

Single Buffer/Line Driver: 3-state**CJ74AHC/AHCT1G125 Logic****1 Introduction**

CJ74AHC1G125 and CJ74AHCT1G125 are high-speed Si-gate CMOS devices. They provide one non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input (/OE). A HIGH at /OE causes the output to assume a high-impedance OFF-state.

The AHC device has CMOS input switching levels and supply voltage range 2V to 5.5V.

The AHCT device has TTL input switching levels and supply voltage range 4.5V to 5.5V.

2 Available Packages

PART NUMBER	PACKAGE
CJ74AHC1G125	SOT-23-5L
	SOT-353
CJ74AHCT1G125	SOT-23-5L
	SOT-353

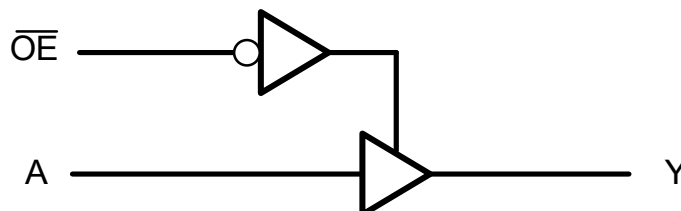
Note: For all available packages, please refer to the part Orderable Information.

3 Features

- Symmetrical output impedance
- Low power dissipation
- Balanced propagation delays
- Specified from -40°C to +125°C

4 Applications

- Projectors
- TVs
- Servers
- Motor Controls: AC Induction
- Patient Monitoring
- Electronic Points of Sale



Simplified schematic

5 Orderable Information

DEVICE	PACKAGE	OP TEMP	ECO PLAN	MSL	PACKING OPTION	SORT
CJ74AHC1G125M5N	SOT-23-5L	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 3000 Units / Reel	Active
CJ74AHCT1G125M5N	SOT-23-5L	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 3000 Units / Reel	Active
CJ74AHC1G125R5N	SOT-353	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 3000 Units / Reel	Active
CJ74AHCT1G125R5N	SOT-353	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 3000 Units / Reel	Active

Note:

ECO PLAN: For the RoHS and Green certification standards of this product, please refer to the official report provided by JSCJ.

MSL: Moisture Sensitivity Level. Determined according to JEDEC industry standard classification.

SORT: Specifically defined as follows:

Active: Recommended for new products;

Customized: Products manufactured to meet the specific needs of customers;

Preview: The device has been released and has not been fully mass produced. The sample may or may not be available;

NoRD: It is not recommended to use the device for new design. The device is only produced for the needs of existing customers;

Obsolete: The device has been discontinued.

6 Pin Configuration and Marking Information

6.1 Pin Configuration

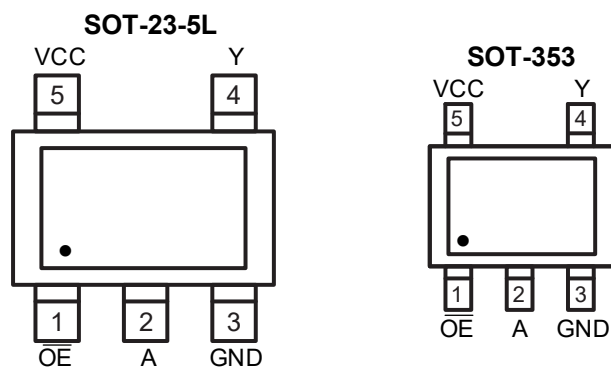


Figure 6-1 Pin configuration

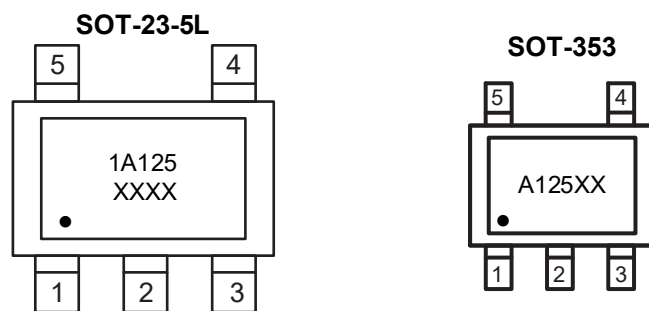
6.2 Pin Function

PIN		I/O ⁽¹⁾	DESCRIPTION
No.	NAME		
1	$\overline{\text{OE}}$	I	Output enable input
2	A	I	Data input
3	GND	G	Ground (0V)
4	Y	O	Data output
5	VCC	P	Supply voltage

(1) I-Input, O-Output, P-Power, G-Ground

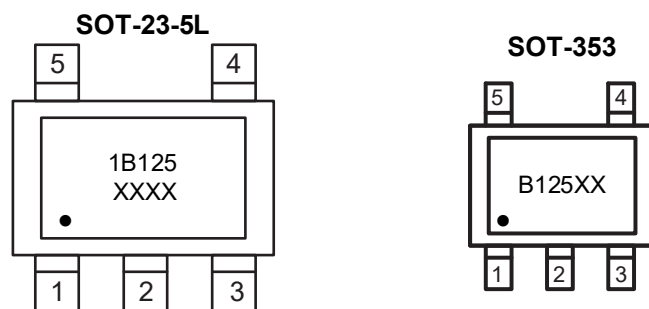
6.3 Marking Information

6.3.1 CJ74AHC1G125



XXXX or XX: Code, indicates weekly record information.

6.3.2 CJ74AHCT1G125



XXXX or XX: Code, indicates weekly record information.

7 Specifications

7.1 Absolute Maximum Ratings

$T_{amb}=25^{\circ}\text{C}$, all voltage referenced to GND, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CC}	Supply voltage	-	-0.5	+7.0	V
V_I	Input voltage	-	-0.5	+7.0	V
I_{IK}	Input clamping current	$V_I < -0.5\text{V}$	-20	-	mA
I_{OK}	Output clamping current	$V_O < -0.5\text{V}$ or $V_O > V_{CC} + 0.5\text{V}$	-	± 20	mA
I_O	Output current	$-0.5\text{V} < V_O < V_{CC} + 0.5\text{V}$	-	± 25	mA
I_{CC}	Supply current	-	-	75	mA
I_{GND}	Ground current	-	-75	-	mA
T_{stg}	Storage temperature	-	-65	+150	$^{\circ}\text{C}$
P_{tot}	Total power dissipation	-	-	250	mW
T_L	Soldering temperature	10s	-	260	$^{\circ}\text{C}$

Note: Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to GND. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

7.2 Recommended Operating Conditions

Voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125						
V _{CC}	Supply voltage	-	2.0	5.0	5.5	V
V _I	Input voltage	-	0	-	5.5	V
V _O	Output voltage	-	0	-	V _{CC}	V
T _{amb}	Ambient temperature	-	-40	-	+125	°C
Δt/ΔV	Input transition rise and fall rate	V _{CC} =3.3V±0.3V	-	-	100	ns/V
		V _{CC} =5.0V±0.5V	-	-	20	ns/V
CJ74AHCT1G125						
V _{CC}	Supply voltage	-	4.5	5.0	5.5	V
V _I	Input voltage	-	0	-	5.5	V
V _O	Output voltage	-	0	-	V _{CC}	V
T _{amb}	Ambient temperature	-	-40	-	+125	°C
Δt/ΔV	Input transition rise and fall rate	V _{CC} =3.3V±0.3V	-	-	-	ns/V
		V _{CC} =5.0V±0.5V	-	-	20	ns/V

7.3 ESD Ratings

SYMBOL	ESD RATINGS		VALUE	UNIT
$V_{ESD-HBM}$	Electrostatic discharge	Human body model (HBM) ⁽¹⁾	± 2000	V

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

7.4 Electrical Characteristics

7.4.1 DC Characteristics 1

$T_{amb}=25^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125							
V _{IH}	HIGH-level input voltage	V _{CC} =2.0V		1.5	-	-	V
		V _{CC} =3.0V		2.1	-	-	V
		V _{CC} =5.5V		3.85	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} =2.0V		-	-	0.5	V
		V _{CC} =3.0V		-	-	0.9	V
		V _{CC} =5.5V		-	-	1.65	V
V _{OH}	HIGH-level output voltage	V _I =V _{IH} or V _{IL}	I _O =-50uA; V _{CC} =2.0V	1.9	2.0	-	V
			I _O =-50uA; V _{CC} =3.0V	2.9	3.0	-	V
			I _O =-50uA; V _{CC} =4.5V	4.4	4.5	-	V
			I _O =-4mA; V _{CC} =3.0V	2.58	-	-	V
			I _O =-8mA; V _{CC} =4.5V	3.94	-	-	V
V _{OL}	LOW-level output voltage	V _I =V _{IH} or V _{IL}	I _O =50uA; V _{CC} =2.0V	-	0	0.1	V
			I _O =50uA; V _{CC} =3.0V	-	0	0.1	V
			I _O =50uA; V _{CC} =4.5V	-	0	0.1	V
			I _O =4mA; V _{CC} =3.0V	-	-	0.36	V
			I _O =8mA; V _{CC} =4.5V	-	-	0.36	V
I _{OZ}	OFF-state output current	V _I =V _{CC} or GND; V _{CC} =5.5V		-	-	1.0	uA
I _I	Input leakage current	V _I =5.5V or GND; V _{CC} =0V to 5.5V		-	-	1.0	uA
I _{CC}	Supply current	V _I =V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	1.0	uA
C _I	Input capacitance	-		-	1.5	10	pF
CJ74AHCT1G125							
V _{IH}	HIGH-level input voltage	V _{CC} =4.5V to 5.5V		2.0	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} =4.5V to 5.5V		-	-	0.8	V
V _{OH}	HIGH-level output voltage	V _I =V _{IH} or V _{IL}	I _O =-50uA; V _{CC} =4.5V	4.4	4.5	-	V
			I _O =-8mA; V _{CC} =4.5V	3.94	-	-	V
V _{OL}	LOW-level output voltage	V _I =V _{IH} or V _{IL}	I _O =50uA; V _{CC} =4.5V	-	0	0.1	V
			I _O =8mA; V _{CC} =4.5V	-	-	0.36	V
I _{OZ}	OFF-state output current	V _I =V _{CC} or GND; V _{CC} =5.5V		-	-	1.0	uA
I _I	Input leakage current	V _I =5.5V or GND; V _{CC} =0V to 5.5V		-	-	1.0	uA
I _{CC}	Supply current	V _I =V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	1.0	uA
ΔI _{CC}	Additional supply current	Per input pin; V _I =3.4V; Other inputs at V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	1.35	mA
C _I	Input capacitance	-		-	1.5	10	pF

7.4.2 DC Characteristics 2

$T_{amb} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125							
V _{IH}	HIGH-level input voltage	V _{CC} =2.0V		1.5	-	-	V
		V _{CC} =3.0V		2.1	-	-	V
		V _{CC} =5.5V		3.85	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} =2.0V		-	-	0.5	V
		V _{CC} =3.0V		-	-	0.9	V
		V _{CC} =5.5V		-	-	1.65	V
V _{OH}	HIGH-level output voltage	V _I =V _{IH} or V _{IL}	I _O =-50uA; V _{CC} =2.0V	1.9	-	-	V
			I _O =-50uA; V _{CC} =3.0V	2.9	-	-	V
			I _O =-50uA; V _{CC} =4.5V	4.4	-	-	V
			I _O =-4mA; V _{CC} =3.0V	2.48	-	-	V
			I _O =-8mA; V _{CC} =4.5V	3.8	-	-	V
V _{OL}	LOW-level output voltage	V _I =V _{IH} or V _{IL}	I _O =50uA; V _{CC} =2.0V	-	-	0.1	V
			I _O =50uA; V _{CC} =3.0V	-	-	0.1	V
			I _O =50uA; V _{CC} =4.5V	-	-	0.1	V
			I _O =4mA; V _{CC} =3.0V	-	-	0.44	V
			I _O =8mA; V _{CC} =4.5V	-	-	0.44	V
I _{OZ}	OFF-state output current	V _I =V _{CC} or GND; V _{CC} =5.5V		-	-	2.5	uA
I _I	Input leakage current	V _I =5.5V or GND; V _{CC} =0V to 5.5V		-	-	1.0	uA
I _{CC}	Supply current	V _I =V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	10	uA
C _I	Input capacitance	-		-	-	10	pF
CJ74AHCT1G125							
V _{IH}	HIGH-level input voltage	V _{CC} =4.5V to 5.5V		2.0	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} =4.5V to 5.5V		-	-	0.8	V
V _{OH}	HIGH-level output voltage	V _I =V _{IH} or V _{IL}	I _O =-50uA; V _{CC} =4.5V	4.4	-	-	V
			I _O =-8mA; V _{CC} =4.5V	3.8	-	-	V
V _{OL}	LOW-level output voltage	V _I =V _{IH} or V _{IL}	I _O =50uA; V _{CC} =4.5V	-	-	0.1	V
			I _O =8mA; V _{CC} =4.5V	-	-	0.44	V
I _{OZ}	OFF-state output current	V _I =V _{CC} or GND; V _{CC} =5.5V		-	-	2.5	uA
I _I	Input leakage current	V _I =5.5V or GND; V _{CC} =0V to 5.5V		-	-	1.0	uA
I _{CC}	Supply current	V _I =V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	10	uA
ΔI _{CC}	Additional supply current	Per input pin; V _I =3.4V; Other inputs at V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	1.5	mA
C _I	Input capacitance	-		-	-	10	pF

7.4.3 DC Characteristics 3

T_{amb}=-40°C to +125°C, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125							
V _{IH}	HIGH-level input voltage	V _{CC} =2.0V		1.5	-	-	V
		V _{CC} =3.0V		2.1	-	-	V
		V _{CC} =5.5V		3.85	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} =2.0V		-	-	0.5	V
		V _{CC} =3.0V		-	-	0.9	V
		V _{CC} =5.5V		-	-	1.65	V
V _{OH}	HIGH-level output voltage	V _I =V _{IH} or V _{IL}	I _O =-50uA; V _{CC} =2.0V	1.9	-	-	V
			I _O =-50uA; V _{CC} =3.0V	2.9	-	-	V
			I _O =-50uA; V _{CC} =4.5V	4.4	-	-	V
			I _O =-4mA; V _{CC} =3.0V	2.4	-	-	V
			I _O =-8mA; V _{CC} =4.5V	3.7	-	-	V
V _{OL}	LOW-level output voltage	V _I =V _{IH} or V _{IL}	I _O =50uA; V _{CC} =2.0V	-	-	0.1	V
			I _O =50uA; V _{CC} =3.0V	-	-	0.1	V
			I _O =50uA; V _{CC} =4.5V	-	-	0.1	V
			I _O =4mA; V _{CC} =3.0V	-	-	0.55	V
			I _O =8mA; V _{CC} =4.5V	-	-	0.55	V
I _{OZ}	OFF-state output current	V _I =V _{CC} or GND; V _{CC} =5.5V		-	-	10	uA
I _I	Input leakage current	V _I =5.5V or GND; V _{CC} =0V to 5.5V		-	-	2.0	uA
I _{CC}	Supply current	V _I =V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	40	uA
C _I	Input capacitance	-		-	-	10	pF
CJ74AHCT1G125							
V _{IH}	HIGH-level input voltage	V _{CC} =4.5V to 5.5V		2.0	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} =4.5V to 5.5V		-	-	0.8	V
V _{OH}	HIGH-level output voltage	V _I =V _{IH} or V _{IL}	I _O =-50uA; V _{CC} =4.5V	4.4	-	-	V
			I _O =-8mA; V _{CC} =4.5V	3.7	-	-	V
V _{OL}	LOW-level output voltage	V _I =V _{IH} or V _{IL}	I _O =50uA; V _{CC} =4.5V	-	-	0.1	V
			I _O =8mA; V _{CC} =4.5V	-	-	0.55	V
I _{OZ}	OFF-state output current	V _I =V _{CC} or GND; V _{CC} =5.5V		-	-	10	uA
I _I	Input leakage current	V _I =5.5V or GND; V _{CC} =0V to 5.5V		-	-	2.0	uA
I _{CC}	Supply current	V _I =V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	40	uA
ΔI _{CC}	Additional supply current	Per input pin; V _I =3.4V; Other inputs at V _{CC} or GND; I _O =0A; V _{CC} =5.5V		-	-	1.5	mA
C _I	Input capacitance	-		-	-	10	pF

7.4.4 AC Characteristics 1

T_{amb}=25°C, GND=0V, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125							
t _{pd}	Propagation delay	A to Y; See Figure 8-5 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	-	4.7	8.0	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	-	6.6	11.5	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	3.4	5.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	4.8	7.5	ns
t _{en}	Enable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	-	5.0	8.0	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	-	6.9	11.5	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	3.6	5.1	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	4.9	7.5	ns
t _{dis}	Disable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	-	6.0	9.7	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	-	8.3	13.2	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	4.1	6.8	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	5.7	6.8	ns
C _{PD}	Power dissipation capacitance	Per buffer; C _L =50pF; f=1MHz; V _I =GND to V _{CC} ⁽⁴⁾		-	9	-	pF
CJ74AHCT1G125							
t _{pd}	Propagation delay	A to Y; See Figure 8-5 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	3.4	5.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	4.8	7.5	ns
t _{en}	Enable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	3.9	5.1	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	5.1	7.5	ns
t _{dis}	Disable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	4.5	6.8	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	-	6.1	8.8	ns
C _{PD}	Power dissipation capacitance	Per buffer; C _L =50pF; f=1MHz; V _I =GND to V _{CC} ⁽⁴⁾		-	11	-	pF

(1) t_{pd} is the same as t_{PLH} and t_{PHL}.

t_{en} is the same as t_{PZL} and t_{PZH}.

t_{dis} is the same as t_{PLZ} and t_{PHZ}.

(2) Typical values are measured at V_{CC}=3.3V.

(3) Typical values are measured at V_{CC}=5V.

(4) C_{PD} is used to determine the dynamic power dissipation (P_D in uW).

$P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum (C_L \times V_{CC}^2 \times f_o)$ where:

f_i=input frequency in MHz; f_o=output frequency in MHz;

C_L=output load capacitance in pF; V_{CC}=supply voltage in Volts.

7.4.5 AC Characteristics 2

T_{amb}=-40°C to +85°C, GND=0V, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125							
t _{pd}	Propagation delay	A to Y; See Figure 8-5 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	9.5	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	13.0	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	6.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.5	ns
t _{en}	Enable time	$\overline{\text{OE}}$ to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	9.5	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	13.0	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	6.0	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.5	ns
t _{dis}	Disable time	$\overline{\text{OE}}$ to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	11.5	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	15.0	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.0	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	10.0	ns
C _{PD}	Power dissipation capacitance	Per buffer; C _L =50pF; f=1MHz; V _I =GND to V _{CC} ⁽⁴⁾		-	-	-	pF
CJ74AHCT1G125							
t _{pd}	Propagation delay	A to Y; See Figure 8-5 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	6.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.5	ns
t _{en}	Enable time	$\overline{\text{OE}}$ to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	6.0	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.5	ns
t _{dis}	Disable time	$\overline{\text{OE}}$ to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.0	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	10.0	ns
C _{PD}	Power dissipation capacitance	Per buffer; C _L =50pF; f=1MHz; V _I =GND to V _{CC} ⁽⁴⁾		-	-	-	pF

(1) t_{pd} is the same as t_{PLH} and t_{PHL}.

t_{en} is the same as t_{PZL} and t_{PZH}.

t_{dis} is the same as t_{PLZ} and t_{PHZ}.

(2) Typical values are measured at V_{CC}=3.3V.

(3) Typical values are measured at V_{CC}=5V.

(4) C_{PD} is used to determine the dynamic power dissipation (P_D in uW).

P_D=C_{PD}×V_{CC}²×f_i+Σ(C_L×V_{CC}²×f_o) where:

f_i=input frequency in MHz; f_o=output frequency in MHz;

C_L=output load capacitance in pF; V_{CC}=supply voltage in Volts.

7.4.6 AC Characteristics 3

T_{amb}=-40°C to +125°C, GND=0V, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
CJ74AHC1G125							
t _{pd}	Propagation delay	A to Y; See Figure 8-5 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	11.5	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	14.5	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	7.0	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	9.5	ns
t _{en}	Enable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	11.5	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	14.5	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	6.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	9.5	ns
t _{dis}	Disable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	12.5	ns
			C _L =50pF; V _{CC} =3.0V to 3.6V ⁽²⁾	1.0	-	16.5	ns
			C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	11.0	ns
C _{PD}	Power dissipation capacitance	Per buffer; C _L =50pF; f=1MHz; V _I =GND to V _{CC} ⁽⁴⁾		-	-	-	pF
CJ74AHCT1G125							
t _{pd}	Propagation delay	A to Y; See Figure 8-5 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	7.0	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	9.5	ns
t _{en}	Enable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	6.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	9.5	ns
t _{dis}	Disable time	OE to Y; See Figure 8-6 ⁽¹⁾	C _L =15pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	8.5	ns
			C _L =50pF; V _{CC} =4.5V to 5.5V ⁽³⁾	1.0	-	11.0	ns
C _{PD}	Power dissipation capacitance	Per buffer; C _L =50pF; f=1MHz; V _I =GND to V _{CC} ⁽⁴⁾		-	-	-	pF

(1) t_{pd} is the same as t_{PLH} and t_{PHL}.

t_{en} is the same as t_{PZL} and t_{PZH}.

t_{dis} is the same as t_{PLZ} and t_{PHZ}.

(2) Typical values are measured at V_{CC}=3.3V.

(3) Typical values are measured at V_{CC}=5V.

(4) C_{PD} is used to determine the dynamic power dissipation (P_D in uW).

P_D=C_{PD}×V_{CC}²×f_i+Σ(C_L×V_{CC}²×f_o) where:

f_i=input frequency in MHz; f_o=output frequency in MHz;

C_L=output load capacitance in pF; V_{CC}=supply voltage in Volts.

8 Detailed Description

8.1 Overview

CJ74AHC1G125 and CJ74AHCT1G125 are high-speed Si-gate CMOS devices. They provide a 2-input AND function.

The AHC device has CMOS input switching levels and supply voltage range 2V to 5.5V.

The AHCT device has TTL input switching levels and supply voltage range 4.5V to 5.5V.

8.2 Functional Block Diagram

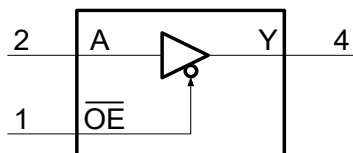


Figure 8-1 Logic symbol

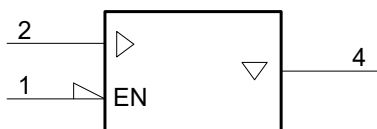


Figure 8-2 IEC logic symbol

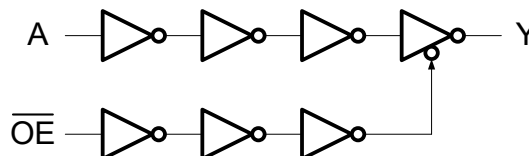


Figure 8-3 Logic diagram

8.3 Function Table⁽¹⁾

INPUT		OUTPUT
OE	A	Y
L	L	L
L	H	H
H	X	Z

(1) H=HIGH voltage level; L=LOW voltage level; X=don't care; Z=high-impedance OFF-state.

8.4 Testing Circuit

8.4.1 AC Testing Circuit

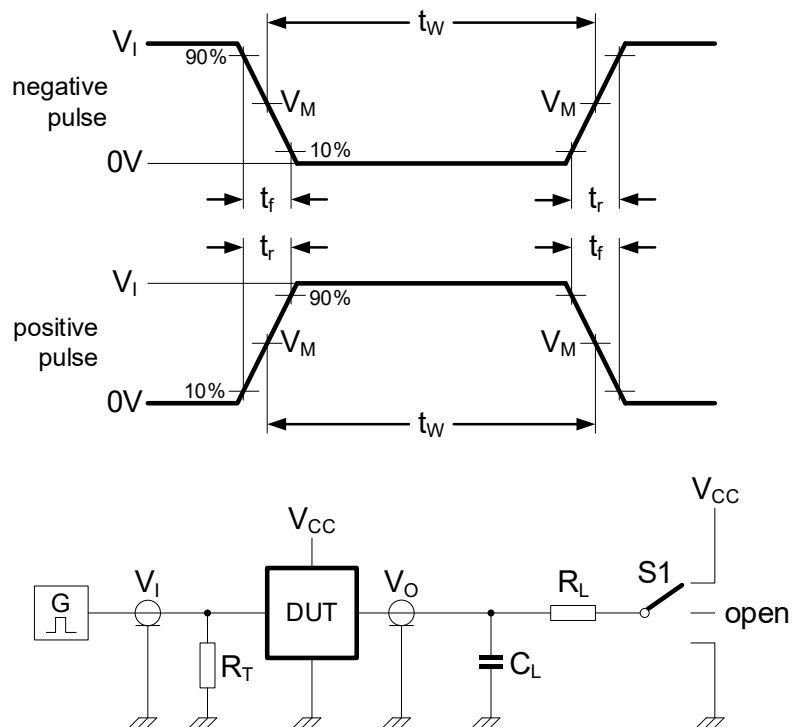


Figure 8-4 Test circuit for measuring switching times

Definitions test circuit:

R_T =Termination resistance should be equal to output impedance Z_o of the pulse generator.

C_L =Load capacitance including jig and probe capacitance.

R_L =Load resistance.

S1=Test selection switch.

8.4.2 AC Testing Waveforms

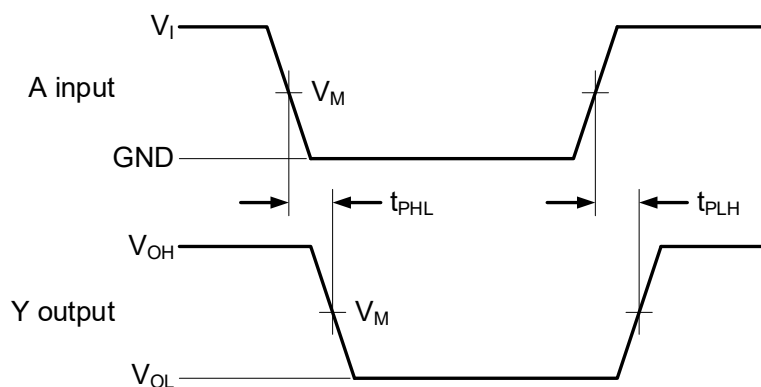


Figure 8-5 Input (A) to output (Y) propagation delays

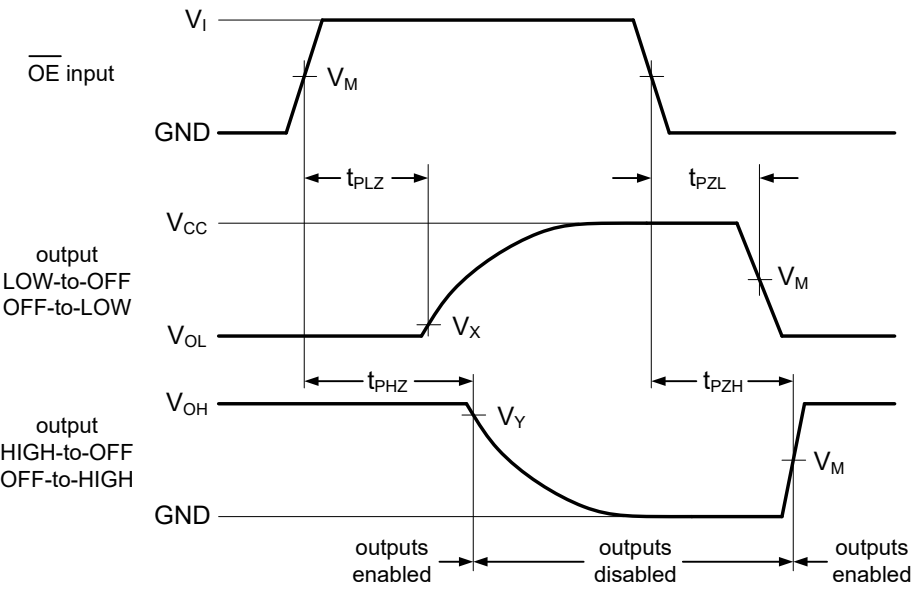


Figure 8-6 Enable and disable times

8.4.3 Measurement Points

TYPE	INPUT		OUTPUT		
	V_I	V_M	V_M	V_X	V_Y
CJ74AHC1G125	GND to V_{CC}	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$
CJ74AHCT1G125	GND to 3.0V	1.5V	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$

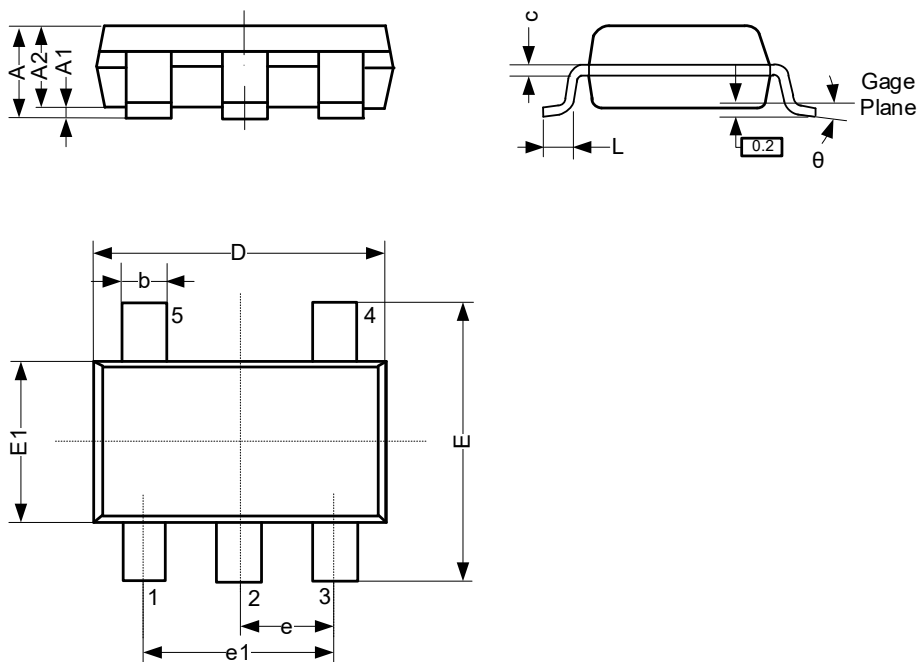
8.4.4 Test Data

TYPE	INPUT		LOAD		S1 POSITION		
	V_I	t_r, t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
CJ74AHC1G125	V_{CC}	$\leq 3ns$	15pF, 50pF	1k Ω	Open	GND	V_{CC}
CJ74AHCT1G125	3V	$\leq 3ns$	15pF, 50pF	1k Ω	Open	GND	V_{CC}

9 Mechanical Information

9.1 SOT-23-5L Mechanical Information

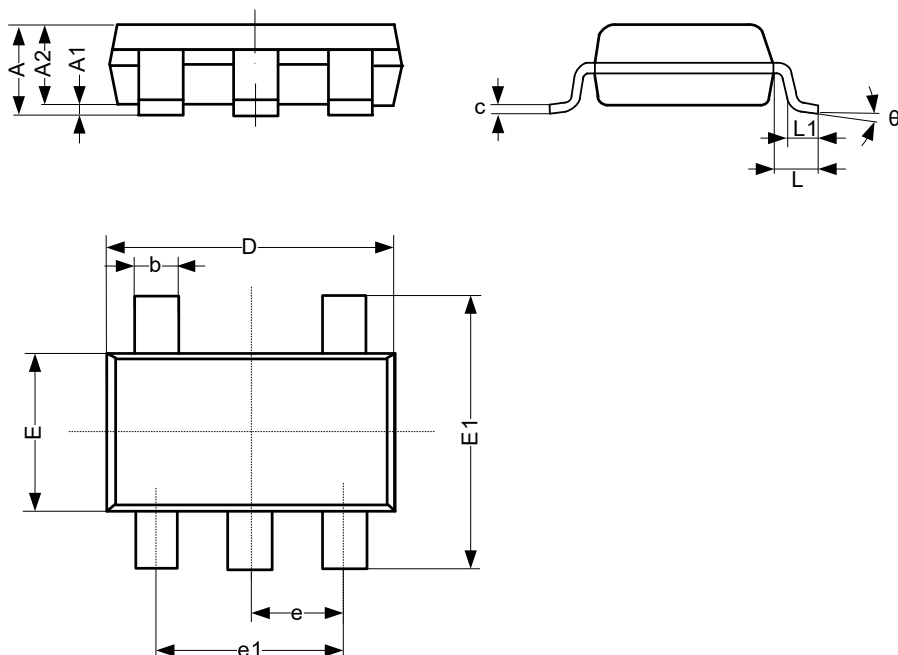
9.1.1 SOT-23-5L Outline Dimensions



SYMBOL	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	-	-	1.26
A1	0.00	-	0.12
A2	1.00	-	1.20
b	0.30	-	0.50
c	0.10	-	0.20
D	2.82	-	3.02
E	2.60	-	3.00
E1	1.50	-	1.70
e	0.95 BSC		
e1	1.80	-	2.00
L	0.30	-	0.60
θ	0°	-	8°
Unit: mm			

9.2 SOT-353 Mechanical Information

9.2.1 SOT-353 Outline Dimensions



SYMBOL	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.90	-	1.10
A1	0.00	-	0.10
A2	0.90	-	1.00
b	0.15	-	0.35
c	0.11	-	0.175
D	2.00	-	2.20
E	1.15	-	1.35
E1	2.15	-	2.45
e	0.65 BSC		
e1	1.20	-	1.40
L	-	0.525	-
L1	0.26	-	0.46
θ	0°	-	8°
Unit: mm			

10 Notes and Revision History

10.1 Associated Product Family and Others

To view other products of the same type or IC products of other types, click the official website of JSCJ -- <https://www.jscj-elec.com> for more details.

10.2 Notes

Electrostatic Discharge Caution



This IC may be damaged by ESD. Relevant personnel shall comply with correct installation and use specifications to avoid ESD damage to the IC. If appropriate measures are not taken to prevent ESD damage, the hazards caused by ESD include but are not limited to degradation of integrated circuit performance or complete damage of integrated circuit. For some precision integrated circuits, a very small parameter change may cause the whole device to be inconsistent with its published specifications.

DISCLAIMER

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