

## Libraries

Name	Process	Form Factor
RGO_TSMC07_18V33_7FF_20C_SMB	7FF	Staggered

## Summary

The SMBus library provides open-drain bi-directional I/O cells designed for the High-Power SMBus two-line interface. It is compliant with the Rev 3.1 of the SMBus specification.

The design supports the Sm, Fm and Fm+ modes of operation at the SMBus operating voltage (VDDP) of either extended range 3.3V or standard 1.8V logic.

This 7nm library is available in a staggered flip chip implementation.

To utilize these cells in the pad ring, an additional library is required – 1.8V Support: Power. That library contains the power cells, the POC cell, and a rail splitter to isolate the SMBus cells in their own power domain as recommended. 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 complete 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)

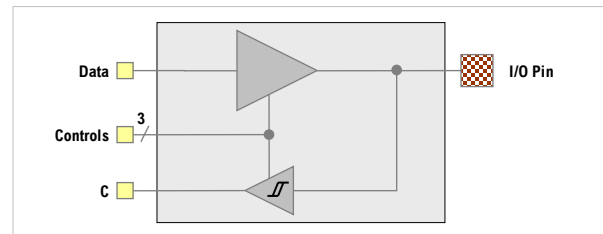
### Latch-up Immunity:

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

## Cell Size & Form Factor

- Staggered (pad-limited) – TBD $\mu\text{m}$  x TBD $\mu\text{m}$

## SMP\_ON\_003\_1833V\_NC



## Product Features

- Supported I2C operating modes:
  - Standard-mode (Sm) – 10 to 100 kbps data rate
  - Fast mode (Fm) – 10 to 400 kbps data rate
  - Fast mode (Fm+) – 10 kbps to 1 Mbps data rate
- Open drain operation only (floating NWELL with PMOS used for ESD protection only)
- Built-in output slew rate control to meet I<sup>2</sup>C T<sub>of</sub> minimum of (20 x VDDP/5.5V) ns
- Output enable
- Receiver enable
- ESD protection is accomplished with an SCR (no diode to the positive power supply)
- Standard LVCMOS compatible inputs with Schmitt trigger (hysteresis) option
- Power-on sequencing independent design with Power-On Control
- DVDD = 1.62V to 1.98V
- Pad VDDP (power supply reference for Output)
  - 2.7V to 3.63V – extended range 3.3V
  - 1.62V to 1.98V – standard range 1.8V
- The circuit consumes no DC supply current in the static state

An open-drain design, this cell requires an external pull-up resistor to a high voltage power supply. The pull-up power supply (VDDP) can be 3.63V maximum, independent of the I/O cell power supply (DVDD). In a 1.8V SMBus application, VDDP can track DVDD but it is not necessary.

Vertical-only (\_V) and horizontal-only (\_H) variants provided.

## Recommended operating conditions

Description	Min	Nom	Max	Units	
V <sub>DVDD</sub> I/O supply voltage	1.62	1.8	1.98	V	
V <sub>VDDP</sub> External pull-up supply to PAD	3.3V	2.70	3.3	3.63	V
	1.8V	1.62	1.8	1.98	V
V <sub>VDD</sub> Core supply voltage	0.675	0.75	0.825	V	
	0.765	0.85	0.935	V	
T <sub>J</sub> Junction temperature	-40	25	125	°C	
V <sub>PAD</sub> Voltage at PAD	V <sub>DVSS</sub> - 0.3	-	3.63	V	

## Characterization Corners \*

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

[1] VDD = 0.75V  
 [2] DVDD = 1.8V  
 \* PRELIMINARY

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Published by:

**Aragio Solutions**  
2201 K Avenue  
Section B Suite 200  
Plano, TX 75074-5918  
Phone: (972) 516-0999  
Fax: (972) 516-0998  
Web: <http://www.aragio.com/>

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Printed in the United States of America