

M62457FP

Peak hold IC for 5 band spectrum analyzer displays

DESCRIPTION

The M62457FP is 5 band peak hold ICs that use microprocessor time division to produce serial output for spectrum analyzer displays.

FEATURES

- 5 band peak hold elements for spectrum analyzer displays.
- Discharge time constant circuit for each band is on the chip.
- Single 5V power supply.

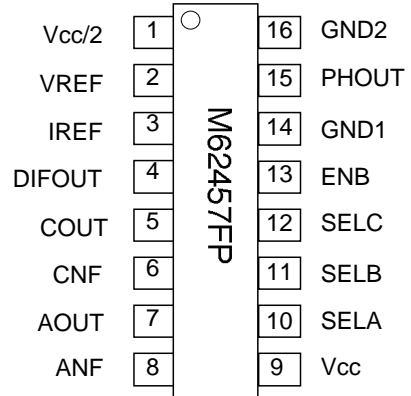
APPLICATION

CD radio cassette players , mini-component stereo systems, car stereos

RECOMMENDED OPERATING CONDITIONS

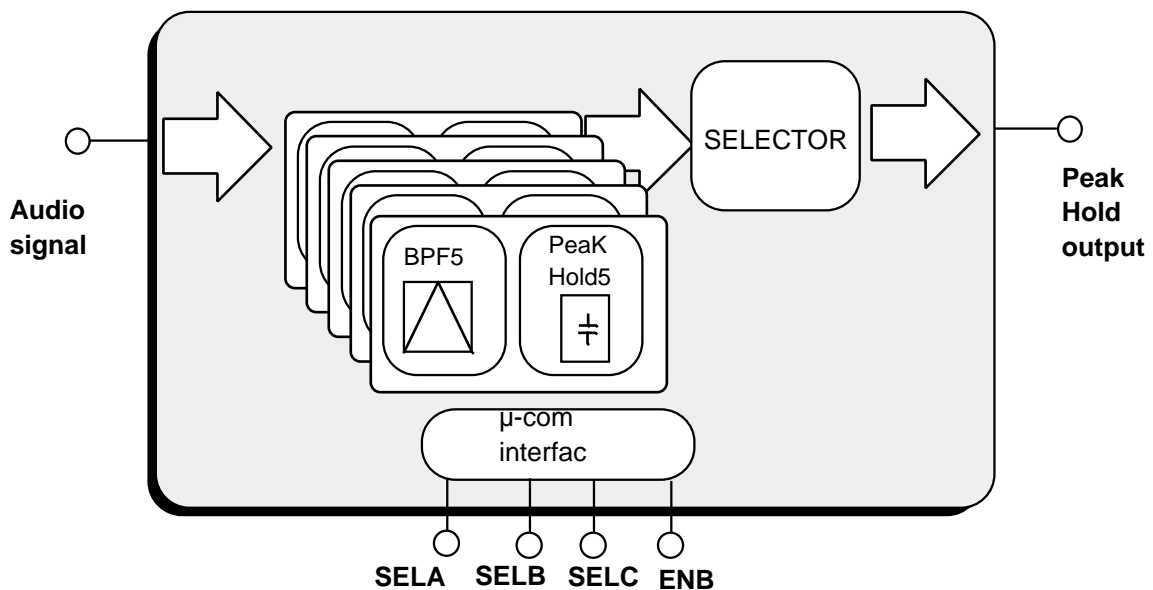
Supply voltage range •••• 4.5 to 6.5V
 Rated supply voltage •••• 5.0V

PIN CONFIGURATION (TOP VIEW)



Outline 16P2N-A

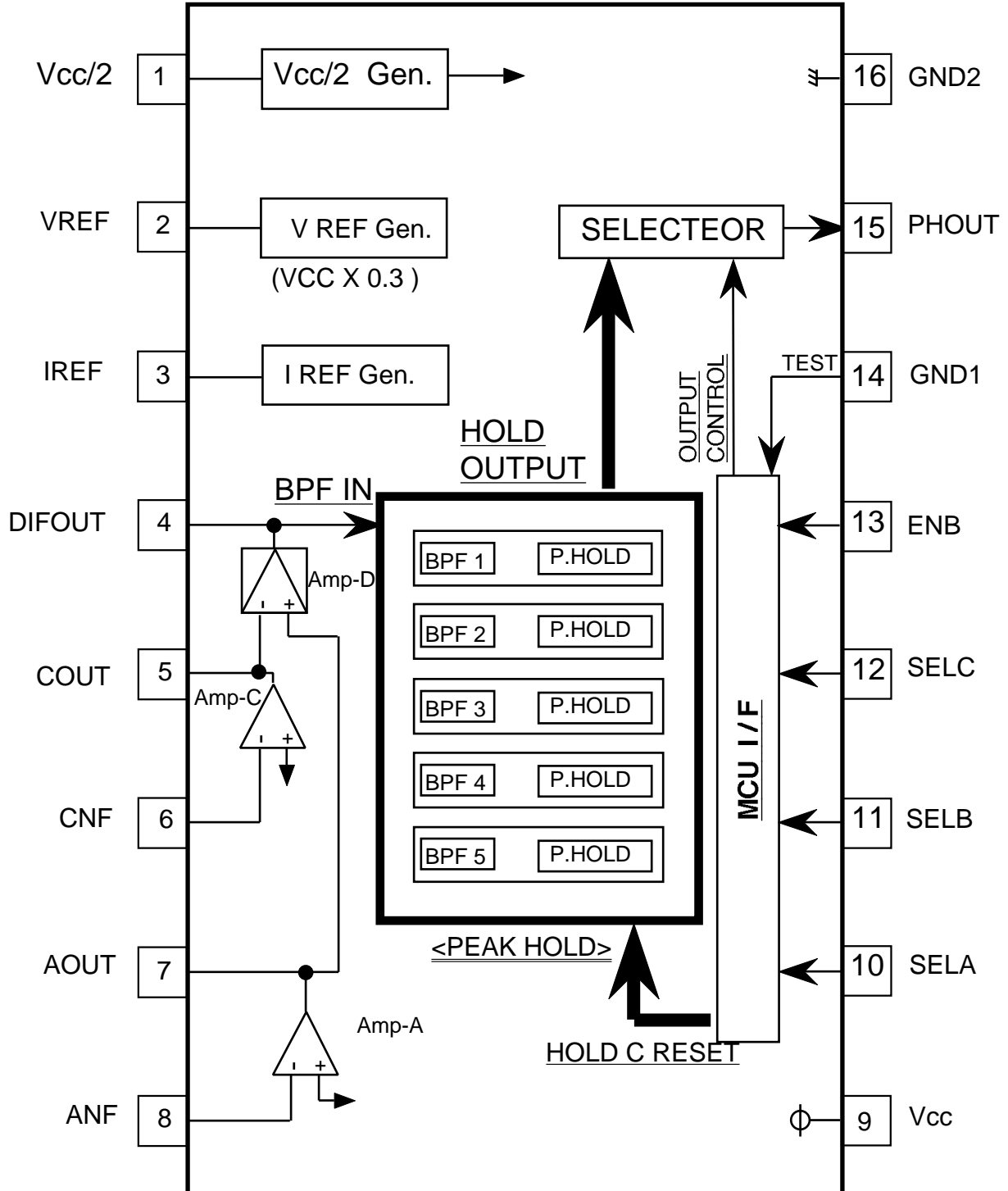
SYSTEM BLOCK DIAGRAM



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PIN CONFIGURATION AND IC INTERNAL BLOCK DIAGRAM



(Notes) f1=105Hz, f2=340Hz, f3=1KHz, f4=3.4KHz, f5=10.5KHz
 (The value is the design value)

Functional description

- (1) Audio signal passes Amp-a and Amp-d, and it is input into BPF/peak hold circuit for spectrum analyzer.

Basic use examples, the last output signal is input into A/D of microprocessor. However VCC, GND of analog series had better be common with VCC, GND of microprocessor. The microprocessor does ground isolation to analog series. Amp-C is the input amplifier to reject common-mode signal (noise), it utilizes effect of common-mode rejection of Amp-D.

- (2) BPF/peak hold circuit is setting of 5 band spectrum analyzer

< center frequency >

f1=105Hz

f2=340Hz

f3=1KHz

f4=3.4KHz

f5=10.5KHz

(The value is the design value)

Center frequency and Q of BPF is done general setting of like next.

$\omega_0 = gm/C$

gm: mutual conductance of inside amplifier circuit

(It depends on outside resistor of Pin.No.3)

C: inside capacitor

$Q = (R1+R2)/R1$; it is fixed by inside resistor ratio.

(The design value is 3.5)

- (3) The hold capacitor of peak hold circuit use inside capacitor.

When a selection of hold output is over the reset signal of hold value, The reset signal is made automatically.

(Discharge pulse : -3dB typ. output value fall)

- (4) Output voltage of peak hold circuit is $V_{cc}/2$ (Pin.No1)

When it is selected by the output select circuit, it is converted into the voltage of GND standard and outputs it in PHout (Pin.No.15).

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PIN DESCRIPTION 1

PIN No.	Name	I/O	Function
1	Vcc / 2	I	1/2Vcc supply terminal
2	VREF	I	0.3Vcc supply terminal
3	IREF	I	BPF center frequency setting current terminal
4	DIFOPUT	O	Output of amplifier (BPF input signal)
5	COUT	O	Output of amplifier for analog COM series
6	CNF	I	Inverted input of amplifier for analog COM series
7	AOUT	O	Output of amplifier for analog signal series
8	ANF	I	Inverted input of amplifier for analog signal series
9	Vcc	I	System supply terminal
10	SELA	I	Output setting control terminal A (logic input)
11	SELB	I	Output setting control terminal B (logic input)
12	SELC	I	Output setting control terminal C (logic input)
13	ENB	I	Output setting control enable terminal (logic input)
14	GND1	I	Ground1 (it is assumed in the voltage same as PIN16)
15	PHOUT	O	Peak hold outout terminal
16	GND2	I	Ground2 (signal series)

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PIN DESCRIPTION 2

PIN No.	Name	I/O	Peripheral circuit of pins
1	Vcc / 2	I	
2	VREF	I	
3	IREF	I	
4	DIFOPUT	O	
5	COUT	O	
6	CNF	I	
7	AOUT	O	
8	ANF	I	
9	Vcc	I	
10	SELA	I	
11	SELB	I	
12	SELC	I	
13	ENB	I	
14	GND1	I	
15	PHOUT	O	
16	GND2	I	

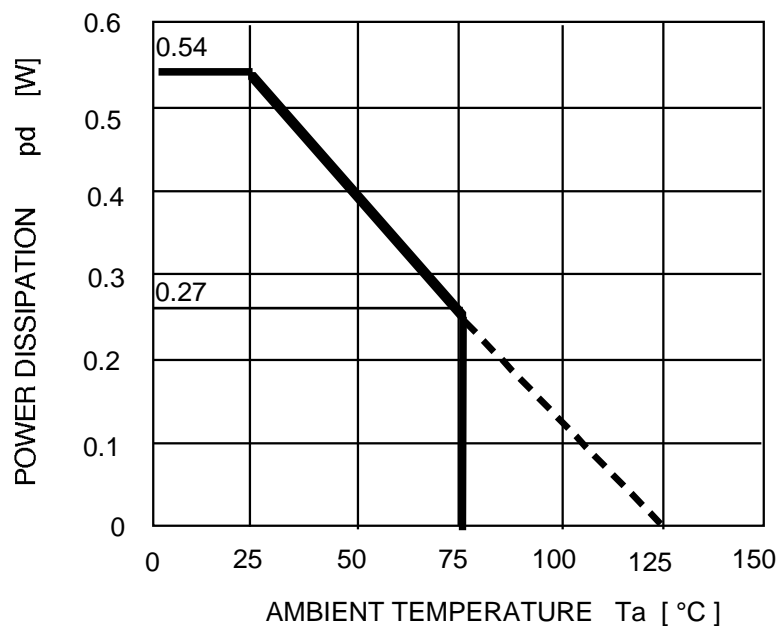
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ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
Vcc(max)	Supply Voltage		7	V
Pd	Power dissipation	Ta 25°C	540	mW
K θ	Thermal derating	Ta > 25°C	5.4	mW/°C
Topr	Operating temperature		-20 to +75	°C
Tstg	Storage temperature		-40 to +125	°C
Vi(max)	Allowable input voltage range		GND-0.3 to Vcc+0.3	V
Vo(max)	Allowable output voltage range		GND to Vcc	V

THERMAL DERATING
(MAXIMUM RATING)



Recommended operating conditions

(Ta=25°C unless otherwise noted)

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Supply voltage	V _{CC}		4.5	5.0	6.5	V
Logic input H level voltage	V _{IH}	V _{CC} =5V	2.5	—	V _{CC}	V
Logic input L level voltage	V _{IL}	V _{CC} =5V	GND	—	0.5	V

(Note1)

The center frequency characteristics of BPF are determined by the resistor connected between 3PIN terminal and GND. If it is necessary, use a variable resistor (note: all band will shift together).

Q of BPF is fixed in 3.5 by inside circuit.

(note 2)

The output resistor of peak hold output (PIN 15) is 10K typ.
You do the input resistor of microprocessor side in a value fully big for 10K .

(note 3)

Set up as the control voltage from a microprocessor during GND-0.3V and 5V.

If the voltage of tolerance outside is added, conserve it resistance or diode.

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Output select logic table

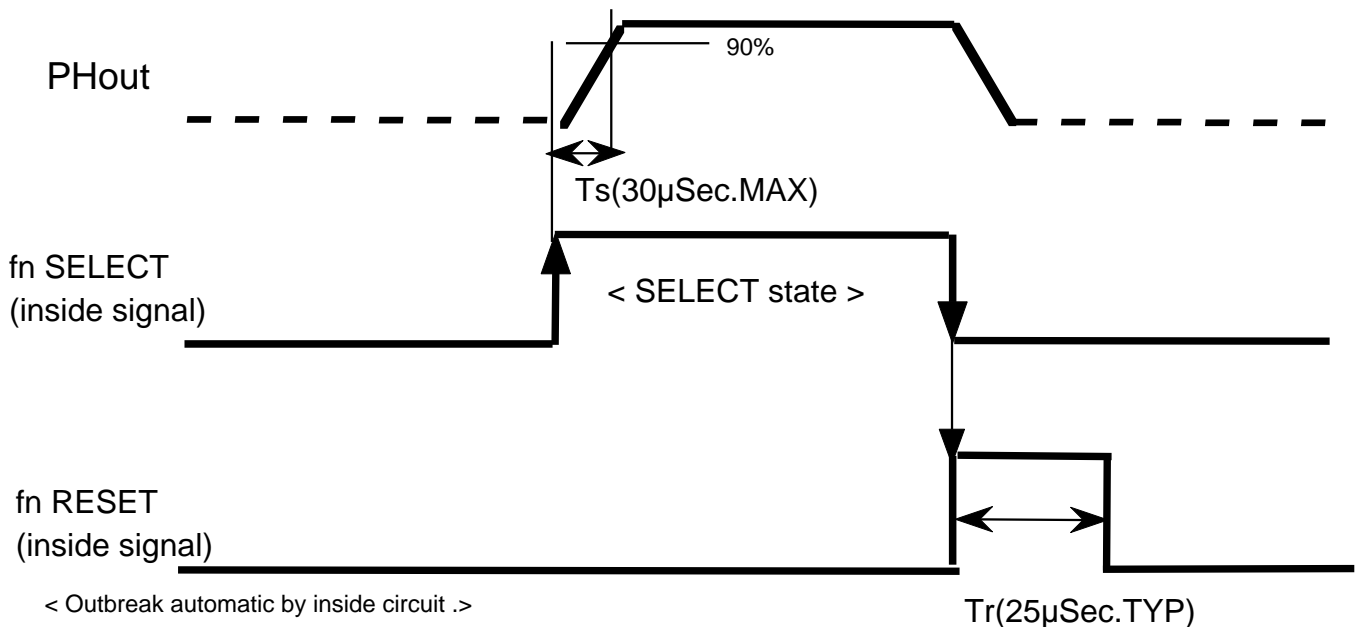
PHout (PinNo.15)	ENB	SELA	SELB	SELC	Note
GND(output stop)	0	X	X	X	Don't Care
GND	1	0	0	0	
f1 ; 105Hz	1	0	0	1	
f2 ; 340Hz	1	0	1	0	
GND	1	0	1	1	
f3 ; 1KHz	1	1	0	0	
GND	1	1	0	1	
f4 ; 3.4KHz	1	1	1	0	
f5 ; 10.5KHz	1	1	1	1	

< Note1 >

"0"=low level,"1"=high level,"X"="0"or "1"

< Note2 >

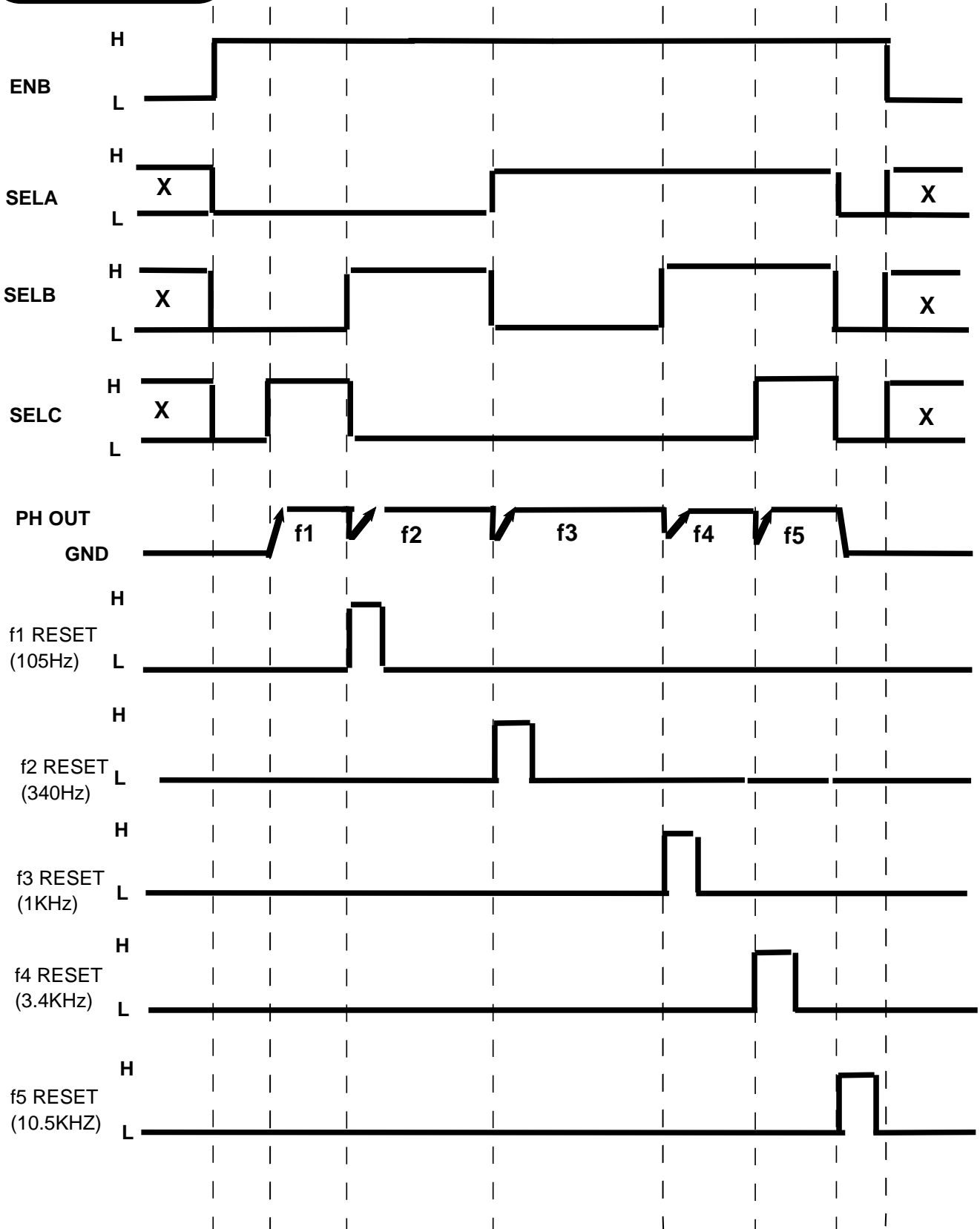
you hold the output setting state by more than 30µSec for a long time
(When the output setting state is short, movement of output value and reset signal become instable)



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Timing chart



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ELECTRICAL CHARACTERISTICS

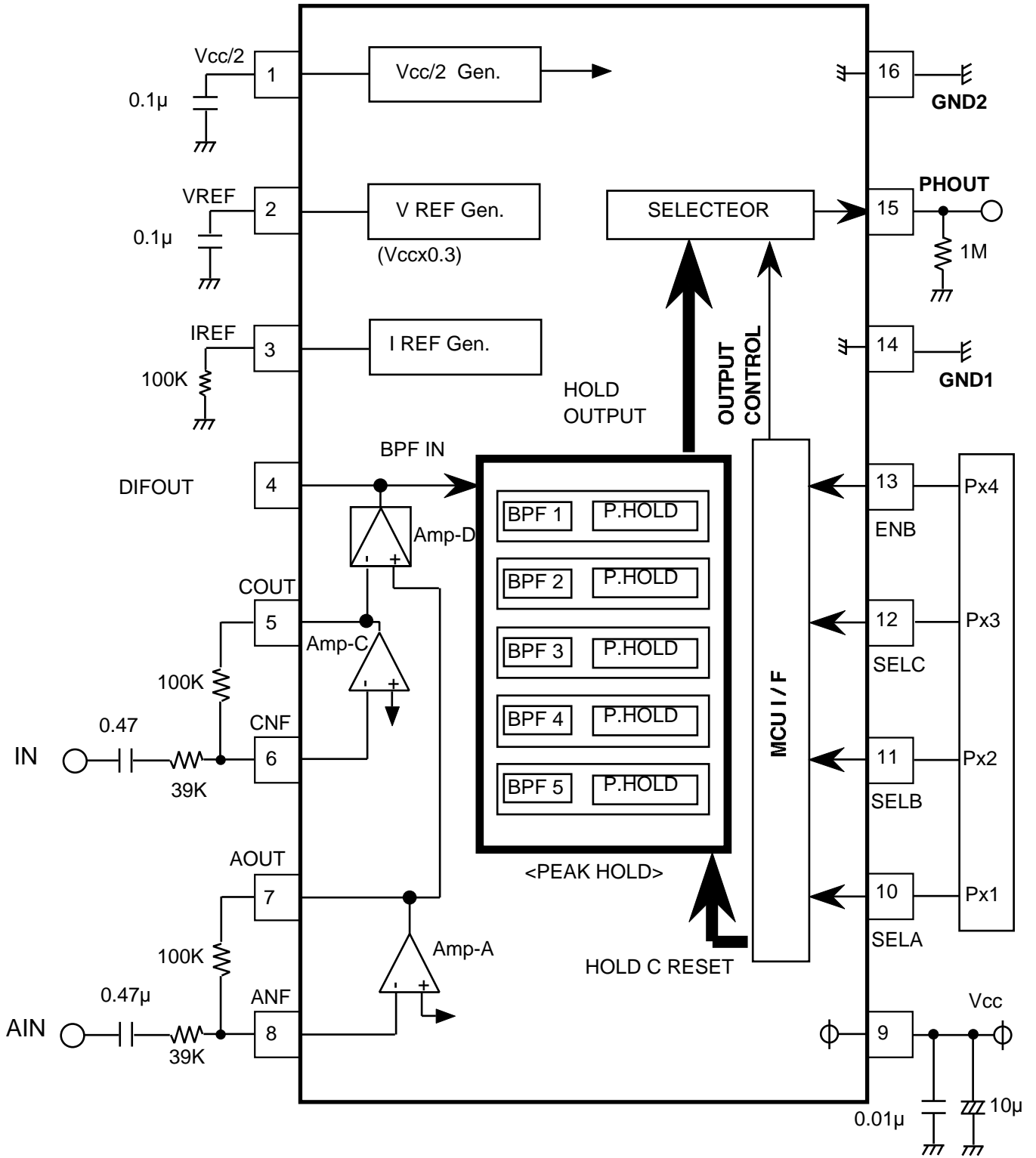
(Ta=25°C, Vcc=5.0V, PHout(Pin.No.15) RL=1M unless otherwise noted.
 VAIN=-30dBV, f=1KHz, ENB(Pin.No.13)=1)

Parameter	Symbol	Condition	Limis			Unit
			Min	typ	Max	
Circuit current	Icc	No signal, No select (ENB, SELA, SELB, SELC=0)	—	8	13	mA
Maximum output level	Vo	f1 to f5 Measured at each output (VAIN= -14dBV)	2.7	3.5	—	V
Output offset voltage	Vos	f1 to f5 Measured at each output (No signal, ENB=0/1)	—	30	60	mV
Logic input H level	VIH		2.5	5.0	Vcc +0.3	V
Logic input L level	VIL		GND -0.3	0	0.5	V
Common-mode rejection ratio	CMRR		25	50	—	dB
f1 output level	Vo1	f1 (fin=105Hz)	0.5	1.0	1.70	V
f2 output level	Vo2	f2 (fin=340Hz)	0.5	1.0	1.70	V
f3 output level	Vo3	f3 (fin=1KHz)	0.5	1.0	1.70	V
f4 output level	Vo4	f4 (fin=3.4KHz)	0.5	1.0	1.70	V
f5 output level	Vo5	f5 (fin=10.5KHz)	0.5	1.0	1.70	V
Output response time	Ts	The time from the rise of output selection until the rise of PHout(90% of peak)	—	20	30	μsec
Discharge level	DS	< Reference > Inside reset signal Tr=25μsecTYP	—	-3	—	dB

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TEST CIRCUIT

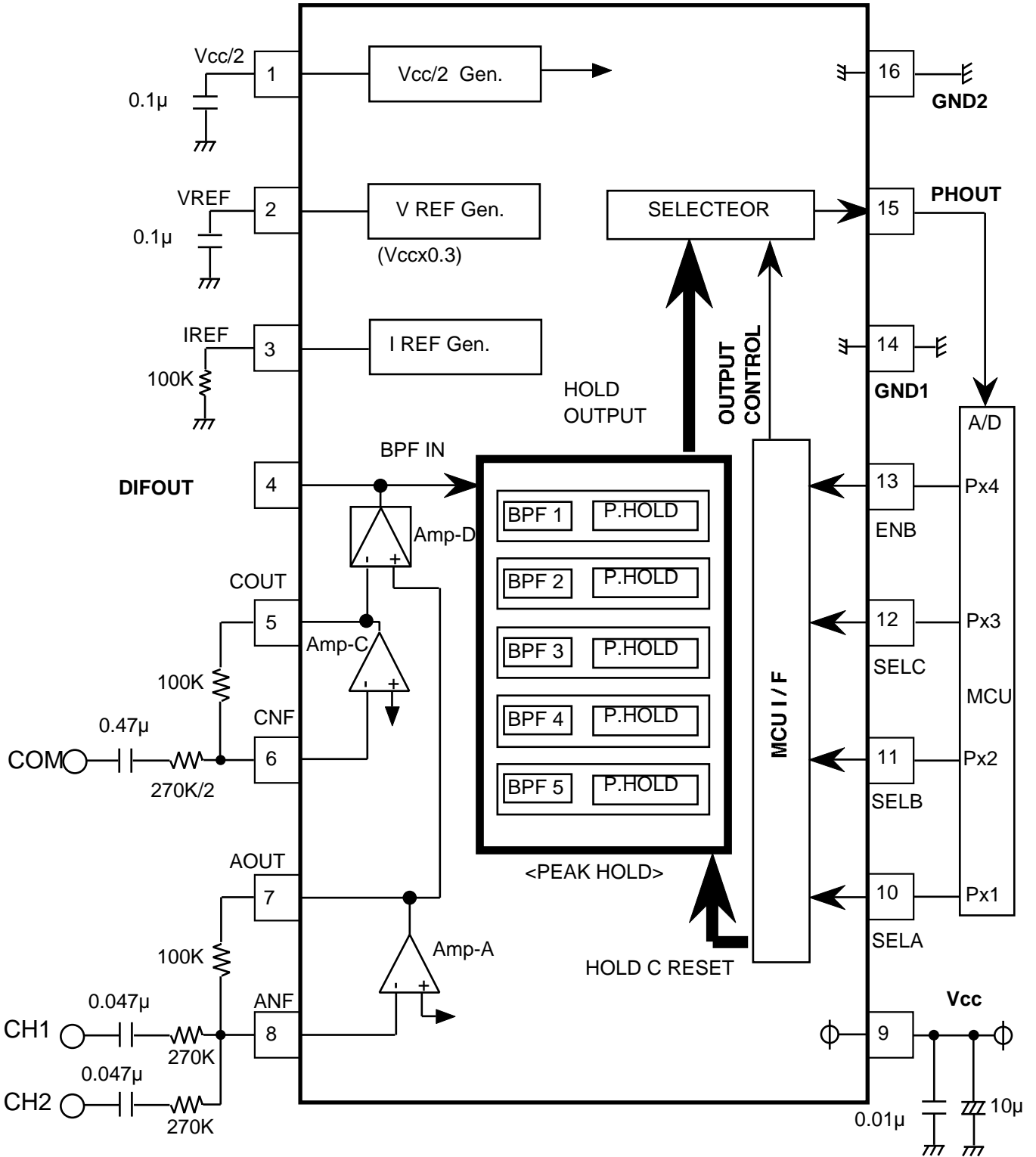


Units resistance;
capacitance; F

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APPLICATION EXAMPLE



Units resistance;
capacitance; F