RAD-TOLERANT, HIGH-SPEED PWM CONTROLLER

Check for Samples: UC1825A-DIE

FEATURES

- **Rad-Tolerant: 30 kRad (Si) TID** (1)
- **Compatible With Voltage-Mode or Current-Mode Control Methods**
- **Practical Operation at Switching Frequencies**
- **50-ns Propagation Delay to Output**
- **High-Current Dual Totem Pole Outputs**
- **Trimmed Oscillator Discharge Current**
- **Low 100-µA Startup Current**
- **Pulse-by-Pulse Current Limiting Comparator**
- **Latched Overcurrent Comparator With Full Cycle Restart**

(1) Radiation tolerance is a typical value based upon initial device qualification with dose rate = 10 mrad/sec. Radiation Lot Acceptance Testing is available - contact factory for details.

DESCRIPTION

The UC1825A-DIE PWM controller is an improved version of the standard UC1825 family. Performance enhancements have been made to several of the circuit blocks. Error amplifier gain bandwidth product is 12 MHz, while input offset voltage is 2 mV. Current limit threshold is assured to a tolerance of 5%. Oscillator discharge current is specified at 10 mA for accurate dead time control. Frequency accuracy is improved to 6%. Startup supply current, typically 100 µA, is ideal for off-line applications. The output drivers are redesigned to actively sink current during UVLO at no expense to the startup current specification. In addition each output is capable of 2-A peak currents during transitions.

ORDERING INFORMATION(1)

PRODUCT	PACKAGE DESIGNATOR	PACKAGE	ORDERABLE PART NUMBER	PACKAGE QUANTITY
UC1825A	TD	Bare die in waffle pack(2)	UC1825AVTD1	81
			UC1825AVTD2	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 space 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.

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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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	Ti/AlCu2%	2214.3 nm

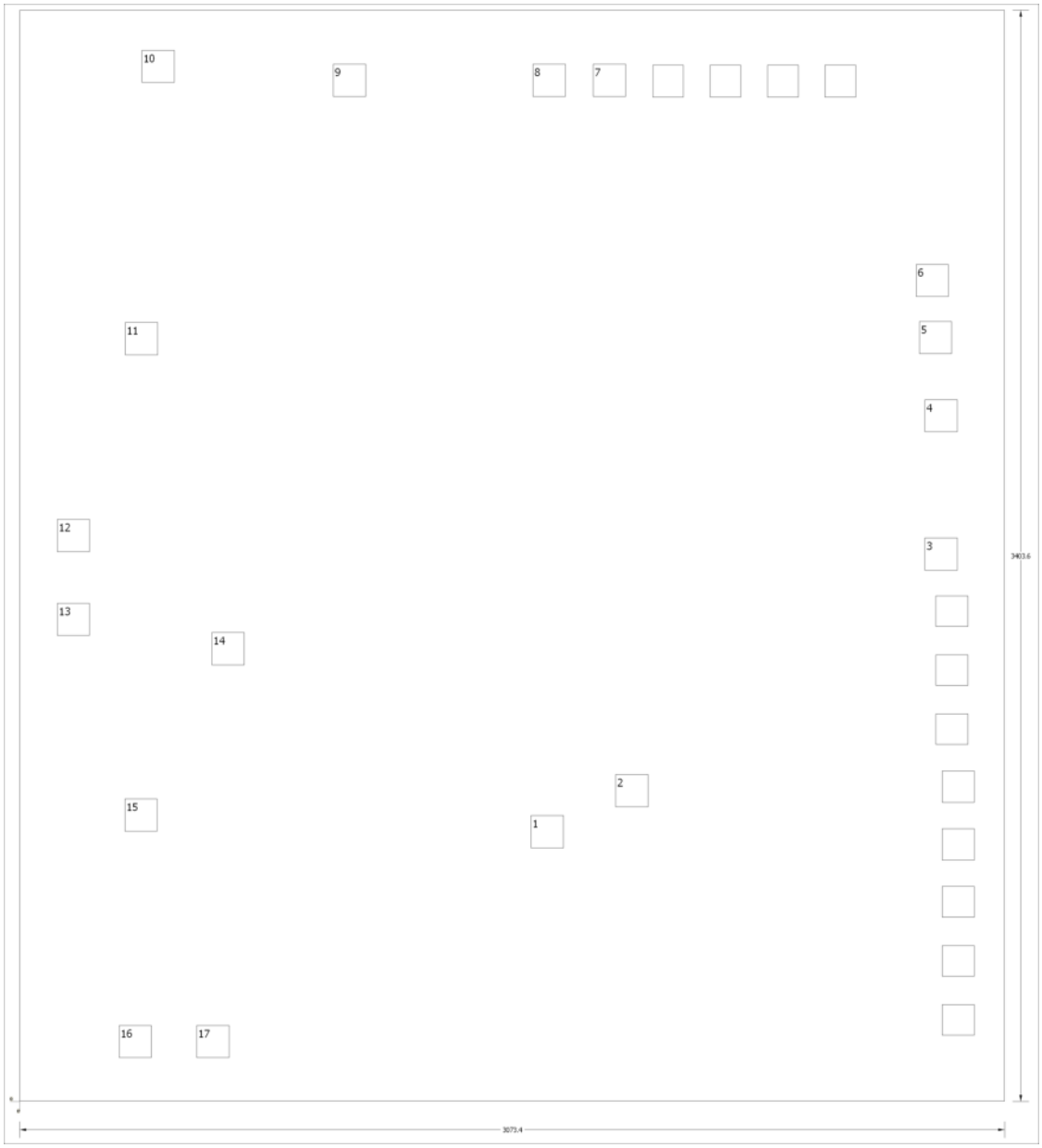

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Table 1. Bond Pad Coordinates in Microns

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
INV	1	1595.12	789.94	1696.72	891.54
NI	2	1859.28	918.21	1960.88	1019.81
EAOUT	3	2824.48	1656.08	2926.08	1757.68
CLK/LEB	4	2824.48	2087.88	2926.08	2189.48
RT	5	2806.7	2331.72	2908.3	2433.32
CT	6	2796.54	2509.52	2898.14	2611.12
RAMP	7	1789.43	3134.36	1891.03	3235.96
SS	8	1601.47	3134.36	1703.07	3235.96
ILIM	9	977.9	3134.36	1079.5	3235.96
GND	10	381	3177.54	482.6	3279.14
OUTA	11	328.93	2327.91	430.53	2429.51
PGND	12	116.84	1714.5	218.44	1816.1
PGND	13	116.84	1452.88	218.44	1554.48
VC	14	599.44	1361.44	701.04	1463.04
OUTB	15	327.66	842.01	429.26	943.61
VCC	16	309.88	135.89	411.48	237.49
VREF	17	552.45	135.89	654.05	237.49

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PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
UC1825AVTD1	Active	Production	null (null) | 0	81 | NOT REQUIRED	-	Call TI	Call TI	25 to 25	
UC1825AVTD1.A	Active	Production	null (null) | 0	81 | NOT REQUIRED	-	Call TI	Call TI	25 to 25	
UC1825AVTD2	Active	Production	null (null) | 0	10 | NOT REQUIRED	-	Call TI	Call TI	25 to 25	
UC1825AVTD2.A	Active	Production	null (null) | 0	10 | NOT REQUIRED	-	Call TI	Call TI	25 to 25	

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts 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.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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OTHER QUALIFIED VERSIONS OF UC1825A-DIE :

- Space : UC1825A-SP

NOTE: Qualified Version Definitions:

- Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

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