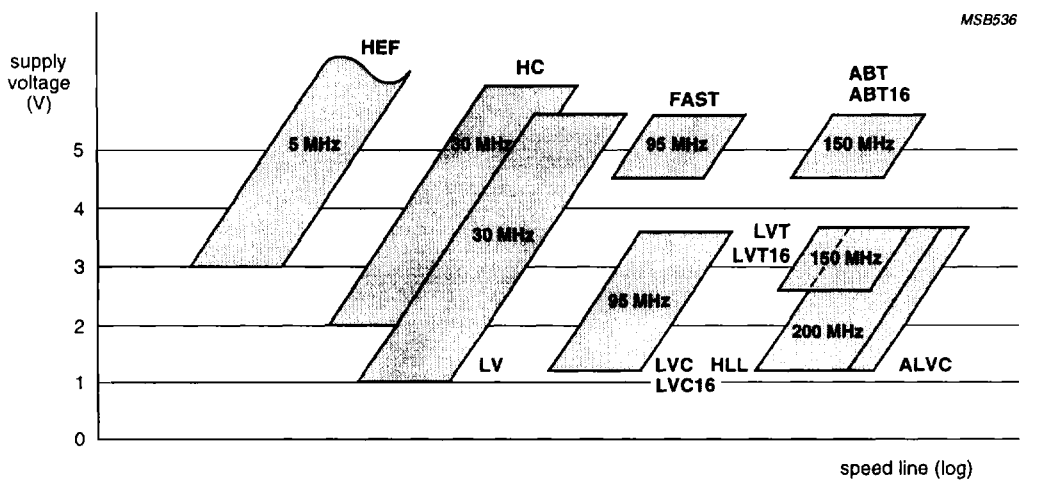
FIVE NEW LOW-VOLTAGE LOGIC FAMILIES

Philips has introduced four low-voltage CMOS logic families and one new low-voltage BiCMOS family to complement their existing range of logic ICs: LV-HCMOS, LVC/LVC-A/LVC16, HLL, ALVC and LVT/LVT16. All five families are completely new designs, specifically for 3.3 V operation. LV-HCMOS (Low-voltage, high speed CMOS) logic is a 3.3 V version of our HCMOS family, LVC/LVC-A/LVC16 (Low-voltage CMOS) logic are 3.3 V families compatible with FAST logic. HLL (High speed Low-power Low-voltage) CMOS logic is the worlds fastest 3.3 V TTL-compatible logic, ALVC (Advanced Low-voltage CMOS) is the fastest 16-bit 3.3 V logic with very high speeds and high output drive and very low power consumption. LVT/LVT16 (Low-Voltage Technology) advanced BiCMOS logic are 3.3 V versions of ABT logic.
In summary:

1. **LV-HCMOS**
   - Low Voltage HCMOS
   - A 3.3 V version of our HCMOS series
2. **LVC/LVC-A/LVC16**
   - Low Voltage CMOS
   - 3.3 V, compatible with FAST
3. **HLL**
   - High speed, Low voltage, Low power
   - Low skew, low EMC
4. **ALVC**
   - Advanced Low Voltage CMOS
   - Fastest 3.3 V logic available
5. **LVT/LVT16**
   - Low-Voltage Technology BiCMOS
   - A 3.3 V version of ABT/ABT16



Guaranteed speed versus supply voltage for 3 V and 5 V logic. The speed range per family is due to the various functions within each family

The complementarity of our low-voltage logic families

Feature	LV	LVC/LVC-A	LVC16	HLL	ALVC	LVT	LVT16
Process	CMOS	CMOS	CMOS	CMOS	CMOS	BiCMOS	BiCMOS
Speed	medium	high	high	very high	very high	very high	very high
Product range	switches gates/FF decoders MUX/DEMUX octals	gates/FF decoders MUX/DEMUX octals	multibyte	octals	multibyte	octals	multibyte
Output drive	low	high	high	high	high	very high	very high
5 V input & output[1)]	no	yes	yes	yes	yes	yes	yes
Over-voltage protection	no	no	no	no	no	yes	yes
Live insertion support	no	no	no	no	no	yes	yes
5 V equivalent	HC, LS	F, ACL	F, ACL	FCT-C	FCT16-C	ABT, BCT, FCT-A	ABT16, FCT16-C
Primary applications	glue logic portable eq.	glue logic portable eq. local bus	portable eq. local bus super µP	portable eq. local bus super µP	portable eq. local bus super µP	local bus super µP backplanes	local bus super µP backplanes

Note:
1) See next table for details.

Key parameters and features comparison of Philips 3 V logic families

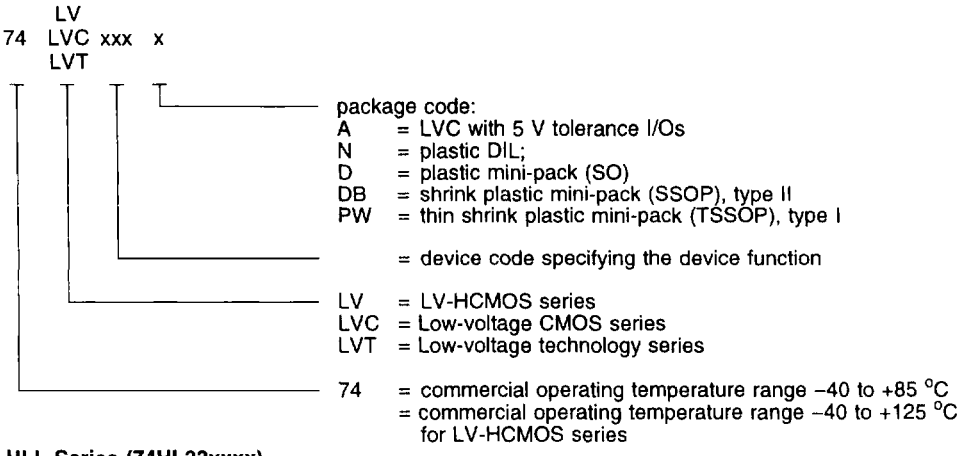
	LV	LVC/LVC-A	LVC16	HLL	ALVC	LVT	LVT16
Key parameters							
Nomenclature [1]	74LVxxxX	74LVCxxxX	74LVC16xx xX	74HLL33xxxX	74ALVC16xxxX	74LVTxxxX	74LVT16xxxX
Minimum V_{CC} V	1.0	1.2	1.2	1.2	1.2	2.7	2.7
Maximum V_{CC} V	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Output current I_{OH}/I_{OL} mA	6/6	24/24	24/24	24/24	24/24	32/64	32/64
Quiescent current µA	80	20	40	80	40	80	80
'244 propagation delay:							
T_{pd} typ. ns	9	4.0	4.0	2.1	2.1	2.4	2.4
T_{pd} max. ns	18	5.8	5.8	4.0	4.0	3.6	3.6
Max. ground bounce V	0.5	0.8	0.8	1.0	0.7	0.8	0.5
Features							
Full CMOS	✓	✓	✓	✓	✓		
Advanced BiCMOS						✓	✓
Drive capability:							
135 Ω	✓						
50 Ω		✓	✓	✓	✓		
35 Ω						✓	✓
Feature size:							
2.0 µm	✓						
0.8 µm						✓	✓
0.6 µm		✓	✓	✓	✓		
Corner supply pins	✓	✓				✓	
Centre supply pins				✓			
Multiple supply/GND pins			✓		✓		✓
TTL level input	✓	✓	✓	✓	✓	✓	✓
TTL level output	✓	✓	✓	✓	✓	✓	✓
5 V input capability		✓ [4]	✓ [3]	✓ [2]	✓ [3]	✓	✓
Over-voltage protection						✓	✓
Live insertion						✓	✓
Input bus hold		✓ [4]				✓	✓
Packages:							
DIL	✓						
SO	✓	✓		✓		✓	
SSOP	✓	✓	✓	✓	✓	✓	✓
TSSOP	✓	✓	✓	✓	✓	✓	✓
Application:							
glue logic	✓	✓					
battery-powered	✓	✓	✓	✓	✓		
equipment		✓	✓	✓	✓	✓	✓
local bus			✓	✓	✓	✓	✓
super µP backplane						✓	✓
Compatible 5 V families	LS-TTL HC/HCT N74xx	FAST, ALS ACL (Q)FACT	FAST, ALS ACL (Q)FACT	FCT-C	FCT-C	ABT BC/BCT FCT-A	ABT BC/BCT FCT16-C

Notes:

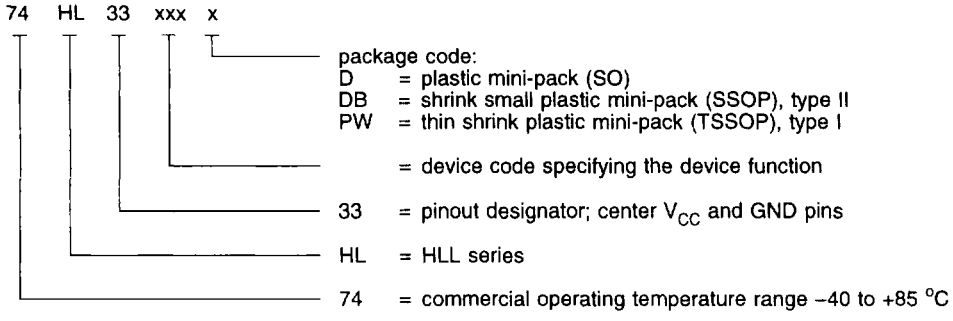
1) xxx = function indication; 245 etc.
X = package code: D = SO, DB = SSOP II, PW = TSSOP I, DL = SSOP 48-56, DGG = TSSOP 48-56.
2) For transceiver I/O pins $V_{IN\,max} = V_{CC} + 0.5$ V.
3) For control pins only; other input and output pins: $V_{IN\,max} = V_{CC} + 0.5$ V.
4) For LVC-A: 5 V tolerance for inputs and outputs; Bus hold as an option.

Type number designation

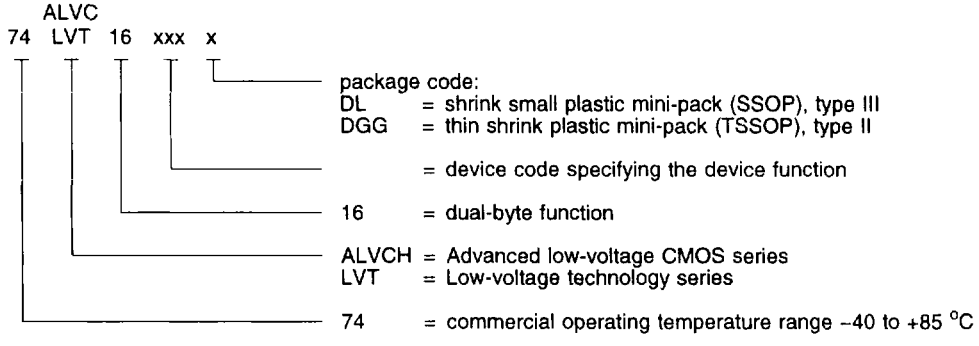
LV, LVC and LVT Series (74LVxxxx, 74LVCxxxx, 74LVTxxxx)



HLL Series (74HL33xxxx)



ALVC Series (74ALVC16xxxx, 74LVT16xxxx)



Family ratings for the LV series

Limiting values in accordance with the Absolute Maximum System (IEC 134)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+7.0	V
DC input diode current	$V_I < -0.5$ V or $V_I > V_{CC}+0.5$ V	I_{IK}	–	20	mA
DC output diode current	$V_O < -0.5$ V or $V_O > V_{CC}+0.5$ V	I_{OK}	–	50	mA
DC output source or sink current	$-0.5V < V_O < V_{CC}+0.5$ V				
- standard outputs		I_O	–	25	mA
- bus driver outputs		I_O	–	35	mA
DC V_{CC} or GND current					
- standard outputs		I_{CC}; I_{GND}	–	50	mA
- bus driver outputs		I_{CC}; I_{GND}	–	70	mA
Storage temperature range		T_{stg}	−65	+150	°C
Power dissipation per package	for temperature range: −40 to +125 °C;				
- plastic DIL	above +70 °C derate linearly by 12 mW/K	P_{tot}	–	750	mW
- plastic mini-pack (SO)	above +70 °C derate linearly by 8 mW/K	P_{tot}	–	500	mW
- plastic shrink small outline (SSOP type II)	above +70 °C derate linearly by 8 mW/K	P_{tot}	–	500	mW
- plastic thin shrink small outline (TSSOP type I)	above +70 °C derate linearly by 8 mW/K	P_{tot}	–	500	mW

Recommended operating conditions for the LV series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	min.	typ.	max.	unit	conditions
DC supply voltage range[1]	V_{CC}	1.0	3.3	5.5	V	
DC input voltage range	V_I	0	–	V_{CC}	V	
DC output voltage range	V_O	0	–	V_{CC}	V	
Operating ambient temperature range in free air	T_{amb}	−40 −40	– –	+85 +125	°C °C	see AC and DC characteristics per device
Input rise and fall times except for Schmitt trigger inputs	t_r; t_f	– – –	– – –	500 200 100	ns/V ns/V ns/V	V_{CC} = 1.0 to 2.0 V V_{CC} = 2.0 to 2.7 V V_{CC} = 2.7 to 3.6 V

Note:
1. The LV is guaranteed to function down to V_{CC} = 1.0 V (input levels GND or V_{CC}); DC characteristics are guaranteed from V_{CC} = 1.2 V to V_{CC} = 3.6 V

DC family characteristics for the LV series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) –40 to +85 min.	–40 to +85 typ.	–40 to +85 max.	–40 to +125 min.	–40 to +125 max.	unit	conditions V_I	conditions other
HIGH level input voltage	1.2	V_{IH}	0.9	–	–	0.9	–	V		
	2.0		1.4	–	–	1.4	–			
	2.7 .. 3.6		2.0	–	–	2.0	–			
	4.5 .. 5.5		$0.7V_{CC}$	–	–	$0.7V_{CC}$	–			
LOW level input voltage	1.2	V_{IL}	–	–	0.3	–	0.3	V		
	2.0		–	–	0.6	–	0.6			
	2.7 .. 3.6		–	–	0.8	–	0.8			
	4.5 .. 5.5		–	–	$0.3V_{CC}$	–	$0.3V_{CC}$			
HIGH level output voltage all outputs	1.2	V_{OH}	–	1.2	–	–	–	V	V_{IH} or V_{IL}	$-I_O$ = 100 µA
	2.0		1.8	2.0	–	1.8	–			
	2.7		2.5	2.7	–	2.5	–			
	3.0		2.8	3.0	–	2.8	–			
	4.5		4.3	4.5	–	4.3	–			
HIGH level output voltage standard	3.0	V_{OH}	2.40	2.82	–	2.20	–	V	V_{IH} or V_{IL}	$-I_O$ = 6 mA $-I_O$ = 10 mA
	4.5		3.60	4.20	–	–	–			
HIGH level output voltage bus driver	3.0	V_{OH}	2.40	2.82	–	2.20	–	V	V_{IH} or V_{IL}	$-I_O$ = 8 mA $-I_O$ = 16 mA
	4.5		3.60	4.20	–	–	–			
LOW level output voltage all outputs	1.2	V_{OL}	–	0	0.2	–	0.2	V	V_{IH} or V_{IL}	I_O = 100 µA
	2.0		–	0	0.2	–	0.2			
	2.7		–	0	0.2	–	0.2			
	3.0		–	0	0.2	–	0.2			
	4.5		–	0	0.2	–	0.2			
LOW level output voltage standard	3.0	V_{OL}	–	0.25	0.4	–	0.5	V	V_{IH} or V_{IL}	I_O = 6 mA I_O = 10 mA
	4.5		–	0.35	0.55	–	–			
LOW level output voltage bus driver	3.0	V_{OL}	–	0.20	0.4	–	0.5	V	V_{IH} or V_{IL}	I_O = 8 mA I_O = 16 mA
	4.5		–	0.35	0.55	–	–			
Input leakage current	3.6	I_I	–	–	1.0	–	1.0	µA	V_{CC} or GND	
	5.5		–	–	1.0	–	–			
3-state OFF-state current	3.6	I_{OZ}	–	–	5.0	–	10.0	µA	V_{IH} or V_{IL}	V_O = V_{CC} or GND
	5.5		–	–	5.0	–	–			
Quiescent supply current										
SSI	3.6	I_{CC}	–	–	20	–	40	µA	V_{CC} or GND	I_O = 0
flip-flops	3.6	I_{CC}	–	–	20	–	80	µA		I_O = 0
MSI	3.6	I_{CC}	–	–	20	–	160	µA		I_O = 0
LSI	3.6	I_{CC}	–	–	500	–	1000	µA		I_O = 0
additional quiescent sypply current per input	2.7 .. 3.6	ΔI_{CC}	–	–	500	–	850	µA	V_{CC} –0.6V	

Note: All typical values are measured at T_{amb} = 25°C

Family ratings for the LVC series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+6.5	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	note 2	V_I	−0.5	+5.5	V
DC input voltage range for I/Os		$V_{I/O}$	−0.5	V_{CC} + 0.5	V
DC output diode current	$V_O > V_{CC}$ or $V_O < 0$	I_{OK}	–	±50	mA
DC output voltage	note 2	V_O	−0.5	V_{CC} + 0.5	V
DC output source or sink current	V_O = 0 to V_{CC}	I_O	–	±50	mA
DC V_{CC} or GND current		I_{CC}; I_{GND}	–	±100	mA
Storage temperature range		T_{stg}	−60	+150	°C
Power dissipation per package	see data handbook	P_{tot}			

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the LVC series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	min.	max.	unit	conditions
DC supply voltage range (for max. speed performance)	V_{CC}	2.7	3.6	V	
DC supply voltage (for low-voltage applications)	V_{CC}	1.2	3.6	V	
DC input voltage range	V_I	0	5.5	V	
DC input voltage range for I/Os	$V_{I/O}$	0	V_{CC}	V	
DC output voltage range	V_O	0	V_{CC}	V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	see AC and DC characteristics per device
Input rise and fall times	t_r; t_f	–	20	ns/V	V_{CC} = 1.2 to 2.7 V
		–	10	ns/V	V_{CC} = 2.7 to 3.6 V

DC family characteristics for the LVC series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) −40 to +85 min.	typ.	max.	unit	conditions V_I	other
HIGH level input voltage	1.2 2.7 .. 3.6	V_{IH}	V_{CC} 2.0	– –	– –	V		
LOW level input voltage	1.2 2.7 .. 3.6	V_{IL}	– –	– –	GND 0.8	V		
HIGH level output voltage	2.7 3.0 3.0 3.0	V_{OH}	V_{CC} − 0.5 V_{CC} − 0.2 V_{CC} − 0.6 V_{CC} − 1.0	– V_{CC} – –	– – – –	V	V_{IH} or V_{IL}	I_O = −12 mA I_O = −100 µA I_O = −18 mA I_O = −24 mA
LOW level output voltage	2.7 3.0 3.0	V_{OL}	– – –	– – –	0.40 0.20 0.55	V	V_{IH} or V_{IL}	I_O = 12 mA I_O = 100 µA I_O = 24 mA
Input leakage current	3.6	I_I	–	±0.1	±5	µA	5.5 V or GND	not for I/O pins
Input current for common I/O pins	3.6	I_{IHZ}/I_{ILZ}	–	±0.1	±15	µA	V_{CC} or GND	
3-state output OFF-state current	3.6	I_{OZ}	–	0.1	±10	µA	V_{IH} or V_{IL}	V_O = V_{CC} or GND
Quiescent supply current	3.6	I_{CC}	–	0.1	20	µA	V_{CC} or GND	I_O = 0
Additional quiescent sypply current per control pin	2.7 .. 3.6	ΔI_{CC}	–	5	500	µA	V_{CC} − 0.6 V	I_O = 0

Note: All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25°C.

Family ratings for the LVC-A series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+6.5	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	note 2	V_I	−0.5	+6.5	V
DC output diode current	$V_O > V_{CC}$ or $V_O < 0$	I_{OK}	–	±50	mA
DC output voltage; output HIGH or LOW state	note 2	V_O	−0.5	V_{CC} + 0.5	V
DC output voltage; output 3-state	note 2	V_O	−0.5	6.5	V
DC output source or sink current	V_O = 0 to V_{CC}	I_O	–	±50	mA
DC V_{CC} or GND current		I_{CC}; I_{GND}	–	±100	mA
Storage temperature range		T_{stg}	−60	+150	°C
Power dissipation per package		P_{tot}			
plastic mini-pack (SO)	above +70°C derate linearly with 8 mW/K		–	500	mW
plastic shrink mini-pack (SSOP and TSSOP)	above +60°C derate linearly with 5.5 mW/K		–	500	mW

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the LVC-A series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	min.	max.	unit	conditions
DC supply voltage range (for max. speed performance)	V_{CC}	2.7	3.6	V	
DC supply voltage (for low-voltage applications)	V_{CC}	1.2	3.6	V	
DC input voltage range	V_I	0	5.5	V	
DC output voltage range; output HIGH or LOW state	V_O	0	V_{CC}	V	
DC output voltage range; output 3-state	V_O	0	5.5	V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	see AC and DC characteristics per device
Input rise and fall times	t_r; t_f	–	20	ns/V	V_{CC} = 1.2 to 2.7 V
		–	10	ns/V	V_{CC} = 2.7 to 3.6 V

DC family characteristics for the LVC-A series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) −40 to +85 min.	typ.	max.	unit	conditions V_I	other
HIGH level input voltage	1.2	V_{IH}	V_{CC}	–	–	V		
	2.7 .. 3.6		2.0	–	–			
LOW level input voltage	1.2	V_{IL}	–	–	GND	V		
	2.7 .. 3.6		–	–	0.8			
HIGH level output voltage	2.7	V_{OH}	V_{CC} − 0.5	–	–	V	V_{IH}	I_O = −12 mA
	3.0		V_{CC} − 0.2	V_{CC}	–		or	I_O = −100 µA
	3.0		V_{CC} − 0.6	–	–		V_{IL}	I_O = −18 mA
	3.0		V_{CC} − 0.8	–	–			I_O = −24 mA
LOW level output voltage	2.7	V_{OL}	–	–	0.40	V	V_{IH}	I_O = 12 mA
	3.0		–	–	0.20		or	I_O = 100 µA
	3.0		–	–	0.55		V_{IL}	I_O = 24 mA
Input leakage current	3.6	I_I	–	±0.1	±5	µA	5.5 V or GND	not for I/O pins
Input current for common I/O pins	3.6	I_{IHZ}/I_{ILZ}	–	±0.1	±10	µA	5.5 V or GND	
3-state OFF-state current	3.6	I_{OZ}	–	0.1	±10	µA	V_{IH} or V_{IL}	V_O = 5.5 V or GND
Power off leakage current	0.0	I_{off}	–	–	±100	µA	V_I or V_O = 5.5 V	
Quiescent supply current	3.6	I_{CC}	–	0.1	20	µA	V_{CC} or GND	I_O = 0
Additional quiescent sypply current per control pin	2.7 .. 3.6	ΔI_{CC}	–	5	500	µA	V_{CC} − 0.6 V	I_O = 0
Bushold LOW sustaining current	3.0	I_{BHL}	75	–	–	µA	0.8 V	notes 2 and 3
Bushold HIGH sustaining current	3.0	I_{BHH}	−75	–	–	µA	2.0 V	notes 2 and 3
Bushold LOW overdrive current	3.6	I_{BHLO}	450	–	–	µA		notes 2 and 3
Bushold HIGH overdrive current	3.6	I_{BHHO}	−450	–	–	µA		notes 2 and 3

Notes:
1. All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25°C.
2. Control inputs do not have a bushold circuit. Parts with busholds are called LVH-A.
3. The specified sustaining current at the data input holds the input below the specified V_I level.
4. The specified overdrive current at the data input porces the data input to the opposite logic input state.

Family ratings for the LVC16 series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+4.6	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	for control pins only; note 2	V_I	−0.5	+5.5	V
DC input voltage	for data pins only; note 2	V_I	−0.5	V_{CC} + 0.5	V
DC output diode current	$V_O > V_{CC}$ or $V_O < 0$	I_{OK}	–	±50	mA
DC output voltage	note 2	V_O	−0.5	V_{CC} + 0.5	V
DC output source or sink current	V_O = 0 to V_{CC}	I_O	–	±50	mA
DC V_{CC} or GND current		I_{CC}; I_{GND}	–	±100	mA
Storage temperature range		T_{stg}	−60	+150	°C
Power dissipation per package	see data handbook	P_{tot}			

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the LVC16 series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	min.	max.	unit	conditions
DC supply voltage range (for max. speed performance)	V_{CC}	2.7	3.6	V	
DC supply voltage (for low-voltage applications)	V_{CC}	1.2	3.6	V	
DC input voltage range	V_I	0	5.5	V	
DC input voltage range	V_I	0	V_{CC}	V	
DC output voltage range	V_O	0	V_{CC}	V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	see AC and DC characteristics per device
Input rise and fall times	t_r; t_f	–	20	ns/V	V_{CC} = 3.6 V
		–	10	ns/V	V_{CC} = 1.2 V

DC family characteristics for the LVC16 series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) −40 to +85 min.	typ.[1]	max.	unit	conditions V_I	other
HIGH level input voltage	1.2 2.7 .. 3.6	V_{IH}	V_{CC} 2.0	– –	– –	V		
LOW level input voltage	1.2 2.7 .. 3.6	V_{IL}	– –	– –	GND 0.8	V		
HIGH level output voltage	2.7 3.0 3.0	V_{OH}	V_{CC} − 0.5 V_{CC} − 0.2 V_{CC} − 0.1	– V_{CC} –	– – –	V	V_{IH} or V_{IL}	I_O = −12 mA I_O = −100 µA I_O = −24 mA
LOW level output voltage	2.7 3.0 3.0	V_{OL}	– – –	– – –	0.40 0.20 0.55	V	V_{IH} or V_{IL}	I_O = 12 mA I_O = 100 µA I_O = 24 mA
Input leakage current	3.6	I_I	–	±0.1	±5	µA	5.5 V or GND	for control pins only
Input leakage current	3.6	I_I	–	±0.1	±5	µA	V_{CC} or GND	for data inputs only
Input current for common I/O pins	3.6	I_{IHZ}/I_{ILZ}	–	±0.1	±15	µA	V_{CC} or GND	
3-state OFF-state current	3.6	I_{OZ}	–	0.1	±10	µA	V_{IH} or V_{IL}	V_O = V_{CC} or GND
Quiescent supply current	3.6	I_{CC}	–	0.2	40	µA	V_{CC} or GND	I_O = 0
Additional quiescent sypply current per control pin	2.7 .. 3.6	ΔI_{CC}	–	5	500	µA	V_{CC} − 0.6 V	I_O = 0
Additional quiescent sypply current per data I/O pin	2.7 .. 3.6	ΔI_{CC}	–	150	750	µA	V_{CC} − 0.6 V	I_O = 0
Bushold LOW sustaining current	3.0	I_{BHL}	75	–	–	µA	0.8 V	for data inputs only[2]
Bushold HIGH sustaining current	3.0	I_{BHH}	−75	–	–	µA	2.0 V	for data inputs only[2]
Bushold LOW overdrive current	3.6	I_{BHLO}	450	–	–	µA		for data inputs only[2]
Bushold HIGH overdrive current	3.6	I_{BHHO}	−450	–	–	µA		for data inputs only[2]

Notes:
1. All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25°C.
2. Control inputs do not have a bushold circuit.

Family ratings for the HLL series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+4.6	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	note 2	V_I	−0.5	+5.5	V
DC input voltage range for I/Os		$V_{I/O}$		V_{CC} +0.5	V
DC output diode current	$V_O > V_{CC}$ or $V_O < 0$	I_{OK}	–	±75	mA
DC output voltage	note 2	V_O	−0.5	V_{CC} +0.5	V
DC output source or sink current	V_O = 0 to V_{CC}	I_O	–	±70	mA
DC V_{CC} or GND current		I_{CC}; I_{GND}	–	100	mA
Storage temperature range		T_{stg}	−60	+150	°C
Power dissipation per package	see data handbook	–			

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the HLL series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	typ.	max.	unit	conditions
DC supply voltage range (for max. speed performance)	V_{CC}	3.0	3.6	V	
DC supply voltage (for low-voltage applications)	V_{CC}	1.2	3.6	V	
DC input voltage range	V_I	0	5.5	V	
DC input voltage range for I/Os	$V_{I/O}$	0	V_{CC}	V	
DC output voltage range	V_O	0	V_{CC}	V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	see AC and DC characteristics per device
Input rise and fall times	t_r; t_f	–	20	ns	V_{CC} = 3.6 V
		–	50	ns	V_{CC} = 1.2 V

DC characteristics for the HLL series

Over recommended operation conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) +25 min.	+25 typ.	+25 max.	−40 to +85 min.	−40 to +85 max.	unit	conditions V_I	conditions other
HIGH level input voltage	3.6	V_{IH}	–	–	–	2.0	–	V		
LOW level input voltage	3.0	V_{IL}	–	–	–	–	0.8	V		
Hysteresis (all inputs)	3.0 .. 3.6	V_H	–	0.25	–	–	–	V		
HIGH level output voltage	3.0	V_{OH}	V_{CC}−0.2 V_{CC}−0.4	V_{CC} –	– – –	V_{CC}−0.2 V_{CC}−0.4	– –	V V	V_{IH} or V_{IL}	I_O = 100 µA I_O = −24 mA
LOW level output voltage	3.0	V_{OL}	– –	– –	0.2 0.4	– –	0.2 0.4	V V	V_{IH} or V_{IL}	I_O = 100 µA I_O = 24 mA
Input leakage current	3.6	I_I	–	–	–	–	±5	µA	V_{CC} or GND	
3-state output OFF-state current	3.6	I_{OZ}	–	–	–	–	10	µA	V_{IH} or V_{IL}	V_O = V_{CC} or GND
Quiescent supply current	3.6	I_{CC}	–	–	8.0	–	80	µA	V_{CC} or GND	I_O = 0

Family ratings for the ALVC series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+4.6	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	for control pins only; note 2	V_I	−0.5	+5.5	V
DC input voltage	for data pins only; note 2	V_I	−0.5	V_{CC} + 0.5	V
DC output diode current	$V_O > V_{CC}$ or $V_O < 0$	I_{OK}	–	±50	mA
DC output voltage	note 2	V_O	−0.5	V_{CC} + 0.5	V
DC output source or sink current	V_O = 0 to V_{CC}	I_O	–	±50	mA
DC V_{CC} or GND current		I_{CC}; I_{GND}	–	100	mA
Storage temperature range		T_{stg}	−60	+150	°C
Power dissipation per package	see data handbook	P_{tot}			

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the ALVC series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	typ.	max.	unit	conditions
DC supply voltage range (for max. speed performance)	V_{CC}	3.0	3.6	V	
DC supply voltage (for low-voltage applications)	V_{CC}	1.2	3.6	V	
DC input voltage range	V_I	0	5.5	V	
DC input voltage range for I/Os	$V_{I/O}$	0	V_{CC}	V	
DC output voltage range	V_O	0	V_{CC}	V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	see AC and DC characteristics per device
Input rise and fall times	t_r; t_f	–	20	ns	V_{CC} = 3.6 V
		–	50	ns	V_{CC} = 1.2 V

DC family characteristics for the ALVC series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) −40 to +85 min.	typ.[1]	max.	unit	conditions V_I	other
HIGH level input voltage	1.2 2.7 .. 3.6	V_{IH}	V_{CC} 2.0	– –	– –	V		
LOW level input voltage	1.2 2.7 .. 3.6	V_{IL}	– –	– –	GND 0.8	V		
HIGH level output voltage	2.7 3.0 3.0	V_{OH}	V_{CC} − 0.5 V_{CC} − 0.2 V_{CC} − 0.1	– V_{CC} –	– – –	V	V_{IH} or V_{IL}	I_O = −12 mA I_O = −100 µA I_O = −24 mA
LOW level output voltage	2.7 3.0 3.0	V_{OL}	– – –	– – –	0.40 0.20 0.55	V	V_{IH} or V_{IL}	I_O = 12 mA I_O = 100 µA I_O = 24 mA
Input leakage current	3.6	I_I	–	±0.1	±5	µA	5.5 V or GND	for control pins only
Input leakage current	3.6	I_I	–	±0.1	±5	µA	V_{CC} or GND	for data inputs only
Input current for common I/O pins	3.6	I_{IHZ}/I_{ILZ}	–	±0.1	±15	µA	V_{CC} or GND	
3-state OFF-state current	3.6	I_{OZ}	–	0.1	±10	µA	V_{IH} or V_{IL}	V_O = V_{CC} or GND
Quiescent supply current	3.6	I_{CC}	–	0.2	40	µA	V_{CC} or GND	I_O = 0
additional quiescent sypply current per control pin	2.7 .. 3.6	ΔI_{CC}	–	5	500	µA	V_{CC} − 0.6 V	I_O = 0
additional quiescent sypply current per data I/O pin	2.7 .. 3.6	ΔI_{CC}	–	150	750	µA	V_{CC} − 0.6 V	I_O = 0
Bushold LOW sustaining current	3.0	I_{BHL}	75	–	–	µA	0.8 V	for data inputs only[2]
Bushold HIGH sustaining current	3.0	I_{BHH}	−75	–	–	µA	2.0 V	for data inputs only[2]
Bushold LOW overdrive current	3.6	I_{BHLO}	450	–	–	µA		for data inputs only[2]
Bushold HIGH overdrive current	3.6	I_{BHHO}	−450	–	–	µA		for data inputs only[2]

Notes:
1. All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25°C.
2. Control inputs do not have a bushold circuit.

Family ratings for the LVT series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+4.6	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	note 3	V_I	−0.5	7	V
DC output diode current	$V_O < 0$	I_{OK}	–	−50	mA
DC output voltage	output in HIGH or OFF state; note 3	V_O	−0.5	7	V
DC output source or sink current	output in LOW state output in HIGH state	I_O	–	128 −64	mA
Storage temperature range		T_{stg}	−65	+150	°C

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The temperature capability of a high-performance integrated circuit in conjunction with thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature should not exceed 150°C.
3. The input and output negative voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the LVT series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	typ.	max.	unit	conditions
DC supply voltage	V_{CC}	2.7	3.6	V	
DC input voltage	V_I	0	5.5	V	
HIGH level input voltage	V_{IH}	2.0	–	V	
LOW level input voltage	V_{IL}	–	0.8	V	
HIGH level output current	I_{OH}	–	−32	mA	
LOW level output current	I_{OL}	–	32	mA	
LOW level output current	I_{OL}	0	64	mA	current duty cycle ≤50%, f ≥1 kHz
Input transition rise or fall rate, outputs enabled	$\Delta t/\Delta V$	–	10	ns/V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	

DC family characteristics for the LVT series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) −40 to +85 min.	typ.[1]	max.	unit	conditions V_I	other
Input clamping voltage	2.7	V_{IK}	–	–	1.2	V		I_{IK} = −18 mA
HIGH level output voltage	2.7	V_{OH}	V_{CC} − 0.2	–	–	V		I_{OH} = −100 µA
	2.7		2.4	–	–			I_{OH} = −8 mA
	3.0		2.0	–	–			I_{OH} = −32 mA
LOW level output voltage	2.7	V_{OL}	–	–	0.2	V		I_{OL} = 100 µA
	2.7		–	–	0.5			I_{OL} = 24 mA
	3.0		–	–	0.4			I_{OL} = 16 mA
	3.0		–	–	0.5			I_{OL} = 32 mA
	3.0		–	–	0.55			I_{OL} = 64 mA
Power-up output LOW voltage[5]	3.6	V_{RST}	–	–	0.55	V	V_{CC} or GND	I_O = 1 mA
Input leakage current								
all pins	0 or 3.6	I_I	–	–	10	µA	5.5 V	
control pins	3.6		–	–	±1		V_{CC} or GND	
I/O pins[4]	3.6		–	–	10		V_{CC}	
I/O pins[4]	3.6		–	–	20		5.5	
data pins[4]	3.6		–	–	1		V_{CC}	
data pins[4]	3.6		–	–	−5		0 V	
Output off current	0	I_{OFF}	–	–	±100	µA		V_I or V_O = 0 to 4.5 V
Bus hold current A or B	3.0	I_{HOLD}	75	–	–	µA	0.8 V	
outputs	3.0		−75	–	–		2.0 V	
Current into an output in the HIGH state when $V_O > V_{CC}$	3.0	I_{EX}	–	–	125	µA		V_O = 5.5 V
Quiescent supply current	3.6	I_{CCH}	–	0.13	0.19	mA	V_{CC} or GND	I_O = 0
Quiescent sypply current	3.6	I_{CCL}	–	3	12	mA	V_{CC} or GND	I_O = 0
Quiescent sypply current	3.6	I_{CCZ}	–	0.13	0.19	mA	V_{CC} or GND	I_O = 0
Additional supply current per input pin[2]	3.0 .. 3.6	ΔI_{CC}	–	–	200	µA		one input at V_{CC} - 0.6 V; other inputs at V_{CC} or GND
Power-up/down 3-state output current[3]	≤1.2	$I_{PU/PD}$	–	–	±100	µA	V_{CC} or GND	V_O = 0.5 V to V_{CC}; OE = don't care
Input capacitance		C_I	–	4	–	pF	0 or 3 V	
Output capacitance		C_O	–	10	–	pF	0 0r 3 V	

Notes:
1. All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25°C.
2. This is the increase in supply current for each input at the specified voltage level other than V_{CC} or GND.
3. This parameter is valid for any V_{CC} between 0 V and 1.2 V with a transition time of up to 10 ms. From V_{CC} = 1.2 V to V_{CC} = 3.3 V, a transition time of 100 µs is permitted. This parameter is valid at T_{amb} = 25°C.
4. Unused pins at V_{CC} or GND.
5. This applies to parts with storage cells. For valid results, data must not be loaded in the flip-flops (or latches) after applying the power.

Family ratings for the LVT16 series

Limiting values in accordance with the Absolute Maximum System (IEC 134), (notes 1 and 2)
Voltages are referenced to GND (ground = 0 V)

parameter	conditions	symbol	min.	max.	unit
DC supply voltage		V_{CC}	−0.5	+4.6	V
DC input diode current	$V_I < 0$	I_{IK}	–	−50	mA
DC input voltage	note 3	V_I	−0.5	7	V
DC output diode current	$V_O < 0$	I_{OK}	–	−50	mA
DC output voltage	output in HIGH or OFF state; note 3	V_O	−0.5	7	V
DC output source or sink current	output in LOW state output in HIGH state	I_O	–	128 −64	mA
Storage temperature range		T_{stg}	−65	+150	°C

Notes:
1. Stresses beyond those listed 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 under 'recommended operating conditions' is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.
2. The temperature capability of a high-performance integrated circuit in conjunction with thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature should not exceed 150°C.
3. The input and output negative voltage ratings may be exceeded if the input and output current ratings are observed.

Recommended operating conditions for the LVT16 series

Voltages are referenced to GND (ground = 0V)

parameter	symbol	typ.	max.	unit	conditions
DC supply voltage	V_{CC}	2.7	3.6	V	
DC input voltage	V_I	0	5.5	V	
HIGH level input voltage	V_{IH}	2.0	–	V	
LOW level input voltage	V_{IL}	–	0.8	V	
HIGH level output current	I_{OH}	–	−32	mA	
LOW level output current	I_{OL}	–	32	mA	
LOW level output current	I_{OL}	0	64	mA	current duty cycle ≤50%, f ≥1 kHz
Input transition rise or fall rate, outputs enabled	$\Delta t/\Delta V$	–	10	ns/V	
Operating ambient temperature range in free air	T_{amb}	−40	+85	°C	

DC family characteristics for the LVT16 series

Over recommended operating conditions
Voltages are referenced to GND (ground = 0 V)

parameter	V_{CC} V	symbol	T_{amb} (°C) −40 to +85 min.	typ.[1]	max.	unit	conditions V_I	other
Input clamping voltage	2.7	V_{IK}	–	–	1.2	V		I_{IK} = −18 mA
HIGH level output voltage	2.7	V_{OH}	V_{CC} − 0.2	–	–	V		I_{OH} = −100 µA
	2.7		2.4	–	–			I_{OH} = −8 mA
	3.0		2.0	–	–			I_{OH} = −32 mA
LOW level output voltage	2.7	V_{OL}	–	–	0.2	V		I_{OL} = 100 µA
	2.7		–	–	0.5			I_{OL} = 24 mA
	3.0		–	–	0.4			I_{OL} = 16 mA
	3.0		–	–	0.5			I_{OL} = 32 mA
	3.0		–	–	0.55			I_{OL} = 64 mA
Power-up output LOW voltage[5]	3.6	V_{RST}	–	–	0.55	V	V_{CC} or GND	I_O = 1 mA
Input leakage current								
all pins	0 or 3.6	I_I	–	–	10	µA	5.5 V	
control pins	3.6		–	–	±1		V_{CC} or GND	
I/O pins[4]	3.6		–	–	10		V_{CC}	
I/O pins[4]	3.6		–	–	20		5.5	
data pins[4]	3.6		–	–	1		V_{CC}	
data pins[4]	3.6		–	–	−5		0 V	
Output off current	0	I_{OFF}	–	–	±100	µA		V_I or V_O = 0 to 4.5 V
Bus hold current A or B	3.0	I_{HOLD}	75	–	–	µA	0.8 V	
outputs	3.0		−75	–	–		2.0 V	
Current into an output in the HIGH state when $V_O > V_{CC}$	3.0	I_{EX}	–	–	125	µA		V_O = 5.5 V
Quiescent supply current	3.6	I_{CCH}	–	–	0.12	mA	V_{CC} or GND	I_O = 0
Quiescent sypply current	3.6	I_{CCL}	–	–	6	mA	V_{CC} or GND	I_O = 0
Quiescent sypply current	3.6	I_{CCZ}	–	–	0.12	mA	V_{CC} or GND	I_O = 0
Additional supply current per input pin[2]	3.0 .. 3.6	ΔI_{CC}	–	–	200	µA		one input at V_{CC} - 0.6 V; other inputs at V_{CC} or GND
Power-up/down 3-state output current[3]	≤1.2	$I_{PU/PD}$	–	–	±100	µA	V_{CC} or GND	V_O = 0.5 V to V_{CC}; OE = don't care
Input capacitance		C_I	–	4	–	pF	0 or 3 V	
Output capacitance		C_O	–	10	–	pF	0 0r 3 V	

Notes:
1. All typical values are measured at V_{CC} = 3.3 V and T_{amb} = 25°C.
2. This is the increase in supply current for each input at the specified voltage level other than V_{CC} or GND.
3. This parameter is valid for any V_{CC} between 0 V and 1.2 V with a transition time of up to 10 ms. From V_{CC} = 1.2 V to V_{CC} = 3.3 V, a transition time of 100 µs is permitted. This parameter is valid at T_{amb} = 25°C.
4. Unused pins at V_{CC} or GND.
5. This applies to parts with storage cells. For valid results, data must not be loaded in the flip-flops (or latches) after applying the power.

LOW-VOLTAGE SERIES		LV	LVC	LVC16	HLL	ALVC	LVT	LVT16
AND GATES								
08	Quad 2-input AND gate	o	o				o	
11	Triple 3-input AND gate	o	o					
COMPLEX GATES								
51	Dual 2-wide 2-input AND-OR-invert gate		o					
EXCLUSIVE-OR GATES								
86	Quad 2-input EXCLUSIVE-OR gate	o	o					
NAND GATES								
00	Quad 2-input NAND gate	o	o				o	
03	Quad 2-input NAND gate; open drain	o						
10	Tripe 3-input NAND gate	o	o				o	
20	Dual 4-input NAND gate	o	o				o	
30	8-input NAND gate		o					
38	Quad 2-input NAND buffer; open collector		o					
40	Dual 4-input NAND buffer		o					
NOR GATES								
02	Quad 2-input NOR gate	o	o				o	
27	Triple 3-input NOR gate	o	o					
OR GATES								
32	Quad 2-input OR gate	o	o				o	
INVERTERS								
04	Hex inverter	o	o				o	
U04	Hex inverter (unbuffered)	o	o					
BUFFERS/LINE DRIVERS								
125	Quad buffer/line driver; 3-state	o	o				o	
126	Quad buffer/line driver; 3-state	o	o				o	
240	Octal buffer/line driver; 3-state; inverting	o	o	o	o	o	o	
2240A	16-bit buffer/line drivers with 30 Ω termination resistors; 3-state; inverting							o
240A	16-bit buffer/line drivers; 3-state; inverting							o
241	Octal buffer/line driver; 3-state	o	o		o	o		
244	Octal buffer/line driver; 3-state	o	o	o	o	o		
2244	Octal 30 Ω terminated buffer/line driver; 3-state		o	o		o		
244A	Octal buffer/line driver; 3-state						o	
2244B	16-bit 30 Ω terminated buffer/line drivers; 3-state							o

LOW-VOLTAGE SERIES		LV	LVC	LVC16	HLL	ALVC	LVT	LVT16
244B	16-bit buffer/line drivers; 3-state							●
365	Hex buffer/line driver; 3-state	●						
367	Hex buffer/line driver; 3-state	●						
368	Hex inverter buffer/driver; 3-state	●						
540	Dual octal buffer/line driver; 3-state; inverting		●			●		
541	Octal buffer/line driver; 3-state	●	●			●		
541A	16-bit buffer/line driver; 3-state							●
827	10-bit buffer line driver; non-inverting; 3-state		●				●	
827A	20-bit buffer line driver; non-inverting; 3-state							●

COUNTERS

161	Presettable synchronous 4-bit binary counter; asynchronous reset	●						
163	Presettable synchronous 4-bit binary counter; synchronous reset	●						
191	Presettable synchronous 4-bit binary up/down counter	●	●					
193	Presettable synchronous 4-bit binary up/down counter	●	●					
269	Presettable synchronous 8-bit bidirectional binary counter		●					
393	Dual 4-bit binary ripple counter	●						
579	Octal bidirectional binary counter; common I/O		●					
4020	14-stage binary ripple counter	●						
4040	12-stage binary ripple counter	●						
4060	14-stage binary ripple counter with oscillator	●						

DECODERS/DEMULTIPLEXERS

138	3-to-8 line decoder/demultiplexer; inverting	●	●					
139	Dual 2-to-4 line decoder/demultiplexer	●	●					
154	4-to-16 line decoder/demultiplexer	●						

D-TYPE PLIP/FLOPS

74	Dual D-type flip-flop with set and reset; pos.-edge trig.	●	●				●	
174	Hex D-type flip-flop with reset; positive-edge trigger	●						
175	Quad D-type flip-flop with reset; positive edge-trigger	●						
273	Octal D-type flip-flop with reset; positive edge-trigger	●	●				●	
273A	16-bit D-type flip-flop							●
373	Octal D-type transparent latch; 3-state	●	●	●	●	●	●	
373A	16-bit D-type transparant latch; 3-state							●
374	Octal D-type flip-flop; positive-edge trigger; 3-state	●	●	●	●	●	●	
374A	16-bit edge triggered D-type flip-flop; 3-state							●
377	Octal D-type flip-flop with data enable; pos.-edge trigger	●	●					
533	Octal D-type transparent latch; 3-state; inverting				●			
534	Octal D-type flip-flop; positive-edge trigger; 3-state; inv.				●		●	
573	Octal D-type transparent latch; 3-state	●	●				●	
574	Octal D-type flip-flop; positive-edge trigger; 3-state	●	●				●	

JK FLIP-FLOPS

107	Dual JK flip-flop with reset; negative-edge trigger	●						
109	Dual JK flip-flop with set and reset; positive edge trigger	●	●					

LOW-VOLTAGE SERIES		LV	LVC	LVC16	HLL	ALVC	LVT	LVT16
LATCHES								
259	Octal addressable latch		●					
841	10-bit bus interface latch; non-inverting; 3-state		●				●	
841A	20-bit bus interface latch; non-inverting; 3-state							●
843	9-bit bus interface latch; 3-state						●	
MULTIPLEXERS/DEMULTIPLEXERS								
153	Dual 4-input multiplexer		●					
157	Quad 2-input multiplexer		●					
158	Quad 2-to-1 data selector/multiplexer; inverting		●					
251	8-input multiplexer; 3-state	●						
257	Quad 2-input multiplexer; 3-state		●					
258	Quad 2-to-1 data selector/multiplexer; inverting; 3-state		●					
4051	8-channel analog multiplexer/demultiplexer	●						
4052	Dual 4-channel analog multiplexer/demultiplexer	●						
4053	Triple 2 channel analog multiplexer/demultiplexer	●						
4067	16-channel analog multiplexer/demultiplexer	●						
MULTIVIBRATORS								
123	Dual retriggerable monostable multivibrator with reset	●						
REGISTERS								
164	Octal serial-in/parallel-out shift register	●						
165	Octal parallel in/serial out shift register	●						
595	Octal serial-in/serial-out shift register with output latches; 3-state	●						
821	10-bit bus interface register; non-inverting; 3-state		●				●	
821A	20-bit bus interface register; non-inverting; 3-state							●
821-1	10-bit bus interface register; non-inverting; 3-state						●	
823	9-bit bus interface register; non-inverting; 3-state		●				●	
823A	18-bit bus interface register; non-inverting; 3-state							●
825	Octal bus interface register		●					
4094	8-stage shift-and-store bus register	●						
SCHMITT TRIGGERS								
14	Hex inverting Schmitt trigger		●					
132	Quad 2-input NAND Schmitt trigger	●						
SWITCHES								
4066	Quad bilateral switches	●						
4316	Quad bilateral switches; seperate analog ground	●						

LOW-VOLTAGE SERIES		LV	LVC	LVC16	HLL	ALVC	LVT	LVT16
TRANSCEIVERS								
245	Octal bus transceiver; 3-state	—	o	—	o	o	o	—
245-1	Octal 30 Ω terminated transceiver with direction pin; 3-state	—	—	—	—	—	o	—
245B	16-bit bus transceiver with direction pin; 3-state	—	—	—	—	—	—	o
2245	16-bit 30 Ω terminated transceiver with direction pin; 3-state	—	—	—	—	o	o	—
2245B	16-bit 30 Ω terminated transceiver with direction pin; 3-state	—	—	—	—	—	—	o
470	16-bit registered transceiver; 3-state	—	—	—	—	o	—	—
500	18-bit universal bus transceiver; 3-state	—	—	—	—	o	—	—
500A	18-bit universal bus transceiver; 3-state	—	—	—	—	—	—	o
501	18-bit universal bus transceiver; 3-state	—	—	—	—	o	—	—
501A	18-bit universal bus transceiver; 3-state	—	—	—	—	—	—	o
543	Octal registered transceiver; non-inverting; 3-state	—	o	—	—	o	o	—
543-1	Octal registered transceiver; non-inverting; 3-state	—	—	—	—	—	o	—
2543	Octal 30 Ω terminated registered transceiver; non-inverting; 3-state	—	—	—	—	—	o	—
543A	16-bit registered transceiver; 3-state	—	—	—	—	—	—	o
544	Octal registered transceiver; inverting; 3-state	—	o	—	—	—	o	—
600	18-bit universal bus transceiver; 3-state	—	—	—	—	o	—	—
601	18-bit universal bus transceiver; 3-state	—	—	—	—	o	—	—
620	Octal bus transceiver; inverting; 3-state	—	o	—	o	—	o	—
623	Octal bus transceiver; non-inverting; 3-state	—	o	—	o	o	o	—
640	Octal bus transceiver; 3-state; inverting	—	o	—	o	—	o	—
646	Octal bus transceiver/register; 3-state	—	o	—	o	o	o	—
646A	16-bit bus transceiver; 3-state	—	—	—	—	—	—	o
648	Octal bus transceiver/register; 3-state; inverting	—	—	—	o	—	—	—
651	Octal transceiver/register; inverting; 3-state	—	—	—	o	—	o	—
652	Octal registered bus transceiver	—	o	—	o	o	o	—
652A	16-bit bus transceiver/registers; 3-state	—	—	—	—	—	—	o
899	16-bit latched transceiver; 3-state	—	—	—	—	—	—	o
952	Octal registered transceiver; 3-state	—	—	—	o	o	—	—
952A	16-bit registered transceiver; 3-state	—	—	—	—	—	—	o
953	Octal registered transceiver; inverting; 3-state	—	—	—	o	—	—	—
2952	8-bit transceiver; non-inverting; 3-state	—	o	—	—	—	o	—
TRANSLATORS AND TRANSCEIVERS								
4245	Octal dual supply translating transceiver; 3-state; 3V/5V level shifter	—	o	—	—	o	—	—
SPECIAL FUNCTIONS								
4799	NiMH battery management circuit	o	—	—	—	—	—	—

Note:
All ALVC, ALVC16 and LVT16 devices have double-byte, 18-, or 20-bit functionality.