

Libraries

Name	Process	Form Factor
RGO_GF28_18V33_SLP_20C_I2C	SLP	Staggered
RGO_GF28_18V33_HPP_20C_I2C	HPP	Staggered

Summary

Conforms to UM10204 I2C-bus specification and user manual, Rev.4 – 13 February 2012, NXP

The I2C I/O pad is an open-drain bi-directional I/O cell that is designed for the I2C two-line interface. Utilized with the 3.3V GPIO library, it is compliant with the I2C-bus specification.

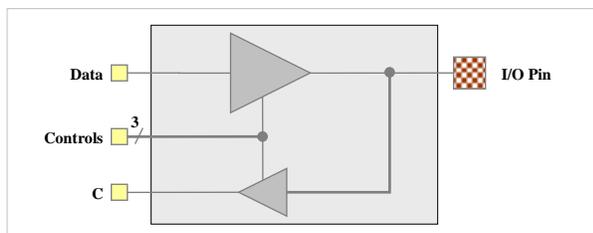
The I2C cell is designed for 100Kbps, 400 Kbps and 1 Mbps operation. Due to system load options and EMI considerations, most applications operate within the 400 Kbps data rate.

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 3.6V maximum and is independent of the I/O cell power supply (DVDD). The sizing of the external resistor is application dependent and can range from 1.1 K Ω to 40 K Ω .

Product Features

- Supported I2C operating modes:
 - Standard-mode (Sm) – 100 Kbps data rate
 - Fast mode (Fm) – 400 Kbps data rate
 - Fast mode (Fm+) – 1.0 Mbps data rate
- Open drain operation only (floating N_{WELL} with PMOS used for ESD protection only)
- Built-in output slew rate control to meet I²C T_{of} minimum of (20 x VDDP/5.5V) ns
- Output enable
- Receiver enable
- ESD protection uses snap-back devices (no diode to the positive power supply)
- Standard LVCMOS input thresholds (no hysteresis)
- Staggered I/O CUP implementation
- Power-on sequencing independent design with Power-On Control
- DVDD = 2.7V to 3.63V and VDD = 0.85V to 1.1V
- Pad VDDP (power supply reference for Output) = 2.7V to 3.63V independent of DVDD.
- The circuit consumes no DC supply current in the static state

I2P_ON_003_33V_NC



ESD Protection

I/O pads are designed with robust ESD protection for all market segments. Passed:

- 2KV ESD Human Body Model (HBM)
- 200 V ESD Machine Model (MM)
- 500 V ESD Charge Device Model (CDM)

Recommended operating conditions

Description	Min	Nom	Max	Units	
V _{DVDD} I/O supply voltage	2.70	3.3	3.63	V	
V _{VDDP} External pull-up supply to PAD	2.70	3.3	3.63	V	
V _{VDD} Core supply voltage		SLP	0.90	1.0	1.10
			0.99	1.1	1.155
		HPP	0.765	0.85	0.935
			0.81	0.9	0.945
T _J Junction temperature	-40	25	125	°C	
V _{PAD} Voltage at PAD	V _{DVSS} – 0.3	-	V _{VDDP}	V	

Characterization Corners

Nominal VDD	Model	VDD	DVDD ^[1]	Temperature
1.1 (SLP)	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
1.0 (SLP)	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
0.9 (HPP)	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
0.85 (HPP)	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 = 3.0V / 3.3V

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