



## UR6516B

Preliminary

CMOS IC

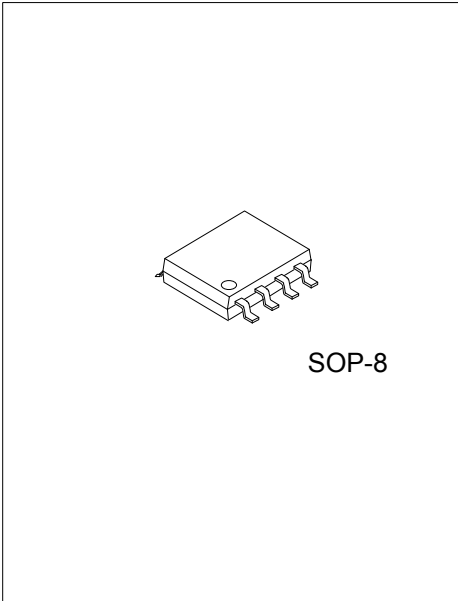
### 2A SINK & SOURCE ADJUSTABLE LINEAR BUS TERMINATOR

#### DESCRIPTION

The UTC **UR6516B** is a low cost linear regulator providing a desired output voltage or termination voltage for various applications by converting voltage supplies ranging from 1V ~ 6.0V. The desired output voltage could be programmable by two external voltage divider resistors.

The UTC **UR6516B** can source or sink up to 2A of current while regulating an output voltage to within 2% (DDR-I), 3% (DDR-II) or less.

The UTC **UR6516B** can be used in applications, such as PCI/AGP graphics, game/play station, set top box, mother board.



#### FEATURES

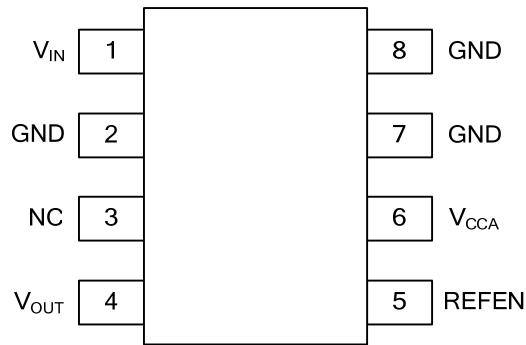
- \* Ideal for DDR-I ,DDR-II
- \* Output Voltage could Drop Down to 0.6V
- \* Source and Sink up to 2A, Without an External Heat Sink
- \* Integrated Power MOSFETs
- \* Output Voltage Varies though Adjusting External Resistors
- \* I<sub>CCQ</sub> is Lower than 500uA at V<sub>CCA</sub>
- \* Thermal Shutdown Protection, Current Limit Protection, and Short Circuit Protection Circuits Included
- \* Shutdown for Standby or Suspend Mode Operation
- \* Requiring Minimum External Components

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UR6516BL-S08-T	UR6516BG-S08-T	SOP-8	Tube
UR6516BL-S08-R	UR6516BG-S08-R	SOP-8	Tape Reel

<p>UR6516BL-S08-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Halogen Free</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) L: Lead Free, G: Halogen Free</p>
--	---

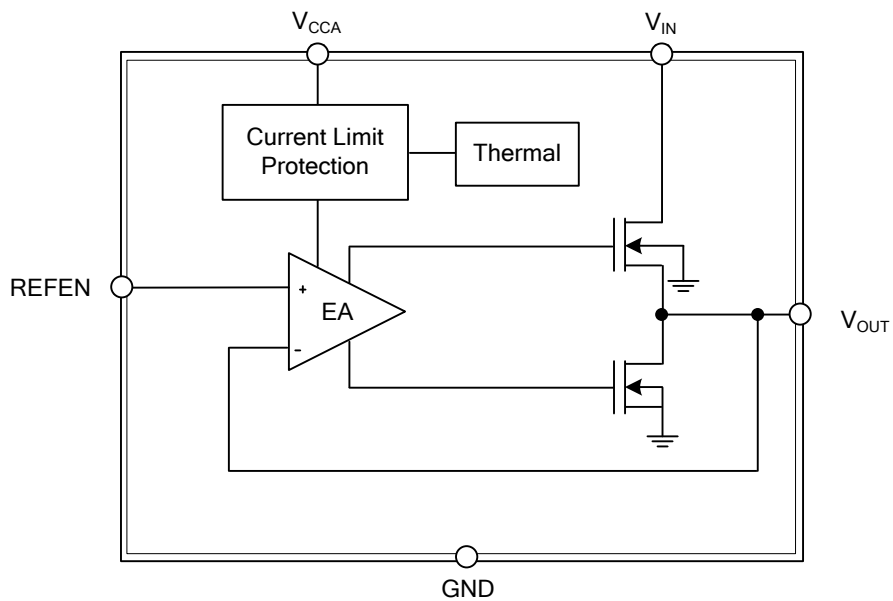
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	V <sub>IN</sub>	Input Power
2,7,8	GND	Ground
3	NC	No Connection
4	V <sub>OUT</sub>	Output Voltage
5	REFEN	Reference Voltage Input and Chip Enable
6	V <sub>CCA</sub>	Voltage Supply for Internal Circuits

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
$V_{IN}, V_{CCA}$	$V_{IN}, V_{CCA}$	7	V
Output RMS Current, Source or Sink		2	A
Storage Temperature	$T_{STG}$	-65~125	°C

Notes: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ OPERATING RATING

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Power	$V_{IN}$		1	2.5/1.8/1.5	6	V
Output Voltage	$V_{OUT}$				$V_{CCA}-1.9$	V
Reference Voltage Input and Chip Enable	REFEN				$V_{CCA}-1.9$	V
Voltage Supply for Internal Circuits	$V_{CCA}$				6	V

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Case	$\theta_{JC}$	60	°C/W

### ■ ELECTRICAL CHARACTERISTICS

( $T_A=25^\circ\text{C}$ ;  $V_{IN}=+2.5\text{V}$  and  $V_{CCA}=+3.3\text{V}$ ,  $V_{REFEN}=1.25\text{V}$ , unless otherwise specified) (Note 1)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Offset Voltage (Note 2)	$V_{OS}$	$I_{OUT}=0\text{A}$	-20		20	mV
Operating Current at $V_{IN}$	$I_{OP}$	No Load, $C_{OUT}=200\mu\text{F}$			1	mA
Load Regulation (DDR I/II)	$ \Delta V_{LOAD} $	$I_L: 0\text{A} \rightarrow 2\text{A}$		0.8/1.2	2/3	%
		$I_L: 0\text{A} \rightarrow -2\text{A}$		0.8/1.2	2/3	%
Dropout Voltage	$V_{DROPOUT}$	$V_{CCA}>V_{OUT}+1.9\text{V}$ , $I_{OUT}=2\text{A}$		0.3	0.4	V
		$V_{CCA}>V_{OUT}+1.9\text{V}$ , $I_{OUT}=1.5\text{A}$		0.2	0.25	V
Quiescent Current at $V_{CCA}$	$I_{CCQ}$	At Room Temp.		190	230	$\mu\text{A}$
Current in Shutdown Mode	$I_{SHDN}$	$V_{REFEN}<0.2\text{V}$ , $R_L=10\text{ Ohm}$		90	110	$\mu\text{A}$
Input Voltage Range (Note 3)	$V_{IN}$	No Load	1	2.5/1.8	6	V
Input Voltage Range (Note 3)	$V_{CCA}$	$R_L=10\text{ Ohm}$	3.15	3.3	6	V
<b>Short Circuit Protection</b>						
Current Limit	$I_{LIMIT}$			5		A
Short Current	$I_{SC}, V_{IN}$	Sinking	2			A
Short Current	$I_{SC}, G_{ND}$	Sourcing	2			A
<b>Over Thermal Protection</b>						
Thermal Shutdown Temperature	THSD	$3.15\text{V} \leq V_{CCA} \leq 6\text{V}$	125	150	155	°C
Thermal Shutdown Hysteresis			25	30	35	°C
<b>REFEN Function</b>						
REFEN Threshold		$V_{REFEN} < V_{IN}$ $V_{REFEN} < V_{CCA} - 1.9\text{V}$	0.4	0.5	0.6	V

- Notes: 1. Maximum ratings are stress ratings only and functional device operation is not implied.  
Limits are guaranteed by 100% testing, sampling, or correlation with worst case test conditions
2.  $V_{OS} = V_{REFEN} - V_{OUT}$
3. Keep  $V_{CCA} \geq V_{IN}$  and  $V_{CCA} \geq V_{REFEN} + 1.9\text{V}$  on operation power on and power off sequences
4. Guaranteed by design, not 100% test

## FUNCTIONAL DESCRIPTION

The UTC **UR6516B** is a low cost linear regulator, which can sink and source 2A of current without an external heat sink.

The UTC **UR6516B** incorporates power MOSFETs that are capable of sourcing and sinking 2A of current while keeping perfect voltage regulation. By using the external feedback, the output voltage can be regulated within 3% or less. Separate voltage supply inputs have been added to fit applications with various power supplies for the databus and power buses.

## OUTPUTS

The V<sub>OUT</sub> pins (output voltage pins) are connected to the databus, address, or clock lines via an external inductor. The output voltage varies depending on the input voltage.

## INPUTS

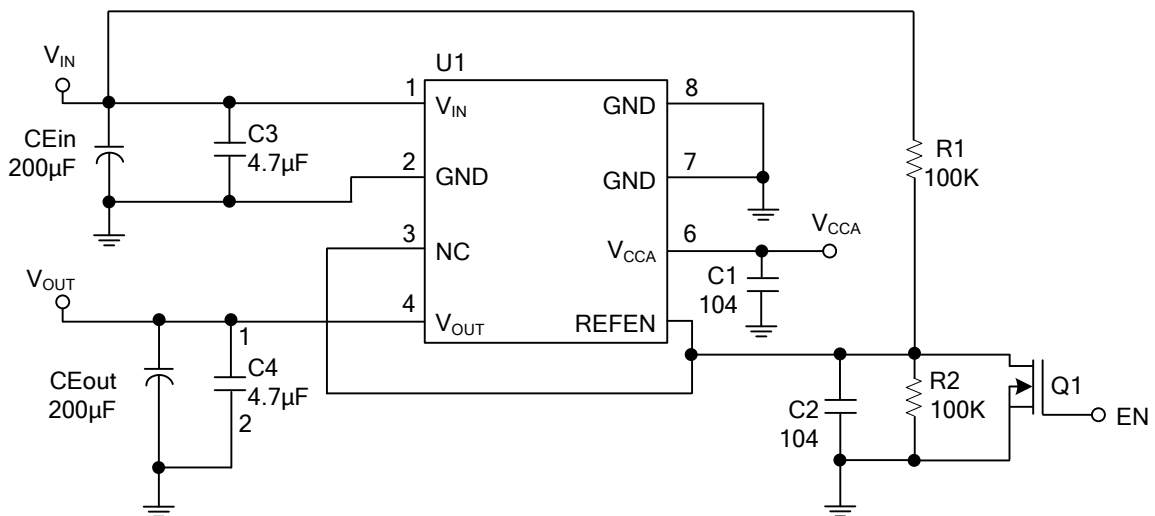
The output voltage is determined by the input voltage. The desired output voltage could be programmable by two external voltage divider resistors.

The V<sub>IN</sub> pin is suggested to connect to VDDQ of memory module for better tracking with memory VDDQ.

## OTHER SUPPLY VOLTAGES

V<sub>CCA</sub> provide the voltage supply to the logic section and internal error amplifiers of UTC **UR6516B**.

## TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.