

HIGH-SPEED PWM CONTROLLER

FEATURES

- Improved Version of the UC2825 PWM
- Compatible With Voltage-Mode or Current-Mode Control Methods
- Practical Operation at Switching Frequencies to 1 MHz
- 50-ns Propagation Delay to Output
- High-Current Dual Totem-Pole Outputs (2-A Peak)
- Trimmed Oscillator Discharge Current
- Low 100- μ A Startup Current
- Pulse-by-Pulse Current-Limiting Comparator
- Latched Overcurrent Comparator With Full Cycle Restart

SUPPORTS DEFENSE, AEROSPACE, AND MEDICAL APPLICATIONS

- Controlled Baseline
- One Assembly/Test Site
- One Fabrication Site
- Available in Military ($-55^{\circ}\text{C}/125^{\circ}\text{C}$) Temperature Range⁽¹⁾
- Extended Product Life Cycle
- Extended Product-Change Notification
- Product Traceability

(1) Additional temperature ranges are available - contact factory

DESCRIPTION/ORDERING INFORMATION

The UC2825A-EP pulse width modulation (PWM) controller is an improved version of the standard UC2825. 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 specified 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 μ A, is ideal for off-line applications. The output drivers are redesigned to actively sink current during undervoltage lockout (UVLO) at no expense to the startup current specification. In addition, each output is capable of 2-A peak currents during transitions.

Functional improvements also have been implemented in this family. The UC2825A-EP shutdown comparator is now a high-speed overcurrent comparator with a threshold of 1.2 V. The overcurrent comparator sets a latch that ensures full discharge of the soft-start capacitor before allowing a restart. While the fault latch is set, the outputs are in the low state. In the event of continuous faults, the soft-start capacitor is fully charged before discharge to ensure that the fault frequency does not exceed the designed soft-start period. The UC2825 CLOCK pin is CLK/LEB in the UC2825A-EP. This pin combines the functions of clock output and leading-edge blanking adjustment and has been buffered for easier interfacing.

The UC2825A-EP has dual alternating outputs and the same pin configuration as UC2825. UVLO thresholds are identical to the original UC2825.

Consult the application report, *The UC3823A,B and UC2825A,B Enhanced Generation of PWM Controllers*, literature number SLUA125, for detailed technical and applications information.



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.



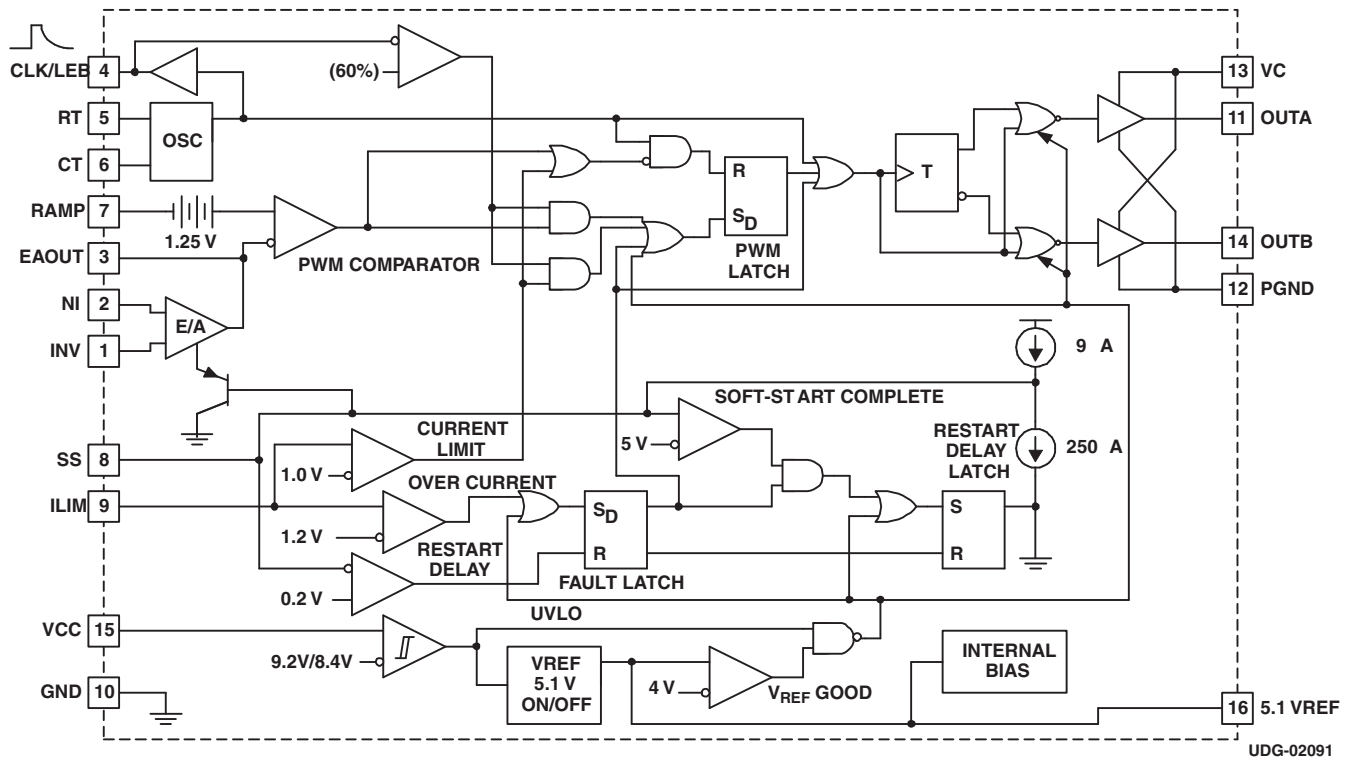
These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

ORDERING INFORMATION

T _A	PACKAGE ⁽¹⁾	ORDERABLE PART NUMBER	TOP-SIDE MARKING
-40°C to 125°C	SOIC – DW	UC2825AQDWREP	UC2825AQEP
-55°C to 125°C	SOIC – DW	UC2825AMDWREP	UC2825AMEP

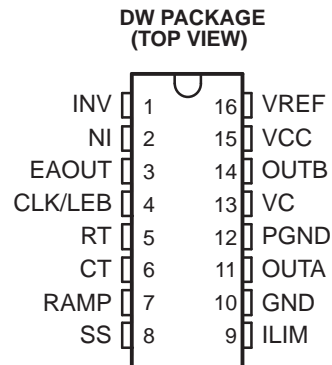
(1) Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

BLOCK DIAGRAM



UDG-02091

PIN ASSIGNMENTS



TERMINAL FUNCTIONS

TERMINAL		I/O	DESCRIPTION
NAME	NO.		
CLK/LEB	4	O	Clock/leading-edge blanking. Output of the internal oscillator.
CT	6	I	Capacitor timing. Timing capacitor connection for oscillator frequency programming. The timing capacitor should be connected to the device ground using minimal trace length.
EAOUT	3	O	Output of the error amplifier for compensation
GND	10		Analog ground return
ILIM	9	I	Input to the current-limit comparator
INV	1	I	Inverting input to the error amplifier
NI	2	I	Noninverting input to the error amplifier
OUTA	11	O	High-current totem-pole output A of the on-chip drive stage
OUTB	14	O	High-current totem-pole output B of the on-chip drive stage
PGND	12		Ground return for the output driver stage
RAMP	7	I	Noninverting input to the PWM comparator, with 1.25-V internal input offset. In voltage-mode operation, this serves as the input voltage feed-forward function by using the CT ramp. In peak current mode operation, this serves as the slope compensation input.
RT	5	I	Resistor timing. Timing resistor connection for oscillator frequency programming.
SS	8	I	Soft-start. SS also doubles as the maximum duty cycle clamp.
VC	13		Power-supply for the output stage. This pin should be bypassed with a 0.1- μ F monolithic ceramic low-ESL capacitor with minimal trace lengths.
VCC	15	O	Power supply for the device. This pin should be bypassed with a 0.1- μ F monolithic ceramic low-ESL capacitor with minimal trace lengths.
VREF	16		5.1-V reference. For stability, the reference should be bypassed with a 0.1- μ F monolithic ceramic low-ESL capacitor and minimal trace length to the ground plane.

Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)⁽¹⁾

			UNIT
V _{IN}	Supply voltage	VC, VCC	22 V
I _O	Source or sink current, DC	OUTA, OUTB	0.5 A
I _O	Source or sink current, pulse (0.5 μs)	OUTA, OUTB	2.2 A
Analog inputs		INV, NI, RAMP	–0.3 V to 7 V
		ILIM, SS	–0.3 V to 6 V
Power ground		PGND	±0.2 V
Outputs		OUTA, OUTB limits	PGND –0.3 V to VC +0.3 V
I _{CLK}	Clock output current	CLK/LEB	–5 mA
I _{O(EA)}	Error amplifier output current	EAOUT	5 mA
I _{SS}	Soft-start sink current	SS	20 mA
I _{OSC}	Oscillator charging current	RT	–5 mA
T _J	Operating virtual junction temperature range		–55°C to 150°C
T _{stg}	Storage temperature ⁽²⁾		–65°C to 150°C
		Lead temperature 1,6 mm (1/16 in) from case for 10 s	–55°C to 150°C
t _{stg}	Storage temperature ⁽²⁾		–65°C to 150°C
		Lead temperature 1,6 mm (1/16 in) from case for 10 s	300°C

- (1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) Long-term high-temperature storage and/or extended use at maximum recommended operating conditions may result in a reduction of overall device life. See http://www.ti.com/ep_quality for additional information on enhanced plastic packaging.

DISSIPATION RATING TABLE – FREE-AIR TEMPERATURE

PACKAGE	AIR FLOW (CFM)	T _A ≤ 25°C POWER RATING	DERATING FACTOR ABOVE T _A = 25°C	T _A = 70°C POWER RATING	T _A = 85°C POWER RATING	T _A = 125°C POWER RATING
DW	0	1.105 W	9.62 mW/°C	673 mW	528 mW	144 mW

Electrical Characteristics

 $T_A = -40^\circ\text{C}$ to 125°C for Q temperature and $T_A = -55^\circ\text{C}$ to 125°C for M temperature, $R_T = 3.65\text{ k}\Omega$, $C_T = 1\text{ nF}$, $V_{CC} = 12\text{ V}$

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reference, V_{REF}						
V_O	Output voltage range	$T_J = 25^\circ\text{C}$, $I_O = 1\text{ mA}$	5.05	5.1	5.15	V
	Line regulation	$12\text{ V} \leq V_{CC} \leq 20\text{ V}$		2	15	mV
	Load regulation	$1\text{ mA} \leq I_O \leq 10\text{ mA}$		5	20	mV
	Total output variation	Line, load, temperature	5.03		5.17	V
	Temperature stability ⁽¹⁾	$T_{(min)} < T_A < T_{(max)}$		0.2	0.4	mV/°C
	Output noise voltage ⁽¹⁾	$10\text{ Hz} < f < 10\text{ kHz}$		50		μV_{RMS}
	Long-term stability ⁽¹⁾	$T_J = 125^\circ\text{C}$, 1000 h		5	25	mV
	Short-circuit current	$V_{REF} = 0\text{ V}$	30	60	90	mA
Oscillator						
f_{OSC}	Initial accuracy ⁽¹⁾	$T_J = 25^\circ\text{C}$	375	400	425	kHz
		$R_T = 6.6\text{ k}\Omega$, $C_T = 220\text{ pF}$, $T_A = 25^\circ\text{C}$	0.9	1	1.1	MHz
	Total variation ⁽¹⁾	Line, temperature			450	kHz
		$R_T = 6.6\text{ k}\Omega$, $C_T = 220\text{ pF}$	0.85		1.15	MHz
	Voltage stability	$12\text{ V} \leq V_{CC} \leq 20\text{ V}$			1%	
	Temperature stability ⁽¹⁾	$T_{(min)} < T_A < T_{(max)}$		5%		
	High-level output voltage, clock		3.7	4		V
	Low-level output voltage, clock			0	0.2	V
	Ramp peak		2.6	2.8	3	V
	Ramp valley		0.7	1	1.25	V
	Ramp valley to peak		1.6	1.8	2	V
I_{OSC}	Oscillator discharge current	$R_T = \text{OPEN}$, $V_{CT} = 2\text{ V}$	9	10	11	mA
Error Amplifier						
	Input offset voltage			2	10	mV
	Input bias current			0.6	3	μA
	Input offset current			0.1	1	μA
	Open-loop gain	$1\text{ V} < V_O < 4\text{ V}$	60	95		dB
CMRR	Common-mode rejection ratio	$1.5\text{ V} < V_{\text{CM}} < 5.5\text{ V}$	75	95		dB
PSRR	Power-supply rejection ratio	$12\text{ V} < V_{CC} < 20\text{ V}$	85	110		dB
$I_{\text{O(sink)}}$	Output sink current	$V_{\text{EAOUT}} = 1\text{ V}$	1	2.5		mA
$I_{\text{O(src)}}$	Output source current	$V_{\text{EAOUT}} = 4\text{ V}$	-0.5	-1.3		mA
	High-level output voltage	$I_{\text{EAOUT}} = -0.5\text{ mA}$	4.5	4.7	5	V
	Low-level output voltage	$I_{\text{EAOUT}} = -1\text{ mA}$	0	0.5	1	V
	Gain bandwidth product	$f = 200\text{ kHz}$	6	12		MHz
	Slew rate ⁽¹⁾		6	9		V/ μs
PWM Comparator						
I_{BIAS}	Bias current, RAMP	$V_{\text{RAMP}} = 0\text{ V}$		-1	-8	μA
	Minimum duty cycle				0%	
	Maximum duty cycle		85%			
t_{LEB}	Leading-edge blanking time	$R_{\text{LEB}} = 2\text{ k}\Omega$, $C_{\text{LEB}} = 470\text{ pF}$	300	375	450	ns
R_{LEB}	Leading-edge blanking resistance	$V_{\text{CLK/LEB}} = 3\text{ V}$	8.5	10	11.5	k Ω
V_{ZDC}	Zero dc threshold voltage, EAOUT	$V_{\text{RAMP}} = 0\text{ V}$	1.1	1.25	1.4	V
t_{DELAY}	Delay-to-output time	$V_{\text{EAOUT}} = 2.1\text{ V}$, $V_{\text{ILIM}} = 0\text{-V}$ to 2-V step		50	80	ns

(1) Specified by design. Not production tested.

Electrical Characteristics (continued)
 $T_A = -40^\circ\text{C}$ to 125°C for Q temperature and $T_A = -55^\circ\text{C}$ to 125°C for M temperature, $R_T = 3.65\text{ k}\Omega$, $C_T = 1\text{ nF}$, $V_{CC} = 12\text{ V}$

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Current Limit/Start Sequence/Fault						
I_{SS}	Soft-start charge current	$V_{SS} = 2.5\text{ V}$	8	14	20	μA
V_{SS}	Full soft-start threshold voltage		4.3	5		V
I_{DSCH}	Restart discharge current	$V_{SS} = 2.5\text{ V}$	100	250	350	μA
I_{SS}	Restart threshold voltage			0.3	0.5	V
I_{BIAS}	ILIM bias current	$V_{ILIM} = 0\text{-V to } 2\text{-V step}$			15	μA
I_{CL}	Current-limit threshold voltage		0.95	1	1.05	V
	Overcurrent threshold voltage		1.14	1.2	1.26	V
t_d	Delay-to-output time, ILIM ⁽²⁾	$V_{ILIM} = 0\text{-V to } 2\text{-V step}$		50	80	ns
Output						
	Low-level output saturation voltage	$I_{OUT} = 20\text{ mA}$		0.25	0.4	V
		$I_{OUT} = 200\text{ mA}$		1.2	2.2	
	High-level output saturation voltage	$I_{OUT} = 20\text{ mA}$		1.9	2.9	V
		$I_{OUT} = 200\text{ mA}$		2	3	
t_r, t_f	Rise/fall time ⁽²⁾	$C_L = 1\text{ nF}$		20	45	ns
Undervoltage Lockout (UVLO)						
	Start threshold voltage		8.4	9.2	9.6	V
	UVLO hysteresis		0.4	0.8	1.2	V
Supply Current						
I_{su}	Startup current	$V_C = V_{CC} = V_{TH} = -0.5\text{ V}$		100	300	μA
I_{CC}	Input current			28	36	mA

(2) Specified by design. Not production tested.

APPLICATION INFORMATION

The oscillator of the UC2825A-EP is a sawtooth. The rising edge is governed by a current controlled by the RT pin and value of capacitance at the CT pin (C_{CT}). The falling edge of the sawtooth sets dead time for the outputs. Selection of RT should be done first, based on desired maximum duty cycle. CT then can be chosen, based on the desired frequency (RT) and D_{MAX}. The design equations are:

$$R_T = \frac{3\text{ V}}{(10\text{ mA}) \times (1 - D_{MAX})} \quad C_T = \frac{(1.6 \times D_{MAX})}{(R_T \times f)} \quad (1)$$

Recommended values for R_T range from 1 kΩ to 100 kΩ. Control of D_{MAX} less than 70% is not recommended.

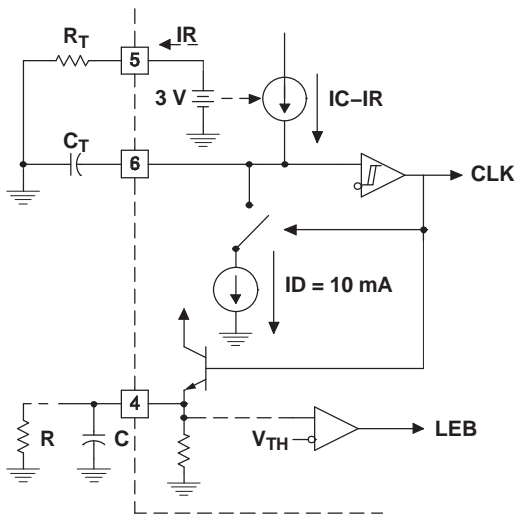


Figure 1. Oscillator

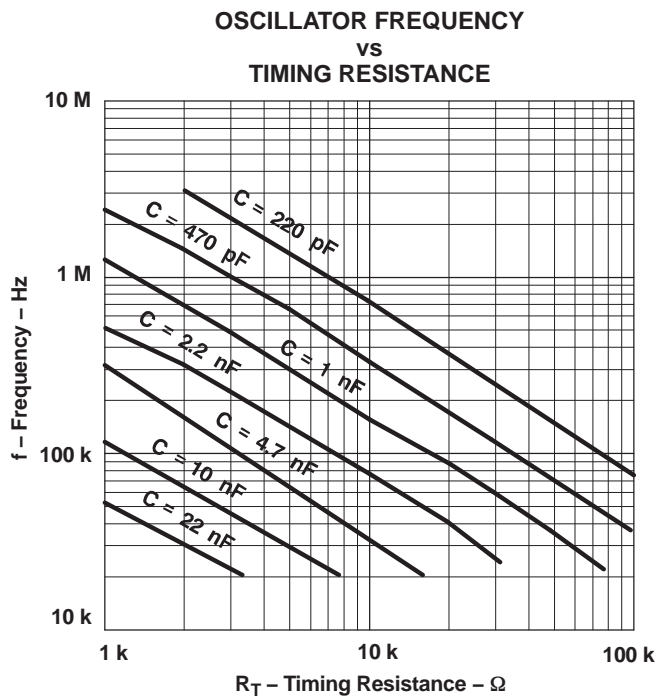


Figure 2.

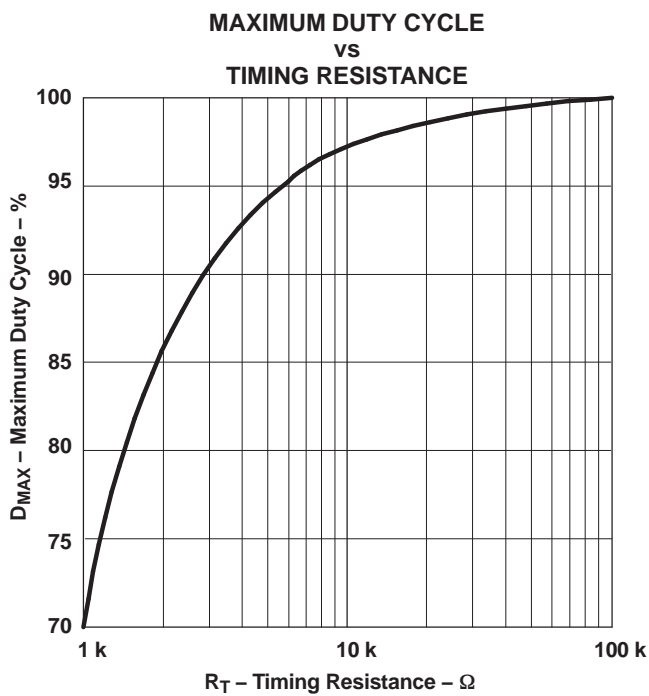


Figure 3.

Leading-Edge Blanking (LEB)

The UC2825A-EP performs fixed-frequency PWM control. The UC2825A-EP outputs are alternately controlled. During every other cycle, one output is off. Each output then switches at one-half the oscillator frequency, varying in duty cycle from 0 to less than 50%.

To limit maximum duty cycle, the internal clock pulse blanks both outputs low during the discharge time of the oscillator. On the falling edge of the clock, the appropriate output(s) is driven high. The end of the pulse is controlled by the PWM comparator, current-limit comparator, or the overcurrent comparator.

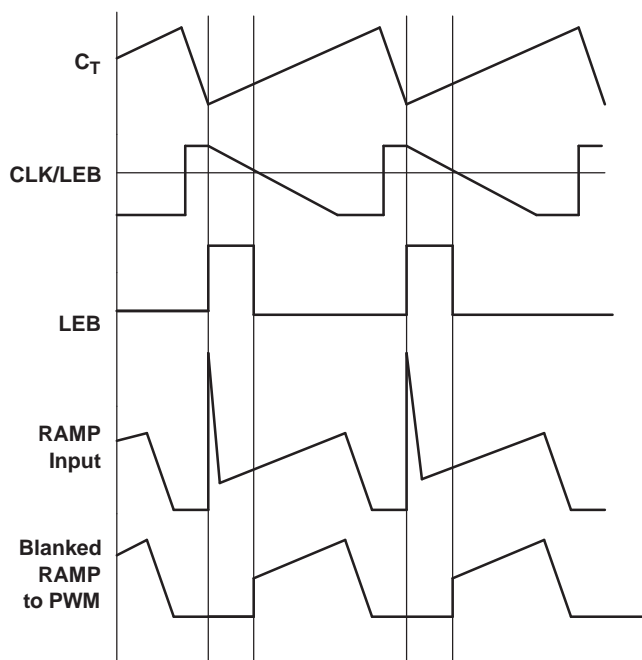
Normally the PWM comparator senses a ramp crossing a control voltage (error-amplifier output) and terminates the pulse. LEB causes the PWM comparator to be ignored for a fixed amount of time after the start of the pulse. This allows noise inherent with switched-mode power conversion to be rejected. The PWM ramp input may not require any filtering as a result of LEB.

To program an LEB period, connect a capacitor, C, to CLK/LEB. The discharge time set by C and the internal 10-k Ω resistor determines the blanked interval. The 10-k Ω resistor has a 10% tolerance. For more accuracy, an external 2-k Ω 1% resistor (R) can be added, resulting in an equivalent resistance of 1.66 k Ω with a tolerance of 2.4%. The design equation is:

$$t_{LEB} = 0.5 \times (R \parallel 10 \text{ k}\Omega) \times C \quad (2)$$

Values of R less than 2 k Ω should not be used.

LEB also is applied to the current-limit comparator. After LEB, if the ILIM pin exceeds the 1-V threshold, the pulse is terminated. The overcurrent comparator, however, is not blanked. It catches catastrophic overcurrent faults without a blanking delay. Any time the ILIM pin exceeds 1.2 V, the fault latch is set, and the outputs are driven low. For this reason, some noise filtering may be required on the ILIM pin.



UDG–95105

Figure 4. LEB Operational Waveforms

Undervoltage Lockout (UVLO), Soft-Start, and Fault Management

Soft-start is programmed by a capacitor on the soft-start (SS) pin. At power up, SS is discharged. When SS is low, the error-amplifier output also is forced low. While the internal 9- μ A source charges SS, the error-amplifier output follows until closed-loop regulation takes over.

Anytime ILIM exceeds 1.2 V, the fault latch is set and the output pins are driven low. The soft-start cap then is discharged by a 250- μ A current sink. No more output pulses are allowed until soft-start is fully discharged and ILIM is below 1.2 V. At this point, the fault latch resets and the chip executes a soft-start.

Should the fault latch get set during soft-start, the outputs are terminated immediately, but the soft-start capacitor does not discharge until it has been fully charged first. This results in a controlled hiccup interval for continuous fault conditions.

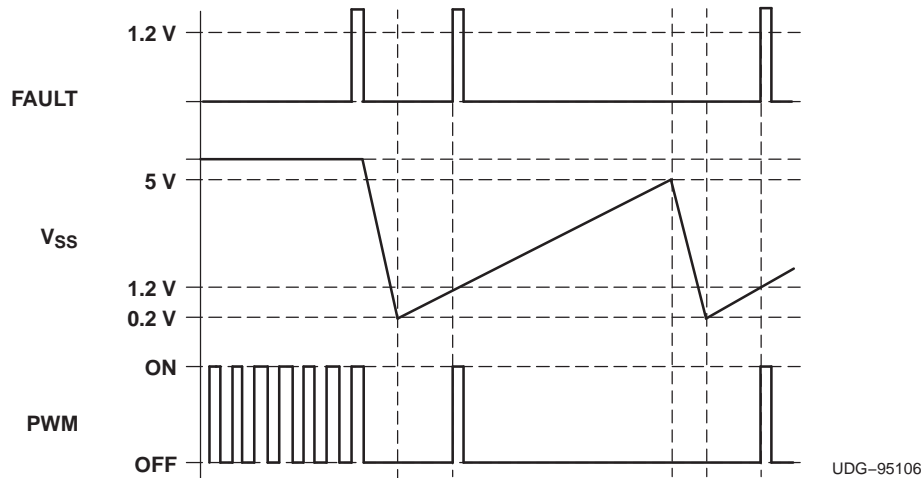
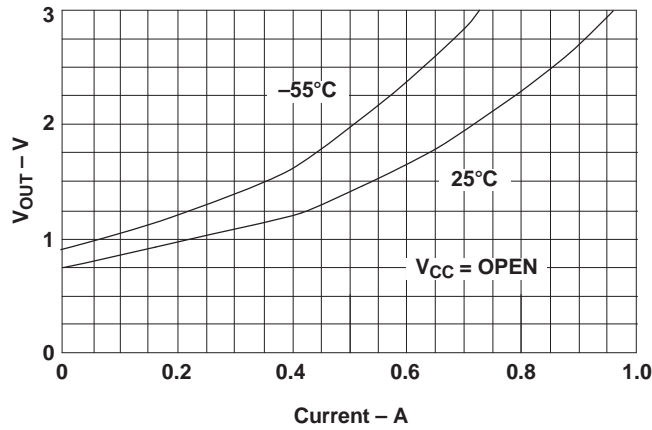


Figure 5. Soft-Start and Fault Waveforms

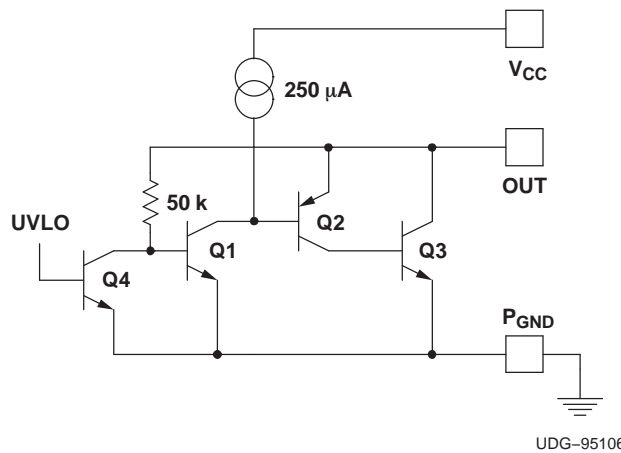
Active-Low Outputs During UVLO

The UVLO function forces the outputs to be low and considers both VCC and VREF before allowing the chip to operate.



UDG-95108

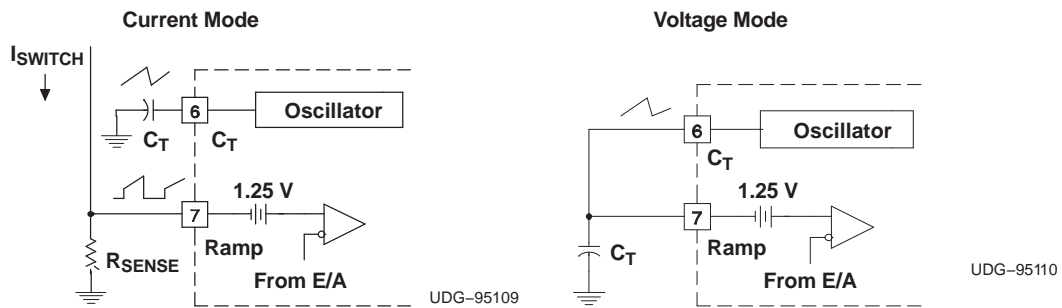
Figure 6. Output Voltage vs Output Current



UDG-95106

Figure 7. Output V and I During UVLO

Control Methods



UDG-95109

UDG-95110

Figure 8. Control Methods

Synchronization

The oscillator can be synchronized by an external pulse inserted in series with the timing capacitor. Program the free-running frequency of the oscillator to be 10% to 15% slower than the desired synchronous frequency. The pulse width should be greater than 10 ns and less than half the discharge time of the oscillator. The rising edge of the CLK/LEB pin can be used to generate a synchronizing pulse for other chips. Note that CLK/LEB no longer accepts an incoming synchronizing signal.

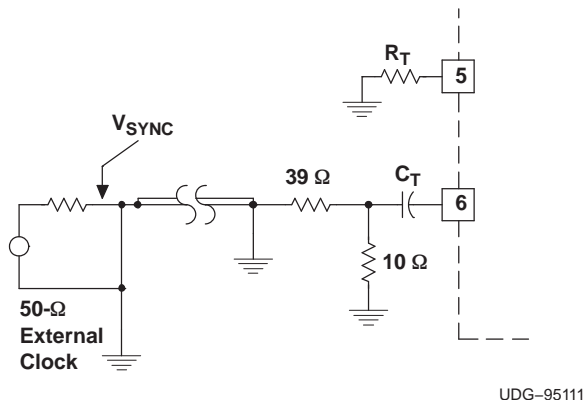


Figure 9. General Oscillator Synchronization

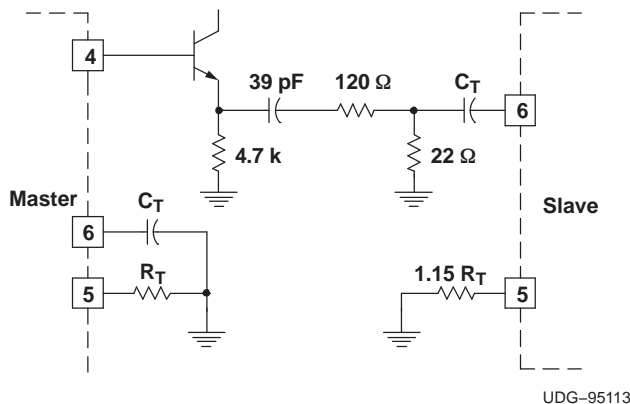
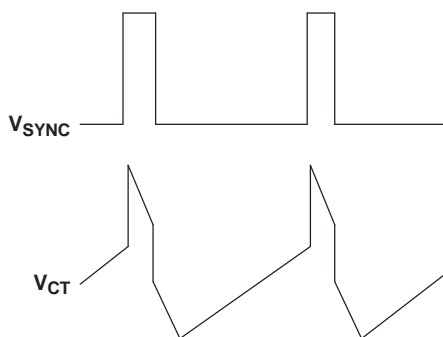


Figure 10. Two-Unit Interface

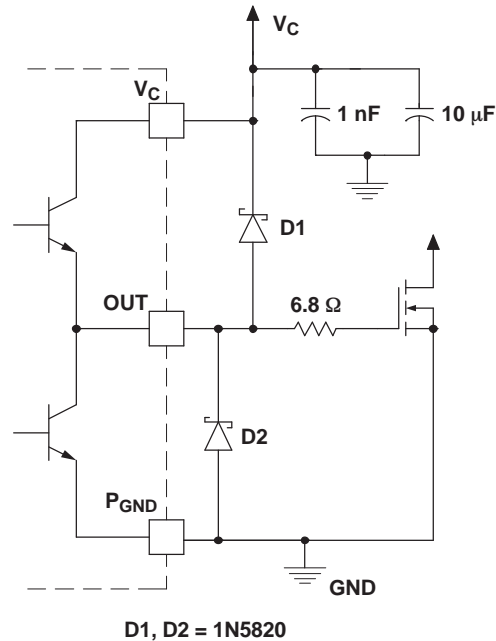


UDG-95112

Figure 11. Operational Waveforms

High-Current Outputs

Each totem-pole output of the UC2825A-EP can deliver a 2-A peak current into a capacitive load. The output can slew a 1000-pF capacitor by 15 V in approximately 20 ns. Separate collector supply (VC) and power ground (PGND) pins help decouple the device analog circuitry from the high-power gate drive noise. The use of 3-A Schottky diodes (1N5120, USD245, or equivalent) (see Figure 13) from each output to both VC and PGND are recommended. The diodes clamp the output swing to the supply rails, necessary with any type of inductive/capacitive load, typical of a MOSFET gate. Schottky diodes must be used because a low forward voltage drop is required. Do not use standard silicon diodes.



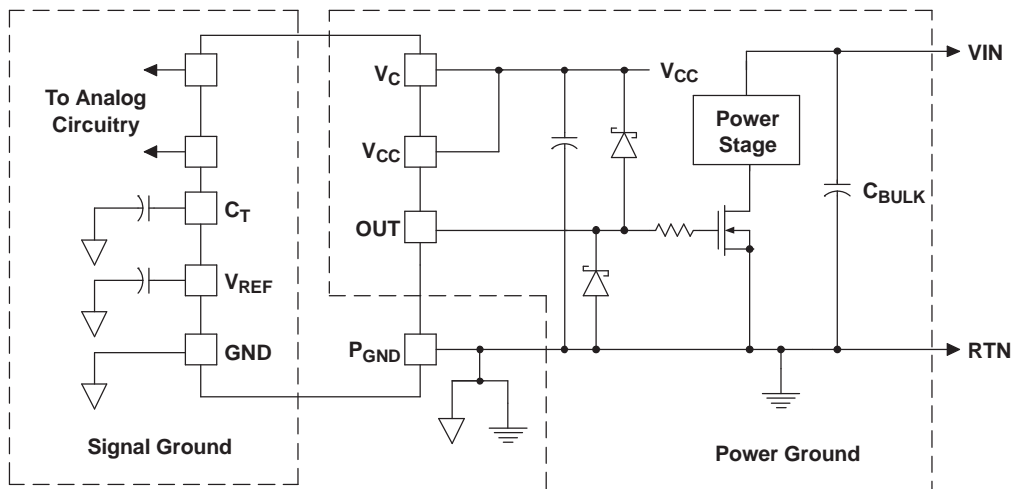
UDG–95114

Figure 12. Power MOSFET Drive Circuit

Ground Planes

Each output driver of these devices is capable of 2-A peak currents. Careful layout is essential for correct operation of the chip. A ground plane must be employed. A unique section of the ground plane must be designated for high di/dt currents associated with the output stages. This point is the power ground to which the PGND pin is connected. Power ground can be separated from the rest of the ground plane and connected at a single point, although this is not necessary if the high di/dt paths are well understood and accounted for. VCC should be bypassed directly to power ground with a good high-frequency capacitor. The sources of the power MOSFET should connect to power ground as should the return connection for input power to the system and the bulk input capacitor. The output should be clamped with a high-current Schottky diode to both VCC and PGND. Nothing else should be connected to power ground.

VREF should be bypassed directly to the signal portion of the ground plane with a good high-frequency capacitor. Low-ESR/ESL ceramic 1-mF capacitors are recommended for both VCC and VREF. All analog circuitry likewise, should be bypassed to the signal ground plane.



UDG-95115

Figure 13. Ground Planes

Open-Loop Test Circuit

This test fixture is useful for exercising many functions of this device family and measuring their specifications. As with any wideband circuit, careful grounding and bypass procedures should be followed. The use of a ground plane is highly recommended.

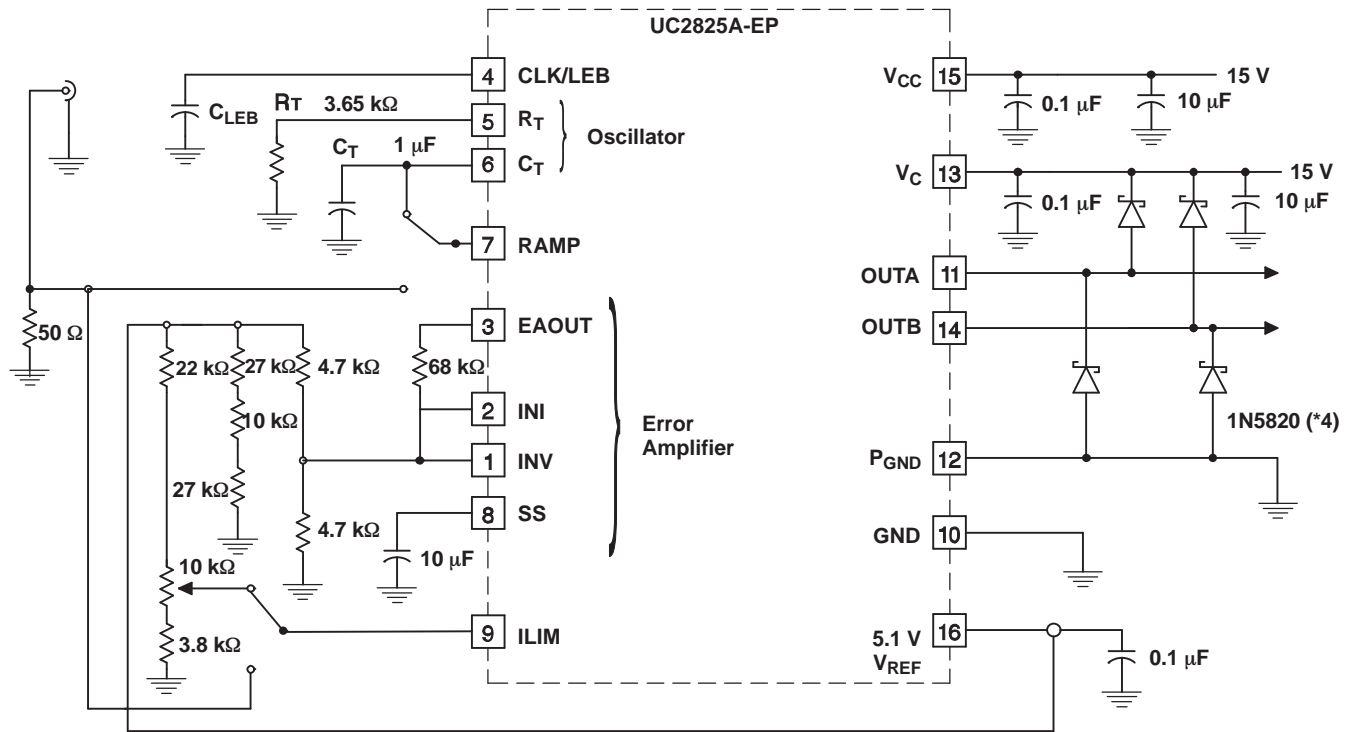


Figure 14. Open-Loop Test Circuit

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
UC2825AMDWREP	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
UC2825AMDWREPG4	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
UC2825AQDWREP	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
V62/05616-01XE	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
V62/05616-02XE	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽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⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

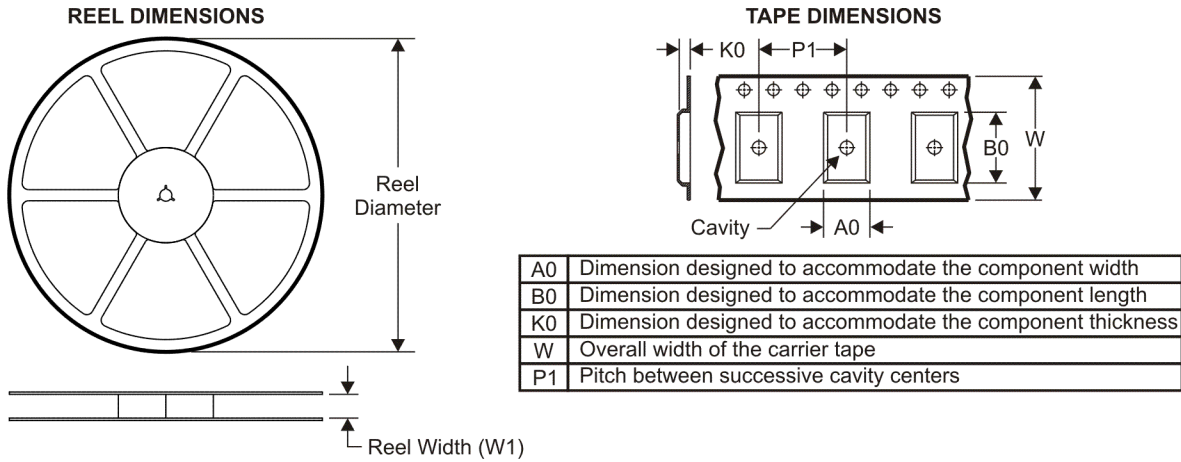
OTHER QUALIFIED VERSIONS OF UC2825A-EP :

- Catalog: [UC2825A](#)
- Automotive: [UC2825A-Q1](#)

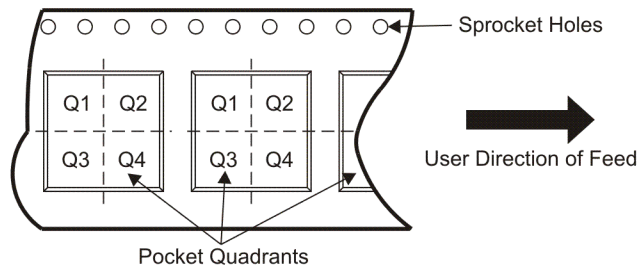
NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
UC2825AMDWREP	SOIC	DW	16	2000	330.0	16.4	10.85	10.8	2.7	12.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS

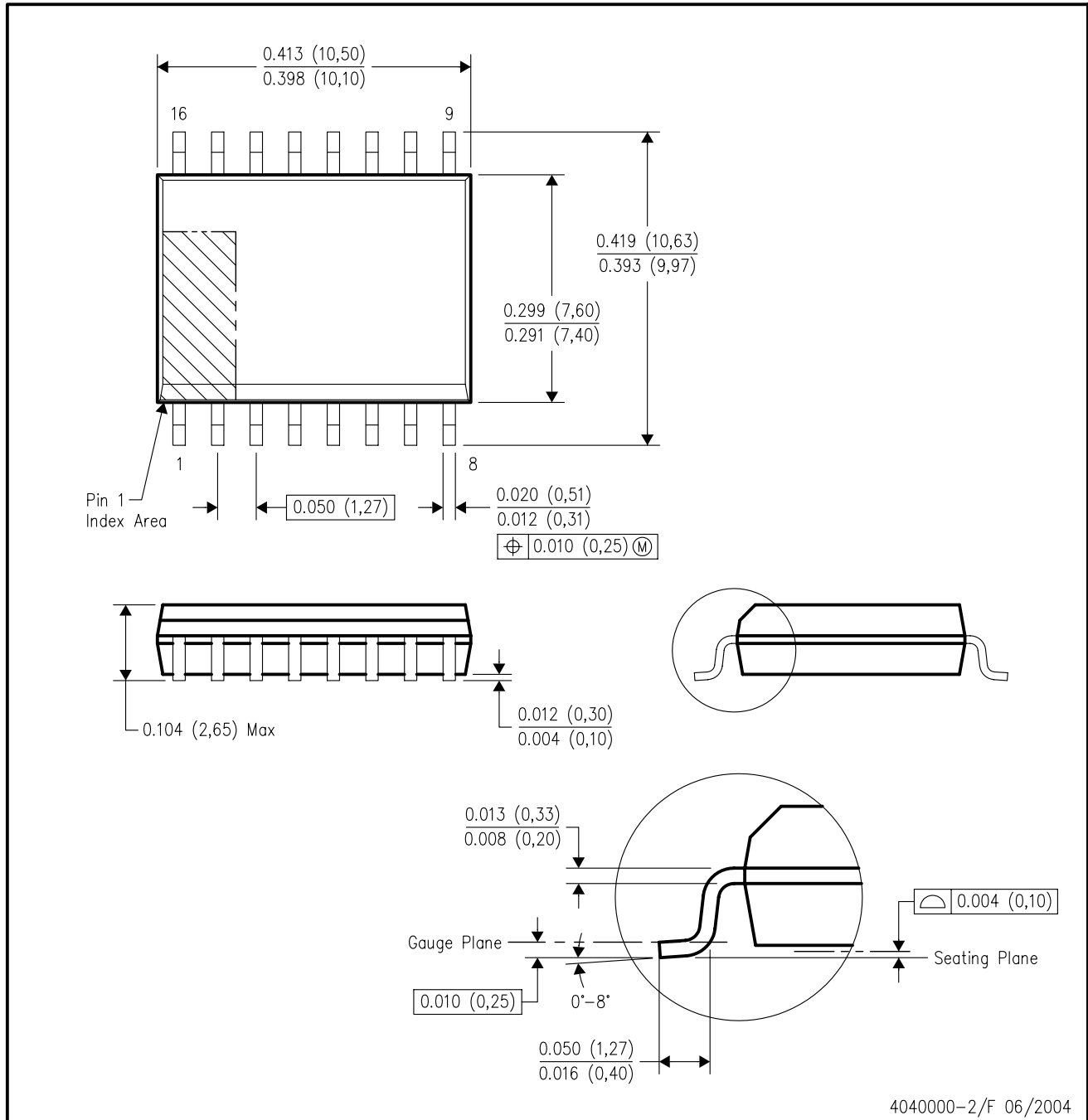


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
UC2825AMDWREP	SOIC	DW	16	2000	346.0	346.0	33.0

DW (R-PDSO-G16)

PLASTIC SMALL-OUTLINE PACKAGE



4040000-2/F 06/2004

- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
 - D. Falls within JEDEC MS-013 variation AA.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2009, Texas Instruments Incorporated