SMG28: (R)GMII

Libraries

Name	Process	Form Factor
RGO_SMG28_18V33_FDS_20C_RGMII	FD-SOI	Staggered CUP

Summary

The (R)GMII library provides driver / receiver cells 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. It is compliant with IEEE 802.2-2005 (GMII) and HP RGMII, version 1.3, 12/10/2000.

This 28nm library is available in a staggered CUP wire bond implementation.

The library includes the VREF cell needed to use the (R)GMII cells. An additional library is required – 3.3V Support: Power. That library contains the power cells, the POC cell, and a rail splitter to isolate the (R)GMII cells in their own power domain as required. It also contains an input-only buffer, isolated analog I/O, and a full complement of power cells along with corner and spacer cells to assemble a functional pad ring by abutment. The rail splitter allows multiple power domains to be isolated in the same pad ring while maintaining continuous VDD/VSS for robust ESD protection.

ESD Protection:

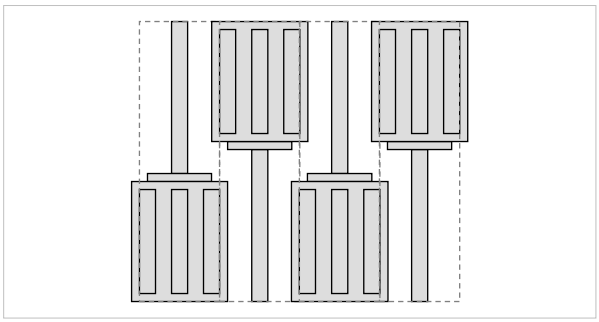
- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 500 V ESD Charge Device Model (CDM)

Latch-up Immunity:

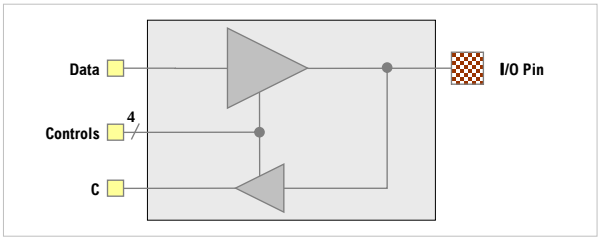
- JEDEC compliant
  - Tested to I-Test criteria of ± 100mA @ 125°C

Cell Size & Form Factor

Staggered (pad-limited) – 32µm x 131µm



MIP_BI_SDS_33V_NC / RIP_BI_SDS_33V_SC



(R)GMII Combo Driver Features:

MIP cell

- GMII mode – 3.3V operation
- RGMII modes – 2.5V or 1.8V operation

RIP cell

- RGMII only
- 3.3V, 2.5V, or 1.8V operation

Recommended operating conditions

	Description		Min	Nom	Max	Units
V_{VDD}	Core supply voltage		0.9	1.0	1.1	V
			0.99	1.1	1.155	V
T_J	Junction temperature		-40	25	+125	°C
V_{PAD}	Voltage at IO		0		V_{DVDD}	V
V_{DVDD}	I/O supply voltage	GMII / 3.3V RGMII	2.97	3.3	3.63	V
V_{IH}	Input logic high		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	2.5V RGMII	2.25	2.5	2.75	V
V_{IH}	Input logic high		1.7	-	-	V
V_{IL}	Input logic low		-	-	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
V_{DVDD}	I/O supply voltage	1.8V RGMII	1.62	1.8	1.98	V
V_{IH}	Input logic high		0.7 x V_{DVDD}	-	-	V
V_{IL}	Input logic low		-	-	0.3 x V_{DVDD}	V
V_{OH}	Output logic high voltage		1.4	-	V_{DVDD} +0.3	V
V_{OL}	Output logic low voltage		V_{DVSS} - 0.3	-	0.4	V

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

Characterization Corners

Nominal VDD	Model	VDD	DVDD[1]	Temperature
1.0V	FF	+10%	+10%	-40°C
	FF	+10%	+10%	125°C
	FF	+10%	+10%	85°C
	FF	+10%	+10%	0°C
	TT	nominal	nominal	25°C
	SS	-10%	-10%	0°C
	SS	-10%	-10%	85°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C
1.1V Overdrive	FF	+5%	+10%	-40°C
	FF	+5%	+10%	125°C
	FF	+5%	+10%	85°C
	FF	+5%	+10%	0°C
	TT	nominal	nominal	25°C
	SS	-10%	-10%	0°C
	SS	-10%	-10%	85°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C

[1] DVDD = 1.8V, 2.5V & 3.3V

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