



BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1356C2

COMPLETE PICTURE IF IC FOR COLOR TV

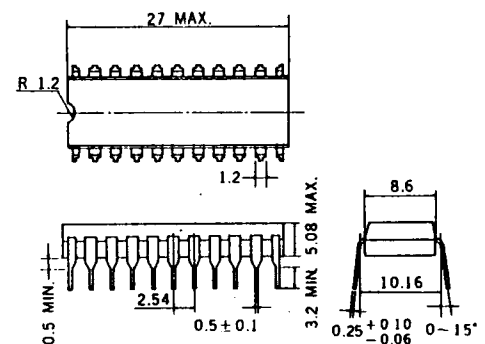
SILICON BIPOLAR MONOLITHIC INTEGRATED CIRCUIT

The μ PC1356C2 is a silicon monolithic integrated circuit for PIF section in Color Television receivers. As it contains picture detector and sound IF detector separately, it can offer excellent low buzz characteristics. This IC has all functions including picture IF amplifier (4th), picture low-level detector, sound IF detector, AFC detector, IF AGC, RF AGC and picture amplifier.

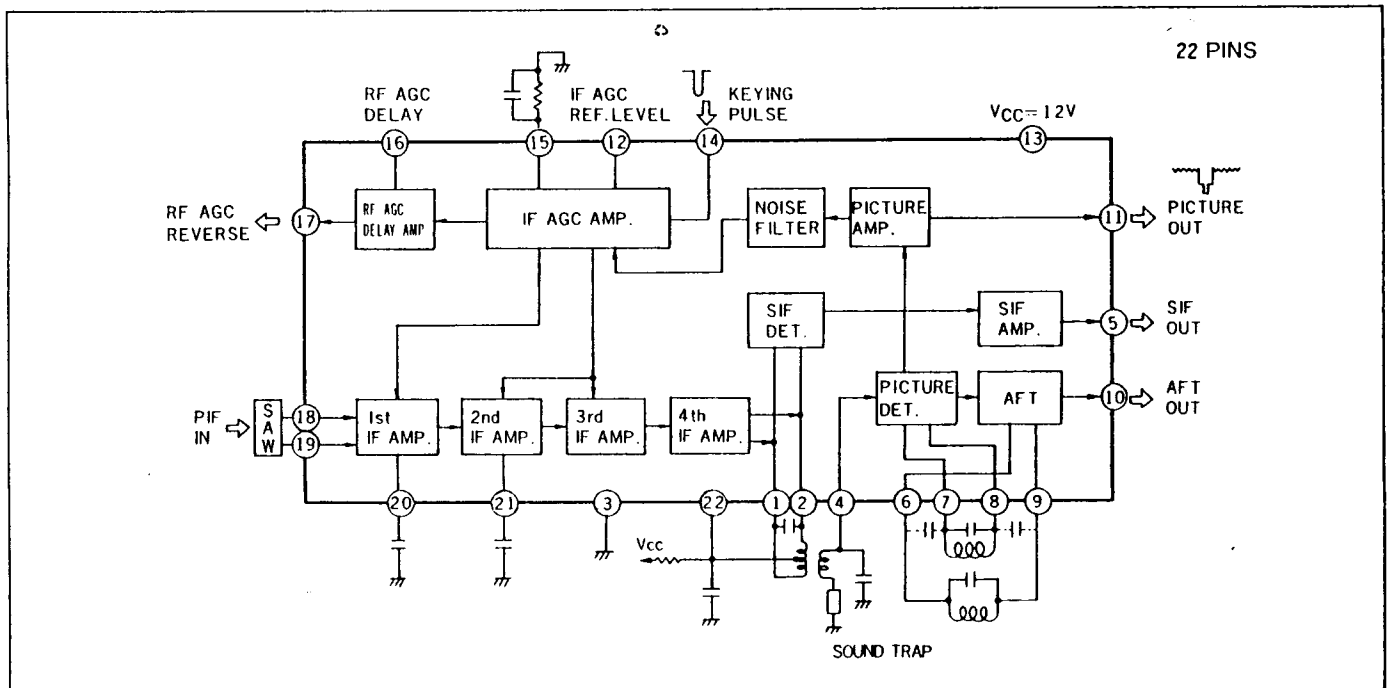
FEATURES

- As it contains picture detector and sound IF detector separately, it can offer excellent low buzz characteristics for Audio Multiplex TV.
- High input sensitivity; TYP. 32 dB μ
- The AGC control range is wide; TYP. 70 dB
- As input is differential mode, it can be used with SAW filter.

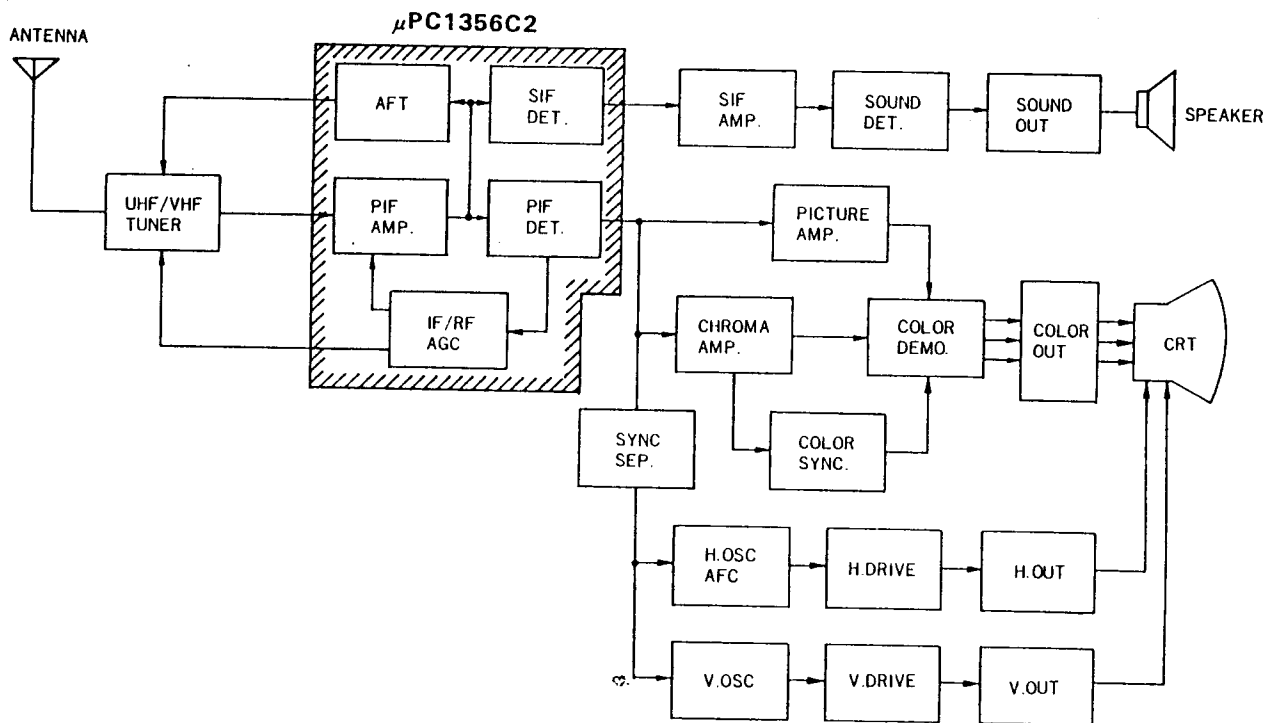
PACKAGE DIMENSIONS (Unit: mm)



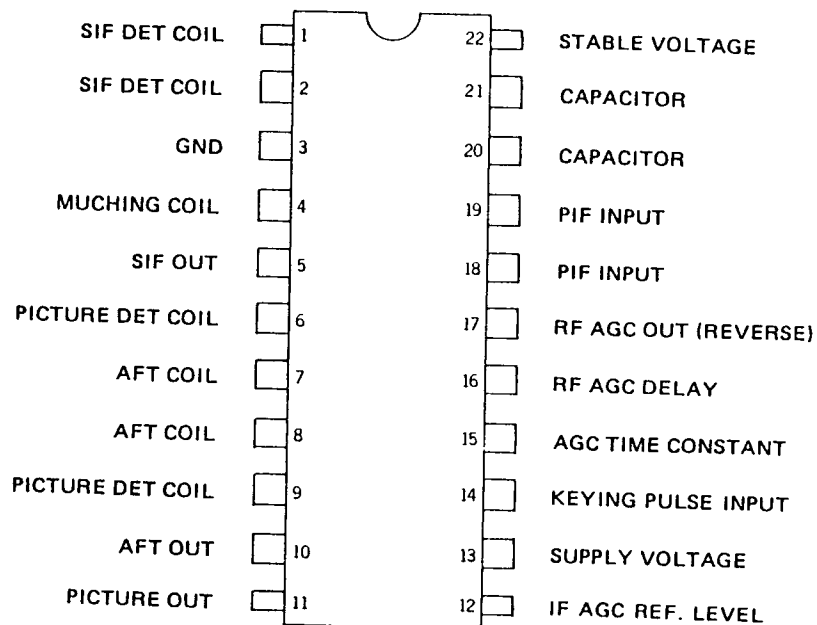
BLOCK DIAGRAM



TV BLOCK DIAGRAM



CONNECTION DIAGRAM (Top View)



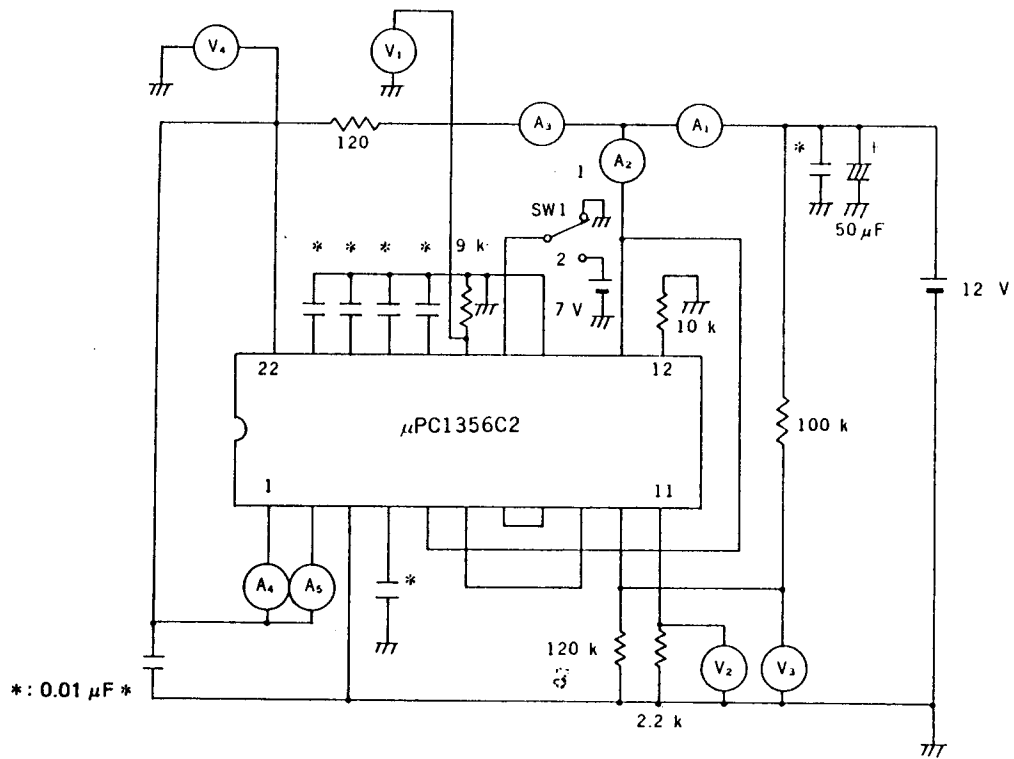
ABSOLUTE MAXIMUM RATINGS ($T_a = 25 \pm 3^\circ\text{C}$)

Supply Voltage Pin-13	$V_{13\text{MAX.}}$	15	V
Terminal 22 Current	$I_{22\text{MAX.}}$	100	mA
Terminal 14 Current	$I_{14\text{MAX.}}$	± 3	mA
Power Dissipation	P_d	900 ($T_a \leq 65^\circ\text{C}$)	mW
Operating Temperature	T_{opt}	-15 to +65	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

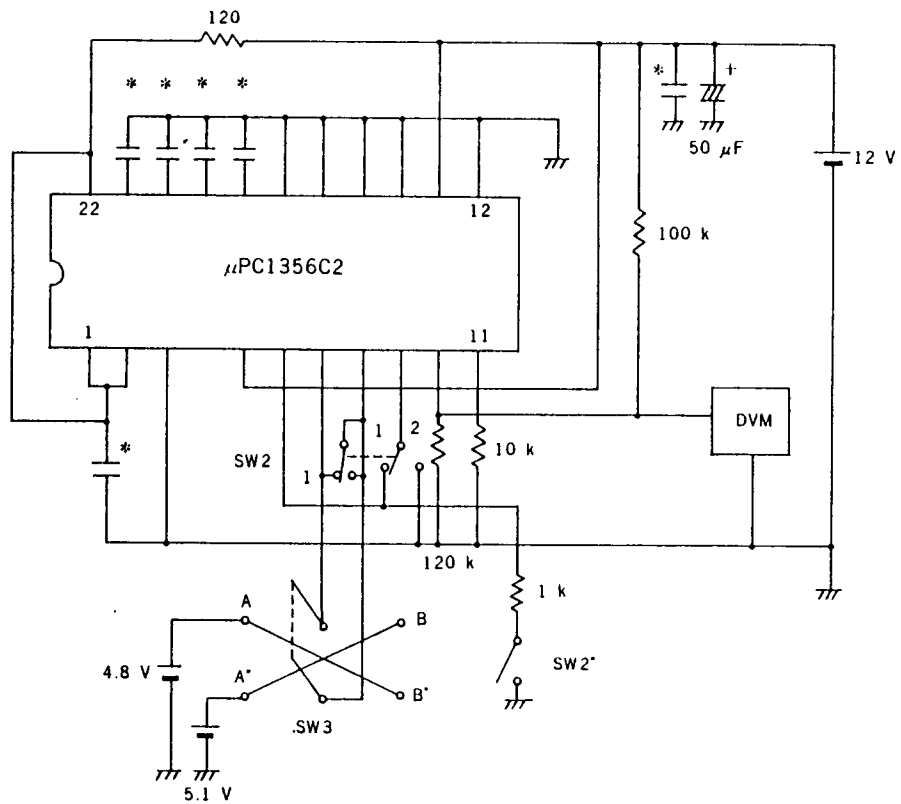
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 12\text{ V}$, $R_A = 120\ \Omega$, $f_p = 58.75\text{ MHz}$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Total Supply Current	I_{CC}	1	55	70	90	mA	Zero Carrier
Terminal 13 Current	I_{13}	1	20	30	40	mA	Zero Carrier
Terminal 22 Current	I_{22}	1	35	40	50	mA	Zero Carrier
Terminal 22 Voltage	V_{22}	1	6.6	7.2	7.6	V	
Maximum RF AGC Voltage	V_{17H}	1	9.0	9.2	10.0	V	$V_{16} = 7\text{ V}$
Minimum RF AGC Voltage	V_{17L}	1		0	0.5	V	$V_{16} = 0\text{ V}$
Terminal 11 Voltage	V_{11}	1	3.7	4.1	4.7	V	
Terminal 10 Voltage	V_{10}	2	5.0	6.5	7.7	V	
Maximum AFT Out Voltage	V_{10H}	2	11.0			V	$V_7 = 4.8\text{ V}$ $V_8 = 5.1\text{ V}$
Minimum AFT Out Voltage	V_{10L}	2			1.0	V	$V_7 = 5.1\text{ V}$ $V_8 = 4.8\text{ V}$
Input Sensitivity	$U_i(\text{lim})$	3	25	32	41	dB μ	$f_m = 400\text{ Hz}$ $m = 40\%$ $U_o = 0.8\text{ Vp-p}$
AGC Range	G.R	3	60	80		dB	$f_m = 10\text{ kHz}$ $m = 40\%$ $U_o = 0.8\text{ Vp-p}$
Maximum Input Voltage	$U_i(\text{MAX})$	3	100	55		mVr.m.s.	$f_m = 10\text{ kHz}$ $m = 40\%$ $U_o = 0.8\text{ Vp-p}$
Signal To Noise Ratio	S/N	3	50			dB	$f_m = 15.75\text{ kHz}$ $m = 80\%$ $U_o = 1.5\text{ Vp-p}$ $U_i = 10\text{ mVr.m.s.}$
SIF Output Voltage	$U_o(\text{SIF})$	3	12	25	50	mVrms	$f_m = 400\text{ Hz}$ $m = 40\%$ $U_i(P) = 3\text{ mVr.m.s.}$ $f_s = 54.25\text{ MHz}$ $U_i(S) = 300\ \mu\text{Vr.m.s.}$
Carrier Leak	CL(DET)	3		5	50	mVr.m.s.	$U_i = 20\text{ mVr.m.s.}$
Picture Frequency Response	f_C	3	5	13		MHz	$m = 40\%$ $U_i = 20\text{ mVr.m.s.}$
Differential Gain	DG	3		5		%	$f_p = 58.75\text{ MHz}$ Stair Step $f_m = 3.58\text{ MHz}$ $m = 85\%$
Differential Phase	DP	3		5		deg	14 % Modulated White To Sync Level $U_o(\text{DET}) = 1.4\text{ Vp-p}$
AFT Control Sensitivity	S_f	3	50	150		mV/kHz	$f_m = 400\text{ Hz}$ $m = 40\%$ $U_o = 0.8\text{ Vp-p}$
AFT Band Width	BW	3	0.2	1.1	2.1	MHz	$f_m = 400\text{ Hz}$ $m = 40\%$ $U_o = 0.8\text{ Vp-p}$
PIF Input Resistance	R_i	4		1.5		k Ω	
PIF Input Capacitance	C_i	4		3.5		pF	

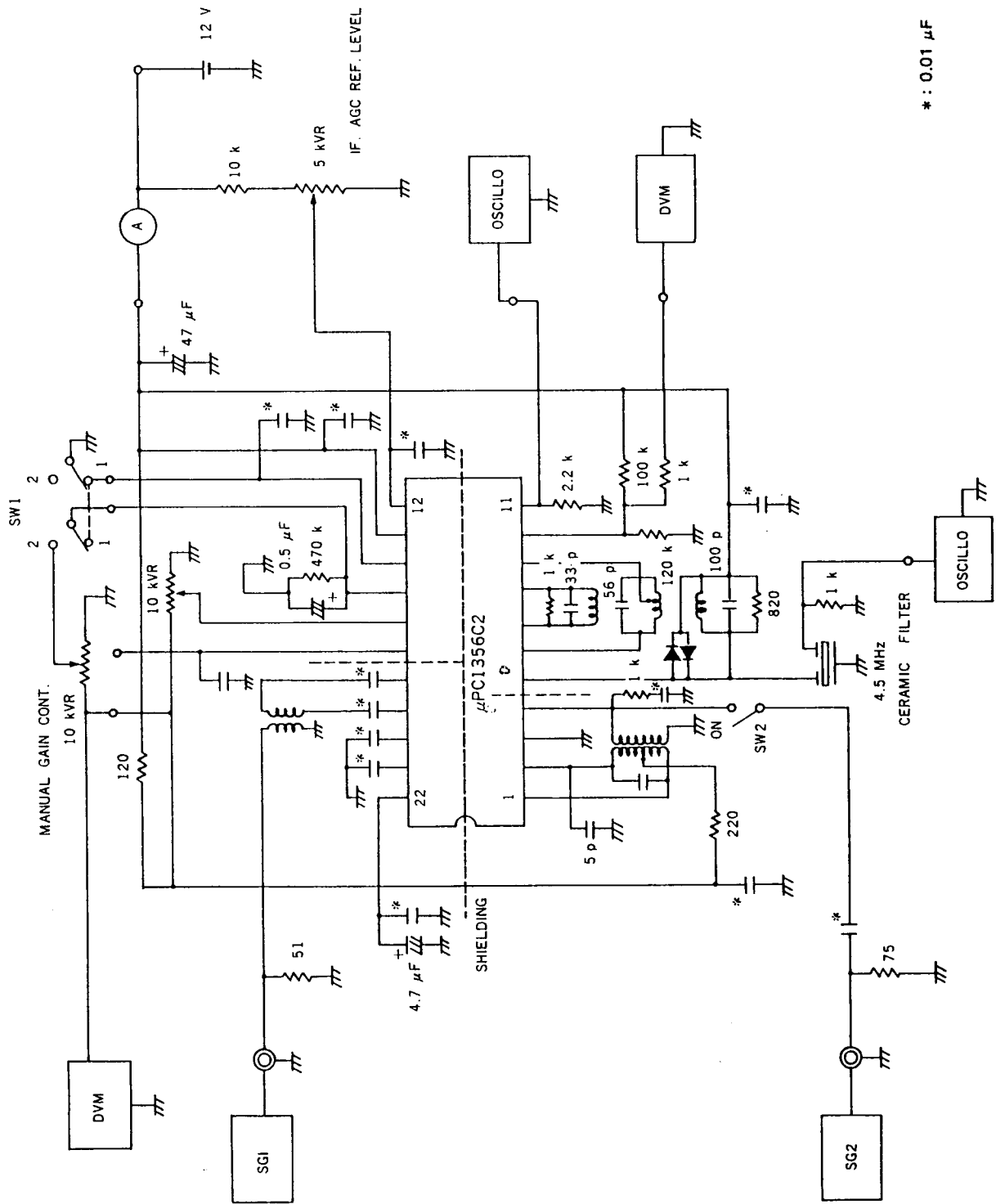
TEST CIRCUIT 1



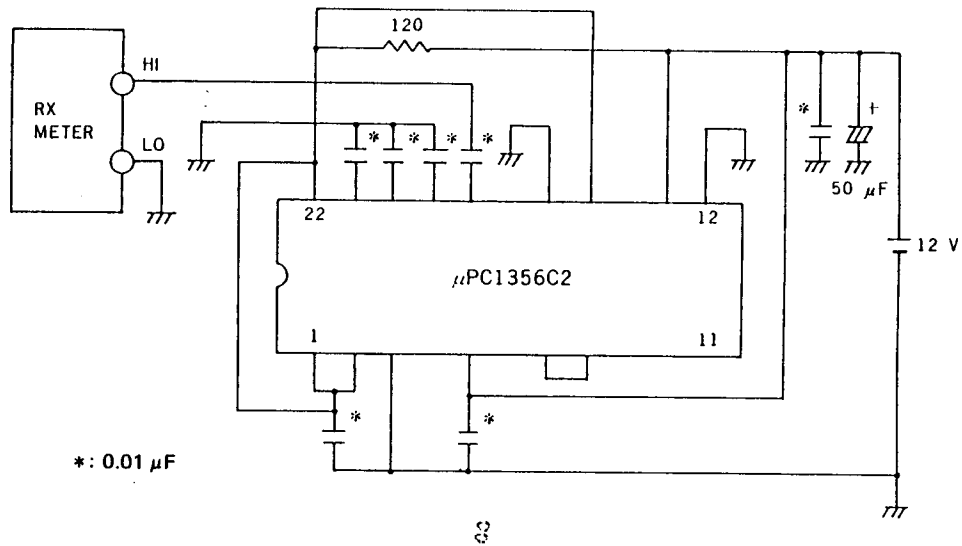
TEST CIRCUIT 2



TEST CIRCUIT 3



TEST CIRCUIT 4



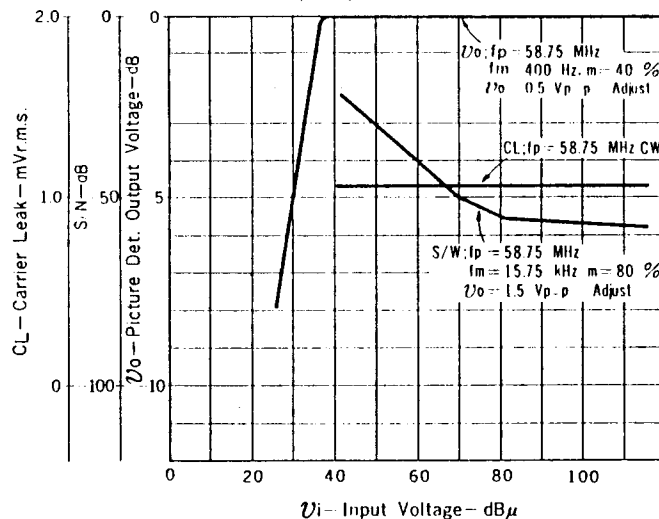
SWITCH TABLE

ITEM	I _{CC}	I ₁₃	I ₂₂	V ₂₂	I _{1,12}	Δ I	V _{17H}	V _{17L}	V ₁₁	V ₁₀	V _{10H}	V _{10L}
TEST CIRCUIT	1	1	1	1	1	1	1	1	1	2	2	2
SW1	1	1	1	1	1	1	2	1	1	—	—	—
SW2	—	—	—	—	—	—	—	—	—	1 SW2 OFF	2	2
SW3	—	—	—	—	—	—	—	—	—	OFF	AA'	BB'
METER	A ₁	A ₂	A ₃	A ₄	A _{4A5}	A _{4A5}	V ₁	V ₁	V ₂	V ₃	V ₃	V ₃

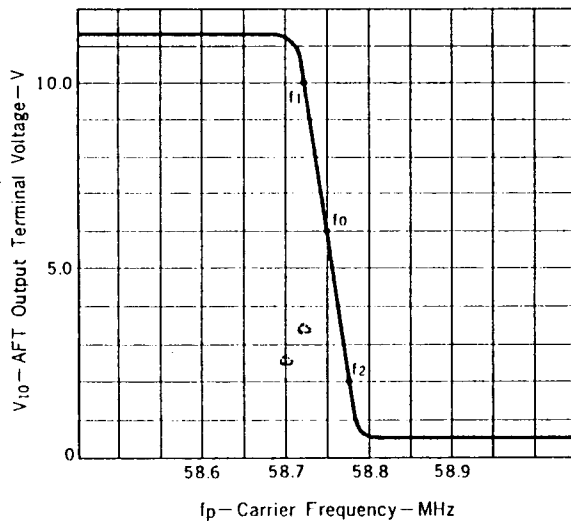
ITEM	V _i (J _m)	G.R.	V _i MAX	S/N	V _o (SIF)	CL(DET)	f _C	D.G.	D.P.	S _f	B	R _i	C _i
TEST CIRCUIT	3	3	3	3	3	3	3	3	3	3	3	4	4
SW1	1	1	1	2	1	2	2	2	2	2	2	—	—
SW2	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	—	—
MGCVR				VARIABLE		MGC GAIN MIN	MGC GAIN MIN	MGC GAIN MIN	MGC GAIN MIN	MGC GAIN MIN	MGC GAIN MIN		
SG	SG ₁	SG ₁	SG ₁	SG ₁	SG ₁	SG ₂	SG ₂	SG ₂	SG ₂	SG ₂	SG ₂	—	—
METER	OSCILLO	OSCILLO	OSCILLO	NOISE METER	OSCILLO	VTVM	OSCILLO	DG/DP METER	DG/DP METER	DIGIT VOLT METER	DIGIT VOLT METER	RX METER	RX METER

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

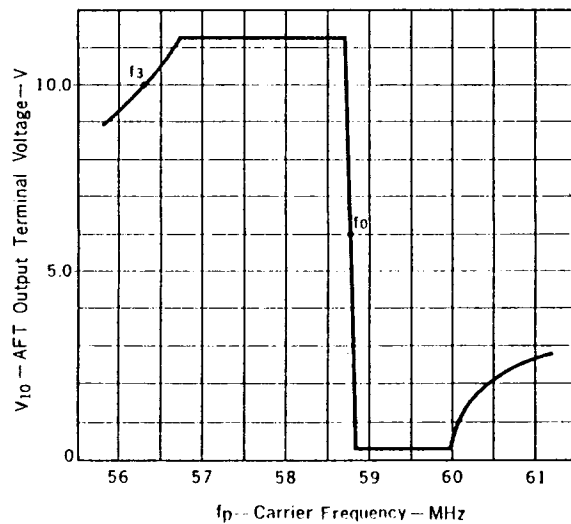
PICTURE DET. OUTPUT VOLTAGE, S/N, CARRIER LEAK vs. INPUT VOLTAGE



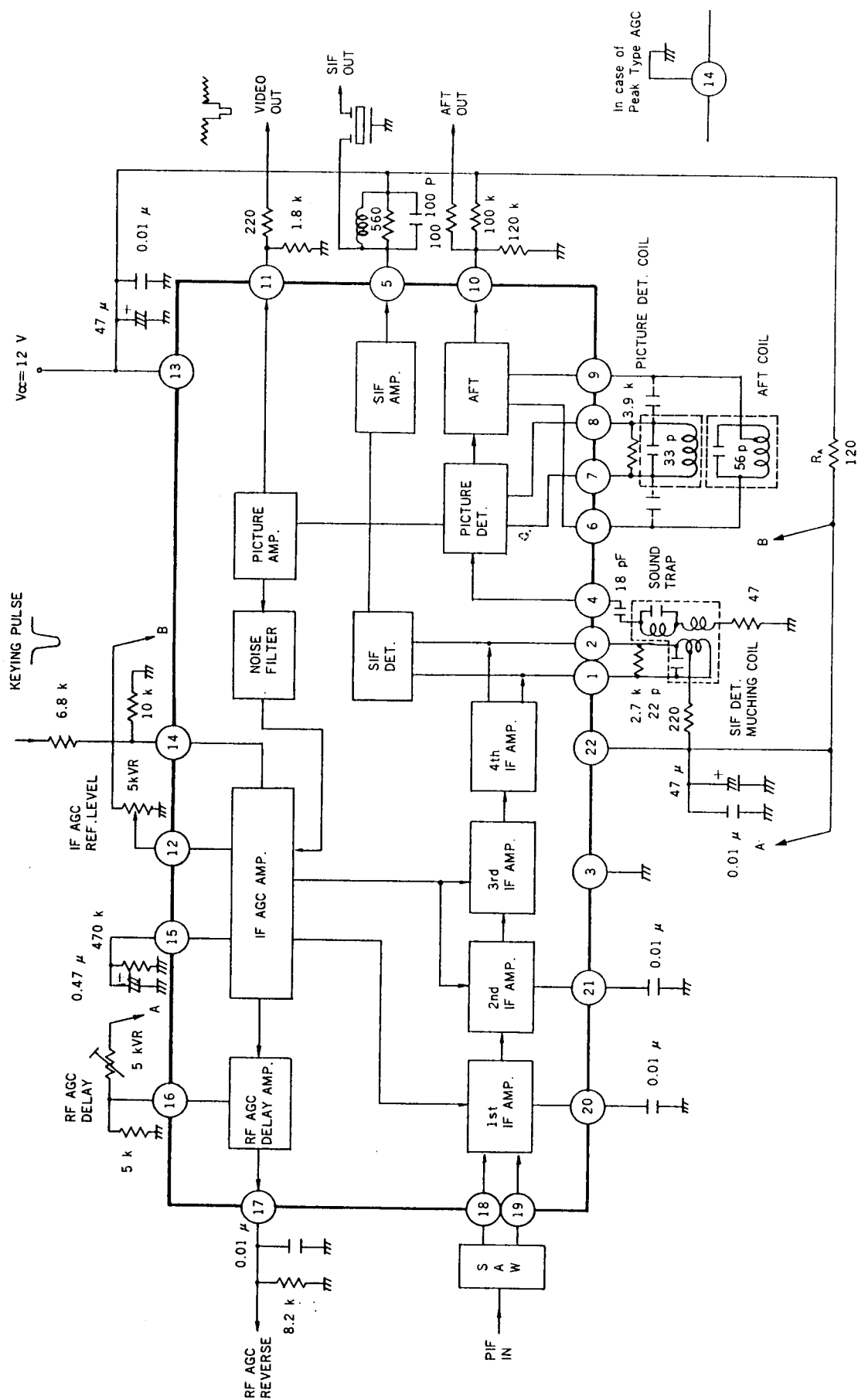
AFT OUTPUT TERMINAL VOLTAGE vs. CARRIER FREQUENCY - 1



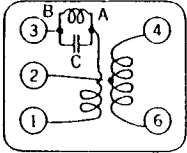
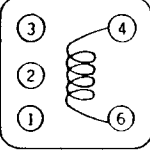
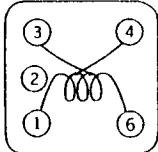
AFT OUTPUT TERMINAL VOLTAGE vs. CARRIER FREQUENCY - 2



STANDARD APPLICATION CIRCUIT



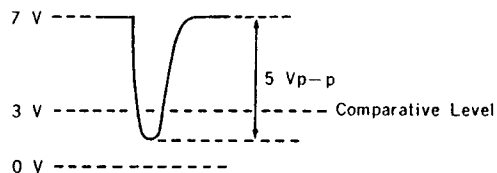
COIL SPEC. (COIL MAKER; TOKO, INC.)

COIL DRAWING (BOTTOM VIEW)	ITEM	$f_p = 57 \text{ MHz SPEC.}$	$f_p = 45 \text{ MHz SPEC.}$
SIF DET. MUCHING COIL 	TYPE No.	13 TD	13 TD
	COIL No.	TV4BVC - 21132AFQ	TV4BVC - 21135AFQ
	TURN	4-6 5½ T 6-2 2½ T 2-4 3 T 1-A 4½ T A-B 3 T C 100 pF	4-6 7½ T 6-2 3½ T 2-4 4 T 1-A 5½ T A-B 5 T C 100 pF
	WIRE	0.2 ϕ 2 UEW A-B 1.0 ϕ TINNED WIRE	0.2 ϕ 2 UEW A-B 1.0 ϕ TINNED WIRE
PICTURE DET. COIL 	TYPE No.	10 KN	10 KN
	COIL No.	180PNA - 10212BS	180PNA - 10223BS
	MUCHING C.	33 pF	40 pF
	NO LOAD Q.	96 $\pm$ 20 %	95 $\pm$ 20 %
	TURN	4-6 6 T	4-6 6½ T
	WIRE	0.16 ϕ 2 UEW	0.16 ϕ 2 UEW
AFT COIL 	TYPE No.	10KN	10KN
	COIL No.	180PNAS - 10232ALR	180PNAS - 10235ALR
	MUCHING C.	33 pF	33 pF
	NO LOAD Q.	93 $\pm$ 20 %	97 $\pm$ 20 %
	TURN	6-1 5 T 6-3 1½ T 6-4 3½ T	6-1 7 T 6-3 2½ T 6-4 4 T
	WIRE	0.23 ϕ 2 UEW	0.23 ϕ 2 UEW

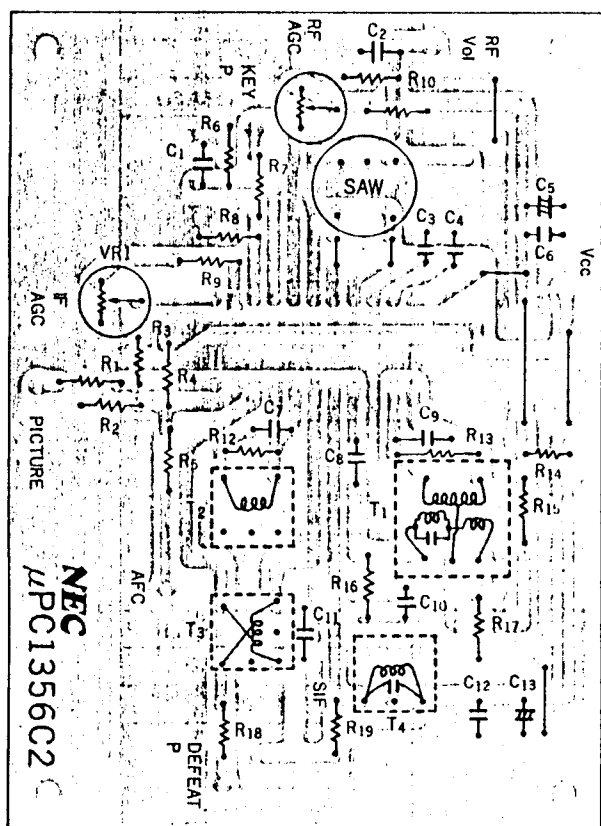
STANDARD USING CONDITION ($T_a = 25^\circ \text{C}$)

Supply Voltage	V_{CC}	12	ϕV
PIF Input Voltage	v_i	10	mVr.m.s.
Keying Pulse		*5	V_{p-p}
RF AGC Voltage	V_6	2~5	V

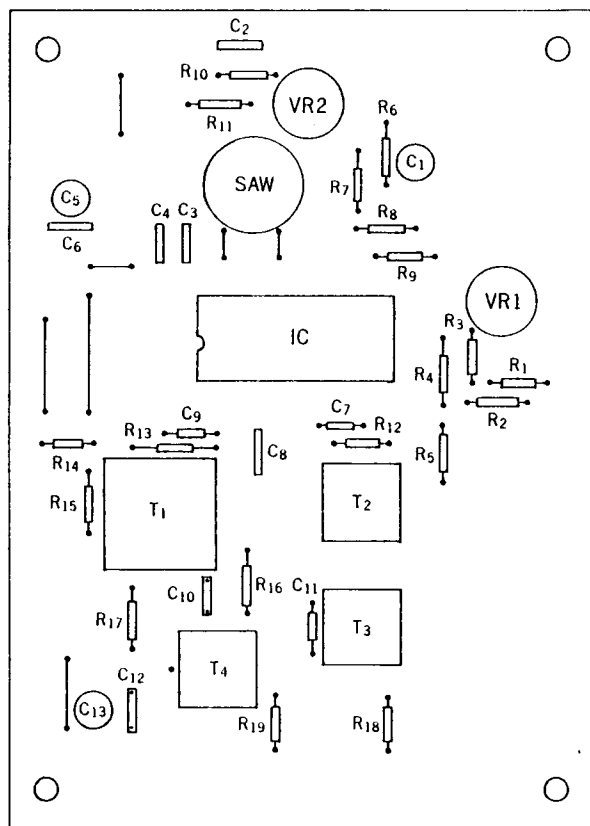
*Keying Pulse



• P.C. BOARD PATTERN



COMPONENTS LAYOUT



COMPONENTS (For $f_p = 57 \text{ MHz}$)

SYMBOL	SPEC.	SYMBOL	SPEC.
R ₁	220 Ω	C ₁	0.47 μF 10V
R ₂	120 k Ω	C ₂	0.01 μF
R ₃	1.8 k Ω	C ₃	0.01 μF
R ₄	100 k Ω	C ₄	0.01 μF
R ₅	100 Ω	C ₅	47 μF 16V
R ₆	470 k Ω	C ₆	0.01 μF
R ₇	6.8 k Ω	C ₇	20 pF
R ₈	10 k Ω	C ₈	20 pF
R ₉	10 k Ω	C ₉	20 pF
R ₁₀	8.2 k Ω	C ₁₀	0.01 μF
R ₁₁	5 k Ω	C ₁₁	33 pF
R ₁₂	3.9 k Ω	C ₁₂	0.01 μF
R ₁₃	2.7 k Ω	C ₁₃	47 μF 10V
R ₁₄	120 Ω	VR ₁	5 k Ω -B
R ₁₅	220 Ω	VR ₂	5 k Ω -B
R ₁₆	1 k Ω		
R ₁₇	47 Ω		
R ₁₈	200 Ω	T ₁	TO-KO TV4BVC-21132AFQ
R ₁₉	560 Ω	T ₂	TO-KO 180PNA-10212BS
		T ₃	TO-KO 180PNAS-10232ALR
		T ₄	TO-KO MTKAC-19951Z

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