

GF22: 1.8V Support: Power



Libraries

Name	Process	Form Factor
RGO_GF22_18V18_ULL_25C_SPT	FDX_ULL	Staggered CUP
RGO_GF22_18V18_ULL_45C_SPT	FDX_ULL	Inline CUP

Summary

The 1.8V Support: Power **ultra low leakage** library provides a full complement of cells to support the assembly of a complete pad ring by abutment. It is supplied as a standard addition to the ultra low leakage GPIO libraries and other ultra low leakage I/O library offerings from Aragio Solutions that use a compatible pad ring bus structure.

These 22nm libraries are available in inline and staggered CUP wire bond implementations with a flip chip option.

The 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:

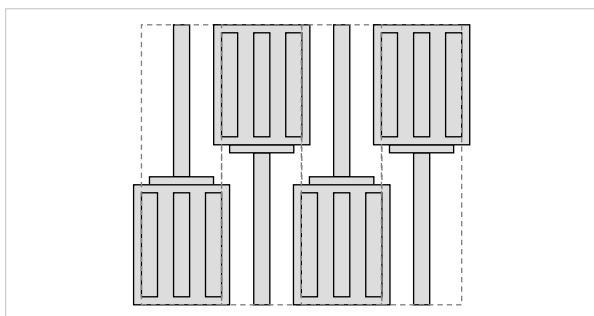
- JEDEC compliant
 - 2KV ESD Human Body Model (HBM)
 - 500 V ESD Charge Device Model (CDM)
 - 750V corner pin C4B package classification achieved by following key design priorities

Latch-up Immunity:

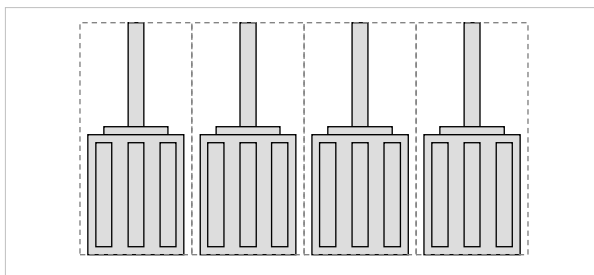
- JEDEC compliant
 - Tested to I-Test criteria of $\pm 100\text{mA}$ @ 125°C

Cell Size & Form Factor

Staggered (pad-limited) – $30\mu\text{m} \times 79\mu\text{m}$



Inline (core-limited) – $48\mu\text{m} \times 48\mu\text{m}$



Cell List

Name	Description
Digital Pads *	
STx_IN_001_18V_NC	Input-only buffer
I/O Power / Ground Pads *	
PWx_VD_PDO_18V	I/O power (DVDD) with POC
PWx_VD_RDO_18V	I/O power (DVDD)
PWx_VS_RDO_18V	I/O ground (DVSS)
PWx_VS_DRC_18V	Common ground with I/O ESD
Core Power / Ground Pads *	
PWx_VD_RCD_10V	Core power (VDD)
PWx_VS_RCD_10V	Core ground (VSS)
PWx_VS_DRC_10V	Common ground with Core ESD
Analog Pads *	
ANx_BI_DWR_18V	1.8V Analog Input cell
ANx_BI_DWR_10V	0.8V Analog Input cell
Analog Power / Ground Pads *	
PWx_VD_ANA_10V	Analog power (AVDD) 0.8V
PWx_VS_ANA_10V	Analog ground (AVSS)
PWx_VD_ANA_18V	Analog power (ADVDD) 1.8V
PWx_VS_ANA_18V	Analog ground (ADVSS)
Support Pads	
SPx_CO_000_18V	Corner cell (rail splitter)
SPx_CO_001_18V	Corner cell (continuous)
SPx_SP_000_18V	0.1 μm spacer
SPx_SP_001_18V	1 μm spacer
SPx_SP_005_18V	5 μm spacer
SPx_SP_010_18V	10 μm spacer
SPx_RS_005_18V	Rail splitter

* Vertical-only (_V) and horizontal only (_H) variants provided
Cell names / descriptions abbreviated

Staggered CUP Cells

CUP_GF22_44X44_IN	44 μm X 44 μm Inner
CUP_GF22_44X44_OUT	44 μm X 44 μm Outer
CUP_GF22_FC	Flip chip cell

Inline CUP Cells

CUP_GF22_44X44_ULL_INLINE	44 μm X 44 μm Inline
CUP_GF22_FC_INLINE	Flip chip cell

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Recommended operating conditions

Description	Min	Nom	Max	Units
V_{VDD} Core supply voltage	0.81	0.9	0.945	V
	0.72	0.8	0.88	V
V_{DVDD} I/O supply voltage	1.62	1.8	1.98	V
	1.35	1.5	1.65	V
	1.08	1.2	1.32	V
T_J Junction temperature	-40	25	125	°C
V_{PAD} Voltage at PAD	$V_{DVSS} - 0.3$	-	$V_{DVDD} + 0.3$	V

Characterization Corners

Nominal VDD	Model	VDD	DVDD ^[1]	Temperature
0.8V	FFG	+10%	+10%	-40°C
	FFG	+10%	+10%	125°C
	TT	nominal	nominal	25°C
	TT	nominal	nominal	85°C
	SSG	-10%	-10%	-40°C
	SSG	-10%	-10%	125°C
0.9V Overdrive	FFG	+5%	+10%	-40°C
	FFG	+5%	+10%	125°C
	TT	nominal	nominal	25°C
	TT	nominal	nominal	85°C
	SSG	-10%	-10%	-40°C
	SSG	-10%	-10%	125°C

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

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