

# GF22: 1.8V GPIO 3VT



## Libraries

Name	Process	Form Factor
RGO_GF22_18V18_FDX_20C_3VT	FDX	Staggered CUP

## Summary

The 1.8V GPIO 3VT library provides general purpose bidirectional I/O cells that are both fault tolerant and 3.3V tolerant. These programmable, multi-voltage I/O's give the system designer the flexibility to design to a wide range of performance targets.

This 22nm library is available in a staggered CUP wire bond implementation with a flip chip option.

To design a functional I/O power domain with these cells, an additional library is required – 1.8V Support: Power. That library 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. 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:

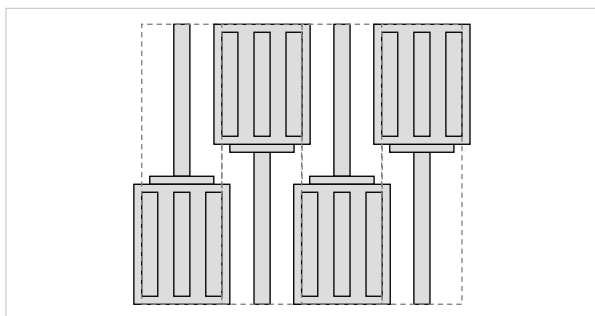
- JEDEC compliant
  - 2KV ESD Human Body Model (HBM)
  - 500 V ESD Charge Device Model (CDM)

### Latch-up Immunity:

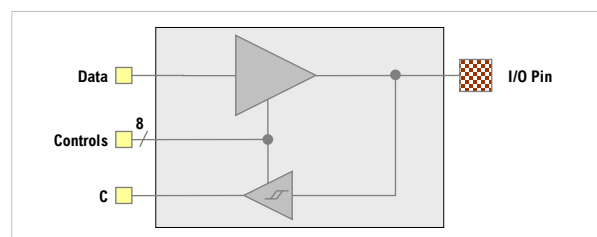
- JEDEC compliant
  - Tested to I-Test criteria of  $\pm 100\text{mA}$  @  $125^\circ\text{C}$

## Cell Size & Form Factor

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



## FRP\_BI\_SDS\_33T\_STB



## Bidirectional GPIO Driver Features

- Multi-Voltage (1.2V, 1.5V, 1.8V)
- Fault tolerant
- 3.3V tolerant at 1.8V operation
- 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)
- Power sequencing independent design with Power-On Control

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.

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

## Recommended operating conditions

Description	Min	Nom	Max	Units
$V_{DD}$ Core supply voltage	0.72	0.80	0.88	V
$V_{DD}$ I/O supply voltage	1.62	1.8	1.98	V
	1.35	1.5	1.65	V
$V_{DD}$ I/O supply voltage	1.08	1.2	1.32	V
	1.08	1.2	1.32	V
$T_J$ Junction temperature	-40	25	125	$^\circ\text{C}$
$V_{PAD}$ Voltage at PAD	$V_{DVSS} - 0.3$	-	$V_{DD} + 0.3$	V

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## Characterization Corners

Nominal VDD	Model	VDD	DVDD <sup>[1]</sup>	Temperature
0.8V	FF	+10%	+10%	-40°C
	FF	+10%	+10%	125°C
	TT	nominal	nominal	25°C
	TT	nominal	nominal	85°C
	SS	-10%	-10%	-40°C
	SS	-10%	-10%	125°C

[1] DVDD = 1.2V, 1.5V & 1.8V

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