

AN1311, AN1311S

Single High-Speed Comparators

Overview

The AN1311 and the AN1311S are single high-speed voltage comparators with large output sink current, wide operating supply voltage range, and excellent characteristics for $\pm 15V$ operation as well as for 5V single power supply operation. They are provided with strobe pins and can be applied widely to drive the standard logic circuit directly.

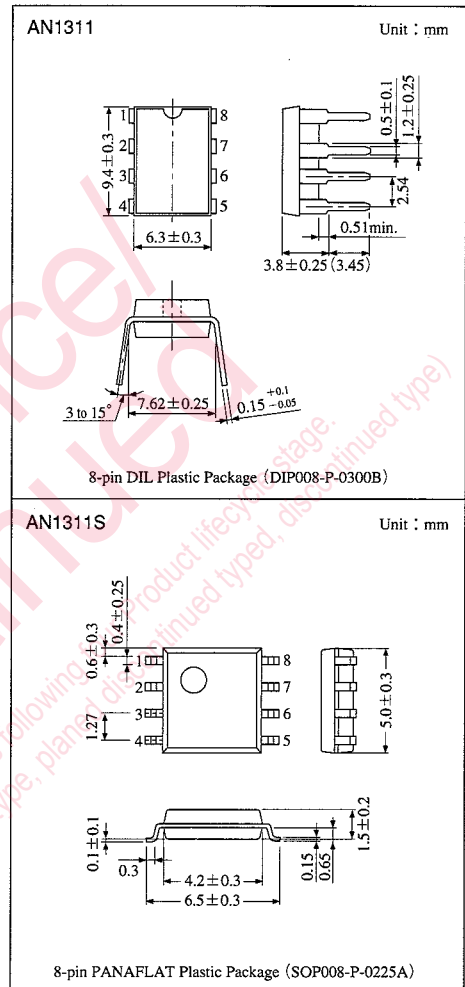
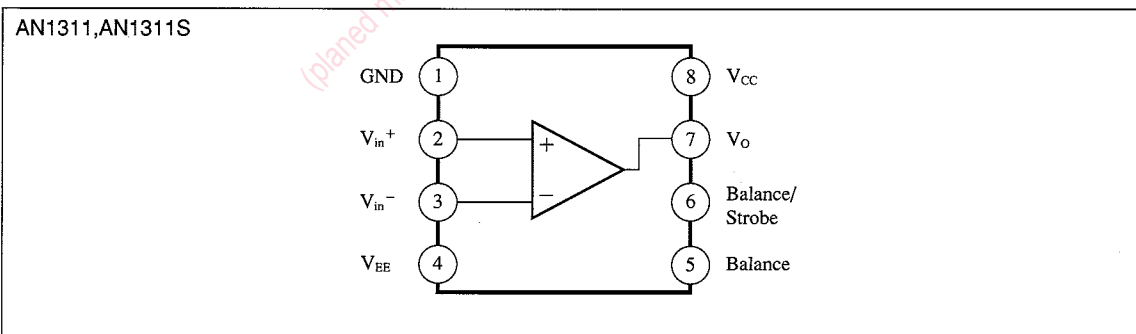
Features

- The output levels are compatible with TTL and MOS logic.
- Offset balancing and strobe capability are available.
- Large output sink current drives LED and lamps.
- Output stage forms open collector and emitter follower.

Pin Descriptions

Pin No.	Pin name
1	GND
2	Non inverting input
3	Inverting input
4	V_{EE}
5	Balance
6	Balance/Strobe
7	Output
8	V_{CC}

Block Diagram



Comparators

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

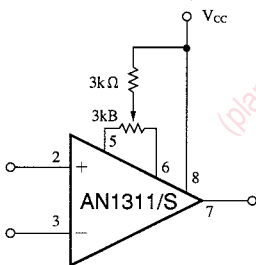
Parameter		Symbol	Rating	Unit
Voltage	Supply voltage	V_{CC}	± 18	V
	Differential input voltage	V_{ID}	± 30	V
	Common-mode input voltage	V_{ICM}	± 15	V
	Voltage between output and negative power supply	$V_O - V_{EE}$	36	V
	Voltage between ground and negative power supply	$V_{GND} - V_{EE}$	30	V
Output short-circuit duration		t_{OS}	10	s
Power dissipation	AN1311	P_D	500	mW
	AN1311S		360	
Operating ambient temperature		T_{opr}	-20 to +75	$^{\circ}\text{C}$
Storage temperature	AN1311	T_{stg}	-55 to +150	$^{\circ}\text{C}$
	AN1311S		-55 to +125	

Electrical Characteristics ($V_{CC}=15\text{V}$, $V_{EE}=-15\text{V}$, $T_a=25^{\circ}\text{C}$)

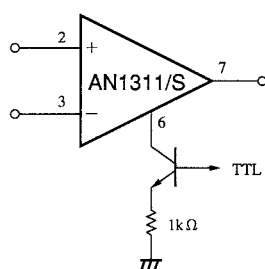
Parameter	Symbol	Condition	min	typ	max	Unit
Input offset voltage	$V_{I(\text{offset})}$	$R_S \leq 50\text{k}\Omega$	—	2.0	7.5	mV
Input offset current	I_{IO}	$R_S \leq 50\text{k}\Omega$	—	6.0	50	nA
Input bias current	I_{bias}	$R_S \leq 50\text{k}\Omega$	—	100	250	nA
Voltage gain	G_V	$R_L = 1\text{k}\Omega$	—	106	—	dB
Response time	t_r	Step input 100mV, Overdrive 5mV	—	200	—	ns
Saturation voltage	$V_{O(\text{sat})}$	$V_{IN} \geq 10\text{mV}$, $I_O = 50\text{mA}$	—	0.75	1.5	V
Strobe on current	I_{ST}		—	3	—	mA
Output leakage current	$I_{O(\text{leak})}$	$V_{IN} \geq 10\text{mV}$, $V_O = 35\text{V}$	—	0.2	50	nA
Positive supply current	I_{CC}		—	5.1	7.5	mA
Negative supply current	I_{EE}		—	4.1	5.0	mA
Input voltage range	V_I		—	± 14	—	V
Saturation voltage	$V_{O(\text{sat})}$	$V_{CC} \geq 4.5\text{V}$, $V_{EE} = 0\text{V}$, $V_{IN} \geq 10\text{mV}$, $I_O = 8\text{mA}$	—	0.23	0.4	V

Typical Application (Balance Strobe Pin, Output Pin, GND Pin)

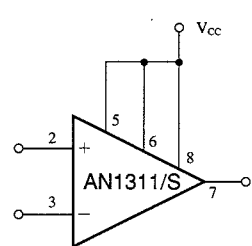
Offset Null Circuit



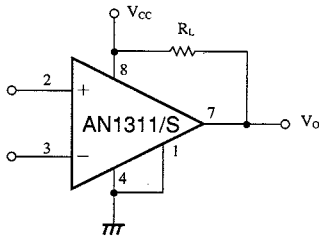
Strobe Circuit



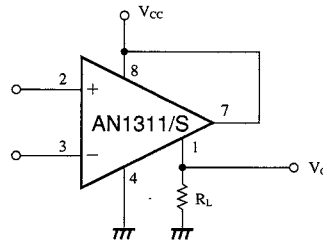
Increasing Input Stage Current



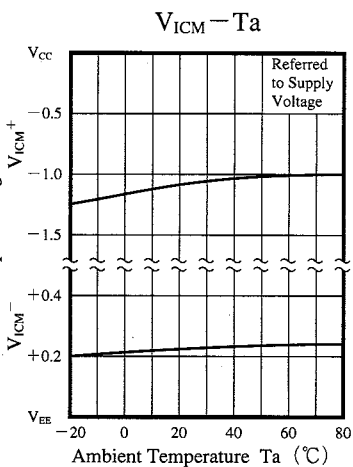
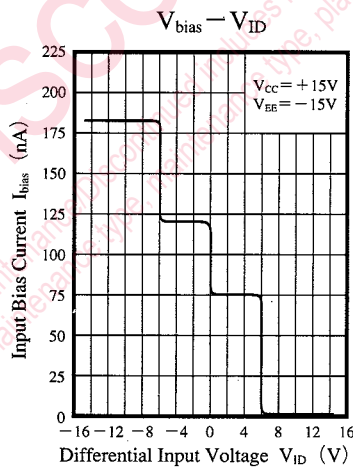
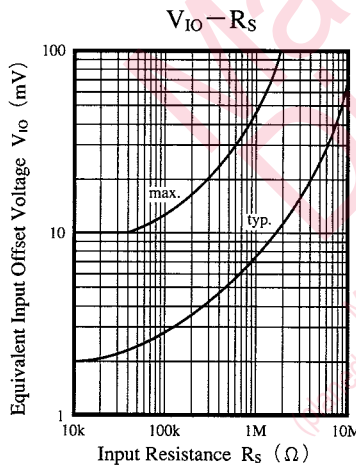
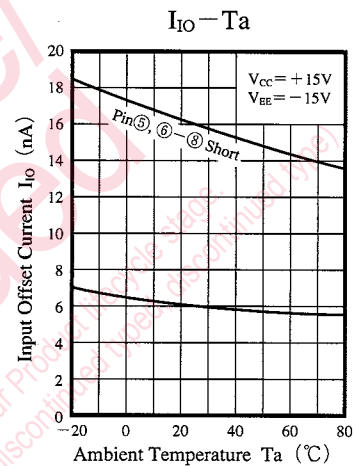
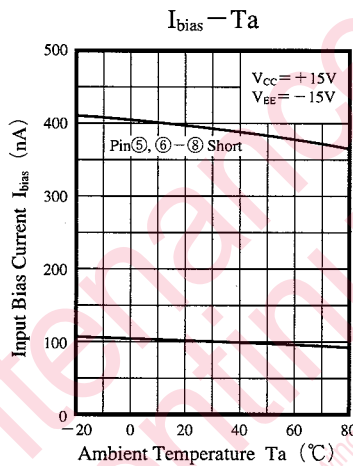
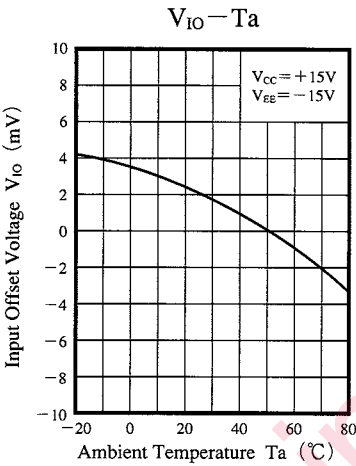
Collector Output



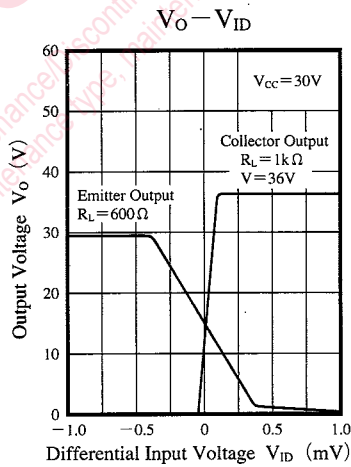
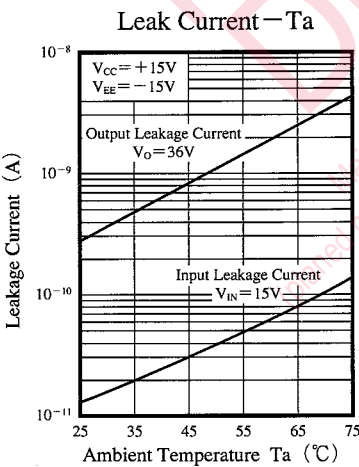
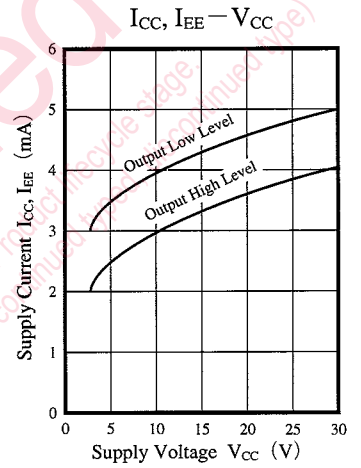
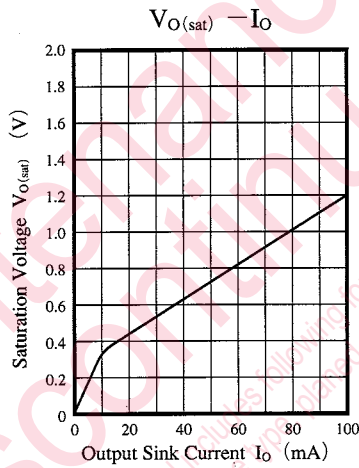
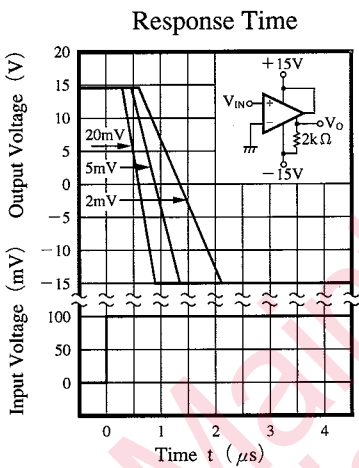
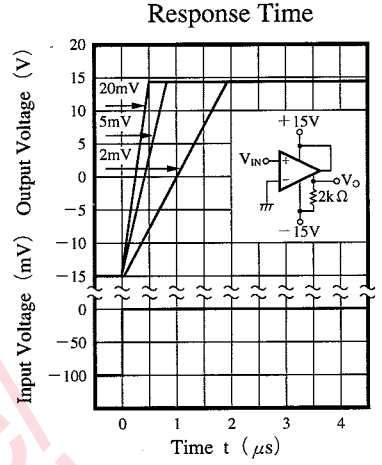
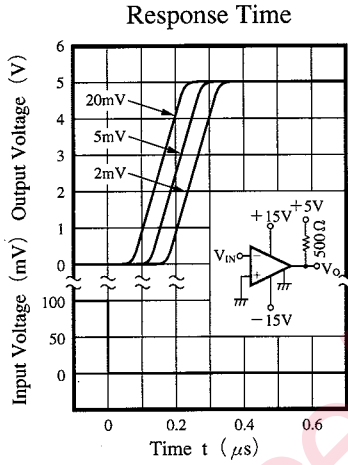
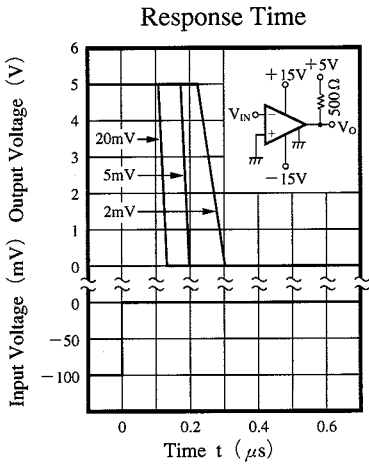
Emitter Output



■ Characteristics Curve



Comparators



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