Freescale Semiconductor
Engineering Bulletin

MSC711x IBIS Model Files

The Input/Output Buffer Information Specification (IBIS) from the Electronics Industry Alliance defines a modeling technique that provides a simple table-based buffer model for semiconductor devices. The MSC711x family of devices has two sets of IBIS models, one for 3.3 V signals and one for 2.5 V signals. These files contain the basic signal models for each type of signal in an MSC711x device. The models can be used to characterize I/V output curves, rise/fall transition waveforms, and device package parasitic information. They cannot be used as a delay model for detailed timing analysis.

This engineering bulletin describes the individual cells in the MSC711x IBIS model file and lists the I/O signals associated with each model.

CONTENTS

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1   I/O Cell Definition

MSC711x I/O cells are one of two types:

- 3.3 V. For general-purpose I/O, these cells operate at TTL/CMOS levels. The 3.3 V I/O cells can be one of the following types:
  — Input only
  — Input with Schmitt trigger
  — Input/Output

  The first three letters of the cell name signify the type of cell. The next two numbers specify the drive current in mA. The remaining letters signify whether the cell has Schmitt-trigger functionality.

- 2.5 V. Strictly for SSTL I/O. When the SSTL I/O is terminated, it follows the SSTL1/SSTL2 specifications. However, it is safe to clock the SSTL I/O unterminated up to a 100 MHz clock rate (200 MHz data throughput). When unterminated, SSTL I/O has a full swing between 0 V and 2.5 V. Only one type of I/O driver cell is used for the SSTL2 version, labeled PSSTL22X.

Note: Not all pins are available in all parts. This is a generic representation for all MSC711x devices.

2   Translation of I/O Cell Types to Signals

Table 1 lists the cell models along with the associated signal names and operating voltage.

Table 1.   Translation of I/O Cell Types to Signals

IO Cell Model Name	Signal Name	Ball Designator	Operating Voltage
PDB08DGZ	DBREQ	R19	3.3 V
PDB08DGZ	EVNT0	V10	3.3 V
PDB08DGZ	EVNT2	W10	3.3 V
PDB08DGZ	EVNT3	Y9	3.3 V
PDB08DGZ	EVNT4	V11	3.3 V
PDB08DGZ	MDC	W20	3.3 V
PDB08DGZ	MDIO	T18	3.3 V
PDB08DGZ	RXD0	V17	3.3 V
PDB08DGZ	RXD1	Y18	3.3 V
PDB08DGZ	RXD2	V16	3.3 V
PDB08DGZ	RXD3	W16	3.3 V
PDB08DGZ	RX_DV	Y20	3.3 V
PDB08DGZ	RX_ER	W19	3.3 V
PDB08DGZ	SCL	N19	3.3 V
PDB08DGZ	SDA	M18	3.3 V
PDB08DGZ	T0RD	Y11	3.3 V
PDB08DGZ	T0RFS	W11	3.3 V
PDB08DGZ	T0TD	Y12	3.3 V
PDB08DGZ	T0TFS	W12	3.3 V
PDB08DGZ	T1RD	W13	3.3 V
PDB08DGZ	T1RFS	V13	3.3 V
PDB08DGZ	T1TD	V14	3.3 V
PDB08DGZ	T1TFS	W14	3.3 V

Table 1. Translation of I/O Cell Types to Signals (Continued)

IO Cell Model Name	Signal Name	Ball Designator	Operating Voltage
PDB08DGZ	TXD0	Y17	3.3 V
PDB08DGZ	TXD1	W17	3.3 V
PDB08DGZ	TXD2	W15	3.3 V
PDB08DGZ	TX_EN	V18	3.3 V
PDB08DGZ	TX_ER	V15	3.3 V
PDB08DGZ	URXD	M20	3.3 V
PDB08DGZ	UTXD	M19	3.3 V
PDB08SDGZ	RXCLK	Y16	3.3 V
PDB08SDGZ	HRESET_B	T20	3.3 V
PDB08SDGZ	T0RCK	Y10	3.3 V
PDB08SDGZ	T0TCK	V12	3.3 V
PDB08SDGZ	T1RCK	Y13	3.3 V
PDB08SDGZ	T1TCK	Y14	3.3 V
PDB08SDGZ	TXCLK	W18	3.3 V
PDB08SDGZ	TXD3	Y15	3.3 V
PDB12DGZ	HA0	K18	3.3 V
PDB12DGZ	HA1	H20	3.3 V
PDB12DGZ	HA2	H19	3.3 V
PDB12DGZ	HA3	J18	3.3 V
PDB12DGZ	HCS1	L19	3.3 V
PDB12DGZ	HCS2	L18	3.3 V
PDB12DGZ	HD0	A14	3.3 V
PDB12DGZ	HD1	A13	3.3 V
PDB12DGZ	HD10	A9	3.3 V
PDB12DGZ	HD11	B10	3.3 V
PDB12DGZ	HD12	A8	3.3 V
PDB12DGZ	HD13	C10	3.3 V
PDB12DGZ	HD14	B9	3.3 V
PDB12DGZ	HD15	A7	3.3 V
PDB12DGZ	HD2	B13	3.3 V
PDB12DGZ	HD3	C12	3.3 V
PDB12DGZ	HD4	A12	3.3 V
PDB12DGZ	HD5	B12	3.3 V
PDB12DGZ	HD6	A11	3.3 V
PDB12DGZ	HD7	A10	3.3 V
PDB12DGZ	HD8	B11	3.3 V
PDB12DGZ	HD9	C11	3.3 V
PDB12DGZ	HDDS	K19	3.3 V
PDB12DGZ	HREQ	J20	3.3 V
PDB12SDGZ	HACK	J19	3.3 V
PDB12SDGZ	HDS	K20	3.3 V
PDB12SDGZ	HRW	L20	3.3 V
PDB24DGZ	EVNT1	W9	3.3 V
PDIDGZ	COL	U18	3.3 V
PDIDGZ	CRS	V19	3.3 V

MSC711x IBIS Model Files, Rev. 1

Table 1. Translation of I/O Cell Types to Signals (Continued)

IO Cell Model Name	Signal Name	Ball Designator	Operating Voltage
PDIDGZ	TCK	U19	3.3 V
PDIDGZ	TEST0	R20	3.3 V
PDIDGZ	TPSEL	P19	3.3 V
PDIDGZ	CLKIN	N18	3.3 V
PDIDGZ	$\overline{\text{PORESET}}$	P18	3.3 V
PDISDGZ	$\overline{\text{NMI}}$	Y8	3.3 V
PDT08DGZ	TDO	V20	3.3 V
PSSTL22X	$\overline{\text{CAS}}$	T19	2.5 V
PSSTL22X	$\overline{\text{RAS}}$	U20	2.5 V
PSSTL22X	$\overline{\text{WE}}$	R18	2.5 V
PSSTL22X	A0	C9	2.5 V
PSSTL22X	A1	C8	2.5 V
PSSTL22X	A10	B8	2.5 V
PSSTL22X	A11	Y5	2.5 V
PSSTL22X	A12	Y4	2.5 V
PSSTL22X	A13	V5	2.5 V
PSSTL22X	A2	V4	2.5 V
PSSTL22X	A3	W3	2.5 V
PSSTL22X	A4	V3	2.5 V
PSSTL22X	A5	V7	2.5 V
PSSTL22X	A6	W7	2.5 V
PSSTL22X	A7	Y6	2.5 V
PSSTL22X	A8	V6	2.5 V
PSSTL22X	A9	W6	2.5 V
PSSTL22X	BA0	W5	2.5 V
PSSTL22X	BA1	W4	2.5 V
PSSTL22X	CK	Y3	2.5 V
PSSTL22X	$\overline{\text{CK}}$	V8	2.5 V
PSSTL22X	CKE	Y7	2.5 V
PSSTL22X	$\overline{\text{CS0}}$	A5	2.5 V
PSSTL22X	$\overline{\text{CS1}}$	A6	2.5 V
PSSTL22X	D0	B7	2.5 V
PSSTL22X	D1	B3	2.5 V
PSSTL22X	D10	C4	2.5 V
PSSTL22X	D11	K1	2.5 V
PSSTL22X	D12	L1	2.5 V
PSSTL22X	D13	J1	2.5 V
PSSTL22X	D14	H3	2.5 V
PSSTL22X	D15	H2	2.5 V
PSSTL22X	D16	G2	2.5 V
PSSTL22X	D17	H1	2.5 V
PSSTL22X	D18	F2	2.5 V
PSSTL22X	D19	P3	2.5 V
PSSTL22X	D2	P2	2.5 V
PSSTL22X	D20	R3	2.5 V

MSC711x IBIS Model Files, Rev. 1

Table 1. Translation of I/O Cell Types to Signals (Continued)

IO Cell Model Name	Signal Name	Ball Designator	Operating Voltage
PSSTL22X	D21	R2	2.5 V
PSSTL22X	D22	M1	2.5 V
PSSTL22X	D23	T2	2.5 V
PSSTL22X	D24	U2	2.5 V
PSSTL22X	D25	T3	2.5 V
PSSTL22X	D26	U3	2.5 V
PSSTL22X	D27	C1	2.5 V
PSSTL22X	D28	C3	2.5 V
PSSTL22X	D29	E2	2.5 V
PSSTL22X	D3	D3	2.5 V
PSSTL22X	D30	D2	2.5 V
PSSTL22X	D31	F3	2.5 V
PSSTL22X	D4	L3	2.5 V
PSSTL22X	D5	C2	2.5 V
PSSTL22X	D6	E3	2.5 V
PSSTL22X	D7	N1	2.5 V
PSSTL22X	D8	M3	2.5 V
PSSTL22X	D9	N2	2.5 V
PSSTL22X	DQM0	P1	2.5 V
PSSTL22X	DQM1	K3	2.5 V
PSSTL22X	DQM2	J3	2.5 V
PSSTL22X	DQM3	C6	2.5 V
PSSTL22X	DQS0	A3	2.5 V
PSSTL22X	DQS1	B4	2.5 V
PSSTL22X	DQS2	C5	2.5 V
PSSTL22X	DQS3	B6	2.5 V

3 Reserved/No Connect Pins

The following ball locations are driven by the cell PDB12DGZ:

- A16, A20
- B14, B15, B19, B20
- C13, C17–C20
- D18–D20
- E18–E20
- F18–F20
- G18–G20
- H18

The following ball grid locations are driven by the cell PDT12DGZ:

- A17–A19
- B16–B18
- C15, C16

The following ball grid locations are driven by the cell PDIDGZ:

- C14

The following ball grid locations are driven by the cell SSTL22X:

- B2
- V2, V9
- W8

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