

CSC Off-Detector Electronics Power Considerations, 9U subrack

Occupied VMEbus slots per subrack	18		
Transition modules per subrack	16		
	400	220	120
	mm	mm	mm
	TM	TM	TM

ATLAS Power Supply Limitations:

3.3V supply current	200	200	200	A/subrack
5.0V supply current	300	300	300	A/subrack
3.3V supply current	11.1	11.1	11.1	A/slot
5.0V supply current	16.7	16.7	16.7	A/slot
3.3V supply power	36.7	36.7	36.7	W/slot
5.0V supply power	83.3	83.3	83.3	W/slot
Power per slot	120.0	120.0	120.0	W/slot

ATLAS Cooling Limitations

Transition module power	70	39	21	W/TM
VMEbus module power	110	110	110	W/VMEbus module
Power per slot	180	149	131	W/slot

DSP module count	13			DSP/ROD	
ROD Motherboard FPGA count	10			FPGA/ROD	
ASM's serviced per Transition Module	10			ASM/TM	
TM FPGA count	9			FPGA/TM	
serializer power dissipation	0.255			W/serializer	power for 1 MGT even though RX is not used
deserializer power dissipation	0.255			W/serializer	power for 1 MGT even though TX is not used

	<u>w/o inefficiency</u>			<u>efficiency</u>	<u>w/ inefficiency</u>		
	<u>3.3V</u>	<u>5V</u>	<u>total</u>		<u>3.3V</u>	<u>5V</u>	<u>total</u>
ROD DSP Modules							
DSP core power (300 MHz 6203)		1.5		93%	0.0	1.6	W/DSP
DSP I/O power	0.3			100%	0.3	0.0	W/DSP
FPGA internal power		0.5		93%	0.0	0.5	W/DSP
FPGA I/O power	0.3			100%	0.3	0.0	W/DSP
subtotal per ROD	7.8	26.0	33.8		7.8	28.0	35.8 W/ROD
ROD Motherboard FPGA's							
FPGA internal power		0.5		93%	0.0	0.5	W/FPGA
FPGA I/O power	0.3			100%	0.3	0.0	W/FPGA
subtotal per ROD	3.0	5.0	8.0		3.0	5.4	8.4 W/ROD
ROD Motherboard Other							
PLD's	1.0			100%	1.0	0.0	W/ROD
VME buffers		1.0		100%	0.0	1.0	W/ROD
Clock Generation	1.0	1.4		100%	1.0	1.4	W/ROD
FIFO's	0.3			100%	0.3	0.0	W/ROD
DPRAM's	0.1			100%	0.1	0.0	W/ROD
buffers	1.0			100%	1.0	0.0	W/ROD
subtotal per ROD	3.5	2.4	5.9		3.5	2.4	5.9 W/ROD
TM Links to/from ASM							
optical transmitter (one 12-fiber module)	1.1			100%	1.1	0.0	W/TM
optical receivers (two 12-fiber modules)	2.6			100%	2.6	0.0	W/TM
calibration serializers (two 1032's)		0.5		75%	0.0	0.7	W/TM
monitor deserializers (two 1034's)		0.5		75%	0.0	0.7	W/TM
serializer (one 1032)		0.3		75%	0.0	0.3	W/ASM
deserializers (two 1034's)		0.5		75%	0.0	0.7	W/ASM
subtotal per Transition Module	3.7	8.2	11.9		3.7	11.6	15.3 W/TM
TM other							
S-Link	7.5			100%	7.5	0.0	W/SLINK
FPGA internal power (1.5V)		0.6		80%	0.0	0.8	W/FPGA
FPGA aux power (2.5V)		0.4		80%	0.0	0.5	W/FPGA
FPGA I/O power		0.2		80%	0.0	0.3	W/FPGA
subtotal per Transition Module	7.5	10.8	18.3		7.5	13.5	21.0 W/TM

Power:					3.3V	5V	total	
ROD Total	14.3	33.4	47.7		14.3	35.7	50.0	W/ROD
TM Total	11.2	19.0	30.2		11.2	25.1	36.3	W/TM
Grand Total	25.5	52.4	77.8	90%	25.5	60.8	86.2	W/slot
Max allowed					36.7	83.3	120.0	W/slot (limited by power supply current rating)

Current:					3.3V	5V	total	
ROD Total					4.3	7.1		A/ROD
TM Total					3.4	5.0		A/TM
Grand Total					7.7	12.2		A/slot
Max allowed					11.1	16.7		A/slot (limited by power supply current rating)

Power Pins:

	3.3V	5V	total	
ROD: VME backplane	10	6		pin/ROD
ROD: J5/J6 backplane	12	8		pin/ROD
TM: VME backplane	0	3		pin/TM
TM: J5/J6 backplane	12	8		pin/TM
ROD: total	22	14		pin/ROD
TM: total	12	11		pin/TM