



LA1178M

FM Front End for Car Radio, Home Radio-Use

Functions

- Double end type mixer
- Oscillator
- Oscillator buffer
- Wide-band AGC circuit
- IF amplifier

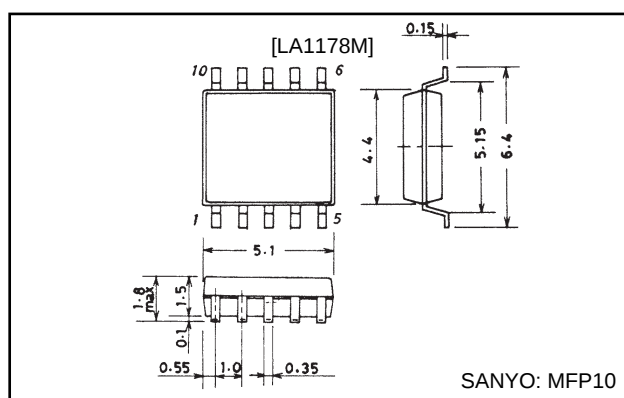
Features

- Excellent intermodulation characteristic (wide-band AGC circuit)
- On-chip local oscillation buffer for electronic tuning.

Package Dimensions

unit: mm

3086-MFP10



Specifications

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max	Pins 2, 3, 10	10	V
Allowable power dissipation	P _d max	T _a ≤75°C	440	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 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, f_{im}=88MHz, See specified Test Circuit.

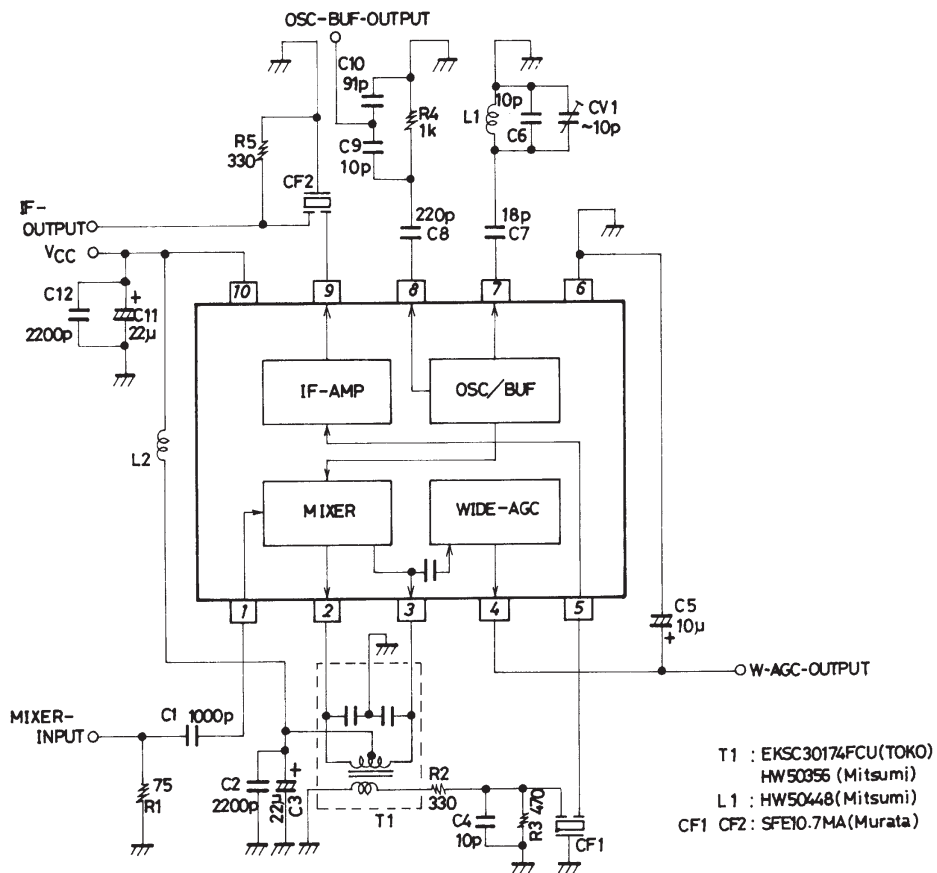
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	I _{CCO}	No input	21	26	31	mA
AGC high-level voltage	V _{AGC-H}	0dBμ, pin 4	7.7	8.0		V
AGC low-level voltage	V _{AGC-L}	100dBμ, pin 4		0.07	0.3	V
AGC mixer input	V _{IN AGC}	V _{AGC} ≤2V, Pin 4	67	74	81	dBμ
IF saturation output voltage	V _{IF-max}	110dBμ	108	112	116	dBμ
Input limiting voltage	V _{lim}		81	88	95	dBμ
Voltage gain	V _G	65dBμ	84	88	92	dBμ
Local OSC output voltage	V _{OSC}	No input, 75Ω termination	80	84	88	dBμ

Note) Extreme caution should be exercised when applying voltage across pin 10 and 3 as dielectric breakdown may occur.

Typical Voltage on Each Pin and Pin Description

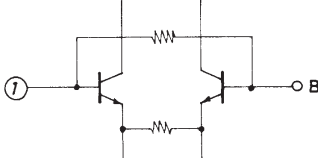
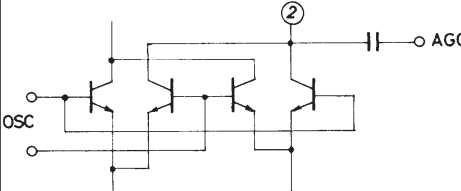
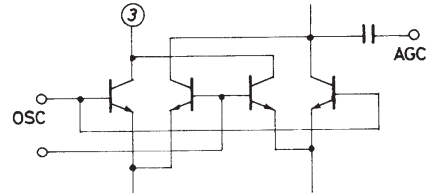
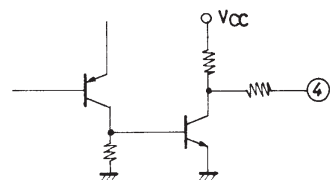
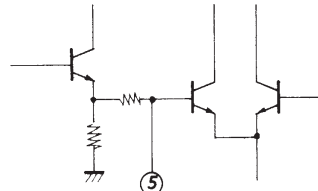
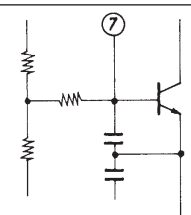
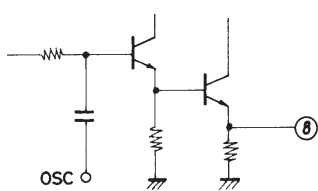
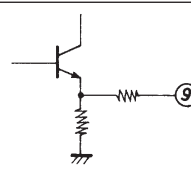
Pin No.	Typical voltage [V]	Description	Remarks
1	2.7	Mixer input	
2	8.0	Mixer output	
3	8.0	Mixer output	
4	8.0	AGC input	No input
5	2.0	IF amp input	
6	0.0	GND	
7	4.9	Oscillator base terminal	
8	1.4	Oscillation buffer output	
9	4.4	IF output	
10	8.0	V _{CC}	

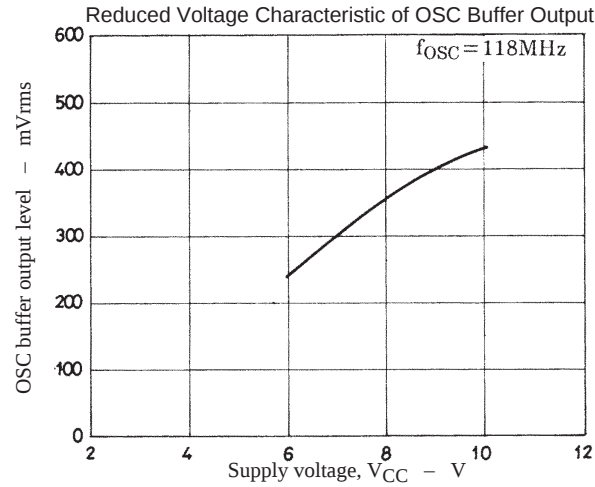
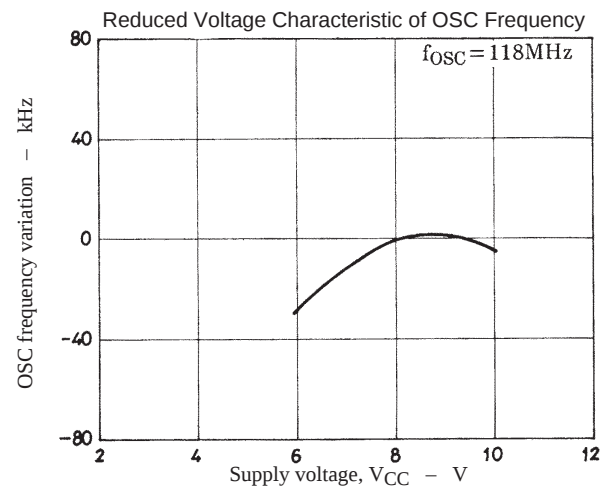
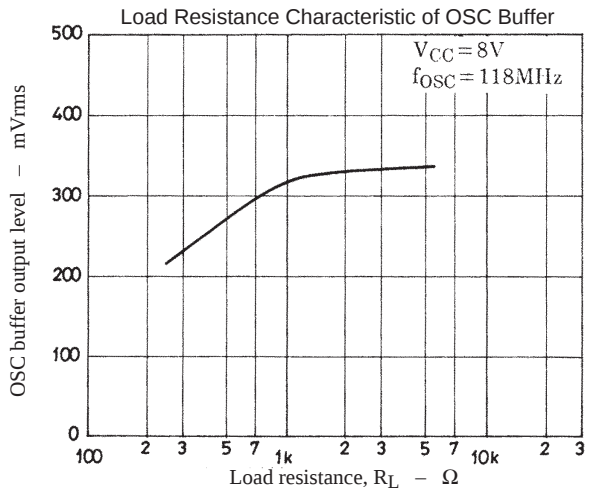
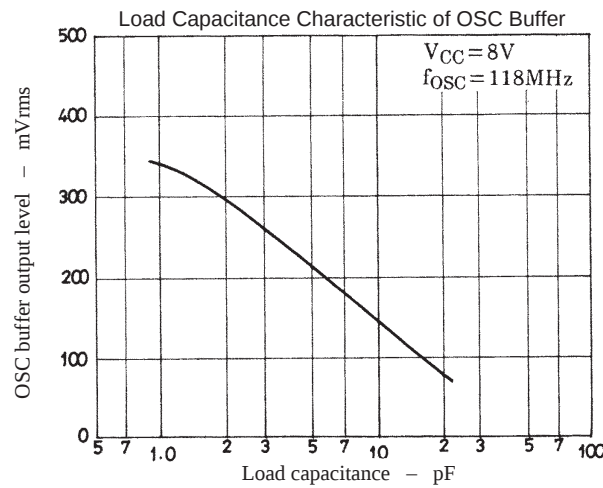
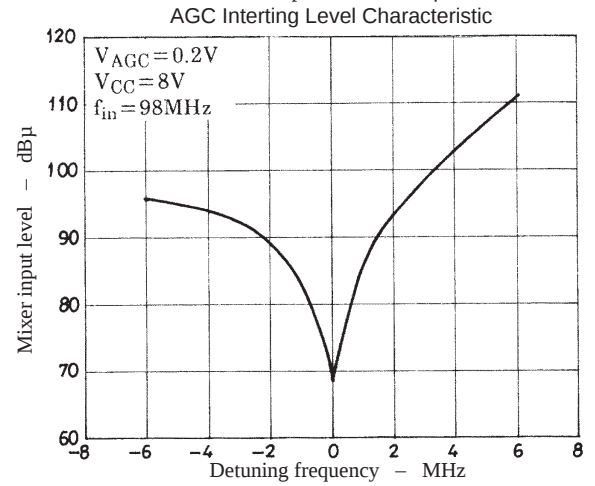
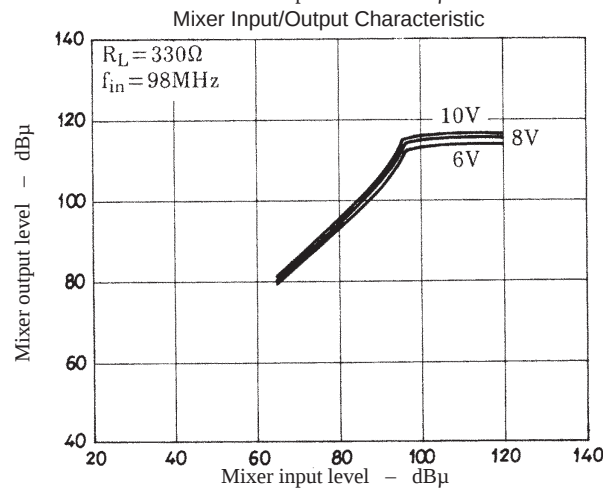
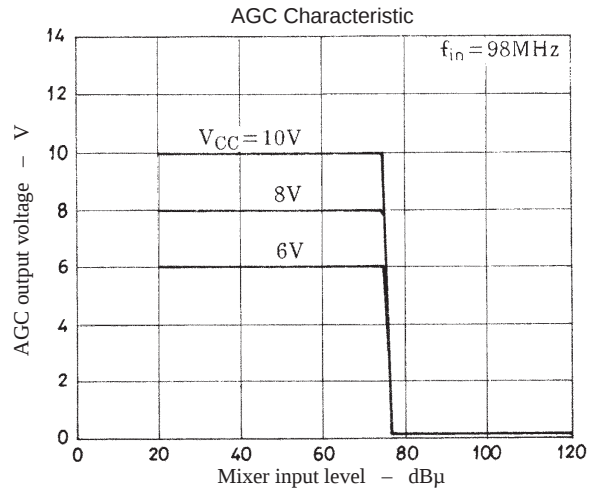
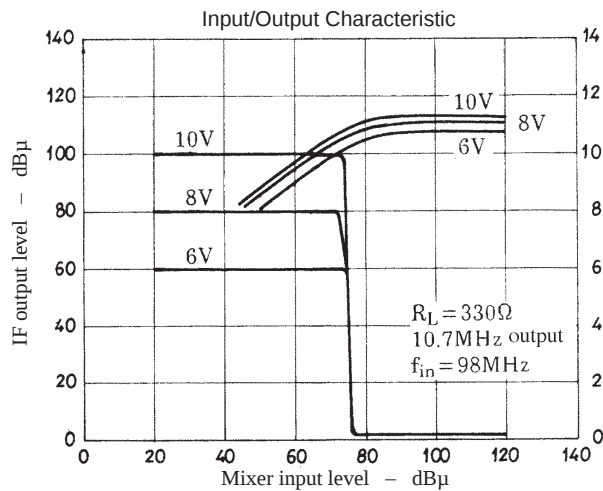
Evaluation Circuit and Internal Equivalent Circuit Block Diagram

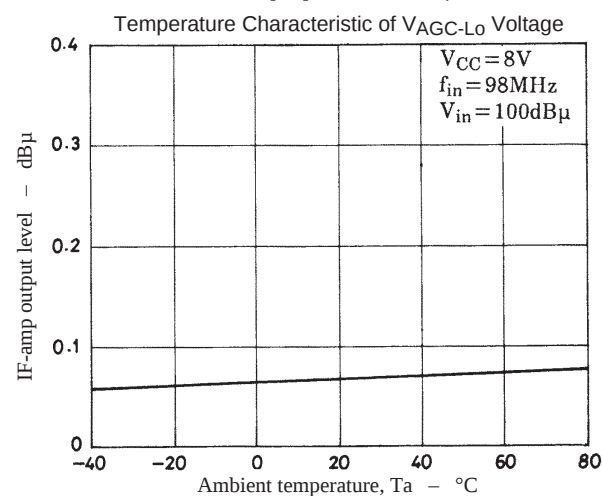
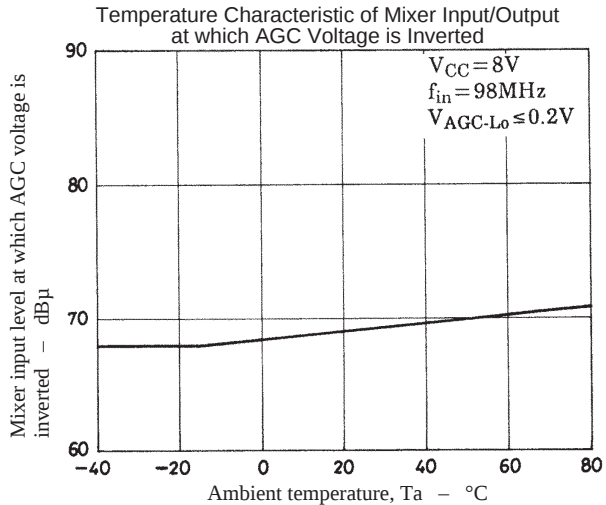
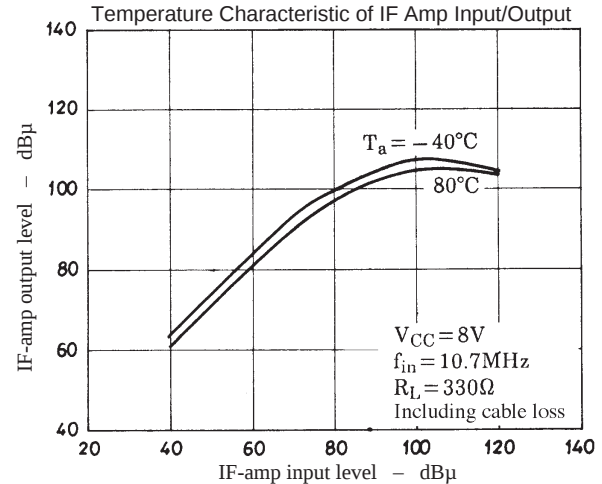
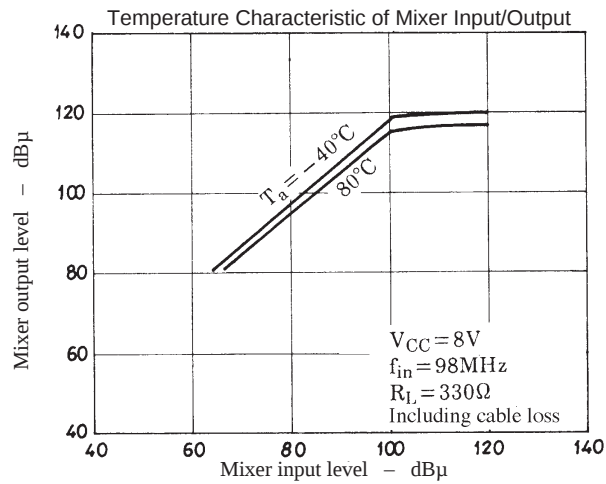
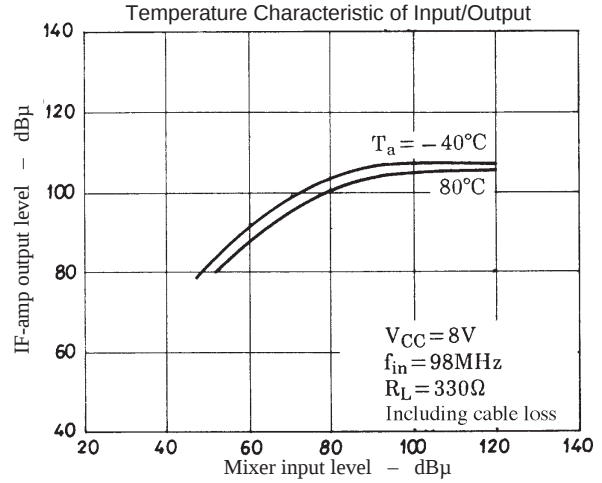
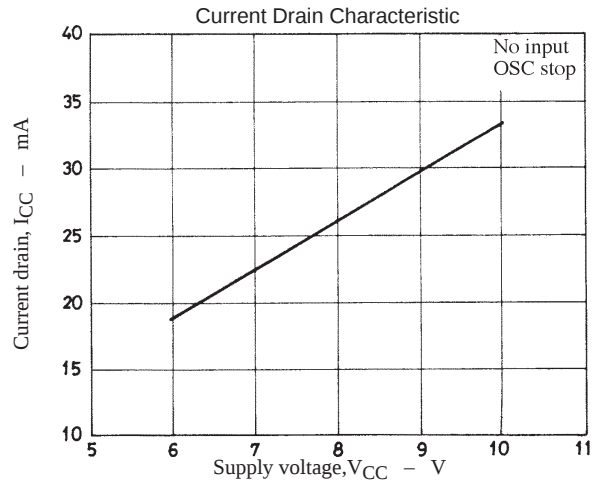
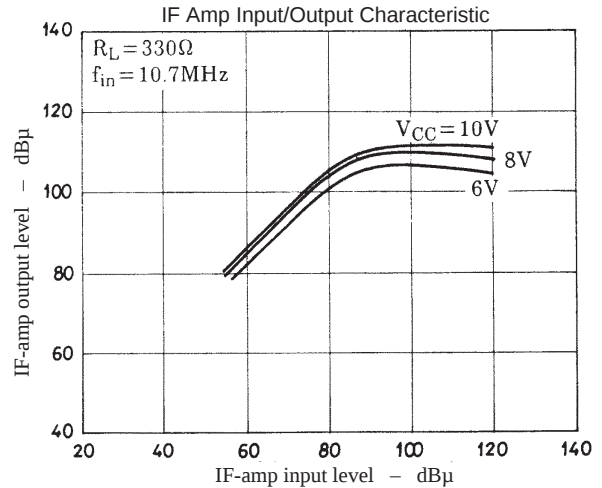
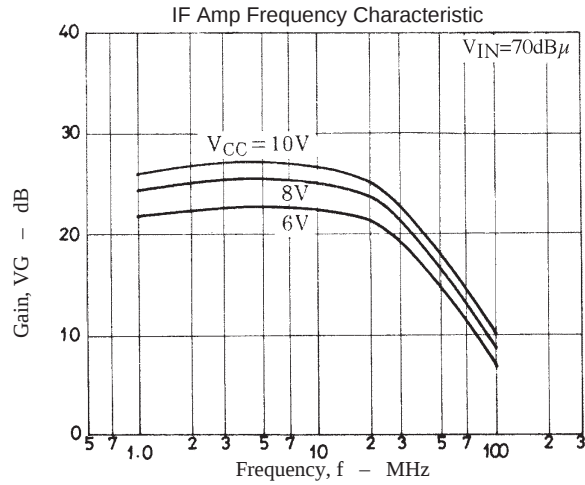


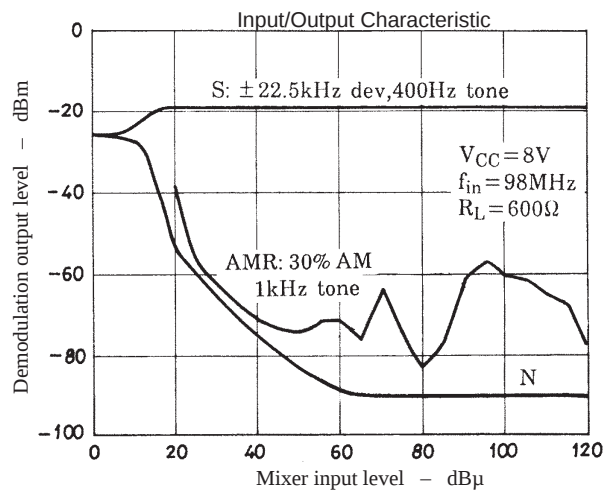
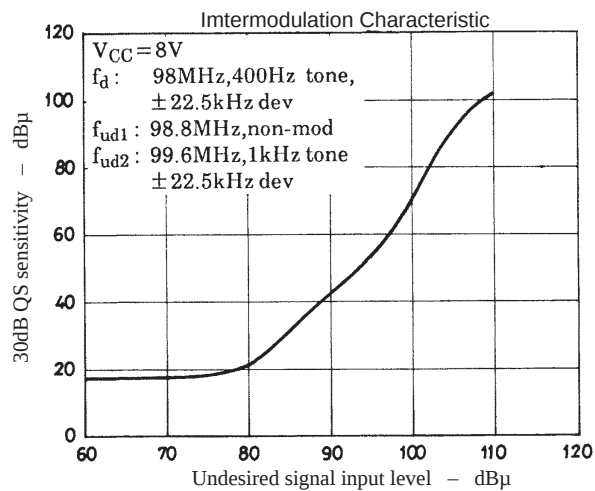
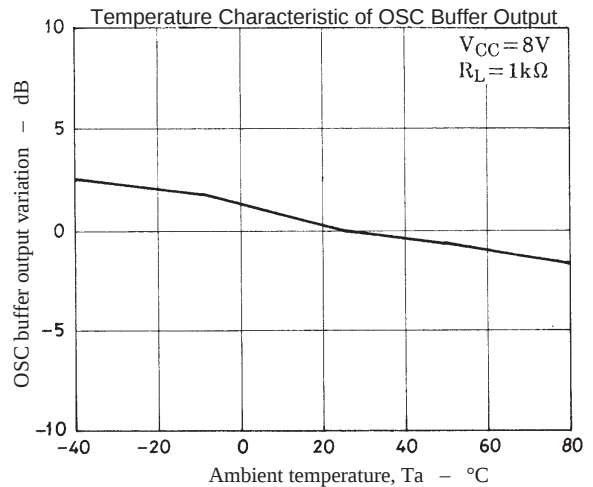
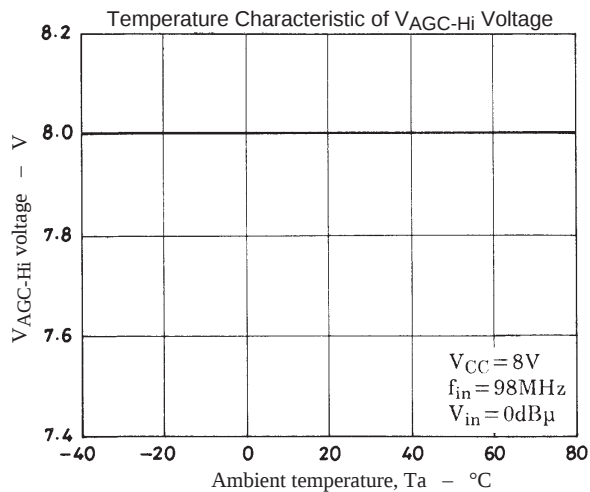
LA1178M

Pin Description

Pin No.	Function	Internal Equivalent Circuit	Remarks
1	Mixer input		
2	Mixer output		AGC pickup pin is connected.
3	Mixer output		
4	Wide-band AGC output		
5	IF amp input		$R_{IN} \approx 330\Omega$
6	IF amp input		
7	OSC		
8	OSC buffer output		
9	IF amp output		$R_{OUT} \approx 330\Omega$
10	V _{CC}	V _{CC}	



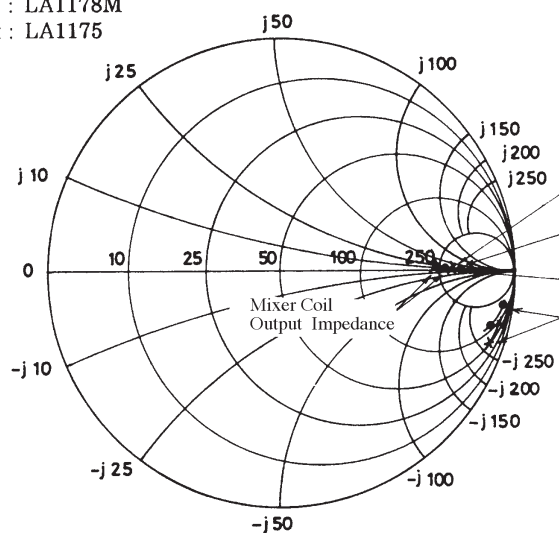




Smith Chart

$V_{CC} = 8V$

● : LA1178M
 × : LA1175



IF AMP
 Input/Output impedance (LA1175)
 IF AMP
 Input impedance (LA1178M)
 IF AMP
 Output impedance (LA1178M)
 Mixer
 Input impedance : $f=80$ to $110MHz$

$f=10.7MHz$

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