## GENERAL DESCRIPTION

The CM8566 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 1.6V to 6.0V. The desired output voltage could be programmable by two external voltage divider resistors.

The CM8566 is capable of sourcing or sinking up to 2A of current while regulating an output VOUT voltage .

The CM8566 provides low profile 8-pin SOIC package to save system space.

## FEATURES

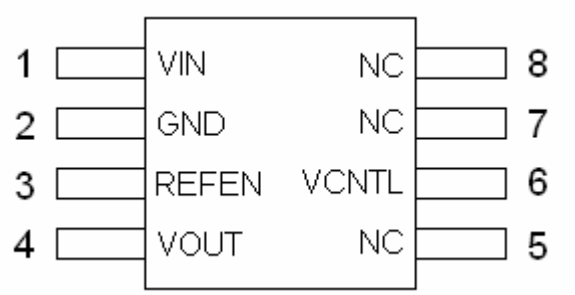
- 8-pin SOIC w/ power pad package
- 2 ways to adjust the output, VOUT with VFB pin
- Source and sink up to 2A , no heat sink required
- Integrated power MOSFETs
- Programmable output voltage by external resistors
- Output voltage could go down to 0.6V
- Iccq at VCCA less than 500uA
- Current limit protection 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



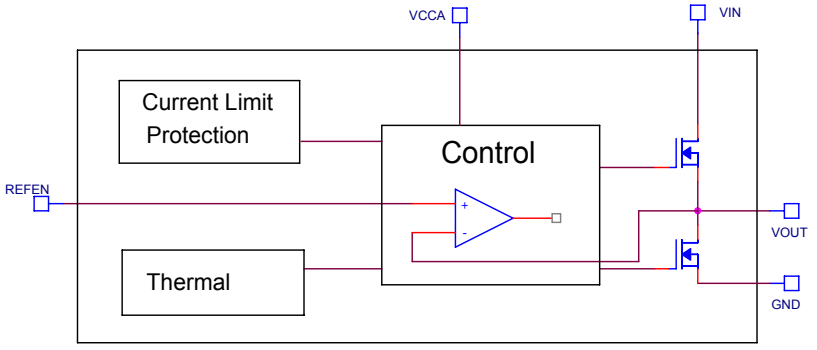
## PIN DESCRIPTION

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

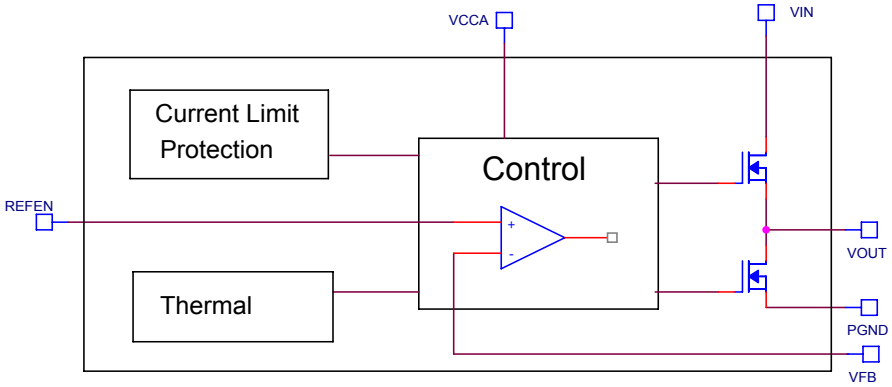
## ORDERING INFORMATION

| Part Number | Temperature Range | Package |
|---|---|---|
| CM8566IS | -40℃ to 85℃ | 8-Pin SOP (S08) |
| CM8566GIS | -40℃ to 85℃ | 8-Pin SOP (S08) |

## BLOCK DIAGRAM

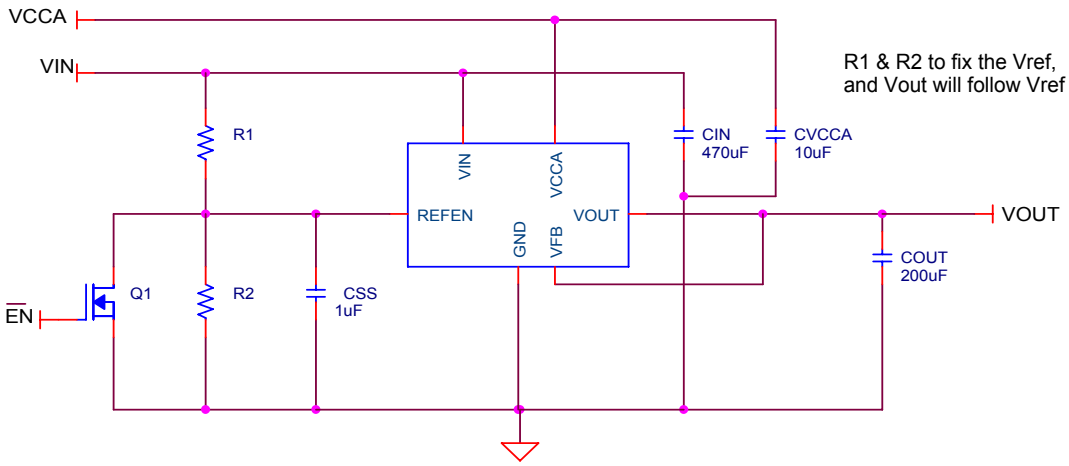



**5-Pin Block Diagram**

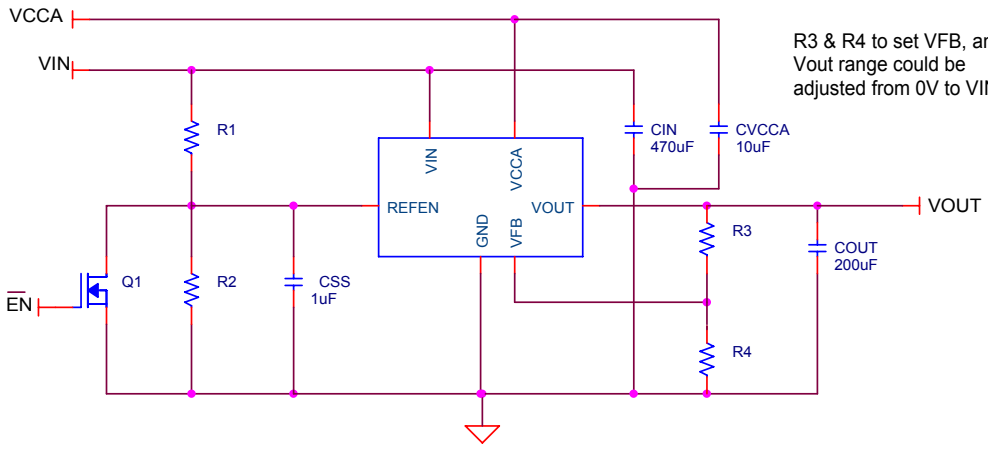



**8-Pin Block Diagram**

## APPLICATION CIRCUITS




**Application Circuit as Fixed LDO**




**Application Circuit as Adjustable LDO**

## ABSOLUTE MAXIMUM RATINGS

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

VIN, VCCA, VFB ……..6V

Output RMS Current, Source or Sink ……..2A

Storage Temperature …….. -65°C to 125°C

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°C; VIN=+2.5V and VCCA=+3.3V, VREFEN=1.25V)** maximum ratings are stress ratings only and functional device operation is not implied. (Note 1)

| Symbol | Parameter | Test Conditions | CM8566 | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $V_{OS}$ | Output Offset Voltage | $I_{OUT}$=0A (Note 2) | -20 | -5 | 20 | mV |
| $\lvert \Delta V_{LOAD} \rvert$ | Load Regulation (DDR I/II) | $I_L$: 0A -> 2A | -- | 0.5 | 2 | % |
| | | $I_L$: 0A -> -2A | -- | 0.5 | 2 | |
| $I_{SHDN}$ | Current in Shutdown Mode | REFEN<0.2V, $R_L$ = 180Ω | -- | 1 | 90 | μA |
| $V_{IN}$ | Input Voltage Range (DDR I/II) | Keep $V_{CNTL} \geqq V_{IN}$ on operation power on and power off sequences | 1.6 | 2.5/1.8 | -- | V |
| $V_{CNTL}$ | | | | 3.3 | 6 | |
| **SHORT CIRCUIT PROTECTION** | | | | | | |
| $I_{LIMIT}$ | Current Limit | | -- | 2.5 | -- | A |
| $I_Q$ | Quiescent Current | $I_L$=2.0A | -- | 1.4 | 3 | mA |
| **OVER THERMAL PROTECTION** | | | | | | |
| $T_{CASE}$ | Thermal Shutdown Temperature | $3.3V \leqq V_{CNTL} \leqq 5V$ | -- | 100 | -- | ℃ |
| | Thermal Shutdown Hysterresis | Guaranteed by design | -- | 30 | -- | ℃ |
| **SHUTDOWN FUNCTION** | | | | | | |
| | Shutdown Threshold Trigger | Output = High | 0.8 | -- | -- | V |
| | | Output = Low | -- | -- | 0.2 | |

**Note 1:** Exceeding the absolute maximum rating may damage the device.

**Note 2:** $V_{OS}$ Offset is the voltage measurement defined as $V_{OUT}$ subtracted from $V_{REFEN}$.

## FUNCTIONAL DESCRIPTION

The CM8566 is a linear regulator that is capable of sinking and sourcing 2A of current without an external heat sink.

The CM8566 integrates power MOSFETs that are capable of source and sink2A 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

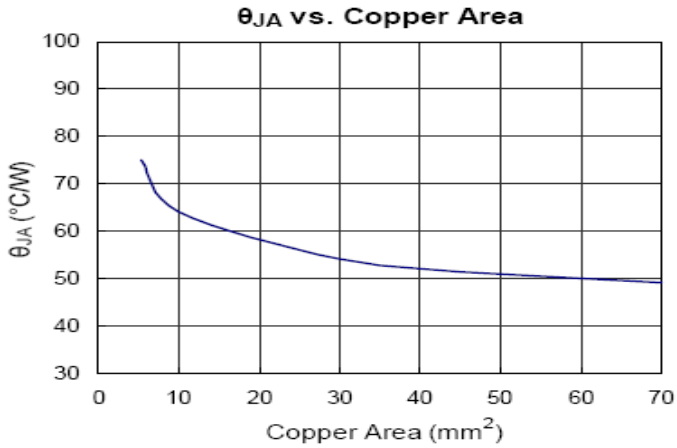
The input voltage pins (VIN) determine the output voltages (VOUT). At CM8566, the desired output voltage could be programmable by two external voltage divider resistors. VIN is suggested to connect to VDDQ of memory module for better tracking with memory VDDQ.

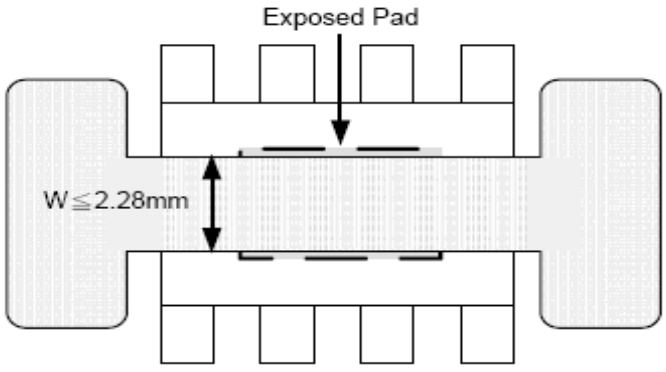
### OTHER SUPPLY VOLTAGES

VCCA provide the voltage supply to the logic section and internal error amplifiers of CM8566.

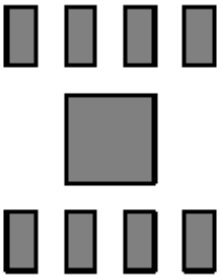
## DIFFERENT HEATSINK AREA

**Thermal Resistance vs. Different Cooper Area Layout Design**

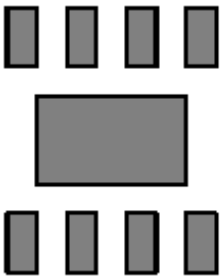


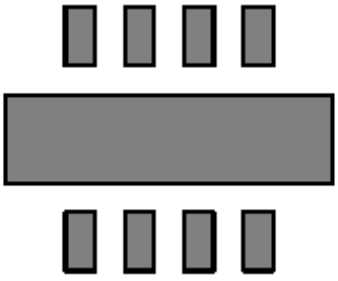

Dog-Bone Layout



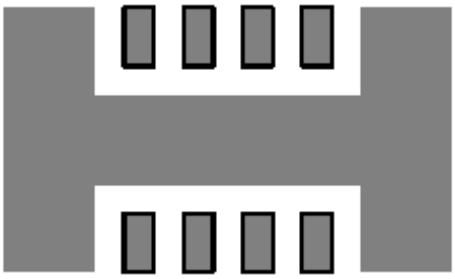
Minimum Footprint , $\theta_{JA}$ = 75℃/W



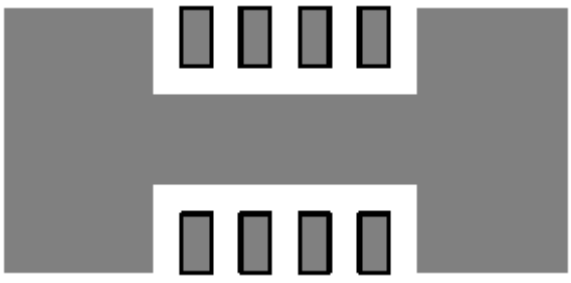
Copper Area = 10mm$^2$ , $\theta_{JA}$ = 64℃/W



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



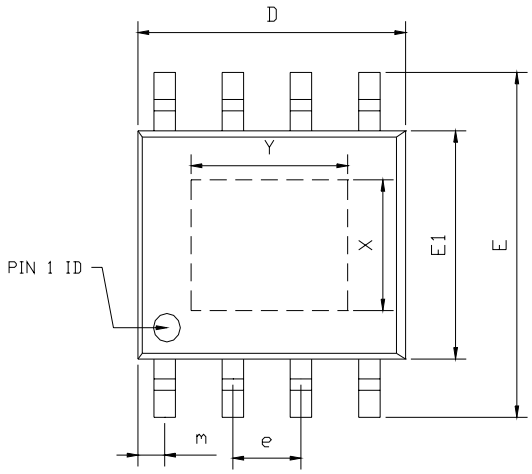
Copper Area = 50mm$^2$ , $\theta_{JA}$ = 51℃/W



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

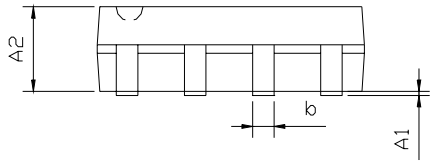
## PACKAGE DIMENSION

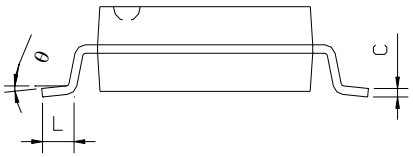
**8-Pin SOP w/ Power Pad (PS08)**




| 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 | --- | 0.26 | 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



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**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**

11F, No. 306-3, Sec. 1, Ta Tung Rd.,
Hsichih, Taipei Hsien,
Taiwan 221

TEL: +886-2-8692 1591
FAX: +886-2-8692 1596