

JEDEC STANDARD

**1.8 V \pm 0.15 V (Normal Range) and
1.2 V - 1.95 V (Wide Range) Power
Supply Voltage and Interface Standard
for Nonterminated Digital Integrated
Circuits**

JESD8-7A

(Revision of JESD8-7, February 1997)

JUNE 2006

JEDEC SOLID STATE TECHNOLOGY ASSOCIATION



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**1.8 V \pm 0.15 V (NORMAL RANGE), AND 1.2-1.95 V (WIDE RANGE)
POWER SUPPLY VOLTAGE AND INTERFACE STANDARD FOR
NONTERMINATED DIGITAL INTEGRATED CIRCUIT**

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1.8 V \pm 0.15 V (NORMAL RANGE) AND 1.2 V - 1.95 V (WIDE RANGE) POWER SUPPLY VOLTAGE AND INTERFACE STANDARD FOR NONTERMINATED DIGITAL INTEGRATED CIRCUITS

(From JEDEC Board Ballots JCB-96-29 and JCB-05-78, formulated under the cognizance of the JC-16 Committee on Interface Technology.)

1 Scope

This standard defines power supply voltages, dc interface and switching parameters for a high speed, low voltage family of non-terminated digital circuits driving/driven by parts of the same family, or mixed families which comply with the input/output interface specifications. The specifications in this standard represent a minimum set of interface specifications for CMOS compatible circuits, they also allow limited interoperability with JESD8-6 compliant HSTL devices.

The purpose is to provide a standard of specification for uniformity, multiplicity of sources, elimination of confusion, and ease of device specification and design by users. Paragraph 2.3 describes normal DC electrical characteristics and paragraph 2.4 (added into revision A) describes the optional characteristics for Schmitt trigger operation.

2 Standard specifications

All voltages are referenced to ground except where noted. A given part may be specified as a normal range part, a wide range part, or both.

2.1 Absolute maximum continuous ratings

Supply Voltage, V_{DD}	-0.5 V to 2.5 V
dc Input Voltage, V_{IN} (except I/O pins)(note 1 and 2)	-0.5 V to $V_{DD}+0.5$ V
dc Output Voltage, V_{OUT} (including I/O pins)(note 2)	-0.5 V to $V_{DD}+0.5$ V
dc Input Diode Current, I_{IK} ($V_I < 0$ or $V_I > V_{DD}$)	+/- 20 mA
dc Output Diode Current, I_{OK} ($V_{OUT} < 0$ or $V_{OUT} > V_{DD}$)	+/- 20 mA

NOTE 1 Absolute maximum continuous ratings are those values beyond which damage to the device may occur. Exposure to these conditions or conditions beyond those indicated may adversely affect device reliability. Functional operation under absolute maximum conditions is not implied.

NOTE 2 Not to exceed 2.5 V.

2.2 Recommended operating conditions

2.2.1 Normal range

Symbol	Parameter	Operating Range
V_{DD}	Power Supply Voltage	1.65 V to 1.95 V
T_A	Operating Temperature	Note 1

NOTE 1 Specified by manufacture to be commercial, industrial, and/or military grade.

2.2.2 Wide range

Symbol	Parameter	Operating Range
V_{DD}	Power Supply Voltage	1.2 V to 1.95 V
T_A	Operating Temperature	Note 1

NOTE 1 Specified by manufacture to be commercial, industrial, and/or military grade.

2.3 DC electrical characteristics

2.3.1 Normal range

[$V_{DD(min)} = 1.65$ V and $V_{DD(max)} = 1.95$ V across operating temperature range]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage		1.65	1.95	V
V_{IH}	Input High Voltage		$0.65 V_{DD}$	$V_{DD}+0.3$	V
V_{IL}	Input Low Voltage		-0.3	$0.35 V_{DD}$	V
V_{OH}	Output High Voltage	$I_{OH} = -2$ mA	$V_{DD} - 0.45$		V
V_{OL}	Output Low Voltage	$I_{OL} = 2$ mA		0.45	V

2.3.2 Wide range

[$V_{DD(min)} = 1.2$ V and $V_{DD(max)} = 1.95$ V across operating temperature range]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage		1.2	1.95	V
V_{IH}	Input High Voltage	$V_{OUT} \geq V_{OH(min)}$	$0.7 V_{DD}$	$V_{DD}+0.3$	V
V_{IL}	Input Low Voltage	$V_{OUT} \leq V_{OL(max)}$	-0.3	$0.3 V_{DD}$	V
V_{OH}	Output High Voltage	$I_{OH} = -100$ uA	$V_{DD} - 0.2$		V
V_{OL}	Output Low Voltage	$I_{OL} = 100$ uA		0.2	V

2.4 Optional DC electrical characteristics for Schmitt trigger operation

2.4.1 Optional Schmitt trigger operation - Normal range

[$V_{DD(\min)} = 1.65 \text{ V}$ and $V_{DD(\max)} = 1.95 \text{ V}$ across operating temperature range.]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage	---	1.65	1.95	V
$V_{t+} (V_p)$	Positive Going Threshold Voltage	$V_{OUT} \geq V_{OH(\min)}$	$0.4 V_{DD}$	$0.7 V_{DD}$	V
$V_{t-} (V_n)$	Negative Going Threshold Voltage	$V_{OUT} \leq V_{OL(\max)}$	$0.3 V_{DD}$	$0.6 V_{DD}$	V
$V_h (\Delta V_t)$	Hysteresis Voltage	$V_{t+} - V_{t-}$	$0.1 V_{DD}$	$0.4 V_{DD}$	V
V_{OH}	Output High Voltage	$I_{OH} = -2 \text{ mA}$	$V_{DD}-0.45$		V
V_{OL}	Output Low Voltage	$I_{OL} = 2 \text{ mA}$		0.45	V

2.4.2 Optional Schmitt trigger operation - Wide range

[$V_{DD(\min)} = 1.2 \text{ V}$ and $V_{DD(\max)} = 1.95 \text{ V}$ across operating temperature range]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage	---	1.2	1.95	V
$V_{t+} (V_p)$	Positive Going Threshold Voltage	$V_{OUT} \geq V_{OH(\min)}$	$0.35 V_{DD}$	$0.75 V_{DD}$	V
$V_{t-} (V_n)$	Negative Going Threshold Voltage	$V_{OUT} \leq V_{OL(\max)}$	$0.25 V_{DD}$	$0.65 V_{DD}$	V
$V_h (\Delta V_t)$	Hysteresis Voltage	$V_{t+} - V_{t-}$	$0.1 V_{DD}$	$0.5 V_{DD}$	V
V_{OH}	Output High Voltage	$I_{OH} = -100 \text{ uA}$	$V_{DD}-0.2$		V
V_{OL}	Output Low Voltage	$I_{OL} = 100 \text{ uA}$		0.2	V

3 Test conditions for optional Schmitt trigger operation

3.1 Positive Going Threshold Voltage: V_{t+} (V_p)

As the input signal is raised from a ground level in the measurement circuit shown in Figure 1, the input voltage value at which the output logic changed is determined as V_{t+} (V_p).

3.2 Negative Going Threshold Voltage: V_{t-} (V_n)

As the input signal is dropped from a power supply voltage level in the measurement circuit shown in Figure 1, the input voltage value at which the output logic changed is determined as V_{t-} (V_n).

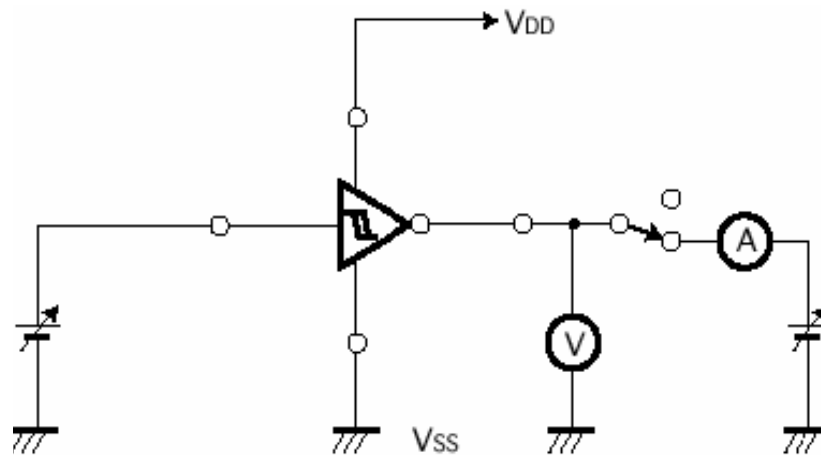


Figure 1 — DC characteristic measurement circuit of Schmitt trigger input.

Annex A Differences between JESD8-7A and JESD8-7

This table briefly describes most of the changes made to entries that appear in this standard, JESD8-7A, compared to its predecessor, JESD8-7 (February 1997). If the change to a concept involves any words added or deleted (excluding deletion of accidentally repeated words), it is included. Some punctuation changes are not included.

Page	Description of change
All	Document renumbered to be consistent with the JEDEC Style Manual, JM7
3	Added Section 2.4 to describe the DC electrical characteristics for optional Schmitt trigger operation.
4	Added Section 3 to provide the test conditions for optional Schmitt trigger operation



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The referenced clause number has proven to be:

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