



I had more email correspondence with the **Design Support Group** on 24 August 2004 where I wrote *'The LM3886 has almost identical characteristics to half of an LM4780, so I assume their design is very similar'*.

The response on 26 August 2004 was *'The LM4780 is two LM3886 die in a single package. So the equivalent schematic from the LM3886 DS can be used as an equivalent schematic for each channel (amplifier) in the LM4780. With the LM4780 being two die the GND pins are NOT internally connected'*. A further response on 27 August 2004 was *'There is no difference in the two die used in the LM4780 and the single die used in the LM3886. Using two die is more efficient thermally as the distance between the die helps improve heat flow out of the package to the heat sink. Cost is also reduced as smaller die have higher yields than larger die due to defect density so a single, large dual die design would not have any benefits over two separate die'*.

I wrote again on 30 August 2004 *'From the connection diagram on*

*page 2 of the LM4780 PDF data sheet it is fairly clear how the lead-outs from the two LM3886 dice are allocated to pins 7 & 12-16 for die "A" and pins 19-25 for die "B", but I am confused about the five pairs of V+ and V- pins. Are the five V+ pins connected together internally, and the five V- pins connected together internally, or are they individually distributed between the two dice?'*

The **Design Support Group** responded on 14 September 2004 '*Here is the connection of each die:*

*Pin Connection*

*1 N/C*

*2 V- (Vee) Down bond to the DAP of the package*

*3 N/C*

*4 V- (Vee) to die A 1st V- pad*

*5 V+ (Vcc) to die A 1st V+ pad*

*6 N/C*

*7 Output from die A pad*

*8 V+ (Vcc) to die A 2nd V+ pad*

*9 V+ (Vcc) to die A 2nd V+ pad*

*10 V- (Vee) to die A 2nd V- pad*

*11 V- (Vee) to die A 2nd V- pad*

*12 GND to die A GND pad*

*13 N/C*

*14 Mute to die A Mute pad*

*15 INA- to die A INA- pad*

*16 INA+ to die A INA+ pad*

*17 V+ (Vcc) to die B 2nd V+ pad*

*18 V- (Vee) to die B 2nd V- pad*

*19 GND to die B GND pad*

*20 Mute to die B Mute pad*

*21 INB- to die B INB- pad*

*22 INB+ to die B INB+ pad*

*23 N/C*

*24 N/C*

*25 Output from die B pad*

*26 N/C*

*27 V+ (Vcc) to die B 1st V+ pad*

*Internal Downbond to DAP from die B 1st V- pad*

*The reason sometimes there are two V- or V+ pins to a pad is that there is one bond wire from each pin. This makes for better connection to the PCB. When there is only one pin then there are two bond wires from the pin to the pad. Downbonds are all double wires as well. Inputs, Mute and GND are all single bond wires since they are low current'.*

*After I asked for some clarification on a couple of the connections, there was a further response on 15 September 2004 'DAP means Die Attach Pad, it is the flat area where the die is attached to the package. .... There is only one wire from pin 4 to the V- pad because of spacing it was not possible to do two wires. Also, the output pins have two wires to them but each die actually has two output pads. One wire from each pad goes to pin 7 or pin 25 respectively. So two wires to each output pin'.*

<http://home.mira.net/~gnb/audio/lm4780.html#annotated>