

## 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:

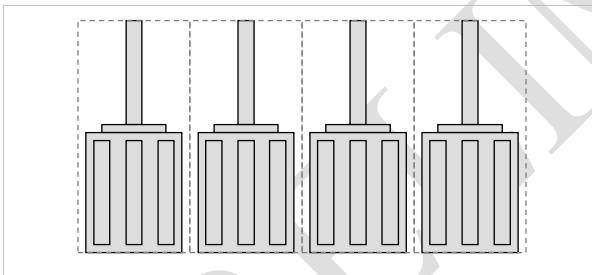
- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 500 V ESD Charge Device Model (CDM)

### Latch-up Immunity:

- JEDEC compliant
  - Tested to I-Test criteria of  $\pm 100\text{mA}$  @  $125^\circ\text{C}$

## Cell Size & Form Factor

Inline (core-limited) –  $99.82\mu\text{m} \times 100.1\mu\text{m}$

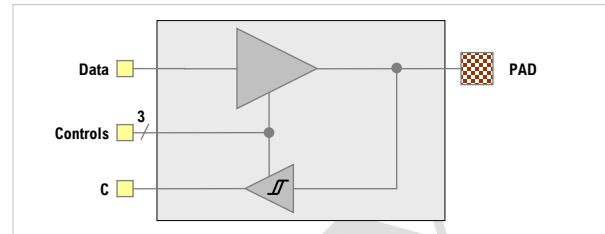


Orientation-limited cells are only provided in the vertical-only ( $\_V$ ) orientation.

## 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	$^\circ\text{C}$
$V_{PAD}$ 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  $DVDD = 0\text{V}$ )
- Output enable
- Receiver enable
- Standard LVCMOS compatible input with Schmitt trigger (hysteresis)
- Power-on sequencing independent design with Power-On Control
- $DVDD = 1.08\text{V}$  to  $1.32\text{V}$
- Pad  $VDDP = 0.95\text{V}$  to  $1.08\text{V}$  – 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 $^\circ\text{C}$
FFGNP	Cbest_CCbest	+10%	+10%	0 $^\circ\text{C}$
FFGNP	Cbest_CCbest	+10%	+10%	125 $^\circ\text{C}$
TT	Ctypical	nominal	nominal	25 $^\circ\text{C}$
TT	Ctypical	nominal	nominal	85 $^\circ\text{C}$
SSGNP	Cworst_CCworst	-10%	-10%	-40 $^\circ\text{C}$
SSGNP	Cworst_CCworst	-10%	-10%	0 $^\circ\text{C}$
SSGNP	Cworst_CCworst	-10%	-10%	125 $^\circ\text{C}$

[1]  $VDD = 0.75\text{V}$  &  $0.85\text{V}$   
 [2]  $DVDD = 1.8\text{V}$

PRELIMINARY

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