



DESCRIPTION

The AL1G17 Single Schmitt-trigger buffer is designed for 1.65V to 5.5V V_{CC} operation. The AL1G17 device contains one buffer and performs the Boolean function $Y=A$.

The CMOS AL1G17 has high output drive while maintaining low static power dissipation over a broad V_{CC} operating Range.

The AL1G17 functions as an independent buffer with Schmitt-trigger inputs, so the device has different input threshold levels for positive-going (V_{T+}) and negative going (V_{T-}) signals to provide hysteresis (ΔV_T) which makes the device tolerant to slow or noisy input signals.

This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

The AL1G17 is available in SOT-25 and SC70-5 packages.

ORDERING INFORMATION

Package Type	Part Number	
SOT-25 SPQ: 3,000pcs/Reel	E5	AL1G17E5R
		AL1G17E5VR
SC70-5 SPQ: 3,000pcs/Reel	C5	AL1G17C5R
		AL1G17C5VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

FEATURES

- Supports 5V V_{CC} Operation
- Inputs Accept Voltage to 5.5V
- Operating Voltage Range: 1.65V to 5.5V
- ± 24 mA High Output Drive at $V_{CC}=3.0$ V
- Low Power Consumption: 1 μ A (Max)
- I_{off} Supports Partial-Power-Down Mode
- Operation Operating Temperature Range: -40°C to +125°C
- Available in SOT-25 and SC70-5 packages

APPLICATION

- AV Receiver
- Audio Dock: Portable
- Blue-ray Player and Home Theater
- MP3 Player/Recorder
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- TV: LCD/Digital and High-Definition (HDTV)
- Tablet: Enterprise
- Video Analytics: Server
- Wireless Headset, Keyboard, and Mouse
- Desktops or Notebook PCs
- Digital Video Cameras (DVC)
- Mobile Phones
- Personal Navigation Device (GPS)

FUNCTIONAL BLOCK DIAGRAM





PIN DESCRIPTION

<p style="text-align: center;">Top View</p>		<p style="text-align: center;">Top View</p>		
Pin #		Symbol	I/O	Function
SOT-25	SC70-5			
1	1	N.C.	-	Not connected
2	2	A	I	Input
3	2	GND	P	Ground
4	4	Y	O	Output
5	5	V _{cc}	P	Power Pin

FUNCTION TABLE

Input	Output
A	Y
H	H
L	L

Y=A

H=High Voltage Level

L=Low Voltage Level



ABSOLUTE MAXIMUM RATINGS

over operating free-air temperature range, unless otherwise noted ^{NOTE1}

V _{CC} , Supply Voltage Range		-0.5V ~ 6.5V
V _I , Input Voltage Range ^{NOTE1}		-0.5V ~ 6.5V
V _O , Voltage range applied to any output in the high-impedance or power-off state ^{NOTE1}		-0.5V ~ 6.5V
V _O , Voltage range applied to any output in the high or low state ^{NOTE1, 2}		-0.5V ~ V _{CC} +0.5V
I _{IK} , Input Clamp Current	V _I <0	-50mA
I _{OK} , Output Clamp Current	V _O <0	-50mA
I _O , Continuous Output Current		±50mA
Continuous Current Through V _{CC} or GND		±100mA
T _J , Junction Temperature		150°C
T _{STG} , Storage Temperature		-65°C ~ 150°C
ESD Ratings		
V _(ESD) , Electrostatic Discharge	Human-body model (HBM)	±8000V
	Machine model (MM)	±500V

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

NOTE2: The value of V_{CC} is provided in the Recommended Operating Conditions table.



RECOMMENDED OPERATING CONDITIONS

over recommended operating free-air temperature range Full=-40°C to +125°C, typical values are at $T_A = +25^\circ\text{C}$, unless otherwise noted.^{NOTE3}

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	Operating	1.65	-	5.5	V
		Data retention only	1.5	-	-	
Input Voltage	V_I		0	-	5.5	V
Output Voltage	V_O		0	-	V_{CC}	V
Operating Temperature	T_A		-40	-	+125	°C

DC ELECTRICAL CHARACTERISTICS

over recommended operating free-air temperature range Full=-40°C to +125°C, typical values are at $T_A = +25^\circ\text{C}$, unless otherwise noted.^{NOTE3}

Parameter		Conditions	Temp	Min.	Typ.	Max.	Unit
V_{T+}	Positive Going Input Threshold Voltage	$V_{CC}=1.65\text{V}$	Full	0.75	-	1.05	V
		$V_{CC}=2.3\text{V}$		1.25	-	1.55	
		$V_{CC}=3\text{V}$		1.5	-	2.1	
		$V_{CC}=4.5\text{V}$		2.3	-	3.0	
		$V_{CC}=5.5\text{V}$		2.8	-	3.4	
V_{T-}	Negative Going Input Threshold Voltage	$V_{CC}=1.65\text{V}$	Full	0.3	-	0.6	V
		$V_{CC}=2.3\text{V}$		0.35	-	0.65	
		$V_{CC}=3\text{V}$		0.45	-	0.75	
		$V_{CC}=4.5\text{V}$		0.7	-	1.0	
		$V_{CC}=5.5\text{V}$		0.85	-	1.15	
ΔV_T	Hysteresis ($V_{T+} - V_{T-}$)	$V_{CC}=1.65\text{V}$	Full	0.35	-	0.6	V
		$V_{CC}=2.3\text{V}$		0.6	-	1.2	
		$V_{CC}=3\text{V}$		1.05	-	1.65	
		$V_{CC}=4.5\text{V}$		1.6	-	2.0	
		$V_{CC}=5.5\text{V}$		1.95	-	2.25	
V_{OH}		$I_{OH} = -100\mu\text{A}, V_{CC}=1.65\text{V to } 5.5\text{V}$	Full	V_{CC}	-	-	V
		$I_{OH} = -4\text{mA}, V_{CC}=1.65\text{V}$		-0.1	-	-	
		$I_{OH} = -8\text{mA}, V_{CC}=2.3\text{V}$		1.2	-	-	
		$I_{OH} = -16\text{mA}, V_{CC}=3\text{V}$		1.9	-	-	
		$I_{OH} = -24\text{mA}, V_{CC}=3\text{V}$		2.4	-	-	
		$I_{OH} = -32\text{mA}, V_{CC}=4.5\text{V}$		2.3	-	-	
				3.8	-	-	



Parameter		Conditions	Temp	Min.	Typ.	Max.	Unit
V _{OL}		I _{OH} =100μA, V _{CC} =1.65V to 5.5V	Full	-	-	0.1	V
		I _{OH} =4mA, V _{CC} =1.65V		-	-	0.45	
		I _{OH} =8mA, V _{CC} =2.3V		-	-	0.3	
		I _{OH} =16mA, V _{CC} =3V		-	-	0.4	
		I _{OH} =24mA, V _{CC} =3V		-	-	0.55	
		I _{OH} =32mA, V _{CC} =4.5V		-	-	0.55	
I _I	A input	V _I =5.5V or GND, V _{CC} = 0V to 5.5V	+25°C	-	±0.1	±1	μA
			Full	-	-	±5	
I _{off}		V _I or V _O =5.5V, V _{CC} =0V	+25°C		±0.1	±1	μA
			Full			±10	
I _{CC}		V _I =5.5V or GND, I _O =0, V _{CC} =1.65V to 5.5V	+25°C	-	0.1	1	μA
			Full	-	-	10	
ΔI _{CC}		One input at V _{CC} - 0.6V, Other inputs at V _{CC} or GND V _{CC} =3V to 5.5V	Full	-	-	500	μA

AC ELECTRICAL CHARACTERISTICS

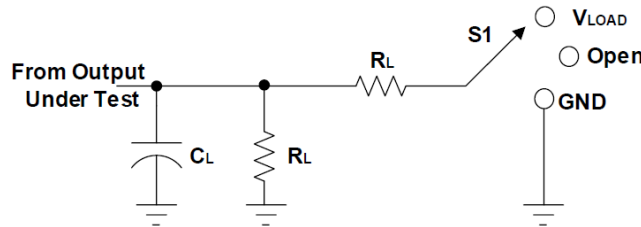
over recommended operating free-air temperature range Full=-40°C to +125°C, typical values are at T_A = +25°C, unless otherwise noted.^{NOTE3}

Parameter	Symbol	Conditions		Temp	Min.	Typ.	Max.	Unit
Propagation Delay	t _{pd}	V _{CC} =1.8V±0.15V	C _L =30pF, R _L =500Ω	Full	-	21	-	ns
		V _{CC} =2.5V±0.2V	C _L =30pF, R _L =500Ω		-	7.8	-	
		V _{CC} =3.3V±0.3V	C _L =50pF, R _L =500Ω		-	5.7	-	
		V _{CC} =5V±0.5V	C _L =50pF, R _L =500Ω		-	4.2	-	
Input Capacitance	C _i	V _{CC} =3.3V	V _I =V _{CC} or GND	+25°C	-	4	-	pF
Power Dissipation Capacitance	C _{pd}	V _{CC} =1.8V	f=10MHz	+25°C	-	21	-	pF
		V _{CC} =2.5V			-	22	-	
		V _{CC} =3.3V			-	22	-	
		V _{CC} =5V			-	25	-	



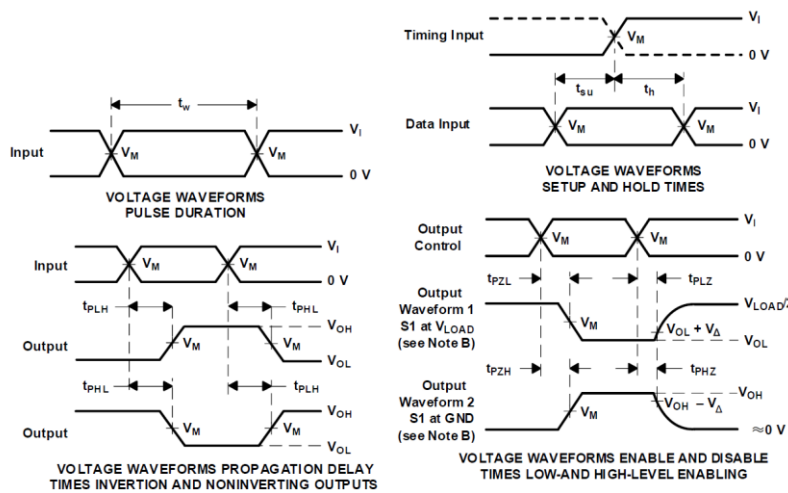
DETAILED INFORMATION

Parameter Measurement Information



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	Inputs		V_M	V_{LOAD}	C_L		R_L		V_{Δ}
	V_I	t_r/t_f							
$1.8V \pm 0.15V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	30pF	1M Ω	1k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	30pF	1M Ω	500 Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	15pF	50pF	1M Ω	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	15pF	50pF	1M Ω	500 Ω	0.3V



NOTE A: C_L includes probe and jig capacitance.

NOTE B: Waveform 1 is for an output with internal conditions such that the output is low, except when disabled by the output control.

Waveform 2 is for an output with internal conditions such that the output is high, except when disabled by the output control.

NOTE C: All input pulses are supplied by generators having the following characteristics: $PRR \leq 10$ MHz, $Z_o = 50\Omega$.

NOTE D: The outputs are measured one at a time, with one transition per measurement.

NOTE E: t_{PLZ} and t_{PHZ} are the same as t_{dis} .

NOTE F: t_{PZL} and t_{PZH} are the same as t_{en} .

NOTE G: t_{PLH} and t_{PHL} are the same as t_{pd} .

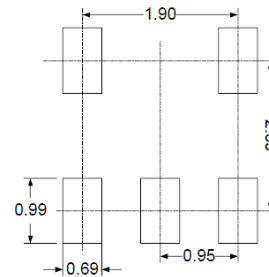
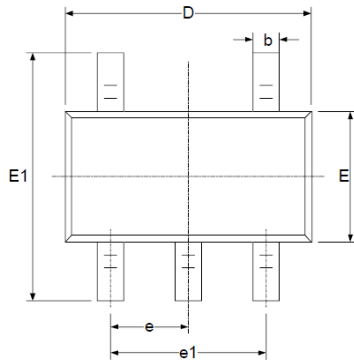
NOTE H: All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

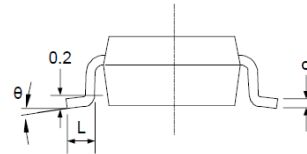
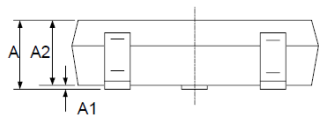


PACKAGE INFORMATION

Dimension in SOT-25 (Unit: mm)



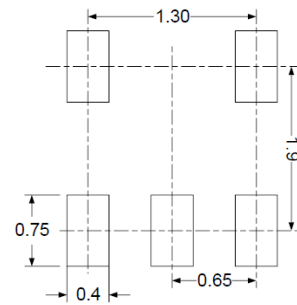
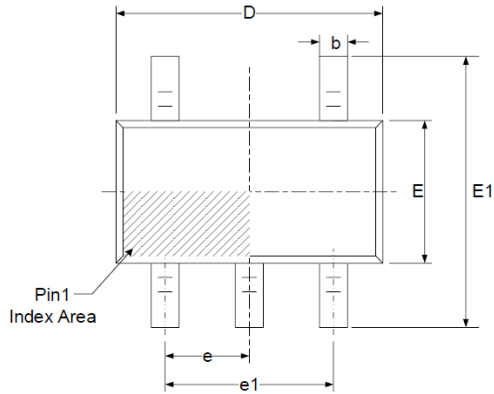
RECOMMENDED LAND PATTERN



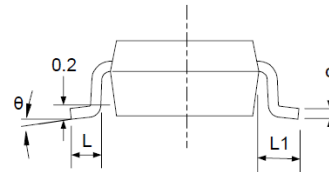
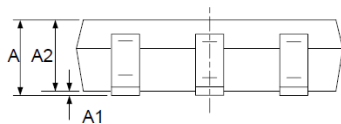
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



Dimension in SC70-5 (Unit: mm)



RECOMMENDED LAND PATTERN



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 BSC		0.026 BSC	
e1	1.300 BSC		0.051 BSC	
L	0.260	0.460	0.010	0.018
L1	0.525		0.021	
θ	0°	8°	0°	8°



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