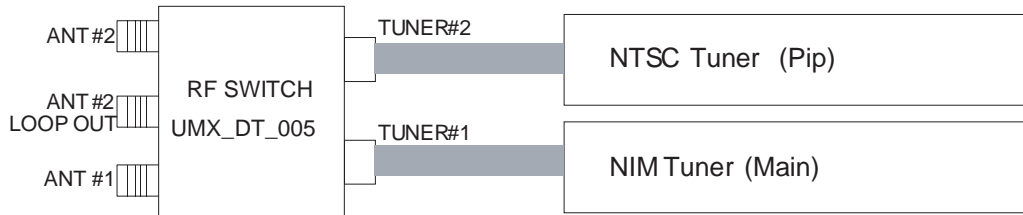


5. IC Line Up, OSD TREE, IDENT SPEC (V.0325)

5-1 BENHUR (PJTV HD Built-in) 2RF Switching Specification

1. RF switch specification to apply



SWITCH OUTPUT	LOW	HIGH	REMARK
TUNER #1	ANT1	ANT2	Main NIM Tuner
TUNER #2	ANT2	ANT2	PIP Analog Tuner
LOOP-THROUGH	ANT2	ANT2	Fixed

- ▶ Case 1 : If ANT1 is equal to the Cable signal and ANT2 is equal to the Air signal,
The Loop output and Pip signal always becomes an Air signal.
- ▶ Case 2 : If ANT1 is equal to the Air signal and ANT2 is equal to the Cable signal,
The Loop output and Pip signal always becomes a Cable signal.

5-2 BENHUR IC Line-Up (U.S.)

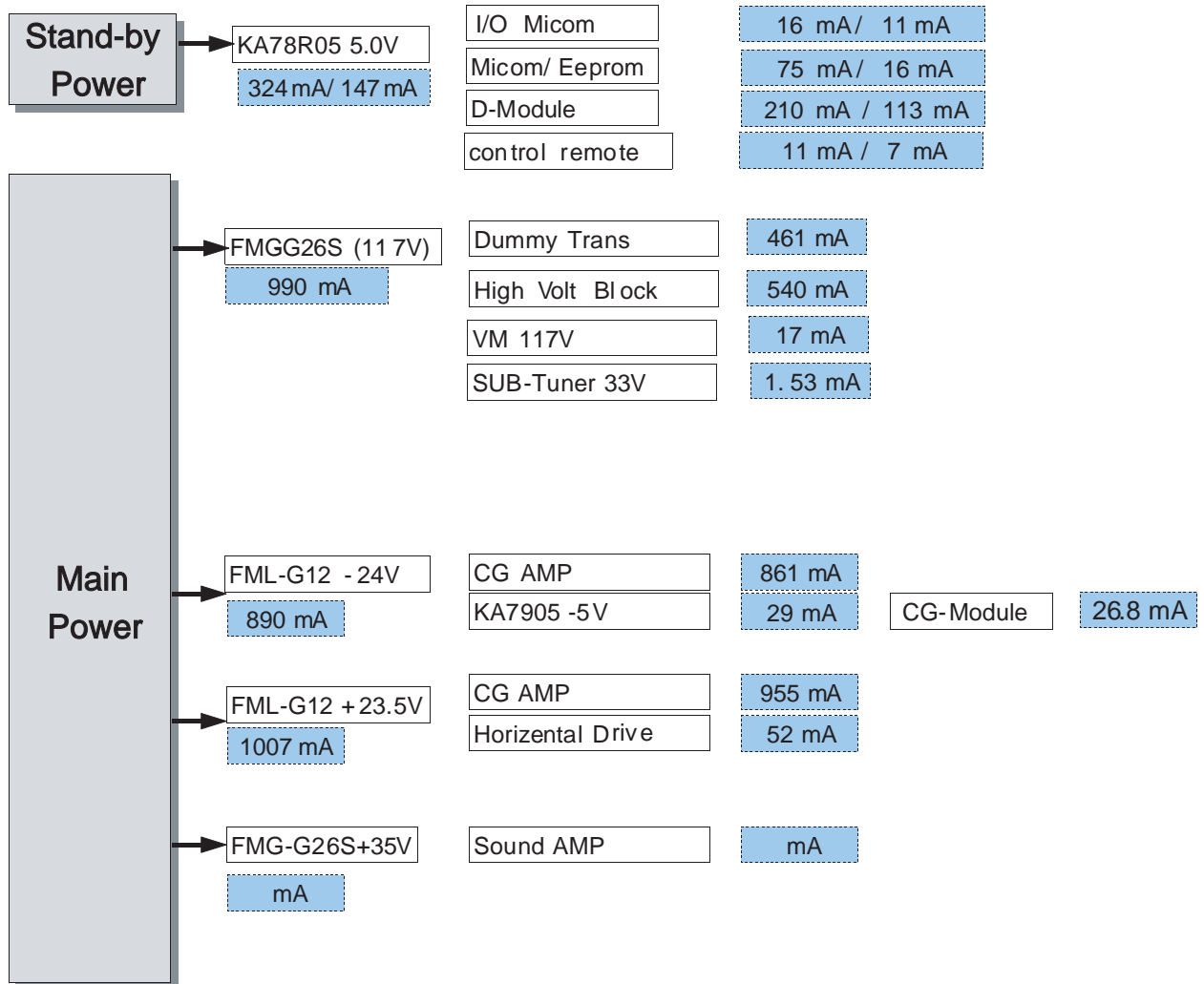
Block Name	IC Location	IC Name	Code-No.	Feature
MAIN-AS SY	IC100	78RM33D	1203-002302	IC-POSI.FIXED REG.
	IC101	LF25C	1203-002351	IC-VOLTAGE REGULATOR
	IC102	MIC39100	1203-002346	IC-POSI.FIXED REG.
	IC300	TEA6425D	1001-001177	IC-VIDEO SWITCH
	IC301	TEA6425D	1001-001177	IC-VIDEO SWITCH
	IC600	TL062CDT	1201-000541	IC-OP AMP
	IC601	MSP4450G	1204-002123	IC-SOUND PROCESSOR
	IC602	TEA6422D	1001-001178	IC-AUDIO SWITCH
	IC604	TDA7265	AA96-00623E	IC-POWER AMP
	IC700	S3P9428	0903-001290	I/O,ADC,PWM MICOM
	IC800	KA278RA05 X 3EA +78R09+7808	AA96-00475C	IC-POSI.FIXED REG. IC- VOLTAGE EGULATOR
	IC802	3050	BP96-00020G	IC-POSI.ADJUST REG.
	IC803	SI-8033S	BP96-00020K	IC-SWITCH VOL. REG.
Micom /VIDEO-MDL	IC900	24C16(SOP)	1103-000180	IC-EEPROM
	IC901	SDA555X-OTP	AA09-00041A	IC MICOM
	IC902	7025	1203-001943	IC-VOL. DETECTOR
	IC903	78RM33D	1203-002302	IC-POSI.FIXED REG.
	IC904	LF25C	1203-002351	IC-VOLTAGE REGULATOR
	IC200	CXA2165Q	1204-001989	IC-VIDEO PROCESS
	IC201	74HC123	0801-000662	IC-CMOS LOGIC MULTIVIBATOR
	IC400	UPD64083GF	1204-001935	IC-SEPARATOR

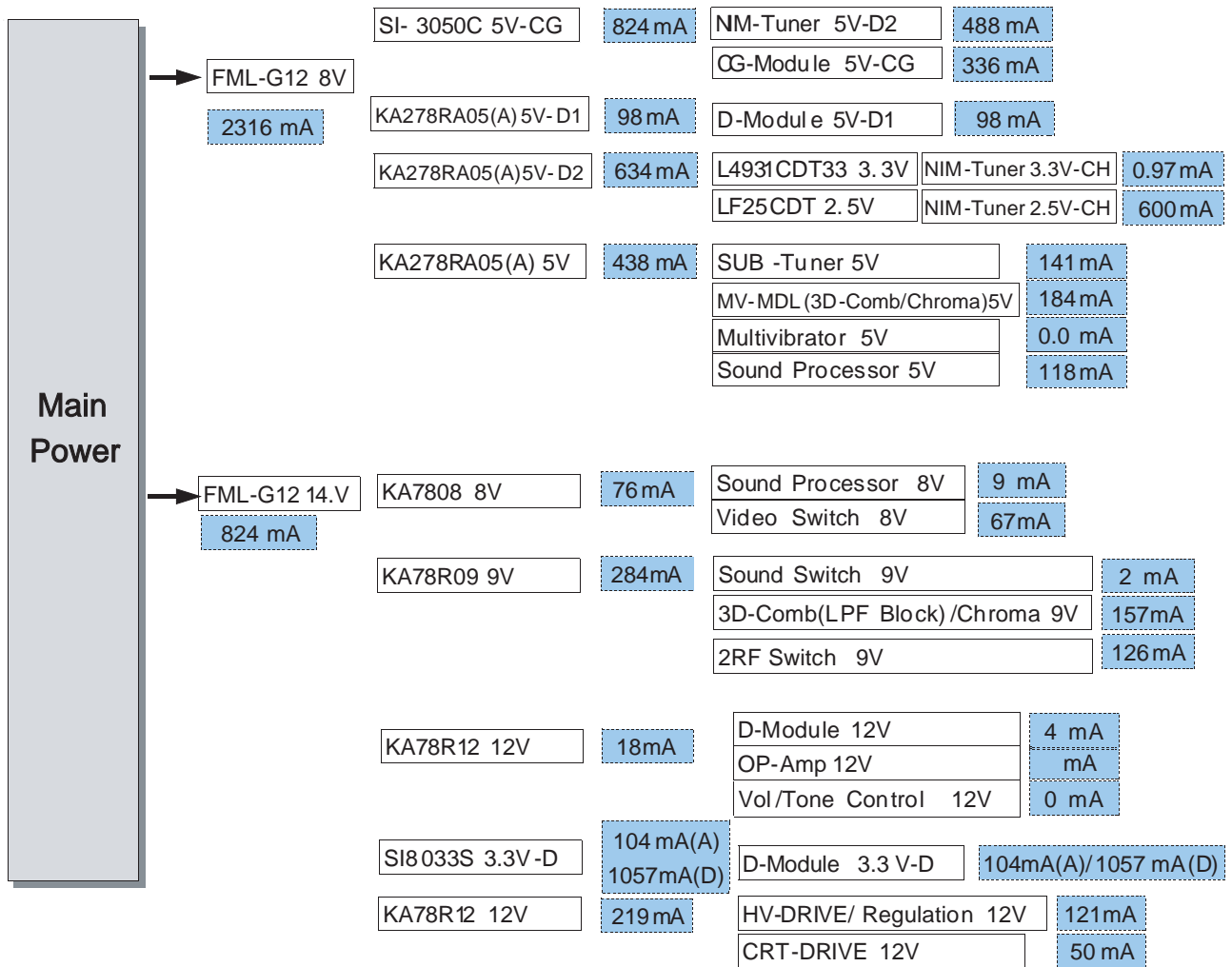
Block Name	IC Location	IC Name	Code-No.	Feature
DTV-MODULE	DU430	AD9888KS	1002-001343	IC-A/D CONVERTER
	DU239	S3C2800X	0902-001540	IC-MICROPROCESSOR
	DU100	4S281632	1105-001308	IC-DRAM
	DU102	4S281632	1105-001308	IC-DRAM
	DU104	28F640	1107-001228	IC-FLASH MEMORY
	DU103	CY2305SC-1H	1205-001606	IC-BUFFER
	DU106	SP3232ECY	1006-001266	IC-LINE TRANSCEIVER
	DU109	24256	1103-001147	IC-EEPROM
	DU300	S5H2000X	1204-002037	CPU IC-VIDEO DECODER
	DU205	VPC3230D-C5	1204-001926	IC-VIDEO PROCESS
	DU204	M4LV3232	AA13-00084A	IC ASIC
	DU503	VSP9407B	1204-001938	IC-DE CODER
	DU101	CY24204-1	1205-002250	IC-CLOCK GENERATOR
	DU518	QS34X245	1001-001067	IC-ANALOG SWITCH
	DU519	74VHC244	0801-002393	IC-CMOS LOGIC
	DU520	74VHC244	0801-002393	IC-CMOS LOGIC
	DU521	74AHCT1G08	0801-002630	IC-CMOS LOGIC
	DU603	ADV7301AKST	1002-001352	IC-D/A CONVERTER
	DU513	SIL169	1205-002198	IC-RECEIVER(DVI)
	DU301	4S643232	1105-001336	IC-DRAM
	DU302	4S643232	1105-001336	IC-DRAM
	DU601	4S643232	1105-001336	IC-DRAM
	DU602	4S643232	1105-001336	IC-DRAM
	DU206	CXA2151Q	1204-001814	IC-SELECTOR
	DU401	CS493264-CL	1204-002066	IC-DE CODER

Block Name	IC Location	IC Name	Code-No.	Feature
DTV-MODULE	DU405	CS8415A-CZ	1001-001170	IC-AUDIO SWITCH
	DU406	CS4228A-KS	1204-001842	IC-Encoder/Decoder
	DU407	74VHC244	0801-002393	IC-CMOS LOGIC
	DU400	CS4340-KSR	1002-001227	IC-D/A CONVERTER
	DU402	3403	1201-000247	IC-OP AMP
	DU404	74LS157	0803-000307	IC-TTL
	DU928	SDP31	1003-001565	IC-DISPLAY DRIVER
	DU959	4S643232	1105-001336	IC-DRAM
	DU961	4S643232	1105-001336	IC-DRAM
CG-MODULE	IC01	SDC12	BP13-00003A	IC ASIC
	IC02	78RM33D	1203-002302	IC-POSI.FIXED REG.
	IC03	7042	1203-001824	IC- VOL. DETECTOR
	IC04	7S04	0801-002345	IC-CMOS LOGIC INVERTER
	IC05	24C64	1103-001195	IC- EEPROM
	IC06	TSC87251G2D- OTP	AA09-00032A	IC MICOM
	IC07	EL2250CS	1201-001520	IC-VIDEO AMP
	IC08	74HC4052	1001-000164	IC-ANALOG MULTIPLEX
	IC09	072	1201-001504	IC-OP AMP
	IC10	072	1201-001504	IC-OP AMP
	IC11	072	1201-001504	IC-OP AMP
	IC12	324	1201-001135	IC-OP AMP
	IC13	NC7SB3157P6X	1001-001155	IC-ANALOG MULTIPLEX
	IC14	072	1201-001504	IC-OP AMP
	IC15	7S04	0801-002345	IC-CMOS LOGIC INVERTER
	IC16	7S04	0801-002345	IC-CMOS LOGIC INVERTER
	IC17	TLC2932IPWLE	1209-001163	IC-PLL

Block Name	IC Location	IC Name	Code-No.	Feature
SUB- ASSY	IC831S	STR-X6459A	AA96-00275Q	STR IC HYBRID
	ICS801S	VIPER12ADIP	1203-002177	IC-PWM CONTROLLER
	PC801S	PS2561	0604-001032	PHOTO-CO UPLER
	PC811S	PS2561	0604-001032	PHOTO-CO UPLER
	ICS802	78R05	1203-001006	IC-VOLTAGE REGULATOR
	IC421	78R05 + FMG-G26S + FML-G12S	AA96-00274A	IC-VOLTAGE REG. DIODE-RECTIFIER
	IC851	SE110N	1203-001400	IC-POWER PRESCALER ERROR_AMP
	IC301	LA7845	AA96-50406A	IC-VERTICAL DEF.
	Q371	2SC4636RB	AA96-00244H	TR-POWER
	IC471	UC494	1203-000610	IC-PWM CONTROLLER
	Q473	IRFS640A	AA96-00037A	FET-SILICON
	IC431	4558	1201-000191	IC-OP AMP
	Q431	FMP-3FU + 2SC5446	AA96-00310A	DIODE-RECTIFIER TR-POWER
	IC430	KA317	1203-000162	IC-POSI.ADJUST REG.
	ICR01S	431	1203-001217	IC-POSI.ADJUST REG.
CRT-A SSY	IC501	TDA6111Q	1201-001131	IC-VIDEO AMP
	IC531	TDA6111Q	1201-001131	IC-VIDEO AMP
	IC561	TDA6111Q	1201-001131	IC-VIDEO AMP
CG-AMP	ICZ103	STK392_040	AA96-00038B	IC-VIDEO AMP
	ICZ104	STK392_040	AA96-00038B	IC-VIDEO AMP

5-3 BENHUR Current System (U.S.)





5-4 OSD TREE

1st Level	2nd Level	3rd Level	4th Level	5th Level	
Input	TV/Video List	TV/Video1/Video2/Video3/S-Video1/S-Video2/Component1/Component2/DVI			
	Edit Name	TV/Video1/Video2/Video3/S-Video1/S-Video2/Component1/Component2/DVI	select name : VCR/DVD/ D-VHS/ Cable STB/HDSTB/ Satellite STB/PVR STB/ AV Receiver/ DVD Receiver/GAME/Camcorder/ Combo/PC/ VOD STB/TV		
Picture	Picture Mode	Dynamic			
		Standard			
		Movie			
		Custom			
	Custom Picture	Contrast		-/+ (control bar)	Location movement
		Brightness			
		Sharpness			
		Color			
		Tint			
	Color Tone	Cool 2			
		Cool 1			
		Normal			
		Warm 1			
		Warm 2			
	Size	Wide			
		Normal			
		Panorama			
		ZOOM1			
		ZOOM2			
	DNLe	On/Off			
PIP	PIP(list) :on/off				
	TV/Video1			enable only PIP on	
	Swap				
	Size	Small/ Medium/ Double			
	Position:	Right Bottom/ Right Top/ Left Top/ Left Bottom			
	PIP Channel				

Sound	Sound Mode	Custom			
		Standard			
		Music			
		Movie			
		Speech			
	Custom Sound	LR	▲▼		
		bass	▲▼		
		mid-low	▲▼		
		mid	▲▼		
		mid-high	▲▼		
		treble	▲▼		
	Auto Volume	On/Off			
	Select Multi-track Sound	Multi-track Language	English/Spanish/French		
Multi-track Sound		Mono/Stereo/SAP			
Digital Output	Dolby Digital / PCM				
BBE	On/Off				
Channel	Select Antenna	Air/Cable			
	Select Favorite Channel				
	Memorize Channel	Select Antenna Connection	Select Cable System (Cable Only)/ Select the antennas to memorize	Action Window	
	Add & Delete Channels	Action window			
	Fine Tune Channels	Action window			
	Check Signal Strength				
Setup	Time	Time Setup Mode	Auto/ Manual		
		Manual Time Setup	Action Window		
		Auto Time Setup	Daylight Savings	Yes/No	
			Time Zone Picture	Eastern /Central/Mountain/Pacific /Hawaii/ Alaska	
		Sleep Timer	10/ 20/ 30/ 60/ 90/ 120/ 150/ 180		
		On Time	AM/PM,Hour,Min,Ch,Vol, Activation(Yes,No)		
		Off Time	AM/ PM,Hour ,Min, Activation(Yes,No)		

	Menu Language	English/Spanish/ French		
	Set Rating Controls	Enter Your PIN	TV parental Guidelines	Activation Window
			Movie Ratings	
	Captions	Caption	On/Off	
		Digital Caption Options	Service	Service1/ Service2/ Service3/ Service4/ Service5/ Service6
			Size	Default/ Small/ Standard/ Large
			Style	Default/ Style0/ Style1/ Style2/ Style3/ Style4/ Style5/ Style6/ Style7
			Foreground	Default/ White/ Black/ Red/ Green/ Blue/ Yellow/ Magenta/ Cyan
			Background	Default/ White/ Black/ Red/ Green/ Blue/ Yellow/ Magenta/ Cyan
			Return to Default	

1-3. Hyper Terminal Setting

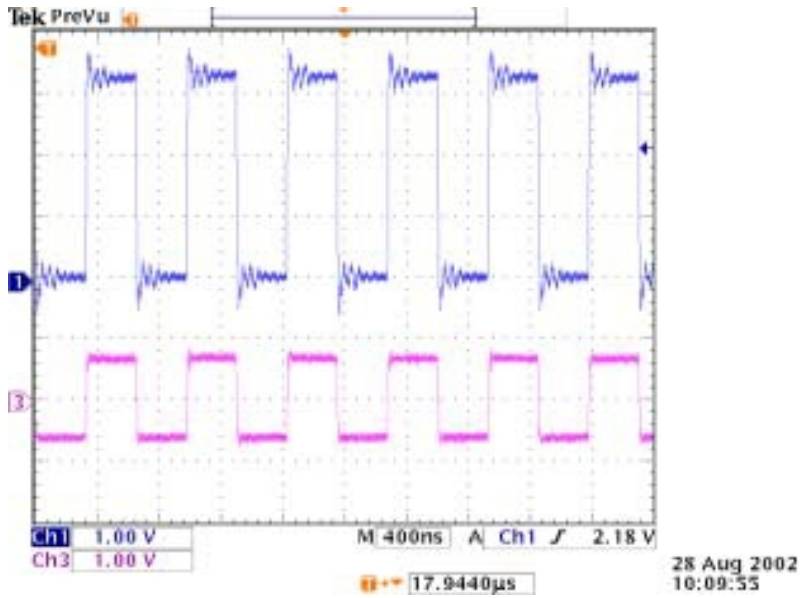
Set the hyper terminal to observe the progress of the TV via the RS-232 cable.

Set up a hyper terminal.

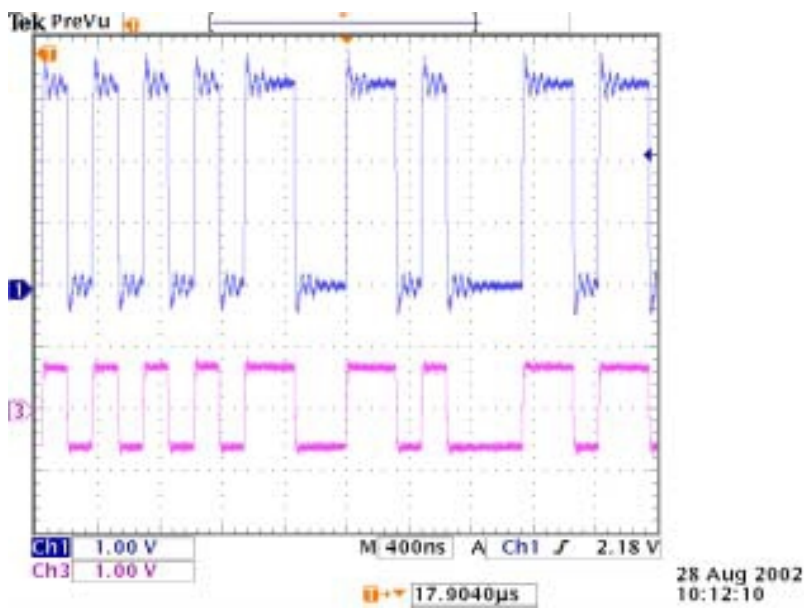
- (1) When setting up a hyper terminal, set it in sub-program.
- (2) Enter a new name.
- (3) Select a modem port.(Com1 and direct connection)
- (4) Set the bit/second to 115200.
- (5) Set the data bit to 8.
- (6) No parity bit.
- (7) Set stop bit to 1.
- (8) No flow control.
- (9) Save in memory.
- (10) At this point the new hyper terminal is ready.

2. Digital Audio output.

When Dolby mode is selected



When PCM mode is selected

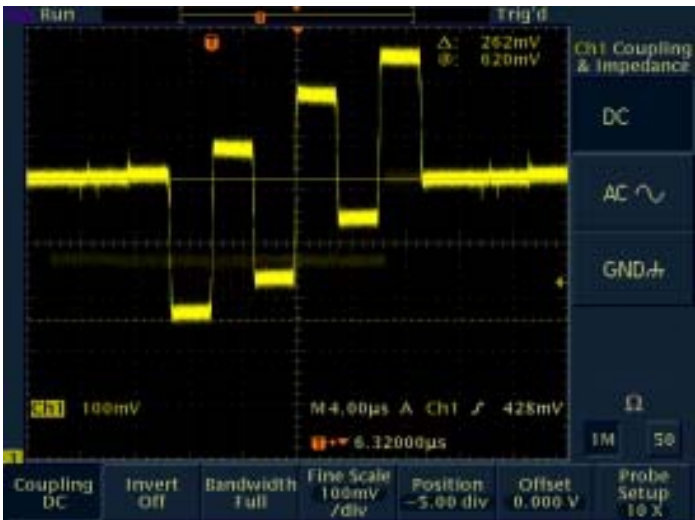


3. Video output

DTV OUT (YPbPr) Timing Diagram



← Y signal (1080i Mode)

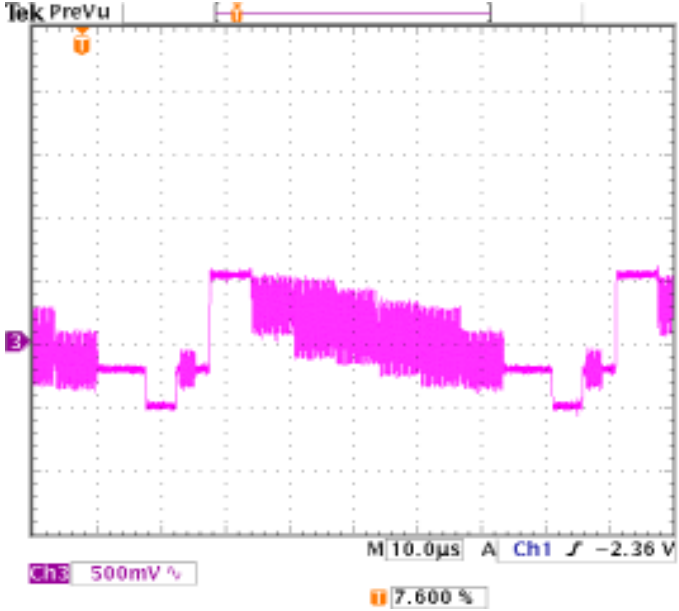


← Pb signal (1080i Mode)

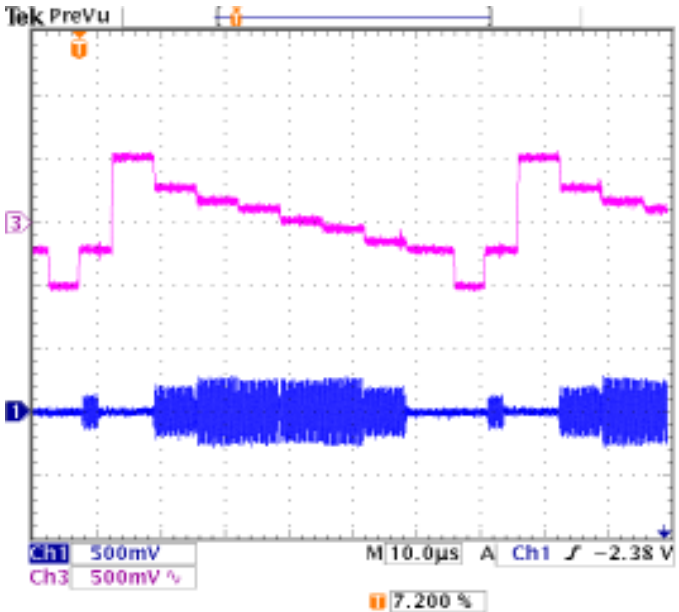


← Pr signal (1080i Mode)

Monitor OUT (CVBS, Y/C) Timing Diagram



← CVBS signal



← Y signal

← C signal

4. DVI (Digital Video Interface)

4-1. Introduction of DVI

The Digital Visual Interface (hereinafter DVI) specification provides a high-speed digital connection for visual data types that is display technology independent. The interface is primarily focused at providing a connection between a computer and its display device. The DVI specification meets the needs of all segments of the PC industry (workstation, desktop, laptop, etc) and will enable these different segments to unite around one monitor interface specification.

The DVI interface enables:

1. Content to remain in the lossless digital domain from creation to consumption
2. Display technology independence
3. Plug and play through hot plug detection, EDID and DDC2B
4. Digital and Analog support in a single connector

4-2. Scope and Motivation

remains in the lossless digital domain from creation to consumption. The digital interface is developed with no assumption made as to the attached display technology.

This specification completely describes the interface so that one could implement a complete transmission and interconnect solution or any portion of the interface. The T.M.D.S. protocol and associated electrical signaling as developed by Silicon Image is described in detail. The mechanical specification of the connector and the signal placement within the connector are described.

A device that is compliant with this specification is should be interoperable with other compliant devices through the plug and play configuration and implementation provided for in this specification. The plug and play interface provides for hot plug detection and monitor feature detection. Additionally, this specification describes the number of T.M.D.S. links available to the display device and the method for configuring the T.M.D.S. links.

The bandwidth and pixel formats that are anticipated and supported by this specification are described. This specification describes the signal quality characteristics required by the cable to support the high data rates required by large pixel format displays. Additionally the DVI specification provides for alternate media implementations. Power management and plug and play configuration management are both fully described. To ensure baseline functionality, low-pixel format requirements are included.

As appropriate, this interface makes use of existing VESA specifications to allow for simple low-cost implementations. Specifically VESA Extended Display Identification Data (EDID) and Display Data Channel (DDC) specifications are referenced for monitor identification and the VESA Monitor Timing Specification (DMT) is referenced for the monitor timings.

remains in the lossless digital domain from creation to consumption. The digital interface is developed with no assumption made as to the attached display technology.

This specification completely describes the interface so that one could implement a complete transmission and interconnect solution or any portion of the interface. The T.M.D.S. protocol and associated electrical signaling as developed by Silicon Image is described in detail. The mechanical specification of the connector and the signal placement within the connector are described.

A device that is compliant with this specification is should be interoperable with other compliant devices through the plug and play configuration and implementation provided for in this specification. The plug and play interface provides for hot plug detection and monitor feature detection. Additionally, this specification describes the number of T.M.D.S. links available to the display device and the method for configuring the T.M.D.S. links.

The bandwidth and pixel formats that are anticipated and supported by this specification are described. This specification describes the signal quality characteristics required by the cable to support the high data rates required by large pixel format displays. Additionally the DVI specification provides for alternate media implementations. Power management and plug and play configuration management are both fully described. To ensure baseline functionality, low-pixel format requirements are included.

As appropriate, this interface makes use of existing VESA specifications to allow for simple low-cost implementations. Specifically VESA Extended Display Identification Data (EDID) and Display Data Channel (DDC) specifications are referenced for monitor identification and the VESA Monitor Timing Specification (DMT) is referenced for the monitor timings.

After the pixel format and timings have been determined there are two more parameters that effect the user perception of the picture quality, gamma and scaling.

The gamma characteristic of a monitor is display technology dependent. In the past a CRT has been assumed as the primary display technology to be used. To ensure display independence, no assumption is made of display technology. The DVI requires a gamma characteristic of the data at the interface allowing monitors of varying display technologies to compensate for their specific display transfer characteristic.

If the monitor is identified in the EDID data structure as a fixed pixel format device that supports more than a single pixel format, then a monitor scalar is assumed to exist. A monitor scalar allows monitor vendors the ability to ensure the quality of the displayed image. For complete details on Scaling and EDID requirement please see their respective sections later in this specification.

MEMO