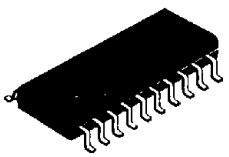
UHF BAND RF MODULATOR

The KA2982D is a monolithic integrated circuit samll out-line package designed for use in the UHF RF converter for VCRs, video game machines and so on.

20-SOP-375



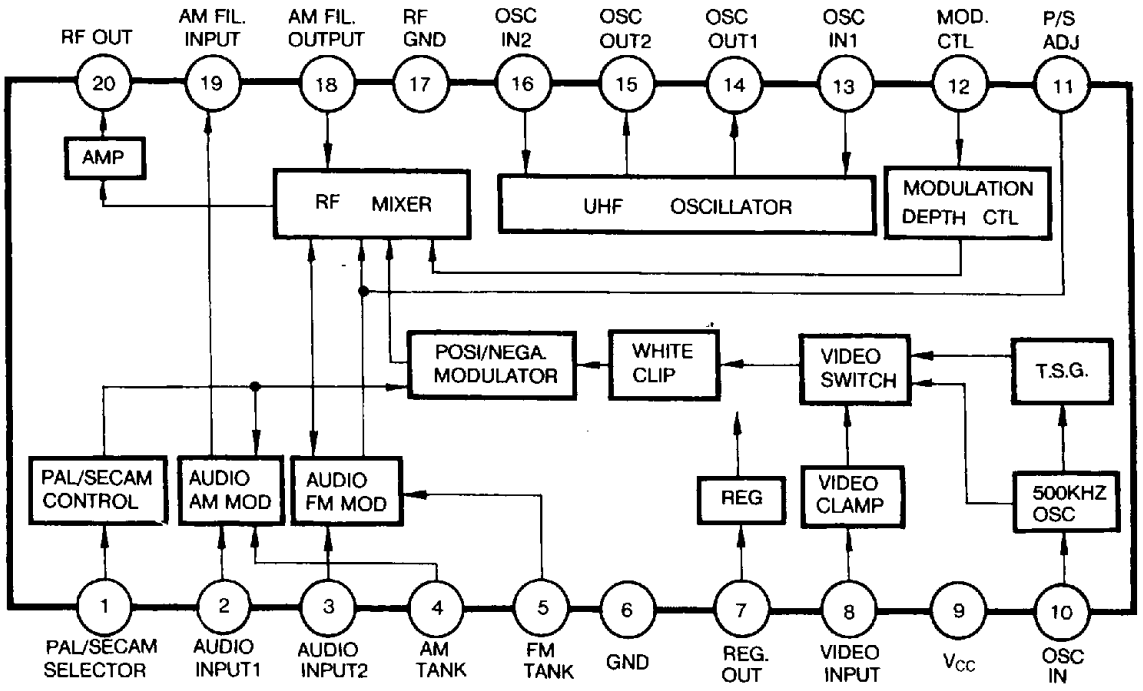
FEATURES

- **Supply voltage 5V (4.5V~5.5V)**
- **Symmetrical RF oscillator to 700MHz**
- **Video input clamp/White clip**
- **Negative/Positive video AM**
- **FM/AM audio modulation**
- **Control of video modulation index**
- **Picture carrier to Sound carrier ratio Adjustment**
- **Oscillator stability**
- **Built in TSG**
- **Picture/Sound RF mixer**

ORDERING INFORMATION

Device	Package	Operating Temperature
KA2982D	20-SOP-375	−20°C~+70°C

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Characteristic	Symbol	Value	Unit
Power supply	V_{CC}	7	V
Power dissipation	P	350	mW
Operating Temperature	T_{opr}	−20~+70	°C
Storage Temperature	T_{stg}	−55~+125	°C

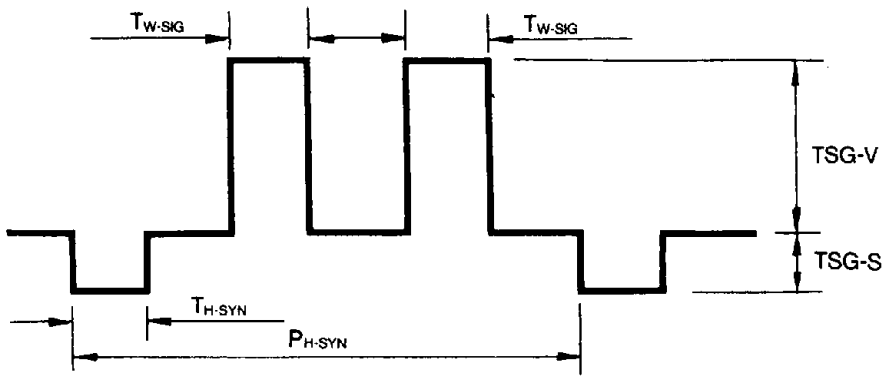
ELECTRICAL CHARACTERISTICS (TA=25°C, V_{CC}=5V)

f_p=591.25MHz +/−1MHz, f_s=5.5MHz +/−100KHz

Characteristic	Symbol	Conditions	SPEC			Unit
			Min	Tpy	Max	
Supply Current	I_{CC}	No input Signal (Audio, Video)	30	40	50	mA
TSG MOD Depth	M_{TSG}	SW2: OFF	70	80	90	%
TSG V/S Ratio	$R_{TSG\ V/S}$	#See NOTE 1	1.7	2.0	2.3	
H-Sync SIG. Period	$P_{H\text{-}SYNC}$		63	64	65	uS
H-Sync SIG. Width	$T_{H\text{-}SYNC}$		3.5	4.0	4.5	uS
White SIG. Width	$T_{W\text{-}SIG}$		3.5	4.0	4.5	uS
Max FM MOD. Depth	$M_{FM\ MAX}$	Sine 1KHZ $5V_{p\text{-}p}$	180			%
A. 2nd Harmonic	$THD_{(A)}$	No Input Signal(AUDIO)	48	53		dB
A. SIG.to Noise R.	$G_{A\text{-}S/N}$	#See NOTE 2	50	55		dB
A. FM MOD. Depth	$M_{A\text{-}FM}$	Sine 1KHZ. $2.5V_{P\text{-}P}$(50KHZ:100%)	58		122	%
A. AM MOD. Depth	$M_{A\text{-}AM}$	Sine 1KHZ. $1V_{P\text{-}P}$	50	60	70	%
A. FM Distortion	$THD_{(FM)}$	Use STD Demodulator (PAL)			3	%
A. AM Distortion	$THD_{(AM)}$	Use STD Demodulator (SECAM)			3	%
Amp. Freq. Respon.	G_A	$0.1V_{p\text{-}p}$, 0.1KHZ-10KHZ(REF:1KHZ)	−2		+2	dB
P/S Carrier Ratio	$G_{P/S}$	No Input Signal(AUDIO, VIDEO)	11.5	13.5	15.5	dB
Sync Crush Level	ΔS_{sync}	V_i=$0.55V_{p\text{-}p}$ Color Bar Signal			10	%
1'st Sync White Signal Rise Time	TV1	No Input Signal. #See Note 1	22	24	26	uS

Characteristic	Symbol	Conditions		SPEC Min	SPEC Tpy	SPEC Max	Unit
2'nd Sync White Signal Rise Time	TV2	No Input Signal. #See Note 1		38	40	42	uS
Differential Phase	DP	$1V_{p-p}$, Stair-Step Video Siginal Measured APL 50% (Chroma=40IRE)			2	3	deg
Differential Gain	DG						%
RF Voltage Change	DG_{RF}	500-700MHz		−2		+2	dB
IN Band Spurious	G_{IN-LKG}	Measure Between F_V & F_a (NO A/V Input Signal)				−53	dB
Out Band Spurious	$G_{OUT-LKG}$	Measure between 0 & 1GHz exept the range of F_V −5.5 MHz (Standard A/V MOD)				−60	dB
V. MOD. Depth	M_{V-NEG}	PAL	$1V_{p-p}$, 100% White Video Signal	70	80	90	%
V. MOD. Depth	V_{V-POS}	SECAM					
V. Output Level	V_O	No Input Signal (VIDEO, AUDIO)		78.5	81	83.5	dBuV
Chroma Beat	G_{C-BEAT}	$0.5V_{p-p}$, Sine 4.43MHz In (PAL)		64	67	−	dB
V. 2nd Har. Dist.	$THD_{(V)}$	V. In=$1V_{p-p}$, Sine 1MHz			−56	−46	dB
V. Freq. Respon.	G_V	$1V_{p-p}$, Sine 0.5MHz-5MHz (REF;1MHZ)		−2		+2	dB
V. S/N Ratio	$G_{V-S/N}$	Use Video S/N Meter		50			dB
Max V. MOD. Depth	M_{V-MAX}	$1\text{-}1.5V_{p-p}$, 100% White Video Signal		84	93		%
OSC Freq. Drift	DF_{OSC}	VCC:4.5-5.5V		−200		+200	KHz

#NOTE1:TSG Output Waveform



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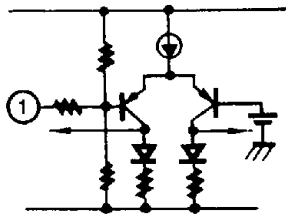
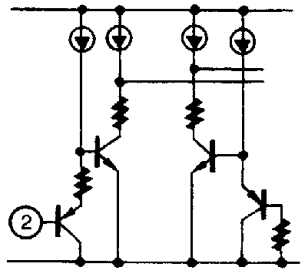
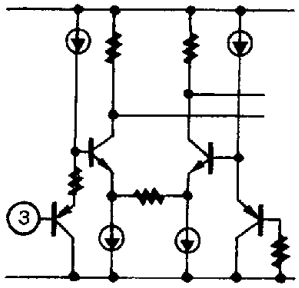
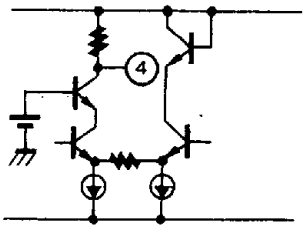
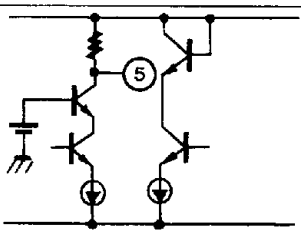
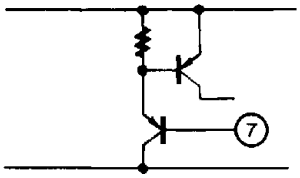
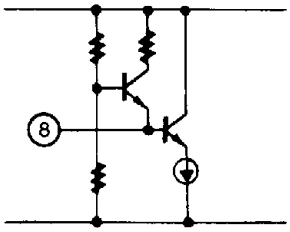
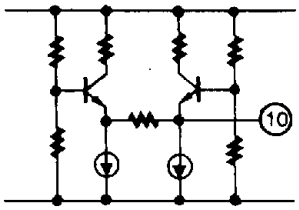
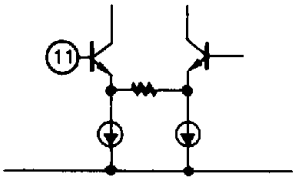
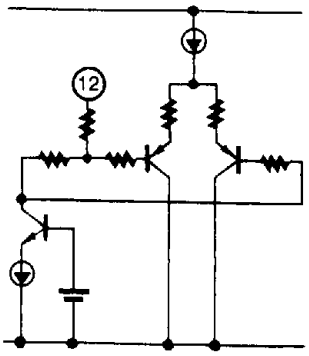
#NOTE2:Input Condition
1) Audio input: Sine Wave 1KHz. $1V_{p-p}$
2) Video input: Stair-Step Video Signal. $1.0V_{p-p}$

PIN DESCRIPTION

Pin	Funciton	Description	Equivalent	Remark
1	PAL/SECAM Mode Control	PAL Mode:HIGH SECAM Mode: OPEN		BIAS: 2.1-2.2V at 1 Pin
2	AUDIO IN 1	AUDIO Input For AM(SECAM System)		BIAS: 0V
3	AUDIO IN 2	AUDIO Input For FM(PAL System)		BIAS: 0V
4	AM TANK	LC Parallel Resonance TANK		BIAS: 3.4V
5	FM TANK	LC Parallel Resonance TANK		

Pin	Funciton	Description	Equivalent	Remark
6	Ground			
7	Regulator Output	Voltage Regulator Output		BIAS: 4.0V
8	Video Input	Video Input (Clamp Input)		BIAS(Clamp Level): 2.7V
9	Vcc	Power Supply		Supply Voltage:4.5-5.5 V
10	OSC Input	OSC in for T.S.G.		Bias: 1.9V
11	P/S ADJ.	P/S Control Pin		PAL Mixer & FM MOD
12	Modulation CTL In	Modulation Control Pin		SECAM&PAL Mixer

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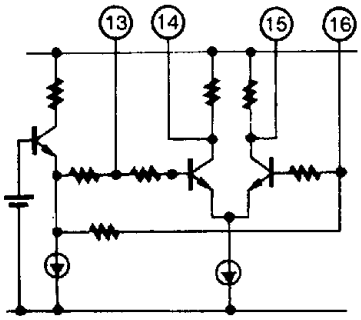
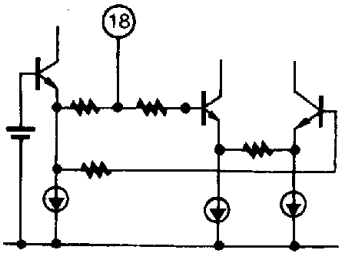
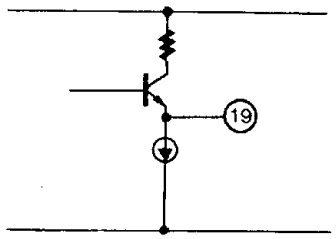
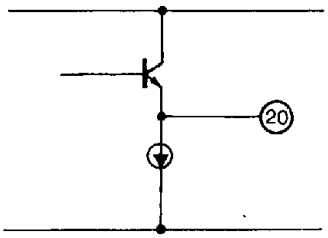
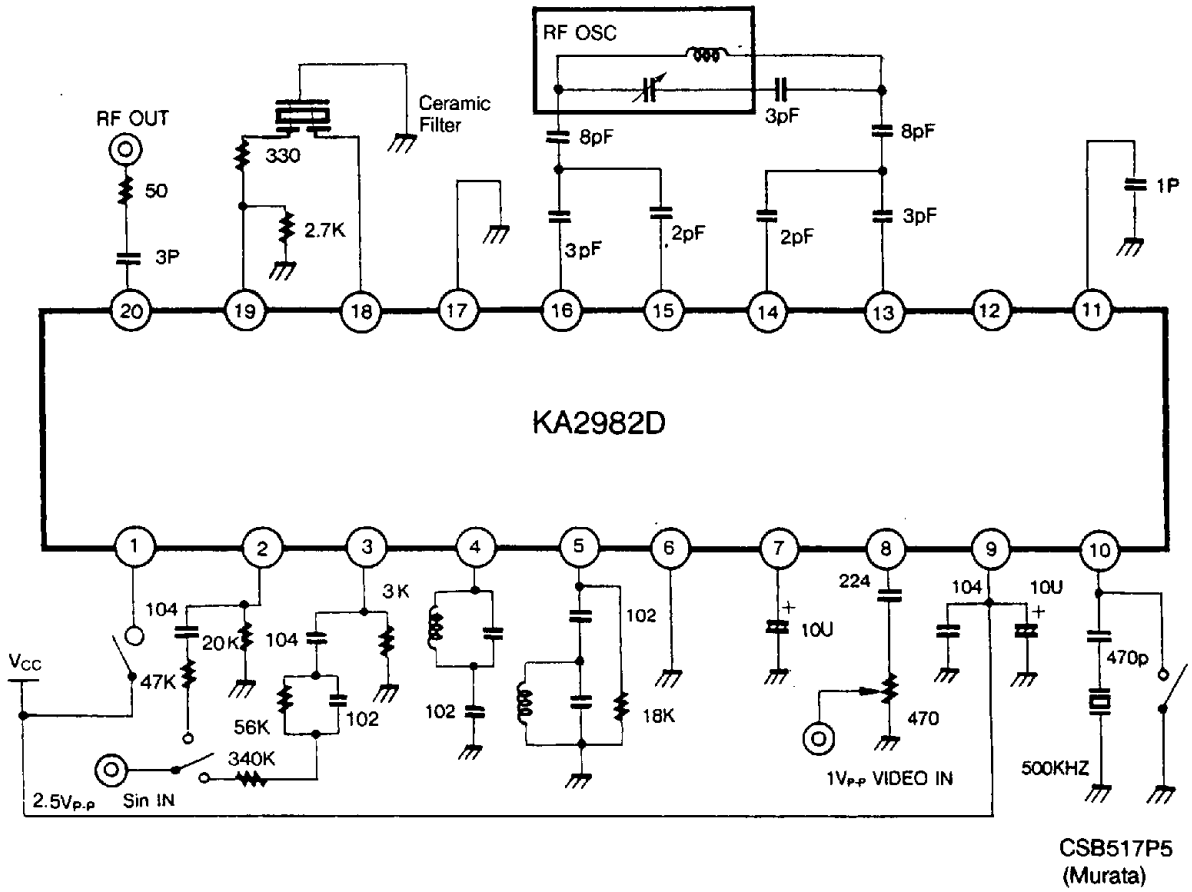
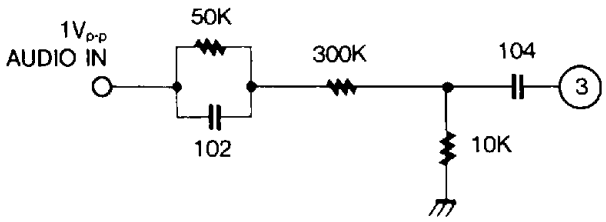
Pin	Funciton	Description	Equivalent	Remark
13	OSC IN 1			
14	OSC OUT 1			
15	OSC OUT 2			
16	OSC IN 2			
17	RF GND			Ground For OSC
18	AM Filter Out			The Output of Ceramic Filter input to SECAM Mixer
19	AM Filter Input (Ceramic Filter Input: AM)			AM MOD OUTPUT
20	RF OUTPUT			RF Output (Buffer Output)

TEST CIRCUIT



NOTE 1: AUDIO PREEMPHASIS TEST CIRCUIT FOR FM.



NOTE 2: Bins Correspond to FM AUDIO MOD Depth

Device	FM AUDIO MOD. Depth
KA2982D-01	58~69.5%
KA2982D-02	65.5~92%
KA2982D-03	88~122%

Application Circuit