



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 $T_a=25^\circ\text{C}$

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

Operating Conditions at $T_a=25^\circ\text{C}$

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 $T_a=25^\circ\text{C}$, $V_{CC}=3\text{V}$, See specified 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

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Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[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
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, 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	-3dB _{L.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: f _m =400Hz]						
Voltage gain	V _G	V _O =50mV		24		dB
Total harmonic distortion	THD	V _O =50mV		0.3		%

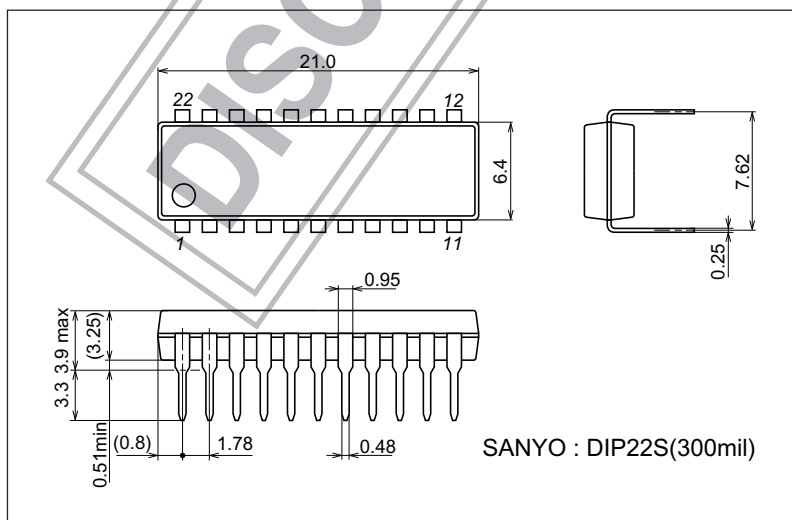
Note : 1. Current drain for FM, AM includes current of AF driver stage.

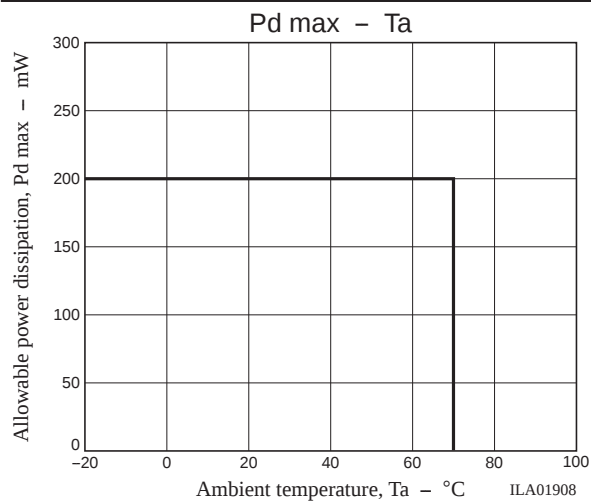
2. When handling the IC, be careful not to cause dielectric breakdown.

Package Dimensions

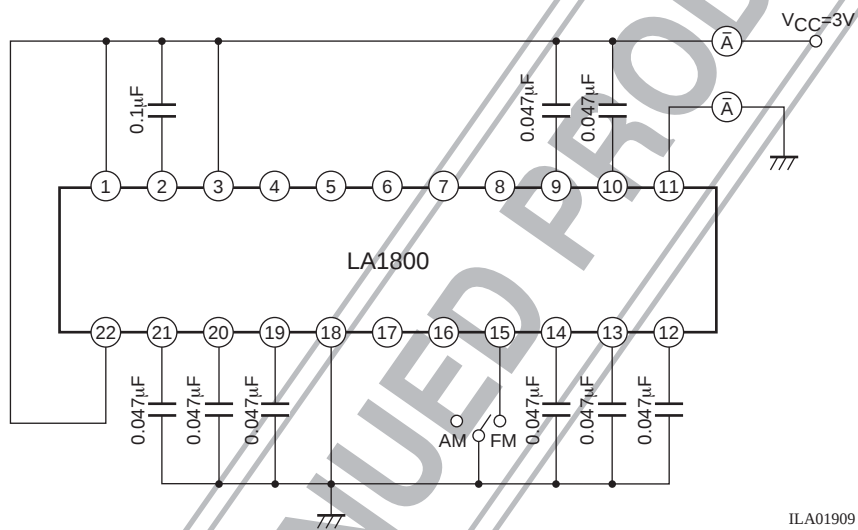
unit : mm

3059A

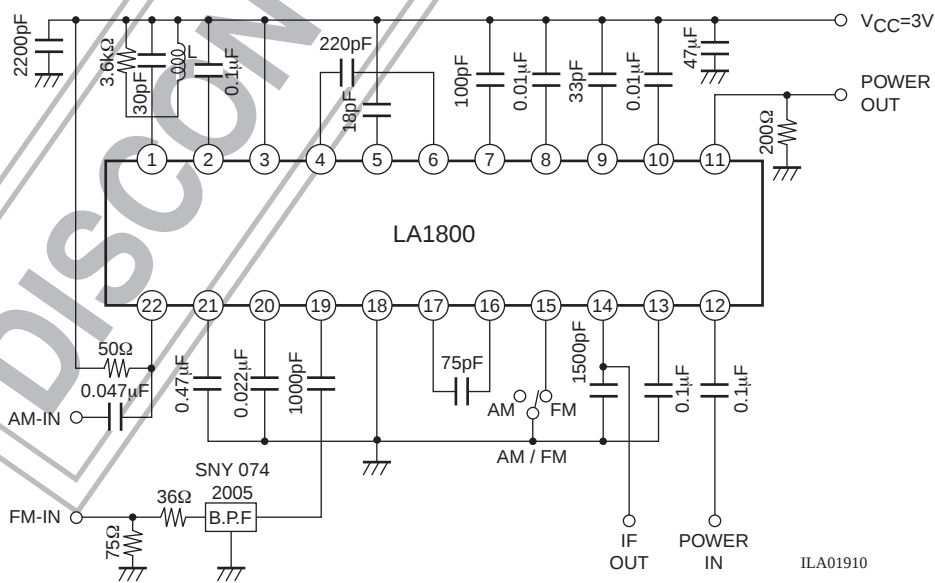




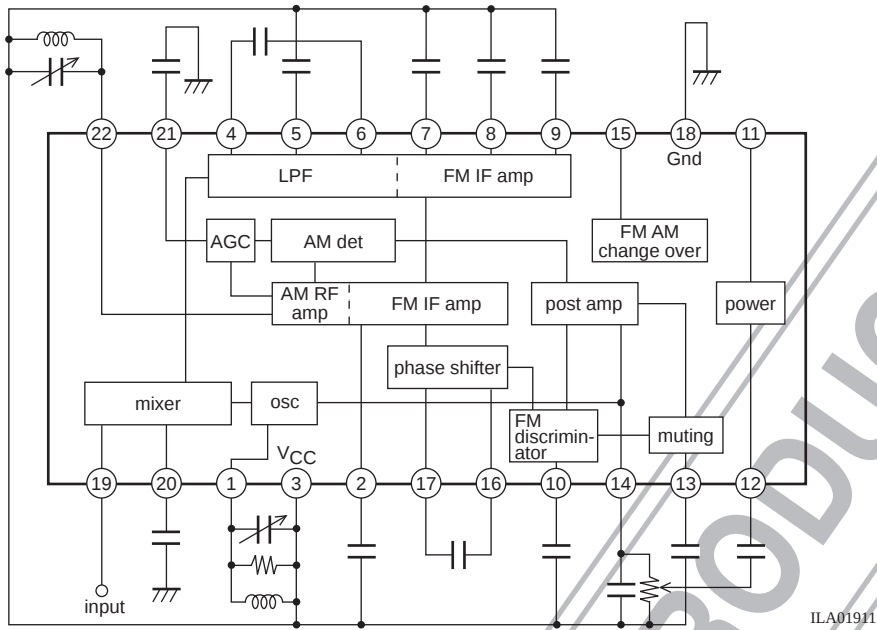
DC Test Circuit



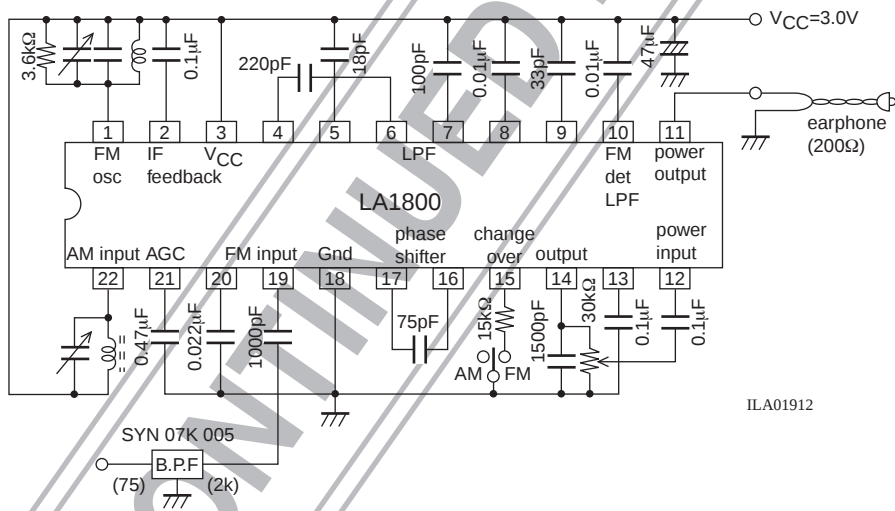
AC Test Circuit



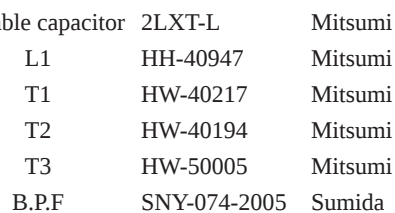
Equivalent Circuit Block Diagram



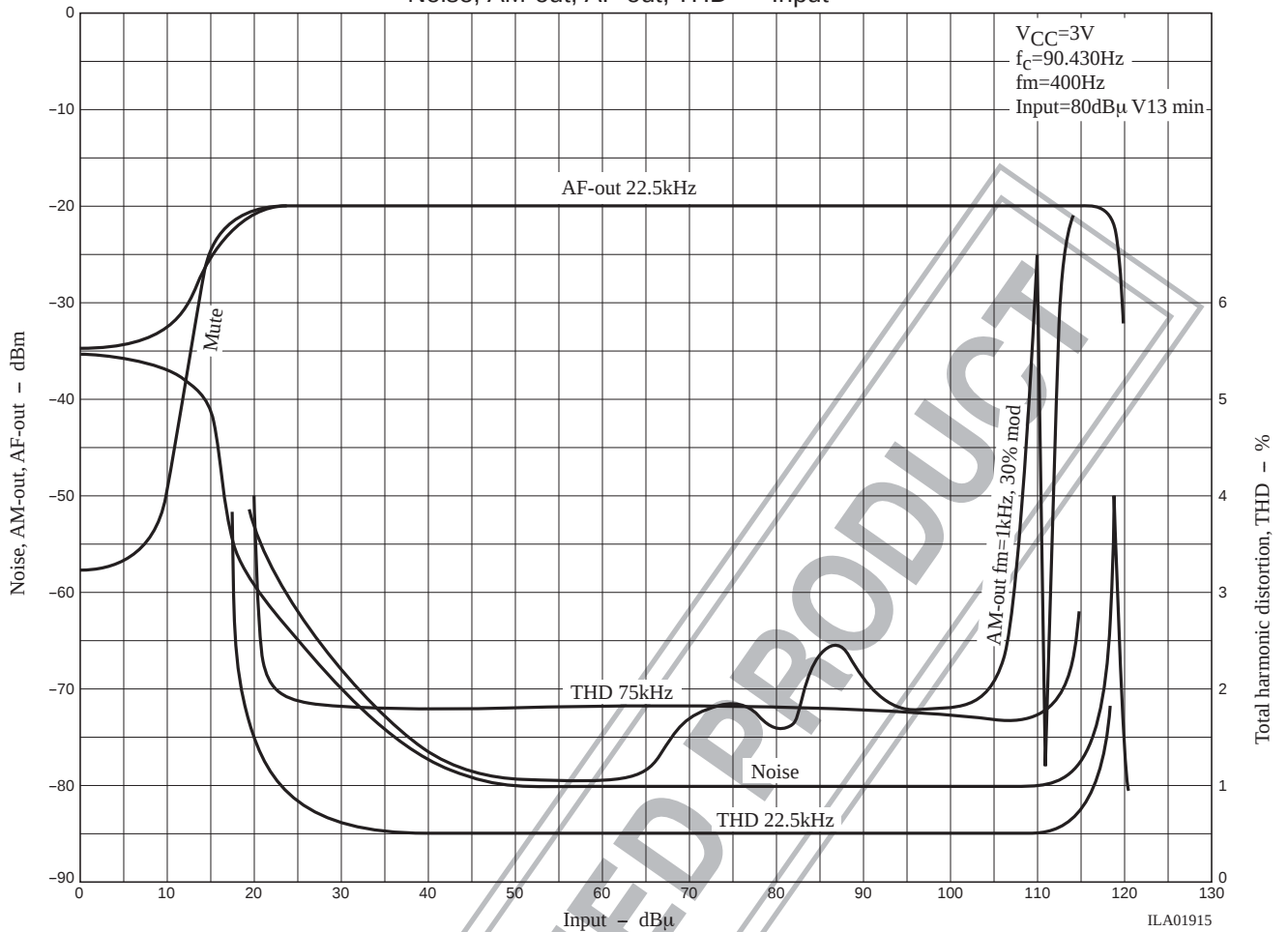
Sample Application Circuit



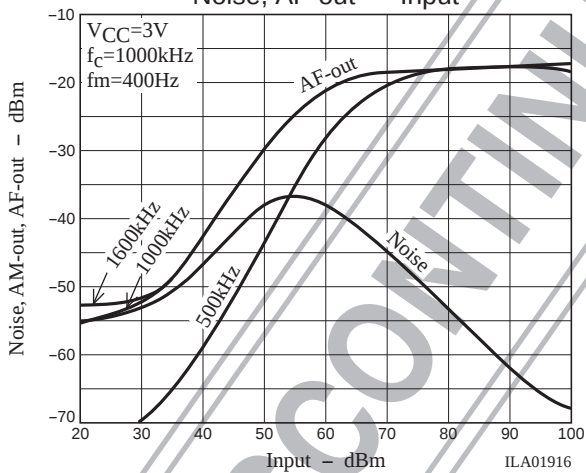
Sample Printed Circuit Pattern (Cu-foiled side)



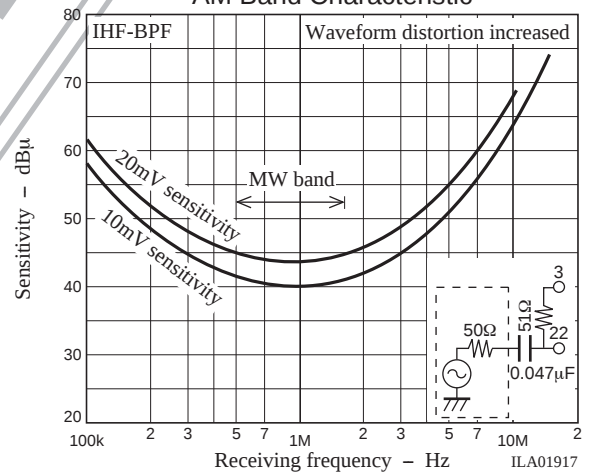
Noise, AM-out, AF-out, THD - Input



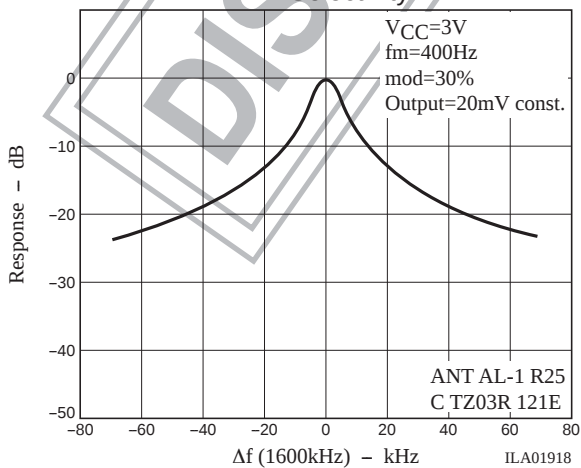
Noise, AF-out - Input



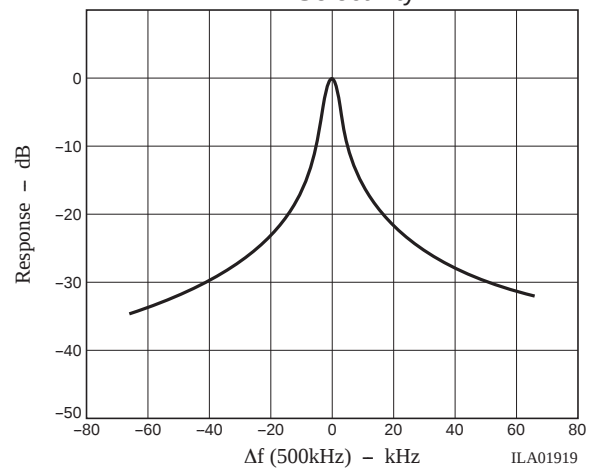
AM Band Characteristic

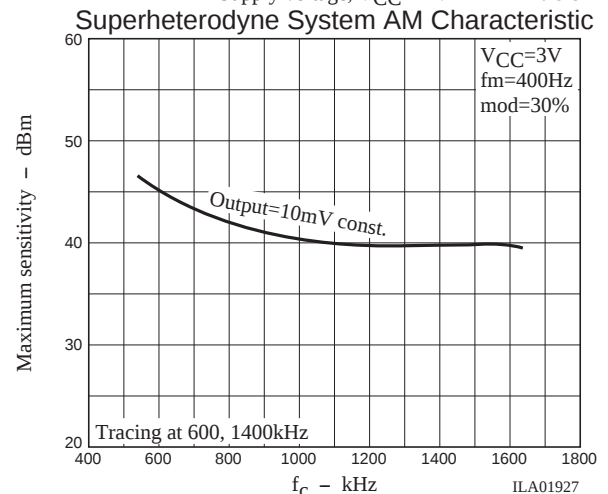
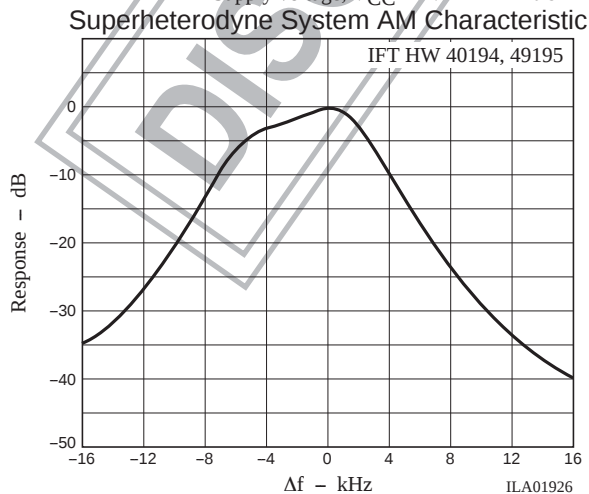
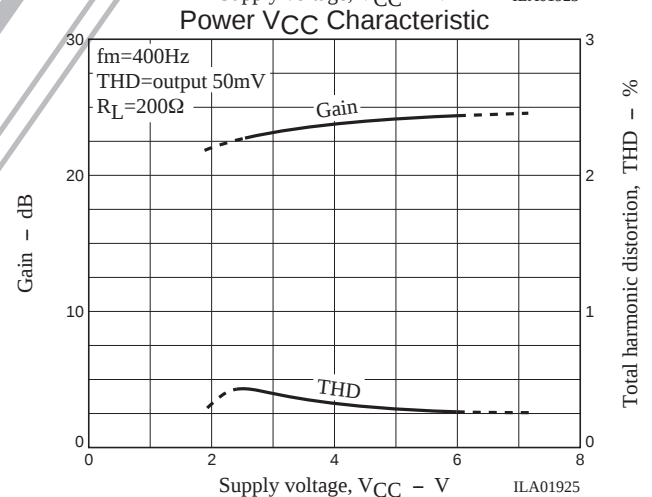
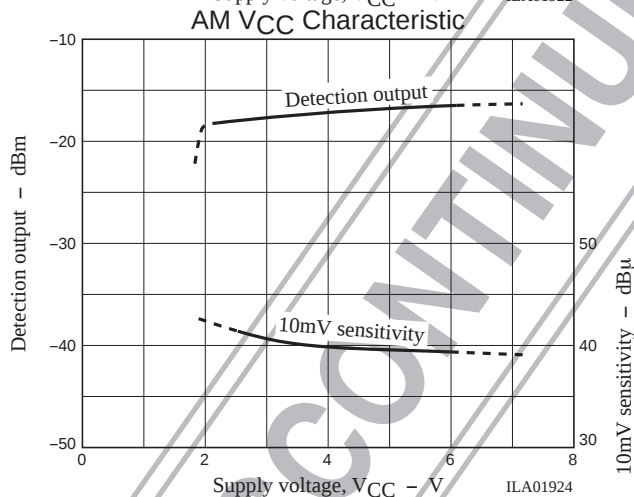
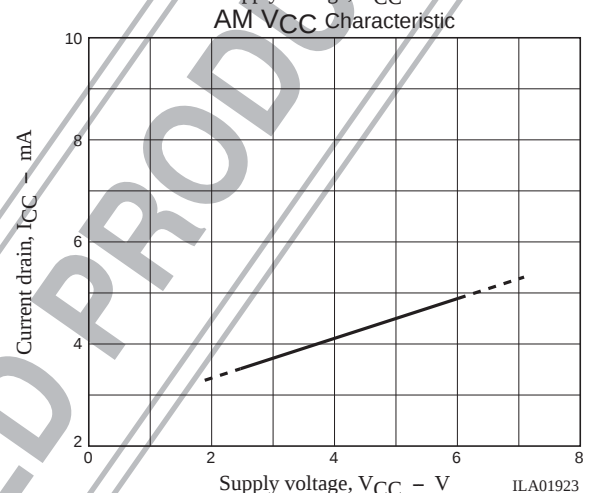
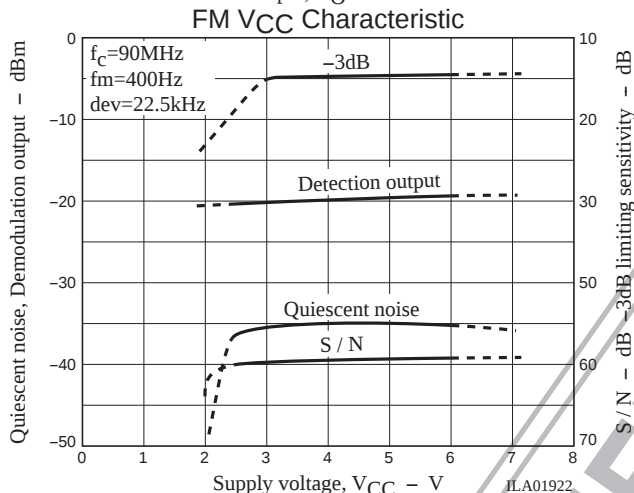
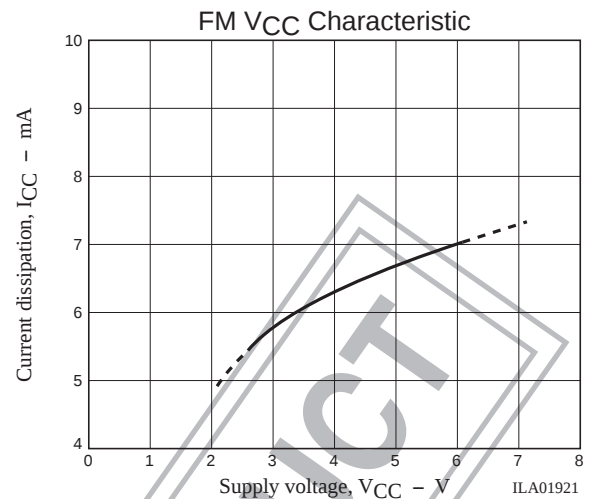
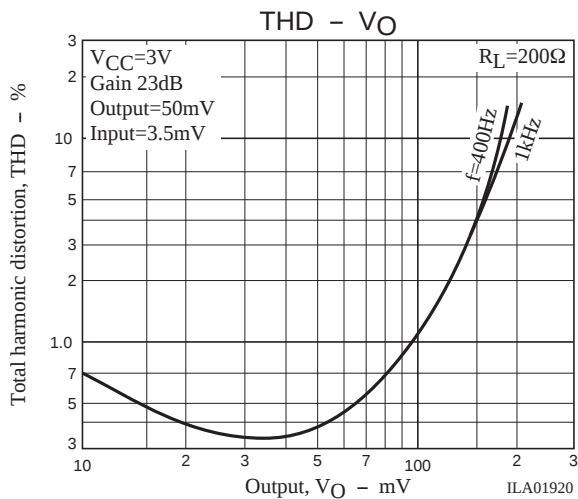


AM Selectivity

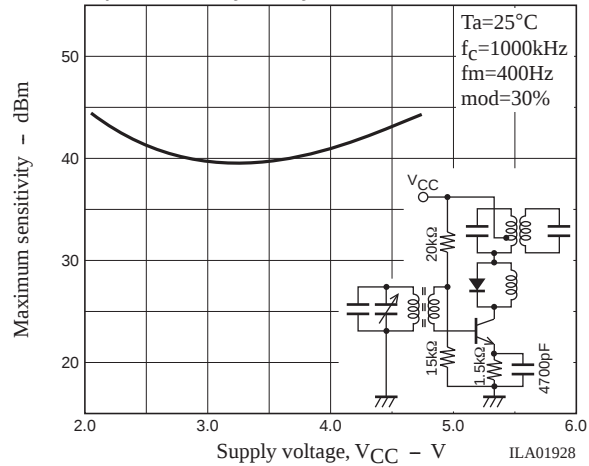


AM Selectivity

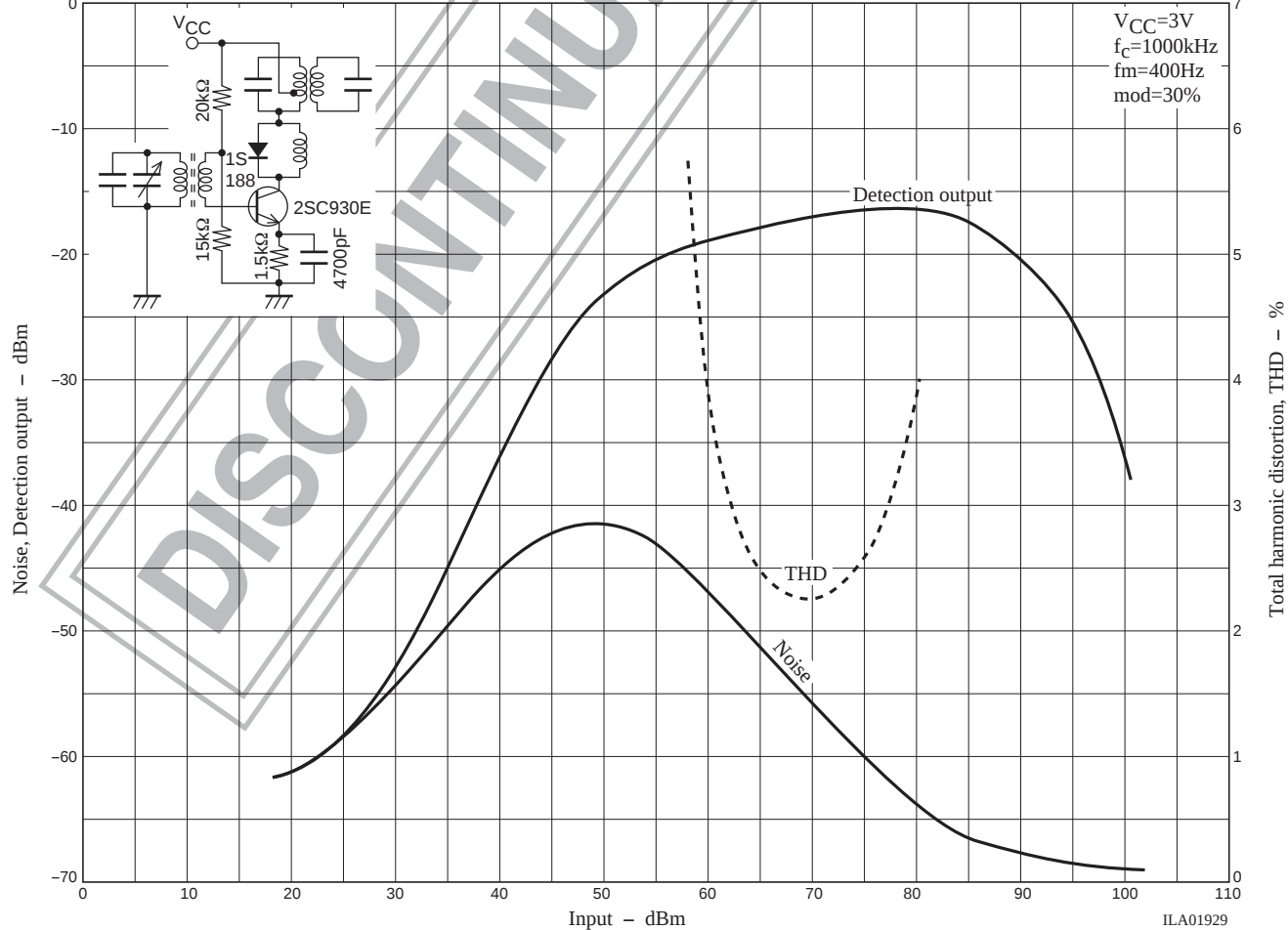


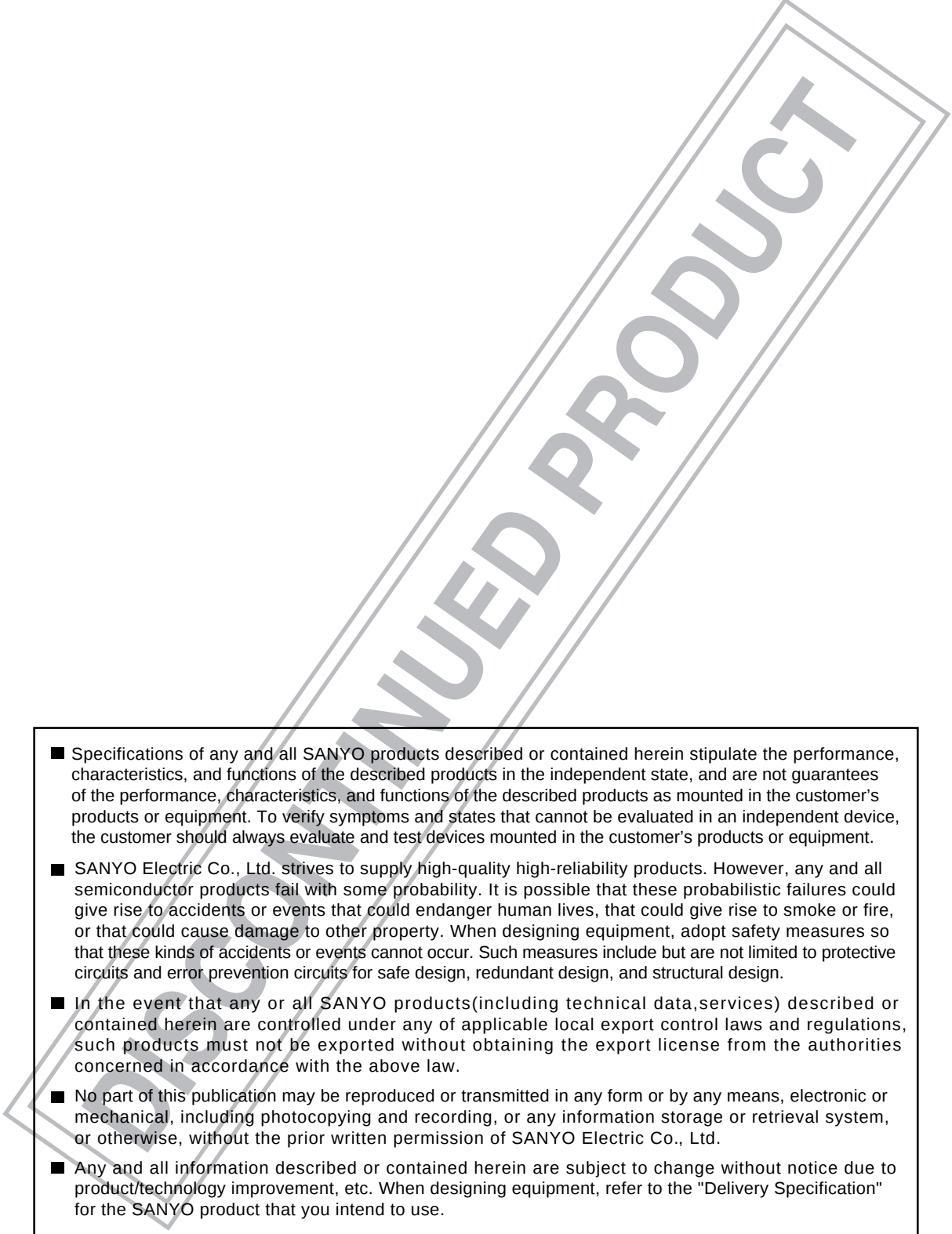


Superheterodyne System AM Characteristic



Superheterodyne System AM Characteristic



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