Ordering number : EN2291B

Monolithic Linear IC

LA1266

AM/FM Tuner System Of Electronic Tuning Type

Functions

FM : IF amplifier, quadrature detector, AF preamplifier, signal meter, IF count outputlifier, tuning indicator drive output (common with stop signal, muting drive output)

AM : RF amplifier, MIX, OSC (with ALC), IF amplifier, detector, AGC, signal meter, tuning indicator drive output (common with stop signal), IF count output, local OSC buffer.

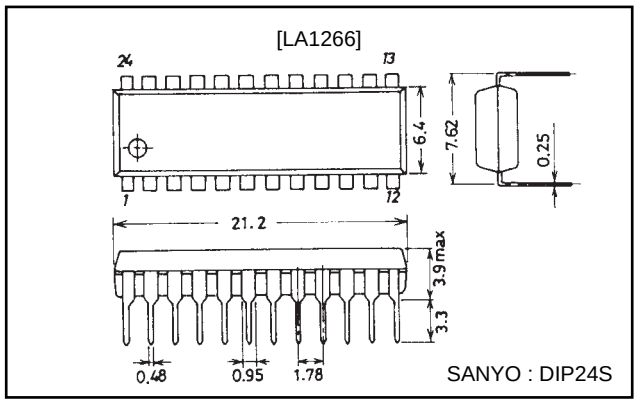
Features

- Minimum number of external parts required.
- Excellent S/N
- Local OSC with ALC
- Local OSC buffer
- Tuning indicator pin (common with narrow-band stop signal and muting drive output)
- Variable stop sensitivity (variable separately for FM, AM)
- Less tweet interference
- Signal meter pin
- IF count output

Package Dimensions

unit : mm

3067-DIP24S



Specifications

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	Pins 7,8,20	16	V
Flow-in current	I_8	Pin 8	20	mA
Flow-out current	I_{22}	Pin 22	1	mA
	I_{24}	Pin 24	2	mA
Allowable power dissipation	Pd max	Ta≤60°C	700	mW
Operating temperature	Topr		–20 to +70	°C
Storage temperature	Tstg		–40 to +125	°C

Operating Conditions at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		8.5	V
Operating voltage range	V_{CC} op		6 to 14	V

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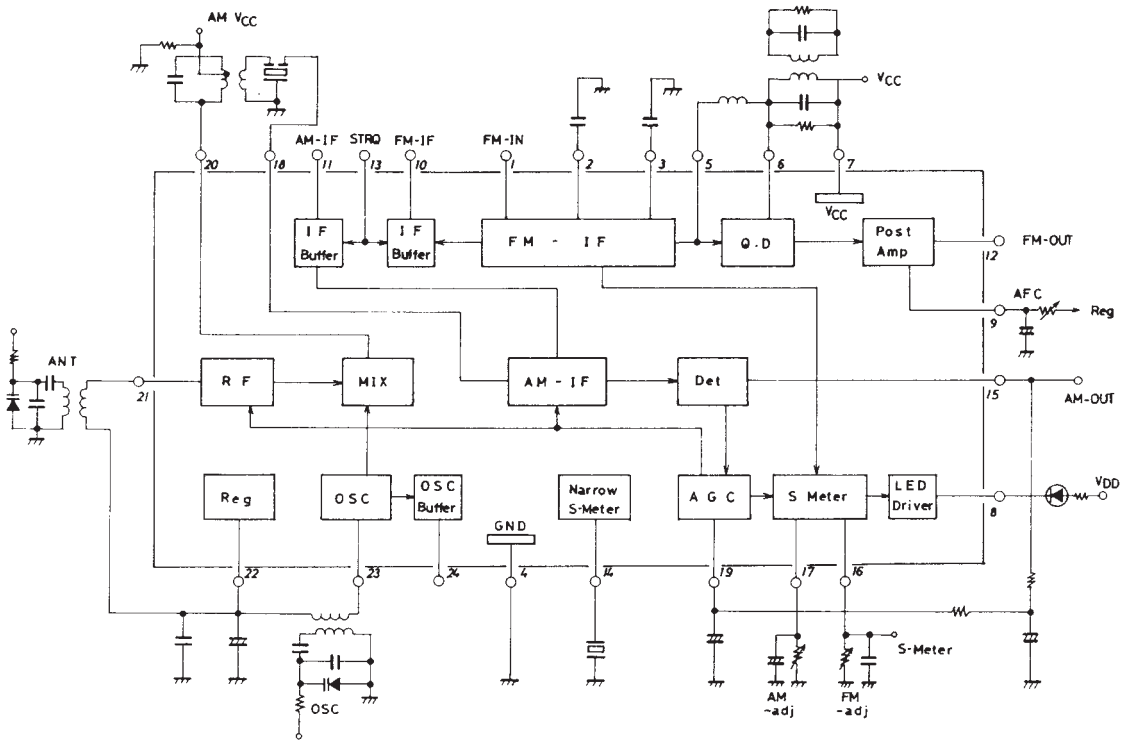
Operating Characteristics at Ta=25°C, V_{CC}=8.5V, See Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM : fc=1MHz, fm=1kHz]						
Quiescent current	Icco	No input		22	30	mA
Detection output	V_O1	V_{IN}=20dBμ, 30% mod.	30	60	110	mV
	V_O2	V_{IN}=80dBμ, 30% mod.	90	150	210	mV
Signal to noise ratio	S/N1	V_{IN}=20dBμ	15	19		dB
	S/N2	V_{IN}=80dBμ	49	54		dB
Total harmonic distortion	THD1	V_{IN}=80dBμ, 30% mod.		0.3	1.0	%
	THD2	V_{IN}=107dBμ, 30% mod.		0.3	1.0	%
Signal meter output	$V_{SM}1$	No input	0	0	0.2	V
	$V_{SM}2$	V_{IN}=80dBμ	1.8	2.8	3.5	V
LED drive sensitivity	LED-ON	I_{LED}=1mA	13	23	33	dBm
Local OSC buffer output	V_{OSC}	fosc=1.45MHz	220	280	340	mV
IF buffer output	V_{IF}	V_{IN}=20dBμ	120	180	250	mV
[FM : fc=10.7MHz, fm=1kHz]						
Quiescent current	Icco	No input		29	40	mA
Input limiting sensitivity	–3dBL.S.	3dB down, 100% mod.		31	37	dBμ
Demodulation output	V_O	V_{IN}=100dBμ, 100% mod.	270	390	540	mV
S/N ratio	S/N	V_{IN}=100dBμ	78	84		dB
Total harmonic distortion	THD	V_{IN}=100dBμ, 100% mod.		0.03	0.3	%
Signal meter output	$V_{SM}1$	No input	0	0	0.2	V
	$V_{SM}2$	V_{IN}=100dBμ	1.7	2.3	3.1	V
LED drive sensitivity	LED-ON	I_{LED}=1mA	46	61	76	dBμ
LED drive bandwidth	LED-BW	V_{IN}=100dBμ, I_{LED}=1mA	70	105	140	kHz
AM rejection ratio	AMR	V_{IN}=100dBμ, 100% mod. AM-1kHz, 30% mod.	45	58		dB
IF buffer output	V_{IF}	V_{IN}=50dBμ	110	160	230	mV

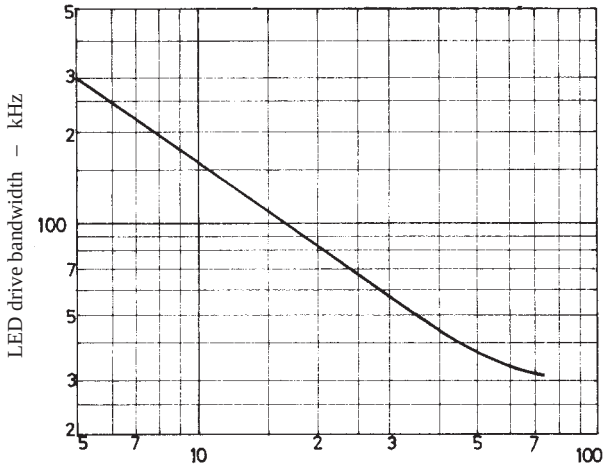
Equivalent Circuit Block Diagram



How to use LA1266

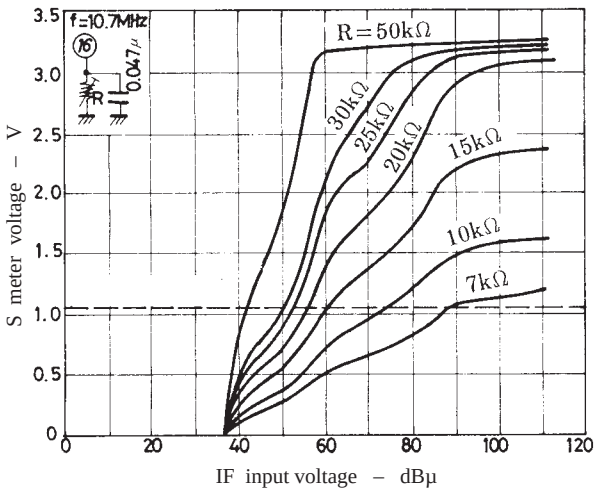
1. LED driver, muting drive output, stop signal(SD).
   - For LED drive, muting drive output, stop signal, the output at pin 8 is used.
   - Voltage on pin 8, when tuned, turns from "H" to "L" . (Active-low)
   - Signal bandwidth at pin 8
     – For AM, the bandwidth depends on the C.F(BFU450CN) at pin 14.
     If a capacitor is connected in place of the C.F, the bandwidth will get wider.
     – For FM, the bandwidth depends on the resistance across pins 9 and 22.
     If the resistance is increased, the bandwidth will get narrower.
     R=15kΩ makes the bandwidth approximately 110kHz.

LED Drive Bandwidth – Resistance across Pins 9 and 22

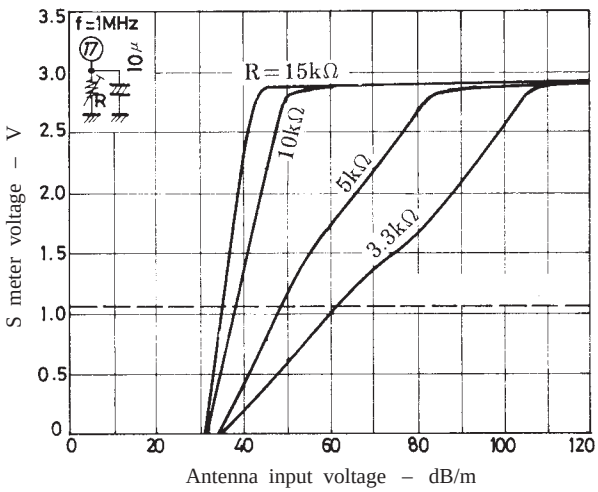


   - Sensitivity adjustment of LED, muting, stop signal
     – For FM, the semifixed variable resistor across pin 16 and GND is used.
     – For AM, the semifixed variable resistor across pin 17 and GND is used.
     The relation (for AM,FM) between signal meter voltage and input voltage with the resistance of the semifixed variable resistor as a parameter is shown below.

FM S Meter Voltage

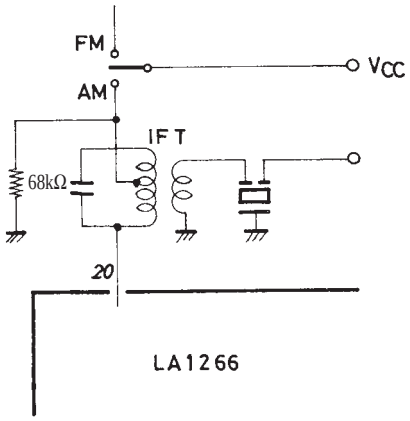


AM S Meter Voltage



Unit (capacitance : F)

2. AM/FM changeover
   - AM/FM changeover is made using pin 20 as shown right.
   - However, the voltage on pin 20 relative to V_{CC} (pin 7) must be within the range of +0.1V to – 0.8V. If not within this range, distortion and selectivity will get worse. A resistance of 68kΩ at the IFT cold terminal, which is used to prevent the changeover circuit from malfunctioning, must be connected.



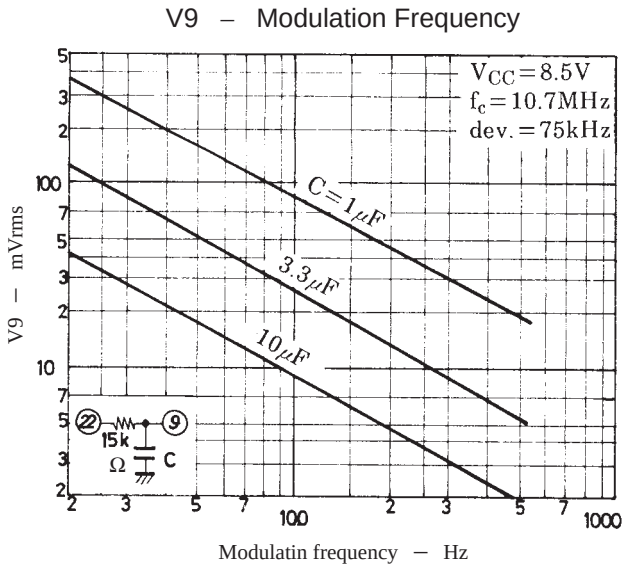
3. Local OSC buffer output
   - When local OSC buffer output waveform is saw-toothed at the SW mode, connect a reistance of 1.2kΩ or thereabouts across pin 24 and GND.

4. Capacitance across pin 9 and GND

   A large capacitance across pin 9 and GND may cause a misstop at an adjacent channel when the channel select speed is made faster at the autmatic channel select mode. In thes case, decrease the capacitance across pin 9 and GND.

   However, if too decreased, the LED will flutter at low modulation frequencies at the time of detuning. Therefore, it is recommended to fix the capacitance across pin 9 and GND to be 3.3µF to 10µF.

   The relation between modulation frequency and demodulation output voltage on pin 9 with the capacitance across pin 9 and GND as a parameter is shown right.



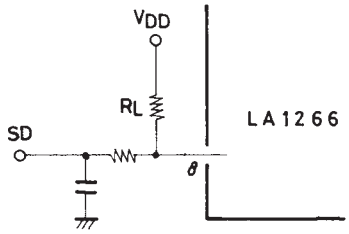
5. If the coupling coefficient of the local OSC coil is small and an antiresonance point of approximately 100MHz is present or the stray capacitance across pin 24 and pin 23 is large, a parasitic oscillation of approximately 100MHz may occur in the buffer output (pin 24). In this case, connect a capacitance of approximately 30pF across pin 24 and GND.

6. AM OSC coil

   Generally speaking, the following should be noted. Avoid winding with loose coupling between primary side and secondary side (especially SW1, SW2). To be concrete, the pot core type is better than the screw type which is loose in coupling. This prevents the local OSC frequency from turning third resonance frequency related to the coupling coefficient.

7. Resistance across pin 8 and V_{DD}

   If pin 8 is used for stop signal (SD) only, without using LED, it is recommended to fix resistance R_L across pin 8 and V_{DD} to be 51kΩ to 100kΩ.

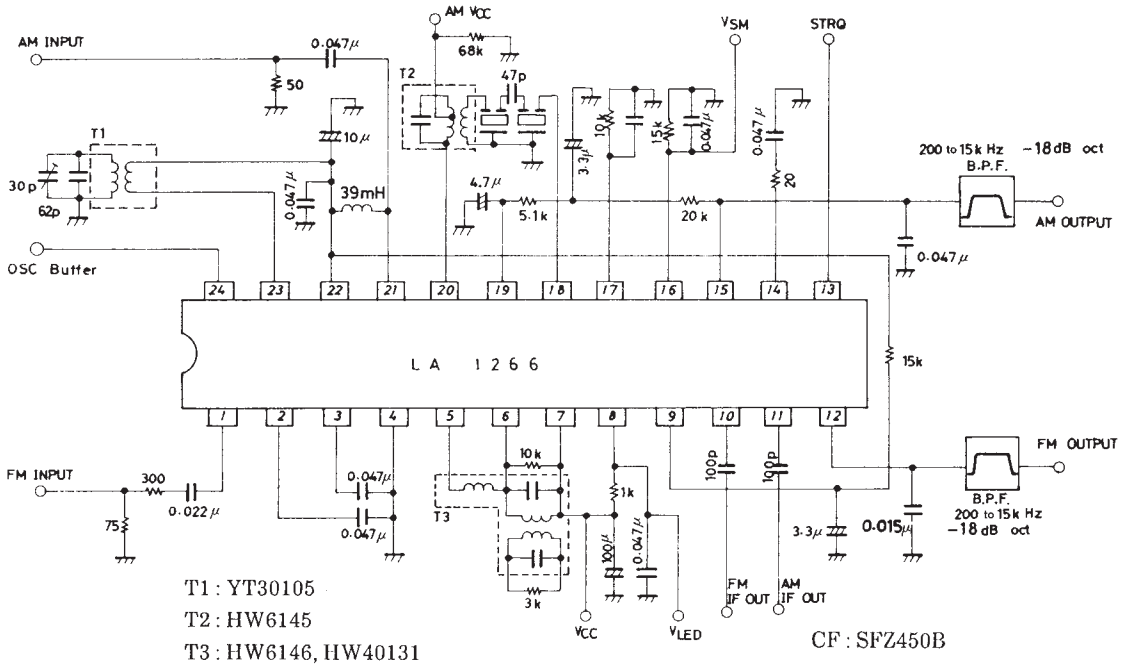


8. To prevent whistle from worsening, make the pattern of AM output pin 15 as short as possible.

9. AM, FM IF buffer output

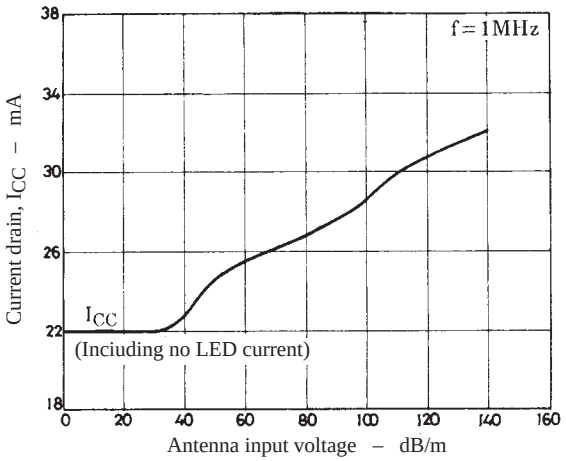
   Application of a voltage to pin 13 (STRQ) causes AM IF(455kHz) signal (at AM mode) and FM IF(10.7MHz) signal (at FM mode) to be delivered at pin 11 and pin 10, respectively. It is recommended that the voltage to be applied to

Test Circuit : FM, AM-MW

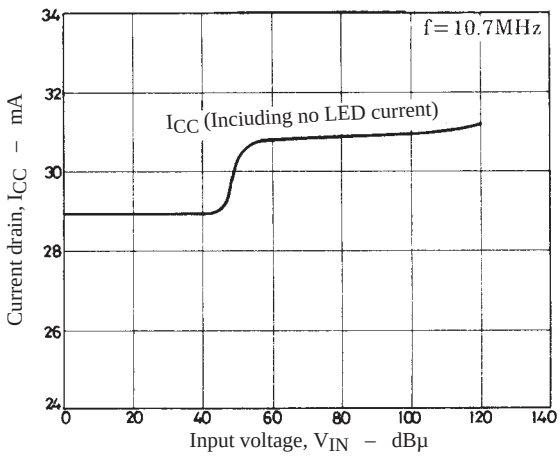


Unit (resistance : Ω, capacitance : F)

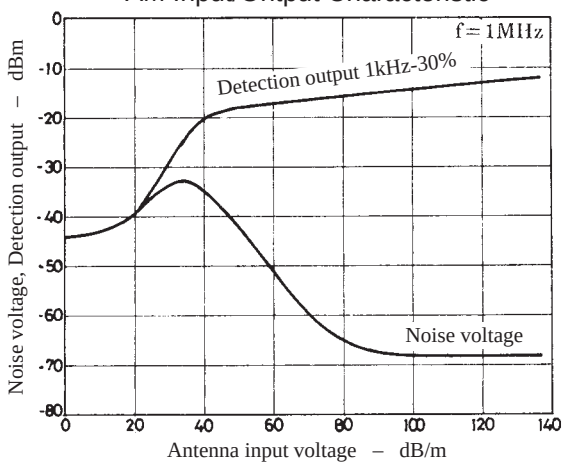
AM Current Drain Characteristic



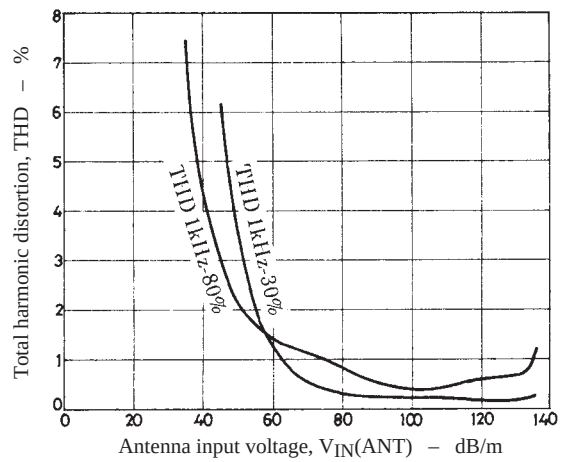
FM Current Drain Characteristic



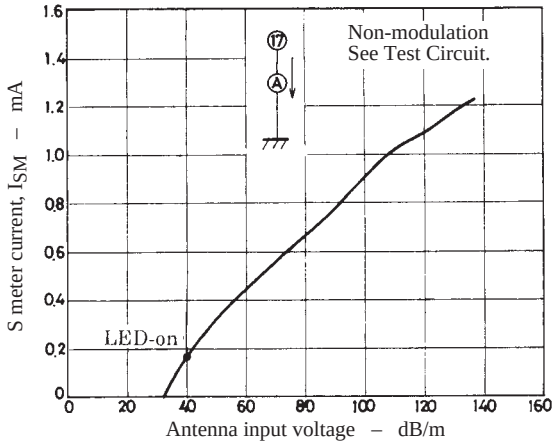
AM Input/Ontput Characteristic



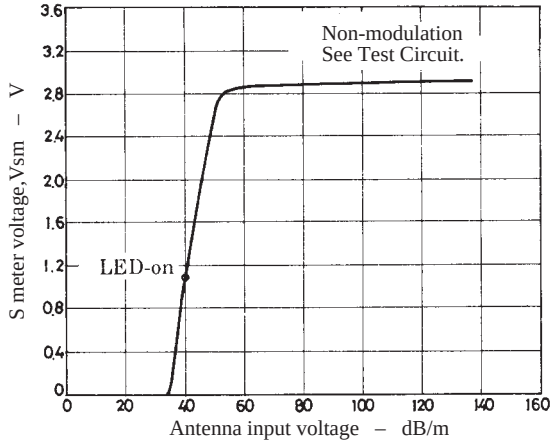
THD – VIN(ANT)



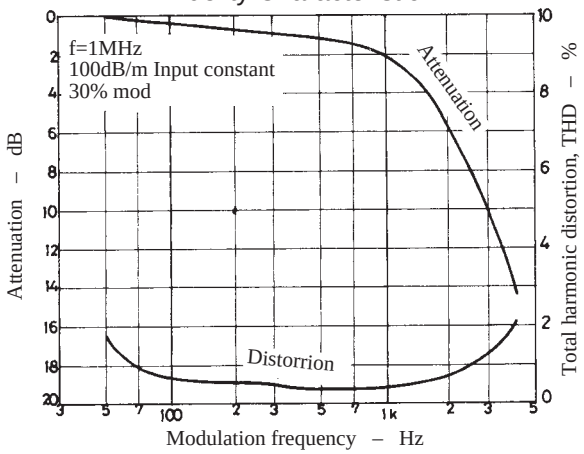
AM S Meter Current Characteristic



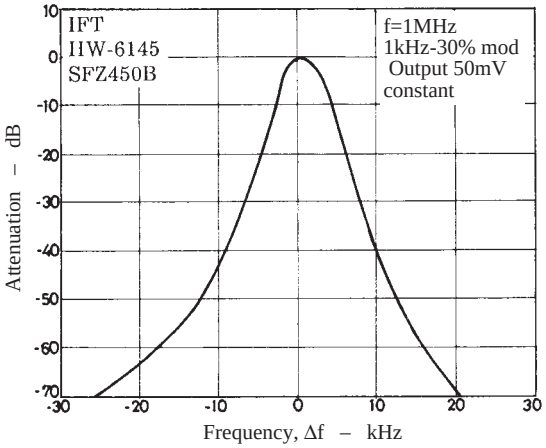
AM S Meter Voltage Characteristic



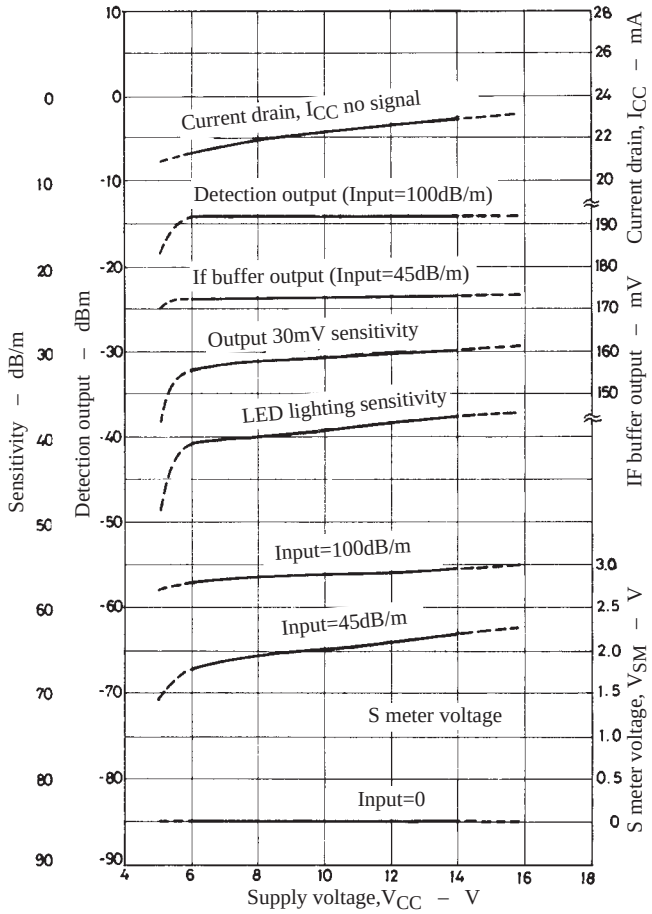
Fidelity Characteristic



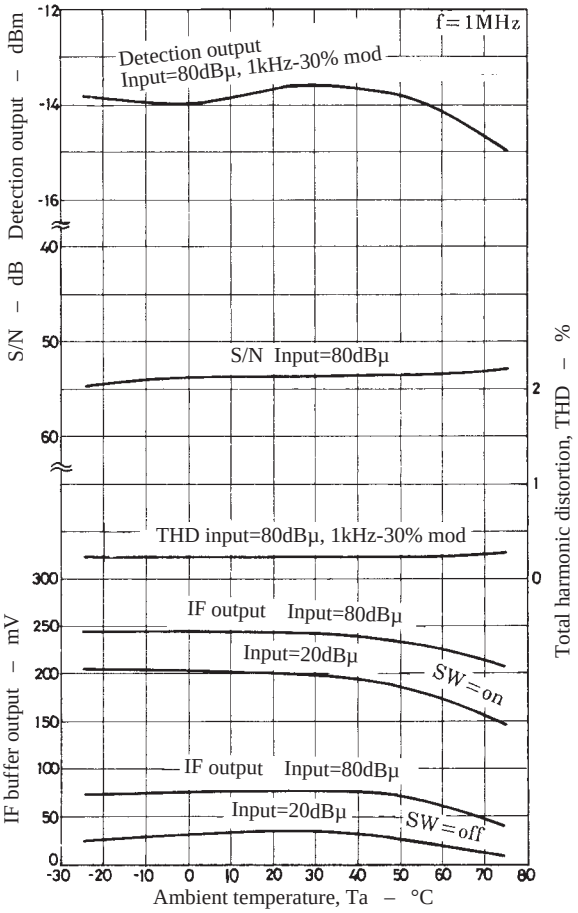
Selectivity Characteristic



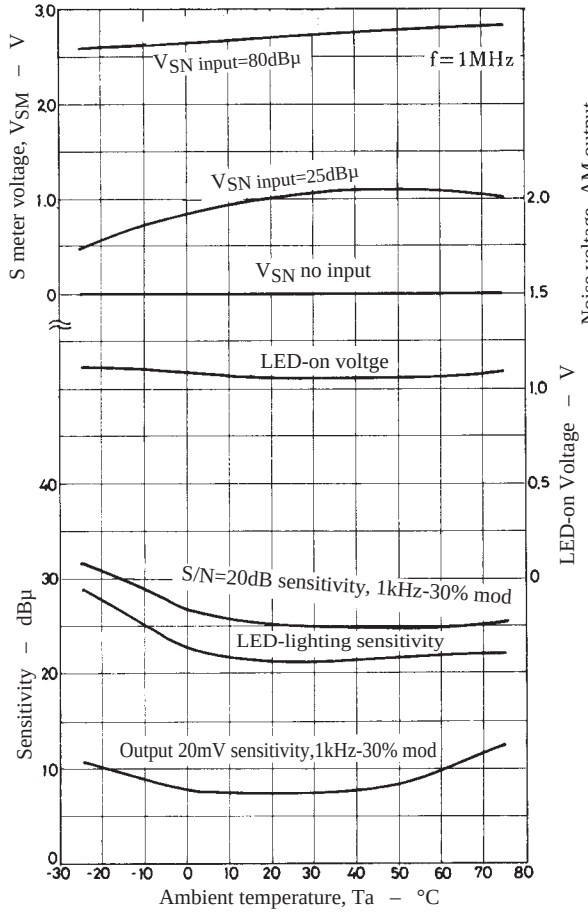
AM V_{CC} Characteristic



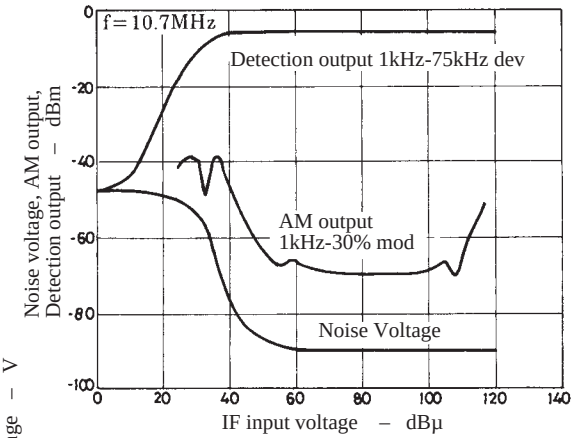
AM Temperature Characteristic (1)



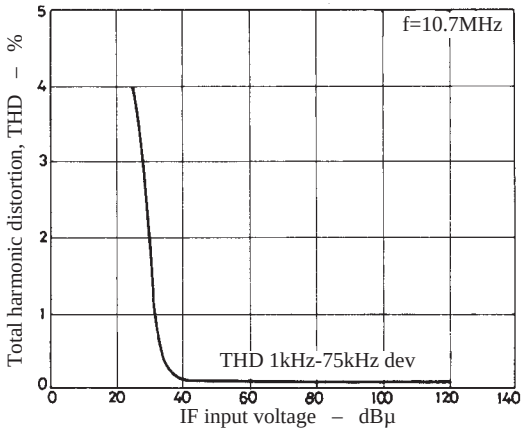
AM Temperature Characteristic(2)



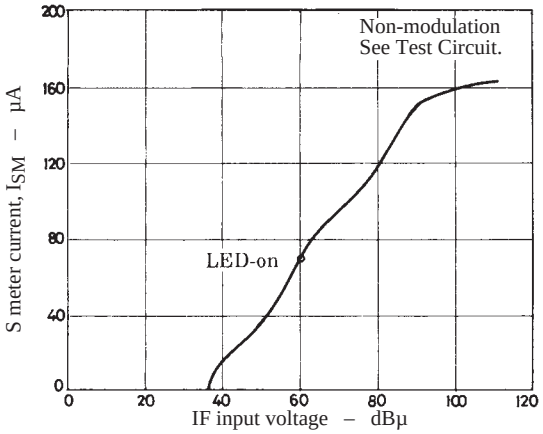
FM Input/Output Characteristic



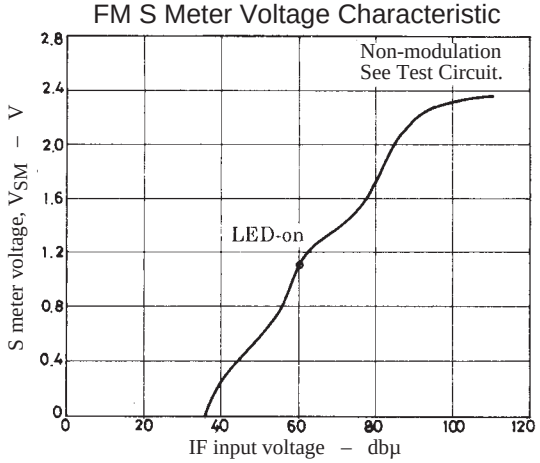
Distortion Characteristic



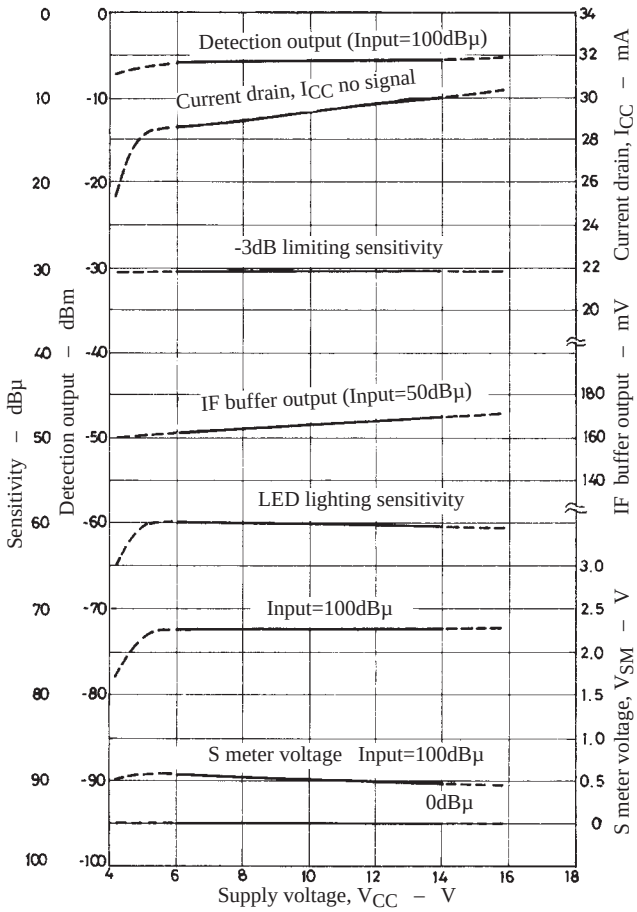
FM S Meter Characteristic



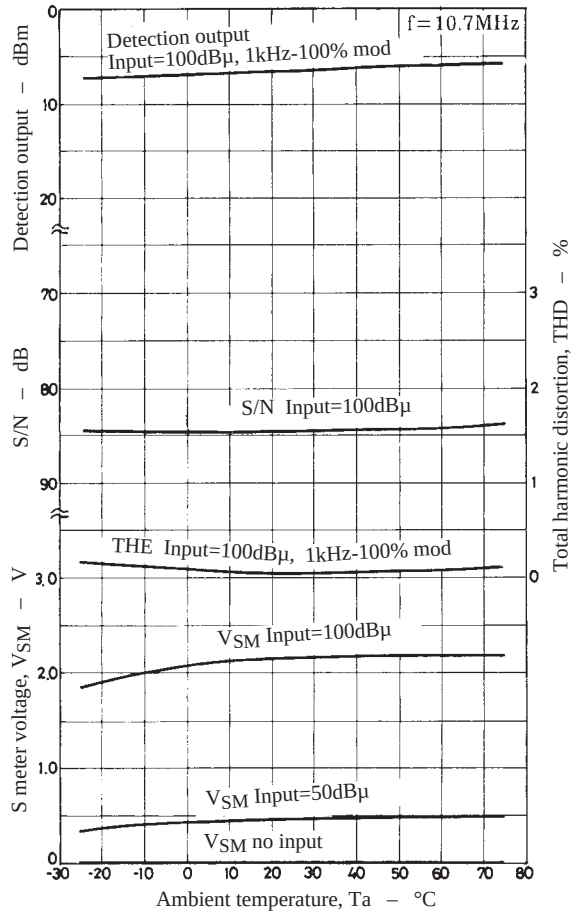
FM S Meter Voltage Characteristic



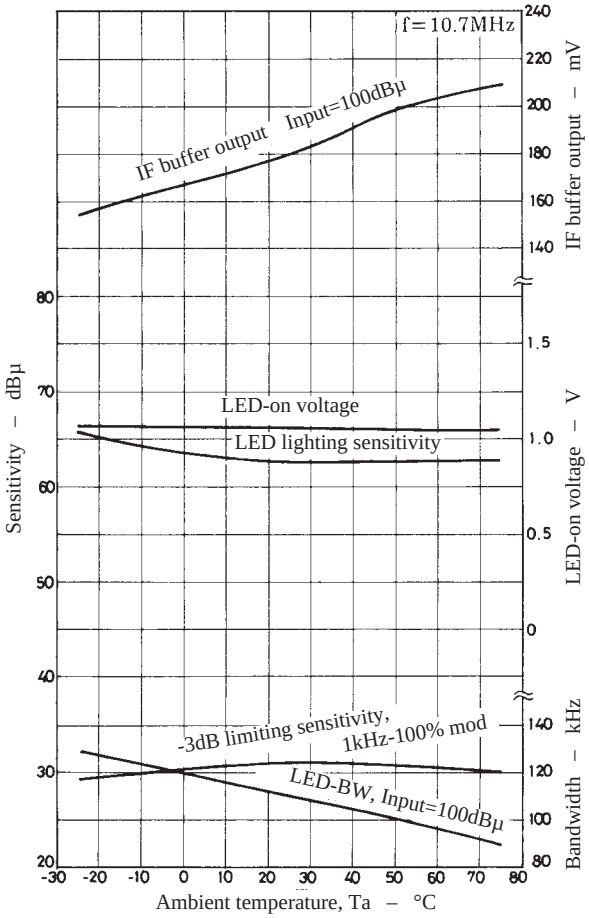
FM V_{CC} Characteristic



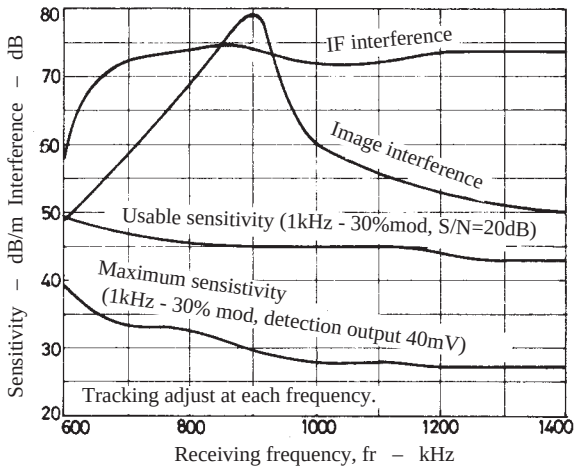
FM Temperature Characteristic(1)



FM Temperature Characteristic(1)

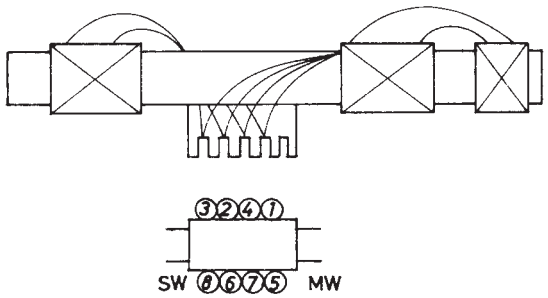


AM Receiving Characteristic



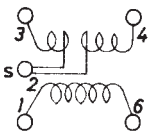
Coil Specifications

MW antenna
Bar antenna (for PVC22KTL)
•TN-10896 (Mitsumi)



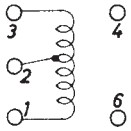
①-② 22T + 49T, ③-④ 10T
Tight solenoid direct winding
⑤-⑥ 17T 0.5ϕ space winding
⑦-⑧ tight solenoid winding
①-② L = 260μH, Q_O = 330 (≧ 200)
⑤-⑥ L = 15μH, Q_O = 250 (≧ 150)

Loop antenna (for SVC321)
• LA300 (Korin Giken)
Loop antenna. matching coil
• KL-412



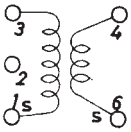
①-⑥ 15.5T, ③-② 7T,
②-④ 58T
Q_O = 200 ± 20%
L = 248μH ± 10%

YT-30150 (Mitsumi)



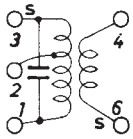
③-② 32T, ②-① 32T
0.07mm 2VEW
Q_O = 140, L = 140μH

• KO-387 (Korin Giken)
For SVC321



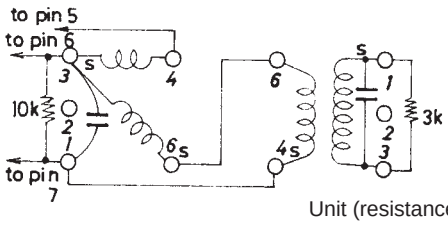
①-③ 48T, ④-⑥ 20T
Q_O = 150 ± 20%

AM IFT coil
Matching coil for SFZ450B
(2-element type)



· HW-6145 (Mitsumi)
③-② 67T, ⑥-④ 10T
②-① 85T
Q_O = 70 ± 20%, f = 450kHz
Internal 180pF

FM double tuning detection coil
HW-6146 HW-40131

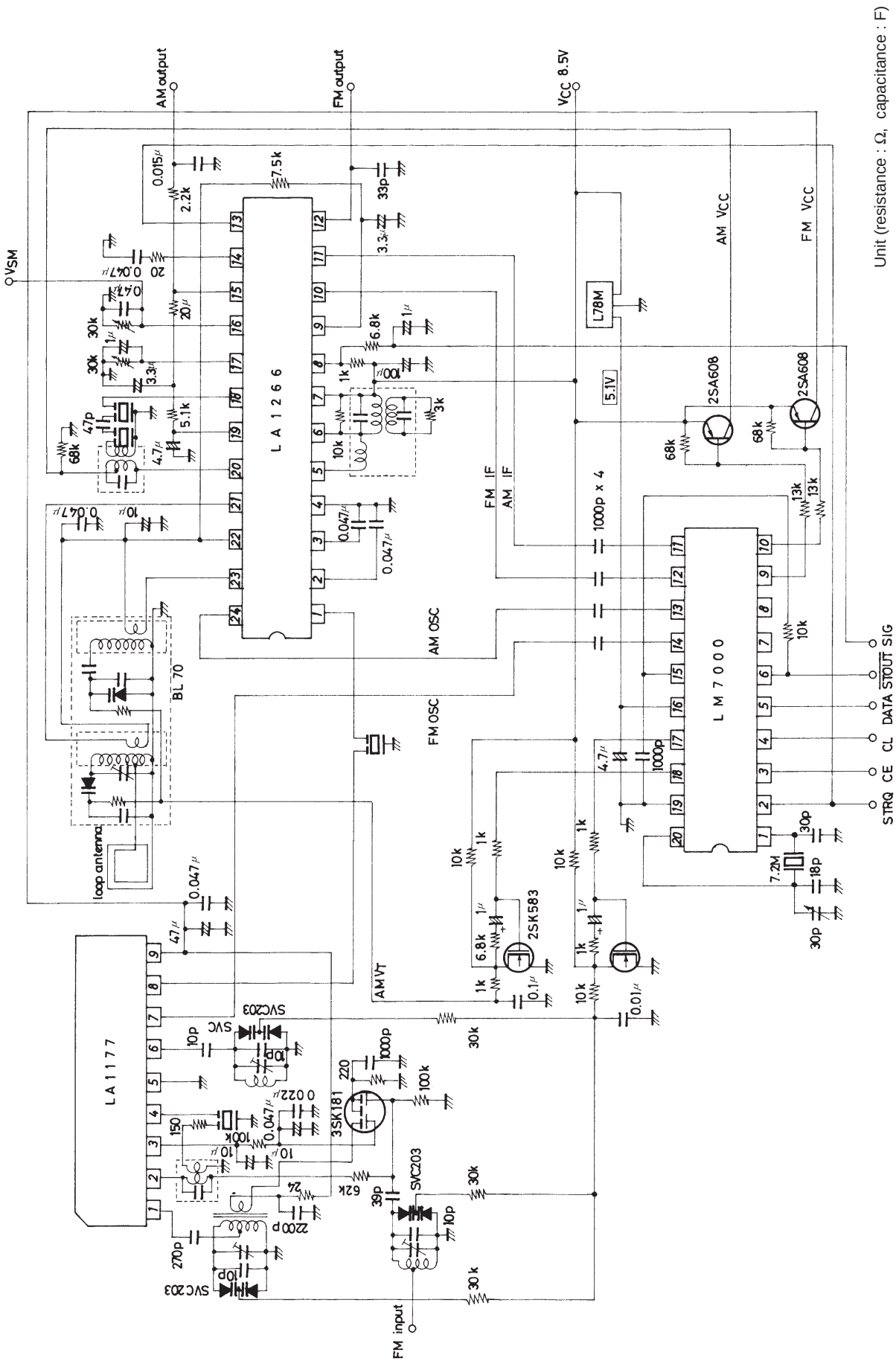


Unit (resistance : Ω)

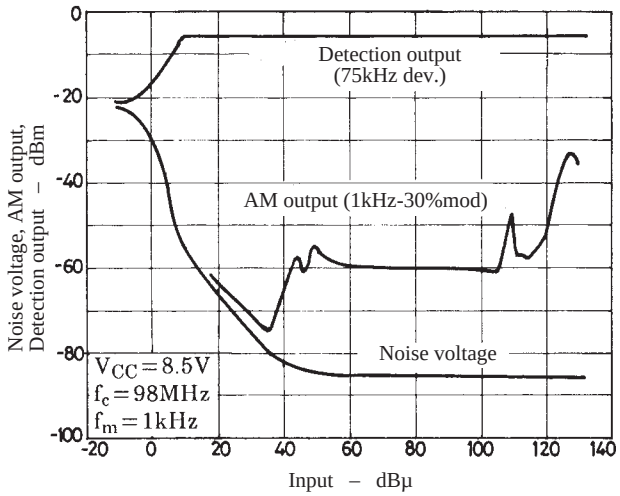
· HW-6146 (Mitsumi)
③-④ 86.5T
③-⑥ 13.5T
Q_O = 50 ± 20%
Internal 100pF±10%

· HW-40131 (Mitsumi)
④-⑥ 1T
①-③ 19T
Q_O = 35 ± 20%
Internal 100pF±10%

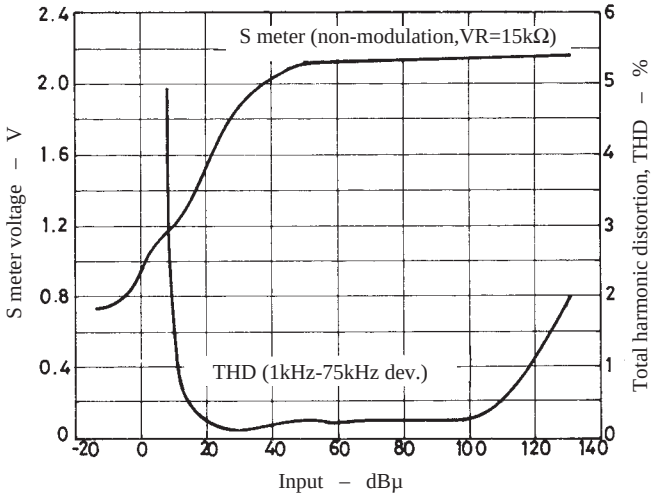
Sample Application Circuit : LA1177, LA1266, LM7000



LA1177+LA1266 Overall Characteristic



LA1177+LA1266 Overall Characteristic



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This catalog provides information as of November, 1997. Specifications and information herein are subject to change without notice.