

**LA1265****FM/AM Tuner of Electronic Tuning Type****Functions**

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

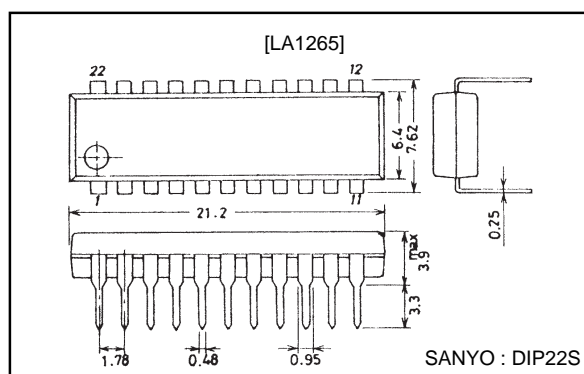
AM : RF amplifier, MIX, OSC (with ALC), IF amplifier, detector, AGC, signal meter, tuning indicator drive output (common with stop signal).

**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)
- Low whistle.
- Signal meter pin.

**Package Dimensions**

unit : mm

**3059-DIP22S****Specifications****Maximum Ratings** at Ta=25°C, See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max	Pins 7, 8, 17	16	V
Flow-in current	I <sub>g</sub>	Pin 8	20	mA
Flow-out current	I <sub>20</sub>	Pin 20	1	mA
	I <sub>22</sub>	Pin 22	2	mA
Allowable power dissipation	P <sub>d</sub> max	Ta≤60°C	650	mW
Operating temperature	T <sub>opr</sub>		-20 to +70	°C
Storage temperature	T <sub>stg</sub>		-40 to +125	°C

**Operating Conditions** at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended operating voltage	V <sub>CC</sub>		8.5	V
Operating voltage range	V <sub>CC</sub> op		6 to 14	V

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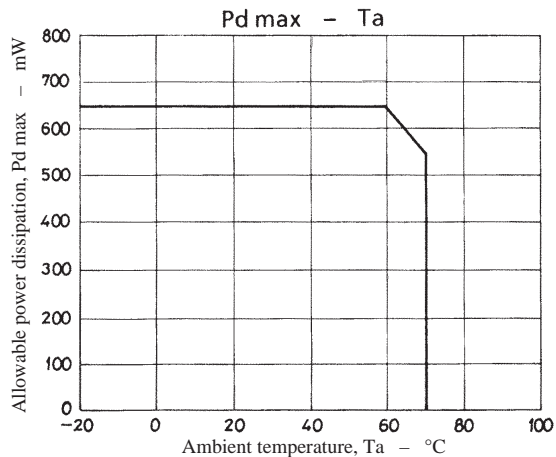
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

N2897HA (KT)/40194HK/O077KI/D095KI/2255KI, TS No.1820-1/15

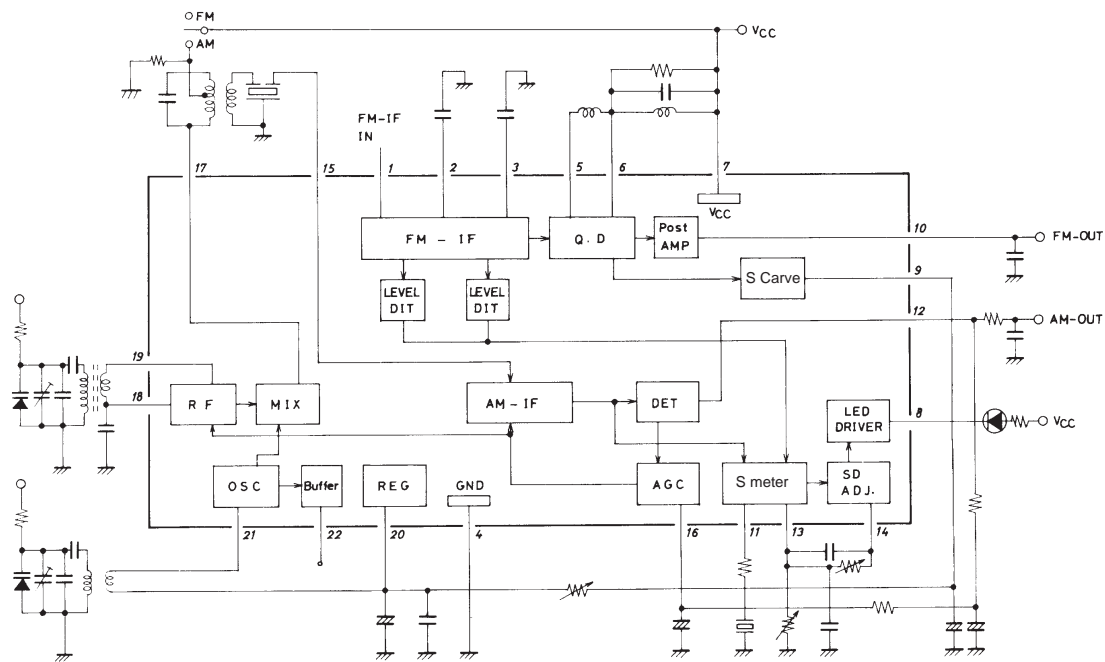
## LA1265

**Operating Characteristics** at  $T_a=25^{\circ}\text{C}$ ,  $V_{CC}=8.5\text{V}$ , See specified Test Circuit

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM : f=1MHz]						
Quiescent current	Icco	No input		18	26	mA
Detection output	VO1	VIN=20dBμ, 400Hz, 30% mod.	30	50	90	mV
	VO2	VIN=80dBμ, 400Hz, 30% mod.	110	160	220	mV
S/N	S/N1	VIN=20dBμ	16	20		dB
	S/N2	VIN=80dBμ	49	54		dB
Total harmonic distortion	THD1	VIN=80dBμ, 400Hz, 30% mod.		0.3	1.0	%
	THD2	VIN=107dBμ, 400Hz, 30% mod.		0.5	2.0	%
Signal meter output	VSM 1	No input	0	0	0.2	V
	VSM 2	VIN=80dBμ	2.4	2.8	3.1	V
LED lighting sensitivity	VLED on	ILED=1mA	15	24	33	dBμ
Local OSC buffer output	VOSC	fOSC=1.45MHz	220	275	330	mV
[FM : f=10.7MHz]						
Quiescent current	Icco	No input		20	28	mA
Input limiting sensitivity	-3dB L.S.	3dB down, 400Hz, 100% mod.		31	37	dBμ
Demodulation output	VO	VIN=10dBμ, 400Hz, 100% mod.	240	330	460	mV
S/N	S/N	VIN=100dBμ	78	84		dB
Total harmonic distortion	THD	VIN=100%dBμ, 400Hz, 100% mod.		0.03	0.3	%
Signal meter output	VSM 1	No input	0	0	0.2	V
	VSM 2	VIN=100dBμ	1.5	2.7	3.1	V
LED lighting sensitivity	LED-on	ILED=1mA	35	50	65	dBμ
LED lighting bandwidth	LED-BW	VIN=100dB, ILED=1mA	90	120	160	kHz
AM rejection ratio	AMR	VIN=100dBμ, FM=400Hz 100% mod. AM=1kHz 30% mod.	45	60		dB



## Equivalent Circuit Block Diagram



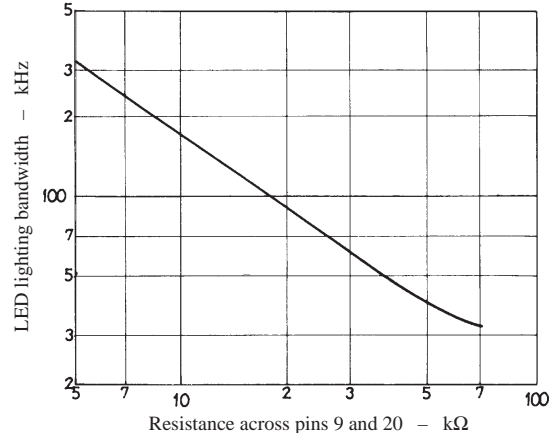
## How to use the LA1265

### 1. LED lighting, muting drive output, stop signal (SD).

- For LED lighting, muting drive output, stop signal, the output at pin 8 is used.
- The 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 CF (BFU450CN) at pin 11. If a capacitor is connected in place of the CF, the bandwidth will get wider.
  - For FM, the bandwidth depends on the resistance across pins 9 and 20. If the resistance is increased, the bandwidth will get narrower.  $R=15k\Omega$  makes the bandwidth approximately 120kHz.
- Sensitivity adjustment of LED, muting, stop signal.
  - For FM, the semifixed variable resistor across pin 13 and GND is used.
  - For AM, the semifixed variable resistor across pins 13 and 14 is used. Be sure to start adjustment for FM, and then make adjustment for AM. For the stop signal sensitivity and FM stop signal bandwidth, the variations should be considered and it is recommended to use the semifixed variable resistor for adjustment.
- LED lighting sensitivity setting for AM.
 

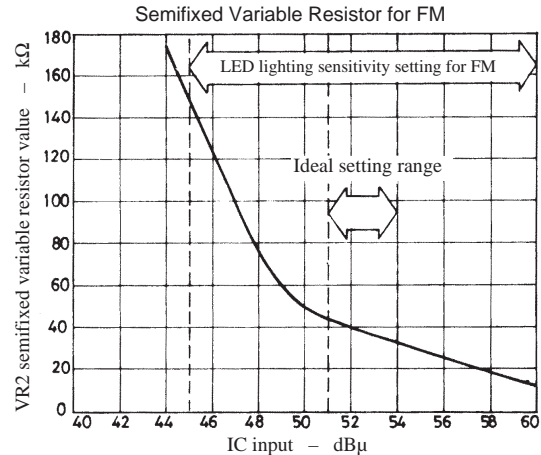
For the LED lighting sensitivity setting for AM, it is desirable that the IC input be 30dB $\mu$  (antenna input : approximately 50dB/m). In this case, the value of VR1 is 30k $\Omega$ .

LED Lighting Bandwidth — Resistance across pins 9 and 20



• LED lighting sensitivity setting for FM.

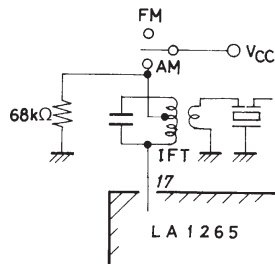
– For the LED lighting sensitivity setting for FM, the IC input may be 45dB $\mu$  to 60dB $\mu$ . With the variations in the front end considered, it is ideal that the IC input in a standard receiving set be 51dB $\mu$  to 54dB $\mu$ . The lower value of VR2 for the LED lighting sensitivity setting is as illustrated right. Since the variations in the front end cause the IC input setting sensitivity to vary, it is recommended to use a value of VR2 at an input voltage lower than a standard setting by 6dB or greater. For example, if IC input 53dB $\mu$  is taken as a standard, use VR2 $\leq$ 100k $\Omega$  at IC input 47dB $\mu$ .



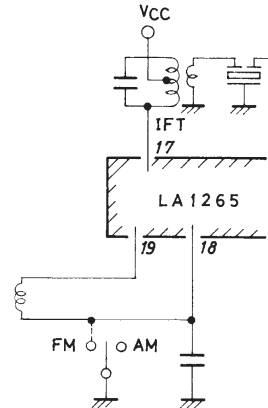
2. AM/FM changeover

- Two selections are available for changeover as shown below : (A) pin 17-used method and (B) pin 18-used method.
- For (A), the voltage on pin 17 relative to V<sub>CC</sub> (pin 7) must be within the range of -0.8V to +0.1V. If not within this range, distortion and selectivity will get worse.
- For (A), a resistance of 68k $\Omega$  at the IFT cold terminal, which is used to prevent the changeover circuit from malfunctioning, must be connected.

(A) pin 17-use method for AM/FM changeover



(B) Pin 18-used method for AM/FM changeover



3. Local OSC buffer output

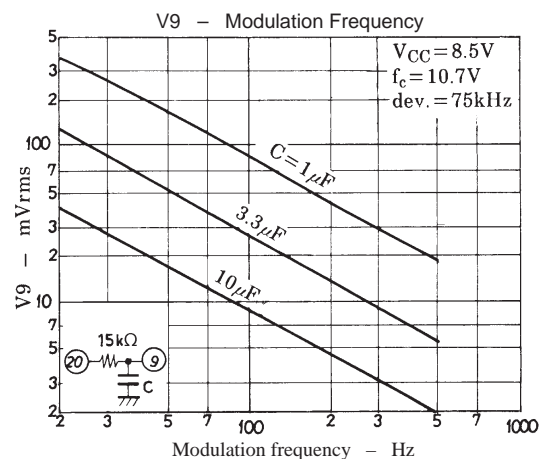
- When local OSC buffer output wave form is saw-toothed at the SW mode, connect a resistance of 1.2k $\Omega$  or thereabouts across pin 22 and GND.

4. AM input pin

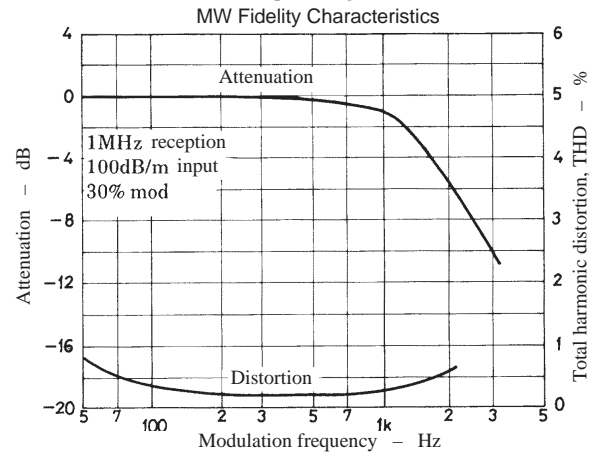
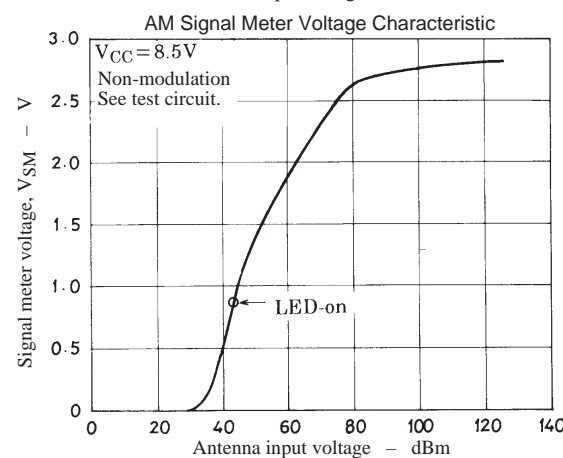
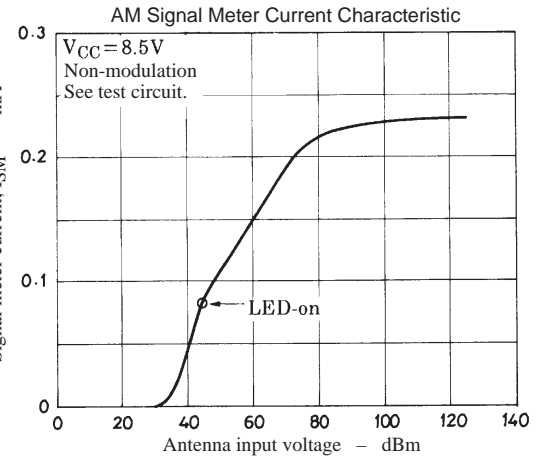
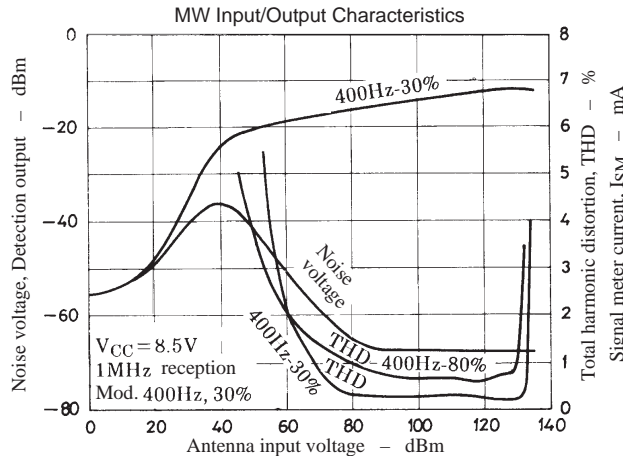
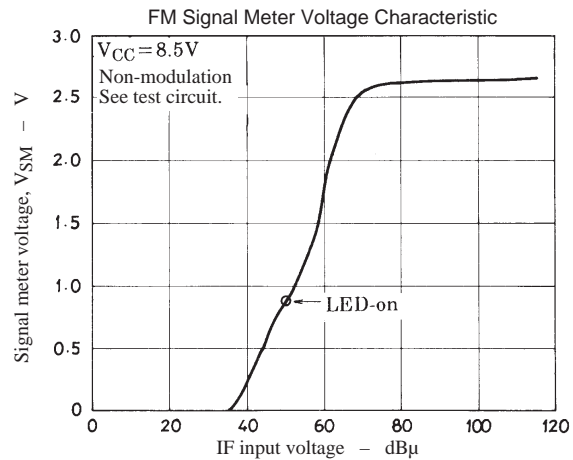
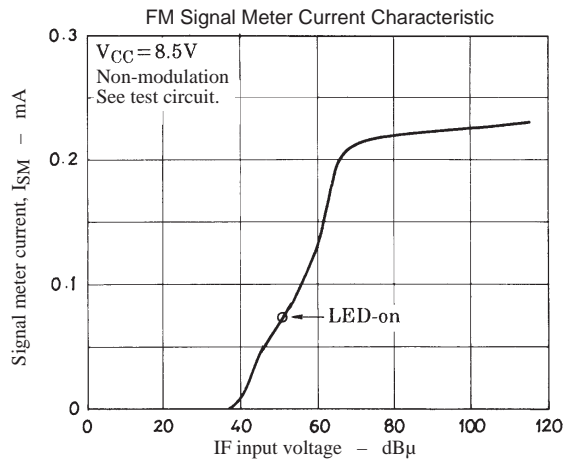
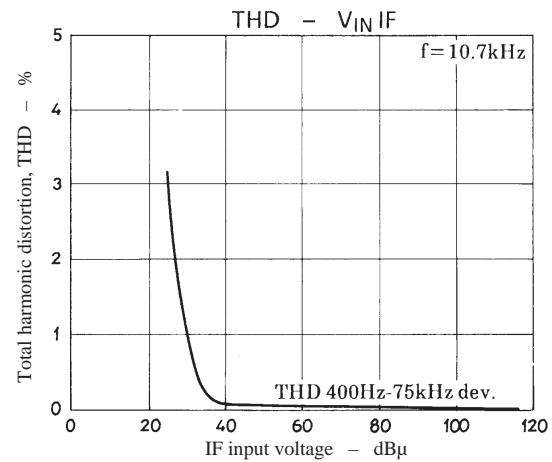
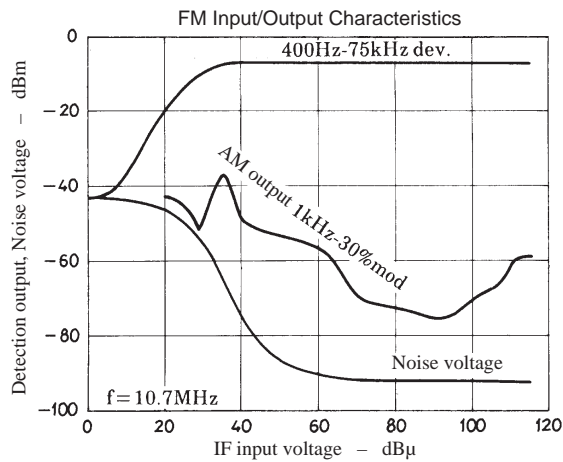
- It is desirable that the AM input pin (pin 19) be L-coupled to pin 18.
- Inputting to pin 19 can be done by DC-cutting with a capacitor. However, an unbalance in the RF amplifier (differential amplifier) causes gain drop and whistle worsening.

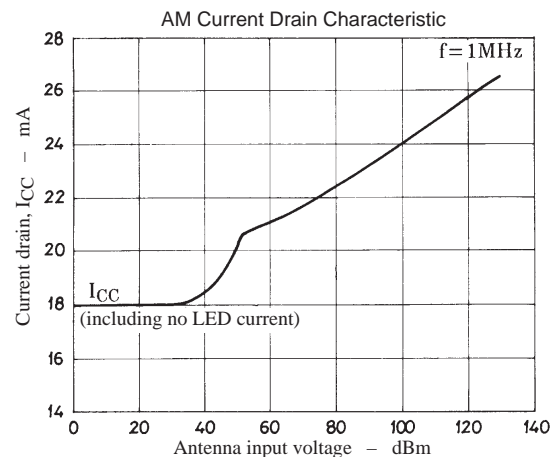
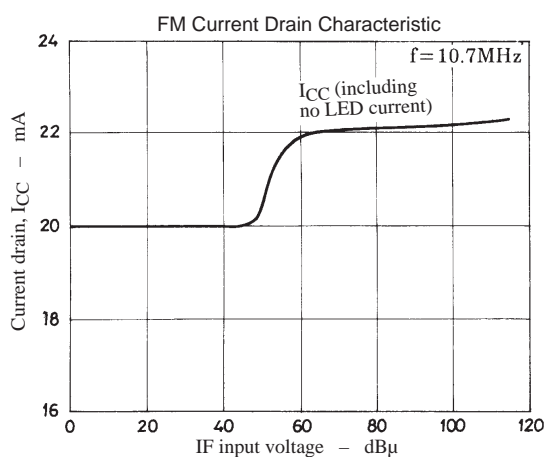
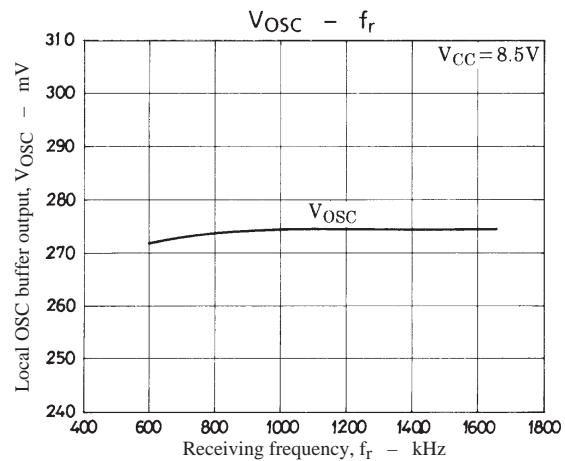
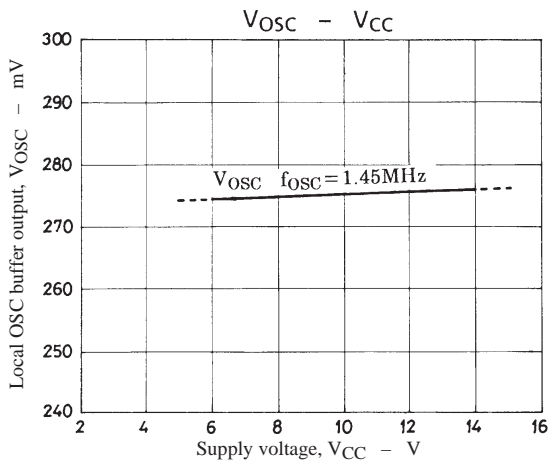
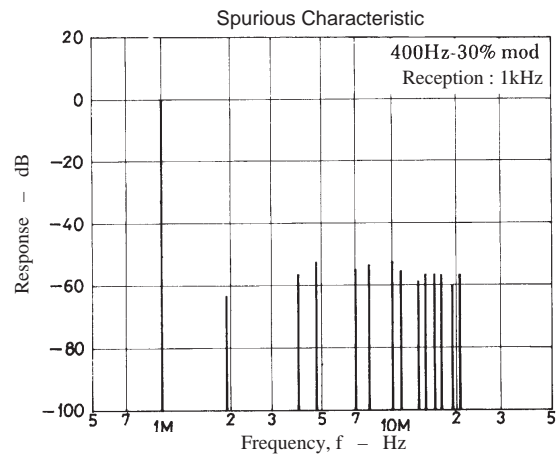
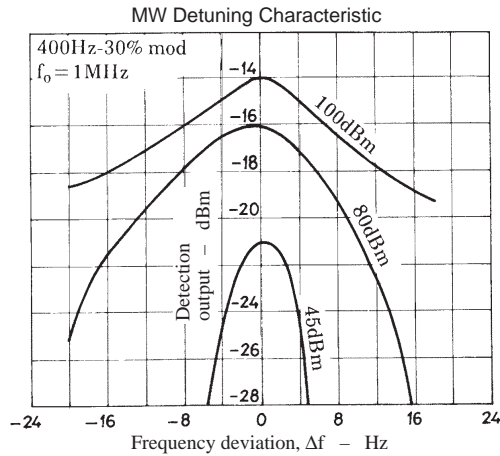
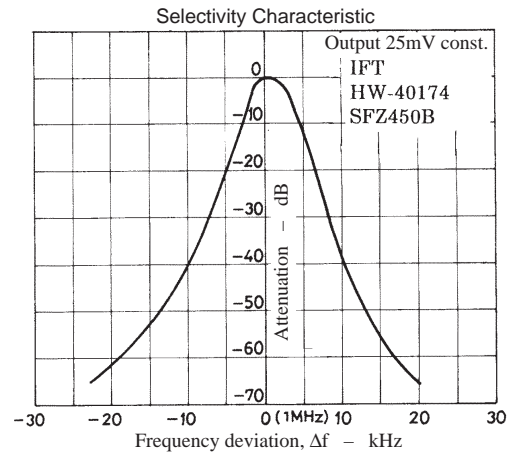
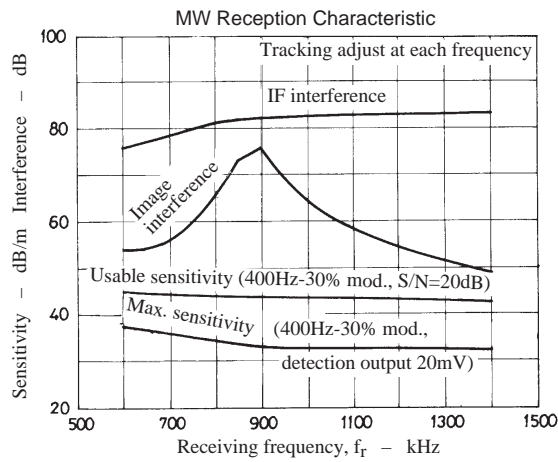
5. Capacitance across pin 9 and GND.

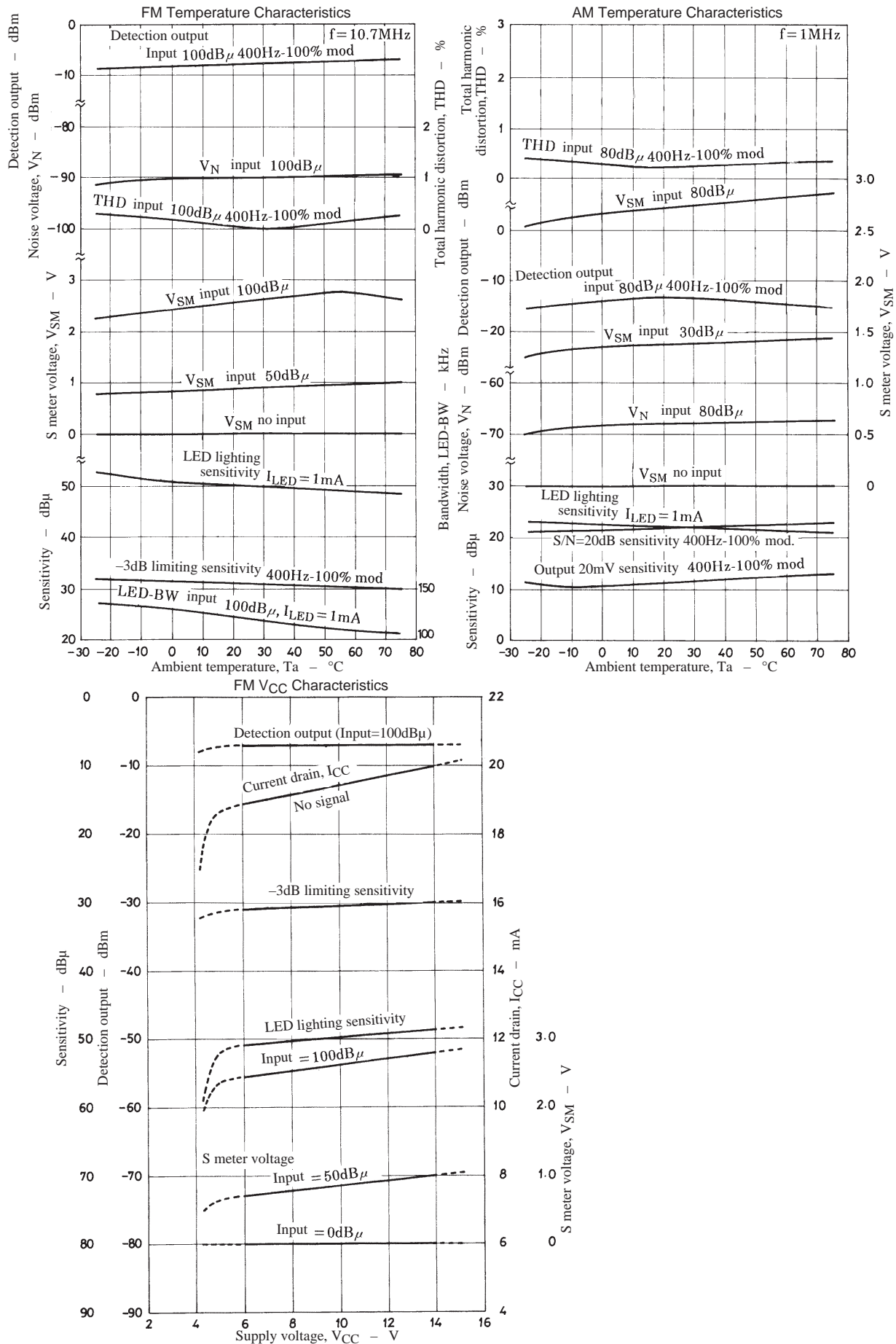
A large capacitance across pin 9 and GND may cause a misstop at an adjacent channel when the channel select speed is made faster at the automatic channel select mode. In this case, decrease the capacitance across pin 9 and GND. However, if too decreased, the LED will flutter at low modulation frequencies at the time of detuning. Therefore, it is recommended to fix the capacitance across pin 9 and GND to be 3.3 $\mu$ F to 10 $\mu$ F. 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.



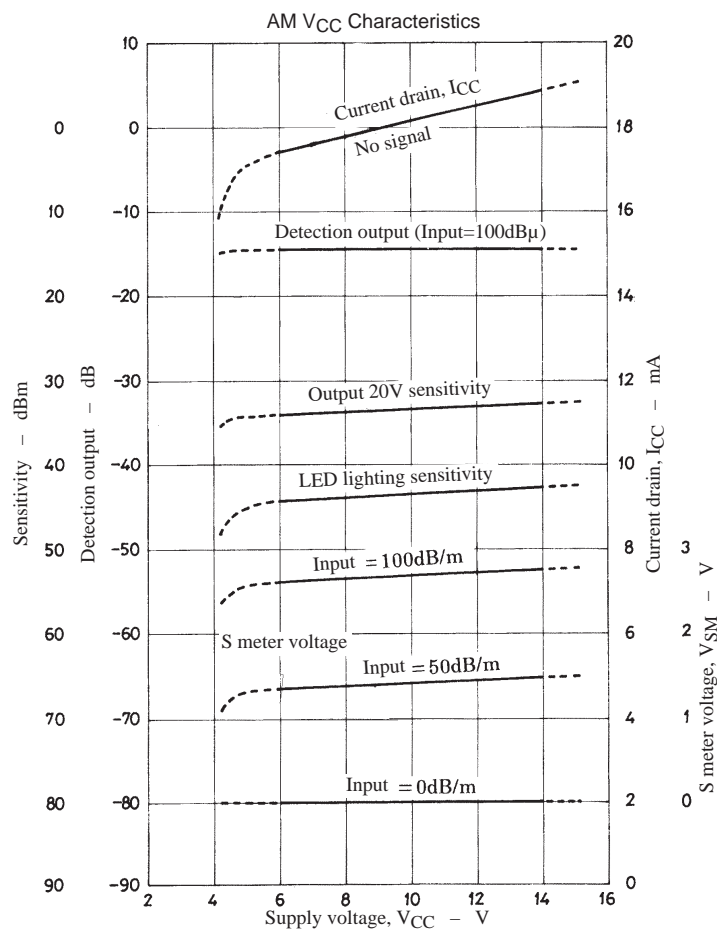




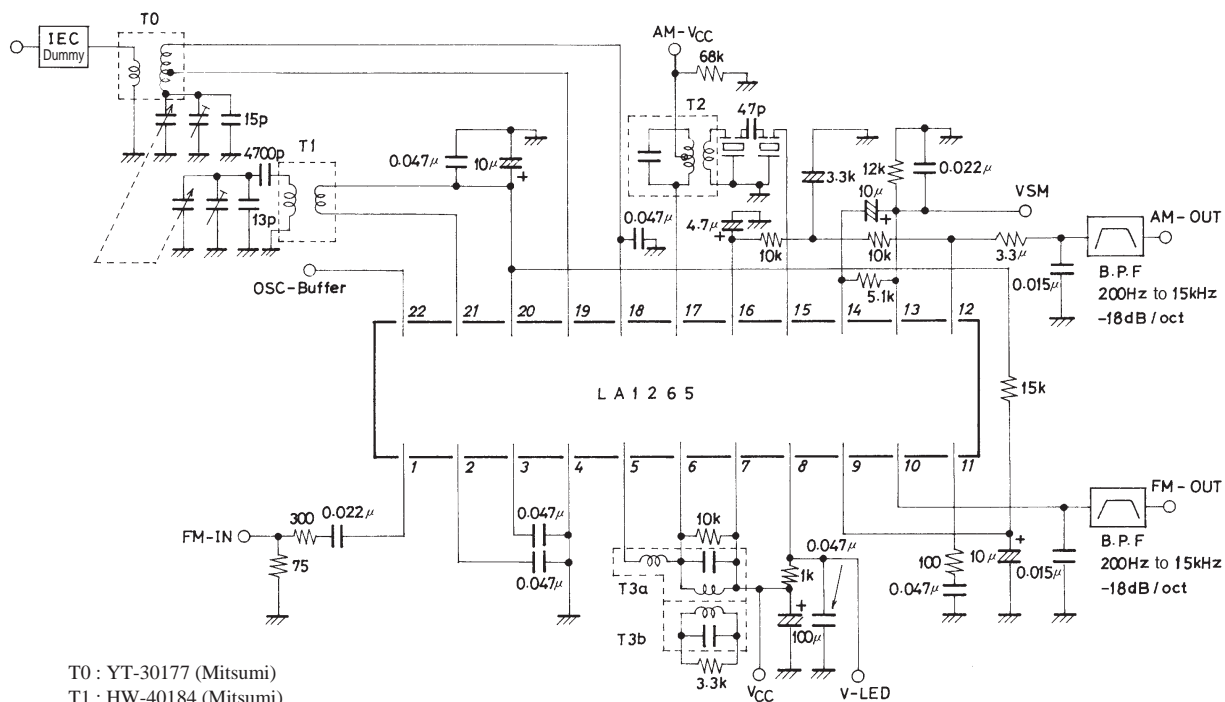






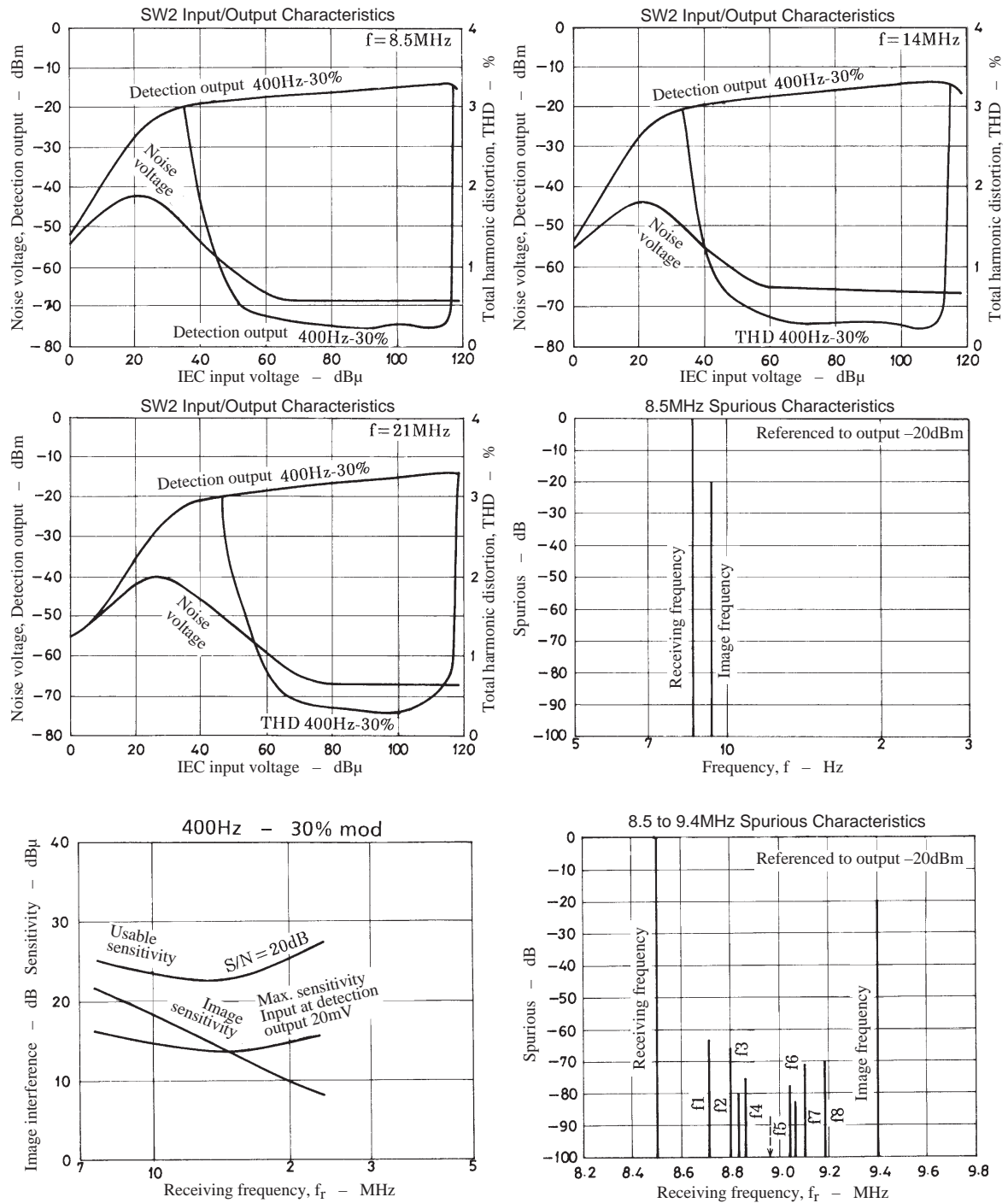


### Test Circuit : SW2



T0 : YT-30177 (Mitsumi)  
 T1 : HW-40184 (Mitsumi)  
 T2 : HW-40174 (Mitsumi)  
 T3a : HW-40130, T3b : HW-40131 (Mitsumi)  
 Variable capacitor PVC 22KTL (Mitsumi)

Unit (resistance :  $\Omega$ , capacitance : F)



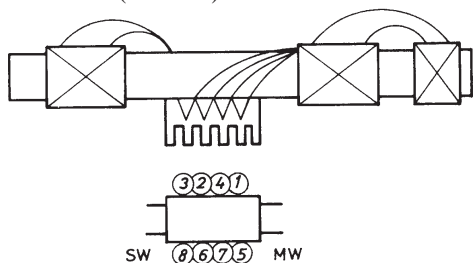
$f_1 : 8.724\text{MHz} \rightarrow 2f_{\text{OSC}} - 2f_1 = 455\text{kHz}$   
 $f_2 : 8.799\text{MHz} \rightarrow 3f_{\text{OSC}} - 3f_2 = 455\text{kHz}$   
 $f_3 : 8.836\text{MHz} \rightarrow 4f_{\text{OSC}} - 4f_3 = 455\text{kHz}$   
 $f_4 : 8.859\text{MHz} \rightarrow 5f_{\text{OSC}} - 5f_4 = 455\text{kHz}$   
 $f_5 : 9.038\text{MHz} \rightarrow 5f_5 - 5f_{\text{OSC}} = 455\text{kHz}$   
 $f_6 : 9.061\text{MHz} \rightarrow 4f_6 - 4f_{\text{OSC}} = 455\text{kHz}$   
 $f_7 : 9.098\text{MHz} \rightarrow 3f_7 - 3f_{\text{OSC}} = 455\text{kHz}$   
 $f_8 : 9.173\text{MHz} \rightarrow 2f_8 - 2f_{\text{OSC}} = 455\text{kHz}$

## Coil Specifications

MW antenna

Bar antenna (for PVC22KTL)

- TN-10896 (Mitsumi)



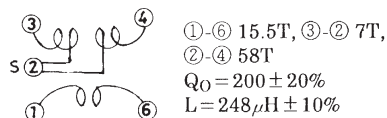
- ①-② 22T + 49T, ③-④ 10T  
Tight solenoid direct winding  
⑤-⑥ 17T 0.5φ space winding  
⑦-⑧ 4T tight solenoid winding  
①-②  $L = 260\mu\text{H}$ ,  $Q_0 = 330 (\geq 200)$   
⑤-⑥  $L = 15\mu\text{H}$ ,  $Q_0 = 250 (\geq 150)$

Loop antenna (for SVC321)

- LA300 (Korin Giken)

Loop antenna matching coil

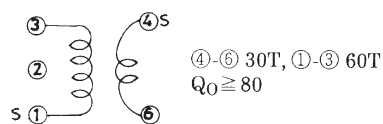
- KT-412



MW OSC

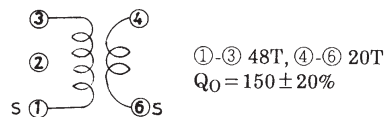
- 4147-1457-177 (Sumida)

For PVC22KTL



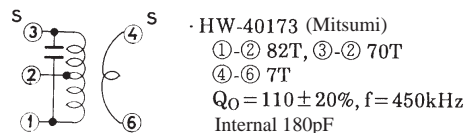
- KO-387 (Korin Giken)

For SVC321



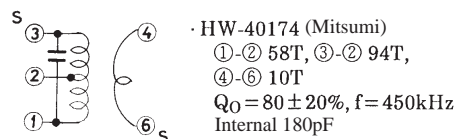
AM-IFT

Matching coil for SFU450B (1-element type)



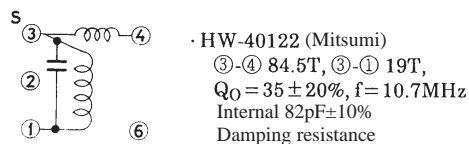
- 2150-2162-197 (Sumida)  
①-② 103T, ③-② 71T,  
④-⑥ 8T  
 $Q_0 \geq 80$ ,  $f = 450\text{kHz}$   
Internal 180pF

Matching coil for SFZ450B (2-element type)



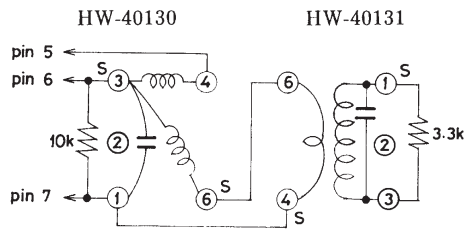
- 2150-2061-049 (Sumida)  
①-② 54T, ③-② 120T,  
④-⑥ 12T  
 $Q_0 \geq 40$   
Internal 180pF

FM single tuning detection coil



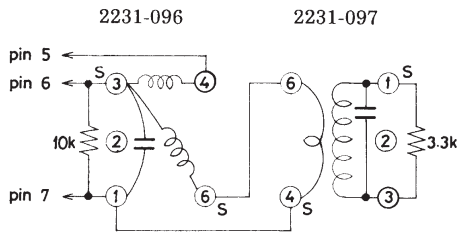
- 2231-016 (Sumida)  
③-④ 73.5T, ③-① 19T,  
 $Q_0 = 30 \pm 20\%$ ,  $f = 10.7\text{MHz}$   
Internal 82pF  $\pm 10\%$   
Damping resistance

FM double tuning detection coil



· HW-40130 (Mitsumi)  
 ③-④ 86.5T  
 ③-⑥ 13.5T  
 $Q_0 = 50 \pm 20\%$   
 Internal 100pF $\pm 10\%$

· HW-40131 (Mitsumi)  
 ④-⑥ 1T  
 ①-③ 19T  
 $Q_0 = 35 \pm 20\%$   
 Internal 100pF $\pm 10\%$

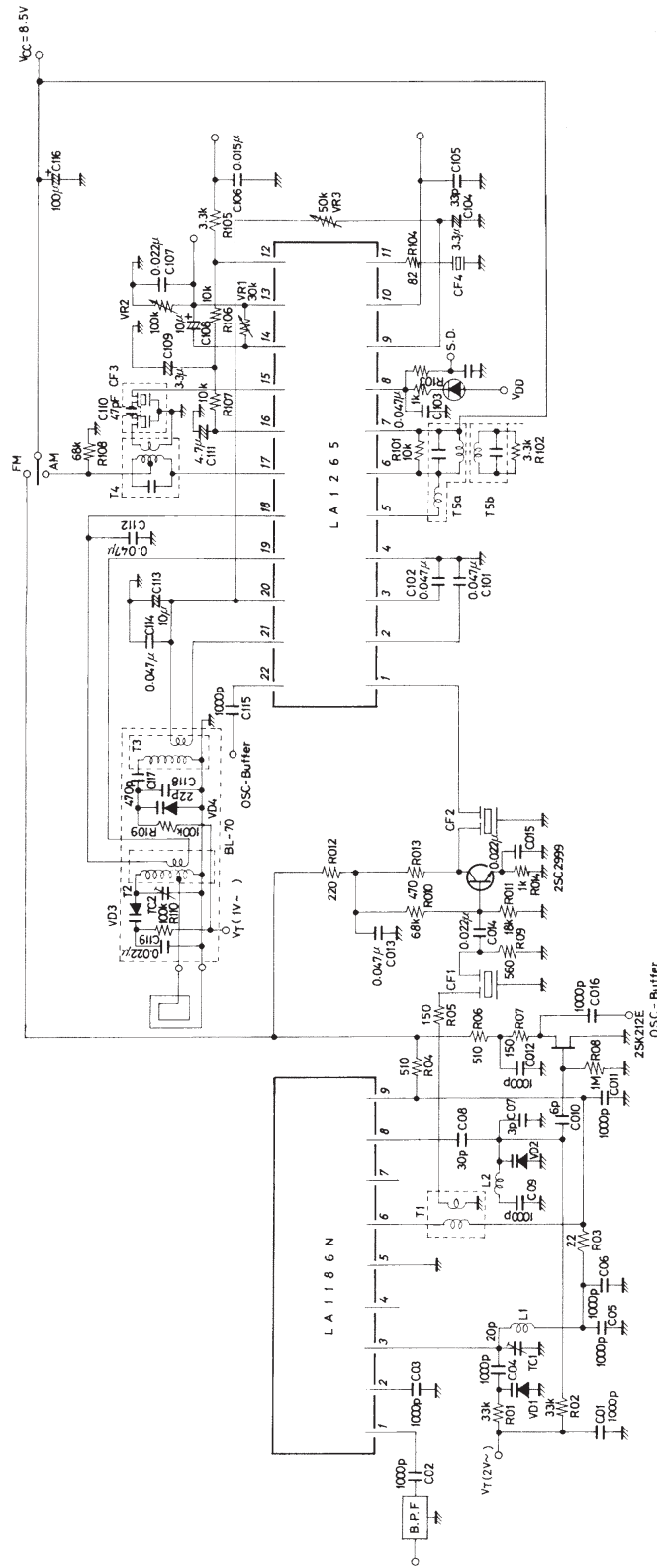


· 2231-096 (Sumida)  
 ③-④ 73.5T  
 ③-⑥ 23.5T  
 $Q_0 = 50 \pm 20\%$   
 Internal 62pF $\pm 10\%$

· 2231-097 (Sumida)  
 ④-⑥ 2T  
 ①-③ 21T  
 $Q_0 = 47 \pm 20\%$   
 Internal 82pF $\pm 10\%$

Unit (resistance :  $\Omega$ )

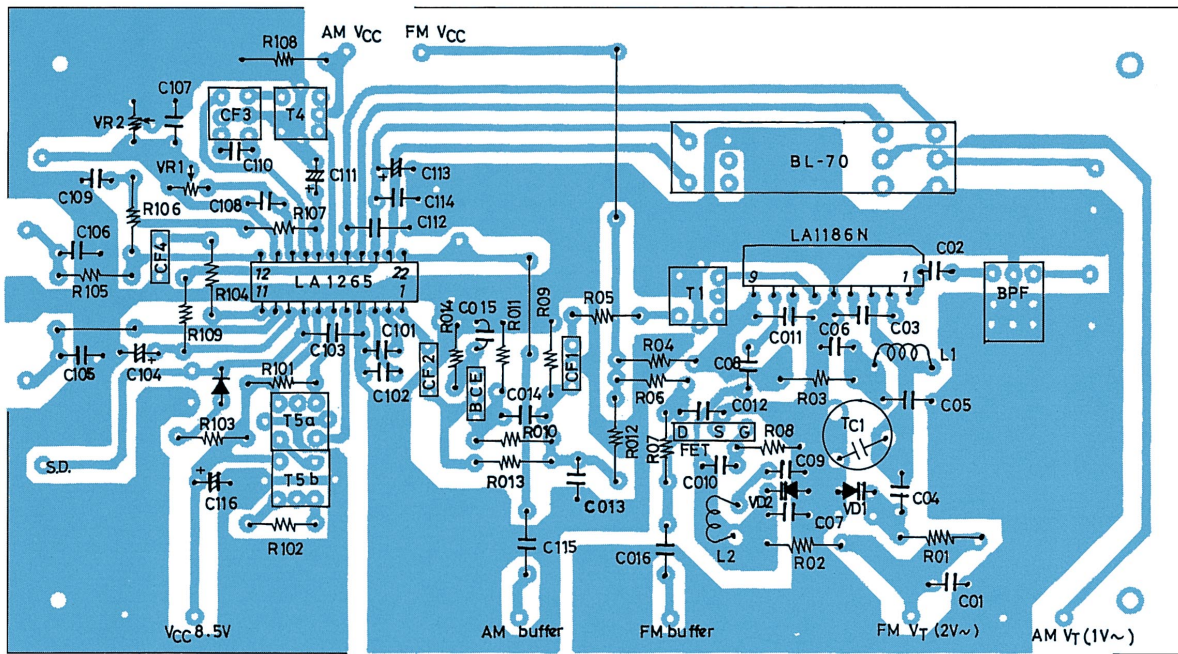
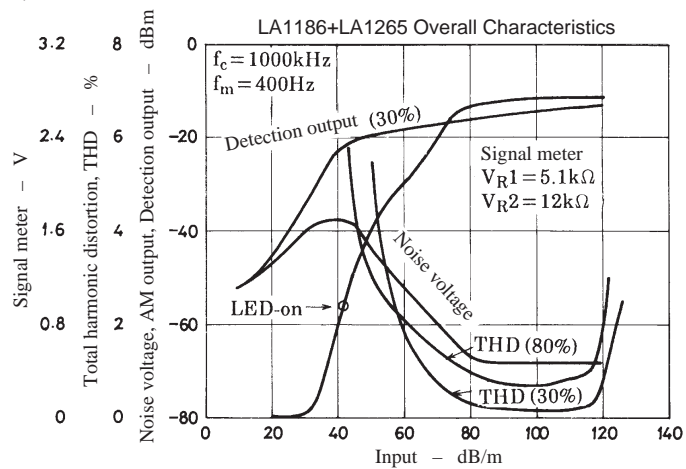
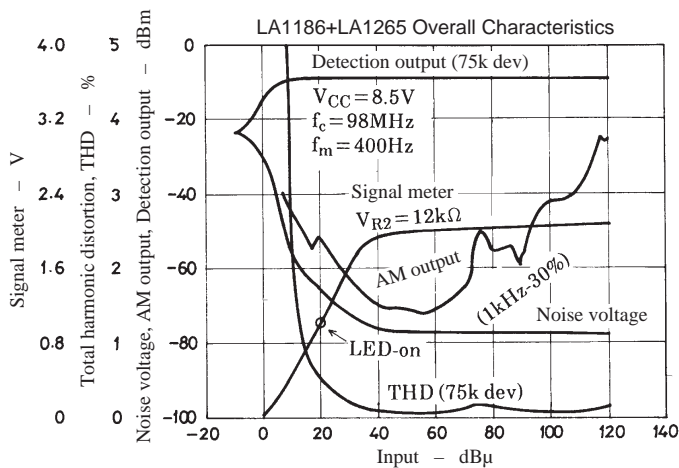
Sample Application Circuit : LA1186N + LA1265 (US Band)



- B.P. F SNY-2101 (Sumida)  
 V<sub>D1</sub>, V<sub>D2</sub>=SVC201  
 V<sub>D3</sub>, V<sub>D4</sub>=SVC321  
 TC1=20pF  
 TC2=20pF  
 CF1, CF2=SFE10.7MA  
 CF3=SFZ450B (Murata)  
 CF4=BFU450CN (Murata)  
 L1 : YT-30196 (Mitsumi), 0708-700 (Sumida)  
 L2 : HW50433 (Mitsumi), 0267-034 (Sumida)
- T1 : YT-30224 (Mitsumi)  
 T2 : KL412 (Korin) } BL-70  
 T3 : KO387 (Korin) }  
 T4 : HW-40174 (Mitsumi), 2150-2061-049 (Sumida)  
 T5a : HW-40130 (Mitsumi), 2231-096 (Sumida)  
 T5b : HW-40130 (Mitsumi), 2231-096 (Sumida)

Unit (resistance : Ω, capacitance : F)

## Sample Printed Circuit Pattern (Cu-foiled area)

85×155mm<sup>2</sup>

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