



AiPGTL2014

4-Bit LVTTTL to GTL Transceiver

Product Specification

Specification Revision History:

Version	Date	Description
2023-02-A1	2023-02	New
2023-05-A2	2023-05	Modify the content



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1、General Description

The AiPGTL2014 is a 4-bit GTL-LVTTL bidirectional transceiver. LVTTL is the typical COMS input/output; GTL parameters allow free configuration: the level input threshold is provided externally, the output is open leakage output, and the high level is provided by external pull-up resistor, which can meet a variety of GTL level requirements.

Features:

- 3V to 3.6V operation with 5V tolerant TTL input
- GTL input and output 3.6V tolerant
- Compatible with GTL-/GTL/GTL+
- GTL reference adjustable from 0.5 V to VCC/2
- IO pin protection: $\pm 8\text{kV}$ HBM
- Packaging information: TSSOP14

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiPGTL2014TA14.TB	TSSOP14	AiPGTL2014	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

Reel packing specifications:

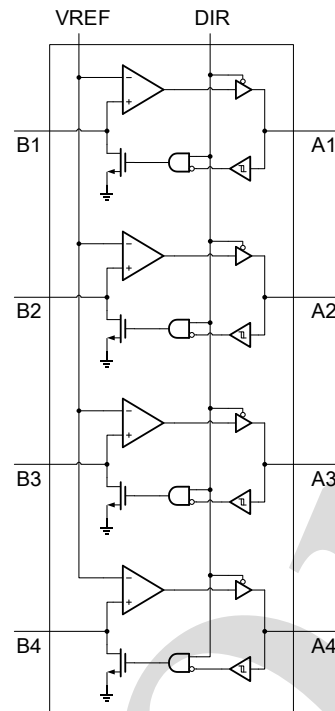
Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiPGTL2014TA14.TR	TSSOP14	AiPGTL2014	5000PCS/reel	10000PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

Note: If the physical information is inconsistent with the ordering information, please refer to the actual product.

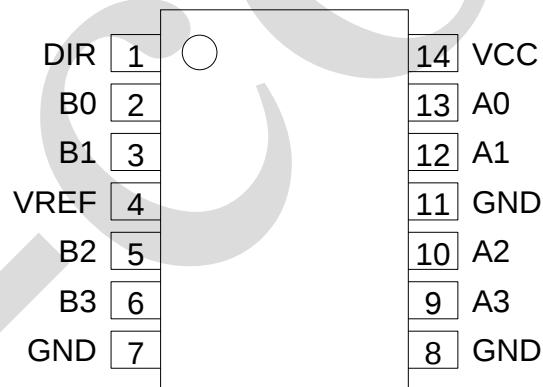


2、Block Diagram And Pin Description

2.1、Block Diagram



2.2、Pin Configurations





2.3、Pin Description

Pin No.	Pin Name	Description
1	DIR	direction control, LVTTL level
7, 8, 11	GND	ground
14	VCC	power supply
4	VREF	GTL reference
2	B0	GTL input/output
3	B1	
5	B2	
6	B3	
13	A0	LVTTL input/output
12	A1	
10	A2	
9	A3	

2.4、Function Table

Input	Input/Output	
DIR	An	Bn
H	input	=An
L	=Bn	input

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, unless otherwise specified)

Characteristic	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V _{CC}	-	-0.5	+4.6	V
input clamping current	I _{IK}	V _{IN} <0V	-	-50	mA
input voltage	V _{IN}	LVTTL	-0.5	+7.0	V
		GTL	-0.5	+4.6	
output clamping current	I _{OK}	LVTTL, V _{OUT} < 0V	-	-50	mA
output voltage	V _{OUT}	LVTTL, output HIGH or OFF	-0.5	+7.0	V
		GTL, output HIGH or OFF	-0.5	+4.6	
LOW-level output current	I _{OL}	LVTTL	-	32	mA
		GTL	-	80	
HIGH-level output current	I _{OH}	LVTTL	-	-32	
storage temperature	T _{stg}	-	-60	150	℃
soldering temperature	T _L	10s	260		℃



3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	3.0	-	3.6	V
cut-off voltage	V_{TT}	GTL-	0.85	0.9	0.95	V
		GTL	1.14	1.2	1.26	
		GTL+	1.35	1.5	1.65	
Reference voltage	V_{REF}	total	0.5	$\frac{2}{3}V_{TT}$	$\frac{1}{2}V_{CC}$	V
		GTL-	0.5	0.6	0.63	
		GTL	0.76	0.8	0.84	
		GTL+	0.87	1.0	1.10	
input voltage	V_{IN}	GTL	0	V_{TT}	3.6	V
		LVTTL	0	3.3	5.5	
HIGH-level input voltage	V_{IH}	GTL	$V_{REF}+0.05$	-	-	V
		LVTTL	2	-	-	
LOW-level input voltage	V_{IL}	GTL	-	-	$V_{REF}-0.05$	V
		LVTTL	-	-	0.8	
HIGH-level output current	I_{OH}	LVTTL	-	-	-16	mA
LOW-level output current	I_{OL}	GTL	-	-	40	
		LVTTL	-	-	16	
ambient temperature	T_{amb}	-	-40	-	125	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics

($T_{amb}=-40^{\circ}\text{C}$ to 125°C , GND=0V, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
HIGH-level output voltage	V_{OH}	A port, $V_{CC}=3.0\text{V}$ to 3.6V , $I_{OH}=-100\mu\text{A}$	$V_{CC}-0.2$	-	-	V
		A port, $V_{CC}=3.0\text{V}$, $I_{OH}=-16\text{mA}$	2.0	-	-	
LOW-level output voltage	V_{OL}	B port, $V_{CC}=3.0\text{V}$, $I_{OL}=40\text{mA}$	-	0.23	0.4	
		A port, $V_{CC}=3.0\text{V}$, $I_{OL}=8\text{mA}$	-	0.28	0.4	
		A port, $V_{CC}=3.0\text{V}$, $I_{OL}=12\text{mA}$	-	0.40	0.55	
		A port, $V_{CC}=3.0\text{V}$, $I_{OL}=16\text{mA}$	-	0.55	0.8	
input current	I_{IN}	control port, $V_{CC}=3.6\text{V}$, $V_{IN}=V_{CC}/\text{GND}$	-	-	± 1	μA
		B port, $V_{CC}=3.6\text{V}$, $V_{IN}=V_{TT}/\text{GND}$	-	-	± 1	
		A port, $V_{CC}=0/3.6\text{V}$, $V_{IN}=5.5\text{V}$	-	-	10	
		A port, $V_{CC}=3.6\text{V}$, $V_{IN}=V_{CC}$	-	-	± 1	
		A port, $V_{CC}=3.6\text{V}$, $V_{IN}=0\text{V}$	-	-	-5	
power-off leakage current	I_{OFF}	A port, $V_{CC}=0\text{V}$, $V_{IN}/V_{OUT}=0\text{V}$ to 3.6V	-	-	± 100	μA
supply current	I_{CC}	A port, $V_{CC}=3.6\text{V}$, $V_{IN}=V_{CC}/\text{GND}$, $I_O=0\text{mA}$	-	4	10	mA
		B port, $V_{CC}=3.6\text{V}$, $V_{IN}=V_{TT}/\text{GND}$, $I_O=0\text{mA}$	-	4	10	
additional supply current	ΔI_{CC}	A or control port, $V_{CC}=3.6\text{V}$, $V_{IN}=V_{CC}-0.6\text{V}$	-	-	500	μA



3.3.2、AC Characteristics

($T_{amb}=-40^{\circ}\text{C}$ to 125°C , $V_{CC}=3.3\pm0.3\text{V}$, unless otherwise specified)

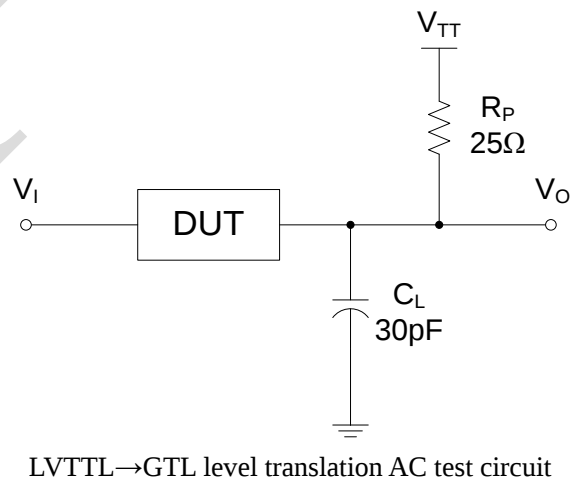
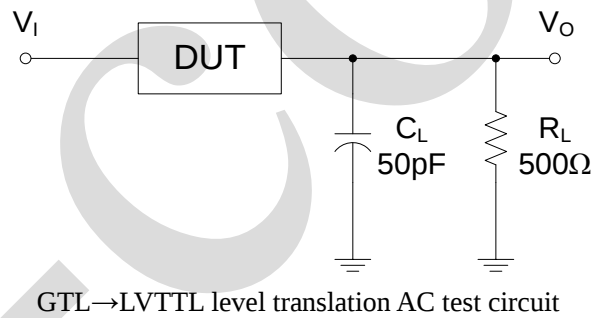
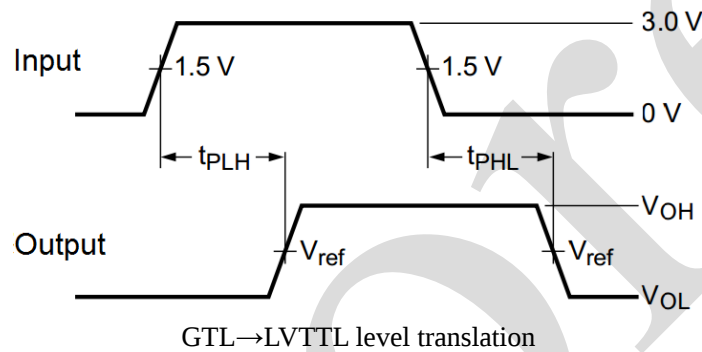
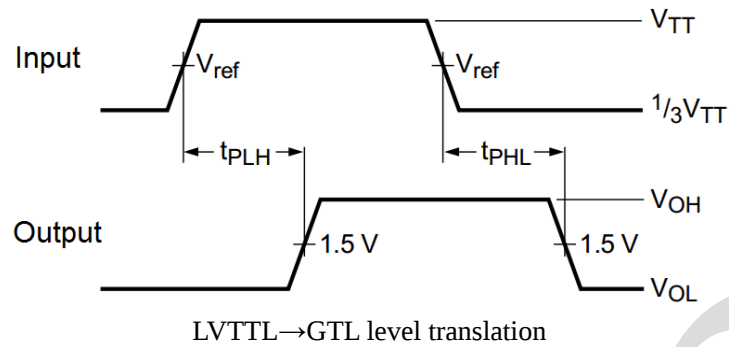
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
GTL-, V _{TT} =0.9V, V _{REF} =0.6V						
LOW to HIGH propagation delay	t _{PLH}	A→B	-	2.8	6	ns
HIGH to LOW propagation delay	t _{PHL}	A→B	-	3.3	8	
LOW to HIGH propagation delay	t _{PLH}	B→A	-	5.3	9	
HIGH to LOW propagation delay	t _{PHL}	B→A	-	5.2	9	
GTL, V _{TT} =1.2V, V _{REF} =0.8V						
LOW to HIGH propagation delay	t _{PLH}	A→B	-	2.8	6	ns
HIGH to LOW propagation delay	t _{PHL}	A→B	-	3.4	9	
LOW to HIGH propagation delay	t _{PLH}	B→A	-	5.2	9	
HIGH to LOW propagation delay	t _{PHL}	B→A	-	4.9	9	
GTL+, V _{TT} =1.5V, V _{REF} =1.0V						
LOW to HIGH propagation delay	t _{PLH}	A→B	-	2.8	6	ns
HIGH to LOW propagation delay	t _{PHL}	A→B	-	3.4	9	
LOW to HIGH propagation delay	t _{PLH}	B→A	-	5.1	9	
HIGH to LOW propagation delay	t _{PHL}	B→A	-	4.7	8	

Note: All typical values are measured at $T_{amb}=25^{\circ}\text{C}$, $V_{CC}=3.3\text{V}$ and $\text{GND}=0\text{V}$.



4、Testing Circuit

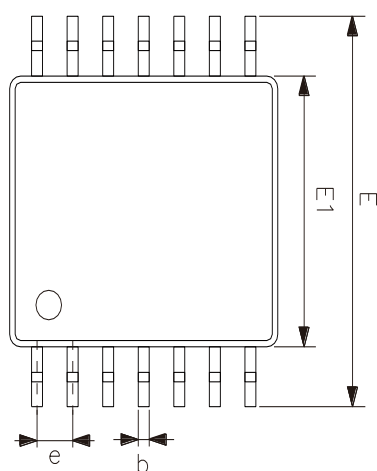
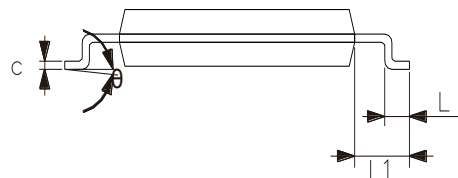
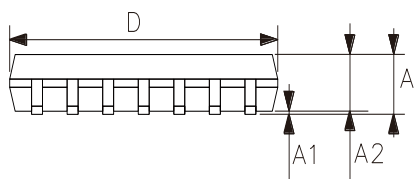
4.1、AC Testing Circuit





5、Package Information

5.1、TSSOP14



2023/12/A	Dimensions In Millimeters	
Symbol	Min	Max
A	—	1.20
A1	0.05	0.15
A2	0.80	1.05
b	0.19	0.30
c	0.09	0.20
D	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°



6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○: Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×: Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、Notes

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