Fluorescent display tube level meter driver, 16-point \times 2 channel, VU scale, bar display **BA6800AS**

The BA6800AS is a two-channel, 16-point fluorescent display tube driver for VU-scale bar-level meters. It uses a dynamic-drive system and has both AC and DC inputs. The AC input mode has a peak hold circuit. The IC features a power-on mute, and the output block can directly drive fluorescent display tubes, so few external components are required. The grid output duty cycle is 1 / 8.

Applications

Level meters for all types of AV equipment

Features

- 1) Uses dynamic-drive system to display two 16-point channels. 30-pin SDIP package.
- 2) AC and DC inputs provided. Switching function allows two-mode display.
- 3) Upper 12 points have peak hold function in AC mode (two seconds).
- 4) Power-on mute function.
- 5) Dynamic-drive system reduces the power dissipation of the fluorescent display tube power supply.
- 6) Square root compression amplifier built in.

Absolute maximum ratings (Ta = 25°C)

| Parameter | Symbol | Limits | Unit | | | | |
|---|---------|------------------|------|--|--|--|--|
| Power supply voltage | Vcc | 7.0 | V | | | | |
| Power dissipation | Pd | 1200* | mW | | | | |
| Operating temperature | Topr | −20~+70 | °C | | | | |
| Storage temperature | Tstg | −55~ +125 | °C | | | | |
| Output voltage | Vcc+Vee | 36 | V | | | | |
| * Reduced by 12mW for each increase in Ta of 1°C over 25°C. | | | | | | | |
| | | | | | | | |
| | | | | | | | |

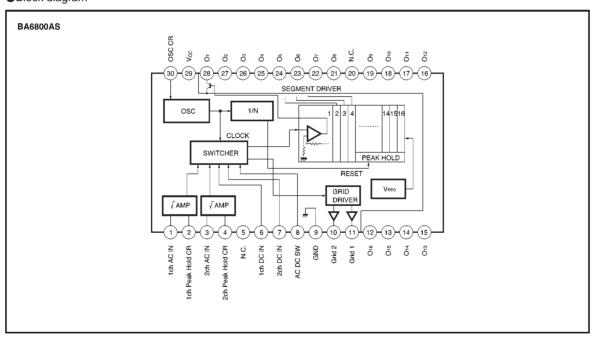
^{*} Reduced by 12mW for each increase in Ta of 1°C over 25°C



• Electrical characteristics (unless otherwise noted, Ta = 25°C)

| Parameter | Symbol | Min. | Тур. | Max. | Unit | Conditions |
|--------------------------------|---------------------|------|------|------|------|-------------------------|
| Operating power supply voltage | Vcc | 4.5 | 5.0 | 5.8 | ٧ | |
| Quiescent current | lα | _ | 17 | 24 | mA | |
| AC input resistance | RINAC | 175 | 250 | 325 | Ω | Pins 1 and 3 |
| DC input resistance | RINDC | 7 | 10 | 13 | kΩ | |
| Oscillator frequency | fosc | 1.7 | 2.0 | 2.3 | kHz | C=0.015 μ F, R=30kΩ |
| Peak hold time | Thold | - | 2 | _ | s | fosc=2kHz |
| Output duty cycle | Duty | _ | 1/8 | _ | _ | fosc=2kHz |
| Grid output low level voltage | V _{GL} | _ | 0.4 | 0.8 | ٧ | I _G =5mA |
| Grid output leakage current | I _{G leak} | 1 | _ | 10 | μΑ | V _{CC} =5V |

●Block diagram



• Electrical characteristics (unless otherwise noted, Ta = 25°C)

| Segment output high level voltage VoH 3.7 4.0 - V Io=2mA | Parameter | Symbol | Min. | Тур. | Max. | Unit | Conditions |
|--|---------------------------------------|--------------------|------------|------------|------|------|------------------------------|
| Input switching threshold | Segment output high level voltage | Vон | 3.7 | 4.0 | _ | V | Io=2mA |
| AC sensitivity | Segment output leakage current | Oleak | _ | _ | 10 | μΑ | -VEE=-31V |
| AC sensitivity New 250 400 630 mV AC comparator 10 on level | Input switching threshold | V _{TH} | 2.2 | 2.5 | 2.8 | V | AC: pin 8 "H", DC: pin 8 "L" |
| Maximum segment output current low 2 — mA Vos=3.7V AC comparator level 16 Voseac 8.5 10 12 dB Pin 12 output AC comparator level 15 Vosac 6.0 7 8.5 dB Pin 13 output AC comparator level 14 Vosac 2.5 3 4.0 dB Pin 14 output AC comparator level 13 Vosac 2.5 3 4.0 dB Pin 15 output AC comparator level 11 Vosac 1.5 2 2.5 dB Pin 16 output AC comparator level 10 Vosac − 0 — dB Pin 17 output AC comparator level 9 Vosac −1.5 −1 −0.5 dB Pin 19 output AC comparator level 8 Vosac −2.5 −2 −1.5 dB Pin 12 output AC comparator level 8 Vosac −6.0 −5 −4.0 dB Pin 23 output AC comparator level 8 Vosac −6.0 −5 < | AC sensitivity | VINAC | 250 | 400 | 630 | mV | |
| AC comparator level 16 AC comparator level 15 AC comparator level 15 AC comparator level 14 AC comparator level 14 AC comparator level 13 AC comparator level 11 AC comparator level 12 AC comparator level 11 AC comparator level 11 AC comparator level 11 AC comparator level 11 AC comparator level 10 AC comparator level 10 AC comparator level 8 AC comparator level 7 AC comparator level 8 AC comparator level 9 AC comparator level 9 AC comparator level 10 AC compar | Maximum grid output current | Ідм | 5 | _ | _ | mA | V _{OL} =0.8V |
| AC comparator level 15 AC comparator level 14 AC comparator level 13 AC comparator level 13 AC comparator level 13 AC comparator level 13 AC comparator level 12 AC comparator level 12 AC comparator level 12 AC comparator level 11 AC comparator level 10 AC comparator level 10 AC comparator level 10 AC comparator level 9 AC comparator level 9 AC comparator level 8 AC comparator level 8 AC comparator level 8 AC comparator level 8 AC comparator level 7 AC comparator level 6 AC comparator level 6 AC comparator level 5 AC comparator level 5 AC comparator level 5 AC comparator level 6 AC comparator level 7 AC comparator level 8 AC comparator level 8 AC comparator level 8 AC comparator level 9 AC comparator level 10 AC comparator level 11 AC comparator level 2 A | Maximum segment output current | Іом | 2 | _ | _ | mA | V _{OH} =3.7V |
| AC comparator level 14 AC comparator level 13 AC comparator level 12 AC comparator level 12 AC comparator level 11 AC comparator level 10 AC comparator level 10 AC comparator level 10 AC comparator level 9 AC comparator level 8 AC comparator level 6 AC comparator level 6 AC comparator level 7 AC comparator level 8 AC comparator level 8 AC comparator level 8 AC comparator level 8 AC comparator level 9 AC comparator level 9 AC comparator level 1 AC comparator level 1 AC comparator level 1 AC comparator level 3 AC comparator level 3 AC comparator level 1 AC comparator level 2 AC comparator level 3 AC comparator level 3 AC compar | AC comparator level 16 | VC16AC | 8.5 | 10 | 12 | dB | Pin 12 output |
| AC comparator level 13 Vortacc Loss and A.O. dB Pin 15 output AC comparator level 12 Vortacc AC comparator level 11 Vortacc AC comparator level 11 Vortacc AC comparator level 10 Vortacc AC comparator level 10 Vortacc AC comparator level 10 Vortacc AC comparator level 9 Vortacc AC comparator level 9 Vortacc AC comparator level 8 Vortacc AC comparator level 8 Vortacc AC comparator level 7 AC comparator level 7 AC comparator level 6 Vortacc AC comparator level 6 Vortacc AC comparator level 5 Vortacc AC comparator level 5 AC comparator level 8 Vortacc AC comparator level 9 AC comparator level 9 AC comparator level 9 AC comparator level 1 AC comparator level 1 AC comparator level 1 AC comparator level 2 Vortacc AC comparator level 3 AC comparator level 2 Vortacc AC comparator level 1 Vortacc AC comparator le | AC comparator level 15 | VC15AC | 6.0 | 7 | 8.5 | dB | Pin 13 output |
| AC comparator level 12 | AC comparator level 14 | VC14AC | 4.0 | 5 | 6.0 | dB | Pin 14 output |
| AC comparator level 11 AC comparator level 9 Vosac - 0 - dB Pin 17 output AC comparator level 9 Vosac - 1.5 -1 -0.5 dB Pin 19 output AC comparator level 8 Vosac - 2.5 -2 -1.5 dB Pin 19 output AC comparator level 8 Vosac - 2.5 -2 -1.5 dB Pin 21 output AC comparator level 6 AC comparator level 6 Vosac - 6.0 -5 -4.0 dB Pin 22 output AC comparator level 5 Vosac - 8.5 -7 -6.0 dB Pin 23 output AC comparator level 4 Vosac - 8.5 -7 -6.0 dB Pin 24 output AC comparator level 4 Vosac - 15 -10 -8.5 dB Pin 25 output AC comparator level 3 Vosac - 25 -20 -15 dB Pin 26 output AC comparator level 3 Vosac - 25 -20 -15 dB Pin 26 output AC comparator level 1 AC comparator level 1 Vosac - 35 -30 -25 dB Pin 27 output AC comparator level 1 Vosac - 35 -30 -25 dB Pin 28 output Comparator level 16 Vosec 2.76 3.10 3.44 V Pin 12 output DC comparator level 15 Vosac - 2.07 2.33 2.59 V Pin 13 output DC comparator level 14 Vosac - 1.86 2.10 2.34 V Pin 15 output DC comparator level 12 Vosac - 1.79 2.03 2.27 V Pin 16 output DC comparator level 11 Vosac - 1.59 1.88 2.14 V Pin 17 output DC comparator level 10 Vosec - 1.51 1.80 2.09 V Pin 18 output DC comparator level 10 Vosec - 1.51 1.80 2.09 V Pin 19 output DC comparator level 10 Vosec - 1.33 1.66 1.99 V Pin 22 output DC comparator level 8 Vosec - 1.40 1.71 2.02 V Pin 19 output DC comparator level 6 Vosec - 1.07 1.41 1.75 V Pin 20 output DC comparator level 6 Vosec - 1.07 1.41 1.75 V Pin 25 output DC comparator level 6 Vosec - 1.07 1.41 1.75 V Pin 25 output DC comparator level 6 Vosec - 1.07 1.41 1.75 V Pin 25 output DC comparator level 6 Vosec - 1.07 1.41 1.75 V Pin 25 output DC comparator level 6 Vosec - 1.07 1.41 1.75 V Pin 25 output DC comparator level 8 Vosec - 1.07 1.41 1.75 V Pin 25 output DC comparator level 9 Vosec - 1.03 1.03 0.45 V Pin 27 output | AC comparator level 13 | V _{C13AC} | 2.5 | 3 | 4.0 | dB | Pin 15 output |
| AC comparator level 10 | AC comparator level 12 | VC12AC | 1.5 | 2 | 2.5 | dB | Pin 16 output |
| AC comparator level 9 AC comparator level 8 Vcsac -2.5 -2 -1.5 dB Pin 19 output AC comparator level 8 Vcsac -2.5 -2 -1.5 dB Pin 21 output AC comparator level 6 Vcsac -6.0 -5 -4.0 dB Pin 22 output AC comparator level 5 Vcsac -6.0 -5 -4.0 dB Pin 23 output AC comparator level 5 Vcsac -8.5 -7 -6.0 dB Pin 23 output AC comparator level 4 Vcsac -8.5 -7 -6.0 dB Pin 24 output AC comparator level 3 Vcsac -8.5 -7 -6.0 dB Pin 25 output AC comparator level 3 Vcsac -25 -20 -15 dB Pin 26 output AC comparator level 2 Vcsac -35 -30 -25 dB Pin 27 output AC comparator level 1 Vc1ac -55 -40 -35 dB Pin 28 output Ccomparator level 16 Vc1ac -55 -40 -35 dB Pin 28 output DC comparator level 15 Vc1ac -55 -40 -35 3.10 3.44 V Pin 12 output DC comparator level 15 Vc1ac C 2.76 3.10 3.44 V Pin 13 output DC comparator level 14 Vc1ac C 2.07 2.33 2.59 V Pin 14 output DC comparator level 12 Vc1ac DC comparator level 13 Vc1ac DC comparator level 11 Vc1ac DC comparator level 12 Vc1ac C 2.70 2.03 2.27 V Pin 16 output DC comparator level 11 Vc1ac DC comparator level 10 Vc1ac Vc1ac 1.62 1.88 2.14 V Pin 17 output DC comparator level 9 Vcsac 1.33 1.66 1.99 V Pin 20 output DC comparator level 8 Vcsac 1.23 1.26 1.59 V Pin 20 output DC comparator level 6 Vcsac 1.07 1.41 1.75 V Pin 20 output DC comparator level 6 Vcsac 1.07 1.41 1.75 V Pin 20 output DC comparator level 6 Vcsac 1.07 1.07 1.37 V Pin 25 output DC comparator level 6 Vcsac 1.07 1.07 1.37 V Pin 26 output DC comparator level 6 Vcsac 0.42 0.60 0.78 V Pin 27 output | AC comparator level 11 | V _{C11AC} | 0.5 | 1 | 1.5 | dB | Pin 17 output |
| AC comparator level 8 | AC comparator level 10 | VC10AC | _ | 0 | _ | dB | Pin 18 output |
| AC comparator level 7 | AC comparator level 9 | Vc9AC | -1.5 | -1 | -0.5 | dB | Pin 19 output |
| AC comparator level 6 Vosac AC comparator level 5 Vosac AC comparator level 5 Vosac AC comparator level 4 Vosac AC comparator level 4 Vosac AC comparator level 4 Vosac AC comparator level 3 Vosac AC comparator level 3 Vosac AC comparator level 3 Vosac AC comparator level 2 Vosac AC comparator level 2 Vosac AC comparator level 1 Vosac AC comparator level 16 Vosac AC comparator level 17 Vosac AC comparator level 18 Vosac AC comparator level 19 Vosac AC comparator level 10 Vosac AC comparator level 10 Vosac AC comparator level 10 Comparator level 10 Vosac AC comparator level 8 Vosac AC comparator level 8 Vosac AC comparator level 6 Vosac AC comparator level 7 Vosac AC comparator level 6 Vosac AC comparator level 6 Vosac AC comparator level 7 Vosac AC comparator level 6 Vosac AC comparator level 7 Vosac AC comparator level 6 Vosac AC comparator level 7 Vosac AC comparator level 7 AC comparator level 6 AC comparator level 7 AC comparator level 7 AC comparator level 6 AC comparator level 7 AC comparator level 7 AC comparator level 7 AC comparator level 8 AC comparator level 9 AC comparator level 6 AC comparator level 6 AC comparator level 7 AC comparator level 8 AC comparator level 9 A | AC comparator level 8 | VC8AC | -2.5 | -2 | -1.5 | dB | Pin 21 output |
| AC comparator level 6 | AC comparator level 7 | VC7AC | -4.0 | -3 | -2.5 | dB | Pin 22 output |
| AC comparator level 4 Comparator level 3 Comparator level 3 Comparator level 3 Comparator level 2 Comparator level 2 Comparator level 2 Comparator level 1 Comparator level 1 Comparator level 1 Comparator level 16 Comparator level 16 Comparator level 15 Comparator level 15 Comparator level 14 Comparator level 14 Comparator level 14 Comparator level 14 Comparator level 15 Comparator level 14 Comparator level 13 Comparator level 13 Comparator level 14 Comparator level 14 Comparator level 15 Comparator level 17 Comparator level 18 Comparator level 19 Comparator level 10 Comparator level 11 Comparator level 11 Comparator level 11 Comparator level 11 Comparator level 10 Comparator level 2 Comparator level 3 Comparator level 4 Comparator level 4 Comparator level 3 Comparator level 2 Comparator level 3 Comparator level 3 Comparator level 3 Comparato | AC comparator level 6 | Vc6AC | -6.0 | - 5 | -4.0 | dB | |
| AC comparator level 3 | AC comparator level 5 | V _{C5AC} | -8.5 | -7 | -6.0 | dB | Pin 24 output |
| AC comparator level 3 | AC comparator level 4 | VC4AC | -15 | -10 | -8.5 | dB | Pin 25 output |
| AC comparator level 1 | AC comparator level 3 | Vсзас | -25 | -20 | -15 | dB | |
| DC comparator level 16 | AC comparator level 2 | V _{C2AC} | -35 | -30 | -25 | dB | Pin 27 output |
| DC comparator level 15 | AC comparator level 1 | VC1AC | -55 | -40 | -35 | dB | Pin 28 output |
| DC comparator level 14 Vc14DC 2.07 2.33 2.59 V Pin 14 output DC comparator level 13 Vc13DC 1.86 2.10 2.34 V Pin 15 output DC comparator level 12 Vc12DC 1.79 2.03 2.27 V Pin 16 output DC comparator level 11 Vc11DC 1.62 1.88 2.14 V Pin 17 output DC comparator level 10 Vc10DC 1.51 1.80 2.09 V Pin 18 output DC comparator level 9 Vc9DC 1.40 1.71 2.02 V Pin 19 output DC comparator level 8 Vc8DC 1.33 1.66 1.99 V Pin 21 output DC comparator level 7 Vc7DC 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vc8DC 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vc8DC 0.93 1.26 1.59 V Pin 25 output DC comparator level 3 Vc3D | DC comparator level 16 | VC16DC | 2.76 | 3.10 | 3.44 | V | Pin 12 output |
| DC comparator level 14 | DC comparator level 15 | V _{C15DC} | 2.35 | 2.64 | 2.93 | V | Pin 13 output |
| DC comparator level 12 Vc12DC 1.79 2.03 2.27 V Pin 16 output DC comparator level 11 Vc11DC 1.62 1.88 2.14 V Pin 17 output DC comparator level 10 Vc10DC 1.51 1.80 2.09 V Pin 18 output DC comparator level 9 Vc9DC 1.40 1.71 2.02 V Pin 19 output DC comparator level 8 Vc8DC 1.33 1.66 1.99 V Pin 21 output DC comparator level 7 Vc7DC 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vc8DC 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vc8DC 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4DC 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3DC 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2DC <td>DC comparator level 14</td> <td>VC14DC</td> <td>2.07</td> <td>2.33</td> <td>2.59</td> <td>V</td> <td>Pin 14 output</td> | DC comparator level 14 | VC14DC | 2.07 | 2.33 | 2.59 | V | Pin 14 output |
| DC comparator level 11 | DC comparator level 13 | VC13DC | 1.86 | 2.10 | 2.34 | V | Pin 15 output |
| DC comparator level 10 Vctobc 1.51 1.80 2.09 V Pin 18 output DC comparator level 9 Vcsbc 1.40 1.71 2.02 V Pin 19 output DC comparator level 8 Vcsbc 1.33 1.66 1.99 V Pin 21 output DC comparator level 7 Vczbc 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vcsbc 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vcsbc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4bc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3bc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | DC comparator level 12 | VC12DC | 1.79 | 2.03 | 2.27 | V | Pin 16 output |
| DC comparator level 9 Vcspc 1.40 1.71 2.02 V Pin 19 output DC comparator level 8 Vcspc 1.33 1.66 1.99 V Pin 21 output DC comparator level 7 Vcspc 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vcspc 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vcspc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4pc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vcspc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vcspc 0.21 0.33 0.45 V Pin 27 output | DC comparator level 11 | VC11DC | 1.62 | 1.88 | 2.14 | V | Pin 17 output |
| DC comparator level 8 Vcsbc 1.33 1.66 1.99 V Pin 21 output DC comparator level 7 Vcrbc 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vcsbc 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vcsbc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4bc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3bc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | DC comparator level 10 | VC10DC | 1.51 | 1.80 | 2.09 | V | Pin 18 output |
| DC comparator level 8 Vcsbc 1.33 1.66 1.99 V Pin 21 output DC comparator level 7 Vczbc 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vcsbc 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vcsbc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4bc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3bc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | · · · · · · · · · · · · · · · · · · · | Vcepc | 1.40 | 1.71 | 2.02 | ٧ | , |
| DC comparator level 7 Vczpc 1.23 1.58 1.93 V Pin 22 output DC comparator level 6 Vcsbc 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vcsbc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4bc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3bc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | · | VCSDC | 1.33 | 1.66 | 1.99 | ٧ | · · |
| DC comparator level 6 Vcsbc 1.07 1.41 1.75 V Pin 23 output DC comparator level 5 Vcsbc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4bc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3bc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | | V _{C7DC} | 1.23 | 1.58 | 1.93 | ٧ | |
| DC comparator level 5 Vcsbc 0.93 1.26 1.59 V Pin 24 output DC comparator level 4 Vc4bc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3bc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | <u> </u> | Vcedc | 1.07 | 1.41 | 1.75 | ٧ | , |
| DC comparator level 4 Vc4Dc 0.77 1.07 1.37 V Pin 25 output DC comparator level 3 Vc3Dc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vc2Dc 0.21 0.33 0.45 V Pin 27 output | · | Vcsdc | 0.93 | 1.26 | 1.59 | ٧ | |
| DC comparator level 3 Vcspc 0.42 0.60 0.78 V Pin 26 output DC comparator level 2 Vczpc 0.21 0.33 0.45 V Pin 27 output | · | V _{C4DC} | 0.77 | | 1.37 | ٧ | ' |
| DC comparator level 2 Vc2bc 0.21 0.33 0.45 V Pin 27 output | · | | | | | ٧ | , |
| | · | Vc2DC | 0.21 | 0.33 | 0.45 | V | |
| | DC comparator level 1 | | | | | | Pin 28 output |

Notes: (1) The value given above for AC comparator level is measured after 0dB point adjustment.

(2) DC comparator level VC (n) DC (Max.) > VC (n+1) DC (Min.), but when the nth comparator is off, the (n+1)th comparator is never on.

Measurement circuit

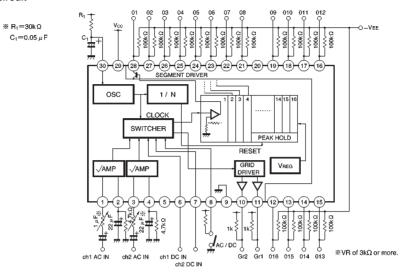


Fig. 1

Application example

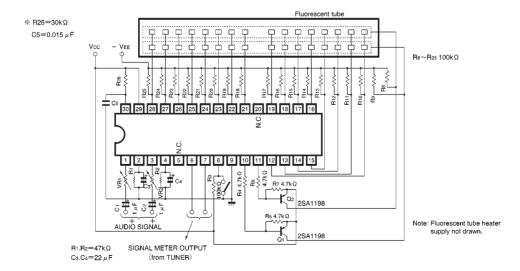


Fig. 2

Circuit operation

(1) Input block

The AC input pins are pins 1 and 3, and the DC input pins are pins 6 and 7. Pin 8 is used to switch between the AC and DC inputs. When the input to pin 8 is "H", AC input is selected (pins 1 and 3). Therefore, by using pin 8 to switch between the AC and DC modes, the IC can do two jobs. For example, pins 1 and 3 can be used for audio signal input, and pins 6 and 7 can be used as the input for the signal meter output from a tuner (DC). The AC input impedance of pins 1 and 3 is a low 250 Ω (typ.), so connect potentiometers (VR₁ and VR₂) in series with the inputs to adjust the sensitivity and ch1 and ch2 balance.

(2) Peak hold circuit

The BA6800AS features a peak hold circuit that temporarily holds peak signal levels in AC input mode. The peak hold function can be used with the upper 12 points (5 to 16). The peak hold time depends on the oscillator frequency. It is 2 sec. (typ.) for an oscillator frequency of 2kHz. DC mode does not have a peak hold function.

(3) Grid output

The pin 10 and 11 grid outputs are open-collector NPN transistors. The logic is active low (the fluorescent tube lights when the output is "L"), so connect two PNP transistors Q1 and Q2 as shown in the application example circuit to drive the fluorescent tubes (see Fig. 3).

Fluorescent tube grid

(4) Segment output block

Pins 12 to 28 are the segment outputs. The output circuits are open-collector PNP transistors. When grid 1 is "L", the ch1 level is output (pin 1 or 6), and when grid 2 is "L", the ch2 level is output (pin 3 or 7). Refer to Fig. 4.

(5) Grid and segment output timing chart

The grid and segment output timing is shown in Fig. 5.

(6) Attack and release times

The response characteristic for AC input signals is set by resistor R1 and capacitor C_3 for ch1 and resistor R_2 and capacitor C_4 for ch2 (pins 2 and 4). When $R_1 = 47k\Omega$ and $C_3 = 22\mu F$, the attack time is about 4ms, and the release time is about 1sec. (same for ch2).

Attack time : Time for the voltage on pins 2 and 4

to rise from 1V to 2.5V when the input goes from no input to 2.6Vrms, then

back to no input.

Release time: Time for the voltage on pins 2 and 4

to fall from 2.5V to 1V when the input goes from 2.6Vrms to no input.

(7) Oscillator frequency

The resistor R_{26} and capacitor C_5 connected to pin 30 determine the oscillator frequency. The oscillator frequency (f_{osc}) and grid output period (T) are related as follows:

 $T (ms) = 16 / f_{osc} (kHz)$

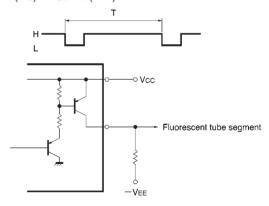


Fig. 4

Timing chart

(when oscillator frequency is 2kHz)

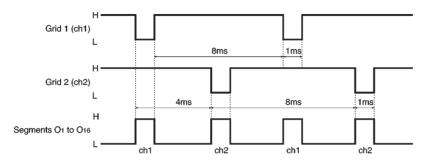


Fig. 5

Attached components (refer to "Circuit operation")

C₁ and C₂: input coupling capacitors.

 VR_1 and VR_2 : AC sensitivity adjustment and balance adjustment ($3k\Omega$ recommended).

 C_3 , R_1 , C_4 and R_2 : set the response characteristics with respect to the AC input signal. In the example given, the attack time is about 4mS and the release time is about 1sec.

 R_3 : Pullup resistor for the input switching terminal (pin 8). R_6 and R_7 : resistor for the grid leak current path (I_Gleak). Set so that I_Gleak \times R_6 (R7) < 0.6V.

R₄ and R₅: base bias resistors for Q₁ and Q₂.

Conditions for base bias current (IB) flow are $V_{\text{CC}} = 5V$ and $V_{\text{F}} = 0.6V$:

$$\frac{R_4}{R_6} < \frac{5-0.6}{0.6} = 7.3$$

the base current is given by the following formula.

Operation notes

- (1) Adjust the potentiometers VR_1 and VR_2 (connected to pins 1 and 3) to adjust the 0dB input level and the dispersion of ch1 and ch2.
- (2) The temperature characteristic for the lighting limit for the 16th LED is shown in Fig. 6.

$$I_{B} \; (mA) \; \ \, \stackrel{\leftarrow}{=} \; \frac{5-0.6}{R_{4} \; (k\Omega)} - \frac{0.6}{R_{6} \; (k\Omega)}$$

Set resistors R4 and R6 (R5 and R7) so that

$$I_B > \frac{Fluorescent tube grid current}{h_{FE}}$$

 Q_1 and Q_2 : grid output inverting transistors. Use transistors for which $V_{\text{CEO}} > V_{\text{CC}} \ + \ V_{\text{EE}}.$

 R_{8} to R_{25} : Resistors that reverse bias the segments and grid when the fluorescent tube is not lit.

The application example given is for general cases. Select the resistors to suit the characteristics of the fluorescent tube used.

C₅ and R₂₆: set the oscillator frequency.

Capacitor C₅ should be a component with good temperature characteristics.

(3) The external resistor R_{26} connected to the oscillator (pin 30) should be in the range of $20k\Omega$ and $100k\Omega$. If it is outside this range, oscillation may stop due to the influence of temperature (see Fig. 7).

Electrical characteristics curves

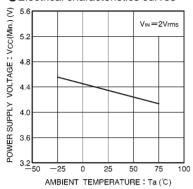


Fig. 6 16th point lighting limit power supply voltage vs. ambient temperature

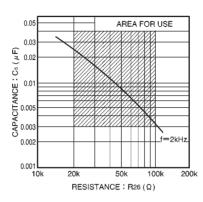


Fig. 7 Value of external components for oscillator (Vcc = 5.0V)

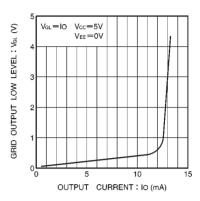


Fig. 8 Grid low level output vs. output current

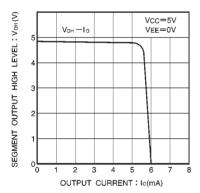


Fig. 9 Segment high level output vs. output current

External dimensions (Units: mm)

