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+-----+
; Parallel Compilation ;

+-----+-----+		
; Processors	; Number	;
+-----+-----+		
; Number detected on machine	; 12	;
; Maximum allowed	; 6	;
;	;	;
; Average used	; 1.27	;
; Maximum used	; 6	;
;	;	;
; Usage by Processor	; % Time Used	;
; Processor 1	; 100.0%	;
; Processor 2	; 5.4%	;
; Processor 3	; 5.4%	;
; Processor 4	; 5.4%	;
; Processor 5	; 5.4%	;
; Processor 6	; 5.3%	;
+-----+-----+		

+-----+-----	
-----+	
; Power Analyzer Summary	
;	
+-----+-----	
-----+	
; Power Analyzer Status	; Successful - Fri Jul 14 19:53:08 2023
;	
; Quartus Prime Version	; 22.1std.1 Build 917 02/14/2023 SC Lite
Edition ;	
; Revision Name	; atm
;	
; Top-level Entity Name	; atm
;	
; Family	; Cyclone V
;	
; Device	; 5CSEMA5F31C6
;	
; Power Models	; Final
;	
; Total FPGA Thermal Power Dissipation	; 439.25 mW
;	
; Core Dynamic Thermal Power Dissipation	; 1.97 mW
;	
; Core Static Thermal Power Dissipation	; 417.34 mW
;	
; I/O Thermal Power Dissipation	; 19.93 mW
;	
;	
;	
; HPS Dynamic (Dual core) Power	; 802.38 mW

```

;
; HPS Dynamic (Single core) Power      ; 793.28 mW
;
;
;
; Total FPGA and HPS Power            ; 1241.63 mW
;
;
;
; Power Estimation Confidence          ; Low: user provided insufficient toggle
rate data ;

```

```

+-----+-----+
-----+

```

```

+-----+-----+
-----+

```

```

; Power Analyzer Settings

```

```

;
+-----+-----+-----+

```

```

+-----+-----+-----+

```

```

; Option                                ; Setting

```

```

; Default Value ;
+-----+-----+-----+

```

```

+-----+-----+-----+

```

```

; Use smart compilation                  ; Off

```

```

; Off ;

```

```

; Enable parallel Assembler and Timing Analyzer during compilation ; On

```

```

; On ;

```

```

; Enable compact report table           ; Off

```

```

; Off ;

```

```

; Default Power Toggle Rate             ; 20.0%

```

```

; 12.5% ;

```

```

; Default Power Input I/O Toggle Rate   ; 20.0%

```

```

; 12.5% ;

```

```

; Ambient Temperature                   ; 28

```

```

; 25 ;

```

```

; Preset Cooling Solution                ; 28 MM HEAT

```

```

SINK WITH 100 LFPM AIRFLOW ;

```

```

; Board thermal model                   ; Typical

```

```

; ;

```

```

; Enable HPS                            ; On

```

```

; Off ;

```

```

; Processor Frequency                    ; 50.000000

```

```

; 0.0 ;

```

```

; Use vectorless estimation             ; On

```

```

; On ;

```

```

; Use Input Files                       ; Off

```

```

; Off ;

```

```

; Filter Glitches in VCD File Reader    ; On

```

```

; On ;
; Power Analyzer Report Signal Activity ; Off
; Off ;
; Power Analyzer Report Power Dissipation ; Off
; Off ;
; Device Power Characteristics ; TYPICAL
; TYPICAL ;
; Automatically Compute Junction Temperature ; On
; On ;
; Specified Junction Temperature ; 25
; 25 ;
; Use Custom Cooling Solution ; Off
; Off ;
; Board Temperature ; 25
; 25 ;
+-----+
-----+

```

```

+-----+
; Operating Conditions Used ;
+-----+-----+
; Setting ; Value ;
+-----+-----+
; Device power characteristics ; Typical ;
; ; ;
; Voltages ; ;
; VCC ; 1.10 V ;
; VCCA_FPLL ; 2.50 V ;
; VCCPGM ; 1.80 V ;
; VCCBAT ; 1.20 V ;
; VCCE_GXB ; 1.10 V ;
; VCCL_GXB ; 1.10 V ;
; VCCH_GXB ; 2.50 V ;
; VCCAUX ; 2.50 V ;
; VCC_HPS ; 1.10 V ;
; VCCRSTCLK_HPS ; 1.80 V ;
; VCCPLL_HPS ; 2.50 V ;
; VCCAUX_SHARED ; 2.50 V ;
; 3.3-V LVCMOS I/O Standard ; 3.3 V ;
; 2.5 V I/O Standard ; 2.5 V ;
; ; ;
; Auto computed junction temperature ; 31.3 degrees Celsius ;
; Ambient temperature ; 28.0 degrees Celsius ;
; Board temperature ; 28.0 degrees Celsius ;
; Junction-to-Case thermal resistance ; 2.30 degrees Celsius/Watt ;
; Case-to-Heat Sink thermal resistance ; 0.10 degrees Celsius/Watt ;
; Heat Sink-to-Ambient thermal resistance ; 2.90 degrees Celsius/Watt ;
; Junction-to-Board thermal resistance ; 5.40 degrees Celsius/Watt ;
; ; ;

```

```

; Board model used                                ; Typical                                ;
+-----+-----+-----+-----+-----+-----+

```

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

```

; Thermal Power Dissipation by Block
;

```

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

```

; Block Name ; Block Type ; Total Thermal Power ; Block Thermal Dynamic Power ;
Block Thermal Static Power (1) ; Routing Thermal Dynamic Power ;

```

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

(1) The "Thermal Power Dissipation by Block" Table has been hidden. To show this table, please select the "Write power dissipation by block to report file" option under "PowerPlay Power Analyzer Settings".

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

```

; Thermal Power Dissipation by Block Type
;

```

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

```

; Block Type ; Total Thermal Power by Block Type ; Block Thermal Dynamic
Power ; Block Thermal Static Power (1) ; Routing Thermal Dynamic Power ; Block
Average Toggle Rate (millions of transitions / sec) ;

```

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

```

; DSP block ; 0.20 mW ; 0.18 mW ; 2.500
; -- ; 0.02 mW ;

```

```

; Combinational cell ; 0.42 mW ; 0.24 mW ; 4.824
; -- ; 0.18 mW ;

```

```

; Clock enable block ; 0.61 mW ; 0.00 mW ; 100.000
; -- ; 0.61 mW ;

```

```

; Register cell ; 0.67 mW ; 0.40 mW ; 6.250
; -- ; 0.27 mW ;

```

```

; I/O ; 11.37 mW ; 9.96 mW ; 13.015
; 1.33 mW ; 0.08 mW ;

```

```

+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+

```

```

-----+-----+-----+-----+
-----+
(1) The "Block Thermal Static Power" for all block types except Pins and the
Voltage Regulator, if one exists, is part of the "Core Static Thermal Power
Dissipation" value found on the PowerPlay Power Analyzer-->Summary report panel.
The "Core Static Thermal Power Dissipation" also contains the thermal static power
dissipated by the routing.

```

```

+-----+
-----+
-----+

```

```

; Thermal Power Dissipation by Hierarchy

```

```

;

```

```

+-----+-----+-----+-----+
-----+-----+-----+-----+
-----+-----+-----+-----+

```

```

; Compilation Hierarchy Node ; Total Thermal Power by Hierarchy (1) ;
Block Thermal Dynamic Power (1) ; Block Thermal Static Power (1)(2) ; Routing
Thermal Dynamic Power (1) ; Full Hierarchy Name ;

```

```

+-----+-----+-----+-----+
-----+-----+-----+-----+
-----+-----+-----+-----+

```

```

; |atm ; 13.27 mW (13.27 mW) ;
10.78 mW (10.78 mW) ; 1.33 mW (1.33 mW) ; 1.15 mW (1.15
mW) ; |atm ;
; |hard_block:auto_generated_inst ; 0.00 mW (0.00 mW) ; 0.00
mW (0.00 mW) ; -- ; 0.00 mW (0.00 mW)
; |atm|hard_block:auto_generated_inst ;

```

```

+-----+-----+-----+-----+
-----+-----+-----+-----+
-----+-----+-----+-----+

```

(1) Value in parentheses is the power consumed at that level of hierarchy. Value not in parentheses is the power consumed at that level of hierarchy plus the power consumed by all levels of hierarchy below it.

(2) The "Block Thermal Static Power" for all levels of hierarchy except the top-level hierarchy is part of the "Core Static Thermal Power Dissipation" value found on the PowerPlay Power Analyzer-->Summary report panel. The "Core Static Thermal Power Dissipation" also contains the thermal static power dissipated by the routing.

```

+-----+
; Core Dynamic Thermal Power Dissipation by Clock Domain ;
+-----+-----+-----+-----+
; Clock Domain ; Clock Frequency (MHz) ; Total Core Dynamic Power ;
+-----+-----+-----+-----+
; clk ; 50.00 ; 1.97 ;

```

+-----+-----+-----+			
+-----+-----+-----+			
; Current Drawn from Voltage Supplies Summary			
;			
+-----+-----+-----+			
; Voltage Supply ; Total Current Drawn (1) ; Dynamic Current Drawn (1) ; Static			
Current Drawn (1) ; Minimum Power Supply Current (2) ;			
+-----+-----+-----+			
+-----+-----+-----+			
; VCC	; 55.51 mA	; 2.30 mA	; 53.21 mA
	; 55.51 mA	;	
; VCCIO	; 3.05 mA	; 2.14 mA	; 0.90 mA
	; 3.05 mA	;	
; VCCPD	; 3.18 mA	; 0.79 mA	; 2.39 mA
	; 3.18 mA	;	
; VCCA_FPLL	; 2.03 mA	; 0.00 mA	; 2.03 mA
	; 2.03 mA	;	
; VCCPGM	; 0.33 mA	; 0.00 mA	; 0.33 mA
	; 0.33 mA	;	
; VCCBAT	; 0.00 mA	; 0.00 mA	; 0.00 mA
	; 0.00 mA	;	
; VCCE_GXB	; 0.00 mA	; 0.00 mA	; 0.00 mA
	; 0.00 mA	;	
; VCCL_GXB	; 0.00 mA	; 0.00 mA	; 0.00 mA
	; 0.00 mA	;	
; VCCH_GXB	; 0.00 mA	; 0.00 mA	; 0.00 mA
	; 0.00 mA	;	
; VCCAUX	; 87.50 mA	; 0.00 mA	; 87.50 mA
	; 87.50 mA	;	
; VCC_HPS	; 10.11 mA	; 0.00 mA	; 10.11 mA
	; 10.11 mA	;	
; VCCIO_HPS	; 0.00 mA	; 0.00 mA	; 0.00 mA
	; 0.00 mA	;	
; VCCPD_HPS	; 0.00 mA	; 0.00 mA	; 0.00 mA
	; 0.00 mA	;	
; VCCRSTCLK_HPS	; 0.14 mA	; 0.00 mA	; 0.14 mA
	; 0.14 mA	;	
; VCCPLL_HPS	; 0.66 mA	; 0.00 mA	; 0.66 mA
	; 0.66 mA	;	
; VCCAUX_SHARED	; 48.95 mA	; 0.00 mA	; 48.95 mA
	; 48.95 mA	;	
+-----+-----+-----+			
+-----+-----+-----+			

(1) Currents reported in columns "Total Current Drawn", "Dynamic Current Drawn", and "Static Current Drawn" are sufficient for user operation of the device.

(2) Currents reported in column "Minimum Power Supply Current" do not include

transient power-up currents. For transient power-up currents, see the device family datasheet, errata sheet, and/or ES guidelines document, as appropriate.

+-----+ -----+				
; VCCIO Supply Current Drawn by I/O Bank				
;				
+-----+-----+-----+-----+				
-----+				
; I/O Bank ; VCCIO Voltage ; Total Current Drawn ; Dynamic Current Drawn ; Static				
Current Drawn ;				
+-----+-----+-----+-----+				
-----+				
; B2L	; --	; --	; --	; --
;				
; B1L	; --	; --	; --	; --
;				
; B0L	; --	; --	; --	; --
;				
; 3A	; 2.5V	; 0.39 mA	; 0.30 mA	; 0.08 mA
;				
; 3B	; 3.3V	; 0.13 mA	; 0.06 mA	; 0.07 mA
;				
; 4A	; 3.3V	; 1.65 mA	; 1.55 mA	; 0.11 mA
;				
; 5A	; 3.3V	; 0.27 mA	; 0.19 mA	; 0.08 mA
;				
; 5B	; 2.5V	; 0.12 mA	; 0.04 mA	; 0.07 mA
;				
; 6B	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 6A	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 7A	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 7B	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 7C	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 7D	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 8A	; 2.5V	; 0.07 mA	; 0.00 mA	; 0.07 mA
;				
; 9A	; --	; --	; --	; --
;				
+-----+-----+-----+-----+				
-----+				

+-----+ -----+ ; VCCIO Supply Current Drawn by Voltage ;			
+-----+-----+-----+-----+ -----+ ; VCCIO Voltage ; Total Current Drawn (1) ; Dynamic Current Drawn (1) ; Static Current Drawn (1) ; Minimum Power Supply Current (2) ; +-----+-----+-----+-----+			
+-----+-----+-----+-----+			
; 2.5V	; 1.00 mA	; 0.35 mA	; 0.65 mA
	; 1.00 mA	;	
; 3.3V	; 2.05 mA	; 1.80 mA	; 0.26 mA
	; 2.05 mA	;	

(1) Currents reported in columns "Total Current Drawn", "Dynamic Current Drawn", and "Static Current Drawn" are sufficient for user operation of the device.
(2) Currents reported in column "Minimum Power Supply Current" do not include transient power-up currents. For transient power-up currents, see the device family datasheet, errata sheet, and/or ES guidelines document, as appropriate.

+-----+ -----+ ; VCCPD Supply Current Drawn by I/O Bank ;			
+-----+-----+-----+-----+ -----+ ; I/O Bank ; VCCPD Voltage ; Total Current Drawn ; Dynamic Current Drawn ; Static Current Drawn ; +-----+-----+-----+-----+			
+-----+-----+-----+-----+			
; B2L	; --	; --	; --
	;		
; B1L	; --	; --	; --
	;		
; B0L	; --	; --	; --
	;		
; 3A	; 2.5V	; 0.39 mA	; 0.19 mA
	;		
; 3B	; 3.3V	; 0.20 mA	; 0.01 mA
	;		
; 4A	; 3.3V	; 0.73 mA	; 0.51 mA
	;		
; 5A	; 3.3V	; 0.26 mA	; 0.07 mA
	;		
; 5B	; 2.5V	; 0.22 mA	; 0.03 mA
	;		
; 6B	; 2.5V	; 0.20 mA	; 0.00 mA
	;		

	;			
; 6A	; 2.5V	; 0.20 mA	; 0.00 mA	; 0.20 mA
	;			
; 7A	; 2.5V	; 0.20 mA	; 0.00 mA	; 0.20 mA
	;			
; 7B	; 2.5V	; 0.20 mA	; 0.00 mA	; 0.20 mA
	;			
; 7C	; 2.5V	; 0.20 mA	; 0.00 mA	; 0.20 mA
	;			
; 7D	; 2.5V	; 0.20 mA	; 0.00 mA	; 0.20 mA
	;			
; 8A	; 2.5V	; 0.20 mA	; 0.00 mA	; 0.20 mA
	;			
; 9A	; --	; --	; --	; --
	;			
+	+	+	+	+
-----	-----	-----	-----	-----
+	+	+	+	+

; VCCPD Supply Current Drawn by Voltage

+	+	+	+	+
-----	-----	-----	-----	-----
+	+	+	+	+
; VCCPD Voltage ; Total Current Drawn (1) ; Dynamic Current Drawn (1) ; Static Current Drawn (1) ; Minimum Power Supply Current (2) ;				
+	+	+	+	+
-----	-----	-----	-----	-----
; 2.5V	; 1.99 mA	; 0.22 mA		; 1.77 mA
	; 1.99 mA			
; 3.3V	; 1.19 mA	; 0.58 mA		; 0.62 mA
	; 1.19 mA			
+	+	+	+	+
-----	-----	-----	-----	-----
+	+	+	+	+

(1) Currents reported in columns "Total Current Drawn", "Dynamic Current Drawn", and "Static Current Drawn" are sufficient for user operation of the device.
(2) Currents reported in column "Minimum Power Supply Current" do not include transient power-up currents. For transient power-up currents, see the device family datasheet, errata sheet, and/or ES guidelines document, as appropriate.

; Confidence Metric Details

+	+	+	+	+
-----	-----	-----	-----	-----
+	+	+	+	+
; Data Source				
	; Total	; Pin	; Registered	; Combinational ;

```

+-----+
+-----+-----+-----+-----+
; Simulation (from file)
;      ;      ;      ;      ;
;      -- Number of signals with Toggle Rate from Simulation
;      ; 0 (0.0%) ; 0 (0.0%) ; 0 (0.0%) ; 0 (0.0%) ;
;      -- Number of signals with Static Probability from Simulation
;      ; 0 (0.0%) ; 0 (0.0%) ; 0 (0.0%) ; 0 (0.0%) ;
;
;      ;      ;      ;      ;
; Node, entity or clock assignment
;      ;      ;      ;      ;
;      -- Number of signals with Toggle Rate from Node, entity or clock assignment
;      ; 2 (0.2%) ; 1 (2.9%) ; 0 (0.0%) ; 1 (0.2%) ;
;      -- Number of signals with Static Probability from Node, entity or clock
assignment ; 2 (0.2%) ; 1 (2.9%) ; 0 (0.0%) ; 1 (0.2%) ;
;
;      ;      ;      ;      ;
; Vectorless estimation
;      ;      ;      ;      ;
;      -- Number of signals with Toggle Rate from Vectorless estimation
;      ; 799 (98.2%) ; 20 (58.8%) ; 213 (100.0%) ; 566 (99.8%) ;
;      -- Number of signals with Zero toggle rate, from Vectorless estimation
;      ; 2 (0.2%) ; 0 (0.0%) ; 0 (0.0%) ; 2 (0.4%) ;
;      -- Number of signals with Static Probability from Vectorless estimation
;      ; 799 (98.2%) ; 20 (58.8%) ; 213 (100.0%) ; 566 (99.8%) ;
;
;      ;      ;      ;      ;
; Default assignment
;      ;      ;      ;      ;
;      -- Number of signals with Toggle Rate from Default assignment
;      ; 13 (1.6%) ; 13 (38.2%) ; 0 (0.0%) ; 0 (0.0%) ;
;      -- Number of signals with Static Probability from Default assignment
;      ; 13 (1.6%) ; 13 (38.2%) ; 0 (0.0%) ; 0 (0.0%) ;
;
;      ;      ;      ;      ;
; Assumed 0
;      ;      ;      ;      ;
;      -- Number of signals with Toggle Rate assumed 0
;      ; 0 (0.0%) ; 0 (0.0%) ; 0 (0.0%) ; 0 (0.0%) ;
+-----+
+-----+-----+-----+-----+

+-----+
+-----+-----+
; Signal Activities
;
+-----+-----+-----+-----+
+-----+-----+-----+-----+

```

; Signal ; Type ; Toggle Rate (millions of transitions / sec) ; Toggle Rate Data
Source ; Static Probability ; Static Probability Data Source ;

+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-----+-----+-----+-----+-----+-----+-----+-----+-----+
(1) The "Signal Activity" Table has been hidden. To show this table, please select
the "Write signal activities to report file" option under "PowerPlay Power Analyzer
Settings".

+-----+
; Power Analyzer Messages ;
+-----+

Info: *****

Info: Running Quartus Prime Power Analyzer

Info: Version 22.1std.1 Build 917 02/14/2023 SC Lite Edition

Info: Processing started: Fri Jul 14 19:53:05 2023

Info: Command: quartus_pow --read_settings_files=on --write_settings_files=off atm
-c atm

Warning (18236): Number of processors has not been specified which may cause
overloading on shared machines. Set the global assignment NUM_PARALLEL_PROCESSORS
in your QSF to an appropriate value for best performance.

Info (21077): Low junction temperature is 0 degrees C

Info (21077): High junction temperature is 85 degrees C

Info (332104): Reading SDC File: 'atm.out.sdc'

Info (332152): The following assignments are ignored by the
derive_clock_uncertainty command

Info (223000): Starting Vectorless Power Activity Estimation

Info (223001): Completed Vectorless Power Activity Estimation

Info (218000): Using Advanced I/O Power to simulate I/O buffers with the specified
board trace model

Warning (215045): The specified board temperature is less than the specified
ambient temperature. Analyzing with the board temperature equal to the ambient
temperature.

Info (334003): Started post-fitting delay annotation

Info (334004): Delay annotation completed successfully

Critical Warning (12585): The HPS power model in the Power Analyzer is enabled. The
HPS power model in the EPE is more accurate

Info (215049): Average toggle rate for this design is 5.654 millions of transitions
/ sec

Info (215031): Total thermal power estimate for the design is 1241.63 mW

Info: Quartus Prime Power Analyzer was successful. 0 errors, 3 warnings

Info: Peak virtual memory: 5255 megabytes

Info: Processing ended: Fri Jul 14 19:53:09 2023

Info: Elapsed time: 00:00:04

Info: Total CPU time (on all processors): 00:00:02