

SERVICE AND OPERATION MANUAL

MTG-1902EN
OPEN FRAME S/VGA COLOR MONITOR

19": 49-1337-VP2

VISION PRO
HAPP CONTROLS

Information in this publication current as of OCT, 2003.

Information subject to change as display technology advance.

This publication produced by TOVIS Engineering Division.

This monitor has been designed and manufactured to deliver high performance video. For continued peak Performance use safe operation, only high quality TOVIS replacement parts or their exact specified Equivalent When servicing.

SAFETY PRECAUTIONS AND WARNINGS

Service Warning

This display contains HIGH VOLTAGE capable of delivering LETHAL quantities of energy. Service should only be attempted by trained personnel familiar with the potential dangers inherent with voltage equipment.

Safety Related Component Warning

Certain components used in TOVIS color monitors are critical for safe operation of the display. These parts Number are marked by () in the parts list and on the schematic diagram it is essential that these Safety critical components be replaced only with exactly specified components to prevent the Possibility of excessive X-radiation emission, electrical shock, fire, or premature component failure.

Modifying the original design without written approval from TOVIS is expressly forbidden, will void the original Parts and labor warranty, and may result in creating a hazardous situation.

X-RADIATION WARNING

COMPONENTS WHICH MAY AFFECT POTENTIAL EXCESS EMISSION OF X-RADIATION IN THE HORIZONTAL DEFLECTION AND HIGH VOLTAGE CIRCUITS (INCLUDING THE PICTURE TUBE) ARE TO BE USE ONLY TYPE AND RATING OF REPLACEMENT COMPONENT AS SHOWN IN THE PARTS LIST.

1. The only potential source of X-radiation emission is the picture tube. When the high voltage and horizontal deflection circuits are operating correctly there is no possibility of excess X-radiation emission. NEVER attempt to modify these circuits.
2. Periodically check the high voltage with a reliably calibrated meter for values not in excess of Manufacturer's recommendations. See high voltage Shut-down Circuit, page 4, for further details.

CRT Warning

All picture tubes used in TOVIS monitors are equipped with an integral implosion protection system. The picture Tube is, however, a highly evacuated component whose outside surfaces are subject to strong external forces. Care must be exercised so as not to bump or scratch the tube during installation or servicing as this may cause the tube to implode resulting in possible personal injury and property damage. Shatter-proof goggles must be worn by Individuals while handling the CRT or installing the display in the cabinet. Do not handle The CRT by the neck.

1. Always ensure the high voltage at the anode cap is fully discharged prior to handling or service.
2. Replace picture tube only with same type and number.

Product Safety and Service Guidelines

1. Service should be performed only after reading all of the warnings and precautions in this manual and as Labeled on the CRT and chassis.
2. Where a short circuit has occurred, replace all components that indicate evidence of overheating or poor Connection on all plastic connectors.
3. Inspect wiring for frayed leads and damaged insulation when service is required, observe original lead Dress is followed as from the factory, especially in the high voltage circuitry area.
4. All protective devices must be reinstalled per original design.

PERFORMANCE AND OPERATING DATA

1. Power Supply

- *Power Input: 90VAC ~ 264VAC, 60/50Hz
- *Fuse Rating: 250V, 50T 3.15A
- *Power Consumption: 120W Max

2. Signal Input

- *Video Input: Analog, Positive Signal (0.7V p-p)
- *Horizontal Sync: TTL Level, Positive or Negative Pulse
- *Horizontal Scan: 30KHz ~ 38KHz
- *Vertical Input: TTL Level, Positive or Negative Pulse
- *Vertical Scan: 50Hz ~ 160Hz
- *Resolution-Mode

Hf	Vf	Resolution	H Range	V range
31KHz	70Hz	720x400	+/-1KHz	50~160Hz
31KHz	60Hz	640x480		
38KHz	60Hz	800x600		

3. Picture Tube

- *Size: 19"
- *Dot Pitch: 0.82mm
- *Phosphor: P22

4. Leakage Current

- To chassis ground, at 220VAC, 50Hz (Line/Neut in common)
- 0.195mA Maximum

5. High Pot

- Line/Neut in common to secondary/chassis, 1500VAC 60Hz for 1 second
- 2.0mA Maximum, No Breakdown

6. Non-Linearity

- Using a vertical and horizontal symmetrical cross hatch pattern to equation for non-linearity will be
- Non-linearity (%) = ((largest grid minus the smallest grid) Divided by (largest grid plus the Smallest grid)) times 100.
- 8% Maximum

7. Temperature

- *Operating: 10° ~ 50°C
- *Storage: -10°C ~ 75°C
- *Humidity: 10% ~ 90%(Non-condensing)

8. Power Save Mode

- Shall be initiated by holding the Vertical Sync input Low (0.5V) and shall reduce the power to less than 20 Watts.

9. Degaussing

- Automatic at power-up and software via control Switch "SEL"

10. Regulation (Static)

- The horizontal and vertical size will change less than 2mm for a 25% white level abrupt luminance change.

11. Display Stability for Temperature

- The temperature is cycled from 25°C to 0°C, and from 25°C to 50°C the video size and centering drift will not exceed 5mm horizontally or 4mm vertically.
- (Measured after a 20 min. warm-up period at 25°C)

12. Monitor Test Specifications

Parameter	Nominal	Specification
H/V (0 μ A Beam Current)	24.5KV	+/-500V
G2	400V DC	+/-10V
Brightness	0.35Ft	+/-0.15Ft
Contrast (15% Window Box)	60.0Ft	+/-5Ft
White Balance (9300)	X: 0.281	+/-0.015
	Y: 0.311	+/-0.015
White Balance (6500)	X: 0.313	+/-0.015
	Y: 0.329	+/-0.015

- *Test Mode: VGA 640 x 480(Fh: 31KHz, Fv: 60Hz)
- *Signal: BSG-170 (BARO)

13. WARRANTY

- Manufacturer warranty 2 years parts and labor.
- (Except on C.R.T)

USER ADJUSTABLE CONTROLS

There are four switches on the control panel.
Adjustable controls allow the best display status for individual preferences

Key Function

① MODE

*MODE - Call the Main-Menu OSD.

② SEL/DEGAUSS

*SEL – Select the function (sub-Menu OSD) on the Main- Menu OSD.

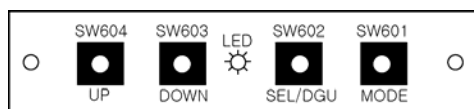
*DEGAUSS – Do degaussing in state that the OSD isn't displayed.

③ DOWN/UP

*When the Main-Menu is displayed, can search each function using these keys.

*When the Sub-Menu is displayed (after select the function), can change each state of the screen using these keys.

O.S.D Control Sub-P.C.B



O.S.D CONTROL METHOD

1) Control items.

Location	Adjustment Method	Function
SUB PCB	OSD Control	Brightness Contrast Horizontal Position Horizontal-Size Vertical Position Vertical-Size Pincushion Trapezoid Parallelog Pin balance Parallelogram
MAIN PCB	VR control, VR502, VR501, FBT	Sub-Bright H.V Adjustment H-Sub Size Focus and Screen

OSD Controls

: User's control.

A. BRIGHTNESS ADJUSTMENT

- 1) Press the "MODE" key then Main-Menu OSD come out as below Figure.
- 2) Search "BRIGHTNESS" sub-menu using "UP/DOWN" key on the Main-Menu OSD.

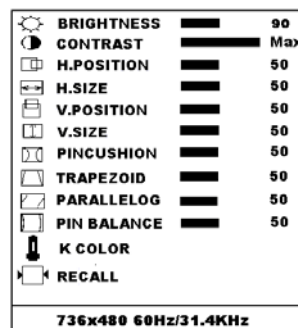
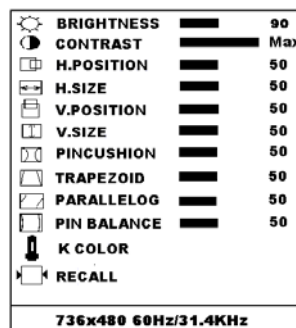
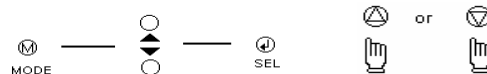
3) Select the "BRIGHTNESS" by pressing "SEL" key. Then The "BRIGHTNESS" OSD color changes from yellow to red.

4) Adjust Brightness as much as you want using "UP/DOWN" key.

5) After finish the Brightness adjust, Press the "MODE" key then the "BRIGHTNESS" OSD color changes from red to yellow and changed brightness value saved automatically.

6) If you want to adjust other function (sub-menu), Search your wanting sub-menu like "CONTRAST" using "UP/DOWN" keys and then adjusts as same way as item 3), 4) and 5).

7) Press the "MODE" key again to finish the adjustment then the OSD disappeared.

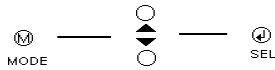


B. CONTRAST	ADJUST AS SAME WAY AS ABOVE
C. H.POSITION	ADJUST AS SAME WAY AS ABOVE
D. H-SIZE	ADJUST AS SAME WAY AS ABOVE
E. V.POSITION	ADJUST AS SAME WAY AS ABOVE
F. V-SIZE	ADJUST AS SAME WAY AS ABOVE
H. PINCUSHION	ADJUST AS SAME WAY AS ABOVE
I. TRAPEZOID	ADJUST AS SAME WAY AS ABOVE
J. PARALLELOG	ADJUST AS SAME WAY AS ABOVE
K. PINBALANCE	ADJUST AS SAME WAY AS ABOVE

USER ADJUSTABLE CONTROLS

K. COLOR ADJUSTMENT

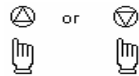
Press the "MODE" key then Main-Menu OSD come out as left below figure.



BRIGHTNESS	90
CONTRAST	Max
H.POSITION	50
H.SIZE	50
V.POSITION	50
V.SIZE	50
PINCUSHION	50
TRAPEZOID	50
PARALLELOG	50
PIN BALANCE	50
K COLOR	
RECALL	

736x480 60Hz/31.4KHz

COLOR1	COLOR2	USER
RED		50
GRE		50
BLU		50



Min→1~99→Max

- 1) Search "COLOR" sub-menu using "UP/DOWN" key on the Main-Menu OSD.

- 2) Select the "COLOR" by pressing "SEL" key. Then The color Sub-Menu OSD comes out as right below figure.

- 3) Search "USER" using "UP/DOWN" key ("COLOR1" and "COLOR2" is adjusted in factory by auto-alignment machine)

- 4) Press "SELECT" key to adjust "RED", "GREEN" and "BLUE". The each "RED", "GREEN" and "BLUE" is selected by pressing the "SELECT" key and selected item changes OSD color from white to it's own color as character (ex: "RED" goes to red color)

- 5) Adjust "RED", "GREEN" or "BLUE" using "UP/DOWN" key.

- 6) Press "MODE" key to finish the color adjustment then the OSD goes back to color Sub-Menu.

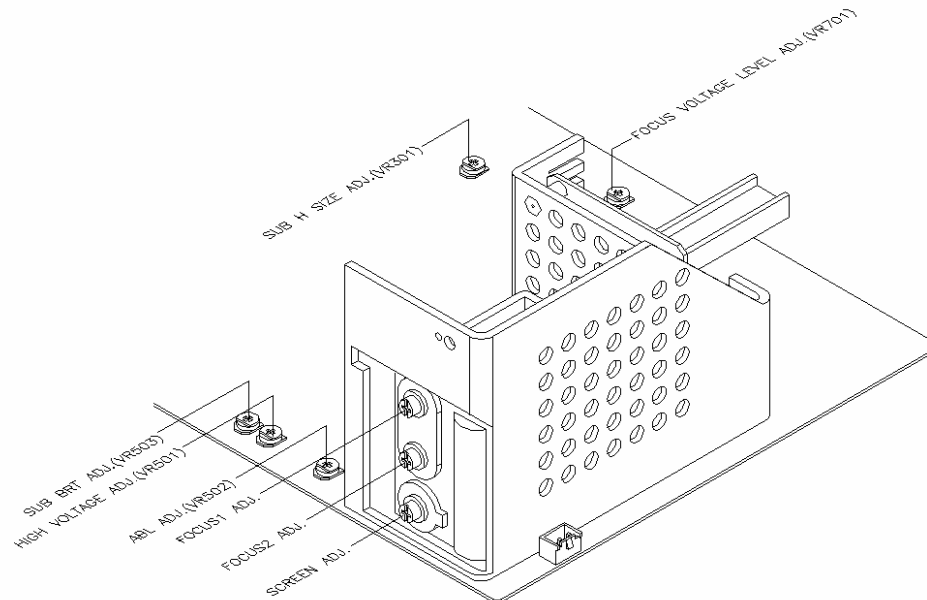
- 7) Press the "MODE" key again to finish the adjustment then Main-Menu appear.

L. RECALL

When press the "RECALL" key, all user's adjustment Value are erased and covered by factory adjustment Value.

At first stage without any user's adjustment, The Monitor set-upped by factory adjustment value.

CONTROLS (VARIABLE RESISTORS)



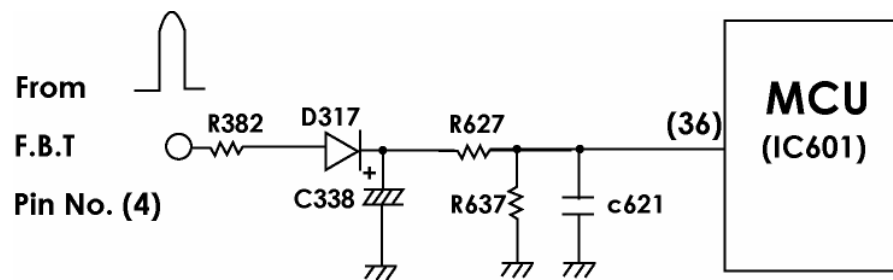
HIGH VOLTAGE SHUT-DOWN CIRCUIT

The chassis of this monitor has been designed to emit a minimum of soft X-radiation, in accordance with US DHHS rules 21 CFR, subchapter. A high voltage shut-down circuit, as shown below, guarantees horizontal oscillation shut-down should the high voltage exceed designed picture tube maximums.

DO NOT ATTEMPT TO MODIFY THIS CIRCUIT.

A fly back pulse is generated at pin (3) of the fly back transformer.

After the pulse converted to DC through rectifying circuit D317 & C338, In Normal Operation, 2.9 VDC impressed on MCU pin 36 with decreased voltage by R627 & R637. But when High Voltage increased more then 3.5 VDC, and it would be impressed on MCU pin 36, than pin 4(suspend) in MCU to be output from high to low, and IC pin 2(+12VDC output) to be off and it has to be shut down.



PART LIST

LOC	PART NAME	DESCRIPTION
SEMICONDUCTORS		
BD101	DIODE BRIDGE	D3SBA60-4100
D101	DIODE RECT-FAST	EU1Z V1
D103	DIODE RECT-ULTRA	EG01Z V1
D104	DIODE RECT-FAST	RU1P
D105	DIODE RECT-FAST	S2L60-4000
D108	DIODE RECT-FAST	EU1Z V1
D109	DIODE SW	1N4148
D110	DIODE RECT-FAST	D5L60-4000
D111	DIODE RECT-FAST	S3L20U-4000
D112	DIODE RECT-FAST	EU2Z V1
D113	DIODE RECT-FAST	S2L60-4000
D114	DIODE RECT-FAST	S3L20U-4000
D201	DIODE RECT	1N4002
D301	DIODE RECT	FMQ-G5FS
D302	DIODE RECT-FAST	D1NL20U-4060
D305	DIODE CHIP	RLS4148
D306	DIODE RECT-FAST	1N4937
D307	DIODE CHIP	RLS4148
D308	DIODE RECT-FAST	S3L60-4000
D310	DIODE CHIP	RLS4148
D312	DIODE RECT-FAST	S3L60-4000
D313	DIODE RECT-FAST	1N4937
D314	DIODE CHIP	RLS4148
D315	DIODE CHIP	RLS4148
D316	DIODE CHIP	RLS4148
D317	DIODE RECT-FAST	1N4937
D318	DIODE RECT-FAST	1N4937
D319	DIODE CHIP	RLS4148
D320	DIODE RECT-FAST	SDS06F150S
D322	DIODE CHIP	RLS4148
D398	DIODE CHIP	RLS4148
D399	DIODE CHIP	RLS4148
D401	DIODE CHIP	RLS4148
D402	DIODE SW	1SS244
D403	DIODE SW	1SS244
D404	DIODE SW	1SS244
D405	DIODE SW	1SS244
D406	DIODE SW	1SS244
D407	DIODE SW	1SS244
D408	DIODE SW	1SS244
D409	DIODE SW	1SS244
D410	DIODE SW	1SS244
D412	DIODE CHIP	RLS4148
D413	DIODE CHIP	RLS4148
D501	DIODE CHIP	RLS4148
D601	LED	SAM3271
D605	DIODE CHIP	RLS4148
D606	DIODE CHIP	RLS4148
D608	DIODE CHIP	RLS4148

LOC	PART NAME	DESCRIPTION
IC101	IC POWER	STR-F6656
IC102	IC REGULATOR	KA278R05
IC103	IC REGULATOR	KA278R12
IC104	IC REGULATOR	KA431AZ
IC201	IC DEFLECTION	KA2142
IC301	IC DEFLECTION	TDA9109A
IC302	IC POWER	KA7500B
IC401	IC VIDEO	KA2500B (S1D2500A01-DOB0)
IC402	IC VIDEO	LM2407T
IC403	IC OSD	S5D2508A
IC501	IC OP-AMP	KA358
IC601	IC u-COM	KS88C6348(S3C863A)
IC602	IC EEPROM	KS24C08P (S524A60X81-DCB0)
PC101	IC PHOTO	PC-17K1 CC
Q102	TR NPN	KSR1009
Q202	TR NPN	KSC2330-YTA
Q204	TR NPN	KSR1009
Q305	TR NPN	KSC3502-E
Q307	TR NPN	2N3904
Q308	TR NPN	FJL6825
Q309	TR NPN	KSC2328A
Q310	TR PNP	KSA928A-Y
Q311	TR PNP	KSA928A-Y
Q312	TR NPN CHIP	KSC1623-Y(C1Y)
Q313	FET	IRF640A(B)
Q314	TR NPN CHIP	KSC1623-Y(C1Y)
Q317	FET	IRF650A(B)
Q319	TR NPN	KSC5386
Q350	TR NPN	KSC2328A
Q351	TR PNP	KSA928A-Y
Q352	FET	IRF640A(B)
Q353	TR NPN	KSC2328A
Q354	TR PNP	KSA928A-Y
Q405	TR PNP	KSA992-F
Q406	TR PNP	KSA992-F
Q407	TR PNP	KSA992-F
Q408	TR NPN	KSC1845-F
Q409	TR NPN	KSC1845-F
Q410	TR NPN	KSC1845-F
Q501	TR PNP CHIP	KSA812-Y(D1Y)
Q507	TR PNP	2N6520
Q601	TR PNP CHIP	KSA812-Y(D1Y)
Q603	TR PNP CHIP	KSA812-Y(D1Y)
ZD301	ZENER DIODE CHIP	UZ-15B
ZD302	ZENER DIODE CHIP	UZ-5.1B
ZD303	ZENER DIODE CHIP	UZ-30B
ZD304	ZENER DIODE CHIP	UZ-30B
ZD305	ZENER DIODE CHIP	UZ-30B
ZD306	ZENER DIODE CHIP	UZ-30B

PART LIST

LOC	PART NAME	DESCRIPTION
ZD501	DIODE ZENER	UZ-5.1B
ZD601	ZENER DIODE CHIP	UZ-5.6B
ZD602	ZENER DIODE CHIP	UZ-5.6B
ZD604	ZENER DIODE CHIP	UZ-5.6B
ZD605	ZENER DIODE CHIP	UZ-5.6B
ZD606	ZENER DIODE CHIP	UZ-5.6B
ZD609	ZENER DIODE CHIP	UZ-5.6B
ZD610	ZENER DIODE CHIP	UZ-5.6B

TRANSFORMERS, COIL

BC101	COIL-BEAD	HC-3550
BC301	COIL-BEAD	HC-3550
BC307	COIL-BEAD	HC-3550
BC402	COIL-BEAD	HC-3550
BC403	COIL-BEAD	HC-3550
BC404	COIL-BEAD	HC-3550
BC405	COIL-BEAD	HC-3550
BC406	COIL-BEAD	HC-3550
BC407	COIL-BEAD	HC-3550
F401	FILTER-LC	22P
F402	FILTER-LC	22P
F403	FILTER-LC	22P
L302	COIL-BEAD	HC-3550
L303	COIL-BEAD	HC-3550
L304	COIL-CHOKE	A85R
L305	COIL-BEAD	HC-3550
L307	COIL-CHOKE	C110R
L601	COIL-PEAKING AXIAL	100uH (AL02)
L602	COIL-PEAKING AXIAL	100uH (AL02)
LF101	FILTER-LINE	LF-2828A
LF102	FILTER-LINE	LF-1620
T101	TRANS-SMPS	TM-1902X
T102	TRANS-SYNC	ST-1902X
T301	COIL-LINEARITY	MS-3709D
T302	TRANS-DRIVE	THD-1902X1
T303	TRANS-DUMMY	DT-1902X
T501	FBT	MCH-19A26

RESISTORS

R101	R CARBON FILM	1/2W 1M J
R103	R METAL OXIDE	2W 100K J(SMALL)
R104	R CHIP	4.7K J 2012
R106	R CHIP	150 J 3216
R107	R CEMENT	2W 0.22 J (MPR TYPE)
R107B	R CEMENT	2W 0.15 J (MPR TYPE)
R108	R CHIP	510 J 3216
R109	R CEMENT	2W 68K J (R TYPE)

RESISTORS

R110	R CHIP	1K J 3216
R111	R CHIP	1K J 3216
R112	R CHIP	100K J 3216
R113	R METAL FILM	1/4W 1.3K F
R114	R CHIP	2K J 3216
R114B	R CHIP	20K J 3216
R115	R CHIP	4.7K J 3216
R122	R METAL OXIDE	3W 10K J
R123	R METAL OXIDE	2W 2 J(R TYPE)
R124	R CHIP	4.7K J 2012
R125	R METAL OXIDE	2W 22 J (SMALL)
R138	R CHIP	1K J 3216
R139	R CHIP	220 J 3216
R197	R METAL OXIDE	3W 10K J(R TYPE)
R198	R METAL OXIDE	3W 15 J
R204	R CHIP	5.6K J 2012
R205	R METAL OXIDE	1W 1 J
R206	R CHIP	12K J 2012
R207	R CHIP	5.1K J 2012
R208	R CARBON FILM	1/2W 240 J
R209	R METAL OXIDE	1W 0.82 J
R210	R CARBON FILM	1/4W 1 J
R211	R CHIP	30K J 2012
R213	R CHIP	4.7K J 3216
R214	R CHIP	10K J 2012
R215	R CHIP	510 J 2012
R216	R CHIP	56K J 2012
R217	R CHIP	8.2K J 2012
R218	R CHIP	33K F 2012
R220	R CHIP	510 J 2012
R221	R CHIP	1K J 2012
R222	R CHIP	2K J 2012
R223	R CHIP	270 J 2012
R304	R CHIP	5.6K J 2012
R307	R CHIP	1/4W 10 J
R308	R CHIP	1K J 3216
R309	R CHIP	10K J 2012
R310	R CHIP	1K J 2012
R311	R CHIP	1K J 2012
R312	R CHIP	100 J 3216
R313	R CHIP	20K J 2012
R314	R METAL CHIP	6.8K F 2012
R315	R CHIP	1.8K J 2012
R316	R CHIP	3K J 2012
R317	R CHIP	10K J 2012
R318	R CHIP	470K J 2012
R321	R METAL OXIDE	1W 330 J
R322	R CHIP	15K J 2012
R324	R CHIP	470 J 3216

PART LIST

LOC	PART NAME	DESCRIPTION	LOC	PART NAME	DESCRIPTION
R325	R CEMENT	7W 470 J (R TYPE)	R408	R METAL OXIDE	2W 2 J
R326	R CHIP	100 J 3216	R409	R CHIP	100 J 3216
R327	R CHIP	47K J 3216	R410	R CHIP	100 J 3216
R328	R METAL OXIDE	2W 3 J (SMALL)	R411	R CHIP	100 J 3216
R329	R CARBON FILM	1/4W 20 J	R412	R CHIP	33 J 2012
R330	R METAL OXIDE	2W 24 J (R TYPE)	R413	R CHIP	100 J 2012
R331	R CHIP	1K J 2012	R414	R CHIP	100 J 2012
R333	R METAL OXIDE	2W 10 J (SMALL)	R415	R CHIP	33 J 2012
R336	R CHIP	10K J 2012	R416	R CHIP	33 J 2012
R337	R CHIP	4.7K J 2012	R417	R CHIP	4.7K J 3216
R340	R CHIP	15K J 3216	R418	R CHIP	220K J 3216
R341	R CHIP	1K J 3216	R419	R CHIP	10 J 2012
R346	R METAL OXIDE	2W 2.7 J (SMALL)	R420	R CHIP	10 J 2012
R347	R CARBON FILM	1/2W 1 J	R421	R CHIP	10 J 2012
R348	R CARBON FILM	1/4W 47 J	R422	R CHIP	390 J 2012
R353	R METAL OXIDE	2W 330 J (SMALL)	R423	R CHIP	390 J 2012
R354	R CEMENT	2W 0.33 J (MPR TYPE)	R424	R CHIP	390 J 2012
R355	R CHIP	1M J 2012	R425	R CARBON FILM	1/4W 2.2 J
R356	R CHIP	20K J 2012	R426	R CHIP	100 J 2012
R357	R CHIP	30K J 2012	R427	R CHIP	100 J 2012
R358	R CHIP	30K J 2012	R432	R CHIP	100 J 2012
R360	R METAL OXIDE	2W 1K J	R433	R CHIP	100 J 2012
R361	R CHIP	47K J 2012	R434	R CHIP	100 J 3216
R362	R CHIP	10K J 2012	R435	R CHIP	100 J 3216
R363	R CHIP	1.5 J 3216	R436	R CHIP	100 J 3216
R364	R CHIP	360 J 2012	R437	R CHIP	4.7K J 3216
R365	R CHIP	1K J 2012	R438	R CHIP	220K J 3216
R366	R CHIP	3.3K J 2012	R439	R CHIP	62K J 2012
R367	R CHIP	1K J 2012	R440	R CHIP	62K J 2012
R368	R CHIP	5.1K J 2012	R441	R CHIP	62K J 2012
R369	R CHIP	100K J 2012	R442	R CHIP	910 J 2012
R370	R CEMENT	2W 0.33 J (MPR TYPE)	R445	R CHIP	820K J 2012
R371	R CHIP	4.7K J 2012	R446	R CHIP	820K J 2012
R372	R CHIP	8.2K J 2012	R447	R CHIP	820K J 2012
R373	R CHIP	22K J 2012	R448	R CHIP	6.2K J 2012
R374	R CHIP	7.5K J 2012	R450	R CARBON FILM	1/4W 10 J
R375	R CHIP	4.7K J 2012	R451	R CHIP	36K J 2012
R377	R CHIP	2K J 2012	R452	R CHIP	100 J 2012
R378	R CHIP	10K J 2012	R453	R CHIP	100 J 2012
R379	R CHIP	3.3K J 2012	R454	R CHIP	100 J 2012
R380	R CARBON FILM	1/2W 10 J	R455	R CHIP	200 J 2012
R381	R CHIP	8.2K J 2012	R456	R CHIP	200 J 2012
R382	R METAL OXIDE	1W 1 J	R457	R CHIP	200 J 2012
R384	R CARBON FILM	1/2W 1 J	R458	R CHIP	200 J 2012
R385	R CARBON FILM	1/4W 3.3K J	R460	R CHIP	47 J 3216
R399	R CHIP	1K J 2012	R461	R CHIP	47 J 3216
R401	R CHIP	75 J 2012	R462	R CHIP	47 J 3216
R402	R CHIP	75 J 2012	R501	R CHIP	100 J 3216
R403	R CHIP	75 J 2012	R502	R CHIP	5.6K J 2012

PART LIST

LOC	PART NAME	DESCRIPTION
R503	R CHIP	100K J 2012
R504	R CHIP	240K J 2012
R505	R CHIP	24K J 2012
R506	R CHIP	2.4K J 2012
R507	R CHIP	33K J 2012
R508	R CHIP	5.1K J 2012
R509	R CHIP	91K J 3216
R510	R CHIP	39K J 3216
R511	R CHIP	39K J 3216
R522	R CHIP	100K J 3216
R532	R CHIP	2K J 2012
R533	R CHIP	3.3K J 2012
R536	R CHIP	68K J 2012
R537	R CHIP	120K J 3216
R601	R CHIP	2K J 2012
R602	R CHIP	100 J 2012
R603	R CHIP	100 J 2012
R604	R CHIP	1.5K J 2012
R605	R CHIP	100 J 2012
R606	R CHIP	1.8K J 2012
R607	R CHIP	100 J 2012
R608	R CHIP	100 J 2012
R610	R CHIP	4.7K J 2012
R611	R CHIP	2K J 2012
R612	R CHIP	100 J 2012
R613	R CHIP	100 J 2012
R618	R CHIP	15K J 2012
R620	R CHIP	4.7K J 2012
R621	R CHIP	4.7K J 2012
R622	R CHIP	1.2K J 2012
R623	R CHIP	330 J 3216
R624	R CHIP	1.2K J 2012
R625	R CHIP	100 J 2012
R626	R CHIP	100 J 2012
R627	R CHIP	200K J 2012
R628	R CHIP	10K J 2012
R629	R CHIP	3.3K J 2012
R630	R CHIP	3.3K J 2012
R631	R CHIP	100 J 2012
R633	R CHIP	100 J 2012
R634	R CHIP	100 J 2012
R635	R CHIP	4.7K J 2012
R636	R CHIP	56K J 2012
R637	R CHIP	27K J 2012
R638	R CHIP	8.2K J 2012
R639	R METAL CHIP	13.7K F 2012
R640	R CHIP	22K J 2012
R641	R METAL CHIP	2.55K F 2012
R642	R CHIP	100 J 2012
R643	R CHIP	100 J 2012

LOC	PART NAME	DESCRIPTION
R645	R CHIP	1K J 2012
R654	R CHIP	10K J 2012
RL101	RELAY	DY313-D12S
RS601	RESONATOR CRYSTAL	8.00MHz(HC-50/U)
VR301	VR-SEMI	NVZ 6TLT 2K
VR501	VR-SEMI	NVZ 6THT 50K
VR502	VR-SEMI	NVZ 6THT 50K
VR503	VR-SEMI	NVZ 6THT 100K

CAPACITORS

C101	C LINE ACROSS	AC 275V 0.22uF
C104	C ELECTRO	450V 330uF FUX
C105	C ELECTRO	50V 47uF RF
C106	C MYLAR	100V 4700pF J
C107	C MYLAR	NPP 630V 0.033uF J
C108	C CHIP	F 0.1uF Z 2012
C109	C ELECTRO	50V 1uF RF
C111	C ELECTRO	16V 220uF RF
C112	C LINE ACROSS	AC 275V 0.22uF
C118	C MYLAR	100V 0.1uF J
C119	C ELECTRO	100V 220uF RUS
C121	C ELECTRO	35V 470uF RF
C122	C ELECTRO	100V 100uF RUS
C124	C ELECTRO	160V 47uF RUS
C125	C CHIP	B 100pF K 2012
C126	C ELECTRO	16V 1000uF RF
C127	C ELECTRO	16V 47uF RF
C132	C ELECTRO	16V 2200uF RF
C202	C ELECTRO	16V 2200uF RF
C203	C ELECTRO	35V 220uF RF
C204	C MYLAR	100V 1500pF J
C205	C MYLAR	100V 5600pF J
C206	C ELECTRO	16V 2200uF RF
C207	C ELECTRO	50V 10uF RF
C208	C MYLAR	MPE 63V 1uF J
C209	C MYLAR	100V 0.01uF J
C210	C MYLAR	MPE 200V 0.3uF J
C212	C MYLAR	MPE 63V 0.1uF J
C213	C MYLAR	100V 0.047uF J
C214	C MYLAR	100V 1500pF J
C215	C CHIP	B 1000pF K 2012
C216	C ELECTRO	16V 220uF RF
C303	C ELECTRO	50V 1uF RF
C305	C MYLAR	100V 0.1uF J
C307	C CHIP	B 470pF K 2012
C308	C MYLAR	100V 0.1uF J
C309	C MYLAR	100V 0.1uF J
C310	C ELECTRO	16V 220uF RF
C311	C MYLAR	NPPS 1.6KV 5300pF J

PART LIST

LOC	PART NAME	DESCRIPTION	LOC	PART NAME	DESCRIPTION
C312	C ELECTRO	16V 100uF RF	C405	C CHIP	F 0.1uF Z 2012
C313	C MYLAR	NPPS 1.6KV 1000pF J	C407	C CHIP	F 0.1uF Z 2012
C315	C ELECTRO	100V 100uF RUS	C408	C CHIP	F 0.1uF Z 2012
C316	C MYLAR	PFU 400V 0.20uF J	C410	C ELECTRO	16V 100uF RF
C318	C MYLAR	MPP 250V 0.27uF J	C413	C ELECTRO	50V 1uF RF
C323	C ELECTRO	16V 100uF RF	C414	C ELECTRO	50V 10uF RF
C324	C CHIP	F 0.1uF Z 2012	C416	C CHIP	F 0.1uF Z 2012
C325	C ELECTRO	16V 47uF RF	C418	C CHIP	F 0.1uF Z 2012
C326	C MYLAR	100V 0.22uF J	C419	C CHIP	F 0.1uF Z 2012
C328	C MYLAR	MPP 250V 0.47uF J	C420	C CHIP	F 0.1uF Z 2012
C329	C MYLAR	MPP 250V 0.56uF J	C421	C CHIP	F 0.1uF Z 2012
C330	C MYLAR	100V 6800pF J	C422	C ELECTRO	100V 22uF RUS
C331	C CHIP	B 1000pF K 2012	C423	C MYLAR	100V 0.1uF J
C332	C MYLAR	100V 0.01uF J	C424	C ELECTRO	50V 1uF RUB
C333	C ELECTRO	50V 10uF RF	C425	C ELECTRO	50V 1uF RUB
C334	C MYLAR	100V 0.047uF J	C426	C ELECTRO	50V 1uF RUB
C336	C CHIP	F 0.1uF Z 2012	C427	C ELECTRO	100V 4.7uF RUS
C337	C ELECTRO	16V 100uF RF	C428	C MYLAR	100V 0.1uF J
C338	C ELECTRO	50V 10uF RF	C429	C MYLAR	100V 0.1uF J
C339	C ELECTRO	50V 2.2uF RF	C430	C MYLAR	100V 0.1uF J
C340	C CHIP	F 0.1uF Z 2012	C431	C MYLAR	100V 0.01uF J
C341	C ELECTRO	16V 1000uF RF	C434	C ELECTRO	16V 100uF RF
C342	C MYLAR	MPE 63V 0.22uF J	C435	C CHIP	F 0.1uF Z 2012
C343	C CHIP	F 0.1uF Z 2012	C436	C CHIP	F 0.1uF Z 2012
C344	C ELECTRO	16V 100uF RF	C437	C ELECTRO	16V 100uF RF
C345	C MYLAR	MPE 63V 0.47uF J	C438	C ELECTRO	16V 100uF RF
C346	C CHIP	B 100pF K 2012	C441	C CHIP	F 0.1uF Z 2012
C347	C MYLAR	100V 1000pF J	C443	C ELECTRO	16V 1000uF RF
C348	C MYLAR	100V 0.022uF J	C444	C MYLAR	100V 0.1uF J
C349	C MYLAR	100V 0.01uF J	C445	C ELECTRO	16V 100uF RF
C350	C ELECTRO	50V 4.7uF RF	C447	C ELECTRO	16V 100uF RF
C351	C MYLAR	100V 0.22uF J	C449	C MYLAR	100V 0.1uF J
C352	C CHIP	B 100pF K 2012	C450	C MYLAR	100V 0.1uF J
C353	C ELECTRO	50V 1uF RF	C451	C MYLAR	100V 0.1uF J
C354	C ELECTRO	50V 3.3uF RF	C452	C MYLAR	100V 0.01uF J
C355	C MYLAR	100V 1000pF J	C453	C MYLAR	100V 0.01uF J
C356	C ELECTRO	50V 47uF RF	C454	C MYLAR	100V 0.01uF J
C357	C MYLAR	100V 3900pF J	C460	C CHIP	B 47pF K 2012
C358	C MYLAR	100V 1000pF J	C461	C CHIP	B 47pF K 2012
C359	C ELECTRO	50V 100uF RF	C462	C CHIP	B 47pF K 2012
C360	C CHIP	F 0.1uF Z 2012	C463	C CHIP	B 47pF K 2012
C362	C MYLAR	100V 0.012uF J	C501	C ELECTRO	50V 10uF RND
C364	C ELECTRO	200V 10uF RUH	C505	C MYLAR	200V 0.1uF K
C365	C MYLAR	100V 0.1uF J	C601	C ELECTRO	50V 10uF RF
C366	C ELECTRO	50V 3.3uF RF	C603	C CHIP	B 100pF K 2012
C370	C CHIP	F 0.015uF K 2012	C605	C ELECTRO	50V 10uF RF
C371	C MYLAR	PFU 400V 0.27uF J	C608	C ELECTRO	50V 10uF RF
C398	C ELECTRO	100V 220uF RUS	C609	C ELECTRO	16V 100uF RF
C401	C CHIP	F 0.1uF Z 2012	C610	C CHIP	F 0.01uF K 2012
C402	C CHIP	F 0.1uF Z 2012	C611	C CHIP	F 0.1uF Z 2012
C404	C ELECTRO	16V 100uF RF			

PART LIST

LOC	PART NAME	DESCRIPTION
C612	C CHIP	B 47pF K 2012
C613	C CHIP	B 47pF K 2012
C614	C CHIP	B 22pF K 2012
C615	C CHIP	B 22pF K 2012
C616	C ELECTRO	16V 220uF RF
C617	C CHIP	F 0.1uF Z 2012
C618	C CHIP	B 1000pF K 2012
C619	C CHIP	B 1000pF K 2012
C621	C CHIP	F 0.1uF Z 2012
C624	C CHIP	F 0.1uF Z 2012
C699	C CHIP	B 1000pF K 2012

MISCELLANEOUS

A001	PCB MAIN	FR-4 282x197x1.6T
A002	PCB POWER	FR-4 230x166x1.6T
A005	PCB NECK	FR-4 228x252x1.6T
CRTGND	WAFER	YFW800-01
F101	FUSE	50T 250V 3.15A
F101A	FUSE CLIP	FC-21D
G2	WAFER	YFW800-01
M001	CRT	A48KRD82X
M002	COIL-DEGAUSSING	CD-0190A-10N
M003	SIGNAL CABLE	PC SIGNAL CABLE 1.65M
M004	CORD-POWER	3P 110V 1.8M KKP-30/CLAMP
M009	CONN ASSY	CRT GND 920(H)
P601	WAFER	YMW250-05
PTC101	POSISTOR	ECPAC7ROM140
SG401	SPARK GAP	MTA-301M
SG402	SPARK GAP	MTA-301M
SG403	SPARK GAP	MTA-301M
SG404	SPARK GAP	MTA-301M
SG405	SPARK GAP	1.5KV+-500V
SIGNAL CABLE	WAFER	YFW800-01
SK401	SOCKET CRT	ISHS04S
TH101	THERMISTOR	8D-13F
W101	WAFER	YFW800-02
W102	CONN ASSY	10P 300 5264-06,04/YBNH250-10
W105	WAFER	LW1143-02
W105	WAFER	LWP1143-02
W105A	CONN ASSY	2P 200, LH03-03/LH03-02
W306	WAFER	YFW800-04
W401	WAFER	YMW250-06
W402	WAFER	YMW250-04
W403	WAFER	YMW250-07

LOC	PART NAME	DESCRIPTION
W404	WAFER	YMW250-06
W601	CONN ASSY	7P 2464 5264-07/YBNH250-07
W603	WAFER	YMW250-04
W604	WAFER	350760-4
W605	WAFER	YMAW250-04
W605A	CONN ASSY	4P 500 5264-04/5264-04
W903	CONN ASSY	3P 180 5264-03/YBNH250-03
WA103	WAFER	YMW250-03
YT01	TERMINAL TAP	GP88119-2
YT02	TERMINAL TAP	GP88119-2
YT03	TERMINAL TAP	GP88119-2
YT04	TERMINAL TAP	GP88119-2

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