



# 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).

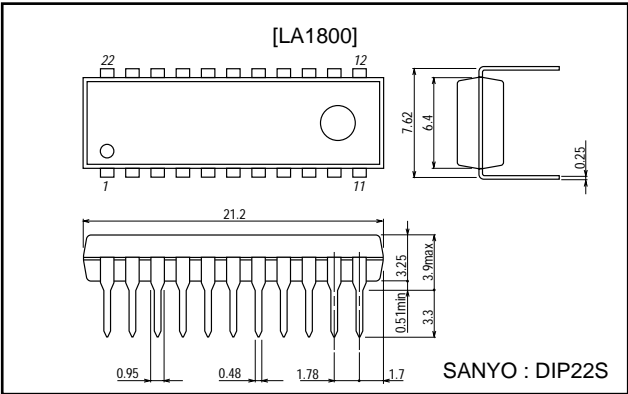
### Features

- 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

Continued on next page.

# LA1800

Continued from preceding page.

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

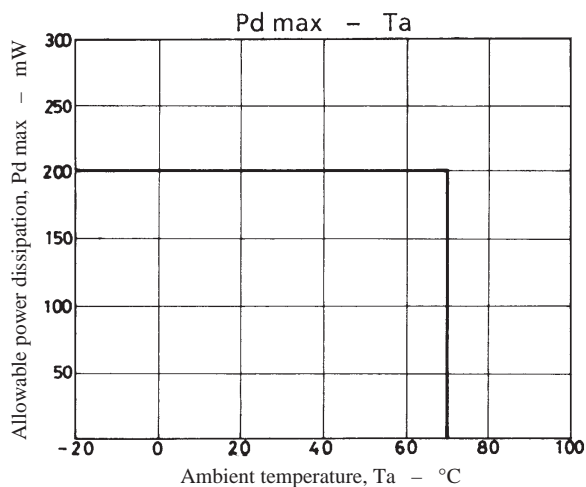
[Reference characteristics]

## Operating Characteristics at Ta=25°C, V<sub>CC</sub>=3V, See Test Circuit 2

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

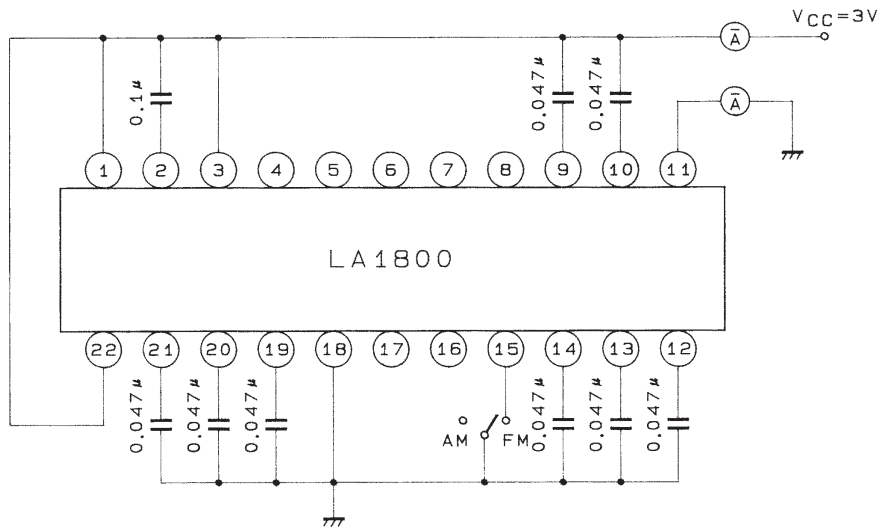
Note : 1. Current drain for FM, AM includes current of AF driver stage.

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



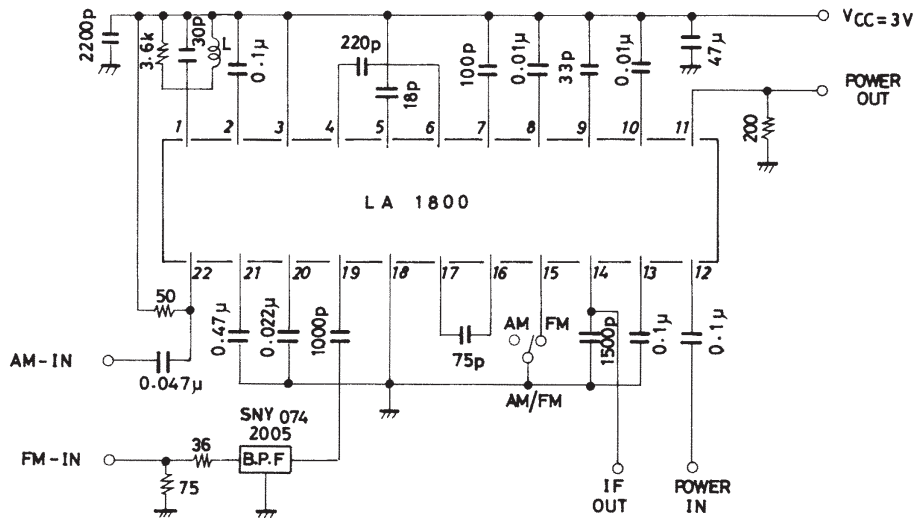
# LA1800

## DC Test Circuit



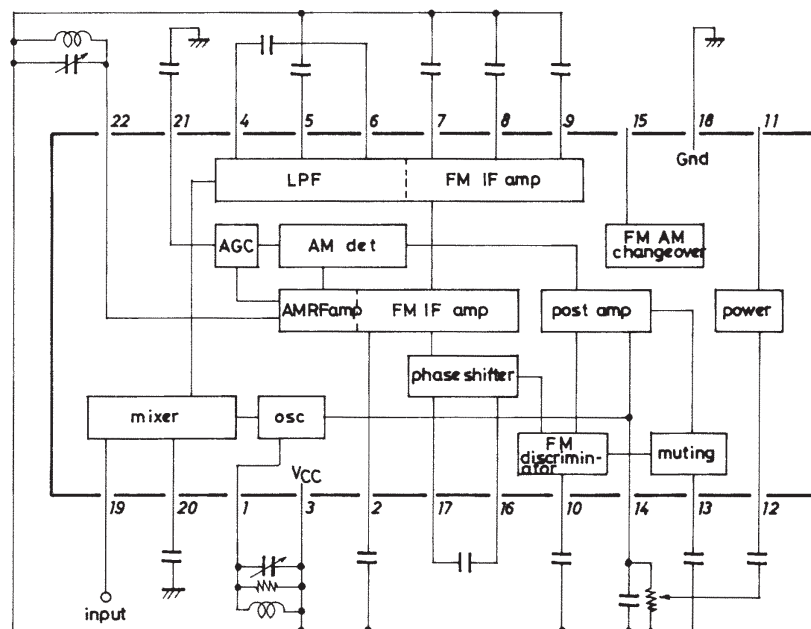
Unit (resistance : Ω, capacitance : F)

## AC Test Circuit



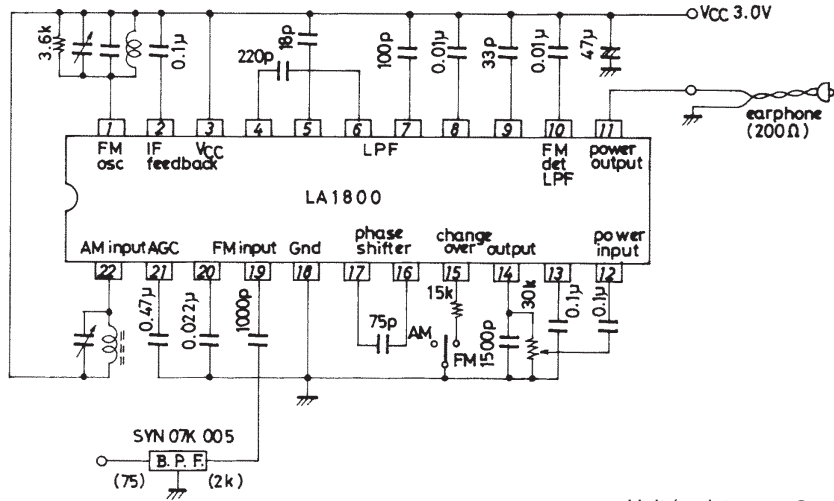
Unit (resistance : Ω, capacitance : F)

## Equivalent Circuit Block Diagram



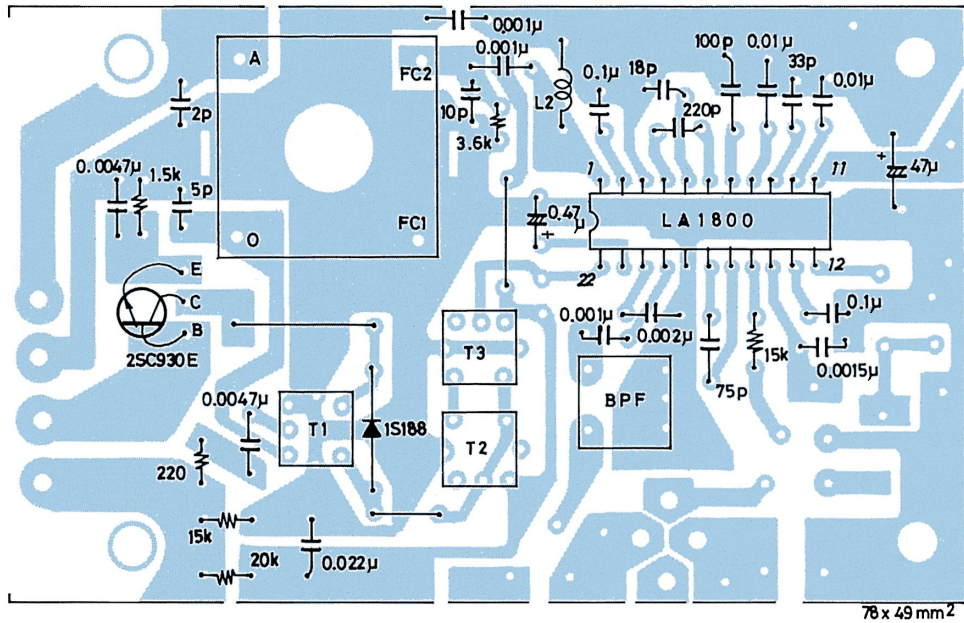
# LA1800

## Sample Application Circuit



Unit (resistance : Ω, capacitance : F)

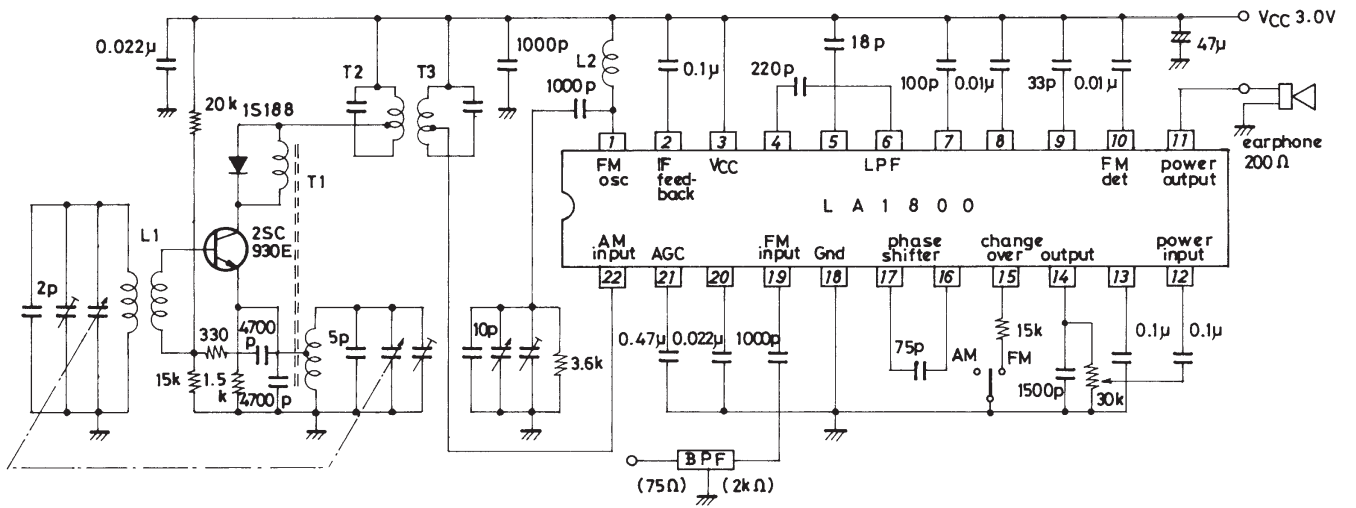
## Sample Printed Circuit Pattern (Cu-foiled side)



Unit (resistance : Ω, capacitance : F)

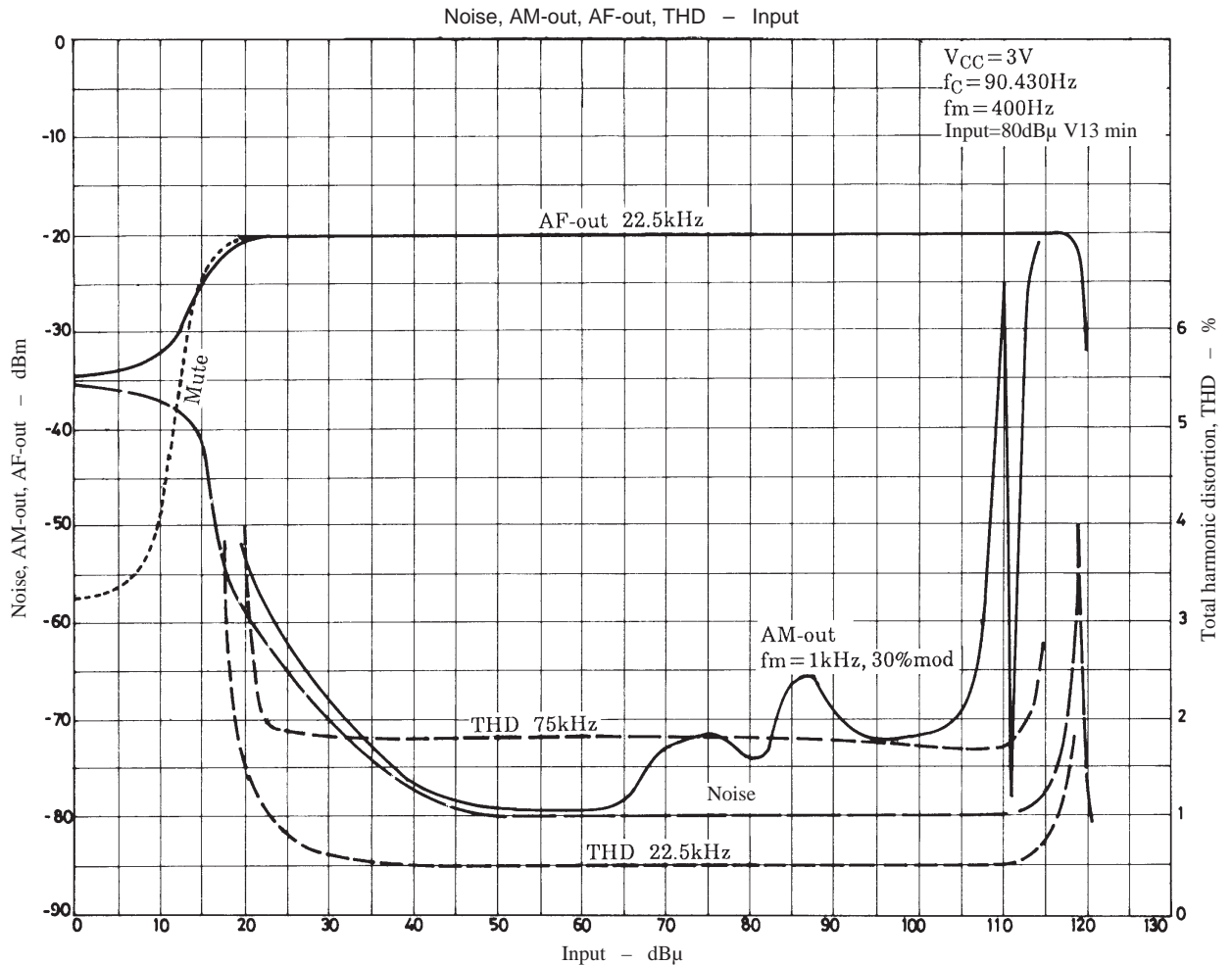
# LA1800

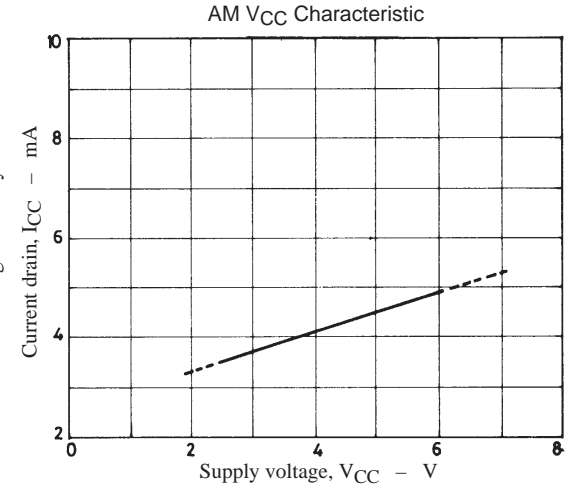
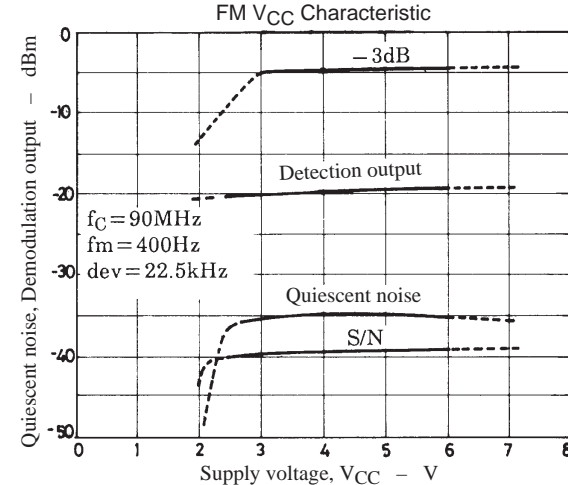
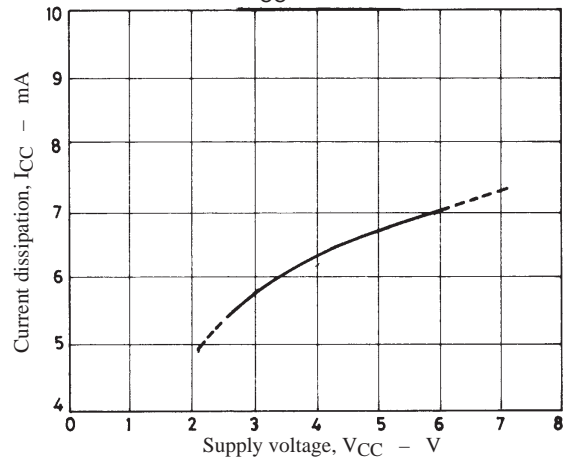
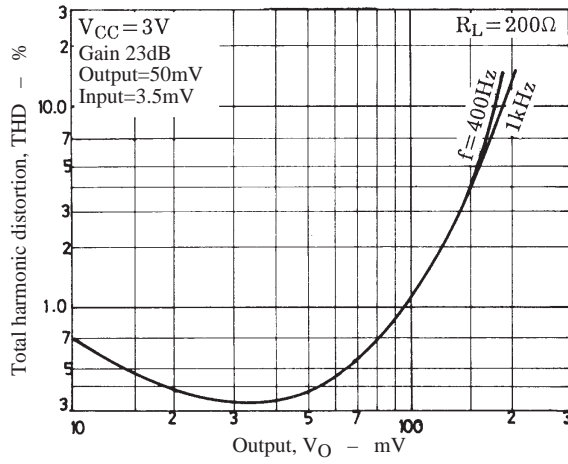
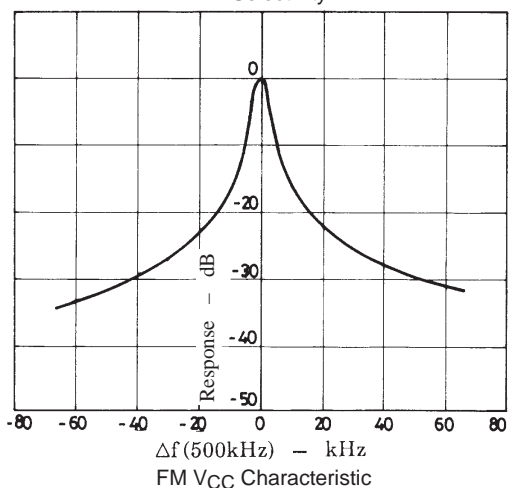
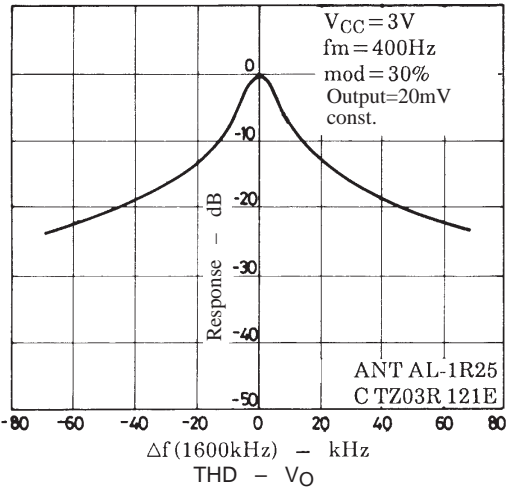
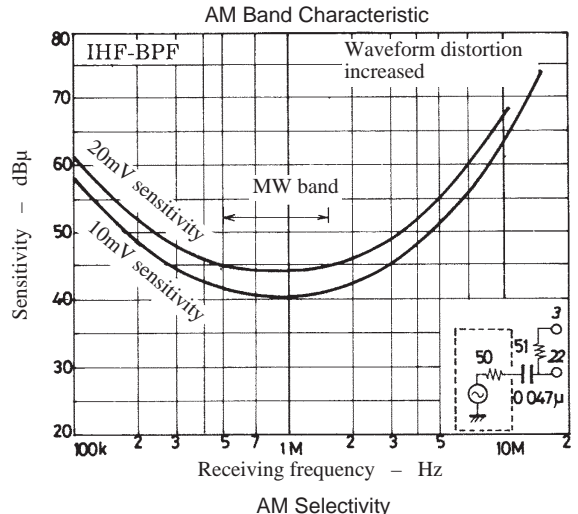
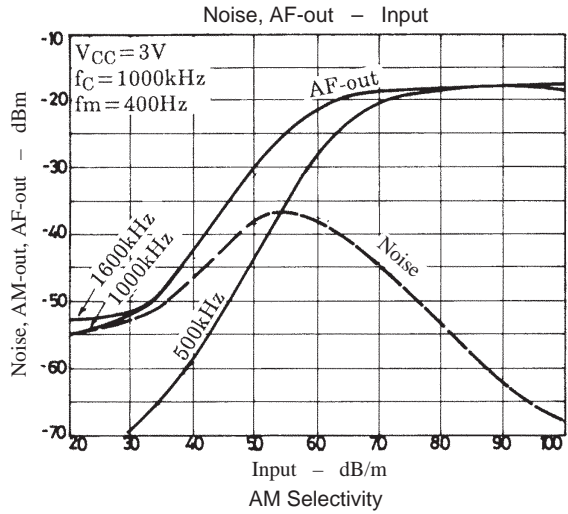
## MW Superheterodyne Use

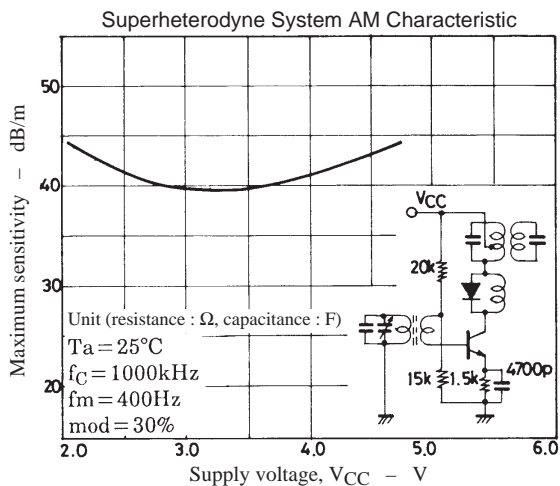
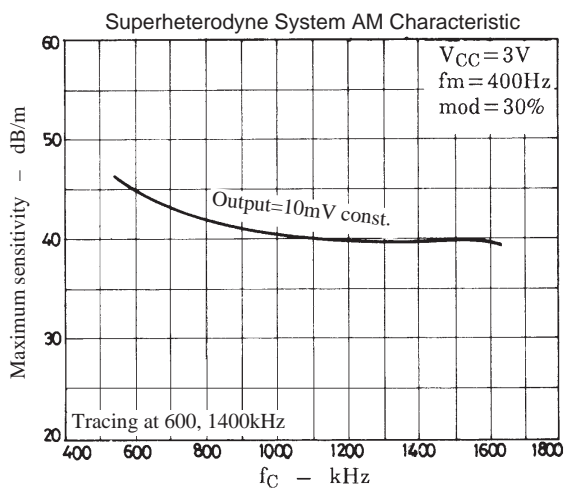
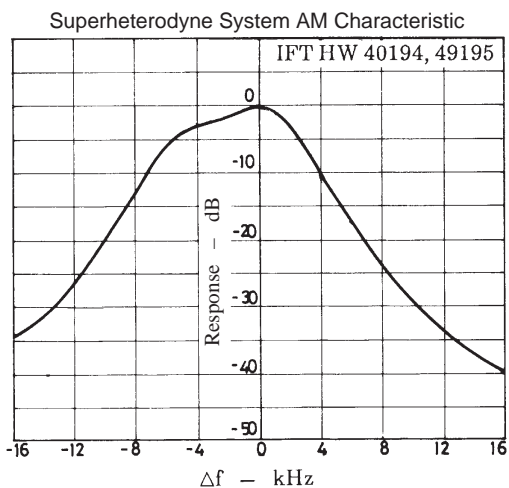
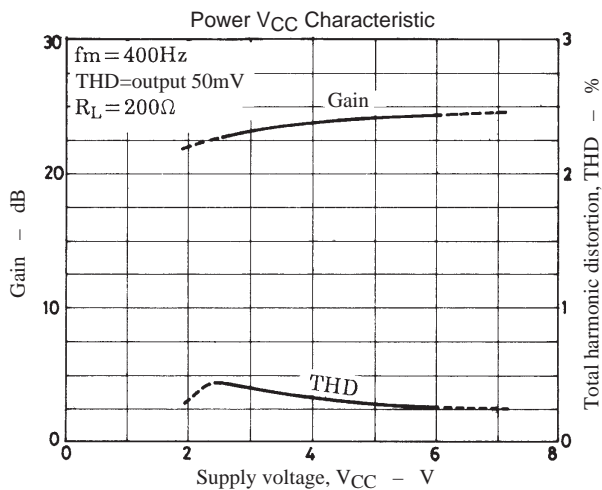
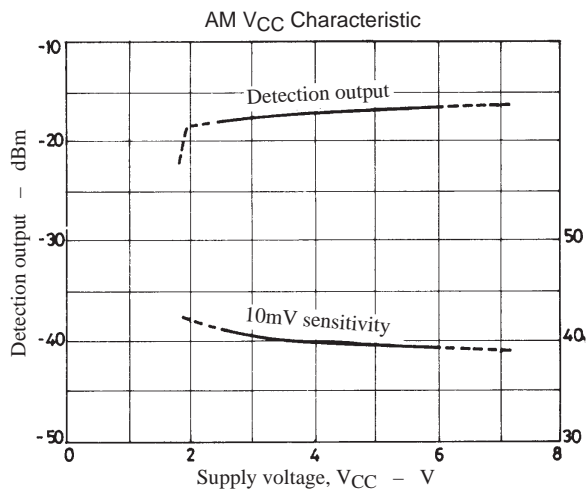


Variable capacitor	2LXT-L	Mitsumi
L1	HH-40947	Mitsumi
T1	HW-40217	Mitsumi
T2	HW-40194	Mitsumi
T3	HW-50005	Mitsumi
B.P.F.	SNY-074-2005	Sumida

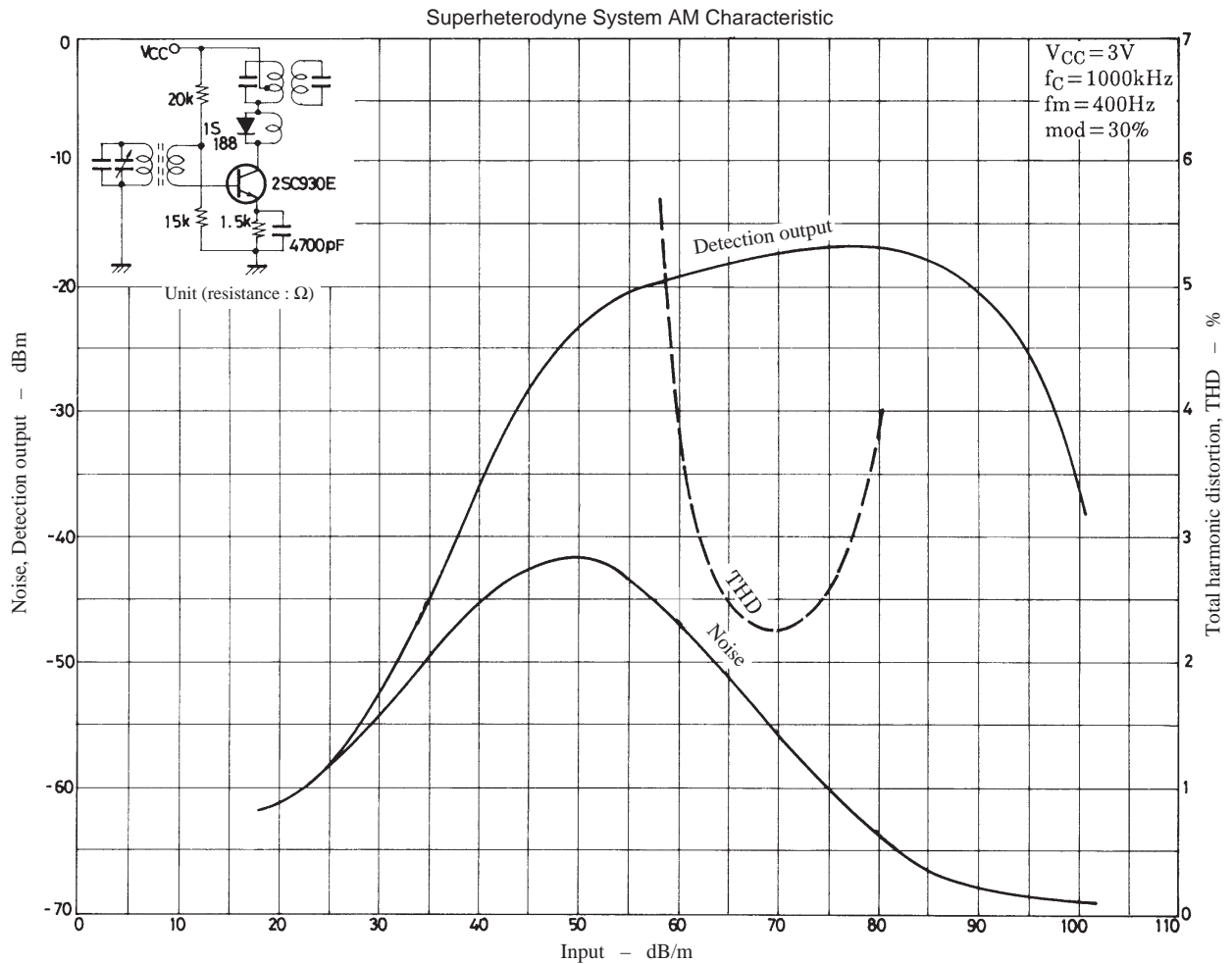
Unit (resistance : Ω, capacitance : F)







# LA1800



■ No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.

■ Anyone purchasing any products described or contained herein for an above-mentioned use shall:

- ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
- ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.

■ Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of January, 1998. Specifications and information herein are subject to change without notice.