ACC750 Series 750 W AC-DC Power Supplies

The ACC750 Series of AC-DC power supplies provides a steady 750 W of regulated DC power through 180-305 VAC and 600 W through 85-137 VAC input voltage ranges in a single output of 24 or 48 VDC. The natural convection cooling operation (without fan), is particularly suitable for environments sensitive to acoustical noise.

The ACC750 Series comes in two U-shaped 1.6" high packages, with and without a protective cover, offering 12 and 5 VSB standby outputs and a full set of protection features.

The ACC750 Series supports digital power management over the Power Management Bus communications protocol. Multiple units may be connected in parallel for redundancy and / or higher power, enabled with the internal OR-ing and current sharing functions.

The ACC750 Series complies with the latest international safety standards and displays the CE-Mark for the European Low Voltage Directive (LVD).

Key Features & Benefits

- Universal input voltage range (85 305 VAC)
- Input inrush current limiting
- 750 W rated power (900 W peak for <10 s)
- High efficiency up to 94%
- Single 24 VDC / 48 VDC output voltage available
- Active PFC, EN 61000-3-2 compliant (Class C, >25% load)
- Low earth / touch leakage current
- Natural convection cooling
- Over temperature, OV, OC and SC protections
- +12 V / 0.3 A; +5 V / 0.72 A Stand by outputs
- Built-in current sharing and OR-ing for parallel operation and N+1 redundancy
- Power good and remote sense signals
- Remote On / Off signal
- Power Management Bus communication protocol supported
- ITE safety approval to IEC 62368-1
- LED lighting approval to UL 8750

Applications

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- Video Wall Display, Entertainment Lighting
- LED Lighting Engine
- Industrial Control Systems
- Industrial Laser Applications



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1. MODEL SELECTION

MODEL NUMBER	PACKAGE & COOLING	INPUT VOLTAGE RANGE [VAC]	NOM. OUTPUT VOLTAGE [VDC]	MAX. OUTPUT POWER [W]	MAX. OUTPUT CURRENT [A]	DIMENSIONS
ACC750-1T24	U-chassis Natural Convection	85 - 305	24	750	31.2	101.6 x 234.0 x 41.0 mm 4.00 x 9.21 x 1.61 in
ACC750-1T48	U-chassis Natural Convection	85 - 305	48	750	15.6	101.6 x 234.0 x 41.0 mm 4.00 x 9.21 x 1.61 in
ACC750-1T24-PC	U-chassis + Protective Cover Natural Convection	85 - 305	24	750	31.2	101.6 x 234.7 x 41.0 mm 4.00 x 9.24 x 1.61 in
ACC750-1T48-PC	U-chassis + Protective Cover Natural Convection	85 - 305	48	750	15.6	101.6 x 234.7 x 41.0 mm 4.00 x 9.24 x 1.61 in

2. INPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION		MIN	NOM	MAX	UNIT
AC Input Voltage	PS starts at 85 V _{AC} at all load condit Operating input voltage range ACC750 Series is designed to opera voltage wave form (i.e. from UPS)	ions ate with a square or trapezoidal input	85	100-277	305	V _{RMS}
DC Input Voltage	Built in fuses safety certified up to 2 that limit up to 300 V _{DC} , does require	50 V _{DC} . Operating the ACC750 above e an external fuse protection *	120	-	300	V _{DC}
Input Frequency			47	50/60	63	Hz
Input Current	At 180 V _{AC} , 750 W, 50 / 60 Hz At 85 V _{AC} , 600 W load, 50 / 60 Hz 163 V _{DC} , maximum load 120 V _{DC} , 600 W		-	-	5.0 8.7 5.6 6.0	A _{RMS}
Inrush Current	At power-on asserted Cold start, 25 °C ambient, full load Any point of the AC input sine	230 Vac 277 Vac	-	- -	30 50	A
Fusing	High breaking, 16 / 20 A, 277 V _{AC} (2	50 V _{DC}) on each AC line.	-	-	16 / 20	А
	At 120 V _{AC}	20% rated load 50% rated load 100% rated load	85 92 92	- - -	- - -	
Efficiency	At 230 V _{AC}	20% rated load 50% rated load 100% rated load	87 93 94	- -	- -	%
Input Power Consumption	At power on, no load, 100 – 277 V _{AC} Stand by, no load, nominal 100 – 27		-	6.0 3.5	-	W
Power Factor	Any nominal input line voltage, 50/6	0 Hz, from 50 to 100% maximum load	0.95	-	-	-
THDi	From 50 to 100% rated load, 100 -	277 V _{AC} , 50/60 Hz.	-	-	20	%
Harmonic Current Fluctuations and Flicker	Complies with EN 61000-3-2 at 230 Complies with EN 61000-3-2 Class Complies with EN 61000-3-3 at non	C at 230 V _{AC} , 50/60 Hz, >300 W load.				
Earth Leakage Current	Normal conditions 115 V _{RMS} , 60 Hz 230 V _{RMS} , 50 Hz 264 V _{RMS} , 60 Hz (worst case)		-	150 170 -	- - 400	μA
Touch Leakage Current	264 V _{RMS} , 60 Hz Normal Condition (NC) Single Fault Condition (SFC)		-	-	100 500	μA
Patient Leakage Current	264 V _{RMS} , 60 Hz Normal Condition (NC) Single Fault Condition (SFC)		-	-	100 500	μA

* Suggested fuse SIBA 5012434.16 and fuse holder SIBA 5105805.1



3. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION		MIN	NOM	MAX	UNIT
V1 Output Voltages	±0.5% set point accuracy RS+ closed on +V1, RS- closed on V1 RTN, at	6% load.	-	24 48	-	V
	85 – 137 V _{AC} (120 – 163 V _{DC})				600	w
V1 Output Power Rating	180 – 305 V _{AC} (163 – 300 V _{DC})				750	vv
	Peak, <10 s, after P_Ok asserted high				900	
V1 Output Current	85 – 137 V _{AC} (120-163 V _{DC})	V1: 24 V _{DC} V1: 48 V _{DC}			25.0 12.5	А
	180 – 305 V _{AC} (163-300 V _{DC})	V1: 24 V _{DC} V1: 48 V _{DC}			31.2 15.6	
V1 Voltage Adjustment Range	Manually by push up and down buttons		-	±5	-	%V1
V1 Line Regulation	V _{AC} : 85 – 305 V _{RMS}		-	-	±0.1	%V1
V1 Load-Line-Cross Regulation	V _{AC} : 85 – 305 V _{RMS} ; I1: 0 – 100%		-	-	±2	%V1
V1 Ripple and Noise	Rated load, Peak-to-peak, 20 MHz BW. (100 nF ceramic, 10 µF tantalum at load)		-	-	1	%V1
Transient Response: V1, 12V _{SB} , 5V _{SB} Voltage Deviation	$\begin{array}{l} \label{eq:constraint} 25\% \mbox{ load changes at 1 A/\mus} \\ 24 V \mbox{ at 1000 } \mu F \mbox{ load / lout > 2.5 A} \\ 48 V \mbox{ at 560 } \mu F \mbox{ load / lout > 1.25 A} \\ 12 V_{SB}, 5 V_{SB} \mbox{ at 0-2200 } \mu F \mbox{ load} \\ \end{array}$		-	-	±5	%V1 %V _{SB}
V1 Start-up Rise Time	85 <vin<305, any="" conditions.<="" load="" td=""><td></td><td>10</td><td>-</td><td>150</td><td>ms</td></vin<305,>		10	-	150	ms
	At nominal V _{IN} , full load SEMI F47-0706 compliant at ≥208 V _{AC}	500/ //0/10	10	-	-	
V1 Hold-up Time		50% sag (104 V) 30% sag (145 V) 20% sag (166 V)	200 500 1000	-	-	ms
V1 Current Sharing Accuracy	Parallel operation up to four units. Two units in parallel at 11 rated load. I-Share signals connected together. RS ⁺ , RS ⁻ signals connected together and to the Max load at start up 750 W, operating 1250 W, Max load at start up 600 W, operating 1000 W,	$180\div 305 \; V_{AC}$	40	-	60	%11
V1 Remote Sense	RS ⁺ and RS ⁻ power path voltage loss compens	ation	-	-	0.36	V
Start-up Delay	V1 in regulation after de-asserting PS_Inhibit V1 in regulation after AC is applied (worst case: 85 V _{AC})		-	-	1700 2200	ms
	5 V_{SB} in regulation after AC is applied (worst case: 85 V_{AC})		-	-	500	
Turn-on Overshoot			-	-	10 10	%V1 %Vsв
Minimum Load	V1, 12 V _{SB} , 5 V _{SB}		0	-	-	A
Maximum Load Capacitance		V1: 24 V _{DC} V1: 48 V _{DC}	-	-	16000 8000	μF
V1 Over Current Protection		V1: 48 V _{DC} V1: 24 V _{DC} V1: 48 V _{DC}	-	-	46.8	А
12 V _{SB} Output Voltage	V_{SB} output voltage is referred to the same V1 o		-	12	-	V
12 V _{SB} Output Current	Up to 70 °C		-	-	0.3	А
12 V _{SB} Ripple & Noise	Peak-to-peak				120	mV
12 V _{SB} Line Cross Regulation	V _{AC} : 85 – 305 V _{RMS} ; I _{SB} : 0 – 100%		-	-	±5	%V _{SB}
5 V _{SB} Output Voltage	V_{SB} output voltage is referred to the same V1 o	utput voltage return	-	5	-	V
5 V _{SB} Output Current	Up to 70 °C		-	-	0.72	А
5 V _{SB} Ripple & Noise	Peak-to-peak				50	mV
5 V _{SB} Load, line cross Regulation	Vac: 85 – 305 Vrms; Isb: 0 – 100%		-	-	±5	%Vse



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3.1 OUTPUT POWER DE-RATING CURVES

Figure 1 Derating Curves of ACC750 Series V1 POUT to TAMB

4. POWER MANAGEMENT BUS

The ACC750 Series does support communication according to the Power Management Bus 1.2 protocol via SDA, SCL and #SMBALERT signals as defined in the SMBus Specification version 2.0.

The power supply shall not load the SMBus if it has no input power (SCL & SDA lines should go to High-Z).

The pull-up resistors (2.2 k Ω) for these signals shall be external to the power supply and referenced to an external +3.3 V bus voltage.

The DSP circuits inside the power supply are powered by the standby output.

The Power Management Bus is active whatever input power is applied to the power supply or a parallel redundant power supply in the system, provided that their $12V_{SB}$ are connected in parallel.

Maximum speed of SMBus is 100 kHz.

The ADDR0 and ADDR1 signals, are inputs to the power supply that control the Power Management Bus address assigned to the power supply.

On the system side, the ADDR0 and ADDR1 signals will either be connected to return through a 1 k Ω pull-down resistor or connected to +3.3 V external bus voltage through a 1 k Ω pull-up resistor.

The address shall be derived from the logic of this pin as indicated on Outline Drawing and Connections section. The power supply is a slave only on SMBus device.

For a comprehensive description of ACC750 Series Power Management Bus management, do refer to the application note, "ACC750 Series Power Management Bus Mgt". The ACC750 Series parameters available through communication bus are:

- Input voltage status
- Output voltages +V1 measured value
- Output current on +V1 measured value
- Current sharing status
- Thermal health measured value
- Fan health status
- Power-On / Working hours
- Product information
- Status information

Failures shall be reported by Power Management Bus for all failure types:

- Protections failure (OV, OC, OT)
- Voltages out of specification



5. SIGNALING & CONTROL SPECIFICATIONS

Base signals and controls are accessible from signal connector P204.

SIGNAL	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
+PS_Inhibit (Active High)	Input low voltage ($I_{IN} = 0 \ \mu A$) Input high voltage ($I_{IN} = 500 \ \mu A$ at 5.5 V) V1 disabled when PS_Inhibit is pulled high V1 enabled when PS_Inhibit is floating or low 5V _{SB} and 12V _{SB} not affected by PS_Inhibit	0 2.5	-	0.8 5.5	V
-PS_Inhibit (Active Low)	Input low voltage (I _{IN} = -800 μ A at 0 V) Input high voltage (I _{IN} = -200 μ A at 2.5 V) (I _{IN} = 700 μ A at 5.5 V) V1 disabled when -PS_Inhibit is pulled low V1 enabled when -PS_Inhibit is floating or high 5V _{SB} and 12V _{SB} not affected by -PS_Inhibit	0 2.5	-	0.8 5.5	V
Power_OK * (PS_OK)	Logic level low (<10 mA sinking) Logic level high (200 µA sourcing) Low to high time after V1 in regulation Power down warning time	- 2.4 150 2	- - -	0.7 3.45 350 -	V ms
I_Share SDA, SCL, #SMBALERT, ADDR0, ADDR1	The I_SHARE signals shall be daisy chained among power supplies operati On a single power supply operating it provides current measurement on V1 On multiple power supplies operating in parallel, it provides current measur These are signals which support Power Management Bus communication p note ACC750 Series Power Management Bus Mgt.	output. ement on	master V1		plication
RSVD RX, RSVD TX	Mainly intended for internal use, these RX and TX signals - available at the P204 - may be used to access some DSP functions (monitoring, threshold). These signals work as an UART Rx/Tx port and can also work as a RS-232 "RS-232 LINE DRIVERS/RECEIVERS" IC	settings, d	lebug func	tions).	
5V _{SB} Output **	Active and in regulation after an $85 < V_{AC} < 305$ is applied Not affected by PS_Inhibit. Available on P204, pin#4	-	-	500	ms
12V _{SB} Output ***	Active and in regulation after an $85 < V_{AC} < 305$ is applied Not affected by PS_Inhibit. Available on P204, pin#16	-	-	500	ms

* When V1 is On, a P_OK low may indicates V1 under voltage condition. When two ACC750 models operate in parallel, P_OK low in one unit indicates that it is not sharing the expected amount of current (current sharing fault). A 3.3 kΩ internal pull up to a 3.3 V internal reference voltage is used; do not add any other external pull up.

** The 5VSB outputs of two or more ACC750 models operating in parallel, cannot be connected in parallel in turn, since doing so results in power supplies damage.

*** The 12VSB outputs of two or more ACC750 models operating in parallel can be connected in parallel in turn, taking into account that the maximum available power will not be higher of a single operating power supply one.



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5.1 BASE SIGNALS / CONTROLS TIMING

AC/DC INPUT OFF-TO-ON AND ON-TO-OFF TIMINGS



PS_INHIBIT OFF-TO-ON AND ON-TO-OFF TIMINGS





6. PROTECTION SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Input Under Voltage	Auto-recovering, hiccup mode.	58	75	82	VAC
Input Fuse	High breaking, 16 / 20 A, 277 V_{AC} (250 V_{DC}) on each AC lines.	-	-	16/20	А
Over Current	At nominal input voltages V1: Hiccup mode, auto-recovering 5 V _{SB} : Auto-recovering 12 V _{SB} : Hiccup mode, auto-recovering	-	-	150 - -	%I1 _{Rated} A A
Short Circuit	At nominal input voltages V1: Hiccup mode or latch $5 V_{SB}$: Auto-recovery 12 V_{SB} : Hiccup mode, auto-recovering.	-	-	-	
Over Voltage	V1, Power shut down, latch off. 12 VsB, Hiccup mode, auto-recovering.	116 -	-	145 150	$%V_{NOM}$
Over Temperature (ambient)	Hiccup mode, auto-recovering.	70	-	-	°C
Over Temperature (on secondary side)	Hiccup mode, auto-recovering.				
Isolation: Primary-to-Secondary	Reinforced	5660 4000	-	-	V _{DC} V _{AC}
Isolation: Input-to-Earth	Basic Production tested at 2642 V _{DC}	2642 1865	-	-	V _{DC} V _{AC}
Isolation: Output-to-Earth	Basic	1500	-	-	VAC
Equipment Protection Class	Class I, compatible with BF (Body Floating) ME (Medical Equipment)				

7. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION	MIN	NOM	MAX	UNIT
Operating Temperature Range	No derating up to 35 °C See derating curves above ACC750 Series starts at -40 °C upon warm up delay	-20	-	35	°C
Operating Temperature Range with Derating	See derating curves and conditions in the Output Specifications section	-	-	70	°C
Storage Temperature Transportation Temperature	As per IEC/EN 60721-3-1 Class 1K4 As per IEC/EN 60721-3-2 Class 2K4	-40	-	85	°C
Humidity	RH, Non-condensing Operating. Non-operating	-	-	90 95	% %
Operating Altitude	Power derating above 1800 m	-	-	4000	m
Shock	EN 60068-2-27 Operating: Half sine, 30 g, 18 ms, 3 axes, 6x each (3 posi Non-Operating: Half sine, 50 g, 11 ms, 3 axes, 6x each (3 posi				
Vibration	EN 60068-2-64 Operating: Sine,10 – 500 Hz, 1 g, 3 axes, 1 oct/min., 60 n Random, 5 – 500 Hz, 0.02 g ² /Hz, 1 g _{RMS} , 3 axe Non-Operating: 5 – 500 Hz, 2.46 g _{RMS} (0.0122 g ² /Hz), 3 axes, 5	es, 30 min.	0,		
MTBF	Full load, 25 °C ambient, 100% duty cycle, Full load, 40 °C ambient, 75% duty cycle Telcordia SR-332 Issue 2	700000 600000	-	-	Hours
Useful Life	Nominal V _{IN} , 80% load, 40 °C ambient (IPC9592)	-	7	-	Years



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PARAMETER	DESCRIPTION / CONDITION	STANDARD	PERFORMANCE CLASS
Conducted	115, 230, 277 V_{RMS} , Maximum load	EN 55032 EN 55011 (ISM) FCC Part 15	В
Radiated		EN 55032 EN 55011 (ISM) FCC Part 15	В*
Line Voltage Fluctuation & Flicker	At 20%, 50% and 100% maximum load Nominal input voltages	EN 61000-3-3	
Harmonic Current Emission	230 V _{AC} input voltage, 50 / 60 Hz 230 V _{AC} 50 / 60 Hz, >300 W load	EN 61000-3-2 EN 61000-3-2	A, D C

8. ELECTROMAGNETIC COMPATIBILITY (EMC) – EMISSIONS

* Performance referred to the enclosed package with additional HF chokes on output power and signal cables. Radiated emission relevant to the package variants, should be assessed at system level.

9. ELECTROMAGNETIC COMPATIBILITY (EMC) – IMMUNITY

PARAMETER	DESCRIPTION /	CONDITION	STANDARD	TEST LEVEL	CRITERIA
	Reference standa Reference standa	rd for ITE rd for Industrial/IMS equipment	EN 55024 EN 61000-6-2		
ESD	15 kV air discharg at any point of the		EN 61000-4-2	4	А
Radiated Field	10 V/m, 20 – 2700	0 MHz, 1 kHz, 80% AM.	EN 61000-4-3	3	А
Electric Fast Transient	±2 kV on AC powe	er port for 1 minute	EN 61000-4-4	3	А
Surge	±2 kV line to line;	\pm 4 kV line to earth on AC power port	EN 61000-4-5	4	А
Conducted RF Immunity	10 V _{RMS} , 0,15 – 80) MHz, 1 kHz, 80% AM	EN 61000-4-6	3	А
Dips and Interruptions	200 – 277 V _{AC} :	Drop-out to 0% for 10 ms Dip to 40% for 5 cycles (100 ms) Dip to 70% for 25 cycles (500 ms) Drop-out to 0% for 5 s	EN61000-4-11 EN61000-4-11 EN61000-4-11 EN61000-4-11		A* A (derate to 500 W) A B
	100 – 127 V _{AC} :	Drop-out to 0% for 10 ms Dip to 40% for 5 cycles (100 ms) Dip to 70% for 25 cycles (500 ms) Drop-out to 0% for 5 s	EN 61000-4-11 EN 61000-4-11 EN 61000-4-11 EN 61000-4-11		A* A (derate to 240 W) A (derate to 400 W) B

* Performance referred to +5 VsB, +12 VsB and V1 (PS_OK goes to low level after 8 ms as per timing described at page 8

10. SAFETY AGENCIES APPROVALS

CERTIFICATION BODY	SAFETY STANDARDS	CATEGORY
CSA / UL	CSA C22.2 No.62368-1, UL 62368-1	Audio Video and Information Technology Equipment
IEC IECEE CB Certification	IEC/EN 62368-1	Audio Video and Information Technology Equipment
	Directive 2014/35/EU: Electrical Safety: Low Voltage electrical equipment (LVD)	Audio Video and Information Technology Equipment
CE	Directive 2014/30/EU: Electromagnetic Compatibility (EMC)	
	Directive EU 2015/863: RoHS 3	
	Meets all essential requirements of the standard IEC/EN/UL/CSA 61010-1 2nd ed	dition



11. CONNECTIONS AND PIN DESCRIPTION

CONNECTIONS	CONNECTOR	REFERENCE	FUNCTION	
AC Input Connections	P1: AMTEK TB25C-B02P-13-00A-L	1	Line 1	
	M4 GROUND STUD	2	Line 2	
		3	Protection Earth	
DC Input Connections	P200, P201, P202, P203:		24 V Optional	24 / 48 V
	BRASS M4 THREADED TERMINALS	P200	+V1	+V1
	(tight to 0.8 – 1 Nm, max. deep screws 7 mm)	P201	+V1	-
	max. deep screws 7 mm)	P202	V1 RTN	V1 RTN
		P203	V1 RTN	-
Signal Connector	P204:	1	RMT (-)	
	MOLEX 501876-1640	2	RMT (+)	
		3	I-SHARE	
		4	+5V _{SB}	
		5	PS_INHIBIT	
		6	PS_OK	
		7	SCL	
		8	SDA	
		9	#SMBALERT	
		10	ADDR0	
		11	-PS_INHIBIT	
		12	ADDR1	
		13	RSVD_RX (OUT)	
		14	RSVD_TX (OUT)	
		15	RTN	
		16	+12V _{SB}	
Additional Control Funct	ions	SW600	V1_ADJ (UP)	
		SW601	V1_ADJ (DOWN)	
		DL600	Bi-colour LED	
		Off	No AC/DC input powe	er provided
		Blinking Green	Input power good, sta V1 inhibited	•
		Steady Green	V1 Active	
		Steady or Blinking red	Power Supply Fault	

12. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITION
Weight	1087 g (2.40 lb) – models without protective cover 1125 g (2.48 lb) – models with protective cover
Overall Dimensions	101.6 x 234.0 x 41.0 mm (4.00 x 9.21 x 1.61 in) – models without protective cover 101.6 x 234.7 x 41.0 mm (4.00 x 9.24 x 1.61 in) – models with protective cover



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12.1 OUTLINE DRAWING & CONNECTIONS - ACC750-1T24 / ACC750-1T48 MODELS



Figure 2. Mechanical Drawing – ACC750-1T24 / ACC750-1T48 Models



Figure 3. Front View - ACC750-1T24 / ACC750-1T48 Models



Figure 4. Rear View - ACC750-1T24 / ACC750-1T48 Models



12.2 OUTLINE DRAWING & CONNECTIONS - ACC750-1T24-PC / ACC750-1T48-PC MODELS



Figure 5. Mechanical Drawing - ACC750-1T24-PC / ACC750-1T48-PC Models



Figure 6. Front View - ACC750-1T24-PC / ACC750-1T48-PC Models







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12.3 PROTECTION EARTH CONNECTION INSTRUCTIONS



For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems. TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

