

M61506FP

Peak hold IC for 5 band spectrum analyzer displays

DESCRIPTION

The M61506FP is a 5 band peak hold ICs that use microprocessor time division to produce serial output for spectrum analyzer displays.

FEATURES

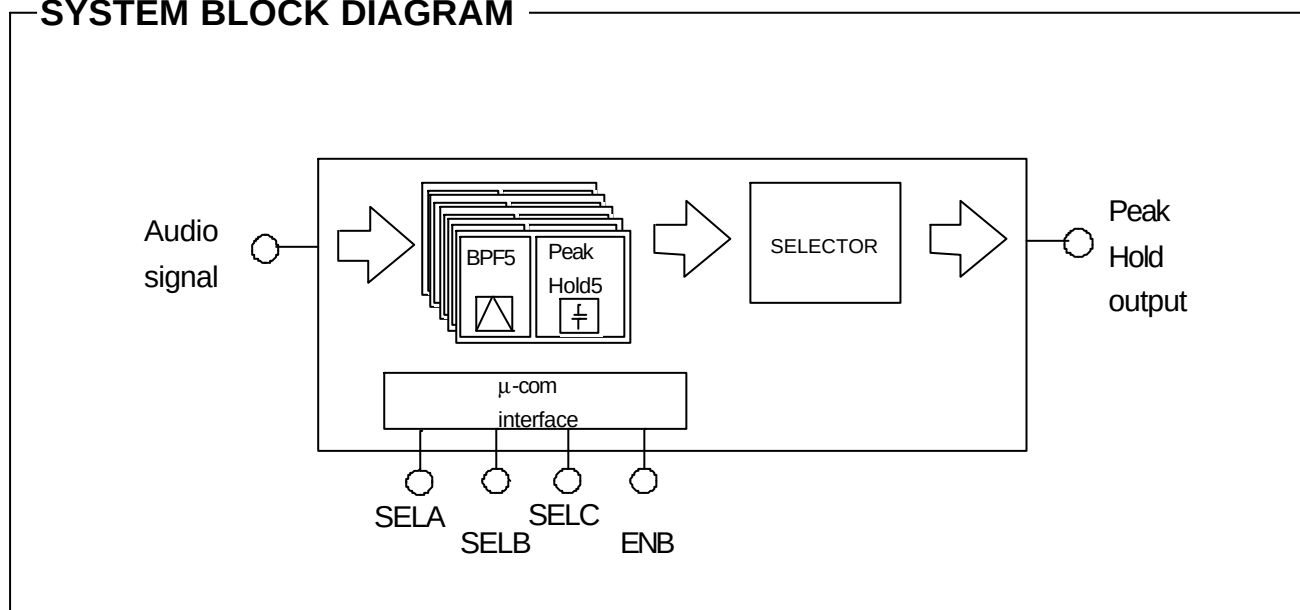
- 5 band peak hold elements for spectrum analyzer displays.
- Discharge time constant circuit for each band is on the chip.
- Single 5V power supply.

RECOMMENDED OPERATING CONDITIONS

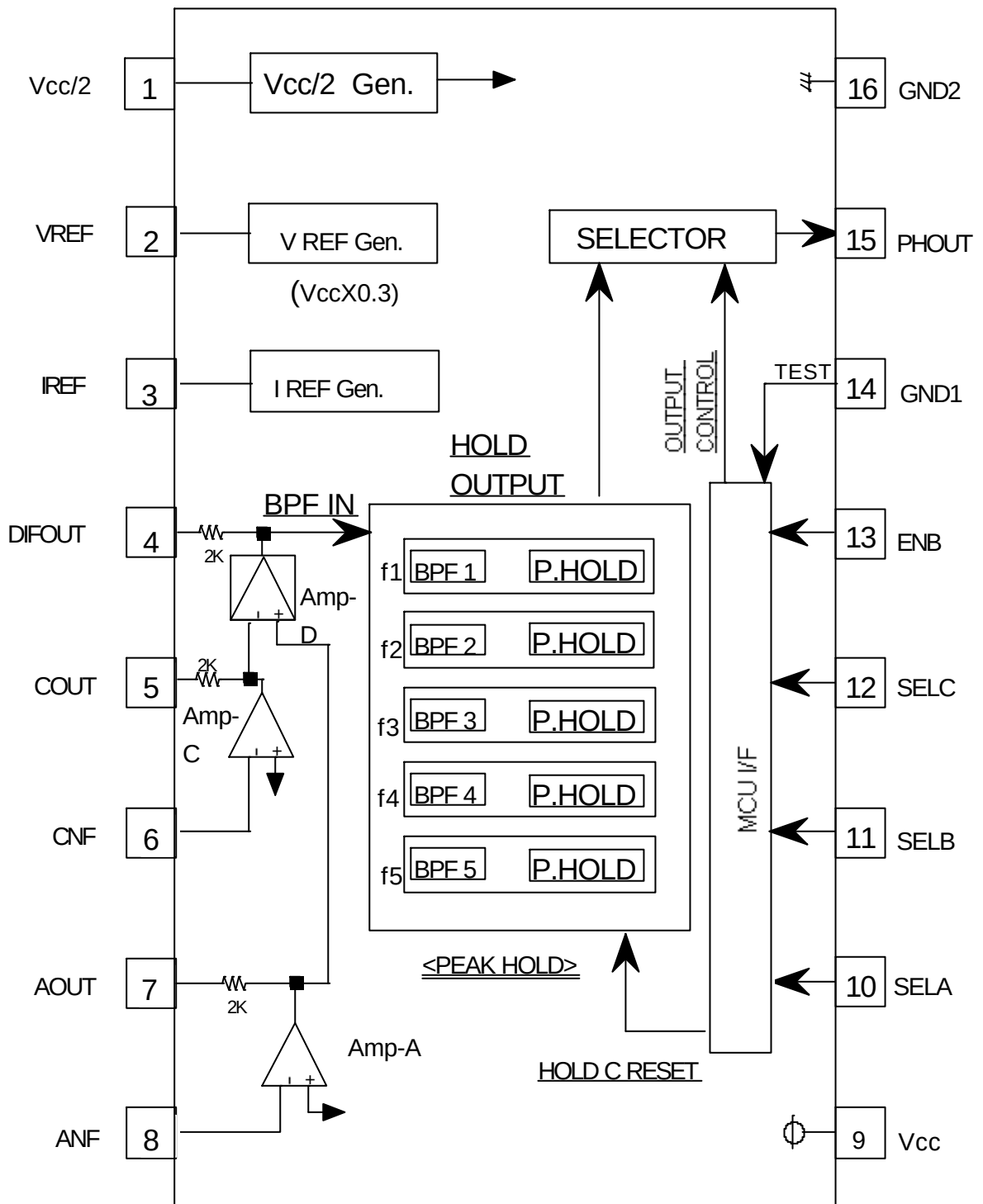
Supply voltage range ——— 4.5 to 6.5V

Rated supply voltage ——— 5.0V

SYSTEM BLOCK DIAGRAM



BLOCK DIAGRAM



(Notes) $f_1=105\text{Hz}$, $f_2=340\text{Hz}$, $f_3=1\text{KHz}$, $f_4=3.4\text{KHz}$, $f_5=10.5\text{KHz}$

(The value is the design value)

Units Resistance : Ω
Capacitance: F

FUNCTIONAL DESCRIPTION

(1)The audio signal amplified by Amp-A and Amp-D into BPF/peak hold circuit for spectrum analyzer display.
Because the last output signal inputs into A/D of microprocessor.
The Vcc,GND had better be common with Vcc,GND of A/D of maicroprocessor.
It utilizes effect of common-mode rejection of Amp-D.Amp-C is the input amplifier to reject common-mode signal(noise).To get to good ground isolation.

(2)BPF/peak hold circuit is fit for 5 band spectrum analyzer display.

<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

$\omega_0 = gm/C$

gm:matual conductance of inside amplifier circuit

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

C:inside capacitor

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

(The design value of Q is 3.5)

(3)The hold capacitor of peak hold circuit is included.

The reset(discharge) signal is made automatically after ending the output of hold value(Discharge pulse effect:-3dB(typ).fall refer to output value)

(4)The internal output voltage of peak hold circuit is refered to Vcc/2.

(Pin.No.1)

When it is selected by the output select circuit,it appear at PHout

(Pin.No.15) refered to GND.



PIN DESCRIPTION

PIN No.	Name	I/O	Function
1	Vcc/2	I	1/2Vcc bias
2	VREF	I	0.3Vcc bias
3	IREF	I	BPF center frequency setting current terminal
4	DIFOUT	O	Output of amplifier-D(BPF input signal)
5	COUT	O	Output of amplifier-C
6	CNF	I	Inverted input of amplifier-C
7	AOUT	O	Output of amplifier-A
8	ANF	I	Inverted input of amplifier-A
9	Vcc	I	System supply
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	Ground 1
15	PHOUT	O	Peak hold output terminal
16	GND2	I	Ground 2



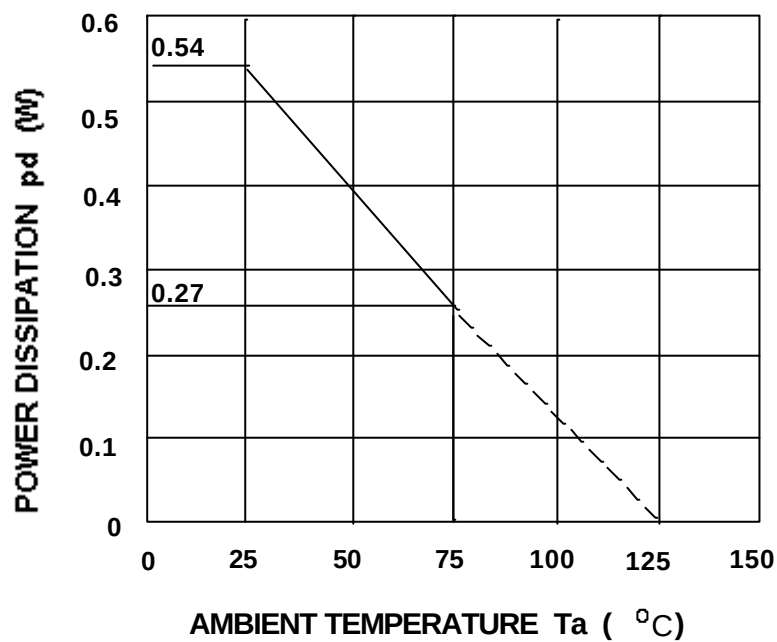
PIN No.	Name	I/O	Peripheral circuit of pins
1	V _{CC} /2	I	
2	V _{REF}	I	
3	I _{REF}	I	
4	DIFOUT	O	
5	COUT	O	
6	CNF	I	
7	AOUT	O	
8	ANF	I	
9	V _{CC}	I	Supply
10	SELA	I	
11	SELB	I	
12	SELC	I	
13	ENB	I	
14	GND1	I	Ground1
15	PHOUT	O	
16	GND2	I	Ground2



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
V _{cc(max)}	Supply Voltage		7	V
P _d	Power dissipation	T _a ≤ 25 °C	540	mW
K θ	Thermal derating	T _a > 25 °C	5.4	mW/ °C
T _{opr}	Operating temperature		-20 to +75	°C
T _{stg}	Storage temperature		-40 to +125	°C
V _{i(max)}	Input voltage range		GND-0.3 to V _{cc} +0.3	V
V _{o(max)}	Output voltage range		GND to V _{cc}	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

(Note 1)

The center frequency characteristics of BPF are determined by the resistor connected between 3pin terminal and GND.If it is necessary,adjust the resistor value(note:all bands will be shifted together).

The Q of BPF is fixed in 3.5 by inside circuit.

(Note 2)

The internal output resistor of peak hold output(PIN 15)is 10k Ω typ.

The input resistance of the microprocessor must be much larger than 10k Ω .

(Note 3)

The control voltage from the microprocessor must be from GND -0.3V to V_{CC}+0.3V.

If the control voltage is out of the above range.

It's necessary to modify the control voltage in the above range by using resistors or diodes.

OUTPUT CONTROL SPECIFICATION

<Output select logic table>

PHout (PinNo.15)	ENB	SELA	SELB	SELC	Note
GND(output stop)	0	X	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	

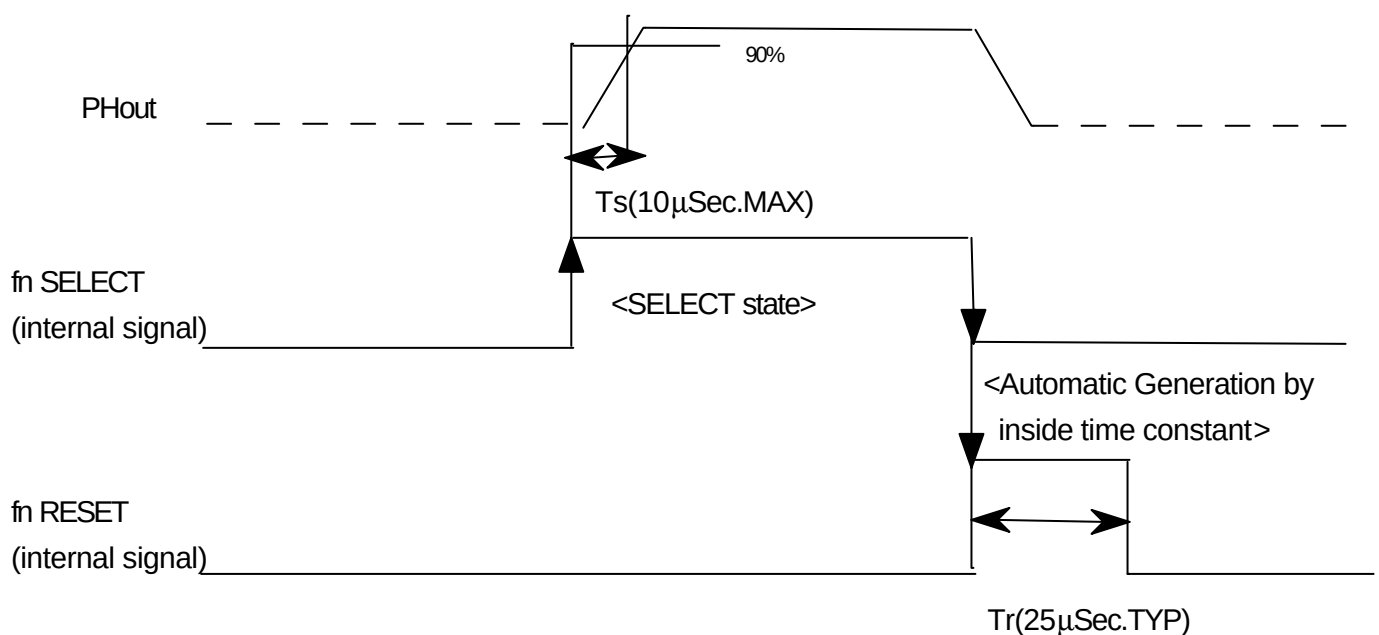
<Note 1>

'H'=low level,'1'=high level,'X'='0'or'1'

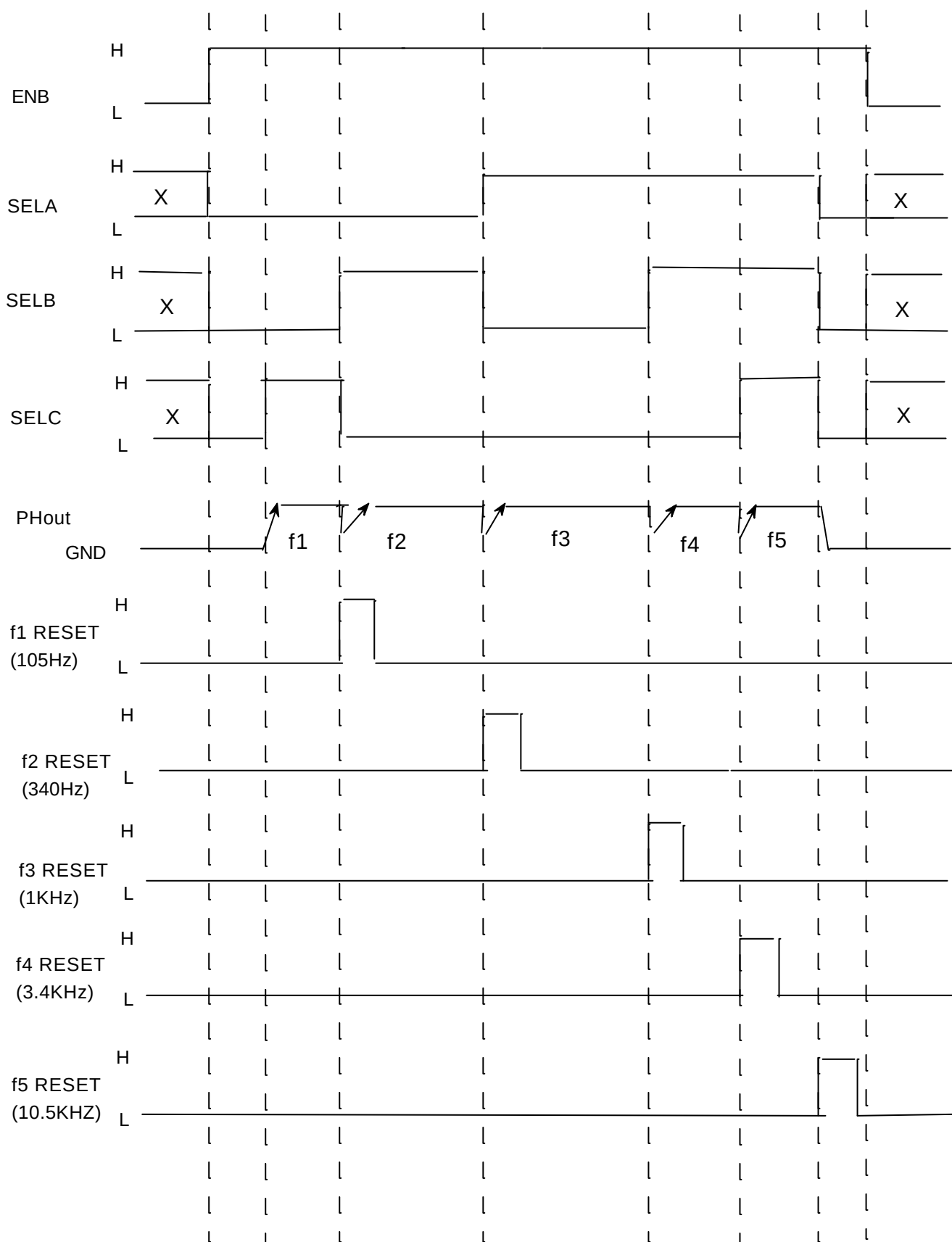
<Note 2>

The output setting time is more than 10 μ sec.

(When the output setting time is short,the output value and reset signal become unstable)



TIMING CHART



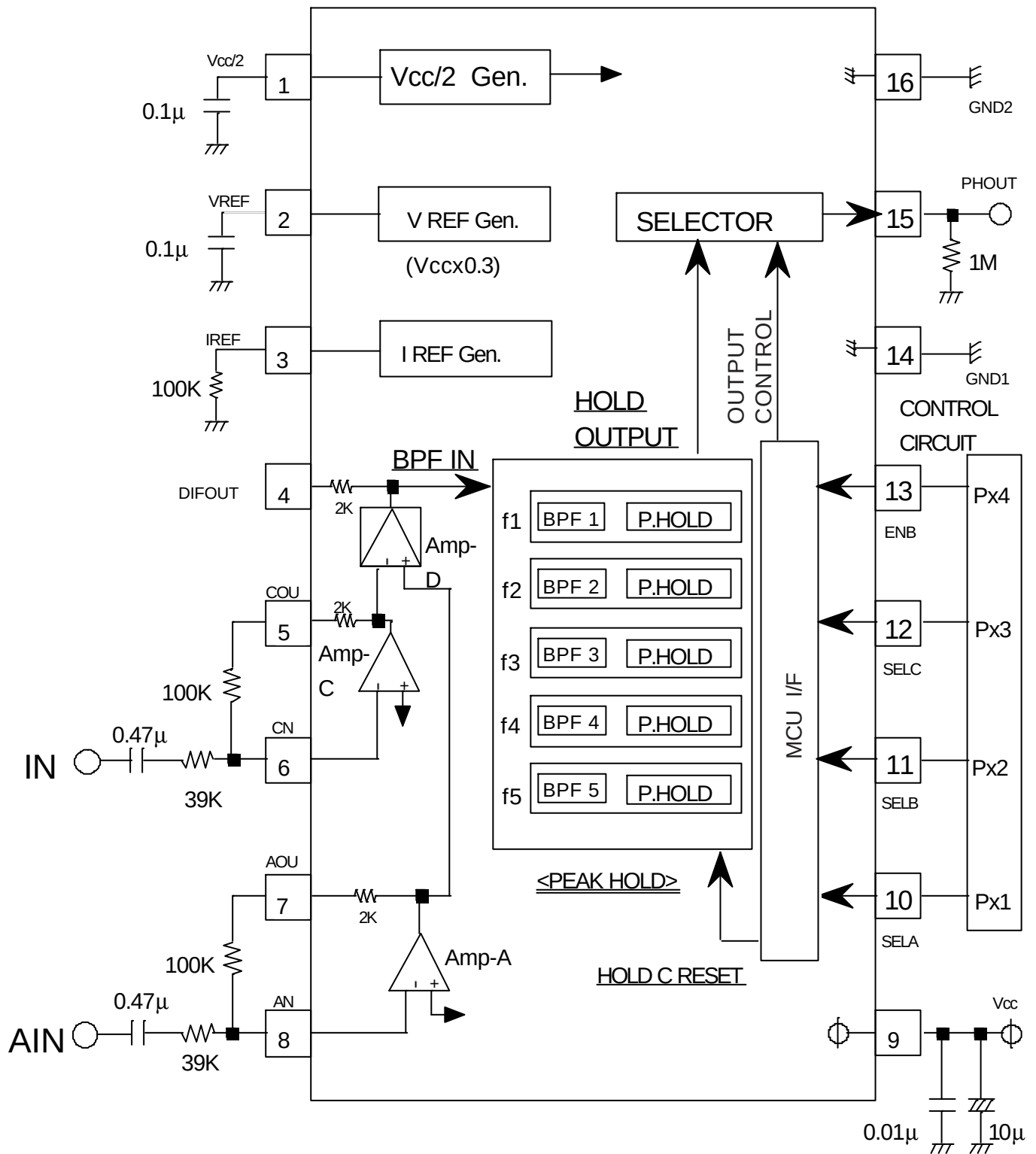
ELECTRICAL CHARACTERISTICS

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

Parameter	Symbol	Condition	Limits			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)	4.0	4.7	—	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=80 to 130Hz)	0.5	1.0	1.70	V
f2 output level	Vo2	f2(fin=270 to 410Hz)	0.5	1.0	1.70	V
f3 output level	Vo3	f3(fin=0.8 to 1.2KHz)	0.5	1.0	1.70	V
f4 output level	Vo4	f4(fin=2.7 to 4.1KHz)	0.5	1.0	1.70	V
f5 output level	Vo5	f5(fin=8.0 to 13.0KHz)	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)	—	5	10	μsec
Discharge level	DS	<Reference> Inside reset signal Tr=25μsecTYP.	—	-3	—	dB



TEST CIRCUIT

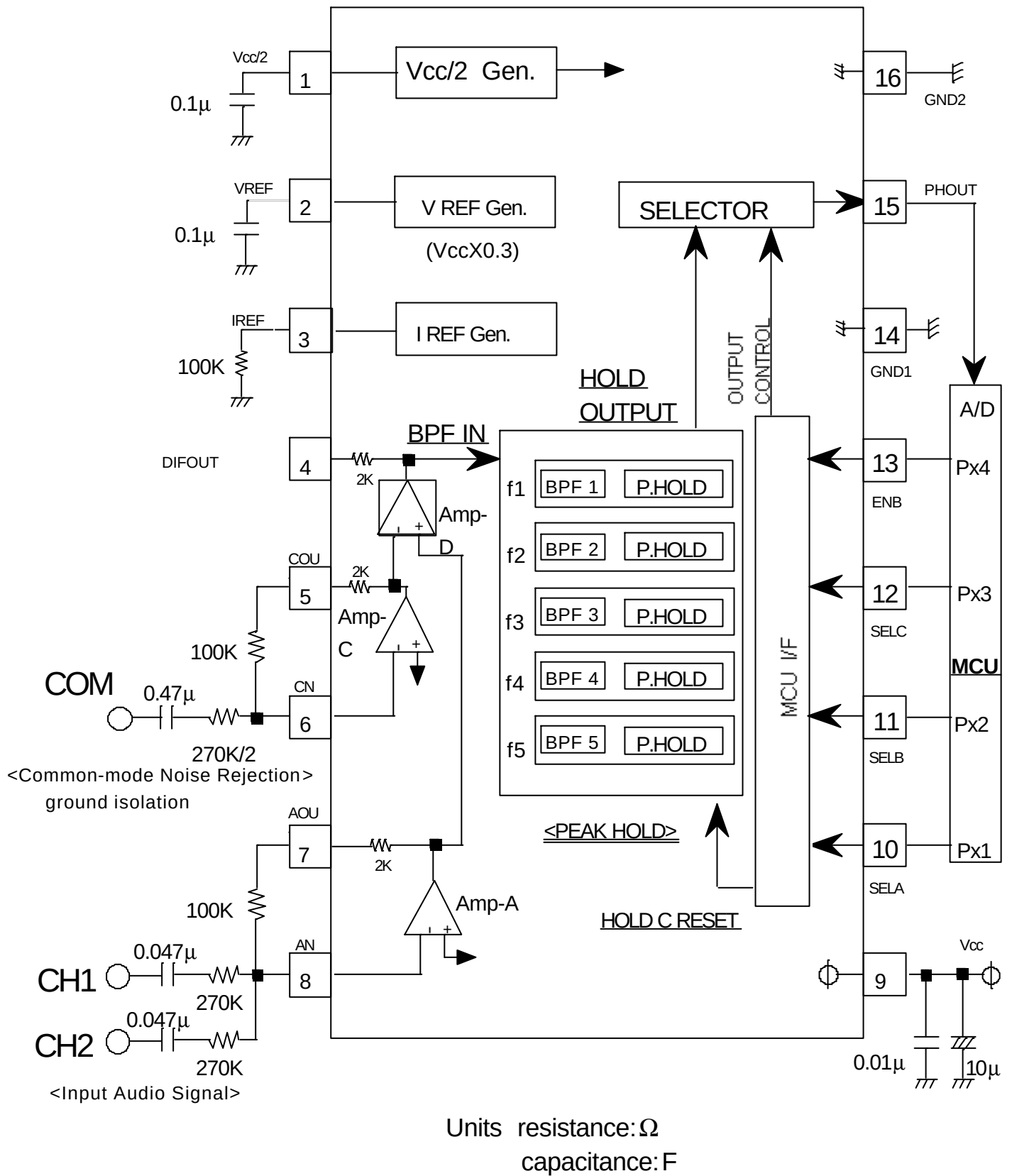


Units resistance: Ω
capacitance: F

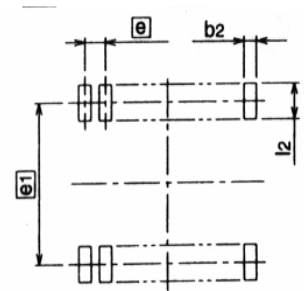
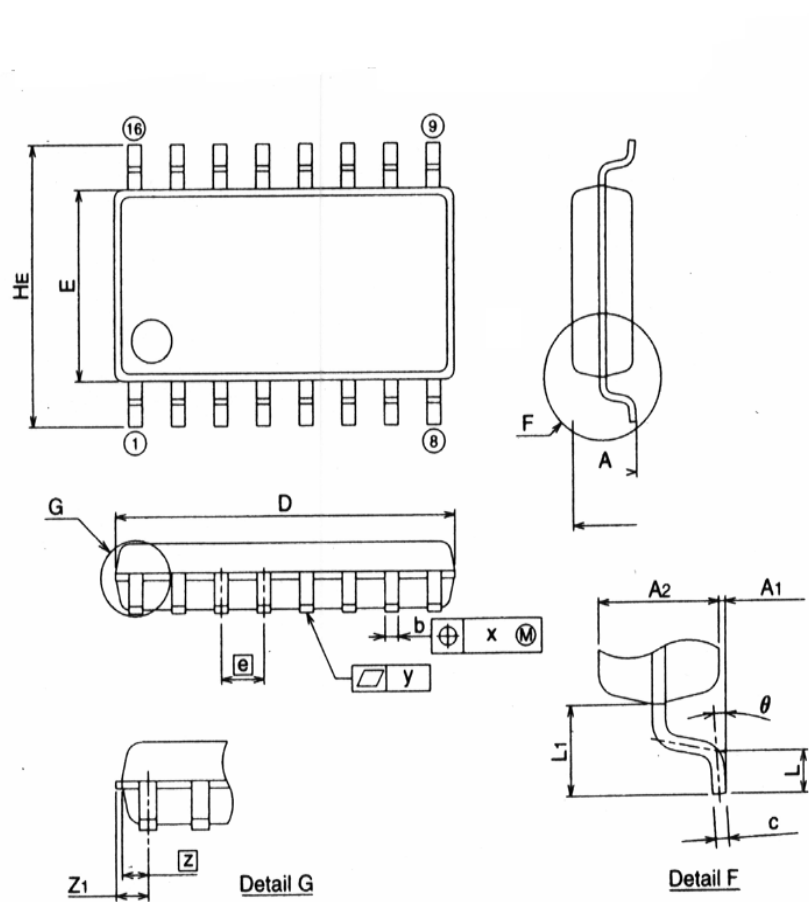


MITSUBISHI
ELECTRIC

APPLICATION EXAMPLE



OUTLINE



Recommended Mount Pad

Symbol	Dimension in Millimeters		
	Min	Nom	Max
A			2.1
A1	0	0.1	0.2
A2	—	1.8	—
b	0.35	0.4	0.5
c	0.18	0.2	0.25
D	10.0	10.1	10.2
E	5.2	5.3	5.4
e	—	1.27	—
HE	7.5	7.8	8.1
L	0.4	0.6	0.8
L1	—	1.25	—
$l2$	—	0.605	—
Z1	—	—	0.755
x	—	—	0.25
y	—	—	0.1
θ	0°	—	8°
b2	—	0.76	—
$e1$	—	7.62	—
$l2$	1.27	—	—