HIGH GAIN OPERATIONAL AMPLIFIER

TAA811

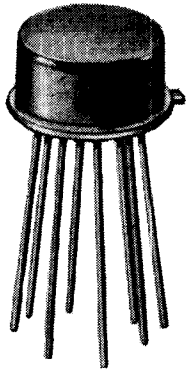
The TAA811 is a general purpose high gain operational amplifier on a monolithic silicon chip. The device is fully compensated with the addition of a single capacitor stabilising the circuit. Used as a comparator the device may be operated with inputs as high as 30V and the output can be clamped at any desired level to make it compatible with logic circuits.

QUICK REFERENCE DATA		
Supply voltage (nominal)	+15 and -15	V
Voltage gain (typ.)	150 000	
Input resistance (typ.)	400	kΩ
Input offset voltage (max.)	7.5	mV
Output voltage swing (typ.) (V_{supply} = ±15V, R_L = 10kΩ)	±14	V
Operating temperature range	0 to +70	°C

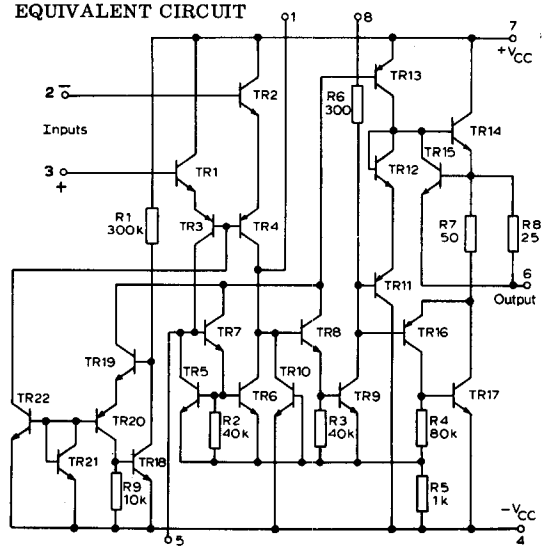
OUTLINE AND DIMENSIONS

Conforms to J.E.D.E.C. TO-99 (eight lead TO-5)
B.S. 3934 SO-44/SB8-1

For details see page 2



EQUIVALENT CIRCUIT



For details of pin numbering see page 2

RATINGS

Limiting values of operation according to the absolute maximum system.

Electrical

Supply voltage pins 7 and 4 (pin 7 positive)	+22 and -22	V
Input voltage (see note 1)		
common mode	±15	V
differential mode (between pins 2 and 3)	30	V
Output short circuit duration (see note 2)		continuous
Power dissipation (see note 3) ($T_{amb} \leq 62.5^{o}C$)	250	mW

Temperature

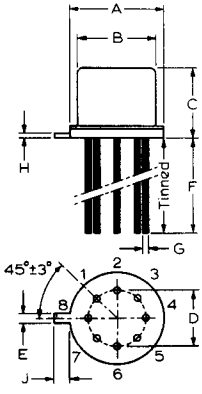
T_{stg} range	-65 to +150	^{o}C
T_{amb} range operating	0 to +70	^{o}C

NOTES

1. For supply voltages less than ±15V the absolute maximum input voltage is equal to the supply voltage.
2. Continuous short circuit is allowed for case temperatures up to $+70^{o}C$ and ambient temperatures up to $+55^{o}C$.
3. For operation at elevated temperatures, the device must be derated based on a $100^{o}C$ maximum junction temperature and a thermal resistance of 150degC/W junction to ambient or 45degC/W junction to case.

OUTLINE AND DIMENSIONS

Conforms to J.E.D.E.C. TO-99



	Millimetres		
	Min.	Nom.	Max.
A	8.64	8.90	9.40
B	7.75	8.15	8.51
C	-	-	4.7
D	-	5.08	-
E	0.71	0.79	0.86
F	12.7	-	-
G	-	0.45	-
H	-	0.4	-
J	0.74	0.85	1.0
K	-	-	0.05

Pin 4 connected to envelope

PINNING

1.	Balance/compensation	5.	Balance
2.	Inverting input	6.	Output (V_{out})
3.	Non-inverting input	7.	Positive supply voltage ($+V_{CC}$)
4.	Negative supply voltage ($-V_{CC}$)	8.	Compensation

ELECTRICAL CHARACTERISTICS

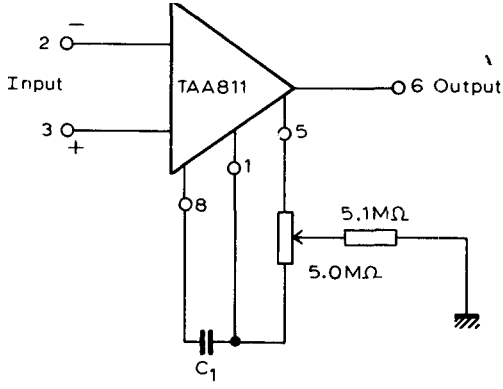
$T_{amb} = 25^{o}C$, $\pm 5V \leq V_{supply} \leq \pm 20V$, $C_1 = 30pF$ unless otherwise stated

	Min.	Typ.	Max.	
Input offset voltage $R_S \leq 10k\Omega$	-	2.0	7.5	mV
Input offset current	-	100	500	nA
Input bias current	-	0.25	1.5	μA
Input resistance	150	400	-	$k\Omega$
Voltage gain $V_{supply} = \pm 15V$, $V_{out} = \pm 10V$, $R_L \geq 2k\Omega$	20	150	-	$\times 10^3$
Supply current $V_{supply} = \pm 20V$	-	1.8	3.0	mA
Over full temperature range ($T_{amb} = 0$ to $+70^{o}C$)				
Input offset voltage $R_S \leq 10k\Omega$	-	-	10	mV
Average temperature coefficient of input offset voltage $R_S \leq 50\Omega$	-	6.0	-	$\mu V/degC$
$R_S \leq 10k\Omega$	-	10	-	$\mu V/degC$
Input offset current $T_{amb} = +70^{o}C$	-	50	400	nA
$T_{amb} = 0^{o}C$	-	150	750	nA
Input bias current $T_{amb} = 0^{o}C$	-	0.32	2.0	μA
Voltage gain $V_{supply} = \pm 15V$, $V_{out} = \pm 10V$, $R_L \geq 2k\Omega$	15	-	-	$\times 10^3$
Input voltage range $V_{supply} = \pm 15V$	± 12	-	-	V

ELECTRICAL CHARACTERISTICS (cont'd)

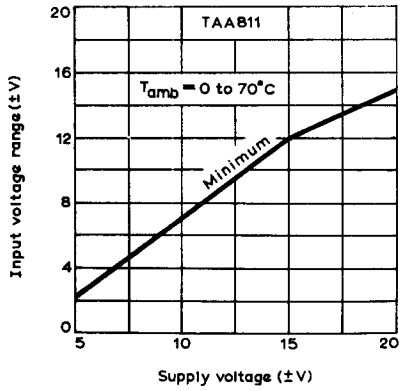
	Min.	Typ.	Max.	
Output voltage swing				
$V_{supply} = \pm 15V$, $R_L = 10k\Omega$	±12	±14	-	V
$V_{supply} = \pm 15V$, $R_L = 2k\Omega$	±10	±13	-	V
Common mode rejection ratio				
$R_S \leq 10k\Omega$	65	90	-	dB
Supply voltage rejection ratio				
$R_S \leq 10k\Omega$	70	90	-	dB

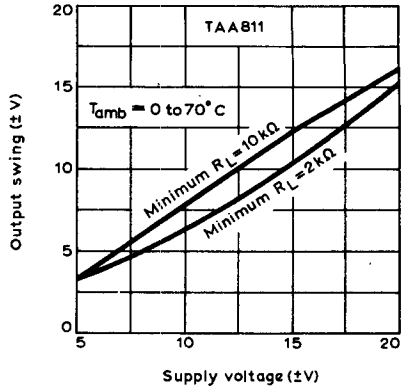
FREQUENCY COMPENSATION AND BALANCE CIRCUIT

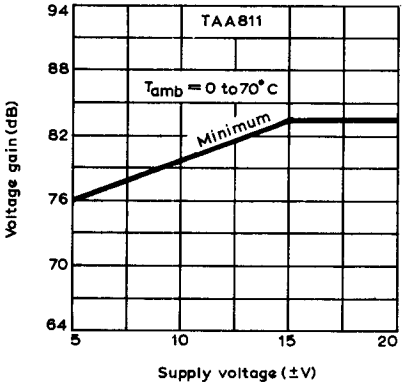


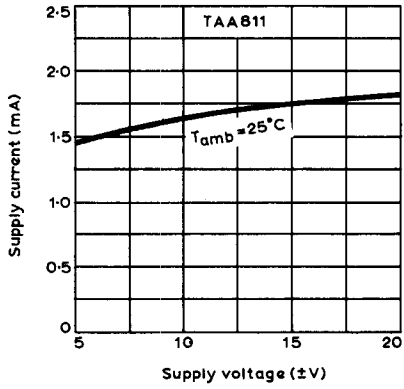
SOLDERING AND WIRING RECOMMENDATIONS

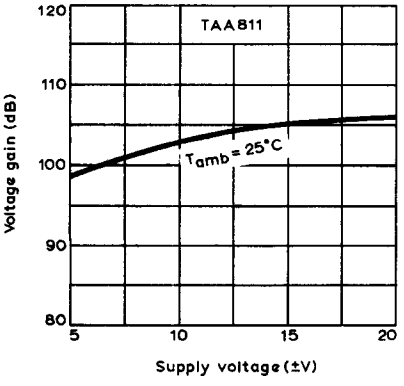
1. Devices may be soldered directly into a circuit with a soldering iron at a maximum iron temperature of 245°C for a time of up to 10 seconds at least 1.5mm from the seal. At an iron temperature of 245°C to 400°C the maximum soldering time is 5 seconds at least 5mm from the seal.
2. These devices may be dip-soldered at a solder temperature of 245°C for a maximum soldering time of 5 seconds. The case temperature during dip-soldering must not at any time exceed the maximum storage temperature. These recommendations apply to a device mounted flush on a board having punched-through holes, or spaced at least 1.5mm above a board having plated-through holes.
3. Care should be taken not to bend the leads nearer than 1.5mm from the seal.
4. If devices are stored at temperatures above 100°C before incorporation into equipment, some deterioration of the external surface is likely to occur which may make soldering into the circuit difficult. Under these circumstances the leads should be retinned using a suitable activated flux.

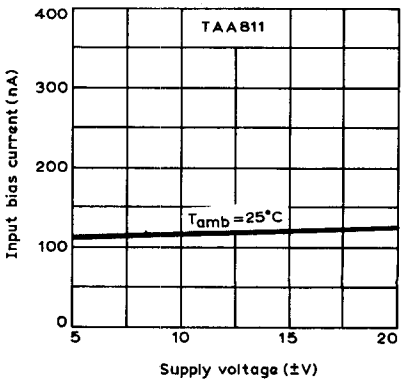

TAA811
T_{amb} = 0 to 70°C
Minimum
Input voltage range (±V)
Supply voltage (±V)

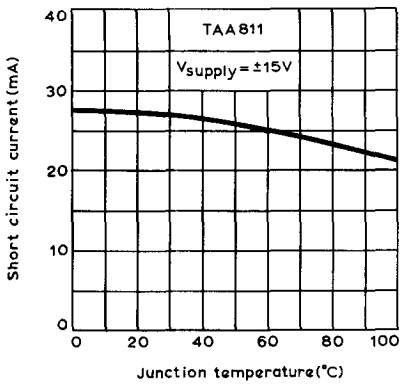

TAA811
T_{amb} = 0 to 70°C
Minimum R_L = 10kΩ
Minimum R_L = 2kΩ
Output swing (±V)
Supply voltage (±V)

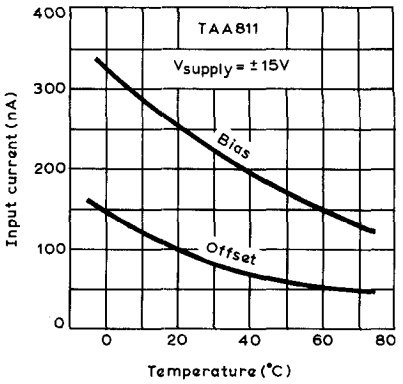

TAA811
T_{amb} = 0 to 70°C
Minimum
Voltage gain (dB)
Supply voltage (±V)

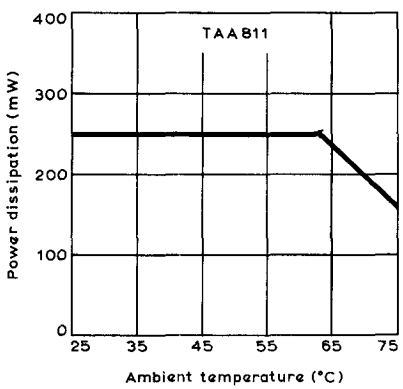

TAA811
T_{amb} = 25°C
Supply current (mA)
Supply voltage (±V)

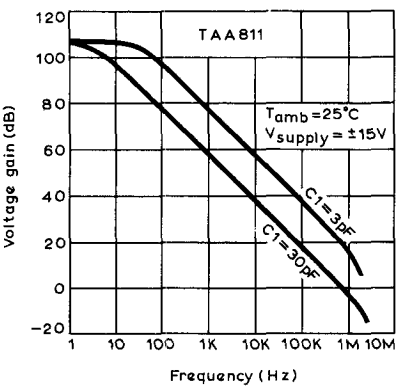

TAA811
T_{amb} = 25°C
Voltage gain (dB)
Supply voltage (±V)

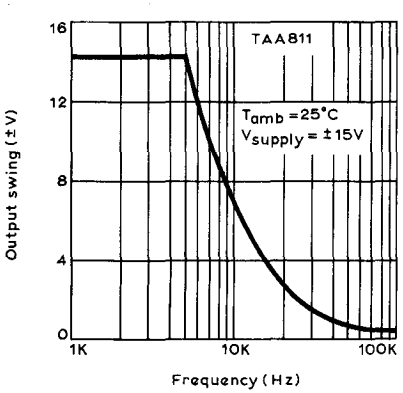

TAA811
T_{amb} = 25°C
Input bias current (nA)
Supply voltage (±V)

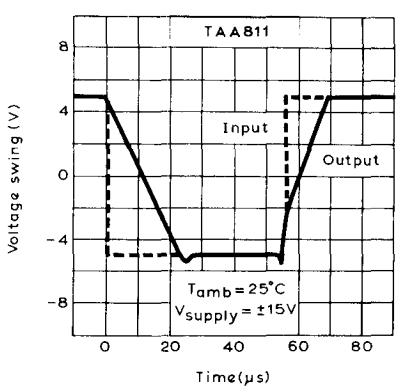

TAA811
$V_{supply} = \pm 15V$
Short circuit current (mA)
Junction temperature (°C)


TAA811
$V_{supply} = \pm 15V$
Bias
Offset
Input current (nA)
Temperature (°C)


TAA811
Power dissipation (mW)
Ambient temperature (°C)


TAA811
$T_{amb} = 25°C$
$V_{supply} = \pm 15V$
$C_1 = 3pF$
$C_1 = 30pF$
Voltage gain (dB)
Frequency (Hz)


TAA811
$T_{amb} = 25°C$
$V_{supply} = \pm 15V$
Output swing (±V)
Frequency (Hz)


TAA811
Input
Output
$T_{amb} = 25°C$
$V_{supply} = \pm 15V$
Voltage swing (V)
Time (μs)