

GF28: 3.3V GPIO



Libraries

Name	Process	Form Factor	Silicon proven
RGO_GF28_25V33_SLP_25C	SLP	staggered	yes
RGO_GF28_25V33_SLP_44C	SLP	Inline	yes
RGO_GF28_25V33_SLP_25C_FT	SLP	staggered	yes
RGO_GF28_25V33_SLP_44C_FT	SLP	Inline	yes
RGO_GF28_25V33_SLP_25C_OSC	SLP	staggered	yes
RGO_GF28_25V33_SLP_44C_OSC	SLP	Inline	yes

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. These libraries use thick oxide 2.5V ZG transistors.

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

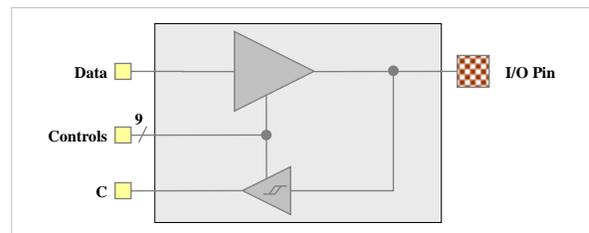
ESD Protection:

- 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 $\pm 100\text{mA}$ @ 125°C

SRx_BI_SDS_33V_STB/ FRx_BI_SDS_33V_STB



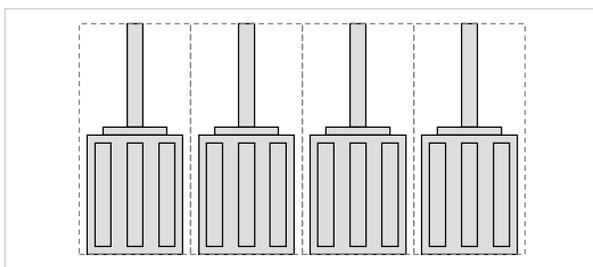
Bidirectional GPIO Driver Features

- Multi-Voltage (1.8V, 2.5V, 3.3V)
- LVCMOS / LVTTTL 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 available in non-SCR version(100V ESD MM) and SCR version (200V ESD MM)

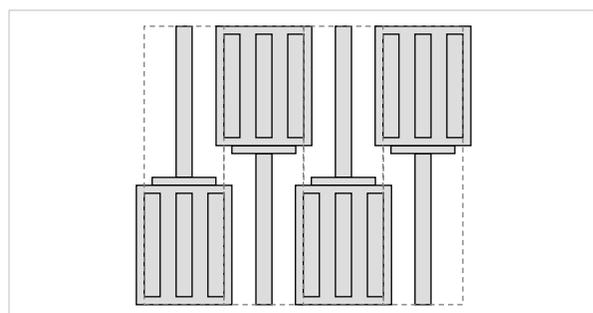
In full-drive mode, this driver can operate to frequencies in excess of 100MHz with 15pF external load and 125 MHz with 10pF load. Actual frequency limits are load and system dependent. A maximum of 200 MHz can be achieved under small capacitive loads.

Cell Sizes & Form Factor

Inline (core-limited) – 44 μm x 92 μm



Staggered (pad-limited) – 22 μm x 180 μm



Recommended operating conditions

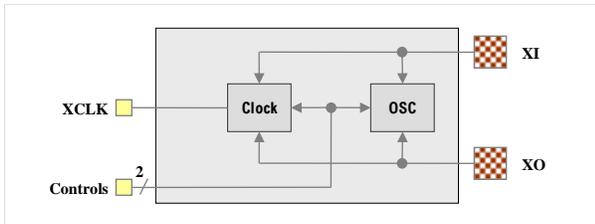
Description	Min	Nom	Max	Units
V _{VDD} Core supply voltage	0.90	1.0	1.10	V
	0.99	1.1	1.155	
V _{DVDD} I/O supply voltage	2.97	3.3	3.63	V
	2.25	2.5	2.75	V
	1.62	1.8	1.98	V
T _J Junction temperature	-40	25	125	°C
V _{PAD} Voltage at PAD	0	-	V _{DVDD}	V

Characterization Corners

Nominal VDD	Model	VDD	DVDD ^[1]	Temperature
1.0	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
1.1	FF	+5%	+10%	-40°C
	FF	+5%	+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

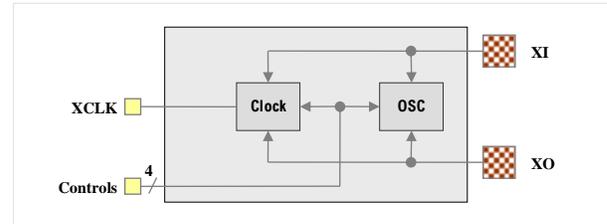
OSP_BI_032_12V



32 KHz RTC Oscillator Features

- Designed to use a 32.786 kHz external crystal for Real Time Clock applications.
- Optimized for low power, stability and minimum jitter
- Characterized with crystal loading capacitors ranging from 10 pF to 30 pF.
- Power-down and bypass modes
- Speed-up circuitry for fast startup
- Low power (2.5 μ W typ)
- Operates on core power only (VDD/VSS cells embedded)

OSP_BI_100_33V



100 MHz Programmable Oscillator Features

- Programmable drive strength for wider frequency range – 1 MHz to > 100 MHz using industry standard external crystals.
- Optimized for stability and minimum jitter
- Power-down and bypass modes
- Operates on I/O and core power (DVDD/DVSS cells embedded)

Oscillator libraries are shipped separately.

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Published by:

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