

# General-Purpose Logic Products

Diodes Incorporated has created popular functions in four major logic families.

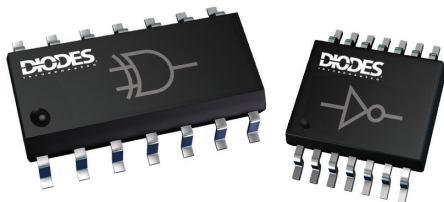
- LVC family has the drive and speed to work well in many demanding applications
- HC/T and AHC/T parts have been re-engineered on advanced wafer processes providing a continuous product supply well into the future.
- AUP is suitable for portable and mobile applications.

A broad assortment of small package options provides choice of size and lead pitch that is compatible with standard manufacturing processes.

DIODES' Logic is compatible with:							
Family	Device type	DIODES	Nexperia	TI	Toshiba	ON Semi	
AHC	Standard Logic	74AHCxx	SN74AHCxx	SN74AHCxx	VHCxxx	VHCxxx	VHCxxx
AHC1G	Single Gate	74AHC1Gxx	SN74AHC1Gxx	SN74AHC1Gxx	TC7SHxx	MC74VHC1Gxx	NC7Sxx
AHCT	Standard Logic	74AHCTxx	SN74AHCTxx	SN74AHCTxx	VHCTxxx	VHCTxxx	VHCTxxx
AHCT1G	Single Gate	74AHCT1Gxx	SN74AHCT1Gxx	SN74AHCT1Gxx	TC7SETxx	MC74VHCT1Gxx	NC7STxx
AUPIG	Single Gate	74AUP1Gxx	SN74AUP1Gxx	SN74AUP1Gxx	TC7SGxx	-	NC7SPxx
AUP2G	Dual Gate	74AUP2Gxx	SN74AUP2Gxx	SN74AUP2Gxx	-	-	NC7WPxx
HC	Standard Logic	74HCxx	SN74HCxx	SN74HCxx	HCxxx	HCxxx	HCxxx
HCT	Standard Logic	74HCTxx	SN74HCTxx	SN74HCTxx	HCTxxx	HCTxxx	HCTxxx
LVC	Standard Logic	74LVCxx	SN74LVCxx	SN74LVCxx	LCxxx	LCxxx	LCxxx
LVC1G	Single Gate	74LVC1Gxx	SN74LVC1Gxx	SN74LVC1Gxx	TC7SZxx	NL17SZxx	NC7SZxx
LVC1T	Single Translator	74LVC1Txx	SN74LVCT1Gxx	SN74LVCT1Gxx	-	-	-
LVC2G	Dual Gate	74LVC2Gxx	SN74LVC2Gxx	SN74LVC2Gxx	TC7WZxx	NL17WZxx	NC7WZxx
LVC2T	Dual Translator	74LVC2Txx	SN74LVCT1Gxx	SN74LVCT1Gxx	-	-	-
LVCH2T	Dual Translator	74LVCH2Txx	SN74LVCT1Gxx	SN74LVCT1Gxx	-	-	-

## WIDE PRODUCT RANGE

- **Eight technology families**  
Voltages up to 5.5 volts with drive capability need for your application
- **Single Gate Logic**  
Available in AHC, AHCT, LVC, and AUP families. Most are available in the smallest DFN0808 package
- **Dual Gate**  
LVC and AUP families. DFN0910 is the smallest available footprint
- **Standard Logic**  
Available in HC, HCT, AHC, AHCT, LV, and LVC families. Packaged in SO-14/-16 as well as TSSOP-14/-16/-20



## THE DIODES ADVANTAGE

- **Inputs are not clamped to VCC (AHC/AHCT/LVC)**  
Voltages up to 5.5 volts can be applied to inputs regardless of  $V_{CC}$
- **Inputs have a small amount of added hysteresis**  
Less susceptible to noise and can tolerate slower transition times
- **Automotive-compliant 1G variants**  
AEC-Q100 Grade 1 qualified, manufactured in IATF 16949 certified sites supporting PPAP documentation  
Gold bond wire - for best solution for extended reliability
- **Automotive parts have no circuits under bond pads**  
Meets stringent automotive requirements

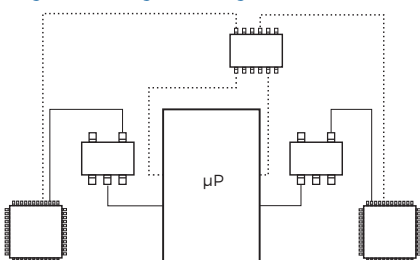
# General-Purpose Single-Gate and Dual-Gate Logic Products

Gate	Family Description	Type	AHC	AHCT	LVC	AUP	LVC	AUP
			1G	1G	1G/1T	1G	2G/2T	2G
0	2-Input NAND Gate		<b>74AHC1G00</b>	<b>74AHCT1G00</b>	<b>74LVC1G00</b>	74AUP1G00	74LVC2G00	74AUP2G00
2	2-Input NOR Gate		<b>74AHC1G02</b>	<b>74AHCT1G02</b>	<b>74LVC1G02</b>	74AUP1G02	74LVC2G02	74AUP2G02
4	Inverter (U04 unbuffered output)		<b>74AHC1G04</b>	<b>74AHCT1G04</b>	<b>74LVC1G04</b>	74AUP1G04	74LVC2G04	74AUP2G04
			74AHC1GU04					
6	Inverter with Open Drain Output		-	-	<b>74LVC1G06</b>	74AUP1G06	74LVC2G06	74AUP2G06
7	Buffer with Open Drain Output		-	-	<b>74LVC1G07</b>	74AUP1G07	74LVC2G07	74AUP2G07
8	2-Input AND Gate		<b>74AHC1G08</b>	<b>74AHCT1G08</b>	<b>74LVC1G08</b>	74AUP1G08	74LVC2G08	74AUP2G08
9	2-Input AND Gate with Open Drain Output		<b>74AHC1G09</b>	-	-	74AUP1G09	-	-
10	3-Input NAND Gate		-	-	74LVC1G10	-	-	-
11	3-Input AND Gate		-	-	74LVC1G11	-	-	-
125	Buffer with 3-State Output OE LOW		<b>74AHC1G125</b>	<b>74AHCT1G125</b>	<b>74LVC1G125</b>	74AUP1G125	74LVC2G125	74AUP2G125
126	Buffer with 3-State Output OE HIGH		<b>74AHC1G126</b>	<b>74AHCT1G126</b>	<b>74LVC1G126</b>	74AUP1G126	74LVC2G126	74AUP2G126
14	Schmitt Trigger Inverter		<b>74AHC1G14</b>	<b>74AHCT1G14</b>	<b>74LVC1G14</b>	74AUP1G14	74LVC2G14	74AUP2G14
17	Schmitt Trigger Buffer		-	-	<b>74LVC1G17</b>	74AUP1G17	74LVC2G17	74AUP2G17
32	2-Input OR Gate		<b>74AHC1G32</b>	<b>74AHCT1G32</b>	<b>74LVC1G32</b>	74AUP1G32	74LVC2G32	74AUP2G32
34	Buffer		-	-	<b>74LVC1G34</b>	74AUP1G34	74LVC2G34	74AUP2G34
45	Translator Dual Voltage		-	-	74LVC1T45	-	74LVC/H2T45	-
57	Configurable Multiple-Function Gate		-	-	74LVC1G57	-	-	-
58	Configurable Multiple-Function Gate		-	-	74LVC1G58	-	-	-
86	2-Input EXCLUSIVE OR Gate		<b>74AHC1G86</b>	<b>74AHCT1G86</b>	<b>74LVC1G86</b>	74AUP1G86	74LVC2G86	74AUP2G86
97	Configurable Multiple-Function Gate		-	-	74LVC1G97	-	-	-
98	Configurable Multiple-Function Gate		-	-	74LVC1G98	-	-	-
	V <sub>CC</sub> (min) ~ (max) - V		2 ~ 5.5	4.5 ~ 5.5	1.65 ~ 5.5	0.8 ~ 3.6	1.65 ~ 5.5	0.8 ~ 3.6
	Packages		SOT25/6 + SOT353/63 + DFN			SOT353 + DFN	SOT26 + SOT363 + DFN-8	

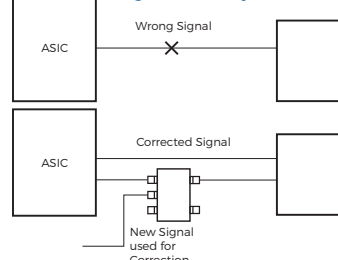
- Automotive-compliant versions (Q-suffix) available (denoted as blue bold face above)  
AEC-Q100 qualified, manufactured in IATF 16949 certified sites supporting PPAP documentation

AHC Characteristics	AHCT Characteristics	LVC Characteristics	AUP Characteristics
<ul style="list-style-type: none"> <li>Supply voltage range: 2.0 - 5.5V</li> <li>±8mA output drive at 4.5V</li> <li>Propagation times of 4 ~ 6ns</li> <li>Balanced propagation delays</li> <li>Balanced drive capability</li> </ul>	<ul style="list-style-type: none"> <li>Supply voltage range: 4.5 - 5.5V</li> <li>TTL compatible inputs</li> <li>±8mA output drive at 4.5V</li> <li>Propagation times of 4 ~ 6ns</li> <li>Balanced propagation delays</li> <li>Balanced drive capability</li> </ul>	<ul style="list-style-type: none"> <li>Supply voltage range: 1.65 - 5.5V</li> <li>±24mA output drive at 3.3V</li> <li>±32mA output drive at 5.5V</li> <li>Propagation times of 2 ~ 3ns</li> </ul>	<ul style="list-style-type: none"> <li>Supply voltage range: 0.8 - 3.6V</li> <li>±4mA output drive at 3.0V</li> <li>Very low power consumption</li> <li>250 mV of input hysteresis for noise rejection</li> </ul>
<b>Design Notes:</b>			
<ul style="list-style-type: none"> <li>Lower drive currents will allow unterminated circuits to be less susceptible to ringing</li> </ul>		<ul style="list-style-type: none"> <li>The I<sub>off</sub> circuit removes clamping action between output and V<sub>CC</sub></li> <li>At V<sub>CC</sub> = 0 both inputs and outputs are high impedance → ideal for power down isolation</li> </ul>	<ul style="list-style-type: none"> <li>Higher drive capability for longer lines</li> <li>Termination may be required</li> </ul>
			<ul style="list-style-type: none"> <li>Lowest power for mobile and IoT</li> </ul>

### Signal Routing/Buffering



### Signal Polarity Correction



### Voltage Level Shifting

