



## General Description

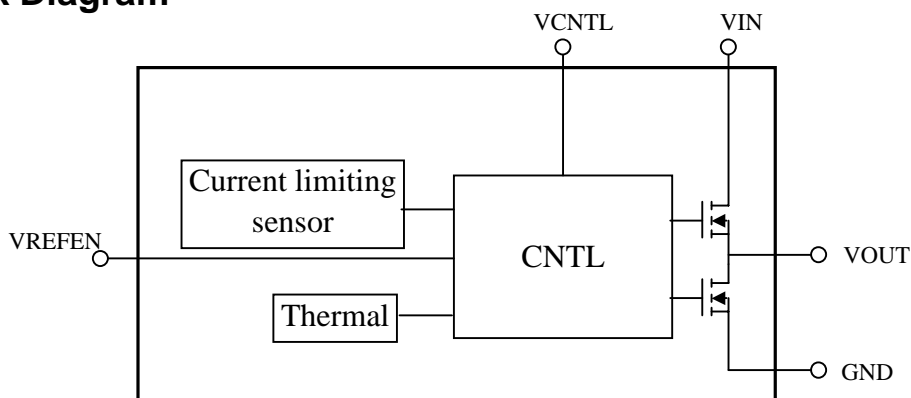
AP1250GM/H is a linear regulator designed as a cost-effective solution for active termination of DDR SDRAM. The converting voltage range is from 1.6V to 6V into a desired output voltage, which is adjusted by two external resistors. The current sourcing and sinking capability of the regulator is up to 1.5A/3A while the output voltage within 2%/3%.

This device provides on-chip thermal shutdown and current limit functions for circuit tolerance of the output fault conditions. SO-8 and TO-252-5L packages are available for all commercial and industrial surface mount applications.

## Features

- ▼ Ideal for DDR-I and DDR-II applications
- ▼ Capable of sourcing and sinking current 1.5A/3A
- ▼ Current limiting protection
- ▼ Thermal protection
- ▼ Current-shoot-through protection
- ▼ High accuracy output voltage at full load
- ▼ Minimum external components
- ▼ Adjustable  $V_{OUT}$  by external resistors
- ▼ Shutdown for standby or suspend mode operation with high-impedance output

## Block Diagram





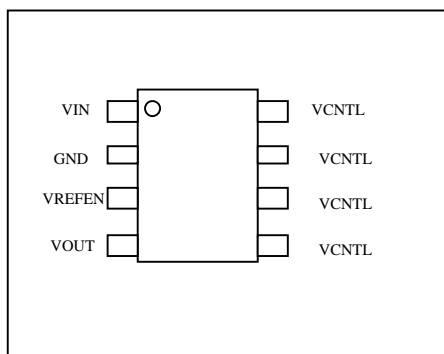
# AP1250GM / AP1250GH

## Applications

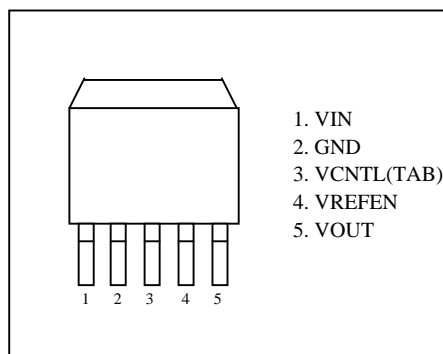
- ▼ Mother Board DDR-SDRAM Termination
- ▼ Mother Board DDR-II Termination
- ▼ Game / Play Station
- ▼ Set Top Box
- ▼ PCI / AGP Graphics
- ▼ IPC
- ▼ SCSI-III Bus Termination

## Pin Configuration

•Part No. AP1250GM (SO-8 package)



•Part No. AP1250GH (TO-252-5L package)



## Pin Description

Pin Name	Function
VIN	Power Input
GND	Ground
VCNTL	Gate Drive Voltage
VREFEN	Reference Voltage Input and Chip Enable
VOUT	Output Voltage



# AP1250GM / AP1250GH

## Absolute Maximum Ratings

Power Input Voltage	6V
Power Dissipation	internal limited
HBM ESD Rating	3KV
Storage Temperature Range	-55 °C to 150 °C
Lead Temperature(Soldering 5 sec)	260 °C
SO-8 Thermal Resistance <sup>3</sup> (R <sub>thjc</sub> )	20°C/W
SO-8 Thermal Resistance(R <sub>thja</sub> )	80°C/W
TO-252-5L Thermal Resistance(R <sub>thjc</sub> )	6°C/W
TO-252-5L Thermal Resistance(R <sub>thja</sub> )	40°C/W

## Electrical Characteristics @ T<sub>A</sub> = 25°C ( unless otherwise specified )

V<sub>IN</sub> = +2.5V, V<sub>CNTL</sub> = +3.3V, V<sub>REFEN</sub> = +1.25V, C<sub>OUT</sub> = 10uF(Ceramic)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>OS</sub>	Output Offset Voltage <sup>1</sup>	I <sub>OUT</sub> = 0A	-20	-5	20	mV
Δ V <sub>LOAD</sub>	Load Regulation	I <sub>L</sub> : 0 --> 1.5A	--	0.5	2	%
		I <sub>L</sub> : 0 --> - 1.5A	--	0.5	2	%
V <sub>IN</sub>	Input Voltage Range(DDR I/II) <sup>2</sup>	V <sub>CNTL</sub> >= V <sub>IN</sub>	1.6	2.5/1.8	--	V
V <sub>CNTL</sub>	Gate Drive Voltage Range <sup>2</sup>	V <sub>CNTL</sub> >= V <sub>IN</sub>	--	3.3	6	V
I <sub>SHDN</sub>	Current in Shutdown	V <sub>REFEN</sub> < 0.2V, R <sub>L</sub> =180Ω	--	10	90	uA
<i>Short Circuit Protection</i>						
I <sub>LIMIT</sub>	Current Limit	AP1250M	--	2	--	A
		AP1250H	--	3	--	A
I <sub>q</sub>	Quiescent Current	I <sub>OUT</sub> = 0A	--	1	3	mA
<i>Over Temperature Protection</i>						
T <sub>OS</sub>	Thermal Shutdown Temperature	3.3V ≤ V <sub>CNTL</sub> ≤ 5V	--	140	--	°C
<i>Shutdown Function</i>						
	Shutdown Threshold Trigger	Output = High	0.8	--	--	V
	Shutdown Threshold Trigger	Output = Low	--	--	0.2	V

### Notes:

- 1.V<sub>OS</sub> is the voltage measurement V<sub>OUT</sub> subtracted from V<sub>REFEN</sub>.
- 2.Keep V<sub>CNTL</sub> >= V<sub>IN</sub> at power on/off sequences.
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board



# AP1250GM / AP1250GH

## Typical Performance Characteristics

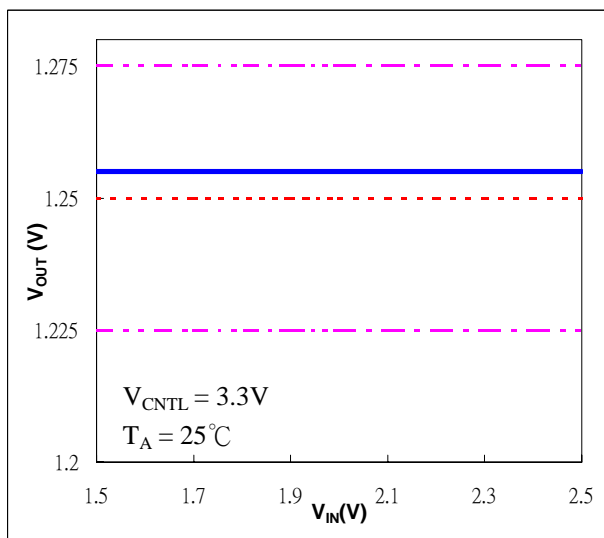


Fig 1. Line Regulation(  $V_{IN}$  vs.  $V_{OUT}$  )

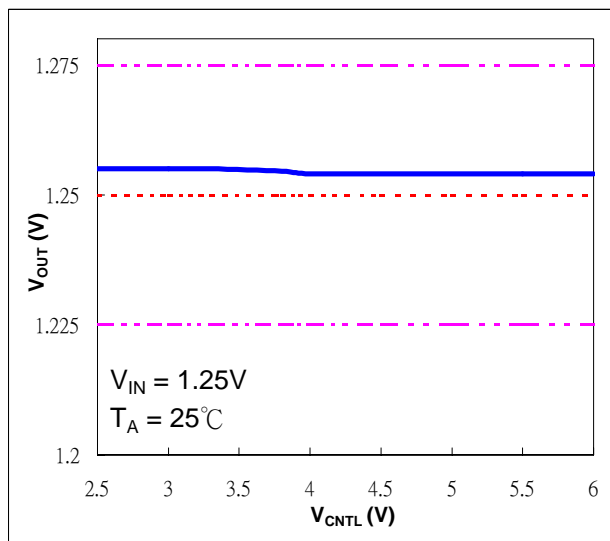


Fig 2. Line Regulation(  $V_{CNTL}$  vs.  $V_{OUT}$  )

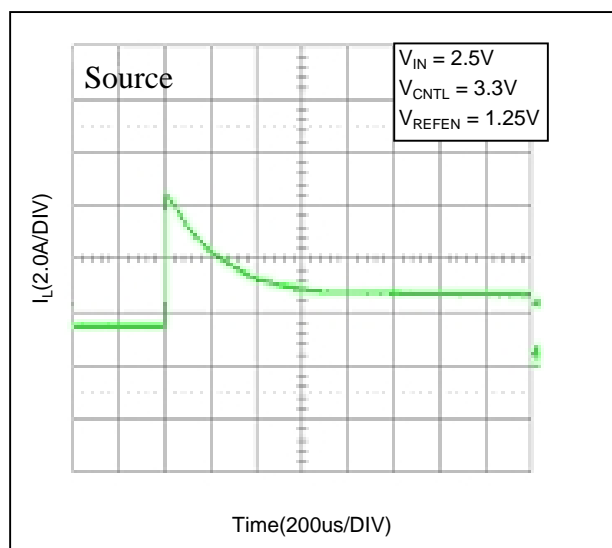


Fig 3. Output Short-Circuit Protection

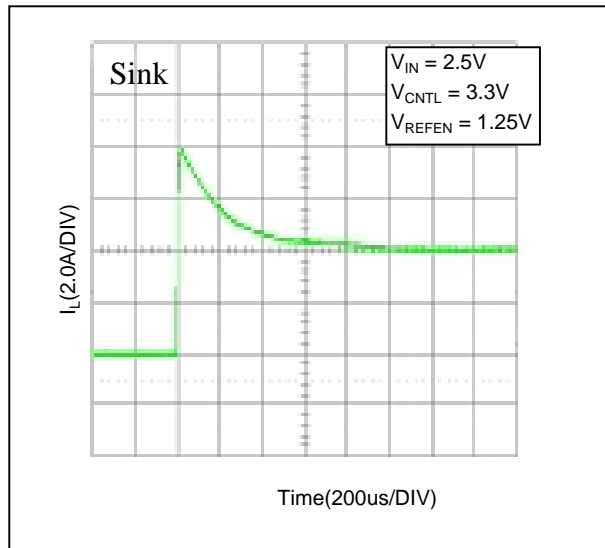


Fig 4. Output Short-Circuit Protection



Typical Performance Characteristics

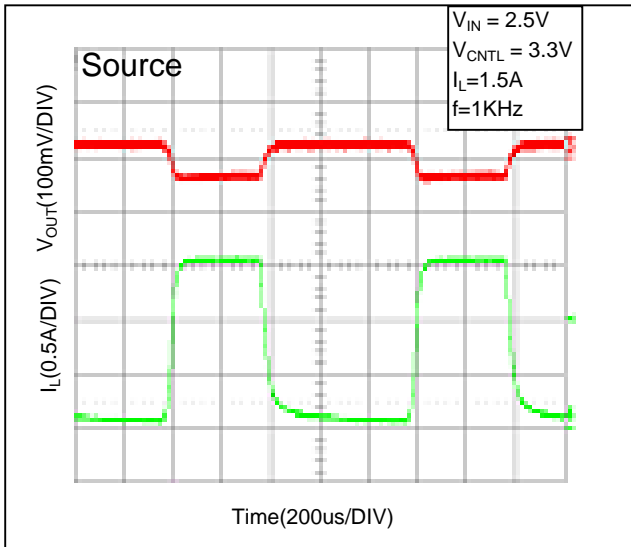


Fig 5. Transient Response

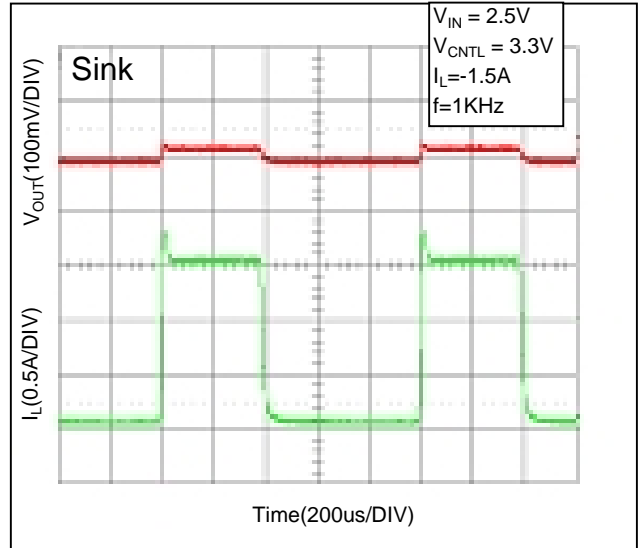


Fig 6. Transient Response

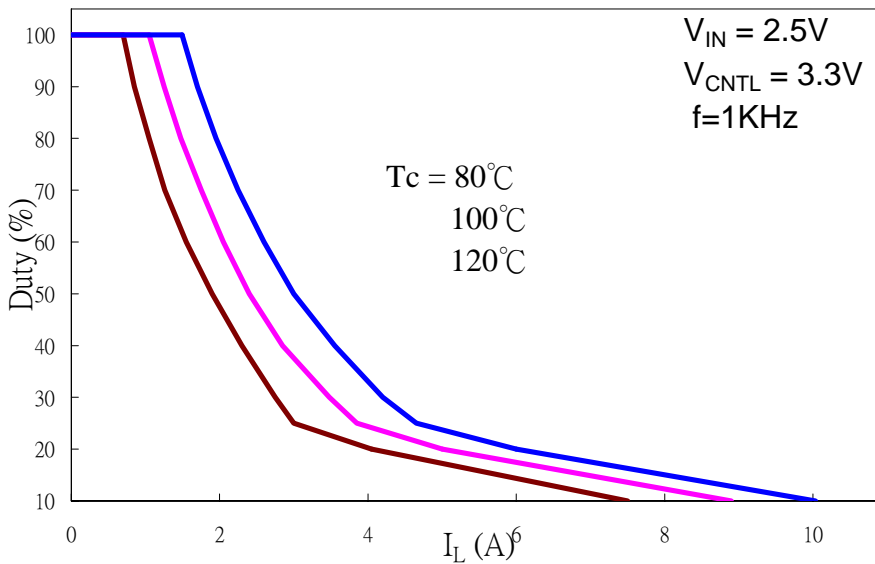


Fig 7. Safe Operating Area