



Details are subject to change without notice

## 14+1-Channel Buffer for TFT LCD

### Features

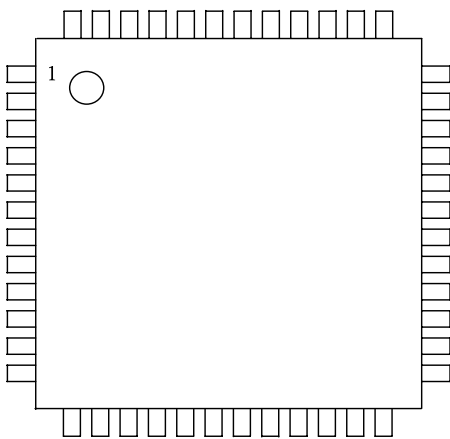
- 14-Channels with Output Current:  $\pm 30\text{mA}$  (MAX)
- One channel  $V_{\text{com}}$  with Output Current:  $\pm 100\text{mA}$  (MAX)
- Unity Gain Buffer Capable of Driving Large Capacitive Loads
- Input Range Adjusted to Match TFT LCD Requirements
- $V_{\text{DD}}$  Specified for 6.5V to 17V
- TQFP-48 Package

### General Description

Consisted of 14+1-channel buffers, the AAT7200 is designed to increase the driving capability for the needs of the thin film transistor liquid crystal display (TFT LCD). This device includes a  $V_{\text{com}}$  buffer circuits, four rail to rail buffer amplifiers circuits, and 10 buffer amplifiers circuits. Each buffer is capable of driving heavy load and offering fast current loading ( $V_{\text{com}}$ : 100mA, the others: 30mA).

### Pin Configuration

TOP VIEW



TQFP-48



**Pin Description**

Pin No.	Name	I/O	Description
1	O13	O	Buffer Channel 13 Output
2	O12	O	Buffer Channel 12 Output
3	O11	O	Buffer Channel 11 Output
4	O10	O	Buffer Channel 10 Output
5	O9	O	Buffer Channel 9 Output
6	O8	O	Buffer Channel 8 Output
7	GND	I	Ground
8	V <sub>DD</sub>	I	Power Supply
9	O7	O	Buffer Channel 7 Output
10	O6	O	Buffer Channel 6 Output
11	O5	O	Buffer Channel 5 Output
12	O4	O	Buffer Channel 4 Output
13	O3	O	Buffer Channel 3 Output
14	NC	-	-
15	V <sub>DD</sub>	I	Power Supply
16	NC	-	-
17	NC	-	-
18	O2	O	Buffer Channel 2 Output
19	GND	I	Ground
20	O1	O	Buffer Channel 1 Output
21	GND	I	Ground
22	V <sub>DD</sub>	I	Power Supply
23	I1	I	Buffer Channel 1 Input
24	I2	I	Buffer Channel 2 Input
25	I3	I	Buffer Channel 3 Input
26	I4	I	Buffer Channel 4 Input
27	I5	I	Buffer Channel 5 Input
28	I6	I	Buffer Channel 6 Input
29	I7	I	Buffer Channel 7 Input
30	V <sub>DD</sub>	I	Power Supply

**Pin Description (Cont.)**

<b>Pin No.</b>	<b>Name</b>	<b>I/O</b>	<b>Description</b>
31	GND	I	Ground
32	I8	I	Buffer Channel 8 Input
33	I9	I	Buffer Channel 9 Input
34	I10	I	Buffer Channel 10 Input
35	I11	I	Buffer Channel 11 Input
36	I12	I	Buffer Channel 12 Input
37	I13	I	Buffer Channel 13 Input
38	I14	I	Buffer Channel 14 Input
39	I <sub>com</sub>	I	Com Buffer Positive Input
40*	NC	-	(For AAT7200 Only)
40*	I <sub>com-</sub>	-	Com Buffer Negative Input (For AAT7200A Only)
41	NC	-	-
42	NC	-	-
43	V <sub>DD</sub>	I	Power Supply
44	GND	I	Ground
45	V <sub>DD</sub>	I	Power Supply
46	GND	I	Ground
47	O <sub>com</sub>	O	Com Buffer Output
48	O14	O	Buffer Channel 14 Output

**Absolute Maximum Ratings**

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Supply Voltage	$V_{DD}$	+18	V
Input Voltage	$V_I$	-0.5 to $V_{DD} + 0.5$	V
Output Voltage	$V_O$	-0.5 to $V_{DD} + 0.5$	V
Output Loading Current for Gamma , Rail-to-Rail Buffer	$I_L$	$\pm 30$	mA
Output Loading Current for Com Buffer		$\pm 100$	mA
Maximum Junction Temperature	$T_J$	+150	°C
Power Dissipation, @ $T_C = 25$ °C	$P_D$	2.72	W
Power Dissipation, @ $T_C = 70$ °C	$P_D$	1.74	W
Package Thermal Resistance	$\theta_{JA}$	46	°C/W
Package Thermal Resistance	$\theta_{JC}$	31	°C/W
Operating Temperature	$T_C$	- 20 to +85	°C
Storage Temperature	$T_{storage}$	- 45 to +125	°C
Lead Temperature (Soldering for 10 seconds)	---	260	°C

Note 1: Operating device at values beyond absolute maximum ratings may cause permanent damage.

**Electrical Characteristics** ( $V_{DD}=10V$ ,  $T_C=25^\circ C$  unless otherwise specified)**Power Supply Performance**

Parameter		Test Conditions	Min	Typ	Max	Units
Power Supply Rejection Ratio	PSRR	$V_{DD}$ from 6.5V to 17.0V	-	80	-	dB
Supply Current	$I_S$		-	9	-	mA

**Input Characteristics**

Parameter		Test Conditions	Min	Typ	Max	Units
Input Offset Voltage	$V_{OS}$	$V_I = V_{DD}/2$ , $V_O = V_{DD}/2$	-	2	12	mV
Input Bias Current	$I_B$	$V_I = V_{DD}/2$ , $V_O = V_{DD}/2$	-	2	50	nA

**AC Characteristics**

Parameter		Test Conditions	Min	Typ	Max	Units
Slew Rate	SR	$V_I = 2V$ to 8V, 20% to 80%	-	1	-	V/ $\mu$ s
Settling Time	$t_s$	$V_I = 4.5V$ to 5.5V 0.1% $V_I = 5.5V$ to 4.5V 0.1%	-	5	-	$\mu$ s



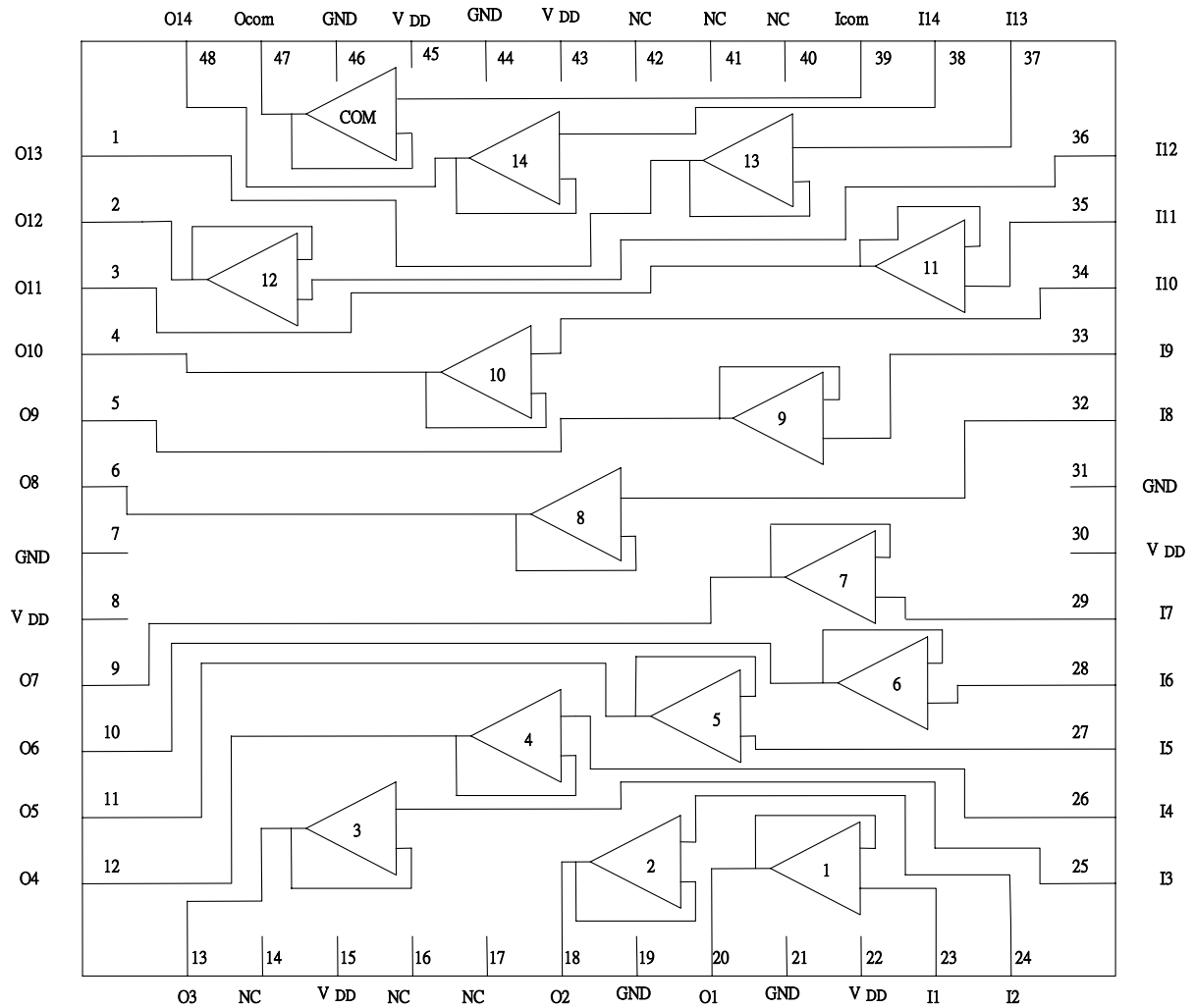
**Electrical Characteristics** ( $V_{DD}=10V$ ,  $T_C=25^\circ C$  unless otherwise specified) (Cont.)

**Output Characteristics**

Parameter		Test Conditions	Min	Typ	Max	Un
Output Swing Low	$V_{OL}$	$I_L=5mA$ (Buffer 1, 2, 13, 14) $V_I=0V$	-	0.08	0.15	V
		$I_L=10mA$ (Buffer 3, 4,..., 11, 12) $V_I=1V$	-	1.02	1.05	
Output Swing High	$V_{OH}$	$I_L=-5mA$ (Buffer 1, 2, 13, 14) $V_I=10V$	9.85	9.92	-	V
		$I_L=-10mA$ (Buffer 3, 4,..., 11, 12) $V_I=9V$	8.95	8.98	-	
Output Swing (Buffer 3, 4,..., 11, 12)	$V_{OL}$	$I_L=10mA$ , $V_I=5V$	-	5.02	5.04	V
	$V_{OH}$	$I_L=-10mA$ $V_I=5V$	4.96	4.98	-	
Output Swing (COM)	$V_{OL}$	$I_L=50mA$ $V_I=5V$	-	5.03	5.05	V
	$V_{OH}$	$I_L=-50mA$ $V_I=5V$	4.95	4.97	-	
Short Circuit Current	$I_{SC}$	(Buffer 1~14 )	-	$\pm 70$	-	mA
		(Com Buffer), $I_{com}$ - short to $O_{com}$ for AAT7200A	-	$\pm 180$	-	mA

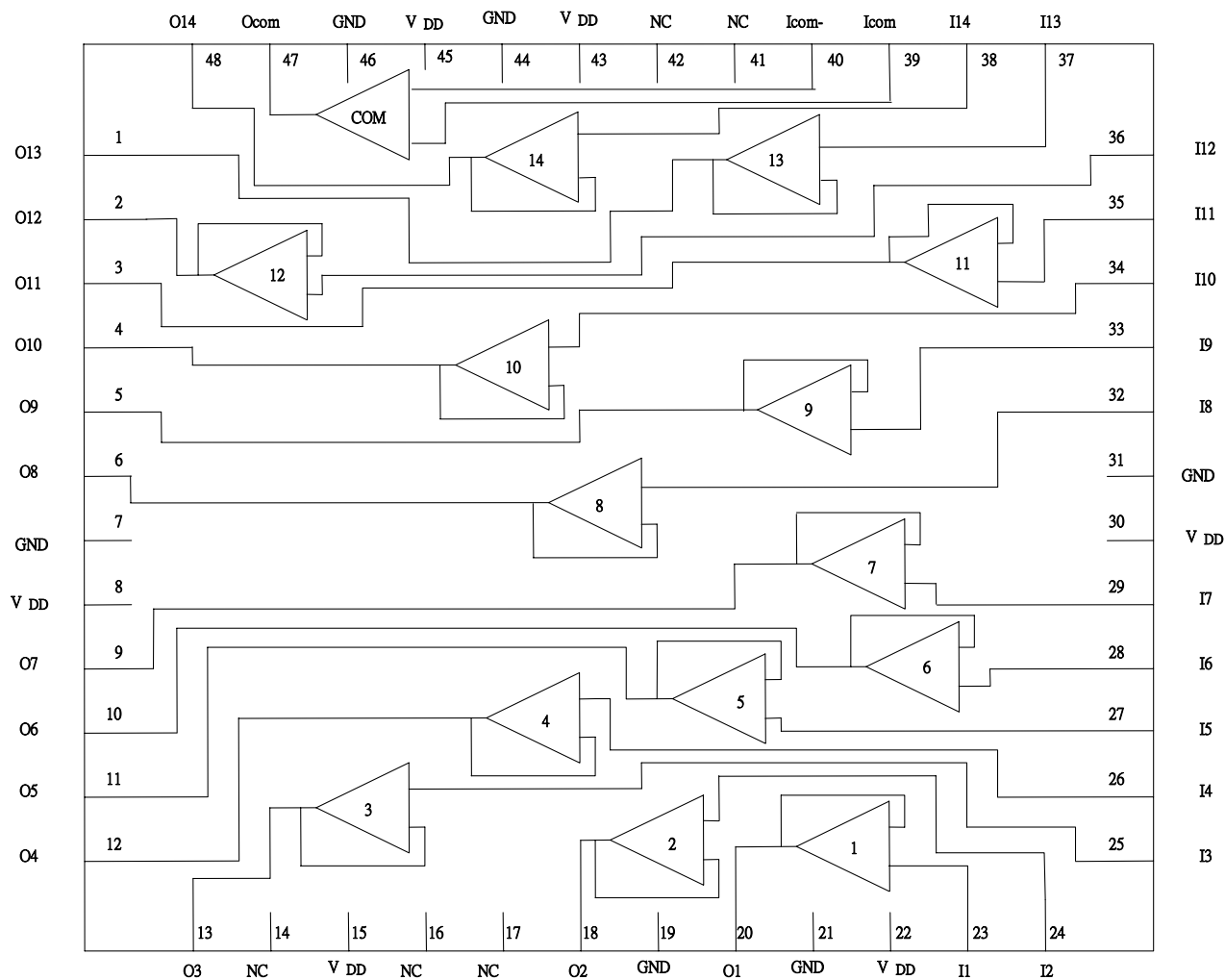


**Block Diagram**  
AAT7200





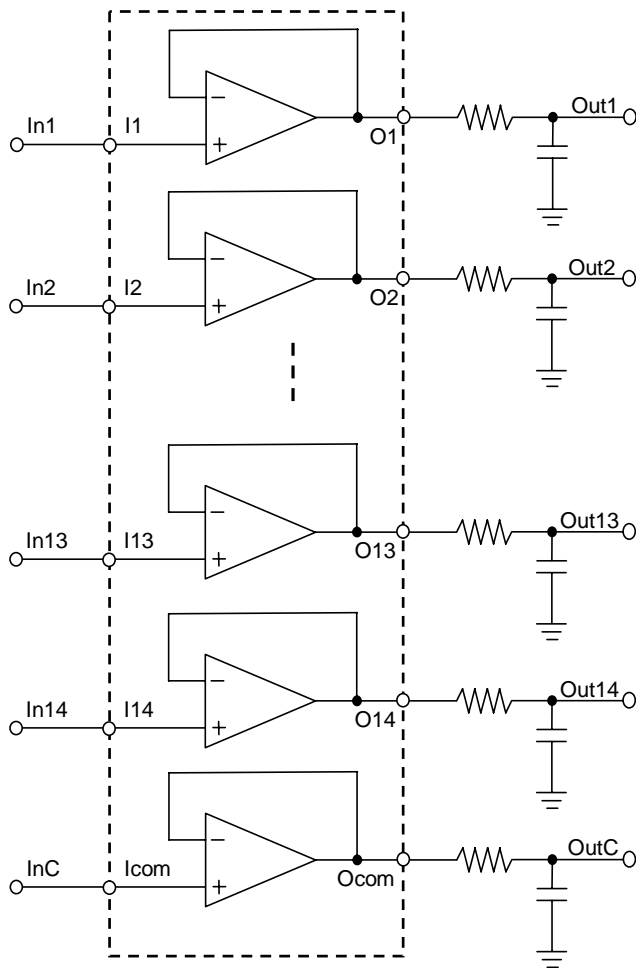
**Block Diagram**  
AAT7200A





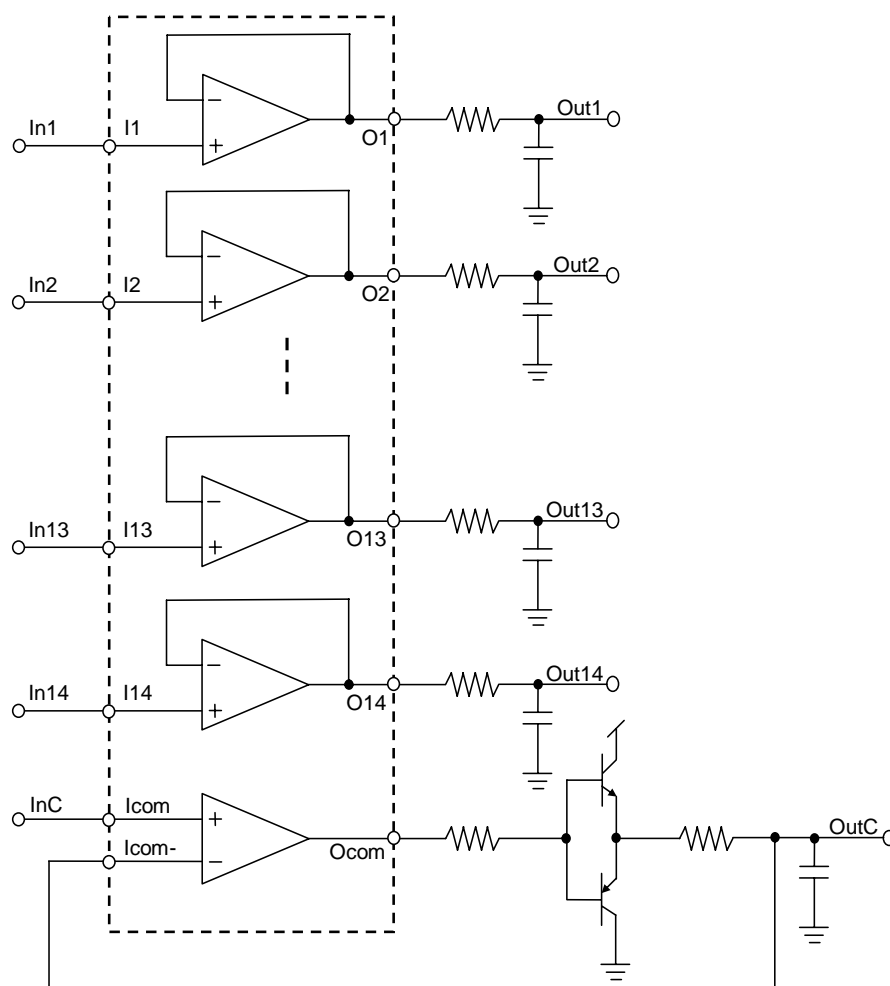


**Application Circuit**  
**AAT7200**



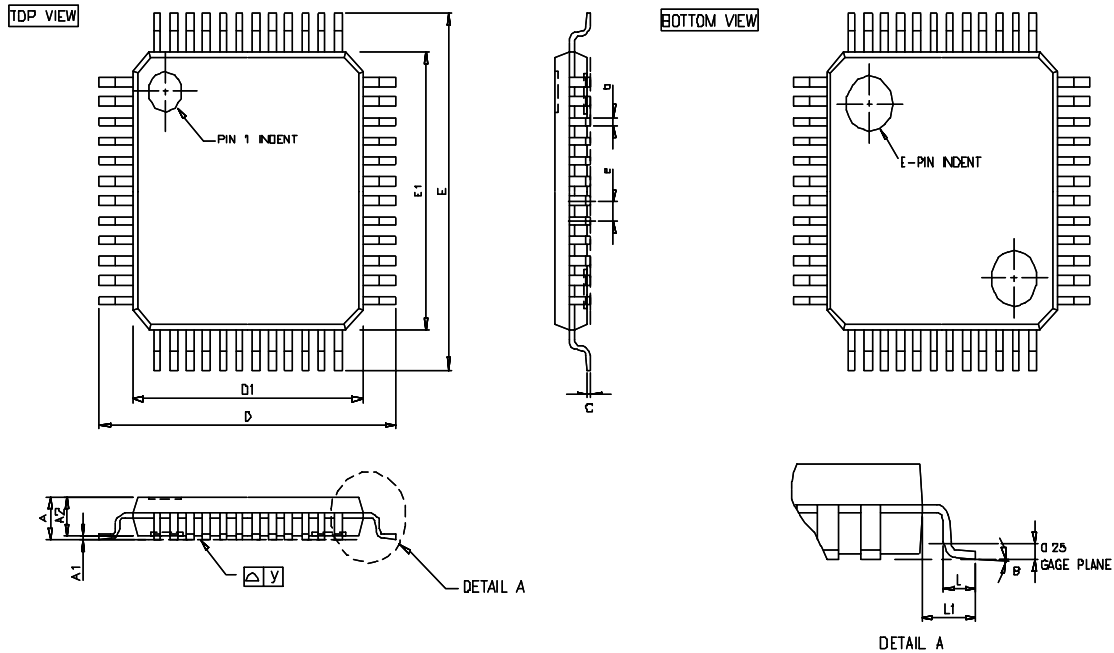


**Application Circuit**  
AAT7200A





**Package Dimension**  
**TQFP48**



Symbol	Dimensions In Millimeters		
	Min	TYP	Max
A	----	----	1.20
A1	0.05	----	0.15
A2	0.95	1.00	1.05
b	0.17	0.22	0.27
C	0.12	----	0.20
D	8.70	9.00	9.30
D1	6.80	7.00	7.20
E	8.70	9.00	9.30
E1	6.80	7.00	7.20
e	----	0.50	----
L	0.45	0.60	0.75
L1	----	1.00	----
$\theta$	0°	3.5°	7°
y	0.00	----	0.080