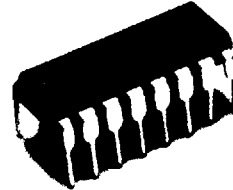


M5226P/FP**5-ELEMENT GRAPHIC EQUALIZER IC****DESCRIPTION**

The M5226 is a 5-element graphic equalizer IC best suited to audio systems. It has a built-in 5-element resonance circuits with transistor system and an output OP amp. The IC can be used in hybrid ICs and compact sets of high-density assemblies. Its applications include radio cassette tape players, car audio systems, and music centers.

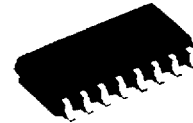
FEATURES

- The number of part can be reduced drastically for compact size.
- Graphic equalizer can be easily composed
- Low distortion.....THD = 0.02 % (typ)
@ Flat input short
- Low noise..... $V_{NO} = 5 \mu V_{rms}$ (typ)
@ $f = 1 \text{ kHz}$, Flat
- Large allowable input voltage..... $V_i = 2.3 V_{rms}$ (typ)
@ $V_{CC} = 9V$, $f = 1 \text{ kHz}$, Flat



Outline 16P4(P)

2.54mm pitch 300mil DIP
(6.3mm × 19.0mm × 3.3mm)

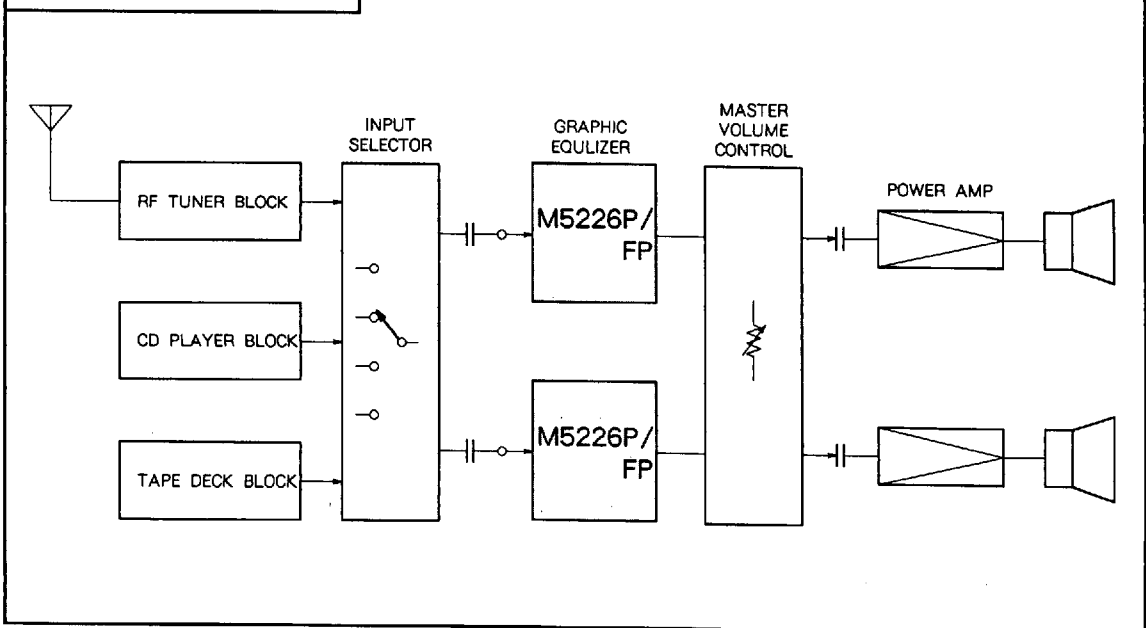


Outline 16P2S-A(FP)

1.27mm pitch 225mil SOP
(4.4mm × 10.0mm × 1.5mm)

RECOMMENDED OPERATING CONDITIONS

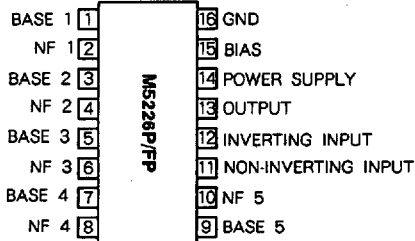
Supply voltage range.....	$V_{CC} = 4 \text{ to } 20V$
Rated supply voltage.....	$V_{CC} = 20V$
Rated power dissipation	700mW (P) 550mW (FP)

SYSTEM CONFIGURATION

M5226P/FP

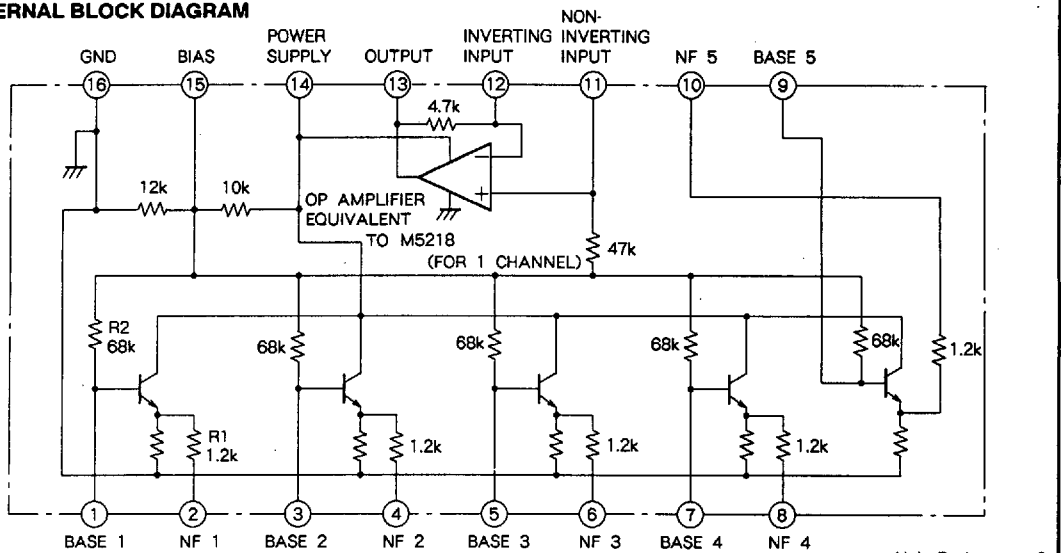
5-ELEMENT GRAPHIC EQUALIZER IC

PIN CONFIGURATION (TOP VIEW)



Outline 16P4(P)
16P2S-A(FP)

IC INTERNAL BLOCK DIAGRAM



M5226P/FP

5-ELEMENT GRAPHIC EQUALIZER IC

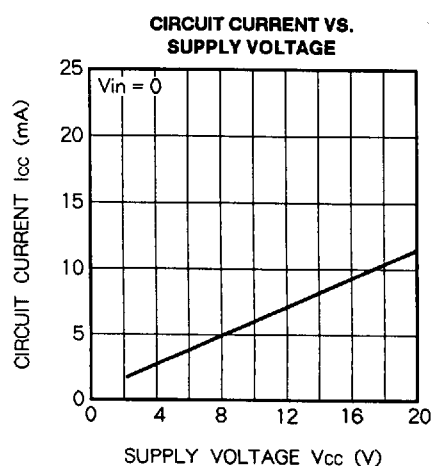
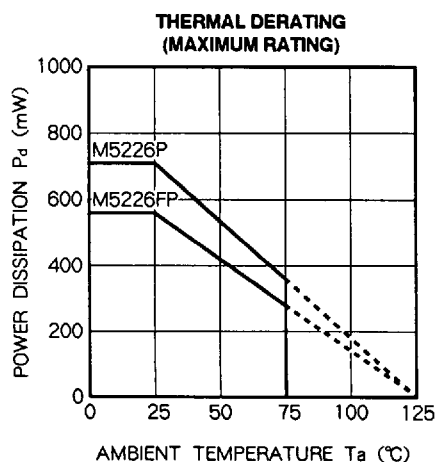
ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C, unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V _{cc}	Supply voltage	20	V
I _{LP}	Load current	30	mA
P _d	Power dissipation	550(FP)/ 1000(DIP)	mW
T _{opr}	Operating temperature	- 20 to + 75	°C
T _{stg}	Storage temperature	- 55 to + 125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25 °C, V_{cc} = 9V)

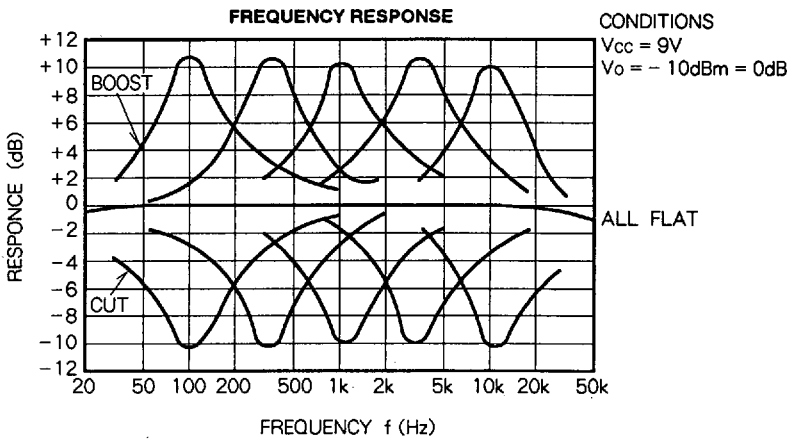
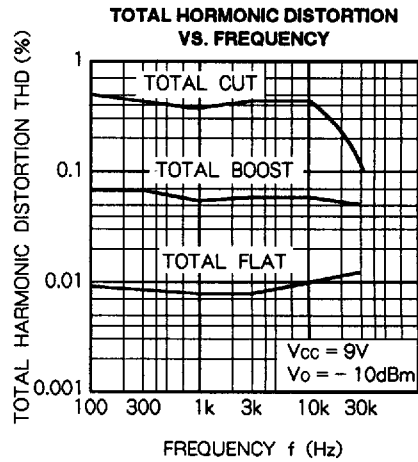
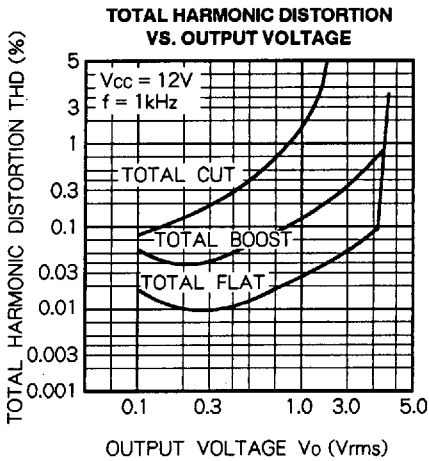
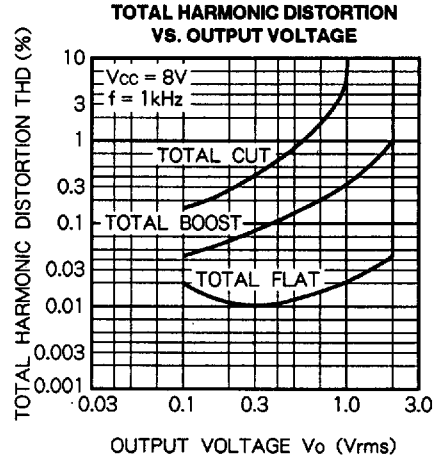
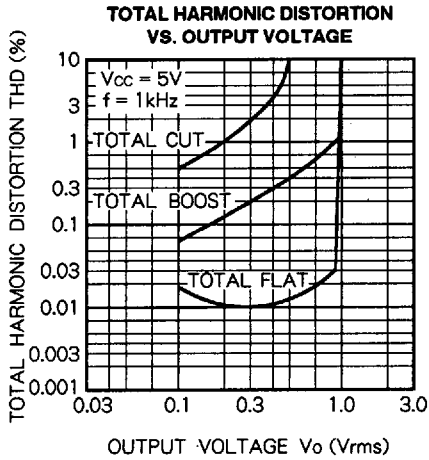
Symbol	Parameter		f (Hz)	Test conditions	Limits			Unit	
					Min	Typ	Max		
I _{CC}	Circuit current		—	V _{in} = 0	3.0	5.2	8.0	mA	
G _{V(FLAT)}	Voltage gain	Flat	1k	V _{in} = - 10dBm	- 3.8	- 0.8	+ 2.2	dB	
G _{V(BOOST)}		Boost	108	V _{in} = - 10dBm	7.2	9.7	11.2		
			343		7.2	9.7	11.2		
			1.08k		7.2	9.7	11.2		
			3.43k		7.2	9.7	11.2		
			10.8k		7.2	9.7	11.2		
G _{V(CUT)}		Cut	108	V _{in} = - 10dBm	-12.8	-11.3	-8.8	dB	
			343		-12.8	-11.3	-8.8		
			1.08k		-12.8	-11.3	-8.8		
			3.43k		-12.8	-11.3	-8.8		
			10.8k		-12.8	-11.3	-8.8		
THD	Total harmonic distortion		1k	V _{in} = 1V _{rms}	—	0.02	0.1	%	
V _{NO}	Output noise voltage		Input short BW: 10Hz to 30kHz (3dB) flat			—	5.0	20	μV _{rms}

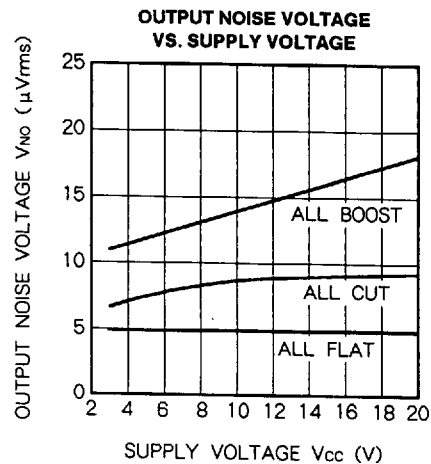
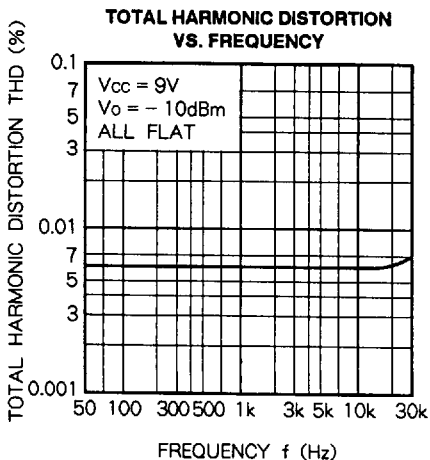
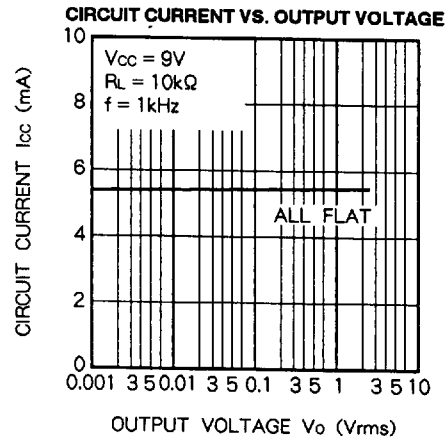
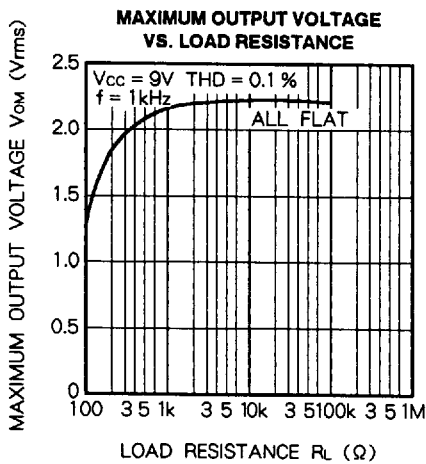
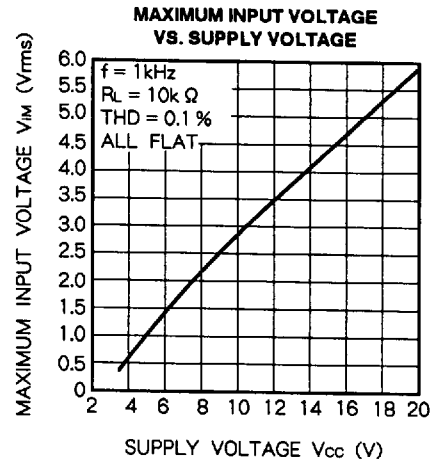
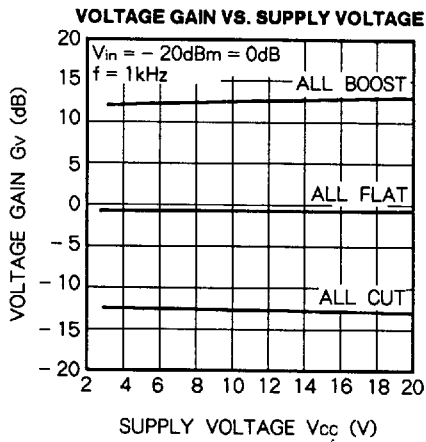
TYPICAL CHARACTERISTICS



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5-ELEMENT GRAPHIC EQUALIZER IC

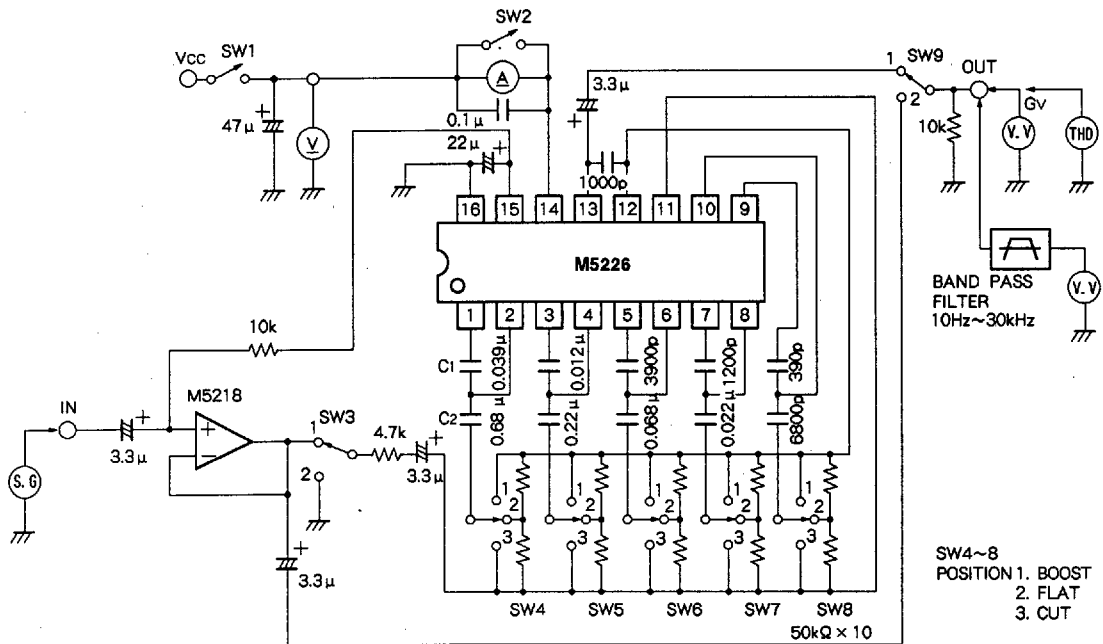




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5-ELEMENT GRAPHIC EQUALIZER IC

TEST CIRCUIT (Circuit current I_{cc} , Voltage gain G_v , Total harmonic distortion THD, Output noise voltage V_{no})



Units Resistance : Ω
Capacitance : F

TEST CIRCUIT SWITCH MATRIX

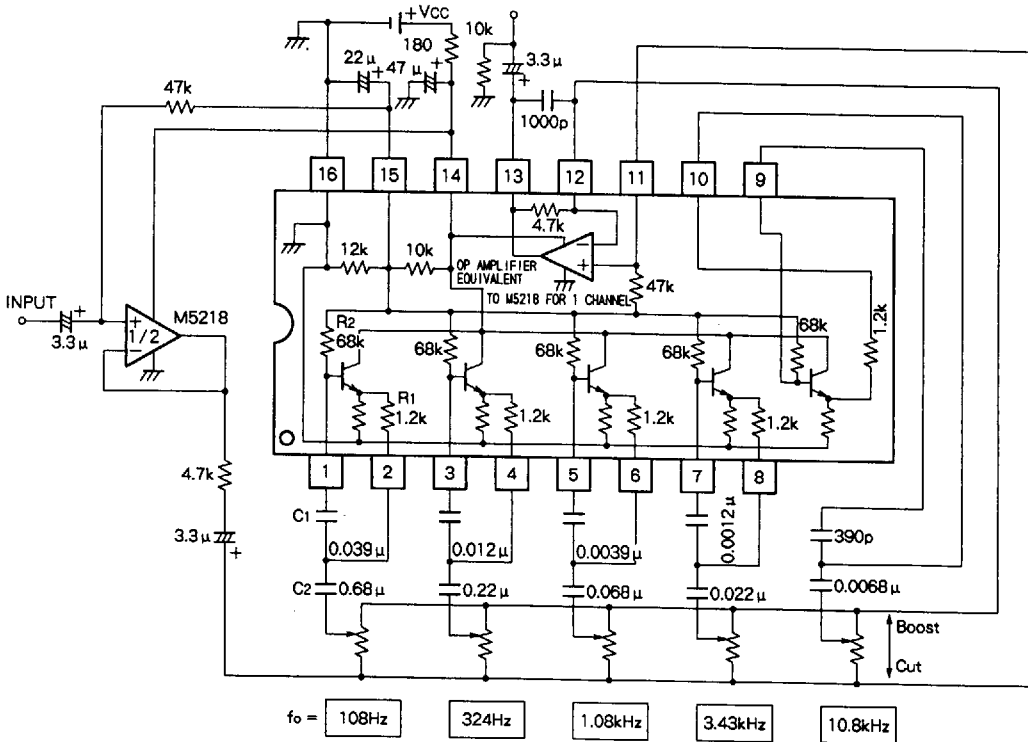
Test item	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9
I_{cc}	OFF	1	○	○	○	○	○	1
$G_v(\text{FLAT})$	ON	1	2	2	2	2	2	1
$G_v(\text{BOOST})$	$f = 108\text{Hz}$	ON	1	2	2	2	2	1
	$f = 343\text{Hz}$	ON	1	2	1	2	2	1
	$f = 1.08\text{kHz}$	ON	1	2	2	1	2	1
	$f = 3.43\text{kHz}$	ON	1	2	2	2	1	1
	$f = 10.8\text{kHz}$	ON	1	2	2	2	1	1
$G_v(\text{CUT})$	$f = 108\text{Hz}$	ON	1	3	2	2	2	1
	$f = 343\text{Hz}$	ON	1	2	3	2	2	1
	$f = 1.08\text{kHz}$	ON	1	2	2	3	2	1
	$f = 3.43\text{kHz}$	ON	1	2	2	3	2	1
	$f = 10.8\text{kHz}$	ON	1	2	2	2	3	1
THD	ON	1	2	2	2	2	2	1
$V_{no}(\text{ALLFLAT})$	ON	2	2	2	2	2	2	1

Note: The mark "○" applies to both 1 and 2

M5226P/FP

5-ELEMENT GRAPHIC EQUALIZER IC

APPLICATION EXAMPLE

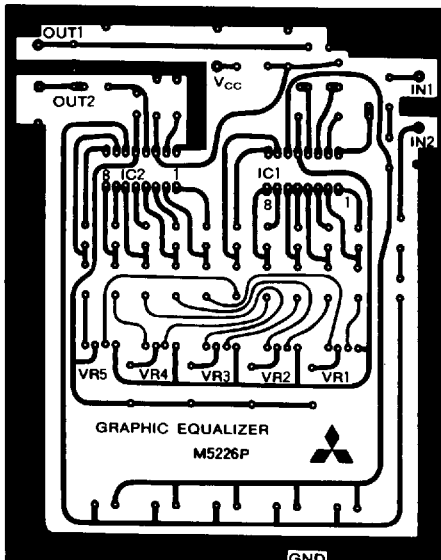


$$\text{RESONANCE FREQUENCY } f_o = \frac{1}{2\pi \sqrt{C_1 \cdot C_2 \cdot R_1 \cdot R_2}} \text{ (Hz)}$$

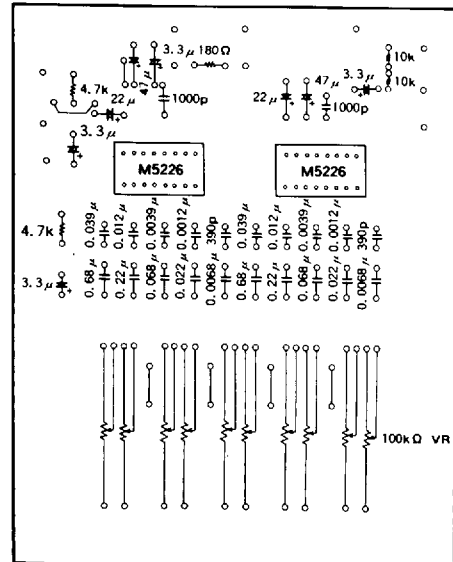
Units Resistance : Ω
Capacitance : F

PRINTED CIRCUIT BOARD FOR CIRCUIT TESTING (TYPICAL APPLICATION EXAMPLE)

PC BOARD PARTS-PLACEMENT DIAGRAM
(COPPER FOIL SIDE)



PC BOARD PARTS-PRACEMENT-DIAGRAM
(PARTS SIDE)



M5226P/FP

5-ELEMENT GRAPHIC EQUALIZER IC

APPLICATION EXAMPLE (7-ELEMENT)

