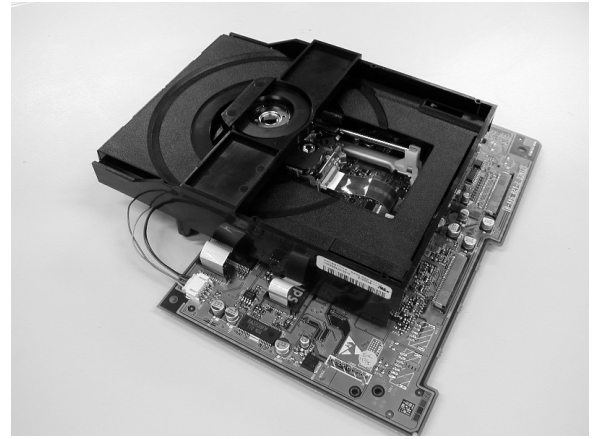
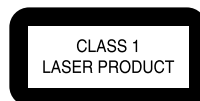


Service Service Service



Service Manual



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PHILIPS

1. Technical Specifications

1.1 Interfaces and Pin Assignments

SD4 00_SA CH supports both configurations of single-disc and 5-disc changer SACD player. In table 1-1, interfaces or connectors stuffing options are given for applications of single-disc and 5-disc changer.

Table 1-1 Interfaces or connectors stuffing options

Disc Type	1100	1300	1301	1302	1500	1701	1702	1703	1704	1900	1012	1013
Single-disc	√	√	√	√	√		√	√	√			√
5-disc	√	√	√		√	√	√	√	√	√		√

The interfaces or connectors are placed on both PCB layers of top and bottom as shown in figure 1-1 and figure 1-2 respectively.

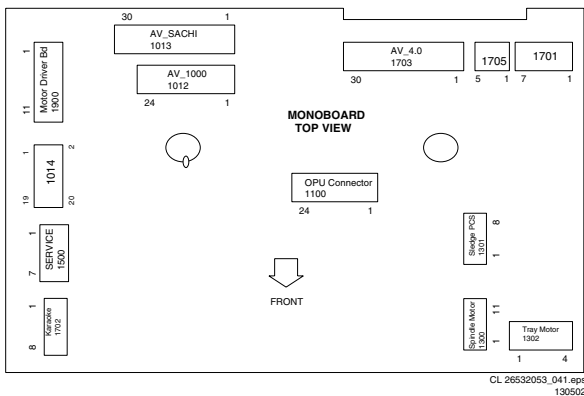


Figure 1-1 Interfaces placement on PCB top layer

Connector 1705 is an option for the usage of SACD1000 set only for connecting monoboard to front panel board. Connector 1701 is also an option for the monoboard power supply 12V/5V/3V3 in case of the requirements needed for further improvement on audio performance of SACD. Connector 1014 is for either DCU (Diagnostic Controller Unit) or BST (Boundary Scan Test) used by industrial only.

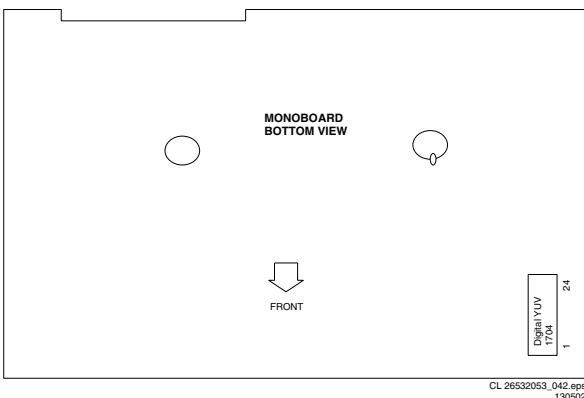


Figure 1-2 Interfaces placement on PCB bottom layer

1.2 Connections

1.2.1 Interface AV_4.0 at Location 1703:

- 1. I²C_SCL/SIODATA I²C SCL
- 2. I²C_SDA/SIOCLK I²C SDA
- 3. SCART1 low blanking 1 (0/6/12V)
- 4. SCART0 low blanking 0 (0/6/12V)

- 5. B_REF GND
- 6. B_U B_output
- 7. G_REF GND
- 8. G_Y G_output
- 9. R_REF GND
- 10. R_V R_output
- 11. Y_REF GND
- 12. Y Y_output
- 13. C_REF GND
- 14. C C_output
- 15. CVBS-REF GND
- 16. CVBS CVBS output
- 17. +3V3 Power supply +3V3
- 18. +3V3 Power supply +3V3
- 19. +5V Power supply +5V
- 20. +12V Power supply +12V
- 21. +12V Power supply +12V
- 22. MUTE Analogue output Mute
- 23. GND GND
- 24. PCMSCLK PCM Bit clock
- 25. PCMDATA0 PCM data 0
- 26. GND GND
- 27. PCMCLK PCM Clock
- 28. PCMLRCLK PCM Word clock
- 29. GND GND
- 30. SPDIF SPDIF output

1.2.2 Optional Interface AV_1000 at Location 1012:

- 1. GND GND
- 2. 384FS 16.9344MHz DAC mastering clock
- 3. GND GND
- 4. SEL_PCM/DSD_LFE DSD_LFE LFE channel (Ch-3)
- 5. GND GND
- 6. DATA_CeLf/DSD_CENTRE DSD_CENTRE Front Centre channel (Ch-2)
- 7. GND GND
- 8. SEL_PCM/DSD_Rs DSD_Rs Right surround (Ch-5)
- 9. GND GND
- 10. DATA_LsRs/DSD_Ls DSD_Ls Left surround (Ch-4)
- 11. GND GND
- 12. SEL_PCM/DSD_RIGHT DSD_RIGHT Front Right Channel (Ch-1)
- 13. GND GND
- 14. DATA_LeRi/DSD_LEFT DSD_LEFT Front Left Channel (Ch-0)
- 15. GND GND
- 16. WORK_CLK/SEL_DSD DSD stereo
- 17. GND GND
- 18. BIT_CLK/DSD_CLK DSD clock
- 19. GND GND
- 20. 256FS Audio Clock
FS=32KHz, 44.1KHz, 48KHz and 96KHz
- 21. GND GND
- 22. SCL-DAC I²C SCL for DAC
- 23. SDA-DAC I²C SDA for DAC

24. GND GND

1.2.3 Optional Power Supply Connector at Location 1701:

1. +3V3 Power supply +3V3
 2. +3V3 Power supply +3V3
 3. +5V Power supply +5V
 4. GND Ground
 5. GND Ground
 6. MGND Power ground
 7. +12V Power supply +12

1.2.4 Optional Connector of Sacd1000 Set (From Monoboard to Front Panel) at Location 1705:

1. SCL I²C SCL
 2. GND Ground
 3. SDA I²C SDA
 4. STB_CONT Standby Control
 5. P50 Project P5

1.2.5 Interface AV_SACHI at Location 1013:

1. GND GND
 2. 384FS DAC mastering clock
 16.9344MHz
 3. GND GND
 4. SEL_PCM/DSD_LFE LFE channel (Ch-3)
 5. GND GND
 6. DATA_CeLf/DSD_CENTRE Front Centre channel (Ch-2)
 7. GND GND
 8. SEL_PCM/DSD_Rs Right surround (Ch-5)
 9. GND GND
 10. DATA_LsRs/DSD_Ls Left surround (Ch-4)
 11. GND GND
 12. SEL_PCM/DSD_RIGHT Front Right Channel (Ch-1)
 13. GND GND
 14. DATA_LeRi/DSD_LEFT Front Left Channel (Ch-0)
 15. GND GND
 16. WORK_CLK/SEL_DSD DSD stereo
 17. GND GND
 18. BIT_CLK/DSD_CLK DSD clock
 19. GND GND
 20. 256FS Audio Clock
 FS=32KHz, 44.1KHz,
 48KHz and 96KHz
 21. GND GND
 22. SCL-DAC I2C SCL for DAC
 23. SDA-DAC I2C SDA for DAC
 24. GND GND
 25. PCMDATA3/DSD_PCM8 Option 1:PCMDATA3
 Option 2: DSD_Ch7
 26. GND GND
 27. P50 P50 (I2C Slave Data Available
 Interrupt)
 28. GPIO2 General I/O port 2
 Option 1 : Supporting 3
 control line type DAC,
 DAC_CLK
 29. GPIO3 General I/O port 3
 Option 1: Supporting 3 control
 line type DAC, DAC_DATA
 30. GPIO1 General I/O port
 Option 1: Supporting 3 control
 line type DAC, DAC_C

1.2.6 Karaoke Interface at Location 1702:

1. KOKSCLK Karaoke PCM bit clock (I2S
 format)
 2. +12V Power Supply +12V
 3. KOKLRCLK Karaoke PCM left-right / word
 clock (I2S format)

4. GND Ground
 5. KOKDATA Karaoke PCM data (I2S
 format)
 6. GND Ground
 7. KOKPCMCLK Karaoke PCM system clock
 (I2S format)
 8. KOKVOCDT Karaoke vocal detect signal

1.2.7 Digital YUV Interface at Location 1704:

1. GND Ground
 2. SDA I2C SDA
 3. SCL I2C SCL
 4. Odd/Even
 5. HSYNC Horizontal Sync
 6. GND Ground
 7. 27MHz Clock 27MHz Clock
 8. GND Ground
 9. YC0 Digital video bit 0
 10. GND Ground
 11. YC1 Digital video bit 1
 12. GND Ground
 13. YC2 Digital video bit 2
 14. GND Ground
 15. YC3 Digital video bit 3
 16. +5V Power Supply +5V
 17. YC4 Digital video bit 4
 18. +3V3 Power Supply +3V3
 19. YC5 Digital video bit 5
 20. +3V3 Power Supply +3V3
 21. YC6 Digital video bit 6
 22. GND Ground
 23. YC7 Digital video bit 7
 24. GND Ground

1.2.8 Service connector at Location 1500:

1. TXD_SER TXD service UART
 2. SERVICE Service or normal mode select
 3. RXD_SER RXD service UART
 4. RTS_SER Not used (RTS service UART)
 5. GND Ground
 6. CTS_SER Not used (CTS service UART)
 7. +5V_SER Positive 5V (isolated from
 internal +5V by ferrite bead)

1.2.9 To Motor Driver Board Interface at Location 1900:

1. TBL-POS Carousel Rotation Position
 Detection
 2. I2CSCL I2C Clock
 3. I2CSDA I2C Data
 4. GND Ground
 5. Clockwise_CM Carousel Clockwise Rotation
 Control
 6. Counterclockwise_CM Carousel Counterclockwise
 Rotation Control
 7. +5V +5V Power Supply
 8. GND Ground
 9. +12V +12V Power Supply
 10. +12V +12V Power Supply
 11. GND Ground

1.3 Signal Specifications

This the specification of all signals as described under
 "Connections"
 H = +5V ±0.5V
 h = 3V3 ±0.3V
 L = 0V ±0.5V
 l = 0V ±0.3V

Stby : There is no standby mode at module level. The module operate in power-off and power-on only.

Standby control line : Not available on module level.

P50 : Connection between front and A/V board, and can be used as P50 signal line.
: The signal is not connected to the module electronics.

Slow blanking scart : This signal has three levels which depend on the level of the output ports SCART0 and SCART1. It will be converted by the external board to 0/6/12 voltage level use for scart function switching.

Audio mute : Can be used for audio mute transistors during stop or power On/Off.
: Mute on : 3V3 ±0V3
: Mute off: 0V ±0V3

I2S data0 out : I2S front data output.
: Level - h / l

I2S wordselect / I2S bitclock : I2S timing signals
: Level - h / l

I2S systemclock : 256xFS audio systemclock.
: Level - h / l

Clockwise/Counterclockwise_CM : Carousel output for 5-Disc changer
: Level - h / l

TBL_POS : Position sensor for carousel rotation of 5-disc changer
: Level - h / l

LFE_SEL : Low frequency effect selection for the A/V board.
: LFE_SEL_low - l
: LFE_SEL_high - h

Center_on : Switches the center audio to the scart output.
: Center to scart - h
: L/R to scart - l

Karaoke : I2S input - h / l
: PCMCLK output - h / l

SPDIF out : Digital audio output level - H / L

Hor. Sync : Video Horizontal synchronisation
: Level - h / l

DSD/PCM output : Digital output for High End DAC
: Level - h / l

I²C clock / I²C data : I²C databus
: Level - H / L at modules connectors

TXD / RXD / RTS / CTS : Service UART to be connected direct to PC serial input.
: Output levels - H / L
: Input levels RS232 compliant

Service activation : To activate service mode, this line is tied to GND

1.4 Performance:

1.4.1 Digital Output

CDDA/LPCM : according IEC60958
MPEG1 is converted to LPCM :
MPEG2, AC3 audio.MP3 : according IEC1937
DTS. : according IEC61937 amendment 1.
: Digital output level is 0V / 5V with GND as reference. To meet the standards a decouple circuit is necessary.

1.4.2 I2S Output

Resolution : Up to 24bit.
Sample rate : 32kHz / 44.1kHz / 48kHz / 64kHz / 88.2kHz / 96kHz / 128kHz / 176.4kHz / 192kHz.

Standard : Philips I2S output
Number of I2S outputs : Basic 6 channels: Front / Surround / Center-LFE.
: Additional 2 channels: downmix stereo

Deemphasis : Internally processed by the module.

Audio source streams : PCM / LPCM / MPEG1 / MPEG2 / AC3 / MP3 / DTS / MLP.

Audio processing : Dolby ProLogic decoder / Dolby surround downmix / SRS TruSurround / Circle Surround / TruBass.

1.4.3 Analog Audio

The module has no analog audio ouput.
: The analog audio specification will be determined by the external DAC circuit.

1.4.4 Video.

Standards : The video output standard will follow the source material.
: The OSD standard is switchable between PAL or NTSC.

Outputs : The module has 6 analog outputs in 4 formats:
Y/C;
CVBS;
RGB / YUV.
RGB / YUV component video signals share the same lines.
Therefore, the module

- Specification.
- is unable to output both RGB and YUV simultaneous.
 - : The output comply fully with [PQR-IMS] Class III.
 - : DC level - sync bottom at $0.43V \pm 10\%$ (100% white) and $0.9V \pm 10\%$ (black).
 - : Output impedance - 75Ohm.
 - : The following specification points are significantly better than [PQR_IMS]
 - : SNR on all video outputs is better than 65dB.
 - : Video bandwidth - 8MHz ($\pm 3dB$) / 16MHz ($\pm 3dB$) for STi5588 progressive scan.

2. Safety Instructions, Warnings, and Notes

2.1 Safety Instructions

2.1.1 General Safety

Safety regulations require that during a repair:

- Connect the unit to the mains via an isolation transformer.
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:

- Route the wires/cables correctly, and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side:
 1. Unplug the mains cord, and connect a wire between the two pins of the mains plug.
 2. Set the mains switch to the 'on' position (keep the mains cord unplugged!).
 3. Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
 4. Repair or correct unit when the resistance measurement is less than 1 MΩ.
 5. Verify this, before you return the unit to the customer/user (ref. UL-standard no. 1492).
 6. Switch the unit 'off', and remove the wire between the two pins of the mains plug.

2.1.2 Laser Safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

Laser Device Unit

Type	: Semiconductor laser GaAlAs
Wavelength	: 650 nm (DVD) : 780 nm (VCD/CD)
Output Power	: 20 mW (DVD+RW writing) : 0.8 mW (DVD reading) : 0.3 mW (VCD/CD reading)
Beam divergence	: 60 degree

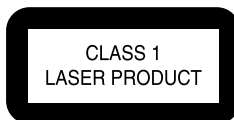


Figure 2-1

Note: Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

2.2 Warnings

2.2.1 General

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD, ⚡). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:
 - Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
 - Wristband tester 4822 344 13999.
- Be careful during measurements in the live voltage section. The primary side of the power supply (pos. 1005), including the heatsink, carries live mains voltage when you connect the player to the mains (even when the player is 'off!'). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A 'lightning stroke' and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.
- Never replace modules, or components, while the unit is 'on'.

2.2.2 Laser

- The use of optical instruments with this product, will increase eye hazard.
- Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.
- Repair handling should take place as much as possible with a disc loaded inside the player.
- Text below is placed inside the unit, on the laser cover shield:

CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM
 ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNNGÅ UDSÆTTELSE FOR STRÅLING
 ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
 VARNING SYNLIG OG OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD BETRÄKTA EJ STRÅLEN
 VARO! AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LASER SÄTEILYLLE. ÄLÄ KÄT SO SÄTEESEEN
 VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETZEN
 DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM
 ATTENTION RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Figure 2-2

2.2.3 Notes

Dolby

Manufactured under licence from Dolby Laboratories. "Dolby", "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories. Confidential Unpublished Works. ©1992-1997 Dolby Laboratories, Inc. All rights reserved.

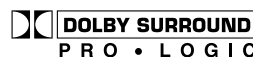


Figure 2-3

Trusurround

TRUSURROUND, SRS and symbol (fig 2-4) are trademarks of SRS Labs, Inc. TRUSURROUND technology is manufactured under licence from SRS labs, Inc.



Figure 2-4

3. Directions for Use

There is no DFU available

4. Mechanical Instructions

4.1 Dismantling Instruction

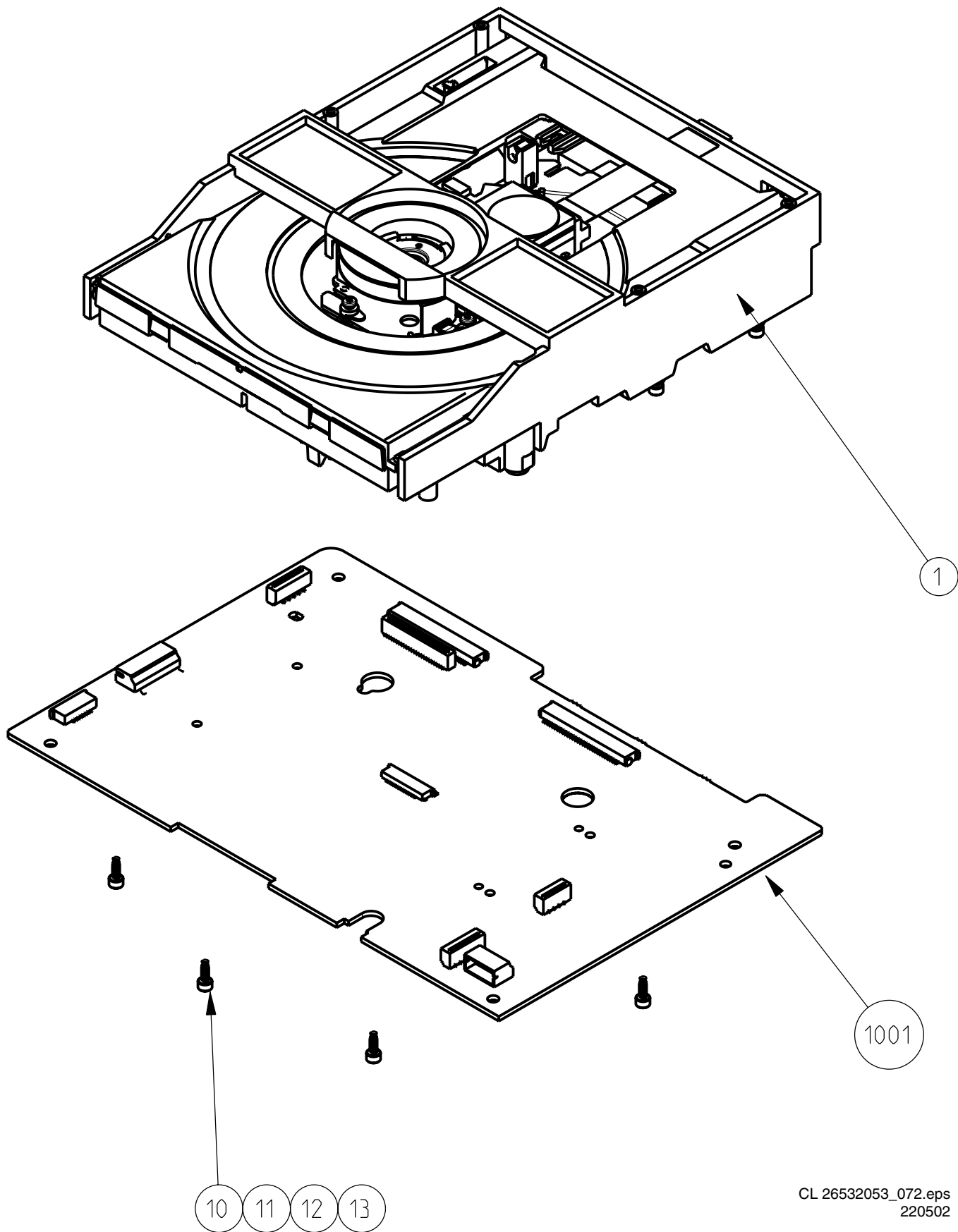


Figure 4-1

4.1.1 Dismantling of DVD Mono Board

1. See Figure 4-1 for dismantling of DVD module.
2. Unlock the OPU conn 1100, Sledge motor conn 1301 and disc motor conn 1300 and remove the Flex connections.
3. Remove the wire connection to Tray motor conn 1302.
4. Remove 4 screws 10 to 13.
5. Remove the Mono Board

Note: Flex cables are very fragile, care should be taken during dismantling and when mounting, ensure that Flex cables are inserted properly into the Flex socket and locked.

4.1.2 Opening of Tray Manually

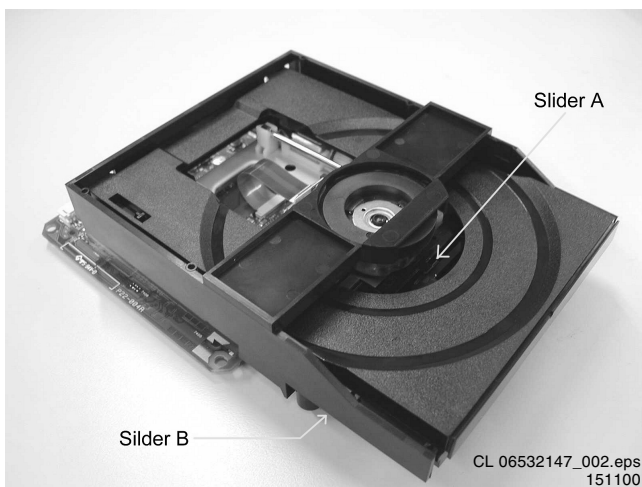


Figure 4-2

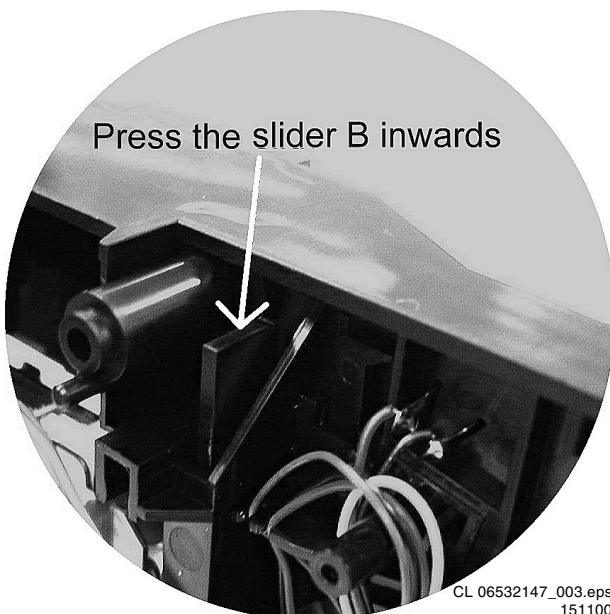


Figure 4-3

It is possible to open the tray manually by moving the Slider in the position as shown in Figure 4-2 and Figure 4-3
When the slider A is not accessible when a disc is loaded, unlock the tray by pressing the slider B inward as shown in

Figure 4-3. The Tray is now disengaged and can be pulled outwards.

When no disc is loaded, unlocking the Tray can also be done by moving the Slider A in the direction as shown in Figure 4-4 and pull the Tray outwards.

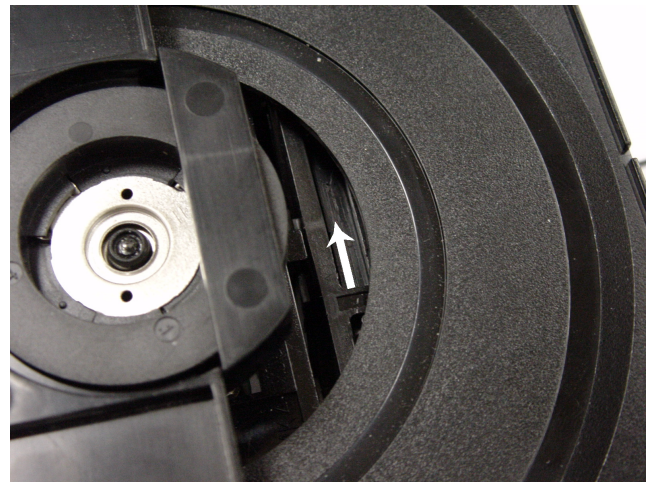


Figure 4-4

4.2 Service Hints

4.2.1 DVD Module

This module can be repaired as follows:

1. The VAL6011/14 is a combination of loading mechanism and DVD-mechanism. Both the mechanism is not a repairable unit and in case of failure it has to be replaced with a new loader VAL6011/14.

Note: When replacing with a new VAL6011/14 two solder joints have to be removed after connecting the OPU flex foil to the board.

The solder joints which shortcircuits the laser diodes to ground are for protection against ESD. Refer to Figure 4-5 and Figure 4-6 for location of solder points.

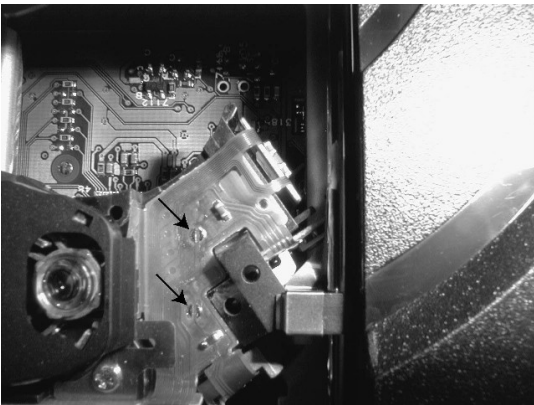


Figure 4-5

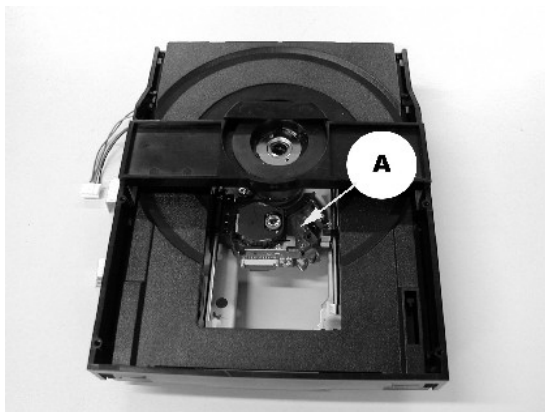


Figure 4-6

2. The mono board has to be repaired down to component level. Repair handling of the monoboard requires a workshop with sophisticated desoldering tools.

5. Test Instructions Mono Board DVD-SD4.00SA_CH

5.1 General

- Impedance of measuring-equipment should be > 1MΩ.
- Most tests have to be done by software commands. Together with the software command you will find a Ref.# nbr. This is the number of the diagnostic nucleus used for this test. More detailed information can be find in the chapter "Diagnostic Nuclei".
- Levels: Most measurements are digital measurements. The signal levels specification in this document are defined as follows:
 - low:< 0.3V
 - high:> 3.0V
 - LOW:< 0.4V
 - HIGH:> 4.5V
- All the waveforms measurement carried out in these test instruction will be base on the testpoint indicated in the Monoboard schematic diagram in the service manual.

5.2 General Start-up Measurements

5.2.1 Supply Check:

Table 5-1 Supply check

Testpoint	Supply	Used by
F781	+3V3	Main supply voltage
F782	+5V	Main supply voltage
F783	+12V	Main supply voltage
F710	+3V3SA	Analog 3V3 front-end circuitry
F711	+3V3SD	Digital 3V3 front-end circuitry
F785	FUR-3V3	Digital 3V3 Furore2 interface circuitry
F784	+3V3ST	Digital 3V3 back-end circuitry
F724	3V3D	Digital 3V3 cicuitry
F787	FUR-1V8	Digital 1V8 Furore2 core circuitry
F786	VDDA-FUR	Analog 1V8 Furore2 circuitry
F717	+5VSA	Analog 5V front-end circuitry
F715	+5VSD	Digital 5V front-end circuitry
F721	+5VAV	Analog 5V back-end circuitry
F718	+5VD	Digital 5V back-end circuitry
F727	VDDSTA	Analog STi 55xx circuitry
F729	VDDSTC	Core STi 55xx circuitry
F725	VDDSTD	Digital STi 55xx circuitry

STi 55xx uses various power supply voltages that depend on which processor is being used

Table 5-2 Back-end processor

Back-end Processor	VDDSTA (Analog)	VDDSTC (Core)	VDDSTD (Digital)
STi 5580	+2V5	+2V5	+2V5
STi 5588	+1V8	+1V8	+3V3
STi 5519	+2V5	+2V5	+2V5

The module operates in power-off and power-on only. There is no standby mode at module level. In power-off, the module does not response to any communication or signals. Before starting the measurement, ensure that all power supply are connected to the monoboard via connector 1703 or 1701 and that the PC interface cable is connected to the Service interface connector 1500 of the monoboard.

5.2.2 Reset Check:

To ensure a proper start-up of the monoboard, the back-end reset signal RESETn is required at the STi55xx input (testpoint F906) after power-on.

To check the reset timing, measure the RESETn (testpoint F906) and the +3V3ST supply (testpoint F784), reset circuit trigger signal.

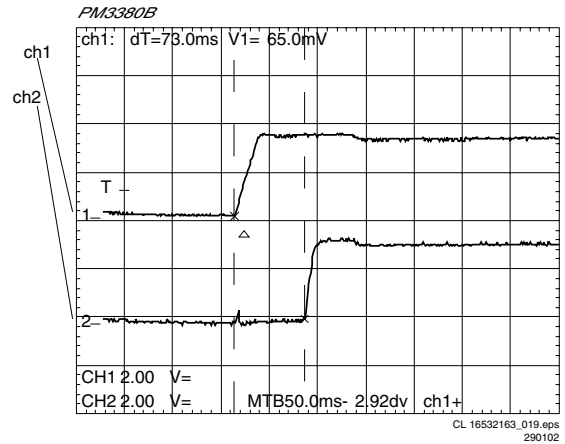


Figure 5-1 Reset

Nb: The RESETn rising edge should be at least 100msec after the +3V3ST (refer to Figure 5-1). If the reset input does not go high then check the reset circuit around transistor 7409.

5.2.3 Clock Check

To check the correct functioning of the STi55xx, we first have to check the presence of all clocks. All clocks to be measured with 0.02% tolerance.

Table 5-3 Clock check

Name	Testpoint	Frequency	Waveform
384FS	F042	16.9344MHz	Refer to Fig 5-3
27M_CLK_ST	F932	27MHz	Refer to Fig 5-2
PCM_CLK_ST	F885	11.2896MHz	Refer to Fig 5-5
Audio_CLK	F935	11.2896MHz	Refer to Fig 5-5
Iguana_CLK	F207	8.4672MHz	Refer to Fig 5-4

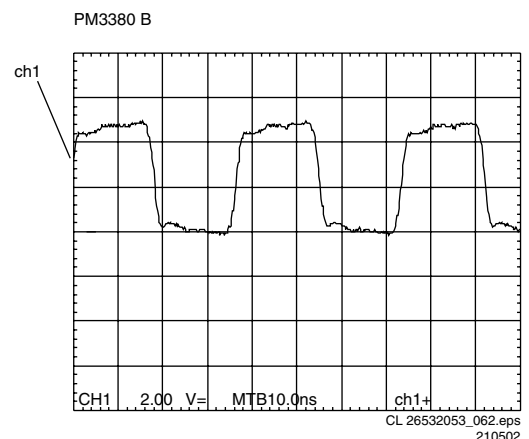


Figure 5-2 27M_CLK

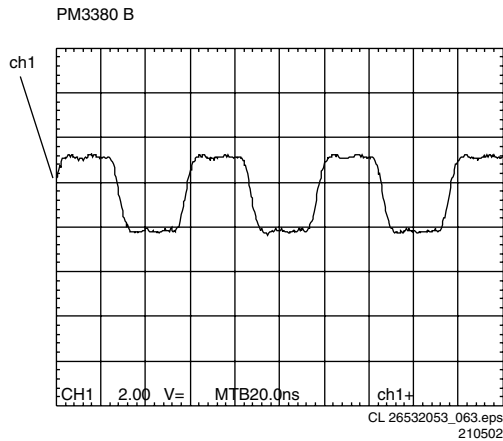


Figure 5-3 384FS

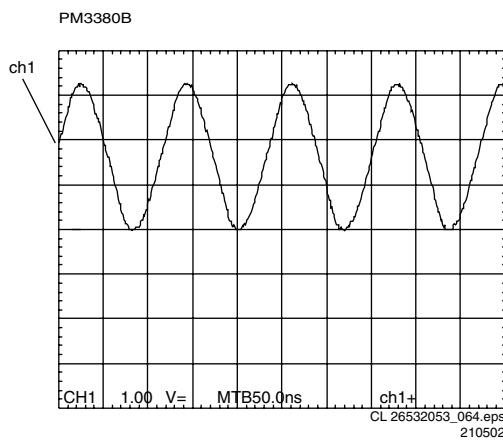


Figure 5-4 Iguana_CLK

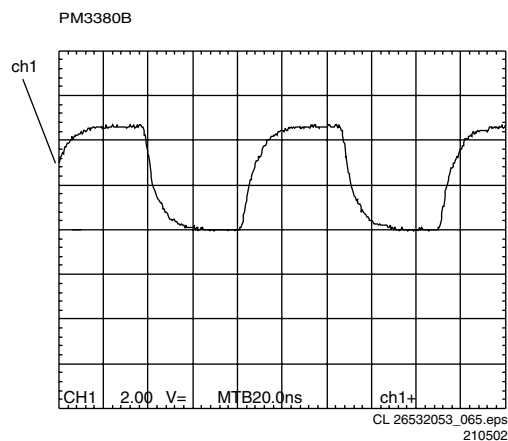


Figure 5-5 PCM_ST_CLK / Audio_CLK

Table 5-4 PC connection

Connector pin	Signal
1500-1	TXT_SER (STi55xx out)
1500-2	SERVICE-mode select
1500-3	RXD_SER (STi55xx in)
1500-4	RTS_SER (Not in use)
1500-5	GND
1500-6	CTS_SER (Not in use)
1500-7	+5V_SER

Now start the terminal program. Make sure that the service-pin (pin 1500-2) of the μ P is pulled low.

The terminal program of your PC should now display: "DVDv4 Diagnostic software version ...". This message already means that the μ P is running. The first 5 commands from the diagnostic software will be carried out automatically during diagnostic start-up. The other commands can be carried out by selecting the "command input" and simply type the reference nbr. to do the test or select the "Menu - driven" test.

To be sure that the μ P is able to run the diagnostic software, serial port will be checked during start-up.

Table 5-5 Serial port check

Ref. #	Reference Name	Remark
(1)	BasicSpAcc	Serial port Access test/initialisation
(2b)	BasicInterconSdram	Check SDRAM interconnection with CPU
(4)	BasicSdramWrR	Check Basic SDRAM memory

With this test, the serial communication is checked in both directions.

5.3 μ P Environment:

5.3.1 General:

All the tests are carried out by software tests. To start the software tests, connect a PC to the serial bus of the STi55xx. Use connector 1500 for this connection:

5.3.2 Memory Check:

The μ P has a data bus that is connected to a Flash and also internal link to the MPEG SDRAM interface.
At start-up, the SDRAM bus is checked

Table 5-6 Memory check

Ref. #	Command Name	Remark
(2b)	BasicInterconSDRAM	Data and address bus Interconnection
6	PapChksFl	Checksum FLASH
16	CompSdramWrR	SDRAM Write Read

CompSdramWrR checks the complete SDRAM for failures inside the IC. The BasicInterconSDRAM check is done by writing & reading some well chosen patterns to all address and data interconnections of the SDRAM.
The PapChksFl calculate and verify checksum of the FLASH. This includes the binary file checksum and the four modules.

5.4 General I/O Port & Peripherals Check

5.4.1 I²C Bus / EEprom Check

To access the EEprom, the I2C bus is used. So by writing and reading to the EEprom the chip and the bus is checked. With next commands a certain byte is written to the EEprom. The original information will always be written back into the EEprom.

Table 5-7 EEprom check

Ref. #	Command Name	Remark
11	PapI2cNvram	I2C NVRAM access

The complete Eeprom can also be checked on failures by writing to all addresses and reading back. This test takes a long time (110 sec).

Table 5-8

Ref. #	Command Name	Remark
15	PapNvramWrR	NVRAM Write Read

5.4.2 Audio Clock Switch Check

The internally generated Audio clock can be set to either 44.1 kHz (CD_DA), 48 kHz (DVD) or 96 kHz (DVD). To check the different mode, use the following commands and measure the waveform as correct operation cannot be detected by the Diagnostic Software.

Table 5-9 Audio clock switch check

Ref #	Command Name	Remark	Test point	Frequency
7a	PapUclkAclkCdda	μ Clock A_CLK in 44.1kHz mode (Fig 5-4)	T885	11.2896MHz 0.02%
7b	PapUclkAclkDvd	μ ClockA_CLK in 48kHz mode (Fig 5-5)	T885	12.288MHz 0.02%
7c	PapUclkAclkDvd96	μ Clock A_CLK in 96kHz mode (Fig 5-6)	T885	24.576MHz 0.02%

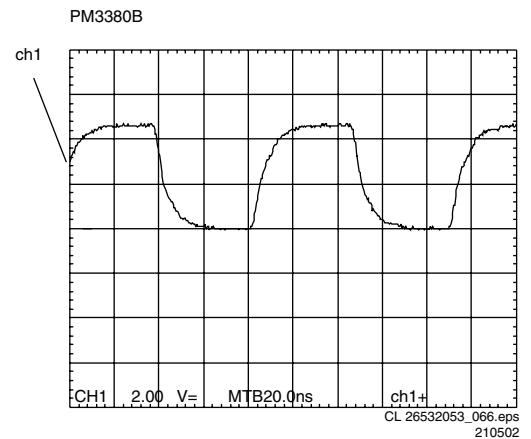


Figure 5-6 μ Clock A_CLK in 44.1kHz mode

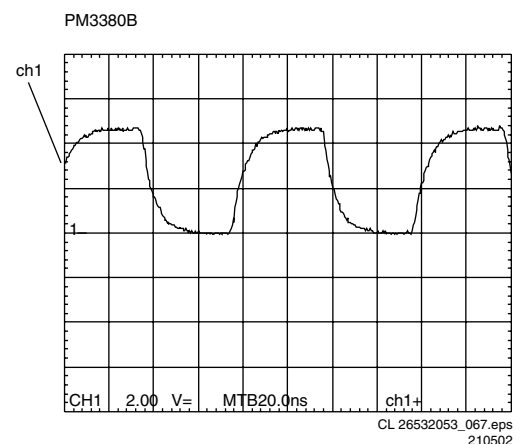


Figure 5-7 μ ClockA_CLK in 48kHz mode

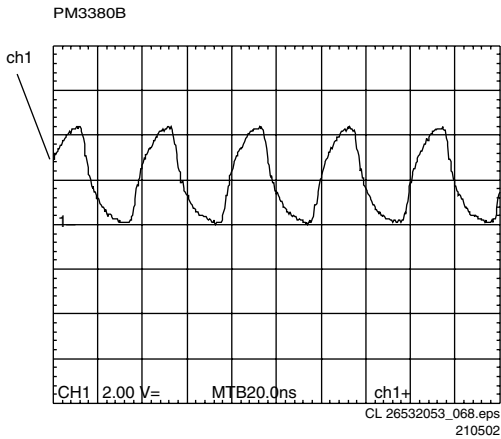


Figure 5-8 μ Clock A_CLK in 96kHz mode

5.4.3 Audio Mute Check

Switch on the Mute circuit by sending next command:

Table 5-10 Audio mute check

Ref. #	Command Name	Remark
19a	AudioMuteOn	AudioMuteOn

Check the Mute output again at testpoint T798: $3V3 \pm 10\%$
Switch off the Mute circuit by sending next command

Table 5-11 Audio mute check

Ref. #	Command Name	Remark
19a	AudioMuteOff	AudioMuteOff

Check the Mute output at testpoint T798: $0V \pm 0.3V$

5.4.4 Audio I2S Check

To check the audio output, connect a audio DAC (on the A/V board) to the I2S output and start-up the audio test. Look at the audio outputs from the A/V board for both sine and pink noise.

Table 5-12 Audio I2S check

Ref. #	Command Name	Remark	Audio outputs
21a	AudioSineOn	Audio Sine signal On	Audio Sine signal On
		Audio Sine signal Off	Sine, 1kHz on stereo Press stop button
20a	AudioPinkNoiseOn	Audio Pinknoise On	Pink Noise on 6 channels
20b	AudioPinkNoiseOff	Audio Pinknoise Off	

The audio signal (sine or pink noise) will also be present on the digital output (SPDif). This can be checked by connecting an amplifier with digital input.
Check the I2S output.

Table 5-13 NameTestpointWaveform

Name	Testpoint	Waveform
PCMLRCLK	F886 / F021	Refer to Figure 5-9
PCMSCLK	F883 / F019	Refer to Figure 5-10
PCMDATA0	F884	Refer to Figure 5-11
DATA_LR/DSD_LEFT	F025	Refer to Figure 5-11
DATA_LsRs/DSD_Ls	F029	Refer to Figure 5-11
DATA_CL/DSD_CENTRE	F034	Refer to Figure 5-11
PCMCLK	F885 / F016	Refer to Figure 5-12
SPDIF	F719	Refer to Figure 5-13

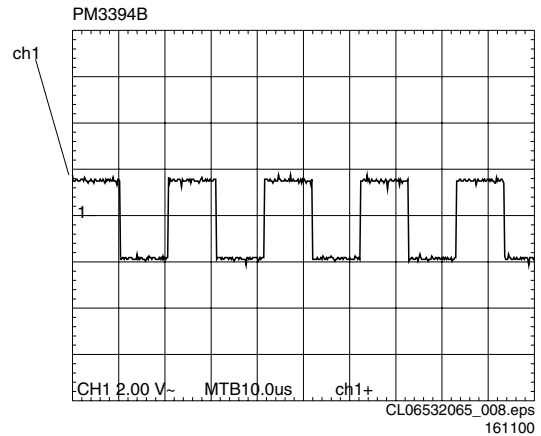


Figure 5-9 PCMLRCLK

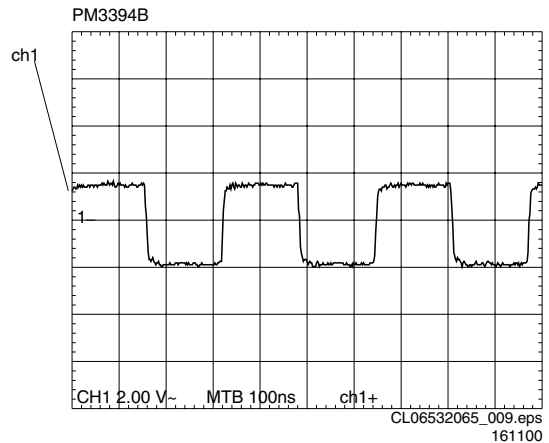


Figure 5-10 PCMSCLK

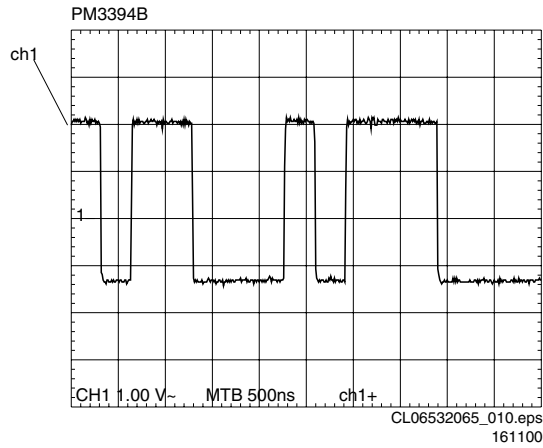


Figure 5-11 PCMDATA

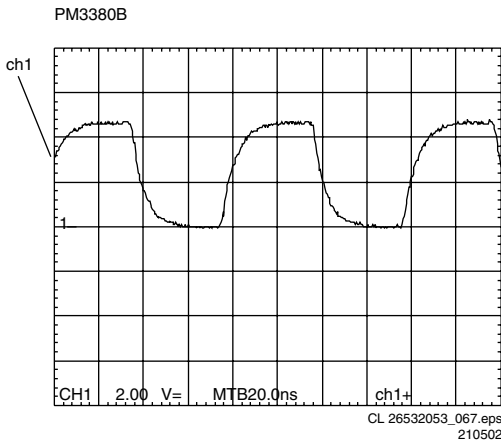


Figure 5-12 PCMLCK

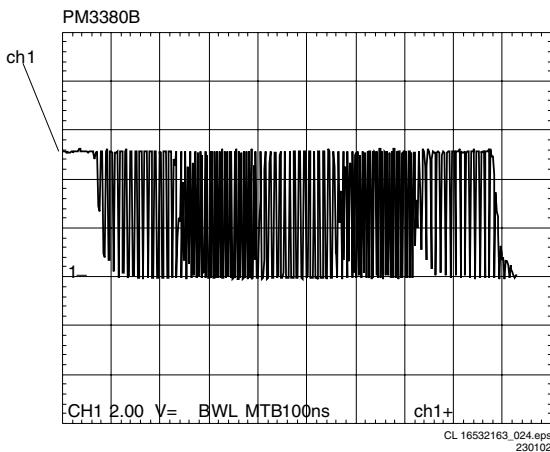


Figure 5-13 SPDIF

Alternatively, there is a check that can be done without A/V board.
First, let the decoder generate pink noise on the audio outputs.

Table 5-14

Ref. #	Command Name	Remark
20a	AudioPinkNoiseOn	Audio Pinknoise On

Measure then these signals on level and frequency.

Table 5-15

Signal	Level between	Frequency
PCMLRCLK	low/high	48kHz 0.02%
PCMSCLK	low/high	3.072MHz 0.02%
PCMCLK	low/high	12.288MHz 0.02%
PCMDATA	low/high	N/A
SPDIF	LOW/HIGH	N/A

Put the pink noise off:

Table 5-16

Ref. #	Command Name	Remark
20b	AudioPinkNoiseOff	Audio Pinknoise Off

To switch the audio signal OFF, press the STOP button on the front.

Without A/V board, the switching levels are as follows:

- DATA_LsRs and DATA_CL switch between low and high for pink noise. For sine, this is low.
- PCMDATA0, PCMLRCLK, PCMCLK and PCMSCLK switches between low and high for both pink noise and sine.
- SPDIF switches between LOW and HIGH

5.5 VIDEO

5.5.1 Video Output Check

Measure the DC voltages at all video-outputs at conn 1703 while the video signal is turned off: $1V \pm 10\%$
 Generate a color-bar via next software commands:

Ref. #	Command Name	Remark
23a	VideoColDencOn	Colourbar DENC ON
61a	VideoColOutRGB	RGB Colourbar
61b	VideoColOutYUV	YUV Colourbar
23b	VideoColDencOff	Colourbar DENC OFF

Check video output at the next testpoints:

Name	Testpoint	Waveform
R VID (V)	F795	Refer to Figure 5-14 5-20
G VID (Y)	F796	Refer to Figure 5-15
B VID (U)	F799	Refer to Figure 5-16 5-21
CVBS VID	F788	Refer to Figure 5-17
C VID	F791	Refer to Figure 5-18
Y VID	F792/F796	Refer to Figure 5-19

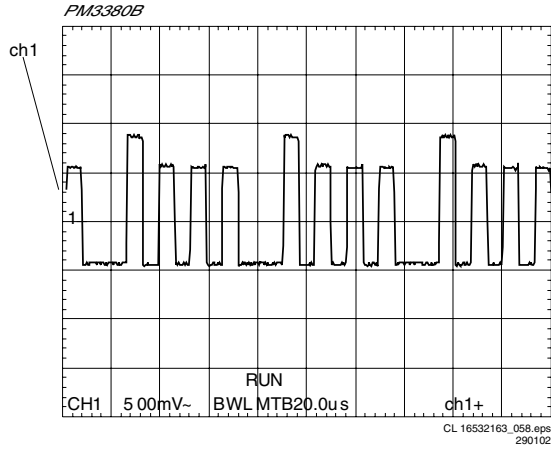


Figure 5-16 B VID (U) with video out at RGB

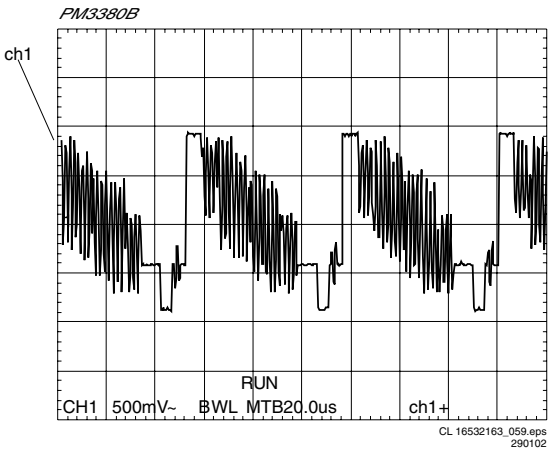


Figure 5-17 CVBS VID

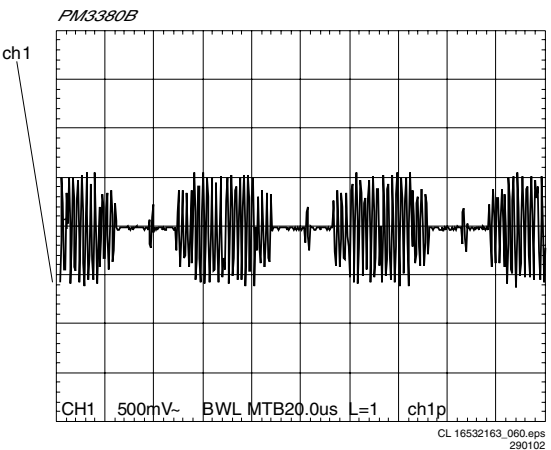


Figure 5-18 C VID

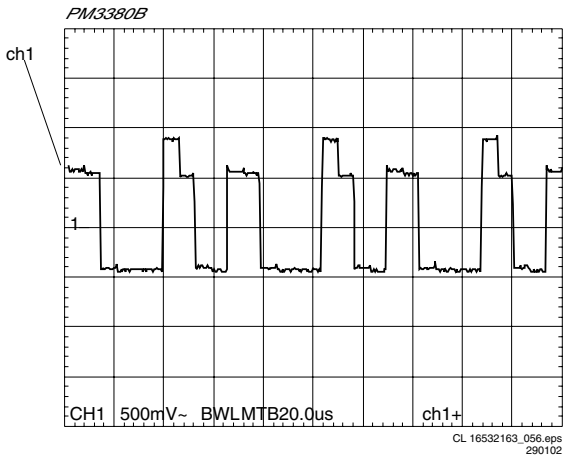


Figure 5-14 R VID (V) with video out at RGB

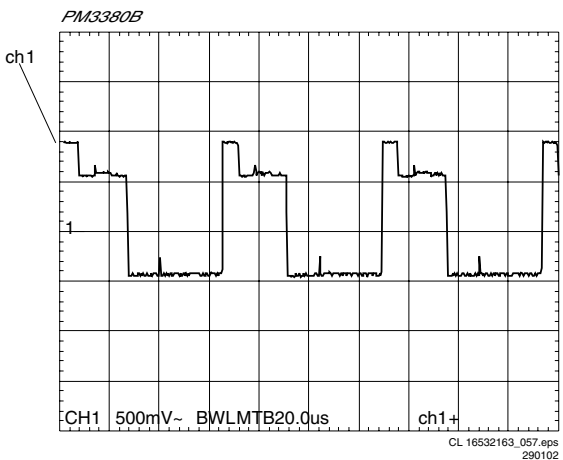


Figure 5-15 G VID (Y) with video out at RGB

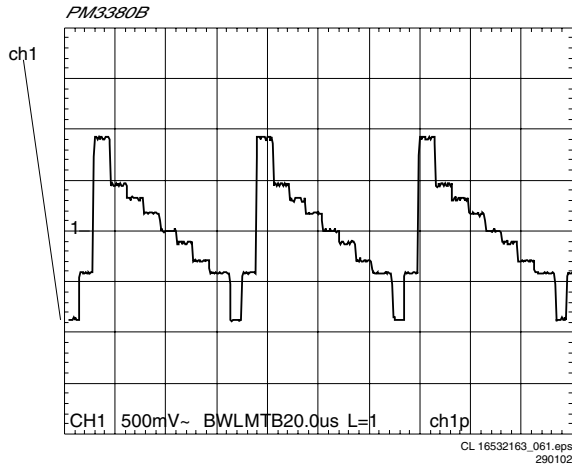


Figure 5-19 Y_VID

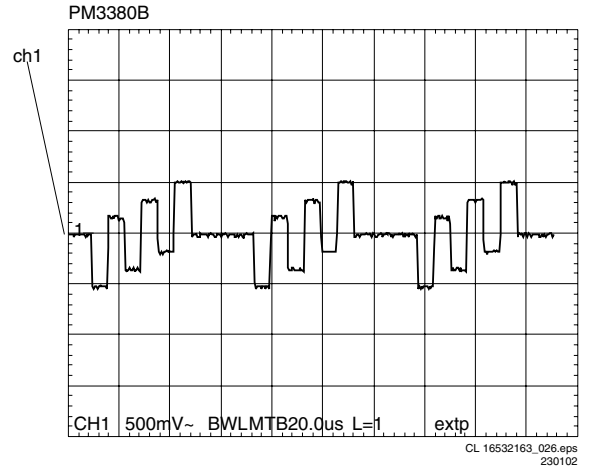


Figure 5-21 B_VID (U) with video out at YUV

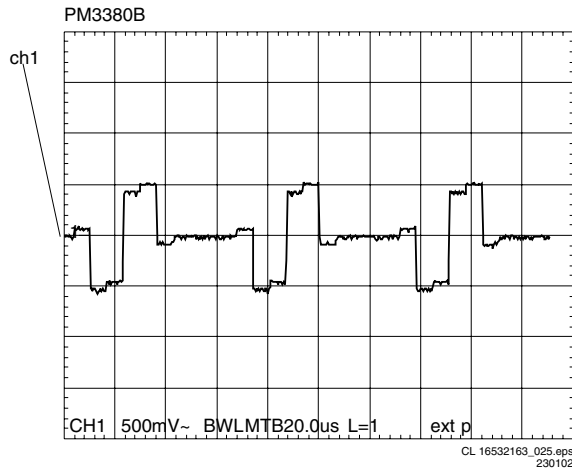


Figure 5-20 R_VID (V) with video out at YUV

5.5.2 Slow Blanking Scart

An additional part of the video-path is the scart function-switching test. The scart function-switching pin has three levels which depend on the level of the output ports SCART0 and SCART1. These latter two signals are driven by the output pins PIO3.6 and PIO3.7 of the STI55xx. Check the level of SCART0 and SCART1 with the following commands:

Table 5-17 Slow blanking scart

Ref. #	Command Name	Scart0 (PIO3.6)	Scart1 (PIO3.7)	Level on Pin 8 of scart
25a	VideoScartLo	1	1	0-2V
25b	VideoScartMi	0	1	4.5-7V
25c	VideoScartHi	0	0	9.5-12V

5.5.3 Video Hsync Check.

To measure the Video Hsync, the connector 1704 must be connected to the external video processing device such as high quality progressive scan codex and high quality Video DAC, else there will not be any waveform. To check for the Hsync, the following commands can be used:

Table 5-18 Video Hsync check

Ref. #	Command Name	Remark	Value	Waveform
23a	VideoColDencOn	ColourbarDENC ON	15.625 kHz 0.02% Vpeak-peak > 3V	Refer to Fig 5-22
61a	VideoColOutRGB	RGB Colourbar ON	15.625 kHz 0.02% Vpeak-peak > 3V	Refer to Fig 5-22
23b	VideoColDencOff	Colourbar DENC OFF	No measurements needed	

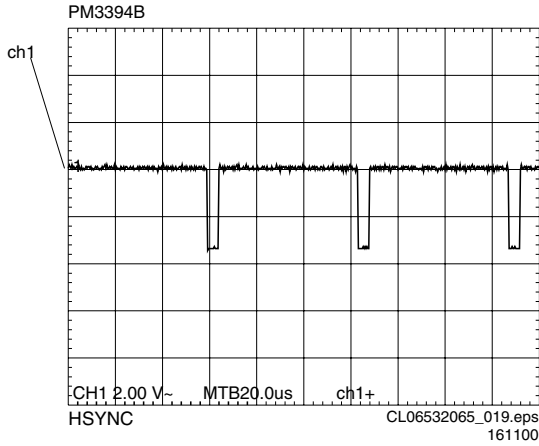


Figure 5-22 Video H Sync

Check Vref

Table 5-20 Vref check

Name	Testpoint	Value
Vref	F111	2.5V 0.3V

Play DVD test Disc and check I2S interface

Table 5-21 I2S interface check

Name	Testpoint	Value	Value
BE_BCLK	F200	6.0 MHz ± 0.1	Refer to Figure 5-23
BE_WCLK	F201	high	Refer to Figure 5-25
BE_DATA	F202	low	Refer to Figure 5-24
BE_FLAG	F203	low	No waveform
BE_V4	F255	low	No waveform
BE_SYNC	F256	low	No waveform

5.6 Servo

5.6.1 General Start-up Measurements:

Reset the Basic Engine part

Table 5-19 Reset basic engine part

Ref. #	Command Name	Remark
44	BeReset	Reset the Basic Engine

Check if the Servo Reset (RSTN) at testpoint F258 goes from low to high after executing BeReset commands.

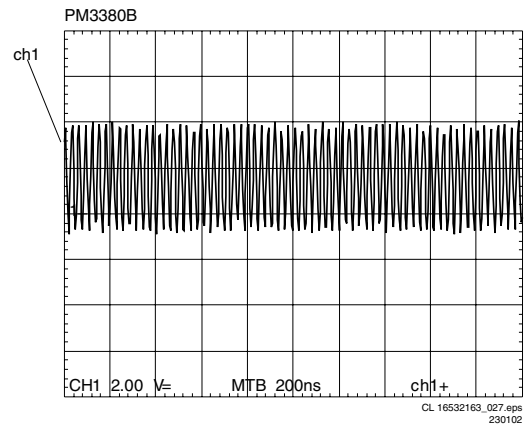


Figure 5-23 BE_BCLK

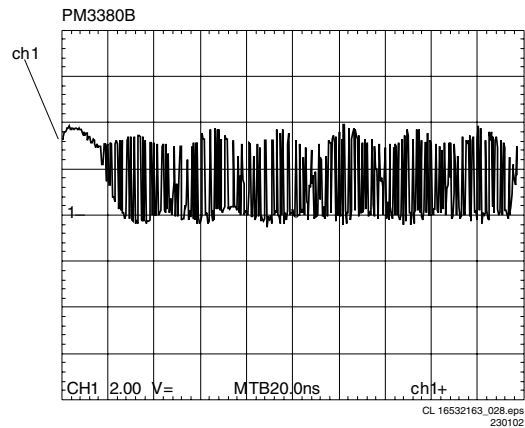


Figure 5-24 BE_DATA

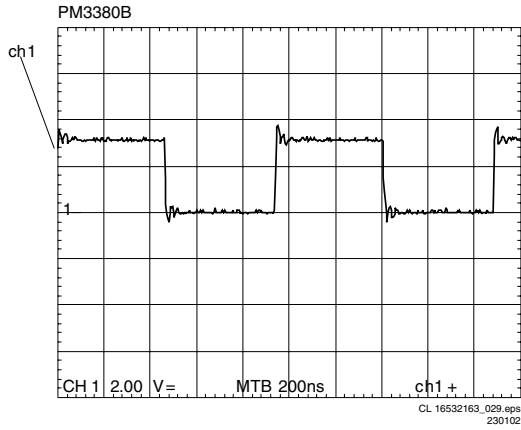


Figure 5-25 BE_WCLK

5.6.2 Spindle Motor:

Before switching on the discmotor, check the following testpoints:

Table 5-22 Spindle motor check

Name	Testpoint	Value
STDBY_MOTOR	F308	low
MOTO1	F350	1V5 0.3

Switch the Discmotor ON/OFF with the following commands:

Table 5-23 Disc motor switching

Ref. #	Command Name	Remark
39a	BeDiscmotorOn	Discmotor on
39b	BeDiscmotorOff	Discmotor off

Check the following signals with the discmotor switched ON and without DVD Disc inserted.

Table 5-24 Disc motor switching

Name	Testpoint	Frequency
STDBY_MOTOR	F308	high
MOTO1	I241	4Vpp ± 0.5V Refer to Figure 5-26
A3	F301	Refer to Figure 5-27
A2	F302	Refer to Figure 5-27
A1	F303	Refer to Figure 5-27
T1	F210	Refer to Figure 5-28
T2	F211	Refer to Figure 5-28
T3	F212	Refer to Figure 5-28
H1+	F306	Refer to Figure 5-29
H1-	F304	Refer to Figure 5-29
H2+	F309	Refer to Figure 5-29
H2-	F305	Refer to Figure 5-29
H3+	F311	Refer to Figure 5-29
H3-	F313	Refer to Figure 5-29

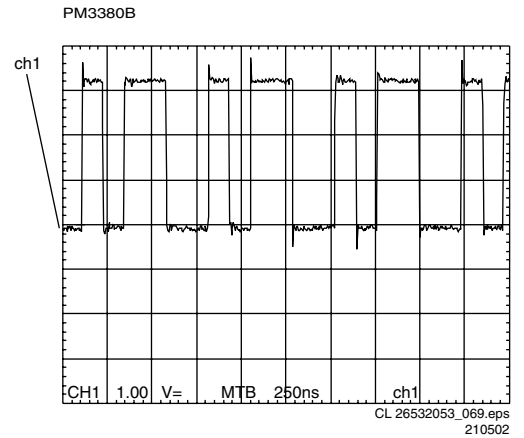


Figure 5-26 Motor 1

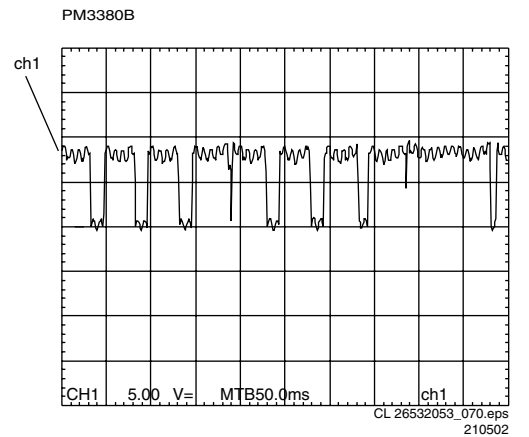


Figure 5-27 A1-A2-A3

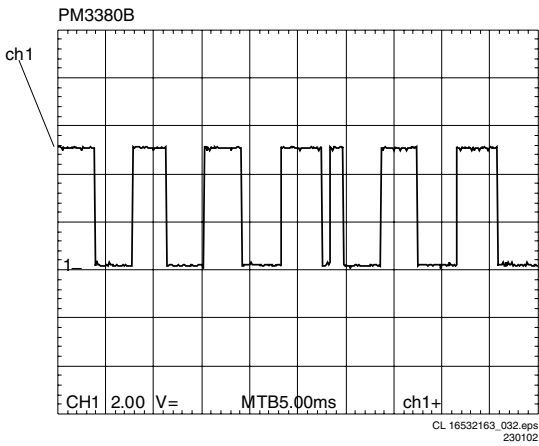


Figure 5-28 T1-T2-T3

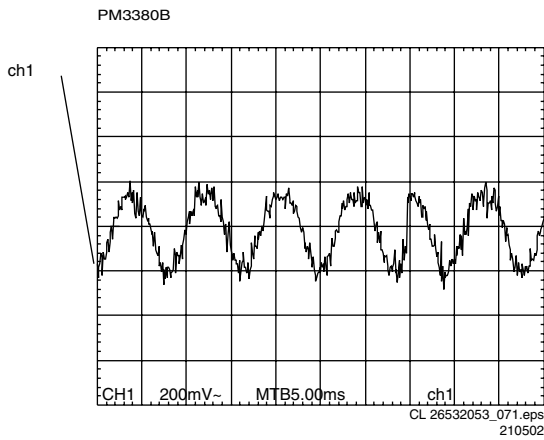


Figure 5-29 H1+ ; H1- ; H2+ ; H2- ; H3+ ; H3-

When measurement is completed, switch the discmotor OFF before executing next command

5.6.3 Radial

Radial ON will only work when the PCB is connected to a CDM and DVD Disc is inserted.

Switch the Radial control ON/OFF with the following commands:

Table 5-25 Radial

Ref. #	Command Name	Remark
40a	BeRadialOn	Radial control on
40b	BeRadialOff	Radial control off

Check the following signals before Radial control ON/OFF

Table 5-26 Radial

Name	Testpoint	Value (Radial ON)
Rad -	F132	4.3V 0.5V
Rad +	F133	4.3V 0.5V
RA	F218	Refer to Figure 5-30 and 5-31

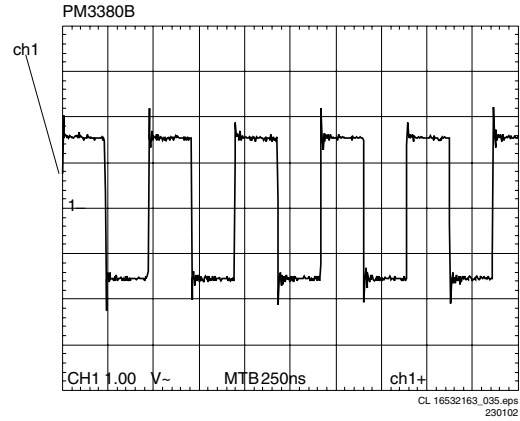


Figure 5-30 RA (BeRadialOff)

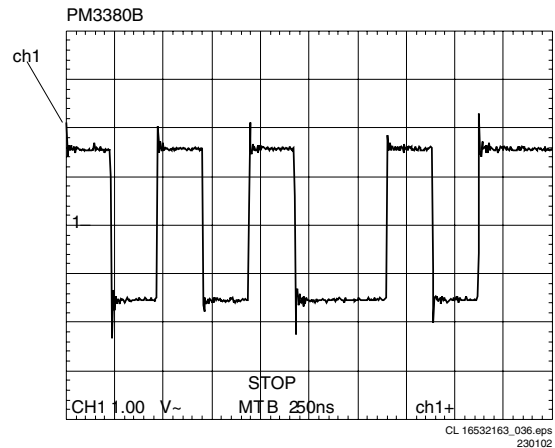


Figure 5-31 RA (BeRadialOn)

Visual check on the laser,when Radial control ON, if the laserlight is visible.

Once the check is completed,switch the Radial control OFF before executing next command

5.6.4 Sledge

Test need a DVD disc in the DVD player to operate properly. Use the following commands to move the sledge:

Table 5-27 Sledge

Ref. #	Command Name	Remark
41a	BeSledgeIn	Sledge inwards
41b	BeSledgeOut	Sledge outwards

Check for the waveform (Figure 5-32) of SL at testpoint F219

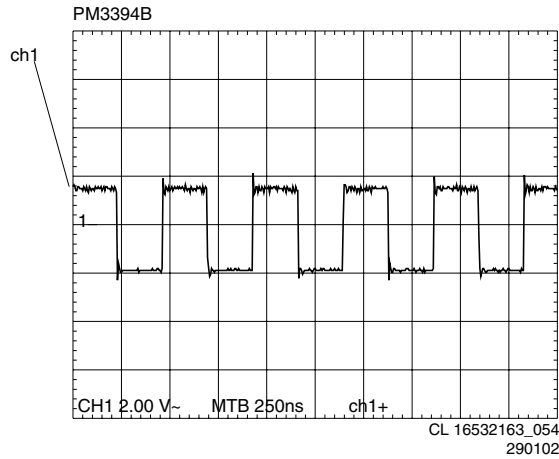


Figure 5-32 SL

Check DC vtg on the following testpoint when Sledge at Inward / Outward position

Table 5-28 DC vtg check

Name	Testpoint	Value
SL -	F327	4.5V 0.5V
SL +	F326	4.5V 0.5V

Measure peak to peak signal on SL- and SL+ while moving sledge outwards.

Signal will only appear momentary during command BeSledgeOut

Table 5-29

Name	Testpoint	Waveform
SL -	F327	Refer to Figure 5-33
SL +	F326	Refer to Figure 5-33

Measure input sledge control (sledge in HOME position)

Table 5-30 Input sledge control

Name	Testpoint	Value
SINPHI	F347	1.5V 0.5V
COSPHI	F346	1.5V 0.5V

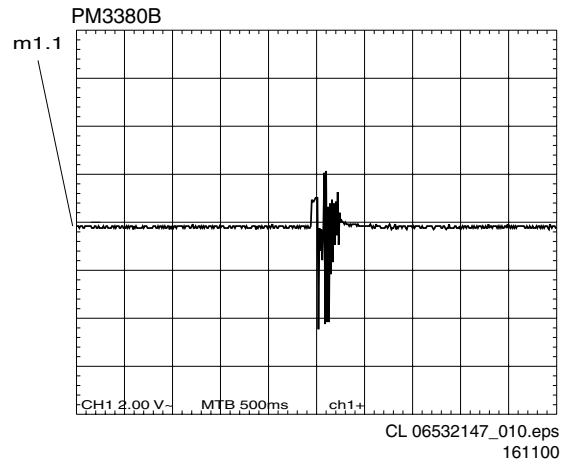


Figure 5-33 SL+ / SL- (SLEDGE OUTWARDS)

5.6.5 Tray:

To open and close the tray use the following commands:

Table 5-31 Tray

Ref. #	Command Name	Remark
43a	BeTrayIn	Tray in
43b	BeTrayOut	Tray out

Measure voltage at the driver outputs of the BA5938FM for the tray closed.

Table 5-32 Tray closes

Name	Testpoint	Value (Tray closed)
TRAY -	F340	4.3V 2.0V
TRAY +	F338	4.3V 2.0V

Measure voltage and waveform at driver outputs while the tray is opening.

Table 5-33 Tray opens

Name	Testpoint	Value (Tray opening)
TRAY -	F340	2.0V 1.0V
TRAY +	F338	6.0V 1.0V

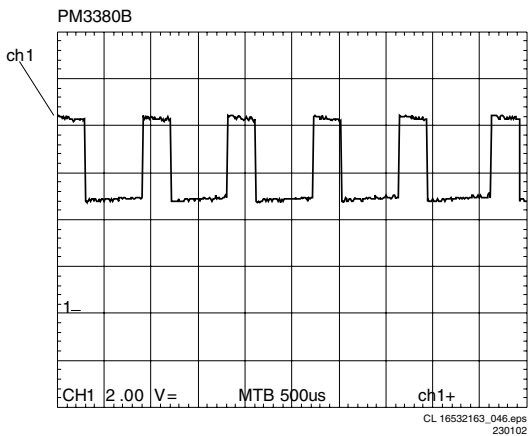


Figure 5-34 TRAY -

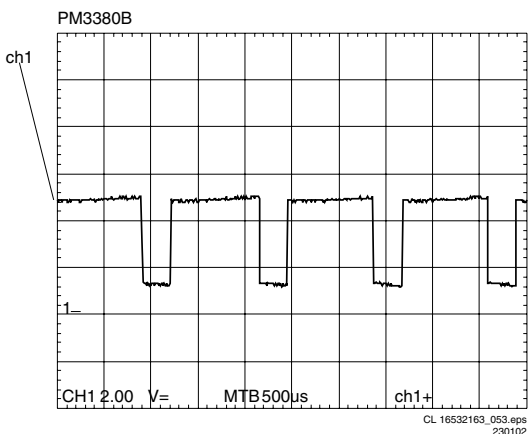


Figure 5-35 TRAY +

5.6.6 Focus

Test need a DVD disc in the DVD player to operate properly. To switch the Focus motor on/off, use the following commands:

Table 5-34 Focus motor switching

Ref. #	Command Name	Remark
38a	BeFocusOn	Focus on
38b	BefocusOff	Focus off

Measure the driver outputs of the BA5938FM for the Focus OFF.

Table 5-35 Focus motor switching

Name	Testpoint	Value (Focus OFF)
FOC -	F134	5V 0.5V
FOC +	F130	5V 0.5V
FO	F220	1.5V 0.3V

Switch the focus ON and measure again the driver outputs

Table 5-36 Focus motor switching

Name	Testpoint	Value	Waveform
FOC -	F134	1Vpp 0.2V	Refer to Figure 5-36
FOC +	F130	1Vpp 0.2V	Refer to Figure 5-36
FO	F220		Refer to Figure 5-37/38

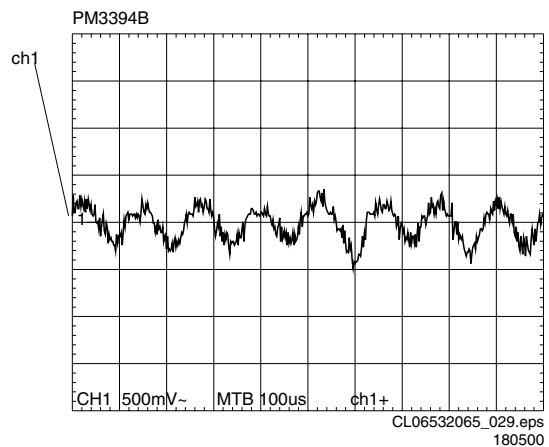


Figure 5-36 FOC+ (BefocusOn)

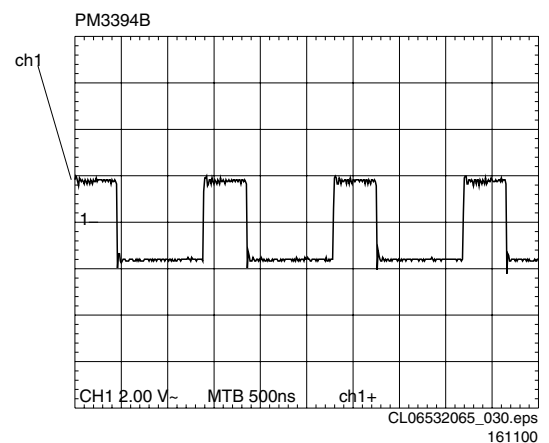


Figure 5-37 FO (BefocusOff)

Measure DVDALAS outputs

Table 5-38 DVDALAS outputs

Name	Testpoint	Value
OA	F104	1V 10%
OB	F107	1V 10%
OC	F108	1V 10%
OD	F110	1V 10%
S1	F113	1V 10%
S2	F112	1V 10%

At output HFN, the following waveform can be measured :
Refer to Figure 5-40

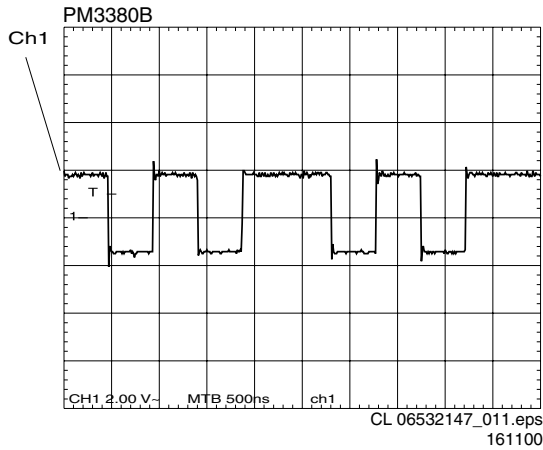


Figure 5-38 FO (BefocusOn)

Visual check on the laser,when Focus control ON, if the laserlight is visible.
Once the check is completed,switch the focus control OFF before executing next command.

5.6.7 Hf Path

Play DVD Test Disc.
Measure outputs of diodes Ax, B, C, D, E, F.

Table 5-37

Name	Testpoint	Value
Ax	F119	2.6V 0.2%
B	F127	2.6V 0.2%
C	F124	2.6V 0.2%
D	F122	2.6V 0.2%
E	F115	2.6V 0.2%
F	F117	2.6V 0.2%

At outputs of diodes A, B, C, D the following waveform can be measured: Refer to Figure 5-39

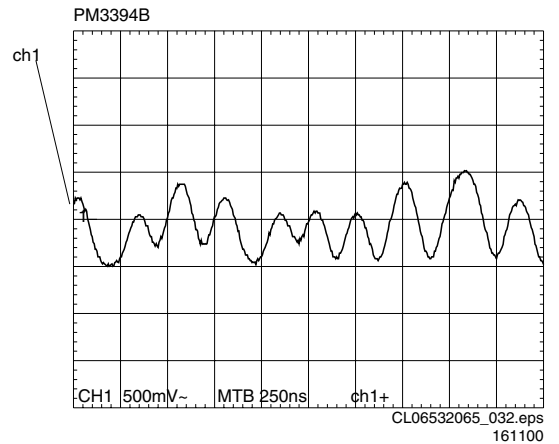


Figure 5-40 HFN / HFP

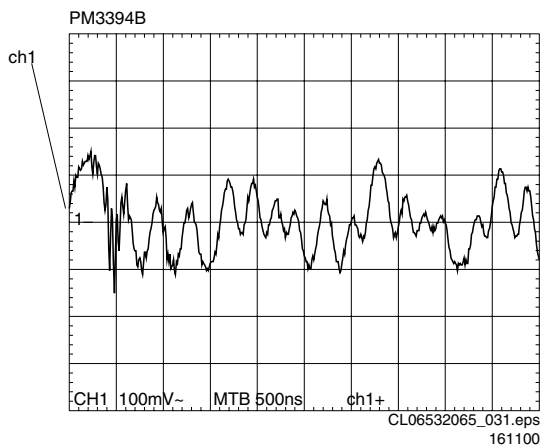


Figure 5-39 Output of diodes A,B,C,D

5.7 Diagnostic Software Description

5.7.1 Introduction

Purpose

This document describes all interfaces from the outside world to the diagnostic software, what is needed to use these interfaces and how to access them.

Scope

This document has been realised within the framework of the DVD video player.

5.7.2 Definitions and Abbreviations

Definitions

- Control PC Automatic test equipment, part of the production control system in the factory, to control the execution of Diagnostic Nuclei in the DVD player.
- Diagnostic Nucleus Part of the Diagnostic Software. Each nucleus contains an atomic and software independent diagnostic test, testing a functional part of the DVD player hardware on component level.
- Script Part of the Diagnostic Software. Each script contains a sequence of Diagnostic Nuclei to be executed.
- Service PC PC used by a service- or repair-person to communicate with the Diagnostic Software in the DVD player.

Abbreviations

- FDS Full Diagnostic Software

5.8 Overview of Interfaces

The table below shows an overview of the user interfaces of the Diagnostic Software. The table is based on logical interface, interfaces as seen from user perspective. A logical interface can use one or more physical interface components. The DVD has only a single RS232 port, implying that all interfaces using this port are mutually exclusive.

Table 5-39 Interface overview

Logical Interface	Description	Physical interface components
Menu Interface	Menu-driven activation of individual nuclei, used for Level 2/ Second Line diagnostic mode. Users are service or repair people	Service PC running a terminal emulation program, connected to the RS232 port of the DVD player Test pin
Command Line Interface	Used during Level 1 diagnostic mode. Used to send commands from the Control PC into the DVD hardware.	Control PC, running a control program (e.g. Asterix), connected to RS232 port of the DVD player Test pin
Script Interface	Used to execute Player Test Script (including reading the error log) and Dealer Test Script.	Local keyboard Local display
S2B interface	Used for S2B communication with the Basic Engine	Service PC, running a S2B monitor program, connected to the RS232 port of DVD player Test pin
Download Interface	Used to download diagnostic software into the DVD player	Service PC running a terminal emulation program, connected to the RS232 port of the DVD player Test pin

- In the next chapters the logical user interfaces are described in more detail including the exact use of the physical interface components.
- Front Panel Key Usage:**
Some of the nuclei used in the diagnostic software require user intervention through the front panel key.

5.9 Description of Interfaces

5.9.1 Menu Interface

The menu interface is part of the Level 2 / Second Line diagnostic mode. Via the menu interface it is possible to control the execution of the Diagnostic Nuclei.

Set-up Physical Interface Components

Hardware required:

- Service PC
- one free COM port on the Service PC
- special cable to connect DVD player to Service PC

The service PC must have a terminal emulation program (e.g. OS2 WarpTerminal or Procomm /Windows Hyperterminal) installed and must have a free COM port (e.g. COM1). Activate the terminal emulation program and check that the port settings for the free COM port are: 19200 bps, 8 data bits, no parity, 1 stop bit and no flow control. The free COM port must be connected via a special cable to the RS232 port of the DVD

player. This special cable will also connect the test pin, which is available on the connector, to ground (i.e. activate test pin).

Activation

Switch the player on and the following text will appear on the screen of the terminal (program):

```
DVdV4 Diagnostic Software version 5.03
(M)enu, (C)ommand or (S)2B interface ? [M]:@ m <enter>

SDRAM Interconnection test passed
Basic SDRAM test passed
Slave Processor: SLAVE2

Press ENTER to go to Main Menu
CC: >
CL 26532053_045.eps
130502
```

Figure 5-41

- The first line indicates that the Diagnostic software has been activated and contains the version number of the diagnostic; this is also an indication that the first basic nucleus (nucleus number 1) has been executed successfully.
- The second line is the prompt asking the user to choose the interface format. Enter 'M' to select Menu mode and the next three lines are the successful result of the two subsequent basic tests (nuclei 2, 4 and the detection of the display type used by the panel respectively).
- The third line indicates the results of the shared SDRAM interconnection test.
- The fourth line indicates the results of the shared SDRAM read/write test.
- The fifth line indicates what front panel processor was connected to the monoboard. It could be one of the following: SLAVE2, SLAVE3, SLAVE 4, or Not Detected.
- The last line is the prompt ('CC>'). Press 'ENTER' key and the main menu will appear. For the layout of the menus, see chapter 'Layout of Menu and Submenu'

To switch between interfaces, the DVD player needs to be switched off and on again.

Note: For player that has no Mechanical power switch, it can be turned on by connecting the power-cable.

Usage

To select, type the number of the chosen menu-item at the prompt. Each entry must be terminated with a 'RETURN'. Invalid selections will cause an error message by the Menu Handler

Example:

```
Select > 99
Invalid menu choice, number out of range ER @
Press RETURN to continue ... @
CL 16532163_038.eps
230102
```

Result and output of an activated (and terminated) nucleus will be sent back to the service terminal. **Example:**

```
Select > 3
1601 Data line X is not connected to the SDRAM ER @
Press RETURN to continue ... @
CL 16532163_039.eps
230102
```

After the user presses a key, the current menu is rebuilt on screen.

Pressing "RETURN" at the prompt without any further input at the terminal will always rebuild the main menu.

Termination

The menu interface is terminated by switching off the DVD player.

5.9.2 Command Line Interface

The command line interface is part of level 1 diagnostic mode. Via a command line interface the execution of Diagnostic Nuclei can be controlled.

Set-up Physical Interface Components

Hardware required:

- Control PC
- one free COM port on the Control PC
- special cable to connect DVD player to the Control PC

The control PC must use the following port settings for the used COM port: 19200 bps, 8 data bits, no parity, 1 stop bit and no flow control. The control PC is connected with a special cable to the RS232 port of the DVD player. Via the same connection the test pin will be connected to ground.

Activation

After power on the next text will sent to the control PC

```
DVDv4 Diagnostic Software version 5.03
(M)enu, (C)ommand, or (S)2B interface ? [M]:@ C <enter>

SDRAM Interconnection test passed
Basic SDRAM test passed
Front Panel Processor: SLAVE2

DD: >
```

CL 26532053_073.eps
220502

The first line indicates that the Diagnostic software has been activated and contains the version number; this is also an indication that the first basic nucleus (nucleus number 1) has been executed successfully. The second line lets the user choose the interface format. Enter 'C' to select Command Mode and the next three lines are the successful result of the two subsequent basic tests (nuclei 2, 4 and the detection of the display type used by the panel respectively). If not all these messages appear on the terminal screen, then the related nucleus found an error. The last line is the prompt ("DD>"). The diagnostic software is now ready to receive commands.

Note: For player that has no Mechanical power switch, it can be turned on by connecting the power-cable.

Usage

The commands that can be given are the numbers of the nuclei. A command must be terminated with a <RETURN> character from the control PC. When typing commands, the backspace key can be used to make corrections. In case of typing errors in the command, an error message is returned. **Example:**

```
DD: > CompSdarmWrR? (Nuclei name cannot be accepted)
0001 Unknown command ER @
DD: >
```

CL 16532163_041.eps
230102

If the command (the nucleus number) is recognised, the nucleus is executed. Result and output of an activated (and terminated) nucleus will be sent back to the control PC according to the standard layout.

Example for a command without error:

```
DD: > 16 (Execute CompSdramWrR nuclei)
1600 OK @
DD: >
```

CL 16532163_042.eps
230102

Example for a command with error:

```
DD: > 16
1601 Address line X not connected to the SDRAM @
DD: >
```

CL 16532163_043.eps
230102

Termination

The command line interface is terminated by switching off the DVD player.

5.9.3 S2B Interface**Set-up Physical Interface Components**

Hardware needed:

- Control PC
- one free COM port on the Control PC
- special cable to connect DVD player to Control PC
- S2B monitor tool running on the Control PC

Activation

To start the S2B interface, connect the RS232 cable to the Control PC in the correct manner. Then start the PC, start the monitor tool and start the DVD player; turn off the monitor tool, turn on S2B monitor tool. The S2B monitor tool now takes all communication.

The S2B interface is activated by sending the bit pattern 110x xxxx with the first character to the DVD player, when the user is asked to choose an interface type. The command handler will then activate the S2B pass-through nucleus. The character sent will be passed to this nucleus without loss.

Note: For player that has no Mechanical power switch, it can be turned on by connecting the power-cable.

Termination

To terminate S2B pass-through mode, switch off the DVD player.

5.10 Script Interfaces

This interface is used during execution of the Player Script and the Dealer Script to display output and error messages on the local display of the stand-alone DVD player.

The activation and the usage can refer to the respective stand-alone DVD player service manual

5.10.1 Layout of Menu and Submenu**Layout Of Menus And Submenus For The Service Terminal**

NOTE: a symbol "--" in the menu layouts indicates that that specific menu choice will invoke the display of a submenu. This symbol will also be used in the implementation of the menus (i.e. the "--" will also appear in the user interface).

Menus**MAIN MENU**

- 1 Audio...
- 2 Video...

- 3 Front Panel...
- 4 Basic Engine...
- 5 Processor Peripherals...
- 6 Error Log...
- 7 Furore...
- 8 Miscellaneous...

First Level Submenus

MAIN > AUDIO MENU

- 1 Mute...
- 2 Pink Noise...
- 3 Sine Wave...
- 4 Digital Ports...
- 5 Ext. DAC Board...

MAIN > VIDEO MENU

- 1 Colourbar...
- 2 Scart...
- 3 Digital Port...

MAIN > FRONT PANEL MENU

- 1 Slave Processor...
- 2 VFT Display [30a]
- 3 LCD Display [30b]
- 4 LCD BkLight [30c]
- 5 Keyboard [27]
- 6 LEDs [29]
- 7 Remote Control [28]
- 8 P50 Check [60]

MAIN > BASIC ENGINE MENU

- 1 Reset [44]
- 2 Version [37]
- 3 S2B...
- 4 Loader Mechanism...
- 5 Special Diagnostics...

MAIN > PROCESSOR PERIPHERALS MENU

- 1 Clock...
- 2 Flash...
- 3 NVRAM...
- 4 SDRAM Write/Read [16]

MAIN > ERROR LOG MENU

- 1 Read Last Errors [31]
- 2 Read Error Bits [32]
- 3 Reset Error Log [33]

MAIN > FURORE MENU

- 1 SDRAM Write/Read [63]
- 2 SDRAM Write/Read [64]
- 3 Chip Revision ID [65]
- 3 Set Output High [84a]
- 3 Set Output Low [84b]
- 3 Reset [83]

MAIN > MISCELLANEOUS MENU

- 1 Statistics Info...
- 2 Read DVD Application version [46]

Second Level Submenus

MAIN > AUDIO > MUTE MENU

- 1 Mute On [19a]
- 2 Mute Off [19b]

MAIN > AUDIO > PINK NOISE MENU

- 1 Pink Noise On [20a]
- 2 Pink Noise / Beep Tone Off [20b]
- 3 Beep Tone On [20c]

MAIN > AUDIO > SINE WAVE MENU

- 1 Audio Sine On [21a]
- 2 Audio Burst On [21b]

MAIN > AUDIO > DIGITAL PORTS MENU

- 1 LFE_SEL High [56a]
- 2 LFE_SEL Low [56b]

MAIN > AUDIO > EXT DAC BOARD MENU

- 1. DAC Reset [79]
- 2. I2C Test...
- 3. Clock...
- 4. Audio...
- 5. Low Power Standby...
- 6. DAC Mode...

MAIN > VIDEO > COLOURBAR MENU

- 1 Colourbar DENC On (PAL) [23a]
- 2 Colourbar DENC On (NTSC) [23c]
- 3 Colourbar DENC/MPEG Off [23b]
- 4 ProgressiveScan MPEG On [24a]
- 5 Enhanced YUV MPEG On [24b]
- 6 Set Video Out To RGB [61a]
- 7 Set Video Out To YUV [61b]

MAIN > VIDEO > SCART MENU

- 1 I2C Scart IC Check [54]
- 2 Scart To DVD [55a]
- 3 Scart Pass Through [55b]
- 4 Scart Pin 8 Low (0 to 2)V [25a]
- 5 Scart Pin 8 Mid (4.5 to 7)V [25b]
- 6 Scart Pin 8 Hi(9.5 to 12)V [25c]

MAIN > VIDEO > DIGITAL PORT MENU

- 1 Video Port Out 0xAA [17a]
- 2 Video Port Out 0x55 [17b]

MAIN > FRONT PANEL > SLAVE PROCESSOR MENU

- 1 Bus Comms Check [12]
- 2 S/W Version [26]

MAIN > BASIC ENGINE > S2B MENU

- 1 S2B Echo [13]
- 2 S2B Pass-Through [14]

MAIN > BASIC ENGINE > MECHANISM MENU

- 1 Disc Motor...
- 2 Laser...
- 3 Tray...
- 4 Focus...
- 5 Radial...
- 6 Sledge...
- 7 Grooves...

MAIN > BASIC ENGINE > SPECIAL DIAGNOSTICS MENU

- 1 Read FlashID [70]
- 2 ROM Checksum [71]
- 3 Scratch Detector Test [72]

MAIN > PROCESSOR PERIPHERALS > PCM CLOCK MENU

- 1 PCM_CLK In CDDA Mode (11.3MHz) [8a]
- 2 PCM_CLK In DVD Mode (12.3MHz) [8b]
- 3 PCM_CLK In DVD96kHz Mode (24.6MHz) [8c]

MAIN > PROCESSOR PERIPHERALS > FLASH MENU

- 1 Verify FLASH Checksum [6]
- 2 Show FLASH Checksum [62]

MAIN > PROCESSOR PERIPHERALS > NVRAM MENU

- 1 I2C NVRAM Acces [11]
- 2 NVRAM Config [34]
- 3 NVRAM Reset [35]

- 4 NVRAM Modify [36]
- 5 NVRAM Read/Wr Test [15]

MAIN > MISCELLANEOUS > STATISTICS INFO MENU

- 1 Total Nr Of Times Tray Open [47a]
- 2 Total Time Power On [47b]
- 3 Total Play-Time CDDA & VCD [47c]
- 4 Total Play-Time DVD [47d]

Third Level Submenus**MAIN > AUDIO > EXT DAC BOARD > I2C TEST MENU**

- 1. I2C Test [66a]
- 2. I2C Enable Pin On [66b]
- 3. I2C Enable Pin Off [66c]

MAIN > AUDIO > EXT DAC BOARD > CLOCK MENU

- 1. Clock Internal [67a]
- 2. Clock External [67b]
- 3. Clock Upsampling 192k (963 only) [82a]
- 4. Clock Upsampling 96k (963 only) [82b]
- 5. Clock Upsampling On (963 only) [82c]
- 6. Clock Upsampling Off (963 only) [82d]

MAIN > AUDIO > EXT DAC BOARD > AUDIO

- 1. Audio Pre-Mute On [68a]
- 2. Audio Pre-Mute Off [68b]
- 3. Audio Center On [69a]
- 4. Audio Center Off [69b]

**MAIN > AUDIO > EXT DAC BOARD > LOW POWER
STANDBY**

- 1. Low Power Standby On [81a]
- 2. Low Power Standby Off [81b]

MAIN > AUDIO > EXT DAC BOARD > DAC MODE MENU

- 1. DAC CDDA Mode [80a]
- 2. DAC DVD48 Mode [80b]
- 3. DAC DVD96 Mode [80c]
- 4. DAC DSD Mode [80d]

**MAIN > BASIC ENGINE > MECHANISM > DISC MOTOR
MENU**

- 1 Disc Motor On [39a]
- 2 Disc Motor Off [39b]

MAIN > BASIC ENGINE > MECHANISM > LASER MENU

- 1 CD Laser On [58a]
- 2 CD Laser Off [58b]
- 3 DVD Laser On [58c]
- 4 DVD Laser Off [58d]

MAIN > BASIC ENGINE > MECHANISM > TRAY MENU

- 1 Tray Open [43b]
- 2 Tray Close [43a]

MAIN > BASIC ENGINE > MECHANISM > FOCUS MENU

- 1 Focus On [38a] (load DVD first)
- 2 Focus Off [38b]

MAIN > BASIC ENGINE > MECHANISM > RADIAL MENU

- 1 Radial Control On [40a] (load DVD first)
- 2 Radial Control Off [40b]

MAIN > BASIC ENGINE > MECHANISM > SLEDGE MENU

- 1 Sledge Inwards [41a]
- 2 Sledge Outwards [41b]

**MAIN > BASIC ENGINE > MECHANISM > GROOVES (Uses
DVD) MENU**

- 1 Jump To Inside Grooves [42a]
- 2 Jump To Middle Grooves [42b]

- 3 Jump To Outside Grooves [42c]

Screen Layout With Menus

When menus are used, no specific screen layout can be given: menu information will not be in a special format, except for the layout as mentioned in the previous paragraphs.

A typical menu session can look as follows:

```

DVDv4 Diagnostic Software version 5.03

(M)enu, (C)ommand or (S)2B interface ? [M]:@ <enter>
SDRAM Interconnection test passed
Basic SDRAM test passed
Slave Processor: SLAVE2

Press ENTER to go to main menu
CC: > <enter>

MAIN MENU
1. Audio ...
2. Video ...
3. Front Panel ...
4. Basic Engine ...
5. Processor Peripherals ...
7. Future ...
8. Miscellaneous ...

Select > 4 <enter>

MAIN > BASIC ENGINE MENU
1. Reset [44]
2. Version [37]
3. S2B
4. Loader Mechanism ...
5. Special Diagnostics ...

Press Enter to go to Main Menu

Select > 5 <enter>

MAIN > BASIC ENGINE > SPECIAL DIAGNOSTIC MENU
1. Read flashID [70]
2. ROM checksum [71]
3. Scratch detector test [72]
Press Enter to go to Main Menu
CL 26532053_047.eps
240502

```

Figure 5-42

Depending on the height of the screen, the text will start scrolling off the top of the screen.

Layout Of Results Diagnostic Nuclei On Control/service Pc
Results returned from a Diagnostic Nucleus to the control/service PC will have a maximum length of 300 characters and are terminated by a CR character (included in the string length). The result has the following layout:

< number >< string > [OK | ER] @< CR >

The use of the "@" enables the Asterix system on the Control PC to parse the output string of each nucleus into a database.

< number > is a 4-digit decimal number padded with leading zeros if its value is less than 4 digits. The first two digits identify the generating nucleus (or group of nuclei), the latter two digits indicate the error number.

< string > is a text string containing information about the result of the Diagnostic Nucleus.

< number > and < string > are defined in [SDD_DN] in the output sections of each Nucleus.

Examples:

```

1. 0001 Unknown command ER @
2. 3100 OK @
3. 0901 Data line X is not connected to the DRAM ER @
4. Device ID: 0x01
   Manufac ID: 0xC2
   7000 OK @
CL 16532163_045.eps
230102

```

5.11 Diagnostic Nuclei

Each nucleus contains an atomic and independent diagnostic test, testing a functional part of the DVD player hardware on component level. Each Nucleus returns a result message to its caller. Some tests (e.g. generating a colour bar) can only return an "OK" result. Internal communication will be done via a uniform interface between the diagnostic Engine, Scripts and the Diagnostic Nuclei.

The diagnostic Engine can only operate if a certain (minimal) set of hardware is functioning properly. To test this set of hardware, a set of basic diagnostic nuclei is embedded in the DVD player. Each basic diagnostic nucleus will only test that part of the hardware which is required for execution of the diagnostic Engine, e.g. a RAM test will only test that part of RAM that is used by the diagnostic engine. After the Diagnostic Engine is operational it is possible to do a full RAM diagnostic. All basic diagnostic nuclei start with prefix 'Basic'.

In the overview each Diagnostic Nucleus consists of a reference number, a reference name and remarks. Reference number and name are coupled and one of them is enough for unique identification.

Table 5-40 Basic diagnostic nuclei

Ref. #	Reference Name	Remark
1	BasicSpAcc	Serial port Access test/ initialization
2a	BasicInterconDram	Data and address bus Interconnection (only for development)
2b	BasicInterconSdram	Data and address bus interconnection
3	BasicDramWrR	DRAM Write Read (only for development)
4	BasicSdramWrR	SDRAM Write Read

Table 5-41 Processor and peripherals

Ref. #	Reference Name	Remark
6	PapChksFl	Checksum FLASH
7a	PapUclkAclkCdda	uClock A_CLK in CD-DA mode
7b	PapUclkAclkDvd	uClock A_CLK in DVD mode
7c	PapUclkAclkDvd96	uClock A_CLK in DVD (96kHz) mode
10	PapFlashWrAcc	FLASH Write Access (only for development)
11	PapI2cNvram	I2C NVRAM access
12	PapI2cDisp	I2C Display PWB
13	PapS2bEcho	S2B Echo
14	PapS2bPass	S2B Pass-through
15	PapNvramWrR	NVRAM Write Read
62	PapChksSum	Show checksums stored in flash

Table 5-42 Components

Ref. #	Reference Name	Remark
16	CompSdramWrR	SDRAM Write Read

Table 5-43 Audio

Ref. #	Reference Name	Remark
19a	AudioMuteOn	Audio Mute On
19b	AudioMuteOff	Audio Mute Off
20a	AudioPinkNoiseOn	Audio Pinknoise On
20b	AudioPinkNoiseOff	Audio Pinknoise (or beep tone) Off
20c	AudioBeepToneOn	Audio Beep Tone On
21a	AudioSineOn	Audio Sine signal On/Off
21b	AudioSineBurst	Audio Sine signal Burst
56a	AudioLfePortHigh	Set the LFE_SEL port to HIGH
56b	AudioLfePortLow	Set the LFE_SEL port to LOW
65	DAC_I2C	Resets DAC and check I2C communication with DAC
66a	DAC_I2CEnable	Enable I2C communication to AV board
66b	DAC_I2CDisable	Disable I2C communication to AV board
67a	DAC_ClockInternal	Uses internal clock from monoboard for DAC (256fs)
67b	DAC_ClockExternal	Uses external clock for DAC (384fs)

Ref. #	Reference Name	Remark
68a	DAC_AudioPreMuteOn	Enable Audio Pre-mute pin
68b	DAC_AudioPreMuteOff	Disable Audio Pre-mute pin
69a	DAC_CenterOn	Enable Center on pin
69b	DAC_CenterOff	Disable Center on pin
79	DAC_Reset	Resets DAC
80a	DAC_ModeCDDA	Sets DAC to CDDA mode
80b	DAC_ModeDVD48	Sets DAC to DVD mode (48kHz)
80c	DAC_ModeDVD96	Sets DAC to DVD mode (96kHz)
80d	DAC_ModeDSD	Sets DAC to DSD mode
81a	DAC_LowPowerStandbyOn	Enable Low Power Standby
81b	DAC_LowPowerStandbyOff	Disable Low Power Standby
82a	DAC_UpsamplingFreq192k	Sets Upsampling frequency to 192kHz
82b	DAC_UpsamplingFreq96k	Sets Upsampling frequency to 96kHz
82c	DAC_UpsamplingOn	Enable upsampling
82d	DAC_UpsamplingOff	Disable upsampling

Table 5-44 Video

Ref. #	Reference Name	Remark
17a	VidPortOutAA	Output the value 0XAA at the Digital Video Interface Port
17b	VidPortOut55	Output the value 0X55 at the Digital Video Interface Port
23a	VideoColDencOnPAL	Colourbar (PAL) DENC On
23b	VideoColDencOff	Colourbar DENC Off
23c	VideoColDencOnNTSC	Colourbar (NTSC) DENC On
24a	VideoProgMPEGon	Progressive - DigitalVideo Colour Bar ON
24b	VideoYuvMPEGon	Enhanced YUV-DigitalVideo Colour Bar
25a	VideoScartLo	Scart Low
25b	VideoScartMi	Scart Medium
25c	VideoScartHi	Scart High
54	VideoScartSwComm	Scart Switch communication
55a	VideoScartSwDvd	Scart Switch Dvd
55b	VideoScartSwPass	Scart Switch Pass-through
57a	VideoScartPinLo	PIO-pins as used in 2A for Scart-switching
57b	VideoScartPinMi	PIO-pins as used in 2A for Scart-switching
57c	VideoScartPinHi	PIO-pins as used in 2A for Scart-switching
61a	VideoColOutRGB (ST5508)	Output RGB from ST5508
61b	VideoColOutYUV (ST5508)	Output YUV from ST5508

Ref. #	Reference Name	Remark
46	MiscApplVer	Read version of application software
47a	MiscTrayOpenNr	Read the number of times the tray opened
47b	MiscPowerOnTime	Read the total time the player's power has been on
47c	MiscPlayTimeCddaVcd	Read the Playtime of CDDA and VCD discs
47d	MiscPlayTimeDvd	Read the Playtime of DVD discs

Table 5-45 Display (slave processor)

Ref. #	Reference Name	Remark
26	DispVer	Version number
27	DispKeyb	Keyboard
28	DispRc	Remote Control
29	DispLed	LEDs
30a	DispDisplay	VFT Display test
30b	DispLCDisplay	LCD Display test
30c	DispLCDBkLight	LCD Backlight test
60	DispP50	P50 loopback test

Table 5-46 Log (Error logging in Nvram)

Ref. #	Reference Name	Remark
31	LogReadErr	Read last Errors
32	LogReadBits	Read errors Bits
33	LogReset	Reset

Table 5-47 Miscellaneous

Ref. #	Reference Name	Remark
34	MiscReadConfig	Read Configuration area from NVRAM
35	MiscNvramReset	NVRAM Reset
36	MiscNvramMod	Modify NVRAM contents

Table 5-48 Basic engine

Ref. #	Reference Name	Remark
37	BeVer	Version number
38a	BeFocusOn	Focus On
38b	BeFocusOff	Focus Off
39a	BeDiscmotorOn	Discmotor On
39b	BeDiscmotorOff	Discmotor Off
40a	BeRadialOn	Radial control On
40b	BeRadialOff	Radial control Off
41a	BeSledgeIn	Sledge Inwards
41b	BeSledgeOut	Sledge Outwards
42a	BeGroovesIn	jump Grooves to Inside
42b	BeGroovesMid	jump Grooves to Middle
42c	BeGroovesOut	jump Grooves to Outside
43a	BeTrayIn	Tray In
43b	BeTrayOut	Tray Out
44	BeReset	Reset Basic Engine
58a	LaserCdOn	CD Laser on
58b	LaserCdOff	CD Laser off
58c	LaserDvdOn	DVD Laser on
58d	LaserDvdOff	DVD Laser off
70	BedReadFlashID	Read flash memory manufacturer and device ID
71	BedCalcRomChecksum	Calculate ROM checksum
72	BedScratchTest	Test scratch detection circuit

Table 5-49 Furore IC

Ref. #	Reference Name	Remark
62	Furore_SdramWrR	Furore SDRAM Write Read test
63	Furore_SdramWrR Fast	Furore SDRAM interconnection test
64	Furore_Id	Furore version ID check
83	Furore_Reset	Furore reset
84a	Furore_High	Sets Furore output pins DSD_PCM0-9 to high
84b	Furore_Low	Sets Furore output pins DSD_PCM0-9 to low

Table 5-50 Karaoke (not available)

Ref. #	Reference Name	Remark
48a	KaraokeModeOff	Switch Karaoke mode off
48b	KaraokeModeOn	Switch Karaoke mode on
49	KaraokeMicInput	Check path from the microphone input to audio output
50a	KaraokeKeyOn	Set Karaoke Key to the maximum level (1200 cent)
50b	KaraokeKeyOff	Set Karaoke Key to flat octave (0 cent)
51a	KaraokeEchoOn	Set Echo Control function on
51b	KaraokeEchoOff	Set Echo Control function off

5.12.1 Audio Nuclei

Error code	Error text
1880	Test successful
1800	Test successful
1900	Test successful
1920	Test successful
2000	Test successful
2020	Test successful
2100	Test successful
5600	Test successful
5620	Test successful
7900	"Checksums = 0xA1, 0xB1, 0xC1, 0xD1"
7901	"DAC I2C bus busy"
7902	"DAC I2C expander "
8000	"Test successful"
8001	"DAC mode CDDA I2C bus busy before start"
8002	"DAC mode CDDA I2C connection failed"
8020	"Test successful"
8021	"DAC mode DVD48 I2C bus busy before start"
8022	"DAC mode DVD48 I2C connection failed"
8040	"Test successful"
8041	"DAC mode DVD96 I2C bus busy before start"
8042	"DAC mode DVD96 I2C connection failed"
8060	"Test successful"
8061	"DAC mode DSD I2C bus busy before start"
8062	"DAC mode DSD I2C connection failed"
8100	"Test successful"
8101	"Low Power Standby On I2C bus busy"
8102	"Low Power Standby On I2C connection failed"
8120	"Test successful"
8121	"Low Power Standby Off I2C bus busy"
8122	"Low Power Standby Off I2C connection failed"
8200	"Test successful"
8201	"DAC Upsample 192k I2C bus busy"
8202	"DAC Upsample 192k I2C connection failed"
8220	"Test successful"
8221	"DAC Upsample 96k I2C bus busy"
8222	"DAC Upsample 96k I2C connection failed"
8200	"Test successful"
8201	"DAC UpSample On bus busy"
8202	"DAC UpSample On I2C connection failed"
8200	"Test successful"
8201	"DAC UpSample Off bus busy"
8202	"DAC UpSample Off I2C connection failed"

5.12 Nuclei Error Codes

In the following tables the error description of the error codes will be described.

5.12.2 Basic Engine Nuclei

Error code	Error text
3900	Test successful
3901	"Parity error from Basic Engine to Serial"
3902	"Unexpected response from Basic Engine"
3903	"Communication time-out error"
3904	"Basic Engine returned error number 0xXX"
3921	"Parity error from Basic Engine to Serial"
3922	"Unexpected response from Basic Engine"
3923	"Communication time-out error"
3924	"Basic Engine returned error number 0xXX"
3800	Test successful
3801	"Parity error from Basic Engine to Serial"
3802	"Unexpected response from Basic Engine"
3803	"Communication time-out error"
3804	"Basic Engine returned error number 0xXX"
3805	"Focus loop could not be closed"
3820	Test successful
3821	"Parity error from Basic Engine to Serial"
3822	"Unexpected response from Basic Engine"
3823	"Communication time-out error"
3824	"Basic Engine returned error number 0xXX"
4200	Test successful
4201	"Parity error from Basic Engine to Serial"
4202	"Unexpected response from Basic Engine"
4203	"Communication time-out error"
4204	"Basic Engine returned error number 0xXX"
4205	"Sledge could not be moved to home position"
4206	"Focus loop could not be closed"
4207	"Motor not on speed within time-out"
4208	"Radial loop could not be closed"
4209	"PLL could not lock in accessing or tracking state"
4210	"Subcode or sector information could not be read"
4211	"Requested subcode item could not be found"
4212	"TOC could not be read in time"
4213	"Seek could not be performed"
4220	Test successful
4221	"Parity error from Basic Engine to Serial"
4222	"Unexpected response from Basic Engine"
4223	"Communication time-out error"
4224	"Basic Engine returned error number 0xXX"
4225	"Sledge could not be moved to home position"
4226	"Focus loop could not be closed"
4227	"Motor not on speed within time-out"
4228	"Radial loop could not be closed"
4229	"PLL could not lock in accessing or tracking state"
4230	"Subcode or sector information could not be read"
4231	"Requested subcode item could not be found"
4232	"TOC could not be read in time"
4233	"Seek could not be performed"
4240	Test successful
4241	"Parity error from Basic Engine to Serial"

Error code	Error text
4242	"Unexpected response from Basic Engine"
4243	"Communication time-out error"
4244	"Basic Engine returned error number 0xXX"
4245	"Sledge could not be moved to home position"
4246	"Focus loop could not be closed"
4247	"Motor not on speed within time-out"
4248	"Radial loop could not be closed"
4249	"PLL could not lock in accessing or tracking state"
4250	"Subcode or sector information could not be read"
4251	"Requested subcode item could not be found"
4252	"TOC could not be read in time"
4253	"Seek could not be performed"
4000	Test successful
4001	"Parity error from Basic Engine to Serial"
4002	"Unexpected response from Basic Engine"
4003	"Communication time-out error"
4004	"Basic Engine returned error number 0xXX"
4005	"Radial loop could not be closed"
4020	Test successful
4021	"Parity error from Basic Engine to Serial"
4022	"Unexpected response from Basic Engine"
4023	"Communication time-out error"
4024	"Basic Engine returned error number 0xXX"
4400	Test successful
4401	Test successful
4100	Test successful
4101	"Parity error from Basic Engine to Serial"
4102	"Unexpected response from Basic Engine"
4103	"Communication time-out error"
4104	"Basic Engine returned error number XX"
4120	Test successful
4121	"Parity error from Basic Engine to Serial"
4122	"Unexpected response from Basic Engine"
4123	"Communication time-out error"
4124	"Basic Engine returned error number XX"
4300	Test successful
4301	"Parity error from Basic Engine to Serial"
4302	"Unexpected response from Basic Engine"
4303	"Communication time-out error"
4304	"Basic Engine returned error number 0xXX"
4320	Test successful
4321	"Parity error from Basic Engine to Serial"
4322	"Unexpected response from Basic Engine"
4323	"Communication time-out error"
4324	"Basic Engine returned error number 0xXX"
3700	"Version: X.Y.Z"
3701	"Parity error from Basic Engine to Serial"
3702	"Unexpected response from Basic Engine"
3703	"Communication time-out error"
3704	"Basic Engine returned error number 0xXX"
5800	Test successful

Error code	Error text
5820	Test successful
5840	Test successful
5860	Test successful
5801	"Unexpected response from Basic Engine"
7000	"Manuf. ID: <XX>" "Device ID: <YY>"
7001	"Comm Test Failed"
7002	"Load Cmd Failed"
7003	"Load Dat Failed"
7004	"Run Cmd Failed"
7100	"ROM Checksum: XXXX"
7101	"Comm Test Failed"
7102	"Load Cmd Failed"
7103	"Load Dat Failed"
7104	"Run Cmd Failed"
7201	"Comm Test Failed"
7200	"Test successful"
7202	"Load Cmd Failed"
7203	"Load Dat Failed"
7204	"Run Cmd Failed"
7205	"Scratch circuit not OK"

5.12.3 Display PWB Nuclei

Error code	Error text
3000	"Test successful"
3001	"Disp not responding"
3002	"Disp key no response"
3003	"One or more patterns not correct"
3004	"Disp type invalid"
3020	"Test successful"
3021	"Disp not responding"
3022	"Disp key no response"
3023	"One or more patterns not correct"
3040	"Test successful"
3041	"Disp not responding"
3042	"Disp key no response"
3043	"One or more patterns not correct"
2700	"Model name in wich the test is running"
2701	"Disp key no response"
2702	"Disp not responding"
2707	"Stop key not pressed"
2708	"Pause key not pressed"
2709	"Play key not pressed"
2710	"Open/close key not pressed"
2713	"Previous key not pressed"
2714	"Next key not pressed"
2715	"More than one key not pressed"
2716	" Audio key not pressed"
2900	"Test successful"
2901	"Slave not responding"
2902	"Slave keyboard not responding"
2903	"Standby led not working"
2800	"Test successful"
2801	"Slave display controller not responding"
2802	"Slave keyboard not responding"
2803	"No key press received from remote control"

Error code	Error text
2600	"The ROM version of the slave processor = 0xXX, and the internal ID = 0xYY"
2601	"I2c bus busy"
2602	"I2c bus not working"
6000	P50 test
6001	"No readback on P50"
6002	"Disp not responding "
6003	"P50 readback error"

5.12.4 Processor & Peripherals Nuclei

Error code	Error text
700	Test successful
720	Test successful
740	Test successful
600	"All checksums are correct"
601	"Following checksum is faulty: BootCode1 Checksum is 0xY2 and is not correct (must be 0xZ2)"
601	"This test is not available when stand-alone compiled"
6200	"Checksums = 0xA1, 0xB1, 0xC1, 0xD1"
6201	"This test is not available when stand-alone compiled"
1000	Test successful
1001	Test successful
1020	Test successful
1021	Test successful
1100	Test successful
1104	"NVRAM reply time-out"
1200	Test successful
1202	"Slave bus not working"
1203	"Slave controller not responding"
1204	"Slave response is not correct"
5900	Test successful
5901	"I2c bus busy"
5902	"I2c bus not working"
5904	"DTS chip response not correct"
1300	Test successful
1301	"Parity error from basic engine to serial"
1302	"Parity error from serial to basic engine"
1303	"No communication between serial and basic engine"
1304	"Communication time-out error"
1600	Test successful
1601	"The DVD SDRAM is faulty"

5.12.5 Log Nuclei

Error code	Error text
3100	"Show error log"
3101	"Error log is invalid"
3102	"Error log could not be read from NVRAM"
3103	"I2C bus busy before start"
3200	"Show error bit"
3201	"Error log is invalid"
3202	"I2C bus busy before start"
3203	"Error log could not be read from NVRAM"
3300	"Error log is cleared"
3301	"Error log could not be cleared"
3302	"I2C bus busy before start"

5.12.6 Miscellaneous Nuclei

Error code	Error text
3400	Test successful
3401	"The configuration data could not be read from NVRAM"
3402	"I2C bus busy before start"
3500	"NVRAM is cleared"
3501	"The NVRAM could not be reset."
3502	"I2C bus busy before start"
3600	"NVRAM contents updated."
	"NVRAM contents and configuration checksum updated."
3601	"NVRAM contents could not be updated."
3602	"I2C bus busy before start"
3603	"NVRAM contents could not be read"
3604	"NVRAM not accessible."
3605	"NVRAM checksum could not be updated."
1500	Test successful
1502	"NVRAM access time-out"
1504	"NVRAM fails"
5400	Test successful
5401	"I2c bus busy"
5402	"I2c bus not working"
5403	"Scart switch controller not responding"
5404	"Scart switch controller response not correct"
5500	Test successful
5501	"I2c bus busy"
5502	"I2c bus not working"
5520	Test successful
5521	"I2c bus busy"
5522	"I2c bus not working"
5523	"Scart switch controller not responding"
5200	Test successful
5201	"I2c bus busy"
5202	"I2c bus not working"
5300	Test successful

Error code	Error text
5301	"I2c bus busy"
5302	"I2c bus not working"
5320	Test successful
5321	"I2c bus busy"
5322	"I2c bus not working"
4700	"Number of times Tray went Open : XX"
4701	The total number of times tray went open could not be read from NVRAM.
4702	I2C bus busy before start
4720	"Total Power On time (minutes) : XX"
4721	The total power-on time could not be read from NVRAM.
4722	I2C bus busy before start
4740	"Total CDDA & VCD disks Play-time (minutes) : XX"
4741	The playtime of CDDA & VCD disks could not be read from NVRAM.
4742	I2C bus busy before start
4760	"Total DVD disks Play-time (minutes) : XX"
4761	The playtime of DVD disks could not be read from NVRAM.
4762	I2C bus busy before start
4600	"Version of Application Software : XX"
4601	"The application version could not be read from NVRAM."
4602	"I2C bus busy before start"

5.12.7 Video Nuclei

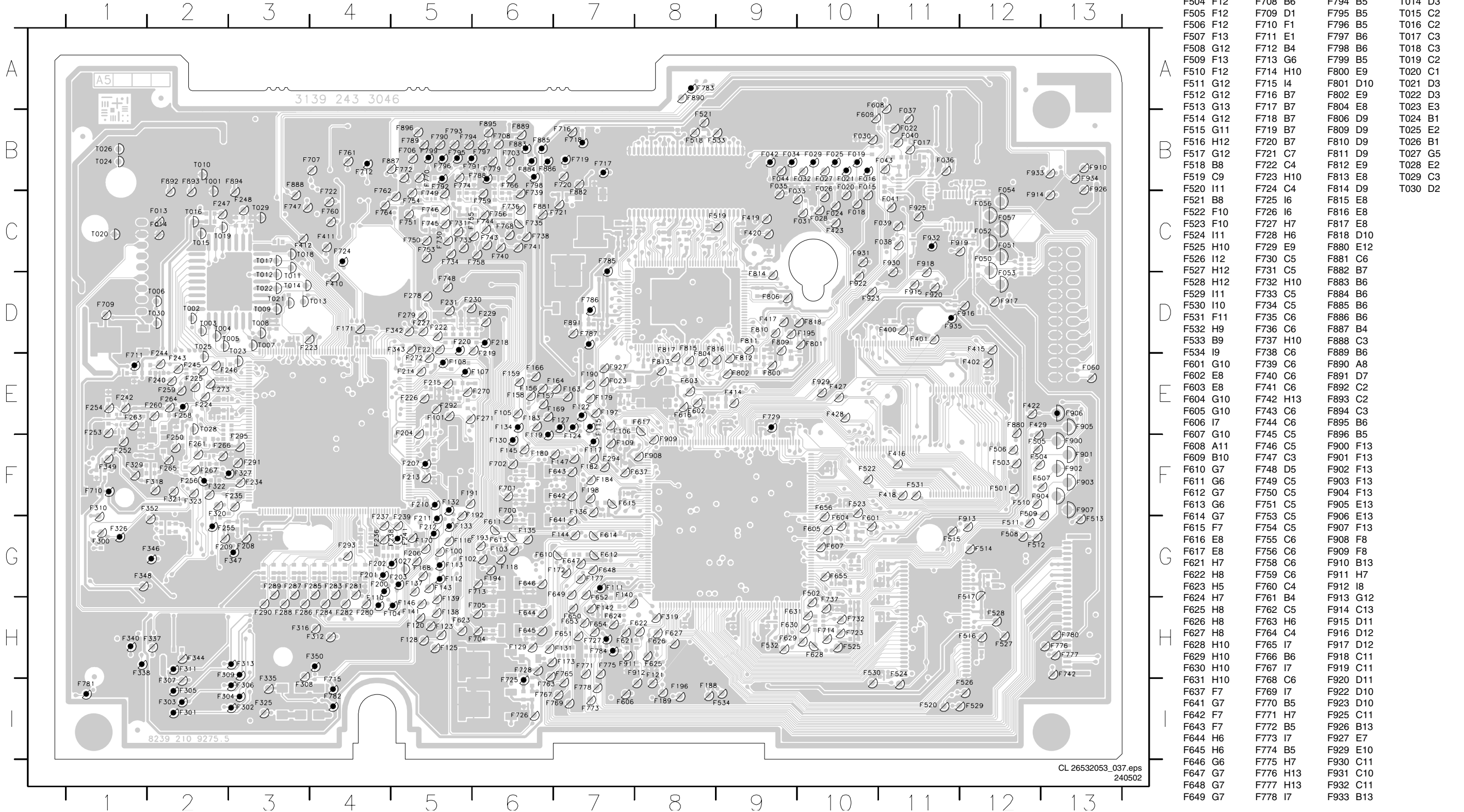
Error code	Error text
2300	Test successful
2320	Test successful
2340	Test successful
2400	Test successful
2401	"I2c bus busy"
2421	"I2c bus busy"
2441	"I2c bus busy"
2500	Test successful
2501	"I2c bus busy"
2502	"I2c bus not working"
2520	Test successful
2521	"I2c bus busy"
2522	"I2c bus not working"
2540	Test successful
2541	"I2c bus busy"
2542	"I2c bus not working"
6100	Test successful
6100	Test successful

5.12.8 Furore Nuclei

Error code	Error text
8300	"Test successful"
8301	"Invalid Version ID read. "
8400	"Test successful"
8420	"Test successful"

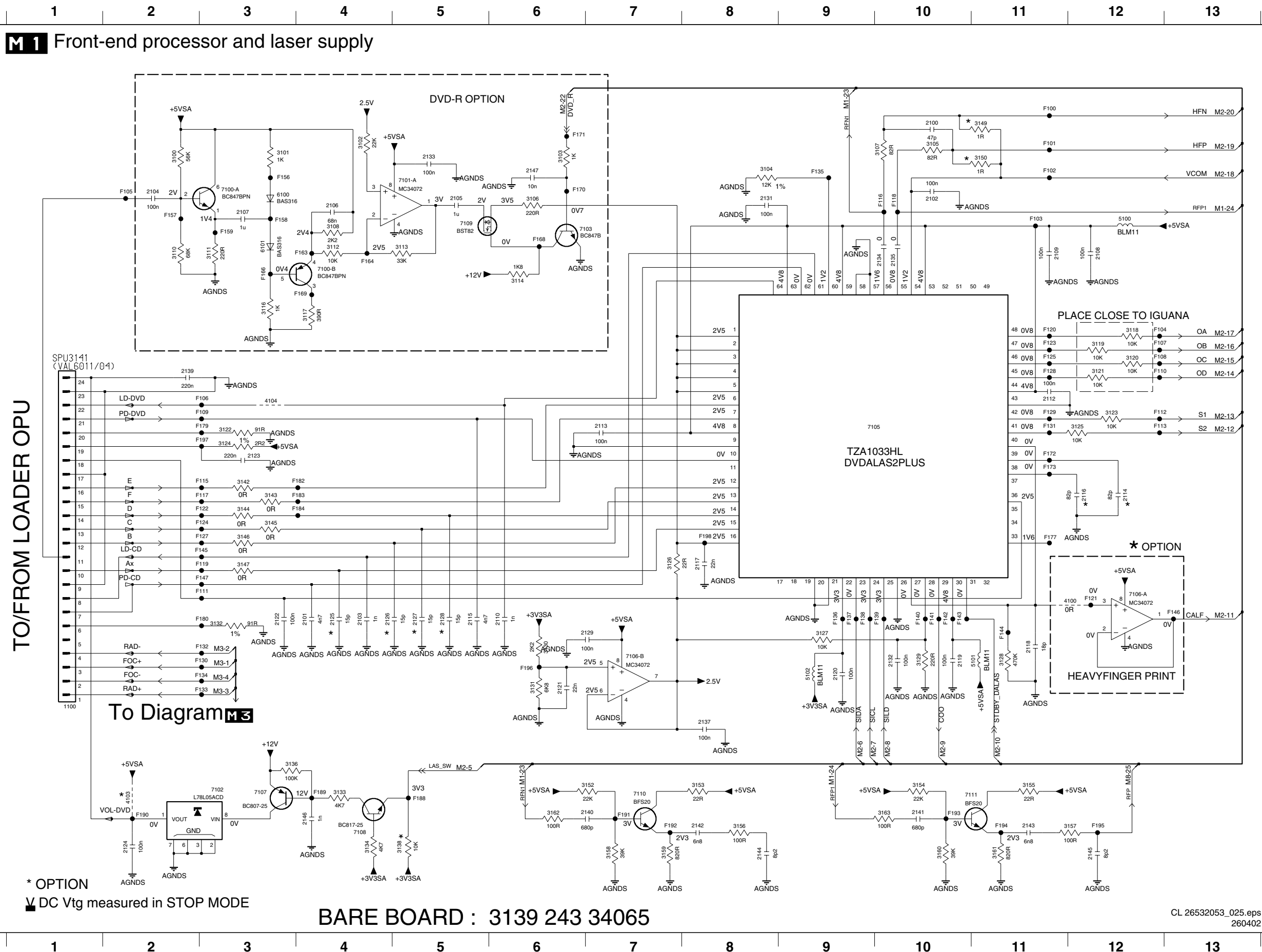
Testpoint Overview

F013 C2	F028 C10	F043 B11	F105 E6	F121 I8	F137 G5	F163 E7	F188 I8	F204 E5	F222 D5	F240 E2	F258 E2	F280 H4	F295 F3	F316 H4	F342 D5	F414 E9	F650 H7	F779 B6	F934 B13
F014 C2	F029 B10	F044 B9	F106 E7	F122 E7	F138 H5	F164 E7	F189 I8	F206 G5	F223 D3	F241 G5	F259 E2	F281 G4	F300 G1	F318 F2	F343 D5	F415 D12	F651 H7	F780 H13	F935 D11
F015 C10	F030 B10	F050 C12	F107 E5	F123 H5	F139 H5	F166 E6	F190 E7	F207 F5	F224 E2	F242 E1	F260 E2	F282 H4	F301 I2	F319 H8	F344 H2	F416 F11	F652 G7	F781 I1	T001 C2
F016 B10	F031 C10	F051 C12	F108 E5	F124 E7	F140 H7	F168 G6	F191 F5	F208 G3	F225 E2	F243 E2	F261 F2	F283 G4	F302 I3	F320 F2	F346 G2	F417 D9	F653 H7	F782 I4	T002 D2
F017 B11	F032 B10	F052 C12	F109 F7	F125 H5	F141 H5	F169 E6	F192 F5	F209 G2	F226 E5	F244 E2	F263 E1	F284 H4	F303 I2	F321 F2	F347 G3	F418 F11	F654 H7	F783 A8	T003 D2
F018 C10	F033 C9	F053 D12	F110 H4	F127 E7	F142 H7	F170 G5	F193 G6	F210 F5	F227 D5	F245 E2	F264 E2	F285 G4	F304 I3	F322 F2	F348 G1	F419 C9	F655 G10	F784 H7	T004 D2
F019 B10	F034 B9	F054 C12	F111 G7	F128 H5	F143 G5	F171 D4	F194 G6	F211 G5	F229 D6	F246 E2	F265 F2	F286 H3	F305 I2	F323 F2	F349 F1	F420 C9	F656 G10	F785 C7	T005 D2
F020 C10	F035 C9	F056 C12	F112 G5	F129 H6	F144 G7	F172 G7	F195 D9	F212 G5	F230 D5	F247 C2	F266 F2	F287 G3	F306 I3	F325 I3	F350 H4	F422 E12	F700 G6	F786 D7	T006 D2
F021 B10	F036 B11	F057 C12	F113 G5	F130 F6	F145 F6	F173 H6	F196 I8	F213 F5	F231 D5	F248 C3	F267 F2	F288 H3	F307 I2	F326 G1	F352 G2	F423 C10	F701 F6	F787 D7	T007 D3
F022 B11	F037 B11	F060 E13	F115 E7	F131 H6	F146 H5	F177 G7	F197 E7	F214 E5	F234 F3	F250 F2	F270 E5	F289 G3	F308 H3	F327 F3	F400 D11	F427 E10	F702 F6	F788 B6	T008 D3
F023 E7	F038 C11	F100 G5	F116 G5	F132 F5	F147 F7	F179 E7	F198 F7	F215 E5	F235 F3	F252 F1	F271 E5	F290 H3	F309 H3	F329 F1	F401 D11	F428 E10	F703 B6	F789 B5	T009 D3
F024 C10	F039 C11	F101 E5	F117 F7	F133 G5	F156 E6	F180 F7	F200 G4	F218 D6	F236 G4	F253 E1	F272 E5	F291 F3	F310 G1	F335 I3	F402 E12	F429 E12	F704 H6	F790 B5	T010 B2
F025 B10	F040 B11	F102 G6	F118 G6	F134 E6	F157 E6	F182 F7	F201 G4	F219 D6	F237 G4	F254 E1	F273 E2	F292 E5	F311 H2	F337 H2	F410 D4	F501 F12	F705 H6	F791 B5	T011 C3
F026 C10	F041 C11	F103 G6	F119 F6	F135 G6	F158 E6	F183 E6	F202 G5	F220 D5	F238 G5	F255 G2	F278 D5	F293 G4	F312 H4	F338 H1	F411 C4	F502 H10	F706 B5	F792 B5	T012 D3
F027 B10	F042 B9	F104 H5	F120 H5	F136 F7	F159 E6	F184 F7	F203 G5	F221 D5	F239 G5	F256 F2	F279 D5	F294 F7	F313 H3	F340 H1	F412 C3	F503 F12	F707 B4	F793 B5	T013 D3



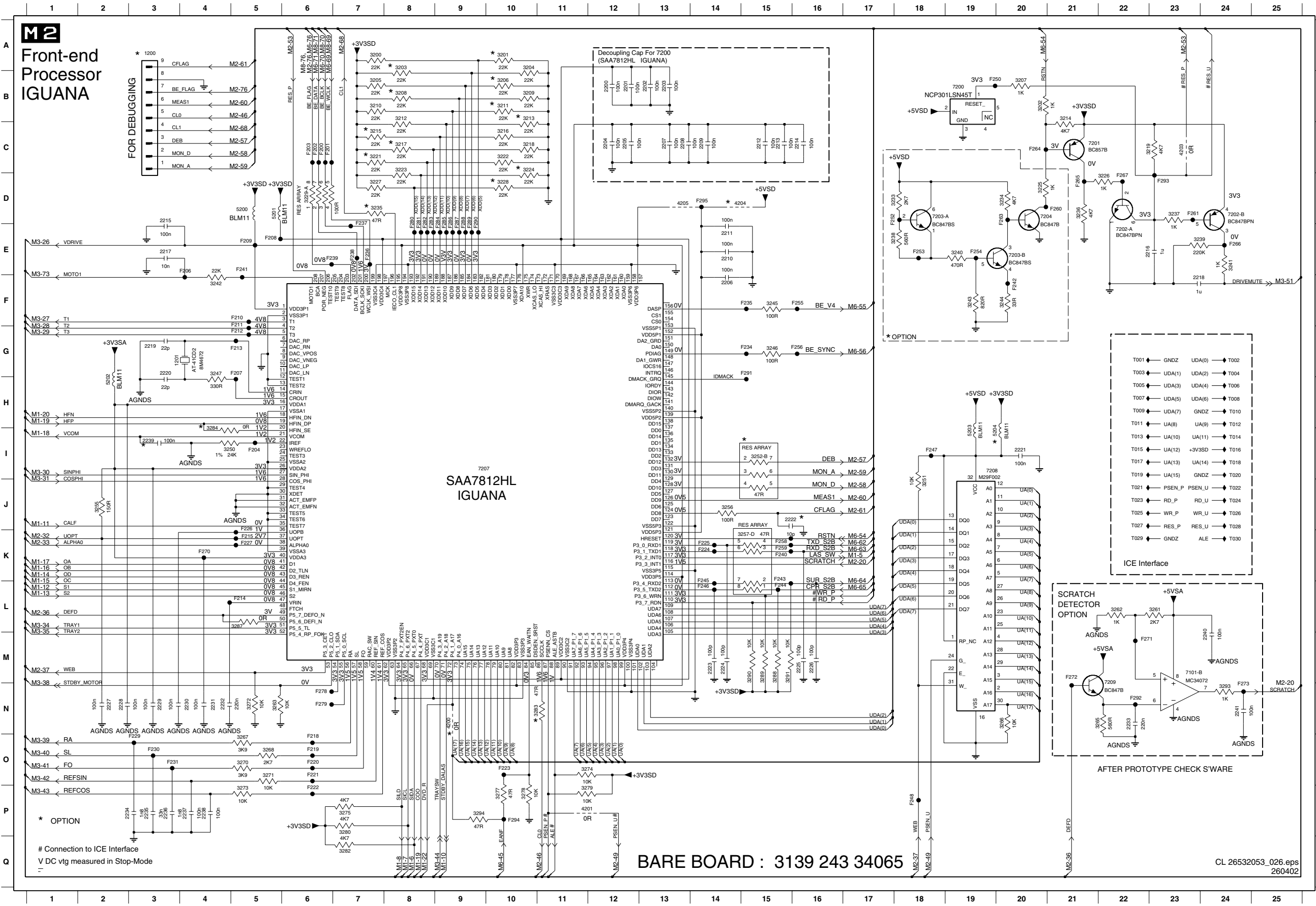
7. Electrical Diagrams and PWB's

Front-End Processor and Laser Supply



- 1100 G1
- 2100 A10
- 2101 F4
- 2102 B10
- 2103 F4
- 2104 B2
- 2105 B5
- 2106 B4
- 2107 B3
- 2108 C12
- 2109 C11
- 2110 F5
- 2112 D11
- 2113 D7
- 2114 E12
- 2115 F5
- 2116 E12
- 2117 F8
- 2118 G11
- 2119 G10
- 2120 G9
- 2121 G6
- 2122 F3
- 2123 E3
- 2124 I2
- 2125 F4
- 2126 F4
- 2127 F5
- 2128 F5
- 2129 G7
- 2131 B8
- 2132 G10
- 2133 B5
- 2134 C10
- 2135 C10
- 2137 H8
- 2139 D2
- 2140 H7
- 2141 H10
- 2142 I8
- 2143 I11
- 2144 I8
- 2145 I12
- 2146 I4
- 2147 B6
- 3100 B2
- 3101 B3
- 3102 B4
- 3103 B6
- 3104 B8
- 3105 B10
- 3106 B6
- 3107 B10
- 3108 B4
- 3110 C2
- 3111 C3
- 3112 C4
- 3113 C5
- 3114 C6
- 3116 C3
- 3117 C4
- 3118 C12
- 3119 D12
- 3120 D12
- 3121 D12
- 3122 E3
- 3123 D12
- 3124 E3
- 3125 D12
- 3126 F7
- 3127 G9
- 3128 G11
- 3129 G10
- 3130 G6
- 3131 G6
- 3132 G3
- 3133 H4
- 3134 I4
- 3136 H3
- 3138 I5
- 3142 E3
- 3143 E3
- 3144 E3
- 3145 E3
- 3146 F3
- 3147 F3
- 3149 A11
- 3150 B11
- 3152 H7
- 3153 H8
- 3154 H10
- 3155 H11
- 3156 I8
- 3157 I12
- 3158 I7
- 3159 I7
- 3160 I10
- 3161 I11
- 3162 H6
- 3163 H10
- 4100 F12
- 4103 H2
- 4104 D3
- 5100 B12
- 5101 G11
- 5102 G9
- 6100 B3
- 6101 C3
- 7100-A B3
- 7100-B C4
- 7101-A B5
- 7102 H3
- 7103 B6
- 7105 D9
- 7106-A F12
- 7106-B G7
- 7107 H3
- 7108 I4
- 7109 B5
- 7110 H7
- 7111 H10
- 7100 A11
- 7101 B11
- 7102 B11
- 7103 B11
- 7104 C12
- 7105 B2
- 7106 D3
- 7107 D12
- 7108 D12
- 7109 D3
- 7110 D12
- 7111 F3
- 7112 D12
- 7113 D12
- 7115 E3
- 7116 B10
- 7117 E3
- 7118 B10
- 7119 F3
- 7120 C11
- 7121 F12
- 7122 E3
- 7123 D11
- 7124 E3
- 7125 D11
- 7127 F3
- 7128 D11
- 7129 D11
- 7130 G3
- 7131 D11
- 7132 G3
- 7133 G3
- 7134 G3
- 7135 B9
- 7136 F9
- 7137 F9
- 7138 F9
- 7139 F10
- 7140 F10
- 7141 F10
- 7142 F10
- 7143 F10
- 7144 G11
- 7145 F3
- 7146 F13
- 7147 F3
- 7156 B3
- 7157 B2
- 7158 B3
- 7159 B3
- 7163 C4
- 7164 C4
- 7166 C3
- 7168 B6
- 7169 C4
- 7170 B6
- 7171 A6
- 7172 E11
- 7173 E11
- 7177 F11
- 7179 D3
- 7180 F3
- 7182 E4
- 7183 E4
- 7184 E4
- 7188 H5
- 7189 H4
- 7190 H2
- 7191 H7
- 7192 I7
- 7193 H10
- 7194 I11
- 7195 I12
- 7196 G6
- 7197 E3
- 7198 F8

Front-End Processor Iguana

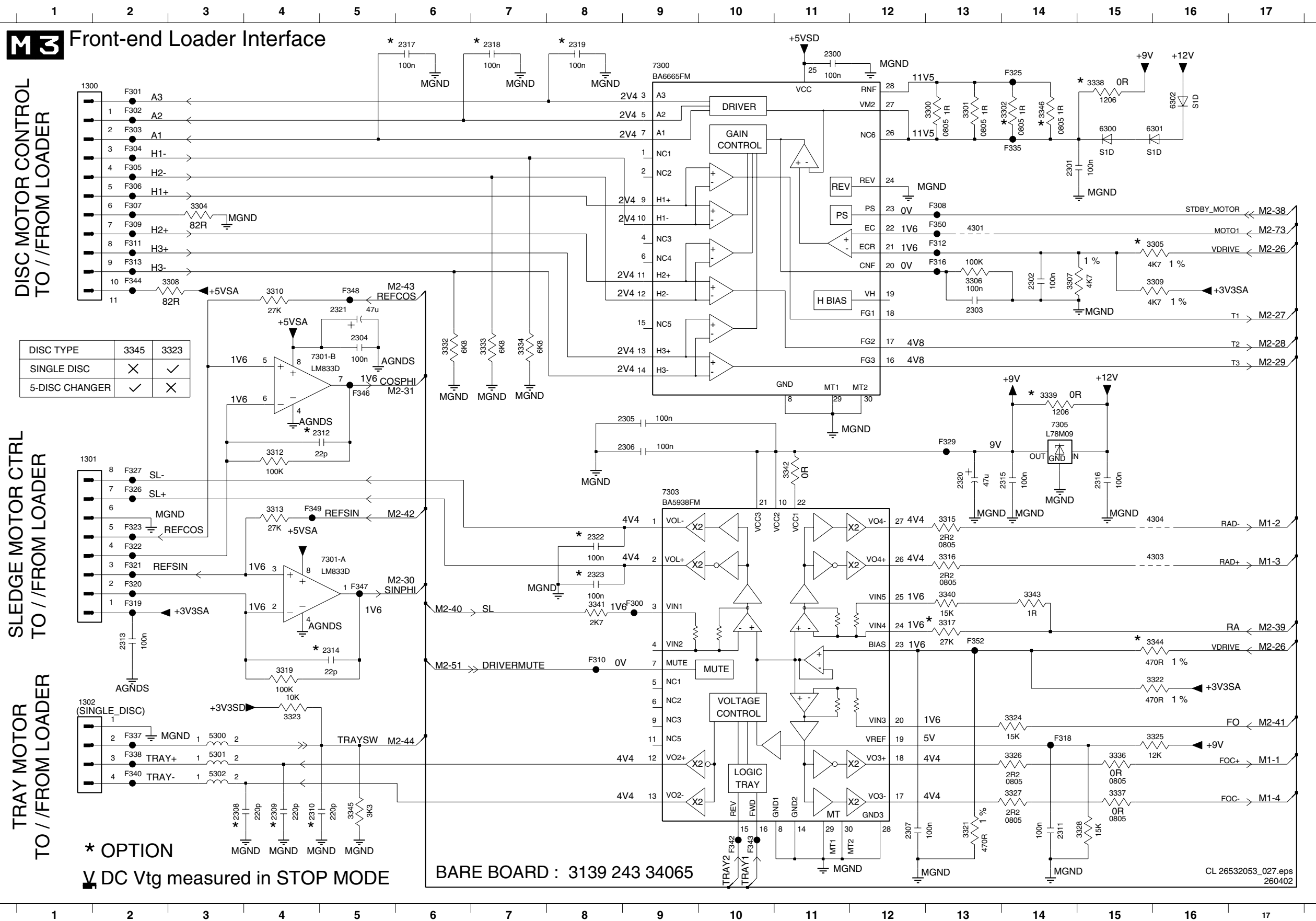


1200 A3	3289 M15
1201 G3	3290 M15
1200 B12	3291 M15
1201 B12	3293 N24
1202 B13	3294 P9
1203 B13	4200 N9
1204 C12	4201 P11
1205 C12	4203 C23
1206 F14	4204 D14
1207 C13	4205 D13
1208 C13	5200 D5
1209 C14	5201 D5
1210 E14	5202 H2
1211 E14	5203 I19
1212 C15	5204 I20
1213 C15	7101-B M23
1214 C16	7200 B19
1215 D3	7201 C21
1216 E23	7202-A E22
1217 E3	7202-B D24
1218 F23	7203-A D18
1219 G3	7203-B E20
1220 G3	7204 D20
1221 I20	7207 I10
1222 J15	7208 I19
1223 M14	7209 N22
1224 M14	F200 C6
1225 M16	F201 C6
1226 M16	F202 C6
1227 N2	F203 C6
1228 N2	F204 I5
1229 N3	F206 E4
1230 N4	F207 G5
1231 N4	F208 E5
1232 N4	F209 E5
1233 N22	F210 F5
1234 P3	F211 F5
1235 P3	F212 G5
1236 P3	F213 G5
1237 P4	F214 L5
1238 P4	F215 K6
1239 I3	F218 O6
1240 M24	F219 O6
1241 N24	F220 O6
1242 N24	F221 O6
1243 N24	F222 P6
1244 N24	F223 O10
1245 N24	F224 K14
1246 N24	F225 K14
1247 N24	F226 K5
1248 N24	F227 K5
1249 N24	F229 O3
1250 N24	F230 O3
1251 N24	F231 O3
1252 N24	F234 G15
1253 N24	F235 F15
1254 N24	F236 E7
1255 N24	F237 E7
1256 N24	F238 E7
1257 N24	F239 E6
1258 N24	F240 K15
1259 N24	F241 E5
1260 N24	F242 F20
1261 N24	F243 K15
1262 N24	F244 L15
1263 N24	F245 K14
1264 N24	F246 L14
1265 N24	F247 I18
1266 N24	F248 P18
1267 N24	F250 B19
1268 N24	F252 D18
1269 N24	F253 E18
1270 N24	F254 E19
1271 N24	F255 F16
1272 N24	F256 G16
1273 N24	F258 K15
1274 N24	F259 K15
1275 N24	F260 D21
1276 N24	F261 D23
1277 N24	F263 D20
1278 N24	F264 C20
1279 N24	F265 E24
1280 N24	F267 D22
1281 N24	F270 K4
1282 N24	F271 M22
1283 N24	F272 M21
1284 N24	F273 M24
1285 N24	F278 N6
1286 N24	F279 N6
1287 N24	F280 D8
1288 N24	F281 D8
1289 N24	F282 D8
1290 N24	F283 D8
1291 N24	F284 D9
1292 N24	F285 D9
1293 N24	F286 D9
1294 N24	F287 D9
1295 N24	F288 D9
1296 N24	F289 D9
1297 N24	F290 D9
1298 N24	F291 G15
1299 N24	F292 N22
1300 N24	F293 D23
1301 N24	F294 P10
1302 N24	F295 D14

BARE BOARD : 3139 243 34065

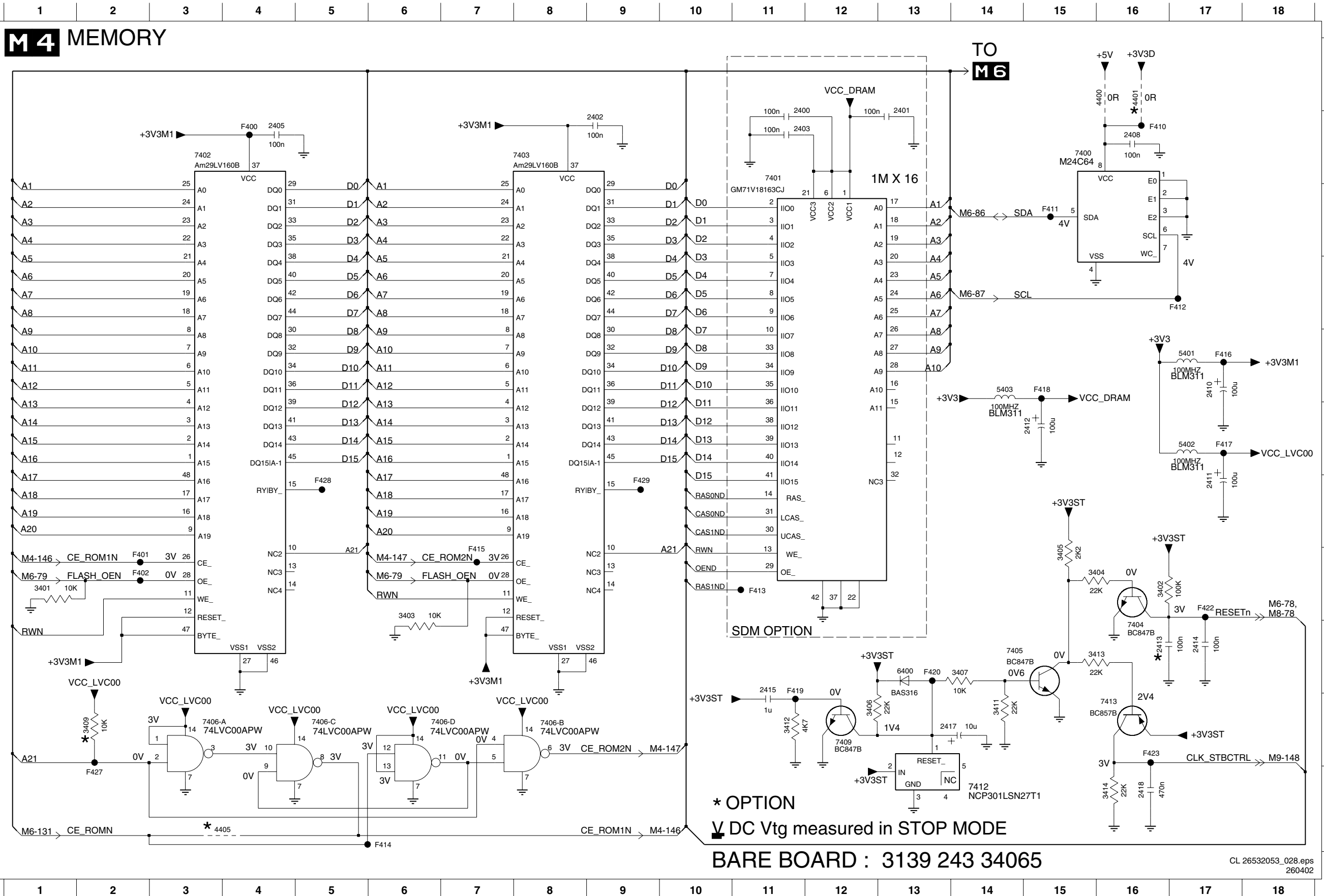
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Front-End Loader Interface



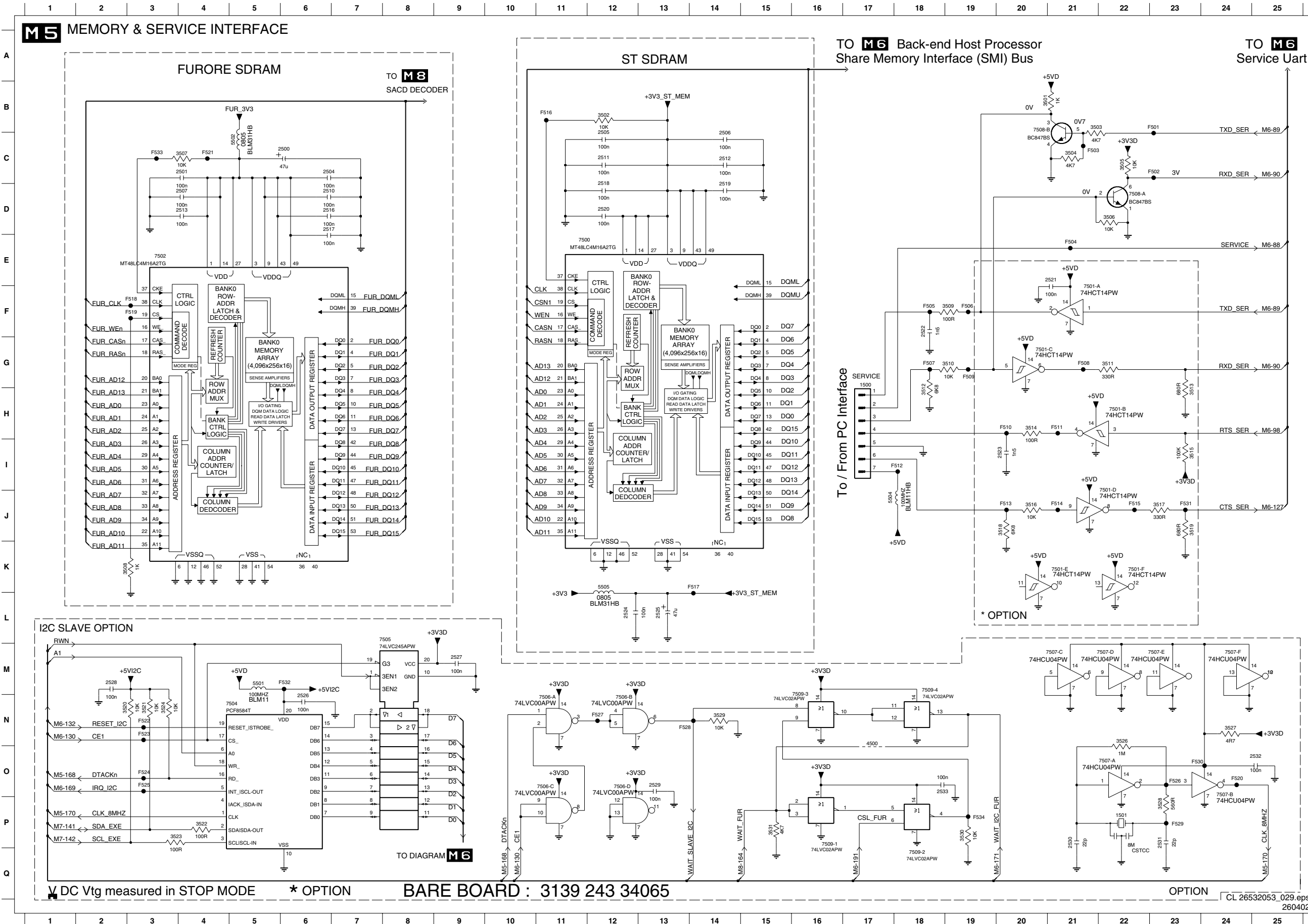
- 1300 A2
- 1301 F2
- 1302 I2
- 2300 A11
- 2301 B14
- 2302 D14
- 2303 D13
- 2304 D5
- 2305 E9
- 2306 F9
- 2307 K12
- 2308 K3
- 2309 K4
- 2310 K4
- 2311 K14
- 2312 F5
- 2313 H2
- 2314 I5
- 2315 F14
- 2316 F15
- 2317 A6
- 2318 A7
- 2319 A8
- 2320 F13
- 2321 D5
- 2322 G8
- 2323 H8
- 3300 A13
- 3301 A13
- 3302 A14
- 3304 C3
- 3305 C16
- 3306 D13
- 3307 D14
- 3308 D3
- 3309 D16
- 3310 D4
- 3312 F4
- 3313 G4
- 3315 G13
- 3316 G13
- 3317 H13
- 3319 I4
- 3321 K13
- 3322 I16
- 3323 I4
- 3324 I14
- 3325 J16
- 3326 J14
- 3327 J14
- 3328 K15
- 3332 D6
- 3333 D7
- 3334 D7
- 3336 J15
- 3337 J15
- 3338 A15
- 3339 E14
- 3340 H13
- 3341 H8
- 3342 H11
- 3343 H14
- 3344 H16
- 3345 K5
- 3346 A14
- 4301 C13
- 4303 G16
- 4304 G16
- 5300 J3
- 5301 J3
- 5302 J3
- 6300 B15
- 6301 B16
- 6302 A16
- 7300 A9
- 7301-A G5
- 7301-B E4
- 7303 F9
- 7305 F14
- F300 H9
- F301 A2
- F302 A2
- F303 B2
- F304 B2
- F305 B2
- F306 B2
- F307 C2
- F308 C13
- F309 C2
- F310 I8
- F311 C2
- F312 C13
- F313 C2
- F316 C13
- F318 J14
- F319 H2
- F320 H2
- F322 G2
- F323 G2
- F325 A14
- F326 F2
- F327 F2
- F329 F13
- F330 B14
- F332 J2
- F333 J2
- F334 J2
- F335 B14
- F337 J2
- F342 K10
- F343 K10
- F344 D2
- F346 E5
- F347 H5
- F348 D5
- F349 G4
- F350 C13
- F352 H13

Memory



- 2400 B11
- 2401 B13
- 2402 B9
- 2403 B11
- 2405 B4
- 2408 B16
- 2410 E17
- 2411 G17
- 2412 F15
- 2413 I16
- 2414 I17
- 2415 I11
- 2417 J13
- 2418 K16
- 3401 H1
- 3402 H16
- 3403 H6
- 3404 H16
- 3405 H15
- 3406 J12
- 3407 I14
- 3409 J2
- 3411 J14
- 3412 J11
- 3413 I16
- 3414 K16
- 4400 A16
- 4401 A16
- 4405 K4
- 5401 E17
- 5402 F17
- 5403 E14
- 6400 I13
- 7400 B15
- 7401 B11
- 7402 B3
- 7403 B7
- 7404 I16
- 7405 I14
- 7406-A J3
- 7406-B J8
- 7406-C J5
- 7406-D J6
- 7409 J12
- 7412 K14
- 7413 J16
- F400 B4
- F401 H2
- F402 H2
- F410 B16
- F411 C15
- F412 D17
- F413 H11
- F414 K6
- F415 H7
- F416 E17
- F417 F17
- F418 E15
- F419 J11
- F420 I13
- F422 H17
- F423 J16
- F427 K2
- F428 G5
- F429 G9

Memory and Service Interface



- 1500 G17
- 1501 P22
- 2500 C6
- 2501 C4
- 2504 C6
- 2505 C12
- 2506 C14
- 2507 D4
- 2510 D6
- 2511 C12
- 2512 D12
- 2513 D4
- 2516 D6
- 2517 D6
- 2518 D12
- 2519 D14
- 2520 D12
- 2521 E21
- 2522 F18
- 2523 I20
- 2524 L12
- 2525 L13
- 2526 N6
- 2527 M9
- 2528 M2
- 2529 O13
- 2530 P21
- 2531 P23
- 2532 O25
- 2533 O18
- 3501 B20
- 3502 B12
- 3503 B21
- 3504 C21
- 3505 C22
- 3506 D22
- 3507 C4
- 3508 K2
- 3509 F19
- 3510 G19
- 3511 G22
- 3512 H18
- 3513 H23
- 3514 H20
- 3515 I23
- 3516 J20
- 3517 J23
- 3518 J20
- 3519 J23
- 3520 N2
- 3521 N3
- 3522 P4
- 3523 P3
- 3524 N3
- 3526 N22
- 3527 N24
- 3528 P23
- 3529 N14
- 3530 P19
- 3531 P15
- 4500 N17
- 5501 M6
- 5502 C5
- 5504 J17
- 5505 K12
- 7500 E12
- 7501-A F22
- 7501-B H22
- 7501-C G20
- 7501-D J22
- 7501-E K21
- 7501-F K22
- 7502 E3
- 7504 N4
- 7505 L7
- 7506-A N11
- 7506-B N12
- 7506-C O11
- 7506-D O12
- 7507-A O22
- 7507-B O24
- 7507-C M20
- 7507-D M21
- 7507-E M22
- 7507-F M24
- 7508-A D22
- 7508-B B21
- 7509-1 P16
- 7509-2 Q18
- 7509-3 N16
- 7509-4 M18
- F501 B23
- F502 C23
- F503 C21
- F504 E21
- F505 F18
- F506 F19
- F507 G18
- F508 G21
- F509 G19
- F510 H20
- F511 H21
- F512 I18
- F513 J20
- F514 J21
- F515 J22
- F516 B11
- F517 K14
- F518 F3
- F519 F3
- F520 O24
- F521 C4
- F522 N3
- F523 N3
- F524 O3
- F525 O3
- F526 O23
- F527 N12
- F528 N13
- F529 P23
- F530 Q23
- F531 J23
- F532 M6
- F533 C3
- F534 P19

DC Vtg measured in STOP MODE * OPTION BARE BOARD : 3139 243 34065

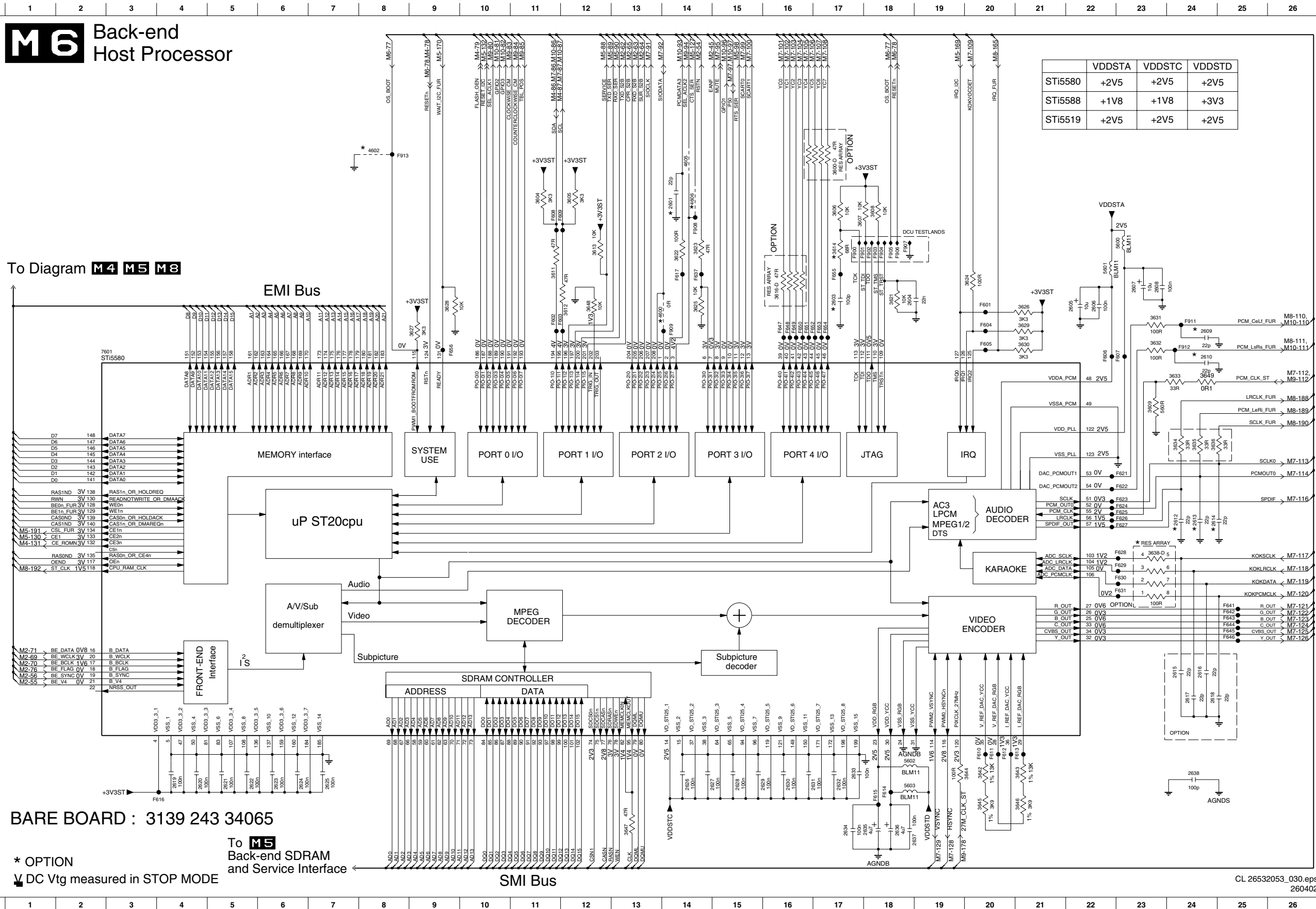
OPTION CL 26532053_029.eps 260402

Back-End Host Processor



Back-end Host Processor

To Diagram M4 M5 M8



BARE BOARD : 3139 243 34065

* OPTION
 V DC Vtg measured in STOP MODE

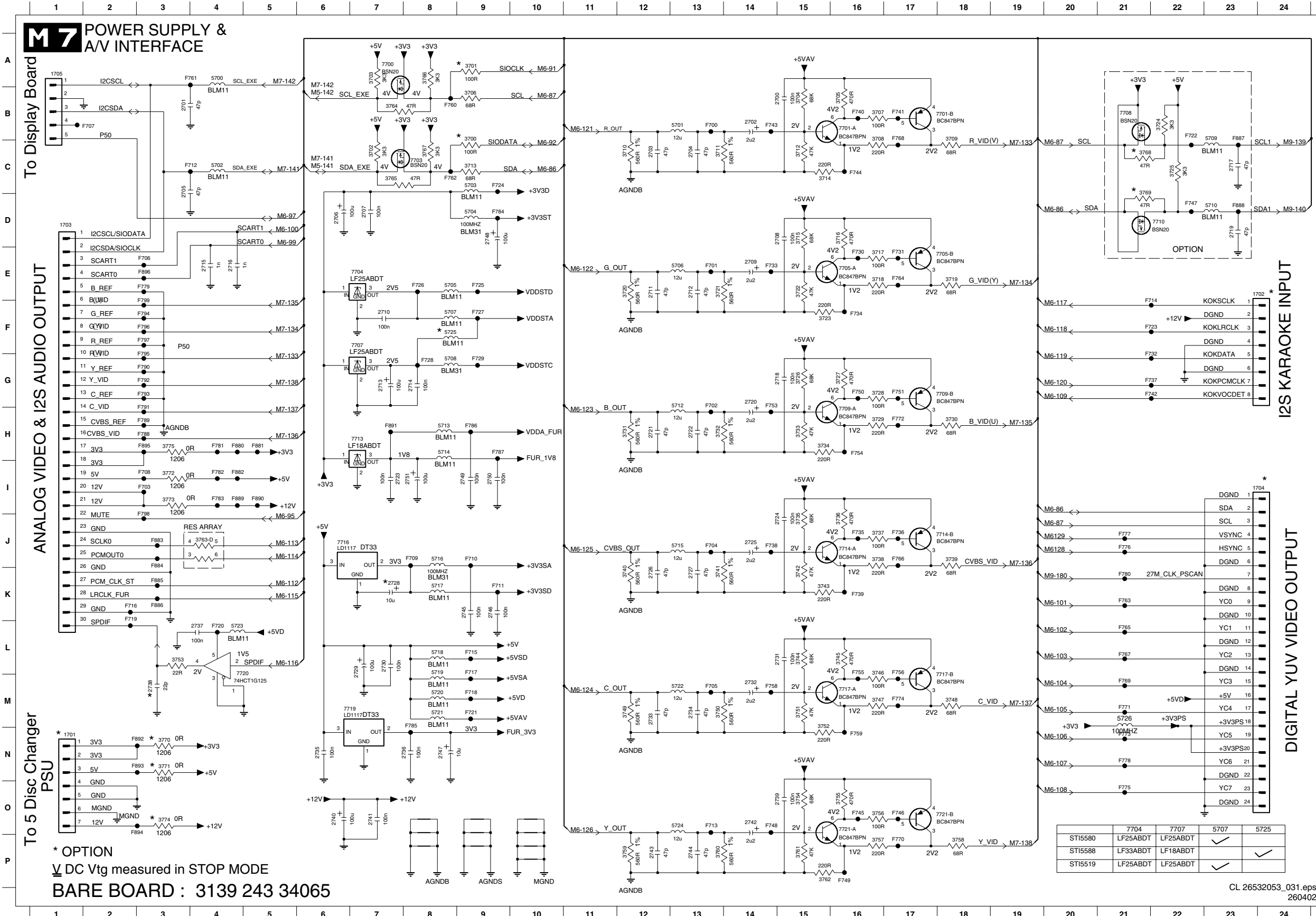
To M5 Back-end SDRAM and Service Interface

SMI Bus

	VDDSTA	VDDSTC	VDDSTD
STI5580	+2V5	+2V5	+2V5
STI5588	+1V8	+1V8	+3V3
STI5519	+2V5	+2V5	+2V5

- 2601 D14
- 2603 F17
- 2604 F18
- 2605 F16
- 2606 F22
- 2607 F23
- 2608 F24
- 2609 G24
- 2610 G24
- 2612 J24
- 2613 J24
- 2614 J24
- 2615 M24
- 2616 M24
- 2617 N24
- 2618 N24
- 2619 O4
- 2620 O4
- 2621 O5
- 2622 O5
- 2623 O6
- 2624 O6
- 2625 O7
- 2626 O14
- 2627 O15
- 2628 O16
- 2629 O16
- 2630 O16
- 2631 O17
- 2632 O17
- 2633 O17
- 2634 P17
- 2635 P18
- 2636 P18
- 2637 O19
- 2638 O24
- 3600-D C17
- 3604 D11
- 3605 D12
- 3606 D17
- 3607 F17
- 3608 D18
- 3609 H23
- 3611 E11
- 3612 F12
- 3613 E12
- 3614 E17
- 3615 F16
- 3621 F18
- 3622 E14
- 3623 E14
- 3624 F20
- 3625 F14
- 3626 F21
- 3627 G9
- 3628 F9
- 3629 F21
- 3630 G21
- 3631 F23
- 3632 G23
- 3633 G24
- 3634 J24
- 3635 J24
- 3636 J24
- 3638-D K23
- 3642 O20
- 3643 O19
- 3644 O21
- 3645 F20
- 3646 P21
- 3647 P13
- 3648 J24
- 3649 G24
- 4600 F14
- 4602 C8
- 4605 C14
- 4606 C14
- 5600 E23
- 5601 E22
- 5602 O18
- 5603 P18
- 7601 G2
- F601 F20
- F602 F11
- F603 F12
- F604 F20
- F605 G20
- F606 G22
- F607 G23
- F608 D11
- F609 D12
- F610 O20
- F611 O20
- F612 O20
- F613 O21
- F614 P18
- F615 P18
- F616 P4
- F617 E14
- F621 J23
- F622 J23
- F623 J23
- F624 J23
- F625 J23
- F626 J23
- F627 J23
- F628 K23
- F629 K23
- F630 K23
- F631 L23
- F637 E14
- F641 L25
- F642 L25
- F643 L25
- F644 L25
- F645 L25
- F646 M25
- F647 F16
- F648 F16
- F649 F16
- F650 F16
- F651 F16
- F652 F17
- F653 F17
- F654 F17
- F655 E17
- F656 G9
- F908 D14
- F909 F14
- F911 F24
- F912 G24
- F913 C8

Power Supply & A/V Interface



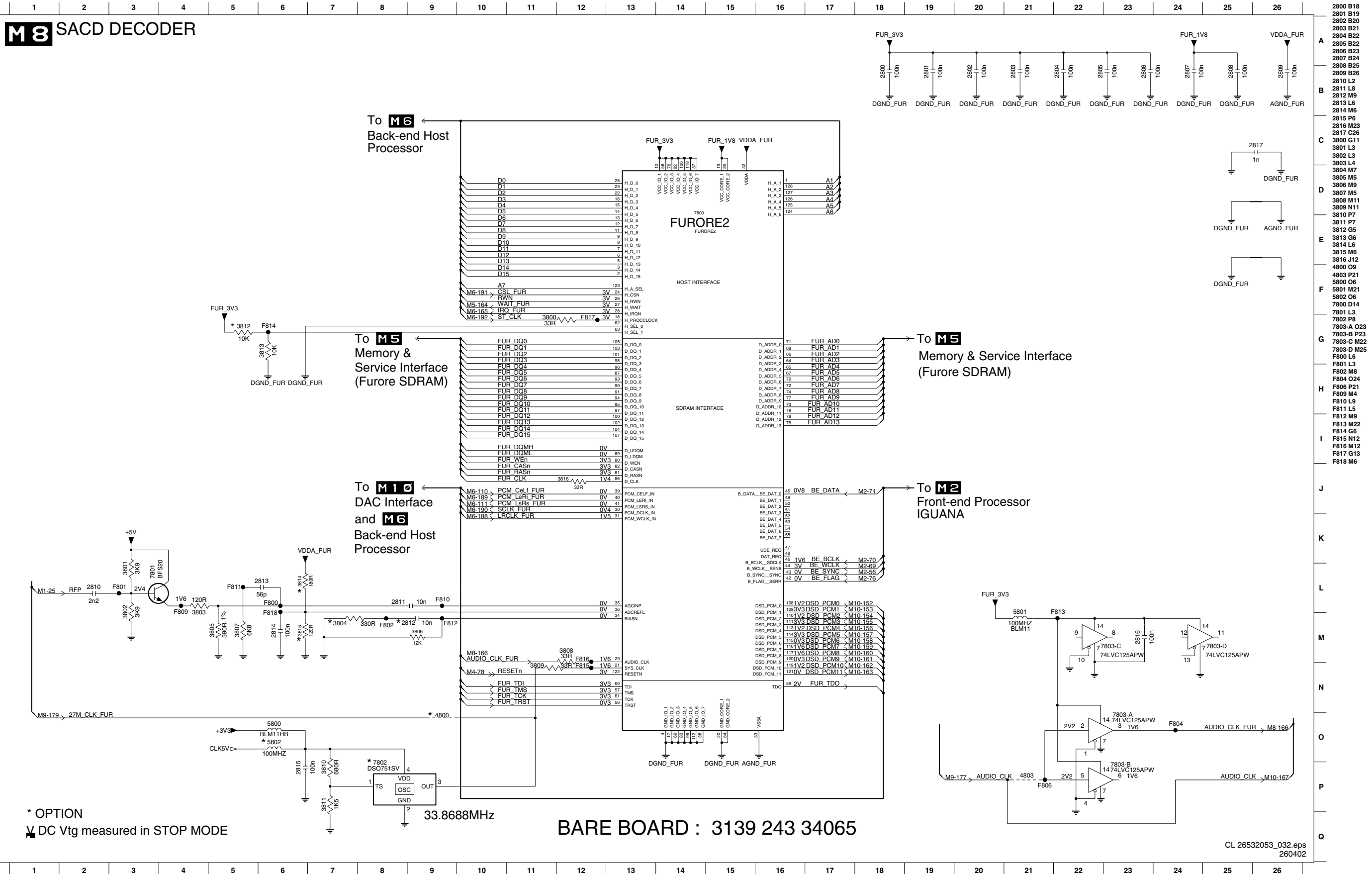
1701 N1	3756 O16	F745 O16
1702 E23	3757 P16	F746 O17
1703 D1	3758 P18	F747 D22
1704 I23	3759 P12	F748 O14
1705 A1	3760 P13	F749 P16
2700 B15	3761 P15	F750 G16
2701 B3	3762 P15	F751 G17
2702 B14	3763-D J4	F753 G14
2703 C12	3764 B7	F754 H16
2704 C13	3765 C7	F755 L16
2705 C3	3766 A8	F756 L17
2706 D6	3767 C8	F758 M14
2707 D7	3768 C21	F759 N16
2708 D15	3769 D21	F760 B8
2709 E14	3770 N3	F761 A4
2710 F7	3771 N3	F762 C8
2711 E12	3772 I3	F763 K21
2712 E13	3773 I3	F764 E17
2713 G7	3774 O3	F765 L21
2714 G8	3775 H3	F766 J17
2715 E4	5700 A4	F767 L21
2716 E4	5701 B13	F768 B17
2717 C23	5702 C4	F769 M21
2718 G15	5703 C9	F770 P17
2719 D23	5704 D9	F771 M21
2720 G14	5705 E8	F772 H17
2721 H12	5706 E13	F773 N21
2722 H13	5707 F8	F774 M17
2723 I7	5708 G8	F775 O21
2724 J15	5709 B23	F776 J21
2725 J14	5710 D23	F777 J21
2726 K12	5712 G13	F778 N21
2727 K13	5713 H8	F779 E3
2728 K7	5714 H8	F780 K21
2729 L7	5715 J13	F781 H4
2730 L7	5716 J8	F782 I4
2731 L15	5717 K8	F783 I4
2732 M14	5718 L8	F784 D9
2733 M12	5719 L8	F785 M8
2734 M13	5720 M8	F786 H9
2735 N6	5721 M8	F787 H9
2736 N8	5722 M13	F788 H8
2737 L4	5723 L4	F789 H3
2738 M3	5724 O13	F790 G3
2739 O15	5725 F8	F791 H3
2740 O6	5726 M21	F792 G3
2741 O7	7700 A7	F793 G3
2742 O14	7701-A B16	F794 F3
2743 P12	7701-B B17	F795 G3
2744 P13	7703 C8	F796 F3
2745 K9	7704 K9	F797 F3
2746 K9	7705-A E16	F798 J3
2747 N8	7705-B E17	F799 F3
2748 D9	7707 F7	F800 H4
2749 I9	7708 B21	F801 H5
2750 I9	7709-A H16	F802 I4
2751 I8	7709-B G17	F803 J3
3700 C9	7710 D22	F804 J3
3701 A9	7713 H7	F805 K3
3702 C7	7714-A J16	F806 K3
3703 A7	7714-B J17	F807 B23
3704 B15	7716 J6	F808 D23
3705 B16	7717-A M16	F809 I4
3706 B9	7717-B L17	F809 I5
3707 B16	7719 M6	F809 H7
3708 C16	7720 M5	F809 N3
3709 C18	7721-A O17	F809 N3
3710 C12	7721-B O16	F809 O3
3711 C13	F700 B13	F809 H3
3712 C15	F701 C15	F809 H3
3713 C9	F702 G13	F809 E3
3714 C15	F703 I3	
3715 D15	F704 J13	
3716 D16	F705 M13	
3717 E16	F706 E3	
3718 E16	F707 B2	
3719 E18	F708 I3	
3720 E12	F709 J8	
3721 E13	F710 J9	
3722 E15	F711 K9	
3723 F15	F712 C4	
3724 B22	F713 O13	
3725 C22	F714 F22	
3726 G15	F715 L9	
3727 G16	F716 K2	
3728 G16	F717 L9	
3729 H16	F718 M9	
3730 H8	F719 K2	
3731 H12	F720 L4	
3732 H13	F721 M9	
3733 H15	F722 B22	
3734 H15	F723 F22	
3735 J15	F724 C9	
3736 J16	F725 E9	
3737 J16	F726 E8	
3738 J16	F727 F9	
3739 J18	F728 G8	
3740 K12	F729 G9	
3741 K13	F730 E16	
3742 K15	F731 E17	
3743 K15	F732 G22	
3744 L15	F733 E14	
3745 L16	F734 F16	
3746 M16	F735 I16	
3747 M16	F736 J17	
3748 M18	F737 G22	
3749 M14	F738 I14	
3750 M13	F739 K16	
3751 M15	F740 B16	
3752 N15	F741 B17	
3753 L3	F742 G22	
3754 B14	F743 B14	
3755 O16	F744 C16	

	7704	7707	5707	5725
ST15580	LF25ABDT	LF25ABDT	✓	
ST15588	LF33ABDT	LF18ABDT		✓
ST15519	LF25ABDT	LF25ABDT	✓	

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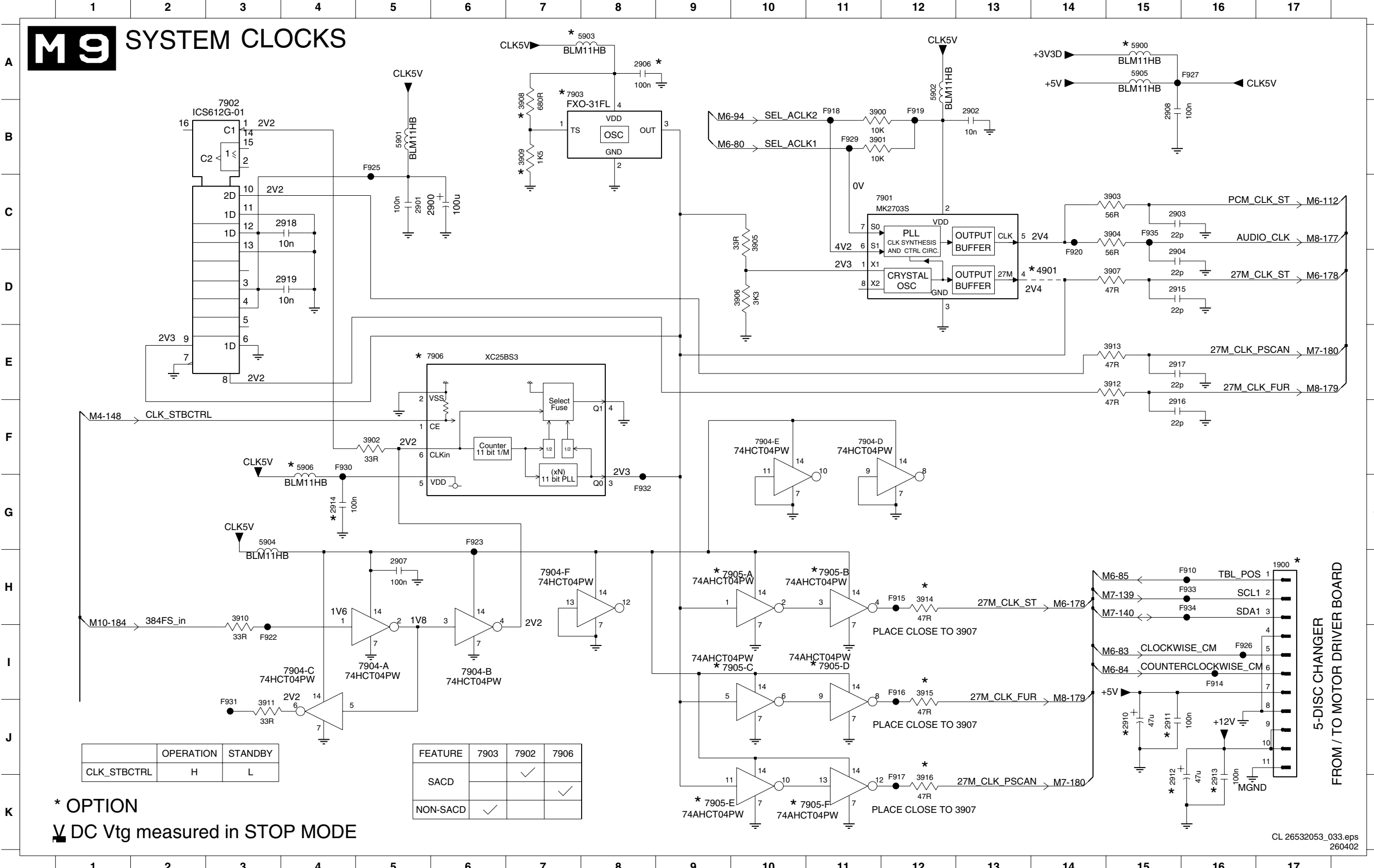
* OPTION
V DC Vtg measured in STOP MODE
BARE BOARD : 3139 243 34065

SACD Decoder



System Clocks

M9 SYSTEM CLOCKS



- 1900 H17
- 2900 C6
- 2901 C5
- 2902 B13
- 2903 C15
- 2904 D15
- 2906 A8
- 2907 H5
- 2908 B15
- 2910 J15
- 2911 J15
- 2912 K15
- 2913 K16
- 2914 G4
- 2915 D15
- 2916 F15
- 2917 E15
- 2918 C4
- 2919 D4
- 3900 B11
- 3901 B11
- 3902 F5
- 3903 C15
- 3904 C15
- 3905 C10
- 3906 D10
- 3907 D15
- 3908 B7
- 3909 B7
- 3910 H3
- 3911 J3
- 3912 E15
- 3913 E15
- 3914 H12
- 3915 I12
- 3916 K12
- 4901 D14
- 5900 A15
- 5901 B5
- 5902 A12
- 5903 A8
- 5904 G3
- 5905 A15
- 5906 F4
- 7901 C11
- 7902 B3
- 7903 A7
- 7904-A I5
- 7904-B I6
- 7904-C I4
- 7904-D F10
- 7904-E F10
- 7904-F H7
- 7905-A H9
- 7905-B H11
- 7905-C I9
- 7905-D I11
- 7905-E K9
- 7905-F K10
- 7906 E5
- F910 H16
- F914 I16
- F915 H12
- F916 I12
- F917 K12
- F918 B11
- F919 B12
- F920 D14
- F922 I3
- F923 G6
- F925 B5
- F926 I16
- F927 A16
- F929 B11
- F930 F4
- F931 J3
- F932 G8
- F933 H16
- F934 H16
- F935 C15

	OPERATION	STANDBY
CLK_STBCTRL	H	L

FEATURE	7903	7902	7906
SACD		✓	
NON-SACD	✓		✓

* OPTION
 ▽ DC Vtg measured in STOP MODE

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 260402

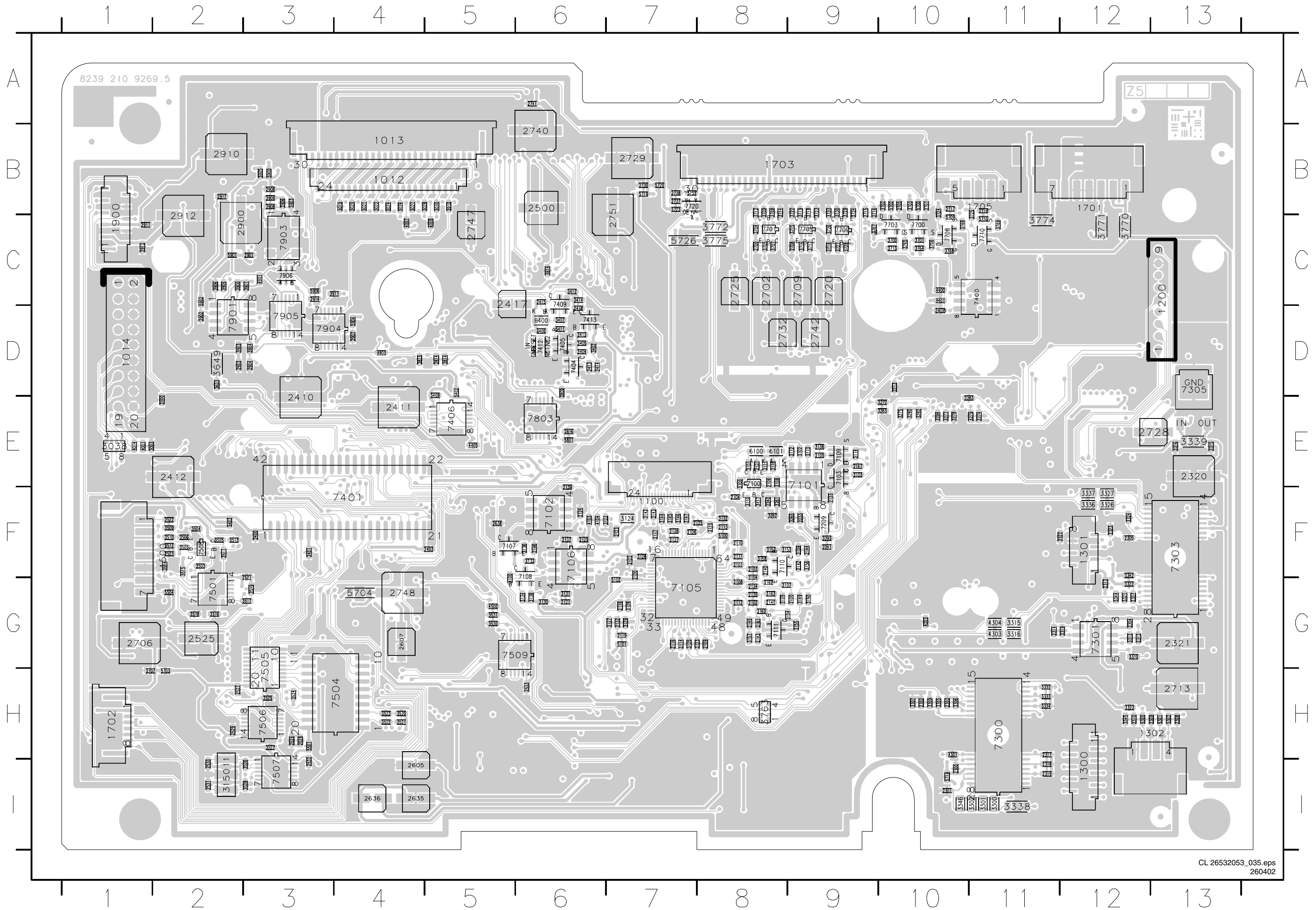
Over Sampling	FS	Frequency Audio_CLK	SEL_ACLK2	SEL_ACLK1
256FS	96KHZ	24.576MHZ	1	1
	44.1KHZ	11.2896MHZ	1	0
	48KHZ	12.288MHZ	0	0
384FS	44.1KHZ	16.9344MHZ		

CLK FACTORY FOR AUDIO_CLK	3914	7901	3900	3901	5902	2902	7905	3903	3904
STI5580 GENERATED	✓		✓				✓	✓	✓
EXTERNAL		✓	✓	✓	✓	✓			

BARE BOARD : 3139 243 34065

5-DISC CHANGER FROM / TO MOTOR DRIVER BOARD

Top Side



Mapping Top Side

1012 B4	2321 G13	3024 B4	3319 G12	3730 B9	7106 F6
1013 B4	2322 F12	3026 B4	3321 G12	3733 B9	7107 F5
1014 D1	2323 F12	3027 B4	3322 G12	3734 B9	7108 F6
1100 F7	2400 F3	3028 B4	3323 H12	3753 B7	7109 E9
1200 C13	2401 F3	3030 B5	3324 F12	3763 H8	7110 F8
1300 I12	2403 F5	3038 E1	3326 F12	3764 C10	7111 G8
1301 F12	2408 D10	3100 E8	3327 F12	3765 C10	7209 F9
1302 H13	2410 E3	3101 E8	3332 H11	3766 C10	7300 H11
1500 F2	2411 E4	3102 E9	3333 H11	3767 C9	7301 G12
1501 I2	2412 E2	3103 E9	3334 H11	3768 C10	7303 F13
1701 B12	2413 D6	3104 F8	3336 F12	3769 C11	7305 D13
1702 H1	2414 D6	3105 G8	3337 F12	3770 C12	7400 C11
1703 B8	2415 C6	3106 E9	3338 I11	3771 C12	7401 F4
1705 B11	2417 C5	3107 G8	3339 E13	3772 C8	7404 D6
1900 C1	2418 D6	3108 E8	3342 F12	3774 C11	7405 D6
2000 E2	2500 B6	3110 F8	3344 G12	3775 C8	7406 E5
2100 G9	2521 F3	3111 E8	3345 H12	3814 D5	7409 C6
2101 F8	2522 F2	3112 E9	3346 I10	3815 D4	7412 D6
2102 G8	2523 F2	3113 E9	3402 D6	3816 C6	7413 D6
2103 F8	2525 G2	3114 E9	3404 D6	3900 C2	7501 G2
2104 F8	2526 H3	3116 E8	3405 D6	3901 C3	7504 H4
2105 E9	2527 H2	3117 F8	3406 D6	3903 D2	7505 G3
2106 E8	2528 H3	3122 F6	3407 D6	3904 D3	7506 H3
2107 E8	2529 H2	3123 G8	3409 D5	3905 C2	7507 I3
2108 G8	2530 I2	3124 F7	3411 D6	3906 C2	7508 F2
2109 G8	2531 I2	3125 G7	3412 C6	3908 B3	7509 G5
2110 F8	2532 I3	3126 F7	3413 D6	3909 B3	7700 C10
2112 G8	2533 H6	3127 G7	3414 C6	3910 B5	7701 C8
2113 F8	2605 I4	3128 G7	3501 F2	3911 C4	7703 C10
2114 G7	2607 G4	3129 G7	3503 F2	4001 E1	7705 C9
2115 F8	2635 I4	3130 G6	3504 F2	4007 C4	7708 C10
2116 G7	2636 I4	3131 G6	3505 F2	4008 C5	7709 C9
2117 F7	2638 F5	3132 F8	3506 F2	4014 E1	7710 C11
2118 G7	2700 C8	3133 F6	3509 F2	4100 G5	7720 B7
2119 G7	2701 B10	3134 G6	3510 F2	4103 F6	7803 E6
2120 F7	2702 C8	3136 F6	3511 F2	4104 F6	7901 D2
2121 G6	2705 B10	3138 G6	3512 F2	4203 G10	7903 C3
2122 F7	2706 G1	3142 F7	3513 F2	4301 H10	7904 D3
2123 F7	2707 H1	3143 F7	3514 F2	4303 G11	7905 D3
2124 F6	2708 C9	3144 F7	3515 F2	4304 G11	7906 C3
2125 F8	2709 C9	3145 F7	3516 G2	4400 C10	
2126 F7	2713 H13	3146 F7	3517 G3	4401 C10	
2127 F7	2715 B9	3147 F7	3518 G2	4405 E5	
2128 F7	2716 B9	3149 G9	3519 G3	4500 G5	
2129 F6	2717 B10	3150 G9	3520 H4	4803 D4	
2131 F8	2718 C9	3152 F8	3521 H4	4901 C3	
2132 G7	2719 B11	3153 F8	3522 H4	5100 F8	
2133 F9	2720 C9	3154 G9	3523 H4	5101 G7	
2134 G8	2725 C8	3155 G9	3524 H3	5102 G7	
2135 G8	2728 E13	3156 F9	3526 I3	5300 H12	
2137 F6	2729 B7	3157 G8	3527 H3	5301 H13	
2139 F6	2730 B7	3158 F8	3528 I3	5302 H13	
2140 F8	2732 D8	3159 F9	3529 H3	5402 D5	
2141 G8	2737 B7	3160 G8	3530 G5	5403 F2	
2142 F9	2738 B7	3161 G8	3531 G5	5501 H3	
2143 G8	2740 B6	3162 G8	3633 D2	5504 G2	
2144 F9	2741 A6	3163 G8	3649 D2	5700 B10	
2145 G8	2742 D9	3261 F8	3700 C10	5702 B10	
2146 F6	2747 C5	3262 F8	3701 C10	5703 H2	
2147 E9	2748 G4	3263 E10	3702 B10	5704 G4	
2213 D10	2751 C7	3265 F9	3703 B10	5709 C10	
2233 F9	2809 D6	3272 E10	3704 C8	5710 C11	
2240 F8	2814 D5	3274 E11	3705 C8	5718 I10	
2241 F9	2816 E6	3275 E10	3706 C10	5719 B7	
2300 I10	2900 C2	3277 E10	3707 C8	5720 B7	
2301 I10	2901 C3	3278 E10	3708 B8	5723 B7	
2302 H10	2902 D2	3279 E11	3709 B8	5726 C7	
2303 H10	2903 D2	3280 E10	3712 B8	5801 E6	
2304 G12	2904 D3	3282 E10	3713 C10	5900 B3	
2305 F12	2906 B3	3283 E10	3714 B8	5901 C2	
2307 G12	2907 D4	3293 F9	3715 C9	5902 C2	
2308 H13	2908 B3	3294 E10	3716 C9	5903 B3	
2309 H13	2910 B2	3300 I11	3717 C9	5904 D4	
2310 H12	2911 C1	3301 I11	3718 B9	5905 B3	
2312 G12	2912 C2	3302 I11	3719 B9	5906 C3	
2313 G12	2913 C1	3305 H10	3722 B9	6100 E8	
2314 G11	2914 C3	3306 H10	3723 B9	6101 E8	
2315 E13	2917 B2	3307 H10	3724 B10	6400 D6	
2316 E13	3003 E1	3309 H10	3725 B11	7100 E8	
2317 H11	3019 B4	3310 G12	3726 C9	7101 E9	
2318 I11	3020 B4	3312 G12	3727 C9	7102 F6	
2319 I11	3021 B4	3315 G11	3728 C9	7103 E9	
2320 E13	3022 B4	3316 G11	3729 B9	7105 G7	

Mapping Bottom Side

2004 B10	2619 F7	3207 F2	3623 F7	4602 G10
2005 B10	2620 G7	3208 G3	3624 G10	4605 F7
2006 B10	2621 H9	3209 G3	3625 F7	4606 F7
2007 B11	2622 H10	3210 G3	3626 G10	4800 E8
2008 B10	2623 F10	3211 G3	3627 G10	5200 G2
2009 B10	2624 E9	3212 G4	3628 F10	5201 G3
2010 B10	2625 E9	3213 G4	3629 G10	5202 E6
2011 B10	2626 G7	3214 F1	3630 G10	5203 C2
2012 B9	2627 F7	3215 G4	3631 H7	5204 C2
2013 B9	2628 H8	3216 G4	3632 H8	5401 D11
2014 B10	2629 H9	3217 G4	3634 H8	5502 C7
2015 B11	2630 G10	3218 G4	3635 H7	5505 G12
2200 G3	2631 F10	3219 F2	3636 H7	5600 G10
2201 G4	2632 E9	3221 G4	3638 H10	5601 H7
2202 D3	2633 E8	3222 G4	3642 G7	5602 F7
2203 D4	2634 F7	3223 G4	3643 G6	5603 G7
2204 G4	2637 G7	3224 G4	3644 G11	5701 G6
2205 G3	2703 G7	3225 E2	3645 G7	5705 I6
2206 F3	2704 G6	3226 F2	3646 G6	5706 F6
2207 G3	2710 I6	3227 G4	3647 H9	5707 I6
2208 F5	2711 F7	3228 G4	3648 E8	5708 H6
2209 D3	2712 F6	3229 G4	3710 G7	5712 F6
2210 F3	2714 H6	3233 E1	3711 G6	5713 D7
2211 E2	2721 F7	3234 E1	3720 F7	5714 D7
2212 E2	2722 F6	3235 G4	3721 F6	5715 H6
2214 D3	2723 D7	3236 F2	3731 F7	5716 F1
2215 G4	2724 C6	3237 F2	3732 F6	5717 E1
2216 F2	2726 H6	3238 E1	3735 C6	5721 C7
2217 G5	2727 H6	3239 F2	3736 C6	5722 H6
2218 F2	2731 C5	3240 E1	3737 C6	5724 G6
2219 F5	2733 H6	3241 F2	3738 B6	5725 I6
2220 F5	2734 H6	3242 G5	3739 B6	5800 E7
2221 C3	2735 B7	3243 E1	3740 H6	5802 E7
2222 E2	2736 C7	3244 E1	3741 H6	6300 I3
2223 E2	2739 C5	3245 G2	3742 B6	6301 I3
2224 E2	2743 G6	3246 F2	3743 B6	6302 I4
2225 E2	2744 G6	3247 F5	3744 C5	7000 B11
2226 E2	2745 F1	3250 E5	3745 C5	7200 E2
2227 E5	2746 E1	3251 C3	3746 C6	7201 F2
2228 E5	2749 D7	3252 E2	3747 B5	7202 F2
2229 E5	2750 D7	3255 E5	3748 B5	7203 E1
2230 E5	2800 E9	3256 E2	3749 H6	7204 E2
2231 E5	2801 D9	3257 E2	3750 H6	7207 E4
2232 E5	2802 E8	3266 C3	3751 B5	7208 D2
2234 D6	2803 D7	3267 D6	3752 B6	7402 E11
2235 D5	2804 D7	3268 D5	3754 C5	7403 F12
2236 D5	2805 C8	3270 D5	3755 C5	7500 H11
2237 D5	2806 C8	3271 D5	3756 C5	7502 B8
2238 D5	2807 E8	3273 D5	3757 B5	7601 G9
2239 E5	2808 C8	3284 E5	3758 B5	7704 I6
2306 F1	2810 D9	3287 E5	3759 G6	7707 H6
2311 F2	2811 E9	3288 E1	3760 G6	7713 D7
2402 E12	2812 E9	3289 E2	3761 B5	7714 C6
2405 D11	2813 E9	3290 E2	3762 B5	7716 D1
2501 C9	2815 E7	3291 E1	3773 B6	7717 C5
2504 C7	2817 C9	3304 I2	3800 E8	7719 C7
2505 H11	2915 C12	3308 H2	3801 E10	7721 C5
2506 G12	2916 C12	3313 F2	3802 D10	7800 D8
2507 C8	2918 B12	3317 G2	3803 E9	7801 E9
2510 C8	2919 C11	3325 F2	3804 E9	7802 E8
2511 H12	3008 C12	3328 F2	3805 E9	7902 C11
2512 H11	3010 D12	3340 G2	3806 E9	
2513 C8	3023 B11	3341 G1	3807 D9	
2516 B8	3025 B11	3343 G2	3808 E8	
2517 B8	3029 C11	3401 D11	3809 E8	
2518 G11	3031 B11	3403 E12	3810 E7	
2519 H11	3032 C11	3502 H12	3811 E7	
2520 G11	3033 B11	3507 B8	3812 D9	
2524 G12	3034 B11	3508 C8	3813 D9	
2601 E7	3035 B10	3600 H7	3902 C11	
2603 G10	3036 C12	3604 E9	3907 C12	
2604 H10	3037 C12	3605 E9	3912 C12	
2606 G7	3118 E5	3606 G10	3913 B12	
2608 G10	3119 E6	3607 G10	3914 D12	
2609 H7	3120 E5	3608 G10	3915 D11	
2610 H8	3121 E5	3609 H8	3916 D12	
2612 H8	3200 G3	3611 E8	4005 B11	
2613 H7	3201 G3	3612 E8	4006 B11	
2614 H7	3202 E2	3613 E8	4200 C3	
2615 H10	3203 G3	3614 G10	4201 D3	
2616 H10	3204 G3	3616 H7	4204 E2	

8. Alignments

Not applicable.

9. Circuit Descriptions, List of Abbreviations and IC Data

Index of this chapter:

1. Introduction
2. Loader/Mono Board
3. Abbreviations
4. IC Data

Notes:

- Only the new circuit parts are described. For the other descriptions, see the SD4.0 Service Manual (3122 785 12240).
- For a good understanding of the following circuit descriptions, please also check the diagrams in chapter 6 and 7.

9.1 Introduction

9.1.1 Features

The SD4.0SA_CH modules consist of the Mercury 3 Loader VAL6013/01 (from Philips Optical Storage), and a Mono Board. The module is capable of analogue video (with option for digital YUV video) and digital audio and SACD decoding.

9.1.2 Differences

The DVD-module SD4.0SA_CH is based on its predecessor the SD4.0, with similar functional block partitioning. However, the implementation of most functional blocks has been redesigned due to a new:

- Furore IC for SACD decoding.
- Module interface.
- Mechanical construction.

9.1.3 Modules

The main modules are:

- Mercury 3 Loader - VAL6013/01.
- Mono Board.

9.2 Loader/Mono Board

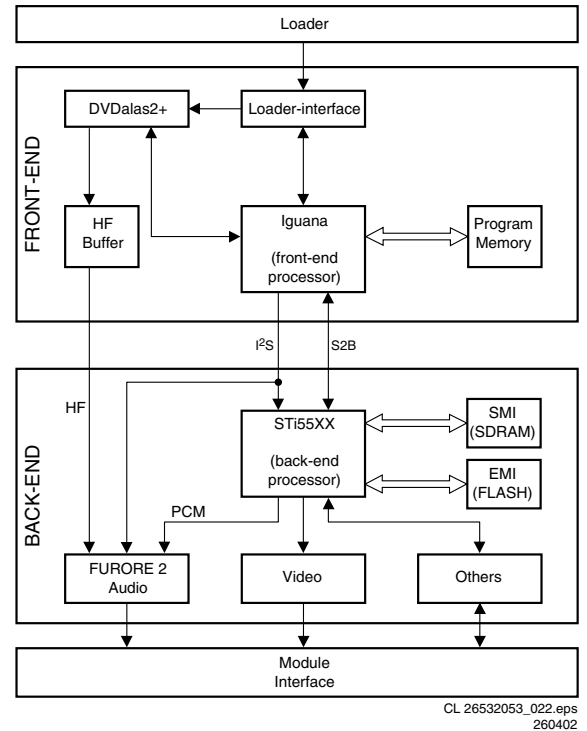


Figure 9-1 Block Diagram Loader/Mono board

The SD4.00_SA_CH (SACHI_4) is the 2nd generation Philips Architectural Standard Design of SACD mono board based on Furore 2, and will be used in the new generation of SACD players. It is designed in a multi-task way so that it can support the following optional main functions:

- SD4.00_SA_CH: Support SACD player with 5-disc changer.
- SD4.00_SA: Support SACD player with single-disc.
- SD4.00_CH: Support DVD player with 5-disc changer but without SACD playback.
- SD4.00_SA_I2C: Support SACD player with single-disc and I2C slave.

The SD4.00_SA_CH (SACHI_4) module consist of the following key components:

1. OPU: Mercury 2 Loader VAL6011/14 (slim type) for a single-disc SACD player, or DVD VAM6001/14 mechanism for a 5-disc SACD changer.
2. **Front-end:** M2 Basic Engine.
3. **Back-end:** DVD Host Processor STi55xx and Furore 2 SACD DSD/DST decoder.
4. **Power supply:** To convert the PSU voltages to the correct values.
5. **Reset circuit:** This circuit that the booting of the several devices on the mono board takes place in the correct order.

9.2.1 The Optical Pick-up Unit (OPU)

The Mercury 2 Loader has an optical unit consisting of two lasers:

- One for CD with a wavelength of 780 nm.
- One for DVD with a wavelength of 650 nm.

The TZA1033 (item 7105) controls the data from these lasers, and the supply to them.

9.2.2 Front-end: the Servo Part

The front-end consists of:

- The Loader interface
- The Servo Processor/Decoder
- The Interface/Program Memory

The Loader Interface

The TZA1033HL/K2 (or DVDALAS2plus, item 7105) is an analogue pre-processor and laser supply circuit. It contains data amplifiers and several options for radial tracking and focus control.

It is possible to optimise the dynamic range of this pre-amp/processor combination for the LF servo and RF data paths. The gain in both channels is separately programmable. This will guarantee an optimal playability for all kind of discs.

Also, a dual laser supply is implemented, with fully automatic laser control including stabilisation and an ON/OFF switch, plus a separate supply pin for power efficiency.

The Servo Processor/Decoder

In the SD3.0 module, the servo signals were fed to the MACE2 servo processor, while the HF output signal was fed to the SAA7335 decoder. In the new SD4.0SA_CH module, these ICs are combined into one chip: the SAA7812 Iguana.

This chip contains the following blocks: channel decoder, block decoder, servo processor, and microcontroller.

The servo circuit in the SAA7812 (item 7207) takes care of the servo controls.

In a CD system, there are some twelve control loops active. About six of them are needed to adjust the servo error signals that is once per disc rotation. It also adjusts offsets, signal amplitudes, and loop gains (AGCs), to enlarge system robustness and to avoid expensive potentiometer adjustments in production.

The other six loops determine the laser spot position on the disc in the radial, axial (focus), and tangential directions. It also has to take care that the spot accesses a required position as fast as possible. This access system consists of two parts, namely the actuator and the sled, which are (within a certain range) mechanically and electrically independent. Therefore, during an access, the servo has to control as well the actuator as the sled.

The analogue signals, from the diode pre-processor, are converted into a digital representation using A/D converters. For the communication between the host processor (STi55xx) and the servo processor, the S2B bus is used. This bus supports full-duplex asynchronous communication.

The SAA7812 is also a combined CD/DVD compatible decoding device. The device operates with built in hardware for CD/DVD error correction and de-interleaving operations. It decodes EFM or EFM+HF signals directly from the laser pre-amplifier, including analogue front-end, PLL data recovery, demodulation, and error correction.

Its analogue front-end input (the channel decoder), converts the HF input signal to the digital domain via an 8-bit ADC, preceded by an AGC circuit to obtain the optimum performance from the converter. An external resonator clocks this block. This subsystem recovers the data from the channel stream. It corrects asymmetry, performs noise filtering and equalisation, and finally recovers the bit clock and data from the channel using a digital PLL.

The demodulator part detects the frame synchronisation signals and decodes the EFM (14 bit) and EFM+ (16 bit) data and sub-code words into 8-bit symbols. Via the serial output interface, the I²S data (audio and video) go to the DVD decoder STi55xx.

The spindle-motor interface provides both motor control signals from the demodulator and, in addition, contains a tachometer loop that accepts tachometer pulses from the motor unit. They drive the motor IC (BA6665FM, item 7300).

The SAA7812 has two independent microcontroller interfaces. The first is a serial I²C-bus and the second is a standard 8-bit multiplexed parallel interface. Both of these interfaces provide access to 32 8-bit registers for control and status.

The Interface/Program Memory

The interface between front-end (SAA7812) and back-end (STi55xx) is via:

- I2S bus (BCLK, DATA, WCLK, FLAG, SYNC and V4).
- S2B bus (RXD_S2B, TXD_S2B, CPR_S2B and SUR_S2B).
- Miscellaneous I/O ports (RSTNF= front-end reset, EANF= front-end processor boot select).

Service tip: These lines contain series resistors (47 or 100 Ω) for easy hardware debugging, and for EMC/noise reduction of the high-speed I2S lines.

The front-end processor SAA7812 (Iguana) has two boot modes: normal boot from flash memory, or serial mode. The boot selection is via the EANF pin. The Iguana samples the EANF signal level once during boot-up. Once boot-up is completed, this pin is no longer used for this purpose. However, in the SD4.0SA_CH circuit, the EANF is also connected to the flash memory. Therefore, when this pin is LOW, the lower 1Mbits of the memory is accessible. Conversely, when this pin is HIGH, the upper 1Mbits is accessible.

Under front-end normal operation, the program memory (less than 1Mbits in size) should reside in the lower bank. Therefore, the EANF pin should be LOW at all times. Since the actual flash memory used is 2Mbits, the upper 1Mbits is unused. This area is reserved for possible use by the front-end self-diagnostic software, or flash download application.

9.2.3 Back-end: the Digital Part

The back-end consists of:

- DVD back-end processor
- SACD DSD processor
- Audio output
- Video output
- Clock factory
- Miscellaneous

DVD Back-end Processor

The SD4.0SA_CH is designed for the STi55xx family. Some of the DVD related features of these ICs are:

Processor overview

Function	STi5580	STi5588	STi5519
Basic CD/VCD/DVD decoding	X	X	X
Extra 2-channel of I2S output (PCMDATA3)	X	X	X
Karaoke	X	X	X
DTS	X	X	X
Audio post processing (equalizer, level meter, etc)		X	X
DVD audio		X	X
Progressive scan at analog video output		X	X

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Figure 9-2 Processor overview

The STi5580 has the same architecture as the STi5508 (used in earlier DVD generations), and is pin-to-pin compatible. It works on 3.3 V (VDD), and comprises the following functions:

- Video decoder, which supports MPEG1 and MPEG2.
- Audio decoder that supports AC-3, MPEG1, MPEG2, DTS, PCM, S/PDIF, and MP3.
- PAL/NTSC video encoder with simultaneously Y/C, CVBS, and RGB/YUV outputs.

- The video encoder supports Closed Caption and allows MacroVision 7.0/6.1.
- Full screen On Screen Display (OSD) generator.
- Three on-chip PLLs to generate all necessary clocks (as reference the 27 MHz video clock is used).

Input

Input data comes from the I2S-bus. The front-end interface of this device, accepts DVD, CD and CD-DA information.

Signal Processing

For video, the input data stream is decoded to the appropriate MPEG, Sub Picture, and OSD data streams, after which they are fed to the PAL/NTSC encoder. This cell will convert the digital MPEG/Sub Picture/OSD stream into a standard base band signal and into RGB components. It handles interlaced and non-interlaced data, can perform CC/TXT encoding, and allows MacroVision copy protection.

For audio, the processing cell is a fully compatible DTS, Dolby Digital (AC-3), MPEG1, MPEG2, PCM decoder, capable of decoding 5.1 and 2 channel streams.

Output

For video, six analogue output pins are available on which CVBS, S-VHS (Y/C), and RGB signals are present. They go, via a buffer, to connector 1703. As an option, a digital YUV output is available at connector 1704.

External Memory

The STi55xx family is capable of accessing external memory via three buses:

- **The enhanced memory interface (EMI).** This interface is configurable and can be used to access Flash, ROM, and various flavours of DRAM.
- **The shared memory interface (SMI).** The SMI is only used to access SDRAM. The SMI is connected to a 64Mbits (4M x 16bit) 7.5ns SDRAM (item 7500). The SDRAM has the following functions:
 - It is used by the MPEG video decoder as a frame buffer,
 - It holds the software and the variables used by it.
- **The I2C bus.** Via this bus, the NVRAM (or EEPROM) is accessible. This memory is used to store user settings, player settings, and region code. As the STi55xx I/O-lines are potentially unable handle 5V inputs, a voltage level shifter is foreseen for all I2C-busses. This circuit will isolate the STi55xx I2C ports (3.3V) from the system I2C bus (5V). See figure below.

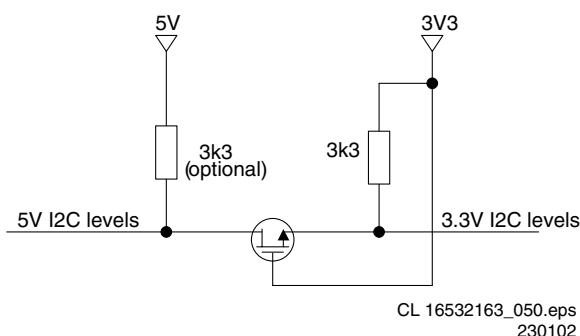


Figure 9-3 I2C voltage level shifter

The SACD DSD processor

The Furore-IC is a one-chip design, containing all the hardware that is required for SACD processing. It is intended to interface with the STi55xx-family DVD video decoders.

The Furore-IC contains a memory interface to support an external 16 or 64 Mbit SDRAM.

During SACD application, the STi55xx serves as a host, whereby the Furore is controlled via the EMI interface. The

Furore processing part is not used during all other play modes. In these modes, the PCM audio signals are fed through the Furore to the appropriate DAC.

Block diagram

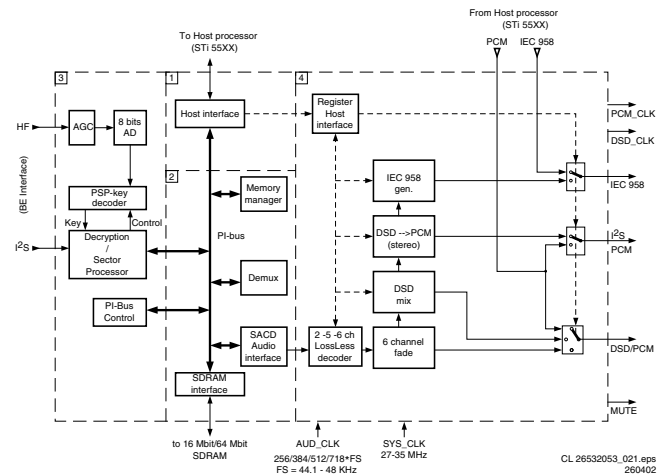


Figure 9-4 Block diagram Furore

We can divide the Furore-IC in four main parts (see block diagram):

1. **Host interface.** This is the link between the host bus and the internal registers and memory bus. It also supplies the general reset signal (HW and SW) and the interrupt signals.
2. **Data processing.** All modules and peripherals in this part are connected to a so-called PI-bus. It is beyond the scope of this manual to go more in detail on this subject.
3. **Copy protection.** On every SACD disc, a PSP-signal is recorded. The player can only play a disc if a valid PSP-signal is detected. This PSP-key is recorded, via a special mechanism, in the EFM-signal on the disc. To detect this key, the analogue HF-signal from the optical pick-up unit is fed directly to the Furore-IC. Via an AGC, the signal is fed to an ADC. The digitised HF signal is then fed to a block where key is encrypted. Control of this process is done via the host interface (sector processor).
4. **DSD decoding and post processing.** In this part, all processing is done to generate a DSD and/or an I²S stream (from the de-multiplexed stream coming from the data processing block), in such a way that it can directly be connected to a DA-converter. All processing is done on 384*FS.

Interfaces

Basic Engine Interface:

- Data input interface. The Basic Engine Interface (I2S) is connected to the output of the SAA7335 (HD61) high speed CD decoder.
- Analogue HF input. The analogue HF input, coming from the optical pickup unit (OPU), is also fed to the Furore-IC, to extract the copy-protection information PSP (Pit Signal Processing = invisible data is stored on to disc, which is required to decrypt the encrypted content).

- **SDRAM Interface:** The SDRAM interface forms a glue less interface to one 64 Mbit SDRAM device. The interface takes care for the power-up sequence, mode programming and refreshing of the SDRAM devices. This is hard coded in the interface and does not have to be controlled by the host.

Audio data input/output Interface:

- DSD/PCM combined data output. DSD_PCM: Output intended for a combined 6-channel DSD (SACD) and PCM (DVD-CDDA) DAC. Switching between the PCM data coming from the STi55xx, and the internal generated DSD signals, is done in the Furore IC.

- Stereo DSD only output. DSD_stereo: 2-channel DSD output with stereo down mix in the case of 5- and 6-channel, and normal stereo in case of 2-channel DSD mode.
- Stereo PCM data output. Two possible stereo sources can be selected as stereo PCM output:
 1. Stereo PCM coming from the STi55xx via the PCM input on Furore.
 2. Stereo or down-mix-PCM derived via a decimation filter from the SACD-DSD signal.
- Digital audio output interface (IEC958). The IEC958 format is intended to connect the DVD736SA to a digital receiver. No DSD signals are defined for IEC958, therefore the 'DSD-->PCM converted' signal is transmitted. Following two types of signals are possible on the digital interface:
 1. IEC958 data coming from the STi55xx.
 2. IEC958 data (stereo or down-mix-PCM) derived via a decimation filter from the SACD-DSD signal.
- Clock + reset input. Two different processing clocks and a reset pulse are needed:
 1. Sys_clk: System clock for data processing part, frequency can be 27 MHz or 768*FS.
 2. 384*FS: Processing clock for LLD and post processing.
 3. RESETn is an asynchronous reset and should be low for at least 1 period of DSD_CLK.

Memory

- SDRAM.
 - The size of the SDRAM is 64 Mbit.
 - The SDRAM (items 7500 and 7502) has the following functions:
 - It is used by the MPEG video decoder as a frame buffer,
 - It holds the software and the variables used by it.
- **Flash-ROM.** Two 2MB Flash-ROMs (items 7402 and 7403) hold the DVD firmware, and are controlled by pin 16 (FLASH_OEN) of the STi55xx. It must be able to perform a download (by disk or OS-link) in a Flash-only system.
- EEPROM. User settings, player settings, and region code are stored in a 32 Kb I²C EEPROM.

Audio Output

The audio interfaces available in SD4.0SA_CH are I2S and S/PDIF for digital audio output, and I2S karaoke microphone input.

In SACD player, two types of DACs (that are PCM DAC and high end DSD DAC), are used on AV board.

The audio data path to both DACs is routed via the Furore 2.

I2S audio

The STi55xx is capable of 6-channel I2S output. These channels can be configured to output 5.1 Dolby Digital, DTS, etc.

- PCM_OUT0: Left and Right.
- PCM_OUT1: Centre and LFE (subwoofer).
- PCM_OUT2: Left and Right surround.

Two additional channels (available in STi5580 and STi5588) are capable of providing down-mixed stereo.

S/PDIF

The S/PDIF signal level (pin 57, SPDIF_OUT) is 5V TTL at module interface. To meet the complete S/PDIF specifications, an external de-coupling circuit (item 7720, diagram M7) is implemented.

I2S karaoke (optional)

The STi5580 and STi5588 have built-in karaoke processing. The internal karaoke block accepts I2S signal, acting as the master by generating the required KOKPCMCLK frequency. This frequency is always 1/4 the music sampling frequency.

An external analogue-to-digital converter (ADC), acting as slave, is required to convert the microphone signals to I2S signals.

CD-DA/DVD Data Path

The data path for CD-DA and DVD is as follows:

- I2S data from the M2 basic engine enters the STi55xx.
- The STi55xx processes the data, and sends the 6 PCM output channels to Furore 2. The LeRi channels are directly passed to the AV board also.
- The switch matrix of the Furore 2 sends the two incoming stereo PCM channels (LeRi) to the AV board.
- The switch matrix of the Furore 2 sends the six incoming PCM channels to the high end DAC board.
- The mute signal from the STi55xx is directly passed to the AV board. This requires a patch on the mono board.
- The IEC958 output of the STi55xx is fed directly to AV board.

The clock distribution is as follows:

- The master clock 384FS is received from the high end DAC board.
- From this clock the 27 MHz clock for STi5580 and the Furore 2 is derived (Video clock).
- From the 27 MHz clock the audio clock (256FS) is derived. The STi55xx and Furore 2 use this clock. For CD-DA FS amounts to 44.1 KHz, for DVD 48 or 96 KHz.
- In case of CD-DA, the high end DAC uses its internal clock (384FS). In case of DVD, the switch matrix of Furore 2 sends the audio clock (256FS) to the high end DAC on AV board.
- The AV board receives the 256FS clock.

Selection of the audio clock is done in the clock factory. For a description of the clock factory, see paragraph 'Clock Factory'.

SACD Data Path

The data path for DSD/DST is as follows:

- I2S data from the basic engine enters the Furore 2.
- The Furore 2 processes the data. This results in 6 DSD/DST channels.
- The switch matrix of the Furore 2 sends the 6 DSD/DST channels to the high end DAC on AV board.
- The 6 DSD/DST channels are down mixed to a stereo PCM signal.
- The switch matrix of the Furore 2 sends the stereo PCM signal to the AV board.
- The mute signal from the STi55xx is directly passed to the AV board. This requires a patch on the mono board.

The clock distribution is as follows:

- The master clock 384FS is received from the high end DAC on AV board.
- From this clock the 27 MHz clock for STi55xx and Furore 2 is derived (video clock).
- From the 27 MHz clock the audio clock (256FS) is derived. The STi5580 and Furore 2 use this clock.
- The high end DAC on AV board uses its own XTAL clock (384FS). The 256FS clock to the DAC board is switched off, to prevent for interference.
- The AV board receives the 256FS clock.

Selection of the audio clock is done in the clock factory. For a description of the clock factory, see paragraph 'Clock Factory'.

Video Output

Digital video (optional)

Digital YUV output is routed directly from STi55xx ports to a 24-pin connector (item 1704). From the same connector, the HSYNC, VSYNC and 27MHZ_CLK signals are available. The digital YUV connector is the interface to external video processing devices; such as high quality progressive scan codex and high quality video DAC.

Analogue video

The STi55xx is capable of 6-channel analogue video. Three channels (pins 25, 26 and 27) are RGB or YUV format, while the other three channels (pins 32, 33 and 34) are Y, C, and CVBS.

A video output buffer (see diagram M7, e.g. item 7701 for R) is implemented: an 8MHz/16MHz selectable filter stage and a 75Ω drive stage.

Clock Factory

One clock factory is implemented to support all clocks required by the Furore 2. The various master clock, which depends on whether SACD is present, is used for SD4.00_SA_CH. The clock factory of SD4.00_SA_CH is showed in Figure 8-2.

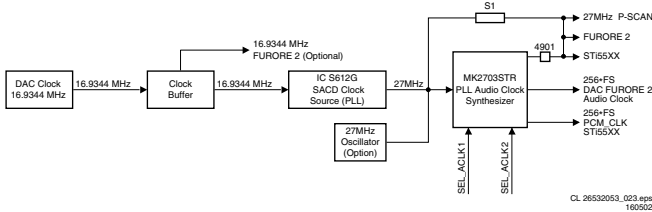


Figure 9-5 Block diagram clock factory

For the SACD player, the clock system is a DAC master clock system. For non-SACD system, the clock system is a mono board master clock system.

The Furore 2 supports clock 256*FS/384*FS/512*FS. The most convenient value in the market is 16.9344 MHz (384*FS, FS=44.1kHz). Therefore, the master clock on the SD4.00_SA_CH mono board is the 384*FS coming from the A/V board. The 384*FS (16.9344 MHz) from the DAC clock, must always be present. It is buffered before it is sent to the Furore 2 and the rest of the clock factory. The IC S612G delivers a 27 MHz system clock.

The Furore 2 and Sti5580/Sti5588 (Video) use this clock. It is used to derive the PCM audio clocks 256*FS by the MK2703STR. This IC is also used to buffer the incoming 27 MHz clock.

The communication between the Sti55xx and the Furore 2 is asynchronous.

To support non-SACD playback, an on-board 27MHz oscillator delivers the master clock for SD4.00_SA_CH mono board.

Miscellaneous

Most general IO ports are connected directly to the module interface. Compared with the SD3.0 module, some on-board circuits are removed, as it made more sense (and more cost effective) to implement these circuits externally.

SCART Status Signal

The SCART0 and SCART1 signals are directly available at the module interface, where the 0_6_12V signal is generated. See table below:

Table 9-1 0_6_12V SCART status truth table

Function	PIO3_6 (SCART0)	PIO3_7 (SCART1)	0_6_12V (at SCART connector)
TV display	1	1	0V
TV display	0	1	0V
16:9 aspect ratio	1	0	+6V
4:3 aspect ratio	0	0	+12V

Mute

The audio MUTE signal (active 'high') is directly available at the module interface.

Service

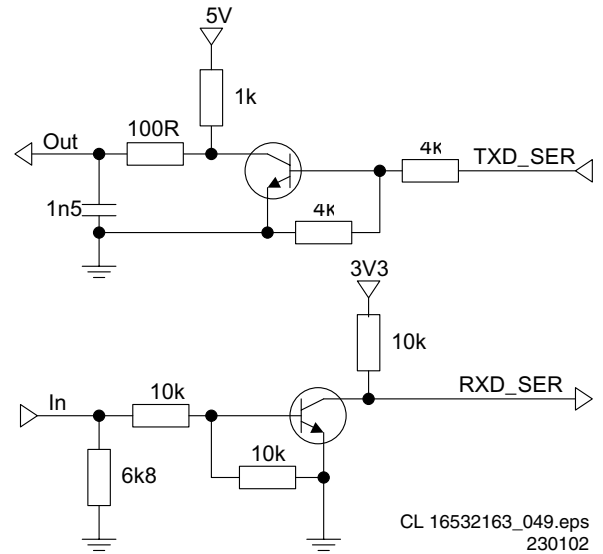


Figure 9-6 Service Port Buffer

The service port (see diagram M5) is simplified to reduce cost. The unused RTS and CTS lines are no longer connected. A transistor buffer (item 7508) is used instead of the Schmitt Trigger buffer (item 7501).

The overall loading and driving capability of the RS-232 emulator port is not greatly changed. However, as a precaution, the Schmitt Trigger circuit remains in the layout as an optional implementation.

This SD4.0SA_CH has the same ComPair connector as in previous DVD generations. Flashing of the application-SW is not possible with the ComPair cable, except with a CD-R disc. For sets with Mask-ROM software, replace it with a programmed Flash (available via your Philips Service organisation).

Power Supply (diagram M7)

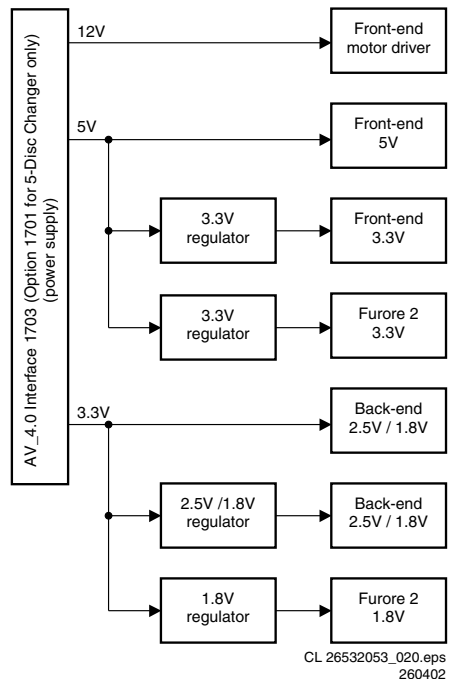


Figure 9-7 Mono Board Power Supply Block Diagram

The main power supplies to the module are 3.3V, 5V, and 12V (input via connector 1703).

The SACD DSD/DST decoder Furore 2 uses 1.8V for its core and analogue portion, and 3.3V for its interface. The on-board 1.8V linear regulator LF18ABDT and 3.3V linear LD1117DT33 are used to generate 1.8V and 3.3V power supply respectively. The back-end section mainly uses the 1.8V or 2.5V and 3.3V, which depend on which back-end processor is used. The on-board linear regulators LF25ABDT or LF18ABDT are used to generate the 2.5V (or 1.8V) required by the STi55xx. The front-end section mainly uses the 5V and 12V. An on-board linear regulator LD1117DT33 can be used to generate the 3.3V required by the front-end. The 12V is used by the motor and servo drivers.

Reset Circuit

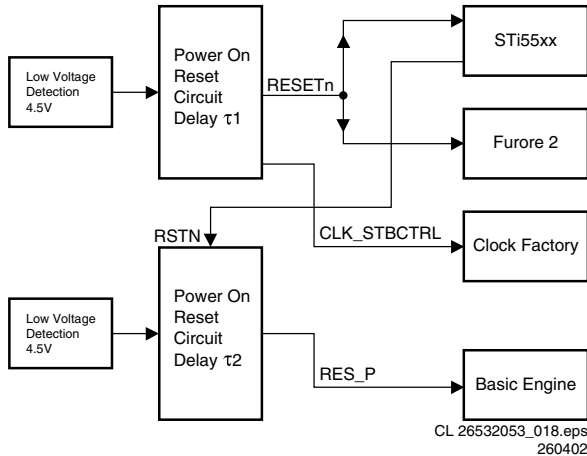


Figure 9-8 Block diagram of reset circuit

This reset circuit takes care that booting the different devices on the mono board takes place in the correct order. The correct reset order is:

1. The Power On Reset circuit (delay t1) creates a reset signal 'RESETn' to reset the STi55xx and Furore .
2. In the meantime, the Power On Reset circuit (delay t1) creates a reset signal 'CLK_STBCTRL', which is inverted to 'RESETn', to enable the Clock Factory.
3. Then, the Power On Reset circuit (delay t2) generates a reset signal 'RES_P' to reset the Basic Engine.
4. The STi55xx can now reset the Basic Engine via 'RSTN'.

9.3 Abbreviation List

ADC	Analogue to Digital Converter
AM	Amplitude Modulation
BE	Basic Engine
ComPair	Computer aided rePair
CD-DA	CD Digital Audio
CS	Chip Select
DAC	Digital to Analogue Converter
DAIO	Digital Audio Input Output
DENC	Digital Encoder
DFU	Direction For Use: description for the end user
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSD	Direct Stream Digital
DSP	Digital Signal Processing
DTS	Digital Theatre Sound
DVD	Digital Versatile Disc
EEPROM	Electrically Erasable and Programmable Read Only Memory
EFM	Eight to Fourteen bit Modulation
EMI	External Memory Interface (STi55xx)
FFC	Flat Foil Cable
FLASH	Flash memory
HPF	High Pass Filter
HW	Hardware
I2C	Integrated IC bus (signals at 5V level)
I2S	Integrated IC Sound bus (signals at 3.3V level)
IC	Integrated Circuit
IF	Intermediate Frequency
IRQ	Interrupt Request
LLD	Loss Less Decoder
LPCM	Linear Pulse Code Modulation
LRCLK	Left/Right clock
LVTTTL	Low Voltage Transistor Transistor Logic (3.3V logic)
MACE	Mini All Compact Disc Engine
MPEG	Motion Pictures Experts Group
NC	Not Connected
NVM	Non Volatile Memory: IC containing TV related data e.g. alignments
OC	Open Circuit
OPU	Optical Pick-up Unit
PCB	Printed Circuit Board (see PWB)
PCM	Pulse Code Modulation
PCM_CLK	Audio system clock for DAC
PCM_OUTx	Audio serial output data
PSU	Power Supply Unit
PWB	Printed Wiring Board (see PCB)
RAM	Random Access Memory
RGB	Red, Green and Blue colour space
ROM	Read Only Memory
S2B	Serial to Basic Engine, communication bus between host- and servo processor
SCL	Serial Clock I2C
SCLK	Audio serial bit clock
SDA	Serial Data I2C
SDRAM	Synchronous DRAM
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
STBY	Standby
SVCD	Super Video CD
SW	Software
THD	Total Harmonic Distortion
TTL	Transistor Transistor Logic (5V logic)
uP	Microprocessor
VCD	Video CD
Y/C	Luminance (Y) and Chrominance (C) signal
YUV	Component video

9.4 IC Data

In this paragraph, the internal blockdiagrams and pinning are given of ICs that are drawn as 'black box' in the electrical diagrams (with exception of 'memory' and 'logic' ICs).

9.4.1 Diagram M1

DVDALAS2plus Advanced Analogue DVD Signal Processor and Laser Supply

TZA1033

DEVICE BLOCK DIAGRAM

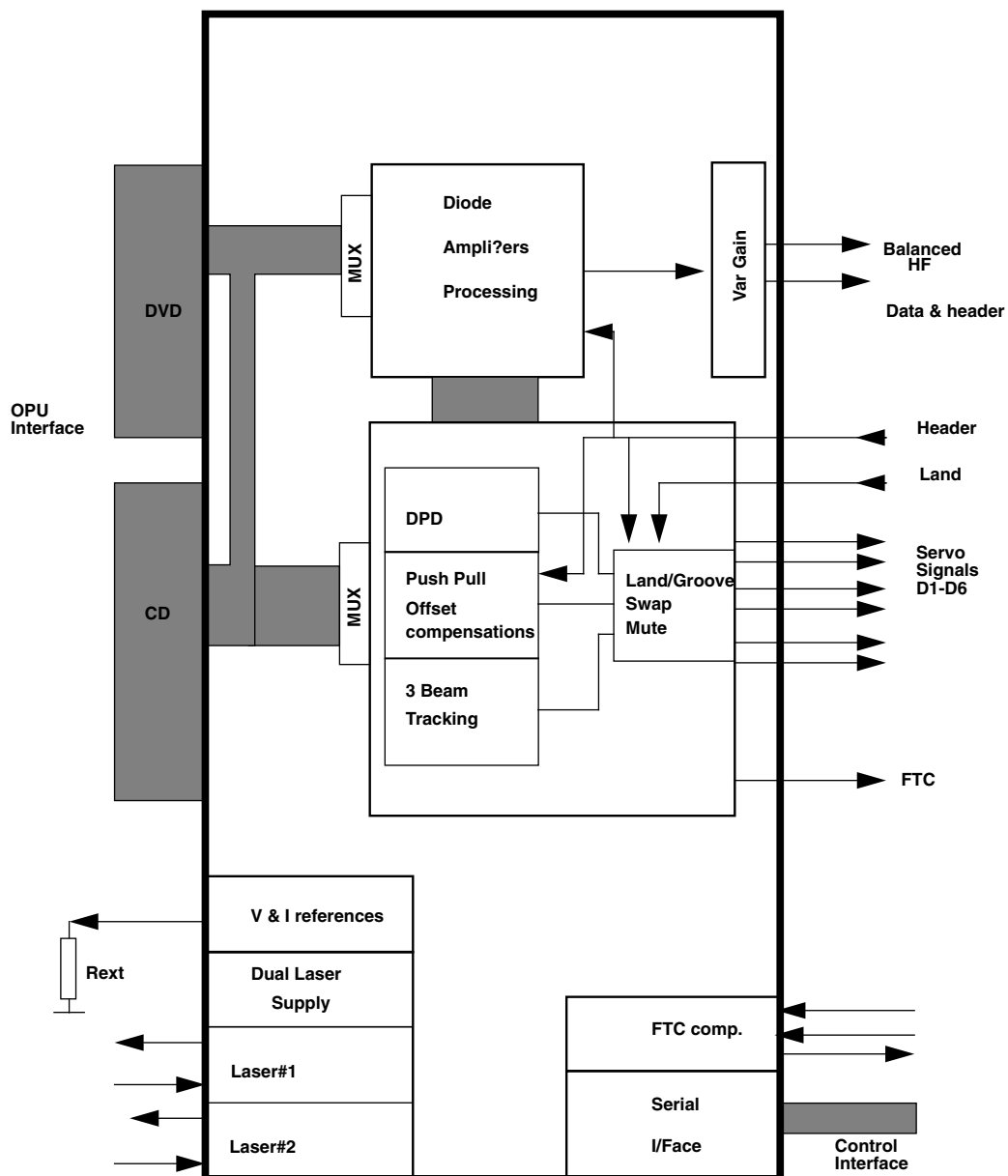


Figure 9-9 TZA1033 Device Block Diagram (item 7100)

DVDALAS2plus Advanced Analogue DVD
Signal Processor and Laser Supply

TZA1033

PINNING

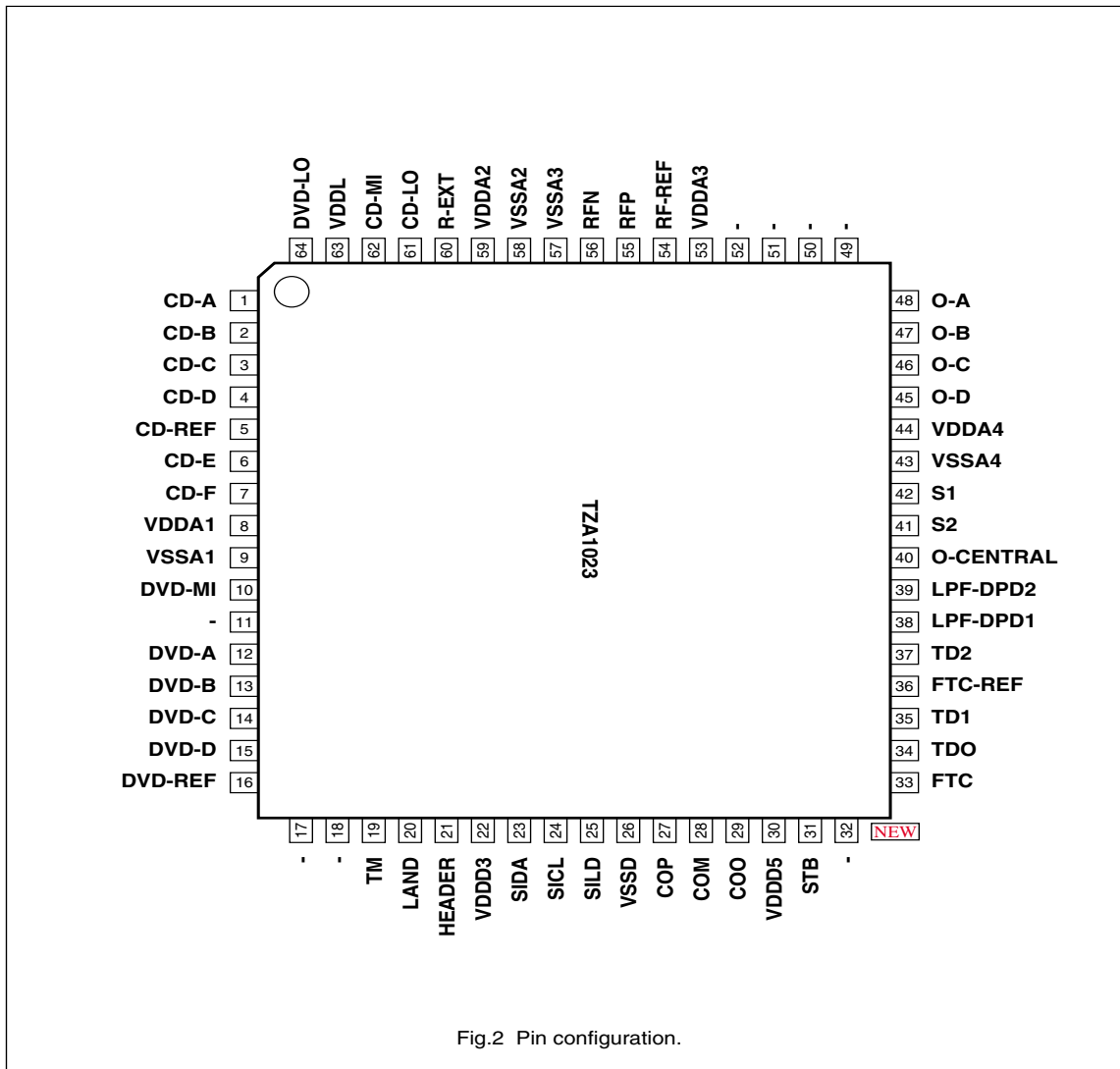


Fig.2 Pin configuration.

Figure 9-10 TZA1033 Pinning (item 7100)

9.4.2 Diagram M2

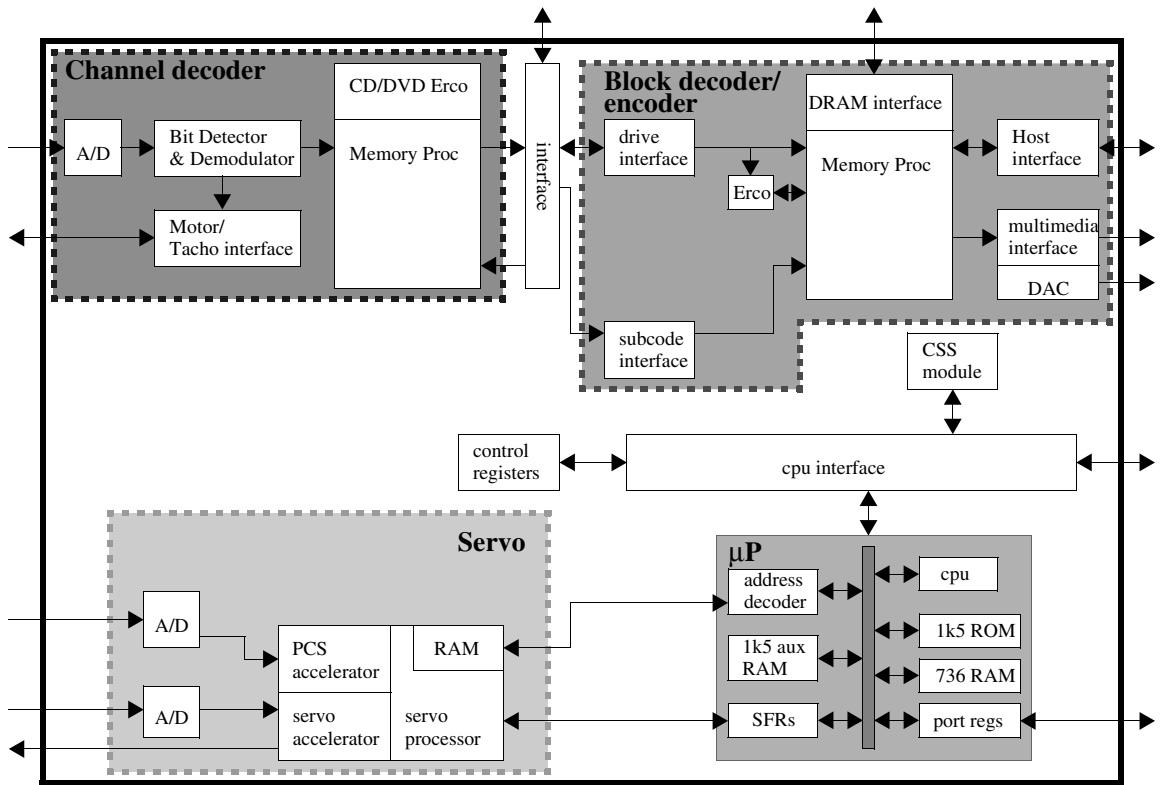


Figure 1 Functional Block Diagram

Figure 9-11 SAA7812HL Block Diagram (item 7200)

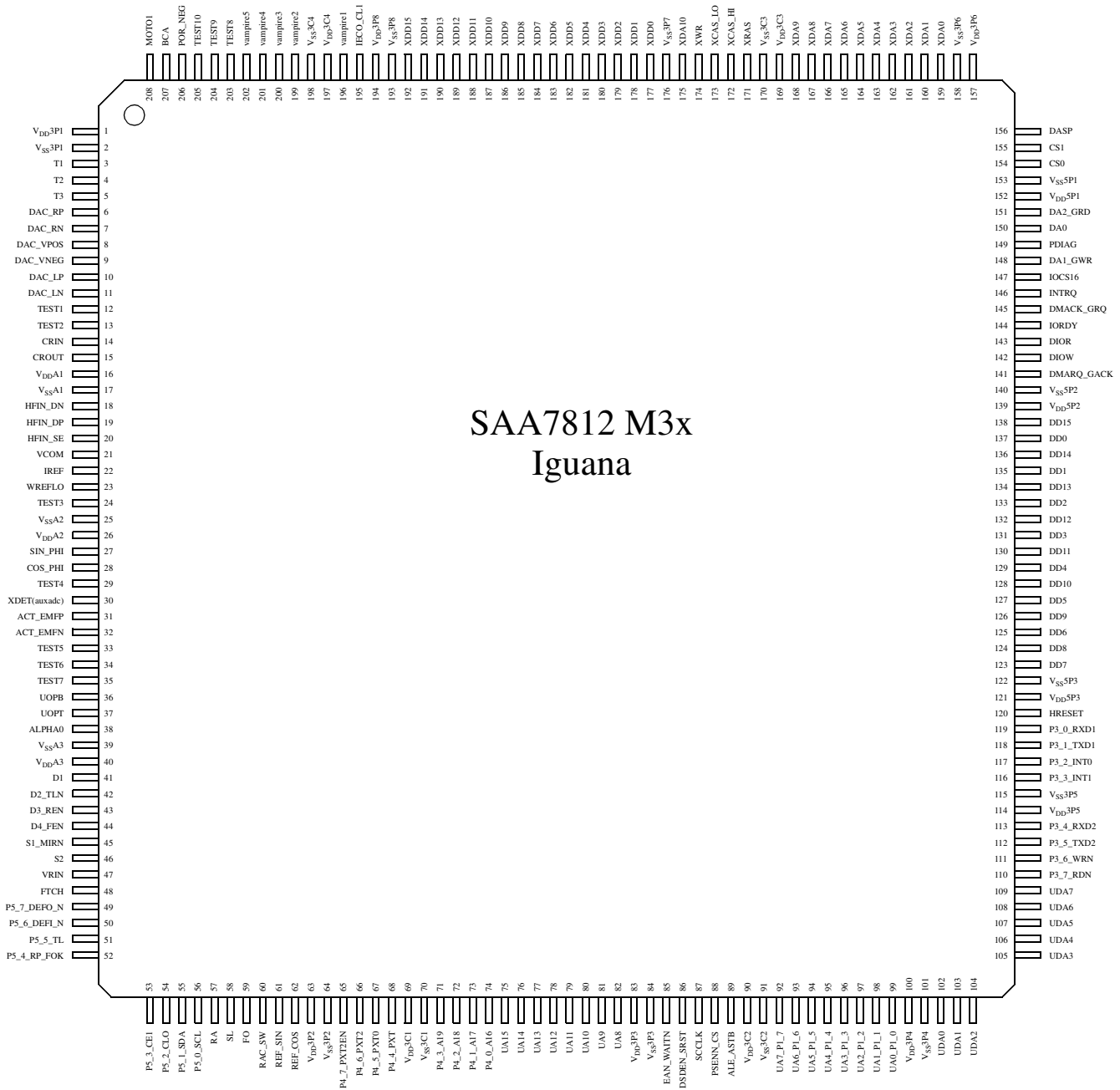


Figure 2 Pinning Diagram

Figure 9-12 SAA7812HL Pinning (item 7200)

9.4.3 Diagram M6

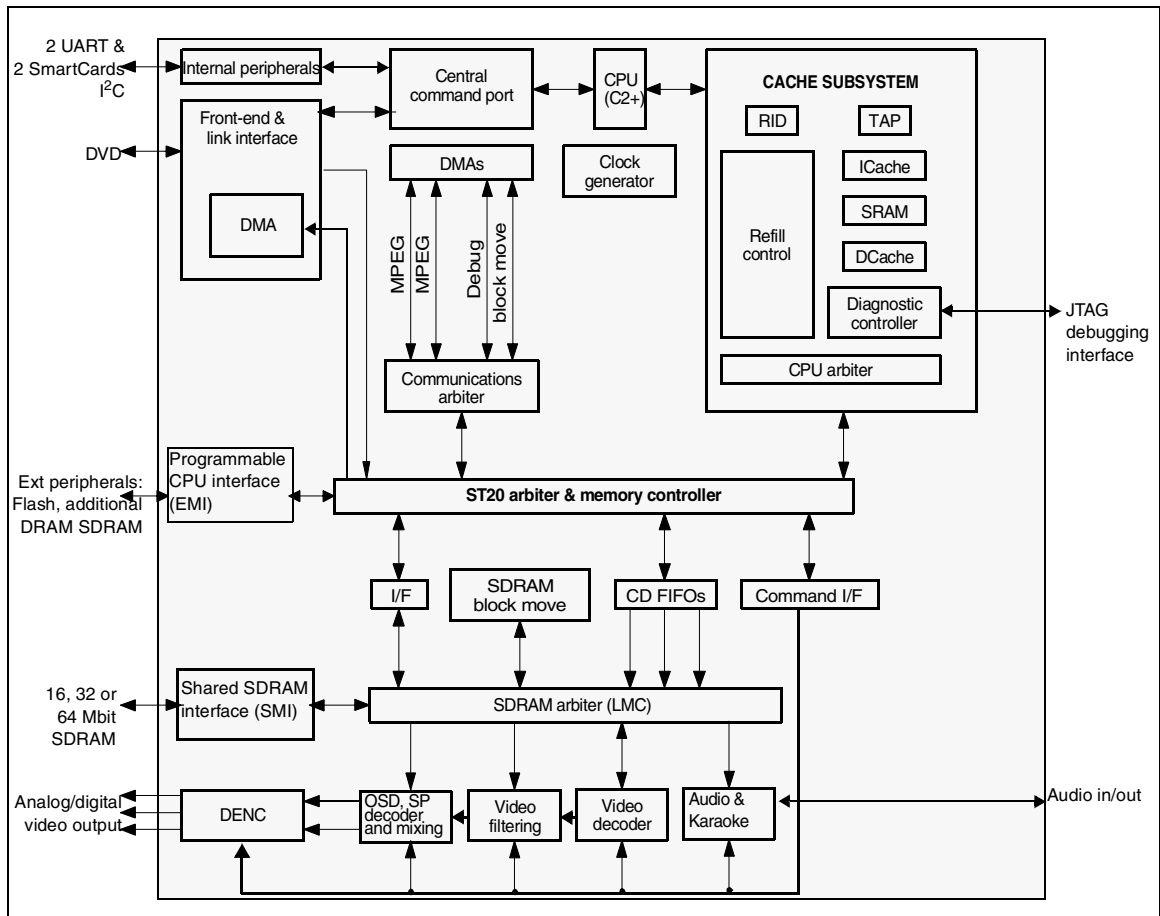


Figure 9-13 STi5580 Block Diagram (item 7600)

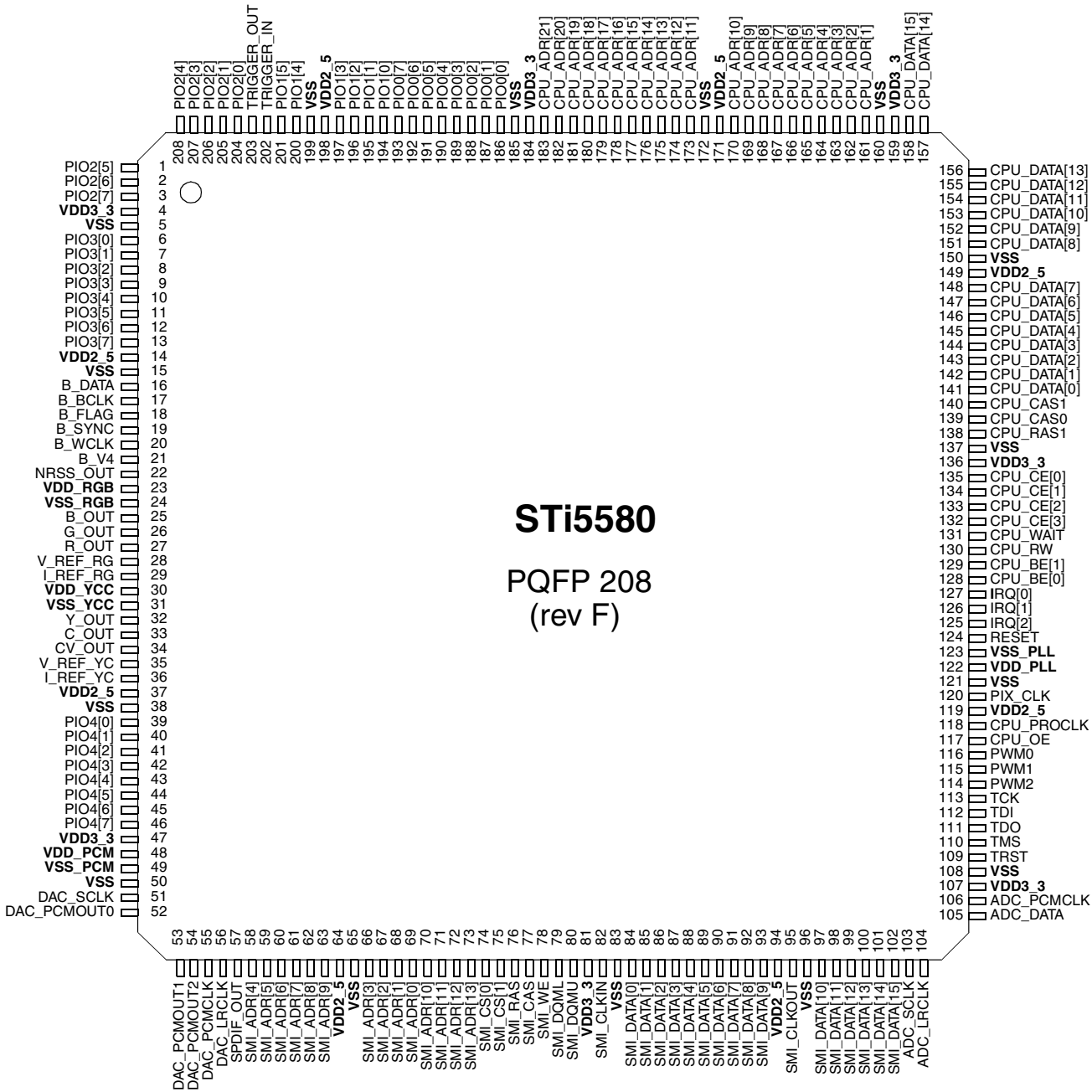


Figure 9-14 STi5580 Pinning (item 7600)

10. Spare parts list

Mono Board

Various

1013	2422 025 17451	CON BM H 30P F 1.00 FFC 0.3 R
1100	2422 025 17529	CON BM H 24P F 0.50 FFC 0.3 R
1201	2422 543 01292	RES XTL SM 8M4672 30P AT-41 R
1300	2422 025 17746	CON BM V 11P F 1.00 FFC 0.3 R
1301	2422 025 17747	CON BM V 8P F 1.00 FFC 0.3 R
1302	2422 025 16543	CON BM H 4P M 2.00 PH SMD R
1500	2422 025 16703	CON H 7P M 2.00 PH SMD R
1703	2422 025 17451	CON BM H 30P F 1.00 FFC 0.3 R

-II-

2000	4822 126 13879	220nF 20% 16V
2100	4822 126 11785	0603 50V 47P PM5
2101	4822 126 13193	4.7nF 10% 63V
2102	2238 586 59812	0603 50V 100NP80M
2103	3198 016 31020	0603 25V 1nF
2104	2238 586 59812	0603 50V 100NP80M
2105	3198 017 41050	0603 10V 1µF COL R
2106	3198 017 36830	0603 16V 68nF COL
2107	3198 017 41050	0603 10V 1µF COL R
2108	2238 586 59812	0603 50V 100NP80M
2109	2238 586 59812	0603 50V 100NP80M
2110	3198 016 31020	0603 25V 1nF
2112	2238 586 59812	0603 50V 100NP80M
2113	2238 586 59812	0603 50V 100NP80M
2115	4822 126 13193	4.7nF 10% 63V
2117	4822 126 14494	22nF 10% 25V 0603
2118	4822 126 14507	18pF 5% 50V 0603
2119	2238 586 59812	0603 50V 100NP80M
2120	2238 586 59812	0603 50V 100NP80M
2121	4822 126 14494	22nF 10% 25V 0603
2122	2238 586 59812	0603 50V 100NP80M
2123	4822 126 13879	220nF 20% 16V
2124	2238 586 59812	0603 50V 100NP80M
2129	2238 586 59812	0603 50V 100NP80M
2131	2238 586 59812	0603 50V 100NP80M
2132	2238 586 59812	0603 50V 100NP80M
2133	2238 586 59812	0603 50V 100NP80M
2134	4822 051 30008	OR00 JUMPER
2135	4822 051 30008	OR00 JUMPER
2137	2238 586 59812	0603 50V 100NP80M
2139	4822 126 13879	220nF 20% 16V
2140	3198 016 36810	0603 25V 680P COL R
2141	3198 016 36810	0603 25V 680P COL R
2142	5322 126 11582	6.8nF 10% 63V
2143	5322 126 11582	6.8nF 10% 63V
2144	4822 126 14487	8.2pF 0.5% 50V 0603
2145	4822 126 14487	8.2pF 0.5% 50V 0603
2146	3198 016 31020	0603 25V 1nF
2147	5322 126 11583	10nF 10% 50V 0603
2200	2238 586 59812	0603 50V 100NP80M
2201	2238 586 59812	0603 50V 100NP80M
2202	2238 586 59812	0603 50V 100NP80M
2203	2238 586 59812	0603 50V 100NP80M
2204	2238 586 59812	0603 50V 100NP80M
2205	2238 586 59812	0603 50V 100NP80M
2206	2238 586 59812	0603 50V 100NP80M
2207	2238 586 59812	0603 50V 100NP80M
2208	2238 586 59812	0603 50V 100NP80M
2209	2238 586 59812	0603 50V 100NP80M
2210	2238 586 59812	0603 50V 100NP80M
2211	2238 586 59812	0603 50V 100NP80M
2212	2238 586 59812	0603 50V 100NP80M
2213	2238 586 59812	0603 50V 100NP80M
2214	2238 586 59812	0603 50V 100NP80M
2215	2238 586 59812	0603 50V 100NP80M
2216	3198 017 41050	0603 10V 1µF COL R
2217	5322 126 11583	10nF 10% 50V 0603
2218	3198 017 41050	0603 10V 1µF COL R
2219	4822 122 33761	22pF 5% 50V
2220	4822 122 33761	22pF 5% 50V
2221	2238 586 59812	0603 50V 100NP80M
2223	2020 552 94427	0603 50V 100P PM5 R
2224	2020 552 94427	0603 50V 100P PM5 R
2225	2020 552 94427	0603 50V 100P PM5 R
2226	2020 552 94427	0603 50V 100P PM5 R
2227	2238 586 59812	0603 50V 100NP80M

2228	2238 586 59812	0603 50V 100NP80M
2229	2238 586 59812	0603 50V 100NP80M
2230	2238 586 59812	0603 50V 100NP80M
2231	2238 586 59812	0603 50V 100NP80M
2232	4822 126 13879	220nF 20% 16V
2234	4822 126 13617	1.8nF 10% 50V
2235	4822 126 14549	33nF 10V O6O3
2236	4822 126 13617	1.8nF 10% 50V
2237	2238 586 59812	0603 50V 100NP80M
2238	2238 586 59812	0603 50V 100NP80M
2239	2238 586 59812	0603 50V 100NP80M
2300	2238 586 59812	0603 50V 100NP80M
2301	2238 586 59812	0603 50V 100NP80M
2302	2238 586 59812	0603 50V 100NP80M
2303	2238 586 59812	0603 50V 100NP80M
2304	2238 586 59812	0603 50V 100NP80M
2305	2238 586 59812	0603 50V 100NP80M
2306	2238 586 59812	0603 50V 100NP80M
2307	2238 586 59812	0603 50V 100NP80M
2308	4822 126 13883	220pF 5% 50V
2309	4822 126 13883	220pF 5% 50V
2310	4822 126 13883	220pF 5% 50V
2311	2238 586 59812	0603 50V 100NP80M
2313	2238 586 59812	0603 50V 100NP80M
2315	2238 586 59812	0603 50V 100NP80M
2316	2238 586 59812	0603 50V 100NP80M
2320	4822 124 80151	47µF 16V
2321	4822 124 80151	47µF 16V
2402	2238 586 59812	0603 50V 100NP80M
2405	2238 586 59812	0603 50V 100NP80M
2408	2238 586 59812	0603 50V 100NP80M
2410	4822 124 12095	100µF 20% 16V
2411	4822 124 12095	100µF 20% 16V
2414	2238 586 59812	0603 50V 100NP80M
2415	3198 017 41050	0603 10V 1µF COL R
2417	4822 124 23002	10µF 16V
2418	3198 017 44740	0603 10V 470nF COL
2500	4822 124 80349	47µF 20% 6.3V
2501	2238 586 59812	0603 50V 100NP80M
2504	2238 586 59812	0603 50V 100NP80M
2505	2238 586 59812	0603 50V 100NP80M
2506	2238 586 59812	0603 50V 100NP80M
2507	2238 586 59812	0603 50V 100NP80M
2510	2238 586 59812	0603 50V 100NP80M
2511	2238 586 59812	0603 50V 100NP80M
2512	2238 586 59812	0603 50V 100NP80M
2513	2238 586 59812	0603 50V 100NP80M
2516	2238 586 59812	0603 50V 100NP80M
2517	2238 586 59812	0603 50V 100NP80M
2518	2238 586 59812	0603 50V 100NP80M
2519	2238 586 59812	0603 50V 100NP80M
2520	2238 586 59812	0603 50V 100NP80M
2522	4822 126 14247	0603 50V 1N5 COL R
2524	2238 586 59812	0603 50V 100NP80M
2525	4822 124 80349	47µF 20% 6.3V
2533	2238 586 59812	0603 50V 100NP80M
2604	4822 126 14494	22nF 10% 25V 0603
2605	4822 124 23002	10µF 16V
2606	2238 586 59812	0603 50V 100NP80M
2607	4822 124 23002	10µF 16V
2608	2238 586 59812	0603 50V 100NP80M
2619	2238 586 59812	0603 50V 100NP80M
2620	2238 586 59812	0603 50V 100NP80M
2621	2238 586 59812	0603 50V 100NP80M
2622	2238 586 59812	0603 50V 100NP80M
2623	2238 586 59812	0603 50V 100NP80M
2624	2238 586 59812	0603 50V 100NP80M
2625	2238 586 59812	0603 50V 100NP80M
2626	2238 586 59812	0603 50V 100NP80M
2627	2238 586 59812	0603 50V 100NP80M
2628	2238 586 59812	0603 50V 100NP80M
2629	2238 586 59812	0603 50V 100NP80M
2630	2238 586 59812	0603 50V 100NP80M
2631	2238 586 59812	0603 50V 100NP80M
2632	2238 586 59812	0603 50V 100NP80M
2633	2238 586 59812	0603 50V 100NP80M
2634	2238 586 59812	0603 50V 100NP80M
2635	3198 030 74780	EL SM 35V 4U7 PM20 COL R
2636	3198 030 74780	EL SM 35V 4U7 PM20 COL R
2637	2238 586 59812	0603 50V 100NP80M
2638	2020 552 94427	0603 50V 100P PM5 R
2700	2238 586 59812	0603 50V 100NP80M
2701	4822 126 11785	0603 50V 47P PM5
2702	3198 030 82280	EL SM 50V 2U2 PM20 COL R
2703	4822 126 11785	0603 50V 47P PM5
2704	4822 126 11785	0603 50V 47P PM5

2705	4822 126 11785	0603 50V 47P PM5
2706	4822 124 12095	100µF 20% 16V
2707	2238 586 59812	0603 50V 100NP80M
2708	2238 586 59812	0603 50V 100NP80M
2709	3198 030 82280	EL SM 50V 2U2 PM20 COL R
2710	2238 586 59812	0603 50V 100NP80M
2711	4822 126 11785	0603 50V 47P PM5
2712	4822 126 11785	0603 50V 47P PM5
2713	4822 124 12095	100µF 20% 16V
2714	2238 586 59812	0603 50V 100NP80M
2715	3198 016 31020	0603 25V 1nF
2716	3198 016 31020	0603 25V 1nF
2718	2238 586 59812	0603 50V 100NP80M
2720	3198 030 82280	EL SM 50V 2U2 PM20 COL R
2721	4822 126 11785	0603 50V 47P PM5
2722	4822 126 11785	0603 50V 47P PM5
2723	2238 586 59812	0603 50V 100NP80M
2724	2238 586 59812	0603 50V 100NP80M
2725	3198 030 82280	EL SM 50V 2U2 PM20 COL R
2726	4822 126 11785	0603 50V 47P PM5
2727	4822 126 11785	0603 50V 47P PM5
2728	4822 124 23002	10µF 16V
2729	4822 124 12095	100µF 20% 16V
2730	2238 586 59812	0603 50V 100NP80M
2731	2238 586 59812	0603 50V 100NP80M
2732	3198 030 82280	EL SM 50V 2U2 PM20 COL R
2733	4822 126 11785	0603 50V 47P PM5
2734	4822 126 11785	0603 50V 47P PM5
2735	2238 586 59812	0603 50V 100NP80M
2736	2238 586 59812	0603 50V 100NP80M
2737	2238 586 59812	0603 50V 100NP80M
2738	4822 122 33761	22pF 5% 50V
2739	2238 586 59812	0603 50V 100NP80M
2740	4822 124 12095	100µF 20% 16V
2741	2238 586 59812	0603 50V 100NP80M
2742	3198 030 82280	EL SM 50V 2U2 PM20 COL R
2743	4822 126 11785	0603 50V 47P PM5
2744	4822 126 11785	0603 50V 47P PM5
2745	2238 586 59812	0603 50V 100NP80M
2746	2238 586 59812	0603 50V 100NP80M
2747	4822 124 23002	10µF 16V
2748	4822 124 12095	100µF 20% 16V
2749	2238 586 59812	0603 50V 100NP80M
2750	2238 586 59812	0603 50V 100NP80M
2751	4822 124 12095	100µF 20% 16V
2800	2238 586 59812	0603 50V 100NP80M
2801	2238 586 59812	0603 50V 100NP80M
2802	2238 586 59812	0603 50V 100NP80M
2803	2238 586 59812	0603 50V 100NP80M
2804	2238 586 59812	0603 50V 100NP80M
2805	2238 586 59812	0603 50V 100NP80M
2806	2238 586 59812	0603 50V 100NP80M
2807	2238 586 59812	0603 50V 100NP80M
2808	2238 586 59812	0603 50V 100NP80M
2809	2238 586 59812	0603 50V 100NP80M
2810	4822 126 14238	0603 50V 2N2 COL R
2811	5322 126 11583	10nF 10% 50V 0603
2813	4822 126 14225	56pF 5% 50V 0603
2814	2238 586 59812	0603 50V 100NP80M
2816	2238 586 59812	0603 50V 100NP80M
2817	5322 126 11578	1nF 10% 50V 0603
2900	4822 124 12095	100µF 20% 16V
2901	2238 586 59812	0603 50V 100NP80M
2902	5322 126 11583	10nF 10% 50V 0603

3027	4822 051 30339	33Ω 5% 0.062W	3270	4822 051 30392	3k9 5% 0.063W 0603	3633	4822 051 30339	33Ω 5% 0.062W
3028	4822 051 30339	33Ω 5% 0.062W	3271	4822 051 30103	10k 5% 0.062W	3634	4822 051 30339	33Ω 5% 0.062W
3029	4822 051 30339	33Ω 5% 0.062W	3272	4822 051 30103	10k 5% 0.062W	3635	4822 051 30339	33Ω 5% 0.062W
3030	4822 051 30339	33Ω 5% 0.062W	3273	4822 051 30103	10k 5% 0.062W	3636	4822 051 30339	33Ω 5% 0.062W
3036	4822 051 30103	10k 5% 0.062W	3274	4822 051 30103	10k 5% 0.062W	3642	2322 704 61303	RST SM 0603 RC22H 13k PM1 R
3037	4822 117 13573	NETW 4 X 47Ω 5% MNR14	3275	4822 051 30472	4k7 5% 0.062W	3643	2322 704 61303	RST SM 0603 RC22H 13k PM1 R
3100	4822 051 30563	56k 5% 0.062W	3277	4822 051 30479	47Ω 5% 0.062W	3644	4822 051 30101	100Ω 5% 0.062W
3101	4822 051 30102	1k 5% 0.062W	3278	4822 051 30103	10k 5% 0.062W	3645	5322 117 13042	3k9 1% 0.063W 0603 RC22H
3102	4822 051 30223	22k 5% 0.062W	3279	4822 051 30103	10k 5% 0.062W	3646	5322 117 13042	3k9 1% 0.063W 0603 RC22H
3103	4822 051 30102	1k 5% 0.062W	3280	4822 051 30472	4k7 5% 0.062W	3647	4822 051 30479	47Ω 5% 0.062W
3104	5322 117 13028	12k 1% 0.063W 0603 RC22H	3282	4822 051 30472	4k7 5% 0.062W	3648	4822 051 30103	10k 5% 0.062W
3105	4822 117 13501	82Ω 5% 0.62W 0603	3287	4822 051 30008	0Ω jumper	3702	4822 051 30332	3k3 5% 0.062W
3106	4822 051 30221	220Ω 5% 0.062W	3288	4822 051 30103	10k 5% 0.062W	3703	4822 051 30332	3k3 5% 0.062W
3107	4822 117 13501	82Ω 5% 0.62W 0603	3289	4822 051 30103	10k 5% 0.062W	3704	4822 051 30683	68k 5% 0.062W
3108	4822 051 30222	2k2 5% 0.062W	3290	4822 051 30103	10k 5% 0.062W	3705	4822 051 30471	470Ω 5% 0.062W
3110	4822 051 30683	68k 5% 0.062W	3291	4822 051 30103	10k 5% 0.062W	3706	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3111	4822 051 30221	220Ω 5% 0.062W	3294	4822 051 30479	47Ω 5% 0.062W	3707	4822 051 30101	100Ω 5% 0.062W
3112	4822 051 30103	10k 5% 0.062W	3300	4822 051 20108	1Ω 5% 0.1W	3708	4822 051 30221	220Ω 5% 0.062W
3113	4822 051 30333	33k 5% 0.062W	3301	4822 051 20108	1Ω 5% 0.1W	3709	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3114	4822 117 12903	1k8 1% 0.063W 0603	3304	4822 117 13501	82Ω 5% 0.62W 0603	3710	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3116	4822 051 30102	1k 5% 0.062W	3306	4822 117 13632	100k 1% 0.603 0.62W	3711	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3117	4822 051 30391	390Ω 5% 0.062W	3307	5322 117 13026	4k7 1% 0.063W 0603 RC22H	3712	4822 117 12925	47k 1% 0.063W 0603
3118	4822 051 30103	10k 5% 0.062W	3308	4822 117 13501	82Ω 5% 0.62W 0603	3713	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3119	4822 051 30103	10k 5% 0.062W	3309	5322 117 13026	4k7 1% 0.063W 0603 RC22H	3714	4822 051 30221	220Ω 5% 0.062W
3120	4822 051 30103	10k 5% 0.062W	3310	4822 051 30273	27k 5% 0.062W	3715	4822 051 30683	68k 5% 0.062W
3121	4822 051 30103	10k 5% 0.062W	3312	4822 117 13632	100k 1% 0.603 0.62W	3716	4822 051 30471	470Ω 5% 0.062W
3122	2322 704 69109		3313	4822 051 30273	27k 5% 0.062W	3717	4822 051 30101	100Ω 5% 0.062W
3123	4822 051 30103	10k 5% 0.062W	3315	4822 051 20228	2Ω 5% 0.1W	3718	4822 051 30221	220Ω 5% 0.062W
3124	4822 051 20228	2Ω 5% 0.1W	3316	4822 051 20228	2Ω 5% 0.1W	3719	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3125	4822 051 30103	10k 5% 0.062W	3319	4822 117 13632	100k 1% 0.603 0.62W	3720	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3126	4822 117 12139	22Ω 5% 0.062W	3321	5322 117 13049	470Ω 1% 0.063W 0603 RC22H	3721	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3127	4822 051 30103	10k 5% 0.062W	3322	5322 117 13049	470Ω 1% 0.063W 0603 RC22H	3722	4822 117 12925	47k 1% 0.063W 0603
3128	4822 051 30474	470k 5% 0.062W	3323	4822 051 30103	10k 5% 0.062W	3723	4822 051 30221	220Ω 5% 0.062W
3129	4822 051 30221	220Ω 5% 0.062W	3324	4822 051 30103	10k 5% 0.062W	3726	4822 051 30683	68k 5% 0.062W
3130	4822 051 30222	2k2 5% 0.062W	3325	4822 051 30153	12k 5% 0.062W	3727	4822 051 30471	470Ω 5% 0.062W
3131	4822 051 30682	68k 5% 0.062W	3326	4822 051 20228	2Ω 5% 0.1W	3728	4822 051 30101	100Ω 5% 0.062W
3132	2322 704 69109		3327	4822 051 20228	2Ω 5% 0.1W	3729	4822 051 30221	220Ω 5% 0.062W
3133	4822 051 30472	4k7 5% 0.062W	3328	4822 051 30153	15k 5% 0.062W	3730	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3134	4822 051 30472	4k7 5% 0.062W	3332	4822 051 30682	6k8 5% 0.062W	3731	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3136	4822 117 13632	100k 1% 0.603 0.62W	3333	4822 051 30682	6k8 5% 0.062W	3732	4822 117 12925	47k 1% 0.063W 0603
3138	4822 051 30103	10k 5% 0.062W	3334	4822 051 30682	6k8 5% 0.062W	3733	4822 051 30221	220Ω 5% 0.062W
3142	4822 051 30008	0Ω jumper	3336	4822 051 20008	0Ω jumper . (0805)	3734	4822 051 30221	220Ω 5% 0.062W
3143	4822 051 30008	0Ω jumper	3337	4822 051 20008	0Ω jumper . (0805)	3735	4822 051 30683	68k 5% 0.062W
3144	4822 051 30008	0Ω jumper	3340	4822 051 30153	15k 5% 0.062W	3736	4822 051 30471	470Ω 5% 0.062W
3145	4822 051 30008	0Ω jumper	3341	4822 051 30272	2k7 5% 0.062W	3737	4822 051 30101	100Ω 5% 0.062W
3146	4822 051 30008	0Ω jumper	3342	4822 051 30008	0Ω jumper	3738	4822 051 30221	220Ω 5% 0.062W
3147	4822 051 30008	0Ω jumper	3343	4822 117 12917	1Ω 5% 0.062W CASE0603	3739	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3152	4822 051 30223	22k 5% 0.062W	3401	4822 051 30103	10k 5% 0.062W	3740	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3153	4822 117 12139	22Ω 5% 0.062W	3402	4822 117 13632	100k 1% 0.603 0.62W	3741	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3154	4822 051 30223	22k 5% 0.062W	3403	4822 051 30103	10k 5% 0.062W	3742	4822 117 12925	47k 1% 0.063W 0603
3155	4822 117 12139	22Ω 5% 0.062W	3404	4822 051 30223	22k 5% 0.062W	3743	4822 051 30221	220Ω 5% 0.062W
3156	4822 051 30101	100Ω 5% 0.062W	3405	4822 051 30222	2k2 5% 0.062W	3744	4822 051 30683	68k 5% 0.062W
3157	4822 051 30101	100Ω 5% 0.062W	3406	4822 051 30223	22k 5% 0.062W	3745	4822 051 30471	470Ω 5% 0.062W
3158	4822 051 30393	39k 5% 0.062W	3407	4822 051 30103	10k 5% 0.062W	3746	4822 051 30101	100Ω 5% 0.062W
3159	4822 117 12968	820Ω 5% 0.62W	3409	4822 051 30103	10k 5% 0.062W	3747	4822 051 30221	220Ω 5% 0.062W
3160	4822 051 30393	39k 5% 0.062W	3411	4822 051 30223	22k 5% 0.062W	3748	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3161	4822 117 12968	820Ω 5% 0.62W	3412	4822 051 30472	4k7 5% 0.062W	3749	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3162	4822 051 30101	100Ω 5% 0.062W	3413	4822 051 30223	22k 5% 0.062W	3750	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3163	4822 051 30101	100Ω 5% 0.062W	3414	4822 051 30223	22k 5% 0.062W	3751	4822 117 12925	47k 1% 0.063W 0603
3200	4822 051 30223	22k 5% 0.062W	3501	4822 051 30102	1k 5% 0.062W	3752	4822 051 30221	220Ω 5% 0.062W
3202	4822 051 30102	1k 5% 0.062W	3502	4822 051 30103	10k 5% 0.062W	3753	4822 117 12139	22Ω 5% 0.062W
3204	4822 051 30223	22k 5% 0.062W	3503	4822 051 30472	4k7 5% 0.062W	3754	4822 051 30683	68k 5% 0.062W
3205	4822 051 30223	22k 5% 0.062W	3504	4822 051 30472	4k7 5% 0.062W	3755	4822 051 30471	470Ω 5% 0.062W
3207	4822 051 30102	1k 5% 0.062W	3505	4822 051 30103	10k 5% 0.062W	3756	4822 051 30101	100Ω 5% 0.062W
3209	4822 051 30223	22k 5% 0.062W	3506	4822 051 30103	10k 5% 0.062W	3757	4822 051 30221	220Ω 5% 0.062W
3210	4822 051 30223	22k 5% 0.062W	3507	4822 051 30103	10k 5% 0.062W	3758	4822 051 30689	68Ω 5% 0.063W 0603 RC21 RST SM
3212	4822 051 30223	22k 5% 0.062W	3508	4822 051 30102	1k 5% 0.062W	3759	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3214	4822 051 30472	4k7 5% 0.062W	3509	4822 051 30101	100Ω 5% 0.062W	3760	5322 117 13059	560Ω 1% 0.063W 0603 RC22H
3216	4822 051 30223	22k 5% 0.062W	3510	4822 051 30103	10k 5% 0.062W	3761	4822 117 12925	47k 1% 0.063W 0603
3218	4822 051 30223	22k 5% 0.062W	3512	4822 051 30682	6k8 5% 0.062W	3762	4822 051 30221	220Ω 5% 0.062W
3219	4822 051 30472	4k7 5% 0.062W	3531	4822 051 30472	4k7 5% 0.062W	3763	3198 031 11010	RST NETW 1206 4X100Ω PM5 COL R
3222	4822 051 30223	22k 5% 0.062W	3604	4822 051 30332	3k3 5% 0.062W			
3223	4822 051 30223	22k 5% 0.062W	3605	4822 051 30332	3k3 5% 0.062W			
3226	4822 051 30102	1k 5% 0.062W	3606	4822 051 30103	10k 5% 0.062W			
3227	4822 051 30223	22k 5% 0.062W	3607	4822 051 30103	10k 5% 0.062W			
3229	3198 031 11010	RST NETW 1206 4X100Ω PM5 COL R	3608	4822 051 30103	10k 5% 0.062W			
3236	4822 051 30472	4k7 5% 0.062W	3609	4822 051 30561	560Ω 5% 0.062W			
3237	4822 051 30102	1k 5% 0.062W	3611	4822 051 30479	47Ω 5% 0.062W			
3239	4822 117 12891	220k 1% ERJ3Ω	3612	4822 051 30479	47Ω 5% 0.062W			
3241	4822 051 30102	1k 5% 0.062W	3613	4822 051 30103	10k 5% 0.062W			
3242	4822 051 30223	22k 5% 0.062W	3621	4822 051 30103	10k 5% 0.062W			
3245	4822 051 30101	100Ω 5% 0.062W	3622	4822 051 30101	100Ω 5% 0.062W			
3246	4822 051 30101	100Ω 5% 0.062W	3623	4822 051 30479	47Ω 5% 0.062W			
3247	4822 051 30331	330Ω 5% 0.062W	3624	4822 051 30101	100Ω 5% 0.062W			
3250	4822 117 13525	24k 1% 0.62W RC22H 0603	3625	4822 051 30103	10k 5% 0.062W			
3251	4822 051 30103	10k 5% 0.062W	3626	4822 051 30332	3k3 5% 0.062W			
3255	4822 051 30151	150Ω 5% 0.062W	3627	4822 051 30332	3k3 5% 0.062W</			

3764	4822 051 30479	47Ω 5% 0.062W
3765	4822 051 30479	47Ω 5% 0.062W
3766	4822 051 30332	3k3 5% 0.062W
3767	4822 051 30332	3k3 5% 0.062W
3772	4822 051 20008	0Ω jumper . (0805)
3773	4822 051 20008	0Ω jumper . (0805)
3775	4822 051 20008	0Ω jumper . (0805)
3800	4822 051 30339	33Ω 5% 0.062W
3801	4822 051 30392	3k9 5% 0.063W 0603
3802	4822 051 30392	3k9 5% 0.063W 0603
3803	4822 117 12139	22Ω 5% 0.062W
3805	5322 117 13062	390Ω 1% 0.063W 0603 RC22H
3806	4822 051 30123	12k 5% 0.062W
3807	4822 051 30682	6k8 5% 0.062W
3808	4822 051 30339	33Ω 5% 0.062W
3813	4822 051 30103	10k 5% 0.062W
3816	4822 051 30339	33Ω 5% 0.062W
3900	4822 051 30103	10k 5% 0.062W
3901	4822 051 30103	10k 5% 0.062W
3902	4822 051 30339	33Ω 5% 0.062W
3903	4822 051 30569	56Ω 5% 0.062W
3904	4822 051 30569	56Ω 5% 0.062W
3905	4822 051 30339	33Ω 5% 0.062W
3906	4822 051 30332	3k3 5% 0.062W
3907	4822 051 30479	47Ω 5% 0.062W
3910	4822 051 30339	33Ω 5% 0.062W
4xxx	4822 051 10008	0Ω 5% 0.25W (1206)
4xxx	4822 051 20008	0Ω 5% 0.25W (0805)

5100	4822 157 11499	BLM11P600SPT
5101	4822 157 11499	BLM11P600SPT
5102	4822 157 11499	BLM11P600SPT
5200	4822 157 11499	BLM11P600SPT
5201	4822 157 11499	BLM11P600SPT
5202	4822 157 11499	BLM11P600SPT
5203	4822 157 11499	BLM11P600SPT
5300	4822 157 11499	BLM11P600SPT
5301	4822 157 11499	BLM11P600SPT
5302	4822 157 11499	BLM11P600SPT
5401	4822 157 11499	BLM11P600SPT
5402	4822 157 11499	BLM11P600SPT
5502	4822 157 71206	BLM21A601SPT
5504	2422 549 43303	IND FXD SM EMI 100mH z 600R R
5505	4822 157 71206	BLM21A601SPT
5600	4822 157 11499	BLM11P600SPT
5601	4822 157 11499	BLM11P600SPT
5602	4822 157 11499	BLM11P600SPT
5603	4822 157 11499	BLM11P600SPT
5700	4822 157 11499	BLM11P600SPT
5701	4822 157 70651	12μH (NL322522T-120J)
5702	4822 157 11499	BLM11P600SPT
5703	4822 157 11499	BLM11P600SPT
5704	4822 157 11717	BLM31P500SPT
5705	4822 157 11499	BLM11P600SPT
5706	4822 157 70651	12μH (NL322522T-120J)
5707	4822 157 11499	BLM11P600SPT
5708	4822 157 11717	BLM31P500SPT
5712	4822 157 70651	12μH (NL322522T-120J)
5713	4822 157 11499	BLM11P600SPT
5714	4822 157 11499	BLM11P600SPT
5715	4822 157 70651	12μH (NL322522T-120J)
5716	4822 157 11717	BLM31P500SPT
5717	4822 157 11499	BLM11P600SPT
5718	4822 157 11499	BLM11P600SPT
5719	4822 157 11499	BLM11P600SPT
5720	4822 157 11499	BLM11P600SPT
5721	4822 157 11499	BLM11P600SPT
5722	4822 157 70651	12μH (NL322522T-120J)
5723	4822 157 11499	BLM11P600SPT
5724	4822 157 70651	12μH (NL322522T-120J)
5801	4822 157 11499	BLM11P600SPT
5901	2422 549 43303	IND FXD SM EMI 100mH z 600R R
5902	2422 549 43303	IND FXD SM EMI 100mH z 600R R
5904	2422 549 43303	IND FXD SM EMI 100mH z 600R R
5905	2422 549 43303	IND FXD SM EMI 100mH z 600R R



6100	4822 130 11397	BAS316
6101	4822 130 11397	BAS316
6300	9322 128 69685	S1D
6301	9322 128 69685	S1D
6302	9322 128 69685	S1D
6400	4822 130 11397	BAS316



7100	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7101	4822 209 32073	MC34072D
7102	4822 209 90927	L78L05ACD
7103	5322 130 60159	BC846B
7105	9352 703 49118	IC SM TZA1033HL/K2 (PHSE) R
7106	4822 209 32073	MC34072D
7107	5322 130 60845	BC807-25
7108	4822 130 42804	BC817-25
7109	9337 331 10215	FET SIG SM BST82 (PHSE) R
7110	5322 130 42718	BFS20
7111	5322 130 42718	BFS20
7200	9322 163 27685	IC SM NCP301LSN45 (ONSE) R
7201	4822 130 60373	BC856B
7202	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7207	9352 681 05557	IC SM SAA7812HL/M3B (PHSE) Y
7300	9322 139 85668	BA6665FM
7301	4822 209 30095	LM833D
7303	4822 209 17229	BA5938FM
7305	9322 136 29668	L78M09CDT
7400	9322 130 41668	IC SM M24C64-WMN6 (ST00) R
7404	5322 130 60159	BC846B
7405	5322 130 60159	BC846B
7406	9352 499 80118	IC SM 74LVC00APW (PHSE) R
7409	5322 130 60159	BC846B
7412	9322 178 88685	IC SM NCP301LSN27 (ONSE) R
7413	4822 130 60373	BC856B
7500	9322 166 67668	IC SM MT48LC4M16A2TG- 7E(MRN0)R
7502	9322 166 67668	IC SM MT48LC4M16A2TG- 7E(MRN0)R
7508	9340 425 20115	TRA SIG SM BC847BS (PHSE) R
7601	9322 181 01671	IC SM STI5580EVB (ST00) Y
7700	9965 000 04199	BSN20
7701	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7703	9965 000 04199	BSN20
7704	9322 142 88668	IC SM LF25CDT (ST00) R
7705	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7707	9322 142 88668	IC SM LF25CDT (ST00) R
7709	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7713	9322 179 78668	IC SM LF18ABDT (ST00) R
7714	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7716	4822 209 17398	LD1117DT33
7717	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7719	4822 209 17398	LD1117DT33
7720	9352 456 80115	74HCT1G125GW
7721	9340 425 30115	TRA SIG SM BC847BPN (PHSE) R
7800	9352 708 12557	IC SM SAA7893HL/C2 (PHSE) Y
7801	5322 130 42718	BFS20
7803	9352 317 20118	IC SM 74LVC125APW (PHSE) R
7901	9322 151 71668	IC SM MK2703STR (M1CL) R
7902	9322 184 32668	IC SM ICS612G-01 (ICS1) R
7904	9351 742 20118	IC SM 74HCT04PW (PHSE) R

Module SD4.00SA_CH

Various

0001	9305 023 61114	VAL6011/14
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