1.6A Source/ Sink Bus Termination Regulator

Features

- Minimum external components
- Sinks and sources 1.6A
- Over current protection
- Over temperature protection
- Integrated power MOSFETs
- Excellent accuracy.
  - VTT = VREF ± 5mV
  - VTT = VDDQ/2 ± 0.5%
- 8-pin SOIC package

Applications

- DDR Memory Bus Termination
- Active Termination Buses
- Graphics Card Memory Termination

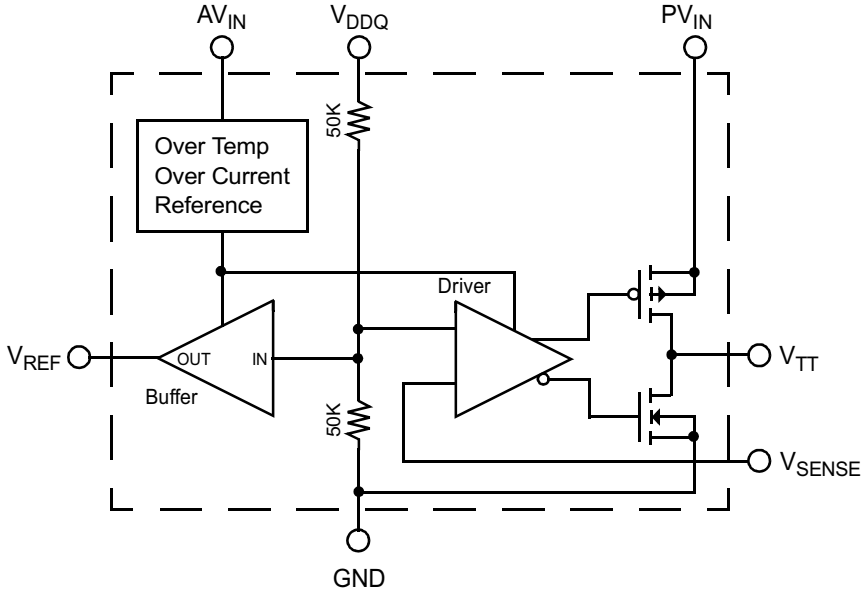
Product Description

The CM3106 is a sinking and sourcing regulator specifically designed for providing power to DDR memory terminating resistors. The output voltage accurately tracks VDDQ/2. The CM3106 can source and sink current up to 1.6A with high accuracy of 0.5% which is enough for DDR memory systems.

The CM3106 provides over current and over temperature protection which protects the from excessive heating due to high current and high temperature.

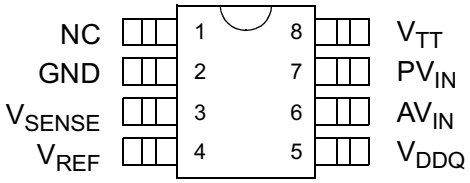
The CM3106 is available in an 8-pin SOIC package.

Simplified Electrical Schematic



PACKAGE / PINOUT DIAGRAM

TOP VIEW



8-pin Power SOIC

Note: This drawing is not to scale.

PIN DESCRIPTIONS

SOIC-8 PIN(S)	NAME	DESCRIPTION
1	NC	No Connect
2	GND	Ground
3	V_{SENSE}	Feedback
4	VREF	Reference Output, VDDQ/2
5	V_{DDQ}	V_{DDQ} Input
6	AV_{IN}	Analog Input
7	PV_{IN}	Power Input
8	V_{TT}	Output

Ordering Information

PART NUMBERING INFORMATION

Pins	Package	Ordering Part Number[2]	Part Marking
8	SOIC-8	CM3106-12SN	CM3106-12SN

Note 1: Parts are shipped in Tape & Reel form unless otherwise specified.

Specifications

ABSOLUTE MAXIMUM RATINGS		
PARAMETER	**RATING**	**UNITS**
AV_{IN} Operating Supply Voltage	7	V
VDDQ Input Voltage	7	V
Pin Voltages VTT Output Any other pins	 7 7	 V V
ESD (HBM)	2	kV
Storage Temperature Range	-40 to +150	°C
Operating Temperature Range Ambient Junction	 0 to +70 (see note1) 0 to +150	 °C °C
Power Dissipation	Internally Limited	W

Note 1: These devices must be derated based on thermal resistance at elevated temperatures. The device packaged in a 8-pin SOIC leadframe must be derated at θ_{JA} = 151°C . Please consult with factory for thermal evaluation assistance.

STANDARD OPERATING CONDITIONS		
PARAMETER	**VALUE**	**UNITS**
V_{DDQ}	2.5	V
AV_{IN}	2.5	V
PV_{IN}	2.5	V
Ambient Operating Temperature	25	°C
C_{OUT}	220 ±20%	µF

ELECTRICAL OPERATING CHARACTERISTICS[1]						
SYMBOL	**PARAMETER**	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNITS**
V_{IN}	Input Voltage Range V_{DDQ} AV_{IN}		 2.2 2.2	 2.5 2.5	 AV_{IN} 5.5	 V V
I_{CC}	AV_{IN} Quiescent Current	I_{VTT} = 0A		450		µV
V_{RLOAD}	Load Regulation	0A ≤ I_{VTT} ≤ 1.5A or -1.5A ≤ I_{VTT} ≤ 0A		6.25		mV
V_{REF}	Output Reference Voltage	V_{DDQ}=2.5V, I_{VREF}=0A	1.225	1.25	1.275	V
VOS_{VTT}	Output Offset from V_{REF}		-20		20	mV
Z_{VREF}	V_{REF} Output Impedance	-5µA ≤ I_{VREF} ≤ 5µA		5		kΩ
Z_{VDDQ}	V_{VDDQ} Input Impedance			100		kΩ
I_{LIM}	V_{TT} Current Limit			2.5		A
$T_{DISABLE}$ T_{HYST}	Shutdown Temperature Thermal Hysteresis			150 50		°C °C

Note 1: Operating Characteristics are over Standard Operating Conditions unless otherwise specified.

Performance Information

Typical DC Characteristics (nominal conditions unless otherwise specified)

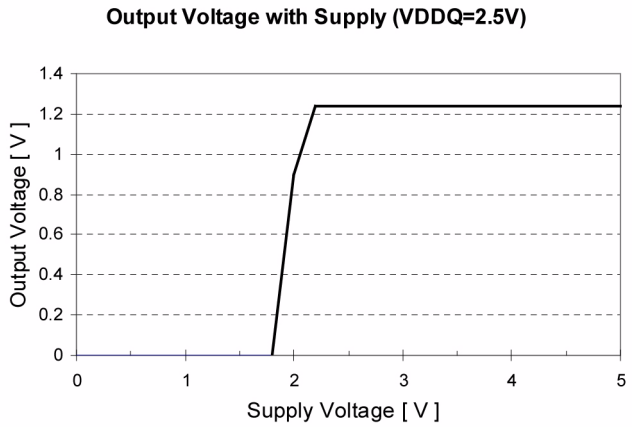


Figure 1. V_{TT} vs. AV_{IN}

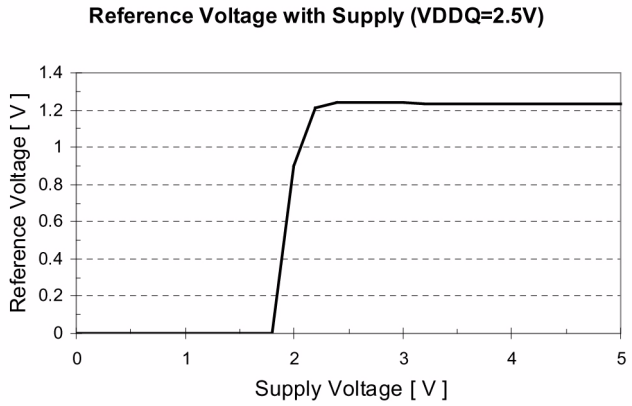


Figure 2. V_{REF} vs. AV_{IN}

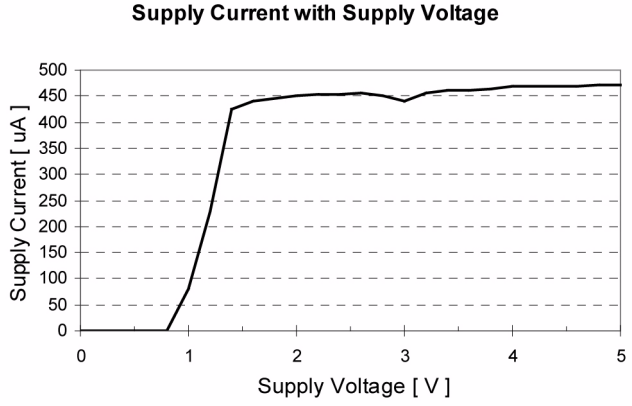


Figure 3. I_{CC} vs. AV_{IN}

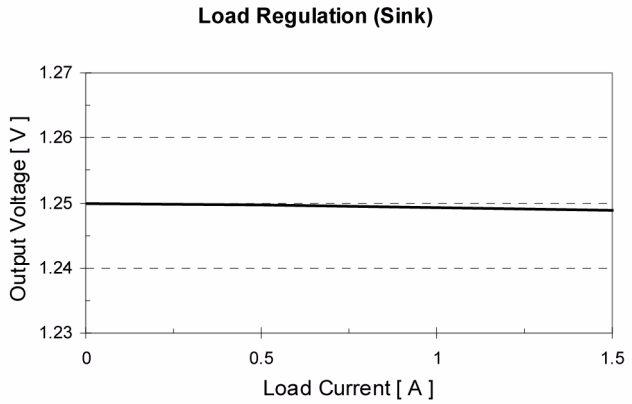


Figure 4. V_{TT} vs. I_{LOAD} (sink)

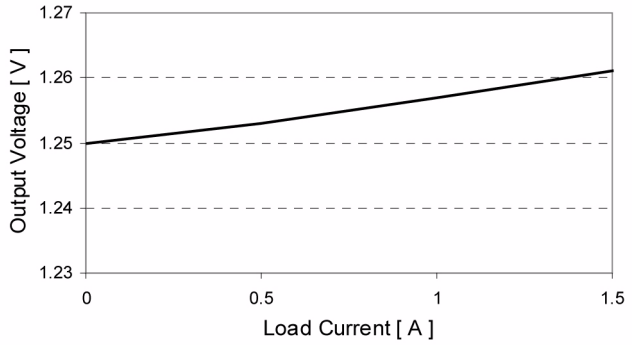


Figure 5. V_{TT} vs. I_{LOAD} (source)

Performance Information (cont'd)

Transient Characteristics (nominal conditions unless otherwise specified)

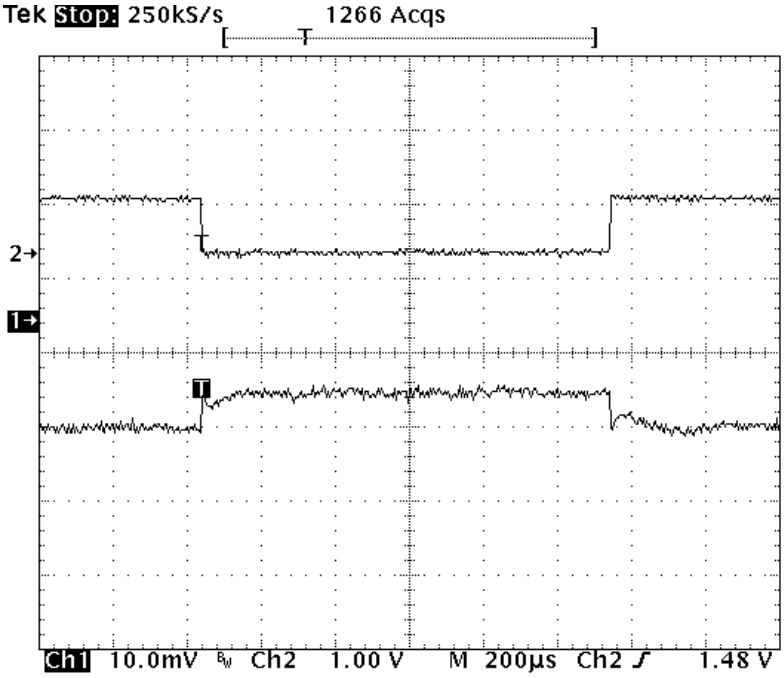


Figure 6. Load Transient Response (0 to 150mA Sink)

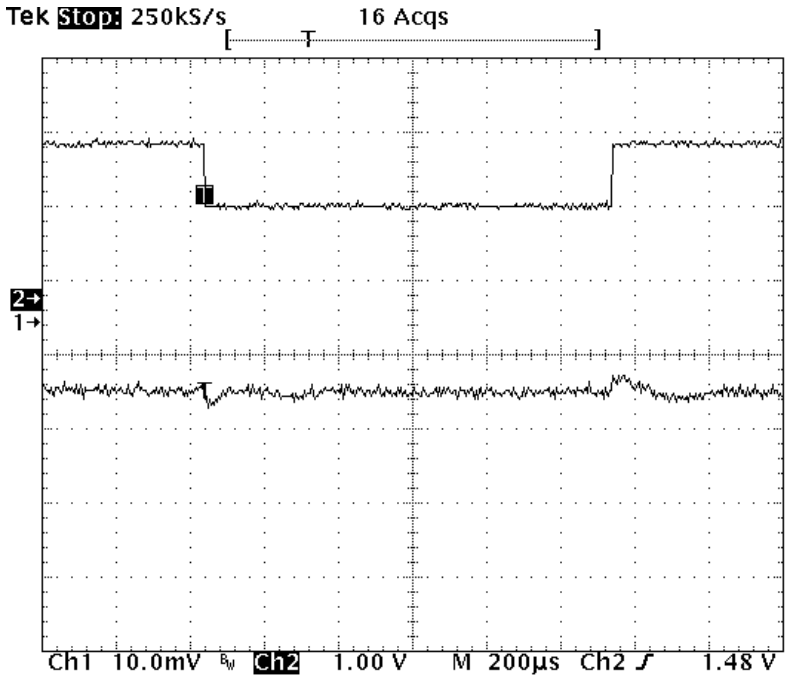


Figure 7. Load Transient Response (0 to 150mA Source)

Performance Information (cont'd)

Transient Characteristics (nominal conditions unless otherwise specified)

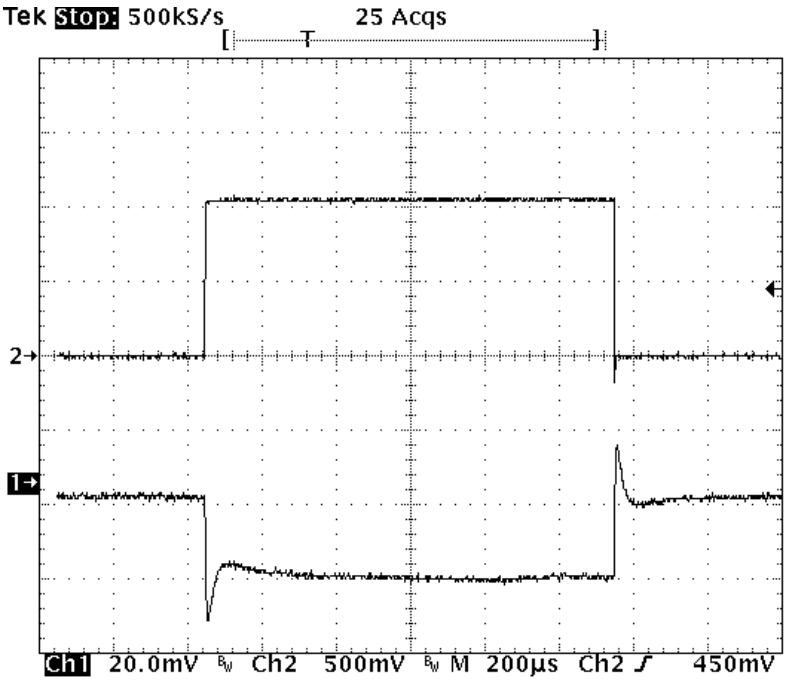


Figure 8. Load Transient Response (0 to 1.5A Sink)

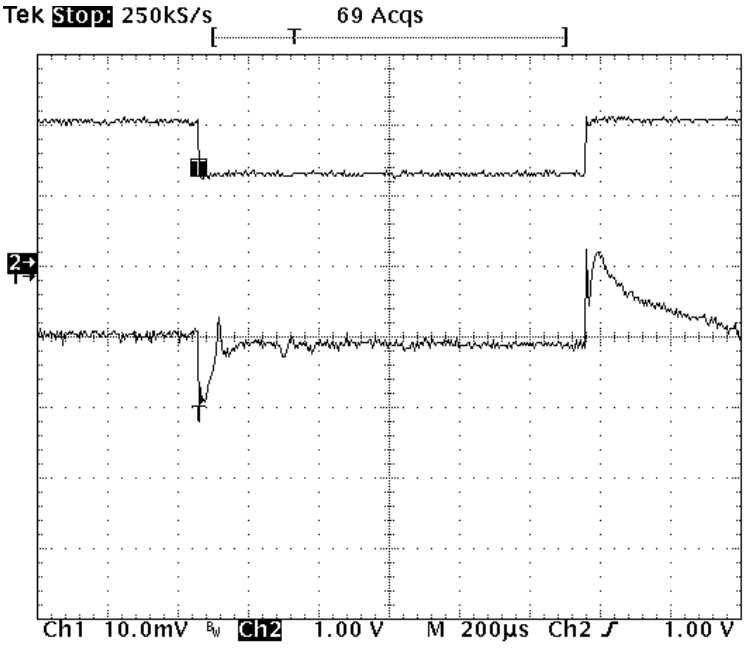


Figure 9. Load Transient Response (0 to 1.5A Source)

Performance Information (cont'd)

Thermal Characteristics (nominal conditions unless otherwise specified)

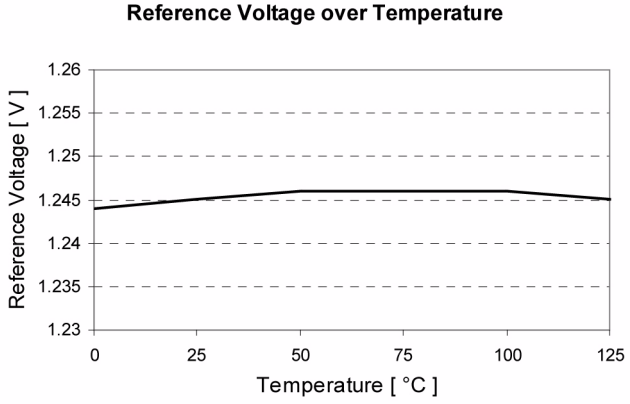


Figure 10. V_{REF} vs. Temperature

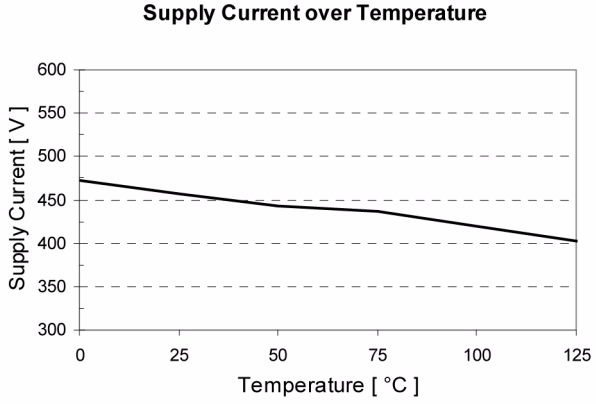


Figure 12. I_{CC} vs. Temperature

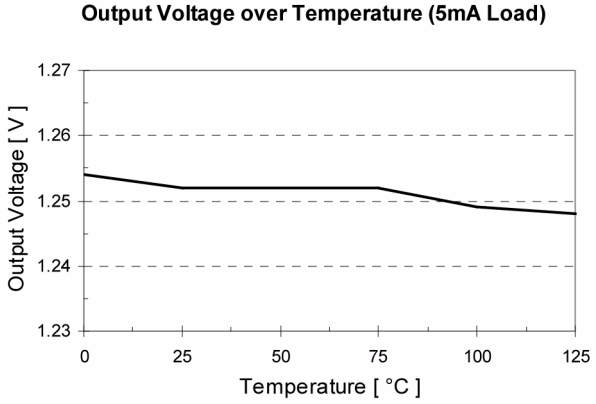


Figure 11. V_{TT} vs. Temperature

Application Information

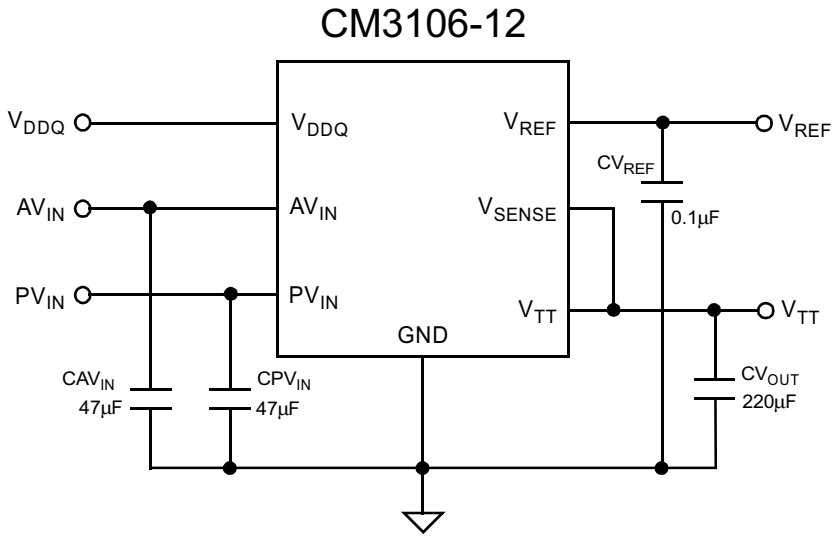


Figure 13. Typical Application Circuit

Mechanical Details

The CM3106 is available in an 8-pin SOIC package.

SOIC-8 Mechanical Specifications

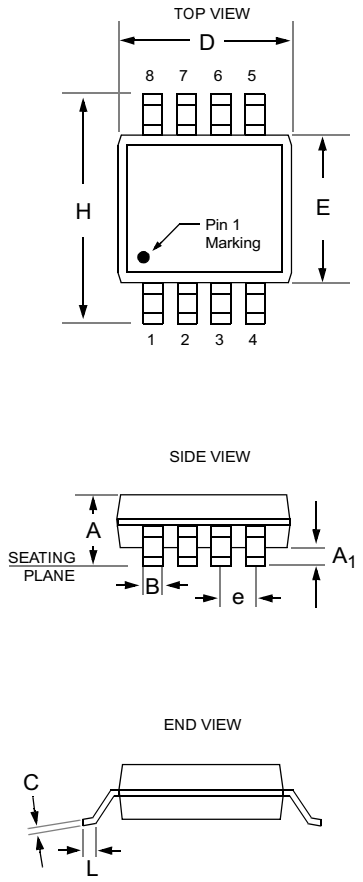
Dimensions for CM3106 devices packaged in 8-pin SOIC packages are presented below.

For complete information on the SOIC-8 package, see the California Micro Devices SOIC Package Information document.

PACKAGE DIMENSIONS				
Package	SOIC			
Pins	8			
Dimensions	**Millimeters**		**Inches**	
	Min	**Max**	**Min**	**Max**
A	1.35	1.75	0.053	0.069
A_1	0.10	0.25	0.004	0.010
B	0.33	0.51	0.013	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	3.80	4.19	0.150	0.165
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
# per tube	100 pieces*			
# per tape and reel	2500 pieces			
Controlling dimension: inches				

* This is an approximate number which may vary.

Mechanical Package Diagrams



Package Dimensions for SOIC-8