



LA1800

FM/AM Single-Chip Radio

Functions

- FM : Front end, low-pass filter, IF amp, quadrature detector, muting.
- AM : RF amp, detector.
- AM : AF driver (earphone driver).

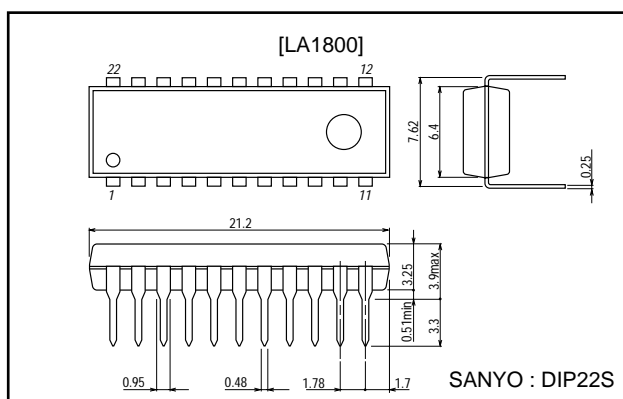
Features

- Minimum number of external parts required : One tuning circuit each for FM, AM
- Low current dissipation : 5.6mA/FM, 3.2mA/AM
- Low-voltage operation : $V_{CC \text{ min}}=2.5V$

Package Dimensions

unit : mm

3059-DIP22S



Specifications

Maximum Ratings at $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC \text{ max}}$	Pin 3	6.0	V
Allowable power dissipation	$P_d \text{ max}$		200	mW
Operating temperature	T_{opr}		-20 to +70	$^\circ C$
Storage temperature	T_{stg}		-40 to +125	$^\circ C$

Operating Conditions at $T_a=25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended operating voltage	V_{CC}		3.0	V
Operating voltage range	$V_{CC \text{ op}}$		2.5 to 5.0	V

Operating Characteristics at $T_a=25^\circ C$, $V_{CC}=3V$, See Test Circuit

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM]						
Current drain	I_{cco}			3.6	5.5	mA
Pin 2 voltage	V_2		1.9	2.4	2.9	V
Pin 14 voltage	V_{14}		0.4	0.9	1.6	V
Pin 21 voltage	V_{21}		0.6	0.9	1.2	V
[FM]						
Current drain	I_{cco}			5.6	8.0	mA
Pin 2 voltage	V_2		1.9	2.6	2.9	V
Pin 4 voltage	V_4		1.7	2.3	2.9	V
Pin 5 voltage	V_5		1.7	2.3	2.9	V

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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Pin 6 voltage	V ₆		1.1	1.7	2.3	V
Pin 7 voltage	V ₇		1.1	1.7	2.3	V
Pin 8 voltage	V ₈		1.1	1.7	2.3	V
Pin 9 voltage	V ₉		1.9	2.6	2.9	V
Pin 10 voltage	V ₁₀		1.8	2.5	2.9	V
Pin 13 voltage	V ₁₃			0	0.6	V
Pin 14 voltage	V ₁₄		0.5	1.0	1.7	V
Pin 16 voltage	V ₁₆		1.6	2.3	2.9	V
Pin 17 voltage	V ₁₇		1.6	2.3	2.9	V
Pin 19 voltage	V ₁₉		0.6	0.86	14	V
Pin 20 voltage	V ₂₀		0.6	0.86	14	V
[AF]						
Pin 11 current	I ₁₁		0.5	1.0	1.5	mA
Pin 12 voltage	V ₁₂			0	0.5	V

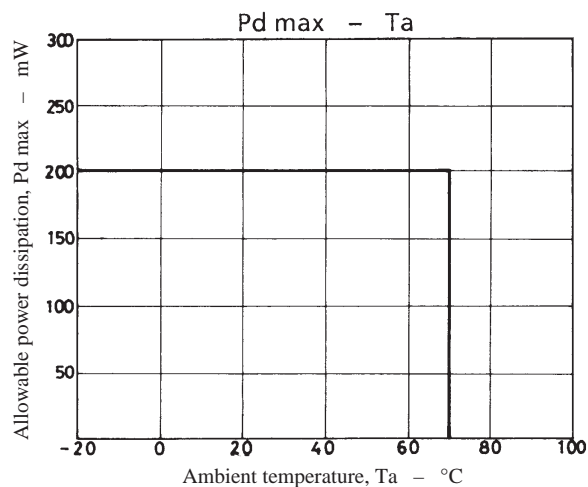
[Reference characteristics]

Operating Characteristics at Ta=25°C, V_{CC}=3V, See Test Circuit 2

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM : f _C =1MHz, f _m =400Hz]						
Current drain	I _{cco}	Quiescent		3.6		mA
Detection output	V _{O1}	V _{IN} =40dBμ, 30% mod		10		mV
	V _{O2}	V _{IN} =70dBμ, 30% mod		100		mV
Signal to noise ratio	S/N	V _{IN} =70dBμ, 30% mod		47		dB
[FM : f _C =90MHz, f _m =400Hz]						
Current drain	I _{cco}	Quiescent		5.6		mA
Input limiting sensitivity	-3dBLS.	3dB down, 30% mod		16		dBμ
Demodulation output	V _O	V _{IN} =80dBμ, 30% mod		90		mV
Total harmonic distortion	THD	V _{IN} =80dBμ, 30% mod		0.8		%
Signal to noise ratio	S/N	V _{IN} =80dBμ		59		dB
[AF : f _m =400Hz]						
Voltage gain	VG	V _O =50mV		24		dB
Total harmonic distortion	THD	V _O =50mV		0.3		%

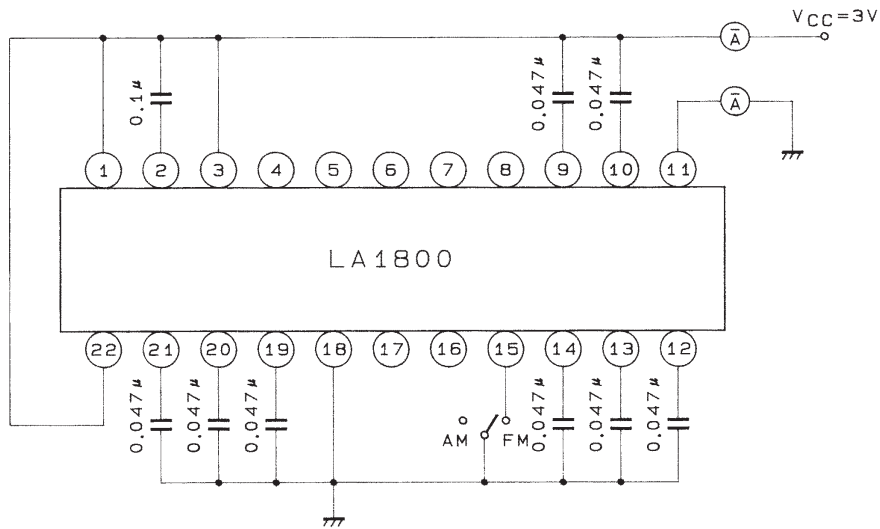
Note : 1. Current drain for FM, AM includes current of AF driver stage.

2. When handling the IC, be careful not to cause dielectric breakdown.



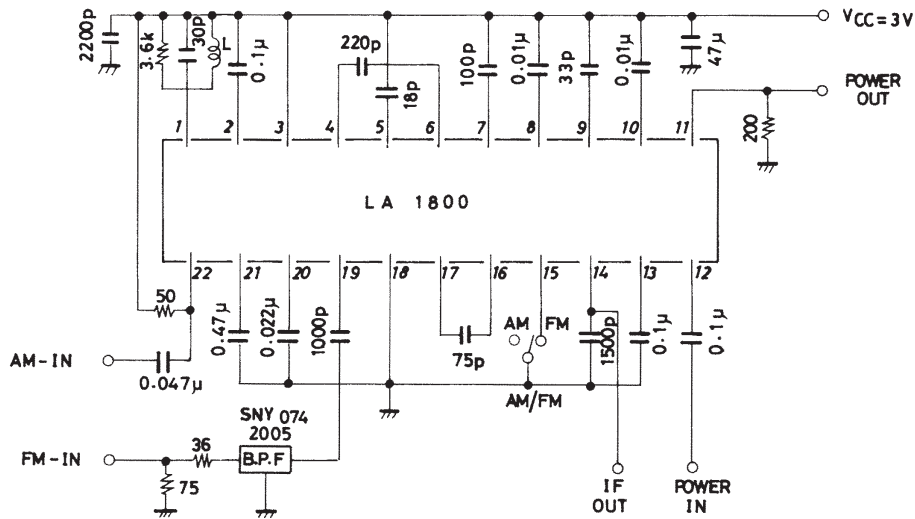
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DC Test Circuit



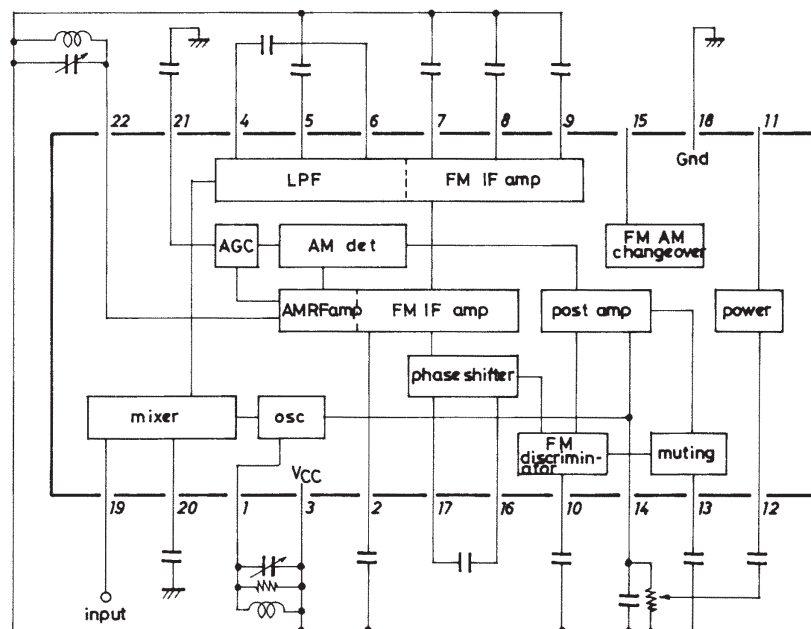
Unit (resistance : Ω, capacitance : F)

AC Test Circuit

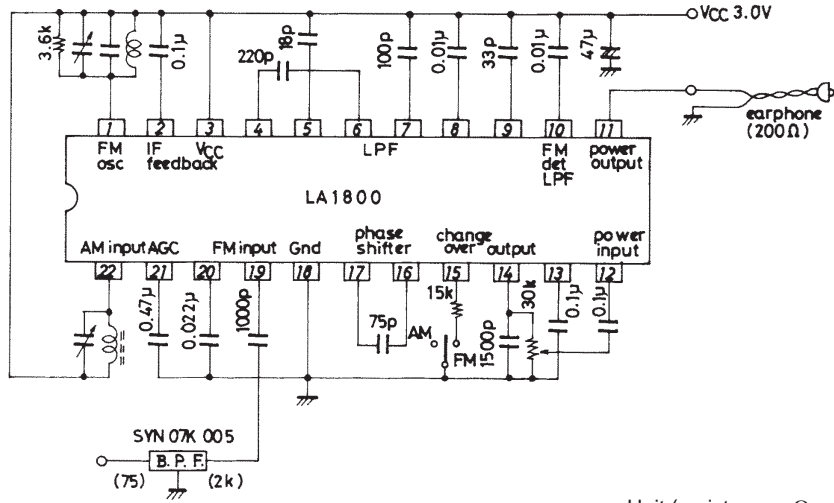


Unit (resistance : Ω, capacitance : F)

Equivalent Circuit Block Diagram

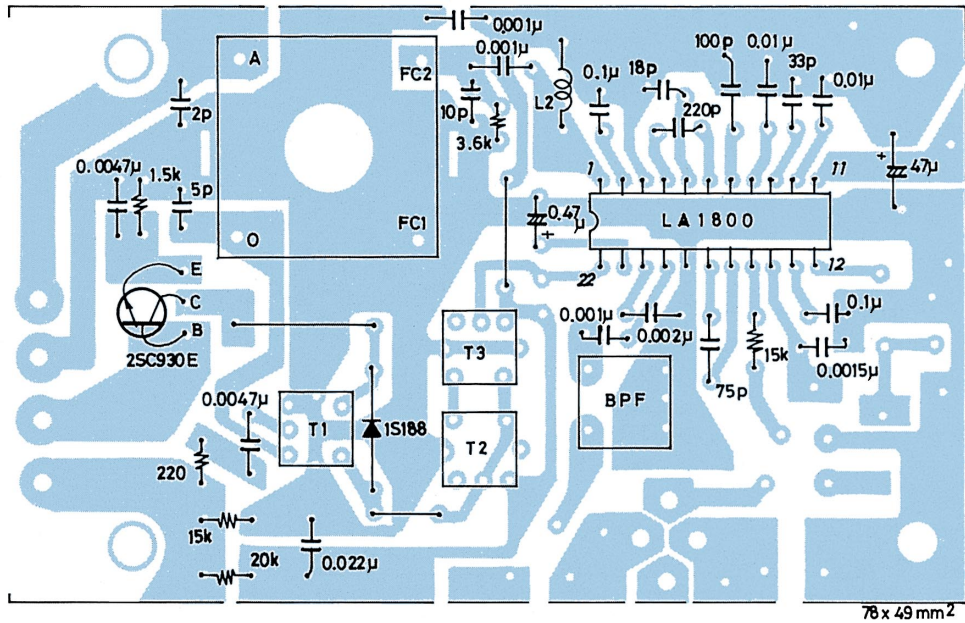


Sample Application Circuit



Unit (resistance : Ω, capacitance : F)

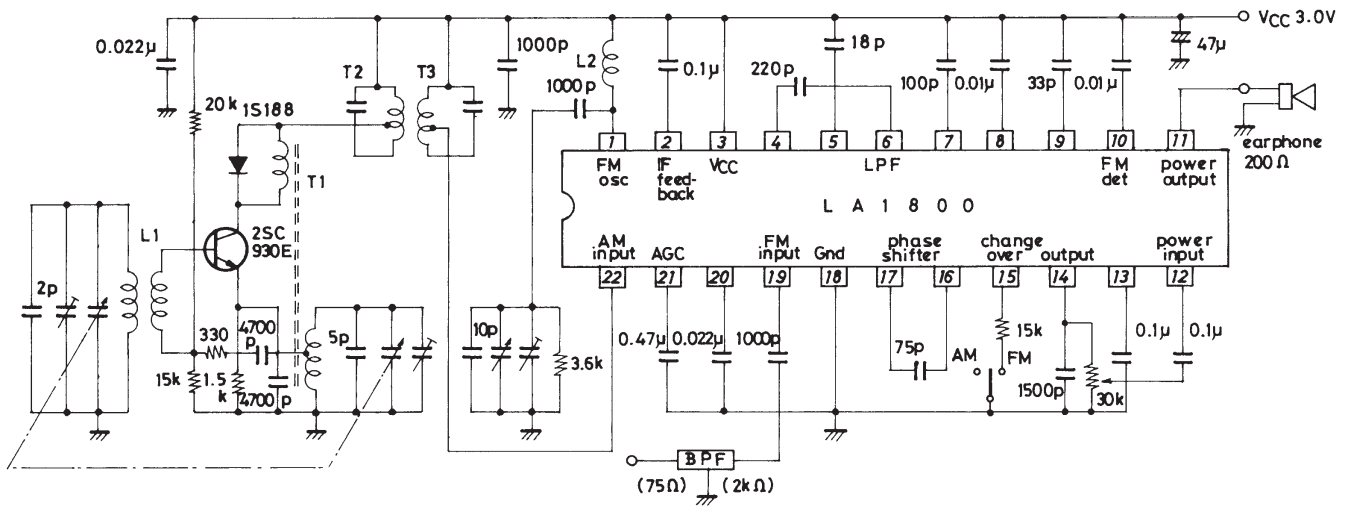
Sample Printed Circuit Pattern (Cu-foiled side)



Unit (resistance : Ω, capacitance : F)

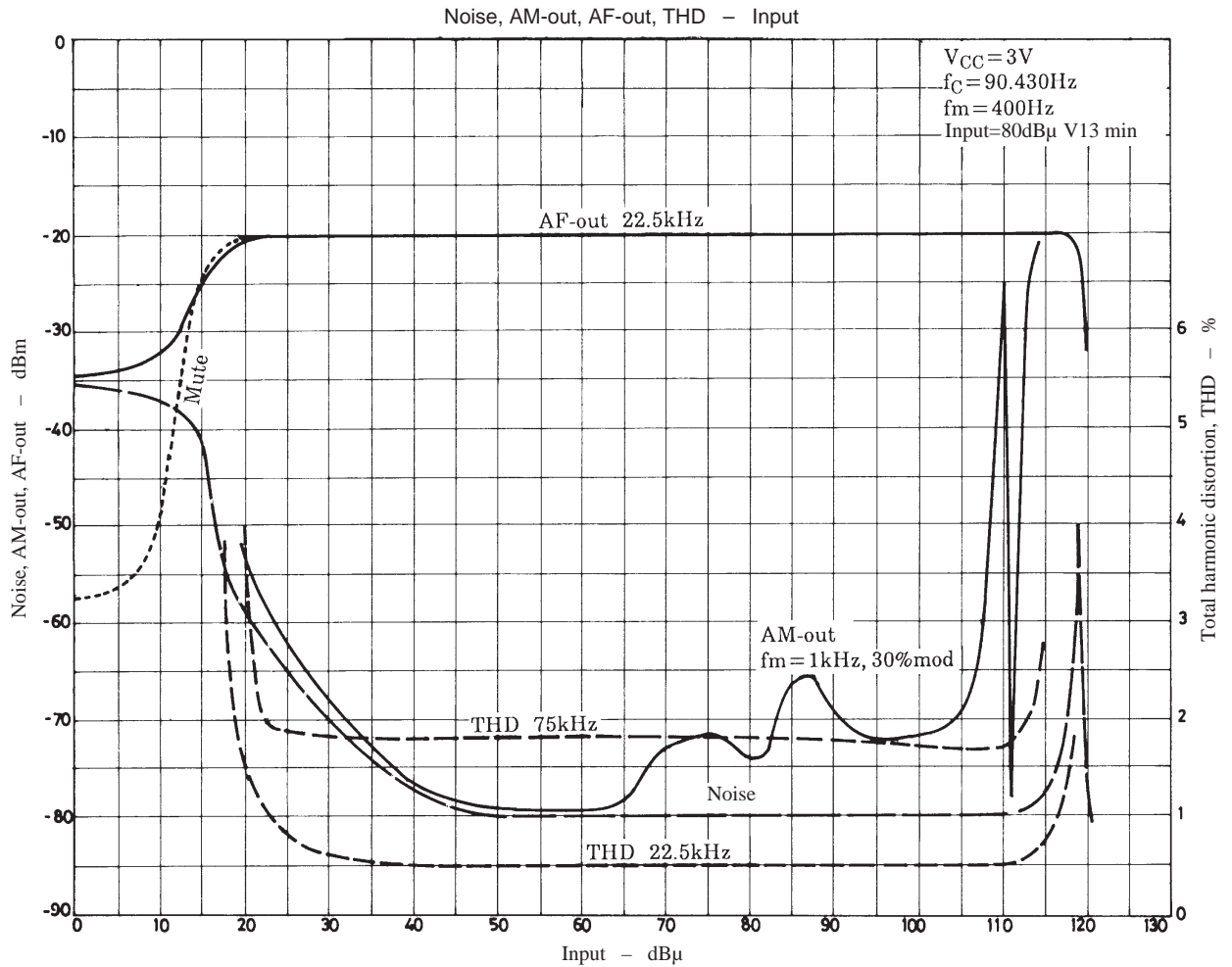
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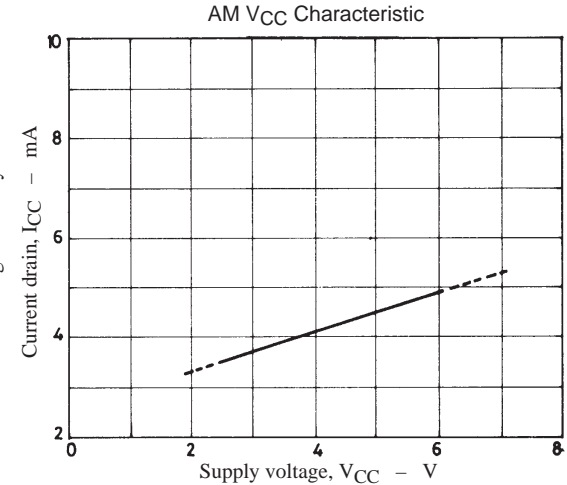
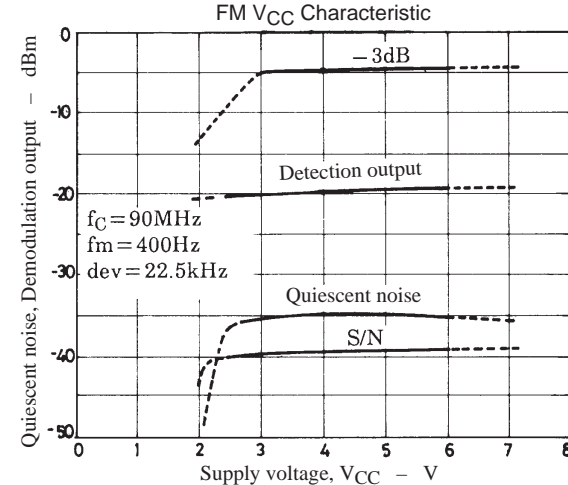
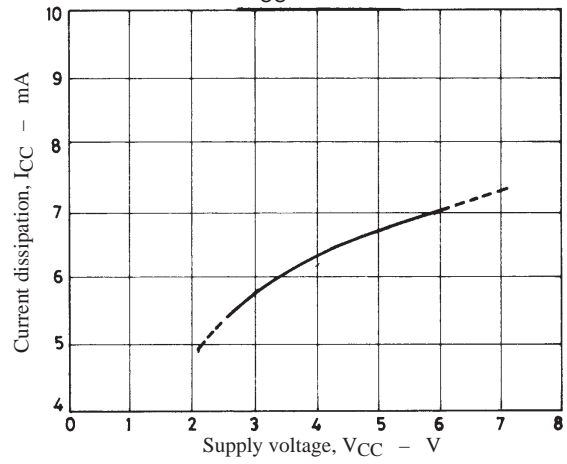
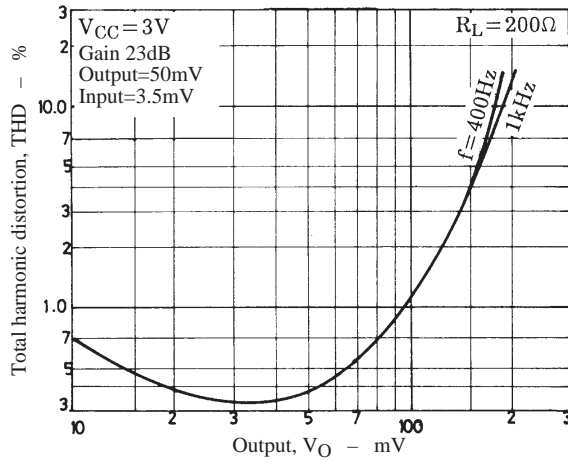
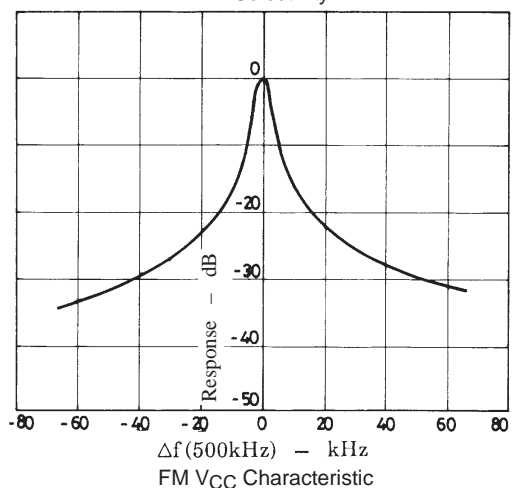
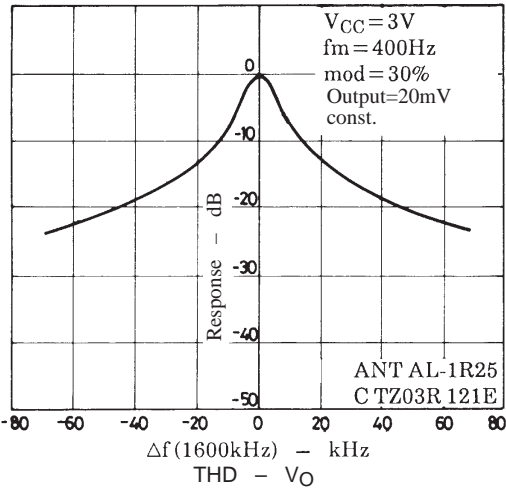
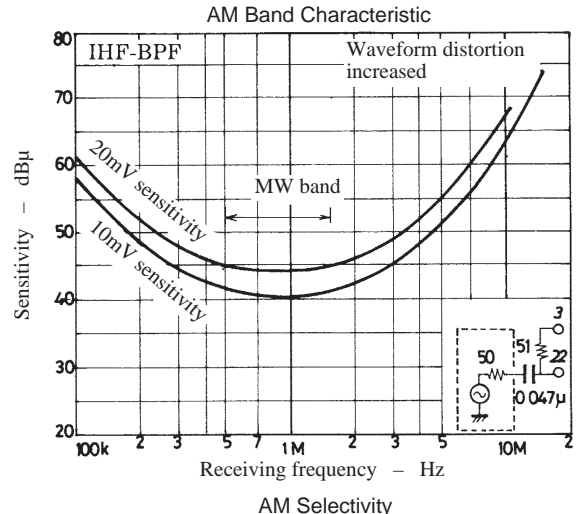
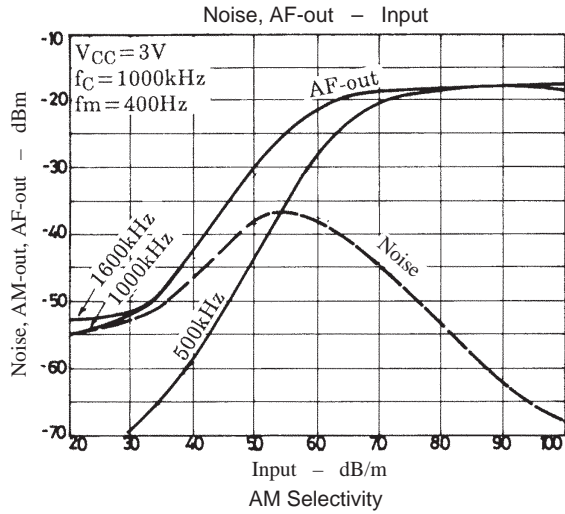
MW Superheterodyne Use

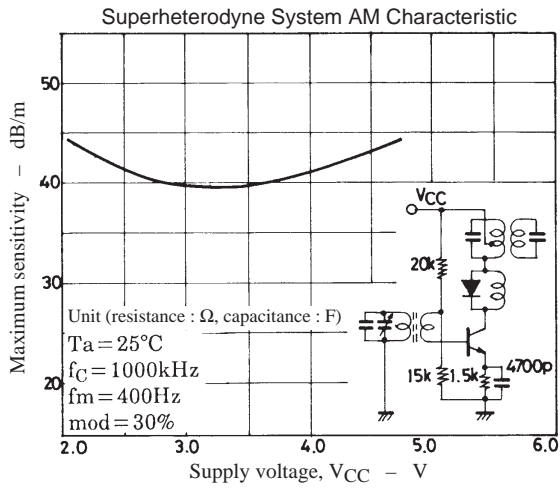
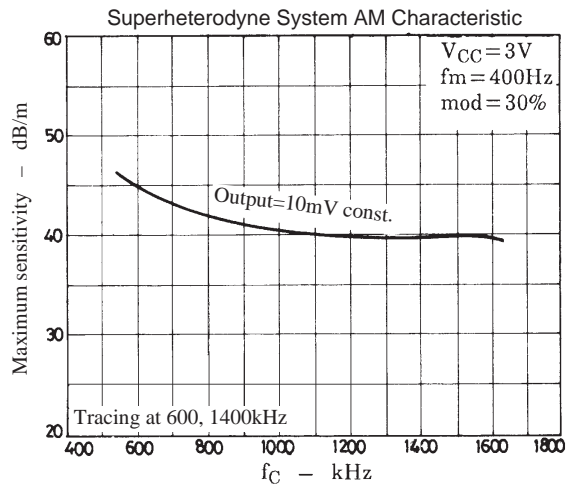
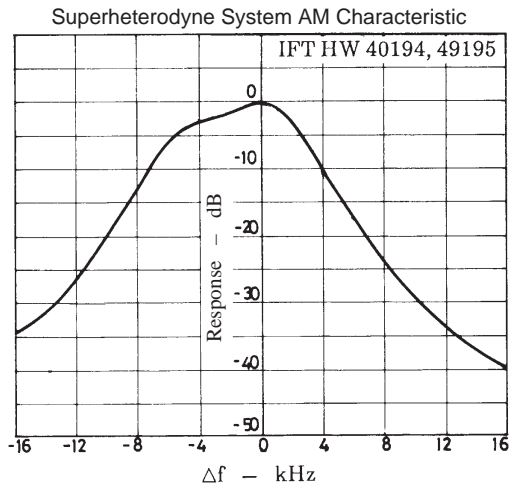
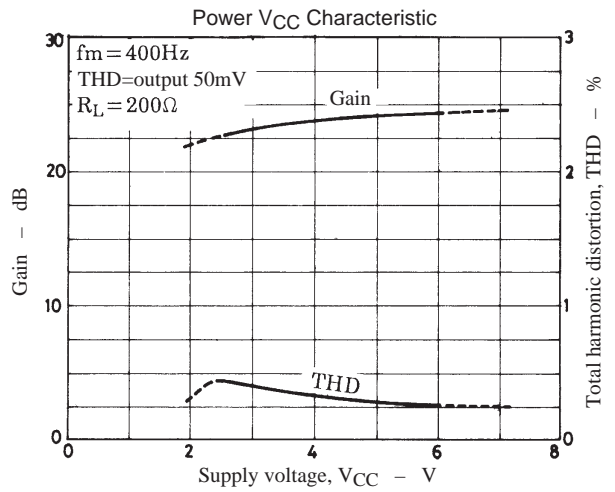
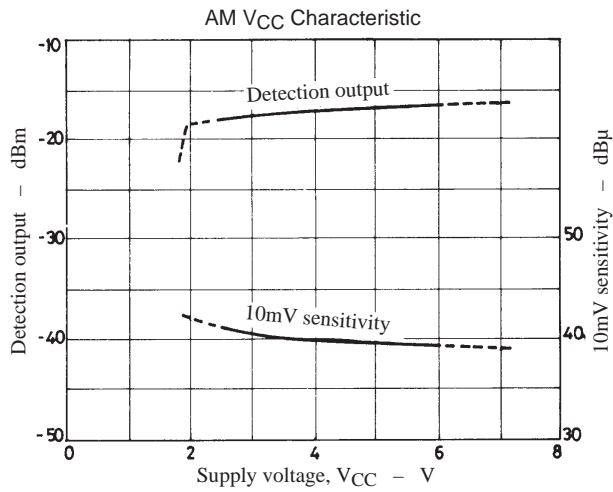


Variable capacitor	2LXT-L	Mitsumi
L1	HH-40947	Mitsumi
T1	HW-40217	Mitsumi
T2	HW-40194	Mitsumi
T3	HW-50005	Mitsumi
B.P.F.	SNY-074-2005	Sumida

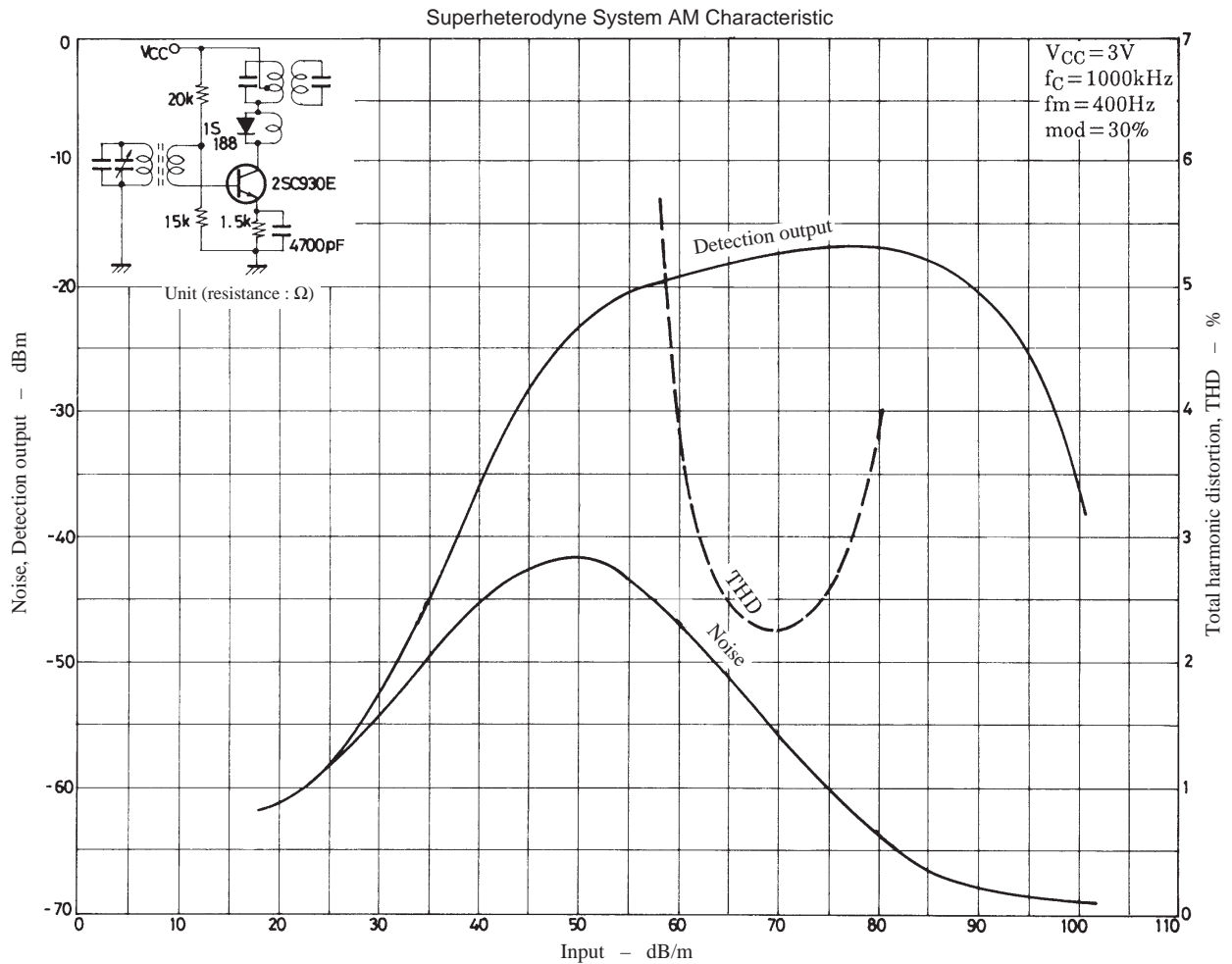
Unit (resistance : Ω, capacitance : F)







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