

Service Service Service



Service Manual

Contents

	Page
1. Revision List	2
2. Technical Specs, Diversity, and Connections	2
3. Precautions, Notes, and Abbreviation List	5
4. Mechanical Instructions	9
5. Service Modes, Error Codes, and Fault Finding	13
6. Alignments	22
7. Circuit Descriptions	24
8. IC Data Sheets	30
9. Block Diagrams	35
10. Circuit Diagrams and PWB Layouts	<i>Drawing PWB</i>
715RLPCB0000000213 SSB	40 90-91
715RLPCB0000000094 AmbiLight	92
715RLPCB0000000103 AmbiLight	94
11. Styling Sheets	
7809 series 42"	96
7809 series 49"	97
7809 series 55"	98

1. Revision List

Manual xxxx xxx xxxx.0

- First release.

2. Technical Specs, Diversity, and Connections

Index of this chapter:

[2.1 Technical Specifications](#)

[2.2 Directions for Use](#)

[2.3 Connections](#)

[2.4 Chassis Overview](#)

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

2.1 Technical Specifications

For on-line product support please use the CTN links in [Table 2-1](#). Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

Table 2-1 Described Model Numbers and Diversity

CTN	2 Connection Overview	4 Mechanics		7 Descr.		9 Block Diagrams						10 Schematics						11 Styling	
		Cable Dressing	Assembly Removal	Power Supply	General Power Architecture	Wiring Diagram	Video	Audio	Control & Clock	I2C	Supply lines	Power Supply	SSB	Amplifier control module	(Keyboard Control Module)	(Wireless LAN, USB, Light Sensor, IR/LED Module)	(Sensor Module)	(AmbiLight)	Styling
42PUK7809/12	2.3	4-1 4-2	4.3	7.3	7.3	9.1	-	-	-	-	9.5	-	10.1	-	-	-	-	10.2	11.1
42PUS7809/12	2.3	4-1 4-2	4.3	7.3	7.3	9.1	-	-	-	-	9.5	-	10.1	-	-	-	-	10.2	11.1
42PUS7809/60	2.3	4-1 4-2	4.3	7.3	7.3	9.1	-	-	-	-	9.5	-	10.1	-	-	-	-	10.2	11.1
49PUK7809/12	2.3	4-3 4-4	4.3	7.3	7.3	9.2	-	-	-	-	9.5	-	10.1	-	-	-	-	10.2	11.2
49PUS7809/12	2.3	4-3 4-4	4.3	7.3	7.3	9.2	-	-	-	-	9.5	-	10.1	-	-	-	-	10.2	11.2
49PUS7809/60	2.3	4-3 4-4	4.3	7.3	7.3	9.2	-	-	-	-	9.5	-	10.1	-	-	-	-	10.2	11.2
55PUK7809/12	2.3	4-5 4-6	4.3	7.3	7.3	9.3	-	-	-	-	9.5	-	10.1	-	-	-	-	10.3	11.3
55PUS7809/12	2.3	4-5 4-6	4.3	7.3	7.3	9.3	-	-	-	-	9.5	-	10.1	-	-	-	-	10.3	11.3
55PUS7809/60	2.3	4-5 4-6	4.3	7.3	7.3	9.3	-	-	-	-	9.5	-	10.1	-	-	-	-	10.3	11.3

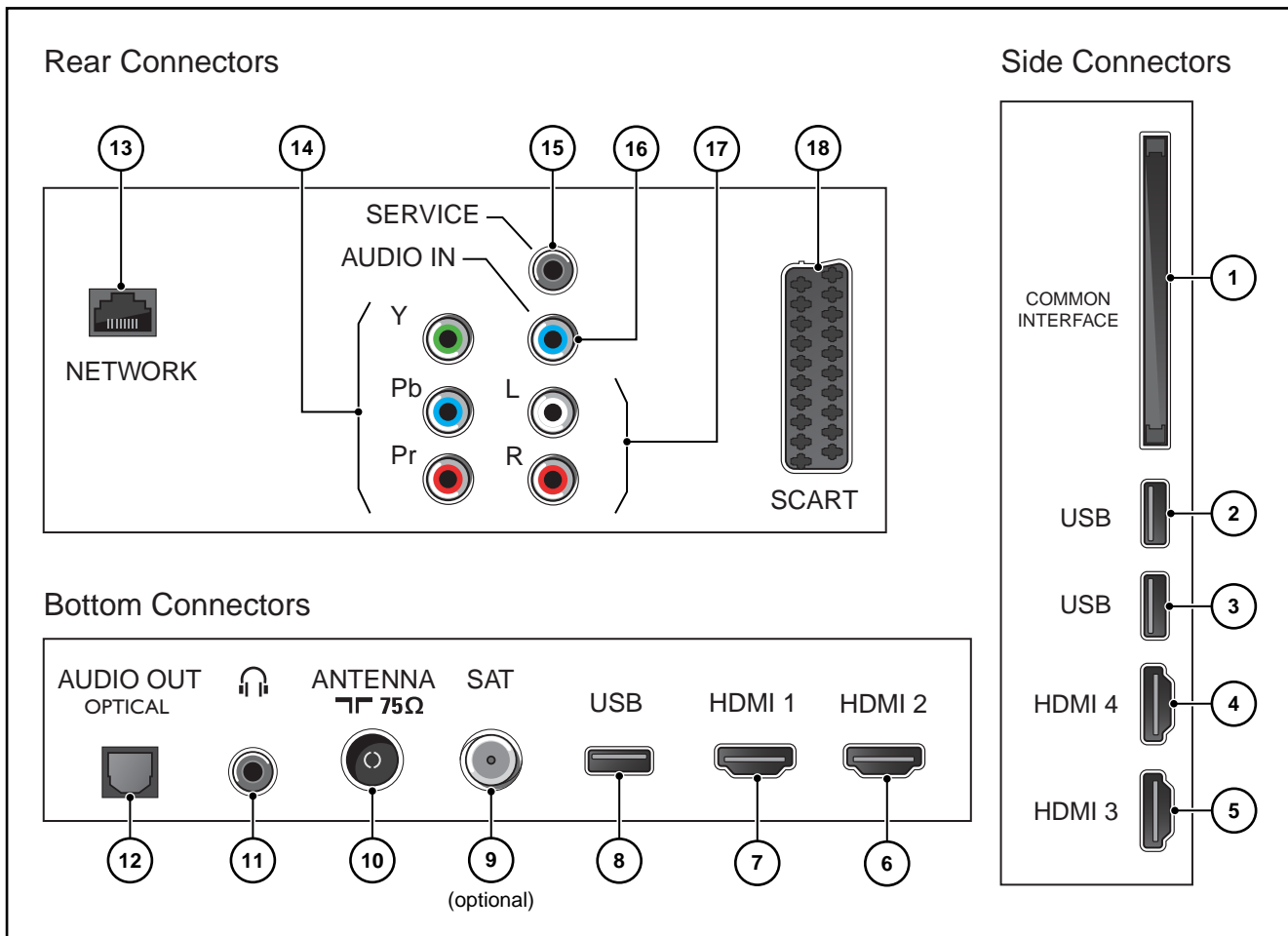
2.2 Directions for Use

You can download this information from the following websites:

<http://www.philips.com/support>

<http://www.p4c.philips.com>

2.3 Connections



19580_141_140401.eps
14-04-01

Figure 2-1 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.3.1 Connections

1 - Common Interface

68p - See [Figure 10-1-26](#)



2, 3 and 8 - USB2.0

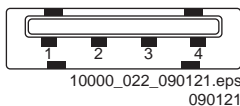
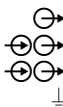


Figure 2-2 USB (type A)

- 1 - +5V
- 2 - Data (-)
- 3 - Data (+)
- 4 - Ground



4, 5, 6 and 7 - HDMI 4, 3, 2, 1
Digital Video - In, Digital Audio with ARC - In/Out

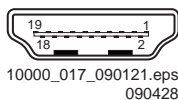


Figure 2-3 HDMI (type A) connector

1 - D2+	Data channel	⊕
2 - Shield	Gnd	⊥
3 - D2-	Data channel	⊕
4 - D1+	Data channel	⊕
5 - Shield	Gnd	⊥
6 - D1-	Data channel	⊕
7 - D0+	Data channel	⊕
8 - Shield	Gnd	⊥
9 - D0-	Data channel	⊕
10 - CLK+	Data channel	⊕
11 - Shield	Gnd	⊥
12 - CLK-	Data channel	⊕
13 - Easylink/CEC	Control channel	⊕ ⊕
14 - ARC	Audio Return Channel	⊕
15 - DDC_SCL	DDC clock	⊕
16 - DDC_SDA	DDC data	⊕ ⊕
17 - Ground	Gnd	⊥
18 - +5V		⊕
19 - HPD	Hot Plug Detect	⊕
20 - Ground	Gnd	⊥

9 - SAT - In (optional)

- -F-type Coax, 75 ohm ⊥

10 - Antenna - In

- -IEC-type (EU) Coax, 75 ohm ⊥

11 - Head phone (Output)

Bk - Head phone 32 - 600 ohm / 10 mW ⊕

12 - Audio - Out: S/PDIF - Out

- Optical



13 - RJ45: Ethernet

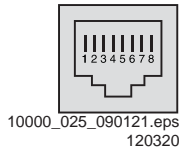


Figure 2-4 Ethernet connector

1	- TD+	Transmit signal	
2	- TD-	Transmit signal	
3	- RD+	Receive signal	
4	- CT	Centre Tap: DC level fixation	
5	- CT	Centre Tap: DC level fixation	
6	- RD-	Receive signal	
7	- GND	Gnd	
8	- GND	Gnd	

14 - Cinch: Video YPbPr - In

Gn	- Video Y	1 V _{PP} / 75 ohm	
Bu	- Video Pb	0.7 V _{PP} / 75 ohm	
Rd	- Video Pr	0.7 V _{PP} / 75 ohm	

15 - Service

1	- Ground	Gnd	
2	- UART_TX	Transmit	
3	- UART_RX	Receive	

16 - Audio - In: Left/Right (VGA/DVI)

Bu	- Audio L/R in	0.5 V _{RMS} / 10 kohm	
----	----------------	--------------------------------	--

17 - Cinch: Audio - In

Rd	- Audio - R	0.5 V _{RMS} / 10 kohm	
Wh	- Audio - L	0.5 V _{RMS} / 10 kohm	

18 - Video RGB - In, CVBS - In/Out, Audio - In/Out

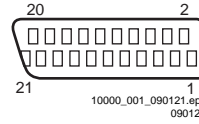


Figure 2-5 SCART connector

1	- n.c.		
2	- Audio R	0.5 V _{RMS} / 10 kohm	
3	- n.c.		
4	- Ground Audio	Gnd	
5	- Ground Blue	Gnd	
6	- Audio L	0.5 V _{RMS} / 10 kohm	
7	- Video Blue	0.7 V _{PP} / 75 ohm	
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	
9	- Ground Green	Gnd	
10	- n.c.		
11	- Video Green	0.7 V _{PP} / 75 ohm	
12	- n.c.		
13	- Ground Red	Gnd	
14	- Ground P50	Gnd	
15	- Video Red	0.7 V _{PP} / 75 ohm	
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 ohm	
17	- Ground Video	Gnd	
18	- Ground FBL	Gnd	
19	- n.c.		
20	- Video CVBS	1 V _{PP} / 75 ohm	
21	- Shield	Gnd	

2.4 Chassis Overview

Refer to chapter [9. Block Diagrams](#) for PWB/CBA locations.

3. Precautions, Notes, and Abbreviation List

Index of this chapter:

- [3.1 Safety Instructions](#)
- [3.2 Warnings](#)
- [3.3 Notes](#)
- [3.4 Abbreviation List](#)

3.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- 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, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
 1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
 2. Set the Mains/AC Power switch to the "on" position (keep the Mains/AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
 4. Switch "off" the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

3.2 Warnings

- 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 connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

3.3 Notes

3.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⊥), or hot ground (↔), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).

- Where necessary, measure the waveforms and voltages with (⊥) and without (↔) aerial signal. Measure the voltages in the power supply section both in normal operation (Ⓜ) and in stand-by (Ⓜ). These values are indicated by means of the appropriate symbols.

3.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed on the Philips Spare Parts Web Portal.

3.3.3 Spare Parts

For the latest spare part overview, consult your Philips Spare Part web portal.

3.3.4 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: <http://www.atyourservice-magazine.com>. Select "Magazine", then go to "Repair downloads". Here you will find information on how to deal with BGA-ICs.

BGA Temperature Profiles

For BGA-ICs, you **must** use the correct temperature-profile. Where applicable and available, this profile is added to the IC Data Sheet information section in this manual.

3.3.5 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
 - To reach a solder-tip temperature of at least 400°C.
 - To stabilize the adjusted temperature at the solder-tip.
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

3.3.6 Alternative BOM identification

It should be noted that on the European Service website, "Alternative BOM" is referred to as "Design variant".

The **third digit** in the serial number (example: AG2B033500001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.

By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number "1" (example: AG1B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG2B033500001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!

For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26 = 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. SN is Lysomice, RJ is Kobierzyce), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2010 week 10 / 2010 week 17). The 6 last digits contain the serial number.



Figure 3-1 Serial number (example)

3.3.7 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.

If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

3.3.8 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue TeleteXT
C	Centre channel (audio)
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See "E-DDC"
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion

DFU	Directions For Use: owner's manual		SDI), is a digitized video format used for broadcast grade video.
DMR	Digital Media Reader: card reader		Uncompressed digital component or digital composite signals can be used.
DMSD	Digital Multi Standard Decoding		The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
DNM	Digital Natural Motion		Institutional TeleVision; TV sets for hotels, hospitals etc.
DNR	Digital Noise Reduction: noise reduction feature of the set	iTV	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
DRAM	Dynamic RAM	LS	Latin America
DRM	Digital Rights Management		Liquid Crystal Display
DSP	Digital Signal Processing		Light Emitting Diode
DST	Dealer Service Tool: special remote control designed for service technicians		Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I LG.Philips LCD (supplier)
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394	LATAM	Loudspeaker
DVB-C	Digital Video Broadcast - Cable		Low Voltage Differential Signalling
DVB-T	Digital Video Broadcast - Terrestrial	LCD	Mega bits per second
DVD	Digital Versatile Disc	LED	Monochrome TV system. Sound carrier distance is 4.5 MHz
DVI(-d)	Digital Visual Interface (d= digital only)	L/L'	Part of a set of international standards related to the presentation of multimedia information, standardised by the Multimedia and Hypermedia Experts Group. It is commonly used as a language to describe interactive television services
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information form the display.	LPL	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
EDID	Extended Display Identification Data (VESA standard)	LS	Matrix Output Processor
EEPROM	Electrically Erasable and Programmable Read Only Memory	LVDS	Metal Oxide Silicon Field Effect Transistor, switching device
EMI	Electro Magnetic Interference	Mbps	Motion Pictures Experts Group
EPG	Electronic Program Guide	M/N	Multi Platform InterFace
EPLD	Erasable Programmable Logic Device	MHEG	MUTE Line
EU	Europe		MUTE Line
EXT	EXternal (source), entering the set by SCART or by cinches (jacks)		Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
FDS	Full Dual Screen (same as FDW)	MIPS	Not Connected
FDW	Full Dual Window (same as FDS)		Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
FLASH	FLASH memory	MOP	Negative Temperature Coefficient, non-linear resistor
FM	Field Memory or Frequency Modulation	MOSFET	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
FPGA	Field-Programmable Gate Array		Non-Volatile Memory: IC containing TV related data such as alignments
FTV	Flat TeleVision	MPEG	Open Circuit
Gb/s	Giga bits per second	MPIF	Over the Air Download. Method of software upgrade via RF transmission.
G-TXT	Green TeleteXT	MUTE	Upgrade software is broadcasted in TS with TV channels.
H	H_sync to the module	MTV	On screen display Teletext and Control; also called Artistic (SAA5800)
HD	High Definition		Project 50: communication protocol between TV and peripherals
HDD	Hard Disk Drive	NC	Phase Alternating Line. Color system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier
HDCP	High-bandwidth Digital Content Protection: A "key" encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a "snow vision" mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP "software key" decoding.	NICAM	
HDMI	High Definition Multimedia Interface	NTC	
HP	HeadPhone	NTSC	
I	Monochrome TV system. Sound carrier distance is 6.0 MHz	NVM	
I ² C	Inter IC bus	O/C	
I ² D	Inter IC Data bus	OSD	
I ² S	Inter IC Sound bus	OAD	
IF	Intermediate Frequency		
IR	Infra Red	OTC	
IRQ	Interrupt Request	P50	
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a.	PAL	

	PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)	SVGA	800 × 600 (4:3)
PCB	Printed Circuit Board (same as "PWB")	SVHS	Super Video Home System
PCM	Pulse Code Modulation	SW	Software
PDP	Plasma Display Panel	SWAN	Spatial temporal Weighted Averaging Noise reduction
PFC	Power Factor Corrector (or Pre-conditioner)	SXGA	1280 × 1024
PIP	Picture In Picture	TFT	Thin Film Transistor
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency	THD	Total Harmonic Distortion
		TMDS	Transmission Minimized Differential Signalling
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)	TS	Transport Stream
		TXT	TeleteXT
POR	Power On Reset, signal to reset the uP	TXT-DW	Dual Window with TeleteXT
PSDL	Power Supply for Direct view LED backlight with 2D-dimming	UI	User Interface
		uP	Microprocessor
PSL	Power Supply with integrated LED drivers	UXGA	1600 × 1200 (4:3)
		V	V-sync to the module
PSLS	Power Supply with integrated LED drivers with added Scanning functionality	VESA	Video Electronics Standards Association
		VGA	640 × 480 (4:3)
PTC	Positive Temperature Coefficient, non-linear resistor	VL	Variable Level out: processed audio output toward external amplifier
PWB	Printed Wiring Board (same as "PCB")	VSB	Vestigial Side Band; modulation method
PWM	Pulse Width Modulation	WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
QRC	Quasi Resonant Converter		
QTNR	Quality Temporal Noise Reduction	WXGA	1280 × 768 (15:9)
QVCP	Quality Video Composition Processor	XTAL	Quartz crystal
RAM	Random Access Memory	XGA	1024 × 768 (4:3)
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.	Y	Luminance signal
		Y/C	Luminance (Y) and Chrominance (C) signal
RC	Remote Control	YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
RC5 / RC6	Signal protocol from the remote control receiver	YUV	Component video
RESET	RESET signal		
ROM	Read Only Memory		
RSDS	Reduced Swing Differential Signalling data interface		
R-TXT	Red TeleteXT		
SAM	Service Alignment Mode		
S/C	Short Circuit		
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs		
SCL	Serial Clock I ² C		
SCL-F	CLock Signal on Fast I ² C bus		
SD	Standard Definition		
SDA	Serial Data I ² C		
SDA-F	DAta Signal on Fast I ² C bus		
SDI	Serial Digital Interface, see "ITU-656"		
SDRAM	Synchronous DRAM		
SECAM	SEquence Couleur Avec Mémoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz		
SIF	Sound Intermediate Frequency		
SMPS	Switched Mode Power Supply		
SoC	System on Chip		
SOG	Sync On Green		
SOPS	Self Oscillating Power Supply		
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard		
S/PDIF	Sony Philips Digital InterFace		
SRAM	Static RAM		
SRP	Service Reference Protocol		
SSB	Small Signal Board		
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI		
STB	Set Top Box		
STBY	STand-BY		

4. Mechanical Instructions

Index of this chapter:

- [4.1 Cable Dressing](#)
- [4.2 Service Positions](#)
- [4.3 Assy/Panel Removal](#)
- [4.4 Set Re-assembly](#)

Notes:

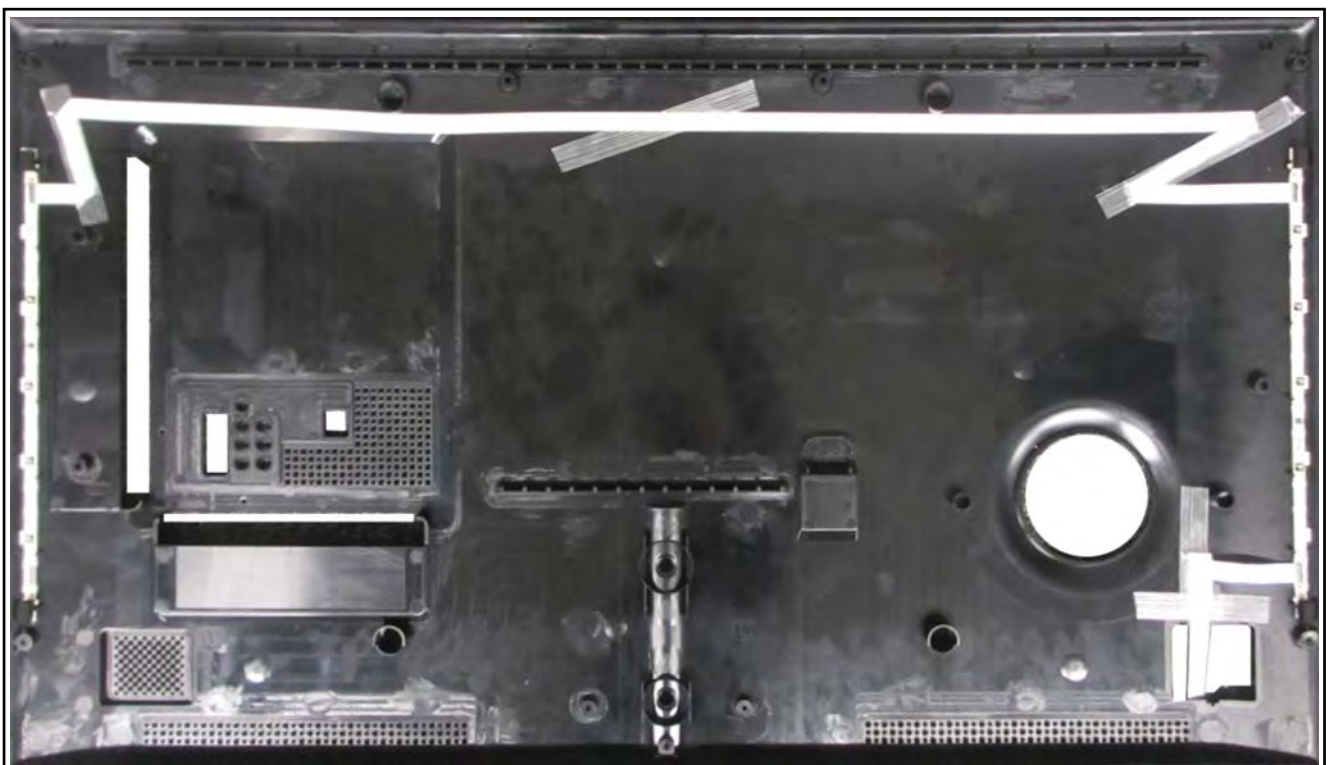
- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing



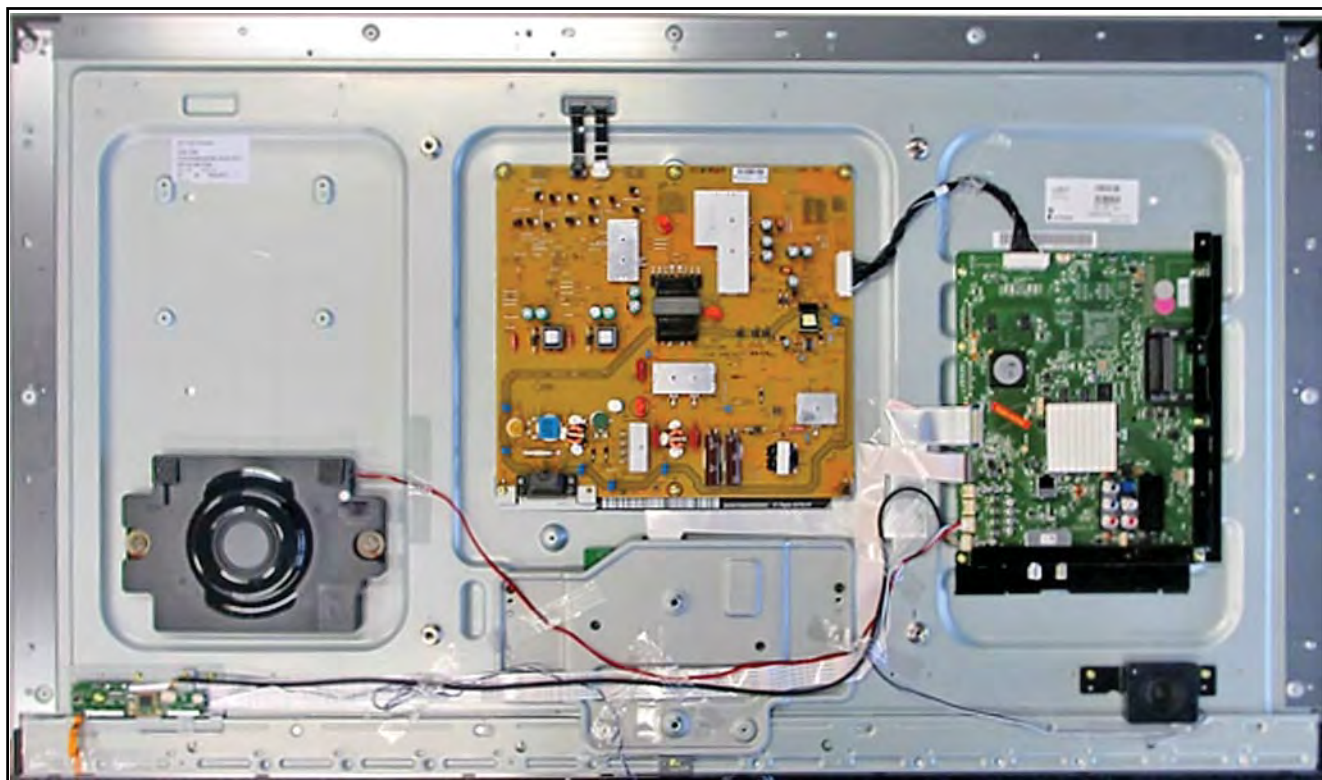
19580_013_140128.eps
140128

Figure 4-1 Cable dressing 42" 7809 series



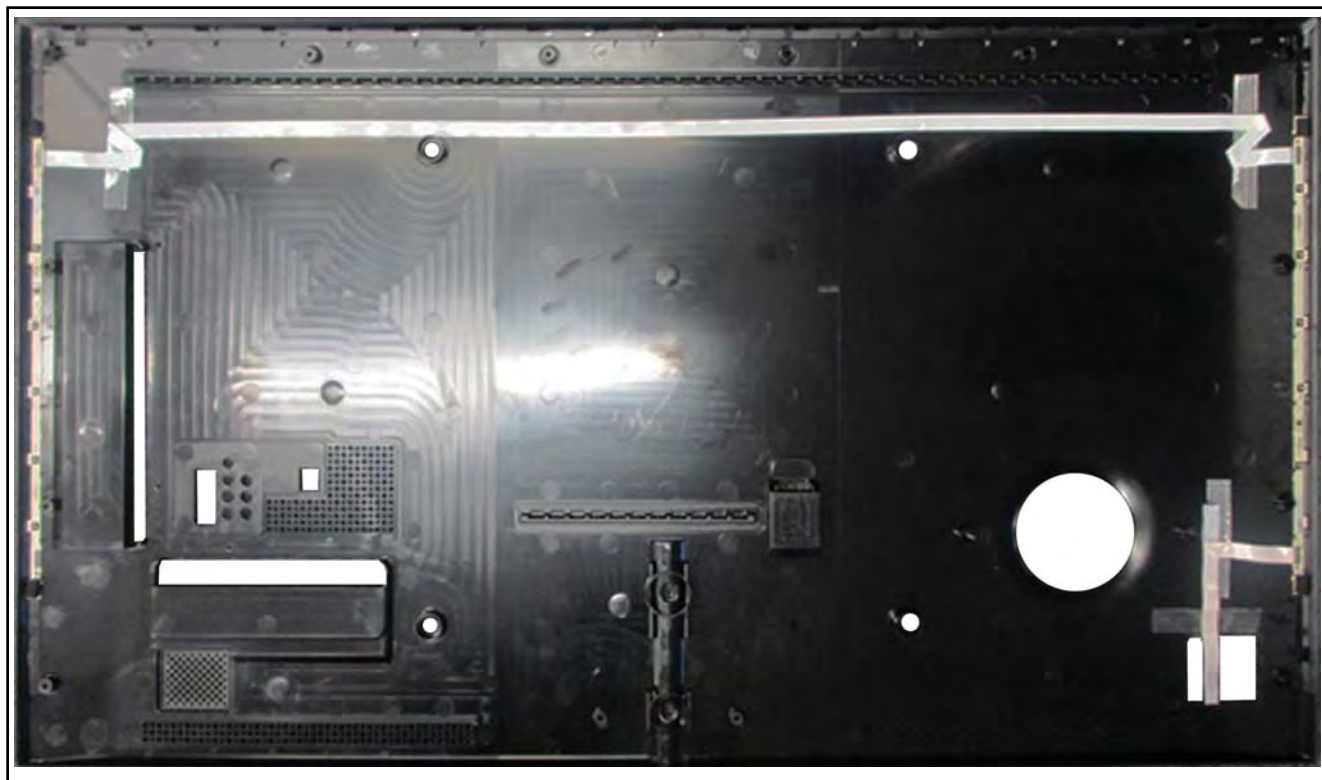
19580_015_140206.eps
140206

Figure 4-2 Cable dressing back cover 42" 7809 series



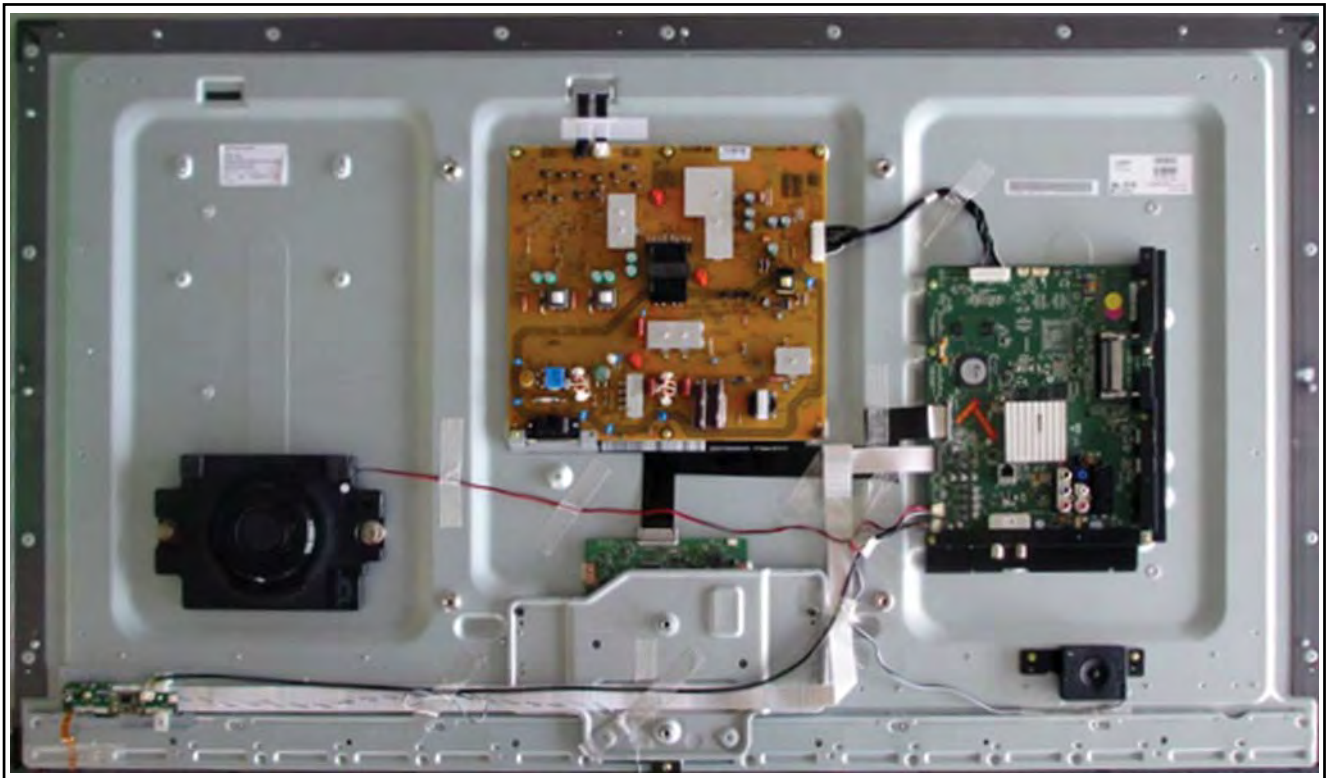
19580_017_140206.eps
140206

Figure 4-3 Cable dressing 49"7809 series



19580_016_140206.eps
140206

Figure 4-4 Cable dressing back cover 49" 7809 series



19580_018_140206.eps
140206

Figure 4-5 Cable dressing 55" 7809 series

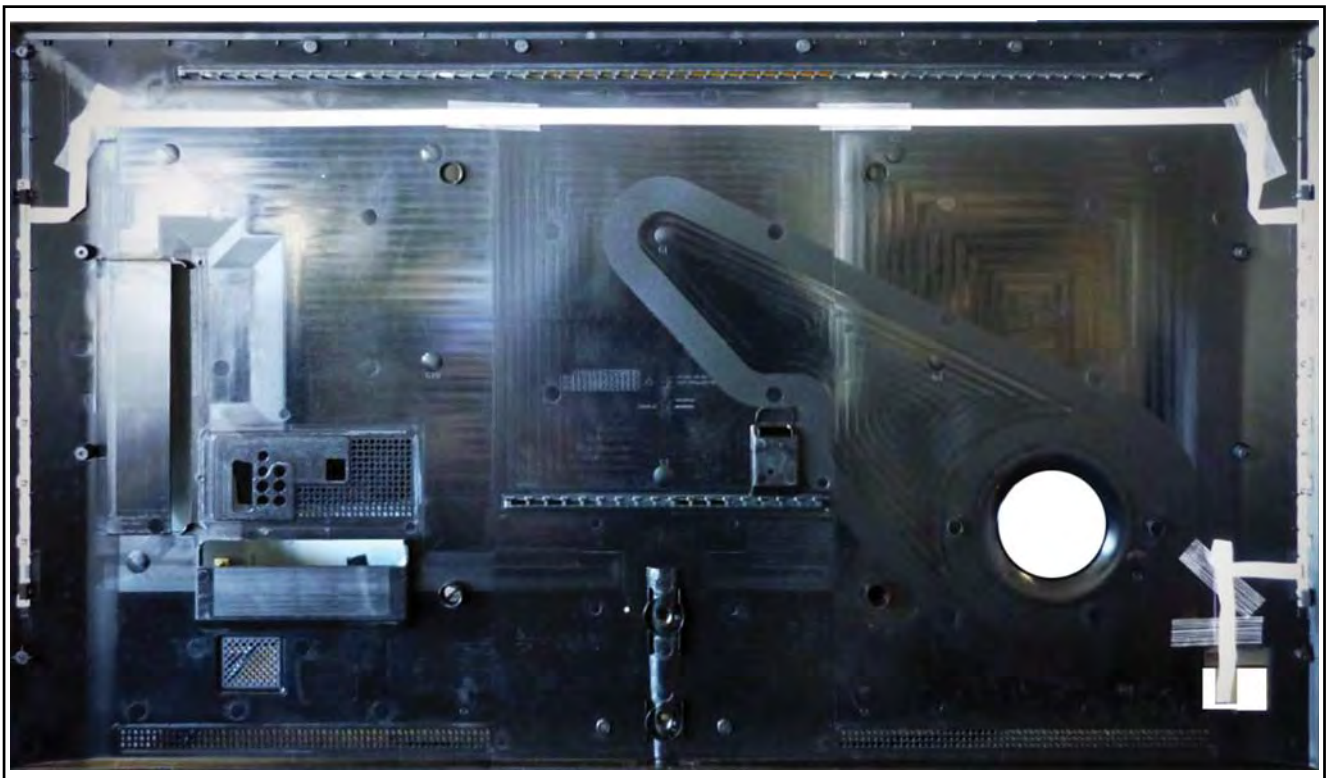


Figure 4-6 Cable dressing back cover 55" 7809 series

4.2 Service Positions

For easy servicing of a TV set, the set should be put face down on a soft flat surface, foam buffers or other specific workshop tools. Ensure that a stable situation is created to perform measurements and alignments. When using foam bars take

care that these always support the cabinet and **never** only the display.

Caution: Failure to follow these guidelines can seriously damage the display!
Ensure that ESD safe measures are taken.

4.3 Assy/Panel Removal

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before removing the rear cover.

Attention: For Ambilight sets, the leading edge cover has to be removed.

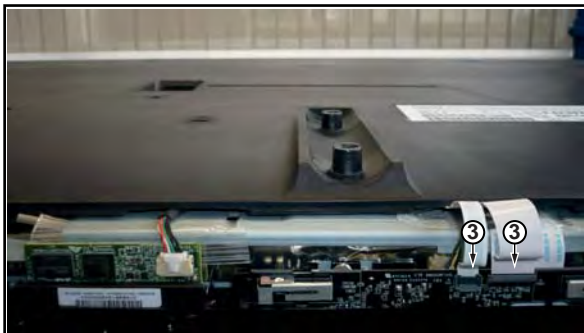
It is mandatory to remove the leading edge cover and disconnect the cables prior to removal of the rear cover! See [Figure 4-7](#) and [Figure 4-8](#) for details.

1. For sets equipped with Ambilight: remove the stand and swivel block [1].
2. Remove the leading edge hatch that covers the Ambilight connector [2].
3. Unplug the Ambilight connectors located underneath the hatch [3].
4. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.



19370_080_130208.eps
130208

Figure 4-7 Rear cover removal Ambilight models -1-



19370_081_130208.eps
130208

Figure 4-8 Rear cover removal Ambilight models -2-

4.3.2 Ambilight units in Rear Cover

The Ambilight units are affixed in the rear cover and will self-destruct upon removal.

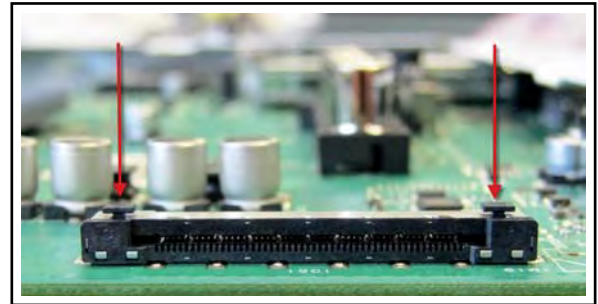
Attention: it is of the utmost importance to remove all remains of any adhesive that might be left on the inside of the rear cover.

The new units come with double-sided adhesive tape. Ensure a correct mounting to avoid uneven light emission of the units.

4.3.3 SSB

Refer to [Figure 4-9](#) and [Figure 4-10](#) for details.

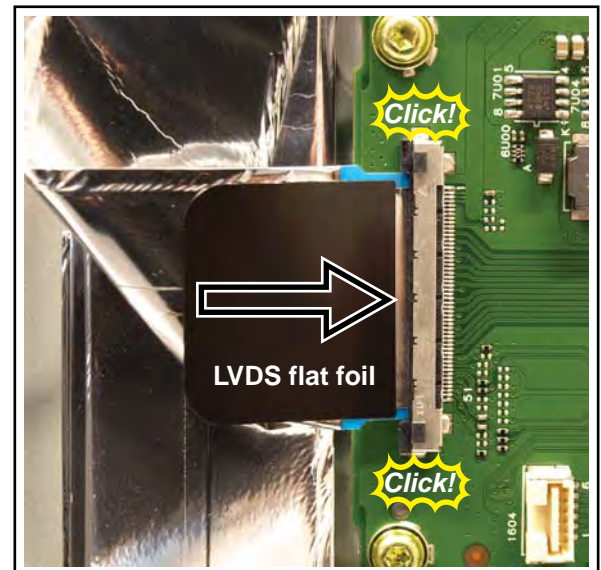
Some SSBs have a dedicated LVDS connector, requiring pressing two catches as indicated in the figure, before removing the LVDS cable.



19054_001_111010.eps
111010

Figure 4-9 SSB LVDS connector catches (optional) -1-

Upon re-connecting the LVDS cable, ensure the catches are locked after having inserted the LVDS cable.



19222_001_120626.eps
120626

Figure 4-10 SSB LVDS connector catches (optional) -2-

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position.
- Pay special attention not to damage the EMC foams in the set. Ensure that EMC foams are mounted correctly.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

[5.1 Test Points](#)

[5.2 Service Modes](#)

[5.3 Stepwise Start-up](#)

[5.4 Service Tools](#)

[5.5 Software Upgrading](#)

[5.6 Error Codes](#)

[5.7 The Blinking LED Procedure](#)

[5.8 Fault Finding and Repair Tips](#)

5.1 Test Points

As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. However, several key ICs are capable of generating test patterns. In this way it is possible to determine which part is defective.

5.2 Service Modes

The Service Mode feature is split into three parts:

- Service Alignment Mode (SAM).
- Factory Mode.
- Customer Service Mode (CSM).

SAM and the Factory mode offer features, which can be used by the Service engineer to repair/align a TV set. Some features are:

- Make alignments (e.g. White Tone), reset the error buffer (SAM and Factory Mode).
- Display information ("SAM" indication in upper right corner of screen, error buffer, software version, operating hours, options and option codes, sub menus).

The CSM is a Service Mode that can be enabled by the consumer. The CSM displays diagnosis information, which the customer can forward to the dealer or call centre. In CSM mode, "CSM", is displayed in the top right corner of the screen. The information provided in CSM and the purpose of CSM is to:

- Increase the home repair hit rate.
- Decrease the number of nuisance calls.
- Solve customer problems without home visit.

Note: For the new model range, a new remote control (RC) is used with some renamed buttons. This has an impact on the activation of the Service modes. For instance the old "MENU" button is now called "HOME" (or is indicated by a "house" icon).

5.2.1 General

Next items are applicable to all Service Modes or are general.

Life Timer

During the life time cycle of the TV set, a timer is kept (called "Op. Hour"). It counts the normal operation hours (not the Stand-by hours). The actual value of the timer is displayed in SAM in a decimal value. Every two soft-resets increase the hour by + 1. Stand-by hours are not counted.

Software Identification, Version, and Cluster

The software ID, version, and cluster will be shown in the main menu display of SAM and CSM.

The screen will show: "AAAAAAB-XXX.YYY.MMM.TTT", where:

- AAAAAA is the chassis name: QN143.
- B is the region indication: E = Europe, A = AP/China, U = NAFTA, L = LATAM.
- XXX is the main version number: this is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 0- 255.
- YYY is the sub version number: this is updated with a minor change of specification (incompatible with the previous versions). Numbering will go from 0- 255.

- MMM is the number of the mandatory (upgrade) release in association with the area of the mandatory (upgrade) release. Numbering will go from 0 - 255.
- TTT bit 7 to 1 is the area of the mandatory (upgrade) release where 0 - none, 1 - Netflix, rest reserved.
- TTT bit 0 : 0 = development release, 1 = production release.

Display Option Code Selection

After an SSB or display exchange, the display option code is not set properly, this can result in a TV with "no display". Therefore, it is required to set this display option code after such a repair.

To do so, press the following key sequence on a standard RC transmitter: "062598" directly followed by MENU and "xxx", where "xxx" is a 3 digit decimal value of the panel type: see column "Display Code" in [Table 6-3](#). When the value is accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed.

During this algorithm, the NVM-content must be filtered, because several items in the NVM are TV-related and not SSB related (e.g. Model and Prod. S/N). Therefore, "Model" and "Prod. S/N" data is changed into "See Type Plate". In case a call centre or consumer reads "See Type Plate" in CSM mode.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To modify the NVM.
- To display/clear the error code buffer.
- To perform alignments.

Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings displayed.
- Error buffer clearing.
- Option settings.
- Software alignments (White Tone).
- NVM Editor.
- Set screen mode to full screen.

How to Activate SAM

To activate SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "062596", directly followed by the "INFO" or "OK" button. Do not allow the display to time out between entries while keying the sequence.

After entering SAM, the following items are displayed, with "SAM" in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

Table 5-1 SAM mode overview

Main Menu	Sub-menu 1	Sub-menu 2	Description
System Information	Op Hour	e.g. 00003	This represents the life timer. The timer counts normal operation hours, but does not count Stand-by hours.
	Main SW ID	e.g. "QN143E_014.001.166.1"	See paragraph Software Identification, Version, and Cluster for the software name definition.
	ERR	e.g. "000 000 000 000 000"	Shows all errors detected since the last time the buffer was erased. Five errors possible.
	OP1	e.g. "000 224 032 000 038 192 192 015"	Used to read-out the option bytes. See paragraph 6.4 Option Settings in the Alignments section for a detailed description. Ten codes are possible.
	OP2	e.g. "159 255 127 061 011003 000 000"	
Clear Codes	Press [OK] to clean the Error Codes immediately		Erases the contents of the error buffer. Select this menu item and press the MENU RIGHT key on the remote control. The content of the error buffer is cleared.
Options	OP#1-OP#16	e.g. "032"	Option code
Alignments	Warm	R Gain	To align the White Tone. See paragraph 6.3 Software Alignments in the Alignments section for a detailed description
		G Gain	
		B Gain	
	Normal	R Gain	
		G Gain	
		B Gain	
	Cool	R Gain	
		G Gain	
		B Gain	
	Store		
NVM Editor	NVM Editor Address		Select and fill in the NVM address
	NVM Editor Value		Select and fill in the NVM value
	NV Editor Store		Store the value in the address
	Service Data Type Number		Select and fill in the NVM Type Number value
	Service Data Production Number		Select and fill in the NVM Type Production Number value
	Service Data 18AC SSB		Select and fill in the NVM 18AC SSB
	Service Data 18AC PSU		Select and fill in the NVM 18AC PSU
Service Data 18AC Display		Select and fill in the NVM 18AC Display	
Upload to USB	Channel List		To upload several settings from the TV to a USB stick
	NVM Copy		
	Readable Info		
	EDID Copy		
Download from USB	Channel List		To download several settings from the USB stick to the TV
	NVM Copy		
	EDID Copy		
Initialize NVM	Press [OK] to Initialize NVM immediately		To initialize a (corrupted) NVM. Be careful, this will erase all settings.
Dealer Options	Set Virgin mode	Virgin mode:Off	Set Virgin mode
	Store	Press [OK] to store virgin mode immediately	Store the virgin mode in the address
RF4CE Clear	Press [OK] to clear the RF4CE pairing table		Enable to clear the pairing table of Radio Frequency for Consumer Electronics

How to Navigate

- In the SAM menu, select menu items with the UP/DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the UP/DOWN keys to display the next/previous menu items.
- With the "LEFT/RIGHT" keys, it is possible to:
 - (De) activate the selected menu item.
 - (De) activate the selected sub menu.
 - Change the value of the selected menu item.
- When you press the MENU button once while in top level SAM, the set will switch to the normal user menu (with the SAM mode still active in the background).

How to Store SAM Settings

To store the settings changed in SAM mode, leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set. Exceptions must be stored separately via the STORE button.

How to Exit SAM

Use one of the following methods:

- Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
- Via a standard RC-transmitter, key in "00" sequence.

Note: When the TV is switched "off" by a power interrupt while in SAM, the TV will show up in "normal operation mode" as

soon as the power is supplied again. The error buffer will not be cleared.

5.2.3 Contents of the Factory mode:

Purpose

- To perform extended alignments.

Specifications

- Displaying and or changing Panel ID information.
- Displaying and or changing Tuner ID information.
- Error buffer clearing.
- Various software alignment settings.
- Testpattern displaying.
- Public Broadcasting Service password Reset.
- etc.

How to Activate the Factory mode

To activate the Factory mode, use the following method:

- Press the following key sequence on the remote control transmitter: from the "Menu/Home screen" press "1999", directly followed by the "Back" button. Do not allow the display to time out between entries while keying the sequence.

After entering the Factory mode, the following items are displayed,

Table 5-2 Factory mode overview

Item	Item value	Default value							Description
		32"	40"	42"	47"	48"	55"	65"	
0	F/W VERSION	Press OK							Displays the software versions of the supplier, Flash PQ, Smart Picture, BL Dimming, Source Meter, the Picture Quality checksum, the Dimming library, the Source meter library, the Flash AQ, the MTK, MCU and OAD software versions.
1	PANEL_ID	See table 6-3 Display code overview							Displays and changes the Panel ID with the left and right cursor; be careful changing this, it can result in not correct displaying the screen!
2	TUNER_ID	5	5	5	5	5	5	3	Displays and changes the Tuner ID with the left and right cursor. Not to be changed when the tuner is replaced with the correct service part.
3	DEMOT_TYPE	3	0	3	3	3	3	4	Choose demot type.
4	ERR Code: xxx xxx xxx xxx xxx	000 000 000 000 000							Values showing the last 5 errors during the last 50 hours of operation, according to table 5-4 Error code overview
5	CLEAR ERROR BUFFER	Press OK							Selecting this clear all current error codes.
6	NVM ADDRESS	0							NVM address 0 to 8191, Use Item 6 to change and 7 to store the data to the correct NVM address
7	NVM VALUE	0							Displays the value at the NVM address of item 5
8	NVM STORE	Press OK							Use this option to save the data of item 6 to NVM address of item 5
9	NVM COPY TV to USB	Press OK							Use this to store the NVM data to the REPAIR folder of a FAT formatted USB memory stick. The TV will write two files in the REPAIR folder of the memory stick. It will create this folder if it does not exist. The items are "Channel list", "Personal settings", "Option codes", "Display-related alignments" and "History list". In case the download to the USB stick was not successful "Failure" will appear. In this case, check if the USB stick is connected properly. Now the settings are stored onto the USB stick and can be used to download onto another TV or other SSB. Uploading is of course only possible if the software is running and if a picture is available. This method is created to be able to save the customer's TV settings and to store them into another SSB.
10	NVM READ USB to TV	Press OK							Use this to store the NVM data from the USB memory stick to the TV. The TV will save the two files which were created in item 8 to the NVM of the set. Use these options when replacing a SSB. When "USB to TV Success" is displayed remove the power and restart the TV
11	RESET_PBS_PWD	Press OK							Use this to reset the Child Lock
12	DIM_LIB RESET	Press OK							Reset the Dimming
13	SRC_METER RESET	Press OK							Reset the Source meter
14	AMBLIGHT RESET	Press OK							Reset Ambilight
15	ACFG RESET	Press OK							Reset ACFG
16	CIPLUS QUERY	Press OK							Shows the Validity of the CI+ key and the supplier information
17	CIPLUS UPDATE	Press OK							Used to enter a new CI+ code into the NVM. This can only be used when no CI+ code exists in the NVM
18	EDID UPDATE	Press OK							Used to enter a new EDID codes into the NVM
19	TEST PATTERN	Press OK							With the "left" and "right" keys of the remote control various test patterns can be chosen
20	VIRGIN_MODE	Off							Use this to return the set to virgin mode. Depends whether the set has been used already.
21	E-Fuse	On							E-fuse mode
22	ORT_MODE	Off							ORT mode
23	VGA_UART_SWITCH	Off							When switched "on" the VGA port can be used for UART logging.
24	DRMWARNING	Off	Off	Off	On	On	On	On	Warning the data rights management
25	AGEING MODE	Off							Use this for aging a new LCD panel
26	CLR_TEMP_R	255							Red colour temperature setting
27	CLR_TEMP_G	255							Green colour temperature setting
28	CLR_TEMP_B	255							Blue colour temperature setting
29	AUTO_COLOR	Press OK							PC: any pattern that has black and white, YPbPr: SMPTE bar (colour bar), any timing.
30	ADC_GAIN_R	146	0	0	83	0	0	0	Red ADC gain
31	ADC_GAIN_G	145	0	0	81	0	0	0	Green ADC gain
32	ADC_GAIN_B	138	0	0	80	0	0	0	Blue ADC gain
33	ADC_OFFSET_R	134	128	128	88	128	128	128	Red ADC offset
34	ADC_OFFSET_G	132	128	128	81	128	128	128	Green ADC offset
35	ADC_OFFSET_B	200	128	128	86	128	128	128	Blue ADC offset
36	YPBPR_PHASE	20	InValid	InValid	InValid	InValid	InValid	InValid	Not available for this chassis
37	AUD_GAIN_LINEIN	0							Line-in audio gain
38	AUD_GAIN_HDMI	0							HDMI audio gain
39	AUD_GAIN_ATV	0							Analogue TV audio gain
40	AUD_GAIN_DTV	0							Digital TV audio gain
41	AUD_GAIN_USB	0							USB audio gain
42	AQ_INDEX	11	9	3	3	9	4	5	Audio Quality index
43	AUDIO TEST MODE	Off							Used for audio testing during production
44	AUDIO CHANNEL TYPE	2.0	2.0	0.0	0.0	2.0	2.0	0.0	Defines the installed speaker system
45	AUDIO SRS	Off							Audio SRS
46	DUMP PQ FROM TV	Press OK							Saves the picture quality data to a file "pq.bin" to the root of a FAT formatted USB memory stick
47	LOAD PQ to TV	Press OK							Loads the picture quality data from a file "pq.bin" in to the TV
48	DUMP AQ FROM TV	Press OK							Saves the audio quality data to a file "AQ.bin" to the root of a FAT formatted USB memory stick

Item	Item value	Default value							Description
		32"	40"	42"	47"	48"	55"	65"	
49	LOAD AQ to TV	Press OK							Loads the audio quality data from a file "AQ.bin" in to the TV
50	COPY BIN CHL to TV	-	-	-	Press OK	-	-	-	COPY BIN CHL to TV
51	COPY BIN CHL to USB	-	-	-	Press OK	-	-	-	COPY BIN CHL to USB
52	FEF CHECK	Off							FEF Check
53	PANEL FLIP	Off	Off	Off	Off	On	Off	Off	Flip panel
54	VGA_SOURCE	Off							Enable/Disable VGA source
55	HDMI2	-	Off	On	-	-	Off	-	Enable/Disable HDMI2 source
56	HDMI3	Off	On	On	On	Off	On	On	Enable/Disable HDMI3 source
57	HDMI4	On							Enable/Disable HDMI4 source
58	USB2	On							Enable/Disable USB2 source
59	USB3	Off	Off	On	On	Off	Off	Off	Enable/Disable USB3 source
60	KEYBOARD CONFIG	On							Enable/Disable HDMI3 source
61	LIGHT SENEOR TUNING	1	1	2	3	1	3	1	Light sensor
62	LIGHT SENSOR TYPE	0							Light sensor
63	TEMP SENSOR TYPE	3							Tempreture sensor
64	AMBILIGHT_DRIVER	0	0	2	0	0	0	0	Drive the Ambient light
65	AMBILIGHT TYPE	1	1	2	1	1	1	1	The type of Ambient light
66	LED TYPE	2							The type of LED
67	MHP APP	Off							MHP APP
68	3D	1	3	1	1	3	1	3	3D on/off
69	SMALL SCREEEN	Off	-	-	Off	Off	-	On	Small screen
70	BLUETOOTH	-	-	-	Off	-	-	Off	Bluetooth on/off
71	EXIT_FACTORY	Press OK							Exits the Factory mode

How to Exit the Factory mode

Use one of the following methods:

- Select EXIT_FACTORY from the menu and press the "OK" button.

Note: When the TV is switched "off" by a power interrupt, or normal switch to "stand-by" while in the factory mode, the TV will show up in "normal operation mode" as soon as the power is supplied again. The error buffer will not be cleared.

5.2.4 Customer Service Mode (CSM)

Purpose

The Customer Service Mode shows error codes and information on the TV operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.

The CSM is a read-only mode; therefore, modifications are not possible in this mode.

Specifications

- Ignore "Service unfriendly modes".
- Line number for every line (to make CSM language independent).
- Set the screen mode to full screen (all contents on screen is visible).
- After leaving the Customer Service Mode, the original settings are restored.
- Possibility to use "CH+" or "CH-" for channel surfing, or enter the specific channel number on the RC.

How to Activate CSM

To activate CSM, press the following key sequence on a standard remote control transmitter: "123654" (do not allow the display to time out between entries while keying the sequence). After entering the Customer Service Mode, the following items are displayed.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!

Contents of CSM

- **1.1 Set Type** This information is very helpful for a helpdesk/workshop as reference for further diagnosis. In this way, it is not necessary for the customer to look at the

rear of the TV-set. Note that if an NVM is replaced or is initialized after corruption, this set type has to be re-written to NVM.

- **1.2 Production code** Displays the production code (the serial number) of the TV. Note that if an NVM is replaced or is initialized after corruption, this production code has to be re-written to NVM.
- **1.3 Installation date** Indicates the date of the first installation of the TV. This date is acquired via time extraction.
- **1.4a Option Code 1** Gives the option codes of option group 1 as set in SAM.
- **1.4b Option Code 2** Gives the option codes of option group 2 as set in SAM.
- **1.5 SSB** Gives an identification of the SSB as stored in NVM. Note that if an NVM is replaced or is initialized after corruption, this identification number has to be re-written to NVM. This identification number is the 12NC number of the SSB.
- **1.6 Display 12NC NVM read/write.**
- **1.7 PSU 12NC NVM read/write.**
- **1.8 RF4CE SW version release.**
- **2.1 Current Main SW** Displays the built-in main software version. In case of field problems related to software, software can be upgraded. As this software is consumer upgradeable, it will also be published on the internet.
- **2.2 Standby SW** Displays the built-in stand-by processor software version. Upgrading this software will be possible via USB.
- **2.3 Panel Code** Displays the Display Code number.
- **2.4 Bootloader ID** ID of Bootloader.
- **2.5 NVM version** Detects and displays NVM version.
- **2.6 Flash ID** ID of flash model.
- **2.7 e-UM version** eDFU (help) version.
- **2.8 Channel Table Structure Version** version of channel table structure.
- **2.9 Error Codes** Detects and displays errors.
- **2.10 Sil Drv Version**
- **3.1 Signal Quality** Analog/digital signal strength.
- **3.2 Child lock** Not active / active. This is a combined item for locks. If any lock (channel lock, parental lock) is active, it is indicated as "active".
- **3.3 HDCP keys** Indicates the validity of the HDMI keys (or HDCP keys). In case these keys are not valid and the customer wants to make use of the HDMI functionality, the SSB has to be replaced.

- **3.4 Ethernet MAC address** A Media Access Control address (MAC address) is a unique identifier assigned to network interfaces for communications on the physical network segment.

How to Navigate

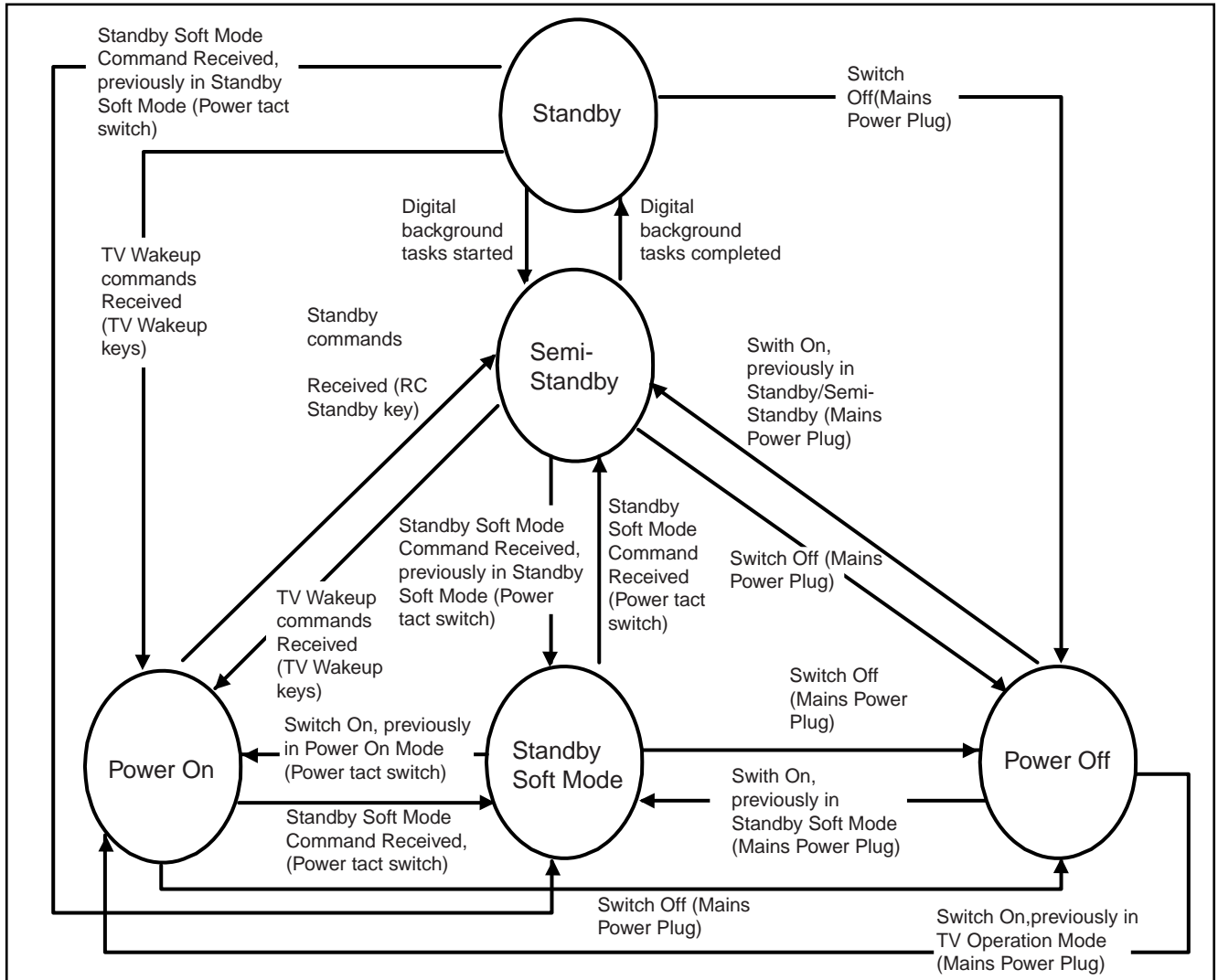
By means of the "CURSOR-DOWN/UP" knob (or the scroll wheel) on the RC-transmitter, can be navigated through the menus.

How to Exit CSM

To exit CSM, use one of the following methods.

- Press the MENU/HOME button on the remote control transmitter.
- Press the POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Stepwise Start-up



19080_206_110323.eps
120224

Figure 5-1 Stepwise Start-up

5.4 Service Tools

5.4.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products and offers the following:

1. ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I²C or UART commands is necessary, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the micro processor is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

Specifications

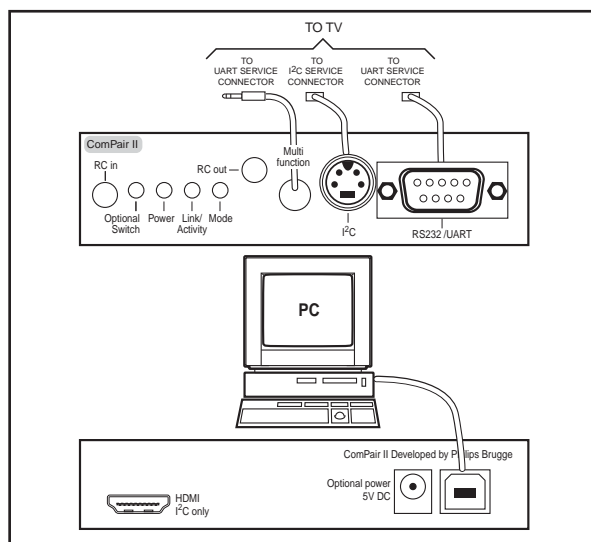
ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair II interface box is connected **to the PC** via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).

Important remark: Currently, for this chassis, dedicated ComPair functionality is not supported.

Still, the interface box can be used as level shifter between the TV set and PC.

How to Connect

This is described in the chassis fault finding database in ComPair.



10000_036_090121.eps
091118

Figure 5-2 ComPair II interface connection

Caution: It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs can be blown!

How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- Software is available via the Philips Service web portal.
- ComPair/UART interface cable for QM14.3x xx.

(using 3.5 mm Mini Jack connector): 3138 188 75051.

Note: When you encounter problems, contact your local support desk.

5.5 Software Upgrading

5.5.1 Description

It is possible for the user to upgrade the main software via the USB port. This allows replacement of a software image in a stand alone set. A description on how to upgrade the main software can be found in the DFU or on the Philips website.

5.5.2 Introduction

Philips continuously tries to improve its products, and it's recommend that the TV software is updated when updates are available. Software update files can be obtained from the dealer or can be downloaded from the following websites:

<http://www.philips.com/support>

Preparing a portable memory for software upgrade

The following requirements have to be met:

1. A personal computer connected to the internet.
2. An archive utility that supports the ZIP-format (e.g. WinZip for Windows or Stuffit for Mac OS).
3. A FAT formatted USB memory stick (preferably empty).

Note:

1. Only FAT/DOS-formatted memory sticks are supported.
2. Only use software update files that can be found on the <http://www.philips.com/support> web site.

5.5.3 Check the current TV software version

Before starting the software upgrade procedure, it is advised to check that what the current TV software:

1. Press the "1 2 3 6 5 4" button on the remote control to enter the CSM mode.
2. Use the up/down cursor keys to select "Current Main Software".

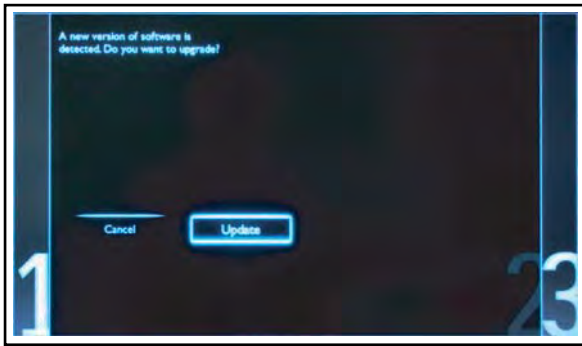
If the current software version of the TV is the same as the latest update file found on <http://www.philips.com/support>, it is not necessary to update the TV software.

5.5.4 Download the latest software

1. Open the internet page <http://www.philips.com/support>.
2. Find information and software related to the TV.
3. Select the latest software update file and download it to the PC.
4. Insert the USB memory stick into one of the USB ports of the PC.
5. Decompress the downloaded ZIP file and copy it to the root directory of the USB flash drive.

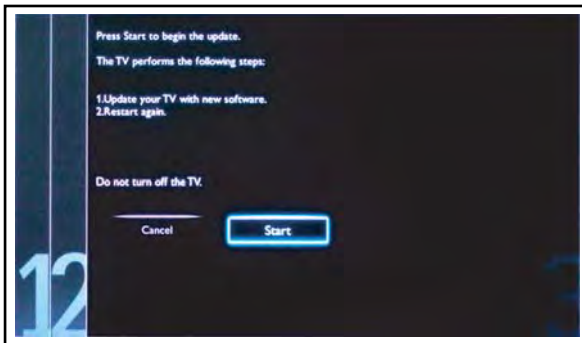
5.5.5 Update the TV software

1. Turn the TV on and wait for it to boot completely.
2. Insert the USB memory stick that contains the software update files in one of the USB ports of the TV.
3. The TV will automatically detect the USB memory stick. Then a window jumps out as [Figure 5-3](#).
Note: If the USB flash drive is not detected after power up, disconnect it and re-insert it.
4. Select [Update] and press OK. See [Figure 5-3](#).
5. To proceed, In next menu select [Start] and press OK to start software updates. See [Figure 5-4](#).
6. Upgrading will now begins and the status of the updating progress will be displayed.
7. When the TV software is updated. Remove your USB flash drive, then select [Restart] and press OK to restart the TV. See [Figure 5-5](#).



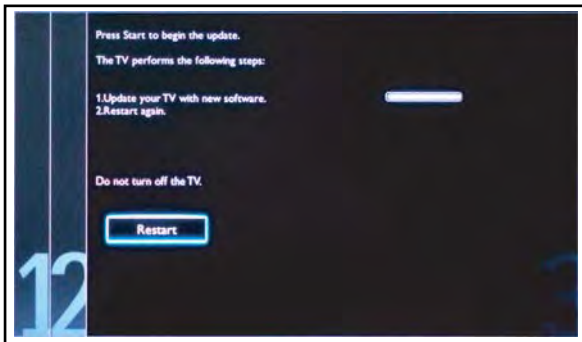
19080_207_110324.eps
110324

Figure 5-3 Update the TV software [1/3]



19080_208_110324.eps
110324

Figure 5-4 Update the TV software [2/3]



19080_209_110324.eps
110324

Figure 5-5 Update the TV software [3/3]

Note:

- Do not remove the USB flash drive during the software update.
- If a power failure occurs during the update, do not remove the USB flash drive from the TV. The TV will continue the software update as soon as the power comes up again.
- If an error occurs during the update retry the procedure or contact the dealer.
- We do not recommend downgrading to an older version.
- Once the upgrade is finished, use the PC to remove the TV software from the USB portable memory.

5.5.6 Content and Usage of the One-Zip Software File

Below you find a content explanation of the One-Zip file, and instructions on how and when to use it. Only files that are relevant for Service are mentioned here.

- **EDID_clustername.zip:** Contains the EDID content of the different EDID NVMs.

- **FUS_clustername_version.zip:** Contains the "autorun.upg" which is needed to upgrade the TV main software and the software download application.
- **NVM_clustername_version.zip:** Dedicated default NVM content.

5.5.7 How to Copy NVM Data to/from USB

When copying data to/and from a USB memory stick, the folder "PhilipsChannelMaps" is used. When inserting an empty USB memory stick, and downloading data to the stick, the TV will create this folder. When sending data from a USB memory stick to a TV, the intended data must be available in the "PhilipsChannelMaps" folder.

Note that when copying EDID data to the TV, all necessary EDID files must be in this folder.

Service mode overview for your reference.

Table 5-3 Service mode overview

Service Modes	Description
SAM	Service alignment mode
Factory Mode	Used for extended alignments
CSM	3-page compact CSM pages. There will be CSM dump to USB-stick upon entering CSM-mode
USB SW upgradeable	SW-upgrading of flash memories can be done via USB. The main SW can be upgraded via the ZIP
NVM-Editor in SAM	NVM-editor will function as in the past: Address and Value field is a decimal value via digit entry
Service Data	New Service data in SAM for CTN, Prod. no., 18AC programming with virtual keyboard
USB copy/paste in SAM	Channel list, NVM data, Readable info, EDID
UART logging	There will be printout available in UART. No specifications of the printout, per MTK provision/definition.
Blind SAM	RC sequence "062598" + "Menu" + "Panel code"

5.6 Error Codes

5.6.1 Introduction

Error codes are required to indicate failures in the TV set. In principle a unique error code is available for every:

- Activated (SW) protection.
- Failing I²C device.
- General I²C error.

The last five errors, stored in the NVM, are shown in the Service menu's. This is called the error buffer.

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

An error will be added to the buffer if this error differs from any error in the buffer. The last found error is displayed on the left.

An error with a designated error code **never** leads to a deadlock situation. It must always be diagnosable (e.g. error buffer via OSD or blinking LED or via ComPair).

In case a failure identified by an error code automatically results in other error codes (cause and effect), only the error code of the MAIN failure is displayed.

5.6.2 How to Read the Error Buffer

You can read the error buffer in three ways:

- On screen via the SAM/CSM (if you have a picture).
Example:
 - **ERROR: 000 000 000 000 000:** No errors detected
 - **ERROR: 013 000 000 000 000:** Error code 13 is the last and only detected error
 - **ERROR: 034 013 000 000 000:** Error code 13 was detected first and error code 34 is the last detected (newest) error

- Via the blinking LED procedure (when you have no picture). See paragraph [5.7 The Blinking LED Procedure](#).
- Via ComPair.

problems wait 2 minutes from start-up onwards, and then check if the front LED is blinking or if an error is logged.

In this chassis only "layer 2" error codes are available and point to problems on the SSB. They are triggered by LED blinking when CSM is activated. Only the following layer 2 errors are defined:

5.6.3 Error codes

Take notice that some errors need several minutes before they start blinking or before they will be logged. So in case of

Table 5-4 Error code overview

Description	Layer 1	Layer 2	Monitored by	Error/Prot	Error Buffer/Blinking LED	Device	Defective Board
FE-bus	2	11	SOC	E	BL / EB	SSB	SSB
BE -bus	2	13	SOC	E	BL / EB	SSB	SSB
SRF-bus	2	14	SOC	E	BL / EB	SSB	SSB
12V	3	16	Stby μ P/SOC	P	BL	/	Supply
Display supply	3	17	SOC	E	BL	/	Supply
HDMI mux	2	23	SOC	E	EB	SiI9287/9573	SSB
I2C switch	2	24/25	SOC	E	EB	PCA954X	SSB
Channel decoder 1	2	27	SOC	E	EB	CXD2834	SSB
Channel decoder 2	2	28	SOC	E	EB	CXD2834	SSB
Rogue HDCP2.2	2	29	SOC	E	EB	SiI9679	SSB
Lnb controller Single/dual	2	31	SOC	E	EB	LNBH25/26	SSB
Hybrid Tuner	2	34	SOC	E	EB	SUT-PEZ	SSB
Class-D	2	37	SOC	E	EB	/	SSB
Light sensor	6	43	SOC	E	EB	/	Set
RF4CE	6	46	SOC	E	EB	CC2533	Set
NT72314	9	61	SOC	E	BL	NT72314	SSB
Splash error	2	65	SOC	P	BL	NT314-SOC	SSB

5.6.4 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu
- By using the CLEAR command in the Factory mode:
- If the content of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.7 The Blinking LED Procedure

5.7.1 Introduction

The software is capable of identifying different kinds of errors. Because it is possible that more than one error can occur over time, an error buffer is available, which is capable of storing the last five errors that occurred. This is useful if the OSD is not working properly.

Errors can also be displayed by the blinking LED procedure. The method is to repeatedly let the front LED pulse with as many pulses as the error code number, followed by a period of 1.5 seconds in which the LED is "off". Then this sequence is repeated.

Example (1): error code 4 will result in four times the sequence LED "on" for 0.25 seconds / LED "off" for 0.25 seconds. After this sequence, the LED will be "off" for 1.5 seconds. Any RC command terminates the sequence. Error code LED blinking is in red color.

Example (2): the content of the error buffer is "12 9 6 0 0" After entering SDM, the following occurs.

- 1 long blink of 5 seconds to start the sequence.
- 12 short blinks followed by a pause of 1.5 seconds.
- 9 short blinks followed by a pause of 1.5 seconds.
- 6 short blinks followed by a pause of 1.5 seconds.
- 1 long blink of 1.5 seconds to finish the sequence.
- The sequence starts again with 12 short blinks.

5.8 Fault Finding and Repair Tips

Note:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.8.1 NVM Editor

In some cases, it can be convenient if one directly can change the NVM contents. This can be done with the "NVM Editor" in SAM mode. With this option, single bytes can be changed.

Caution:

- Do not change these, without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!
- Always write down the existing NVM settings, before changing the settings. This will enable you to return to the original settings, if the new settings turn out to be incorrect.

5.8.2 No Picture

When you have no picture, first make sure you have entered the correct display code. See paragraph [6.4 Option Settings](#) for the instructions. See also [Table 6-3](#).

5.8.3 Unstable Picture via HDMI input

Check if HDMI EDID data is properly programmed.

5.8.4 No Picture via HDMI input

Check if HDCP key is valid. This can be done in CSM.

5.8.5 TV will not start-up from Stand-by

Possible Stand-by Controller failure. Re-flash the software.

5.8.6 CSM

When CSM is activated and there is a USB memory stick connected to the TV, the software will dump the complete CSM content to the USB memory stick. The file (Csm.txt) will be saved in the root of the USB memory stick.

5.8.7 Loudspeakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set!

5.8.8 Display option code

Attention: In case the SSB is replaced, always check the Panel Code in CSM, even when picture is available. Performance with the incorrect display option code can lead to unwanted side-effects for certain conditions.

6. Alignments

Index of this chapter:

[6.1 General Alignment Conditions](#)

[6.2 Hardware Alignments](#)

[6.3 Software Alignments](#)

[6.4 Option Settings](#)

[6.5 Reset of Repaired SSB](#)

6.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 90 - 264 V_{AC}, 50/ 60 ± 3 Hz.
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).

Caution: It is not allowed to use heat sinks as ground.

- Test probe: R_i > 10 MΩ, C_i < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

6.2 Hardware Alignments

Not applicable.

6.3 Software Alignments

Put the set in SAM mode (see Chapter [5. Service Modes, Error Codes, and Fault Finding](#)). The SAM menu will now appear on the screen. Select RGB Align and go to one of the sub menus. The alignments are explained below.

The following items can be aligned:

- White point.

To store the data:

- Press OK on the RC **before the cursor is moved to the left.**
- Select "Store" and press OK on the RC.
- Switch the set to stand-by mode.

For the next alignments, supply the following test signals via a video generator to the RF input:

- **EU/AP-PAL models:** a PAL B/G TV-signal with a signal strength of at least 1 mV and a frequency of 475.25 MHz
- **US/AP-NTSC models:** an NTSC M/N TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).
- **LATAM models:** an NTSC M TV-signal with a signal strength of at least 1 mV and a frequency of 61.25 MHz (channel 3).

6.3.1 RGB Alignment

Before alignment, set the picture as follows:

Picture Setting	
Dynamic backlight	Off
Dynamic Contrast	Off
Color Enhancement	Off
Picture Format	Unscaled
Light Sensor	Off
Brightness	50
Color	0
Contrast	100

White Tone Alignment:

- Activate SAM.
- Select "RGB Align." and choose a color temperature.
- Use a 100% white screen as input signal and set the following values:
 - "Red BL Offset" and "Green BL Offset" to "7" (if present).
 - All "White point" values initial to "128".

In case you have a colour analyser:

- Measure with a calibrated (phosphor- independent) color analyser (e.g. Minolta CA-210) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x, y coordinates (while holding one of the White point registers R, G or B on max. value) by means of decreasing the value of one or two other white points to the correct x, y coordinates (see Table [6-1 White D alignment values](#)). Tolerance: dx: ± 0.003, dy: ± 0.003.
- Repeat this step for the other colour Temperatures that need to be aligned.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 6-1 White D alignment values

Value	Cool (11000 K)	Normal (9000 K)	Warm (6500 K)
x	0.276	0.287	0.313
y	0.282	0.296	0.329

If you do **not** have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production (statistics).

6.3.2 Display Adjustment

You can use the default values. The default values are average values coming from production.

- Enter SAM mode.
- Select a colour temperature (e.g. COOL, NORMAL, or WARM).
- Set the RED, GREEN and BLUE default values according to the values in [Table 6-2](#).
- When finished press OK on the RC, then press STORE to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 6-2 White tone default settings

Picture mode	Screen size	Colour temperature		
		Red	Green	Blue
Normal (9000K)	42PUx7809/xx	255	228	196
	49PUx7809/xx	205	254	204
	55PUx7809/xx	197	255	206
Cool (11000K)	42PUx7809/xx	252	241	252
	49PUx7809/xx	192	255	244
	55PUx7809/xx	182	255	241
Warm (6500K)	42PUx7809/xx	255	202	111
	49PUx7809/xx	239	254	142
	55PUx7809/xx	236	255	146

This group setting of colour temperature will be applied automatically to the TV / VGA / HDMI / AV sources.

6.4 Option Settings

6.4.1 Introduction

The microprocessor communicates with a large number of I²C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence / absence of these MT5591 ICs is configured by the option codes.

Notes:

- After changing the option(s), save them by pressing the OK button on the RC before the cursor is moved to the left, select STORE and press OK on the RC.
- The new option setting is only active after the TV is switched "off" / "stand-by" and "on" again with the mains switch (the NVM is then read again).

6.4.2 Option Code Overview

Enter SAM mode to check the option codes. they could be edited in the NVM.

6.4.3 Display Code Overview

Press the following key sequence on a standard RC transmitter: "062598" directly followed by MENU and "xxx", where "xxx" is a 3 digit decimal value of the panel type: see column "Display Code" in [Table 6-3](#). After resetting the Display Code, restart the set immediately.

Table 6-3 Display code overview

CTN_ALT BOM#	Panel Type	Display Code
42PUK7809/12	TFT-LCD LC420EQE-PGF1	471
42PUS7809/12	TFT-LCD LC420EQE-PGF1	471
42PUS7809/60	TFT-LCD LC420EQE-PGF1	471
49PUK7809/12	TFT-LCD LC490EQE-XGF1	470
49PUS7809/12	TFT-LCD LC490EQE-XGF1	470
49PUS7809/60	TFT-LCD LC490EQE-XGF1	470
55PUK7809/12	TFT-LCD LC550EQE-PGF1	469
55PUS7809/12	TFT-LCD LC550EQE-PGF1	469
55PUS7809/60	TFT-LCD LC550EQE-PGF1	469

6.5 Reset of Repaired SSB

A very important issue towards a repaired SSB from a Service repair shop (SSB repair on component level) implies the reset of the NVM on the SSB.

A repaired SSB in Service should get the service Set type "00PF0000000000" and Production code "00000000000000". Also the virgin bit is to be set. To set all this, you can use the use the "NVM editor" and "Dealer options" items in SAM (do not forget to "store").

After a repaired SSB has been mounted in the set (set repair on board level), the type number (CTN) and production code of the TV has to be set according to the type plate of the set. For this, you can use the NVM editor in SAM.

6.5.1 SSB Identification

SSB's of this chassis are identified by a "715" code on the SSB. 715Axxxx-Nnn-MMM-OOOO

- **715** main category, Printed Wiring Board
- **Axxxx** sub category, sequential coding number
- **Nnn** Version code
 - **N** Development number
 - **nn** Production number
- **MMM** Mounting variation code
- **OOOO** Optional variation code

Make sure when replacing an SSB the SSB identification codes match the replacement panel.

7. Circuit Descriptions

Index of this chapter:

- [7.1 Introduction](#)
- [7.2 MTK platform](#)
- [7.3 Power Supply](#)

Notes:

- Only **new** circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring-, block- (see chapter [9. Block Diagrams](#)) and circuit diagrams (see chapter [10. Circuit Diagrams and PWB Layouts](#)). Where necessary, you will find a separate drawing for clarification.

7.1 Introduction

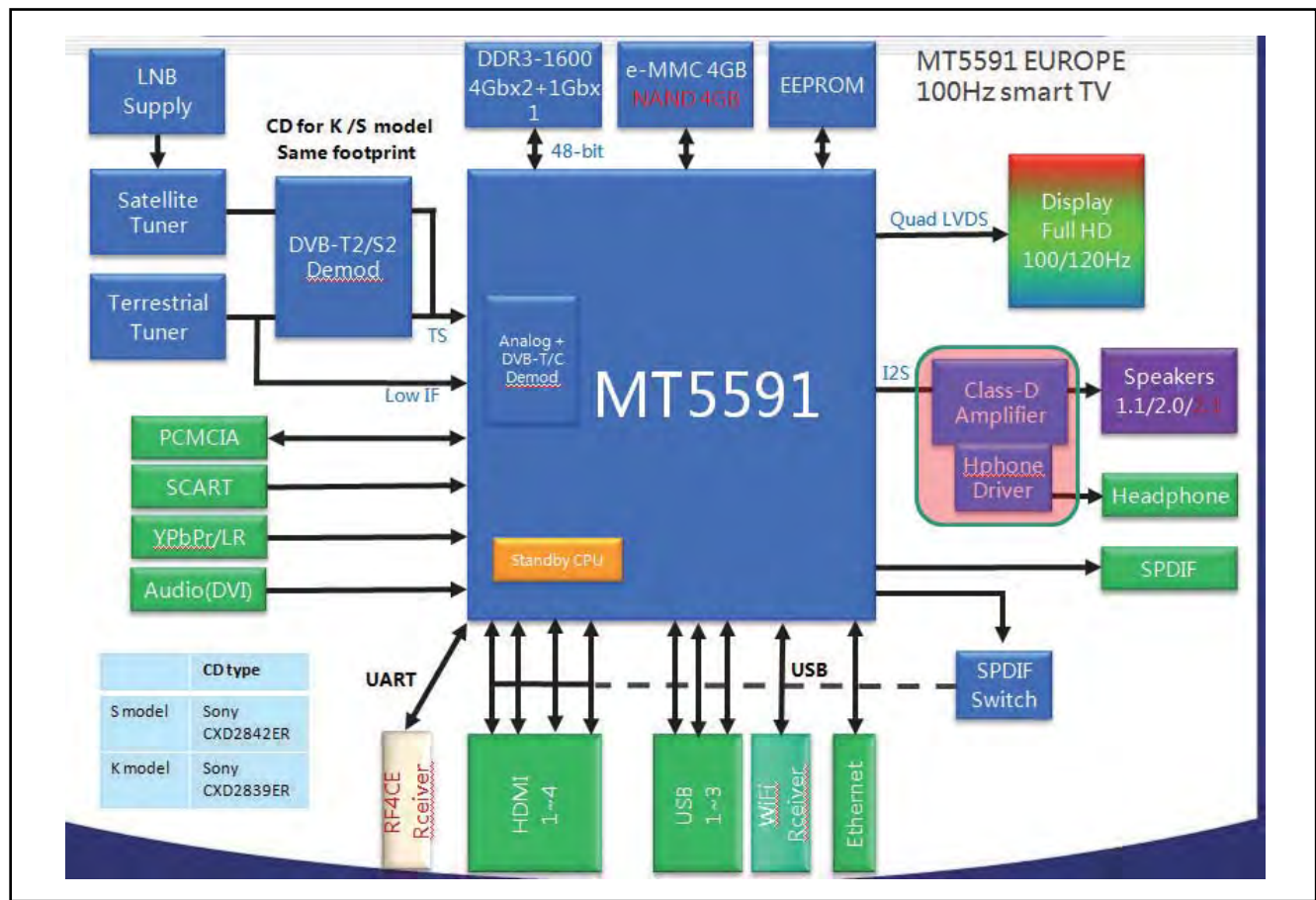
The QM14.3E LA chassis is a new platform launched in Europe in 2014. This chassis contains the MT5591. The major deltas versus its predecessor are DVB-TC; DVB-TC/T2, DVB-TC/S2 with also multimedia, 3D, AmbiLight, WiFi, Smart TV and Light Sensor functionality.

The QM14.3E LA covers sets in the 78xx-range (42", 49", 55").

7.2 MTK platform

7.2.1 Architecture

[Figure 7-1](#) gives an overview of the architecture. Refer to chapter [9. Block Diagrams](#) for a detailed diagram.



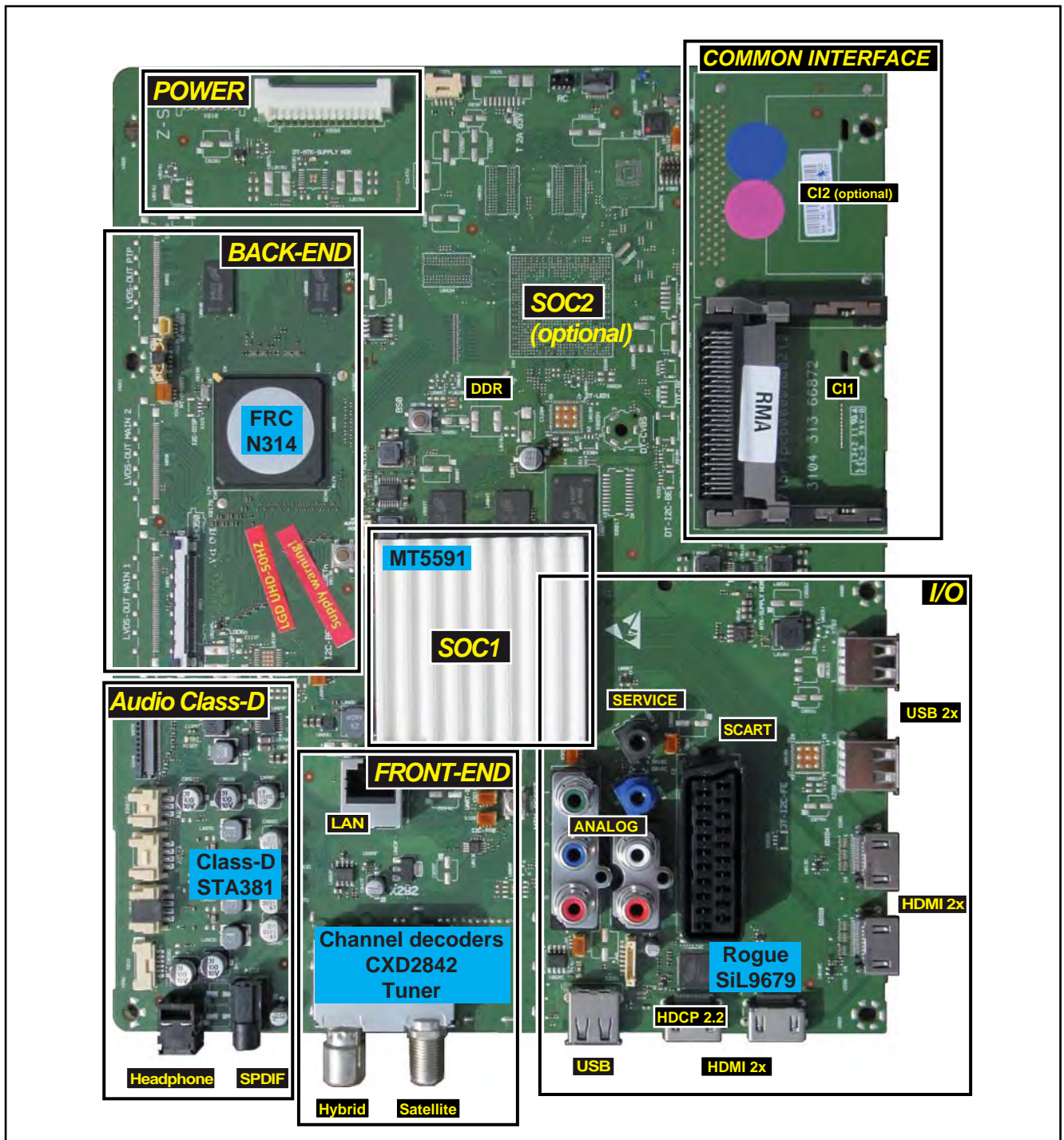
19580_137_140328.eps
14-03-28

Figure 7-1 Architecture of the MT5591 platform

7.2.2 MTK Copper Layout

Refer to chapter 9. Block Diagrams for a detailed diagram.

Figure 7-2 gives the SSB layout and shows the location of parts and principal components.



19580_138_140331.eps
14-03-31

Figure 7-2 MTK MT5591 layout

7.3 Power Supply

7.3.1 Power Supply Unit

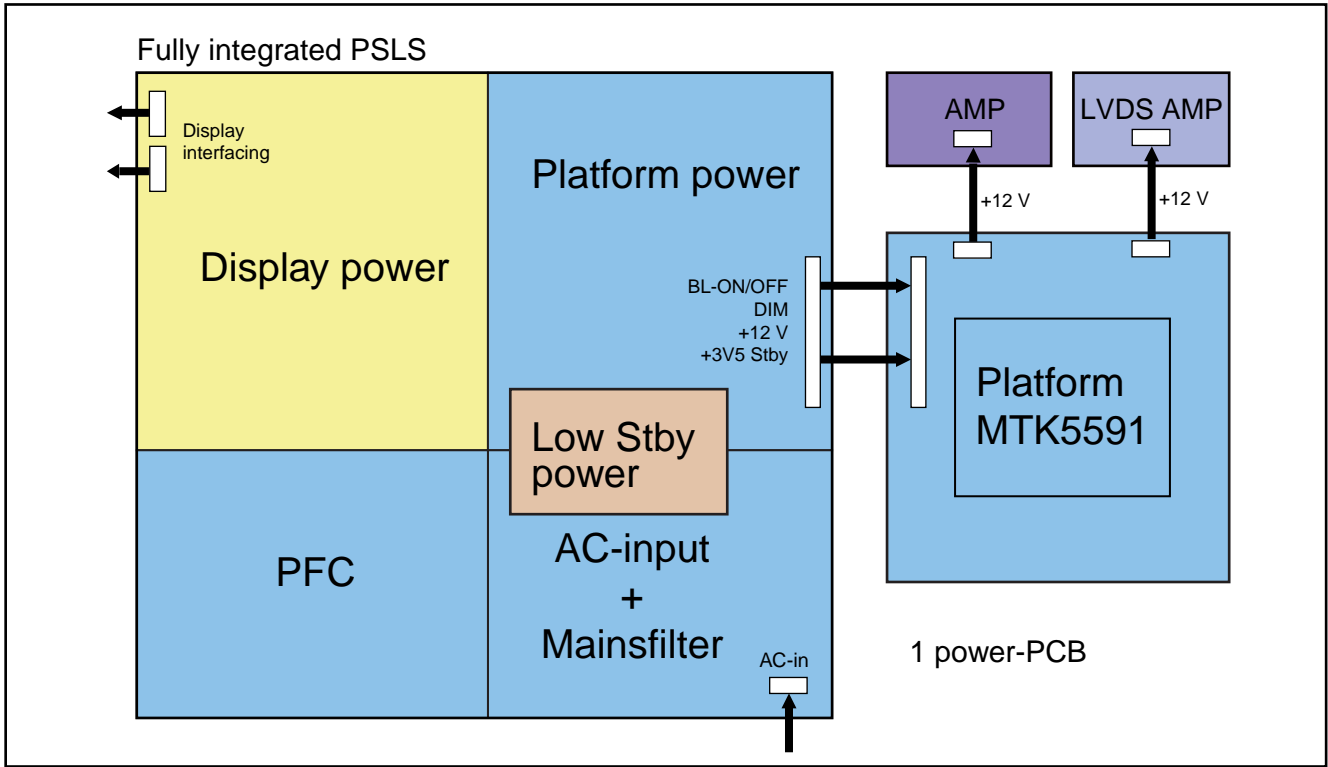
All power supplies are a black box for Service. When any of these power supplies is defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective

fuse with one with the correct specifications! This part is available in the regular market.

Consult the Philips Service web portal for the order codes of the boards.

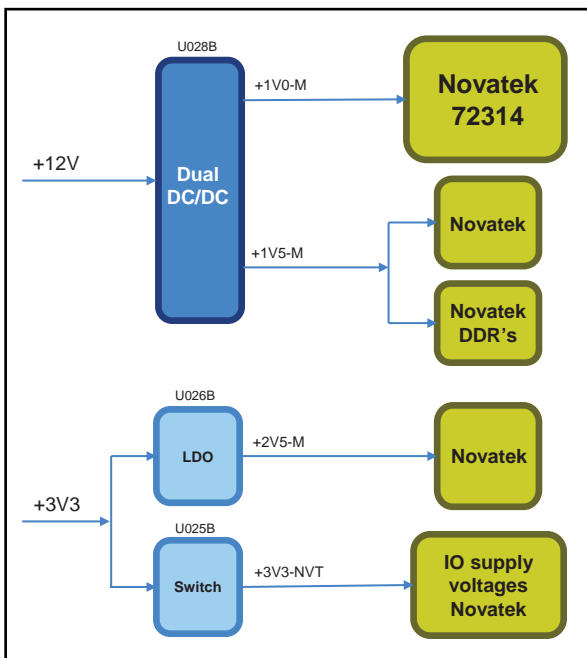
7.3.2 Power Architecture

For the power architecture, refer to figure 7-3



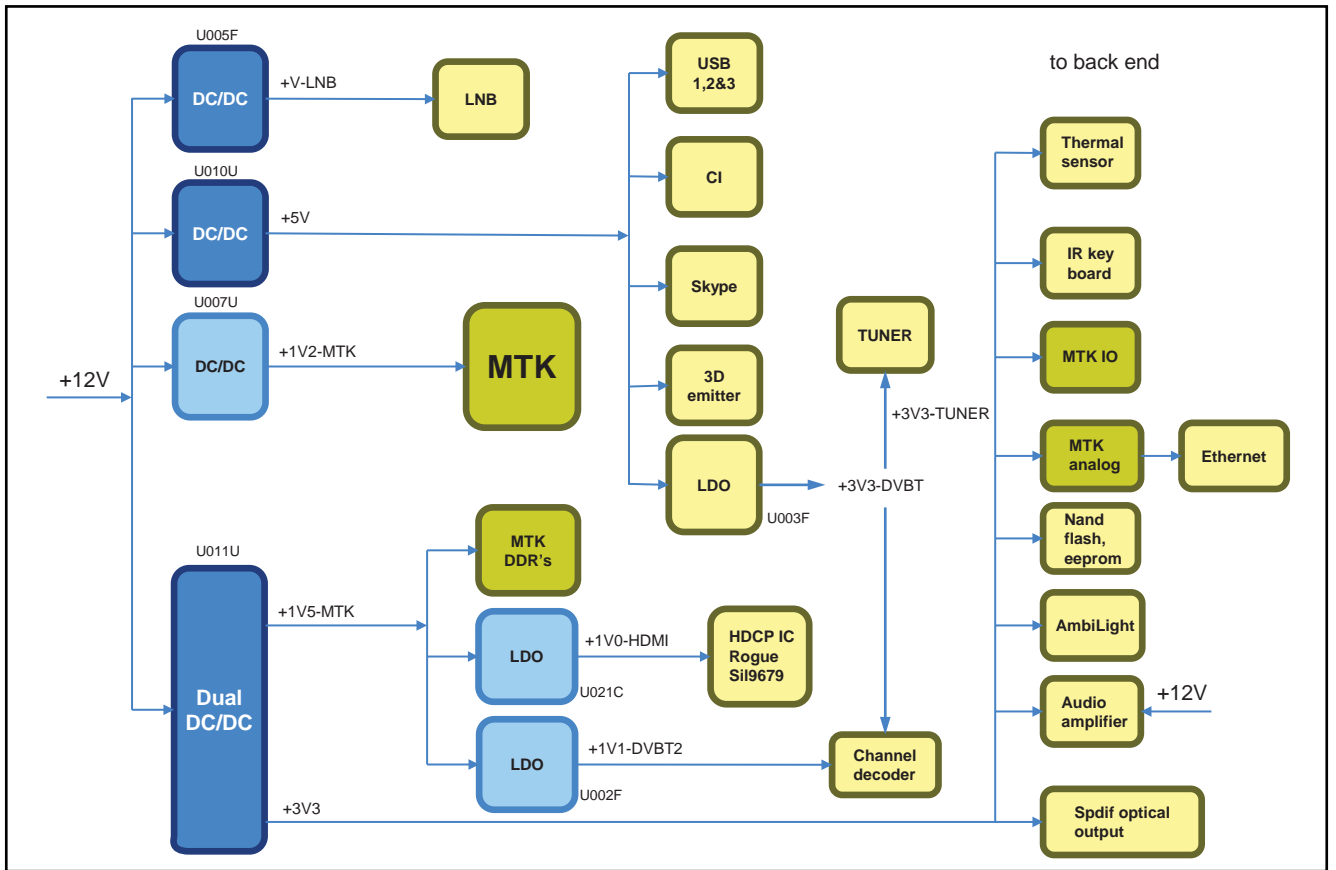
19580_132_140318.eps
14-03-18

Figure 7-3 Power Architecture



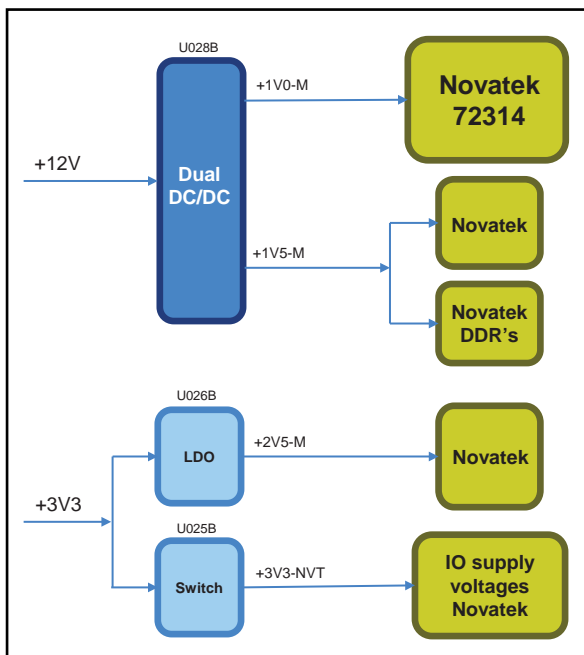
19580_135_140320.eps
14-03-21

Figure 7-4 Power PSU-Connector



19580_134_140320.eps
14-03-21

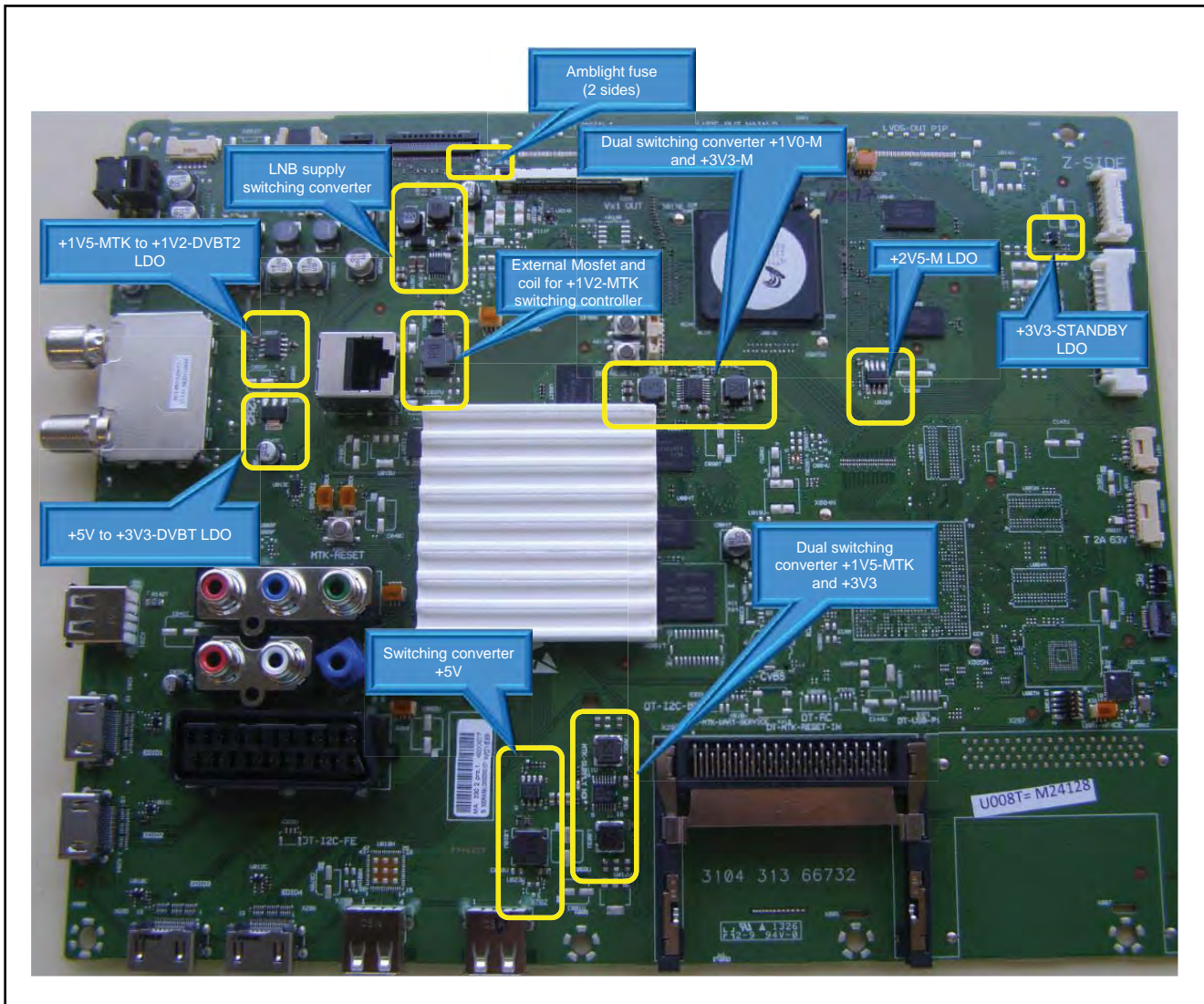
Figure 7-5 Power Front-end



19580_135_140320.eps
14-03-21

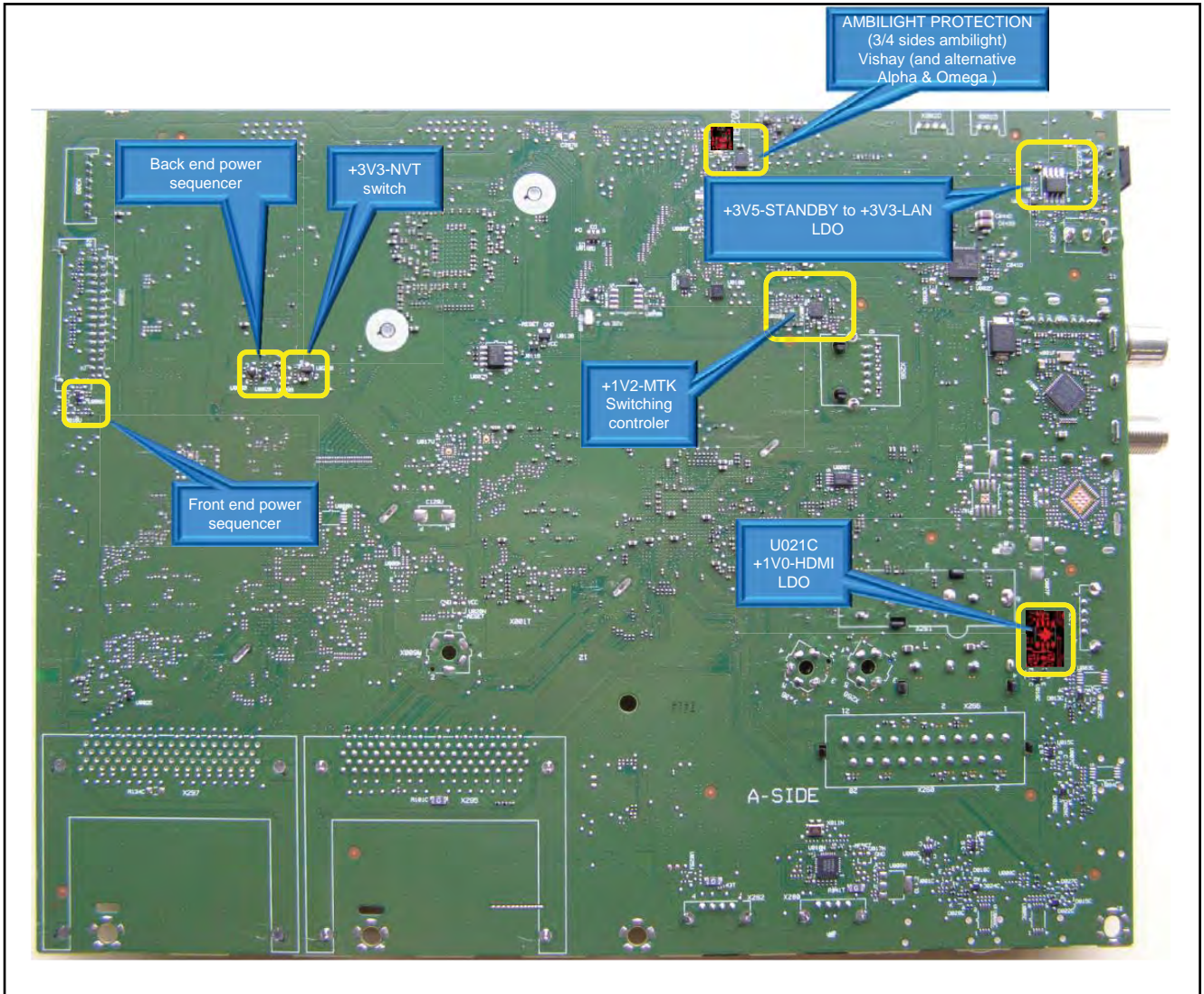
Figure 7-6 Power Back-end

7.3.3 Power Layout



19580_143_140421.eps
14-04-21

Figure 7-7 Power Top View



19580_144_140421.eps
14-04-21

Figure 7-8 Power Bottom View

8. IC Data Sheets

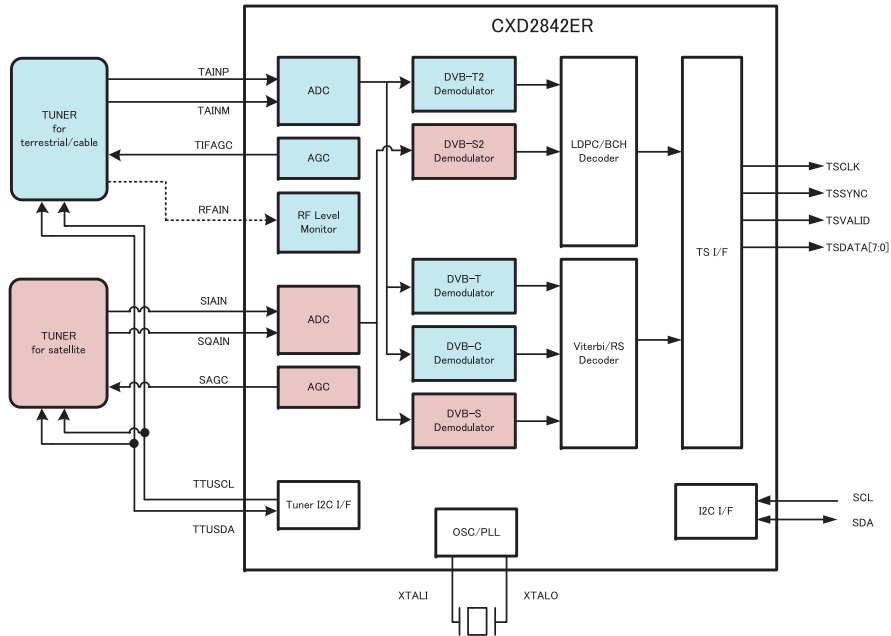
This chapter shows the internal block diagrams and pin configurations of ICs that are drawn as “black boxes” in the

electrical diagrams (with the exception of “memory” and “logic” ICs).

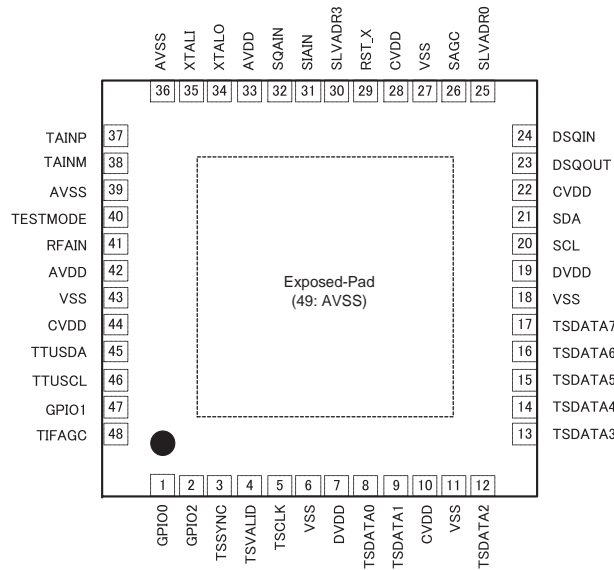
8.1 Diagram, B, CXD2842

For Circuit Diagrams refer to:
[10-1-11 B. DVB CHANNEL DECODER 1](#), and
[10-1-15 B. DVB CHANNEL DECODER 2](#).

Block diagram



Pinning information

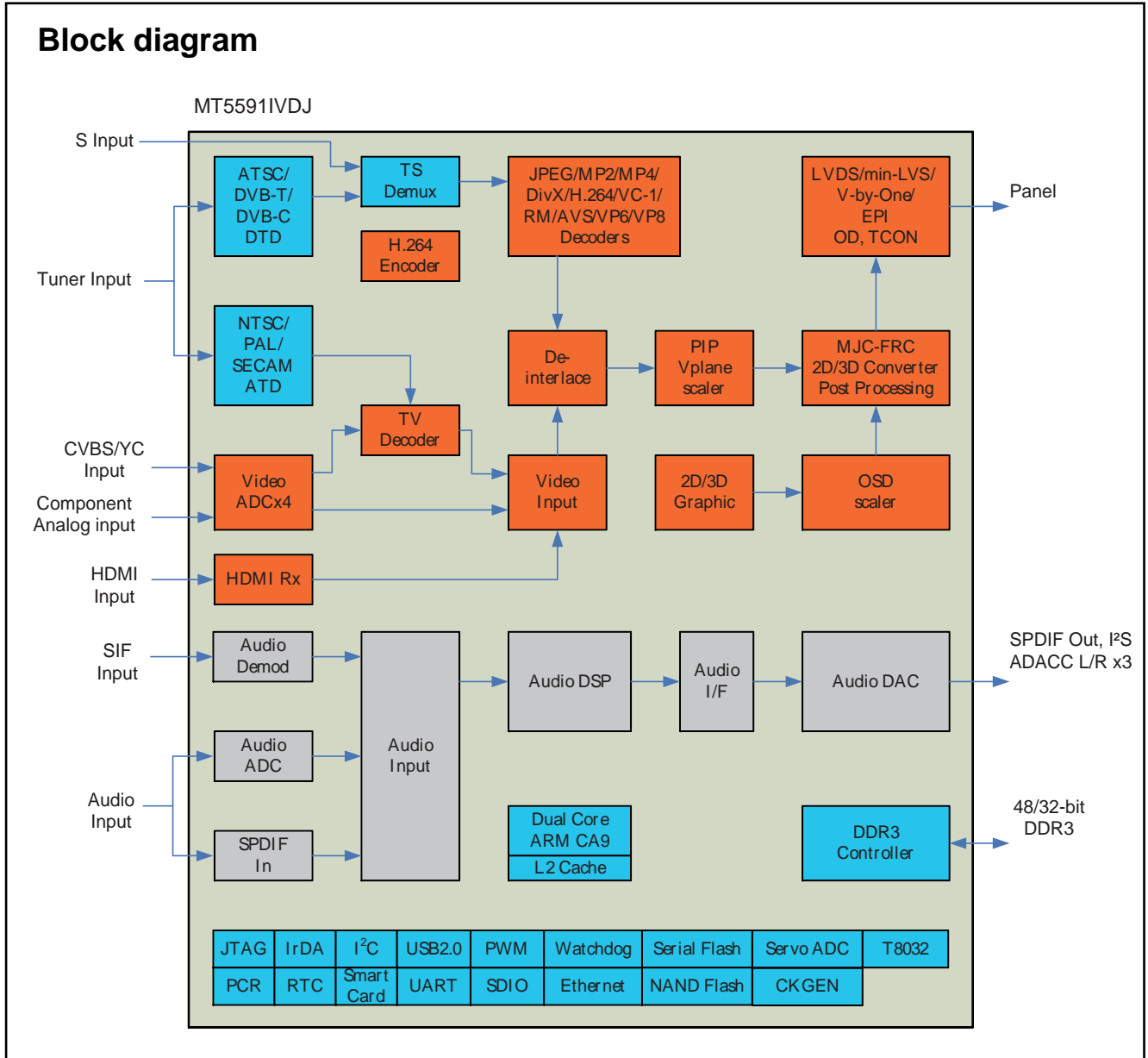


19580_142_140420.eps
14-04-20

Figure 8-1 Internal block diagram and pin configuration

8.2 Diagram, B, MT5591

For Circuit Diagrams refer to [10. Circuit Diagrams and PWB Layouts](#).



19580_139_140401.eps
14-04-01

Figure 8-2 Internal block diagram

Pinning Information

MT5591VDJ

758	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
A	ARDQ24	ARDQ30	ARDQM2	ARDQS3	ARCLK1#		ARDQ29		ARDQ20		ARDQ10		ARDQS1	ARCLK0#		ARDQ13	ARDQ11	
B	ARDQ19	ARDQ17	ARDQ28	ARDQS3#	ARCLK1		ARDQ25		ARDQ5		ARDQ8		ARDQS1#	ARCLK0		ARDQ9	ARDQ0	
C	ARDQ21	RVREF_C	ARDQ23	ARDQ26	ARDQS2#	ARDQM3	ARDQ27	ARDQ18	ARDQ22	ARDQ3	ARDQ14	ARDQ12	DVSS	ARDQS0#	ARDQM1	ARDQ15	ARDQ2	
D	BRDQ4	BRDQ6	BRCAS#	BRCS#	ARDQS2	DVSS	ARDQ31	ARA12	ARDQ7	ARDQ1	ARA14	ARDQM0	DDR	ARDQS0	ARBA0	DVSS	DDR	
E	BRDQ2	BRDQ0	BRODT	BRBA2	BRA0		ARDQ16	DDR		ARA4	ARA11		ARRAS#		ARA3	ARA9	ARA5	
F	BRDQ11	BRDQ9	BRDQ13	BRA9	DDR				ARBA1	ARA6	ARA8		ARODT		ARCSX#	ARA13	ARA2	
G			BRDQ15	BRRESE_T	BRA13	BRA2		ARCKE	ARA10	ARA1	DDR		ARCAS#		ARCS#	ARRESE_T	ARA7	
H	BRDQS0#	BRDQS0	BRDQM1	BRA7	DDR				AVSS33_MEMPLL									
J	BRCLK0#	BRCLK0	BRA15	BRBA0														
K	BRDQS1#	BRDQS1#	DDR	BRWE#	BRA3	BRA5												
L	BRDQM0	BRDQ12	DVSS	BRRAS#	BRA10	BRCKE		DDR			VCC	VCC	VCC	VCC	VCC	VCC	VCC	
M			BRDQ10	BRDQ14	BRA4	BRBA1		DDR			VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
N	BRDQ3	BRDQ7	BRDQ1	BRDQ8	BRA1			DDR			VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
P	BRDQ5	BRA6	BRA8	BRA14	BRA11	BRA12		DDR			VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
R	DDR	DDR	DDR	DDR	DDR	DDR	DDR	DDR			VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
T	REXT_V_PLL		BE4P	BE4N	DDR	DDR	DDR	DDR	VCC3IO_C		VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
U			BE3P	BE3N		TCON3	TCON4	TCON9	TCON10		VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
V	BECKP	BECKN	BE2P	BE2N	AVSS33_LVDS	TCON6	TCON12	TCON5	TCON11		VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
W			BE1P	BE1N		TCON2			TCON8		VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
Y	BE0P	BE0N	BO4P	BO4N						VCC3IO_B	VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
AA			BO3P	BO3N			GPIO50	TCON0	TCON1	VCC3IO_B	VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
AB	BOCKP	BOCKN	BO2P	BO2N		GPIO54	TCON7	GPIO49			VCC	VCC	DVSS	DVSS	DVSS	DVSS	DVSS	
AC			BO1P	BO1N	AVSS33_LVDS	GPIO55	GPIO53	GPIO52		VCC	VCC	VCC	DVSS	DVSS	AVSS33_COM	AVSS33_LD	DVSS	
AD	BO0P	BO0N	AE4P	AE4N		GPIO51		VCC		VCC	VCC		VCC	VCC			VCC	
AE			AE3P	AE3N	AVSS33_LVDS		VCC	VCC	VCC	VCC	AVSS33_USB_P3		AVSS33_ELDO	POR_BND			OPCTRL9	
AF	AECKP	AECKN	AE2P	AE2N	AVSS12_LVDS_3	VCC	VCC	VCC	VCC	AOMCLK	OSDA1		PHYLED1			LED_PWM1	OIRI	
AG			AE1P	AE1N	VCC	VCC	VCC	VCC	ALIN	ASPDIF0	OSCL1		U1RX			LED_PWM0	OPCTRL3	
AH	AE0P	AE0N	AO4P	AO4N	VCC	VCC	VCC	VCC	AOSDAT_A1	AOSDAT_A4	OSCL0	OSDA0	U1TX	U0RX	U0TX		OPCTRL7	
AJ			AO3P	AO3N	VCC	VCC	VCC	VCC	AOSDAT_A2	AOLRCK	AOSDAT_A0	JTMS	JTRST#	PHYLED0			OPCTRL2	
AK	AOCKP	AOCKN	AO2P	AO2N	VCC	VCC	VCC	VCC	AOSDAT_A3	AOBCK	JTCK	JTDI			STB_SD_A	OPCTRL4	AVSS12_RGB	
AL			AO1P	AO1N	VCC	VCC	VCC	OPWM2	JTDO				RXVP_1	TXVP_0	STB_SCL	OPWRSB	OPCTRL11	
AM	AO0P	AO0N	AVSS12_LVDS_2	AVSS12_LVDS_1	VCC	VCC	VCC	OPWM1	OPWM0	USB_DM_P3			RXVN_1	TXVN_0			OPCTRL10	AVDD10_LDO
AN	AVDD12_LVDS_1	AVDD12_LVDS_2	AVDD12_LVDS_3	AVDD33_LVDS	VCC	VCC	VCC	VCC	AVDD33_USB_P3		USB_DP_P3		REXT		AVDD33_ETH		AVDD10_ELDO	AVDD33_VGA_STB
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	

19610_302.eps

Figure 8-3 Pin configuration [1/2]

Pinning Information

MT5591IVDJ

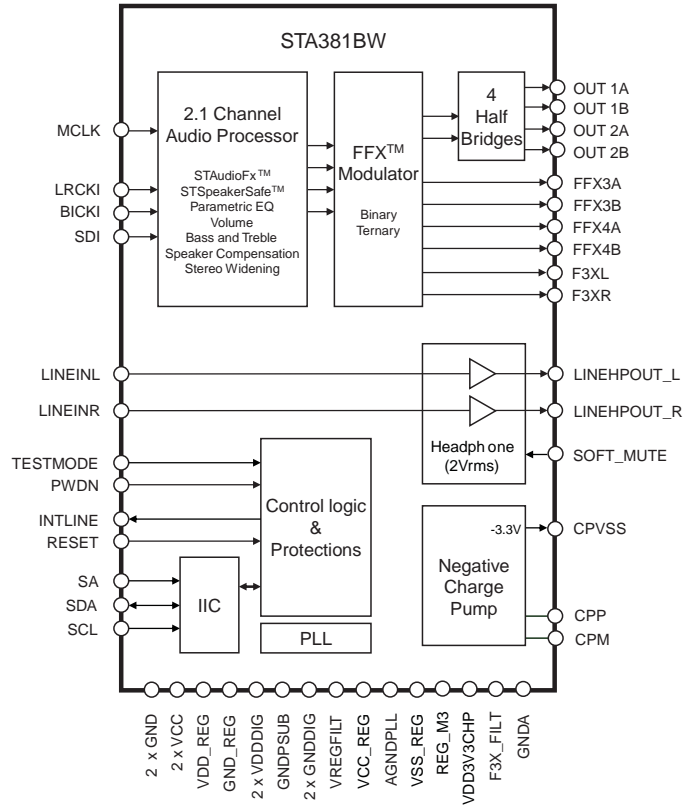
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33			
		DDR	AVDD33_MEMPLL		PDD5	PDD3		POCE0#	PACLE		SD_CMD		GPIO26	GPIO1	GPIO3	GPIO5	A		
		DDR			PDD6	PDD2		POOE#	PAALE		GPIO42		GPIO0	GPIO2	GPIO6	GPIO25	B		
ARDQ4	DDR	FSRC_W R	EMMC_C LK	PDD7	PDD4	PDD0	PARB#	SD_D3	SD_D1	GPIO47	GPIO28	GPIO4	GPIO7	GPIO12	GPIO24		C		
RVREF_A	DDR	DDR	GPIO45	VCC3IO_A	PDD1	POWE#	POCE1#	SD_D2	SD_D0	GPIO36	GPIO35	GPIO15	GPIO21	GPIO16	GPIO22		D		
ARDQ6	DDR	DDR		VCC3IO_A			SD_CLK	GPIO44		GPIO34	GPIO27	GPIO23	GPIO8	GPIO19	GPIO20		E		
ARA0	DDR	DDR					GPIO48			GPIO10	GPIO11	GPIO9	GPIO13	GPIO17	GPIO14	GPIO18	F		
ARBA2	DDR	DDR					GPIO46			GPIO33	GPIO41	GPIO39	GPIO32	GPIO40			G		
ARWE#			AVSS33_CPUPLL									GPIO37	GPIO30			USB_DP_P0	USB_DM_P0	H	
				MEMTP					GPIO31	GPIO38	GPIO29			USB_DM_P1	USB_DP_P1			J	
				MEMTN		DVSS	DVSS	CI_TSDA_TA0	SPI_CLE	GPIO43				USB_DM_P2	USB_DP_P2	AVDD33_US B_P0P1P2		K	
VCKK	VCKK					DVSS	CI_INT	IF_AGC	PVR_TSS_YNC				SPI_CLK1		SPI_DAT_A	SPI_CLK		L	
DVSS	DVSS	DVSS	DVSS	DVSS			AVSS33_USB_P1		PVR_TSV_AL	RF_AGC	PVR_TSD_ATA0	PVR_TSD_ATA1	PVR_TSD_LK	PVR_TSC				M	
DVSS	DVSS	DVSS	DVSS	DVSS				OSDA2	OSCL2				CI_TSSV_NC	CI_TSV_A	DEMOM_TSCLK	CI_TSCL_K		N	
DVSS	DVSS	DVSS	DVSS	DVSS				DEMOM_TSDATA3	DEMOM_TSV_A				DEMOM_RST		AVDD12_H_DMI_3_RX	AVDD12_H_DMI_2_RX		P	
DVSS	DVSS	DVSS	DVSS	DVSS	VCKK			DEMOM_TSDATA7	DEMOM_TSDATA0	DEMOM_TSDATA4	DEMOM_TSSYNC							R	
DVSS	DVSS	DVSS	DVSS	DVSS			AVSS33_HDMI_RX	DEMOM_TSDATA1	DEMOM_TSDATA2				HDMI_3_RX_2	HDMI_3_RX_2B	HDMI_3_RX_1	HDMI_3_RX_1B		T	
DVSS	DVSS	DVSS	DVSS	DVSS				DEMOM_TSDATA6	DEMOM_TSDATA5				HDMI_3_RX_0	HDMI_3_RX_0B				U	
DVSS	DVSS	DVSS	DVSS	DVSS	VCKK	DVSS		HDMI_CE_C	ASPDIF1	HDMI_3_PWR5V	HDMI_3_HPD	HDMI_3_RX_C	HDMI_3_RX_CB					V	
DVSS	DVSS	DVSS	DVSS	DVSS	DVSS		AVSS33_HDMI_RX	HDMI_3_SDA	HDMI_3_SCL				HDMI_2_RX_2	HDMI_2_RX_2B	HDMI_2_RX_1	HDMI_2_RX_1B		W	
DVSS	DVSS	DVSS	DVSS	DVSS	DVSS			HDMI_2_SDA	HDMI_1_PWR5V				HDMI_2_RX_0	HDMI_2_RX_0B				Y	
DVSS	DVSS	DVSS	DVSS	DVSS	DVSS			HDMI_2_SCL	HDMI_1_HPD	HDMI_2_PWR5V	HDMI_2_HPD	HDMI_2_RX_C	HDMI_2_RX_CB	AVDD12_H_DMI_1_RX	AVDD12_H_DMI_0_RX			AA	
DVSS	DVSS	AVSS33_CVBS_1	DVSS	AVSS33_CVBS_2	DVSS			HDMI_1_SDA	HDMI_1_SCL									AB	
DVSS	AVSS33_VDAC_B_G	DVSS	AVSS33_PLLGP	DVSS	AVSS33_ADAC	AVSS33_AADC		HDMI_0_SDA	HDMI_0_SCL				HDMI_1_RX_2	HDMI_1_RX_2B	HDMI_1_RX_1	HDMI_1_RX_1B		AC	
		DVSS							AVSS33_HDMI_RX	ADIN3_S_RV	HDMI_0_HPD	HDMI_0_RX_0	HDMI_1_RX_0B					AD	
	OPCTRL6	AVSS33_VDAC							AVSS33_HDMI_RX	ADIN2_S_RV	HDMI_0_PWR5V	HDMI_1_RX_C	HDMI_1_RX_CB	HDMI_0_RX_2	HDMI_0_RX_2B			AE	
	OPCTRL1			ADIN4_S_RV								HDMI_0_RX_1	HDMI_0_RX_1B					AF	
	OPCTRL8			VGA_SD_A		ADIN6_S_RV						HDMI_0_RX_0	HDMI_0_RX_0B	HDMI_0_RX_C	HDMI_0_RX_CB			AG	
	OPCTRL5			VGA_SCL	ADIN1_S_RV	VDACX_OUT	MPXP	CVBS1P			AL2_ADA_C							AVDD33_HDMI	AH
	OPCTRL0				ADIN0_S_RV	VDACY_OUT		CVBS_C_OM	LOUTN		AL0_ADA_C	AR2_ADA_C	AR1_ADA_C	AVDD33_AADC	AVDD33_AADC			AVDD33_AADC	AJ
HSYNC	SOG	ORESET#	ADIN5_S_RV	PB1P	SOY0		CVBS0P	CVBS3P	LOUTP		AL1_ADA_C	AR0_ADA_C						AIN3_L_A_ADC	AK
VSYNC	BP	RP	COM1	PR1P	PB0P	PROP		AVDD33_PLL	AVSS12_DEMOD	AVSS33_DEMOD	AVSS33_XTAL_STB				AIN1_R_A_ADC	AIN4_R_A_ADC		AIN4_R_A_ADC	AL
ADIN7_S_RV		GP	Y1P		COM0		CVBS2P	AVDD33_CVBS	ADCINP_DEMOD		XTALO			AIN2_L_A_ADC	AIN3_R_A_ADC	AIN2_R_A_ADC		AIN2_R_A_ADC	AM
AVDD12_RGB		COM	SOY1		YOP			AVDD33_VIDEO	AVDD33_DEMOD	ADCINN_DEMOD	AVDD12_DEMOD	XTALI	AVDD33_XTAL_STB	VMID_AA_DC	AIN1_L_A_ADC	AIN4_L_A_ADC		AIN4_L_A_ADC	AN
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33				

19610_303.eps

Figure 8-4 Pin configuration [2/2]

8.3 Diagram 10-1-29 B, AUDIO AMPLIFIER, B, STA381

Block diagram



Pinning information

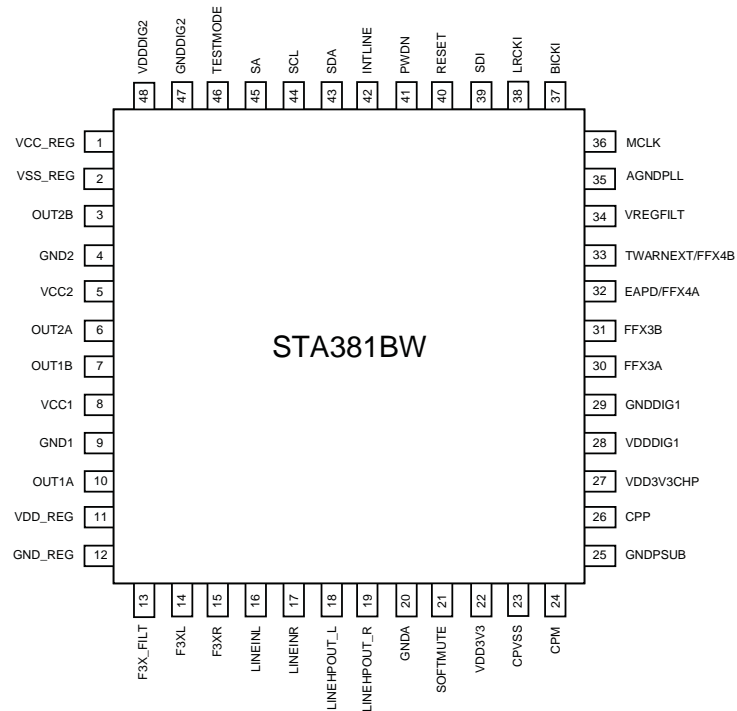
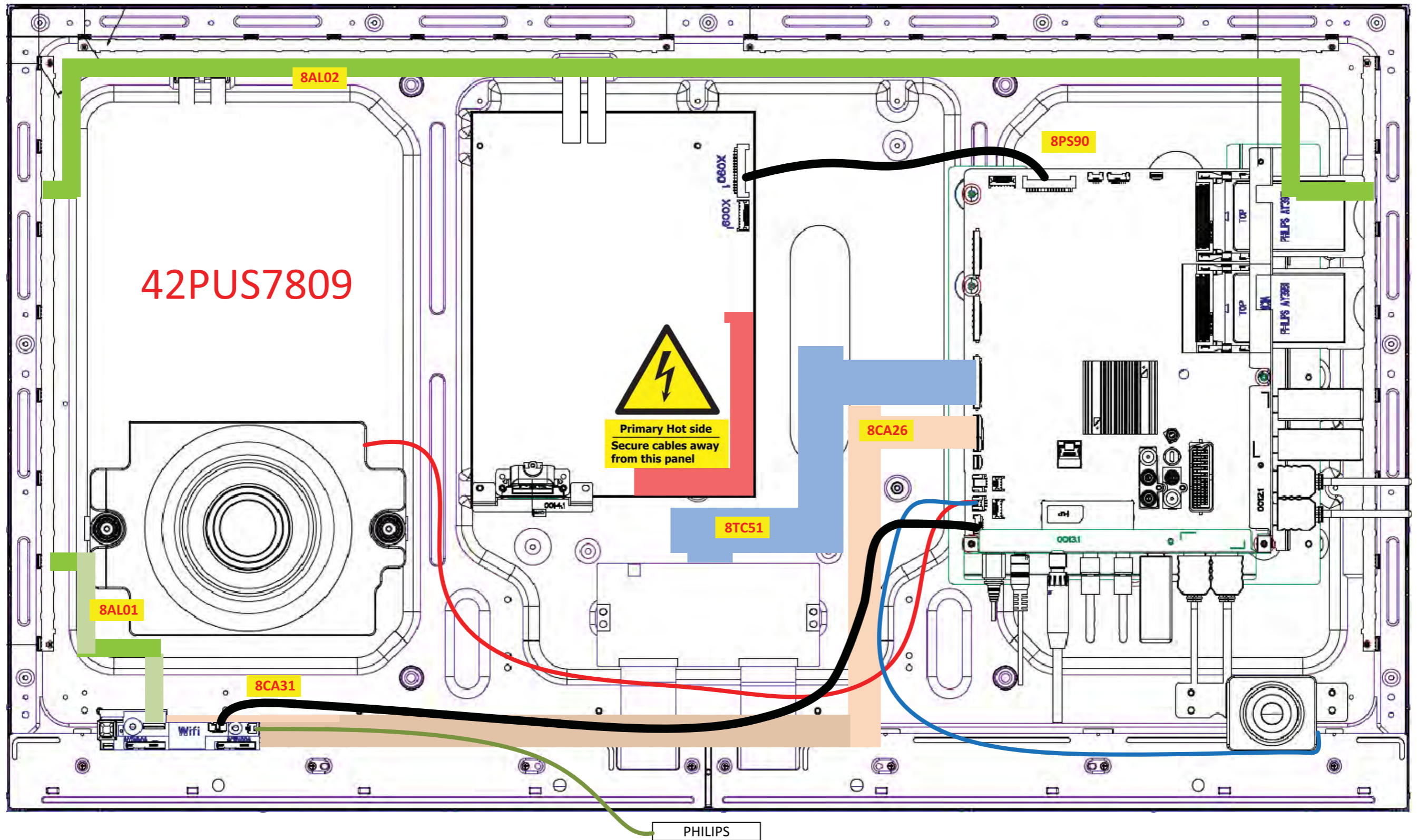


Figure 8-5 Internal block diagram and pin configuration

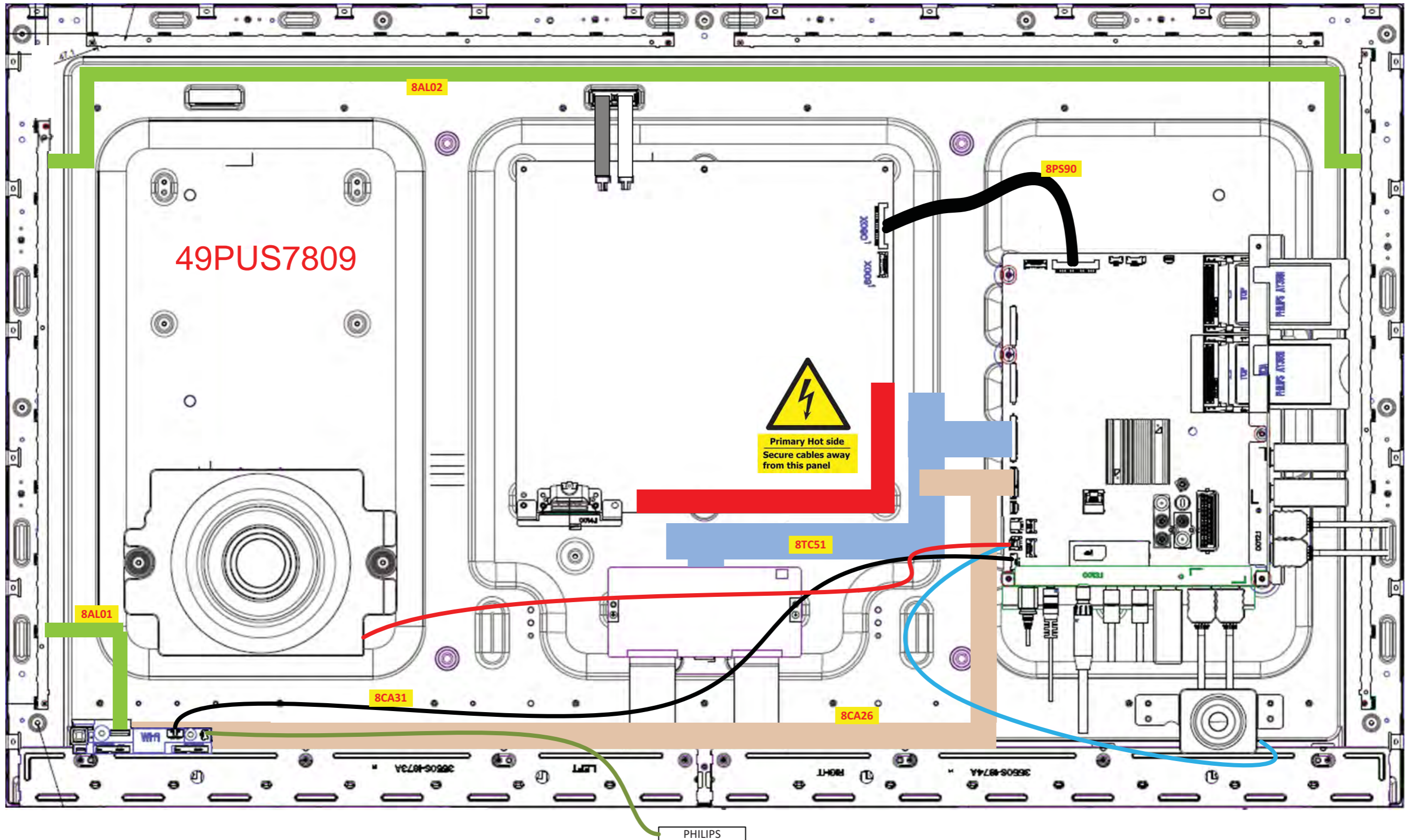
9. Block Diagrams

9.1 Wiring Diagram 7809 series 42"

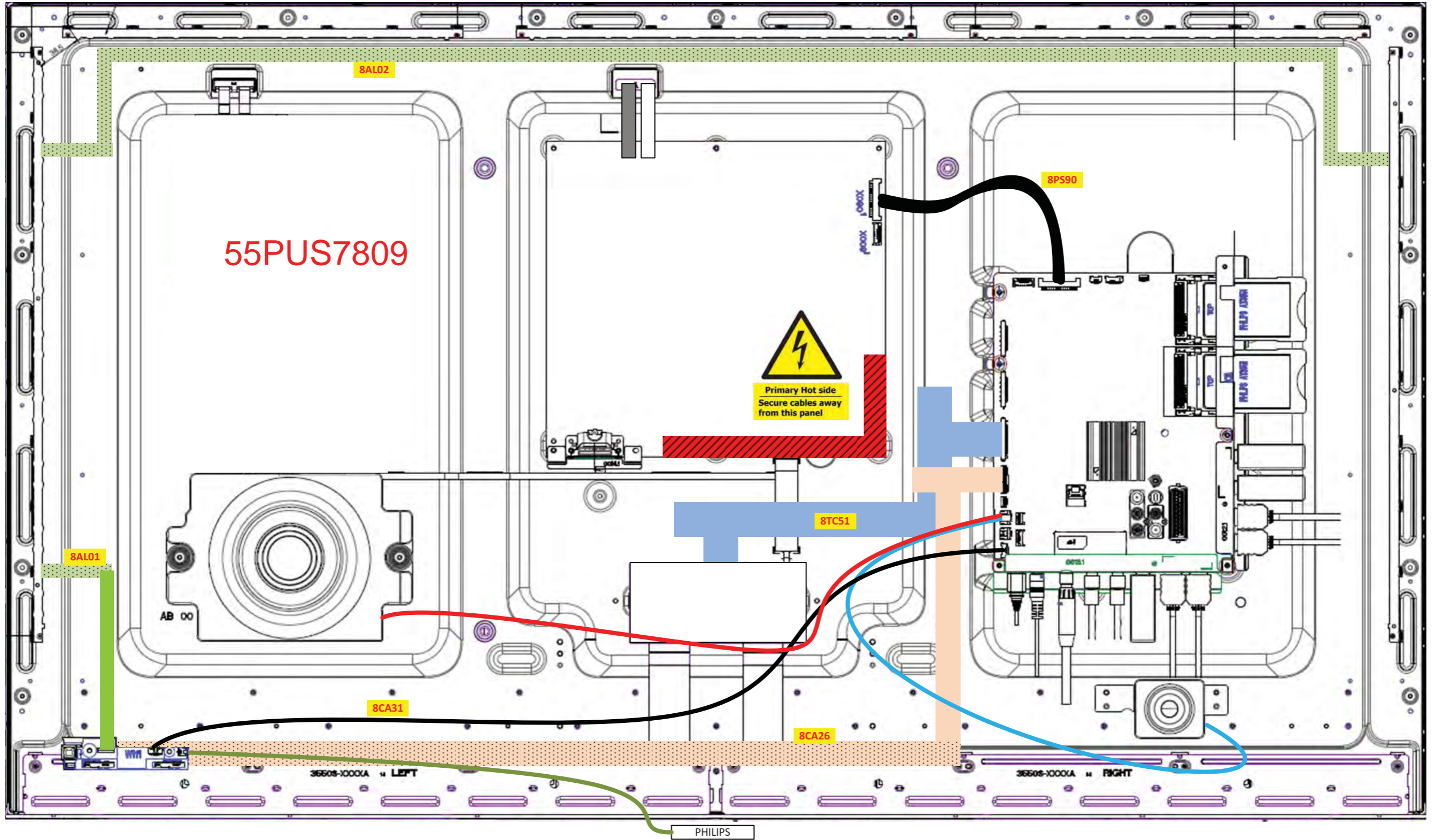
Wiring diagram 42" 78xx series



Wiring diagram 49" 78xx series

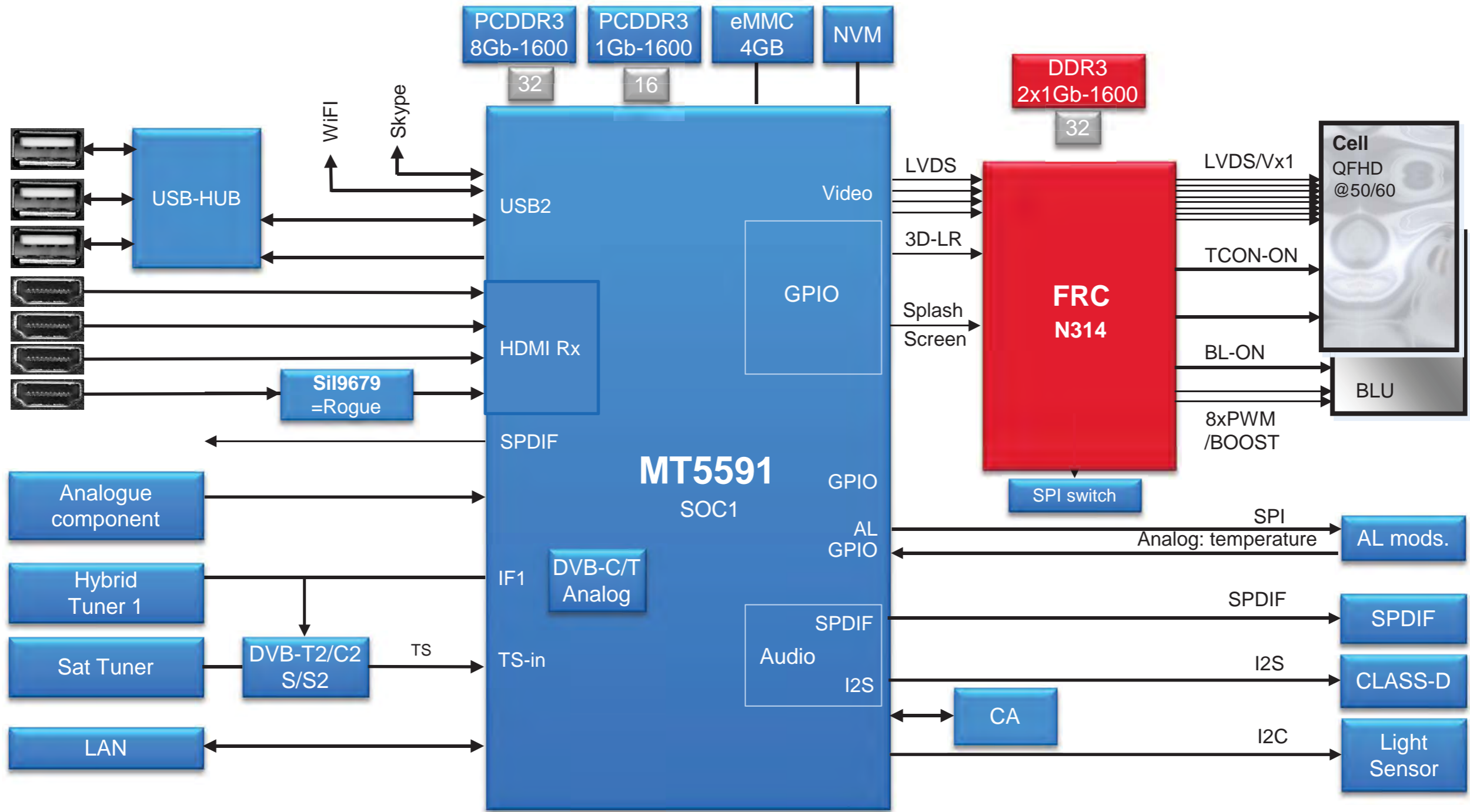


Wiring diagram 55" 78xx series

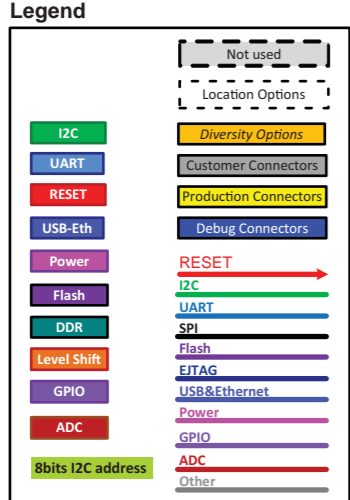
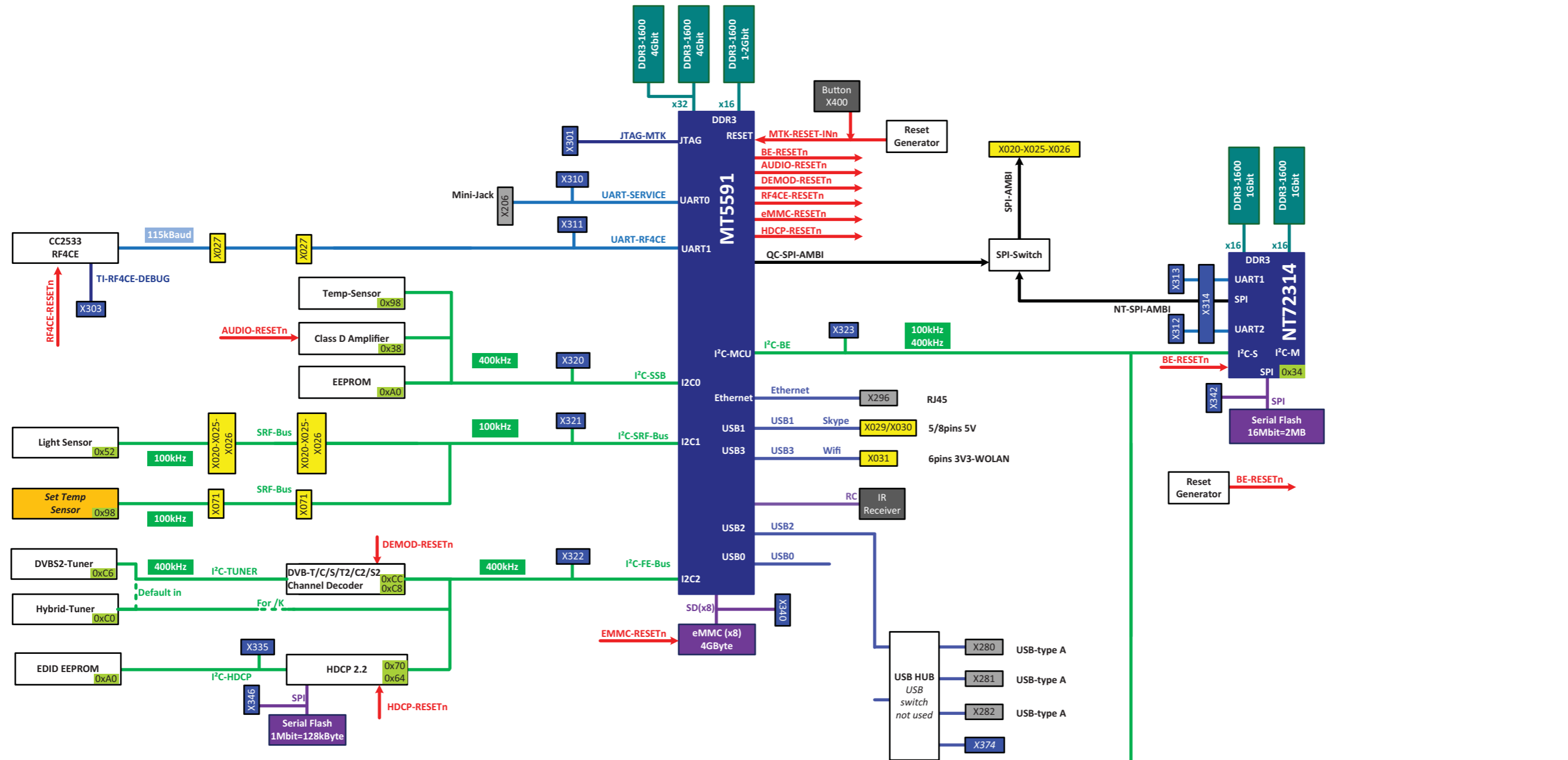


9.4 Block Diagram Architecture

MTK Architecture

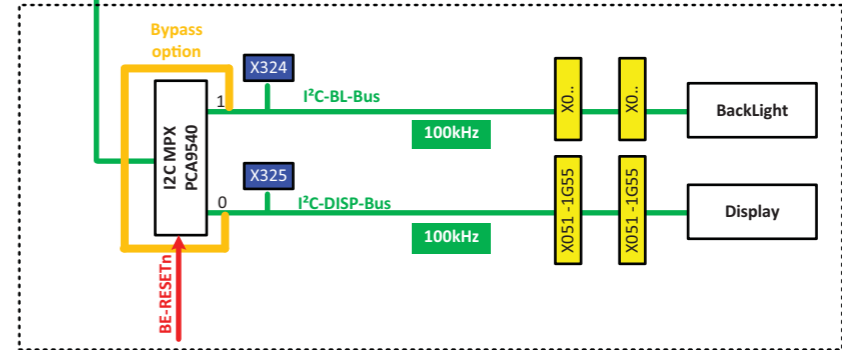


9.5 Block Diagram Connections



Connectors - Applicationata

Position	Application
X000 - X099	Internal connectors
X100 - X199	Internal connectors (spare)
X200 - X299	User connectors
X300 - X399	Debug connectors
X300 - X309	(E)JTAG (incl. µP-debug-IF)
X310 - X319	UART
X320 - X329	I²C
X330 - X339	I²C (spare)
X340 - X349	SPI
X350 - X359	CTRL
X360 - X369	UART (spare)
X370 - X379	USB
X380 - X389	Other



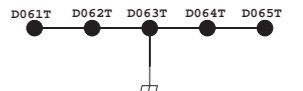
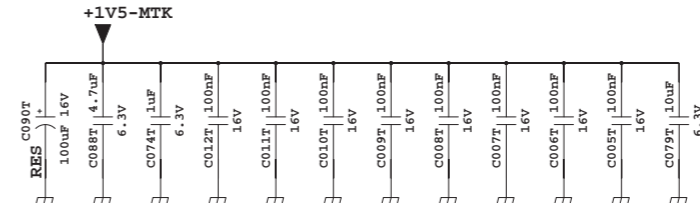
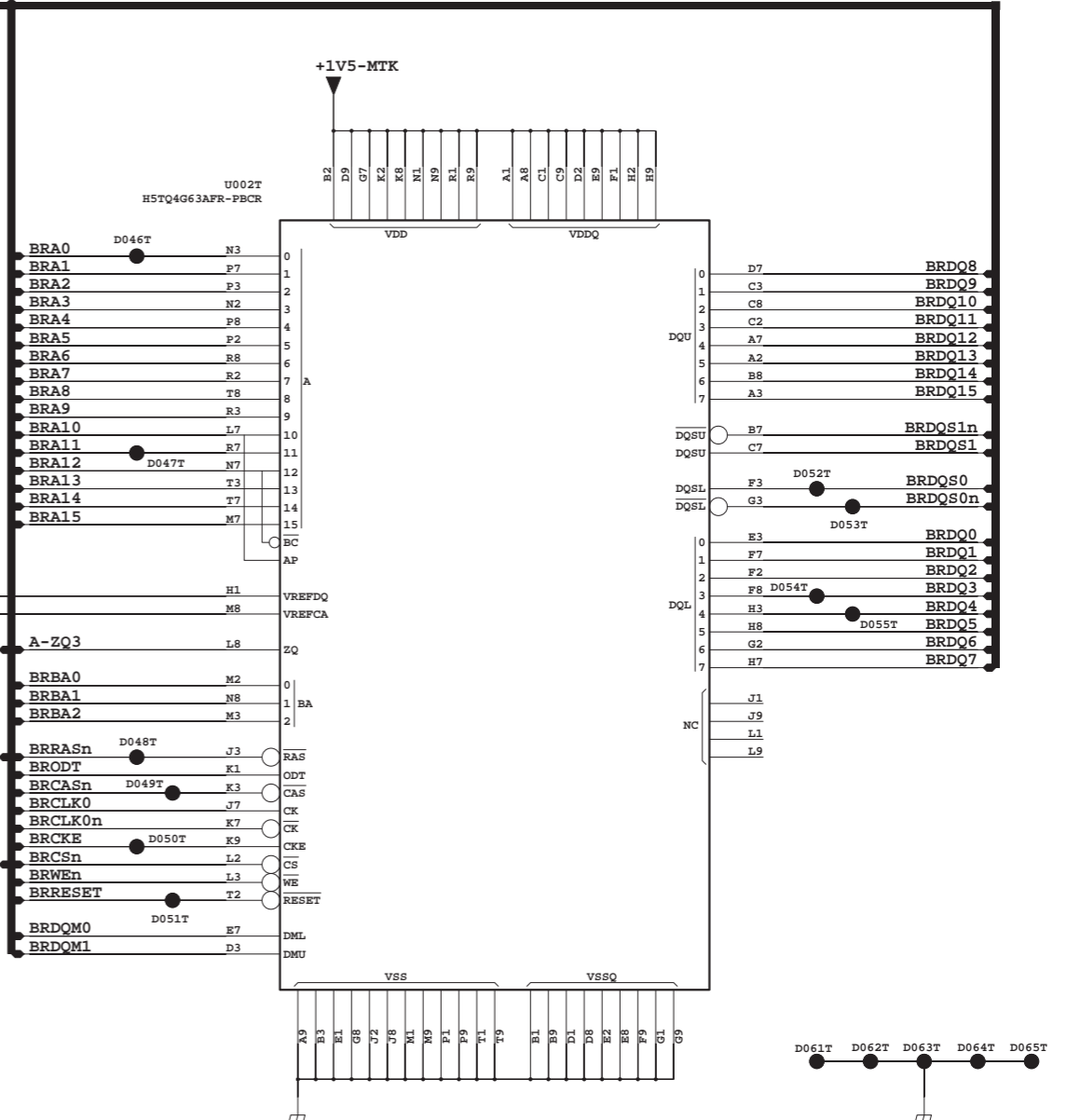
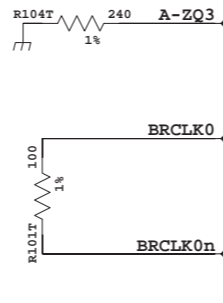
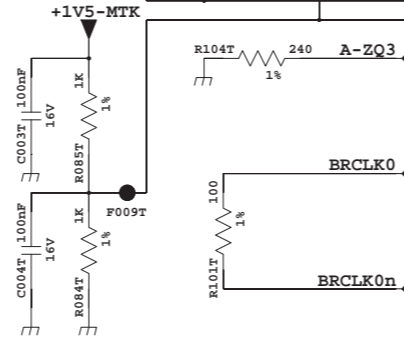
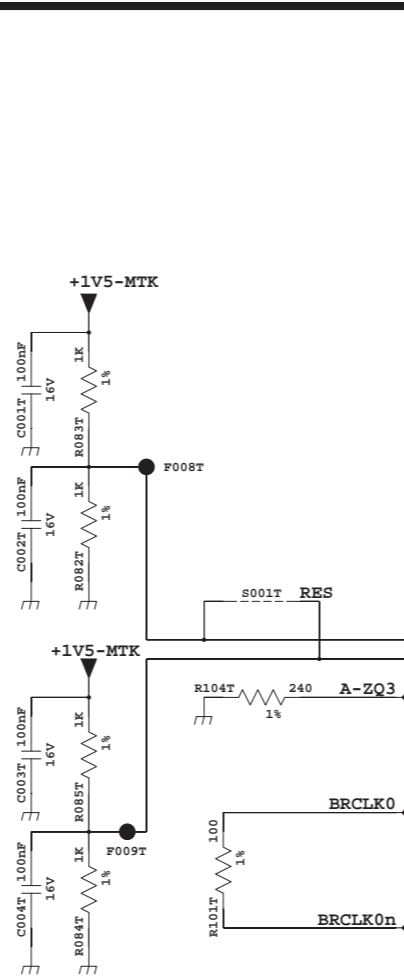
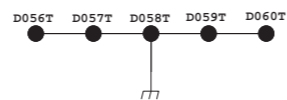
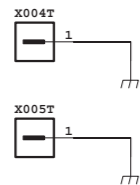
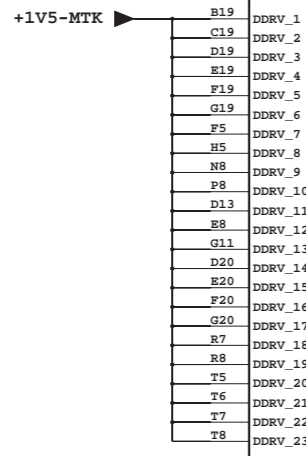
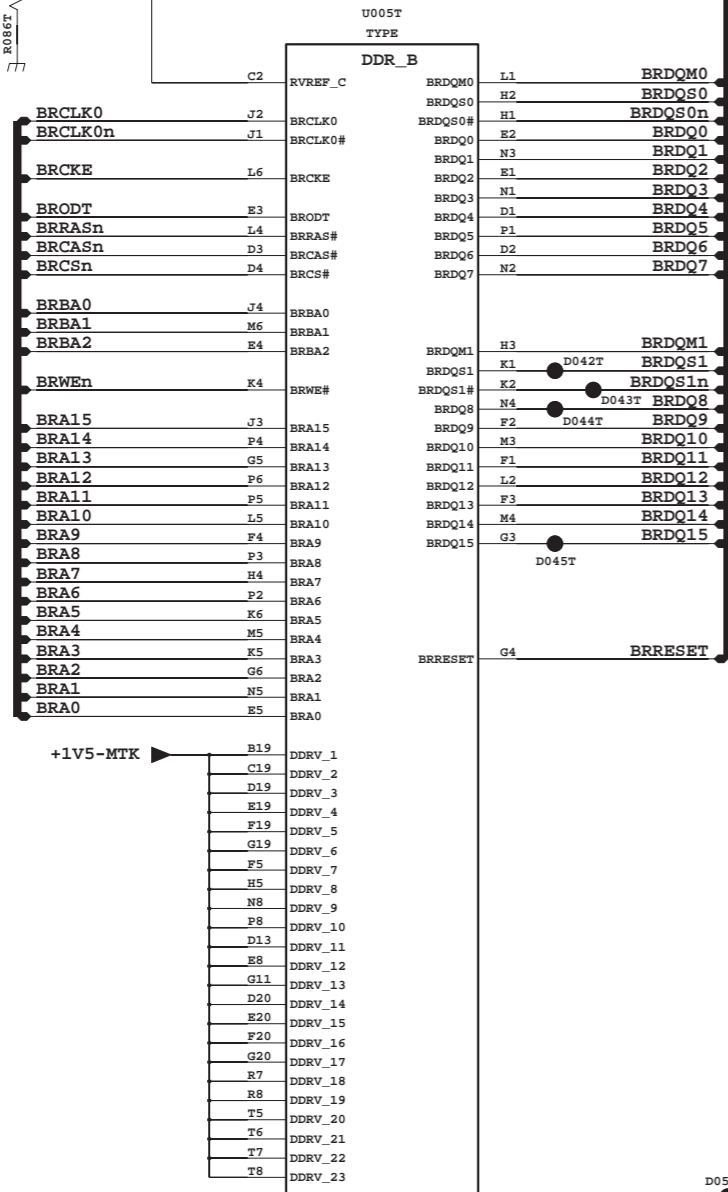
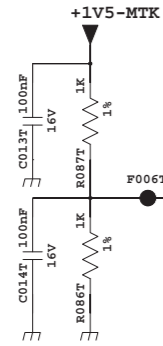
10. Circuit Diagrams and PWB Layouts

10.1 715RLPCB000000213 SSB 10-1-1 B, DDR3 INTERFACE - 16 bits

B

DDR3 INTERFACE - 16 bits

B



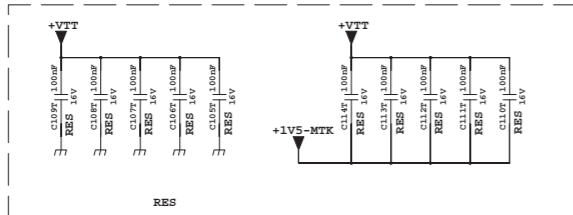
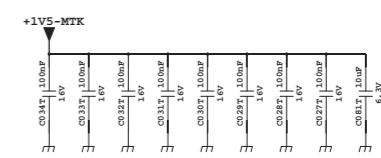
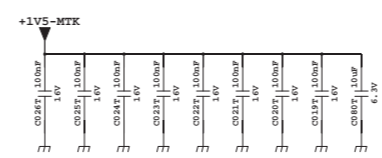
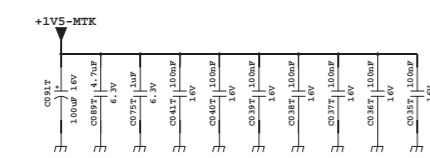
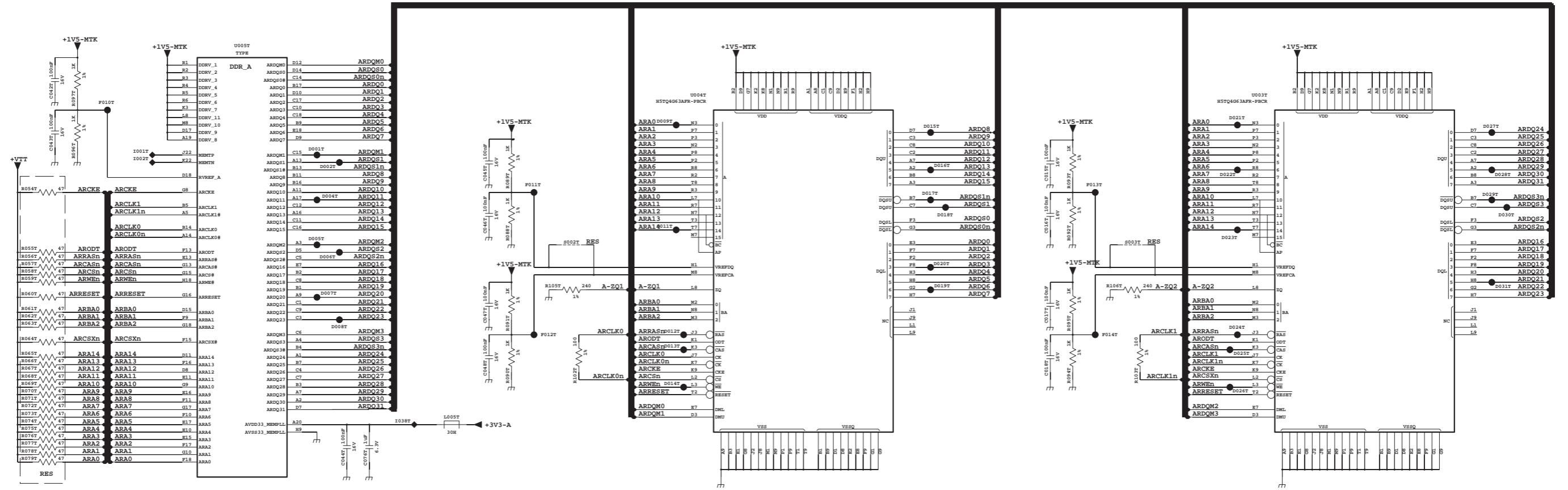
MTK UHD 50 Hz 7800	715RLPCB00000021	3	2013-12-13
-----------------------	------------------	---	------------

10-1-2 B, DDR3 INTERFACE - 32 Bits

B

DDR3 INTERFACE - 32 bits

B



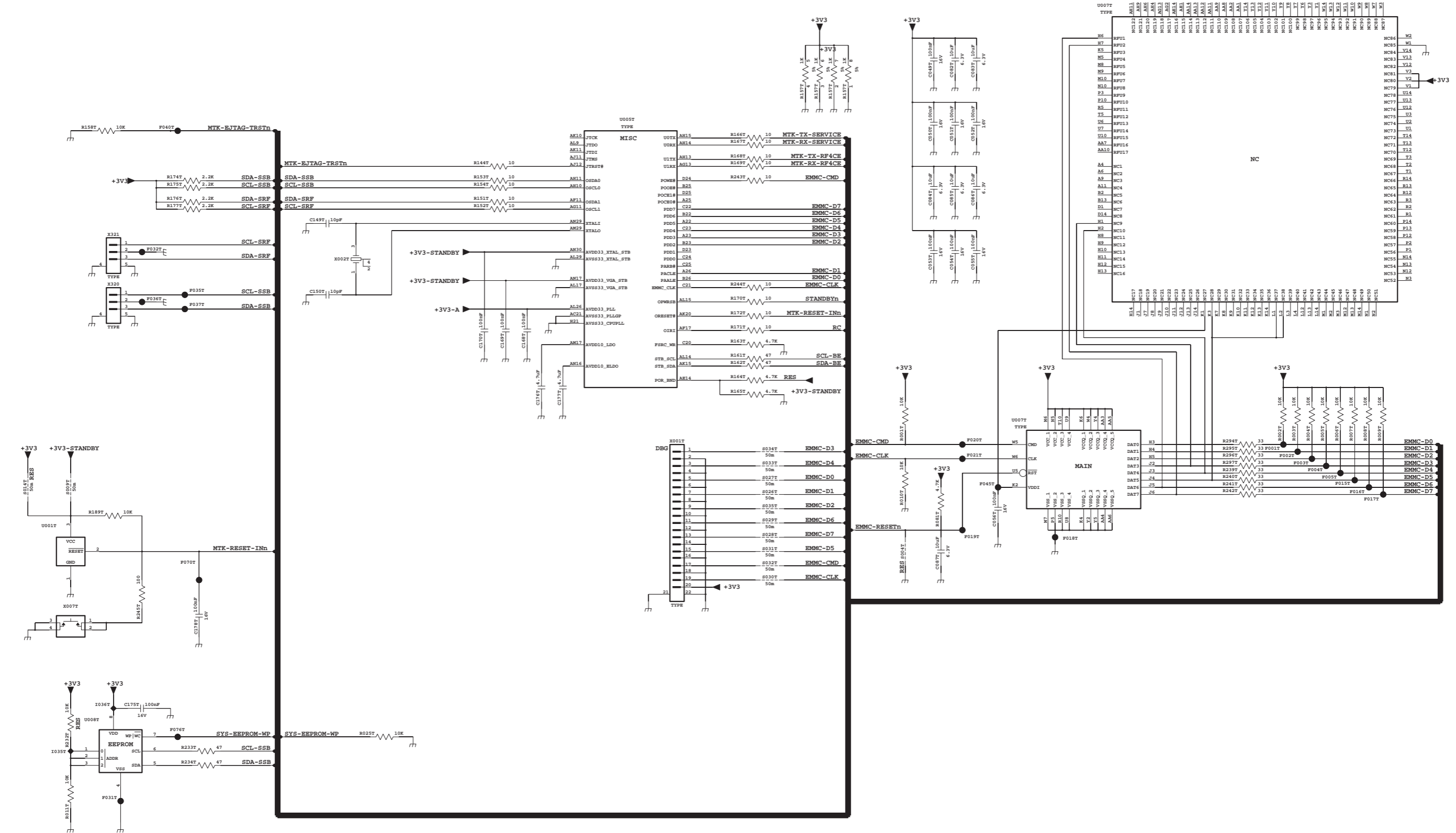
MTK UHD 50 Hz 7800	715RLPCB000000021	2013-12-11
-----------------------	-------------------	------------

10-1-3 B, EMMC

B

EMMC

B

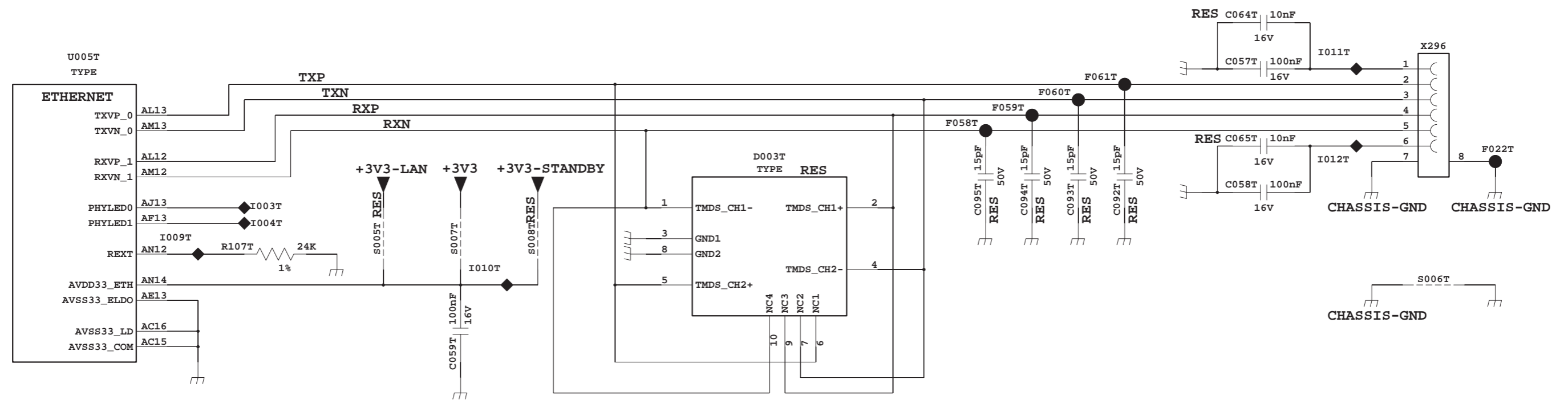


MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-4 B, ETHERNET

B ETHERNET

B



MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

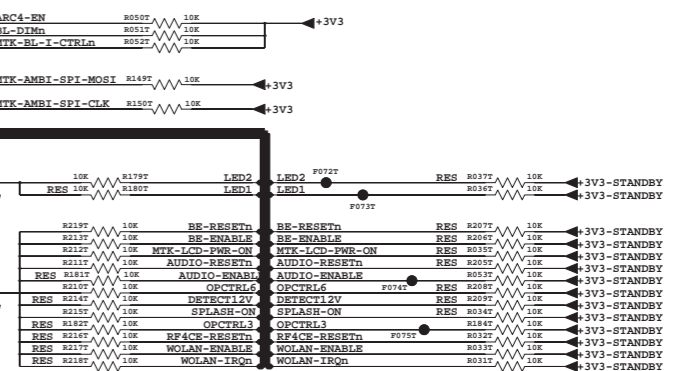
10-1-5 B, AUDIO/VIDEO

B AUDIO / VIDEO

B



STRAP OPTION	LED1	LED2	STRAP	AUDIO-ENABLE
	LED_FWM0	LED_FWM1	OPCTRL3	OPCTRL7
ICE mode + 27M + serial boot	1	0	0	0
ICE mode + 27M + ROM to Nand boot	1	0	0	1
ICE mode + 27M + ROM to eMMC boot from eMMC pins (share pins w/s NAND)	1	0	1	1
ICE mode + 27M + ROM to eMMC boot from SDIO pins	1	1	0	0

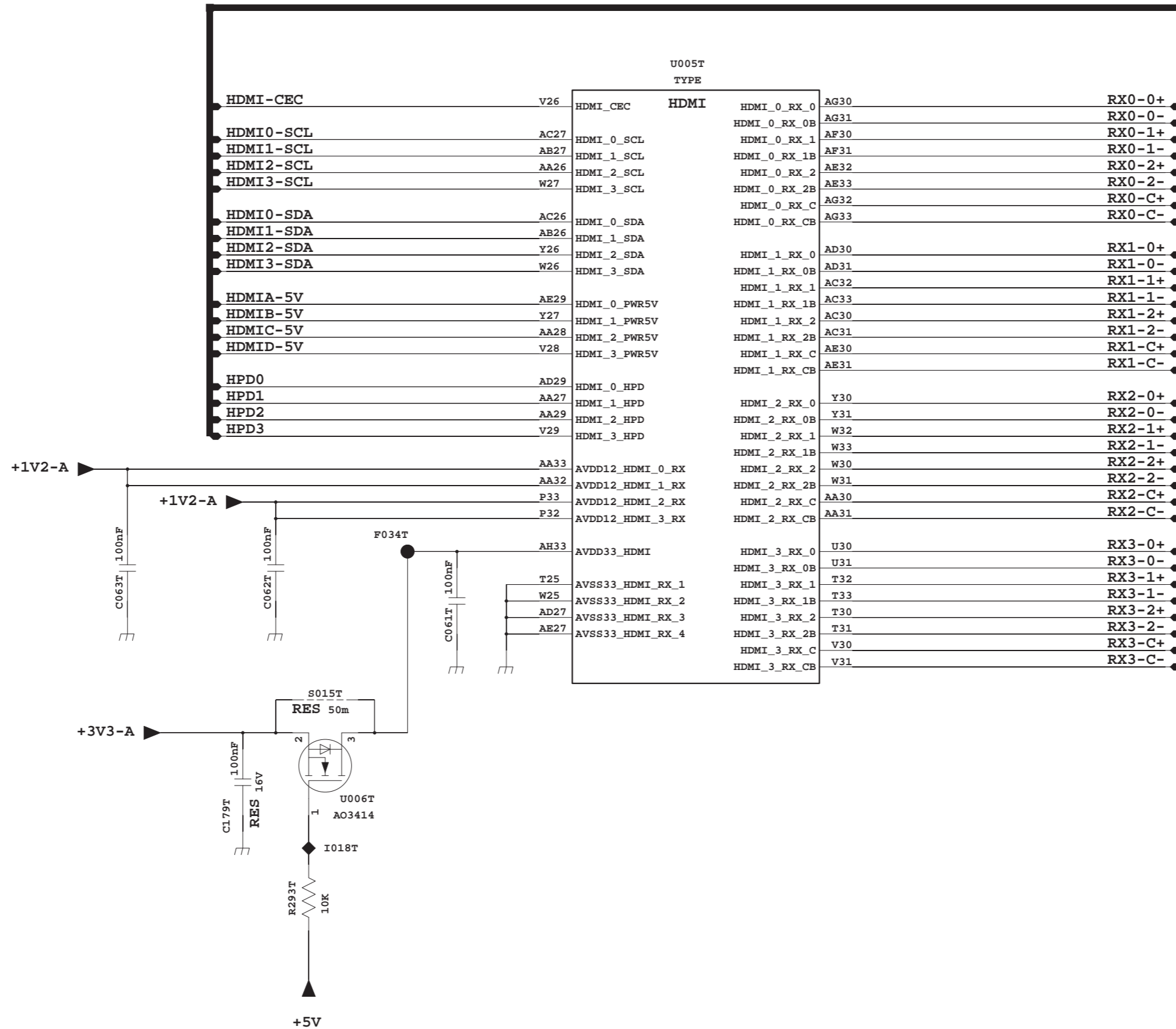


MTK UHD 50 Hz 7800
715RLPCB00000037

B

HDMI

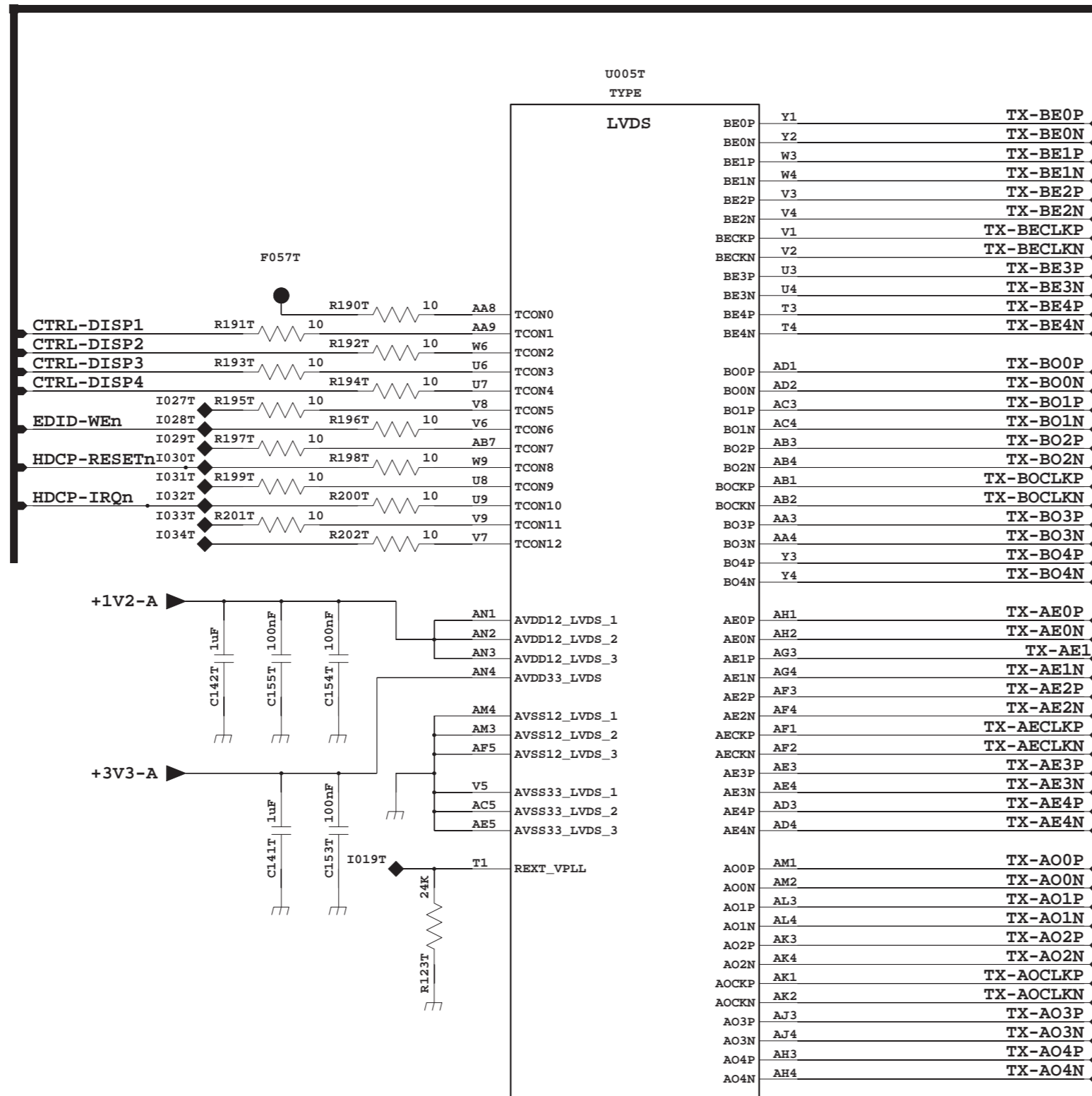
B



10-1-7 B, LVDS

B LVDS

B



TO NT72314

MTK UHD 50 Hz
7800

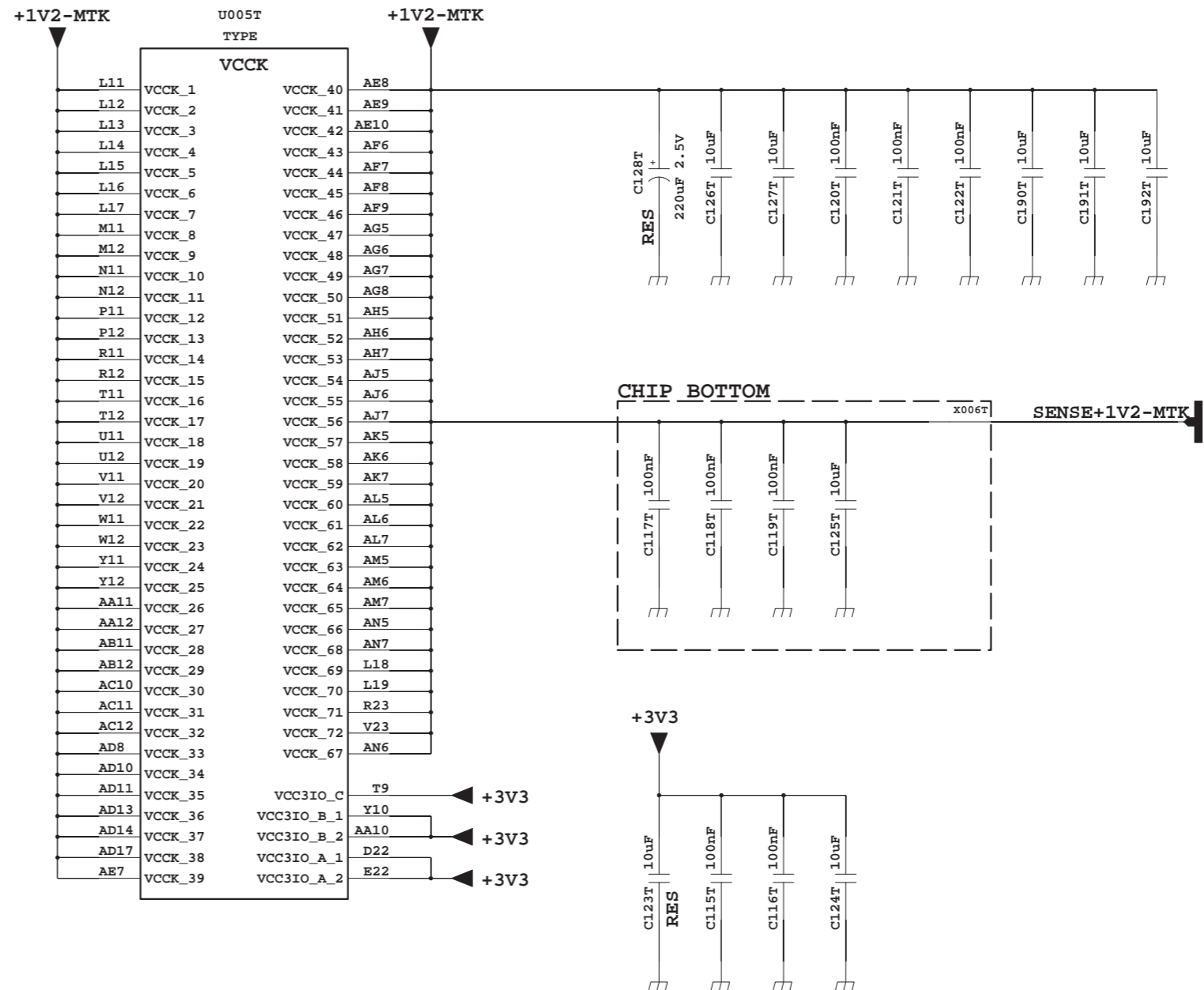
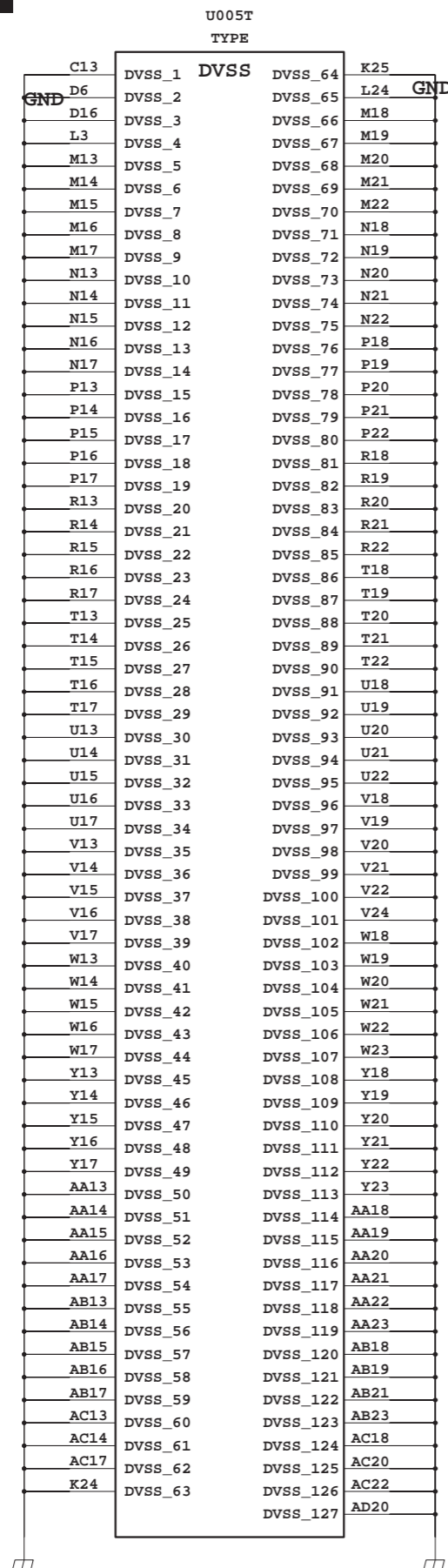
715RLPCB000000037

1	2014-02-14

B

MTK POWER

B



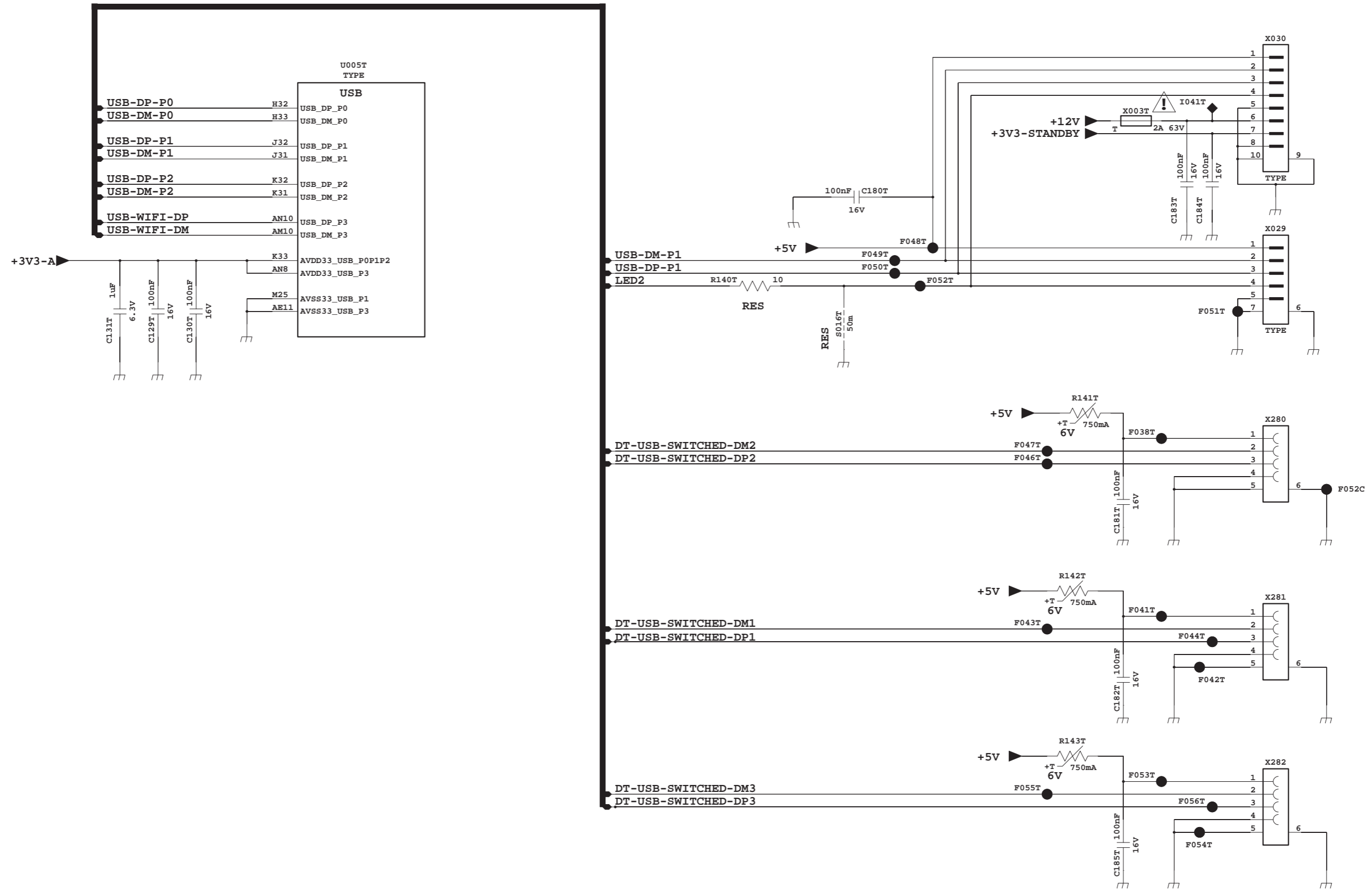
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-9 B, USB

B

USB

B



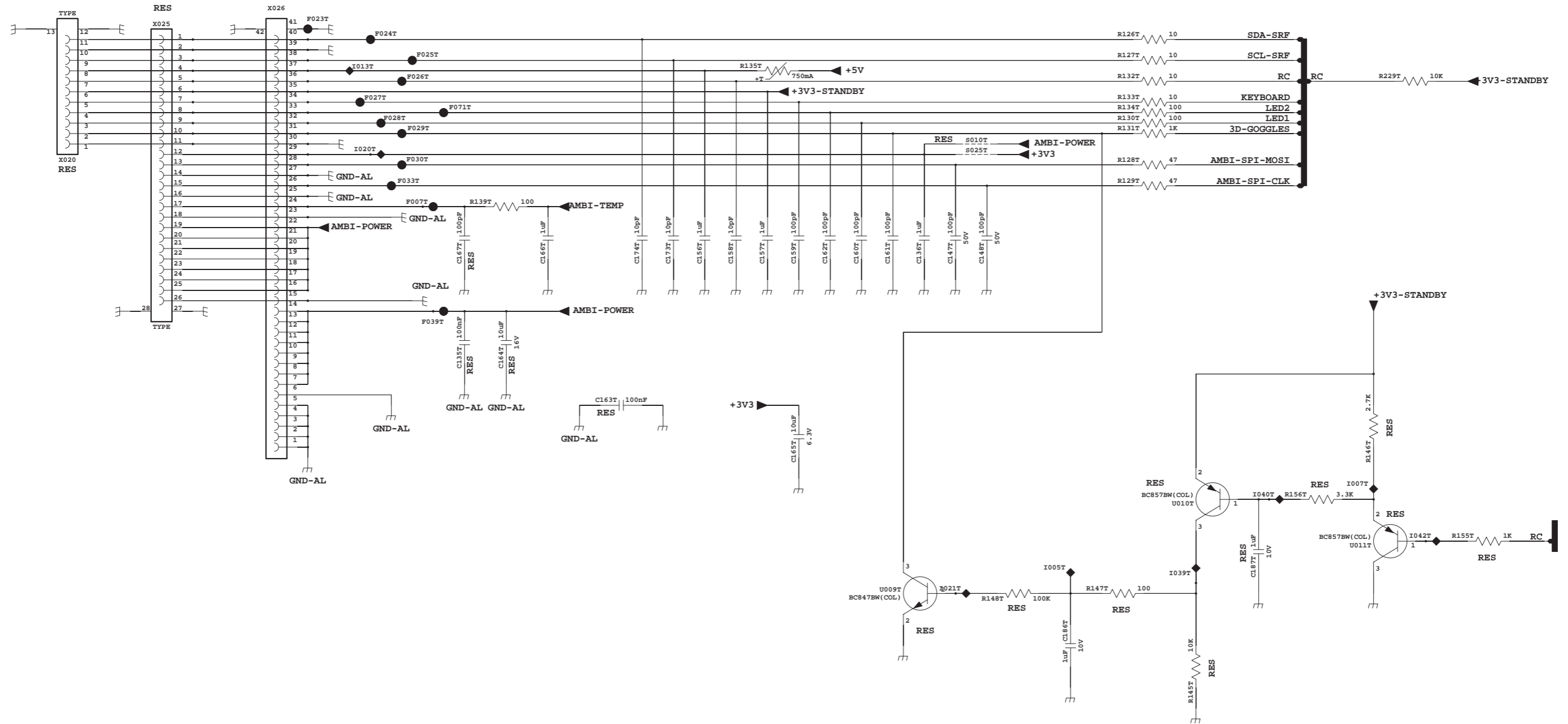
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-10 B, SENSOR BOARD CONNECTION

B

SENSOR BOARD CONNECTION

B



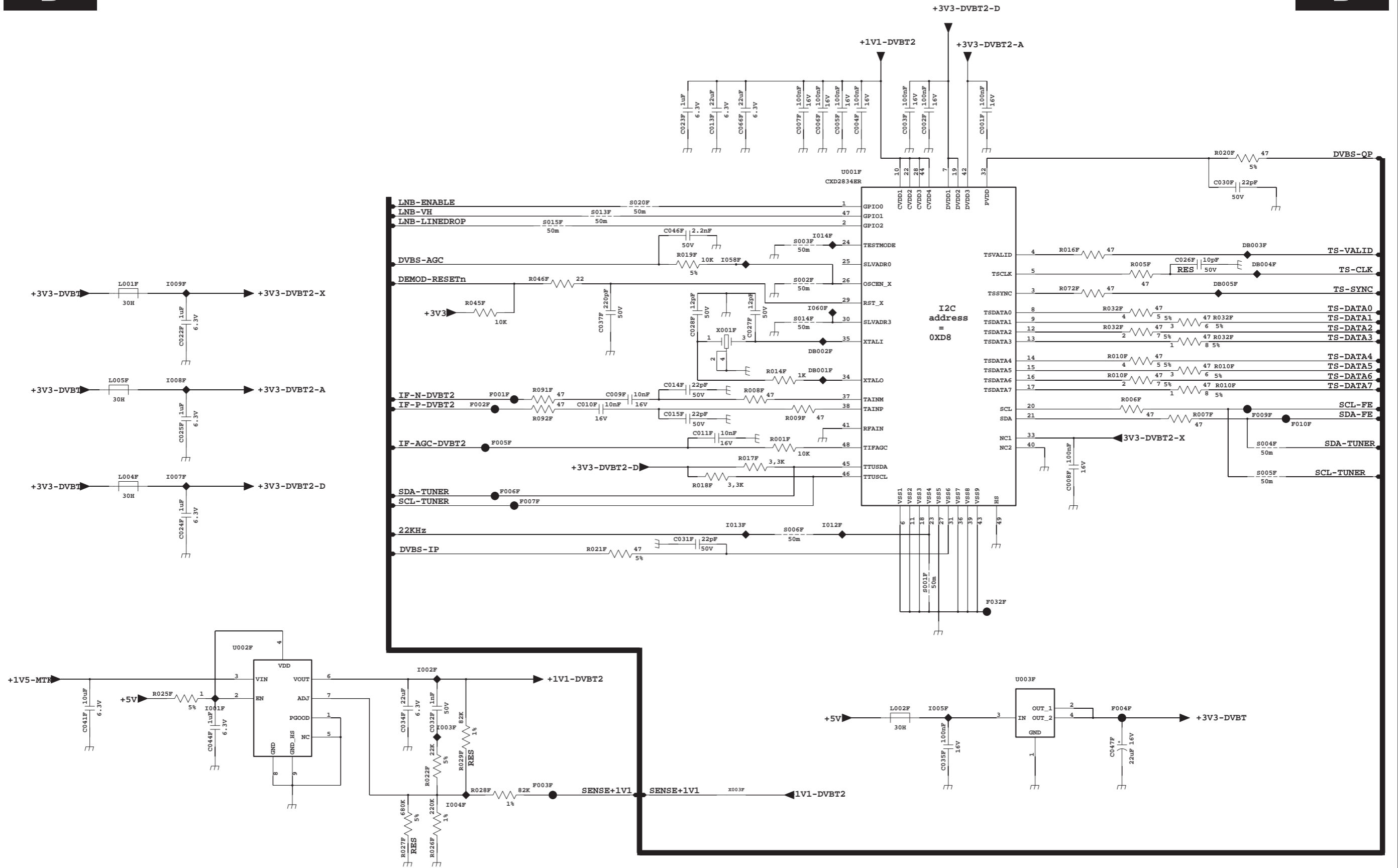
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-11 B, DVB CHANNEL DECODER 1

B

DVB CHANNEL DECODER 1

B

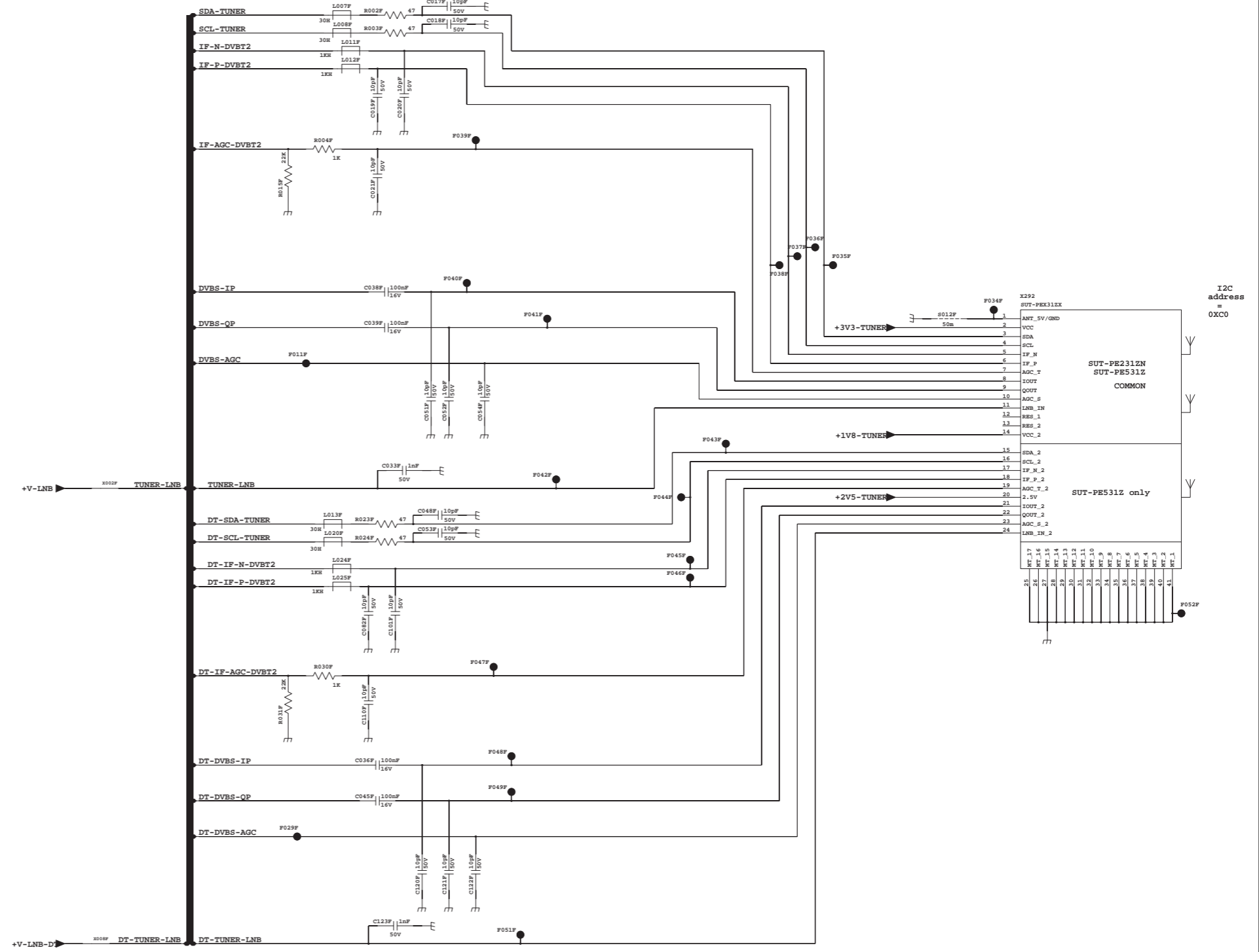
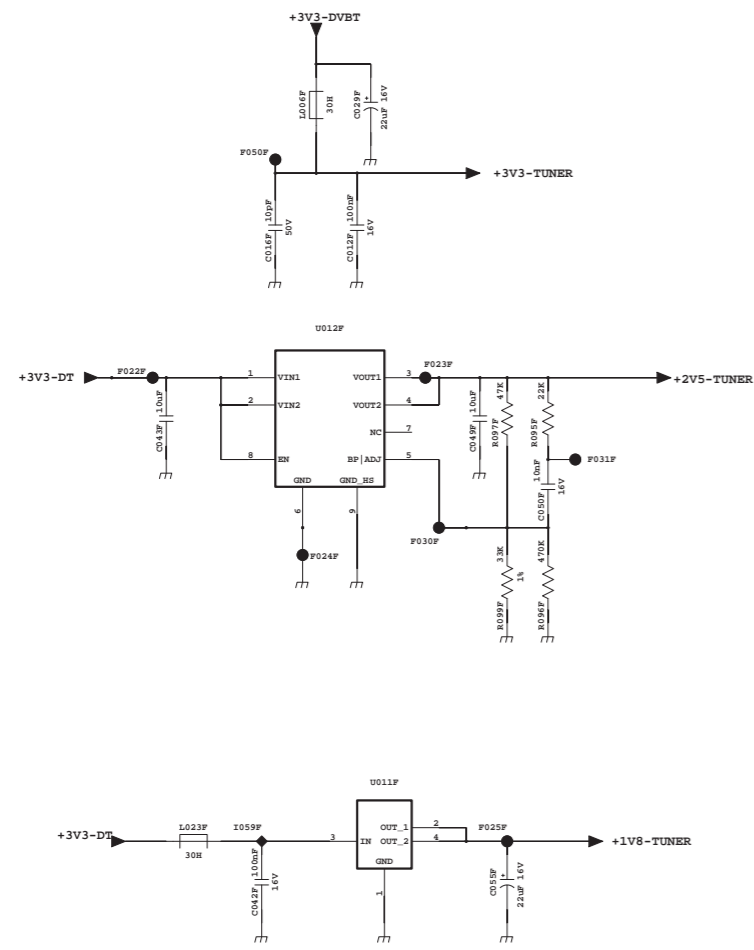


MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-12 B, DVB DUAL TUNER

B DVB DUAL TUNER

B



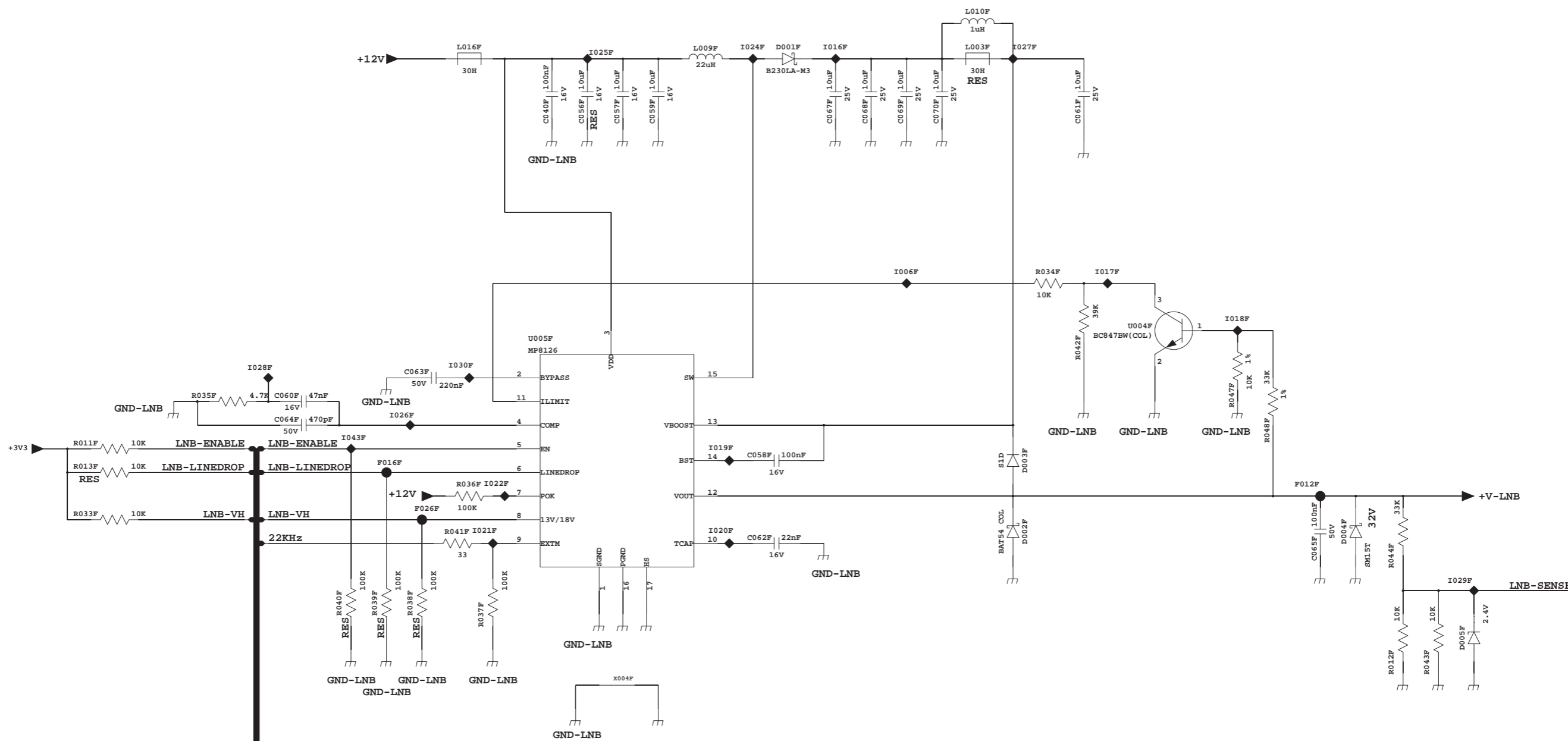
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-13 B, LNB SUPPLY 1

B

LNB SUPPLY 1

B



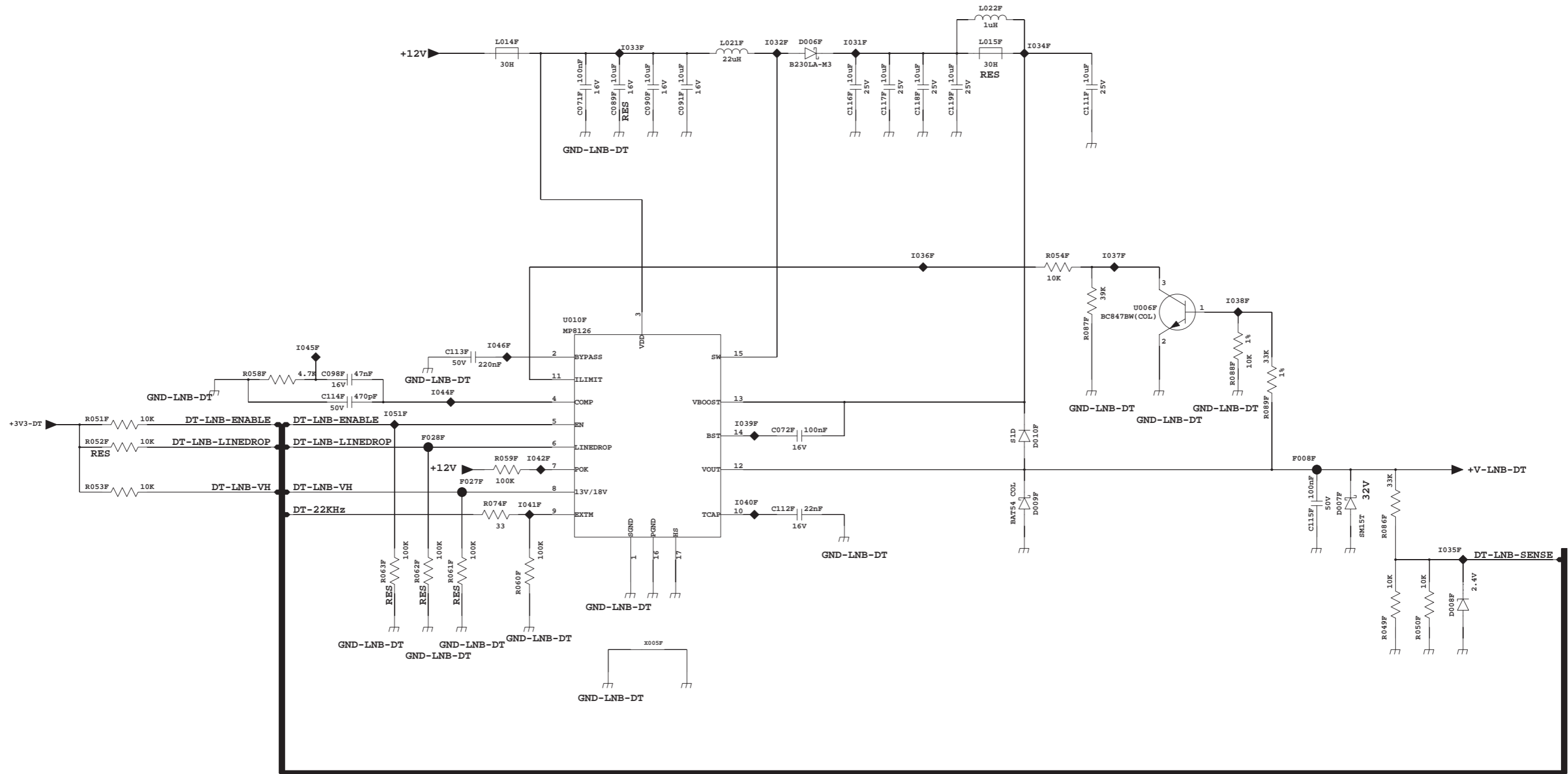
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-14 B, LNB SUPPLY 2

B

LNB SUPPLY 2

B

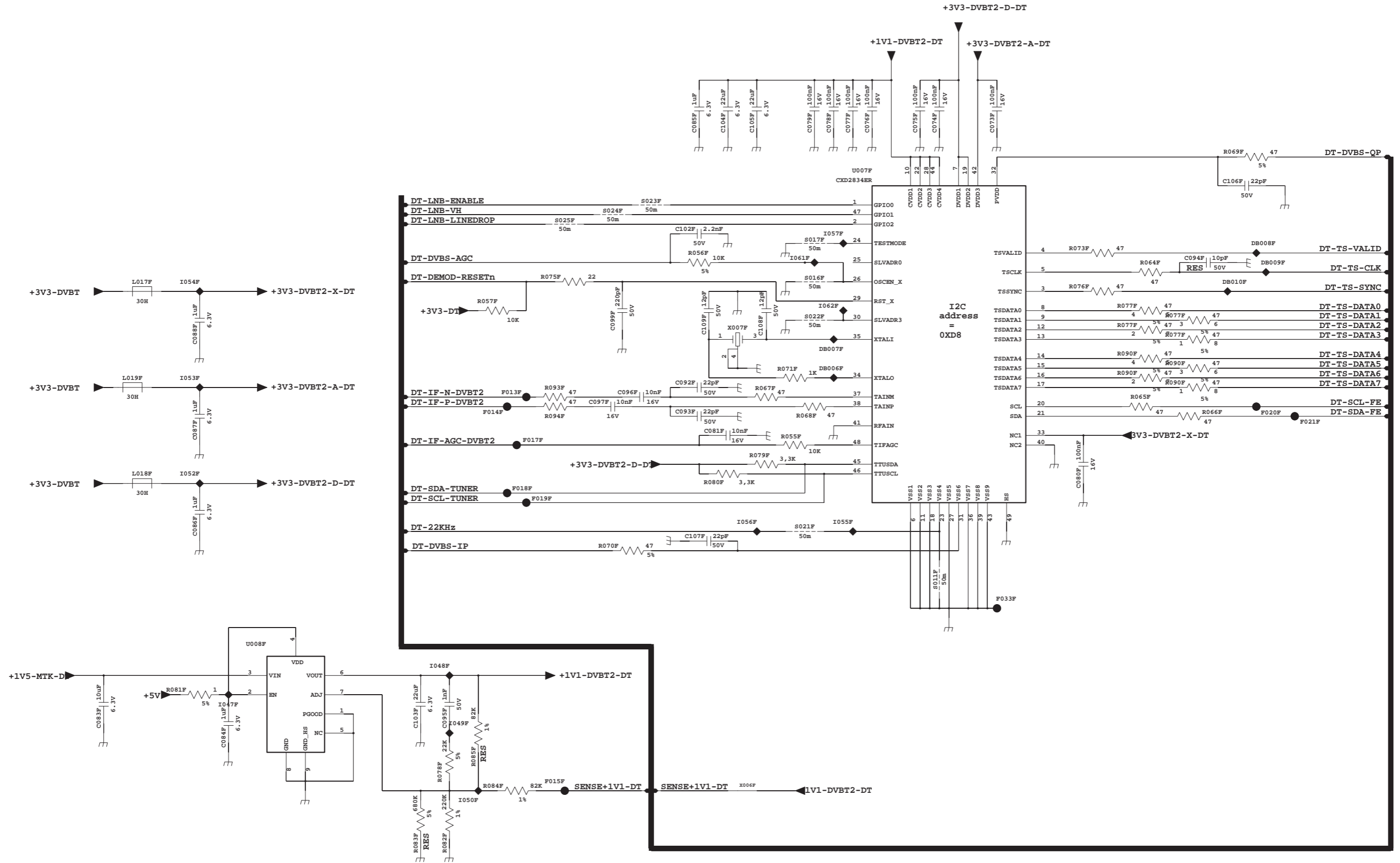


MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

B

DVB CHANNEL DECODER 2

B



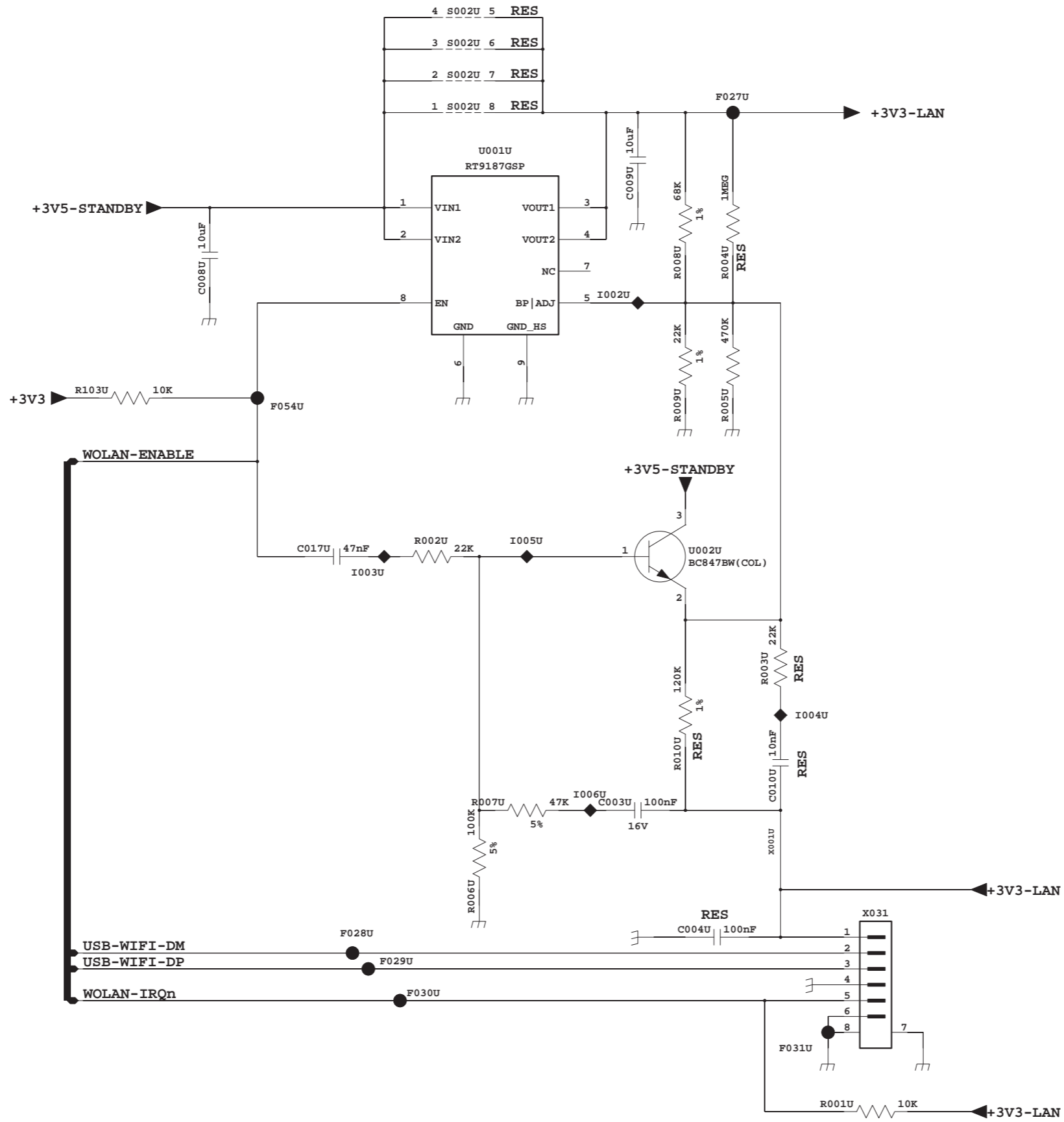
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-17 B, WIFI SUPPLY

B

WIFI SUPPLY

B



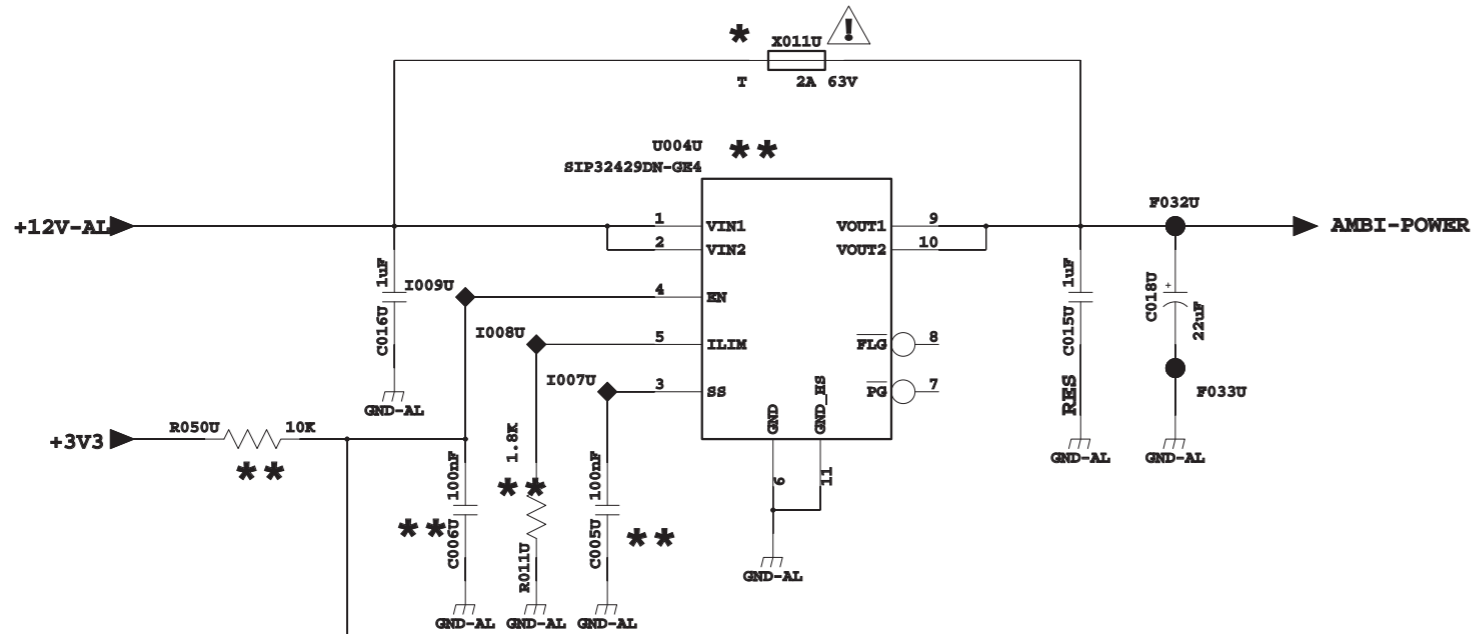
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-18 B, AMBILIGHT PROTECTION

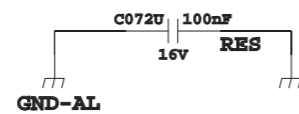
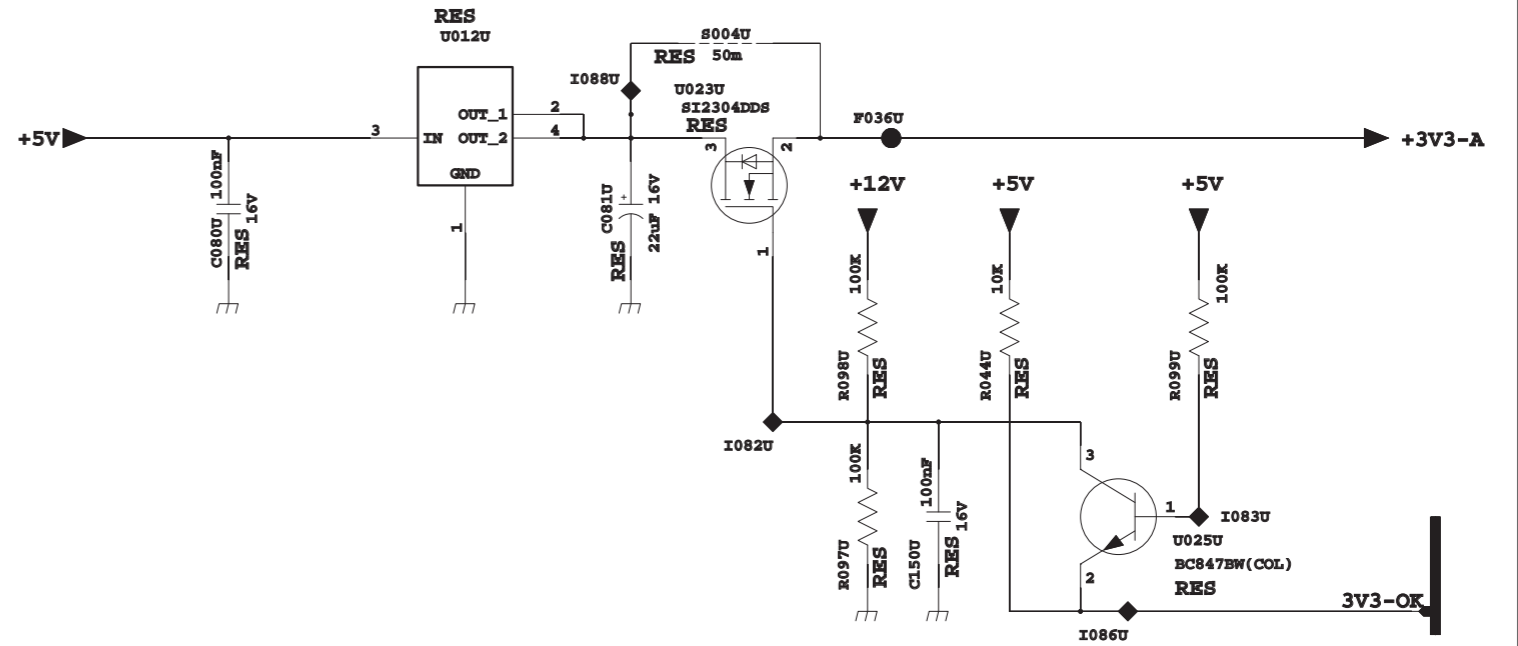
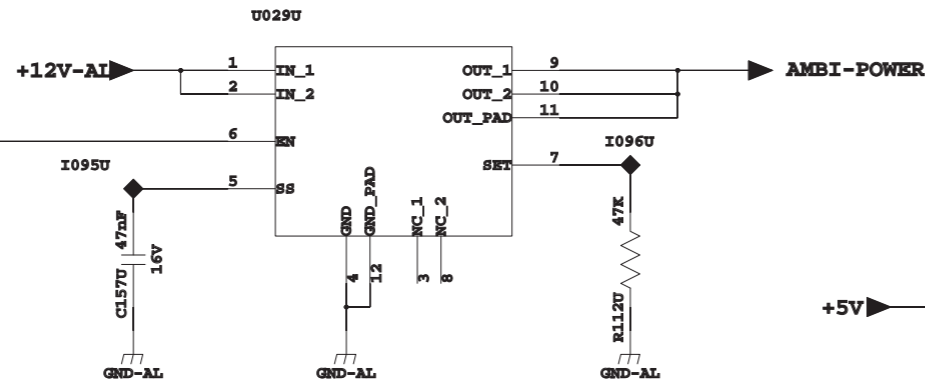
B

AMBILIGHT PROTECTION

B



2-SIDED AMBILIGHT *	3- or 4- SIDED AMBILIGHT **
X011U	U004U
C016U	R050U
C018U	R011U
	C016U
	C006U
	C005U
	C018U



MTK UHD 50 Hz
7800

715RLPCB000000037

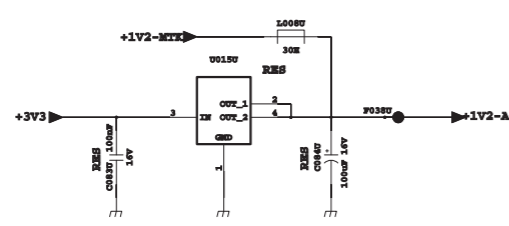
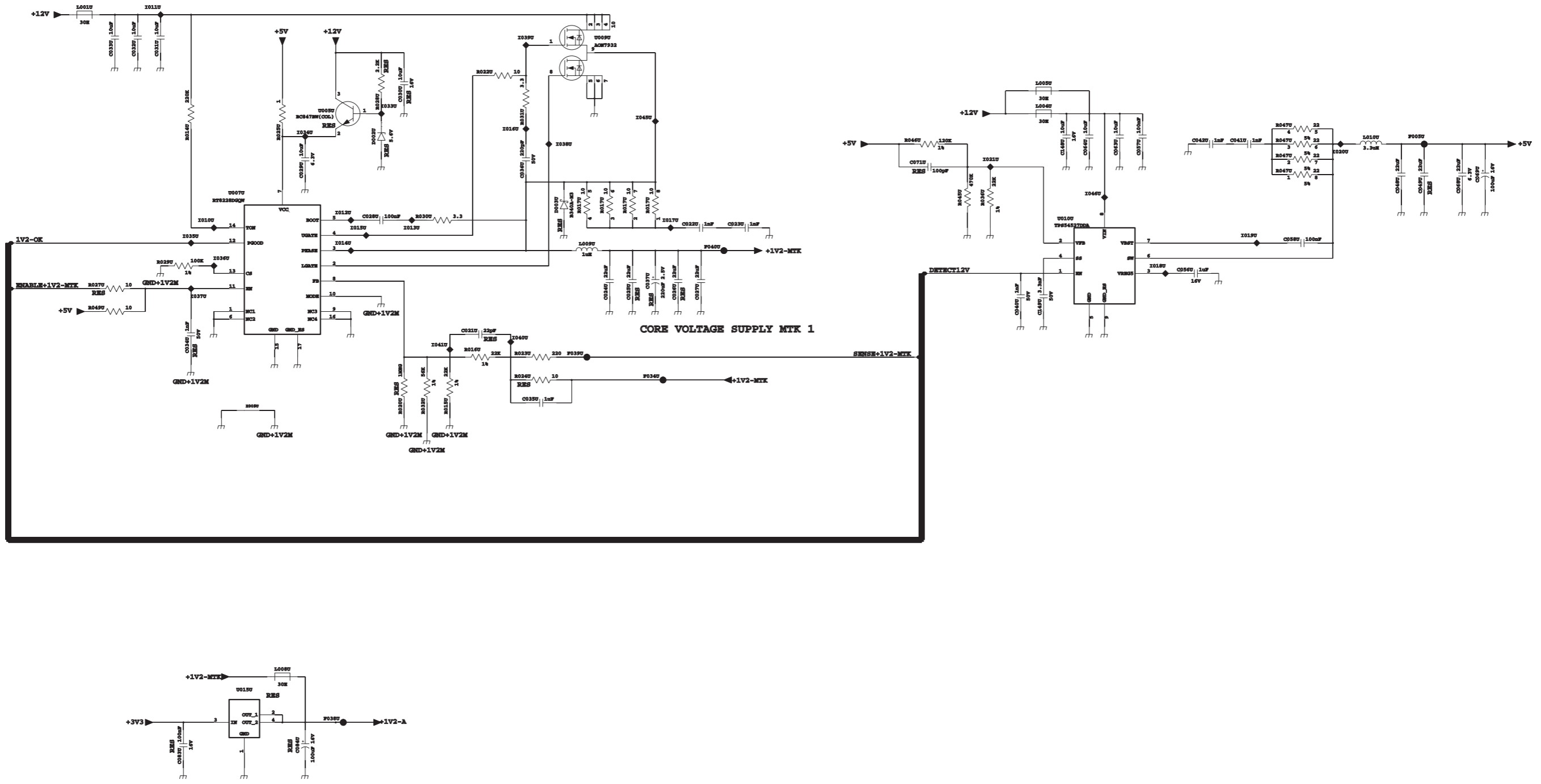
1 2014-02-14

10-1-19 B, SUPPLY 1

B

SUPPLY 1

B



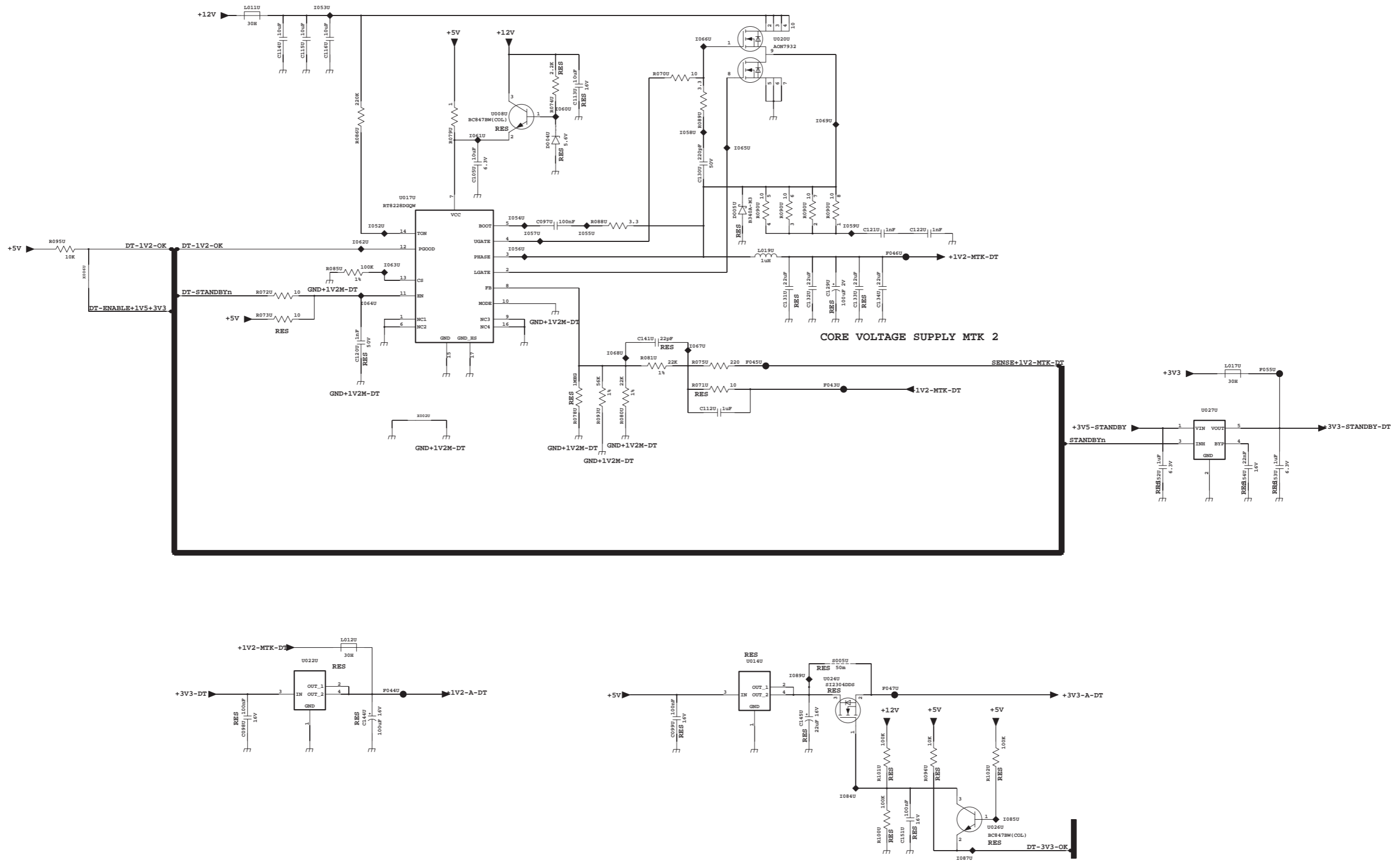
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-21 B, SUPPLY 2

B

SUPPLY 2

B



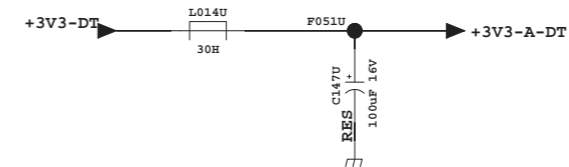
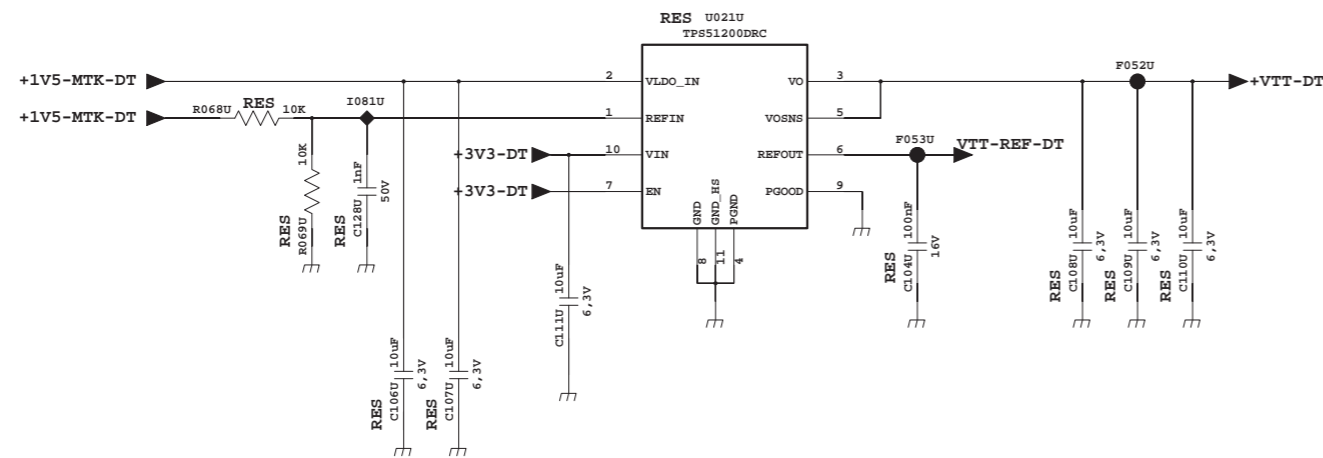
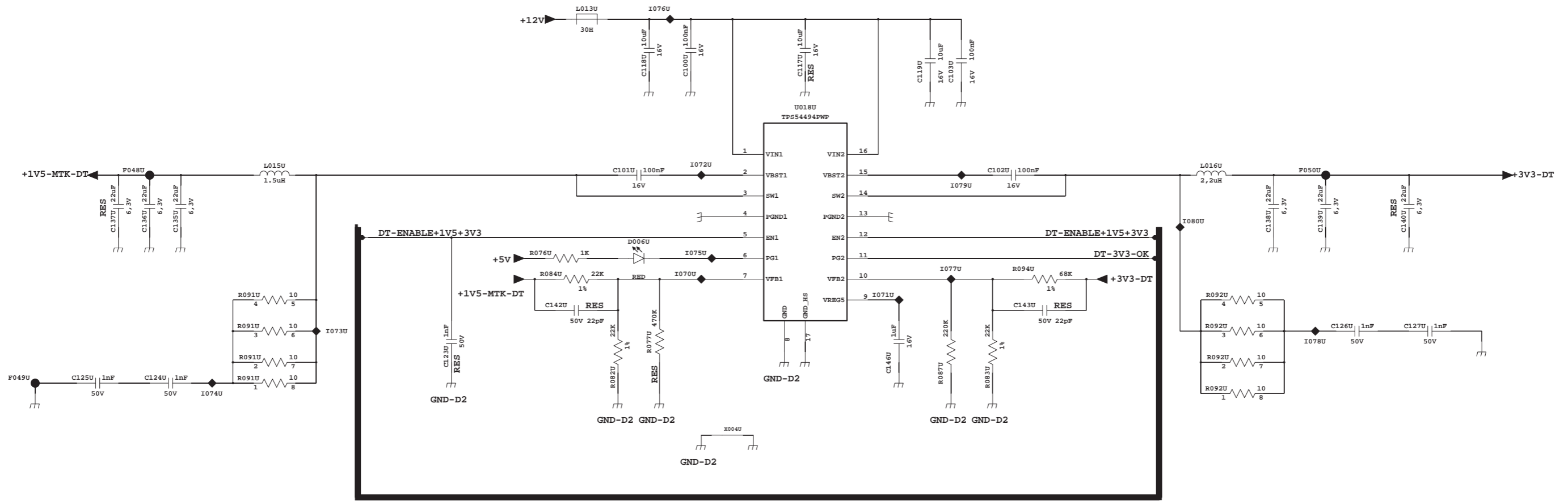
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-22 B, DDR I/O SUPPLY MTK 2

B

DDR I/O SUPPLY MTK 2

B

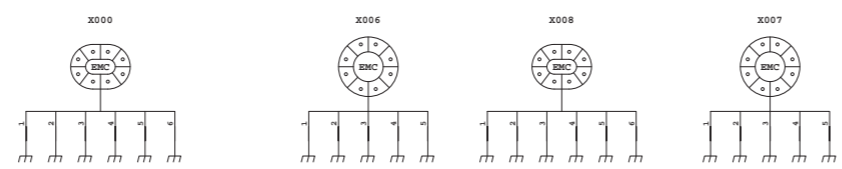
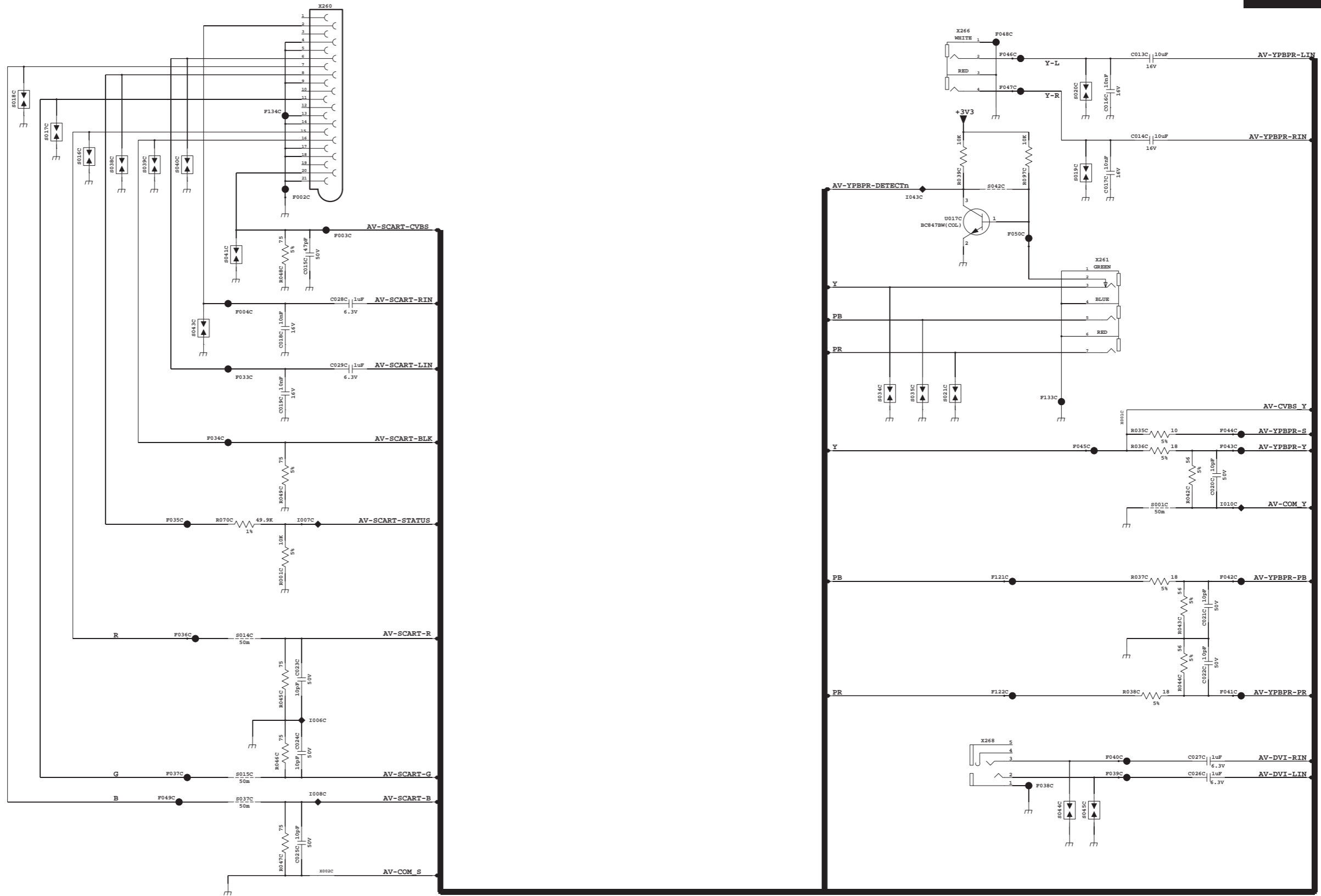


MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-23 B, AUDIO-VIDEO I/O

B AUDIO-VIDEO I/O

B



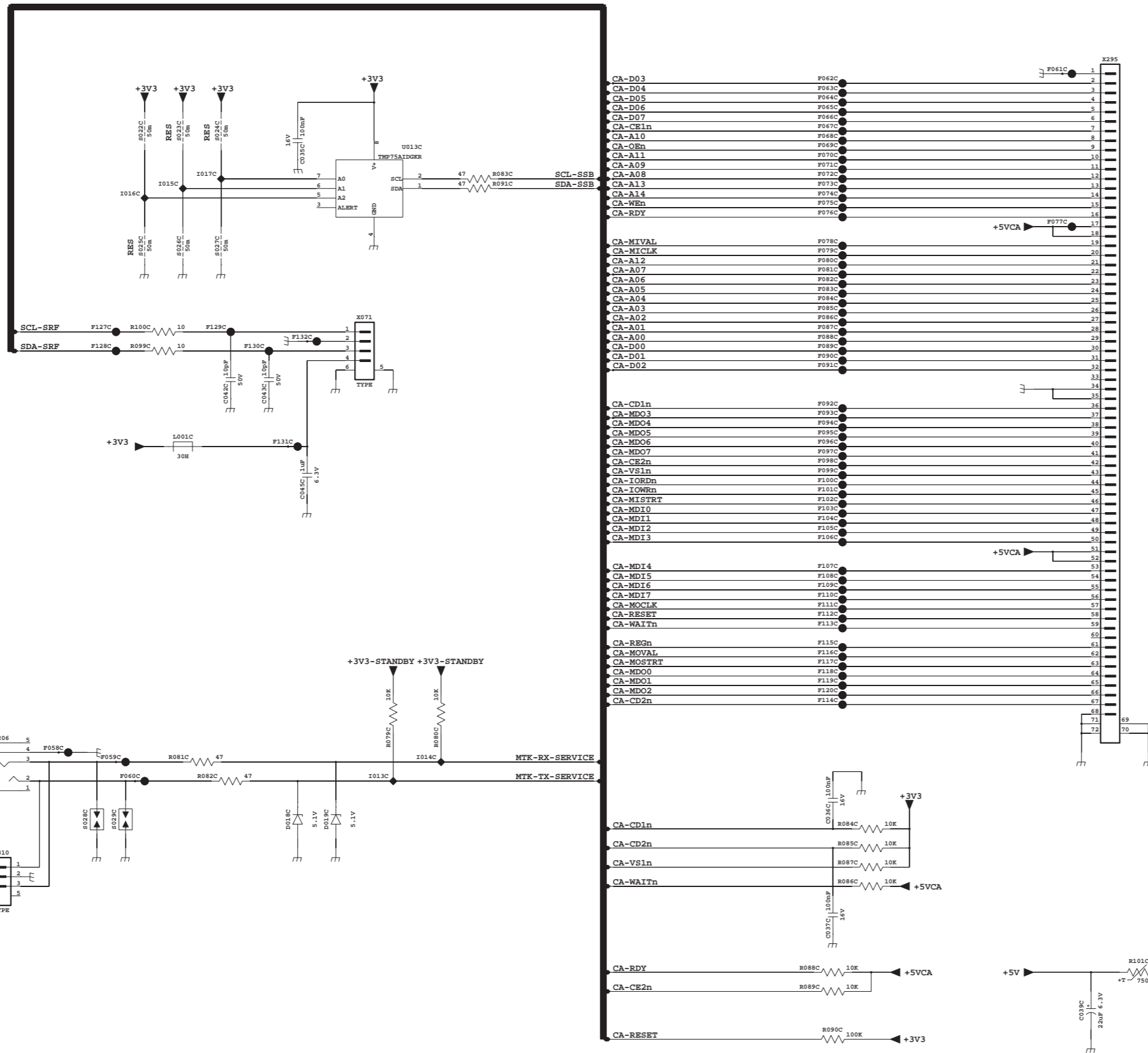
MTK UHD 50 Hz 7800	715RLPCB000000021	1	2013-12-11

10-1-26 B, COMMON INTERFACE

B

COMMON INTERFACE

B

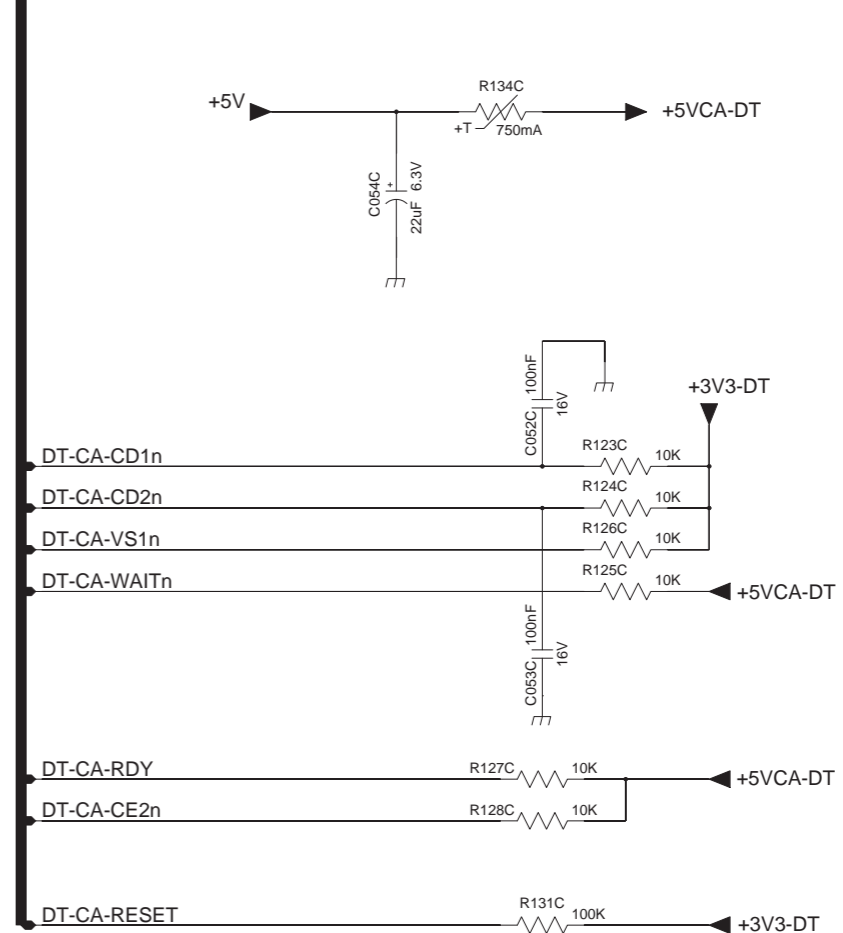


MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

B

DT COMMON INTERFACE

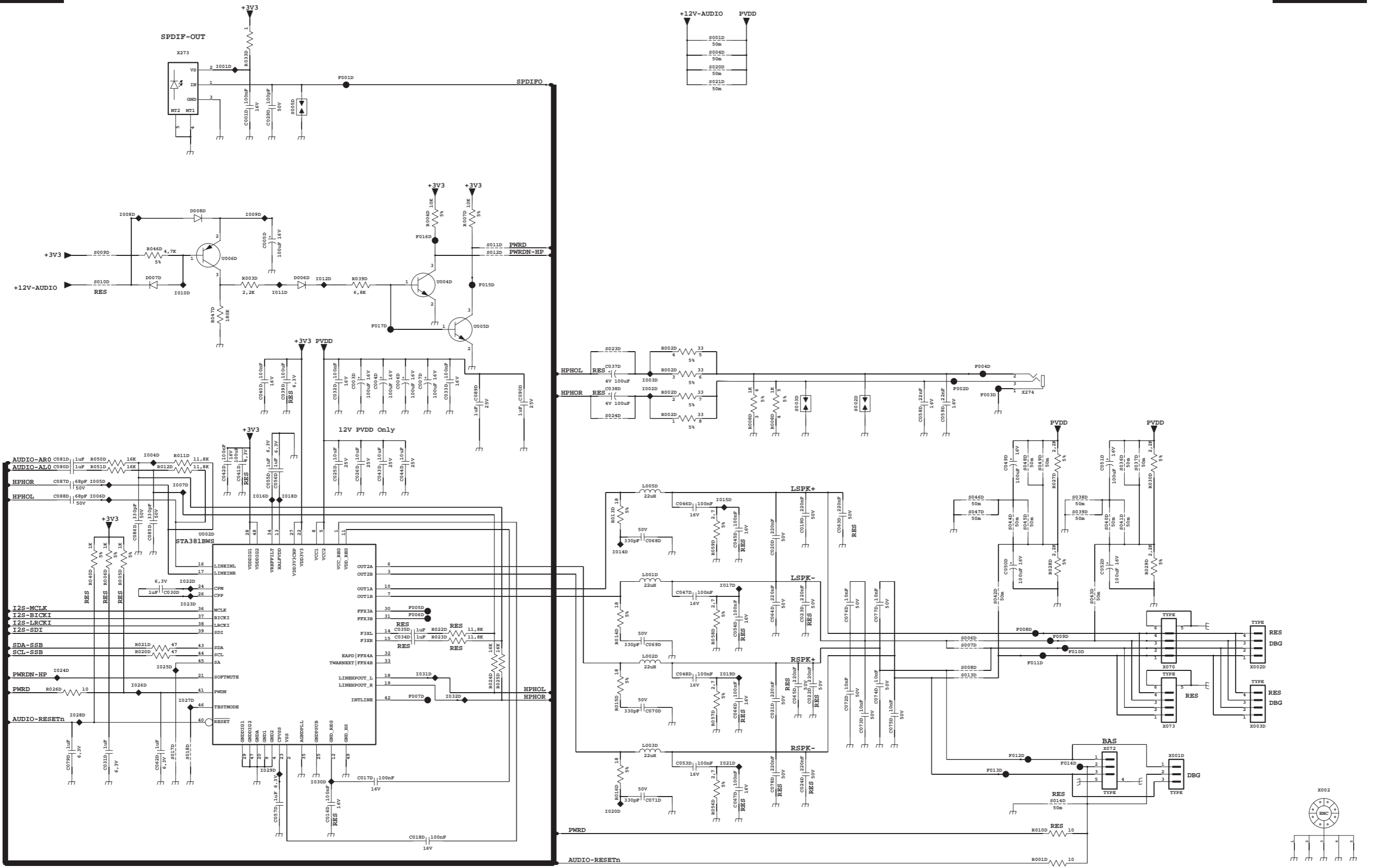
B



MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

B AUDIO AMPLIFIER

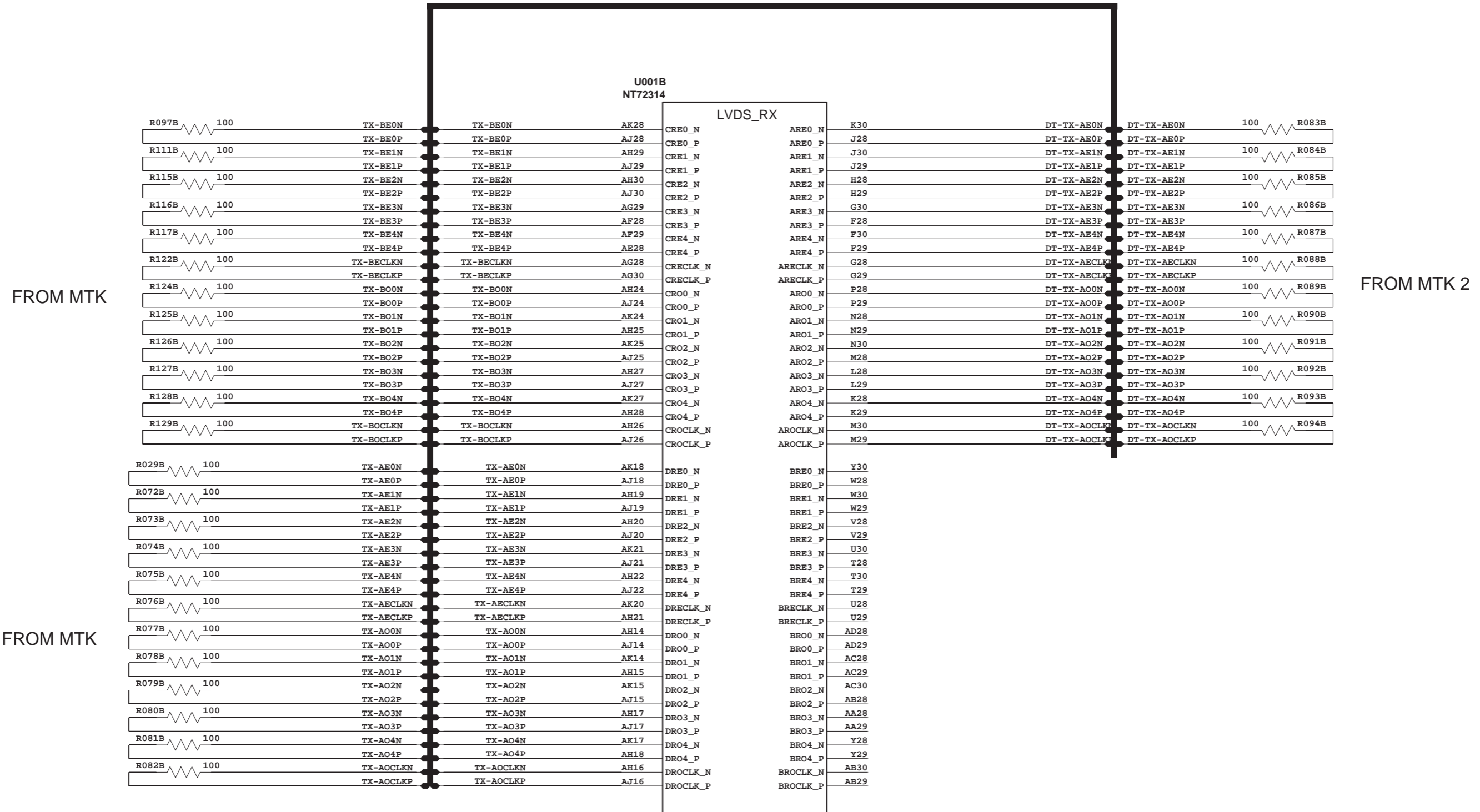
B



MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

B MASTER - LVDS RX

B



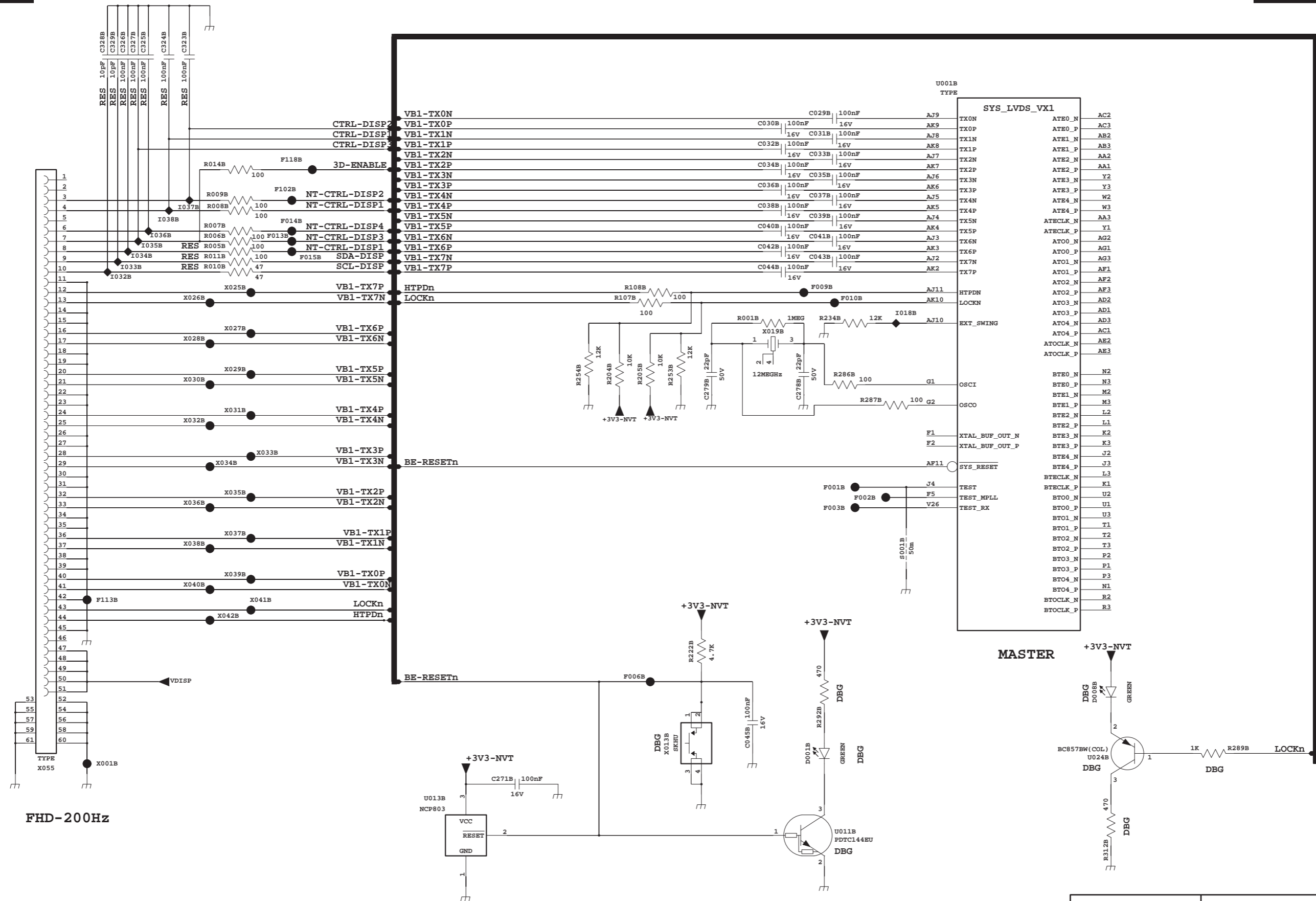
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-31 B, MASTER V-BY-ONE OUTPUT

B

MASTER V-BY-ONE OUTPUT

B

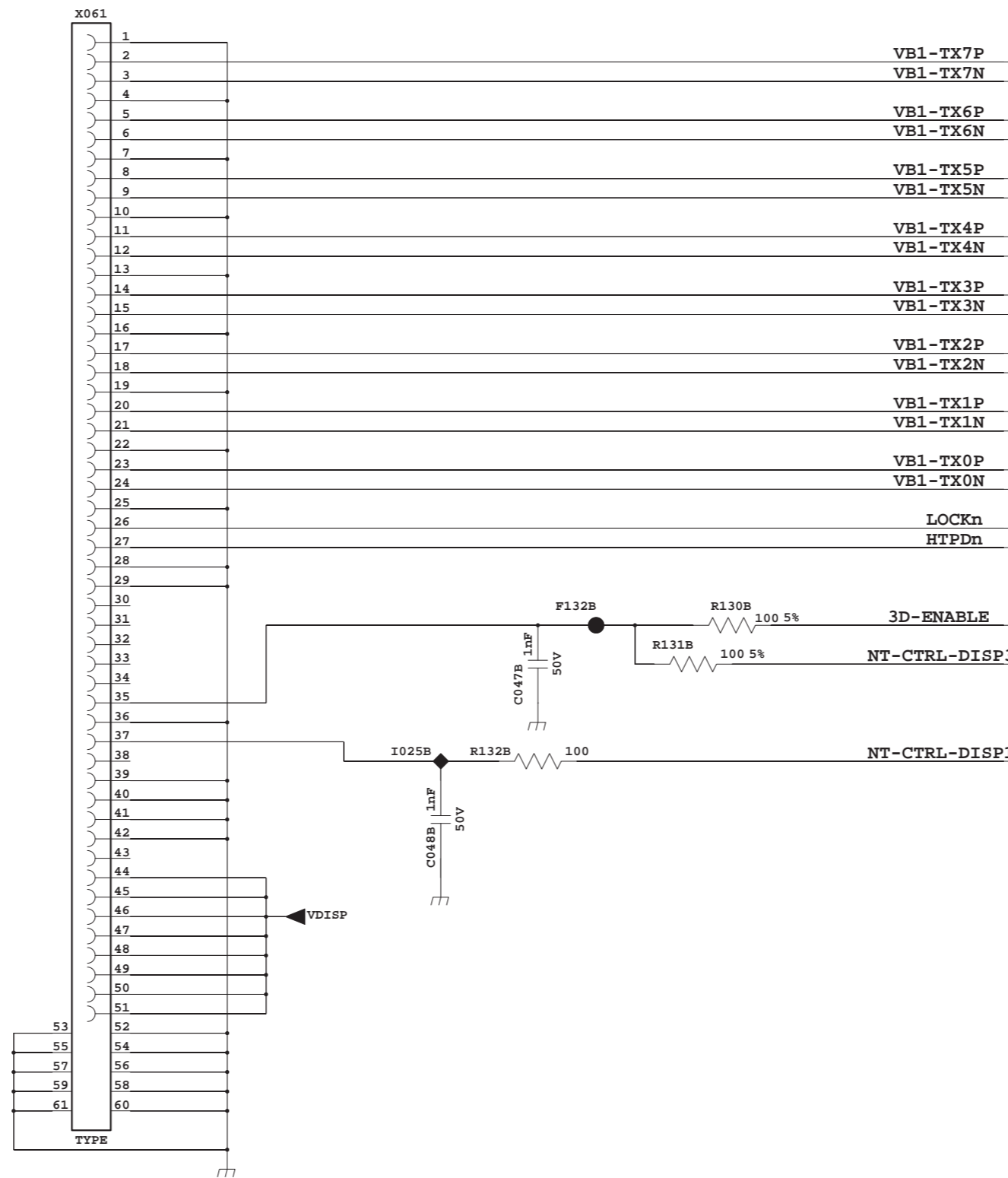


MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14
-----------------------	-------------------	---	------------

B

V-by-One Ultra HD 50 Hz

B



UHD-50Hz

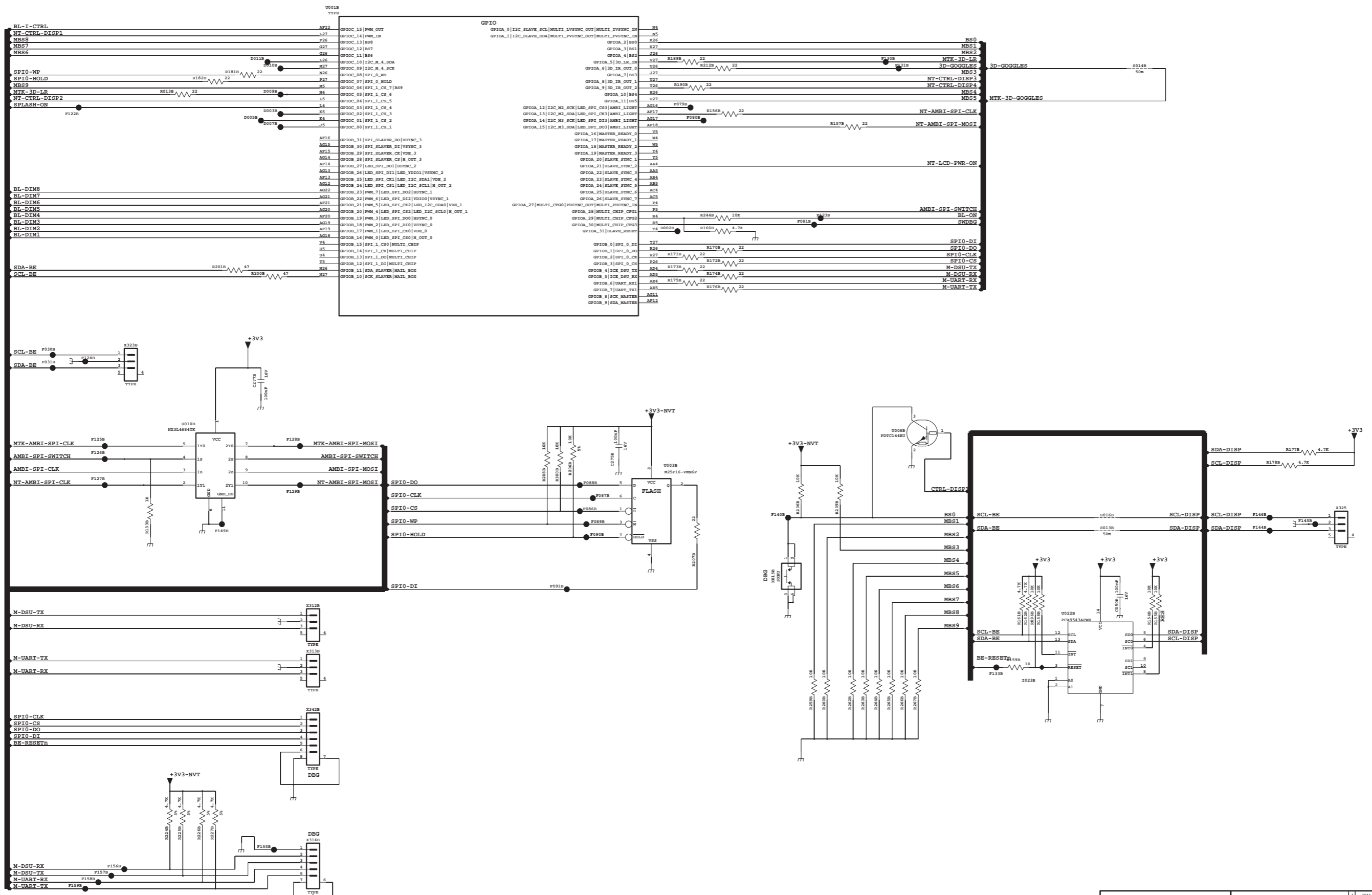
MTK UHD 50 Hz 7800	715RLPCB000000037	1	2014-02-14

10-1-33 B, MASTER I/O, FLASH MEMORY

B

MASTER I/O , FLASH memory

B



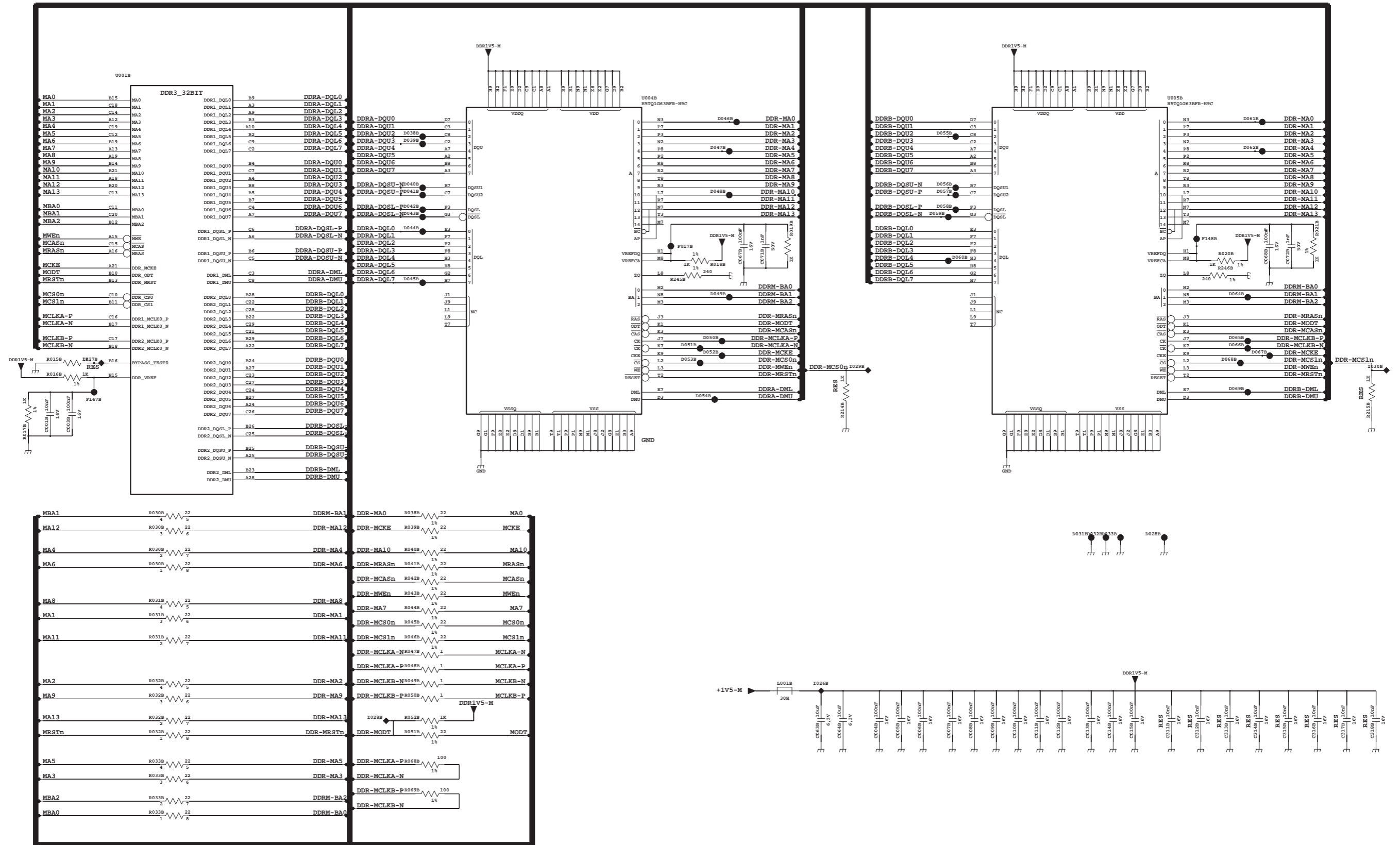
MTK UHD 50 Hz 7800	715RLPCB000000037
-----------------------	-------------------

10-1-34 B, MASTER - DDR

B

MASTER DDR

B

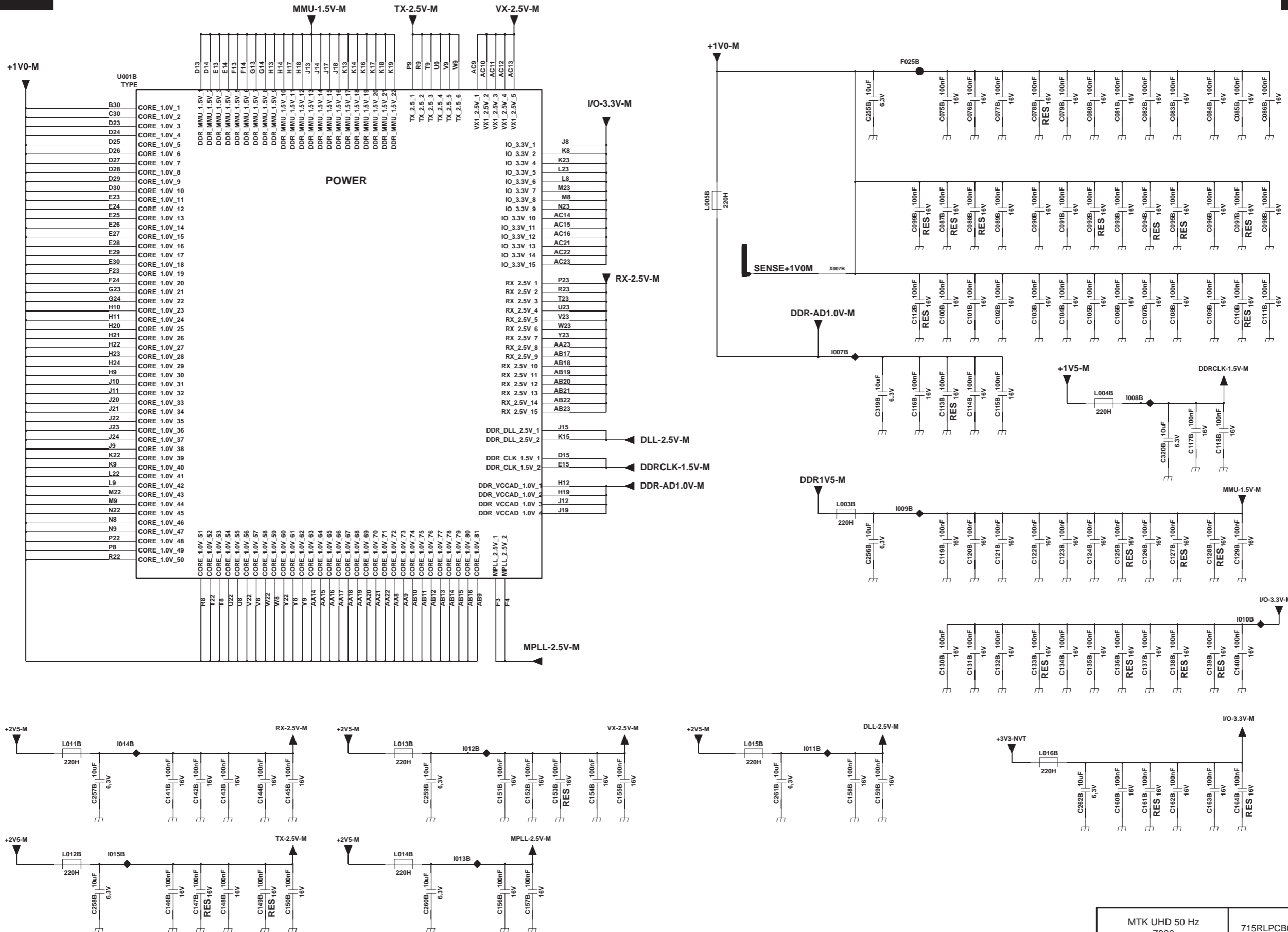


MTK UHD 50 Hz 7800	715RLPCB00000021
-----------------------	------------------

B

MASTER - POWER

B

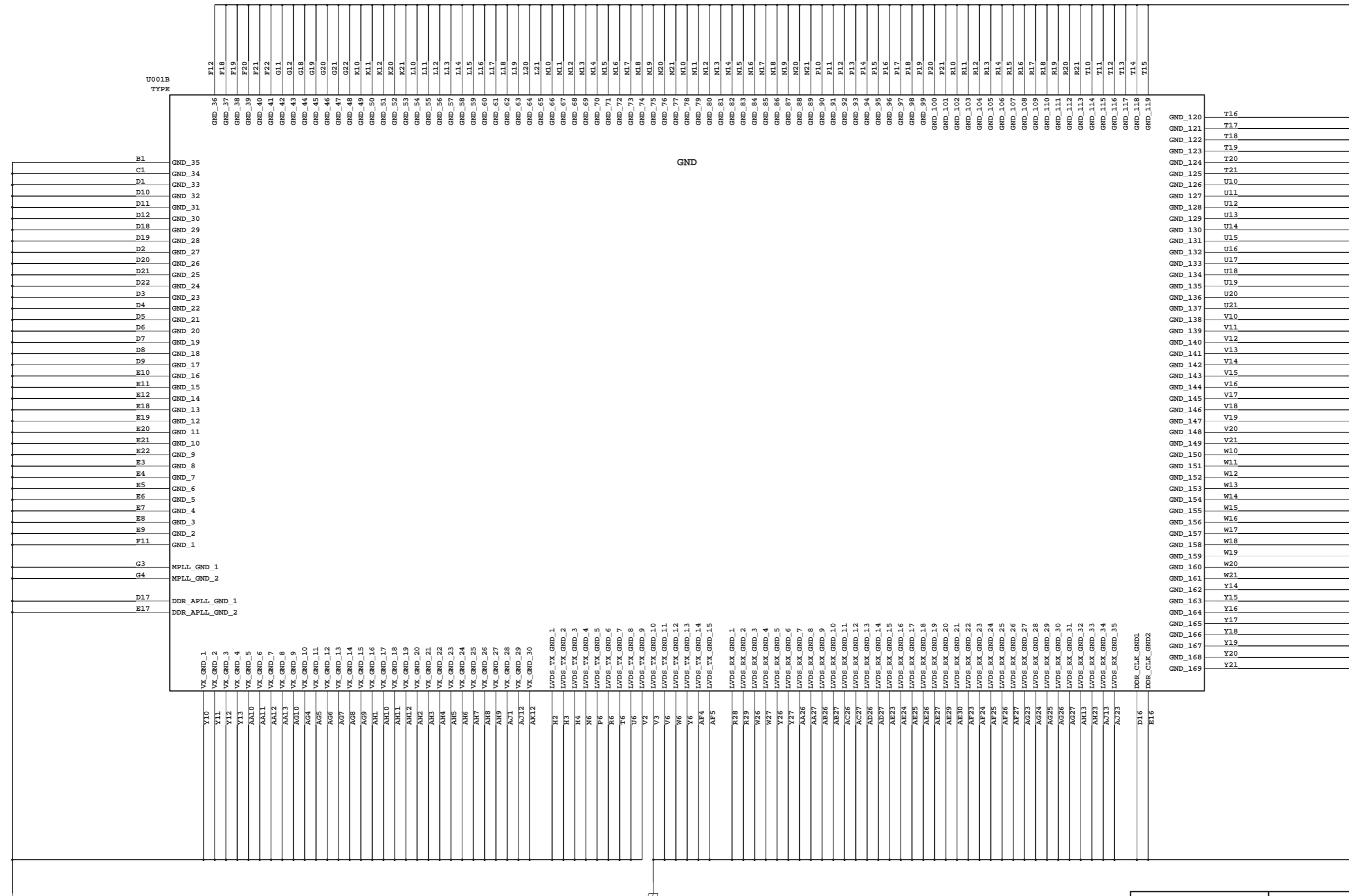


MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

B

MASTER - GND

B

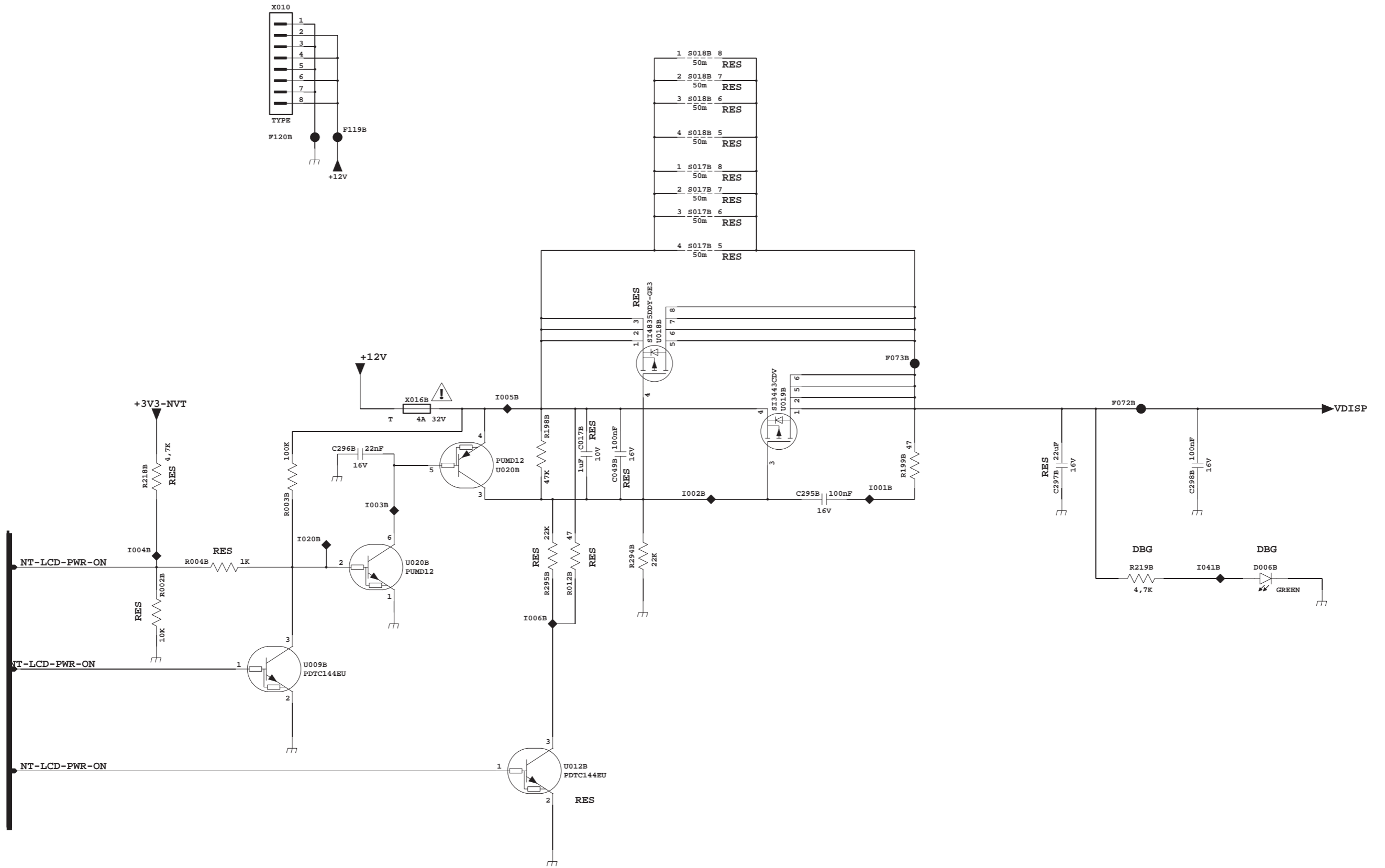


MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

B

Vdisp - UHD

B

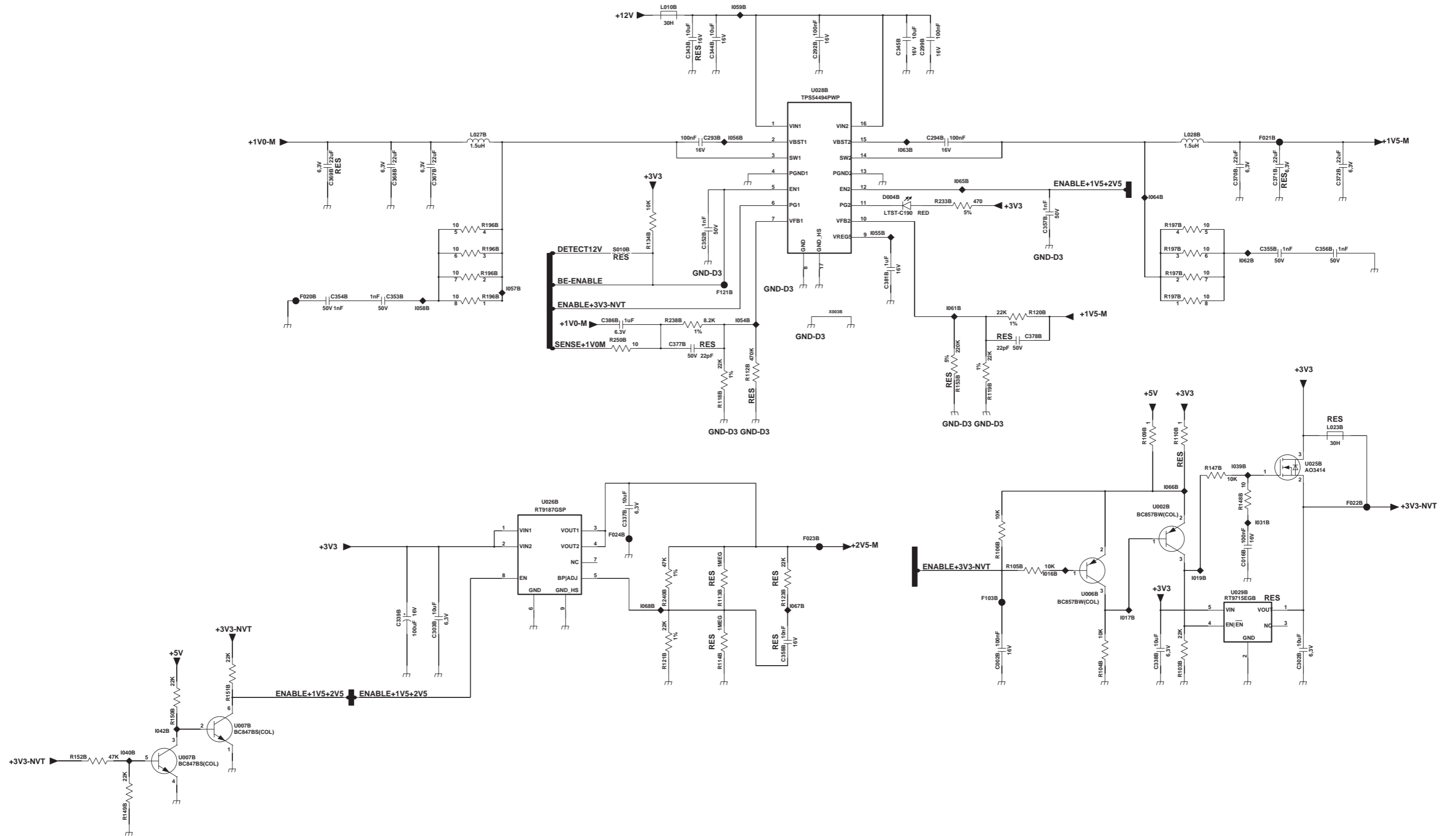


MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

B

NOVATEK SUPPLY

B

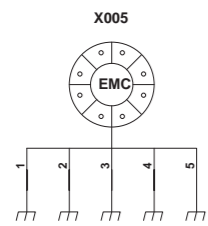
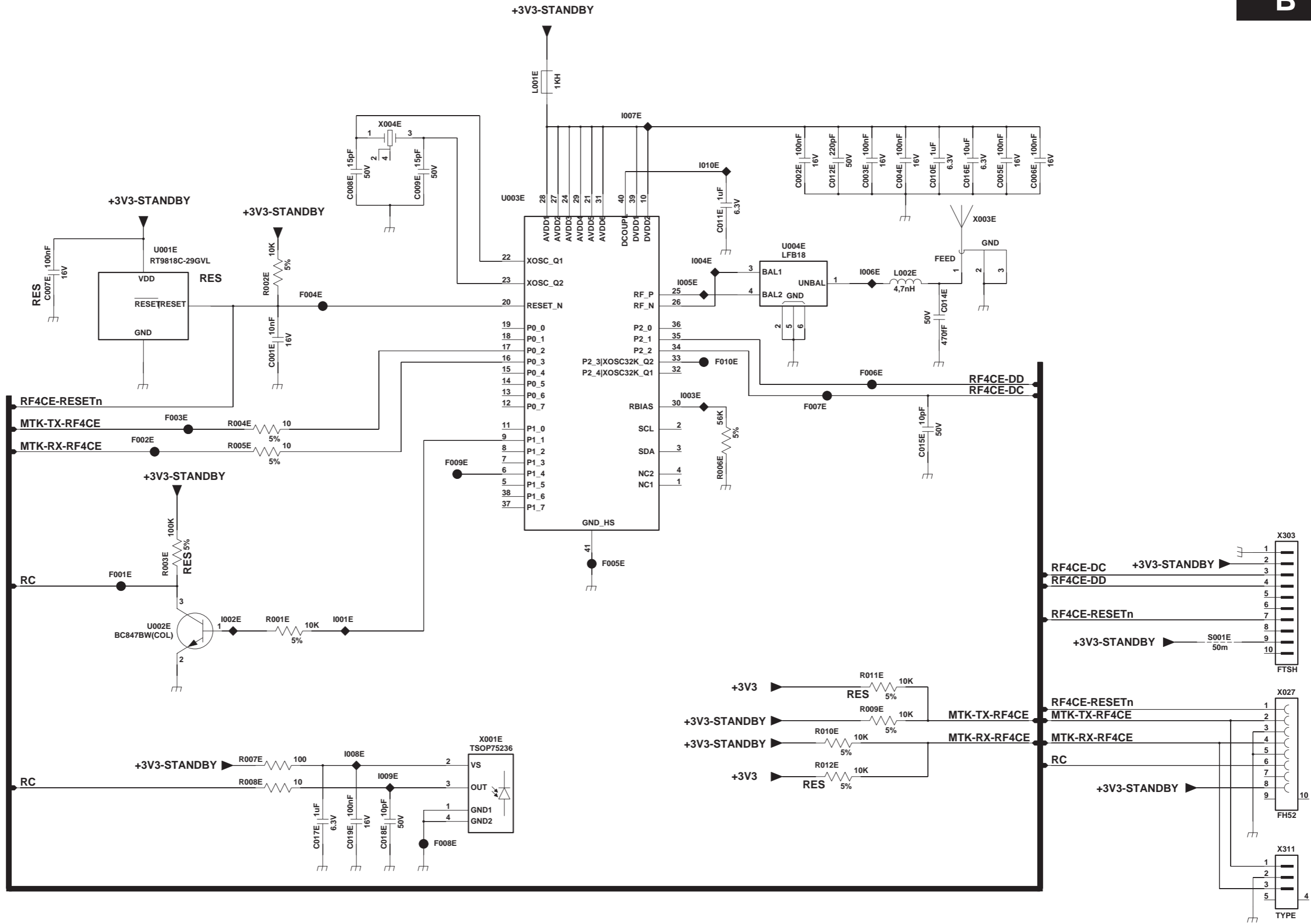


MTK UHD 50 Hz 7800	715RLPCB000000021	1	2013-12-11

10-1-39 B, RF4CE

B RF4CE

B



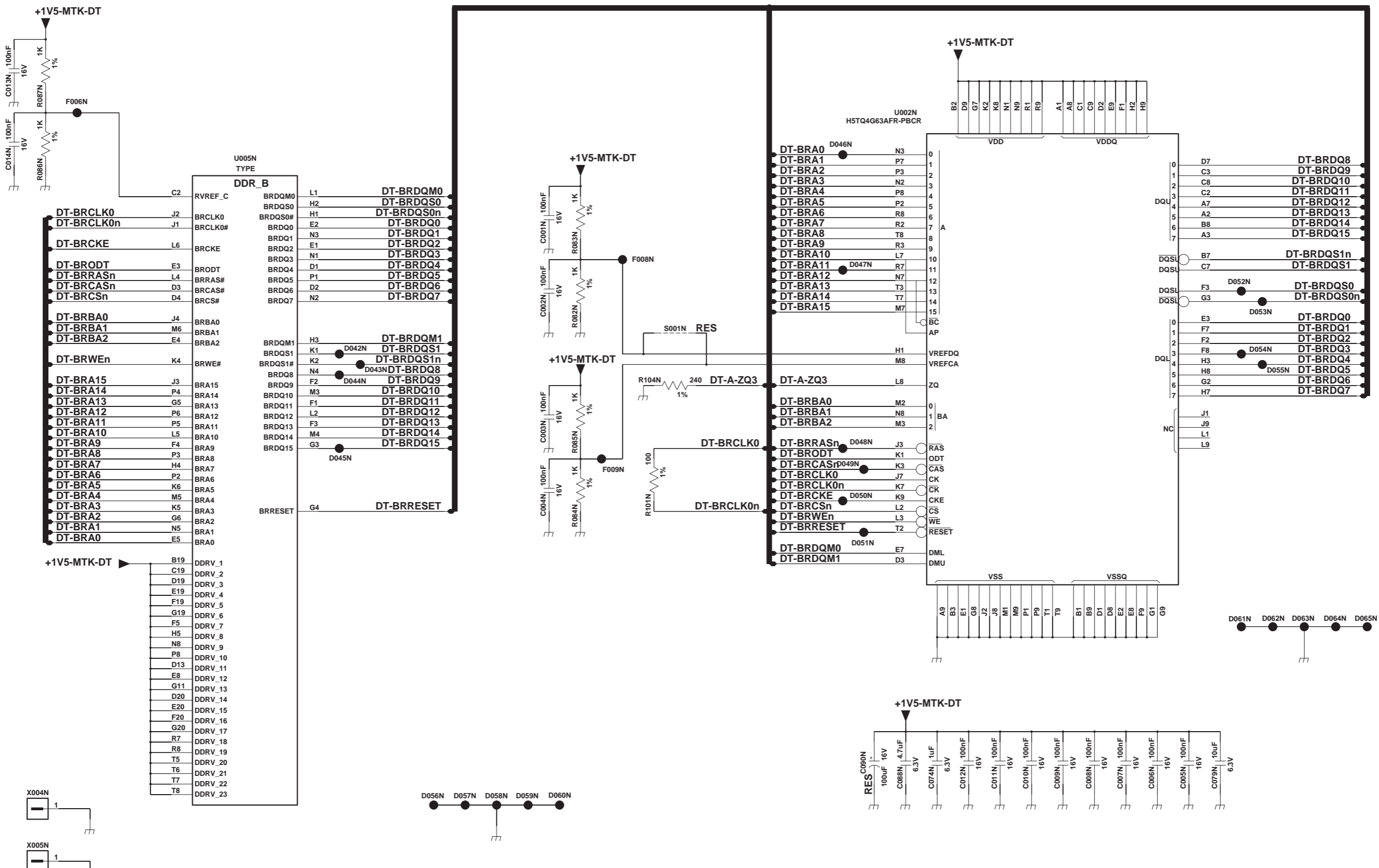
MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

10-1-40 B, DDR 3 INTERFACE - 16 BITS

B

DDR3 INTERFACE - 16 bits - DT

B

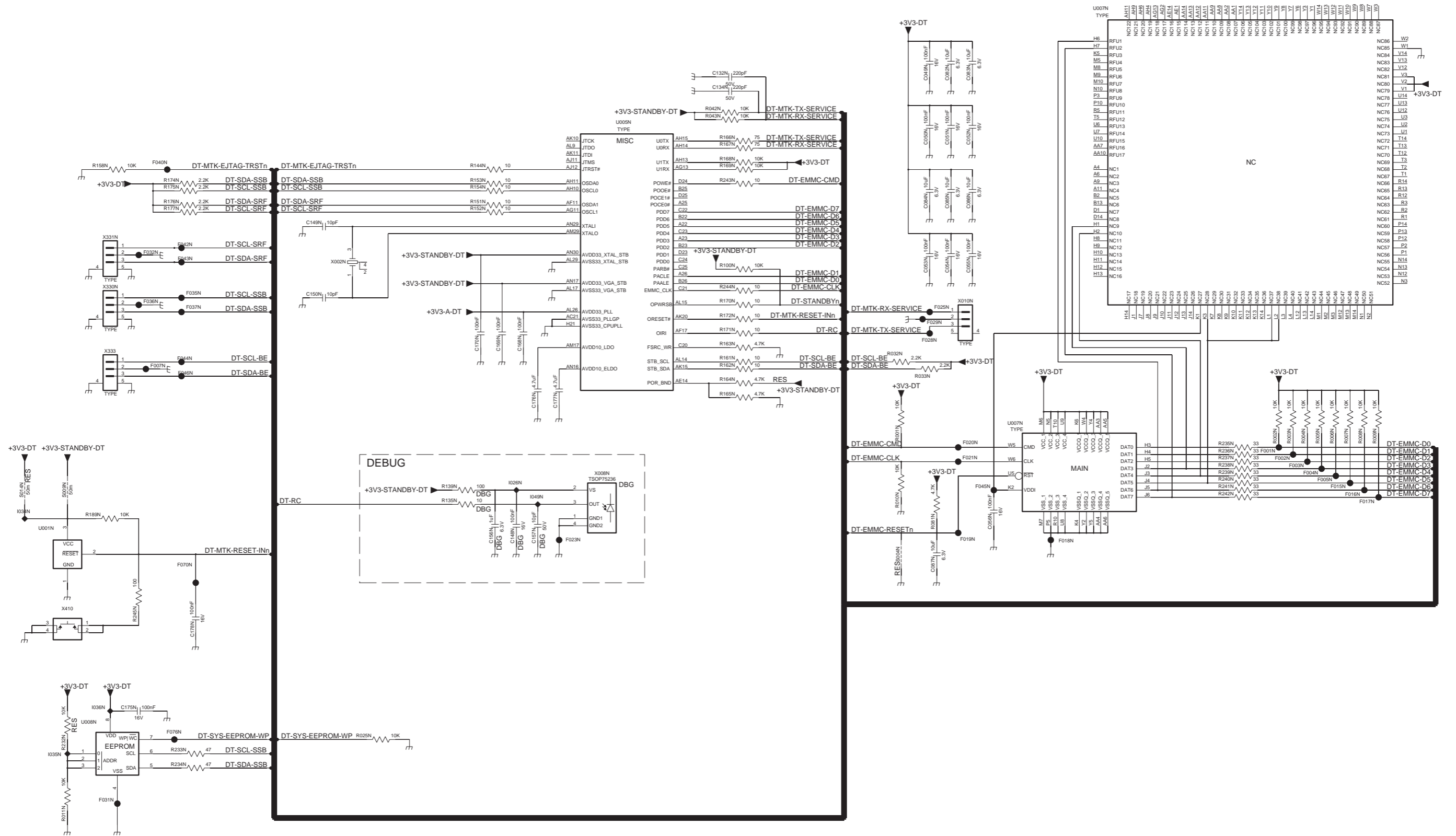


MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

10-1-42 B, EMMC DT

B EMMC - DT

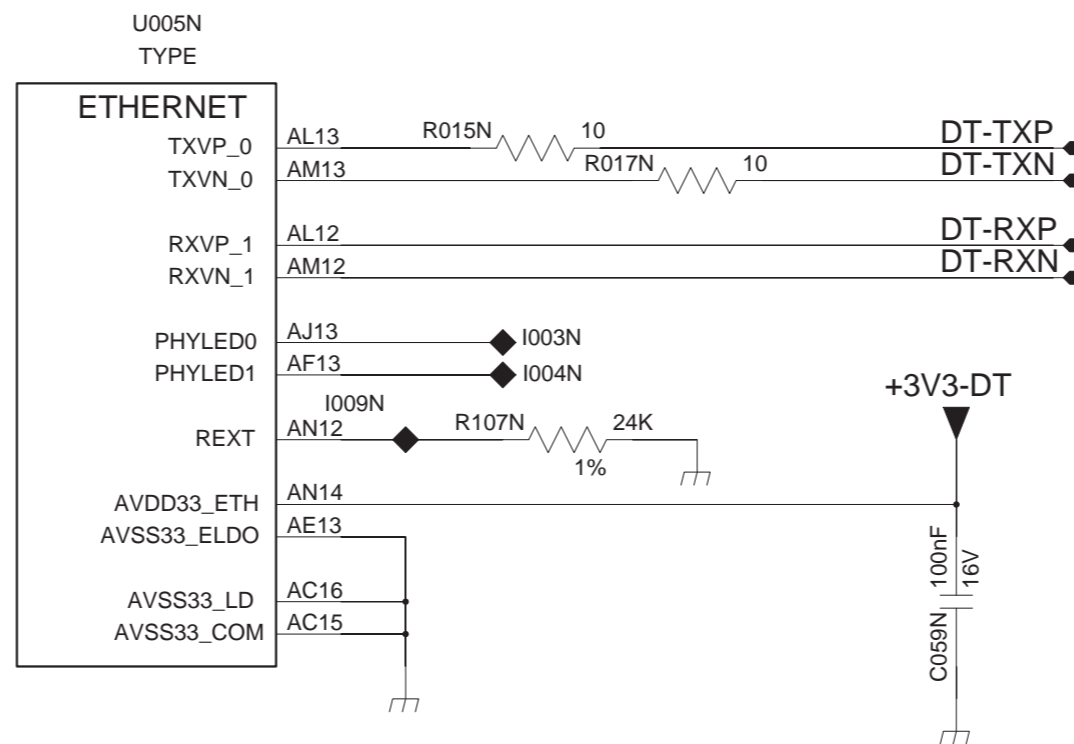
B



MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

B ETHERNET - DT

B



MTK UHD 50 Hz 7800	715RLPCB000000021	2	2013-12-11

10-1-44 B, AUDIO / VIDEO

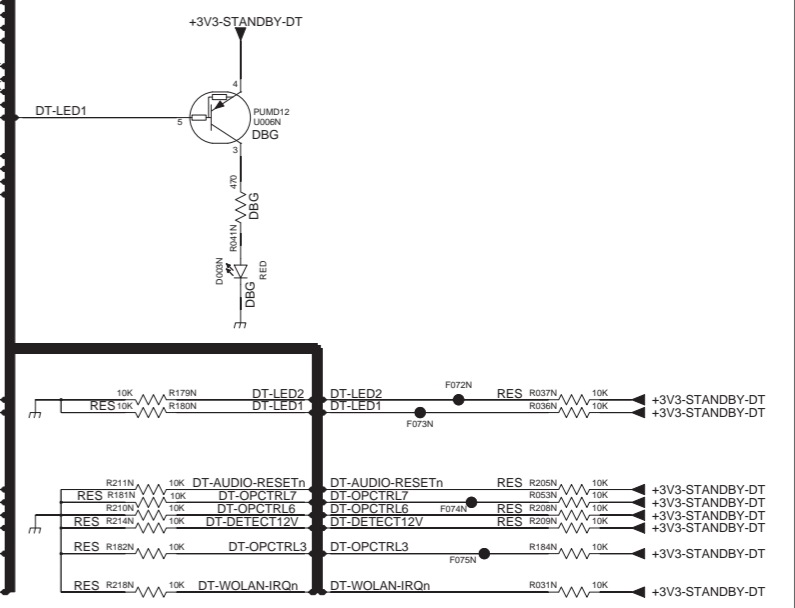
B

AUDIO / VIDEO - DT

B



STRAP OPTION	LED1	LED2	STRAP	AUDIO-ENABLE
	LED_PWM0	LED_PWM1	OPCTRL3	OPCTRL7
ICE mode + 27M + serial boot	1	0	0	0
ICE mode + 27M + ROM to Nand boot	1	0	0	1
ICE mode + 27M + ROM to eMMC boot from eMMC pins (share pins w/S NAND)	1	0	1	1
ICE mode + 27M + ROM to eMMC boot from SDIO pins	1	1	0	0

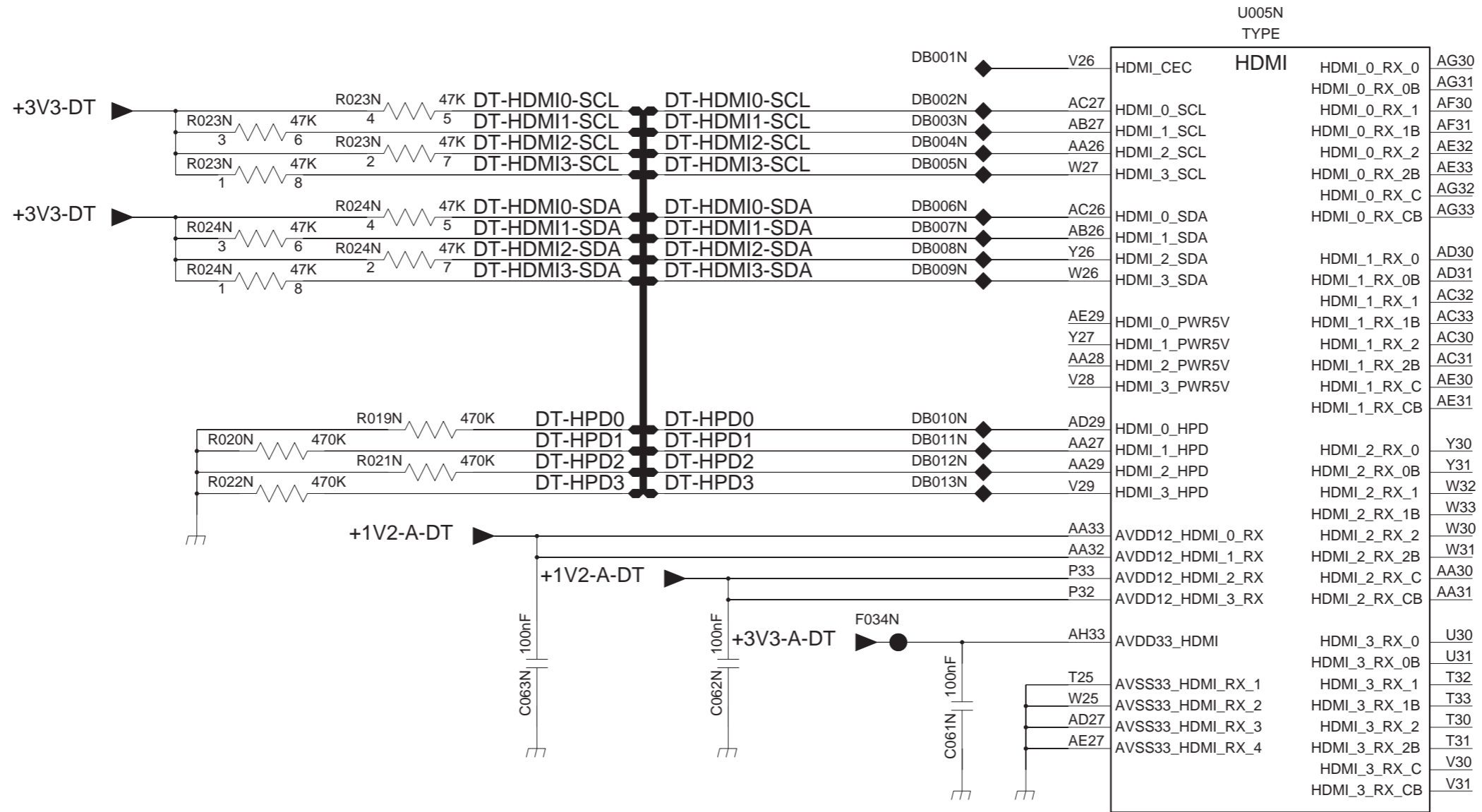


MTK UHD 50 Hz 7800	715RLPCB00000021	3	2013-12-11
-----------------------	------------------	---	------------

10-1-45 B, HDMI - DT

B HDMI - DT

B

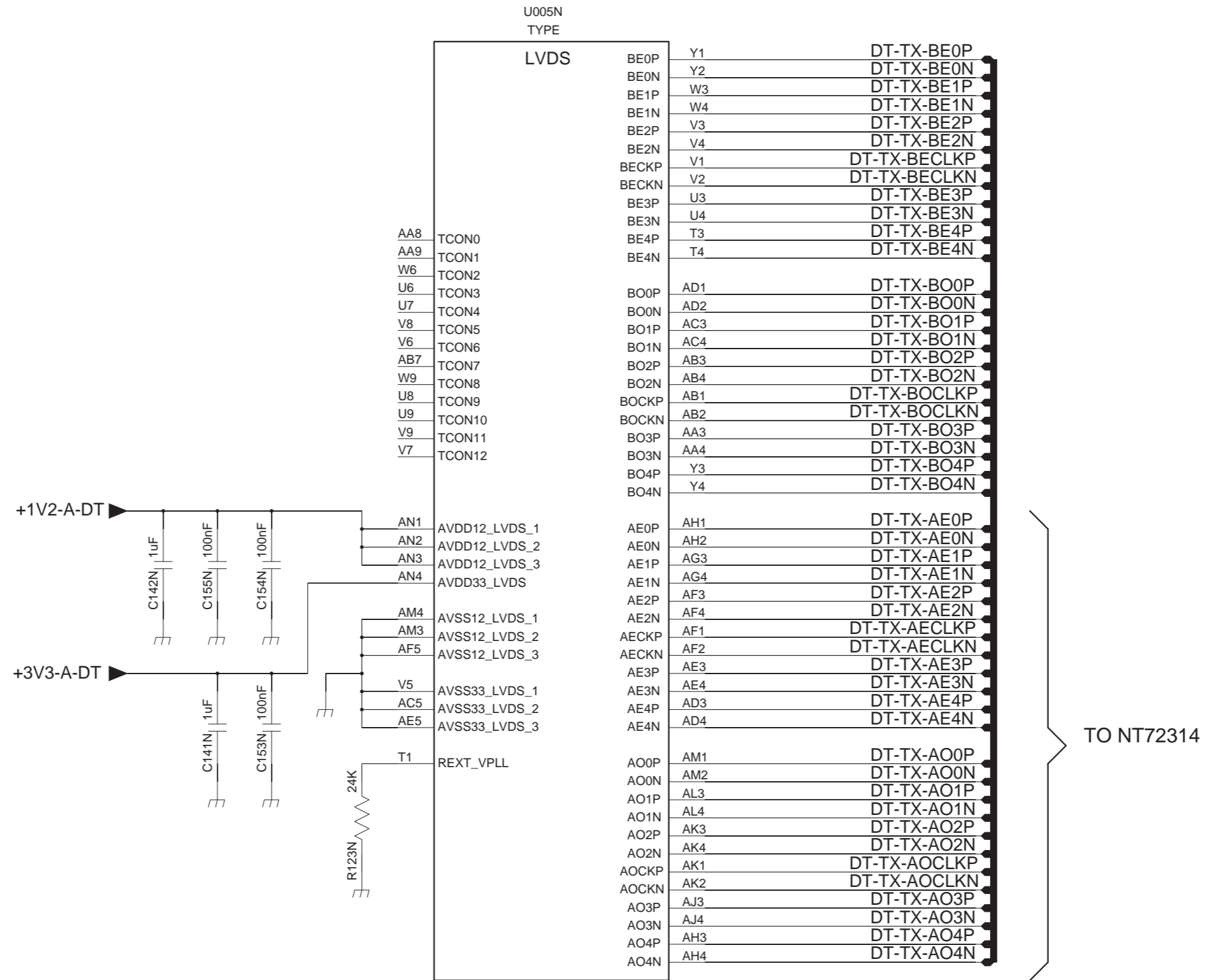


MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11
-----------------------	-------------------	---	------------

B

LVDS - DT

B

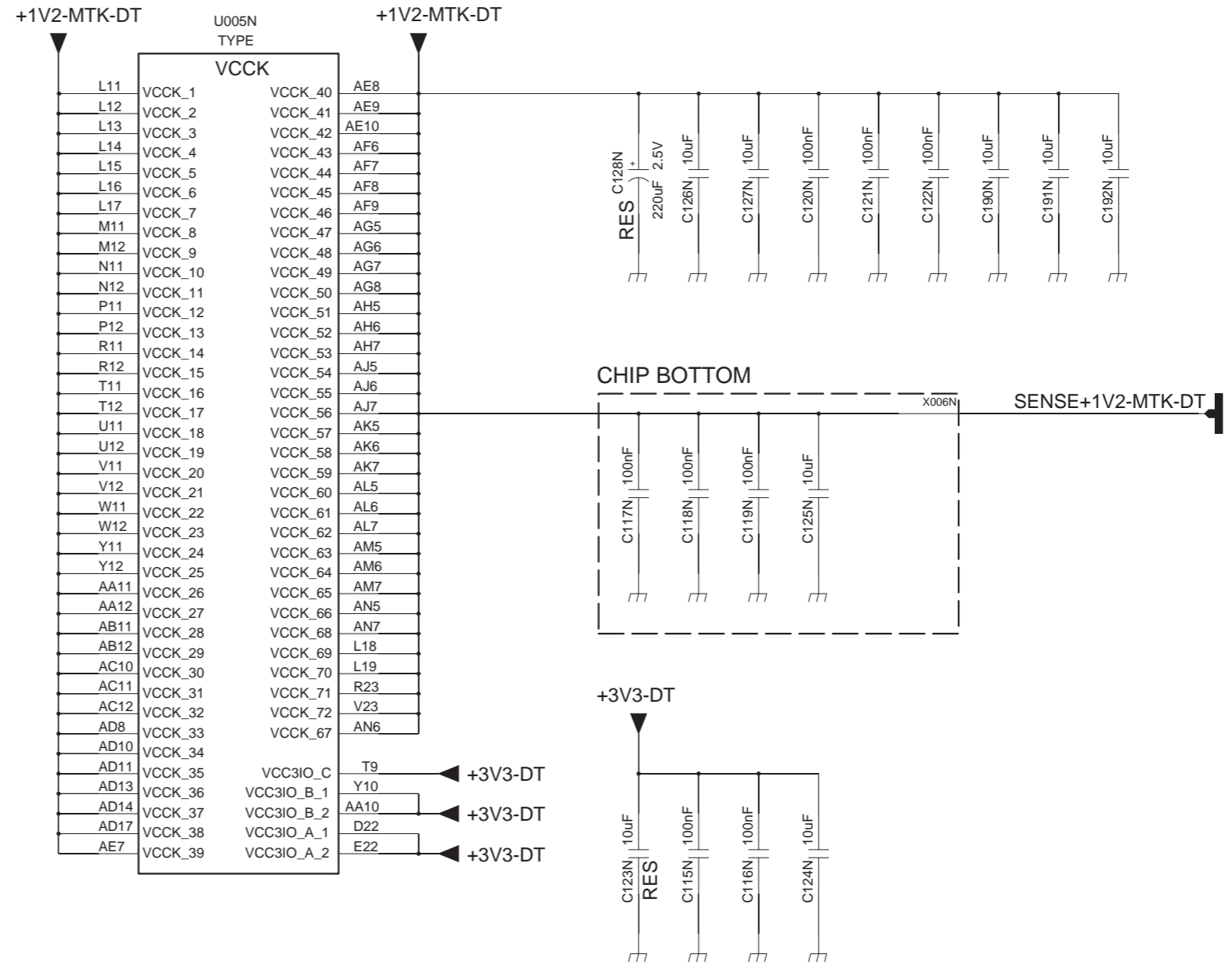
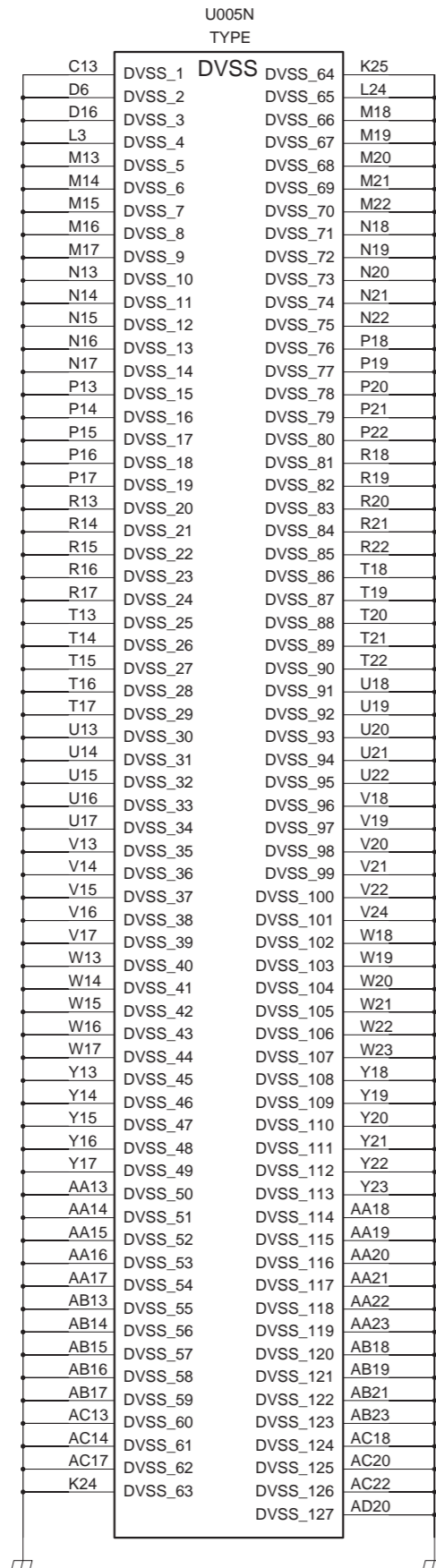


TO NT72314

B

2nd SOC DECOUPLING

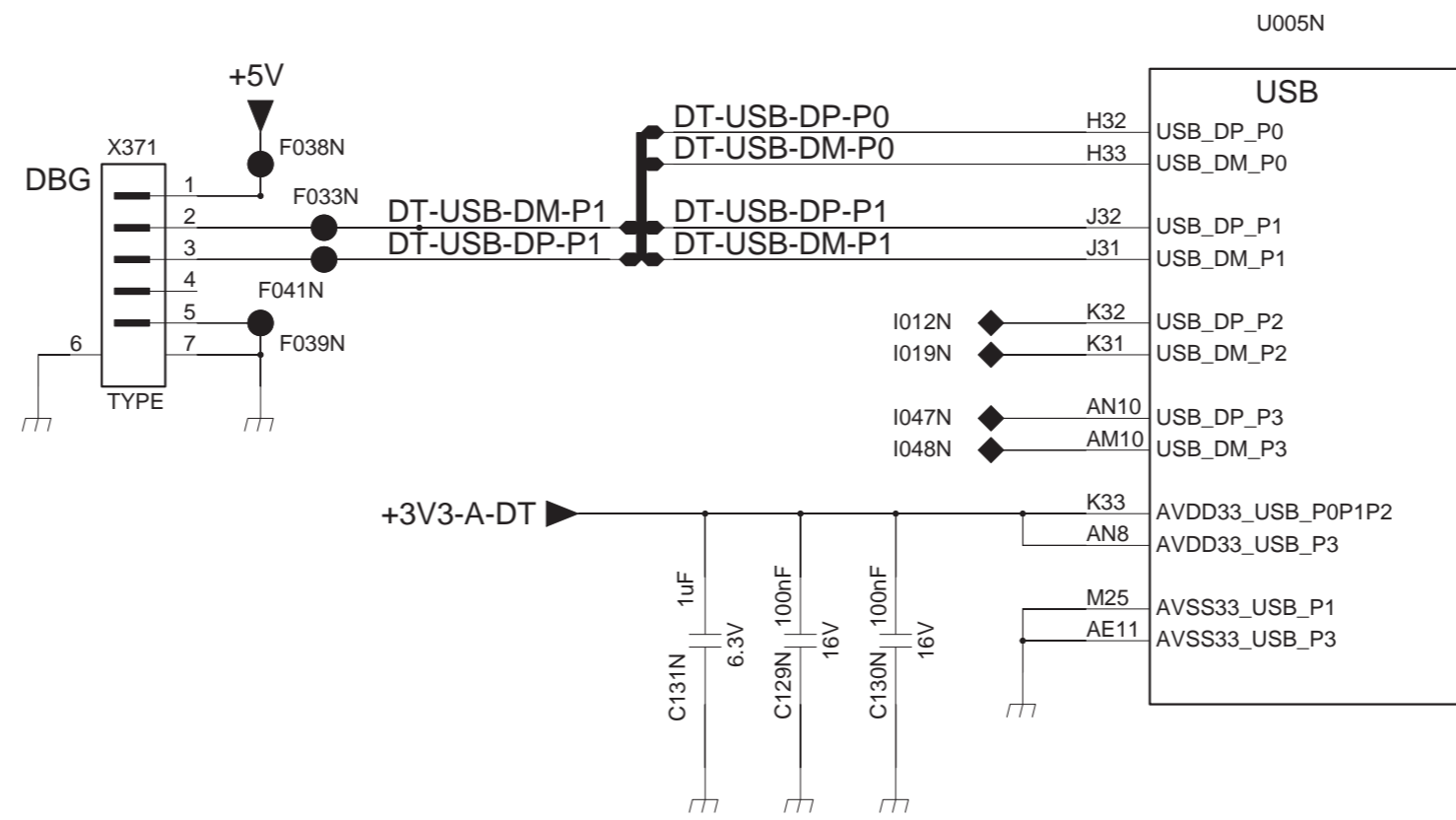
B



MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11
-----------------------	-------------------	---	------------

B USB - DT

B

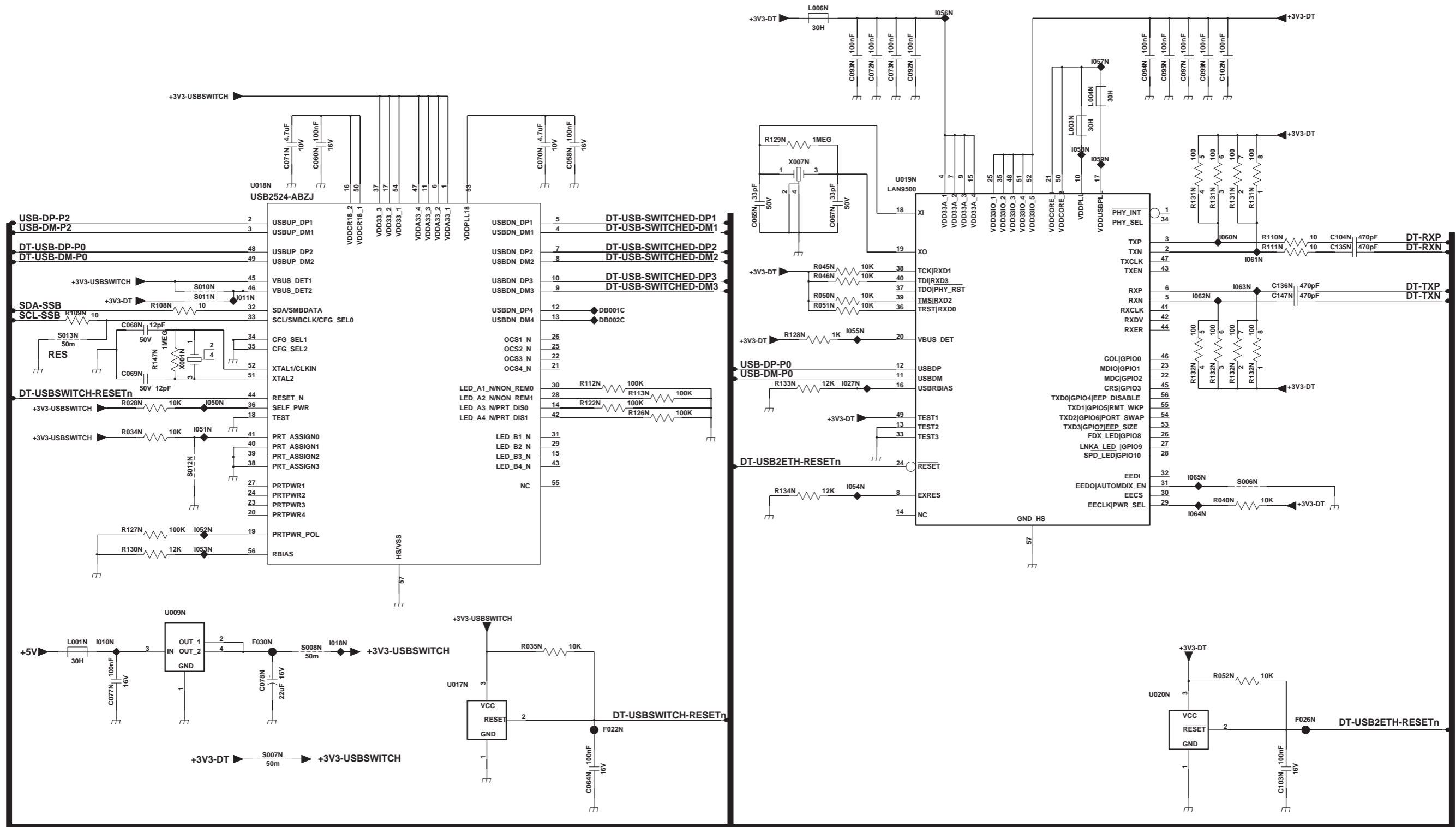


MTK UHD 50 Hz 7800	715RLPCB000000021	2	2013-12-11

B

USB SWITCH DT

B

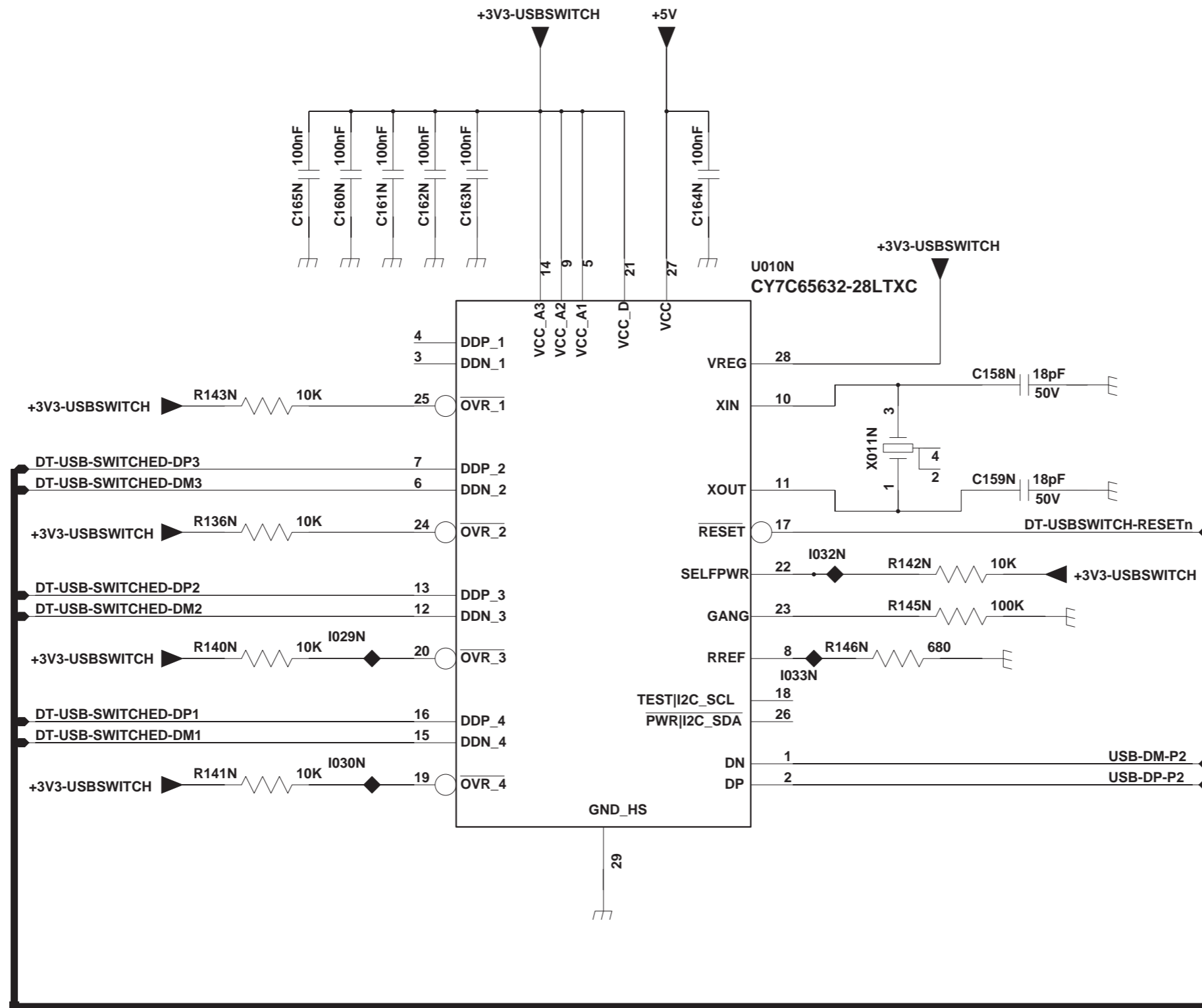


MTK UHD 50 Hz 7800	715RLPCB000000021	3	2013-12-11

10-1-50 B, USB HUB

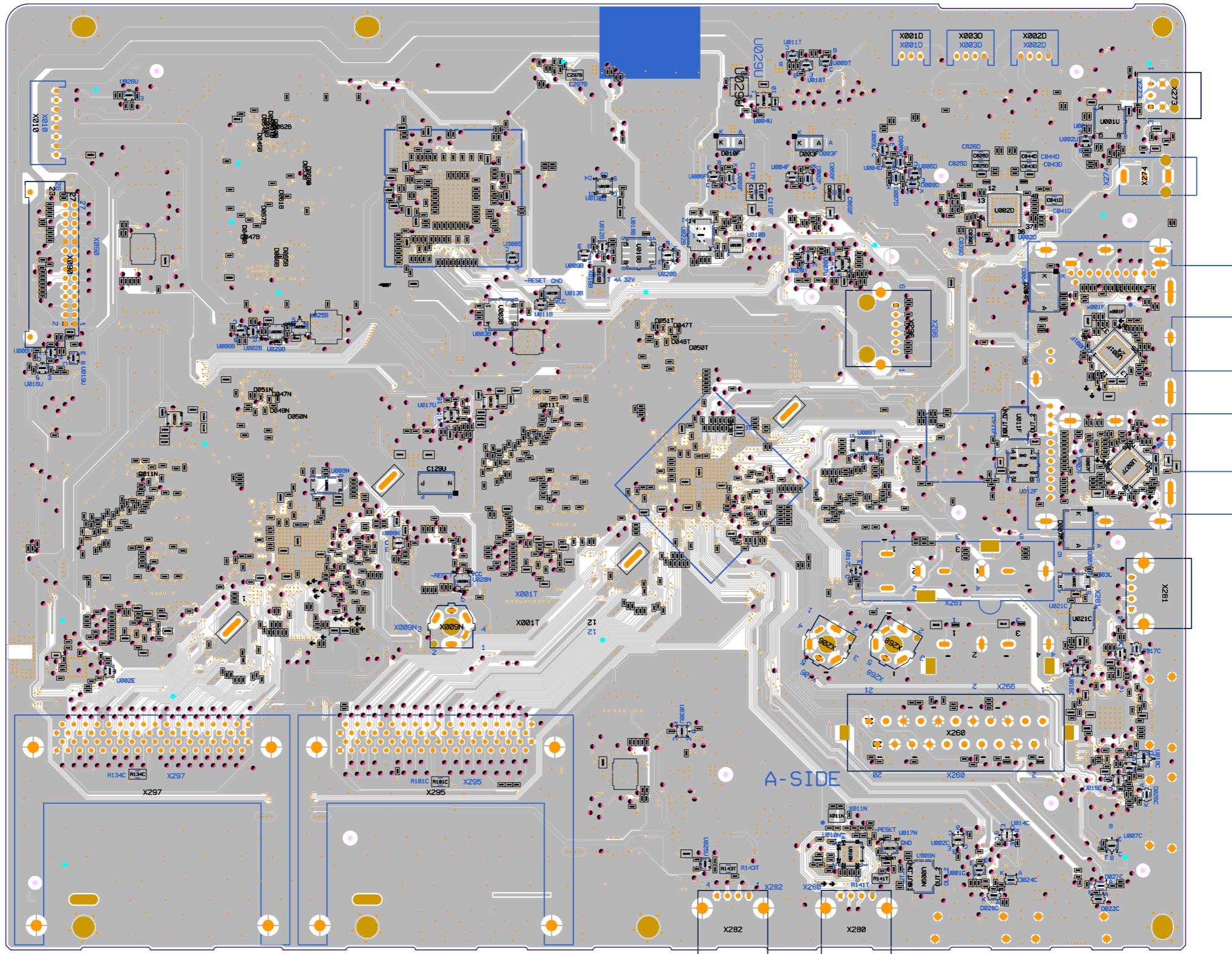
B USB HUB

B



MTK UHD 50 Hz 7800	715RLPCB000000021	2	2013-12-11

10-1-52 Layout Bottom



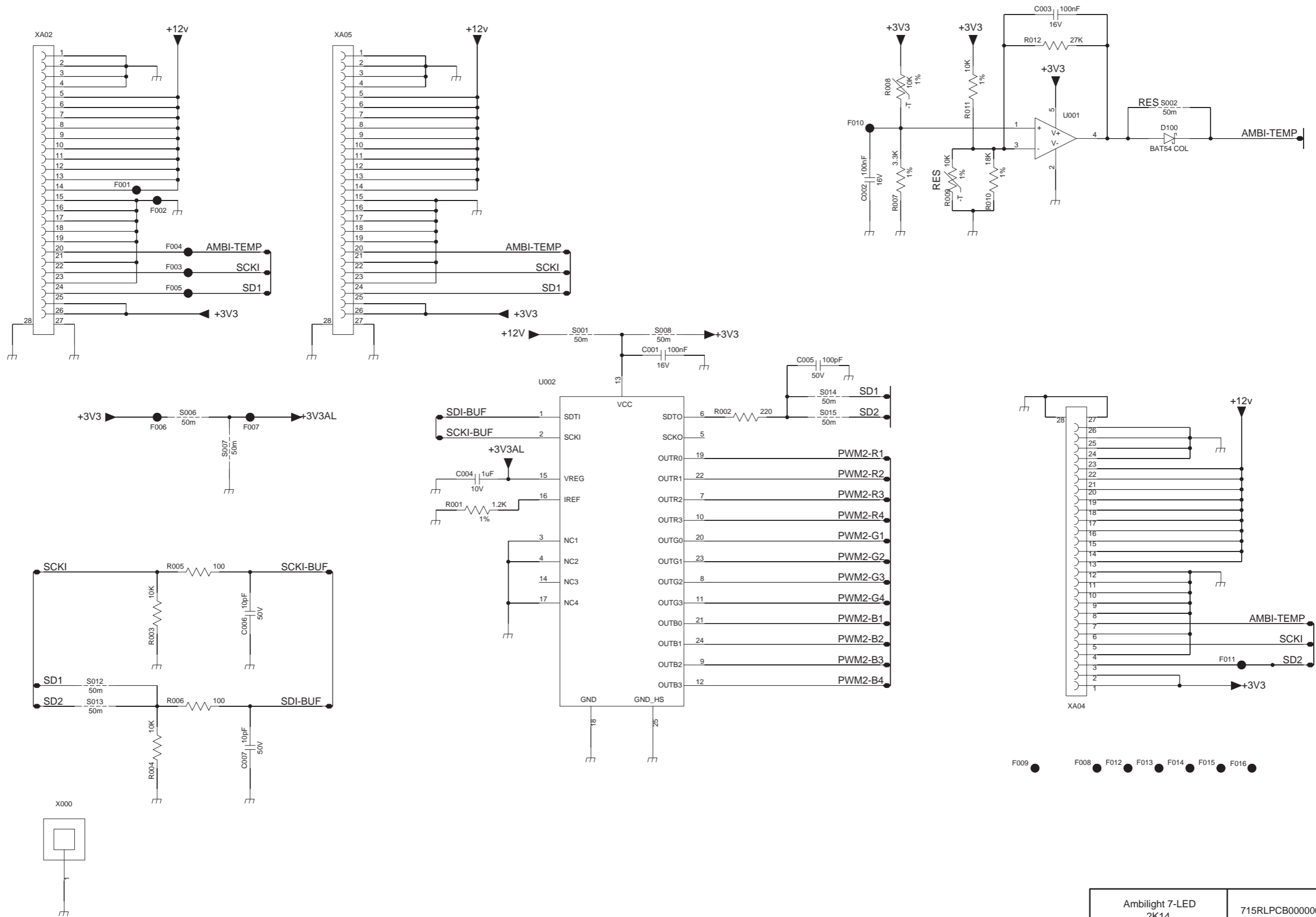
SSB Layout bottom	715RLPCB000000037	1	2014-02-14

10.2 715RLPCB000000094 AmbiLight
10-2-1 AL1, Ambilight 7-LED

AL01

Ambilight 7-LED
2k14

AL01



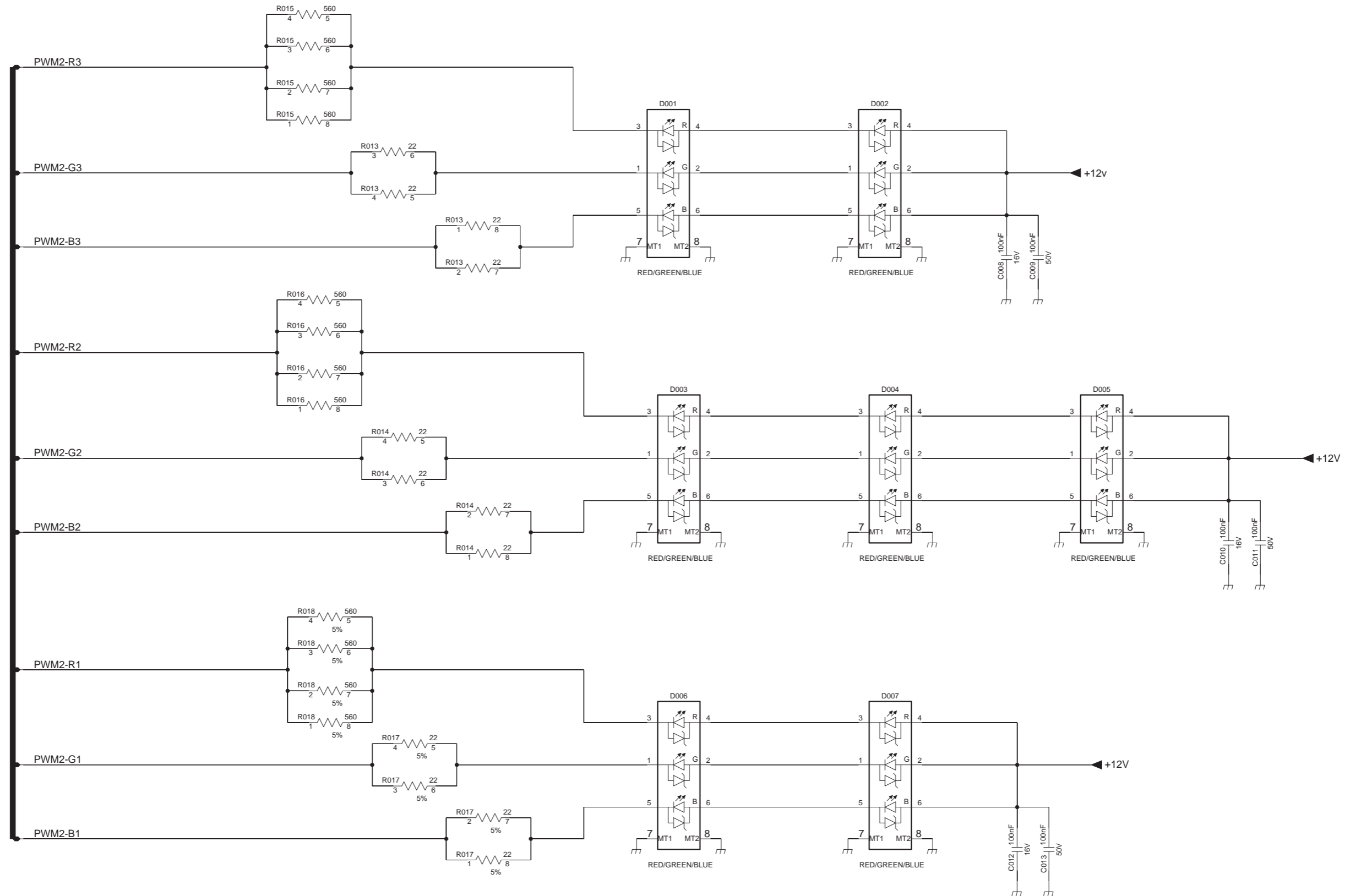
Ambilight 7-LED 2K14	715RLPCB000000099	4	2013-10-14

10-2-2 AL2, Ambilight 7-LED

AL02

Ambilight 7-LED
2k14

AL02



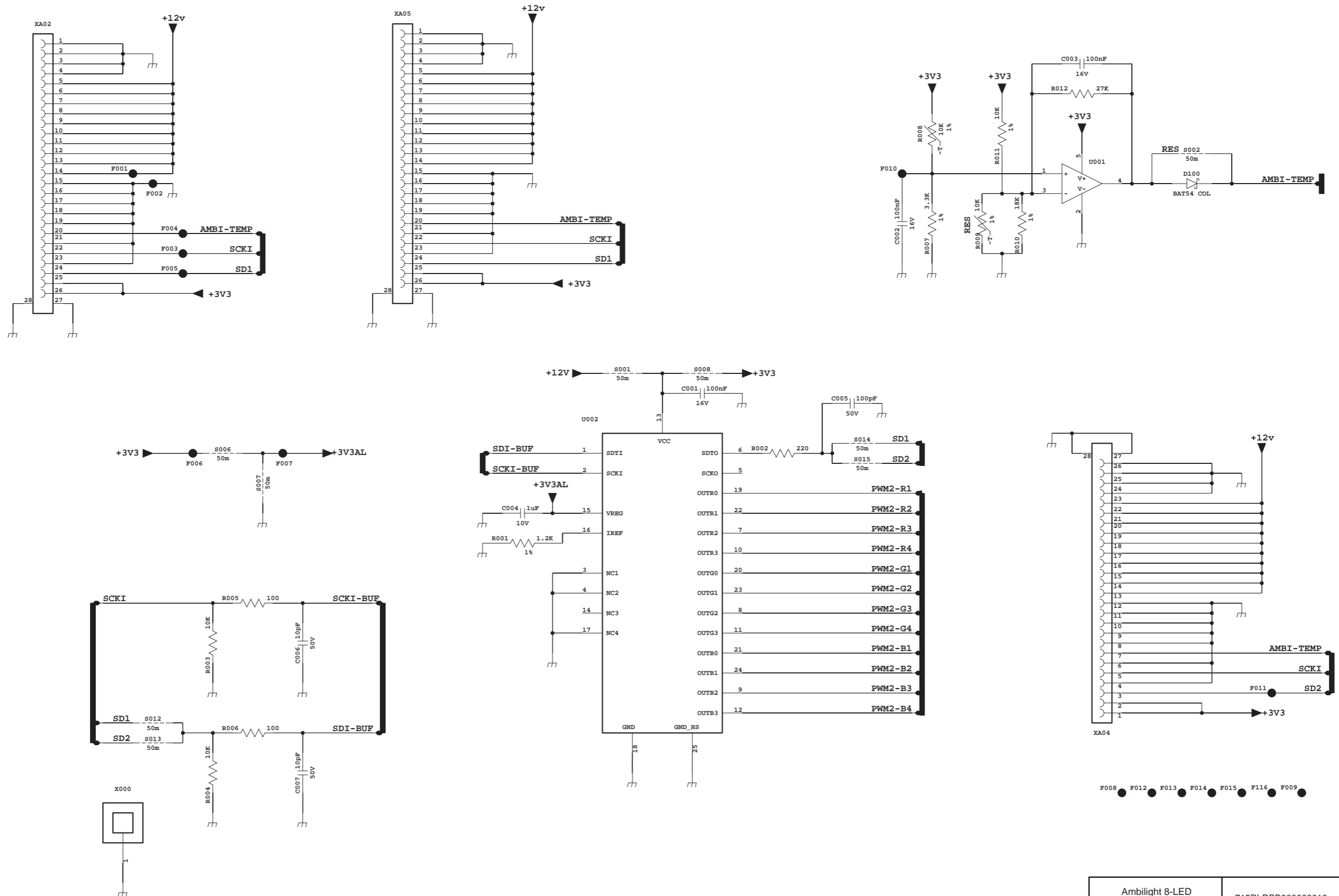
Ambilight 7-LED 2k14	715RLPCB000000009	4	2013-10-14

10.3 715RLPCB000000103 AmbiLight
10-3-1 AL1, Ambilight 8-LED

AL01

Ambilight 8-LED
2k14

AL01

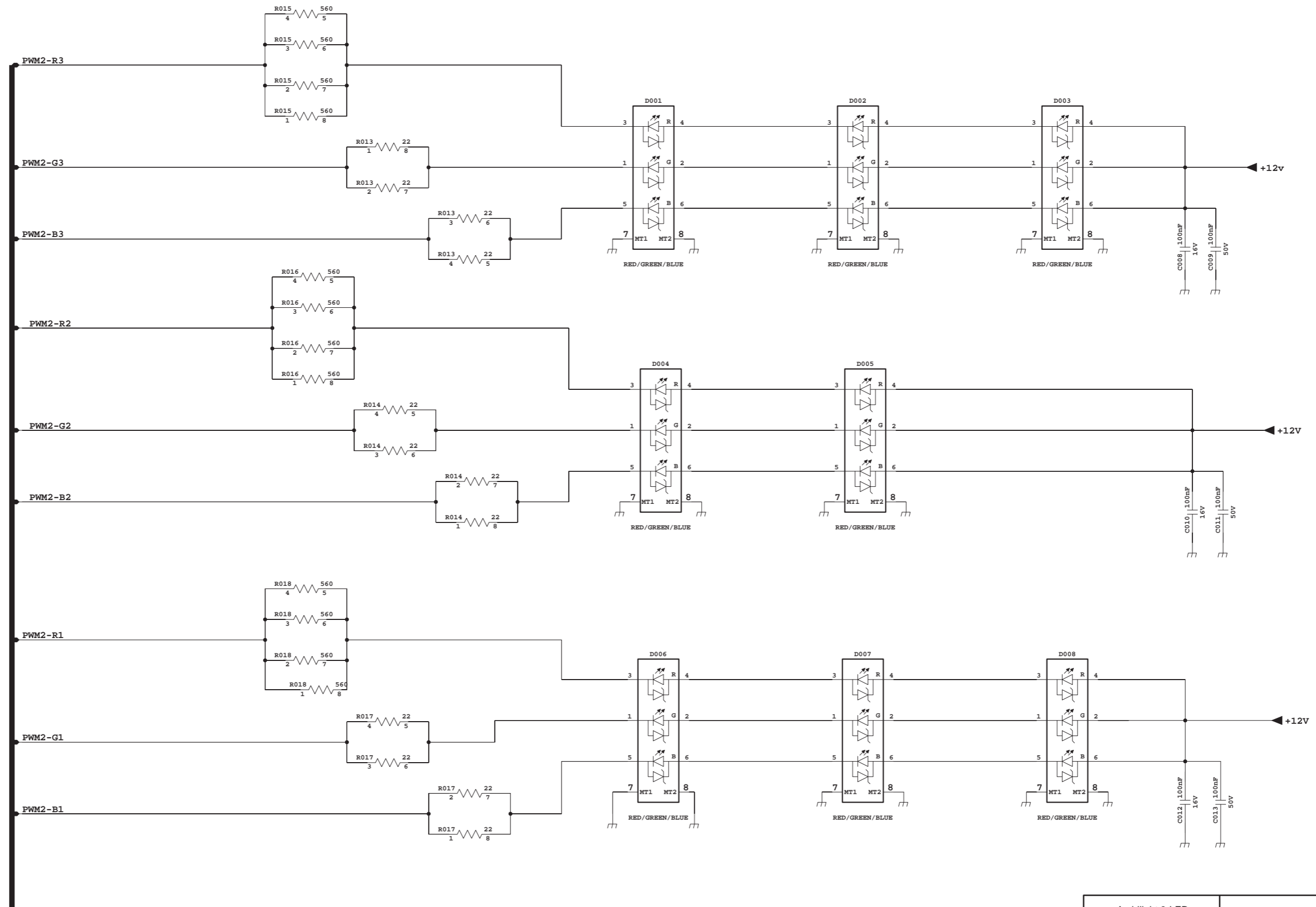


Ambilight 8-LED 2K14	715RLPCB00000010	3	2013-10-14
-------------------------	------------------	---	------------

AL02

Ambilight 8-LED
2k14

AL02

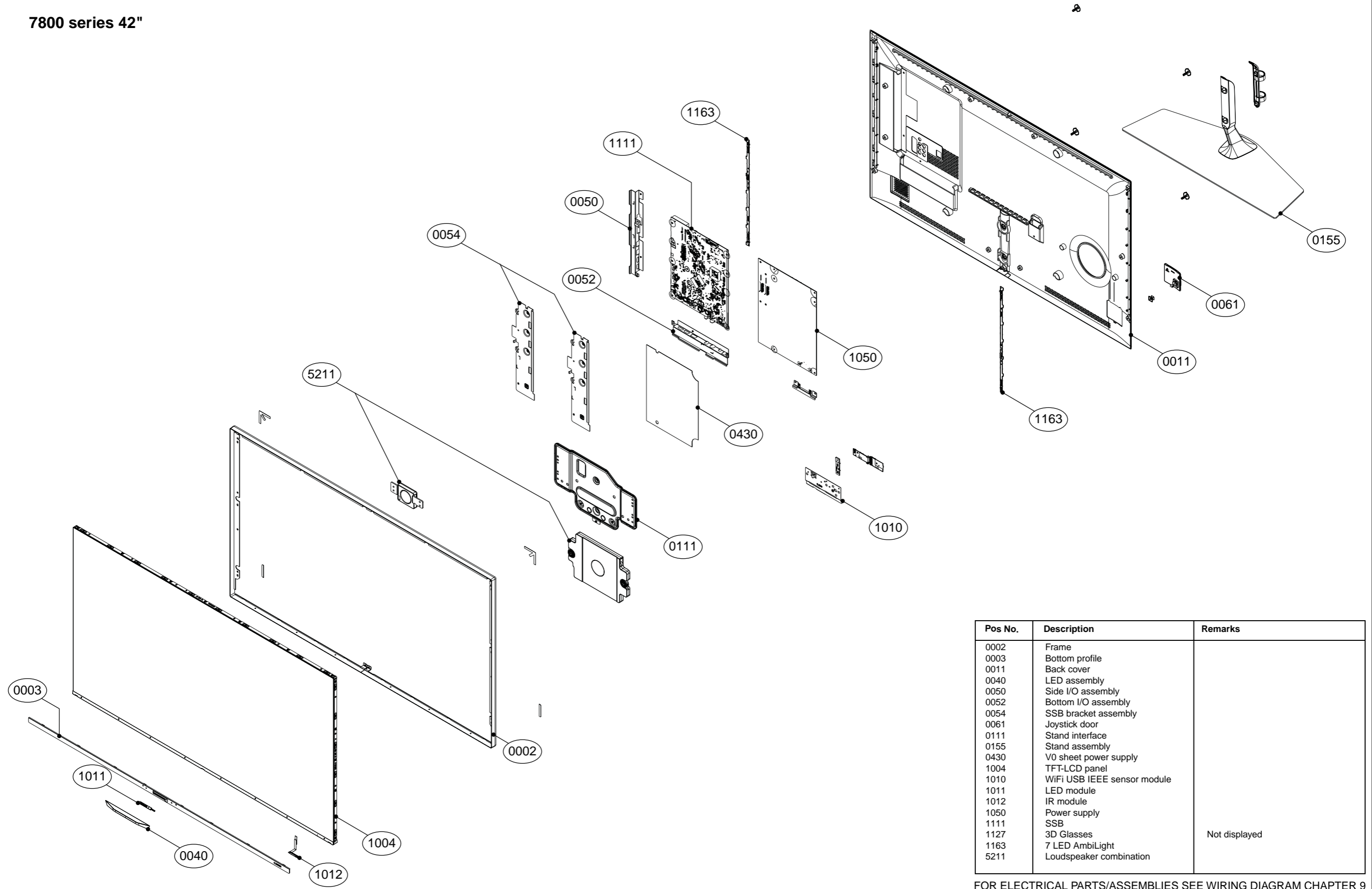


Ambilight 8-LED 2K14	715RLPCB000000010	3	2013-10-14

11. Styling Sheets

11.1 7809 series 42"

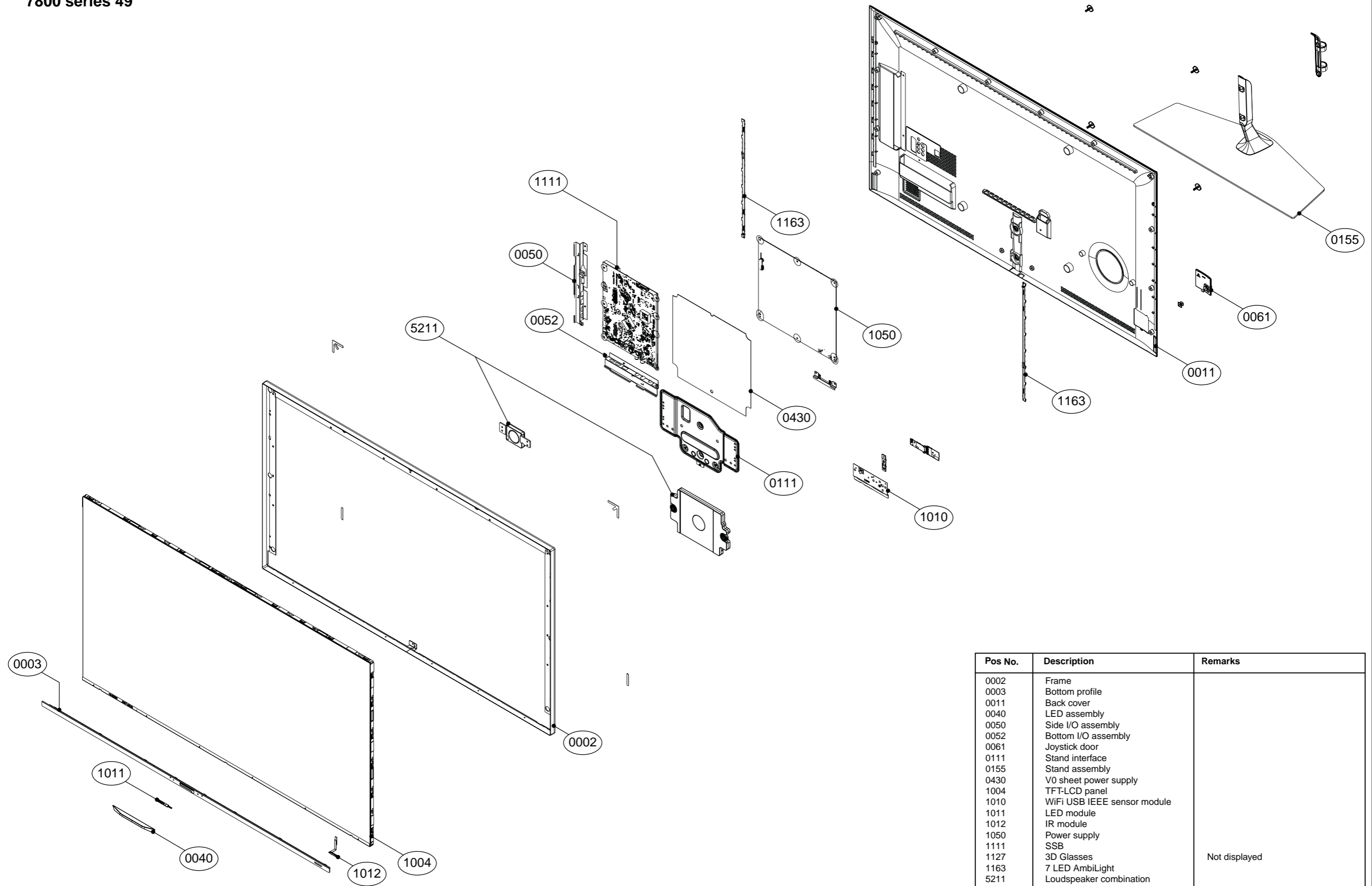
7800 series 42"



Pos No.	Description	Remarks
0002	Frame	
0003	Bottom profile	
0011	Back cover	
0040	LED assembly	
0050	Side I/O assembly	
0052	Bottom I/O assembly	
0054	SSB bracket assembly	
0061	Joystick door	
0111	Stand interface	
0155	Stand assembly	
0430	V0 sheet power supply	
1004	TFT-LCD panel	
1010	WiFi USB IEEE sensor module	
1011	LED module	
1012	IR module	
1050	Power supply	
1111	SSB	
1127	3D Glasses	Not displayed
1163	7 LED AmbiLight	
5211	Loudspeaker combination	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

7800 series 49"

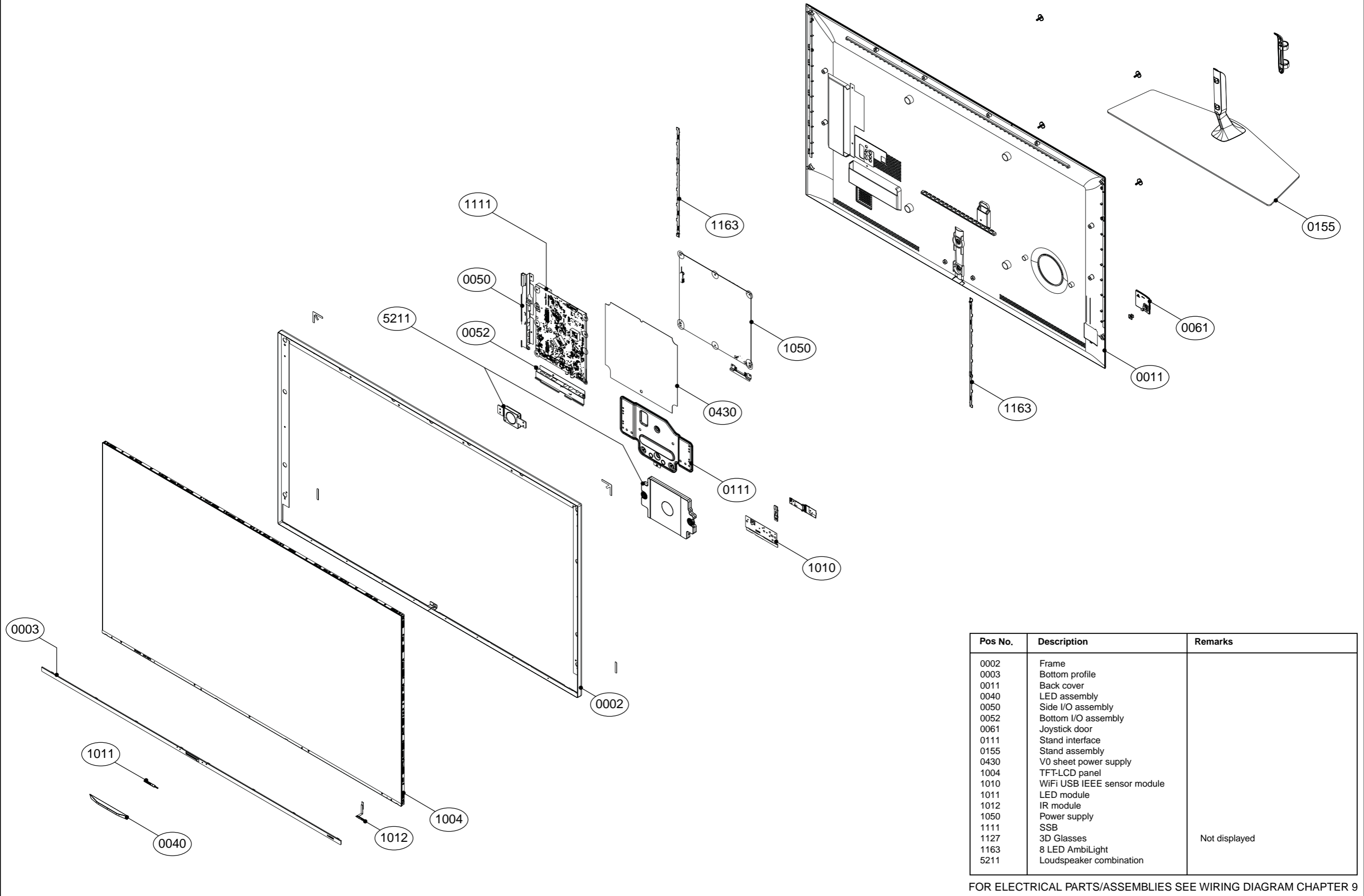


Pos No.	Description	Remarks
0002	Frame	
0003	Bottom profile	
0011	Back cover	
0040	LED assembly	
0050	Side I/O assembly	
0052	Bottom I/O assembly	
0061	Joystick door	
0111	Stand interface	
0155	Stand assembly	
0430	V0 sheet power supply	
1004	TFT-LCD panel	
1010	WiFi USB IEEE sensor module	
1011	LED module	
1012	IR module	
1050	Power supply	
1111	SSB	
1127	3D Glasses	Not displayed
1163	7 LED AmbiLight	
5211	Loudspeaker combination	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

11.3 7809 series 55"

7800 series 55"



Pos No.	Description	Remarks
0002	Frame	
0003	Bottom profile	
0011	Back cover	
0040	LED assembly	
0050	Side I/O assembly	
0052	Bottom I/O assembly	
0061	Joystick door	
0111	Stand interface	
0155	Stand assembly	
0430	V0 sheet power supply	
1004	TFT-LCD panel	
1010	WiFi USB IEEE sensor module	
1011	LED module	
1012	IR module	
1050	Power supply	
1111	SSB	
1127	3D Glasses	Not displayed
1163	8 LED AmbiLight	
5211	Loudspeaker combination	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9