

JEDEC STANDARD

1.5 V +/- 0.1 V (Normal Range) and 0.9 V – 1.6 V (Wide Range) Power Supply Voltage and Interface Standard for Nonterminated Digital Integrated Circuits

JESD8-11A.01

(Minor Revision of JESD8-11A, November 2005)

SEPTEMBER 2007

JEDEC SOLID STATE TECHNOLOGY ASSOCIATION



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1.5 V +/- 0.1 V (Normal Range) and 0.9 - 1.6 V (Wide Range) Power Supply Voltage and Interface Standard for Nonterminated Digital Integrated Circuits.

(From JEDEC Board ballot JCB-00-20 and JCB-05-79, formulated under the cognizance of the JC-16 Committee on Interface Technology.)

1 Scope

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

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

2 Standard specifications

All voltages are referenced to ground except where noted.

2.1 Absolute maximum continuous ratings

Supply Voltage, V_{DD}	-0.5 V to 2.0 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} ($V_O < 0$ or $V_O > V_{DD}$)	+/- 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 2.0 V.

2.2 Recommended operating conditions

2.2.1 Normal range

Symbol	Parameter	Operating Range
V_{DD}	Power Supply Voltage	1.4 V to 1.6 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	0.9 V to 1.6 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

[$V_{DD(min)}$ = 1.4 V and $V_{DD(max)}$ = 1.6 V across operating temperature range - Note 1 and 2]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage		1.4	1.6	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	$I_{OH} = -2 \text{ mA}$	$0.75 V_{DD}$		V
V_{OL}	Output Low Voltage	$I_{OL} = 2 \text{ mA}$		$0.25 V_{DD}$	V

NOTE 1 V_{DD} of the sending and receiving devices must track within 0.1 V to maintain adequate DC margins.

NOTE 2 For V_{IH} and V_{IL} , V_{DD} refers to the receiving device. For V_{OH} and V_{OL} , V_{DD} refers to the sending device.

2.3 DC electrical characteristics (cont'd)

2.3.2 Wide range

[$V_{DD(min)} = 0.9\text{ V}$ and $V_{DD(max)} = 1.6\text{ V}$ across operating temperature range - Note 1 and 2]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage		0.9	1.6	V
V_{IH}	Input High Voltage		$0.7 V_{DD}$	$V_{DD} + 0.3$	V
V_{IL}	Input Low Voltage		-0.3	$0.3 V_{DD}$	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

NOTE 1 V_{DD} of the sending and receiving devices must track within 0.1 V to maintain adequate dc margins.

NOTE 2 For V_{IH} and V_{IL} , V_{DD} refers to the receiving device. For V_{OH} and V_{OL} , V_{DD} refers to the sending device.

2.4 Optional DC electrical characteristics for Schmitt trigger operation

2.4.1 Optional Schmitt trigger operation - Normal range

[$V_{DD(min)} = 1.4\text{ V}$ and $V_{DD(max)} = 1.6\text{ V}$ across operating temperature range - Note 1 and 2]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage	---	1.4	1.6	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	$I_{OH} = -2\text{ mA}$	$0.75 V_{DD}$		V
V_{OL}	Output Low Voltage	$I_{OL} = 2\text{ mA}$		$0.25 V_{DD}$	V

NOTE 1 V_{DD} of the sending and receiving devices must track within 0.1 V to maintain adequate dc margins.

NOTE 2 For $V_{t+} (V_P)$ and $V_{t-} (V_n)$, V_{DD} refers to the receiving device. For V_{OH} and V_{OL} , V_{DD} refers to the sending device.

2.4 Optional DC electrical characteristics for Schmitt trigger operation (cont'd)

2.4.2 Optional Schmitt trigger operation - Wide range

[$V_{DD(min)} = 0.9\text{ V}$ and $V_{DD(max)} = 1.6\text{ V}$ across operating temperature range - Note 1 and 2]

Symbol	Parameter	Test Condition	MIN	MAX	Unit
V_{DD}	Supply Voltage	---	0.9	1.6	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	$I_{OL} = 100\text{ uA}$		$0.2 V_{DD}$	V

NOTE 1 V_{DD} of the sending and receiving devices must track within 0.1 V to maintain adequate dc margins.

NOTE 2 For $V_{t+} (V_P)$ and $V_{t-} (V_n)$, V_{DD} refers to the receiving device. For V_{OH} and V_{OL} , V_{DD} refers to the sending device.

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 $V_{t-} (V_n)$.

3 Test conditions for Optional Schmitt trigger operation (cont'd)

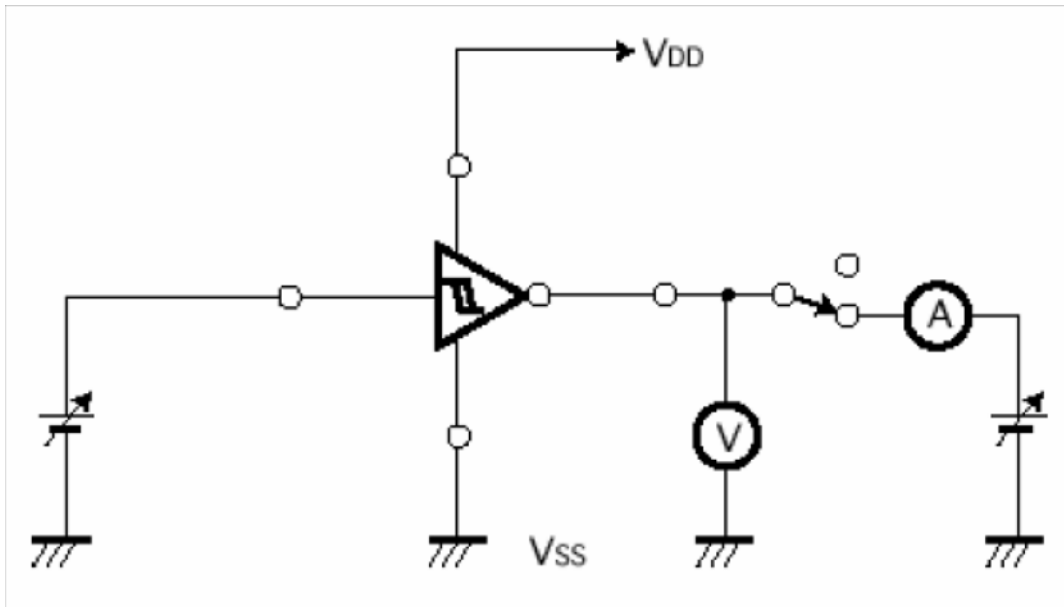


Figure 1 — DC characteristic measurement circuit of Schmitt Trigger input

Annex A (informative) Differences between JESD8-11A.01 and JESD8-11A

This table briefly describes most of the changes made to entries that appear in this standard, JESD8-11A.1, compared to its predecessor, JESD8-11A (November 2005). 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

3 In table in 2.4.1, changed the Test Condition units for V_{OH} and V_{OL} from "uA" to "mA".

A.1 Differences between JESD8-11A and JESD8-11

This table briefly describes most of the changes made to entries that appear in this standard, JESD8-11A, compared to its predecessor, JESD8-11 (October 2000). 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

3 Added subclauses 2.4 and 2.4.1

4 Added subclause 2.4.2

4 Added Clause 3 and its subclauses

5 Added Figure 1



Standard Improvement Form

JEDEC JESD8-11A.01

The purpose of this form is to provide the Technical Committees of JEDEC with input from the industry regarding usage of the subject standard. Individuals or companies are invited to submit comments to JEDEC. All comments will be collected and dispersed to the appropriate committee(s).

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1. I recommend changes to the following:

☐ Requirement, paragraph number _____

☐ Test method number _____ Paragraph number _____

The referenced paragraph number has proven to be:

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☐ Other _____

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