



DESCRIPTION

The AL6G07 provides six independent buffers with open drain outputs. The AL6G07 is designed for operation with a power supply range of 1.65V to 5.5V VCC operation.

The AL6G07 is open drain and can be connected to other open-drain outputs to implement active-low wired-OR or active-high wired-AND functions.

The AL6G07 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. It operates over an ambient temperature range of -40°C to +125°C.

The AL6G07 is available in SOP14 and TSSOP14 Packages.

ORDERING INFORMATION

Package Type	Part Number	
SOP14 SPQ: 4,000pcs/Reel	M14	AL6G07M14R
		AL6G07M14VR
TSSOP14 SPQ:4,000pcs/Reel	TMX14	AL6G07TMX14R
		AL6G07TMX14VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

FEATURES

- Operating Voltage Range: 1.65V to 5.5V
- Low Power Consumption: 1µA (Max).
- Operating Temperature Range: -40°C to +125°C
- Inputs and Open-Drain Outputs Accept Voltage to 5.5V
- High Output Drive: ±24mA at V_{cc}=3.0V
- Available in SOP14 and TSSOP14 Packages

APPLICATION

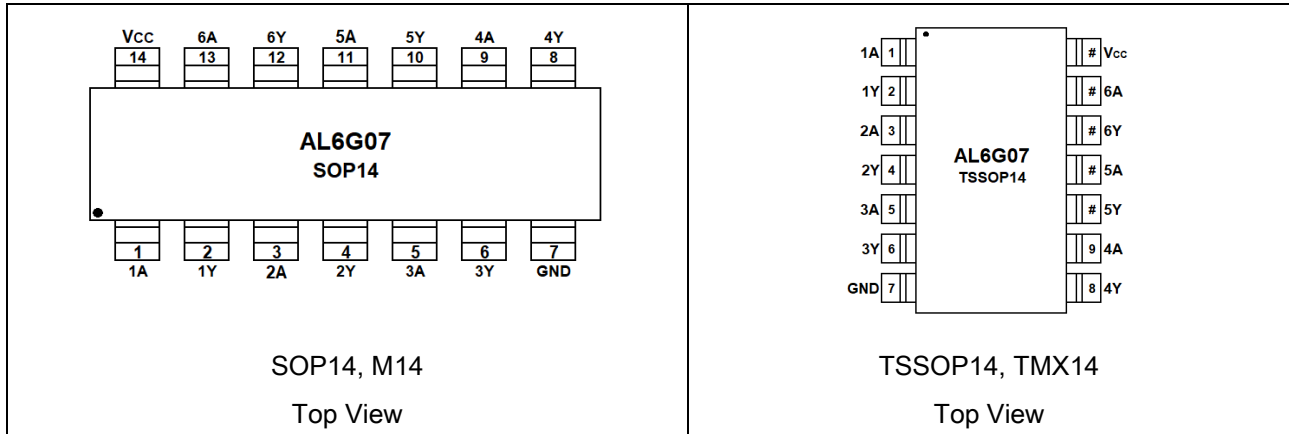
- General Purpose Logic
- Power Down Signa Isolation
- Servers
- Telecom Infrastructures
- TV, DVD, VDR, Set-Top Boxes
- Blu-ray Players and Home Theaters
- Desktops, Notebook PCs, Networking
- Digital Video Cameras (DVC)
- Mobile Phones
- Personal Navigation Device (GPS)
- Portable Media Player
- Computer Peripherals, Hard Drives

SIMPLIFIED SCHEMATIC





PIN DESCRIPTION



PIN#		Symbol	I/O	Function
SOP14	TSSOP14			
1	1	1A	I	Input 1
2	2	1Y	O	Open-Drain Output 1
3	3	2A	I	Input 2
4	4	2Y	O	Open-Drain Output 2
5	5	3A	I	Input 3
6	6	3Y	O	Open-Drain Output 3
7	7	GND	P	Ground
8	8	4Y	O	Open-Drain Output 4
9	9	4A	I	Input 4
10	10	5Y	O	Open-Drain Output 5
11	11	5A	I	Input 5
12	12	6Y	O	Open-Drain Output 6
13	13	6A	I	Input 6
14	14	Vcc	P	Power Pin

**ABSOLUTE MAXIMUM RATINGS**over operating free-air temperature range (unless otherwise noted) ⁽¹⁾ ⁽²⁾

V _{CC} , Supply Voltage Range		-0.5V ~ + 6.5V
V _I , Input Voltage Range ⁽²⁾		-0.5V ~ + 6.5V
V _O , Output Voltage Range ⁽²⁾		-0.5V ~ + 6.5V
I _{IK} , Input Clamp Current	V _I < 0	-50mA
I _{OK} , Output Clamp Current	V _O < 0	-50mA
I _O , Continuous Output Current		±50mA
I _O , Continuous Current through V _{CC} or GND		±100mA
θ _{JA} , Package Thermal Impedance ⁽³⁾	SOP14	105°C/W
	TSSOP14	90°C/W
T _J , Junction Temperature ⁽⁴⁾		-65°C ~ +150°C
T _{STG} , Storage Temperature		-65°C ~ +150°C

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

- (1) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (2) The value of V_{CC} is provided in the Recommended Operating Conditions table.
- (3) The package thermal impedance is calculated in accordance with JESD-51.
- (4) The maximum power dissipation is a function of T_J(MAX), R_{θJA}, and T_A. The maximum allowable power dissipation at any ambient temperature is P_D = (T_J(MAX) - T_A) / R_{θJA}. All numbers apply for packages soldered directly onto a PCB.

ESD RATINGS

Parameter	Symbol	Min	Unit
Human-Body Model (HBM)	V _(ESD) Electrostatic Discharge	±7000	V
Charged-Device Model (CDM)		±1500	
Machine Model (MM)		±400	



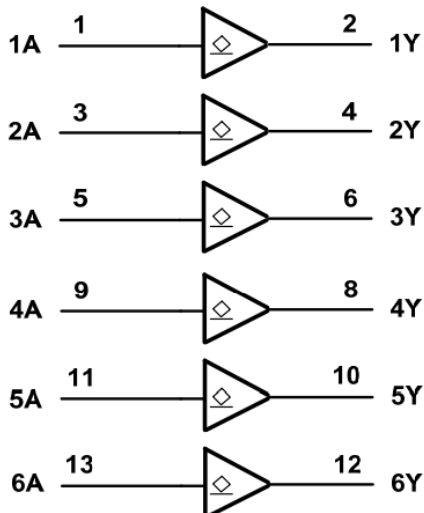
RECOMMENDED OPERATING CONFITIONS

TA=25°C, unless otherwise noted.*

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Supply Voltage	V _{CC}	Operating	1.65	-	5.5	V
		Data Retention only	1.50	-	-	
High-Level Input Voltage	V _{IH}	V _{CC} = 1.65 V ~1.95 V	0.65x V _{CC}	-		V
		V _{CC} = 2.3V ~2.7 V	1.70	-		
		V _{CC} = 3 V ~3.6 V	2.20	-		
		V _{CC} = 4.5 V ~5.5 V	0.70x V _{CC}	-		
Low-Level Input Voltage	V _{IL}	V _{CC} = 1.65 V ~1.95 V	-	-	0.15x V _{CC}	V
		V _{CC} = 2.3V ~2.7 V	-	-	0.30	
		V _{CC} = 3 V ~3.6 V	-	-	0.40	
		V _{CC} = 4.5 V ~5.5 V	-	-	0.15x V _{CC}	
Input Voltage	V _I	-	0	-	5.50	V
Output Voltage	V _O	-	0	-	5.50	V
Input Transition Rise or Fall	$\Delta t/\Delta v$	V _{CC} = 1.8V±0.15V, 2.5V±0.2V	-	-	20	ns/V
		V _{CC} = 3.30 V ± 0.3 V	-	-	10	
		V _{CC} = 5 V ± 0.5V	-	-	5	
Operating Temperature	T _A		-40	-	+125	°C

* All unused inputs of the device must be held at VCC or GND to ensure proper device operation.

BLOCK DIAGRAM





DC CHARACTERISTICS

Parameter		Conditions	Min	Typ.	Max	Unit	
V _{OL}		I _{OL} = 100 μA, V _{CC} =1.65~5.5V	-	-	0.10	V	
		I _{OL} = 4mA, V _{CC} =1.65V	-	-	0.45		
		I _{OL} = 8mA, V _{CC} =2.3V	-40°C ~ +125°C	-	-		0.30
		I _{OL} = 16mA, V _{CC} =3V	-	-	0.40		
		I _{OL} = 24mA, V _{CC} =3V	-	-	0.55		
		I _{OL} = 32mA, V _{CC} =4.5V	-	-	0.55		
I _I	A or B Inputs	V _I = 5.5V or GND, V _{CC} =0V~5.5V	+25°C	±0.1	±1	μA	
			-40°C ~ +125°C	-	±5		
I _{off}		V _I or V _O = 5.5V, V _{CC} =0V	+25°C	-	±0.1	±1	μA
			-40°C ~ +125°C	-	-	±10	
I _{CC}		V _I = 5.5V or GND, I _O =0, V _{CC} =1.65V~5.5V	+25°C	-	0.1	1	μA
			-40°C ~ +125°C	-	-	10	
ΔI _{CC}		One input at V _{CC} -0.6V, Other inputs at V _{CC} or GND, V _{CC} =3V~5.5V	-40°C ~ +125°C	-	-	500	μA

- (1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation
- (2) Limits are 100% production tested at 25°C. Limits over the operating temperature range are ensured through correlations using statistical quality control (SQC) method.
- (3) Typical values represent the most likely parametric norm as determined at the time of characterization. Actual typical values may vary over time and will also depend on the application and configuration.

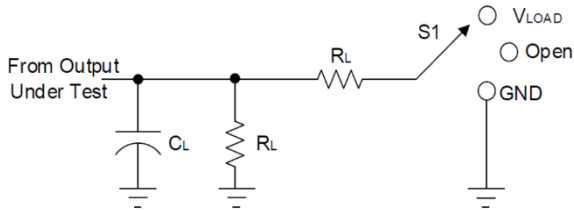
AC CHARACTERISTICS

Parameter	Symbol	Conditions			Min	Typ.	Max	Unit
Input Capacitance	C _i	V _{CC} =3.3V	V _I =V _{CC} or GND	+25°C	-	4	-	ns
Propagation Delay	t _{pd}	V _{CC} =1.8V±0.15V	C _L =30pF, R _L =1KΩ	-40°C ~ +125°C	-	6.4	-	ns
		V _{CC} =2.5V±0.2V	C _L =30pF, R _L =500Ω	-40°C ~ +125°C	-	4.5	-	
		V _{CC} =3.3V±0.3V	C _L =50pF, R _L =500Ω	-40°C ~ +125°C	-	4.2	-	
		V _{CC} =5V±0.5V	C _L =50pF, R _L =500Ω	-40°C ~ +125°C	-	3.7	-	
Power Dissipation Capacitance	C _{pd}	V _{CC} =1.8V±0.15V	f=10MHz	+25°C	-	3	-	pF
		V _{CC} =2.5V±0.2V		+25°C	-	3	-	
		V _{CC} =3.3V±0.3V		+25°C	-	4	-	
		V _{CC} =5V±0.5V		+25°C	-	6	-	

- (1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.
- (2) This parameter is ensured by design and/or characterization and is not tested in production.
- (3) Typical values represent the most likely parametric norm as determined at the time of characterization. Actual typical values may vary over time and will also depend on the application and configuration.



PARAMETER MEASUREMENT INFORMATION



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PIZ}/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}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1k Ω	0.15V
$2.5V \pm 0.2V$	V_{CC}	$\leq 2ns$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	6V	50pF	500 Ω	0.3V
$5V \pm 0.5V$	V_{CC}	$\leq 2.5ns$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V

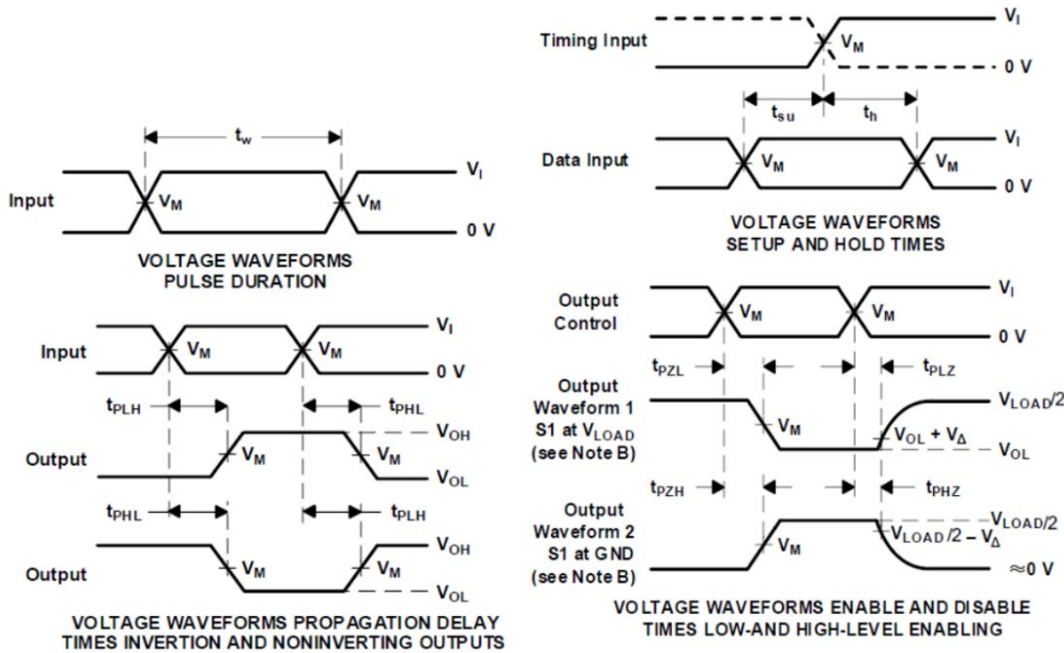


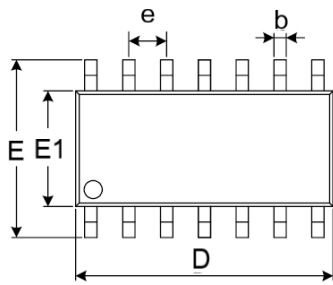
Fig 1. Load Circuit and Voltage Waveforms

- (A) C_L includes probe and jig capacitance.
- (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.
- (C) All input pulses are supplied by generators having the following characteristics: $PRR \leq 10 \text{ MHz}$, $Z_o = 50 \Omega$.
- (D) The outputs are measured one at a time, with one transition per measurement.
- (E) t_{PLZ} and t_{PHZ} are the same as t_{dis} .
- (F) t_{LPZ} and t_{PZH} are the same as t_{en} .
- (G) t_{PLH} and t_{PHL} are the same as t_{pd}
- (H) All parameters and waveforms are not applicable to all devices.

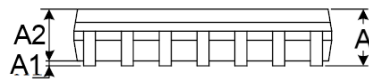


PACKAGE INFORMATION

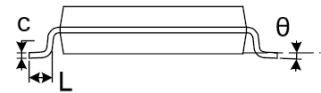
Dimension in SOP14 (Unit: mm)



TOP VIEW

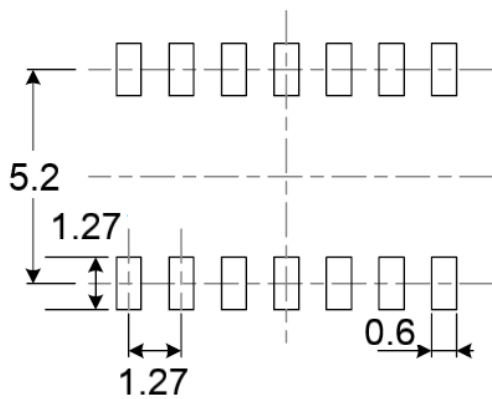


BOTTOM VIEW



SIDE VIEW

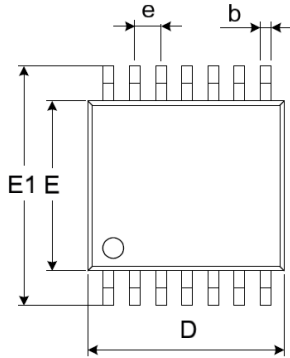
Recommended Land Pattern



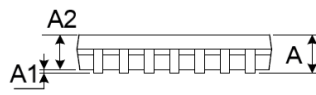
Symbol	Millimeters	
	Min	Max
A	1.350	1.750
A1	0.100	0.250
A2	1.350	1.550
b	0.330	0.510
c	0.170	0.250
D	4.800	5.000
e	1.270 BSC	
E	5.800	6.200
E1	3.800	4.000
L	0.400	1.270
θ	0°	8°



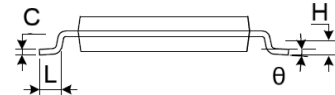
Dimension in TSSOP14 (Unit: mm)



TOP VIEW

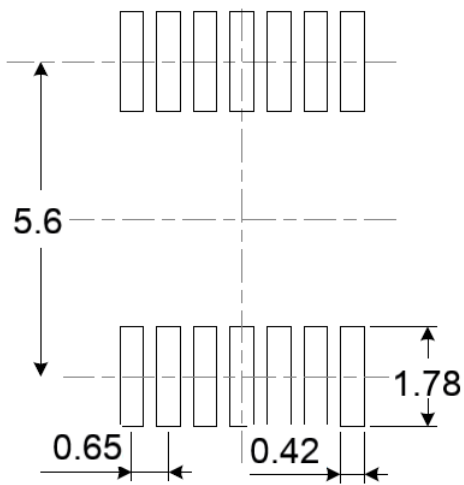


BOTTOM VIEW



SIDE VIEW

Recommended Land Pattern



Symbol	Millimeters	
	Min	Max
A	-	1.200
A1	0.50	0.150
A2	0.800	1.050
b	0.190	0.300
c	0.090	0.200
D	4.860	5.100
E	4.300	4.500
E1	6.250	6.550
e	0.650 BSC	
L	0.500	0.700
H	0.25 TYP	
θ	1°	7°



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