

GENERAL DESCRIPTION

The CM1086 is a high performance low dropout regulator rated for 1.5A output current with fixed 2.5V/3.3V and adjustable output. It is designed for use in applications requiring low dropout characteristics over the rated current range.

On chip trimming adjusts the reference voltage to 1%. These features are ideal for low voltage microprocessor applications requiring a regulated 2.5V to 3.6V power supply.

In addition, the CM1086 provides the device protections including over current and thermal shutdown. Also, reverse battery protection scheme limits the reverse current when the input voltage falls below the output.

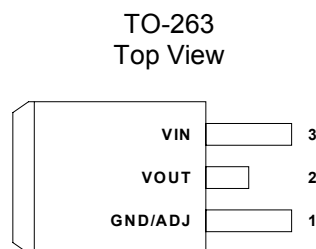
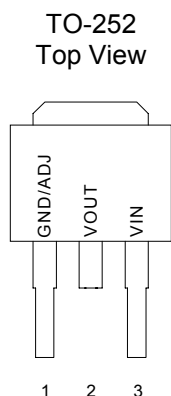
FEATURES

- ◆ Three Terminal Adjustable or Fixed Voltages: 2.5V, 3.3V, and adjustable.
- ◆ Output Current of 1.5A
- ◆ Reverse Battery Protection
- ◆ Fast Transient Response
- ◆ Short Circuit Protection
- ◆ Internal Thermal Overload Protection
- ◆ TO-263 and TO-252 package available

APPLICATIONS

- ◆ Power Supplies
- ◆ Computer Add-On Cards
- ◆ Other Applications Requiring Low Dropout Voltage Over Rated Current

PIN CONFIGURATION



ORDERING INFORMATION

Package Type		Operating Temperature Range (T _A)	Output Voltage
TO-252	TO-263		
CM1086KCN252	CM1086KCN263	0°C ~ +70°C	2.5V
CM1086SCN252	CM1086SCN263	0°C ~ +70°C	3.3V
CM1086CN252	CM1086CN263	0°C ~ +70°C	ADJ.

ABSOLUTE MAXIMUM RATINGS

Input Voltage +13V
 Operating Junction Temperature Range, T_J 0°C to +150°C
 Storage Temperature -65°C to +150°C
 Lead Temperature (10 sec.) 260°C

POWER DISSIPATION TABLE

Package	Θ_{JA} (°C/W)	Derating factor (mW/°C) $T_A \geq 25^\circ\text{C}$	$T_A \leq 25^\circ\text{C}$ Power rating (mW)	$T_A = 70^\circ\text{C}$ Power rating (mW)	$T_A = 85^\circ\text{C}$ Power rating (mW)
TO-252	80	12.5	1562	1000	812
TO-263	45	22.2	2775	1776	1443

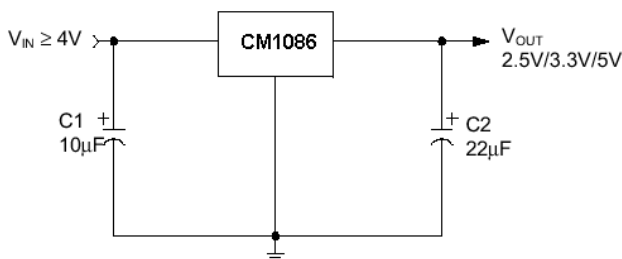
Note:

- Θ_{JA} : Thermal Resistance-Junction to Ambient, D_F : Derating factor, P_O : Power consumption.
 Junction Temperature Calculation: $T_J = T_A + (P_D \times \Theta_{JA})$, $P_O = D_F \times (T_J - T_A)$
 The Θ_{JA} numbers are guidelines for the thermal performance of the device/PC-board system.
 All of the above assume no ambient airflow.
- Θ_{JT} : Thermal Resistance-Junction to Ambient, T_C : case (Tab) temperature, $T_J = T_C + (P_D \times \Theta_{JA})$

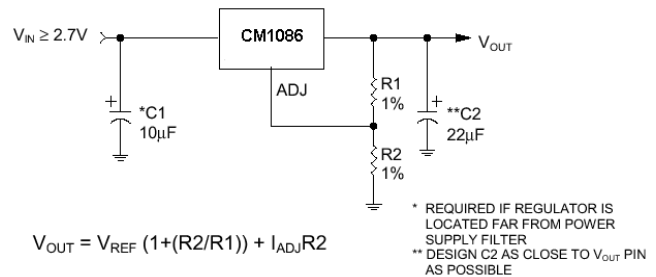
RESOMMENED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max	Units
Input Voltage	V_{IN}	2.7		12	V
Load Current (with adequate heatsinking)	I_O	10			mA
Input Capacitor (V_{IN} to GND)		1.0			μF
Output Capacitor with ESR of 10 Ω max. (V_{OUT} to GND)		10			μF
Operating Ambient Temperature Range		0		70	°C
Junction Temperature	T_J			125	°C

APPLICATION CIRCUIT

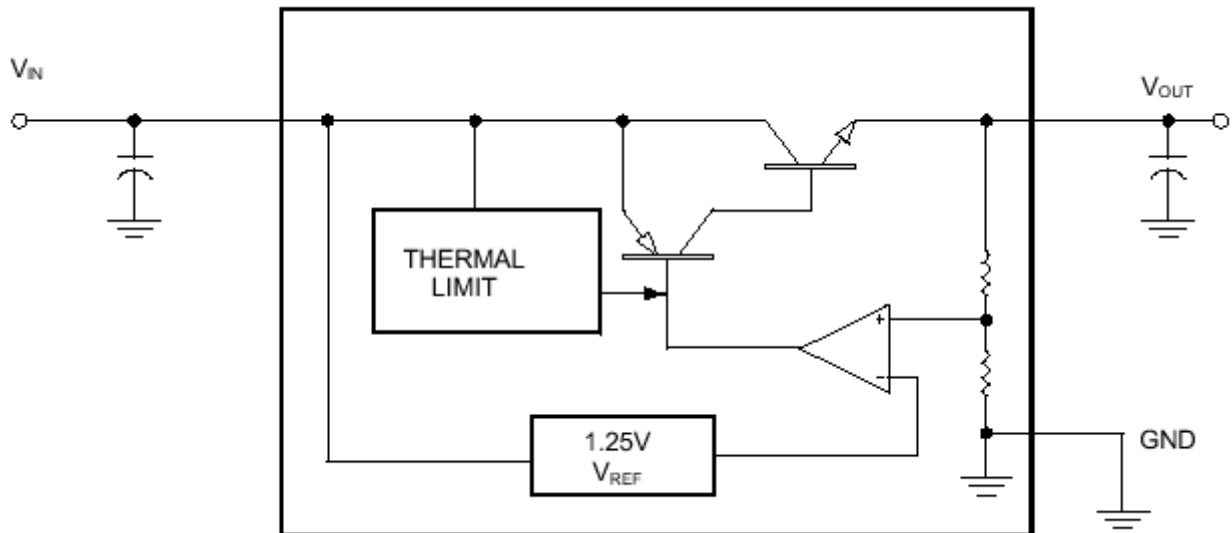


Fixed Output Voltage Regulator

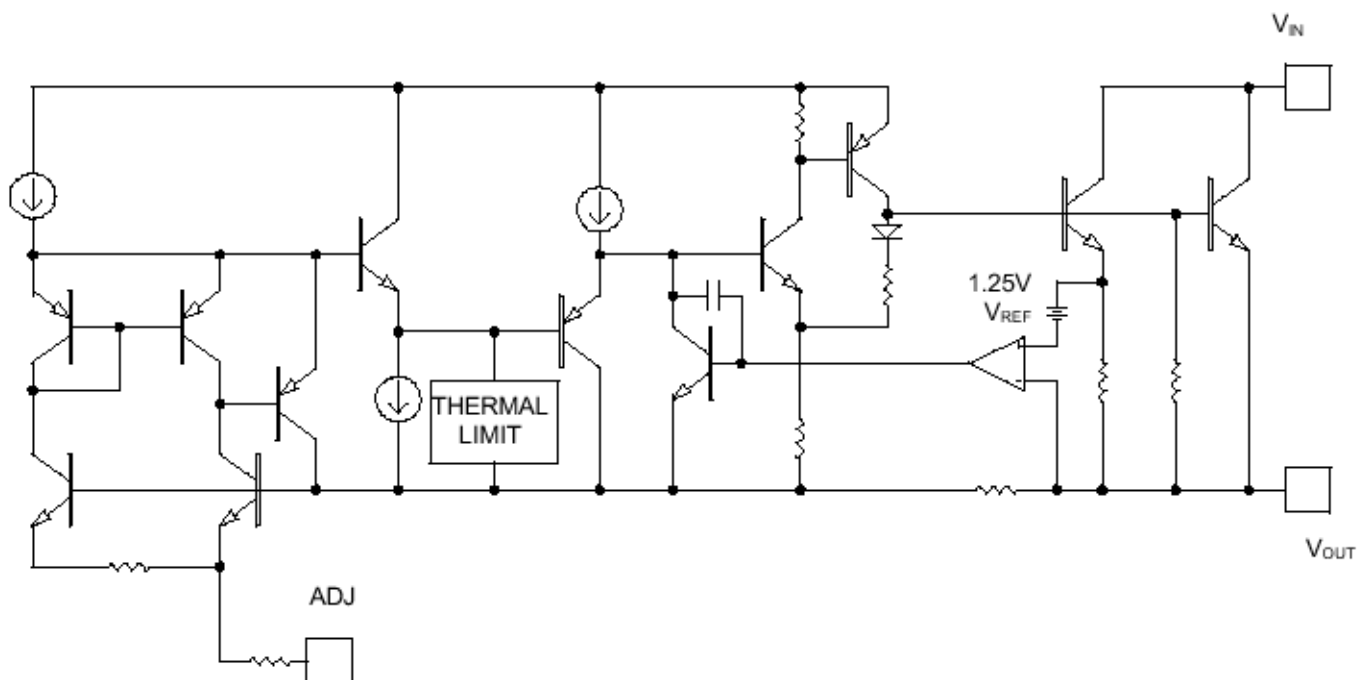


Adjustable Voltage Regulator

BLOCK DIAGRAM



Fixed Output Voltage Regulator Schematic



Adjustable Voltage Regulator Schematic

ELECTRICAL CHARACTERISTICS

Electrical Characteristics at $I_{OUT} = 0\text{mA}$, and $T_J = +25^\circ\text{C}$; unless otherwise noted

Parameter	Device	Test Conditions	CM1086			Unit
			Min.	Typ.	Max.	
Reference Voltage (Note 1)	CM1086	(Note 1) $10\text{mA} \leq I_{OUT} \leq 1.5\text{A}$	1.238 1.230	1.250 1.250	1.262 1.270	V
Output Voltage	CM1086K	$T_A = +25^\circ\text{C}$	2.475	2.500	2.525	V
	CM1086S		3.267	3.300	3.333	V
Output Voltage	CM1086K	$I_{OUT} = 10\text{mA to } 3\text{A}$	2.460	2.500	2.540	V
	CM1086S		3.247	3.300	3.353	V
Line Regulator (Note 1)	CM1086	$1.5\text{V} + V_{OUT} \leq V_{IN} \leq 12\text{V}$		0.04	0.20	%
Load Regulation (Note 1)	CM1086	$I_{OUT} = 10\text{mA to } 3\text{A}$		0.08	0.3	%
Dropout Voltage (Note 2)		$I_{OUT} = 10\text{mA}$		1.00	1.15	V
		$I_{OUT} = 3\text{A}$		1.15	1.30	V
Current Limit		$(V_{IN} - V_{OUT}) = 2\text{V}$	1.5	3		A
Minimum Load Current (Note 3)				5	10	mA
Quiescent Current	CM1086K/S	$V_{IN} \leq 12\text{V}$, $I_{OUT} = 10\text{mA to } 3\text{A}$		8	13	mA
Ripple Rejection (Note 4)		$f_O = 120\text{Hz}$, $V_{RIPPLE} = 1\text{V}_{PP}$, $I_{OUT} = 100\text{mA}$	60	80		dB

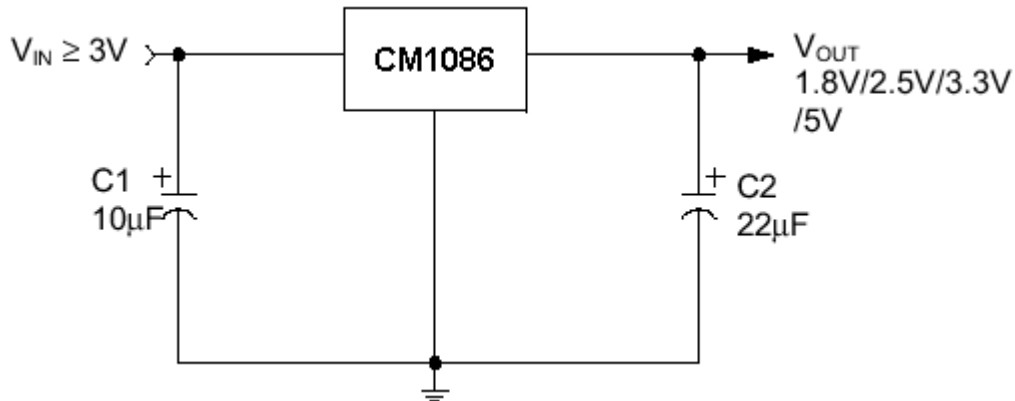
Note 1: Line and load regulations are guaranteed up to maximum power dissipation determined by input/output differential and the output current. However, the maximum power will not be available over the full input/output voltage range.

Note 2: The specifications represent the minimum input/output voltage required to maintain 1% regulation.

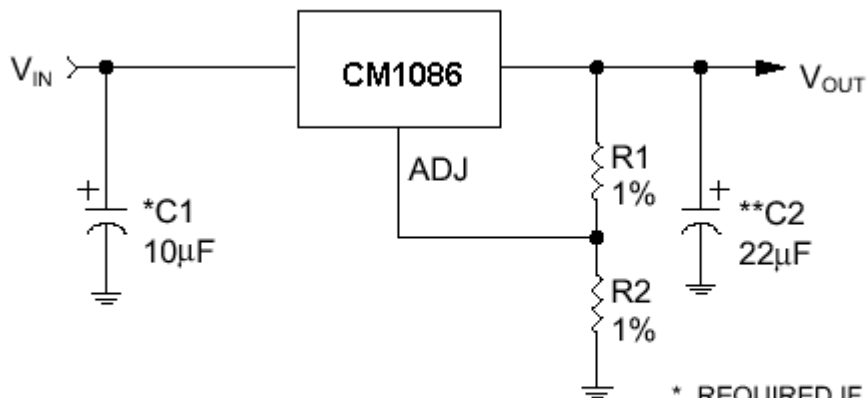
Note 3: The minimum load current is the minimum current required to maintain regulation. Normally the current in the resistor divider used to set the output voltage is selected to meet the minimum load current requirement.

Note 4: These parameters, although guaranteed, are not tested in production prior to shipment.

APPLICATION CIRCUIT



Fixed Output Voltage Regulator



$$V_{OUT} = V_{REF} (1 + (R2/R1)) + I_{ADJ} R2$$

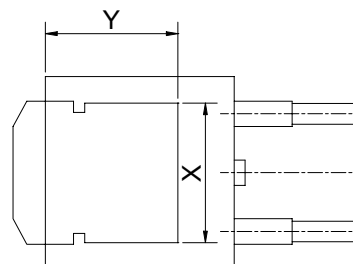
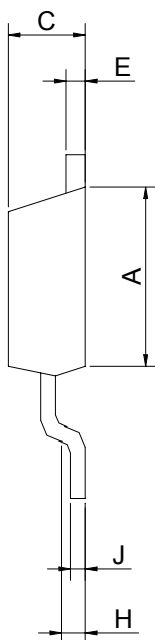
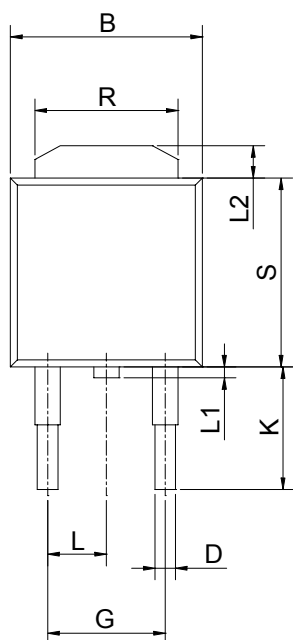
* REQUIRED IF REGULATOR IS LOCATED FAR FROM POWER SUPPLY FILTER

** DESIGN C2 AS CLOSE TO V_{OUT} PIN AS POSSIBLE

Adjustable Regulator

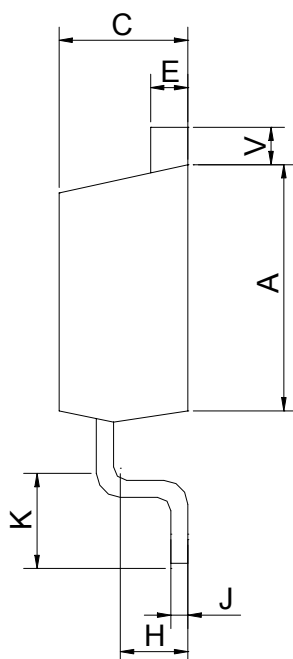
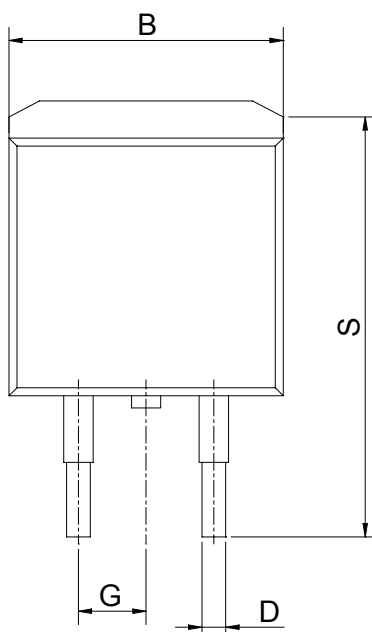
PACKAGE DIMENSION

TO-252 (N252)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	5.97	---	6.35	0.235	---	0.250
B	6.35	---	6.73	0.250	---	0.265
C	2.19	---	2.38	0.086	---	0.094
D	0.69	---	0.88	0.027	---	0.035
E	0.46	---	0.58	0.018	---	0.023
G	4.58BSC			0.180BSC		
H	0.87	---	1.01	0.034	---	0.040
J	0.46	---	0.58	0.018	---	0.023
K	2.60	---	2.89	0.102	---	0.114
L	2.29BSC			0.090BSC		
R	4.45	---	5.46	0.175	---	0.215
S	5.33	---	5.59	0.210	---	0.220
L1	0.64	---	1.02	0.025	---	0.040
L2	1.52	---	2.03	0.060	---	0.080
X	4.12	---	4.56	0.162	---	0.179
Y	5.11	---	5.72	0.201	---	0.225

TO-263 (N263)



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	8.64	---	9.65	0.340	---	0.380
B	9.65	---	10.29	0.380	---	0.405
C	4.06	---	4.83	0.160	---	0.190
D	0.51	---	0.89	0.020	---	0.035
E	1.14	---	1.40	0.045	---	0.055
G	2.54BSC			0.100BSC		
H	2.03	---	2.79	0.080	---	0.110
J	0.46	---	0.64	0.018	---	0.025
K	2.29	---	2.79	0.090	---	0.110
S	14.60	---	15.88	0.575	---	0.625
V	1.14	---	1.40	0.045	---	0.055

IMPORTANT NOTICE

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