

**LA1600****1-Band AM Radio****Overview**

The LA1600, being an AM tuner IC placed in a 9-pin SIP, provides the functions of an AM tuner. It is usable in the band range up to SW band and is especially suited for use in low-cost AM radios and radio-controlled receivers.

Functions

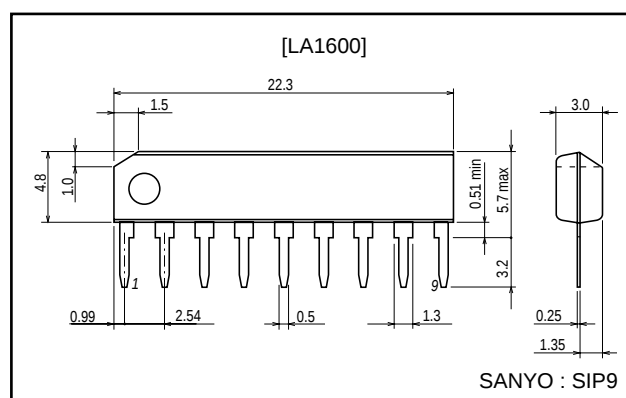
- AM : RF amp, MIX, OSC, IF amp, detector, AGC.

Features

- Minimum number of external parts required.
- Low current drain (3.7mA).
- Low supply voltage (1.8V min).
- Adoption of double-balanced mixer.
- Usable in the band range up to SW band.

Package Dimensions

unit : mm

3017B-SIP9**Specifications**

Maximum Ratings at Ta=25°C, See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max	Pin 3	9	V
		Pin 4	9	V
		Pin 8	7	V
Allowable power dissipation	P _d max	Ta≤70°C	100	mW
Operating temperature	T _{opr}		-20 to +70	°C
Storage temperature	T _{stg}		-40 to +125	°C

Operating Conditions at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended operating voltage	V _{CC}		3	V
Operating voltage range	V _{CC} op		1.8 to 6.0	V

Operating Characteristics at Ta=25°C, V_{CC}=3V, See specified Test Circuit.

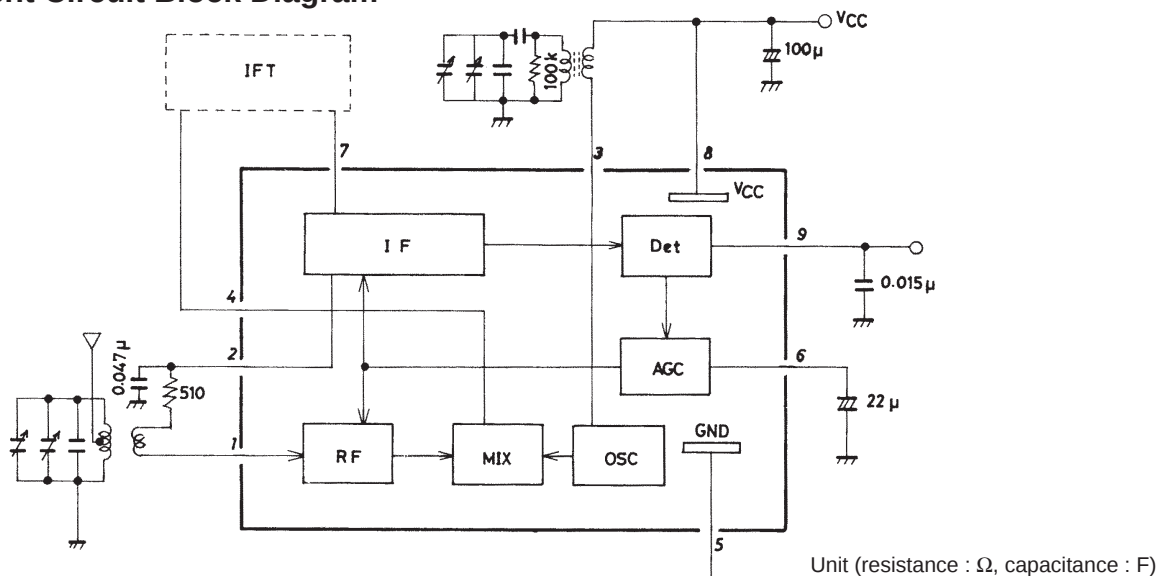
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM Characteristics/f=1MHz]						
Quiescent current	I _{cco}	V _{IN} =No input		3.7	4.6	mA
Detection output	V _{O1}	V _{IN} =23dBμ, 1kHz-30% mod	-30	-25	-20	dBm
			24	43	78	mV
	V _{O2}	V _{IN} =80dBμ, 1kHz-30% mod	-18	-14	-10	dBm
			97	155	250	mV
S/N	S/N1	V _{IN} =23dBμ	18	21.5		dB
	S/N2	V _{IN} =80dBμ	48	53		dB
Total harmonic distortion	THD1	V _{IN} =80dBμ, 1kHz-30% mod		0.3	1.2	%
	THD2	V _{IN} =100dBμ, 1kHz-30% mod		0.4	1.5	%

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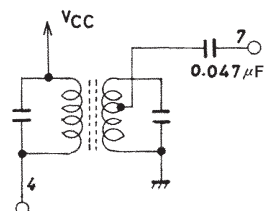
D2797HA (KT)/41594HK/O077KI/4236KI, TS No.2056-1/7

Equivalent Circuit Block Diagram

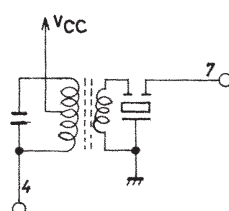


IFT (Intermediate Frequency Transformer)

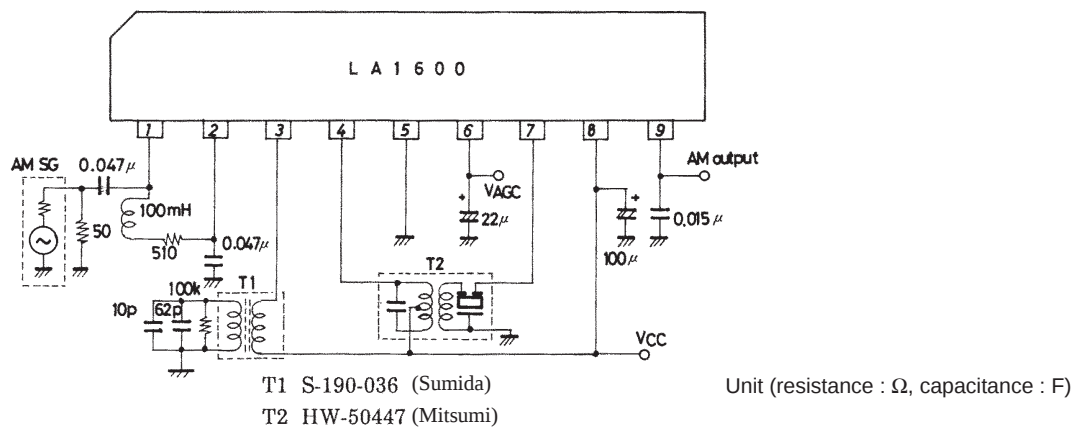
1. Using double tuning coil



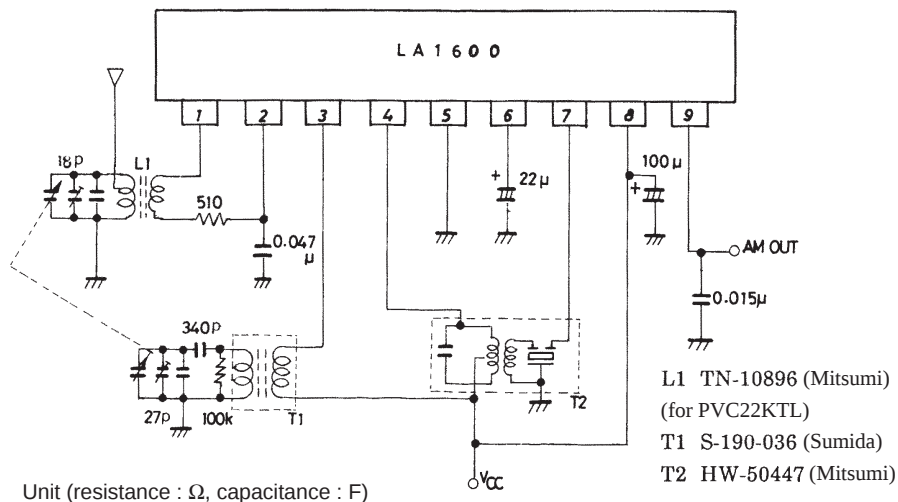
2. Using ceramic filter

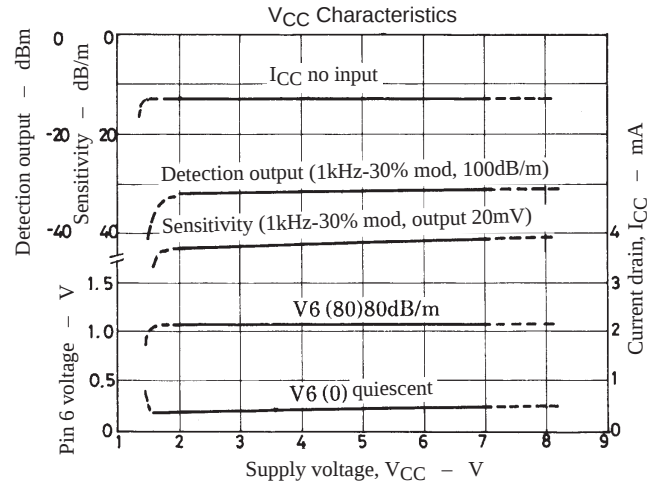
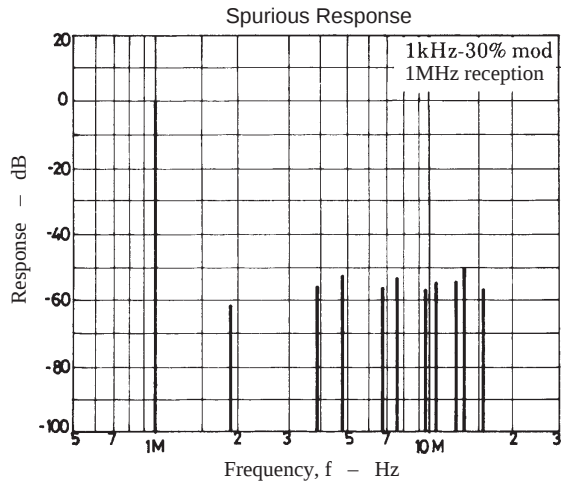
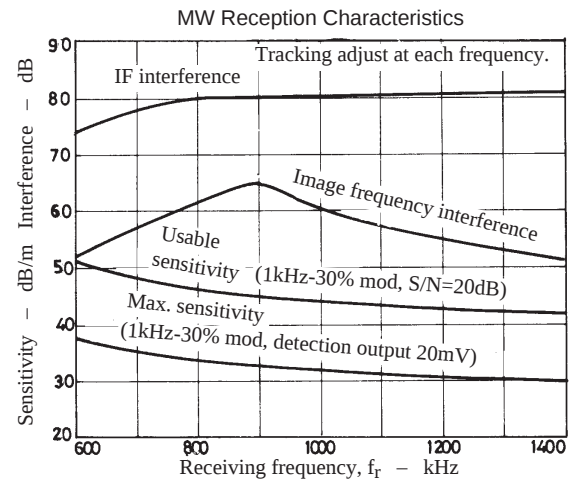
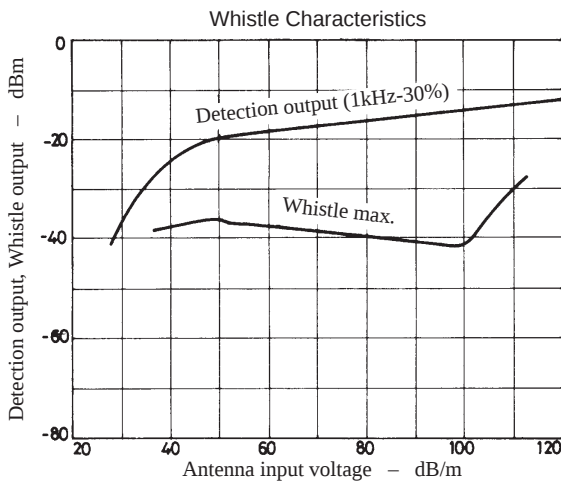
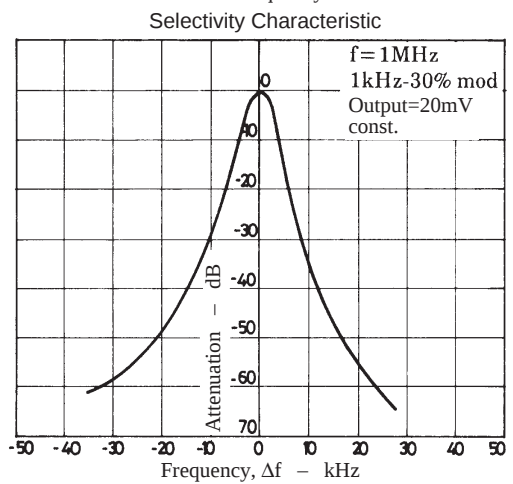
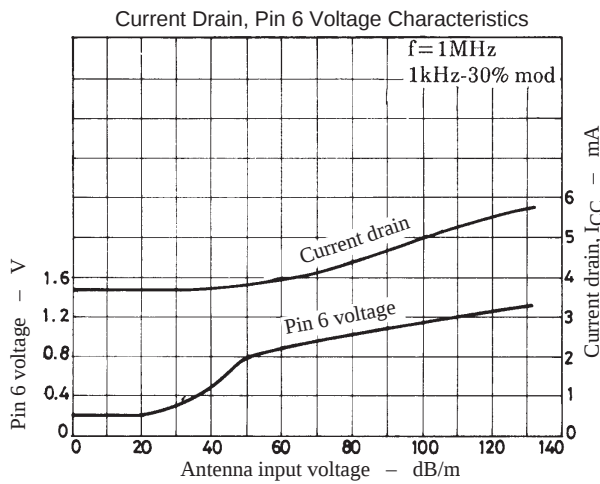
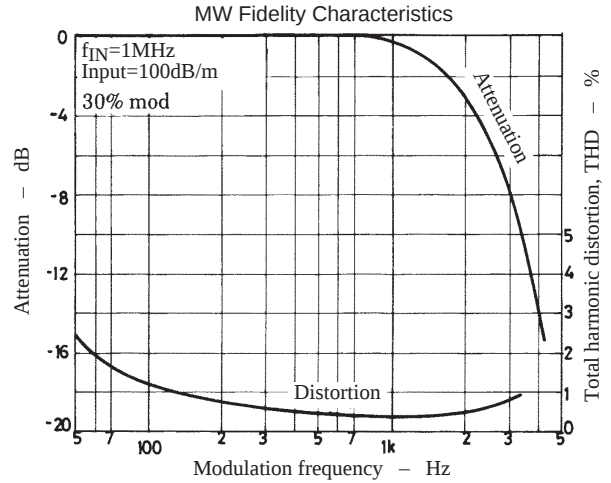
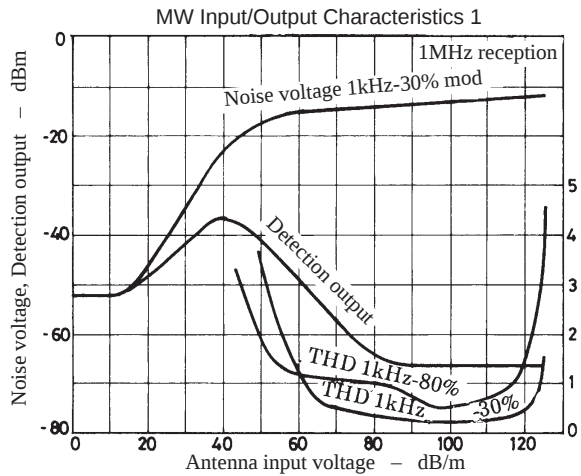


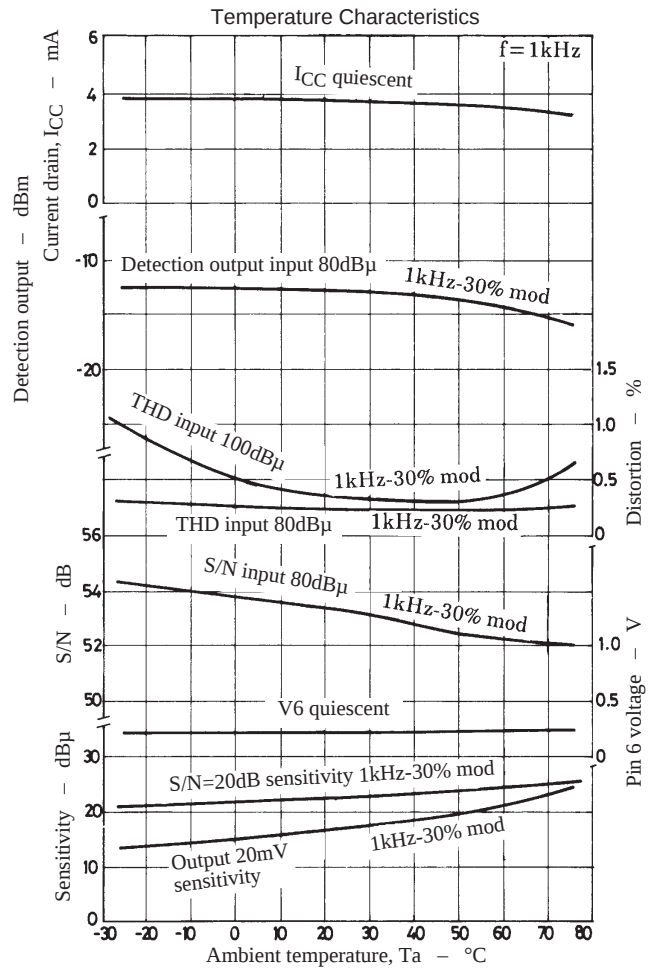
Specified Test Circuit Diagram



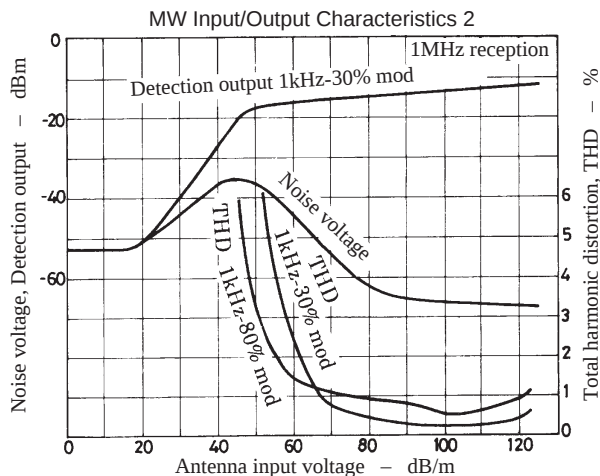
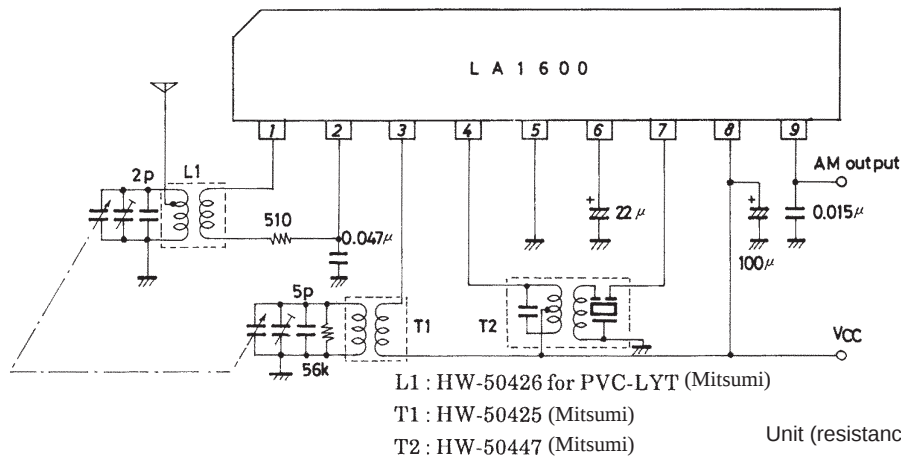
Test Circuit 1 : AM-MW



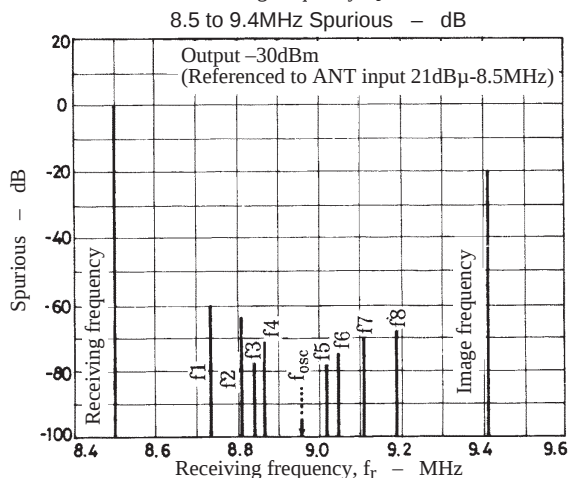
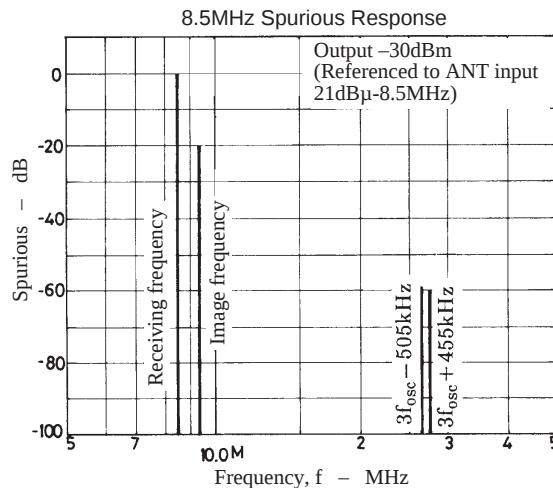
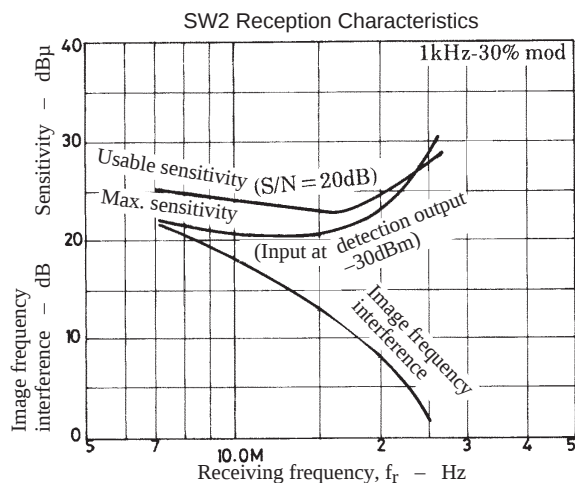
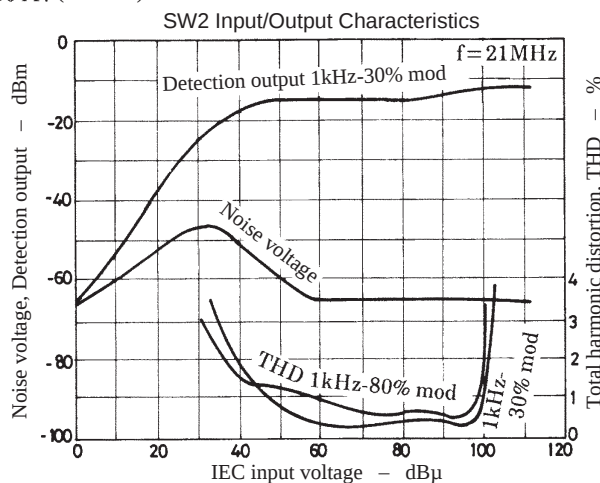
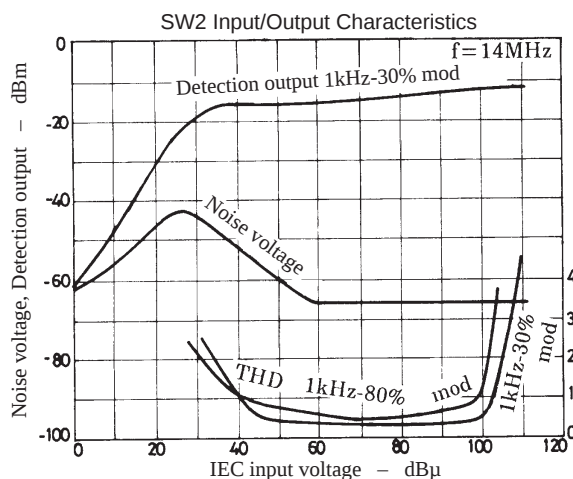
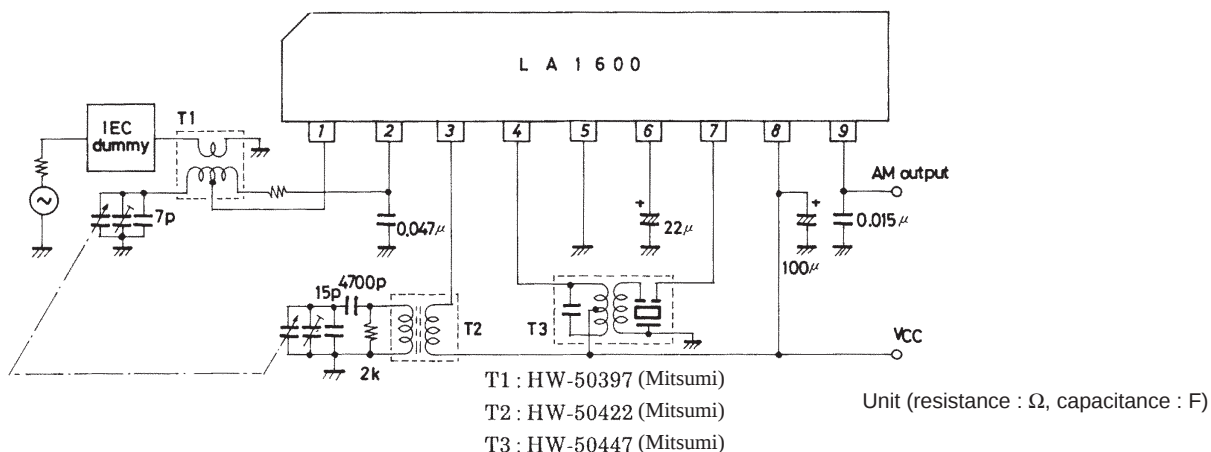




Test Circuit 2 : AM-MW



Test Circuit 3 : SW2 (7.2 to 24.0MHz)



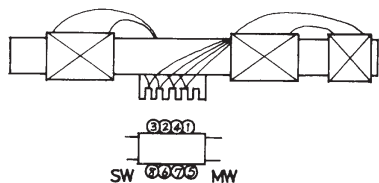
f1 : 8.7336MHz $\rightarrow 2f_{osc} - 2f1 = 455kHz$
 f2 : 8.8097MHz $\rightarrow 3f_{osc} - 3f2 = 455kHz$
 f3 : 8.8478MHz $\rightarrow 4f_{osc} - 4f3 = 455kHz$
 f4 : 8.8702MHz $\rightarrow 5f_{osc} - 5f4 = 455kHz$
 f5 : 9.0263MHz $\rightarrow 5f5 - 5f_{osc} = 455kHz$
 f6 : 9.0525MHz $\rightarrow 4f6 - 4f_{osc} = 455kHz$
 f7 : 9.1130MHz $\rightarrow 3f7 - 3f_{osc} = 455kHz$
 f8 : 9.1888MHz $\rightarrow 2f8 - 2f_{osc} = 455kHz$

Coil Specifications

MW antenna

Bar antenna (for PVC22KTL)

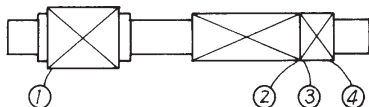
- TN-10896 (Mitsumi)



- ①-② 22T + 49T, ③-④ 10T
Tight solenoid direct winding
⑤-⑥ 17T 0.5φ space winding
⑦-⑧ 4T tight solenoid winding
①-② $L = 260\mu\text{H}$, $Q_0 = 330 (\geq 200)$
⑤-⑥ $L = 15\mu\text{H}$, $Q_0 = 250 (\geq 150)$

Bar antenna (for PVC-LYT)

- HW-50426 (Mitsumi)

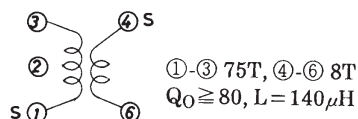


- ①-② 21T + 100T
③-④ 30T
①-② $L = 604\mu\text{H}$, $Q_0 \geq 120$

MW OSC

- S-190-036 (Sumida)

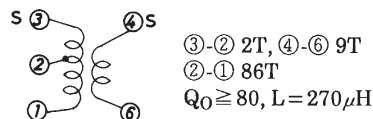
For PVC22KTL



- ①-③ 75T, ④-⑥ 8T
 $Q_0 \geq 80$, $L = 140\mu\text{H}$

- HW-50426 (Mitsumi)

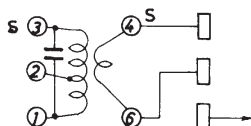
For PVC-LYT



- ③-② 2T, ④-⑥ 9T
②-① 86T
 $Q_0 \geq 80$, $L = 270\mu\text{H}$

AM-IFT

- HW-50447 (Mitsumi)



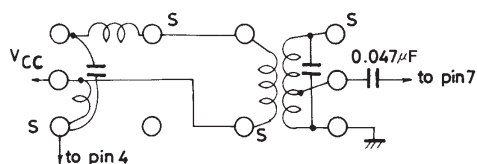
- ①-② 82T, ③-② 70T,
④-⑥ 7T
 $Q_0 = 110 \pm 20\%$, $f = 450\text{kHz}$
Internal 180pF
C.F : SFU450B

AM-IFT

Application where a double tuning coil is used

HW-50475

HW-50498



HW-50475
(Mitsumi)

- ①-② 80T
④-③ 70 1/2T
Internal 180pF
 $Q_0 = 120 \pm 20\%$

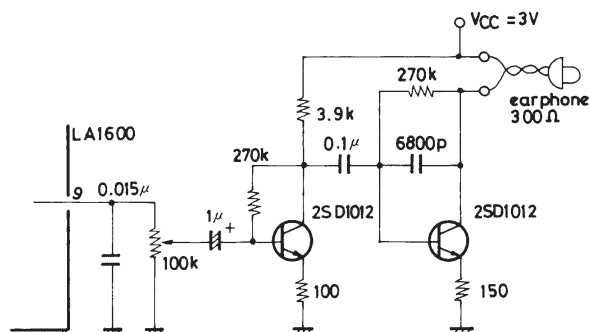
HW-50498
(Mitsumi)

- ①-② 134T
④-⑥ 3T
②-③ 18T
Internal 180pF
 $Q_0 = 70 \pm 20\%$

Sample Application Circuit 1

Earphone

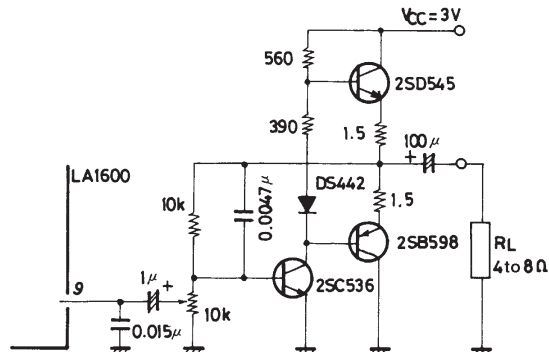
Transistor rank=G280 to 560



Sample Application Circuit 2

Power amp using 3 discrete devices

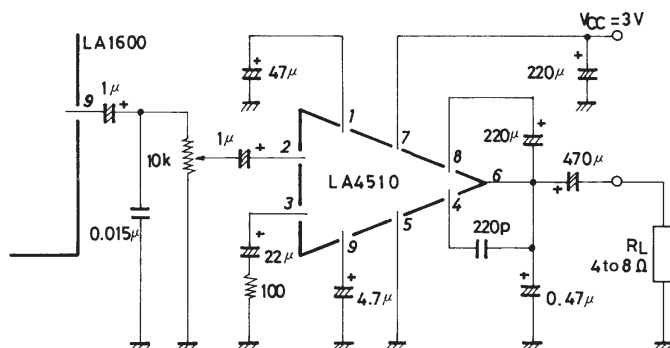
Transistor rank=E100 to 200



Unit (resistance : Ω, capacitance : F)

Sample Application Circuit 3

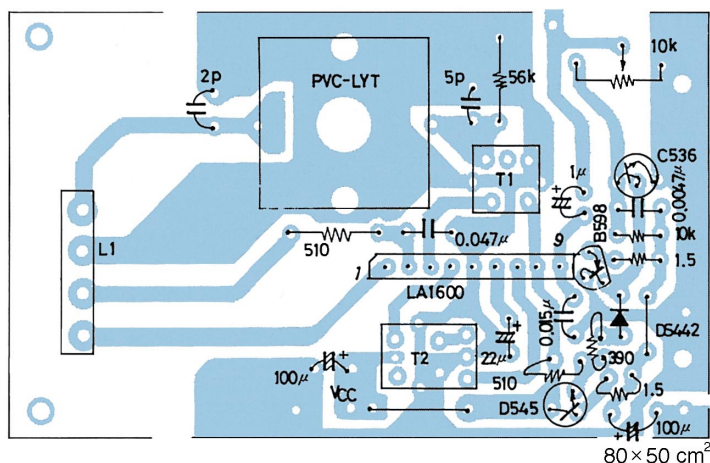
Using the LA4510



Unit (resistance : Ω , capacitance : F)

Sample Printed Circuit Pattern : LA1600 + Power amp using 3 discrete devices

(For the circuit diagram, refer to Test Circuit 2 and Sample Application Circuit 2.)



L1 : HW-50426 (Mitsumi)
L1 : HW-50425 (Mitsumi)
T2 : HW-50447 (Mitsumi)

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