

## 2A SINK & SOURCE ADJUSTABLE LINEAR REGULATOR

### GENERAL DESCRIPTION

The CM8562A is a low cost linear regulator designed to provide a desired output voltage or termination voltage for various applications by converting voltage supplies ranging from 1V to 6.0V. The desired output voltage could be programmable by two external voltage divider resistors.

The CM8562A is capable of sourcing or sinking up to 2A of current while regulating an output VOUT voltage to within 2%(DDR-I) , 3% (DDR-II) or less .

The CM8562A provides low profile 8-pin SOIC package to save system space.

### FEATURES

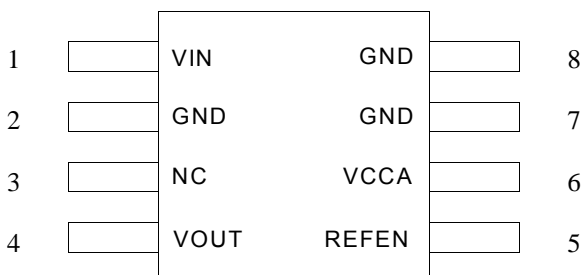
- ◆ Ideal for DDR-I and DDR-II
- ◆ 8-pin SOIC w/ power pad package
- ◆ Source and sink up to 2A , no heat sink required
- ◆ Integrated power MOSFETs
- ◆ Programmable output voltage by external resistors
- ◆ Output voltage could go down to 0.6V
- ◆ Iccq at VCCA less than 500uA
- ◆ Current limit protection and Short Circuit protection
- ◆ Thermal shutdown protection
- ◆ Shutdown for standby or suspend mode operation
- ◆ Minimum external components

### APPLICATIONS

- ◆ Mother Board
- ◆ PCI/AGP Graphics
- ◆ Game/ Play Station
- ◆ Set Top Box
- ◆ IPC
- ◆ SCSI-III Bus terminator

### PIN CONFIGURATION

SOP-8 (S08)  
Top View



### PIN DESCRIPTION

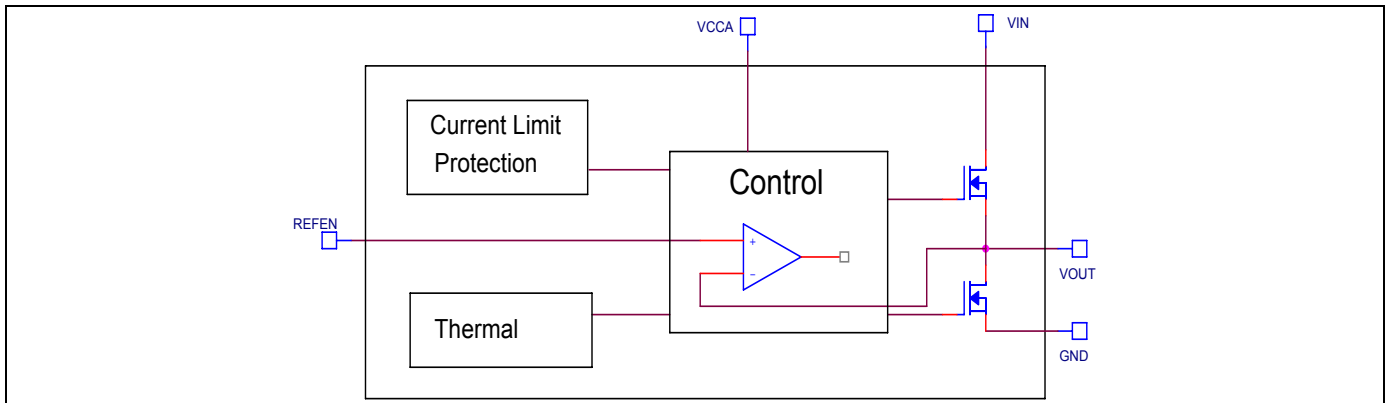
Pin No.	Symbol	Description	Operating Rating			Unit
			Min.	Typ.	Max.	
1	VIN	Input Power	1	2.5/1.8	6	V
3	NC	No Connection				V
4	VOUT	Output Voltage			VCCA-1.9	
5	REFEN	Reference Voltage Input and Chip Enable			VCCA-1.9	V
6	VCCA	Voltage supply for internal circuits			6	V
2,7,8	GND	Ground				

### ORDERING INFORMATION

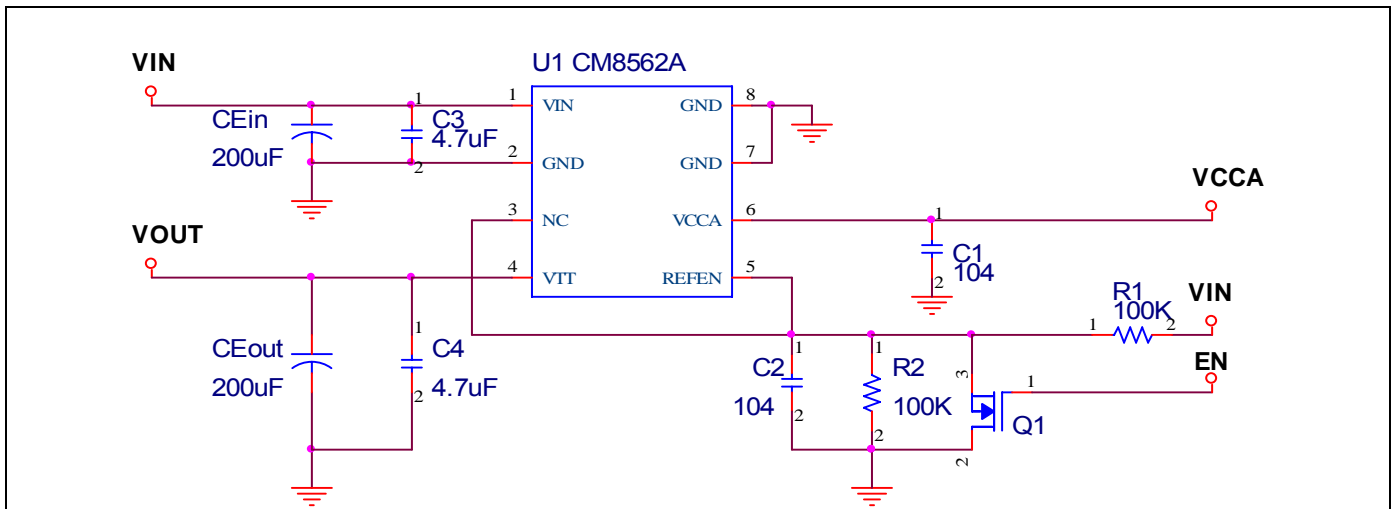
Part Number	Temperature Range	Package
CM8562AIS	-40°C to 85°C	8-Pin SOP (S08)
CM8562AGIS*	-40°C to 85°C	8-Pin SOP (S08)

\*Note : G : Suffix for Pb Free Product

### BLOCK DIAGRAM



### APPLICATION CIRCUITS



**2A SINK & SOURCE ADJUSTABLE LINEAR REGULATOR**
**ABSOLUTE MAXIMUM RATINGS**

Absolute maximum ratings are those values beyond which the device could be permanently damaged.

VIN, VCCA, VFB .....	7V	Storage Temperature .....	-65°C to 125°C
Output RMS Current, Source or Sink .....	2A	Lead Temperature (Soldering, 5 sec).....	260°C
		Thermal Resistance( $\theta_{JC}$ ).....	14°C/W (PSOP-8)
		Thermal Resistance( $\theta_{JA}$ ).....	75°C/W

**ELECTRICAL CHARACTERISTICS** (Unless otherwise stated, these specifications apply  $T_A=25^\circ\text{C}$ ;  $V_{IN}=+2.5\text{V}$  and  $V_{CCA}=+3.3\text{V}$ ,  $V_{REFEN}=1.25\text{V}$ ) maximum ratings are stress ratings only and functional device operation is not implied. (Note 1)

Symbol	Parameter	Test Conditions	CM8562A			Unit
			Min.	Typ.	Max.	
$V_{OS}$	Output Offset Voltage	$I_{OUT}=0\text{A}$ (Note 2)	-20		20	mV
$I_{OP}$	Operating Current at VIN	No load, $C_{out}=200\mu\text{F}$			1	mA
$ \Delta V_{LOAD} $	Load Regulation (DDR I/II)	$I_L: 0\text{A} \rightarrow 2\text{A}$		0.8/1.2	2/3	%
		$I_L: 0\text{A} \rightarrow -2\text{A}$		0.8/1.2	2/3	%
$V_{DROPOUT}$	Dropout Voltage	$V_{CCA}>V_{OUT}+1.9\text{V}$ $I_{out}=2\text{A}$		0.3	0.4	V
		$V_{CCA}>V_{OUT}+1.9\text{V}$ $I_{out}=1.5\text{A}$		0.2	0.25	V
$I_{CCQ}$	Quiescent Current at $V_{CCA}$	At Room Temp.		190	230	$\mu\text{A}$
$I_{SHDN}$	Current in Shutdown Mode	$REFEN<0.2\text{V}$ , $R_L = 10\text{ Ohm}$		90	110	$\mu\text{A}$
$V_{IN}$	Input Voltage Range (Note 3)	No Load	1	2.5/1.8	6	V
$V_{CCA}$	Input Voltage Range (Note 3)	$R_L = 10\text{ Ohm}$	3.15	3.3	6	V
<b>SHORT CIRCUIT PROTECTION</b>						
$I_{LIMIT}$	Current Limit			5		A
$I_{SC,VIN}$	Short Current	Sinking	2			A
$I_{SC,GND}$	Short Current	Sourcing	2			A
<b>OVER THERMAL PROTECTION</b>						
THSD	Thermal Shutdown Temperature	$3.15\text{V}\leq V_{CCA}\leq 6\text{V}$	125	150	155	$^\circ\text{C}$
	Thermal Shutdown Hysteresis		25	30	35	$^\circ\text{C}$
<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

**Note 1:** Limits are guaranteed by 100% testing, sampling, or correlation with worst case test conditions

**Note 2:**  $V_{OS} = V_{REFEN} - V_{OUT}$

**Note 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

**Note 4:** Guaranteed by design, not 100% test

## FUNCTIONAL DESCRIPTION

The CM8562A is a linear regulator that is capable of sinking and sourcing 2A of current without an external heat sink.

The CM8562A integrates power MOSFETs that are capable of source and sink 2A of current while maintaining excellent voltage regulation. The output voltage can be regulated within 3% or less by using the external feedback. Separate voltage supply inputs have been added to fit applications with various power supplies for the databus and power buses.

### OUTPUTS

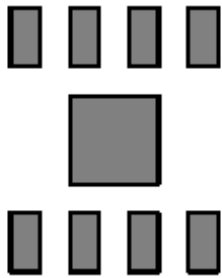
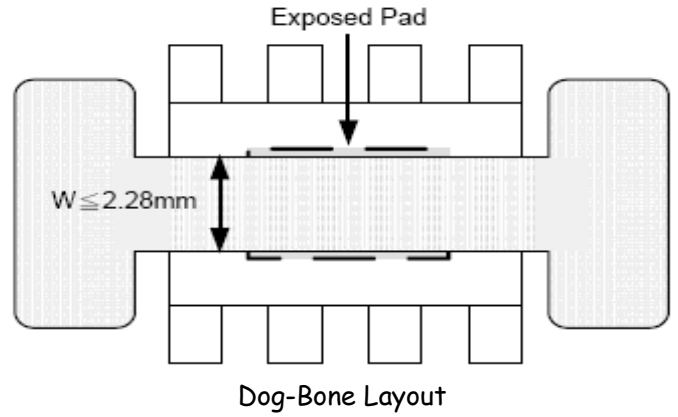
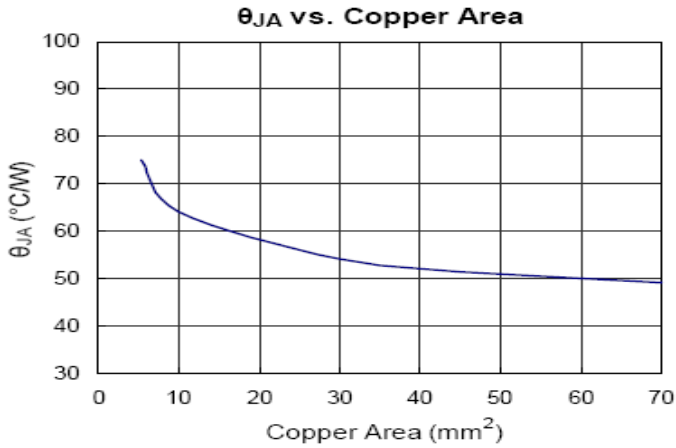
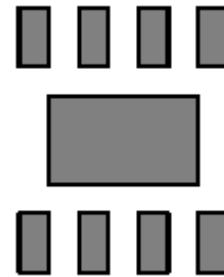
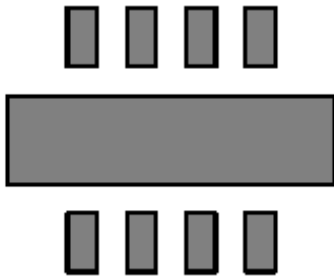
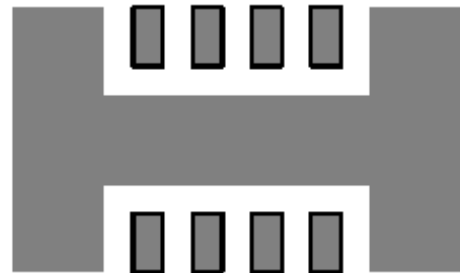
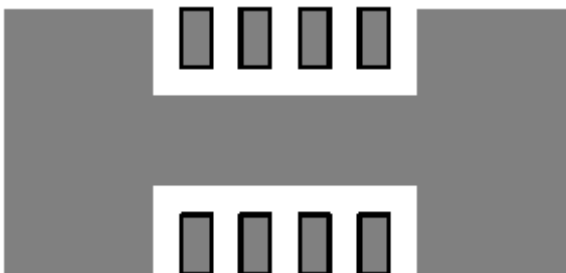
The output voltage pins (VOUT) are tied to the databus, address, or clock lines via an external inductor. Output voltage is determined by the VIN.

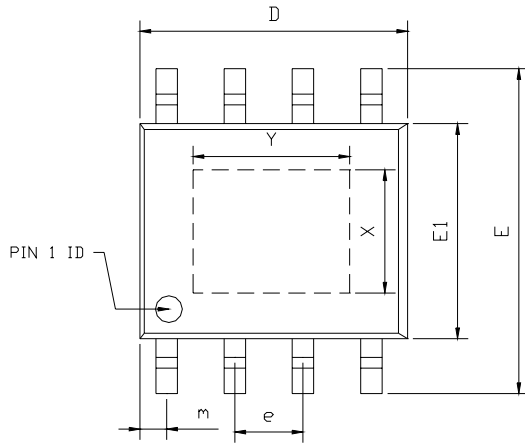
### INPUTS

The input voltage pins (VIN) determine the output voltages (VOUT). At CM8562A, the desired output voltage could be programmable by two external voltage divider resistors. VIN is suggested to connect to VDDQ of memory module for better tracking with memory VDDQ.

### OTHER SUPPLY VOLTAGES

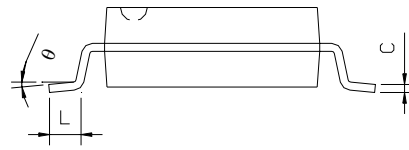
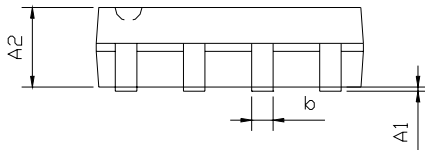
VCCA provide the voltage supply to the logic section and internal error amplifiers of CM8562A.

**DIFFERENT HEATSINK AREA**
**Thermal Resistance vs. Different Cooper Area Layout Design**

 Minimum Footprint ,  $\theta_{JA} = 75^{\circ}\text{C}/\text{W}$ 

 Copper Area =  $10\text{mm}^2$  ,  $\theta_{JA} = 64^{\circ}\text{C}/\text{W}$ 

 Copper Area =  $30\text{mm}^2$  ,  $\theta_{JA} = 54^{\circ}\text{C}/\text{W}$ 

 Copper Area =  $50\text{mm}^2$  ,  $\theta_{JA} = 51^{\circ}\text{C}/\text{W}$ 

 Copper Area =  $70\text{mm}^2$  ,  $\theta_{JA} = 49^{\circ}\text{C}/\text{W}$

**PACKAGE DIMENSION**
**8-Pin SOP w/ Power Pad (PS08)**


SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A1	0.10	---	0.25	0.004	---	0.010
A2	1.40	---	1.55	0.055	---	0.061
b	0.30	---	0.51	0.012	---	0.020
C	0.15	---	0.28	0.006	---	0.010
D	4.60	---	5.06	0.169	---	0.199
E	5.79	---	6.20	0.228	---	0.244
E1	3.76	---	4.01	0.148	---	0.158
e	---	1.27	---	---	0.050	---
L	0.38	---	0.69	0.015	---	0.035
m	0.43	---	0.69	0.017	---	0.027
θ	0°	---	8°	0°	---	8°

EXPOSED PAD DIMENSION : (mm)  
 PAD SIZE: X=2.34 ; Y=2.92



**IMPORTANT NOTICE**

Champion Microelectronic Corporation (CMC) reserves the right to make changes to its products or to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

A few applications using integrated circuit products may involve potential risks of death, personal injury, or severe property or environmental damage. CMC integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life-support applications, devices or systems or other critical applications. Use of CMC products in such applications is understood to be fully at the risk of the customer. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

**HsinChu Headquarter**

5F, No. 11, Park Avenue II,  
Science-Based Industrial Park,  
HsinChu City, Taiwan 300

TEL: +886-3-567 9979

FAX: +886-3-567 9909

<http://www.champion-micro.com>

**Sales & Marketing**

7F-6, No.32, Sec. 1, Chenggong Rd.,  
Nangang District, Taipei City 115, Taiwan

TEL: +886-2-2788 0558

FAX: +886-2-2788 2985