TSMC 05: 1.2V GPIO

Libraries

Name	Process	Form Factor
RGO_TSMC05_15V12_N5_45F_SVD	N5	Inline

Summary

The 1.2V GPIO library provides an open-drain bi-directional I/O driver designed for the SVID three-line interface. It is compliant with the Intel SVID specification.

This 5nm library is available in an inline flip chip implementation.

To design a functional I/O power domain with this cell, an additional library is required – 1.8V Support: Power. That library contains isolated analog I/O, and a full complement of power cells along with spacer cells to assemble a complete pad ring by abutment. An included 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:

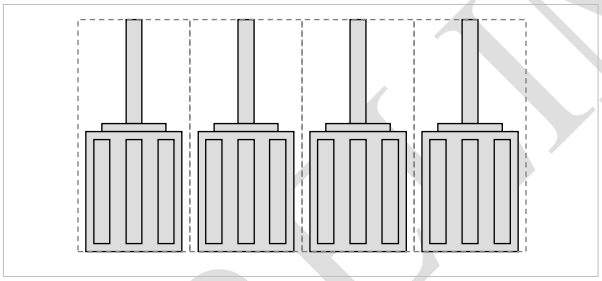
- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 500 V ESD Charge Device Model (CDM)

Latch-up Immunity:

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

Cell Size & Form Factor

Inline (core-limited) – 99.82µm x 100.1µm

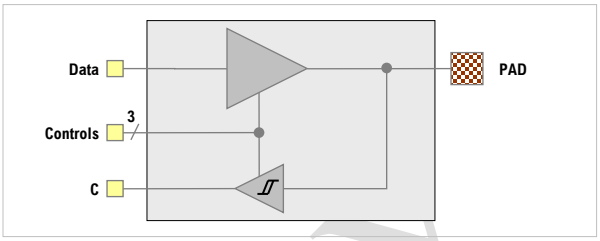


Orientation-limited cells are only provided in the vertical-only (_V) orientation.

Recommended operating conditions

	Description	Min	Nom	Max	Units
V_{DVDD}	I/O supply voltage	1.08	1.2	1.32	V
V_{VDDP}	External pull-up supply to PAD	0.95		1.08	V
V_{VDD}	Core supply voltage	0.675	0.75	0.825	V
		0.765	0.85	0.935	V
T_J	Junction temperature	-40	25	125	°C
V_{PAD}	Voltage at PAD	V_{DVSS} – 0.3	-	1.32	V

FRC_BI_SVD_12V_NC



Bi-directional GPIO Features

- Open drain operation only
  - 24mA rated sink current @ 1.2V
- Operating frequency – up to 25MHz
- Fault-tolerant to 1.32V at PAD (no current flow when DVDD = 0V)
- Output enable
- Receiver enable
- Standard LVCMOS compatible input with Schmitt trigger (hysteresis)
- Power-on sequencing independent design with Power-On Control
- DVDD = 1.08V to 1.32V
- Pad VDDP = 0.95V to 1.08V – independent of DVDD
- The circuit consumes no DC supply current in the static state
- A pull-down function is provided to prevent the PAD port from floating when an open-drain configuration is not used on the system board.

Characterization Corners

Model	LPE Type	VDD [1]	DVDD [2]	Temp
FFGNP	Cbest_CCbest	+10%	+10%	-40°C
FFGNP	Cbest_CCbest	+10%	+10%	0°C
FFGNP	Cbest_CCbest	+10%	+10%	125°C
TT	Ctypical	nominal	nominal	25°C
TT	Ctypical	nominal	nominal	85°C
SSGNP	Cworst_CCworst	-10%	-10%	-40°C
SSGNP	Cworst_CCworst	-10%	-10%	0°C
SSGNP	Cworst_CCworst	-10%	-10%	125°C

[1] VDD = 0.75V & 0.85V
[2] DVDD = 1.8V

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