

Dual-Phase DC-DC Controller for AMD Mobile CPU

FEATURES

- Dual-phase DC-DC controller with integrated drivers
- 6 bit AMD VID codes compatible
- 1% output voltage accuracy
- 6V to 24V input supports 2s to 5s battery power
- Voltage Feed-Forward Compensation
- High efficiency, up to 94%
- High light-load efficiency: 80% at 200mA
- Non-audio skip mode
- Constant Ripple-Current topology facilitates optimum inductor size
- Supports 60A output current
- Ultra-fast transient recovery
- Adjustable load line support
- Slew control at start-up and OTF VID changes
- True differential output voltage remote sensing
- AMD compliant Power Good signal
- VIN & VDDA Undervoltage Lockout Protection
- Latched over-voltage protection
- Cycle-by-cycle Overcurrent protection with latched timeout
- Small, thin 5x5 QFN32 package

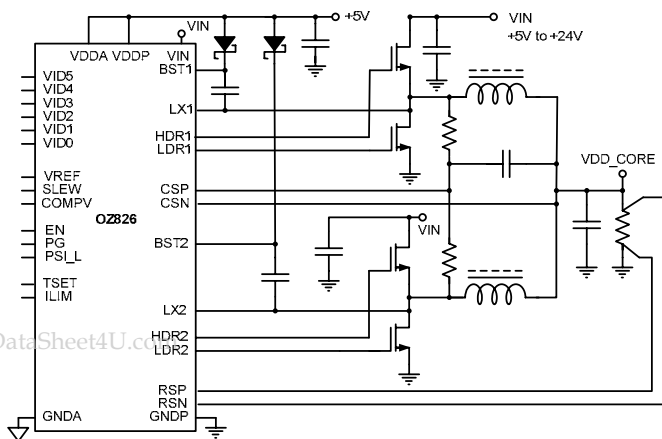
APPLICATIONS

Notebook CPU power supplies

ORDERING INFORMATION

Part Number	Temp Range	Package
OZ826LN	0°C to 85°C	32 QFN 5x5mm

SIMPLIFIED APPLICATION DIAGRAM



GENERAL DESCRIPTION

OZ826 is a DC/DC controller specifically developed to support the design of power supplies for AMD mobile microprocessors supporting the 6 bit VID codes (see **Table 1**). Its high efficiency under both light and heavy load conditions, DC accuracy, remote voltage sensing and excellent transient response make it a good choice for low voltage CPUs.

The core topology is based on a constant-ripple current sync-buck controller with integrated drivers. The voltage feed-forward compensation ensures a high rejection of input voltage transients.

Overvoltage Protection (OVP) acts when the output voltage exceeds the 1.8V threshold. This protection condition is latched and the shutdown occurs. After an OVP event, the EN pin should be toggled or VDDA cycled to restart the circuit.

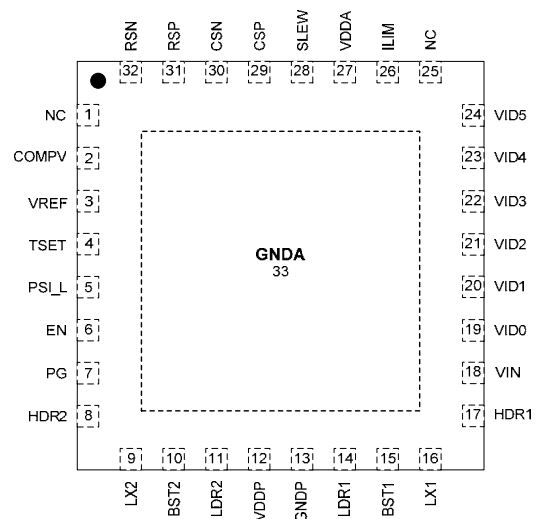
Under Voltage Lockout (UVLO) circuit monitors both VDDA and VIN. Shut down occurs when VDDA falls below 4.2V or VIN is less than typically 4.8V.

The output is protected against overload by a cycle-by-cycle Overcurrent Protection (OCP) circuit. Its limit is user-adjustable. Maximum OCP timeout is typically 1ms.

The Power Good (PG) signal is open drain unless the output voltage drops more than 250mV off the set VID.

At start-up the output voltage ramps up in a controlled manner with an externally adjustable slew rate.

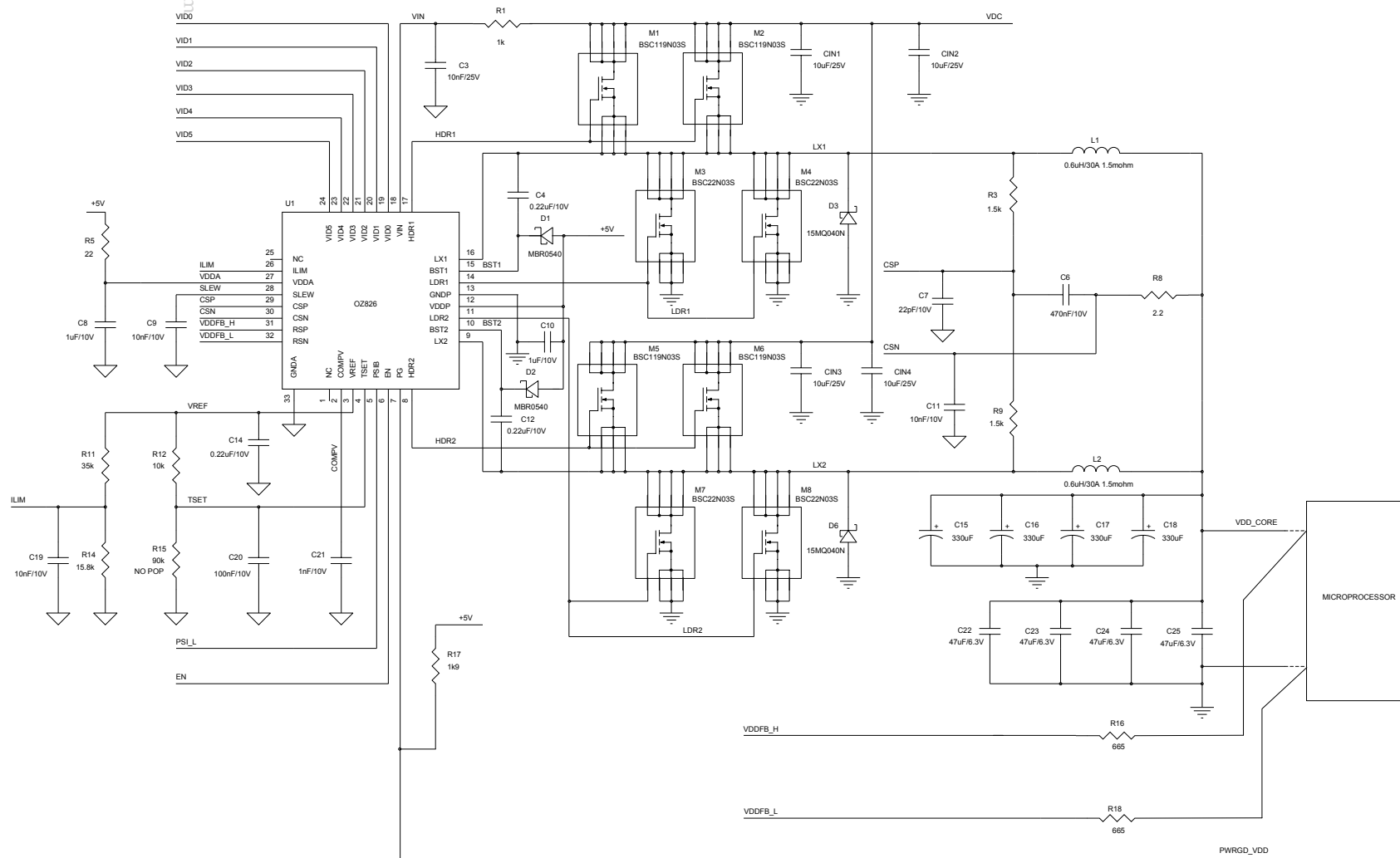
PIN DIAGRAM



PIN DESCRIPTION

No.	Name	I/O	Type	Description
1	NC	-	-	No internal connection
2	COMPV	I/O	Analog	Compensation pin. Requires a capacitor to analog ground
3	VREF	O	Analog	1.55V, +/-1% precision reference voltage
4	TSET	I	Analog	Adjusts the on time interval
5	PSI_L	I	Digital	Enables skip mode of operation when asserted low, 120kΩ internal pull down resistor
6	EN	I	Digital	Enables the controller operation. When asserted high, initiates the startup sequence. 120kΩ internal pull down resistor
7	PG	O	Digital	Power good open drain output. It only provides an indication that the output voltage is within VID set voltage -250mV
8	HDR2	O	Digital	Output of the high side driver of phase 2
9	LX2	P	Power	Inductor switching node for phase 2
10	BST2	P	Power	Positive supply for the high side driver of phase 2. A 0.22μF capacitor should be placed between BST2 and LX2
11	LDR2	O	Digital	Output of the low side driver of phase 2
12	VDDP	P	Power	Power supply for the low side drivers
13	GNDP	P	Power	Power ground for low side drivers
14	LDR1	O	Digital	Output of the low side driver of phase 1
15	BST1	P	Power	Positive supply for the high side driver of phase 1. A 0.22μF capacitor should be placed between BST1 and LX1
16	LX1	P	Power	Inductor switching node for phase 1
17	HDR1	O	Digital	Output of the high side driver of phase 1
18	VIN	I	Analog	Sensing pin for the input voltage of the power stage
19	VID0	I	Digital	Voltage Identification pin, bit 0, 120kΩ internal pull down resistor
20	VID1	I	Digital	Voltage Identification pin, bit 1, 120kΩ internal pull down resistor
21	VID2	I	Digital	Voltage Identification pin, bit 2, 120kΩ internal pull down resistor
22	VID3	I	Digital	Voltage Identification pin, bit 3, 120kΩ internal pull down resistor
23	VID4	I	Digital	Voltage Identification pin, bit 4, 120kΩ internal pull down resistor
24	VID5	I	Digital	Voltage Identification pin, bit 5, 120kΩ internal pull down resistor
25	NC	-	-	No internal connection
26	ILIM	I	Analog	Sets the current limit threshold
27	VDDA	P	Power	+5V supply for the controller analog circuits.
28	SLEW	I/O	Analog	Controls the slew rate of the output voltage during start up and OTF VID code change
29	CSP	I	Analog	Non-inverting current sense pin; also provides voltage feedback information
30	CSN	I	Analog	Inverting current sense pin
31	RSP	I	Analog	Non-inverting voltage remote sense pin
32	RSN	I	Analog	Inverting voltage remote sense pin
33	GND A	P	Power	Ground for the controller analog circuits

TYPICAL APPLICATION SCHEMATIC



Typical Application Schematic: Dual Phase AMD Mobile CPU Core Power Supply with 60A Load Current Capability

BILL OF MATERIALS

Item	Qty	Reference	Value	Vendor Part Number
1	4	CIN1,CIN2,CIN3,CIN4	10µF/25V	C4532X7R1E106M TDK 250S43X5R106M Johanson Dielectrics
2	1	C3	10nF/50V	Ceramic – X7R or X5R
3	3	C4, C12, C14	220nF/10V	Ceramic – X7R or X5R
4	1	C6	470nF/10V	Ceramic – X7R or X5R
5	1	C7,	22pF/10V	Ceramic – X7R or X5R
6	2	C8, C10	1µF/10V	C1608X5R1A105K TDK 100R14X5R105M Johanson Dielectrics
7	3	C9, C11, C19	10nF/10V	Ceramic – X7R or X5R
8	4	C15, C16, C17, C18	330µF/2.5V	SPCAP, POSCAP, OSCON
9	1	C20	100nF	Ceramic – X7R or X5R
10	1	C21	1nF/10V	Ceramic – X7R or X5R
11	4	C22, C23, C24, C25	47µF/6.3V	630S43X5R476MJohanson Dielectrics
12	2	D1, D2	MBR0540	International Rectifier, Vishay Siliconix
13	2	D3, D4	15MQ040N	International Rectifier, Vishay Siliconix
14	2	L1, L2	0.6µH/30A 1.5mΩ	FDH1055 0R56 TOKO
15	4	M1, M2, M5, M6	BSC119N03S	Infineon
16	4	M3, M4, M7, M8	BSC022N03S	Infineon
17	1	R1	1k	Any
18	2	R3, R9	1.5k	Any
19	1	R5	22	Any
20	1	R8	2.2	Any
21	1	R11	35k	Any
22	1	R12	10k	Any
23	1	R14	15.8k	Any
24	2	R16, R18	665	Any
25	1	R17	1.9k	Any
26	1	U1	OZ826	O ₂ Micro, Inc.

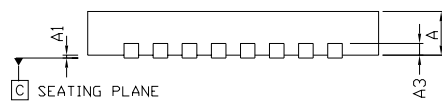
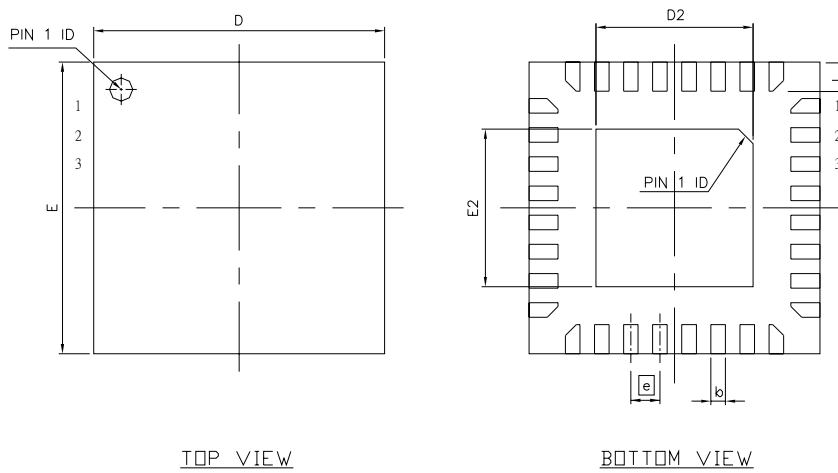
COMPONENT SUPPLIERS

Manufacturer	Contact Information	
	Phone	Website
Power MOSFETs		
Fairchild Semiconductor	888-522-5372 (USA)	www.fairchildsemi.com
International Rectifier	310-322-3331 (USA)	www.irf.com
Siliconix (Vishay)	203-268-6261 (USA)	www.vishay.com
Philips	408-474-8142 (USA)	www.semiconductors.philips.com
Infineon	858-526-2201 (USA)	www.infineon.com
Magnetics/Inductors		
Coilcraft	800-322-2645 (USA)	www.coilcraft.com
Coiltronics	561-752-5000 (USA)	www.coiltronics.com
TOKO	858-675-8013 (USA)	www.tokoam.com
Sumida	408-982-9660 (USA)	www.sumida.com
Capacitors		
Sanyo	65-6281-3226 (Singapore)	www.secc.co.jp
Kemet	408-986-0424 (USA)	www.kemet.com
Other Components		
TDK	847-803-6100 (USA) 81-3-5201-7241 (Japan)	www.component.tdk.com
Taiyo Yuden	03-3667-3408 (Japan) 408-573-4150 (USA)	www.t-yuden.com

PACKAGE INFORMATION - 32 PIN QFN

Exposed pad is GNDA (pin 33) and must be soldered to PCB

32Ld QFN 5x5mm Package Outline Drawing
(Saw Type-1)



SYMBOL	DIMENSION (MM)		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0	0.02	0.05
A3	0.203 REF		
b	0.18	0.25	0.30
D	4.90	5.00	5.10
D2	2.60	2.70	2.80
E	4.90	5.00	5.10
E2	2.60	2.70	2.80
e	0.50 BSC		
L	0.30	0.40	0.50

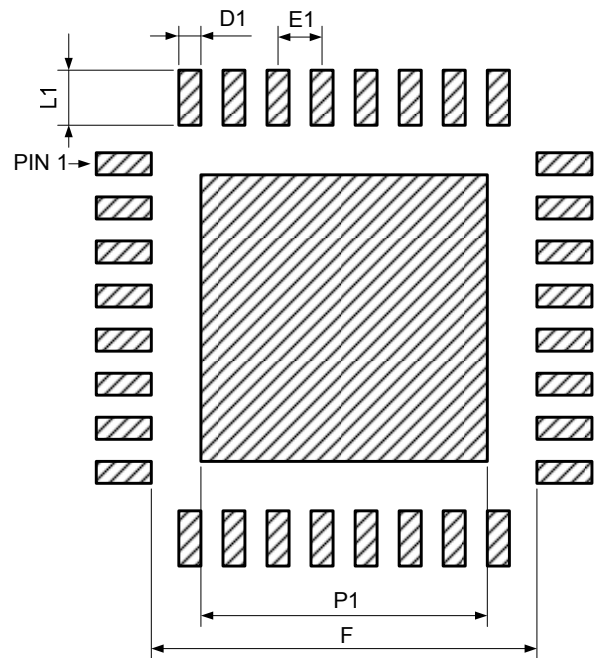
Notes:
1. ALL DIMENTIONS ARE IN MILLIMETER.

Rth j-a (QFN-32 5x5mm package) = 26°C/W

DIMENSION TABLE

SYMBOL	SPECIFICATION
	32L QLP 5X5 BODY
D1	0.25
E1	0.50
L1	0.94
P1	2.8
F	4.25

RECOMMENDED LANDING PATTERN



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