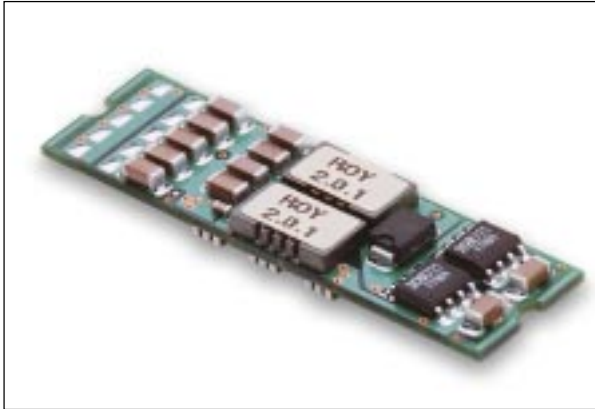




μ PM™ Products

Austin Series Non Isolated SMT dc-dc Power Modules: 3.3 Vdc and 5.0 Vdc Input, 1.5 Vdc to 3.3 Vdc Output; 5 A



The Austin Series Power Modules provide precise voltage and fast transient response in the industry's smallest footprint while offering very high reliability and high efficiency at low cost.

Applications

- Workstations
- Servers
- Desktop computers
- Data processing applications
- LAN/WAN applications
- Telecommunications equipment
- Distributed power architectures
- DSP applications
- Adapter cards

Description

The Austin Series converters are designed to meet the precise voltage and fast transient requirements of present and future DSP circuits and peripherals in a compact size and at an affordable cost. Advanced circuit techniques, high-frequency switching, custom passive and active components, and very high-density, surface-mount packaging technology deliver high-quality, ultracompact, dc-dc conversion at a competitive price.

Features

- Transient response met from 0 A to rated full load
- Small size: ideal for minimizing motherboard area in multiprocessor applications
- Dimensions: 44.83 mm x 12.95 mm x 5.46 mm (1.765 in. x 0.510 in. x 0.215 in.)
- High reliability (200 FITs/5 Million Hr MTBF)
- High efficiency:
 - 3.3 V_{IN}:
 - 85% typical @ 2.5 V, 5 A
 - 75% typical @ 1.8 V, 5 A
 - 5 V_{IN}:
 - 85% typical @ 3.3 V, 5 A
 - 71% typical @ 1.8 V, 5 A
- Output enable/output voltage adjustment pin
- Overcurrent foldback
- $\pm 5\%$ trim with single resistor
- No external bias required
- Low inductance surface-mount connections
- ISO9001 Certified manufacturing facilities
- Designed to meet *UL** 1950, *CSA*† C22.2 No. 950-95, and VDE 0805 (EN60950, IEC950)
- Meets 73/23/EEC and 93/68/EEC directives‡

* *UL* is a registered trademark of Underwriters Laboratories, Inc.

† *CSA* is a registered trademark of Canadian Standards Association.

‡ This product is intended for integration into end-use equipment. All the required procedures for CE marking of end-use equipment should be followed.

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Device	Min	Max	Unit
Input Voltage Continuous	V_{IN}	BFE	-0.3	6.5	V
	V_{IN}	BDD	-0.3	4.5	V
Forced Output Voltage	V_{OF}	All	-0.3	6.0	V
OUTEN/ADJ Terminal Voltage	$V_{OUTEN/ADJ}$	All	TBD	TBD	V
Storage Temperature	$T_{A/stg}$	All	-40	125	°C

Electrical Specifications

Input voltage range is $V_I = 3.0\text{ V}—3.6\text{ V}$, BDD Series. Input voltage range is $V_I = 4.5\text{ V}—5.5\text{ V}$, BFE Series.

Table 1. Input Specifications

Parameter	Symbol	Device	Min	Typ	Max	Unit
Operating Input Voltage	V_{IN}	BDD Series	3.0	3.3	3.6	V
		BFE Series	4.5	5.0	5.5	V
Operating Input Current ($0\text{ A} \leq I_o < 5\text{ A}$) ($3.0\text{ V} < V_I < 3.6\text{ V}$) ($4.5\text{ V} < V_I < 5.5\text{ V}$)	I_{IN}	BDD Series	—	—	5.6	A
		BFE Series	—	—	4.3	A
		All	100	135	200	mA
Quiescent Input Current ($I_o = 0$) ($3.0\text{ V} < V_I < 5.5\text{ V}$)	I_Q	All	100	135	200	mA

Electrical Specifications (continued)

Table 2. Output Specifications

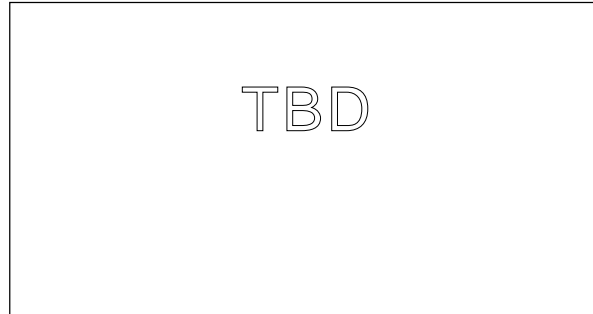
Parameter	Device Code Suffix	Symbol	Min	Typ	Max	Unit
Output Voltage ¹	E (3.3 V) ³	V _o	3.2	3.3	3.4	V
	D (2.5 V)	V _o	2.4	2.5	2.6	V
	C (2.0 V)	V _o	1.9	2.0	2.1	V
	B (1.8 V)	V _o	1.7	1.8	1.9	V
	A (1.5 V)	V _o	1.4	1.5	1.6	V
Output Current	—	I _o	0	—	5.0	A
Efficiency ² V _i = 3.3 V, V _o = 1.5 V, I _o = 4.0 A V _i = 5.0 V, V _o = 1.8 V, I _o = 5.0 A V _i = 3.3 V, V _o = 2.5 V, I _o = 5.0 A V _i = 5.0 V, V _o = 3.3 V, I _o = 5.0 A	BDD Series	η	TBD	75	TBD	%
	BFE Series	η	TBD	73	TBD	%
	BDD Series	η	TBD	85	TBD	%
	BFE Series	η	TBD	86	TBD	%
Step Load	ΔI _o /Δt	I _{OUT} /max	TBD	TBD	TBD	A/μs
		I _{OUT} /max	TBD	TBD	TBD	A/μs

1 These specifications are under all specified input voltage, load current, and temperature conditions. This also includes transient deviation, ripple, and noise voltage.

2 These specifications are under a specified operating temperature range. Efficiency is measured in production at T_A = 25 °C.

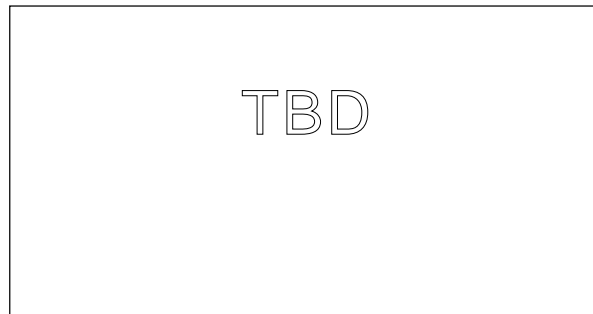
3 BFE series only.

Electrical Specifications (continued)



8-???? (C)

Figure 1. Thermal Derating



8-???? (C)

Figure 2. Load Transient Response

General Specifications

Parameter	Symbol	Value	Ucl	Unit
Reliability ($V_i = 3.3\text{ V}$, $I_o = 4.4\text{ A}$, $T_A = 55\text{ }^\circ\text{C}$), 200 lfm airflow along PCB long axis.	FIT	200	60%	per 10^9 device hours.
ESD Summary	Per MIL-STD-883C, Method 3015.7, Notice 8, $\pm 2000\text{ V}$.			
EMI	FCC Class B and EN55022 Class B Radiated Emissions.			
Safety	Designed to meet <i>UL</i> 1950, <i>CSA</i> C22.2 No. 950-95, and <i>VDE</i> 0805 (EN60950, IEC950) .			

Safety Considerations

Modules meet the standards of *UL* flammability specifications per 94 V-0.

Feature Descriptions

Static Voltage Regulation

The output voltage measured at the converter output pins on the system board will be within the range shown in Table 2, except for input voltage turn-on and turn-off. Static voltage regulation includes:

- dc output initial voltage and set point adjust
- Output ripple and noise
- Input voltage range 3.0 V—3.6 V BDD series
4.5 V—5.5 V BFE series
- Slope regulation of approximately -11 mV/A to allow for current sharing of paralleled modules.

Output Ripple and Noise

Ripple and noise are defined as periodic or random signals at the output pins under constant load.

Turn-On Response Time

The output voltage will be within its specified range with 10 ms of the input or bias voltage reaching its minimum voltage, when OUTEN is already present. When OUTEN is applied after application of input voltage, the output voltage also will be within its specified range within 10 ms of OUTEN application.

Feature Descriptions (continued)

Output Enable/Output Voltage Adjustment — OUTEN/ADJ

The output enable/adjustment pin is a dual-function port which serves to enable/disable the converter or provide a means of adjusting the output voltage over a prescribed range. When the OUTEN/ADJ pin is grounded, the converter is disabled. With the pin left open, the converter regulates to its specified output voltage. For any other voltage applied to the pin, the output voltage follows this relationship:

$$V_O = \frac{V_{OUTEN/ADJ}}{1.5 \text{ V}} \cdot V_{O, \text{nom}}$$

The Thevenin equivalent input resistance of the OUTEN/ADJ port is approximately 7.68 kΩ. A current into or out of the pin can be used to increase or decrease, respectively, the output voltage according to the relationship:

$$V_O = \left[1 + \frac{7.68 \cdot I_{OUTEN/ADJ} \text{ (mA)}}{1.5 \text{ V}} \right] \cdot V_{O, \text{nom}}$$

For example, a current of -10 μA into the OUTEN/ADJ pin will reduce the output voltage by about 5%.

Output Overcurrent Protection

Current overload is defined here as a 30% load over maximum output current up to a dead short. The module will reduce the output current with a lower output voltage (foldback) until the overload for TBD seconds under TBD environmental conditions is removed. It is capable of sustaining a continuous overload without damage or overstress to the circuit.

Environmental

Design, including materials, is consistent with the manufacture of units that meet the environmental standards in Table 3.

Table 3. Environmental Specifications

	Operating	Non-operating
Temperature	TBD	TBD
Humidity (non-condensing)	TBD	TBD
Altitude	TBD	TBD

Mechanical Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Physical Size (See Figure 2.)	L	—	—	44.83 (1.765)	mm (in.)
	W	—	—	12.95 (0.510)	mm (in.)
	H	—	—	TBD (0.215)	mm (in.)
Weight	—	—	4.6 (TBD)	—	grams (oz.)
Connector Coplanarity	—	—	—	TBD (0.005)	mm (in.)
Interconnecting	Low-Inductance Surface-Mount Connector Lucent Comcode 847414885				
Labeling	The label spans the magnetic component and contains the following: Line 1: Device Code. Line 2: Manufacture, date, code, YY/MM, where, YY is the two digit year. Line 3: Six digit circuit for number, starting with 000001. Line 4: The circuit serial number within the lot, which can be either be a four digit number or a barcode. Lots numbers will start from 000001 at the beginning of each year. Serial numbers will reset to 0001 at the start of each new year.				
Shock	Nonoperating, 50 g, trapezoidal waveform followed by MIL-STD-883C, method 2002.3, 500 g, minimum.				
Vibration	Nonoperating, 0.01 g ² /Hz @ 5 Hz, sloping to 0.02 g ² /Hz @ 20 Hz, 0.02 g ² /Hz to 500 Hz.				
Workmanship	Refer to μPM Products workmanship standards.				

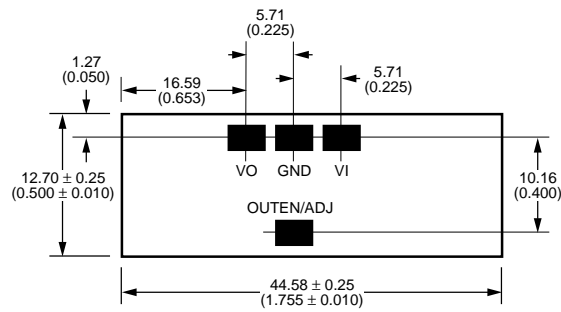
Outline Diagram

Dimensions are in millimeters and (inches).

Tolerances: x.x ± 0.38 mm (0.015 in.), x.xx ± 0.127 mm (0.005 in.).

Recommended customer pad dimensions: 3.56 mm (0.740 in.) x 2.54 mm (0.700 in.).

Bottom View



8-2509 (C)

Ordering Information

Please contact Mr. B.D. Cantrell at 757-312-8651.

Input Voltage	Output Voltage	Output Current	Device Code	Options	Comcode
3.0 V—3.6 V	1.5 V	5 A	BDD05CMAA		108468349
3.0 V—3.6 V	1.8 V	5 A	BDD05CMAB		108468356
3.0 V—3.6 V	2.0 V	5 A	BDD05CMAC		108468364
3.0 V—3.6 V	2.5 V	5 A	BDD05CMAD		108468372
4.5 V—5.5 V	1.5 V	5 A	BFE05CMAA		108505678
4.5 V—5.5 V	1.8 V	5 A	BFE05CMAB		108505686
4.5 V—5.5 V	2.0 V	5 A	BFE05CMAC		108505694
4.5 V—5.5 V	2.5 V	5 A	BFE05CMAD		108505702
4.5 V—5.5 V	3.3 V	5 A	BFE05CMAE		108505710

At 50 °C ambient, 400 lfm airflow.

Notes

Notes

For additional information, contact your Lucent Technologies Account Manager or the following:

POWER SYSTEMS UNIT: Network Products Group, Lucent Technologies Inc., 3000 Skyline Drive, Mesquite, TX 75149, USA

+1-800-526-7819 (Outside U.S.A.: **+1-972-284-2626**, FAX +1-972-284-2900) (product-related questions or technical assistance)

INTERNET: <http://www.lucent.com/networks/power>

E-MAIL: techsupport@lucent.com

ASIA PACIFIC: Lucent Technologies Singapore Pte. Ltd., 750A Chai Chee Road #05-01, Chai Chee Industrial Park, Singapore 469001

Tel. (65) 240 8041, FAX (65) 240 8053

CHINA: Lucent Technologies (China) Co. Ltd., SCITECH Place No. 22 Jian Guo Man Wai Avenue, Beijing 100004, PRC

Tel. (86) 10-6522 5566 ext. 4187, FAX (86) 10-6512 3694

JAPAN: Lucent Technologies Japan Ltd., Mori Building No. 25, 4-30, Roppongi 1-chome, Minato-ku, Tokyo 106-8508, Japan

Tel. (81) 3 5561 3000, FAX (81) 3 5561 4387

LATIN AMERICA: Lucent Technologies Inc., Room 416, 2333 Ponce de Leon Blvd., Coral Gables, FL 33134, USA

Tel. +1-305-569-4722, FAX +1-305-569-3820

EUROPE: Data Requests: DATALINE: **Tel. (44) 1189 324 299**, FAX (44) 1189 328 148

Technical Inquiries: GERMANY: **(49) 89 95086 0** (Munich), UNITED KINGDOM: **(44) 1344 865 900** (Ascot),

FRANCE: **(33) 1 40 83 68 00** (Paris), SWEDEN: **(46) 8 594 607 00** (Stockholm), FINLAND: **(358) 9 4354 2800** (Helsinki),

ITALY: **(39) 02 6608131** (Milan), SPAIN: **(34) 91 807 1441** (Madrid)

Lucent Technologies Inc. reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information. µPM is a trademark of Lucent Technologies Inc.

