

# AKAI SERVICE MANUAL

25" / 29"

## SOLID STATE Color Television Receiver

( PAL / SECAM VERSION )  
MITSUBISHI I<sup>2</sup>C IC

This manual is the latest at the time of printing, and does not include the modification which may be made after the printing, by the constant improvement of product.

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Checked by : \_\_\_\_\_

(Zeng Shui Hua)

## SPECIFICATION

SUPPLY VOLTAGE : AC220V 50Hz  $\geq + 10\%$  /  $-20\%$

SYSTEM :	PAL - I / I	PAL - BG	PAL - I (UK)	PAL - SECAM - BG / DK	PAL - SECAM - BG / DK ( HYPER )	PAL - BG ( HYPER )	PAL - BG ( CATV )	SECAM - L	L'	
CHANNEL L - VHF : H - VHF : UHF :	4 - 13 21 - 69	2 - 4 5 - 12 21 - 69	21 - 69	1 - 5 6 - 12 21 - 69	1 - 5 6 - 12 21 - 69	E2 - S10 E5 - S41 E21 - E69	E2 - S2 E5 - S20 E21 - E69	1 - Q 21 - 69	FB - FC	CH CH CH
VIF FREQUENCY :	38.9	38.9	39.5	38.0	38.9	38.9	38.9	38.9	32.7	MHz
SIF FREQUENCY :	32.9	33.4	33.5	31.5 32.5	32.4 33.4	33.4	33.4	32.4	39.2	MHz
CHROMA IF FREQUENCY :	34.47	34.47	35.07	33.57 33.57	34.47 34.47	34.47	34.47	34.47		MHz
INTER-CARRIER FREQUENCY :	6.0	5.5	6	6.5 5.5	5.5 6.5	5.5	5.5	6.5	6.5	MHz
SCANNING HORIZONTAL : VERTICAL :	15625 LINE 50 Hz									
ANTENNA INPUT IMPEDANCE :	75 OHM									
CRT :	25" 29"									



# ALIGNMENT INSTRUCTION

## **I. PLEASE READ BEFORE ATTEMPTING SERVICE**

1. Never disconnect any leads while receiver is in operation.
2. Disconnect all power before attempting any repairs.
3. Do not short any portion of the circuit while power is on.
4. For safety reasons, all parts replaced should be identical, ( for parts and part numbers see parts list ).
5. Before alignment the set must be pre-heated for 30 minutes or more and erase magnetism thoroughly from CRT front chassis frame by erase coil. ( Except IF, SYNC, COLOR, SECAM, B+, SOUND )

## **II. TEST EQUIPMENT**

- |   |   |
|---|---|
| 1. Colour Bar, Dot, Cross Hatch Generator | 6. High Voltage Meter                     |
| 2. DC Power Supply                        | 7. Ampere Meter ( 0.5 Class, DC 3mA Max ) |
| 3. Oscilloscope                           | 8. Demagnetizing Coil                     |
| 4. Vacuum Tube Voltmeter                  | 9. Philips Pattern Generator              |
| 5. Volt Ohmmeter                          | 10. High Pot Tester                       |

## **III. FACTORY ADJUSTMENT : See table 1- 4**

1. Press REMOTE FACTORY ON button.
2. Press REMOTE FACTORY button.
3. Press REMOTE UP or DOWN button select item.
4. Press REMOTE value (+) (-) button,adjust the value.
5. REMOTE DIALOG CENTRE button can turn off factory mode function.

REMARK : NO this factory on Normal remote control .

## **IV.B+ ADJUSTMENT**

1. Connect a digital voltmeter between the W234 and Ground.
2. Press REMOTE Picture button.
3. Press REMOTE UP/DOWN and value (-) button set Brightness,contrast,color to minimum.
4. Adjust Screen Volume on FBT Until the picture can just been seen.
5. Adjust VR901 and obtain a reading of 143V  $\pm$ 1V (DC).

## **V. AGC ALIGNMENT**

1. Receive CH69 ( UHF ) and input field strength. (60dB in put signal)
2. Connect a digital voltmeter between the TUNER AGC TERMINAL and Ground.
3. Press REMOTE AGC button.
4. Press REMOTE value (+) (-) button adjust value to (0) and then adjust AGC take over value obtain drop down 0.4V. (DC)

REMARK : ( 1/ The drop down voltage should be more than and tends to 0.4V )

( 2/ No observable noise can be seen )

## VI. SOUND TRACKING ALIGNMENT

1. Receive a gray scale pattern.
2. Connect a oscilloscope and monitor IC109 TDA3857 PIN 15 and Ground.
3. Adjust T101 to obtain the waveform Fig.6.
4. Conect a Voltage meten and monitor IC 104 TDA9801 PIN 15 and gorund.
5. Adjust T101 obtain  $5V \pm 0.1V$  (DC).

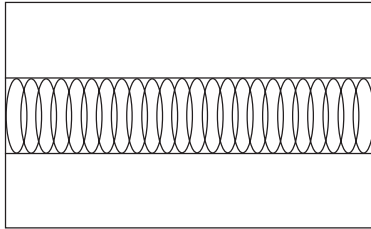


Fig.6

Remark: All frequency of Marker points are  $\pm 0.2\%$  tolerance.

## VII. EAST - WEST CORR ECTION ADJUSTMENT

- 1) Receive a crosshatch and center cross pattern.
- 2) Set the Brightness,contrast to middle position.
- 3) Press REMOTE EW-Par/wid,EW-trap button,Press REMOTE VALUE (+) (-) button adjust Value to normal regular picture.
- 4) Press REMOTE WE-width button,Press REMOTE value (+) (-) button adjust value to proper horizontal width (  $90\% \pm 2\%$  )

## VIII. HORIZONTAL SHIFT ADJUSTMENT

1. Receive Monoscope Pattern input signal  $70dB \pm 10dB$ .
2. Press REMOTE H-shirt button.
3. Press REMOTE value (+) (-) button adjust value to obtain the picture at center  $\pm 2mm$ . ( Specification show in Fig.8 )

## IX. VERTICAL LINEARTY ADJUSTMENT

- 1) Receive a crosshatch and center cross pattern.
- 2) Set the Brightness,contrast to middle position.
- 3) Press REMOTE V-Slope,S-Correction button,Press REMOTE Value (+) (-) button adjust value to normal regular picture.
- 4) Press REMOTE V-Shift button,Press REMOTE Value (+) (-) button adjust value to obtain the picture at center.

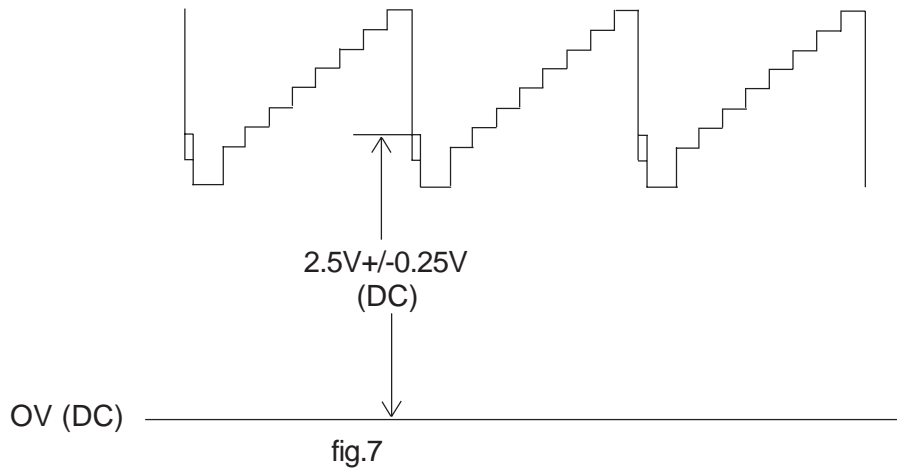
## X. VERTICAL AMPL ADJUSTMENT

1. Receive the Monoscope Pattern.
2. Press REMOTE V-ampl button.
3. Press REMOTE value (+) (-) button adjust value to obtain a normal picture.

## XI. WHITE BALANCE ALIGNMENT STEP

( Degauss the picture by degaussing coil if necessary )

1. Receive a grey scale pattern
2. Connect a oscilloscope and monitor CN101 pin"3"and ground.
3. Press REMOTE picture button.
4. Press REMOTE UP/DOWN and value (-) button set the brightness,contrast, to middle position.
5. Ajust screen volume on FBT untl the waveform to  $2.5V \pm 0.25V$  DC see fig.7.
6. Press REMOTE sub bri button.
7. Press REMOTE value (+) (-) button adjust value to (18).
8. Receive a black and white pattern
9. Press REMOTE with bal button.
10. Press REMOTE UP/Down and value (+) (-) button adjust blue str value to(0).
11. Press REMOTE picture button.
12. Press REMOTE UP/Down and Value(+ ) (-) button set the brightness and color to minimun position. contrast to MAX position.
13. Press REMOTE pt r.g.b.button.
14. Press REMOTE UP/Down and value (+) (-) button adjust the white balance.(9300°k)



## XII.SUB - BRIGHTNESS ALIGNMENT

1. Receive a grey scale pattern.
2. Press REMOTE picture button,.
3. Press REMOTE UP/DOWN and value (-) button set the brightness, contrast to minimum.
4. Press REMOTE sub bright button.
5. Press REMOTE value (+) (-) button adjust value to brightness bar can just be seen.

## XIII. FOCUS ALIGNMENT

- 1) Set the Brightness and Contrast to middle position.
- 2) Receive a monoscope pattern.
- 3) Adjust focus control to obtain sharpest picture.

## XIV. HIGH POT TESTING

- 1) Short the L - pole and N - pole of AC line cord.
- 2) Switch on the power switch of the TV Set.
- 3) Connect The High Pot Tester (-) to L and N pole, (+) to the METAL PART of CABINET.

SAFETY STD. / CONDITION	TEST STANDARD	TEST STANDARD FOR PRODUCTION
VDE, SAA	3.0KV 10mA / 1MIN	$\geq 3.5$ KV $\leq 10$ mA / $\geq 10$ SEC.
BS	4.0KV 10mA / 1MIN	$\geq 4.0$ KV $\leq 10$ mA / $\geq 10$ SEC.
CHINA STANDARD	3.0KV 10mA / 1MIN	$\geq 3.3$ KV $\leq 5$ mA / $\geq 6$ SEC.
UL	1.0KV 5mA / 1MIN	$\geq 1.25$ KV $\leq 5$ mA / $\geq 1$ SEC.

Remark:

- 1) If no other specify, the strength of input signal should be 70dB  $\pm 10$ dB.
- 2) The High Pot Tester can have  $\leq \pm 5\%$  tolerance.

DISTRICT	CENTRE (mm) POSITION	LIMIT (mm)	SCANNING SIZE (%)	SCANNING SIZE LIMIT (%)
THAILAND	-1	0 ~ -2	90	88 ~ 92
FRANCE	+3	0 ~ +5	90	88 ~ 94
GERMANY	+3	0 ~ +5	90	90 ~ 95
*GROUP A	-2	-5 ~ -1	90	88 ~ 94
*GROUP B	0	-2 ~ +2	90	88 ~ 94
*GROUP C	+3	0 ~ +5	90	88 ~ 94

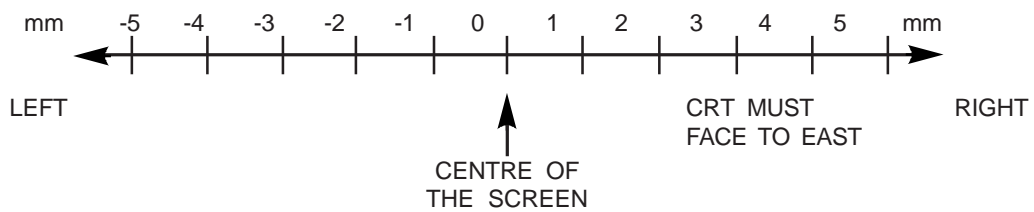


FIG. 8

- REMARK:
1. SUITABLE FOR 14" OR ABOVE TV.
  2. Adjust the centre position must take the upper side of monoscope pattern for standard.
  3. Group A : AUSTRALIA, NEW ZEALAND, TAHITI.
  4. Group B : HONG KONG, CHINA, AMERICA, CANADA, MALAYSIA, MEXICO.
  5. Group C : ENGLAND, ITALY, GERMANY, RUSSIA, SWITZERLAND, JUGOSLAVIA, SPANISH.
- If the above countries are not include, please consult to Engineering Dept.



## FACTORY MODE TABLE 1

ITEM		REF VALUE	REMARK
1	POWER	P	O = TV Status S = Power Status P = Last power status
2	TDA884X	3	1=PAL/NTSC.W/O EW    3=PAL/NTSC.W/EW 2=PAL/SECAM/NTSC.W/O EW    4=PAL/SECAM/NTSC,W/EW
3	S.SYS	6	1 = DK/I                      4 = BG/DK/I/M 2 = BG/DK                    5 = I 3 = DK/I/M                    6 = BG
4	LOGO	1	1 = NIL                      1 = NIL TEAC 2 = TEAC              CHINA    2 = ROWA 3 = HAIER                    3 = CAIXIING 4 = HAIER
5	CT1	0	0 = OFF 1 = ON
6	OSD. ANTENNE LANGUAGE	0	0 = NO BACKGAN    1 = W/BACKGAN 0 = OFF ANTENNE    1 = ON ANTENNE 0 = ENG                1 = RUSSIAN
7	WOOFER	0	0 = OFF 1 = ON
8	TUNE TEXT	0	0=NO POWER ON AUTO TUNER    1=POWER ON AUTO TUNER 0 = OFF TEXT    1 = ON TEXT
9	BLUE EX LANGUAGE	0	0 = OFF BLUE EX    1 = ON BLUE EX 0 = ENGLISH ONLY    1 = CHINESE/ENGLISH
10	AV NO	1	1 = TV/AV1/AV2/AV3/S-VHS 2 = TV/AV1/AV2/S-VHS 3 = TV/AV1/AV2
11	16:9 KARAOKE DVDTX Set	0	0 = OFF 16:9                      1 = ON 16:9 0 = OFF KARAOKE                1 = ON KARAOKE 0 = OFF DVD                      1 = ON DVD
12	BBE	0	0 = OFF 1 = ON
13	HALF SCR	0	0 = Picture 1 = HACF Picture

## FACTORY MODE TABLE 2

ITEM		VALUE ADJUST RANGE	REF VALUE	REMARK
1	H-SHIFT	co-ff	dd	For CTI ON TV set Adjustment
		80-Bf	a3	For CTI OFF TV set Adjustment
2	V-SLOPE	0-3f	2b	For TV set Adjustment
3	V-AMPL	40-80	55	For TV set Adjustment
4	S-CORRECT10N	80-Bf	90	For TV set Adjustment
5	V-SHIFT	0-3f	1e	For TV set Adjustment
6	EW-WIDTH	0-3f	36	For TV set Adjustment
7	EW-PAR	0-3f	16	For TV set Adjustment
8	EW-CORNER	0-3f	0	For TV set Adjustment
9	EW-TRAP	0-3f	2a	For TV set Adjustment
10	CONTROL 0		3	NON-Adjustable Value
11	CONTROL 1		90	NON-Adjustable Value
12	AGC	0-3f (TEAC) 40-7f (CHINA)	12	For TV set Adjustment
13	PLL		40	For TV Set IF Frequency 40 = 38.90 MHz    80 = 33.40 MHz 60 = 38.00 MHz    Cl = 33.90 MHz

### FACTORY MODE TABLE 3

	ITEM	VALUE ADJUST RANGE	REF VALUE	REMARK
1	DVD1	0-FF	38	NON-Adjustable value
	CONTROL 2		18	
2	DVD2	0-FF	bb	NON-Adjustable value
	CONTROL 3		25"set 12 29"set 14	
3	DVD3	0-FF	a3	CTI ON Set 9 CTI OFF Set e9
	CONTROL 4		e9	
4	HOTEL LOCK		0	0 = OFF 1 = ON
5	SaB SHP	00-31	00	Sab shp seting
6	COMB		1	1 = COMB ON 0 = COMB OFF
7	NICAM		1	0 = NICAM/G.ST 2 = G.ST 1 = NICAM
8	CCD		0	0 = OFF CCD 1 = ON CCD



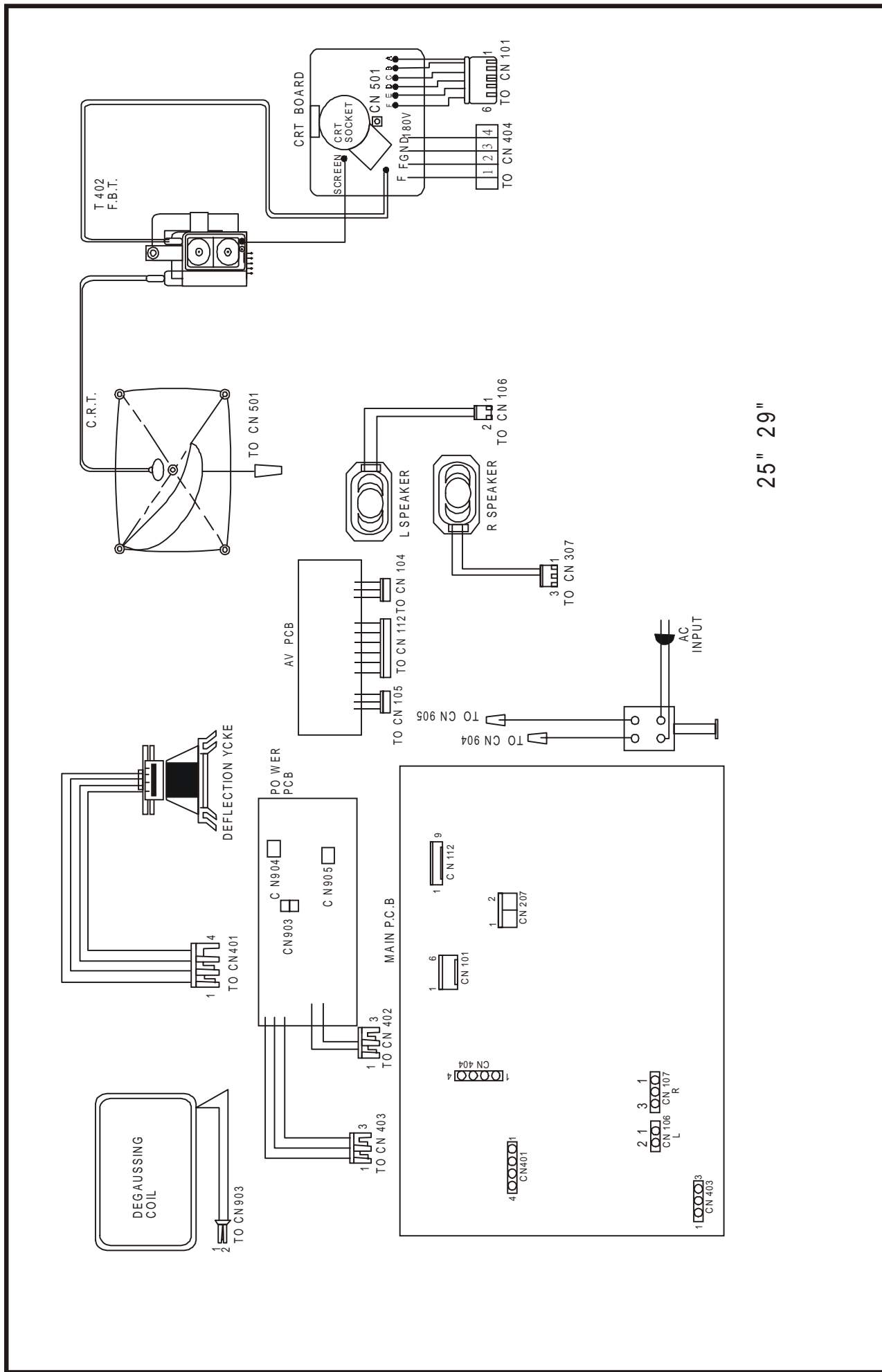
<b>LOCATION</b> \ <b>T R</b>	<b>B.V</b>	<b>C.V</b>	<b>E.V</b>					
Q101	0.7	0	1.6					
Q102	4.9	0.3	4.9					
Q103	4.9	0.15	4.9					
Q104	4.3	4.9	4.9					
Q105	3.2	0	3.2					
Q106	2.4	7.9	1.7					
Q108	2.8	6.7	2.1					
Q109	1	7	0.3					
Q110	0.7	0	1.4					
Q111	7.7	0	7.9					
Q113	4.3	4.8	4.9					
Q114	4.9	4.9	4.6					
Q115	0	4.9	0					
Q116	4.8	0	4.9					
Q117	0.7	0.5	0					
Q118	0	8.1	0					
Q119	0.6	0	0					
Q301	2.8	2.8	2.8					
Q401	13.6	0	14.3					
Q402	0.6	13.8	0					
Q403	0	115	0					
Q404	0.4	76	0					
Q405	21.6	21	21					
Q701	0	10	0					
Q909	-2.35	293	0					
Q910	0	8.6	0					
Q911	10.2	0	1.3					
Q912	8.9	14	8.2					
Q913	15.3	15.3	14.6					
Q914	14.7	15.3	15.3					

PIN NO	SYMBOL	IC101/V	IC102/V	IC103/V	IC104/V	IC105/V	IC106/V	IC107/V
1		NC	0.7	GND	0	5	GND	NC
2		NC	0.7	NC	0	5	GND	NC
3		NC	0	GND	0	5	GND	GND
4		NC	0	GND	0	5	GND	4.2
5		2.6	4.7	4.8	0	5	5	4.2
6		2.1	0	4.8	0	5	5	GND
7		4.3	0.3	4.8	0	5	5	3.9
8		4.3	NC	4.5	0	5	5	2.6
9		6.6	NC		0	GND		0
10		1.1	4.5		0	GND		2.3
11		3.7	NC		0	GND		2.3
12		7.8	NC		0	GND		2.3
13		3.5	NC		0	GND		GND
14		GND	4.7		0	5		GND
15		NC	NC		0	5		4.9
16		3.9	4.1		0	5		4.9
17		3.3	0		0	GND		GND
18		6.5	GND		0	GND		1.9
19		3.1	2.2		0	GND		1.9
20		2.7	1.8		5	5		NC
21		2.5	GND			GND		NC
22		3.6	4.8			GND		NC
23		3.5	3.5			2.4		NC
24		3.5	3.5			GND		NC
25		3.5	4.6			2.1		NC
26		0.2	NC			2.5		NC
27		2.1	NC			0		NC
28		2.1	NC			GND		GND
29		2.4	4.7			NC		2.3
30		2.4	4.7			5		GND
31		2.4	4.3			2.5		2.3
32		2.4	4.3			0		2.3
33		4.2	4.7			0		NC
34		2.5	4.3			0		NC
35		2.5	NC			0		GND
36		4.3	NC			0.8		NC
37		7.9	4.7			0.8		NC
38		1.9	0			5		4.4
39		4.9	0			5		4.4
40		0.3	0			GND		GND
41		0.7	0			2.4		GND
42		4	0			2.7		GND
43		3.8				0		GND
44		GND				5		GND
45		0.5				GND		GND
46		2.4				GND		2.2
47		2.6				GND		2.3
48		4.6				GND		2.3
49		4.6				4.3		GND
50		2.2				4.3		GND
51		3.8				5		NC
52		3.8				5		NC
53		3.4						2.4
54		4.6						2.4
55		2.9						2.4
56		3.7						0
57								NC
58								NC
59								4.8
60								2.3
61								2.3
62								2.4
63								2.4
64								4.9

PIN NO	SYMBOL	IC108/V	IC109/V	IC301/V	IC401/V	IC402/V	IC403/V	IC404/V
1		10.5	1.8	0	0.7	14.6	13.7	11.8
2		15.4	2.1	0	8.3	GND	GND	GND
3		10.5	2.5	0	11.5	8	5	5
4		10.4	1.8	4.8	15.6			
5		GND	1.8	0.7	8.1			
6		10.4	1.9	GND	GND			
7		21	1.9	2	44			
8		10.5	1.8	1.6	GND			
9		10.5	1.8	1	8.4			
10			3.9	1.2	15.6			
11			3.9	GND	1.2			
12			3	4.8	1.2			
13			NC	1	7			
14			2.8	4.2				
15			1.8	4.2				
16			2.8	1				
17			NC	0				
18			GND	0				
19			4.9					
20			1.8					
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