

August 2000 Revised October 2005

KA311

Single Comparator

General Description

The KA311 series is a monolithic, low input current voltage comparator. The device is also designed to operate from dual or single supply voltage.

Features

- Low Input Bias Current: 250nA (Max)
- Low Input Offset Current: 50nA (Max)
- Differential Input Voltage: ±30V
- Power Supply Voltage:
 Single 5.0V to 30V or 15V Split Supplies (±15V)
- Offset Voltage Null Capability
- Strobe Capability

Ordering Information:

Product Number	Package	Operating Temperature		
KA311	8-DIP	0 ~ +70°C		
KA311DTF	8-SOP	0~ +70 0		

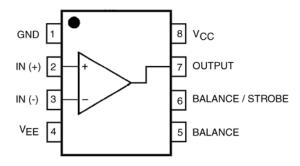
8-DIP



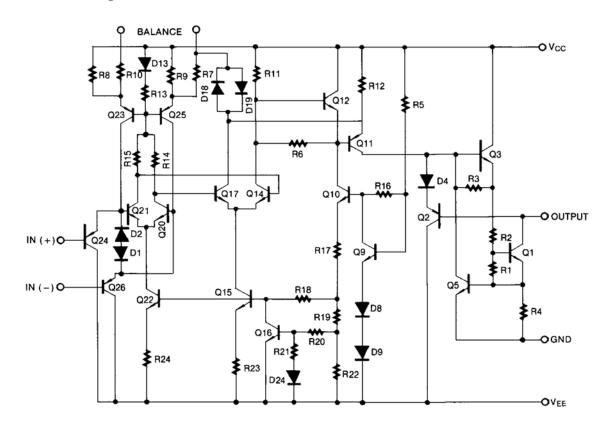
8-SOP



Internal Block Diagram



Schematic Diagram



Absolute Maximum Ratings(Note 1)

Parameter	Symbol	Value	Unit	
Total Supply Voltage	V _{CC} + V _{EE}	36	V	
Output to Negative Supply Voltage KA311	V _O - V _{EE}	40	V	
Ground to Negative voltage	V _{EE}	-30	V	
Differential Input Voltage	V _{I(DIFF)}	30	V	
Input Voltage	V _I	15	V	
Output Short Circuit Duration	_	10	sec.	
Power Dissipation	P _D	500	mW	
Operating Temperature Range	T _{OPR}	0 ~ +70	°C	
Storage Temperature Range	T _{STG}	−65 ~ +150	°C	

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

$\textbf{Electrical Characteristics} \ \, (\text{V}_{\text{CC}} = 15\text{V}, \, \text{V}_{\text{EE}} = -15\text{V}, \, \text{T}_{\text{A}} = 25^{\circ}\text{C}, \, \text{unless otherwise specified})$

Parameter	Symbol	Conditions		Min	Тур	Max	Unit
Input Offset Voltage	V _{IO}	$RS \le 50k\Omega$		-	1.0	7.5	mV
			(Note 2)	-	-	10.0	mv
Input Offset Current	I _{IO}			-	6.0	50.0	nA
			(Note 2)	-	-	70.0	nA
Input Bias Current	I _{BIAS}			-	100	250	nA
			(Note 2)	-	-	300	nA
Voltage Gain	G _V			40.0	200	=	V/mV
Response Time	t _{RES}		(Note 3)	-	200	=	ns
Saturation Voltage	V _{SAT}	$I_O = 50 \text{mA}, V_I \le -10 \text{mV}$		-	0.75	1.5	V
		$V_{CC} \geq 4.5 V, \ V_{EE} = 0 V, \ I_O = 8 mA, \ V_I \leq -10 mV$	(Note 2)	-	0.23	0.4	V
Strobe "ON" Current	I _{STR(ON)}			-	3.0	=	mA
Output Leakage Current	I _{SINK}	I_{STR} = 3mA, $V_I \ge 10$ mV, $V_O = 15$ V, $V_{CC} = \pm 15$ V		-	0.2	50.0	nA
Input Voltage Range	V _{I(R)}		(Note 2)	-14.5 to 13.0	-14.7 to 13.8	=	V
Positive Supply Current	Icc			-	3.0	7.5	mA
Negative Supply Current	I _{EE}			=	-2.2	-5.0	mA
Strobe Current	I _{STR}			-	3.0	=	mA

Note 2: $0 \le T_A + +70^{\circ}C$.

 $\textbf{Note 3:} \ The \ response \ time \ specified \ is \ for \ a \ 100 mV \ input \ step \ with \ 5 mV \ over \ drive.$

Typical Performance Characteristics

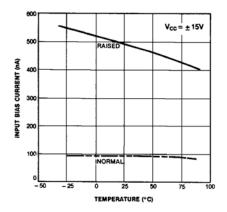


FIGURE 1. Input Bias Current vs. Temperature

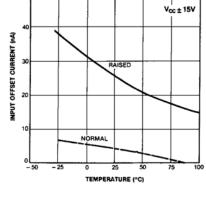


FIGURE 2. Input Offset Current vs. Temperature

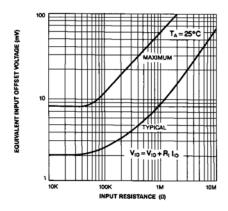


FIGURE 3. Offset Voltage vs. Input Resistance

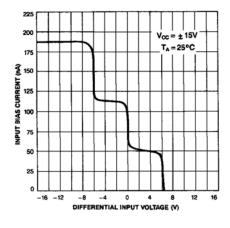


FIGURE 4. Input Bias Current vs. Differential Input Voltage

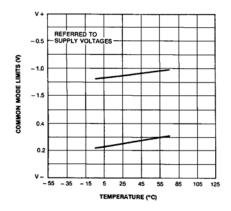


FIGURE 5. Common Mode Limits vs. Temperature

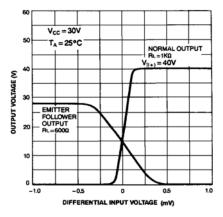


FIGURE 6. Output Voltage vs. Differential Input Voltage

Typical Performance Characteristics (Continued)

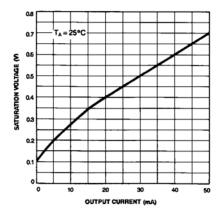


FIGURE 7. Saturation Voltage vs. Current

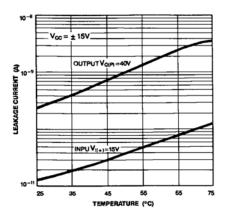


FIGURE 9. Leakage Current vs. Temperature

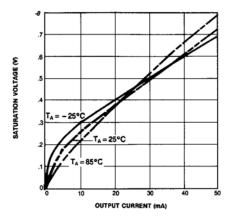


FIGURE 11. Current Saturation Voltage

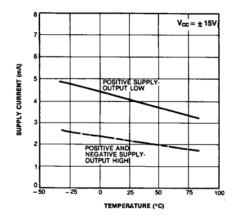


FIGURE 8. Supply Current vs. Temperature

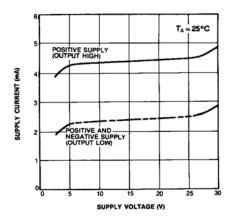


FIGURE 10. Supply Current vs. Supply Voltage

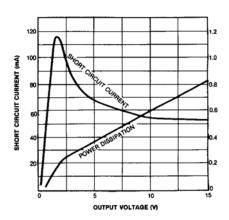
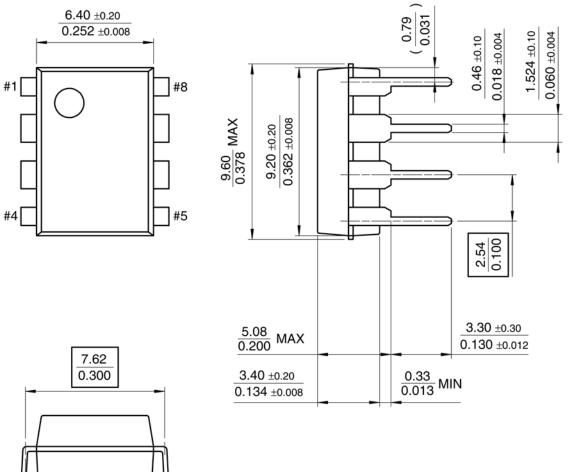


FIGURE 12. Output Limiting Characteristics

Physical Dimensions inches (millimeters) unless otherwise noted

8-DIP

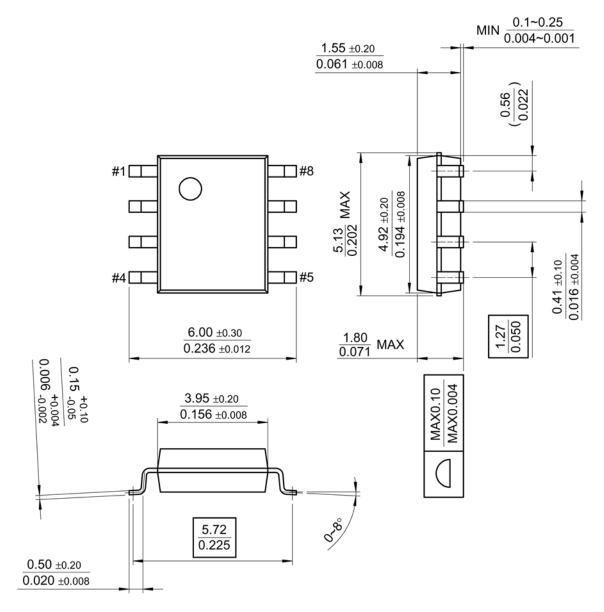


0.25 ^{+0.10}
0.010 ^{+0.004}
0.010 ^{+0.004}

8-Lead Dual-In-Line Package

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

8-SOP



8-Lead Small Outline Package

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PRODUCT STATUS DEFINITIONS

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