TSMC40: (R)GMII

Libraries

Name	Process	Form Factor
RGO_TSMC40_25V33_LP_30C_RGMII	LP	Staggered CUP

Summary

The (R)GMII library provides the combo driver / receiver cell for both Gigabit Media Independent Interface signaling and Reduced Gigabit Media Independent Interface signaling. It is designed to interface Ethernet PHY to network switch ASICs. This library is provided as a supplement to the 40nm GPIO libraries provided by Aragio Solutions.

GMII Specification Compliant:
> IEEE 802.3-2005

RGMII Specification Compliant
> HP RGMII, version 1.3, 12/10/2000

ESD Protection:
- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 200 V ESD Machine Model (MM)
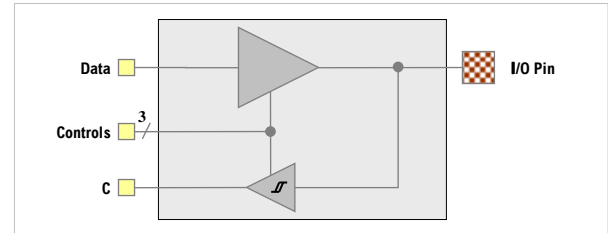 - 500 V ESD Charge Device Model (CDM)

Latch-up Immunity:
- JEDEC compliant
  - Tested to I-Test criteria of ± 100mA @ 125°C

MIP_BI_SDS_33V_SCB

(R)GMII Combo Driver Features:

- Selectable output slew rate
- GMII mode powered by 3.3V I/O & 1,1V core supplies
- RGMII mode powered by 2.5V I/O & 1.1V core supplies

Pad Size

Pad	Width	Height	Units
MIP_BI_SDS_33V_SCB	30	180	µm

Recommended operating conditions

	Description		Min	Nom	Max	Units
V_{VDD}	Core supply voltage		0.99	1.1	1.21	V
T_J	Junction temperature		-40	25	+125	°C
V_{PAD}	Voltage at IO		0		V_{DVDD}	V
V_{DVDD}	I/O supply voltage		2.97	3.3	3.63	V
V_{IH}	Input logic high	GMII	1.7	-	-	V
V_{IL}	Input logic low		-	-	0.9	V
V_{IL_AC}	Input high voltage, AC		1.9	-	-	V
V_{IH_AC}	Input low voltage, AC		-	-	0.7	V
V_{OH}	Output logic high voltage		2.1	-	3.6	V
V_{OL}	Output logic low voltage		0	-	0.5	V
V_{DVDD}	I/O supply voltage		2.25	2.5	2.75	V
V_{IH}	Input logic high		1.7	-	-	V
V_{IL}	Input logic low	RGMII	-	-	0.7	V
V_{OH}	Output logic high voltage		2.0	-	V_{DVDD} +0.3	V
V_{OL}	Output logic low voltage		V_{DVSS} - 0.3	-	0.4	V
F	Clock frequency / accuracy		2.5[1] - 100ppm		125 + 100ppm	MHz

[1] The lowest supported frequency is 10BASE-T over RGMII

Power Dissipation

Mode	Min	Nom	Max	Units
GMII	48	60	74	µW/MHz
RGMII	31	39	50	µW/MHz

RMS Current – GMII

Parameter	Min	Nom	Max	Unit
$I_{DVDD\ rms}$	2.4	3.3	4.5	mA
$I_{VDD\ rms}$	0.11	0.14	0.26	mA

RMS Current – RGMII

Parameter	Min	Nom	Max	Unit
$I_{DVDD\ rms}$	2.2	3.1	4.5	mA
$I_{VDD\ rms}$	0.12	0.13	0.27	mA

Characterization Corners

Nominal VDD	Model	VDD	DVDD[1]	Temperature
	FF	+10%	+10%	-40°C
	FF	+10%	+10%	0°C
	FF	+10%	+10%	125°C
1.1	TT	nominal	nominal	25°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	0°C
	SS	-10%	-10%	125°C

[1] DVDD = 2.5 and 3.3V