TV VIF & SIF & DEFLECTION SYSTEM (IC FOR TV LARGE INTEGRATION)

The KA2915 is a monolithic integrated circuit containing all stages for the VIF, SIF and deflection functions of television receivers.

28 DIP

FUNCTIONS

- IF Amp.
- Video Amp.
- IF AGC
- Tuner AFT
- Sound DET. (FM DET.)
- Vertical trig.
- Vertical drive
- Horizontal drive

- Video DET. (AM DET.)
- Noise canceller
- Forward RF AGC
- SIF Amp.
- Sync separation
- Vertical oscillation
- Horizontal oscillation
- Horizontal AFC
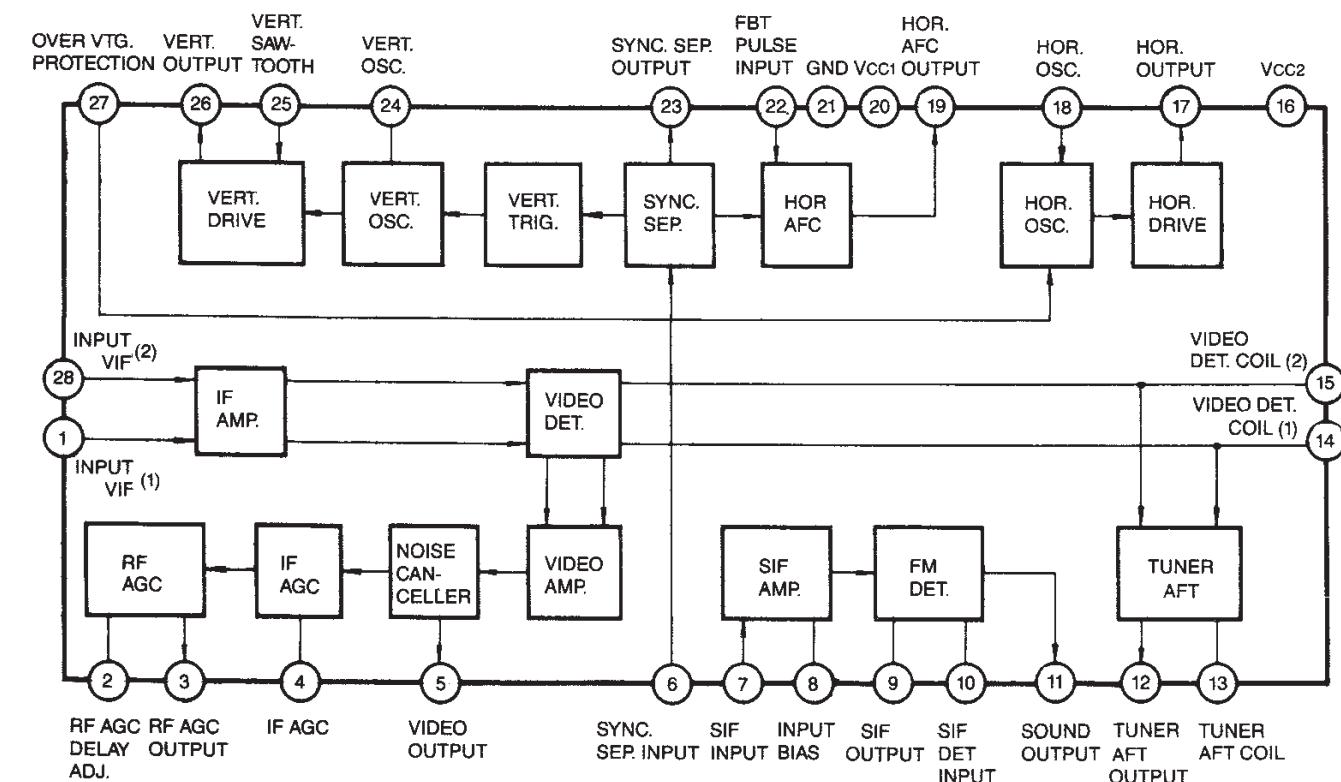
FEATURES

- **High integration technology makes possible the integration of video IF circuit a tuner AFC circuit a sound IF circuit a and deflection-jungle circuit a on a single chip.**
- **Supply voltage range: 8~12V (Typ. 10V).**

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2915	28 DIP	$-20 \sim +70°C$

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS ($T_a = 25°C$)

Characteristic	Symbol	Value		Unit
Supply Voltage	V_{CC} (V_{20-21})	12		V
Supply Current	I_{20}	85		mA
	I_{16}	15		mA
Circuit Voltage	$V_{2, 3, 4, 24-21}$	V_{20-21}	0	V
	V_{8-21}	5.5	0	V
	V_{13-21}	4.2	0	V
	V_{17-21}	V_{16-21}	0	V
Circuit Current	$I_{5, 6, 11, 23, 26}$	+ 0.3	− 10	mA (peak)
	I_{19}	+ 0.6	− 0.6	mA (peak)
	I_{25}	+ 10	0	mA (peak)
	I_{17}	+ 10	− 4	mA (peak)
Power Dissipation ($T_a = 70°C$)	P_D	1100		mW
Operating Temperature	T_{OPR}	− 20 ~ + 70		°C
Storage Temperature	T_{STG}	− 55 ~ + 150		°C

ELECTRICAL CHARACTERISTICS ($V_{CC1} = 10V$, $V_{CC} = 9.5V$, $T_a = 25°C$)
Video Section

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Video Det. Output	V_O	m = 87.5%	2.0	2.3	2.6	V_{p-p}
Input Sensitivity	S_{VI}	$V_O = -3dB$	–	50	55	$dB\mu$
Maximum Input	V_{MAX}	$V_O > +0dB$	105	110	—	dB
SN Rating	S/N	$V_I = 80dB\mu$	51	56	—	dB
Differential Gain	DG	m = 87.5%	—	4	8	%
Differential Phase	DP	m = 87.5%	—	3	6	deg
Video Freq. Characteristic	$G_{V (F)}$	$V_O = -3dB$	4.5	6.0	8.0	MHz
Sync. Peak Voltage	V_P		1.9	2.3	2.7	V
Noise Inverter Output Level	V_{NT}		1.0	1.4	1.8	V
Noise Inverter Capture Level	V_{NI}		3.0	4.0	5.0	V
Sound IF Output	V_{SIF}	P/S = 20dB	100	104	107	$dB\mu$
Input Resistor	R_{INI}	f = 45.75MHz	0.8	1.0	1.2	Kohm
Input Capacitor	C_{ZNI}	f = 45.75MHz	3.0	3.4	3.8	pF
Output Resistor	R_O5	f = 500kHz	30	50	150	ohm
RF AGC Gain	G_{RF} AGC	f = 10kHz, V_4 = 5mV	36	42	48	dB
RF AGC Max. Voltage	$V_{3 (MAX)}$		8.2	8.8	9.4	V
RF AGC Min. Voltage	$V_{3 (MIN)}$		3.6	4.2	4.8	V
AFT Center Voltage	V_2		4.0	5.4	6.0	V

Video Section (Continued)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
AFT SW Operating Voltage	V_{ART} SW	$R_S = 10K\Omega$	0.5	2.6	3.0	V
AFT Maximum Output Voltage	V_{12} (Max.)		8.5	9.6	10.0	V
AFT Minimum Output Voltage	V_2 (Min.)		0	0.7	1.2	V
Selection Sensitivity	μ	$R_L = 68K\Omega/82K\Omega$	30	50	90	mV/kHz

Sound Section

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Sound Det. Output	V_O	$f_O = 4.5MHz$, $f_m = 400Hz$ $\Delta f = \pm 25kHz$, $V_i = 100mVrms$	200	300	440	mVrms
Input Limit Voltage	$V_{I(LIM)}$	$f = 4.5MHz$, $f_m = 400Hz$ $\Delta f = \pm 25kHz$	—	280	450	μVrms
Total Harmonic Distortion	THD	$f_O = 4.5MHz$, $f_m = 400Hz$		0.6	1.0	%
AM Rejection Ratio	AMR	$\Delta f = \pm 25kHz$, $V_i = 100mVrms$	43	55	—	dB
Input Impedance	R_{17}	$f = 4.5MHz$	6	20	100	KΩ
	C_{17}		1.3	4.3	7.3	pF
Detector Input Impedance	R_{D9}	$f = 4.5MHz$	2.0	3.0	4.0	KΩ
	C_{D9}		2.1	5.1	8.1	pF
	R_{D10}		50	200	—	KΩ
	C_{D10}		2.9	3.4	3.9	pF
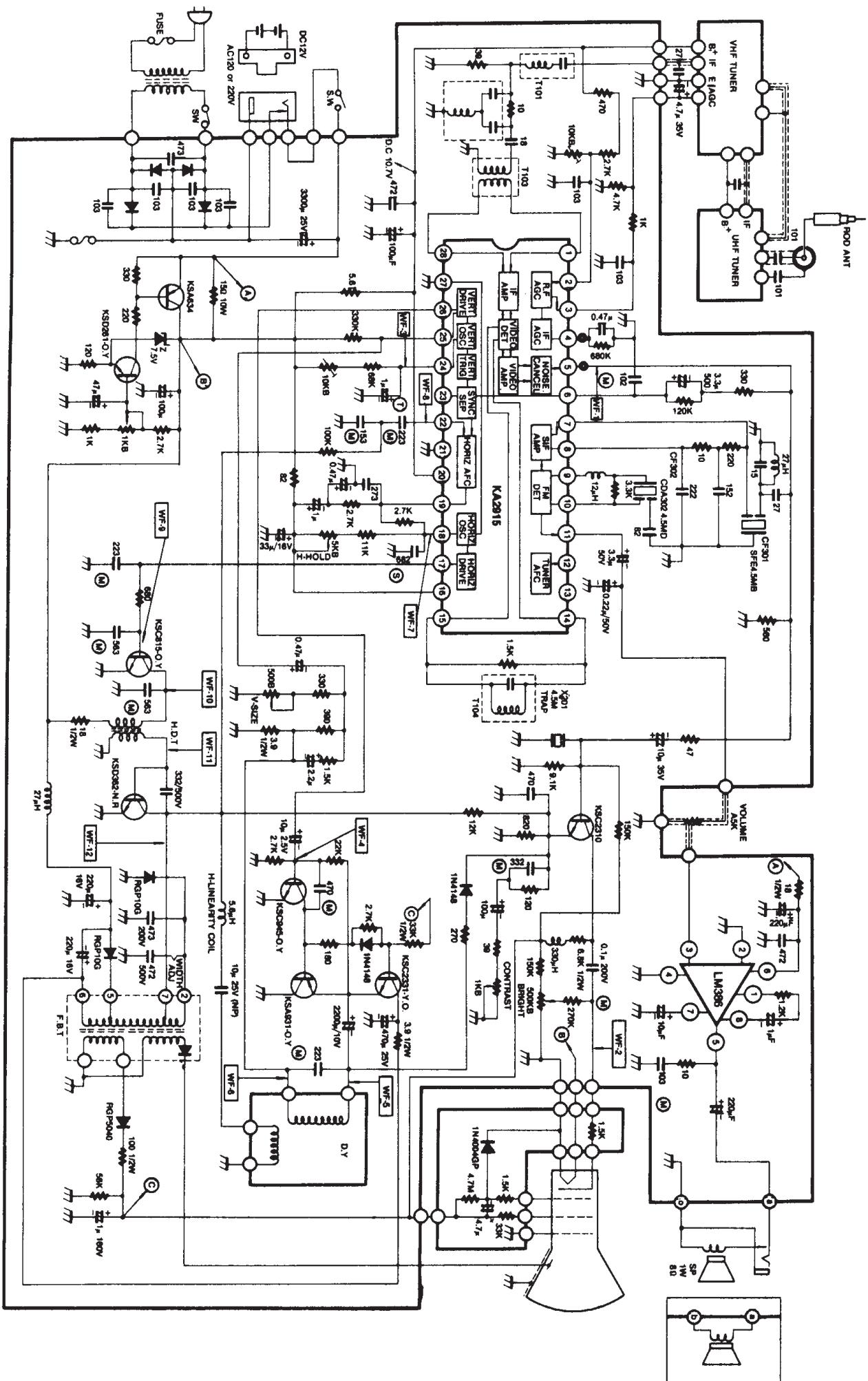
Deflection Section
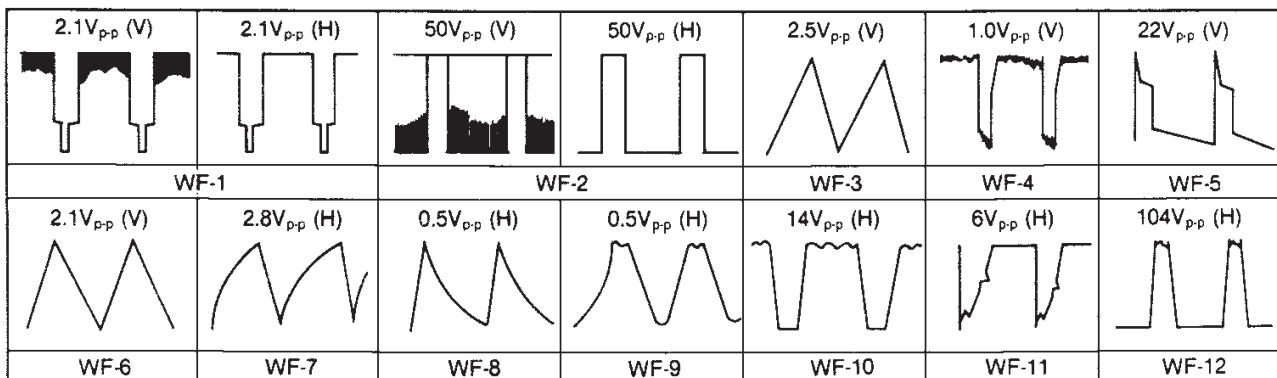
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Sync Sep. Hori. Pulse Width (1)	t_{SYNC1}	Video Input $2.5V_{P-P}$, APL=50%, $V_{CC1} = 10V$	4.8	5.1	5.4	μs
Sync Sep. Hori. Pulse Width (2)	t_{SYNC2}	Video Input $1.0V_{P-P}$, APL=50% $V_{CC1} = 10V$	4.9	5.2	5.5	μs
Hori. AFC Hori. Pulse Width (1)	t_{SYNC3}	Video Input $2.5V_{P-P}$, APL=50% $V_{CC1} = 10V$	4.8	5.1	5.4	μs
Hori. AFC Hori. Pulse Width (2)	t_{SYNC4}	Video Input $1.0V_{P-P}$, APL=50% $V_{CC1} = 10V$	4.9	5.2	5.5	μs
Vert Osc, Start Supply Voltage	$V_{FVO.S}$	$f_{VO} = 50 \sim 70Hz$ Output $= 0.7V_{P-P}$	—	—	6	V
Vert. Free Running Frequency	f_{VO}	$R_{OSC(V)} = 31.5K\Omega$	57	60	63	Hz

Deflection Section (Continued)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Vert. OSC. Pulse Width	t_{VO}	$R_{OSC\,(V)} = 31.5Kohm$	470	650	830	μs
Vert. full in Range	$f_{V\,(PULL)}$	$V_{CC1} = 12V, 8V$ $\Delta f_{VO}/V_{CC} = f_{VO}\,(12V)\text{-}f_{VO}\,(8V)$	0	1.0	1.3	Hz
Vert. Full in Range	f_{PV}	Composite Signal Input $2V_{P\text{-}P}$	—	44	48	Hz
Hori. OSC. Start Supply Voltage	$V_{FHO.S}$	$f_{HO} = 10 \sim 20kHz$ Output$=1V_{P\text{-}P}$ Pin 16 Voltage	—	—	5	V
Hori. OSC. Freq.	f_{HO}	$R_{OSC\,(H)} = 21K\Omega$	15.0	15.75	16.25	kHz
Hori. OSC. Pulse Width	t_{HO}	$R_{OSC\,(H)} = 21\Omega$	23	26	29	μs
Hori. OSC. Freq. Voltage Dependent	$\triangle f_{HO}/V_{CC}$	$V_{CC2} = 10V, 8V$ $\Delta f_{HO}/V_{CC} = f_{HO\,(10V)}\text{-}f_{HO\,(8V)}$	0	50	100	Hz
Hori. OSC. Control Sensitivity	ß	$\Delta I_1 \pm 100\mu A$ Input Variable OSC. Freq. Variable	73	81	89	$Hz/\mu A$
Phase Det. Sensitivity	μP	TV Input $2V_{P\text{-}P}$, $R_{(U)} = 31.4K\Omega, \mu = V19 \times 10$	13.5	16.5	19.5	$\mu A/\mu s$
X-Ray Protector Operating Voltage	$V_{27\text{-}21}$		0.81	0.87	0.93	V
X-Ray Protector Input Resistor	R_{27}		16	19	22.5	$K\Omega$

TYPICAL APPLICATION CIRCUIT (12″ or 14″ B/W TV)
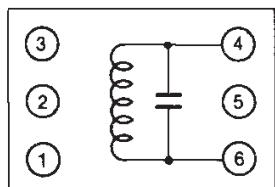
APPLICATION CIRCUIT (12″ or 14″ B/W TV) (Continued)

2.1V$_{p-p}$ (V)	2.1V$_{p-p}$ (H)	50V$_{p-p}$ (V)	50V$_{p-p}$ (H)	2.5V$_{p-p}$ (V)	1.0V$_{p-p}$ (V)	22V$_{p-p}$ (V)
WF-1		WF-2		WF-3	WF-4	WF-5

2.1V$_{p-p}$ (V)	2.8V$_{p-p}$ (H)	0.5V$_{p-p}$ (H)	0.5V$_{p-p}$ (H)	14V$_{p-p}$ (H)	6V$_{p-p}$ (H)	104V$_{p-p}$ (H)
WF-6	WF-7	WF-8	WF-9	WF-10	WF-11	WF-12

Change the specifications on the following table for your system

Location	System				
	B	D	I	IRELAND	AUSTRALIA
X201	5.5	6.5	6.0	6.0	5.5
CF301	SFE 5.5	SFE 6.5	SFE 6.0	SFE 6.0	SFE 5.5
CF302	CDA 5.5	CDA 6.5	CDA 6.0	CDA 6.0	CDA 5.5

NOTES: 1. All resistance values in ohm K = 1,000 M = 1,000,000.
2. All capacitors not noted in the schematic diagram are in pF the 3rd numeral of the capacitance value indicated 10^3 multiplier (EX: 683→68,000 pF).
3. Voltage readings taken with V.T.V.M. from the point indicated to chassis ground tuner on an unused channel at max other controls at normal line voltage 120 volts.
4. All waveforms measured with a strong signal input contrast set give a normal picture.
5. Voltage reading may vary 10%.
6. With this fundamental circuit diagram, some production changes may be made without revision of the overall diagram.

COIL SPECIFICATIONS

T104 Video Detector Coil

Bottom View

C$_O$ (pF)	f (MHz)	Q$_O$	Turns
4-6		4-6	4-6
51	45.75	100	5 7/8t

Wire: 0.3mm ø