CURRENT-MODE PWM CONTROLLER

FEATURES

- **Automatic Feed-Forward Compensation**
- **Programmable Pulse-by-Pulse Current Limiting**
- **Automatic Symmetry Correction in Push-Pull Configuration**
- **Enhanced Load-Response Characteristics**
- **Parallel Operation Capability for Modular Power Systems**
- **Differential Current-Sense Amplifier With Wide Common-Mode Range**
- **Double Pulse Suppression**
- **Undervoltage Lockout**
- **Soft-Start Capability**
- **Shutdown Terminal**

DESCRIPTION

The UC1846 control IC provides all of the necessary features to implement fixed-frequency, current-mode control schemes, while maintaining a minimum external parts count. The superior performance of this technique can be measured in improved line regulation, enhanced load-response characteristics, and a simpler, easier-to-design control loop. Topological advantages include inherent pulse-by-pulse current-limiting capability, automatic symmetry correction for push-pull converters, and the ability to parallel power modules, while maintaining equal current sharing.

Protection circuitry includes built-in undervoltage lockout and programmable current limit, in addition to soft-start capability. A shutdown function is also available, which can initiate either a complete shutdown with automatic restart or latch the supply off.

Other features include fully latched operation, double pulse suppression and deadline adjust capability.

The UC1846 features low outputs in the OFF state.

ORDERING INFORMATION(1)

PRODUCT	PACKAGE DESIGNATOR	PACKAGE	ORDERABLE PART NUMBER	PACKAGE QUANTITY
UC1846	TD	Bare die in waffle pack(2)	UC1846VTD1	100
			UC1846VTD2	10

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.

(2) Processing is per the Texas Instruments commercial production baseline and is in compliance with the Texas Instruments Quality Control System in effect at the time of manufacture. Electrical screening consists of DC parametric and functional testing at room temperature only. Unless otherwise specified by Texas Instruments AC performance and performance over temperature is not warranted. Visual Inspection is performed in accordance with MIL-STD-883 Test Method 2010 Condition B at 75X minimum.

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

BARE DIE INFORMATION

DIE THICKNESS	BACKSIDE FINISH	BACKSIDE POTENTIAL	BOND PAD METALLIZATION COMPOSITION	BOND PAD THICKNESS
10.5 mils.	Silicon with backgrind	Floating	AlCu2	2000 nm

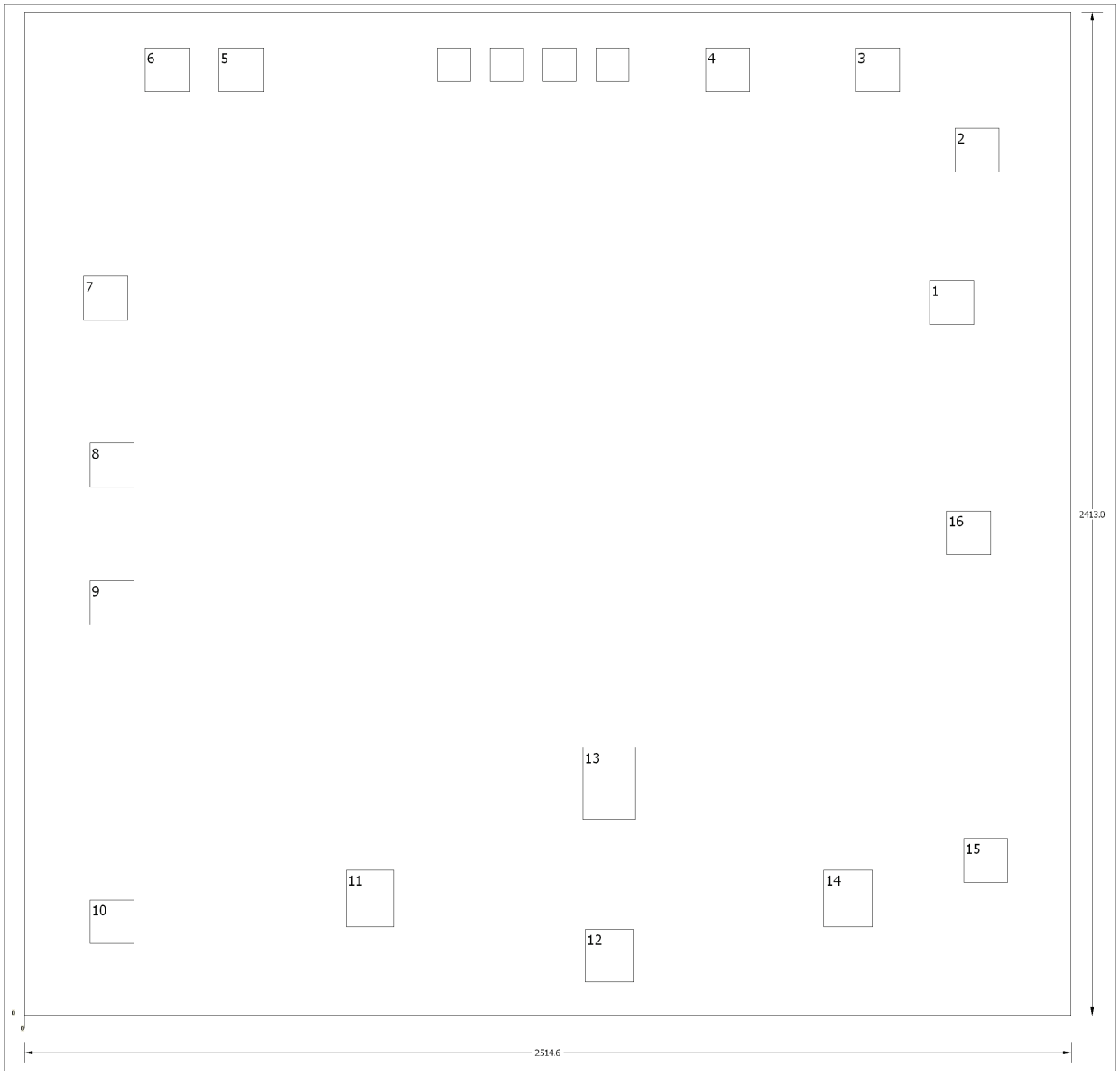

Table 1. Bond Pad Coordinates in Microns

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
C/S SS	1	2174.24	1661.16	2280.92	1767.84
VREF	2	2235.2	2026.92	2341.88	2133.6
C/S-	3	1996.44	2219.96	2103.12	2326.64
C/S+	4	1635.76	2219.96	1742.44	2326.64
E/A+	5	467.36	2219.96	574.04	2326.64
E/A-	6	289.56	2219.96	396.24	2326.64
COMP	7	142.24	1671.32	248.92	1778
CT	8	157.48	1270	264.16	1376.68
RT	9	157.48	939.8	264.16	1046.48
Sync	10	157.48	172.72	264.16	279.4
A Out	11	772.16	213.36	889	350.52
GND	12	1346.2	81.28	1463.04	208.28
VC	13	1341.12	472.44	1468.12	645.16
B Out	14	1920.24	213.36	2037.08	350.52
VIN	15	2255.52	320.04	2362.2	426.72
Shutdown	16	2214.88	1107.44	2321.56	1214.12

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UC1846VTD1	ACTIVE			0	100	Non-RoHS & Non-Green	Call TI	N / A for Pkg Type	-55 to 125		Samples
UC1846VTD2	ACTIVE			0	10	RoHS & Green	Call TI	N / A for Pkg Type	-55 to 125		Samples

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

OTHER QUALIFIED VERSIONS OF UC1846-DIE :

- Enhanced Product : UC1846-EP
- Space : UC1846-SP

NOTE: Qualified Version Definitions:

- Enhanced Product - Supports Defense, Aerospace and Medical Applications
- Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

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