

VIDEO IF SYSTEM FOR COLOR TVs

The KA2911, KA2916 are silicon monolithic integrated circuits designed for the VIF stage in color and B/W television receivers.

KA2911 for Reverse AGC Type.

KA2916 for Forward AGC Type.

FUNCTIONS

- Three controlled IF amplifier stages
- Video demodulator controlled by picture carrier
- Black noise and white noise inverter
- Peak AGC
- DC amplifier for RF AGC out
- Quadrature detector for AFT
- DC amplifier for AFT

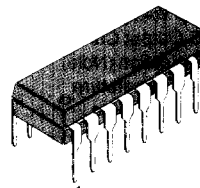
FEATURES

- High gain wide band IF amplifier
- Gain reduction with excellent stability
- Excellent DG/DP characteristics
- Excellent S/N characteristics due to delayed 3-stage AGC action
- Negative video output signal
- Fast AGC action due to noise inverter and peak AGC
- Switch off the video part with VTR SW
- Dual differential AFT output

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2911	16 DIP	- 20 + 65°C
KA2916		

16 DIP



BLOCK DIAGRAM

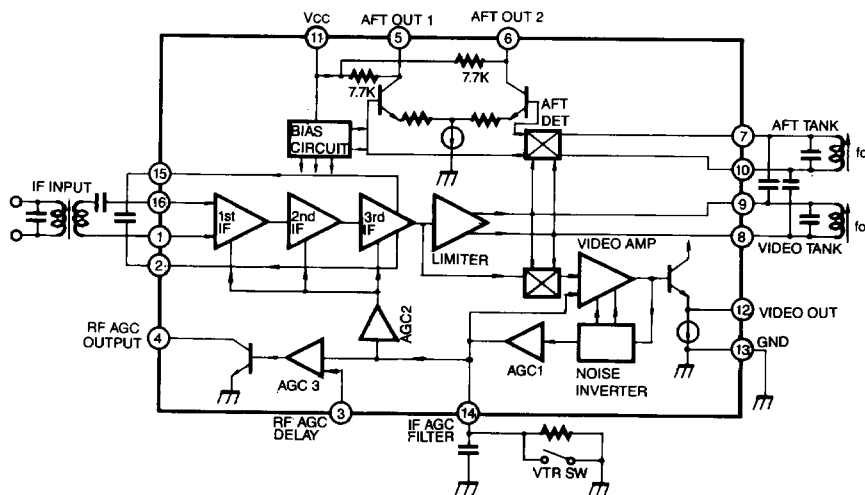


Fig. 2

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC} (Pin 11)	15	V
Open Loop Voltage	V_4 (Pin 4)	15	V
Video DC Output Current	I_{12} (Pin 12)	6	mA
Power Dissipation (Note)	P_d	1.4	W
Operating Temperature	T_{opr}	$-20 \sim +65$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

Note: Derated above $T_a=25^\circ\text{C}$ in the proportion of 11.2mW/ $^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	Test C'CT
Recommended Supply Voltage	V_{CC} (V_{11})		10.8	12.0	13.2	V	
Supply Current	I_{CC} (I_{11})	$V_{CC}=12\text{V}$	42	51	63	mA	1
Video DC Output Voltage	V_{12}	$V_{CC}=12\text{V}$	5.2	5.5	5.8	mA	1
AFT DC Output Voltage	V_5, V_6	$V_{CC}=12\text{V}$ $SW_1: \text{ON}, SW_2: \text{ON}$	5.3	6.8	8.3	V	1
AFT Output Offset Voltage	V_5-V_6	$V_{CC}=12\text{V}$ $SW_1: \text{ON}, SW_2: \text{ON}$	-1.5	0	1.5	V	1
RF AGC Residual Output Voltage	V_4 (sat)	$V_{CC}=12\text{V}, SW_3: 2, SW_4: 2$ KA2916 $SW_2: 1$ KA2911	—	—	0.5	V	1
RF AGC Leak Current	I_4 (Leak)	$V_{CC}=12\text{V}, SW_3: 1, SW_4: 2$ KA2911 $SW_2: 1$ KA2916	—	—	1	μA	1
Video Sensitivity	U_1 Pin (1-16)	$V_{CC}=12\text{V}, V_{12}=0.8\text{V}_{p-p}$ $f_o=45.75\text{MHz AM: } 30\%$	100	200	300	μVrms	2
AGC Range	ΔA (IF)	$V_{CC}=12\text{V}, f_o=45.75\text{MHz}$ $V_{14}=11.5\text{V} \rightarrow 4.0\text{V}$	60	64	—	dB	2
Sync Tip Level Voltage	V_{SYNC} (V_{12})	$V_{CC}=12\text{V}$ $f_o=45.75\text{MHz}$	2.3	2.5	2.7	V	2
Maximum IF Input Voltage	U_{IN} (Max)	$V_{CC}=12\text{V}$ $f_o=45.75\text{MHz}$	100	120	—	mVrms	2
White Noise Threshold	V_{WTH} (V_{12})	$V_{CC}=12\text{V}$ $f_o=45.75\text{MHz}$	5.8	6.2	6.6	V	2
White Noise Clamp Level	V_{WCL} (V_{12})	$V_{CC}=12\text{V}$ $f_o=45.75\text{MHz}$	3.7	4.1	4.5	V	2
Black Noise Threshold	V_{BTH} (V_{12})	$V_{CC}=12\text{V}$ $f_o=45.75\text{MHz}$	1.4	1.6	1.8	V	2
Black Noise Clamp Level	V_{BCL} (V_{12})	$V_{CC}=12\text{V}$ $f_o=45.75\text{MHz}$	2.9	3.3	3.7	V	2
Video Frequency Response	F_{BW}	Input 45.75MHz Sweep generator	4.5	5.5	—	MHz	2

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	Test Fig
Suppression of Carrier	C_L	$SG_1 = 100\text{mVrms}$ $SG_2, SG_3 \text{ OFF}$	40	50	—	dB	4
Suppression of and 2nd Carrier	I_{2nd}	$SG_1 = 100\text{mVrms}$ $SG_2, SG_3 \text{ OFF}$	40	50	—	dB	4
920KHz Beat Level	I_{920}	$SG_1 = 100\text{mVrms}$ $SG_2 = 32\text{mVrms}$ $SG_3 = 32\text{mVrms}$	33	38	—	dB	4
Differential Phase	DP		—	3.5	5	deg	3
Differential Gain	DG		—	7	10	dB	3
Input Impedance	R_{IN}	$f_o = 45.75\text{MHz}$ between Pin 16-1	3.0	4.5	6.0	K Ω	
	C_{IN}		—	2.0	5.0	pF	
AFT Sensitivity	$\Delta F/\Delta V_{5-6}$	$f_o = 45.75\text{MHz}$	—	16	—	KHz/V	2
AFT Output Upper Voltage	$V_{5,}$ $V_6 \text{ (UPP)}$	$f_o = 45.75\text{MHz}$	11.7	11.9	12.0	V	2
AFT Output Lower Voltage	$V_{5,}$ $V_6 \text{ (Low)}$	$f_o = 45.75\text{MHz}$	1.8	2.3	2.8	V	2
Max Available Current	$I_4 \text{ (max)}$	KA2911	0.3	—	—	mA	2
		KA2916	7	—	—	mA	

TYPICAL APPLICATION CIRCUIT

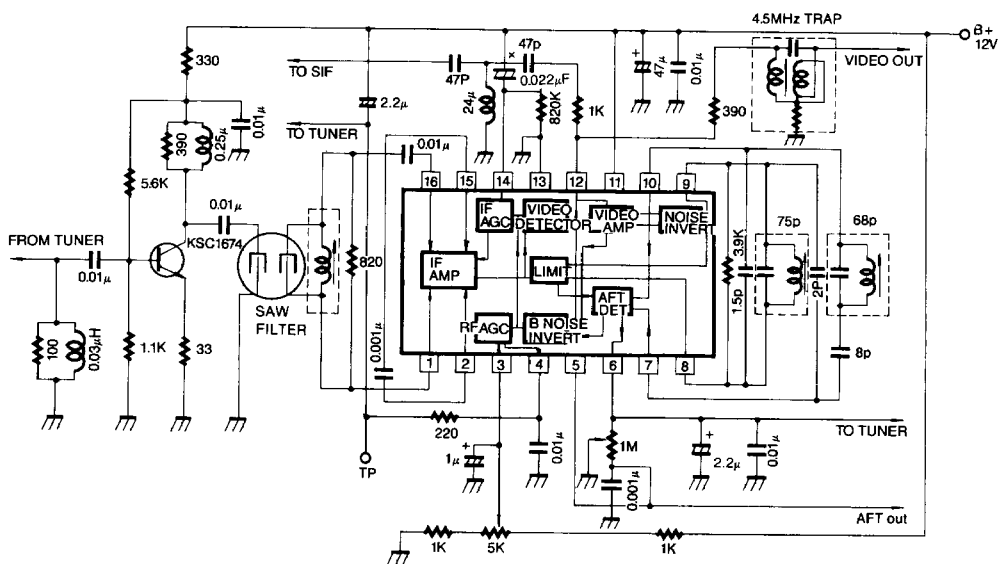


Fig. 2

TEST CIRCUIT 1 (DC Characteristics)

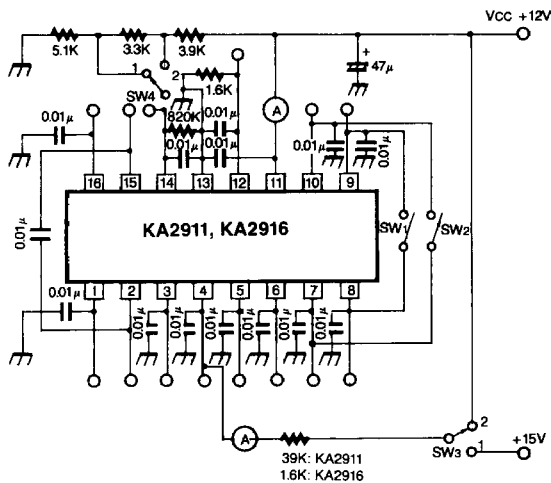


Fig. 3

TEST CIRCUIT 2 (Dynamic Characteristics)

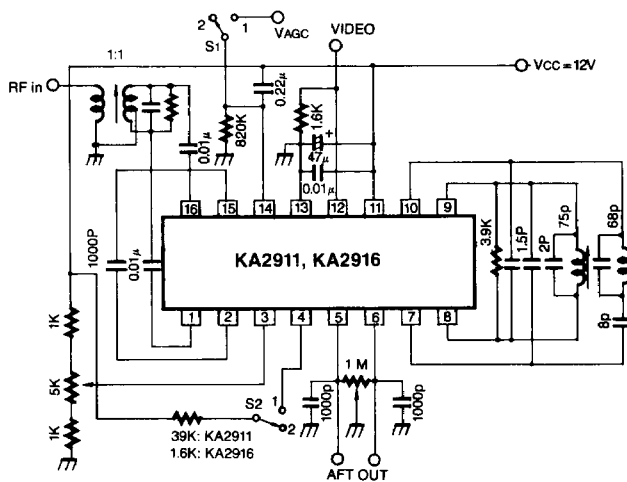


Fig. 4

TEST CIRCUIT 3 (DP, DG)

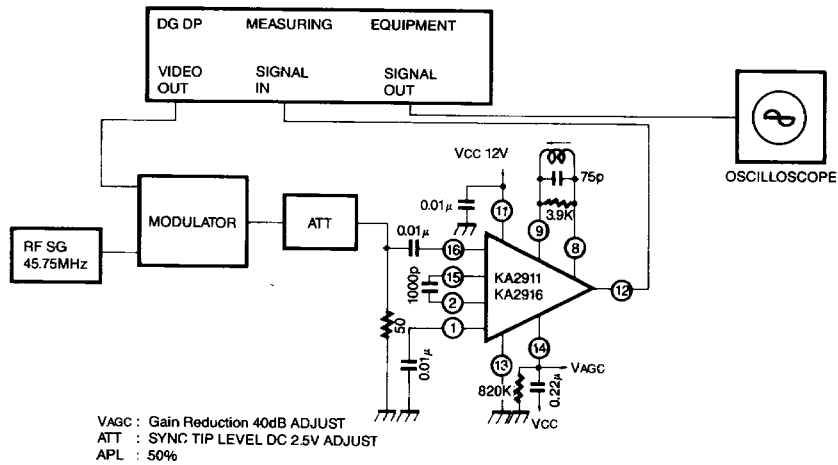


Fig. 4

TEST CIRCUIT 4 (Inter Modulation)

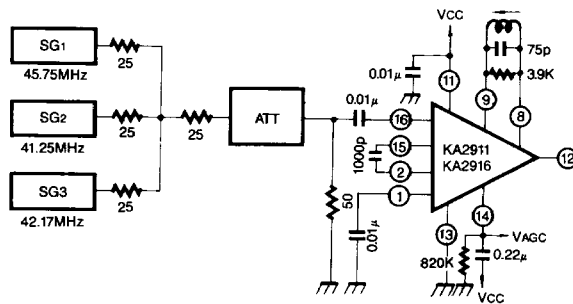


Fig. 5