



July 20, 2010

PCN Number: 1012

PCN Change Level: Major

Subject: IGLOO PLUS Datasheet Update

Dear Customer,

This notice is to inform you that IGLOO[®] PLUS datasheet Revision 11 has been published. The updated datasheet can be downloaded from the Actel website:

http://www.actel.com/documents/IGLOOPLUS_DS.pdf.

The following key changes have been made to this datasheet:

Change # 1: The versioning system for datasheets has been changed.

Datasheets are assigned a revision number that increments each time the datasheet is revised.

Change # 2: Table 2-8 • Power Supply State per Mode is new.

Table 2-8 • Power Supply State per Mode

Modes/Power Supplies	Power Supply Configurations				
	VCC	VCCPLL	VCCI	VJTAG	VPUMP
Flash*Freeze	On	On	On	On	On/off/floating
Sleep	Off	Off	On	Off	Off
Shutdown	Off	Off	Off	Off	Off
No Flash*Freeze	On	On	On	On	On/off/floating

Note: Off: Power Supply level = 0 V



Change # 3: VIH maximum values in tables were updated as needed to 3.6 V.

Table 2-21 • Summary of Maximum and Minimum DC Input and Output Levels Applicable to Commercial and Industrial Conditions—Software Default Settings

I/O Standard	Drive Strength	Equiv. Software Default Drive Strength Option ²	Slew Rate	VIL		VIH		VOL	VOH	I _{OL} ¹	I _{OH} ¹
				Min. V	Max. V	Min. V	Max. V	Max. V	Min. V	mA	mA
3.3 V LVTTTL / 3.3 V LVCMOS	12 mA	12 mA	High	-0.3	0.8	2	3.6	0.4	2.4	12	12
3.3 V LVCMOS Wide Range ³	100 μA	12 mA	High	-0.3	0.8	2	3.6	0.2	VDD 3 0.2	0.1	0.1
2.5 V LVCMOS	12 mA	12 mA	High	-0.3	0.7	1.7	3.6	0.7	1.7	12	12
1.8 V LVCMOS	8 mA	8 mA	High	-0.3	0.35 * VCCI	0.65 * VCCI	3.6	0.45	VCCI - 0.45	8	8
1.5 V LVCMOS	4 mA	4 mA	High	-0.3	0.35 * VCCI	0.65 * VCCI	3.6	0.25 * VCCI	0.75 * VCCI	4	4
1.2 V LVCMOS ⁴	2 mA	2 mA	High	-0.3	0.35 * VCCI	0.65 * VCCI	3.6	0.25 * VCCI	0.75 * VCCI	2	2
1.2 V LVCMOS Wide Range ^{4,5}	100 μA	2 mA	High	-0.3	0.3 * VCCI	0.7 * VCCI	3.6	0.1	VCCI - 0.1	0.1	0.1

Notes:

1. Currents are measured at 85°C junction temperature.
2. Note that 1.2 V LVCMOS and 3.3 V LVCMOS wide range are applicable to 100 μA drive strength only. The configuration will not operate at the equivalent software default drive strength. These values are for normal ranges only.
3. All LVCMOS 3.3 V software macros support LVCMOS 3.3 V wide range as specified in the JESD-8B specification.
4. Applicable to IGLOO PLUS V2 devices operating at $V_{CCI} \geq V_{CC}$.
5. All LVCMOS 1.2 V software macros support LVCMOS 1.2 V wide range as specified in the JESD8-12 specification.

Change # 4: Table 2-29 • I/O Weak Pull-Up/Pull-Down Resistances was revised, including addition of 3.3 V and 1.2 V LVCMOS wide range. The notes defining $R_{\text{WEAK PULLUP-MAX}}$ and $R_{\text{WEAK PULLDOWN-MAX}}$ were revised.

Table 2-29 • I/O Weak Pull-Up/Pull-Down Resistances
Minimum and Maximum Weak Pull-Up/Pull-Down Resistance Values

VCCI	$R_{\text{(WEAK PULL-UP)}}^1$ (Ω)		$R_{\text{(WEAK PULL-DOWN)}}^2$ (Ω)	
	Min.	Max.	Min.	Max.
3.3 V	10 K	45 K	10 K	45 K
3.3 V (wide range I/Os)	10 K	45 K	10 K	45 K
2.5 V	11 K	55 K	12 K	74 K
1.8 V	18 K	70 K	17 K	110 K
1.5 V	19 K	90 K	19 K	140 K
1.2 V	25 K	110 K	25 K	150 K
1.2 V (wide range I/Os)	19 K	110 K	19 K	150 K

Notes:

- $R_{\text{(WEAK PULL-UP-MAX)}} = (VCC_{\text{max}} - VOH_{\text{spec}}) / I_{\text{(WEAK PULL-UP-MIN)}}$
- $R_{\text{(WEAK PULLDOWN-MAX)}} = (VOL_{\text{spec}}) / I_{\text{(WEAK PULLDOWN-MIN)}}$

Change # 5: Table 2-31 • Duration of Short Circuit Event before Failure was revised to change the maximum temperature from 110°C to 100°C, with an example of six months instead of three months.

Table 2-31 • Duration of Short Circuit Event before Failure

Temperature	Time before Failure
-40°C	> 20 years
0°C	> 20 years
25°C	> 20 years
70°C	5 years
85°C	2 years
100°C	6 months

Change # 6: Table 2-90 • IGLOO PLUS CCC/PLL Specification (1.5 V) and Table 2-91 • IGLOO PLUS CCC/PLL Specification (1.2 V) were revised.

VCO output jitter and maximum peak-to-peak jitter data were changed. Three notes were added to the table in connection with these changes.

**Table 2-90 • IGLOO PLUS CCC/PLL Specification
For IGLOO PLUS V2 or V5 devices, 1.5 V DC Core Supply Voltage**

Parameter	Min.	Typ.	Max.	Units
Clock Conditioning Circuitry Input Frequency f_{IN_CCC}	1.5		250	MHz
Clock Conditioning Circuitry Output Frequency f_{OUT_CCC}	0.75		250	MHz
Delay Increments in Programmable Delay Blocks ^{1, 2}		360		ps
Number of Programmable Values in Each Programmable Delay Block			32	
Serial Clock (SCLK) for Dynamic PLL ^{3,4}				
Input Cycle-to-Cycle Jitter (peak magnitude)			100	MHz
Acquisition Time	LockControl = 0		300	μ s
	LockControl = 1		6.0	ms
Tracking Jitter ⁵	LockControl = 0		2.5	
	LockControl = 1		1.5	ns
Output Duty Cycle	48.5		51.5	%
Delay Range in Block: Programmable Delay 1 ^{1, 2}	1.25		15.65	ns
Delay Range in Block: Programmable Delay 2 ^{1, 2}	0.469		15.65	ns
Delay Range in Block: Fixed Delay ^{1, 2}		3.5		ns
VCO Output Peak-to-Peak Period Jitter F_{CCC_OUT} ⁶	Maximum Peak-to-Peak Period Jitter ^{6,7,8}			
	SSO \leq 2	SSO \leq 4	SSO \leq 8	SSO \leq 16
0.75 MHz to 50 MHz	0.50%	0.60%	0.80%	1.20%
50 MHz to 250 MHz	2.50%	4.00%	6.00%	12.00%



**Table 2-91 • IGLOO PLUS CCC/PLL Specification
For IGLOO PLUS V2 Devices, 1.2 V DC Core Supply Voltage**

Parameter	Min.	Typ.	Max.	Units
Clock Conditioning Circuitry Input Frequency f_{IN_CCC}	1.5		160	MHz
Clock Conditioning Circuitry Output Frequency f_{OUT_CCC}	0.75		160	MHz
Delay Increments in Programmable Delay Blocks ^{1, 2}		580		ps
Number of Programmable Values in Each Programmable Delay Block			32	
Serial Clock (SCLK) for Dynamic PLL ^{3,4}				
Input Cycle-to-Cycle Jitter (peak magnitude)			60	MHz
Acquisition Time				
LockControl = 0			300	μs
LockControl = 1			6.0	ms
Tracking Jitter ⁵				
LockControl = 0			4	ns
LockControl = 1			3	ns
Output Duty Cycle	48.5		51.5	%
Delay Range in Block: Programmable Delay 1 ^{1, 2}	2.3		20.86	ns
Delay Range in Block: Programmable Delay 2 ^{1, 2}	0.025		20.86	ns
Delay Range in Block: Fixed Delay ^{1, 2}		5.7		ns
VCO Output Peak-to-Peak Period Jitter F_{CCC_OUT} ⁶	Maximum Peak-to-Peak Period Jitter ^{6,7,8}			
	SSO ≤ 2	SSO ≤ 4	SSO ≤ 8	SSO ≤ 16
0.75 MHz to 50 MHz	0.50%	1.20%	2.00%	3.00%
50 MHz to 160 MHz	2.50%	5.00%	7.00%	15.00%



The following is a list of affected devices.

Table 1 • Affected Devices

AGLP030V2-CS201	AGLP030V5-VQG128	AGLP060V5-CSG289I
AGLP030V2-CS201I	AGLP030V5-VQG128I	AGLP060V5-VQ176
AGLP030V2-CS289	AGLP060V2-CS201	AGLP060V5-VQ176I
AGLP030V2-CS289I	AGLP060V2-CS201I	AGLP060V5-VQG176
AGLP030V2-CSG201	AGLP060V2-CS289	AGLP060V5-VQG176I
AGLP030V2-CSG201I	AGLP060V2-CS289I	AGLP125V2-CS281
AGLP030V2-CSG289	AGLP060V2-CSG201	AGLP125V2-CS281I
AGLP030V2-CSG289I	AGLP060V2-CSG201I	AGLP125V2-CS289
AGLP030V2-VQ128	AGLP060V2-CSG289	AGLP125V2-CS289I
AGLP030V2-VQ128I	AGLP060V2-CSG289I	AGLP125V2-CSG281
AGLP030V2-VQG128	AGLP060V2-VQ176	AGLP125V2-CSG281I
AGLP030V2-VQG128I	AGLP060V2-VQ176I	AGLP125V2-CSG289
AGLP030V5-CS201	AGLP060V2-VQG176	AGLP125V2-CSG289I
AGLP030V5-CS201I	AGLP060V2-VQG176I	AGLP125V5-CS281
AGLP030V5-CS289	AGLP060V5-CS201	AGLP125V5-CS281I
AGLP030V5-CS289I	AGLP060V5-CS201I	AGLP125V5-CS289
AGLP030V5-CSG201	AGLP060V5-CS289	AGLP125V5-CS289I
AGLP030V5-CSG201I	AGLP060V5-CS289I	AGLP125V5-CSG281
AGLP030V5-CSG289	AGLP060V5-CSG201	AGLP125V5-CSG281I
AGLP030V5-CSG289I	AGLP060V5-CSG201I	AGLP125V5-CSG289
AGLP030V5-VQ128	AGLP060V5-CSG289	AGLP125V5-CSG289I
AGLP030V5-VQ128I		

Several other minor updates have also been made to the IGLOO PLUS datasheet. Please refer to the “List of Changes” chapter (page 4-1) for those updates.

For answers to questions, please contact the Actel Technical Support hotline at tech@actel.com.

Regards,

Actel