

STRUCTURE SILICON MONOLITHIC INTEGRATED CIRCUIT

FUNCTION HIGH SLOW RATE QUAD OPERATIONAL AMPLIFIERS

PRODUCT SERIES **BA3474F**
BA3474FV

FEATURES

- Operating temperature range (BA3474F: -40~+75[°C], BA3474FV: -40~+85[°C])
- High slew rate (10[V/us] typ.)
- Wide output voltage range (-14.7[V]~14.0[V] with VCC/VEE=+15[V]/-15[V] typ.)
- Operable with a single power supply. (3[V]~36[V])

○ABSOLUTE MAXIMUM RATINGS (Ta=25[°C])

Parameter	Symbol	Rating	Unit
Supply Voltage	VCC-VEE	+36	V
Power dissipation	Pd	BA3474F	mW
		BA3474FV	
Differential Input Voltage (*4)	Vid	36	V
Input Common Voltage Range	Vicm	(VEE-0.3)~VEE+36	V
Operating Temperature	Topr	BA3474F	°C
		BA3474FV	
Storage Temperature	Tstg	-55~+150	°C
Maximum junction Temperature	Tjmax	150	°C

• This IC is not designed for protection against radioactive rays.

(*1) To use at temperature above Ta=25[°C] reduce 4.9[mW]/[°C].

(*2) To use at temperature above Ta=25[°C] reduce 7.0[mW]/[°C].

(*3) Mounted on a glass epoxy PCB (70[mm]×70[mm]×1.6[mm]).

(*4) The voltage difference between inverting input and non-inverting input is the differential input voltage. Then input terminal voltage is set to more than VEE.

○OPERATING CONDITION

Parameter	Symbol	Rating	Unit
Supply Voltage	VCC	+3.0~+36.0 (Single Supply)	V
		±1.5~±18.0 (Split Supply)	

ELECTRICAL CHARACTERISTICS (unless otherwise specified VCC=+15[V], VEE=-15[V], Ta=25[°C])

Parameter	Symbol	Guaranteed Limit			Unit	Condition
		Min.	Typ.	Max.		
Input Offset Voltage (*5)	Vio	-	1	10	mV	Vicm=0[V], Vout=0[V]
		-	1.5	10		VCC=5[V], VEE=0[V], Vicm=0[V], VOUT=VCC/2
Input Offset Current (*5)	Iio	-	6	75	nA	Vicm=0[V], Vout=0[V]
Input Bias Current (*5)	Ib	-	100	500	nA	Vicm=0[V], Vout=0[V]
Supply Current	ICC	-	8	11	mA	RL=∞ All Op-Amps
High Level Output Voltage	VOH	3.7	4	-	V	VCC=5[V], RL=2[kΩ]
		13.7	14	-		RL=10[kΩ]
		13.5	-	-		RL=2[kΩ]
Low Level Output Voltage	VOL	-	0.1	0.3	V	VCC=5[V], RL=2[kΩ]
		-	-14.7	-14.3		RL=10[kΩ]
		-	-	-13.5		RL=2[kΩ]
Large Signal Voltage Gain	AV	80	100	-	dB	RL ≥ 2[kΩ], Vout = ±10[V]
Input Common-mode Voltage Range	Vicm	0	-	VCC-2.0	V	VCC=5[V], VEE=0[V], VOUT=VCC/2
Common-mode Rejection Ratio	CMRR	60	97	-	dB	Vicm=0[V], Vout=0[V]
Power Supply Rejection Ratio	PSRR	60	97	-	dB	Vicm=0[V], Vout=0[V]
Output Source Current (*6)	IOH	10	30	-	mA	VIN+=1[V], VIN-=0[V], Vout=0[V], Only 1CH is short circuit
Output Sink Current (*6)	IOL	20	30	-	mA	VIN+=0[V], VIN-=1[V], Vout=5[V], Only 1CH is short circuit
Maximum Frequency	ft	-	4	-	MHz	
Slew rate	SR	-	10	-	V/μs	Av=1, Vin=-10 to +10[V], RL=2[kΩ]
Channel Separation	CS	-	120	-	dB	

(*5) Absolute value.

 (*6) Under the high temperature environment, consider the power dissipation of IC when select the output current.
 When output terminal short circuits continuously, the output current reduce to climb temperature inside IC by flash.

- (5) Power dissipation(Pd)
If the IC is used under excessive power dissipation. An increase in the chip temperature will cause deterioration of the radical characteristics of IC.
For example, reduction of current capability. Take consideration of the effective power dissipation and thermal design with a sufficient margin. Pd is reference to the provided power dissipation curve.
- (6) Short circuits between pins and incorrect mounting
Short circuits between pins and incorrect mounting when mounting the IC on a printed circuits board, take notice of the direction and positioning of the IC.
If IC is mounted erroneously, It may be damaged. Also, when a foreign object is inserted between output, between output and VCC terminal or VEE terminal which causes short circuit, the IC may be damaged.
- (7) Using under strong electromagnetic field
Be careful when using the IC under strong electromagnetic field because it may malfunction.
- (8) Usage of IC
When stress is applied to the IC through warp of the printed circuit board,
The characteristics may fluctuate due to the piezo effect.
Be careful of the warp of the printed circuit board.
- (9) Output operation
This IC is configured with a push-pull circuit and Class C output stage. Therefore, when load resistance is connected to the middle point potential of VCC and VEE, this configuration generates crossover distortion when switching between source and sink current.
To suppress crossover distortion, connect a resistor between the output terminal and VEE then increase the bias current to enable Class A operation.
- (10) Testing IC on the set board
When testing IC on the set board, in cases where the capacitor is connected to the low impedance, make sure to discharge per fabrication because there is a possibility that IC may be damaged by stress.
When removing IC from the set board, it is essential to cut supply voltage.
As a countermeasure against the static electricity, observe proper grounding during fabrication process and take due care when carrying and storage it.
- (12) The IC destruction caused by capacitive load
The transistors in circuits may be damaged when VCC terminal and VEE terminal is shorted with the charged output terminal capacitor.
When IC is used as a comparator or as application circuits no constructed negative feed back, where oscillation is not activated by an output capacitor, the output capacitor must be kept below 0.1[μ F] in order to prevent the damage mentioned above.
- (13) The oscillation caused by capacitive load
Designed negative feedback circuit using this IC, verify output oscillation caused by capacitive load.

Notes

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