



# LA1177

## Electronic Tuning-Use FM Front End for Car Radio, Home Stereos

### Overview

- The LA1177 is an FM front end IC for use in car radio, home stereo applications. It requires fewer external parts. The on-chip oscillator and oscillation buffer facilitate designing of electronic tuning sets.

### Features

- Wide-band AGC circuit (Improvement in intermodulation, cross modulation characteristics).
- On-chip local oscillation buffer (For electronic tuning).

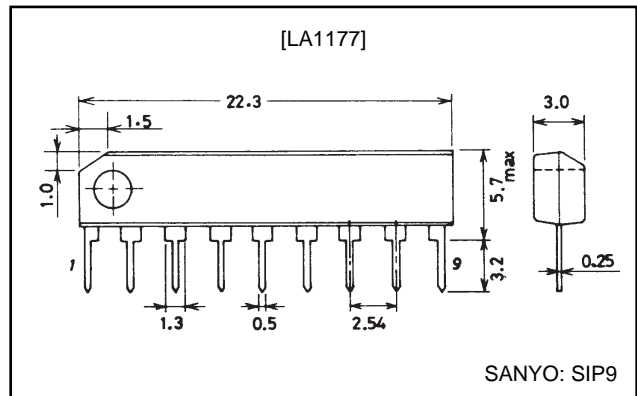
### Functions

- Oscillator, oscillation buffer.
- Mixer.
- Wide-band AGC circuit.
- IF amplifier.

### Package Dimensions

unit: mm

#### 3017C-SIP9



### Specifications

#### Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max	Pins 2, 9	10	V
Allowable power dissipation	P <sub>d</sub> max	T <sub>a</sub> ≤ 70°C	440	mW
Operating temperature	T <sub>opr</sub>		-20 to +70	°C
Storage temperature	T <sub>stg</sub>		-40 to +125	°C

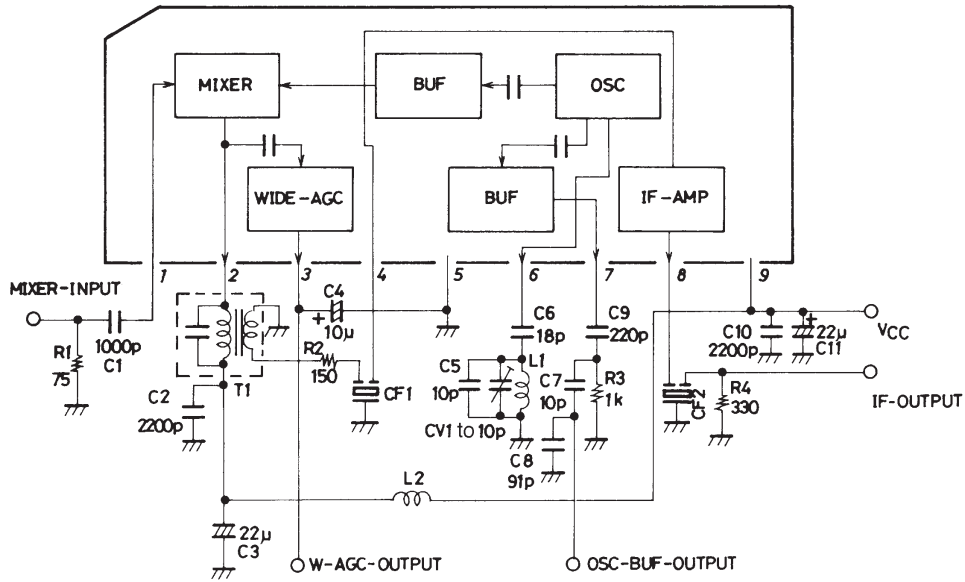
#### Operating Conditions at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		8	V
Operating voltage range	V <sub>CC</sub> op		8 to 9	V

#### Electrical Characteristics at Ta=25°C, V<sub>CC</sub>=8V, f<sub>in</sub>=88MHz

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I <sub>CCO</sub>	No input	21	26	31	mA
AGC high-level voltage	V <sub>AGC-H</sub>	V <sub>IN</sub> =0dBμ	7.7	8.0		V
AGC low-level voltage	V <sub>AGC-L</sub>	V <sub>IN</sub> =100dBμ		0.07	0.3	V
AGC mixer input voltage	V <sub>i</sub> AGC	V <sub>AGC</sub> ≤ 2V, Pin 3	73	80	87	dBμ
IF saturation output voltage	V <sub>IF-max</sub>	V <sub>IN</sub> =1.0dBμ	108	112	116	dBμ
Input limiting voltage	V <sub>i</sub> lim		76	83	90	dBμ
Voltage gain	VG	V <sub>IN</sub> =65dBμ	88	92	96	dBμ
Local OSC output voltage	V <sub>OSC</sub>	No input, 75Ω termination	80	84	88	dBμ

Evaluation Circuit and Internal Equivalent Circuit Block Diagram



Unit (resistance : Ω, capacitance : F)

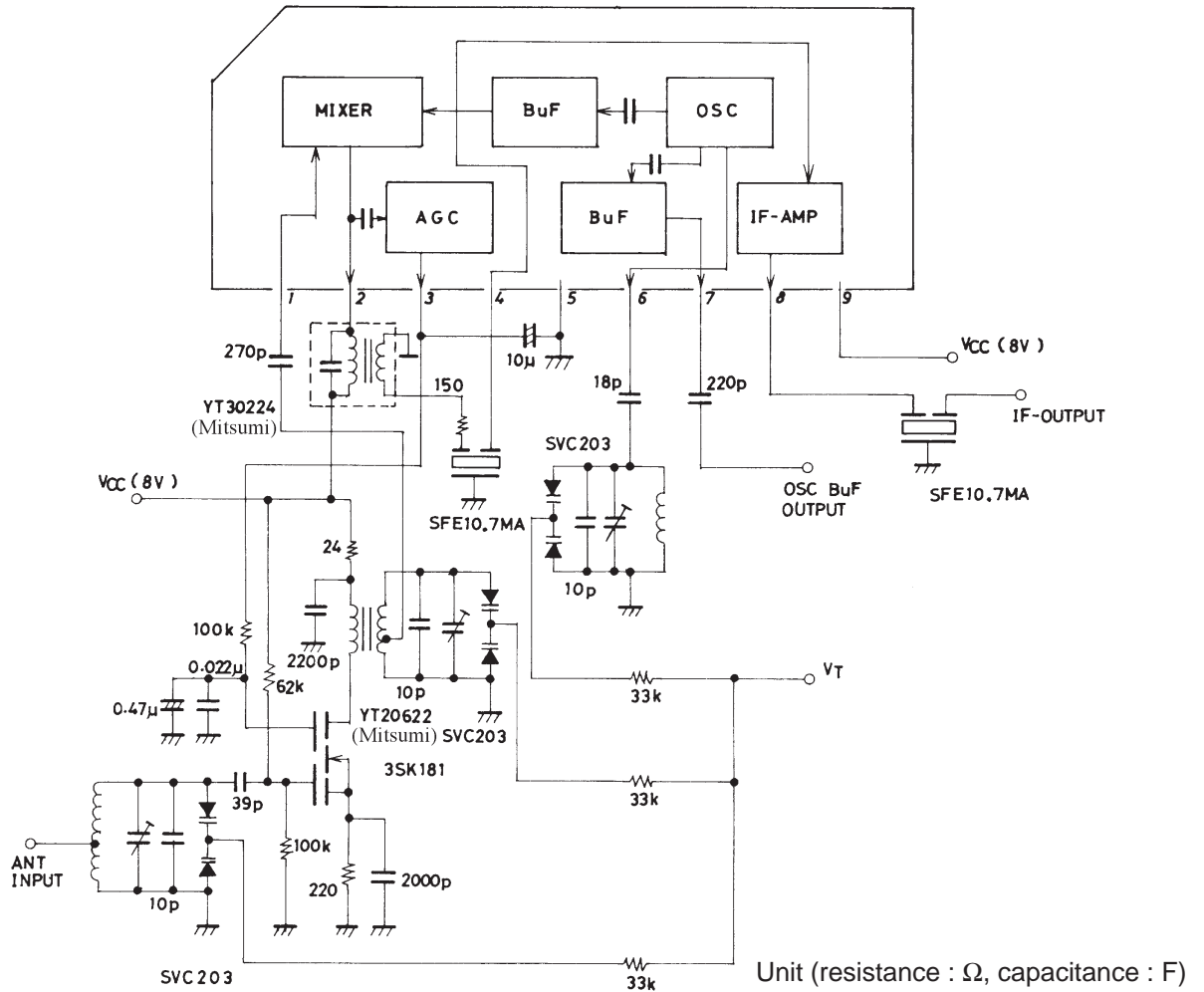
T1 : YT30224 (Mitsumi)  
 L1 : HU-50448 (Mitsumi)  
 CF1-CF2 : SFE10.7MA (Murata)

Typical Voltage on Each Pin

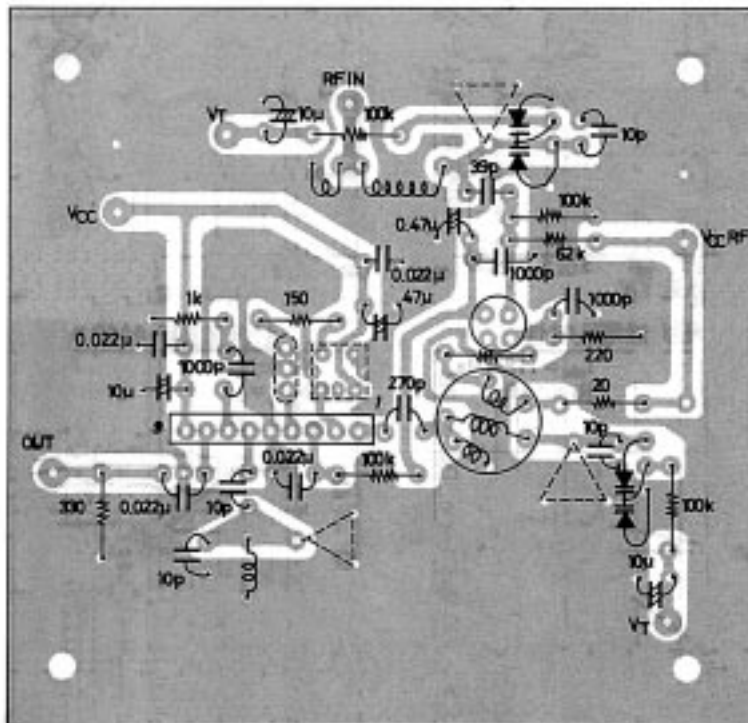
Pin No.	Typical voltage	Description	Remarks
1	2.7V	Mixer input	
2	8.0V	Mixer output	
3	8.0V	AGC input	No input
4	2.0V	IF input	
5	0V	GND	
6	4.9V	Oscillator base terminal	
7	1.4V	Oscillation buffer output	
8	4.4V	IF output	
9	8.0V	V <sub>CC</sub>	

Note : Extreme caution should be exercised when applying voltage across pin 9 (+) and other pins as dielectric breakdown may occur.

Sample Application Circuit

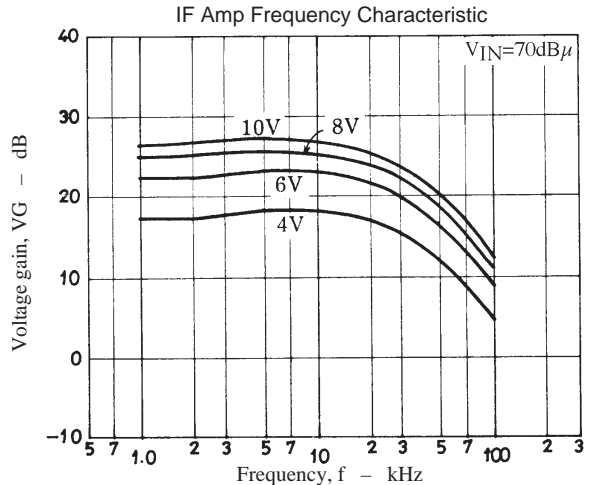
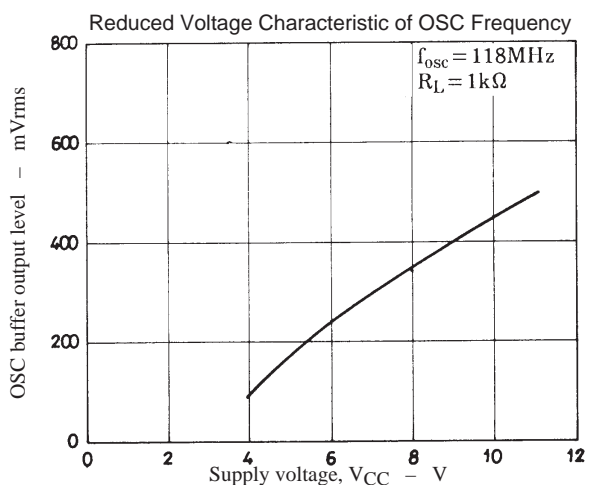
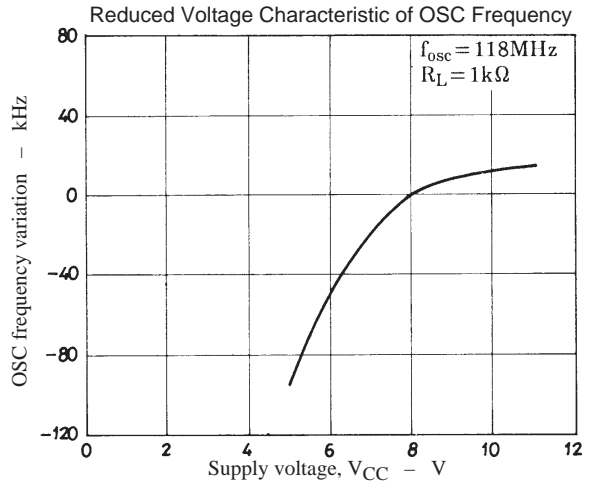
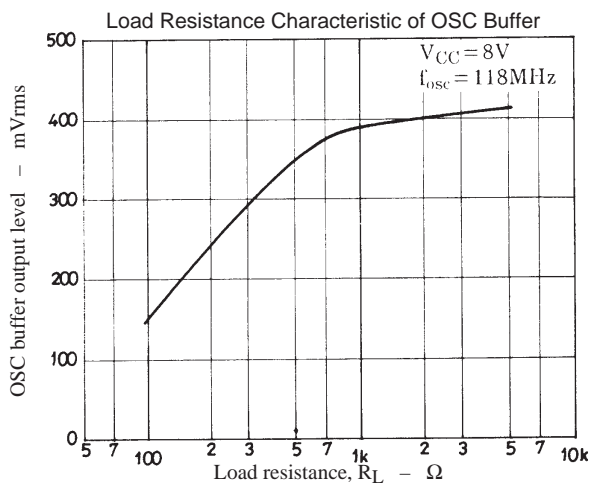
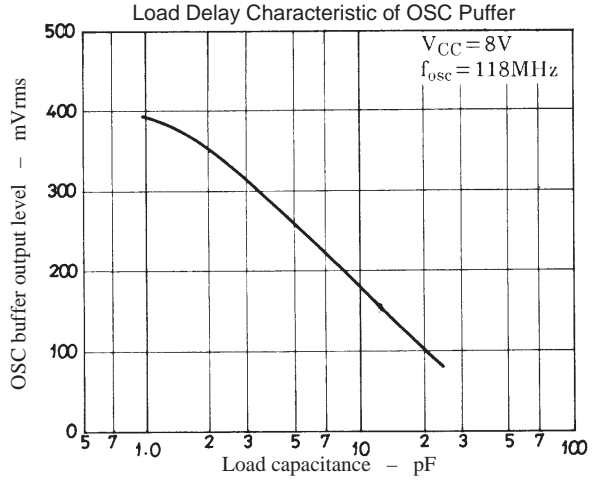
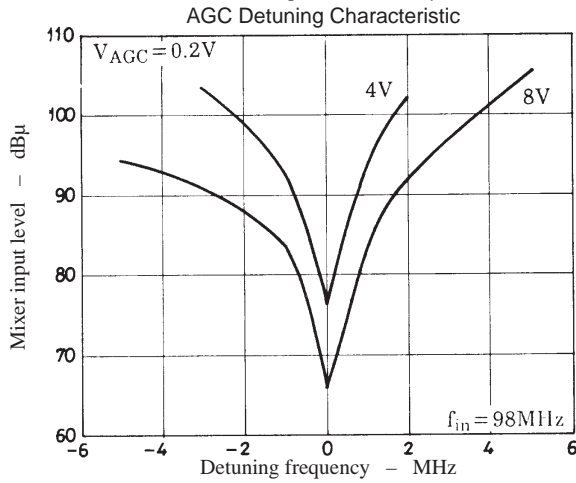
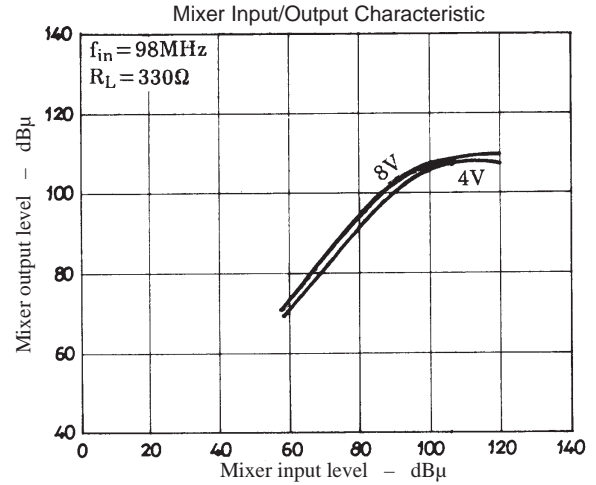
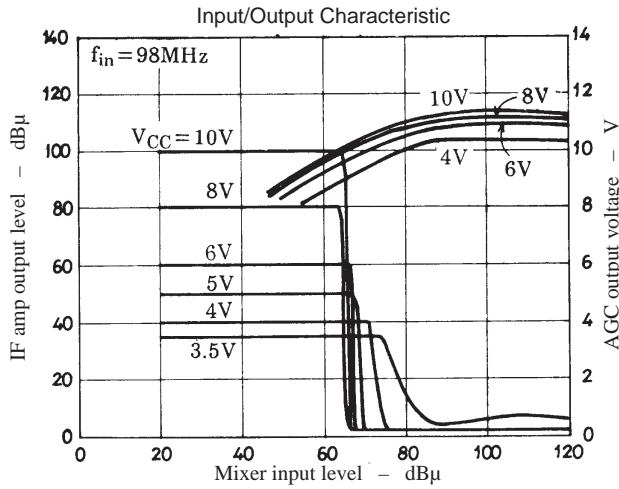


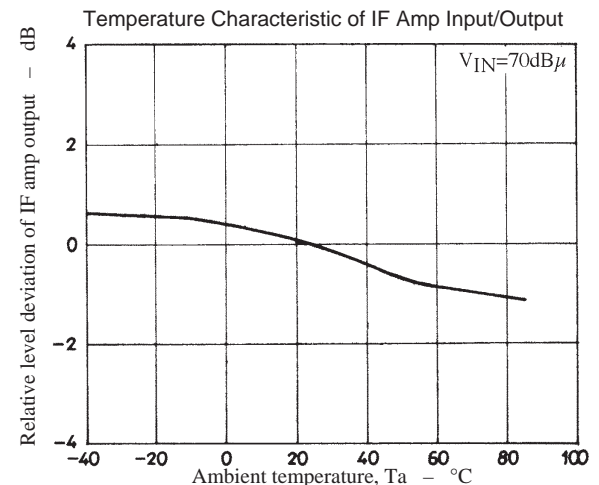
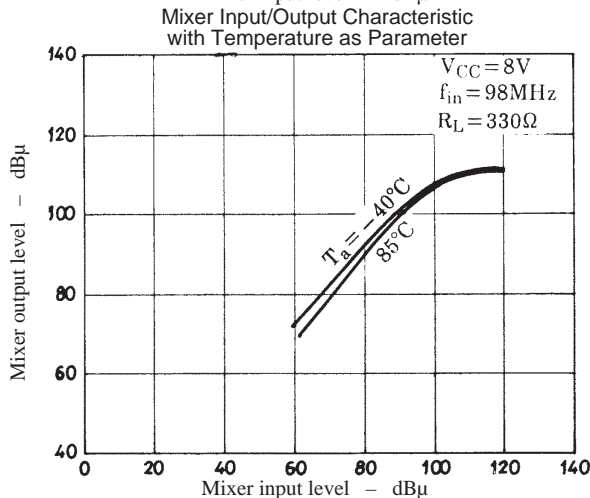
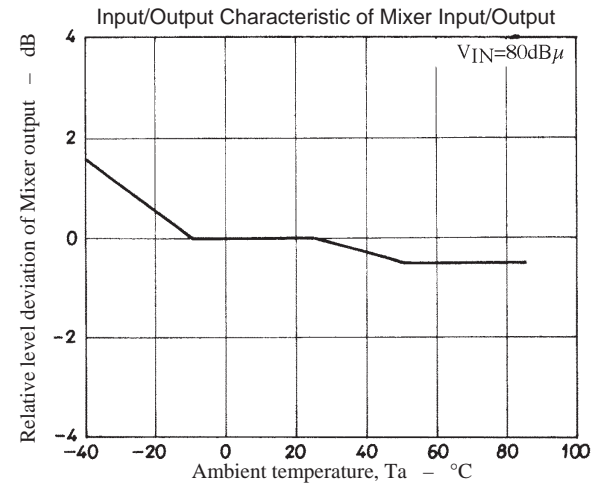
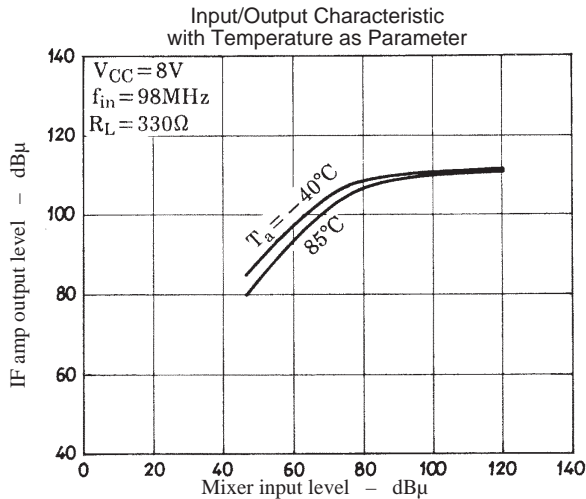
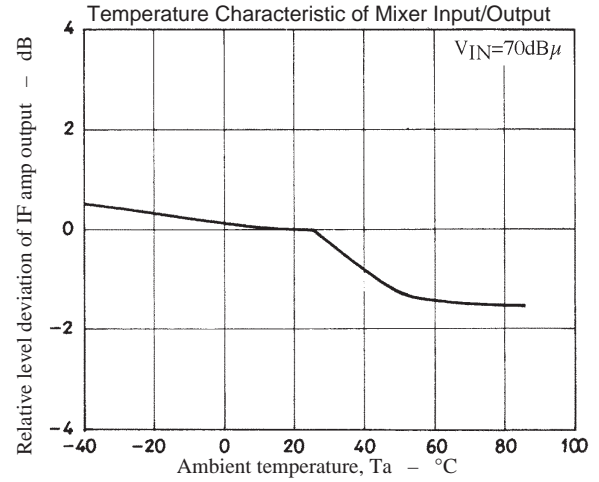
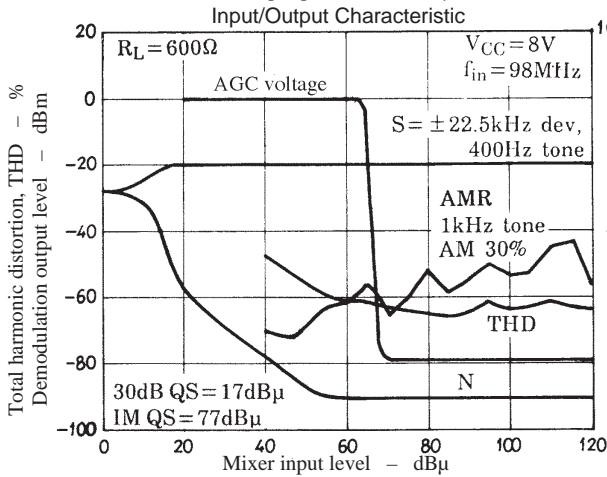
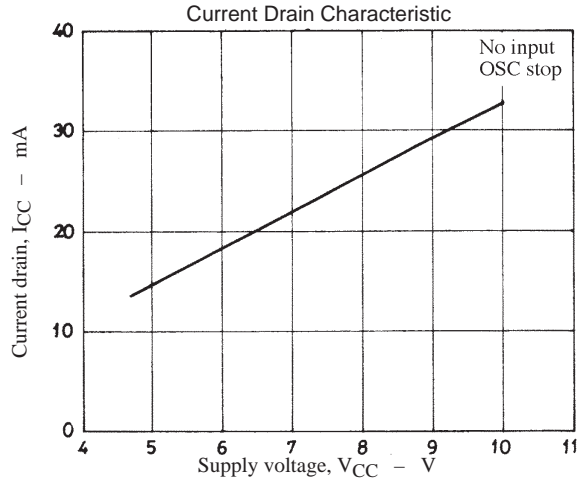
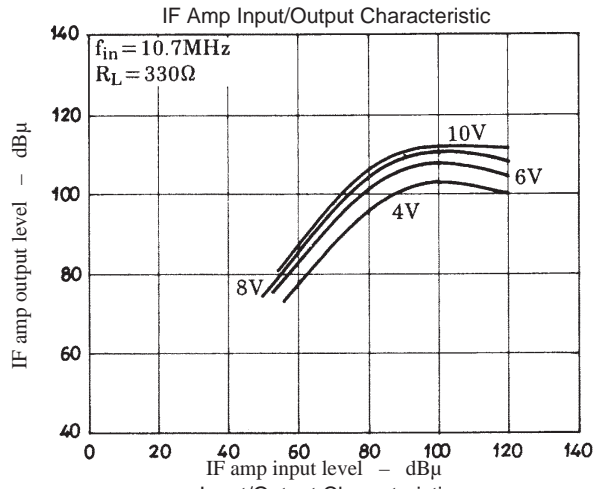
Sample Printed Circuit Pattern



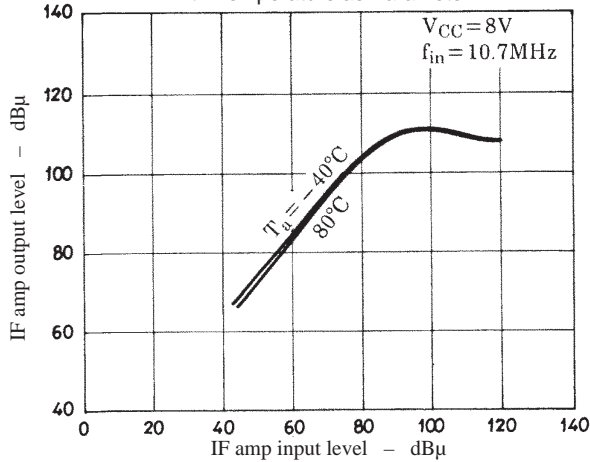
Cu-foiled area 85×82 mm<sup>2</sup>

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

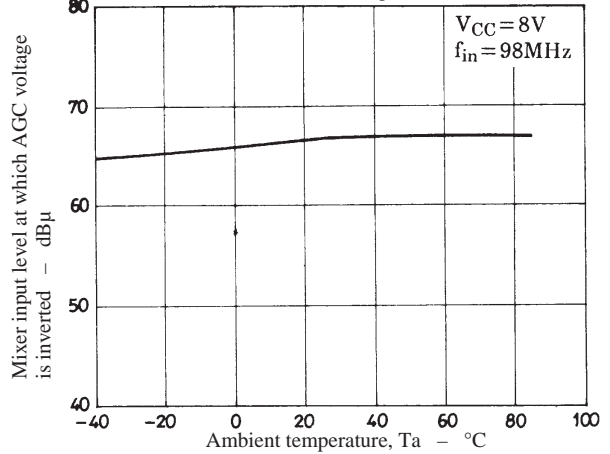




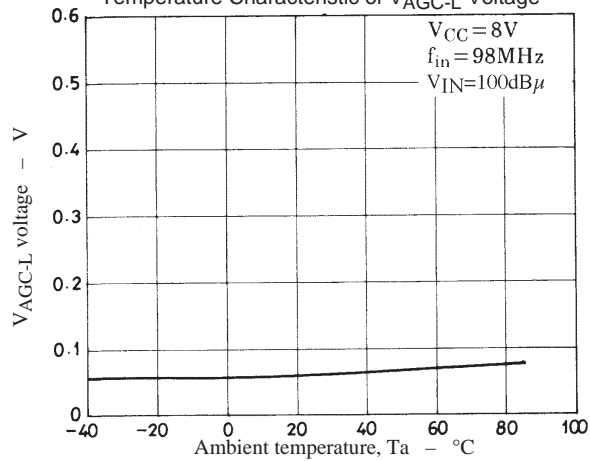
IF Amp Input/Output Characteristic with Temperature as Parameter



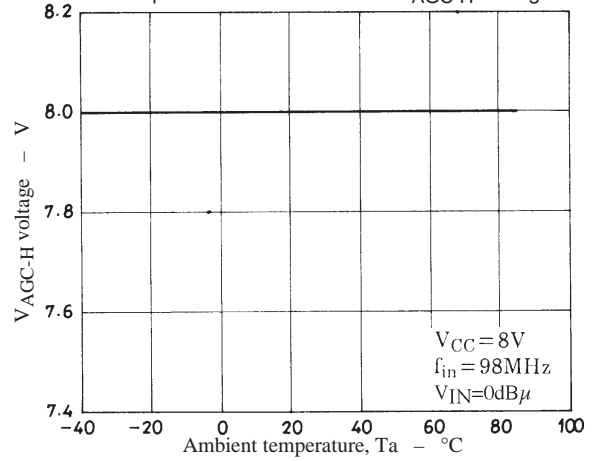
Temperature Characteristic of Mixer Input level at which AGC Voltage is Inverted



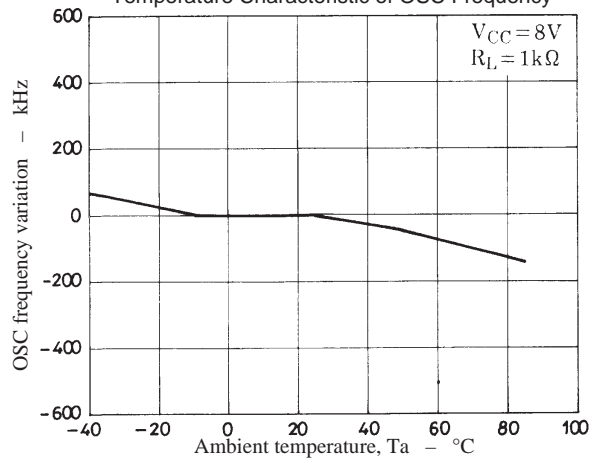
Temperature Characteristic of VAGC-L Voltage



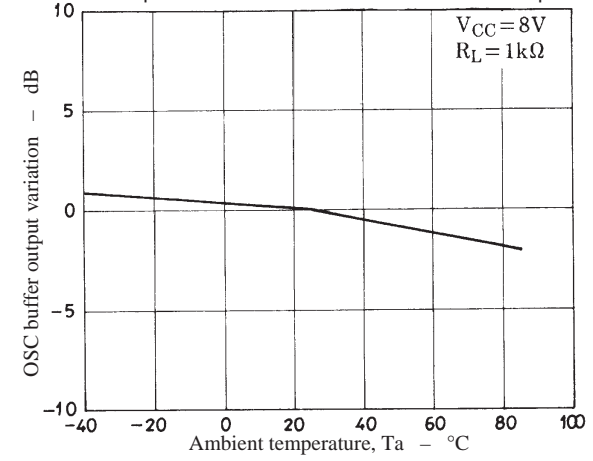
Temperature Characteristic of VAGC-H Voltage



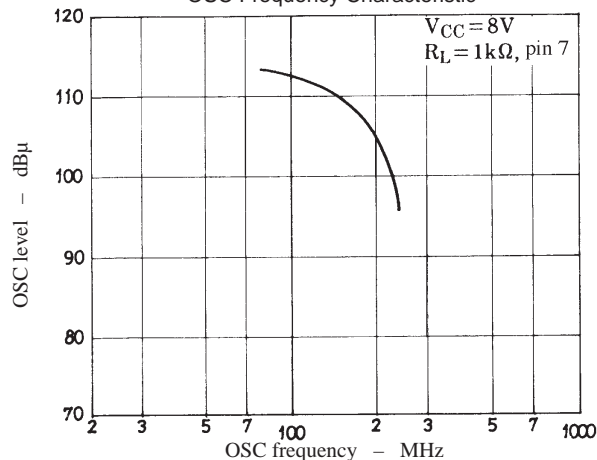
Temperature Characteristic of OSC Frequency



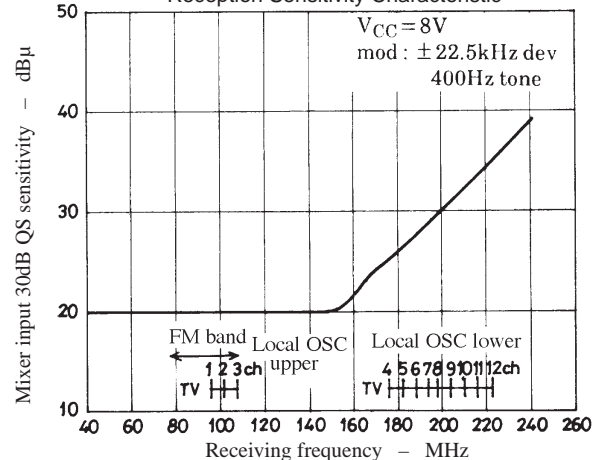
Temperature Characteristic of OSC Buffer Output

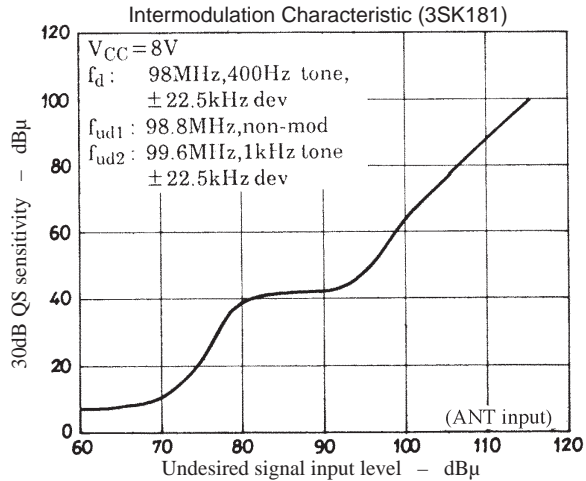
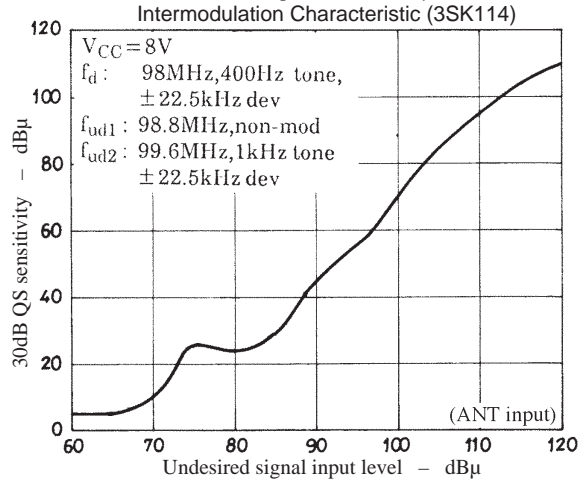
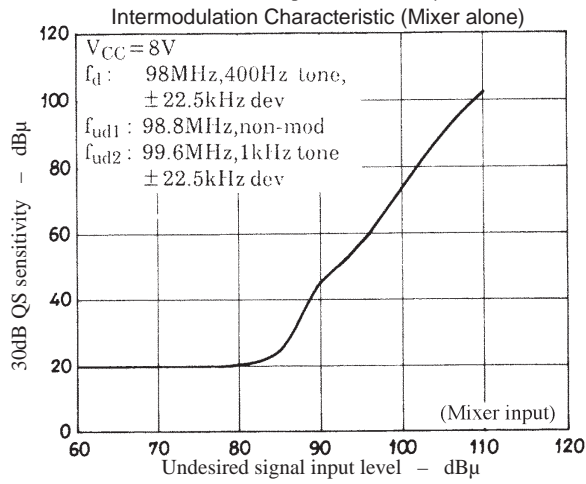
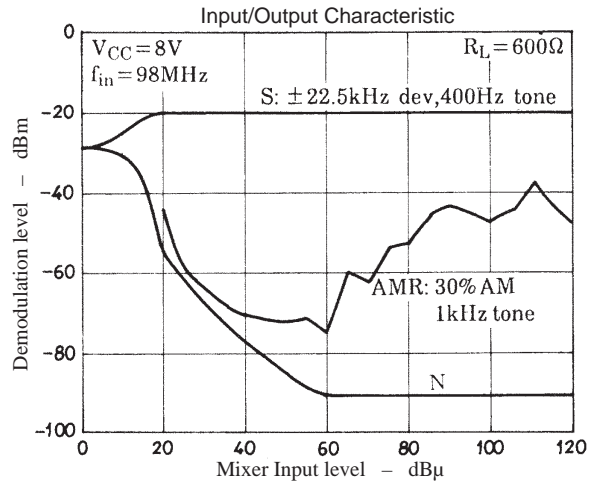
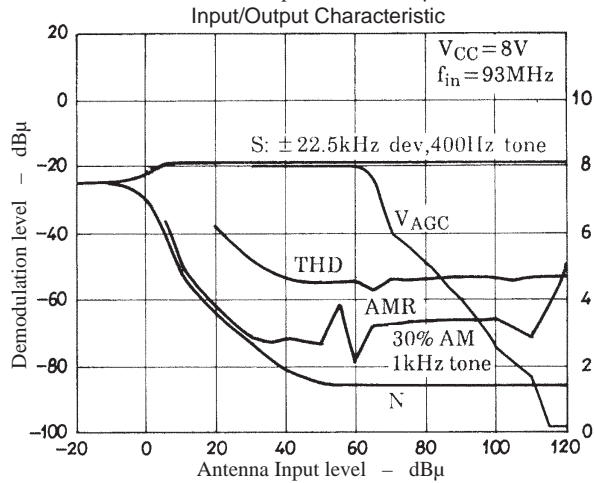
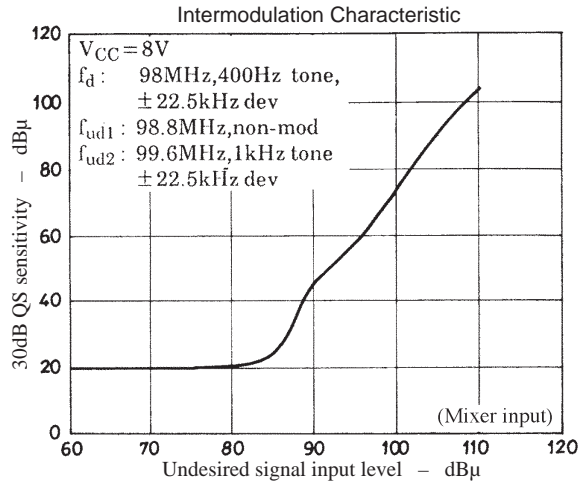
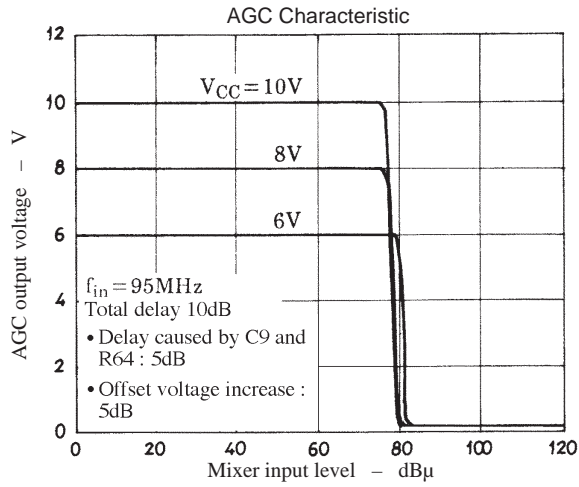


OSC Frequency Characteristic

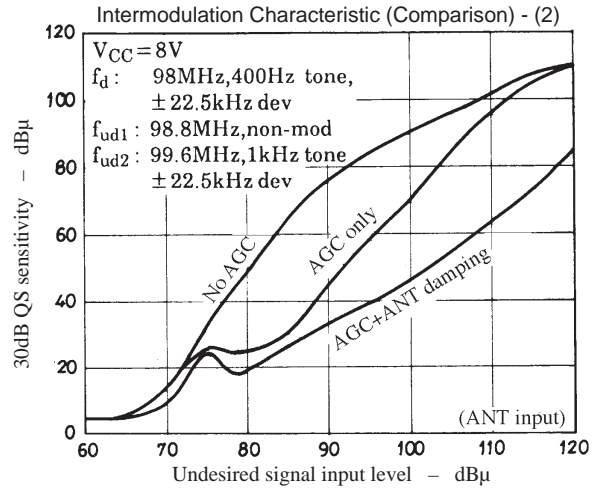
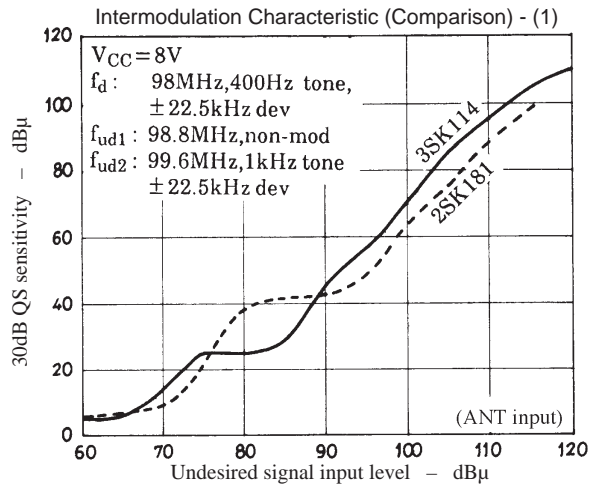


Reception Sensitivity Characteristic









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