Ordering number : EN2257B

Monolithic Linear IC

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).

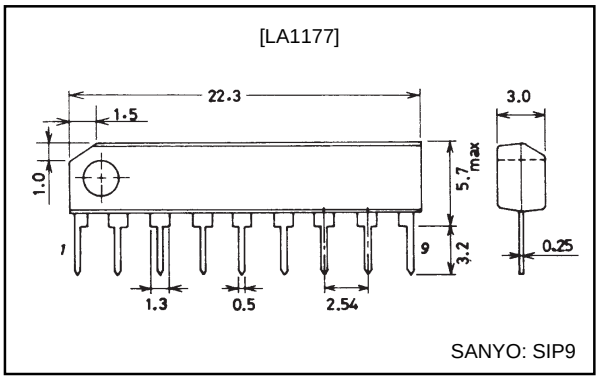
Functions

• 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_{CC} max	Pins 2, 9	10	V
Allowable power dissipation	Pd max	Ta≤70°C	440	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	V
Operating voltage range	V_{CC} op		8 to 9	V

Electrical Characteristics at Ta=25°C, V_{CC}=8V, fin=88MHz

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

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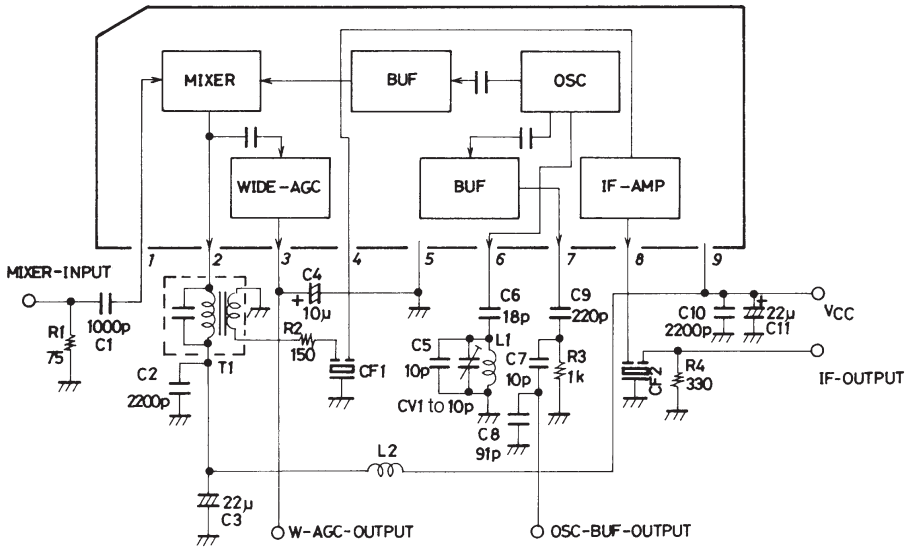
Evaluation Circuit and Internal Equivalent Circuit Block Diagram



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_{CC}	

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

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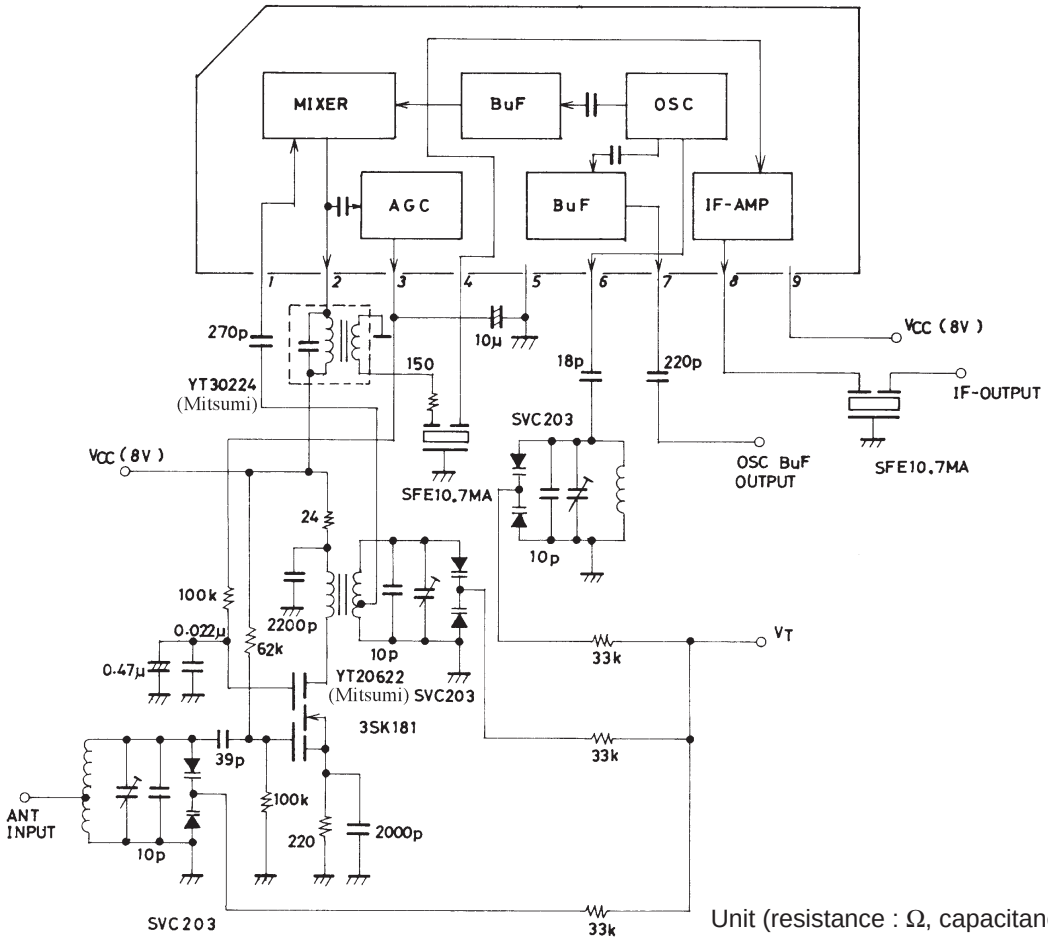
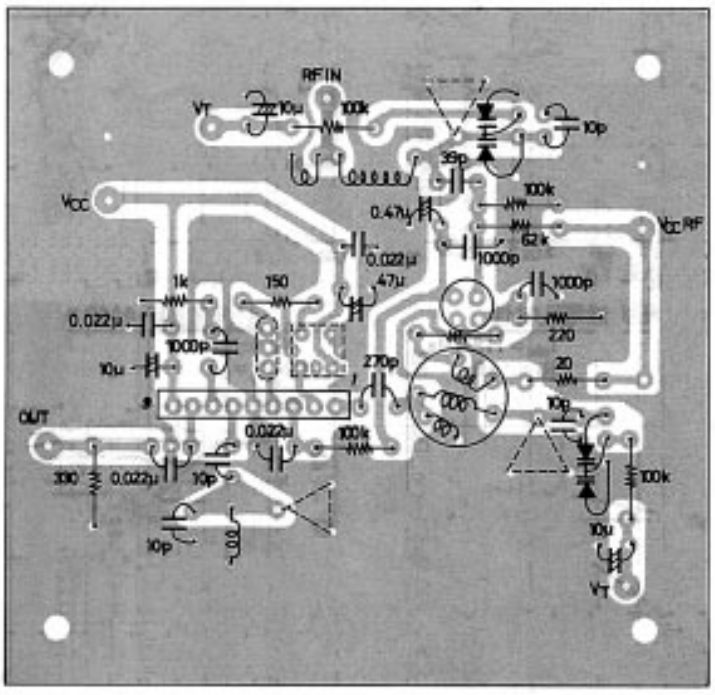
Sample Application Circuit



Unit (resistance : Ω, capacitance : F)

Sample Printed Circuit Pattern



Cu-foiled area 85×82 mm²

Unit (resistance : Ω, capacitance : F)

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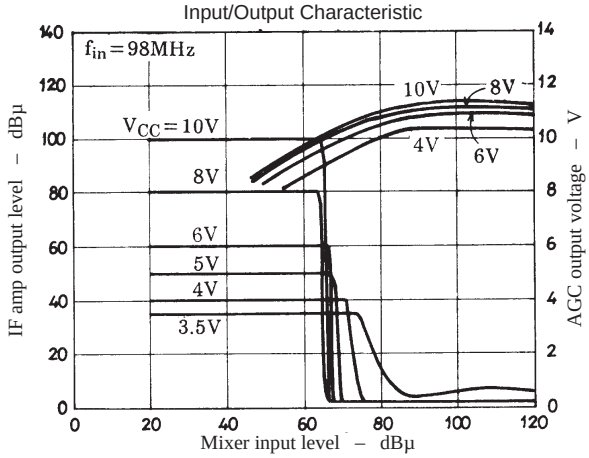
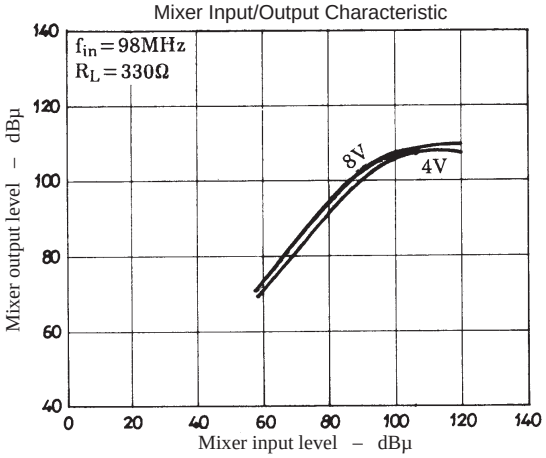
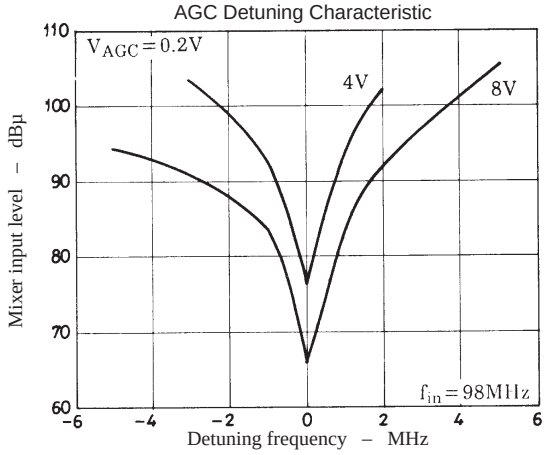
Input/Output Characteristic



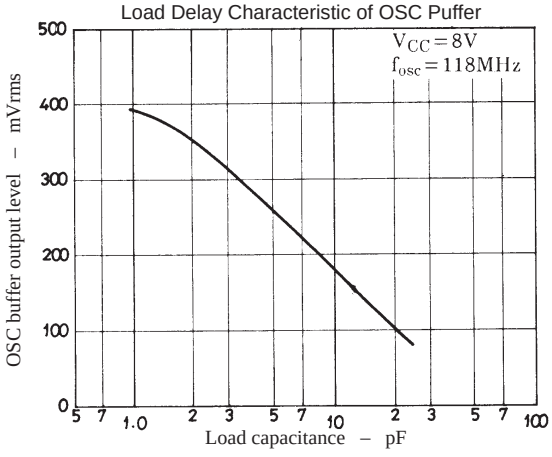
Mixer Input/Output Characteristic



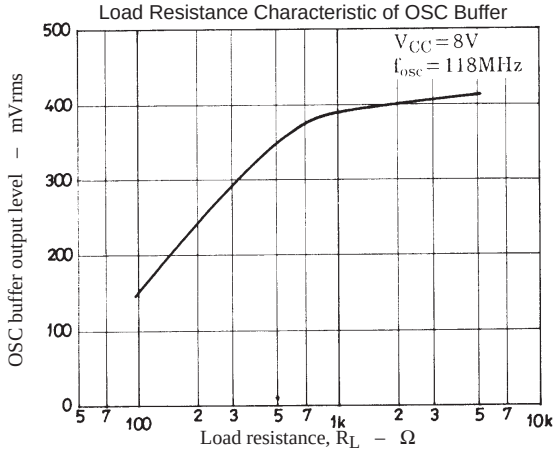
AGC Detuning Characteristic



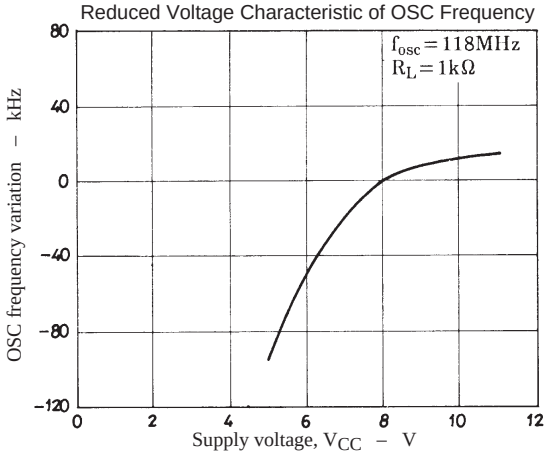
Load Delay Characteristic of OSC Puffer



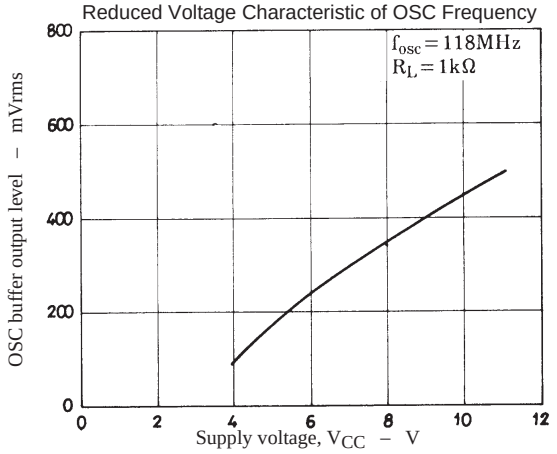
Load Resistance Characteristic of OSC Buffer



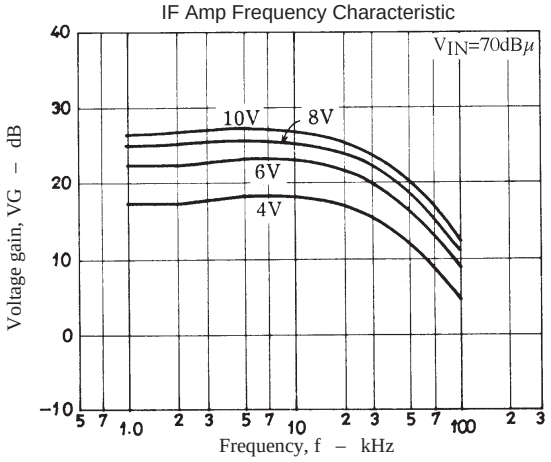
Reduced Voltage Characteristic of OSC Frequency



Reduced Voltage Characteristic of OSC Frequency



IF Amp Frequency Characteristic



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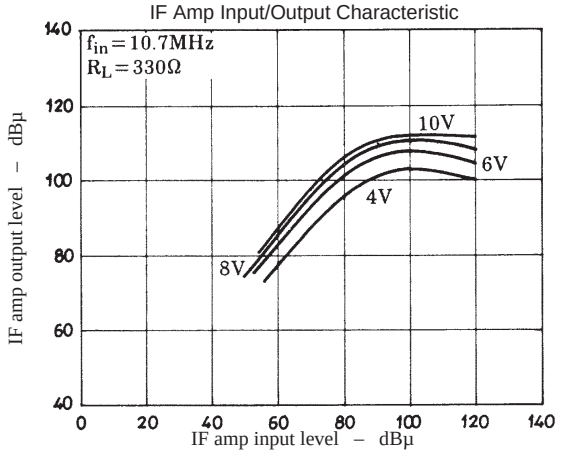
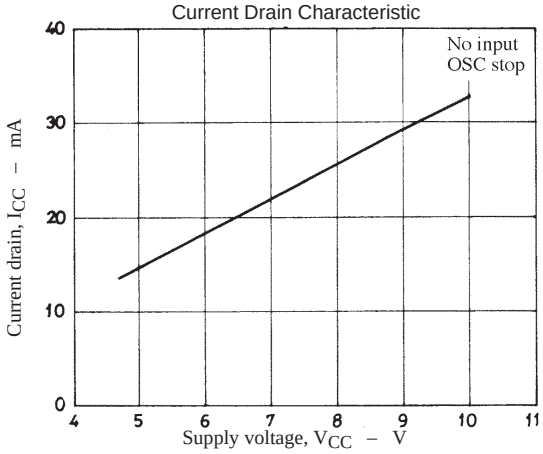
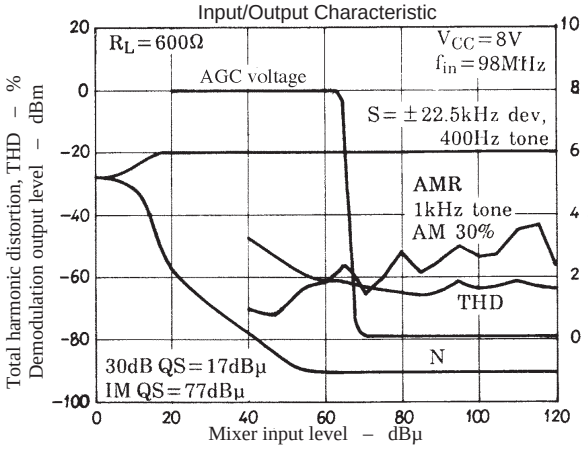
IF Amp Input/Output Characteristic



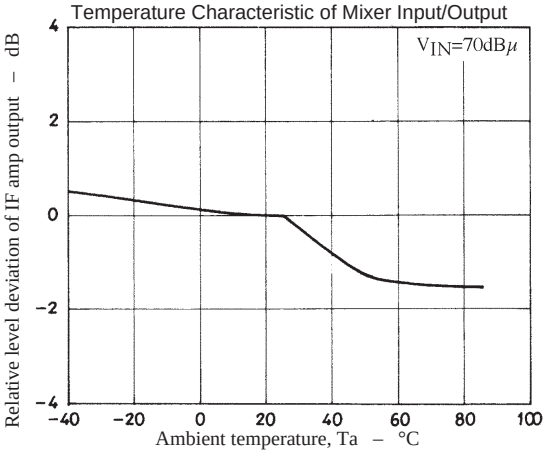
Current Drain Characteristic



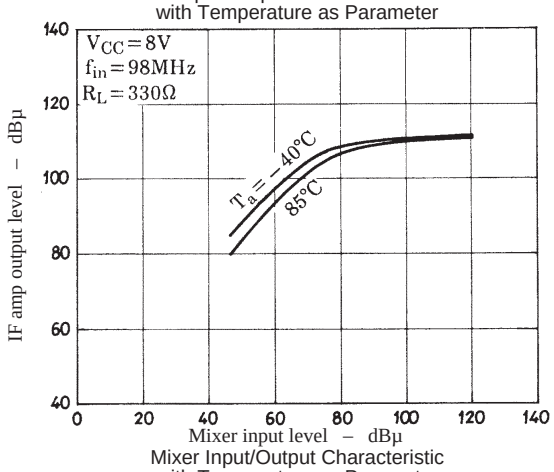
Input/Output Characteristic



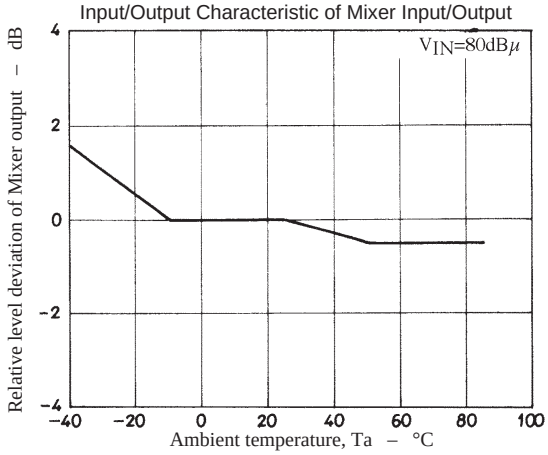
Temperature Characteristic of Mixer Input/Output



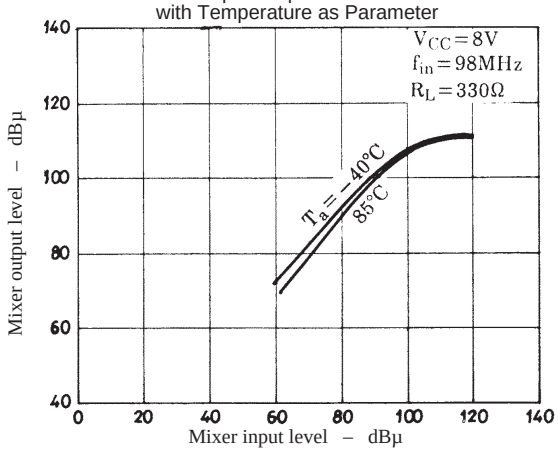
Input/Output Characteristic
with Temperature as Parameter



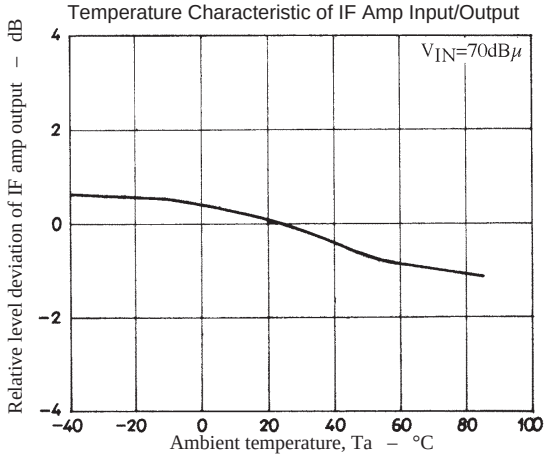
Input/Output Characteristic of Mixer Input/Output



Mixer Input/Output Characteristic
with Temperature as Parameter



Temperature Characteristic of IF Amp Input/Output



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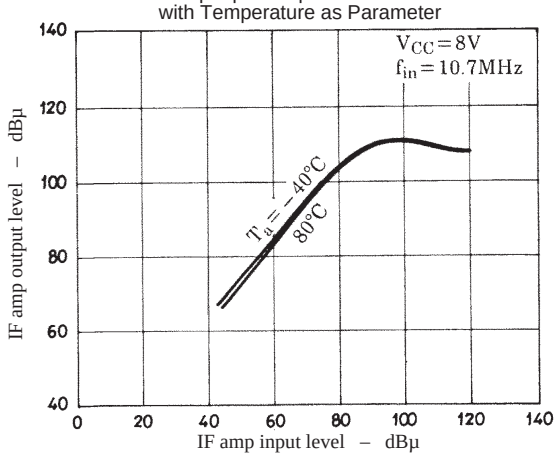
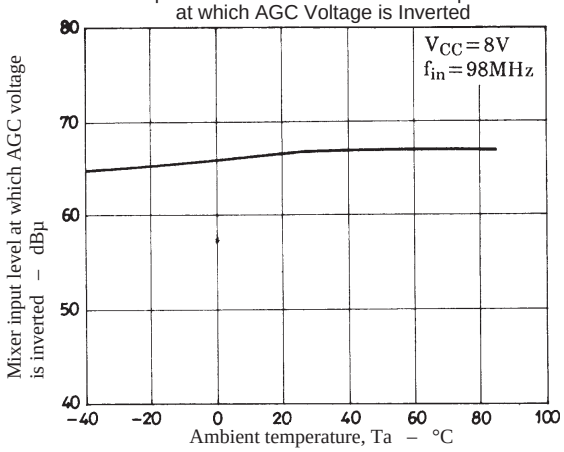
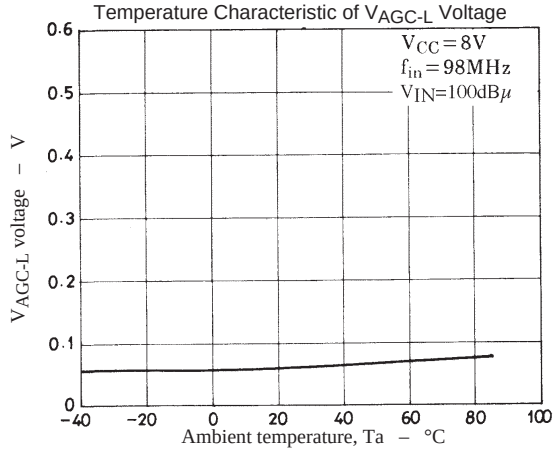
IF Amp Input/Output Characteristic with Temperature as Parameter



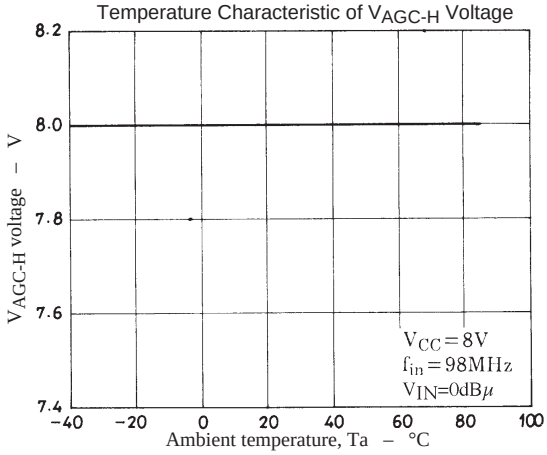
Temperature Characteristic of Mixer Input level at which AGC Voltage is Inverted



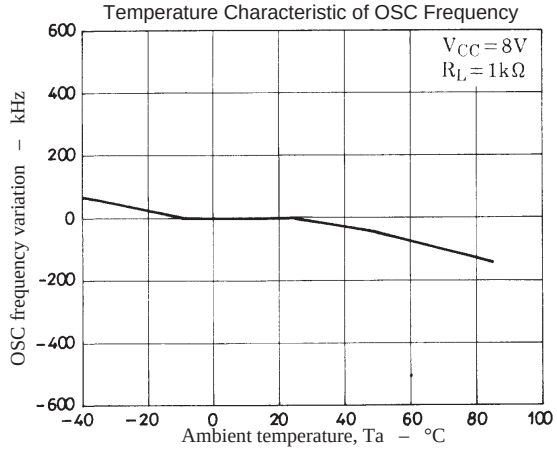
Temperature Characteristic of V_{AGC-L} Voltage



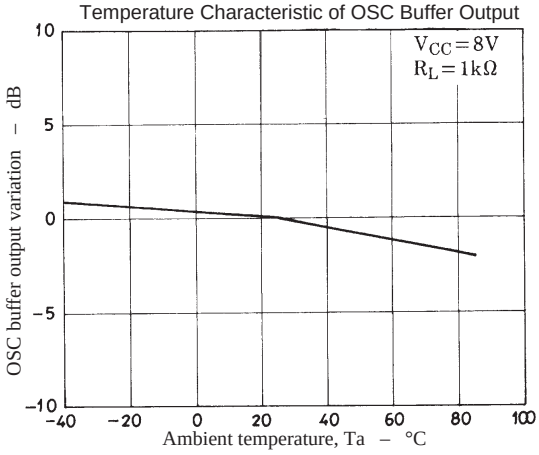
Temperature Characteristic of V_{AGC-H} Voltage



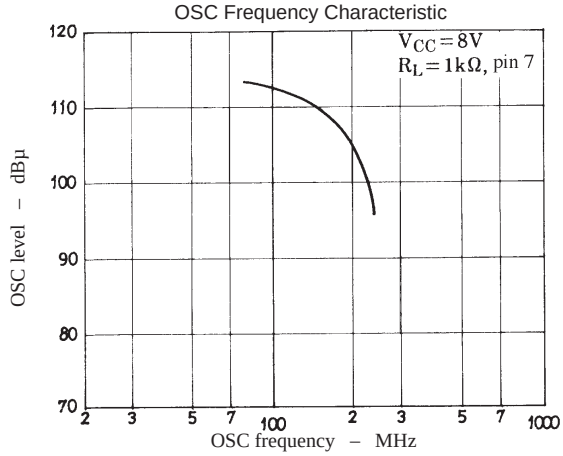
Temperature Characteristic of OSC Frequency



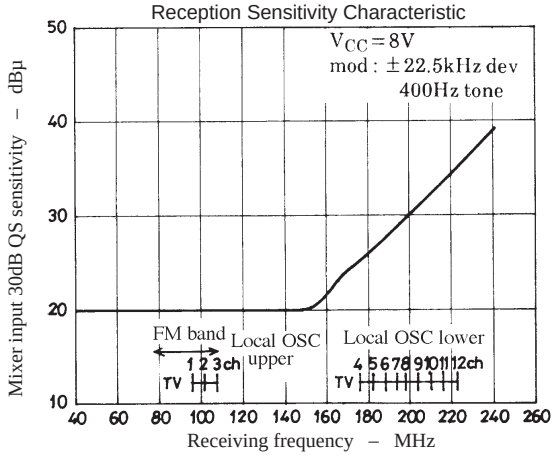
Temperature Characteristic of OSC Buffer Output



OSC Frequency Characteristic



Reception Sensitivity Characteristic



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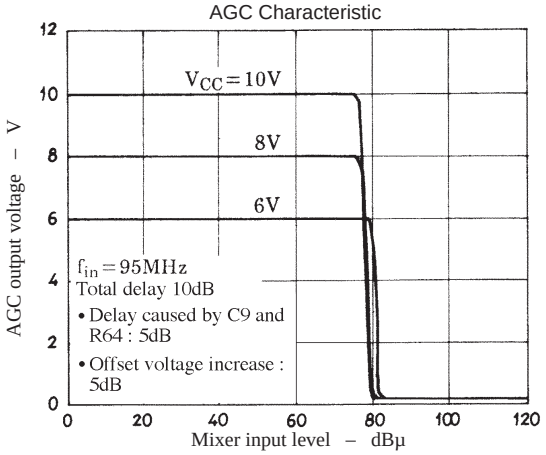
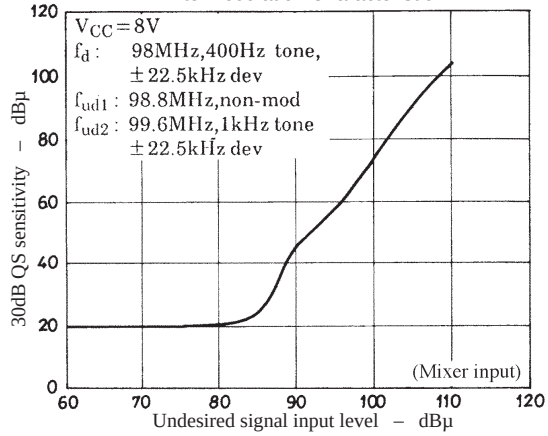
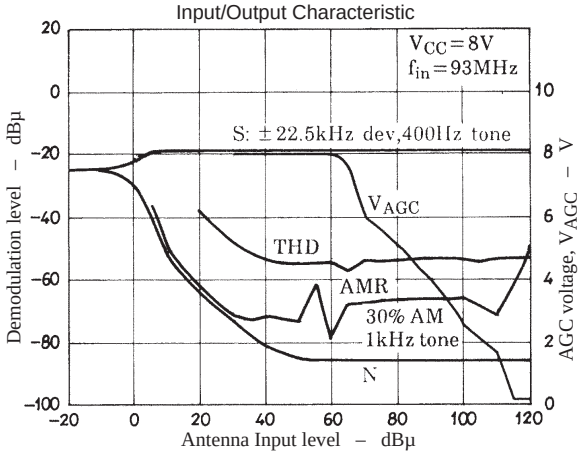
AGC Characteristic



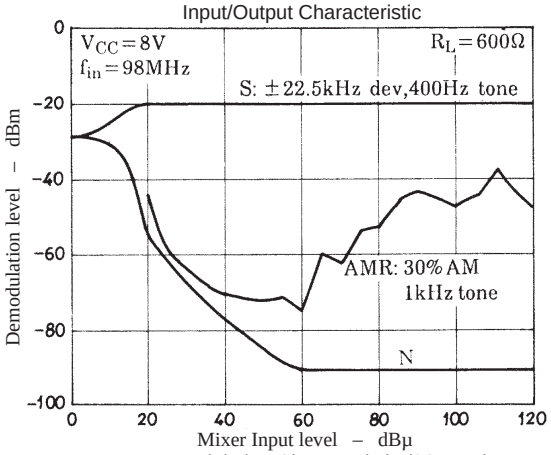
Intermodulation Characteristic



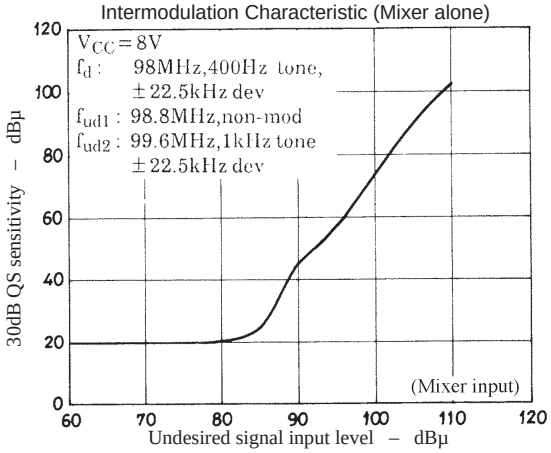
Input/Output Characteristic



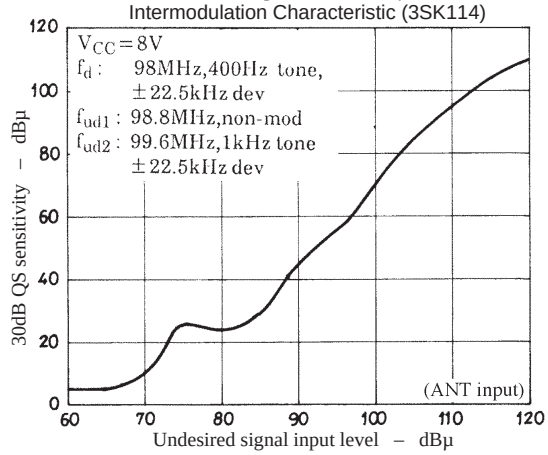
Input/Output Characteristic



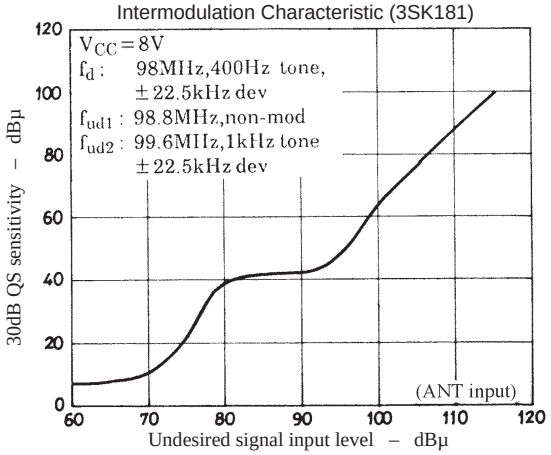
Intermodulation Characteristic (Mixer alone)



Intermodulation Characteristic (3SK114)



Intermodulation Characteristic (3SK181)



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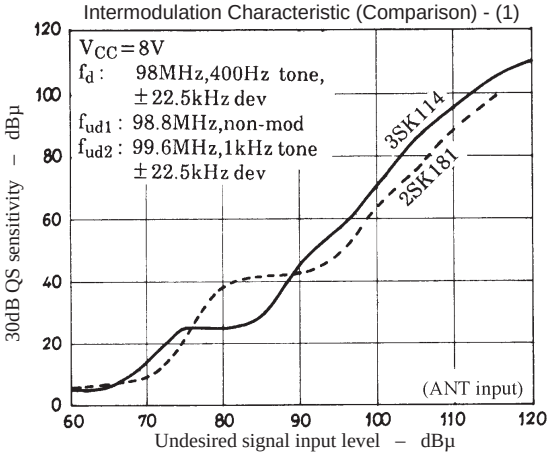
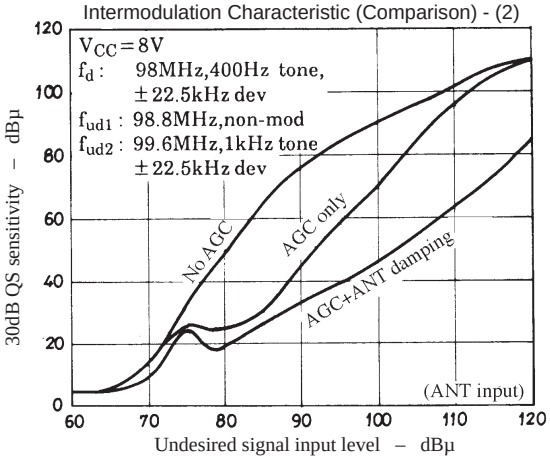
Intermodulation Characteristic (Comparison) - (1)



Intermodulation Characteristic (Comparison) - (2)



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