

54mm 1U Front End AC-DC Power Supply Converter

Main

Output

12Vdc

Min.

90

47

74

70

0.96

0.95

90

94

91

Standby

12Vdc

Nom.

115/230

50/60

Output

Airflow

Front to Back

Back to front

Units

Vac

Hz

Vac

Arms

Apk

%

Max.

264

63

84

80

10

25

The D1U54P-W-650-12-HBxC series are very high efficiency 650 watt power factor corrected front end supplies with a 12V main output and a 12V Standby. An active (analogue) current share characteristic is provided to allow units to operate in parallel. The power supply may be hot plugged; recovers from overtemperature faults, and has status LEDs on the front panel in addition to hardware signal logic and PMBus™ status signals. The low profile 1U package and 21.4W/cubic inch power density make them ideal for delivering reliable, efficient power to networking equipment,

Power Output

90 to 264Vac

650W

FEATURES
650W output power
94% efficiency at 50% load
12V main output
12V standby output
1U height:
■ 2.15" x 9.0" x 1.57"
54.5mm x 228.6mm x 40mm
Full digital control
21.4 Watts per cubic inch density
N+1 redundancy capable, including hot plugging
 Active (analogue) current sharing on 12V main output; ORING FET
Overvoltage, Overcurrent, Overtemperature
protection
Internal cooling fan (variable speed)
■ PMBus [™] /I2C interface with status indicators
RoHS compliant
Two Year Warranty



Available now at: www.murata-ps.com/en/3d/acdc.html

SP[®] For full details go to

www.murata-ps.com/rohs







PMBUS	8 PLU PLATIN
PMETS	PLU PLATIN



workstations, storage systems and other 12V distributed power architectures.

Murata Internal Part Number

M1877

M1876

Conditions

At 230Vac, 20% load

At 230Vac, 50% load

At 230Vac, 100% load

Efficiency (excluding fan load)

PRODUCT OVERVIEW

ORDERING GUIDE

Part Number

D1U54P-W-650-12-HB3C

D1U54P-W-650-12-HB4C

INPUT CHARACTERISTICS

Parameter

DUTPUT VOLTAGE CHARACTERISTICS							
Nominal Output Voltage	Parameter	Conditions	Min.	Тур.	Max.	Units	
	Output Set Point Accuracy	50% load; Tamb =25°C	11.96	12.00	12.04	Vdc	
	Line and Load Regulation	Setpoint; temperature; line and load	-1.0%		+1.0	%	
12V	Ripple Voltage & Noise ^{1, 2}	20MHz Bandwidth			120	mV p-p	
	Output Current Range		0		54.2	А	
	Load Capacitance		500		4000	μF	
12VSB	Output Set Point Accuracy	50% load; Tamb = $25^{\circ}C$	11.96	12.00	12.04		
	Line and Load Regulation	I Load Regulation Setpoint; temperature; line 11.7 and load 11.7			12.3	Vdc	
	Ripple Voltage & Noise ¹	20MHz Bandwidth			120	mV p-p	
	Output Current		0		2	A	

Ripple and noise are measured with 0.1 µF of ceramic capacitance and 10 µF of tantalum capacitance on each of the power supply outputs. A short coaxial cable to the measurement 'scope input, is used.

Measurements assume the use of the minimum load capacitance as specified for the main 12V output and a minimum load of 5%.

Below 5% loading the overall voltage deviation shall be within ±500mV due to zero load "skip" cycle mode of operation.



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UUTPUT GRAKAGTERISTIGS					
Parameter	Conditions	Min.	Тур.	Max.	Units
Startup Time	AC ramp up Note: Following a "turn off" of the 12V Main output (for any reason whatsoever) the output shall not be allowed to "turn on" again for 1sec (even if all necessary operating conditions are met).			3	S
Transient Response	Main 12V, 50% load step, 1A/ $\!\mu s$ di/dt			±5	%
	12VSB, 50% load step, 1A/µs di/dt			500	μs
Current sharing accuracy (Main 12V output)	>10% load; (* percentage of full load)			±5*	%
Hot Swap Transients				±5	%
Holdup Time (Total Effective Hold Up - See Timing Waveforms)	Full AC Input Source Range; full load	12			ms

ENVIRONMENTAL CHARACTERISTICS						
Parameter	Conditions	Min.	Тур.	Max.	Units	
Storage Temperature Range		-40		70	00	
Operating Temperature Range	90V-264Vac, 650W	-5		50	ι.	
Operating Humidity	Noncondensing; +45°C	5		90	0/	
Storage Humidity		5		95	%	
Altitude (without derating at 40°C)	3000 m					
Shock	30G non-operating					
Operational Vibration	Sine sweep; 5-200Hz, 2G; random vibration, 5-500Hz, 1.11G					
MTBF(Target)	Per Telcordia SR-332 M1C1 @40°C 576K hrs					
Safety Approvals	CAN/CSA C22.2 No 60950-1-07, Am.1:2011, Am 2:2014 ANSI/UL 60950-1-2014 IEC60950-1:2005 (2nd Ed.), Am 1:2009 + Am 2:2013 EN 60950-1:2006+A11:2009 +A1:2010 +A12:2011 +A2:2013 BSMI CNS14336-1 (099/09/30); CNS13438 ((095/06/01) CCC GB4943.1-2011; GB9254-1-2008; GB17625, 1-2012					
Input Fuse	Power Supply has internal 12.5A/250V fast blow fuse on the AC line input					
Weight	1.63 lbs (0.741 kg)					

AIRFLOW; PRESSURE VS. FLOW (PQ) CURVES





Notes:

1. The above curves represent performance based upon the use of a 20mm thickness fan.

2. Curves recorded at room ambient (circa 25°C).

3. Curves generated with intermal fan running at 100% duty cycle



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Output	Parameter	Conditions		Min.	Тур.	Max.	Units
	Overtemperature (intake)	Autorestart with 4°C hysteresis for recovery (warning issued at 70°C)			75		°C
	Overvoltage	Latching		13.0		14.5	V
12V	Overcurrent (target)	The output shall shutdown when an overcurrent condition is detected. It will auto restart after 1sec; however if the overcurrent condition is redetected the output will once again shutdown. The output will once again re-start, however if the overcurrent condition persists it will latch of after the fifth unsuccessful attempt. To reset the latch it will be necessary to toggle the PS_ON_L signal (B4) or recycle the incoming AC source.		60		70	A
	Overvoltage Latching			13.0		14.5	V
12VSB Overcurrent The output shall shutdow It will auto restart after 2s the output will once again This cycle will occur inde		The output shall shutdown when It will auto restart after 2sec; how the output will once again shutdo This cycle will occur indefinitely w	an overcurrent is detected. /ever if the overcurrent is re-detected wn. vhile the overcurrent condition	2.5		3.5	A
ISOLATION	CHARACTERISTICS						
Parameter			ions	Min.	Тур.	Max.	Units
Inculation S	Safaty Pating	Input to	o Output - Reinforced	3000			Vrms
mouldion a	Dalety hatility	Input to	o Chassis - Basic	1500			Vrms
Isolation		Output	to Chassis	500			Vdc

EMISSIONS AND IMMUNITY		
Characteristic	Standard	Compliance
Input Current Harmonics	IEC/EN 61000-3-2	Complies
Voltage Fluctuation and Flicker	IEC/EN 61000-3-3	Complies
Conducted Emissions	FCC 47 CFR Part 15 CISPR 22/EN55022	Class A with 6dB margin
ESD Immunity	IEC/EN 61000-4-2	Level 4 criteria A
Radiated Field Immunity	IEC/EN 61000-4-3	Level 3 criteria B
Electrical Fast Transients/Burst Immunity	IEC/EN 61000-4-4	Level 3 criteria A
Surge Immunity	IEC/EN 61000-4-5	 6kV common mode and differential mode, unit shall fail safely[#]. 4kV common mode and differential mode, unit shall survive; the output may shut down and recover automatically (Criteria B) or require manual intervention (Criteria C)[#]. 2kV common and differential mode, unit passes criteria A (normal performance)*
RF Conducted Immunity	IEC/EN 61000-4-6	Level 3 criteria A
Magnetic Field Immunity	IEC/EN 61000-4-8	3 A/m criteria B
		230Vin, 80% load, Phase 0°, Dip 100% Duration 10ms (A)
Voltage Dips, Interruptions	IEC/EN 61000-4-11	230Vin, 50% load, Phase 0°, Dip 100% Duration 20ms (VSB:A, V1:B)

230Vin, 100% load, Phase 0°, Dip 100% Duration > 20ms (VSB, V1:B)

* Impedance is 2 ohms for ±2KV differential and common mode to comply with NEBS GR-1089 limits. Maximum load capacitance is required for these tests.

* Tests above ±2KV will be performed for information purposes to IEC/EN66100-4-5 with 12ohm impedance, differential & common mode.

LED NAME	LED MODE	LED STATE/OPERATION	DESCRIPTION
Input	OK	Solid Green	Input voltage operating within normal specified range
Input	ov/uv warning	Blinking Green	Input voltage operating in: 1) overvoltage warning, or 2) undervoltage warning range
Input	OFF OR FAULT	Off	Input voltage operating: 1) above overvoltage range, or 2) below undervoltage range, or 3) not present
Output	POWER GOOD	Solid Green	Main output and standby output enabled with no power supply warning or fault detected
Output	STANDBY	Blinking Green	Standby output enabled with no power supply warning or fault detected
Output	WARNING	Blinking Amber	Power supply warning detected as per PMBus STATUS_X reporting bytes [•]
<u> </u>		Solid Amber	Power supply fault detected as per PMBus STATUS X reporting



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*LED fault/warning operation follows PMBus fault/warning reporting status flags but will not be 'sticky'; (i.e. if the fault stimulus is removed, even though the actual fault/warning is still showing (still "sticky" and not cleared), the relevant LED will revert to normal (non -fault) operation.

STATUS AND CONTROL	SIGNALS		
Signal Name	I/O	Description	Interface Details
INPUT_OK (AC Source)	Output	The signal output is driven high when input source is available and within acceptable limits. The output is driven low to indicate loss of input power. There is a minimum of 1ms pre-warning time before the signal is driven low prior to the PWR_OK signal going low. The power supply must ensure that this interface signal provides accurate status when AC power is lost.	Pulled up internally via 10K to 3.3Vdc. A logic high >2.0Vdc A logic low <0.8Vdc Driven low by internal CMOS buffer (open drain output).
PW_OK (Output OK)	Output	The signal is asserted, driven high, by the power supply to indicate that all outputs are valid. If any of the outputs fail then this output will be hi-Z or driven low. The output is driven low to indicate that the Main output is outside of lower limit of regulation (11.4Vdc).	Pulled up internally via 10K to 3.3Vdc. A logic high >2.0Vdc A logic low <0.8Vdc Driven low by internal CMOS buffer (open drain output).
SMB_ALERT (FAULT/WARNING)	Output	The signal output is driven low to indicate that the power supply has detected a warning or fault and is intended to alert the system. This output must be driven high when the power is operating correctly (within specified limits). The signal will revert to a high level when the warning/fault stimulus (that caused the alert) is removed.	Pulled up internally via 10K to 3.3Vdc. A logic high >2.0Vdc A logic low <0.8Vdc Driven low by internal CMOS buffer (open drain output).
PRESENT_L (Power Supply Absent)	Output	The signal is used to detect the presence (installed) of a PSU by the host system. The signal is connected to PSU logic SGND within the power module.	Passive connection to +VSB_Return. A logic low <0.8Vdc
PS_ON (Power Supply Enable/Disable	Input	This signal is pulled up internally to the internal housekeeping supply (within the power supply). The power supply main 12Vdc output will be enabled when this signal is pulled low to +VSB_Return. In the low state the signal input shall not source more than 1mA of current. The 12Vdc output will be disabled when the input is driven higher than 2.4V, or open circuited. Cycling this signal shall clear latched fault conditions.	Pulled up internally via 10K to 3.3Vdc. A logic high >2.0Vdc A logic low <0.8Vdc Input is via CMOS Schmitt trigger buffer.
PS_KILL	Input	This signal is used during hot swap to disable the main output during hot swap extraction. The input is pulled up internally to the internal housekeeping supply (within the power supply). The signal is provided on a short (lagging pin) and should be connected to +VSB_Return.	Pulled up internally via 10K to 3.3Vdc. A logic high >2.0Vdc A logic low <0.8Vdc Input is via CMOS Schmitt trigger
ADDR (Address Select)	Input	An analogue input that is used to set the address of the internal slave devices (EEPROM and microprocessor) used for digital communications. Connection of a suitable resistor to +VSB_Return, in conjunction with an internal resistor divider chain, will configure the required address.	DC voltage between the limits of 0 and +3.3Vdc.
SCL (Serial Clock)	Both	A serial clock line compatible with PMBus [™] Power Systems Management Protocol Part 1 – General Requirements Rev 1.1. No additional internal capacitance is added that would affect the speed of the bus. The signal is provided with a series isolator device to disconnect the internal power supply bus in the event that the power module is unpowered.	V⊫ is 0.8V maximum Vo∟ is 0.4V maximum when sinking 3mA V⊮ is 2.1V minimum
SDA (Serial Data)	Both	A serial data line compatible with PMBus [™] Power Systems Management Protocol Part 1 – General Requirements Rev 1.1. The signal is provided with a series isolator device to disconnect the internal power supply bus in the event that the power module is unpowered,	$ \begin{array}{l} V_{I\!L} \text{ is } 0.8V \text{ maximum} \\ V_{0L} \text{ is } 0.4V \text{ maximum when sinking} \\ 3mA \\ V_{I\!H} \text{ is } 2.1V \text{ minimum} \end{array} $
V1_SENSE V1SENSE_RTN	Input	Remote sense connections intended to be connected at and sense the voltage at the point of load. The voltage sense will interact with the internal module regulation loop to compensate for voltage drops due to connection resistance between the output connector and the load. If remote sense compensation is not required then the voltage can be configured for local sense by: 1. V1_SENSE directly connected to power blades 6 to 10 (inclusive) 2. V1_SENSE_RTN directly connected to power blades 1 to 5 (inclusive)	Compensation for a up to 0.12Vdc total connection drop (output and return connections).
ISHARE	Bi- Directional Analogue Bus	The current sharing signal is connected between sharing units (forming an ISHARE bus). It is an input and/or an output (bi-directional analogue bus) as the voltage on the line controls the current share between sharing units. A power supply will respond to a change in this voltage but a power supply can also change the voltage depending on the load drawn from it. On a single unit the voltage on the pin (and the common ISHARE bus would read 8VDC at 100% load (module capability). For two identical units sharing the same 100% load this would read 4VDC for perfect current sharing (i.e. 50% module load capability per unit).	Analogue voltage: +8V maximum; 10K to +12V_RTN



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TIMING SPECIFICATIONS





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TIMING SPECIFICATIONS Power Removal Holdup



Power Removal Timing	Min	Max	Notes
Vsb holdup	40ms	-	
V1 holdup (Effective Total)	12ms	-	Full load
AC fail detect	-	40ms	
PWOK delay off	1.0ms		Full load
PWOK Hold Up	11.0ms		Full load

OUTPUT CONNECTOR & SIGNAL INTERFACE; FCI PN 10122460-005LF



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D1U54P-W-650-12-HBxC Series

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OUTPUT CONNECTOR PIN ASSIGNMENTS - D1U54P-W-650-12-HBx0

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Pin	Signal Name	Comments				
6.7.8.9.10	V1 (+12V0UT)	+12V Main Output				
1, 2, 3, 4, 5	+12V BTN/PGND	+12V Main Output Beturn				
A1	+VSB	Standby Output				
B1	+VSB	Standby Output				
C1	+VSB	Standby Output				
D1	+VSB	Standby Output				
E1	+VSB	Standby Output				
A2	+VSB_Return	Standby Output Return				
B2	+VSB_Return	Standby Output Return				
C2	Unused	No End User Connection				
D2	Unused	No End User Connection				
E2	Unused	No End User Connection				
A3	ADDR	I ² C Address Protocol Selection; (Select address by appropriate pull down resistor – See table below)				
B3	Unused	No End User Connection				
C3	SDA	I ² C Serial Data Line				
D3	V1_SENSE_R	-VE Remote Sense Return				
E3	V1_SENSE	+VE Remote Sense				
A4	SCL	I ² C Serial Clock Line				
B4	PS_ON_L	Remote On/Off (Enable/Disable)				
C4	SMB_ALERT	Alert signal to host system				
D4	Unused	No End User Connection				
E4	AC_OK	AC Input Source Present & "OK"				
A5	PS_KILL	Power Supply "kill"; short pin				
B5	ISHARE	Active Current Share Bus				
C5	PW_0K	Power "OK"; short pin				
D5	Unused	No End User Connection				
E5	PRESENT_L	Power Module Present; short pin				

MATING CONNECTOR	
Part Number	Description
TE Connectivity 2-1926739-5	Right Angle
FCI 10108888-R10253SLF	Right Angle

ADDR ADDRESS SELECTION					
ADDR pin (A3) resistor	Power Supply Main Controller	Power Supply External EEPROM			
to GND (K-ohm)*	(Serial Communications Slave Address)	(Serial Communications Slave Address)			
0.82	0xB0	0xA0			
2.7	0xB2	0xA2			
5.6	0xB4	0xA4			
8.2	0xB6	0xA6			
15	0xB8	0xA8			
27	0xBA	0xAA			
56	0xBC	0xAC			
180	0xBE	0xAE			

* The resistor shall be +/-5% tolerance



FET, BJT, wire or switch (debounced) to turn on +12V

Main Output

D1U54P-W-650-12-HBxC Series

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Optional remote sense lines can be attached to a load that is a distance

ISHARE

VSB

PS_ON

VSB Return

PS_KILL

B5

A1, B1, C1,

A2, B2

A5

D1. E1

B4

CURRENT SHARE NOTES Main Output: Current sharing is achieved using the active current share method details.) 1.

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Current sharing can be achieved with or without the remote (V_SENSE) connected to the common load. 2.

ISHARE

PS_ON

VSB Return

PS_KILL

VSB

B5

B4

A2. B2

A5

A1, B1, C1,

D1. E1

+VSB Outputs can be tied together for redundancy but total combined output power must not exceed the rated standby power. The +VSB output has an internal ORING 3. MOSFET for additional redundancy/internal short protection.

VSB

Load

- The current sharing pin B5 is connected between sharing units (forming an ISHARE bus). It is an input and/or an output (bi-directional analogue bus) as the voltage on the 4. line controls the current share between sharing units. A power supply will respond to a change in this voltage but a power supply can also change the voltage depending on the load drawn from it. On a single unit the voltage on the pin (and the common ISHARE bus would read 8VDC at 100% load. For two units sharing the same load this would read 4VDC for perfect current sharing (i.e. 50% load per unit).
- The load for both the main 12V and the VSB rails at initial startup shall not be allowed to exceed the capability of a single unit. The load can be increased after a delay of 5. 3sec (minimum), to allow all sharing units to achieve steady state regulation.

MECHANICAL DIMENSIONS



54mm 1U Front End AC-DC Power Supply Converter



OPTIONAL ACCESSORIES								
Description	Part Number		MPS Internal Part Number					
12V D1U54P Output Connector Card	D1U54P-12-CONC		8407001-1					
APPLICATION NOTES								
Document Number	Description	Link						
ACAN-64	D1U54P Output Connector Card	http://power.murata.com/datasheet?/data/apnotes/acan-64.pdf						
ACAN-59	D1U54P-x Communication Protocol	http://nower.murata.com/datasheet?/data/appotes/acap-59.pdf						

Murata Power Solutions, Inc.

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- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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