Ordering number : EN1844D

SANYO Semiconductors
DATA SHEET

LA1800 — Monolithic Linear IC
FM / AM Single-Chip Radio

Functions

- FM : Front end, low-pass filter, IF amplifier, quadrature detector, muting.
- AM :RF amplifier, 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} min=2.5V

Specifications

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	Pin 3	6.0	V
Allowable power dissipation	Pd max		200	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}		3.0	V
Operating supply voltage range	V_{CC} op		2.5 to 5.0	V

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM]						
Current drain	Icco			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

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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[FM]						
Current drain	Icco			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
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 specified Test Circuit 2.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[AM: f_C=1MHz, fm=400Hz]						
Current drain	Icco	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, fm=400Hz]						
Current drain	Icco	Quiescent		5.6		mA
Input limiting sensitivity	-3dBL.S.	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: fm=400Hz]						
Voltage gain	VG	V_O=50mV		24		dB
Total harmonic distortion	THD	V_O=50mV		0.3		%

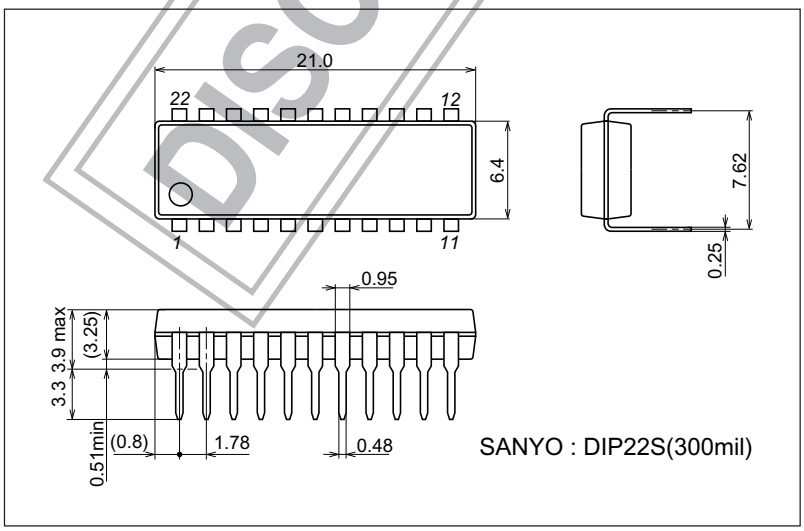
Note : 1. Current drain for FM, AM includes current of AF driver stage.

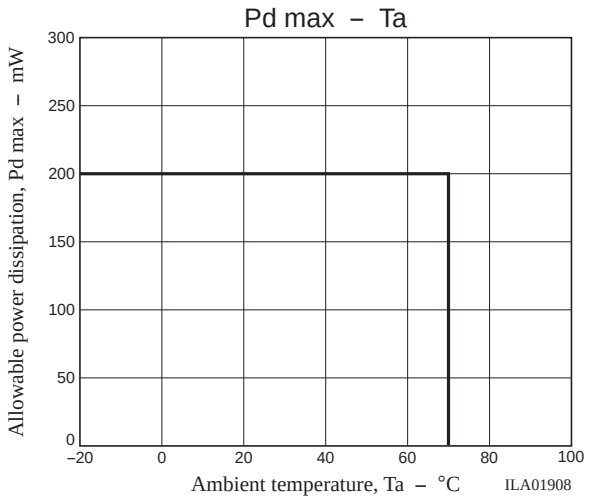
2. When handling the IC, be careful not to cause dielectric breakdown.

Package Dimensions

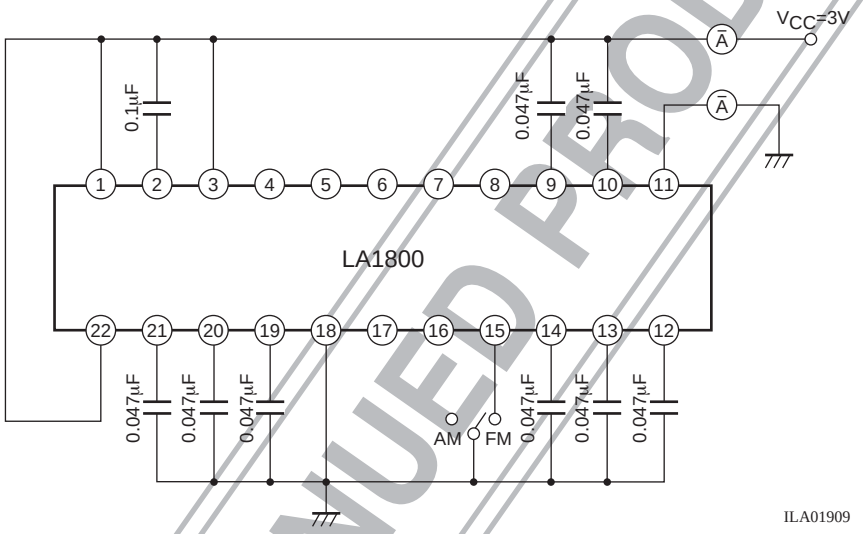
unit : mm

3059A

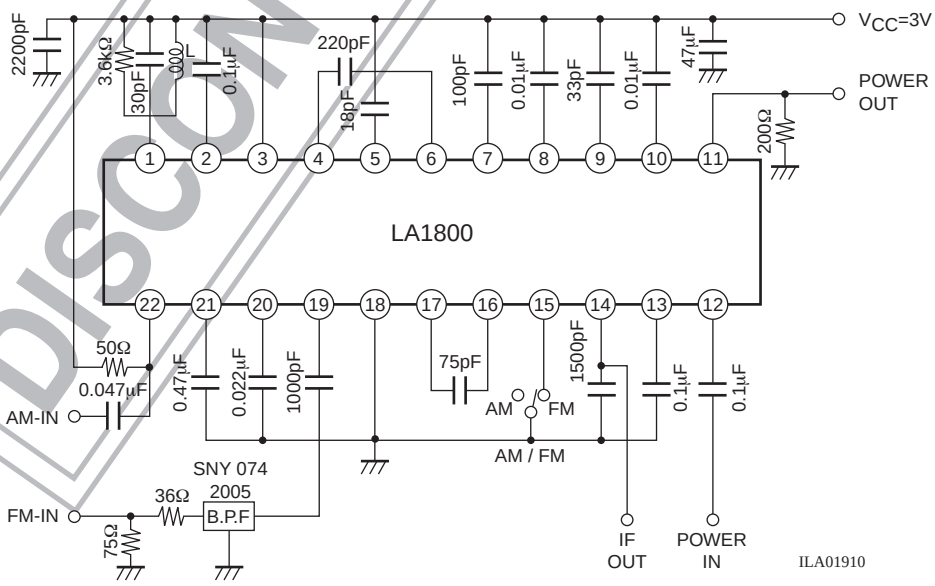




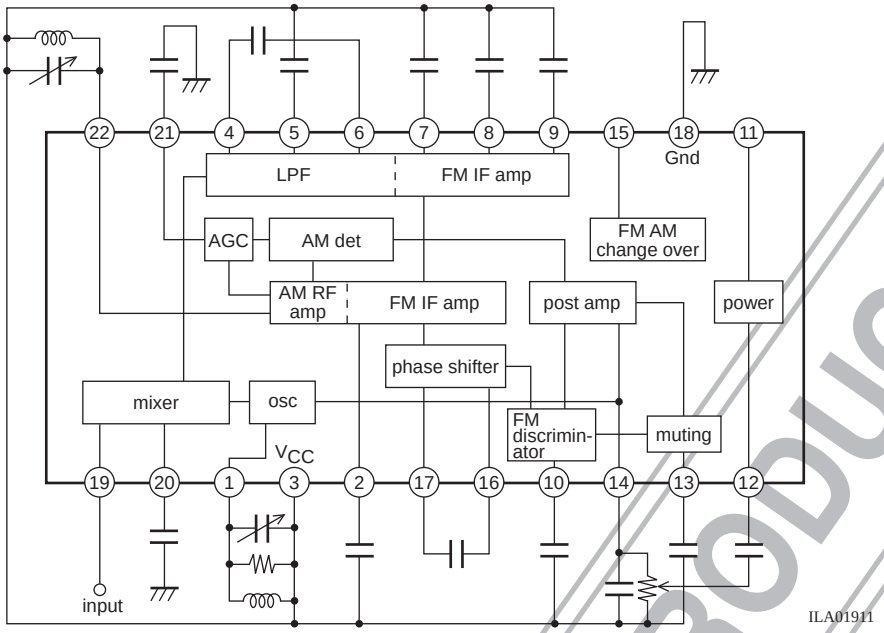
DC Test Circuit



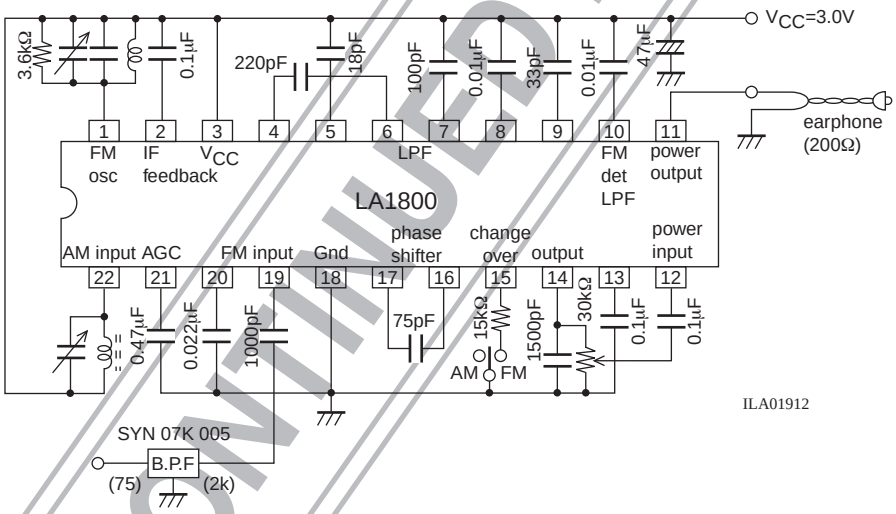
AC Test Circuit



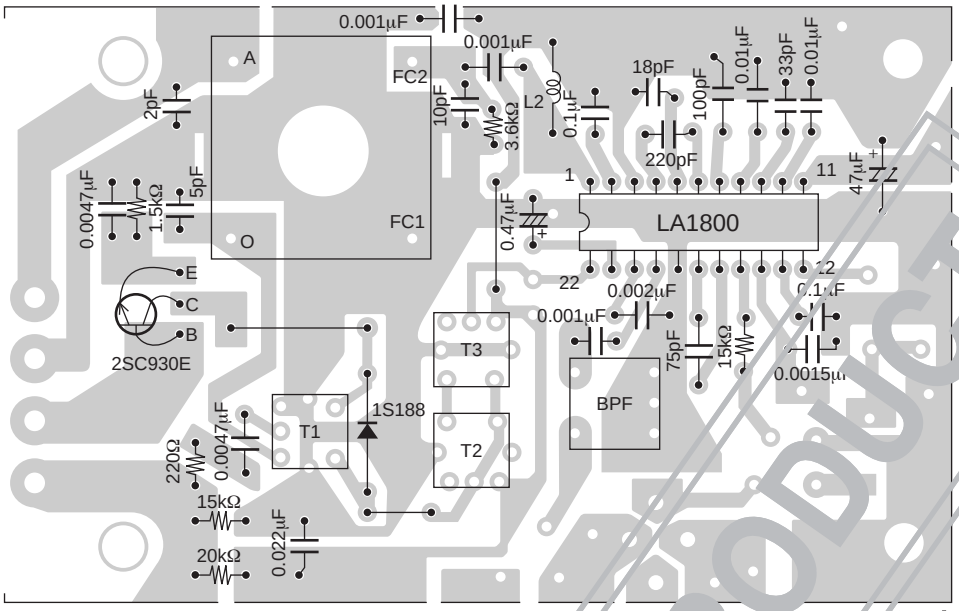
Equivalent Circuit Block Diagram



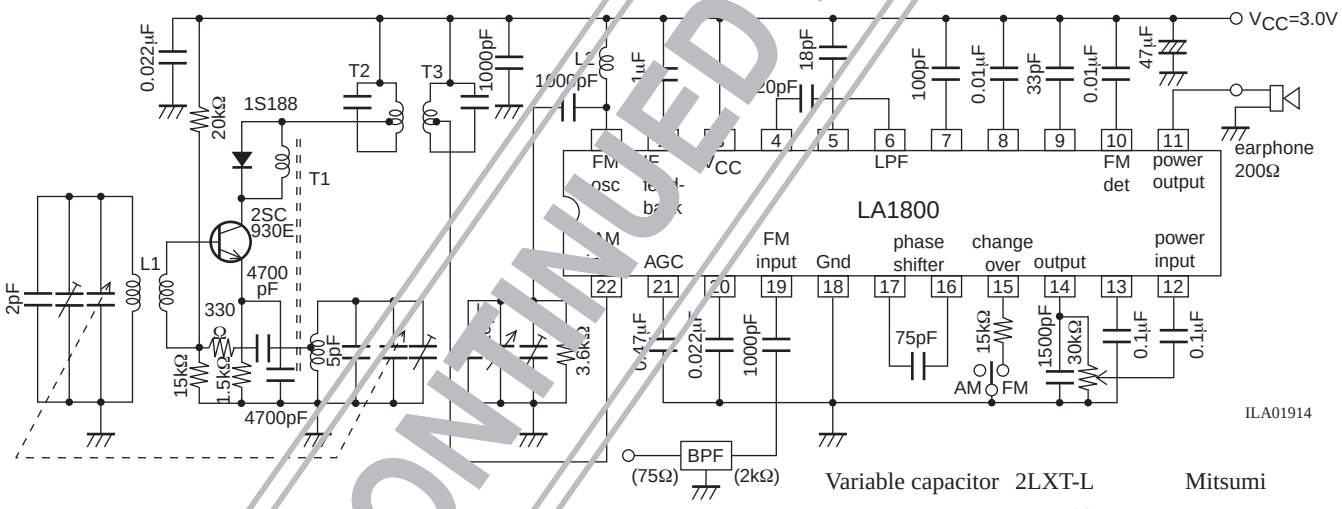
Sample Application Circuit



Sample Printed Circuit Pattern (Cu-foiled side)

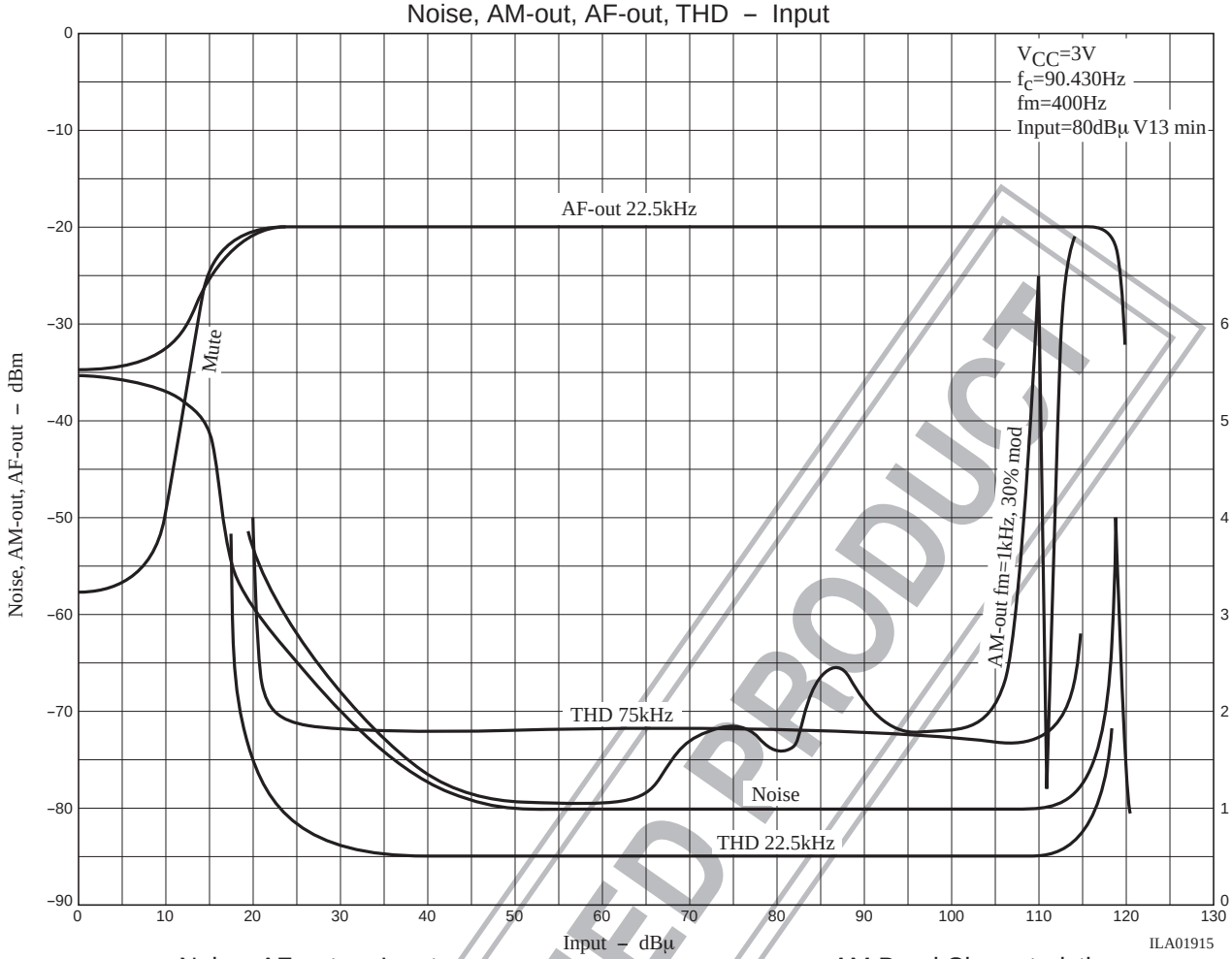


MW Superheterodyne Use

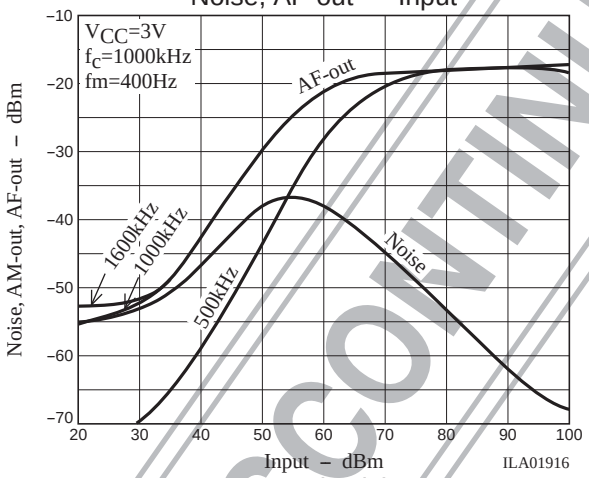


Variable capacitor	2LXT-L	Mitsumi
L1	HH-40947	Mitsumi
T1	HW-40217	Mitsumi
T2	HW-40194	Mitsumi
T3	HW-50005	Mitsumi
B.P.F	SNY-074-2005	Sumida

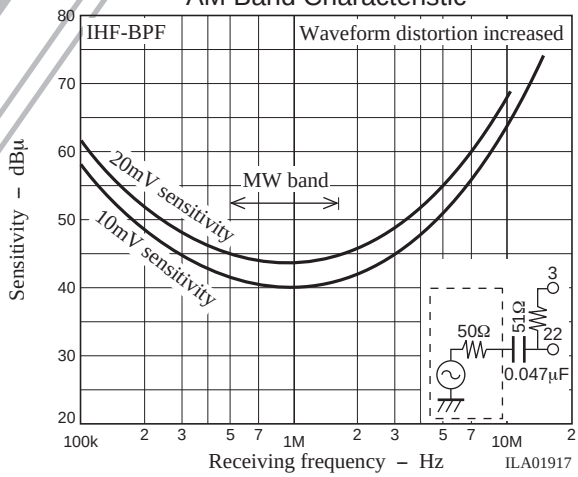
Noise, AM-out, AF-out, THD – Input



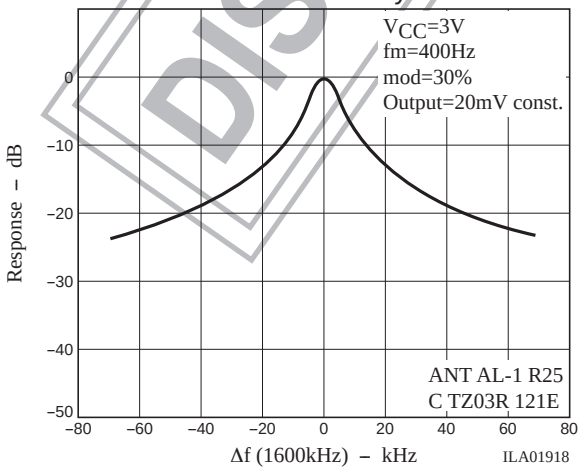
Noise, AF-out – Input



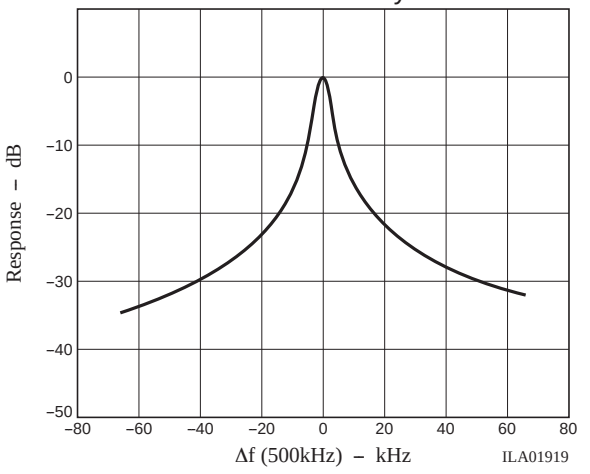
AM Band Characteristic

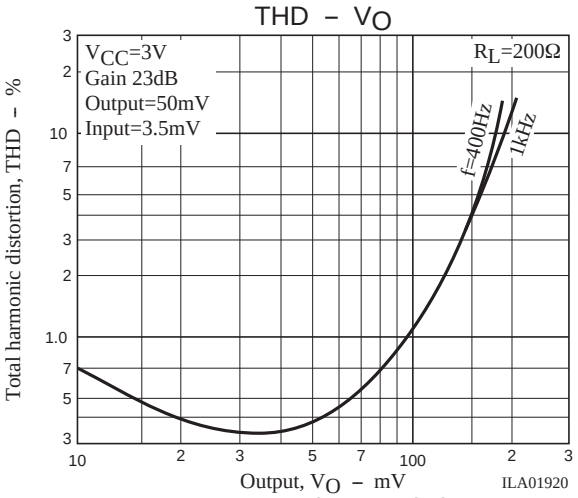


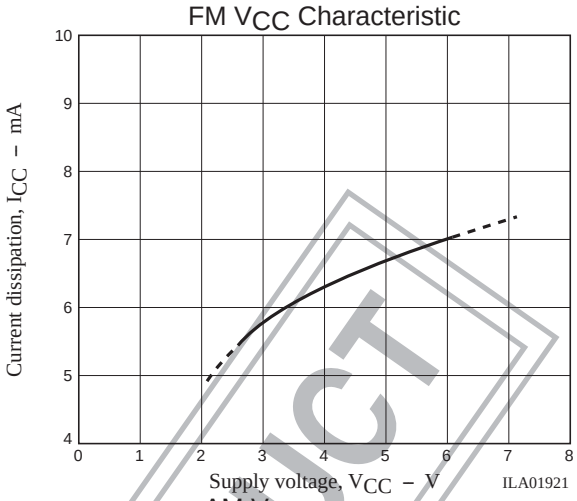
AM Selectivity

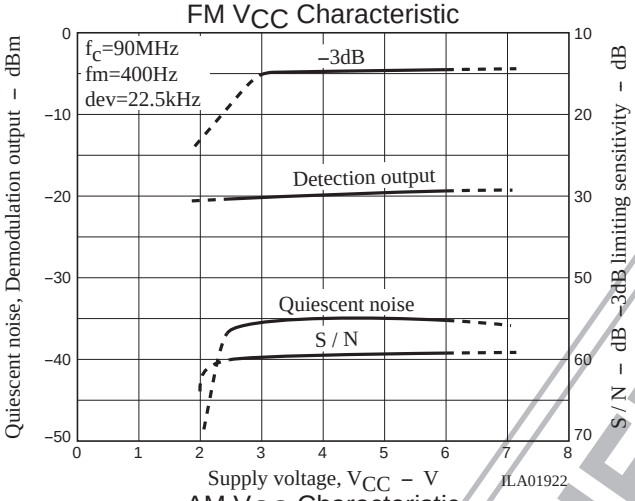


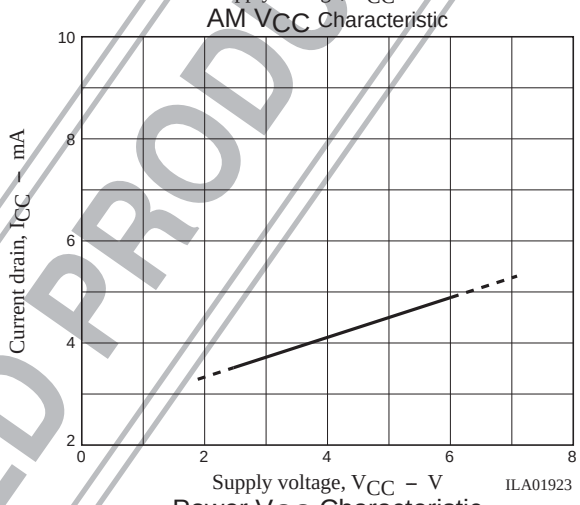
AM Selectivity

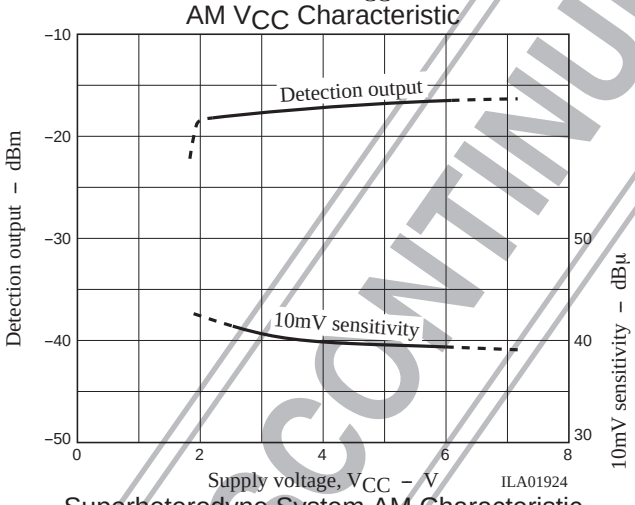


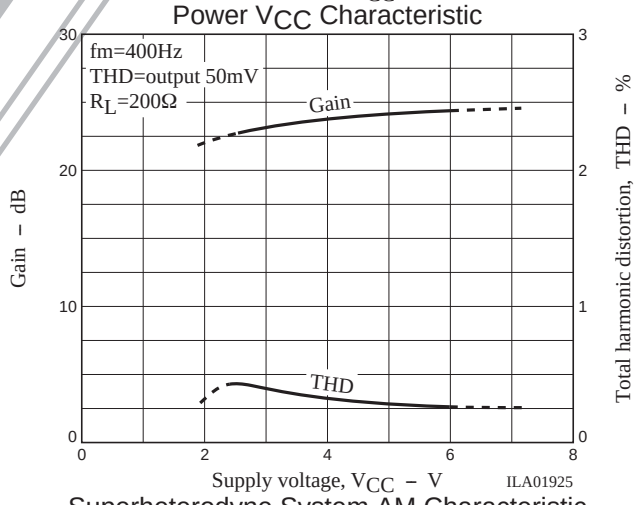


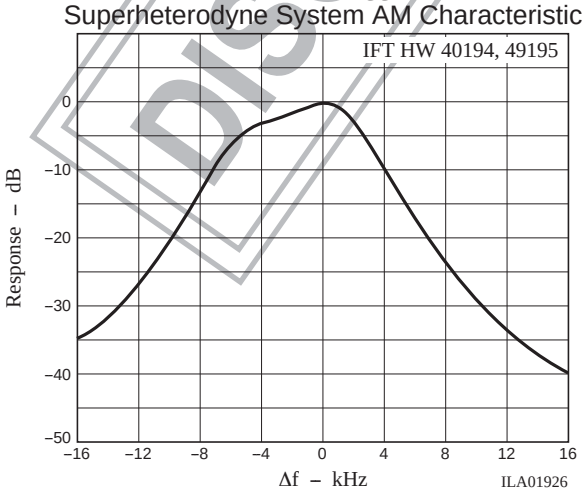


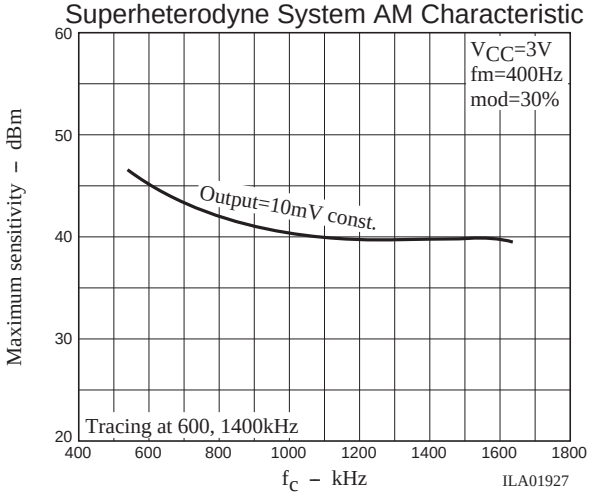




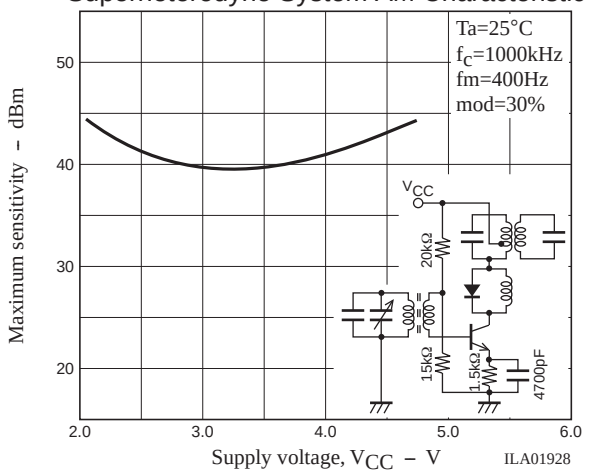








Superheterodyne System AM Characteristic



Superheterodyne System AM Characteristic