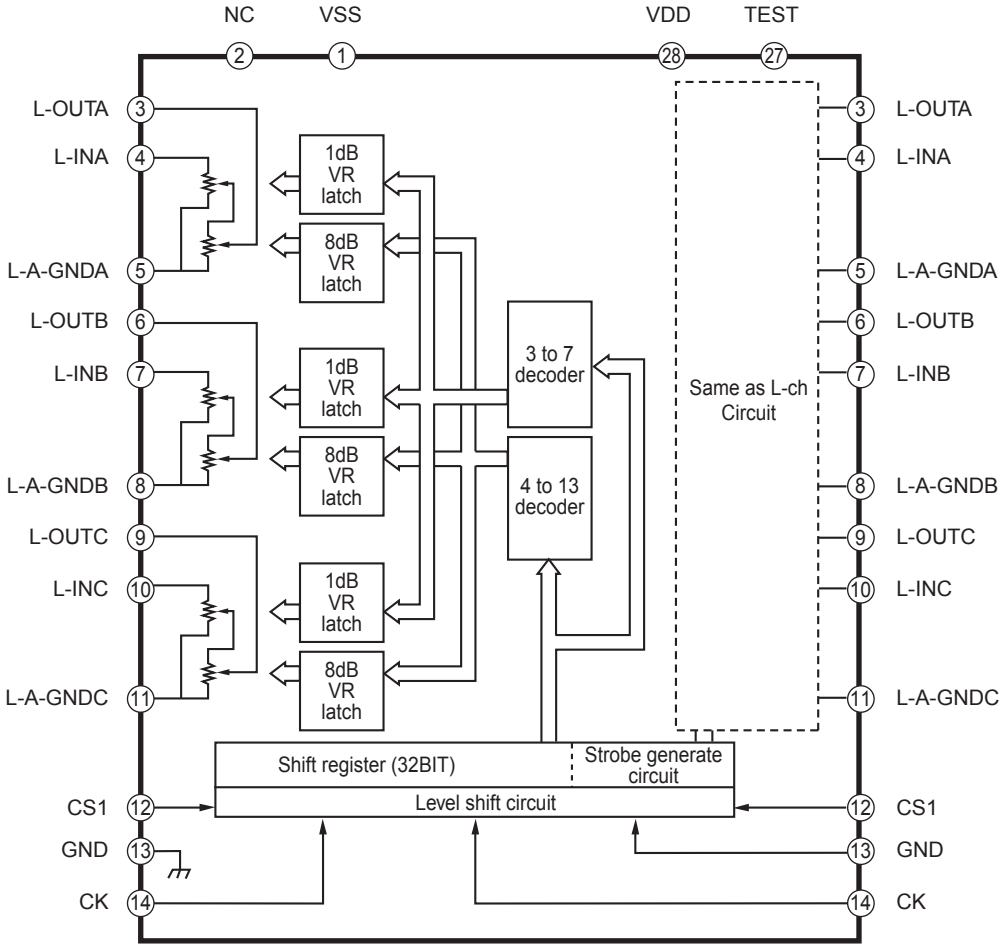


TC9163AF (FUNCTION/INPUT) : IC20

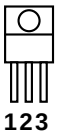
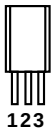
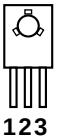
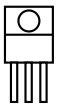
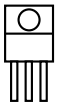
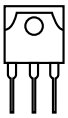
■ BLOCK DIAGRAM



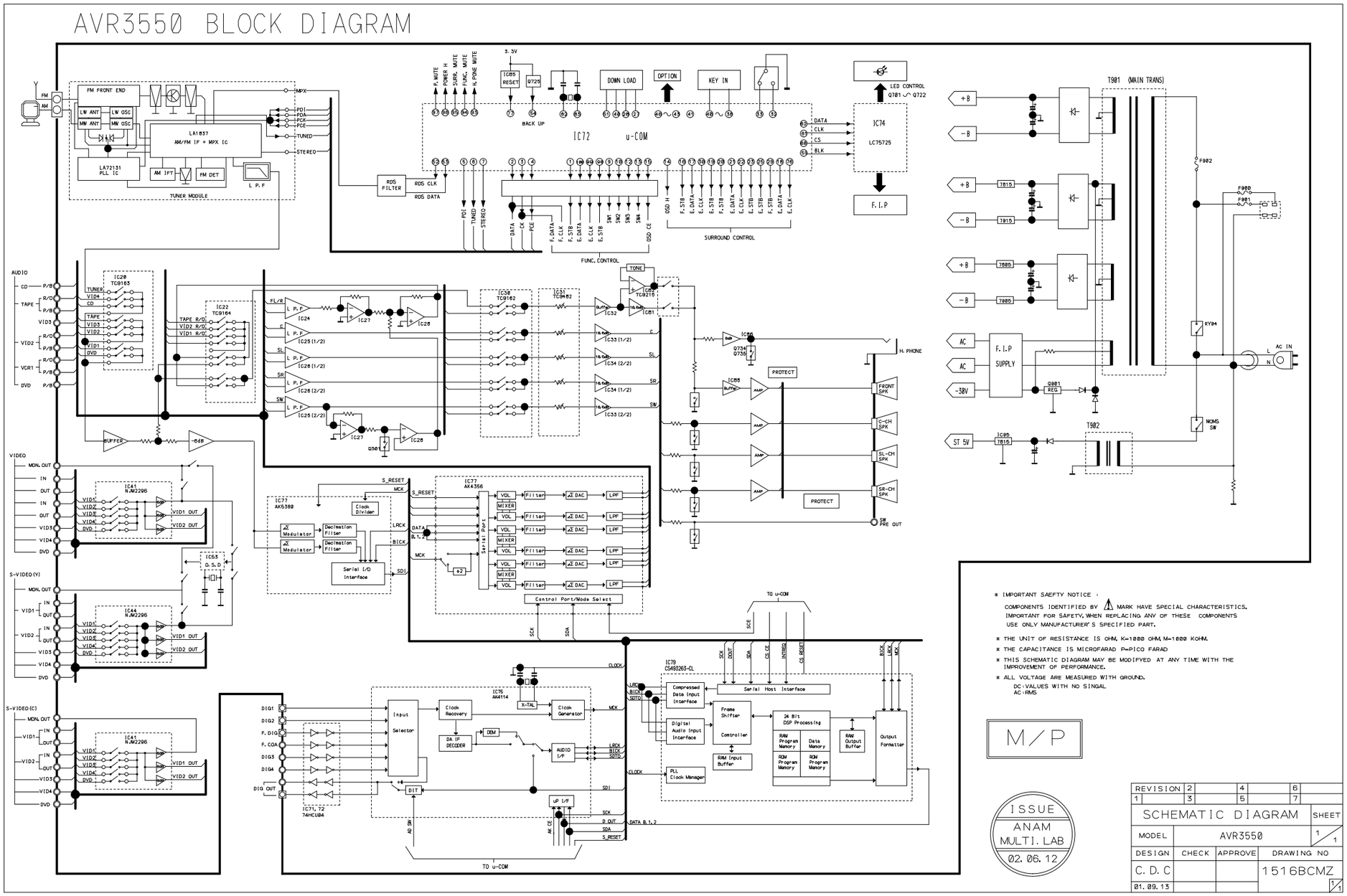
TC9482F (ELECTRONIC VOLUME/INPUT) : IC31



TRANSISTOR, REGULATOR IC BLOCK DIAGRAM

TO-92M  1. Emitter 2. Collector 3. Base KTC2874B KSC2785Y KRA107M KRC107M KRA104M KSA1175Y	TO-92  1. Emitter 2. Collector 3. Base KTD1302T KTA1268GR KTC3200GR KTC3198Y KTA1271Y KSA733CY	TO-220  1. GND 2. INPUT 3. OUTPUT MCNJM7905 MC7915C	TO-92L  1. Emitter 2. Collector 3. Base KTA1024Y KSC2316Y
TO-126  1. Emitter 2. Collector 3. Base 2SA1360O 2SC3423O KTD600KG	TO-220  1. Base 2. Collector 3. Emitter KSA614Y	TO-220  1. INPUT 2. GND 3. OUTPUT MC7815C MC7805C	TO-3P  1. Base 2. Collector 3. Emitter 2SB1647 2SD2560

AVR3550 BLOCK DIAGRAM



* IMPORTANT SAEFTY NOTICE :

COMPONENTS IDENTIFIED BY ⚠ MARK HAVE SPECIAL CHARACTERISTICS. IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS USE ONLY MANUFACTURER'S SPECIFIED PART.

* THE UNIT OF RESISTANCE IS OHM, K=1000 OHM, M=1000 KOHM.

* THE CAPACITANCE IS MICROFARAD P=PICO FARAD

* THIS SCHEMATIC DIAGRAM MAY BE MODIFYED AT ANY TIME WITH THE IMPROVEMENT OF PERFORMANCE.

* ALL VOLTAGE ARE MEASURED WITH GROUND.
DC : VALUES WITH NO SINGAL
AC : RMS

M / P

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REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR3550		1 / 1
DESIGN	CHECK	APPROVE	DRAWING NO
C. D. C			1516BCMZ
01. 09. 13			1 / 1

AVR3550 WIRING DIAGRAM

AVR2550/3550(EUR) : 230V 50Hz
AVR125/225(T/C) : 120V 60Hz

CUP11517-1
CUP11518-2
CUP11518-5
CUP11518-4
CUP11518-3
CUP11518-1
CUP11516-7
CUP11516-1
CUP11516-3
CUP11516-2
CUP11516-5
CUP11516-6
CUP11516-4
CUP11516-8
POWER TRANS
TUNER MODULE
HEAT SINK ASS'Y

CN92 (2P)
CN91 (2P)
JW92
JW91
BN90
BN20
CN20 (3P)
BN21 (8P)
BN21 (8P)
CN95 (8P)
CN94 (10P)
CN96 (7P)
CN80 (8P)
CN48 (3P)
CN47 (6P)
CN41 (6P)
BN48 (3P)
BN47 (6P)
CN13 (13P)
CN15 (13P)
BN11 (9P)
BN12 (14P)
BN95 (8P)
BN94 (10P)
CN11 (9P)
CN12 (14P)
CN16 (8P)
CN10 (4P)
CN18 (5P)
CN72 (32P)
(3P) BN73
(3P) BN78
(3P) BN70
(3P) BN75
(3P) BN72
(3P) BN77
(3P) BN71
(3P) BN76
(3P) BN74
(3P) BN79
CN64(3P)
CN61(3P)
CN63(3P)
CN62(3P)
CN65(3P)
SL-CH
FL-CH
C-CH
FR-CH
SR-CH
CN73(3P) CN78(3P)
CN70(3P) CN75(3P)
CN72(3P) CN77(3P)
CN71(3P) CN76(3P)
CN74(3P) CN79(3P)
CN82 (3P)
CN83 (2P)
CN97 (3P)
CN81 (6P)
BN96 (7P)
BN97 (3P)
BN81 (6P)
BN83 (2P)
CN72 (32P)
BN90 (2P)
CN90 (2P)
BN84 (5P)
CN84 (5P)
BN16 (8P)
BN87 (6P)
BN88 (4P)
BN85 (2P)
CN82 (6P)
(DOWN LOAD)
CN89 (5P)
BN80 (8P)
BN41 (6P)
BN10 (4P)
CN86 (2P)
CN88 (4P)
CN87 (6P)
CN85 (2P)
BN89 (5P)
BN18 (5P)

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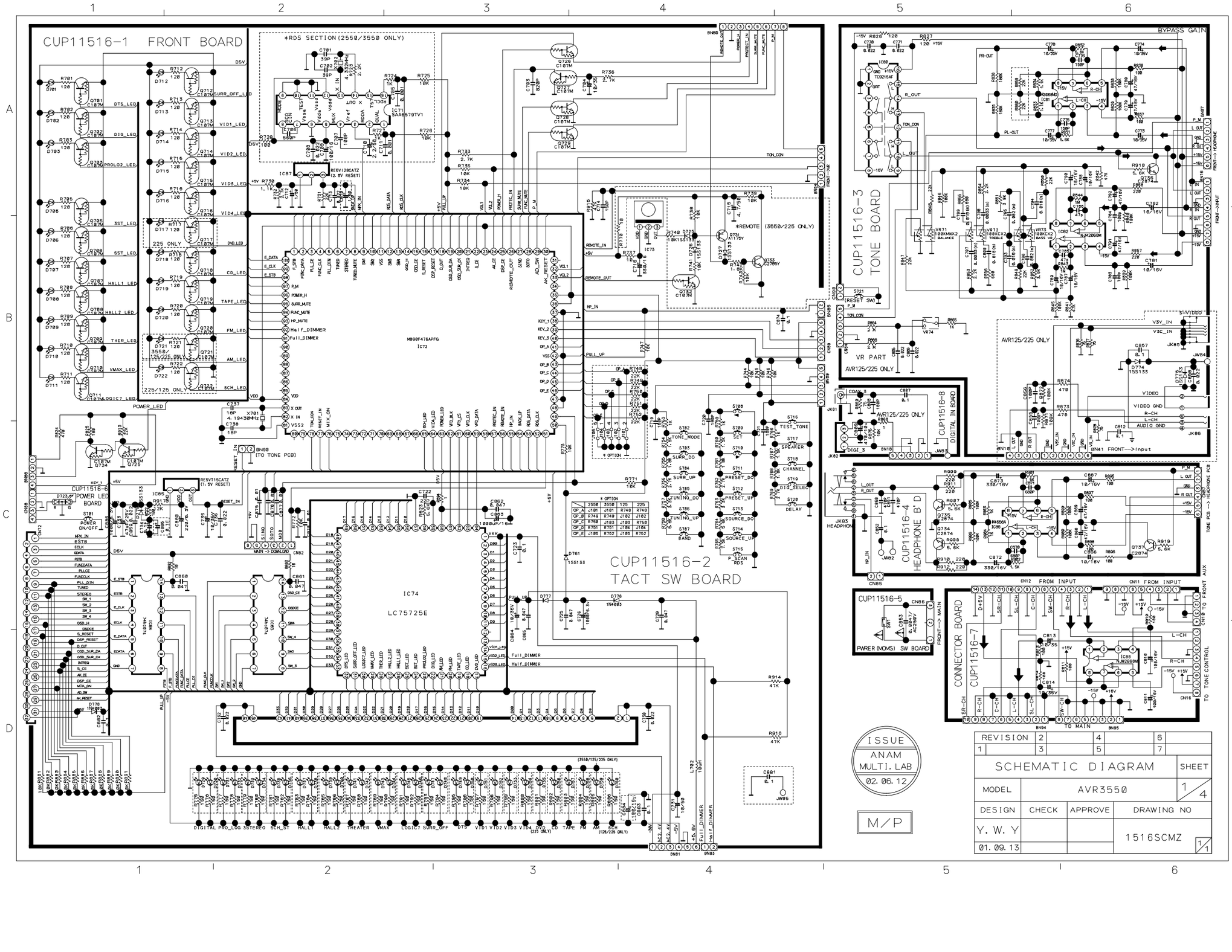
2002. 06. 12

M/P

REVISION	2		4		6	
1		3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR3550		1/1
DESIGN	CHECK	APPROVE	DRAWING NO
C. D. C			1516WCMZ
01. 09. 13			1/1


CUP11516-1 FRONT BOARD
*RDS SECTION(2550/3550 ONLY)
IC71 SAA6579TV1
IC87 RE6V128CATZ (2.8V RESET)
MB90F476APFG IC72
*REMOTE (3550/225 ONLY)
CUP11516-3 TONE BOARD
BYPASS GAIN
VR PART AVR125/225 ONLY
AVR125/225 ONLY
S-VIDEO
CUP11516-8 DIGITAL IN BOARD
CUP11516-4 HEADPHONE B'D
CUP11516-5 PWRER (MOMS) SW BOARD
CUP11516-7 CONNECTOR BOARD
CUP11516-6 POWER LED BOARD
CUP11516-2 TACT SW BOARD
IC74 LC75725E
(TO TONE PCB)
MAIN -> DOWNLOAD
TONE PCB --> HEADPHONE PCB
TO TONE CONTROL
TO FRONT AUX
TO MAIN
FRONT--> MAIN
FRONT--> HEADPHONE
FRONT--> INPUT
ISSUE
ANAM
MULTI. LAB
02. 06. 12
M/P
SCHEMATIC DIAGRAM
MODEL AVR3550
DESIGN Y. W. Y
01. 09. 13
CHECK
APPROVE
DRAWING NO 1516SCMZ
SHEET 1/4
1/1

SL-CH

FL-CH

SR-CH

FR-CH

C-CH

POWER AMP BOARD

DC PROTECTOR

THERMAL PROTECTOR

OVERLOAD DETECTION

FROM CONECT PCB

FROM FRONT PCB

TO TRANS PCB CN96

FROM AC CORD

UL ONLY

AVR3550/AVR225 ONLY

FRONT LEFT

REAR LEFT

CENTER

REAR RIGHT

FRONT RIGHT

ISSUE
ANAM
MULTI. LAB
02. 06. 12

** POWER TR ODT.
Q657, 658, 659, 660, 670
==>AVR125, 2550: 2SD2390
AVR225, 3550: 2SD2560
Q652, 653, 654, 655, 661
==>AVR125, 2550: 2SB1560
AVR225, 3550: 2SB1647

** F900
* 5Ø 2.5A 250V : FOR 100V/110V/120V Area
* T 2.5A L 250V: FOR 220V/230V Area

** F901
* 5Ø 2.5A 250V : FOR 100V/110V/120V Area
* T 2.5A L 250V: FOR 220V/230V Area

** F902
* 5Ø 6.3A 250V : FOR 100V/110V/120V Area
* T 4A L 250V : FOR 220V/230V Area

** IMPORTANT SAFETY NOTICE.
COMPONENTS IDENTIFIED BY ⚠ MARK HAVE SPECIAL CHARACTERISTICS.
IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS
USE ONLY MANUFACTURER'S SPECIFIED PARTS.
** THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM, M=1000 KOHM.
** THE UNIT OF CAPACITANCE IS MICROFARAD (uF)
P=10^-6 uF
** THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WITH THE IMPROVEMENT OF PERFORMANCE

M/P

REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR3550		2/4
DESIGN	CHECK	APPROVE	DRAWING NO
Y. W. Y			1517SCMZ
02. 05. 16			1/1

CUP11518-1
INPUT BOARD

IC79 CS493263-CL

IC77 AK5380VT A/D CONVERTOR

IC75 AK4114VQ (DIR)

IC78 AK4356

IC71 74HCU04D

IC72 74HCU04D

TO CONNECTOR B'D

TO TUNER

FROM FRONT B'D

FROM VIDEO B'D

Only AVR225/3550

Only AVR125, 225

Except AVR2550

** IMPORTANT SAFETY NOTICE.
COMPONENTS IDENTIFIED BY ⚠ MARK HAVE SPECIAL CHARACTERISTICS.
IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS
USE ONLY MANUFACTURER'S SPECIFIED PARTS.
** THE UNIT OF RESISTANCE IS OHM.
K=1000 OHM, M=1000 KOHM.
** THE UNIT OF CAPACITANCE IS MICROFARAD (uF)
P=PF=uF
** THIS SCHEMATIC DIAGRAM MAY MODIFIED AT ANY TIME WITH THE
IMPROVEMENT OF PERFORMANCE

M/P

ISSUE
ANAM
MULTI. LAB
2002. 06. 12

REVISION	2		4		6	
1 o	3		5		7	

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR3550		3/4
DESIGN	CHECK	APPROVE	DRAWING NO
Y. W. Y			1518SCMZ 1/2
2001. 09. 13			

CUP11518-2 VIDEO BOARD

Only AVR125, 225

TO FRONT B'D

CN41

V3Y_IN

V3C_IN

V3_IN

NJM2296 OPTION

FUNC.	SW1	SW2	SW3	SW4	SW5
VIDEO1	L	H	X	X	H
VIDEO2	H	L	X	L	H
VIDEO3	H	H	H	H	H
VIDEO4	H	H	X	L	H
DVD	H	H	L	H	H

V_ MUTE "LOW" ACTIVE

VIDEO3 JK48 — Only AVR225

VIDEO2 OUT JK49

VIDEO1 OUT JK50

DVD

MONITOR OUT — AVR225/3550 =>68

VIDEO3 JK41 — Only AVR225

VIDEO2 OUT JK42

VIDEO1 IN JK43

DVD

MONITOR OUT JK45

AVR225/3550 ==> 68

AVR225/3550 ==> 5.6K

AVR225/3550 ==> 5.6K

Only AVR225, 3550

Only AVR225

Only AVR125, 225

ONLY AVR225/3550

Q501 D1302

Q503 D1302

Q502 A1104M

ONLY AVR225/3550

Q466 A614Y

Only AVR225

Only AVR125, 225

Only AVR225

Only AVR125, 225

NJM2296M

Vcc Vo1 Vo2 SW5 SW1 Vi6 Vi1 SW3 GND Vi4 Vo3 SW4 SW2 Vi5 Vi2 Vs

74HC4066 IC42

CUP11518-5 OSD BOARD

LC74765M IC63

NTSC: 14.318MHz *X503

* OPTION

	C565	C566	X505
PAL/SECOM	27P	27P	17.734
NTSC	33P	33P	14.318

L559 100uH

L551 6uH

L552 22uH

Q551 C2785Y

Q552 A1175Y

Q550 A1175Y

74ACT045C IC61

CUP11518-3 MAIN TRANS BOARD

FULL DIMMER

HALF DIMMER

CN83

Q904 C107M

Q903 A1271Y

Q902 A107M

Q901 A1271Y

Only AVR3550

PWR. TRANS

ISSUE
ANAM MULTI. LAB
02. 06. 12

M/P

CUP11518-4 FUSE BOARD

SB 8A 250V F903

SB 8A 250V F904

CN20

TO MAIN

TRANS AC IN (PRIMARY)
EUR, HK, CHI : 230V/50Hz
USA : 120V/60Hz

CUP11518-8 BRIDGE DIODE BOARD

D_909 GBJ1504

AVR3550/225:15A

CUP11518-7 BRIDGE DIODE BOARD

AVR2550/125:8A

D909 B04F

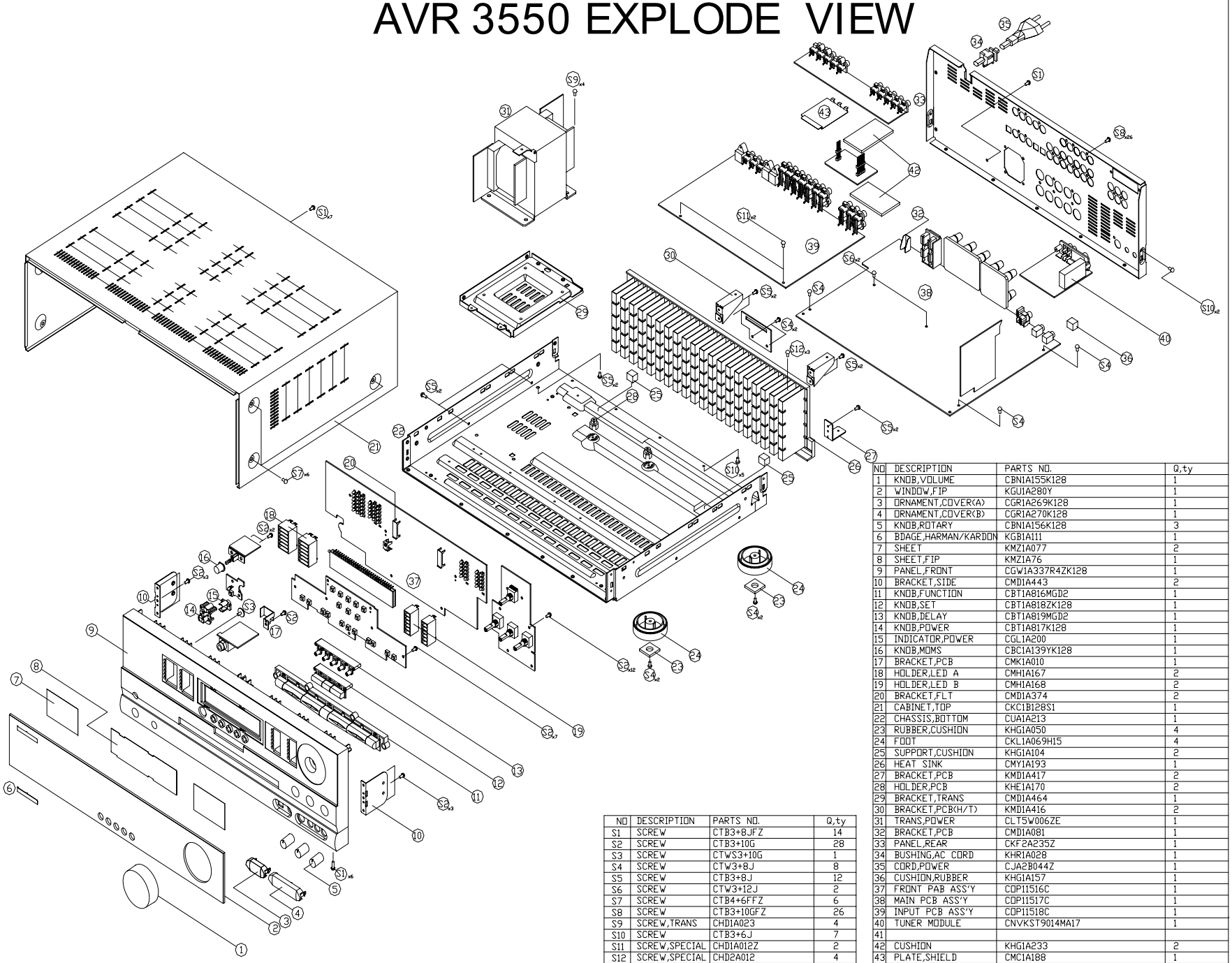
CUP11518-6

IC905 MC7905

REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM			SHEET
MODEL	AVR3550		4/4
DESIGN	CHECK	APPROVE	DRAWING NO
Y. W. Y			1518SCMZ 2/2
01. 09. 13			

AVR 3550 EXPLODE VIEW



NO	DESCRIPTION	PARTS NO.	Q,ty
1	KNOB,VOLUME	CBN1A155K128	1
2	WINDOW,FIP	KGU1A280Y	1
3	ORNAMENT,COVER(A)	CGR1A269K128	1
4	ORNAMENT,COVER(B)	CGR1A270K128	1
5	KNOB,ROTARY	CBN1A156K128	3
6	BDAGE,HARMAN/KARDON	KGB1A111	1
7	SHEET	KMZ1A077	2
8	SHEET,FIP	KMZ1A76	1
9	PANEL,FRONT	CGW1A337R4ZK128	1
10	BRACKET,SIDE	CMD1A443	2
11	KNOB,FUNCTION	CBT1A816MGD2	1
12	KNOB,SET	CBT1A818ZK128	1
13	KNOB,DELAY	CBT1A819MGD2	1
14	KNOB,POWER	CBT1A817K128	1
15	INDICATOR,POWER	CGL1A200	1
16	KNOB,MOMS	CBC1A139YK128	1
17	BRACKET,PCB	CMK1A010	1
18	HOLDER,LED A	CMH1A167	2
19	HOLDER,LED B	CMH1A168	2
20	BRACKET,FLT	CMD1A374	2
21	CABINET,TOP	CKC1B128S1	1
22	CHASSIS,BOTTOM	CUA1A213	1
23	RUBBER,CUSHION	KHG1A050	4
24	FOOT	CKL1A069H15	4
25	SUPPORT,CUSHION	KHG1A104	2
26	HEAT SINK	CMY1A193	1
27	BRACKET,PCB	KMD1A417	2
28	HOLDER,PCB	KHE1A170	2
29	BRACKET,TRANS	CMD1A464	1
30	BRACKET,PCB(H/T)	KMD1A416	2
31	TRANS,POWER	CLT5W006ZE	1
32	BRACKET,PCB	CMD1A081	1
33	PANEL,REAR	CKF2A235Z	1
34	BUSHING,AC CORD	KHR1A028	1
35	CORD,POWER	CJA2B044Z	1
36	CUSHION,RUBBER	KHG1A157	1
37	FRONT PAB ASS'Y	COP11516C	1
38	MAIN PCB ASS'Y	COP11517C	1
39	INPUT PCB ASS'Y	COP11518C	1
40	TUNER MODULE	CNVKST9014MA17	1
41			
42	CUSHION	KHG1A233	2
43	PLATE,SHIELD	CMC1A188	1
44			

NO	DESCRIPTION	PARTS NO.	Q,ty
S1	SCREW	CTB3+8JFZ	14
S2	SCREW	CTB3+10G	28
S3	SCREW	CTWS3+10G	1
S4	SCREW	CTW3+8J	8
S5	SCREW	CTB3+8J	12
S6	SCREW	CTW3+12J	2
S7	SCREW	CTB4+6FFZ	6
S8	SCREW	CTB3+10GFZ	26
S9	SCREW,TRANS	CHD1A023	4
S10	SCREW	CTB3+6J	7
S11	SCREW,SPECIAL	CHD1A012Z	2
S12	SCREW,SPECIAL	CHD2A012	4

■ ELECTRICAL PARTS LIST

REF NO.	PART NO.	DESCRIPTION		REMARKS
	CUP11516X	**PCB , FRONT**		
▸CAPACITOR				
C701,702	HCBS1H390JT	CAP , CERAMIC	39PF 50V J	
C703	HCBS1H821KBT	CAP , CERAMIC	820PF 50V K	
C704,735,773,774 777 778 864	HCEA1VH100T	CAP , ELECT	10UF 35V	
C705,711	HCBS1H102KBT	CAP , CERAMIC	1000PF 50V B	
C706	HCBS1H561KBT	CAP , CERAMIC	560PF 50V K	
C707,783,784	HCBS1H101KBT	CAP , CERAMIC	100PF 50V K	
C708,713,730,732 736 770 771 805 806,859~862	HCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	
C709,810,811	HCEA1CH101T	CAP , ELECT	100UF 16V	
C710	HCEA1HH2R2T	CAP , ELECT	2.2UF 50V	
C712	HCEA1HH1R0T	CAP , ELECT	1UF 50V	
C714,775,776	HCBS1H151KBT	CAP , CERAMIC	150PF 50V K	
C715,813,814	HCEA1HH4R7T	CAP , ELECT	4.7UF 50V	
C716,872,873	HCEA1CH331T	CAP , ELECT	330UF 16V	
C719~721	HCBS1H181KBT	CAP , CERAMIC	180PF 50V K	
C722	HCBS1H220JT	CAP , CERAMIC	22PF 50V J	
C723	CCFT1H104ZF	CAP , SEMI	0.1UF 50V ZF	
C725,729,865	CCKT1H473ZF	CAP , CERAMIC	0.047UF 50V ZF	
C726,863,886	HCEA0JH102T	CAP , ELECT	1000UF 6.3V	
C731	HCEA1HH100T	CAP , ELECT	10UF 50V	
C733	HCEA1EH470T	CAP , ELECT	47UF 25V	
C737,738	HCBS1H180JT	CAP , CERAMIC	18PF 50V J	
C779,780,791,792 868 869	HCEA1CKS470T	CAP, ELECT	47UF 16V	
C781,782,787~790 866 867	HCEA1CKS100T	CAP , ELECT	10UF 16V	
C785,786	HCBS1H470JT	CAP , CERAMIC	47PF 50V J	
C793,794,799,800	KCFE1J183JBT	CAP , FILM	0.018UF 63V J	
C795,796	KCFE1J823JBT	CAP , FILM	0.082UF 63V J	
C797,798	KCFE1J332JBT	CAP , FILM	0.0033UF 63V J	
C850,851	HCBS1H471KBT	CAP , CERAMIC	470PF 50V K	
C852,874,882,883	HCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	
C870,871	HCBS1H681KBT	CAP , CERAMIC	680PF 50V K	
C875~878	HCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z	
C880	HCEA1AH221T	CAP , ELECT	220UF 10V	
C734,885	BCES0HD104	CAP , GOLD JP	EECS0HD104V	
C853	KCKDKS472ME	CAP , CERAMIC(X1/Y2/SC)	0.0047UF/2.5KV	
▸DIODE				
D701~703,705~716 718~721,729~754 756~759	CVD30BSGATAAT	L.E.D , GREEN (TAPPING)		
D725~727,761, 777 779	HVD1SS133MT	DIODE	1SS133T-77	

D776,778	KVD1N4003ST	DIODE	1N4003	
D723	CVD50BOGDWGA	L.E.D , 2 COLOR		
▸COIL				
L702	HLQ02C100KT	COIL , AXAIL	10UH K	
▸TRANSISTOR				
Q701~703,705~716 718~721,724~729 732	HVTKRC107MT	T.R	KRC107M	
Q731	KVTKSA1175YT	T.R	KSA1175Y	
Q732	HVTKRC107MT	T.R	KRC107M	
Q733	KVTKSC2785YT	T.R	KSC2785Y	
Q734~737	HVTKTC2874BT	T.R , MUTE	KTC2874B	
▸RESISTOR				
R701~703,705~716 718~721,826,827	CRD20TJ121T	RES , CARBON	120 OHM 1/5W J	
R704,757,763	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	
R723,732,847,848 853 854	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	
R724,727,753,759 766 865 903 904	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	
R725,726,734,735 738~741,743~747 771~773,881~891	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	
R728,810,811,822, 837,838,895~898	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	
R730,833,834	CRD20TJ112T	RES , CABON	1.1K OHM 1/5W J	
R731,749~751 849 850 913	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	
R733,736,756,762 769 864 866	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	
R737,770,892,893	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	
R742	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	
R754,760,767 901 902	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	
R755,761,768	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	
R758,764,823 831 832 907 908 918 919	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	
R765	CRD20TJ752T	RES , CARBON	7.5K OHM 1/5W J	
R775~800,802~805	CRD20TJ151T	RES , CARBON	150 OHM 1/5W J	
R813,814,839,840 845 846 899 900 905 906	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	
R824	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	
R825	CRD20TJ181T	RES , CARBON	180 OHM 1/5W J	
R829,830,835,836	CRD20TJ184T	RES , CARBON	180K OHM 1/5W J	
R841,842,914~916	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	
R843,844	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	
R851,852	CRD20TJ392T	RES , CARBON	3.9K OHM 1/5W J	

R855,856	CRD20TJ681T	RES , CARBON	680 OHM 1/5W J	
R857,858,909~912	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	
R894	CRD20TJ1R0T	RES , CARBON	1 OHM 1/5W J	
R917	CRD20TJ123T	RES , CARBON	12K OHM 1/5W J	
▸SWITCH				
S701~721	CST1A012ZT	SW , TACT	SKHV10910G	
SW01	HSH1A008ZV	SW , PUSH (MOMS)		
▸WIRE ASS'Y				
BN16	CWZAVR2550BN16	WIRE ASS'Y (SHIELD)		
BN80	CWB2B908320EW	WIRE ASS'Y		
BN81	CWB2B906250BM	WIRE ASS'Y		
BN83	CWB1C902250BM	WIRE ASS'Y		
BN84	CWB2B905100EN	WIRE ASS'Y		
BN85,90	CWB2B902090EN	WIRE ASS'Y		
BN87	CWZAVR2550BN87	WIRE ASS'Y (SHIELD)		
BN88	CWB2B904070EN	WIRE ASS'Y		
BN89	CWB2B905080EN	WIRE ASS'Y		
JW82	CWZAVR2550JW82	WIRE , ASS'Y		
▸CONNECTOR				
BN94	KJP10GB99ZM	WAFER	MOLEX35237-1010	
BN95	KJP08GB99ZM	CONNECTOR , HOUSING	MOLEX35237-0810	
CN11	KJP09GA98ZM	WAFER	MOLEX35336-0910	
CN12	KJP14GA98ZM	WAFER	MOLEX35336-1410	
CN16	KJP08GB46ZM	WAFER	MOLEX53015-0810	
CN72	KJP32GA117ZG	WAFER , CARD CABLE	GF102-32S-TS	
CN82	KJP06HA37ZM	WAFER	MOLEX42140-2206	
CN84,89	KJP05GA19ZM	WAFER	MOLEX53014-0510	
CN85,90	KJP02GA19ZM	WAFER	MOLEX53014-0210	
CN86	KJP02GA89ZM	WAFER	MOLEX35328-02	
CN87	KJP06GA19ZM	WAFER	MOLEX53014-0610	
CN88	KJP04GA19ZM	WAFER	MOLEX53014-0410	
▸F.I.P				
FIP1	HFLCM2054C	F.I.P		
▸I.C				
IC85	HVIRE5VT15CATZ	IC , RESET	RE5VT15CATZ	
IC87	HVIRE5VL28CATZ	IC , RESET	RE5VL28CATZ	
IC71	BVISAA6579TV1	I.C , RDS FILTER TW	SAA6579T/V1	
IC72	BVIMB90F476APFG	IC , FLASH U-COM	FUJITSU	
IC73	HRVRPM6938H4	SENSOR , REMOTE	RPM6938-H4	
IC74	HVILC75725E	IC , VFL DRIVER	LC75725E	
IC80	HVITC9215AF	I.C	TC9215AF	
IC81,82,88	HVINJM2068MTE1	I.C , OP AMP	NJM2068M-TE1	
IC83,84	HVI74ACT04SC	I.C , HEX INVERTER	74ACT04SC	
IC86	HVINJM4556AMTE1	I.C , OP AMP	NJM4556AM-TE1	
▸JACK				
JK83	HJJ2E020Z	JACK , HEADPHONE	HTJ-064-05NG	
▸VARIABLE RESISTOR				
VR71	CVV2X05M104Z	RES , VARIABLE(BALANCE)	RK14128030214Y	
VR72,73	CVV2X07C104Z	RES , VARIABLE(TONE)	RK14128030214C	

▸ENCODER				
VR74	HSR2A023Z	VR , ENCODER		
▸CRYSTAL				
X701	HOX04194E120C	CRYSTAL		
X702	HOX04332E200C	CRYSTAL		
	CUP11517X	**PCB , MAIN**		
▸CAPACITOR				
C501~505	HCEA1VH100T	CAP , ELECT	10UF 35V	
C506~510	CCKT1H331KB	CAP , CERAMIC	330PF 50V KB	
C561~565,907	HCEA1CH101T	CAP , ELECT	100UF 16V	
C566~570	HCEA1EH470T	CAP , ELECT	47UF 25V	
C571~575	CCKT1H681KB	CAP , CERAMIC	680PF 50V KB	
C601~605	CCCT1H120JC	CAP , CERAMIC	12PF 50V JC	
C606~610	CCCT1H330JC	CAP , CERAMIC	33PF 50V JC	
C641~645,681~685	HCEA1HH100T	CAP , ELECT	10UF 50V	
C826	HCQI1H182JZT	CAP , MYLAR	1800PF 50V J	
C901,998	CCFT1H104ZF	CAP , SEMI	0.1UF 50V ZF	
C905,908,923,925 963 999	CCKT1H223ZF	CAP , CERAMIC	0.022UF 50V ZF	
C911	HCEA1CH471T	CAP , ELECT	470UF 16V	
C912	HCEA1CH221T	CAP , ELECT	220UF 16V	
C922,924,962	HCEA1EH101T	CAP , ELECT	100UF 25V	
C938,991	HCEA1HH1R0T	CAP , ELECT	1UF 50V	
C939	HCEA1HH4R7T	CAP , ELECT	4.7UF 50V	
C940	HCEA1AH471T	CAP , ELECT	470UF 10V	
C971~975	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	
C976~979,993~997	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	
C631~640	HCEA1JH221E	CAP , ELECT	220UF 63V	
C903	BCQE2E104KDE	CAP , LINE ACROSS	0.1UF 250V KD	
C904	KCKDKS472ME	CAP , CERAMIC(X1/Y2/SC)	.0047UF/2.5KV	
C906	HCEA1EH102E	CAP , ELECT	1000UF 25V	
C915,916	HCET63VFHS153NI	CAP , ELECT	15000UF/63V	
C917	HCEA1EH332E	CAP , ELECT	3300UF 25V	
C918	HCEA1EH222E	CAP , ELECT	2200UF 25V	
C961	HCEA1CH682E	CAP , ELECT	6800UF 16V	
▸DIODE				
D501~505,581~585 601 902 911 912 914~916,953~955	HVD1SS133MT	DIODE	1SS133T-77	
D901,903~906 961~963	KVD1N4003ST	DIODE	1N4003	
D956	KVD1N4003SRT	DIODE TW	1N4003	
▸TRANSISTOR				
Q501~505,601~605	HVTKTA1268GRT	T.R	KTA1268GR	
Q511~520,556~565	HVTKTC3200GRT	T.R	KTC3200GR	
Q541~545	HVTKTC3198YT	T.R	KTC3198Y	
Q606,938,939,952,992	HVTKRA107MT	T.R	KRA107M	
Q611~615	HVTKTD600KGR	T.R , BIAS	KTD600KGR	
Q621~625	HVT2SA1360O	T.R	2SA1360O	

Q626~630	HVT2SC3423O	T.R	2SC3423O	
Q652~655,661	BVT2SB1647	T.R , POWER	2SB1647	
Q657~660,670	BVT2SD2560	T.R , POWER	2SD2560	
Q681~685,901 942 943	KVTKSC2785YT	T.R	KSC2785Y	
Q806,969~973	HVTKTC2874BT	T.R , MUTE	KTC2874B	
Q951,960,991	HVTKRC107MT	T.R	KRC107M	
Q961	HVTKTA1024YT	T.R	KTA1024Y	
▸**RESISTOR**				
R501~505	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	
R506~510	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	
R511~520,940	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	
R521~525,806	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	
R527~530,621~626	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	
R531~540	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	
R541~545,630	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	
R556~560,962	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	
R561~565	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	
R566~575,581~600 987	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	
R576~580	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	
R601~610,941~943 945	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	
R611~615,961	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	
R616~620	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	
R627,686~690,930 932 966 998	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	
R628,826,979~983	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	
R629	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	
R631~640	KRD25FJ180T	RES , CARBON	18 OHM 1/5W	
R646~655	KRD25FJ3R3T	RES , CARBON	3.3 OHM 1/5W	
R656~660	KRF5EKR22HX2	RES , CEMENT(*2)	0.22/5W *2	
R666~670,696~700	CRD25TJ470T	RES , CARBON	47 OHM 1/4W J	
R671~675	CRD20TJ911T	RES , CARBON	910 OHM 1/5W J	
R676,677	CRD25TJ182T	RES , CARBON	1.8K OHM 1/4W J	
R678~680	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	
R681~685,960.992	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	
R816,939,969~973	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	
R905,993~997	KRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	
R910,963	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	
R911	CRD20TJ820T	RES , CARBON	82 OHM 1/5W J	
R913,914	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	
R917~920	CRD25TJ393T	RES , CARBON	39K OHM 1/4W J	
R944	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	
R974,977	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	
R975,978	CRD20TJ181T	RES , CARBON	180 OHM 1/5W J	
R986	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	
R988	CRD20TJ303T	RES , CARBON	30K OHM 1/5W J	
R991	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	

▸SEMI RESISTOR				
VR61~65	HVN1RA221B01T	RES , SEMI FIXED(220 OHM)	RH0615C100221	
▸WIRE ASS'Y				
BN20	CWB3FB03280UP	WIRE ASS'Y		
BN90	CWB4D232450PU	WIRE ASS'Y		
JW91	CWE8212230VV	WIRE ASS'Y		
JW92	CWEE212120VV	WIRE ASS'Y		
▸CONNECTOR				
CN61~65	KJP03GA01ZM	WAFER	MOLEX 5267-03A	
CN80	KJP08GA19ZM	WAFER	MOLEX53014-0810	
CN91	KJP02KA060ZY	WAFER	7.92MM(YUNHO)	
CN92	KJP02GA89ZM	WAFER	MOLEX35328-02	
CN94	KJP10GA98ZM	WAFER	MOLEX35336-1010	
CN95	KJP08GA98ZM	WAFER	MOLEX35336-0810	
CN96	KJP07GA01ZM	WAFER	MOLEX 5267-07A	
▸I.C				
IC61	BVIKP1010B	IC, PHOTO COUPLER		
IC91	HVIMC7815C	I.C, REGULATOR	A7815-ABTU	
IC92	HVIMC7915C	I.C, REGULATOR	A7915-ABTU	
IC93,94	HVIMC7805C	I.C, REGULATOR	A7805-ABTU	
▸JACK				
JK61,JK62	CJJ2D008Z	JACK , STEREO		
JK91	CJJ5N009Z	TERMINAL , SPEAKER		
JK92	CJJ5Q011Z	TERMINAL , SPEAKER		
JK93	CJJ4M040Z	JACK , BOARD (SW)		
▸COIL				
L501~505	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	
▸OUTLET				
OL91	KJJ7A025Z	OUTLET , EUR(2P)	A3-04-D007-2P	
▸RELAY				
RY94	HSL1A008ZE	RELAY	SDT-S-112DMR	
▸POSISTOR				
TH91	KRTP42T7D330B	THERMAL SENSOR, POSIST	P42T7D330BW20	
▸SUB TRANS				
T902	CLT5J033ZE	TRANS , SUB		
	CUP11518W	**PCB , INPUT**		
▸CAPACITOR				
C201~206,211~224 321,322,325,326	CCKT1H221KB	CAP , CERAMIC	220PF 50V KB	
C231,232,349,350,799 382~386,390,421,424 426,440,447,452,454 456,708,709,712,728 731733,752,754 780,783	HCEA1CH101T	CAP , ELECT	100UF 16V	
C233~236	HCEA1CKS101T	CAP , ELECT	100UF 16V	
C237,240,359,361,362 387,703,705	CCKT1H181KB	CAP , CERAMIC	180PF 50V KB	
C238,239,335,360	CCKT1H471KB	CAP , CERAMIC	470PF 50V KB	

C261~272	HCEA1EH220T	CAP , ELECT	22UF 50V	
C273~284	HCQI1H332JZT	CAP , MYLAR	3300PF 50V J	
C285,286,288~292 294~296,333	CCKT1H561KB	CAP , CERAMIC	560PF 50V KB	
C287,293,371	HCQI1H182JZT	CAP , MYLAR	1800PF 50V J	
C297~302,323,324,327 328,334,347,348,358 420,430,439,446,449 460,511,554,730,766	HCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	
C303~308	HCEA1HH220T	CAP , ELECT	22UF 50V	
C336,357,423,461 555,735,921	CCKT1H223ZF	CAP , CERAMIC	0.022UF 50V ZF	
C339,340,414,772	HCBS1H103ZFT	CAP , CERAMIC	0.01UF 50V Z	
C343~346,351~356 363~368,375~380,413 416,417,419,422,425 428,438,441,443,445 448,453,455,762,769	HCEA1VH100T	CAP , ELECT	10UF 35V	
C372~374	CCKT1H151KB	CAP , CERAMIC	150PF 50V KB	
C388,389	HCEA1CH471T	CAP , ELECT	470UF 16V	
C391,719,720,727,729 732,736,740,743,744 746,747,751,763,768 779,786,787	HCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	
C395,557,560,567	HCEA1HH1R0T	CAP , ELECT	1UF 50V	
C418,431,442,444,458 726,776	CCKT1H101KB	CAP , CERAMIC	100PF 50V KB	
C457,721,737	HCBS1H101KBT	CAP , CERAMIC	100PF 50V K	
C501	HCBS1C472MXT	CAP , CERAMIC	0.0047UF 16V M	
C552,553,565,566 711,713,714,717	CCCT1H270JC	CAP , CERAMIC	27PF 50V JC	
C523	CCCT1H220JC	CAP , CERAMIC	22PF 50V JC	
C558	HCQI1H682JZT	CAP , MYLAR	0.0068UF 50V J	
C562	HCBS1H560JT	CAP , CERAMIC	56PF 50V J	
C563	HCEA1HHR47T	CAP , ELECT	0.47UF 50V	
C564	HCBS1H181KBT	CAP , CERAMIC	180PF 50V KB	
C451,556,582 701,702,781,784	HCEA1AH471T	CAP , ELECT	470UF 10V	
C309~312,314,315,704 706,707,734,755,756 761,773,774,901,902	CCFT1H104ZF	CAP , SEMI	0.1UF 50V ZF	
C710,778,785	CCKT1H473ZF	CAP , CERAMIC	0.047UF 50V ZF	
C715,782	HCBS1H473ZFT	CAP , CERAMIC	0.047UF 50V Z	
C722,723	CCCT1H100DC	CAP , CERAMIC	10PF 50V DC	
C724	HCBS1H330JT	CAP , CERAMIC	33PF 50V J	
C725	CCCT1H330JC	CAP , CERAMIC	33PF 50V JC	
C741,742	HCEA1EH470T	CAP , ELECT	47UF 25V	
C745,770	HCEA1HH2R2T	CAP , ELECT	2.2UF 50V	
C764,765	CCCT1H120JC	CAP , CERAMIC	12PF 50V JC	

C771	HCBS1H471KBT	CAP , CERAMIC	470PF 50V KB	
C775	CCKT1H102KB	CAP , CERAMIC	1000PF 50V KB	
C429,450,459,462~464 561,581,777	HCEA0JH102T	CAP , ELECT	1000UF 6.3V	
C427,903~906,908 910,913	CCKT1H103ZF	CAP , CERAMIC	0.01UF 50V ZF	
C907,909,914	HCEA1HH470T	CAP , ELECT	47UF 50V	
C911	HCEA1HH4R7T	CAP , ELECT	4.7UF 50V	
C912	HCEA1HH101T	CAP , ELECT	100UF 50V	
C915,916	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	
C917,918	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	
C919,920	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	
C922	HCEA1EH101T	CAP , ELECT	100UF 25V	
C923	HCEA1CH332E	CAP , ELECT	3300UF 16V	
C924	HCEA1CH102E	CAP , ELECT	1000UF 16V	
▸DIODE				
D401	HVDMTZJ6.8BT	DIODE , ZENER	6.8V 1/2W	
D411~414	HVD1SS133MT	DIODE	1SS133M	
D418	HVDMTZJ5.6BT	DIODE , ZENER	5.6V 1/2W	
D701	HVDMTZJ4.7BT	DIODE , ZENER	4.7V 1/2W	
D702	HVDMTZJ3.3BT	DIODE , ZENER	3.3V 1/2W	
D901~906	KVD1N4003SRT	DIODE TW	1N4003	
D907,910	HVDMTZJ15BT	DIODE , ZENER	15V 1/2W	
D908	HVDMTZJ6.2BT	DIODE , ZENER	6.2V 1/2W	
D909	BVDGBJ1504	DIODE , BRIDGE	GBJ1504	
▸COIL				
L550	KLQ101J405T	COIL, PEAKING(RADIAL)	100UH 4X5	
L551	KLQ5R6J405T	COIL, PEAKING(RADIAL)	5.6UF 4X5	
L552	KLQ220J405T	COIL, PEAKING(RADIAL)	22UF 4X5	
L705	KLQ100J405T	COIL, PEAKING(RADIAL)	10UH J 4X5	
L703,706,707,709	KLZ9H001Z	BEAD , CORE		
▸TRANSISTOR				
Q301,501,503	HVTKTD1302T	T.R	KTD1302	
Q302,412,415,902	HVTKRA107MT	T.R	KRA107M	
Q395,396	HVTKTC2874BT	T.R , MUTE	KTC2874B	
Q413,416,417,904	HVTKRC107MT	T.R	KRC107M	
Q411,414	KVTKSA733CYT	T.R	KSA733CY	
Q481,482,550,552	KVTKSA1175YT	T.R	KSA1175Y	
Q502	HVTKRA104MT	T.R	KRA104M	
Q551	KVTKSC2785YT	T.R	KSC2785Y	
Q701,702	HVTKSC2316YT	T.R	KSC2316Y	
Q901,903	HVTKTA1271YT	T.R	KTA1271Y	
Q455	HVTKSA614Y	T.R	KSA614Y	
▸RESISTOR				
R201~206,211~223 477,720,771	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	
R224	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	
R225~230,235~247	CRD20TJ474T	RES , CARBON	470K OHM 1/5W J	

R262,263,353~358 365~367,377~379	CRD20TJ184T	RES , CARBON	180K OHM 1/5W J	
R250~255,307~312 329~332,338,339,347 348,351,352,371,389 383~387,511,708,712 715,726,749,753,769	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	
R256~261,359~362 364,369,746,747	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	
R271~274,277~282	CRD20TJ392T	RES , CARBON	3.9K OHM 1/5W J	
R275,276,413,414,416 421,427,430,432,445 446,450~452,458,461 463,465,468,554,561 565~568,729,752,914 390,399,562	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	
R283~288,295~300 340,343~346,374~376 396,397,472,475,504	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	
R289~294,301~306 908	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	
R313~318,599,713 714,716,718	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	
R321~328,333~335 426,440,460,462,501 750,751,765,767	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	
R336,553	CRD20TJ123T	RES , CARBON	12K OHM 1/5W J	
R337,911	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	
R341,395,502,723	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	
R349,350	CRD20TJ151T	RES , CARBON	150 OHM 1/5W J	
R363	CRD25TJ101T	RES , CARBON	100 OHM 1/4W J	
R368,370,380~382,388	CRD20TJ683T	RES , CARBON	68K OHM 1/5W J	
R248,373,418,429,435 439,444,555,701,704 748,754~762,766,773	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	
R391~394	CRD20TJ112T	RES , CABON	1.1K OHM 1/5W J	
R415,428,437,471,474	CRD20TJ680T	RES , CARBON	68 OHM 1/5W J	
R419,425,431,436 453,454,456,457,464 467,470,471,473,474 705~707,709	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	
R422,455,459,702,703 710,711,722,724,736 774,775	CRD20TJ1R0T	RES , CARBON	1 OHM 1/5W J	
R424,438,557	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	
R433,466,469,906	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	
R480,481,560	CRD20TJ682T	RES , CARBON	6.8K OHM 1/5W J	
R551,552	CRD20TJ181T	RES , CARBON	180 OHM 1/5W J	
R556	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	

R558	CRD20TJ393T	RES , CARBON	39K OHM 1/5W J	
R559	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	
R725	CRD20TJ183T	RES , CARBON	18K OHM 1/5W J	
R503,727,728,772	CRD20TJ4R7T	RES , CARBON	4.7 OHM 1/5W J	
R730	CRD20TJ121T	RES , CARBON	120 OHM 1/5W J	
R737	CRD25TJ2R7T	RES , CARBON	2.7 OHM 1/4W J	
R740~745,764,768,777	CRD20TJ330T	RES , CARBON	33 OHM 1/5W J	
R423,434,763	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	
R770	CRD20TJ182T	RES , CARBON	1.8K OHM 1/5W J	
R776	CRD25TJ1R0T	RES , CARBON	1 OHM 1/4W J	
R778,905,907	CRD20TJ8R2T	RES , CARBON	8.2 OHM 1/5W J	
R909,913	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	
R912	CRD20TJ154T	RES , CARBON	150K OHM 1/5W J	
R319	KRG2ANJ470H	RES , METAL OXIDE FILM	47 OHM 2W J	
R901,902	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	
R903,904	KRQ1AJR15H	RES , FUSE	0.15 OHM 1W J	
▸WIRE ASS'Y				
BN21	CWB1E908060MM	WIRE ASS'Y		
BN96	CWB1C907200BM	WIRE ASS'Y		
BN97	CWB1C903080BM	WIRE ASS'Y		
JW21,22	CWE6202070AA	WIRE ASS'Y		
JW23	CWE7202110AA	WIRE ASS'Y		
JW24	CWED202100RV	WIRE ASS'Y		
JW71	CWE7202090AA	WIRE ASS'Y		
▸CONNECTOR				
BN11	KJP09GB99ZM	CONNECTOR	MOLEX35237-0910	
BN12	KJP14GB99ZM	WAFER	MOLEX35237-1410	
CN13,15,43	KJP13GA115ZG	WAFER, CARD CABLE	GF120-13S-TS	
CN20	KJP03GA90ZM	WAFER	MOLEX35313-0310	
BN47	KJP06TT122ZP	CONNECTOR		
CN47	KJP06HA37ZM	CONNECTOR		
BN48	KJP03TT122ZP	CONNECTOR		
CN48	KJP03HA37ZM	CONNECTOR		
CN72	KJP32GA117ZG	WAFER , CARD CABLE	GF102-32S-TS	
CN81	KJP06GA01ZM	WAFER	MOLEX 5267-06A	
CN82,97	KJP03GA01ZM	WAFER	MOLEX 5267-03A	
CN83	KJP02GA01ZM	WAFER	MOLEX 5267-02A	
▸I.C				
IC20	HVITC9163AF	I.C , FUNCTION	TC9163AF	
IC21,23~29,32~34	HVINJM2068MTE1	I.C , OP AMP	NJM2068M-TE1	
IC22	HVITC9164AF	I.C , FUNCTION	TC9164AF	
IC30	HVITC9162AF	I.C , FUNCTION	TC9162AF	
IC31	HVITC9482F	I.C , ELECT VOL	TC9482F	
IC41,43,44	HVINJM2296M	I.C , VIDEO SW	NJM2296M	
IC42	BVI74HC4066D	I.C , SWITCHING	74HC4066D	
IC51	HVI74ACT04SC	I.C , HEX INVERTER	74ACT04SC	
IC53	HVILC74763M	I.C , OSD	LC74763M	
IC71,72	HVITC74HCU04AFN	IC , INVERTER	TC74HCU04AFN	
IC75	HVIAK4114VQ	IC , DIR	AK4114VQ	

IC77	HVIAK5380VT	I.C 2CH AUDIO ADC	AK5380VT	
IC78	HVIAK4356VQ	I.C , D/A CONVERTER	AK4356VQ	
IC79	HVICS493263-CLG	I.C , DSP HK	CS493263-CLG	
IC95	BVINJM7905FA	I.C	NJM7805FA	
▸JACK				
JK21	CJJ4R019W	JACK , IN/OUT		
JK23,24	CJJ4P014W	JACK , IN/OUT		
JK25	CJJ4R034W	JACK , IN/OUT		
JK26,27	HJSTORX179	MODULE,OPTICAL(RECEIVE	TORX179	
JK28	HJS9L001Z	MODULE, OPTICAL	TOTX178	
JK29	CJJ4S022Z	JACK , BOARD		
JK42	HJJ9N001Z	JACK , S-VIDEO(2P/H)	JY-5036-040	
JK43	HJJ9S001Z	JACK , S-VIDEO(3P/H)	JY-5041-040	
JK49	CJJ4N043Z	JACK , BOARD		
JK50	CJJ4S010Z	JACK , BOARD		
▸CRYSTAL				
X503	KOX17744D220F	CRYSTAL		
X701	HOX12288E320C	CRYSTAL		
▸FUSE				
F900,901	KBA2C2500TLE	FUSE (2.5A 250V)		
F902	KBA2C4000TLE	FUSE (4A 250V)		
F903,904	KBA2C8000TLU	FUSE (8A 250V)		
▸CARD CABLE				
CB13	CWC1C4A13B080B	CABLE , CARD		
CB15	CWC1C4A13B130B	CABLE , CARD		
CB72	CWC1B2A32A210B	CABLE , CARD		
▸OTHERS				
T901	CLT5W006ZE	TRANS , POWER		
	CNVKSTM9014MS1	TUNER MODULE	KSTM9014MS17	
	CLZ9W003Z	FERRITE , RING		