Advanced Analog Technology, Inc.

Details are subject to change without notice

## 14+1-Channel Buffer for TFT LCD

Features

- 14-Channels with Output Current: ±30mA (MAX)

- One channel V_{com} with Output Current: ±100mA (MAX)

- Unity Gain Buffer Capable of Driving Large Capacitive Loads

- Input Range Adjusted to Match TFT LCD Requirements

- V_{DD} Specified for 6.5V to 16V

- 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_{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_{com}: 100mA, the others: 30mA).

Pin Configuration

TOP VIEW

TQFP-48
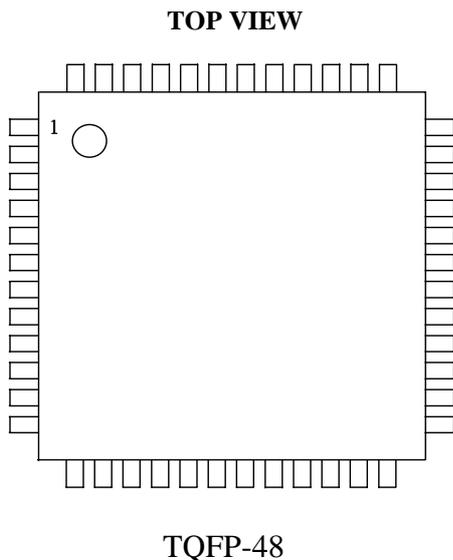
Pin Description

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_{DD}	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_{DD}	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_{DD}	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_{DD}	I	Power Supply

Pin Description (Cont.)

Pin No.	Name	I/O	Description
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_{com}	I	Com Buffer Positive Input
40*	NC	-	(For AAT7200 Only)
40*	I_{com-}	-	Com Buffer Negative Input (For AAT7200A Only)
41	NC	-	-
42	NC	-	-
43	V_{DD}	I	Power Supply
44	GND	I	Ground
45	V_{DD}	I	Power Supply
46	GND	I	Ground
47	O_{com}	O	Com Buffer Output
48	O14	O	Buffer Channel 14 Output

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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	± 30	mA
Output Loading Current for Com Buffer		± 100	mA
Maximum Junction Temperature	T_J	+125	^{o}C
Operating Temperature	T_C	-20 to +85	^{o}C
Storage Temperature	$T_{storage}$	-45 to +125	^{o}C
Lead Temperature (Soldering for10 seconds)	---	260	^{o}C

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

Electrical Characteristics (V_{DD} =10V, T_C =25°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 16.0V	-	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/μs
Settling Time	t_s	V_I=4.5V to 5.5V 0.1% V_I=5.5V to 4.5V 0.1%	-	5	-	μs

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Electrical Characteristics (V_{DD} =10V, T_C =25°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 = -5 mA (Buffer 1, 2, 13, 14) V_I =10V	9.85	9.92	-	V
		I_L = -10 mA (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 = -10 mA 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 = -50 mA V_I =5V	4.95	4.97	-	
Short Circuit Current	I_{SC}	(Buffer 1~14)	-	± 70	-	mA
		(Com Buffer), I_{com-} short to O_{com} for AAT7200A	-	± 180	-	mA

Block Diagram
AAT7200
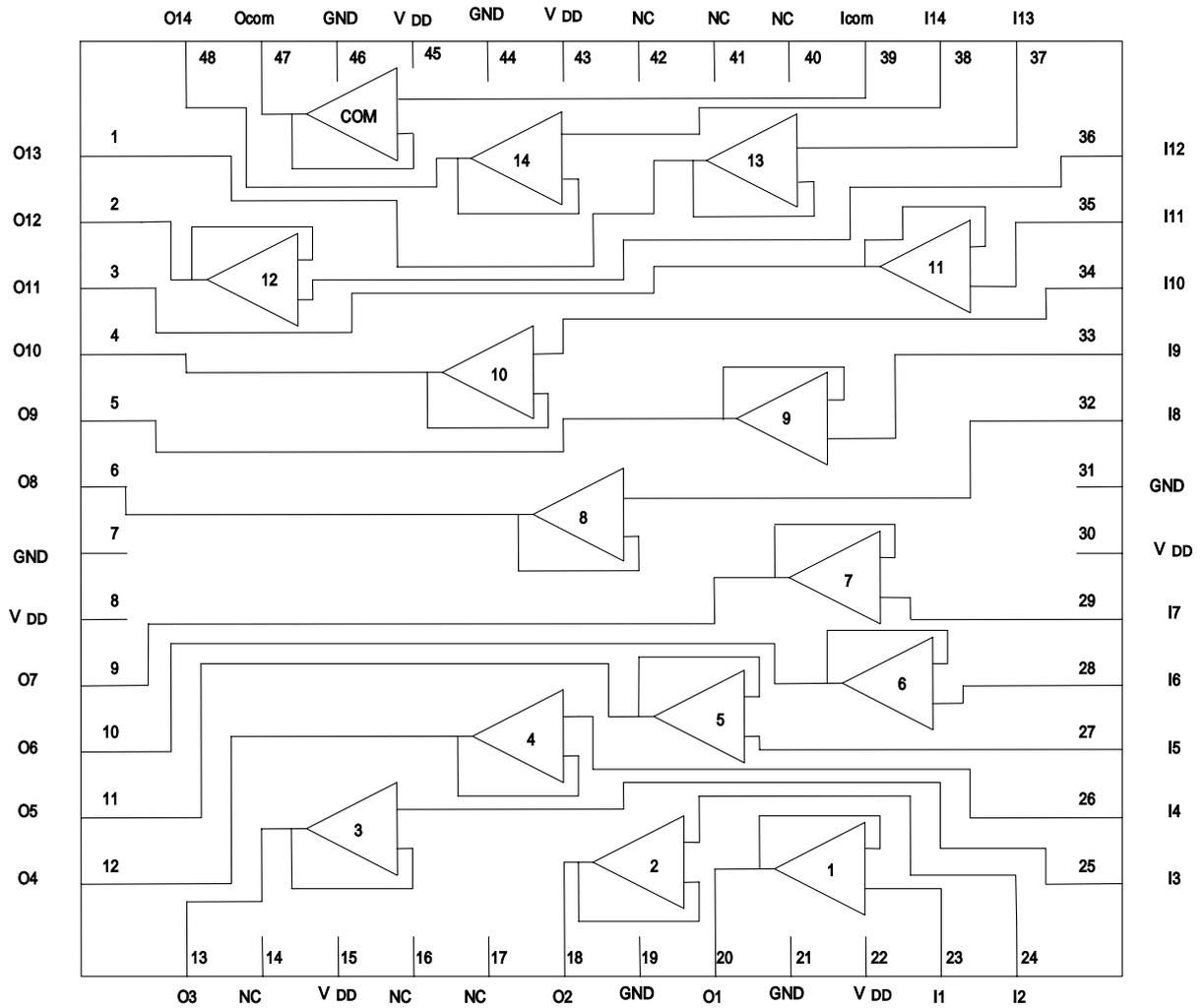
Block Diagram
AAT7200A
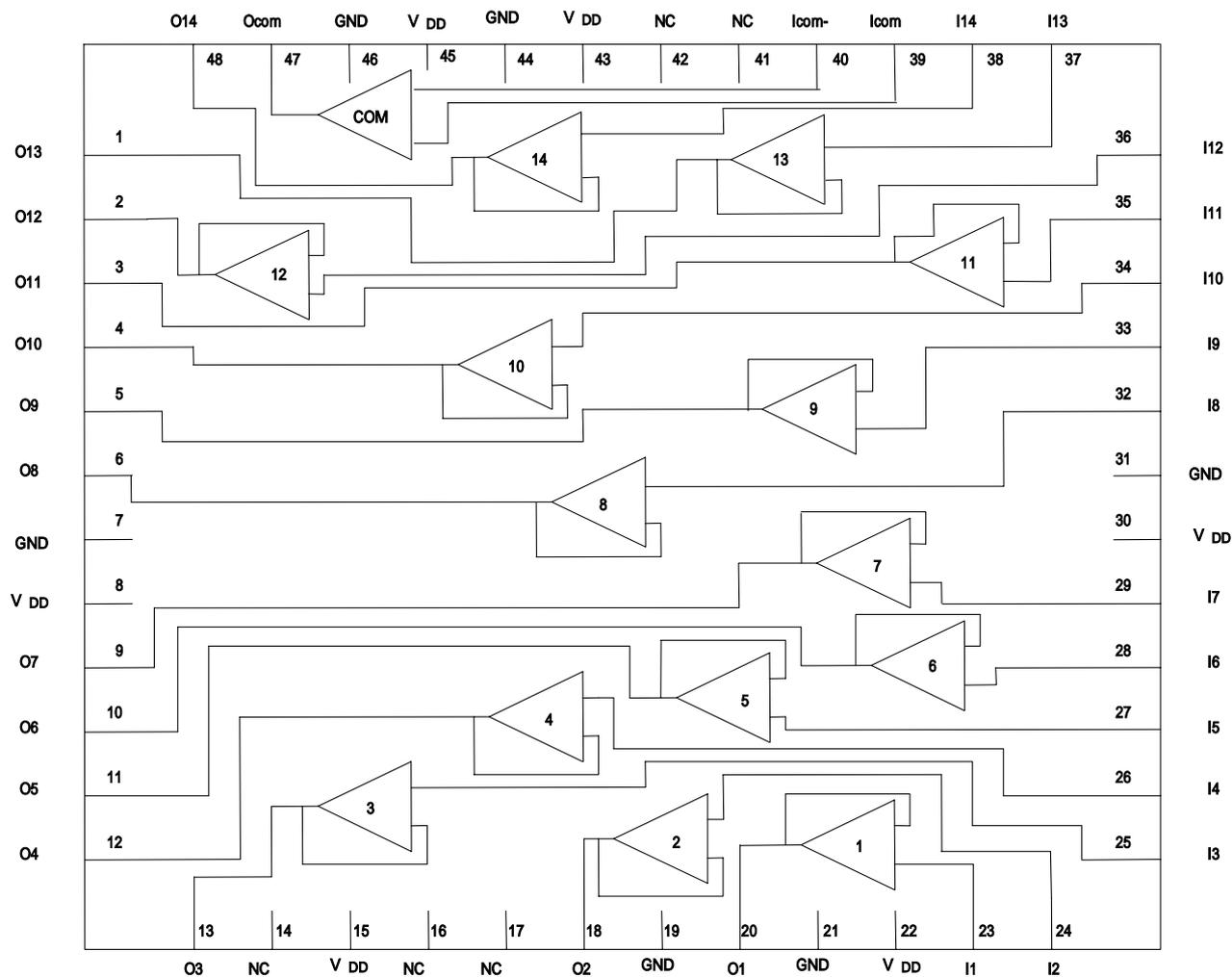
Application Circuit
AAT7200
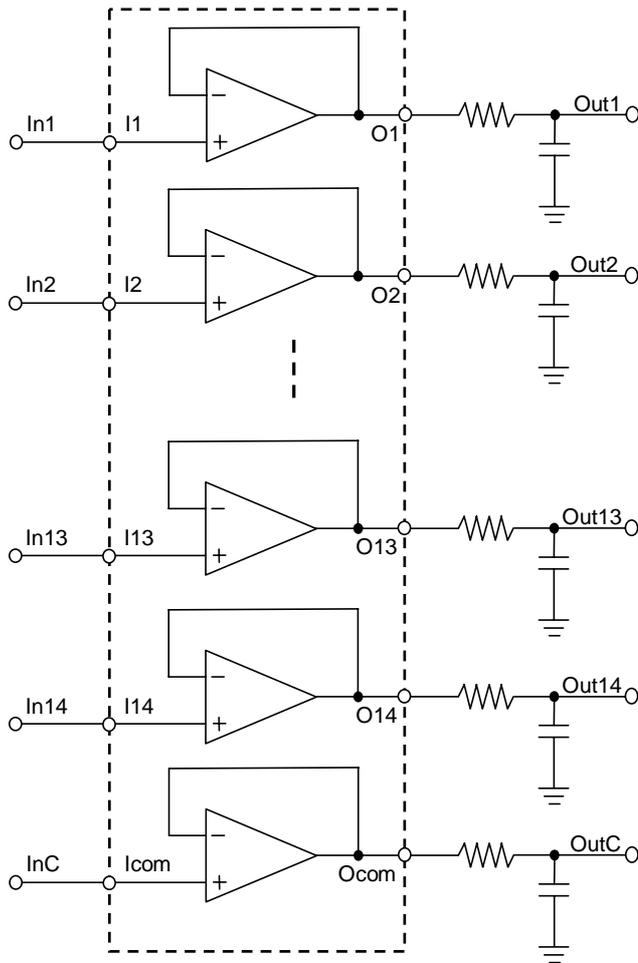
Application Circuit
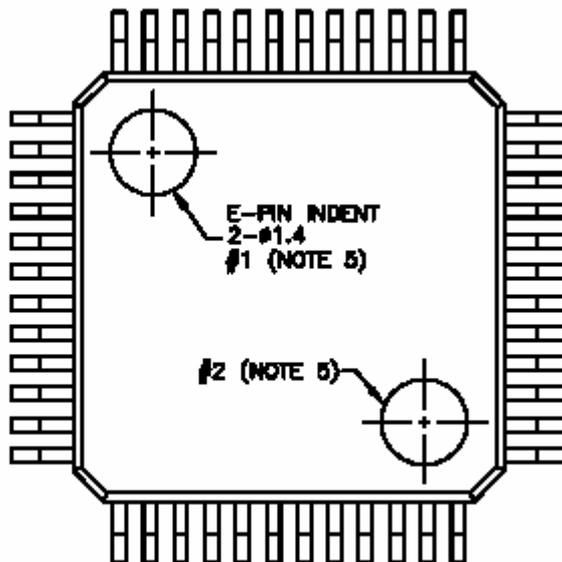**AAT7200A**
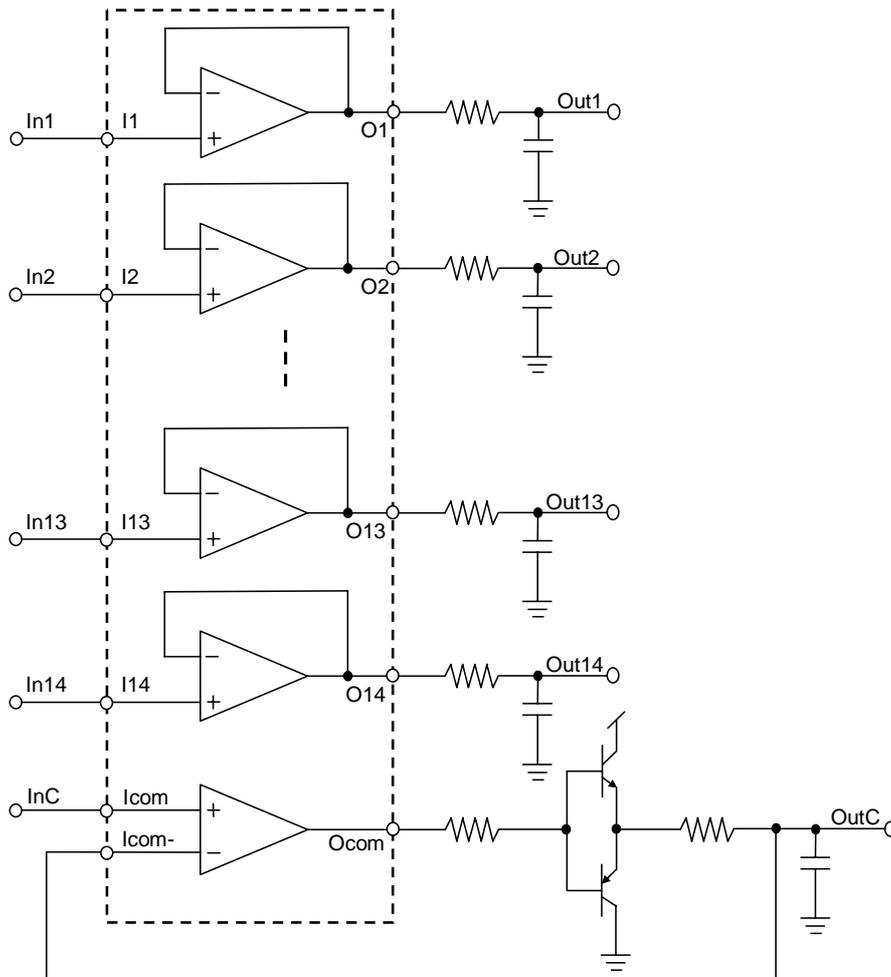
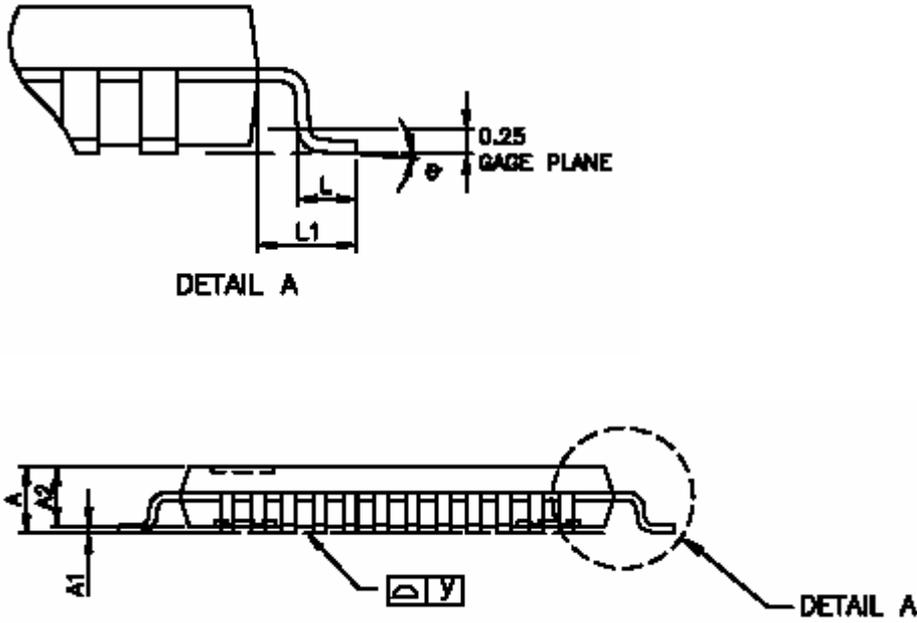**Package Dimension**
TQFP48

Package Dimension (Cont.)
TQFP48

DETAIL A
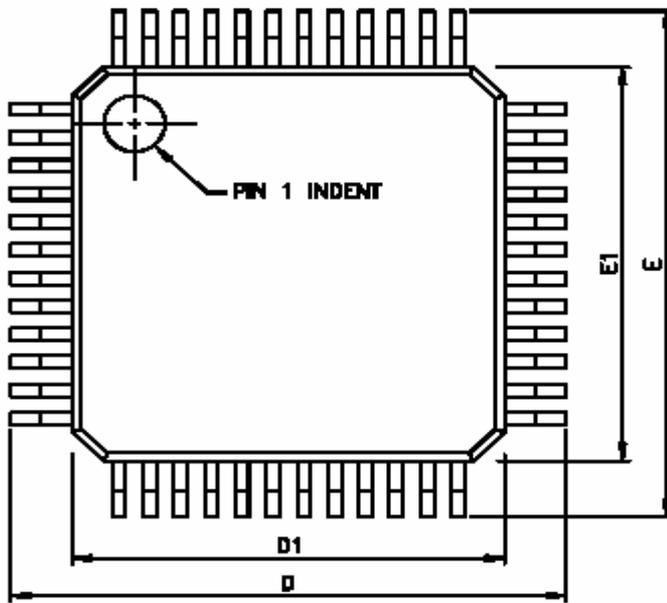
NOTE:
1. CONTROLLING DIMENSION: MILLIMETER
2. LEAD FRAME MATERIAL: COPPER C7025
3. PACKAGE DIMENSION EXCLUSIVE MOLDING FLASH ALLOWABLE PROTRUSION IS 0.25 MILLIMETERS PER SIDE.
4. DIMENSION b DOES NOT INCLUDE DAMBER PROTRUSION. ALLOWABLE DAMBER PROTRUSION SHALL NOT CAUSE THE LEAD WIDTH TO EXCEED THE MAXIMUM b DIMENSION BY MORE THAN 0.08 MILLIMETERS.
5. BOTTOM E-PIN INDENT ARE MARKED AS BELOW

6. ALL EDGE CORNERS HAVE TO BE R 0.20 MAX.
7. JEDEC NUMBER: MS-026

Package Dimension (Cont.)
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	0.09	-	0.20
E	-	9.00	-
E1	-	7.00	-
D	-	9.00	-
D1	-	7.00	-
e	-	0.50	-
L	0.45	0.60	0.75
L1	-	1.00	-
θ	$0°C$	$3.5°C$	$7.0°C$
y	0.0	-	0.08

Tape and Reel

φ20.2 HIN
φ13.0 +0.5 −0.2
2±0.5

330 REF

100 REF

16.8 REF.

COLOR : BLUE

Carrier Tape

Cover Tape

END

Trailer　　COMPONENTS　　Leader

Cover Tape
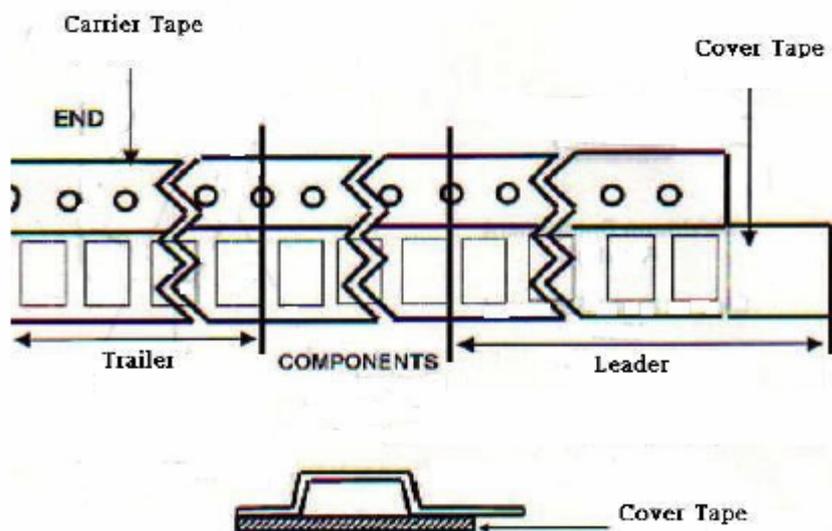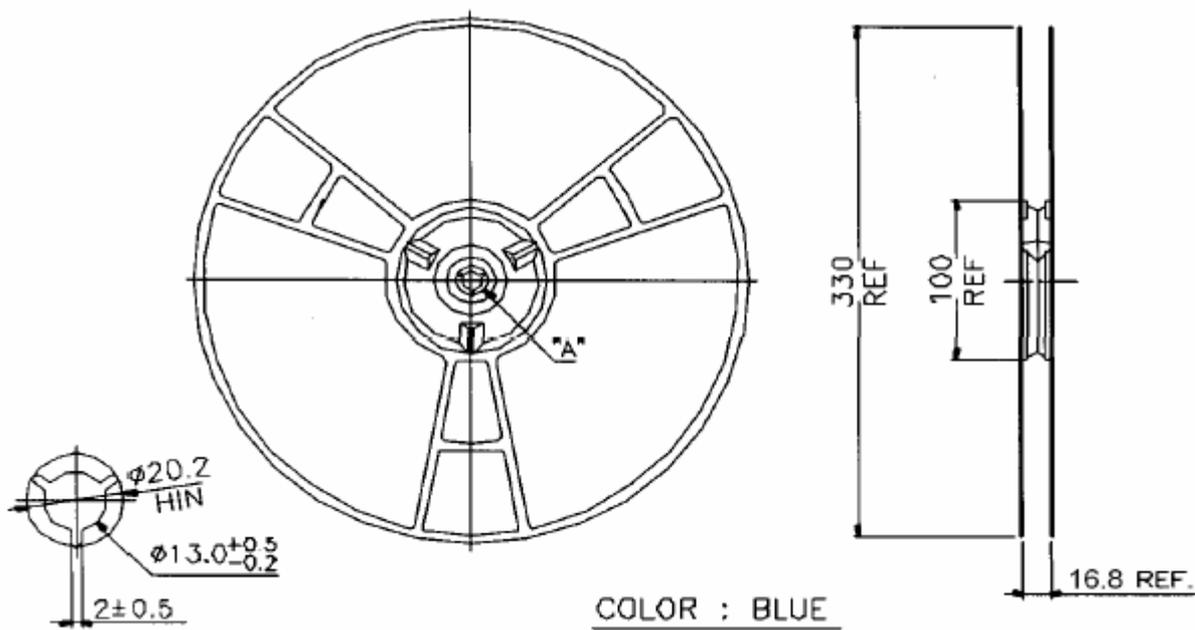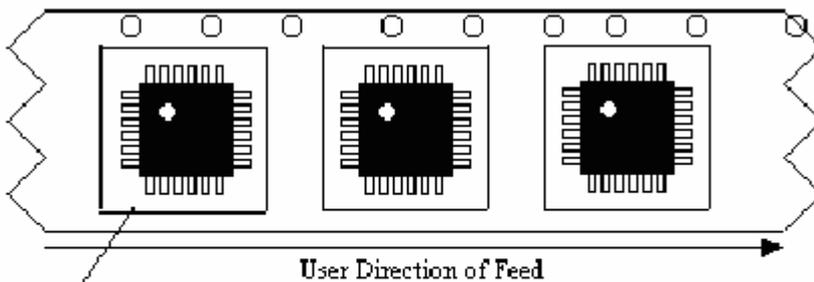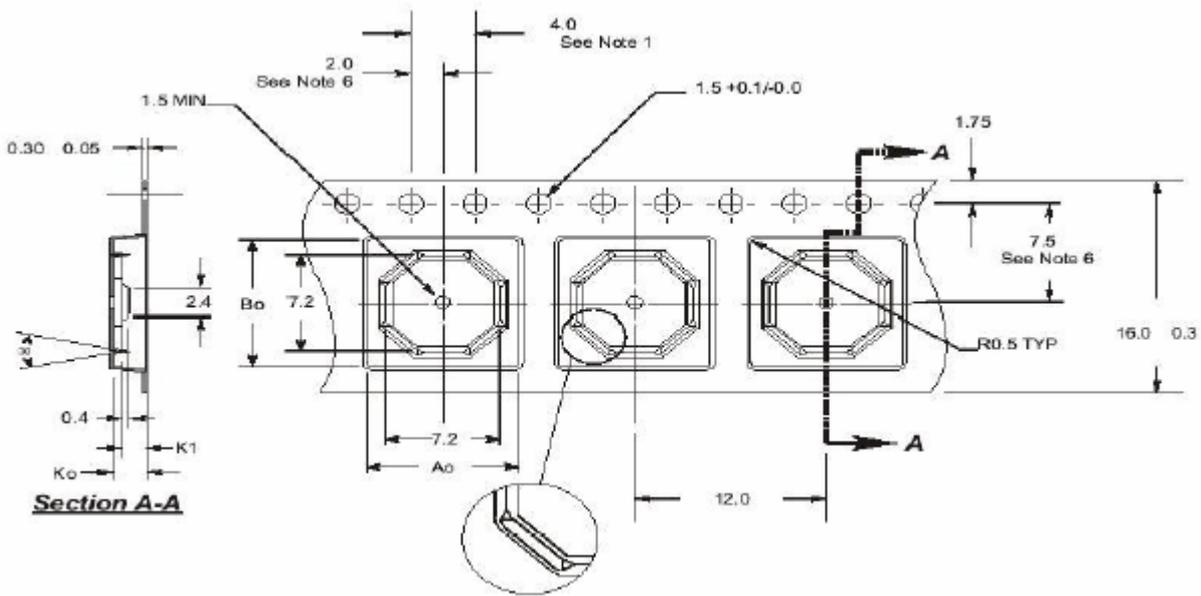
Tape and Reel (Cont.)

Ao = 9.50 mm
Bo = 9.50 mm
Ko = 2.00 mm
K1 = 1.45 mm

Tape and Reel (Cont.)

NOTE:
1. 10 SPROCKET HOLE PITCH CUMULATIVE TOLERANCE .02
2. CAMBER NOT TO EXCEED 1 MILLIMETER IN 100 MILLIMETERS
3. MATERIAL: PS+C
4. Ao AND Bo MEASURED ON A PLANE 0.3 MILLIMETERS ABOVE THE BOTTOM OF THE POCKET
5. Ko MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
6. POCKET POSITION RELATIVE TO SPROCKET HOLE MEASURED AS TRUE POSITION OF POCKET, NOT POCKET HOLE.

Ordering Information

AAT xxxxx-xx-x

AAT Part Number

Package Code 2
T=Taping Reel
Blank=Tube or Tray

Remark:
T=Taping Reel
TQFP48→ 1,000pcs/reel

Blank=Tube

Package Code 1
TQFP48: T3