TSMC65: 3.3V GPIO

Libraries

Name	Process	Form Factor
RGO_TSMC65_25V33_LP_50C	LP - HVT	Inline CUP
RGO_TSMC65_25V33_LP_30C	LP - HVT	Staggered CUP

Summary

The 3.3V General Purpose I/O library provides bidirectional I/O, 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. 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.

- Programmable bidirectional GPIO
- Fault-tolerant programmable bidirectional GPIO
- Input-only buffer
- Isolated analog I/O
- Full complement of power, corner, and spacer cells

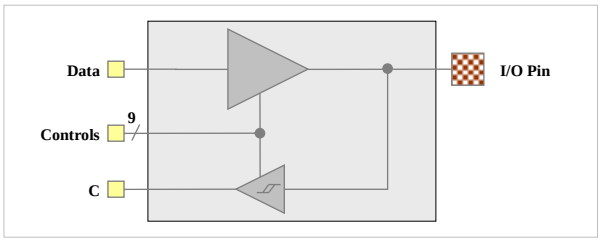
ESD Protection:

- 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

SRx_BI_SDS_33V_STB / FRx_BI_SDS_33V_STB



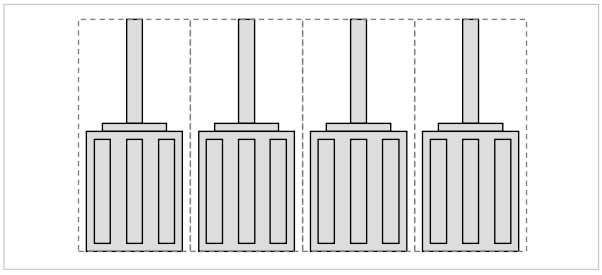
Bidirectional GPIO Driver Features

- Multi-Voltage (1.8V, 2.5V, 2.8V, 3.0V, 3.3V)
- LVCMOS / LVTTL input with selectable hysteresis
- Programmable drive strength (rated 2mA to 12mA)
- Selectable output slew rate
- Optimized for EMC with SSO factor of 8
- Open-drain output mode
- Programmable input options (pull-up/pull-down/repeater)
- Power-On Start (POS) capable
- Power sequencing independent design with Power-On Control
- Fault tolerant cell provides fail-safe operation

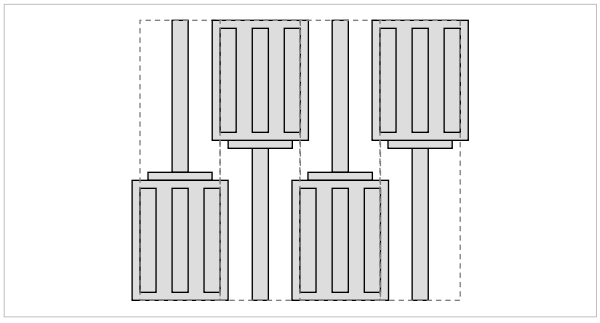
In full-drive mode, this driver can operate to frequencies in excess of 100MHz with 15pF external load and 125 MHz with 10pF load. Actual frequency limits are load and system dependent. A maximum of 200 MHz can be achieved under small capacitive loads.

Cell Sizes & Form Factor

Inline (core-limited) – 50µm x 120µm

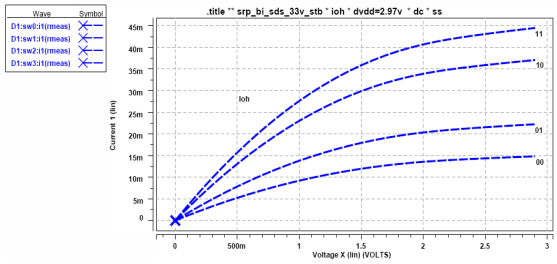


Staggered (pad-limited) – 30µm x 180µm

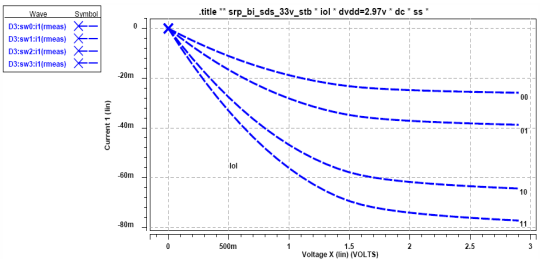


Output Drive Strength

I_{OH} (DVDD = 2.97V, SS)



I_{OL} (DVDD = 2.97V, SS)



Recommended operating conditions

	Description	Min	Nom	Max	Units
V_{VDD}	Core supply voltage	0.9	1.0	1.1	V
		1.08	1.2	1.32	V
V_{DVDD}	I/O supply voltage	2.97	3.3	3.63	V
		2.70	3.0	3.30	V
		2.52	2.8	3.08	V
		2.25	2.5	2.75	V
		1.62	1.8	1.98	V
T_J	Junction temperature	-40	25	125	°C
V_{PAD}	Voltage at PAD	-0.3	-	V_{DVDD} + 0.3	V

Characterization Corners

Nominal VDD	Model	VDD	DVDD[1]	Temperature
1.2V	FF	+10%	+10%	-40°C
	FF	+10%	+10%	125°C
	TT	nominal	nominal	25°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C
1.0V	FF	+10%	+10%	-40°C
	FF	+10%	+10%	125°C
	TT	nominal	nominal	25°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C

[1] DVDD = 1.8, 2.5, 2.8, 3.0 and 3.3V

Published by:

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