TP74AUP2G07 Series

Low-power dual buffer with open-drain output

Features

- Wide supply voltage range from 0.8V to 3.6V
- Inputs accept voltages up to 3.6V
- I_{OFF} supports partial-power-down mode
- Low static power consumption; I_{CC}=0.5μA (Max.)
- ESD Protection Exceeds JESD 22
  -2000-V Human-Body Model (A114-A)
  -200-V Machine Model (A115-A)
  -1000-V Charged-Device Model (C101)

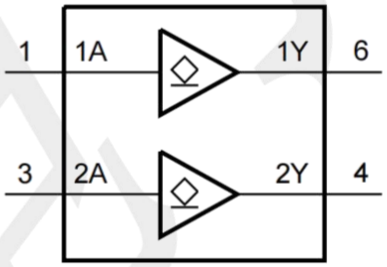
Applications

- AV Receiver
- Audio Dock:Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant(PDA)
- Power:Telecom/Server AC/DC Supply:Single Controller:Analog and Digital
- Solid State Drive(SSD):Client and Enterprise
- Wireless Headset,Keyboard,and Mouse

General Description

The TP74AUP2G07 provides the dual non-inverting buffer with open-drain output. The output of the device is an open drain and can be connected to other open-drain outputs to implement active-LOW wire-OR active-HIGH wire-AND functions.

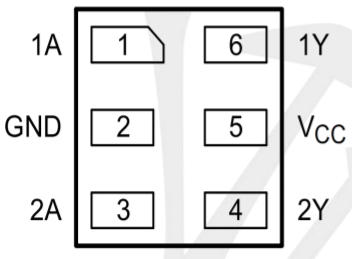
Logic Diagram



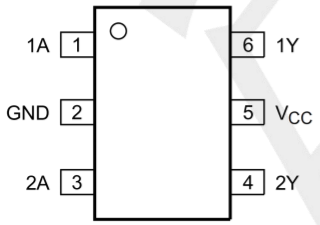
Ordering Information

ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION
TP74AUP2G07C6	SOT363	Tape and Reel,3000
TP74AUP2G07D6	DFN1X1-6	Tape and Reel,5000
TP74AUP2G07N6	DFN1510-6	Tape and Reel,5000

Pin Configuratio (TOP VIEW)



DFN1X1-6
DFN1510-6



SOT363

Function Table (each gate)

Input	Output
nA	**nY**
L	L
H	Z

Note:H: HIGH voltage level;L: LOW voltage level;
Z: high impedance state.

Absolute Maximum Ratings

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNIT
Supply Voltage	V_{CC}		-0.5 ~ +4.6	V
Input Voltage	V_{IN}		-0.5 ~ +4.6	V
Output Voltage	V_{OUT}	Output in the high or low state	-0.5 ~ +V_{CC}+0.5V	V
		Output in the power-off state	-0.5 ~ +4.6	V
VCC or GND Current	I_{CC}		±50	mA
Continuous Output Current	I_{OUT}	VOUT=0~VCC	±20	mA
Input Clamp Current	I_{IK}	VIN<0	-50	mA
Output Clamp Current	I_{OK}	VOUT<0	-50	mA
Storage Temperature Range	T_{STG}		-65 ~ +150	℃
Junction to Ambient	θ_{JA}	SOT363	280	℃/W
		DFN1X1-6	460	℃/W
		DFN1510-6	440	℃/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Recommended Operating Conditions

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	Operating	0.8	--	3.6	V
Input Voltage	V_{IN}		0	--	3.6	V
Output Voltage	V_{OUT}	High or low state	0	--	3.6	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	V_{CC}=0.8V ~ 3.6V	--	--	200	ns/V
Operating Temperature	T_A		-40	--	+125	°C

Electrical Characteristics (T_A=25°C ,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
High-level Input Voltage	V_{IH}	V_{CC}=0.8V		0.7×V_{CC}	--	--	V
		V_{CC}=0.9V ~ 1.95V		0.65×V_{CC}	--	--	V
		V_{CC}=2.3V ~ 2.7V		1.6	--	--	V
		V_{CC}=3V ~ 3.6V		2	--	--	V
Low-level Input Voltage	V_{IL}	V_{CC}=0.8V		--	--	0.3×V_{CC}	V
		V_{CC}=1.1V ~ 1.95V		--	--	0.35×V_{CC}	V
		V_{CC}=2.3V ~ 2.7V		--	--	0.7	V
		V_{CC}=3V ~ 3.6V		--	--	0.9	V
Low-Level Output Voltage	V_{OL}	V_{CC}=0.8 ~ 3.6V, I_{OL}=20μA		--	--	0.1	V
		V_{CC}=1.1V, I_{OL}=1.1mA		--	--	0.3×V_{CC}	V
		V_{CC}=1.4V, I_{OL}=1.7mA		--	--	0.31	V
		V_{CC}=1.65V, I_{OL}=1.9mA		--	--	0.31	V
		V_{CC}=2.3V	I_{OL}=2.3mA	--	--	0.31	V
			I_{OL}=3.1mA	--	--	0.44	V
		V_{CC}=3V	I_{OL}=2.7mA	--	--	0.31	V
			I_{OL}=4mA	--	--	0.44	V
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0 ~ 3.6V, V_{IN}=GND ~ 3.6V		--	--	±0.1	μA
Power OFF Leakage Current	I_{off}	V_{CC}=0 V, V_{IN} or V_{OUT}=0 ~ 3.6V		--	--	±0.2	μA
Additional Power OFF Leakage Current	ΔI_{off}	V_{CC}=0 V~0.2V,V_{IN} or V_{OUT}=0 ~ 3.6V		--	--	±0.2	μA
Quiescent Supply Current	I_{CC}	V_{CC}=0.8 ~3.6V, V_{IN}=V_{CC} or GND,I_{OUT}=0		--	--	0.5	μA
Additional Quiescent Supply Current Per Input Pin	ΔI_{CC}	V_{CC}=3.3 V, V_{IN} =V_{CC}-0.6V, I_{OUT}=0		--	--	40	μA
Input Capacitance	CI	V_{CC}=0V-3.6V, V_{IN}=V_{CC} or GND		--	1.7	--	pF
Output Capacitance	C_{OUT}	V_{CC} =0V, V_{OUT}=GND		--	1.7	--	pF

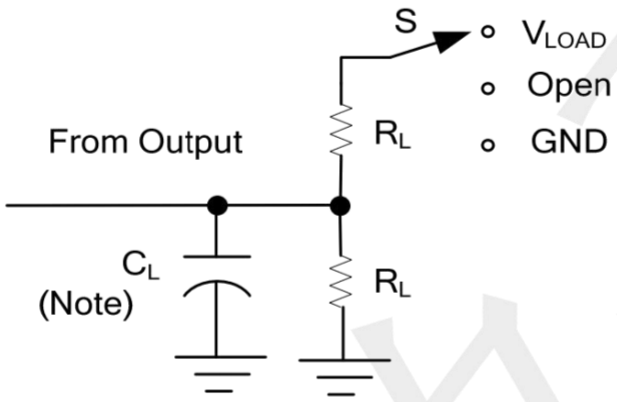
OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	V_{CC}=0.8V	--	1.0	--	pF
		V_{CC}=1.2±0.1V	--	1.0	--	pF
		V_{CC}=1.5±0.1V	--	1.0	--	pF
		V_{CC}=1.8±0.15V	--	1.0	--	pF
		V_{CC}=2.5±0.2V	--	1.0	--	pF
		V_{CC}=3.3±0.3V	--	1.0	--	pF

SWITCHING CHARACTERISTICS (TA =25°C，unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from inputs (A) to output(Y)	t_{PD}	CL=5pF, RL=5KΩ	V_{CC}=0.8V	--	12.2	--	ns
			V_{CC}=1.2V±0.1V	2.1	5.1	--	ns
			V_{CC}=1.5V±0.1V	1.6	3.6	--	ns
			V_{CC}=1.8V±0.15V	1.6	3.1	--	ns
			V_{CC}=2.5V±0.2V	1.1	2.1	--	ns
			V_{CC}=3.3V±0.3V	1.4	2.2	--	ns
		CL=10pF, RL=5KΩ	V_{CC}=0.8V	--	15	--	ns
			V_{CC}=1.2V±0.1V	3	6.2	--	ns
			V_{CC}=1.5V±0.1V	2.3	4.4	--	ns
			V_{CC}=1.8V±0.15V	2.4	3.9	--	ns
			V_{CC}=2.5V±0.2V	1.7	2.8	--	ns
			V_{CC}=3.3V±0.3V	2.2	3.0	--	ns
		CL=15pF, RL=5KΩ	V_{CC}=0.8V	--	18.2	--	ns
			V_{CC}=1.2V±0.1V	3.5	7.3	--	ns
			V_{CC}=1.5V±0.1V	3	5.2	--	ns
			V_{CC}=1.8V±0.15V	2.8	4.8	--	ns
			V_{CC}=2.5V±0.2V	2.4	3.4	--	ns
			V_{CC}=3.3V±0.3V	2.2	3.7	--	ns
		CL=30pF, RL=5KΩ	V_{CC}=0.8V	--	26.5	--	ns
			V_{CC}=1.2V±0.1V	4.8	10.7	--	ns
			V_{CC}=1.5V±0.1V	4.1	7.7	--	ns
			V_{CC}=1.8V±0.15V	3.8	7.5	--	ns
			V_{CC}=2.5V±0.2V	3.7	5.4	--	ns
			V_{CC}=3.3V±0.3V	3.6	6.3	--	ns

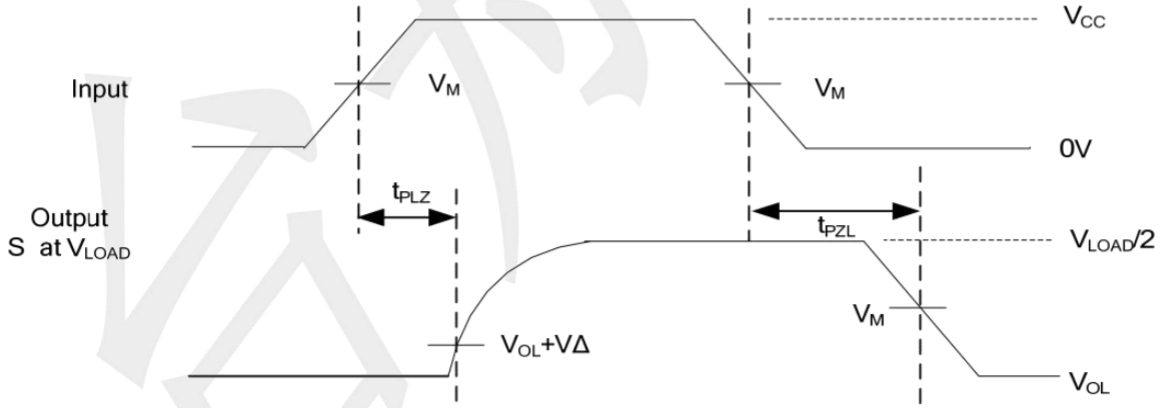
TEST CIRCUIT AND WAVEFORMS



TEST	S
t_{PZL} (Note 1)	V_{LOAD}
t_{PLZ} (Note 1)	V_{LOAD}

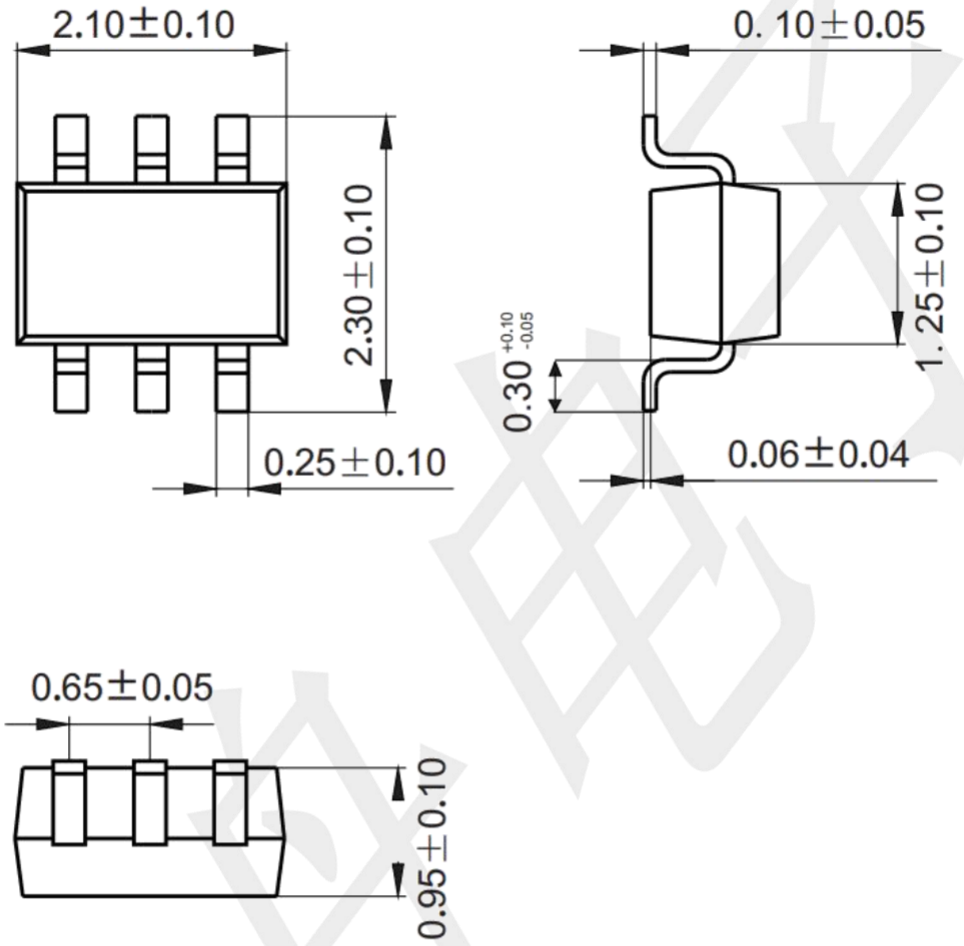
Note: Since this device has open drain outputs, the t_{PLZ} and t_{PZL} is the same as t_{PLH} and t_{PHL} .

V_{CC}	V_{IN}	t_R / t_F	V_M	V_{LOAD}	C_L	R_L	V_Δ
0.8	V_{CC}	3ns	$V_{CC}/2$	$2\times V_{CC}$	5,10,15,30pF	5kΩ	0.1V
1.2±0.1V	V_{CC}	3ns	$V_{CC}/2$	$2\times V_{CC}$	5,10,15,30pF	5kΩ	0.1V
1.5±0.1V	V_{CC}	3ns	$V_{CC}/2$	$2\times V_{CC}$	5,10,15,30pF	5kΩ	0.1V
1.8±0.15V	V_{CC}	3ns	$V_{CC}/2$	$2\times V_{CC}$	5,10,15,30pF	5kΩ	0.15V
2.5±0.2V	V_{CC}	3ns	$V_{CC}/2$	$2\times V_{CC}$	5,10,15,30pF	5kΩ	0.15V
3.3±0.3V	V_{CC}	3ns	$V_{CC}/2$	$2\times V_{CC}$	5,10,15,30pF	5kΩ	0.3V

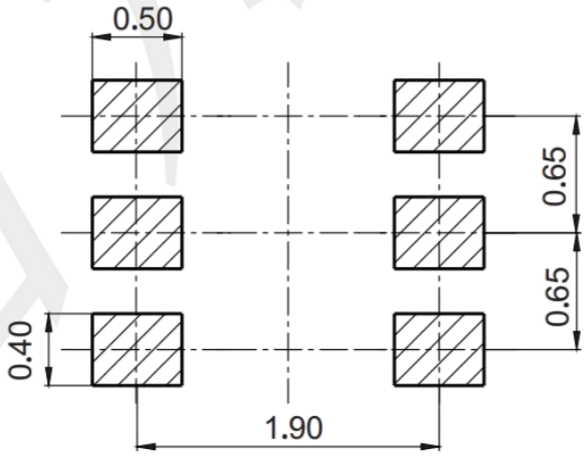


Package information (unit: mm)

SOT363

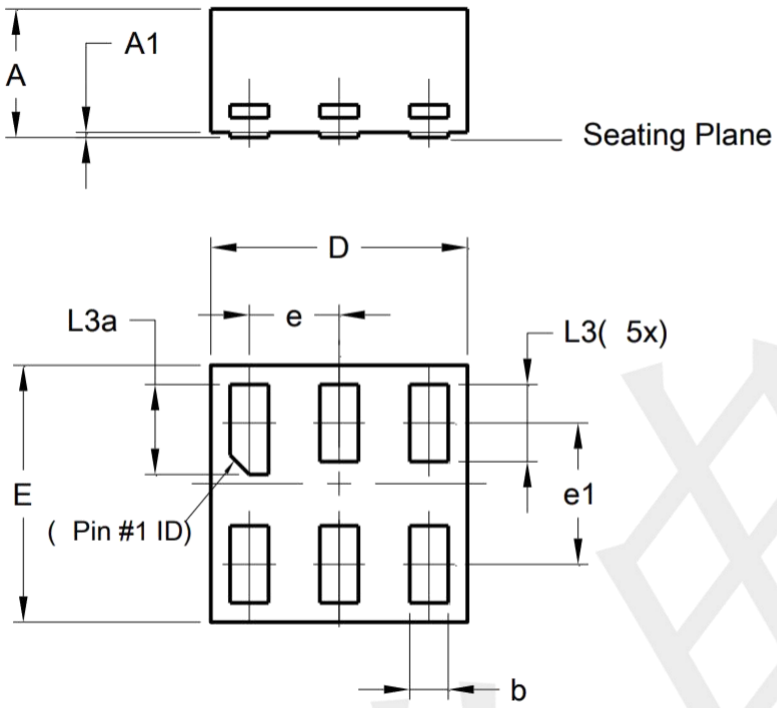


Mounting Pad Layout (unit: mm)



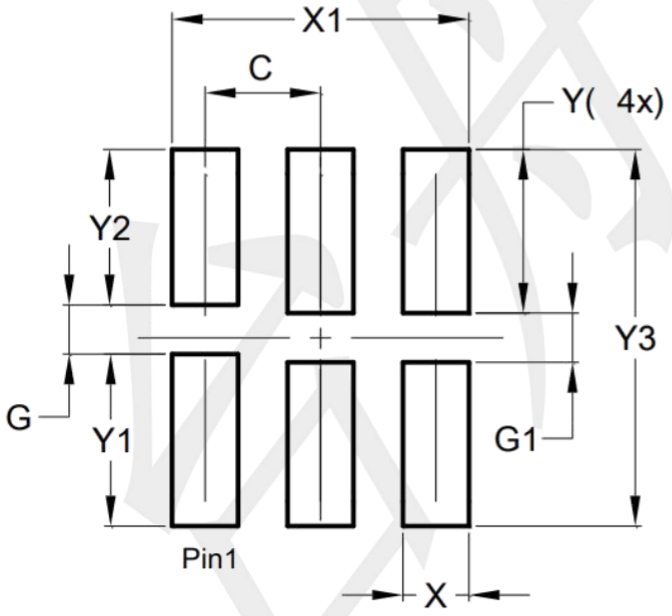
Package informantion (unit: mm)

DFN1X1-6



DFN1010-6 (Type B)			
Dim	Min	Max	Typ
A	-	0.50	0.39
A1	-	0.04	-
b	0.12	0.20	0.15
D	0.95	1.050	1.00
E	0.95	1.050	1.00
e	0.35 BSC		
e1	0.55 BSC		
L3	0.27	0.30	0.30
L3a	0.32	0.40	0.35
All Dimensions in mm			

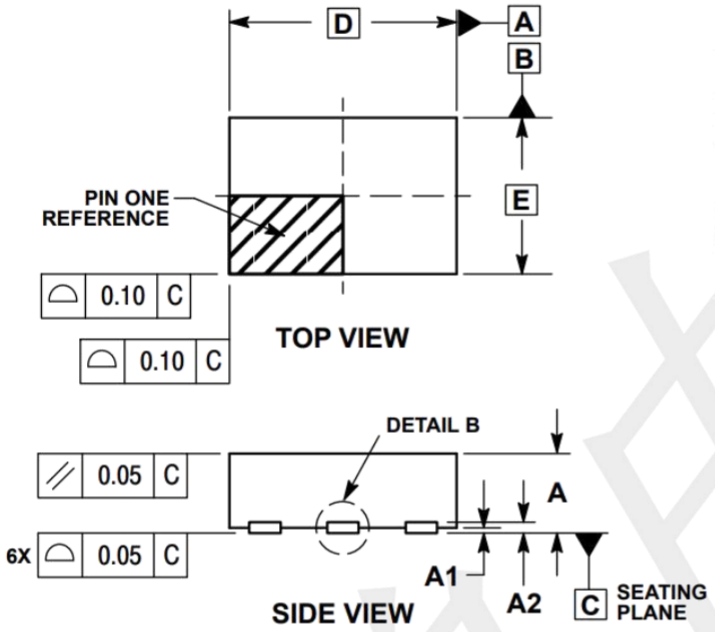
Mounting Pad Layout (unit: mm)



Dimensions	Value (in mm)
C	0.350
G	0.150
G1	0.150
X	0.200
X1	0.900
Y	0.500
Y1	0.525
Y2	0.475
Y3	1.150

Package information (unit: mm)

DFN1510-6



DIM	MILLIMETERS	
	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A2	0.07 REF	
b	0.20	0.30
D	1.45 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.30	0.40
L1	---	0.15

Mounting Pad Layout (unit: mm)