

# NCP51190, NCV51190

## 1.5A DDR Memory Termination Regulator

The NCP/NCV51190 is a simple, cost-effective, high-speed linear regulator designed to generate the  $V_{TT}$  termination voltage rail for DDR-I, DDR-II and DDR-III memory. The regulator is capable of actively sourcing or sinking up to  $\pm 1.5$  A for DDR-I, or up to  $\pm 0.5$  A for DDR-II /-III while regulating the output voltage to within  $\pm 30$  mV.

The output termination voltage is tightly regulated to track  $V_{TT} = (V_{DDQ} / 2)$  over the entire current range.

The NCP/NCV51190 incorporates a high-speed differential amplifier to provide ultra-fast response to line and load transients. Other features include extremely low initial offset voltage, excellent load regulation, source/sink soft-start and on-chip thermal shut-down protection.

The NCP/NCV51190 features the power-saving Suspend To Ram (STR) function which will tri-state the regulator output and lower the quiescent current drawn when the /SS pin is pulled low.

The NCP/NCV51190 is available in a DFN8 package.

### Features

- Generate DDR Memory Termination Voltage ( $V_{TT}$ )
- For DDR-I, DDR-II, DDR-III Source / Sink Currents
- Supports DDR-I to  $\pm 1.5$  A, DDR-II, DDR-III to  $\pm 0.5$  A (peak)
- Integrated Power MOSFETs with Thermal Protection
- Stable with 10  $\mu$ F Ceramic  $V_{TT}$  Capacitor
- High Accuracy Output Voltage at Full-Load
- Minimal External Component Count
- Shutdown for Standby or Suspend to RAM (STR) mode
- Built-in Soft Start
- NCV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These are Pb-Free Devices

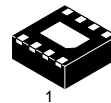
### Applications

- Desktop PC's, Notebooks, and Workstations
- Graphics Card DDR Memory Termination
- Set Top Boxes, Digital TV's, Printers
- Embedded Systems
- Active Bus Termination

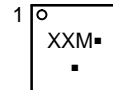


[www.onsemi.com](http://www.onsemi.com)

### MARKING DIAGRAM



DFN8  
MN SUFFIX  
CASE 506AA



XX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Device

(Note: Microdot may be in either location)

### PIN CONNECTION



### ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 8 of this data sheet.

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## 1.5 A, DDR-I /-II /-III TERMINATION REGULATOR

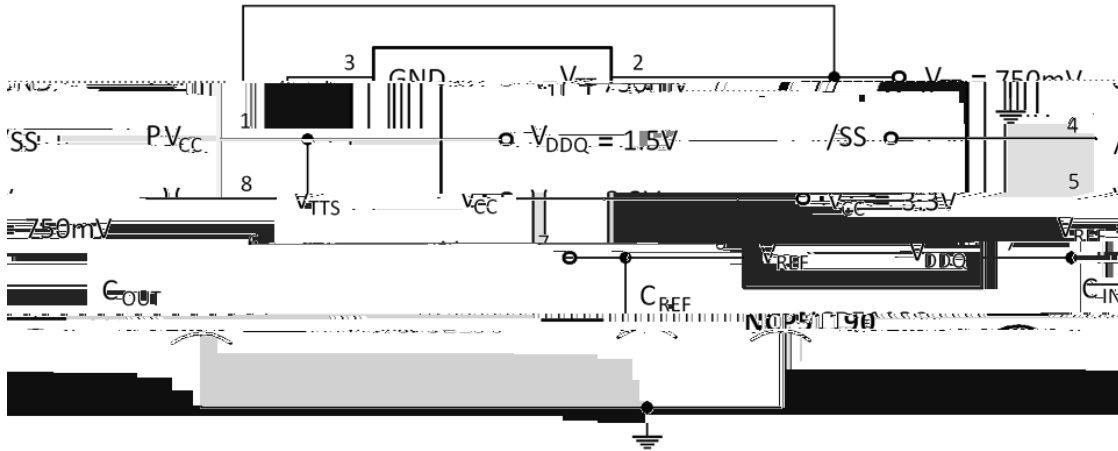


Figure 1. Typical Application Schematic

### PIN FUNCTION DESCRIPTION – NCP51190

| Pin Number | Pin Name | Pin Function |
|------------|----------|--------------|
|------------|----------|--------------|

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## ABSOLUTE MAXIMUM RATINGS

| Rating   | Symbol    | Value       | Unit |
|--|-----------|-------------|------|
| $V_{CC}$ , $PV_{CC}$ , $V_{DDQ}$ , /SS to GND (Note 1) |           | -0.3 to +6  | V    |
| Storage Temperature                                    | $T_{stg}$ | -65 to +150 | °C   |
| Operating Junction Temperature Range                   | $T_J$     | -40 to +125 | °C   |

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## ELECTRICAL CHARACTERISTICS

$-40^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$ ;  $V_{CC} = PV_{CC} = V_{DDQ} = 2.5\text{ V}$ ; unless otherwise noted. Typical values are at  $T_J = +25^{\circ}\text{C}$

Parameter

Max

Unit



# NCP51190, NCV51190

## TYPICAL PERFORMANCE CHARACTERISTICS

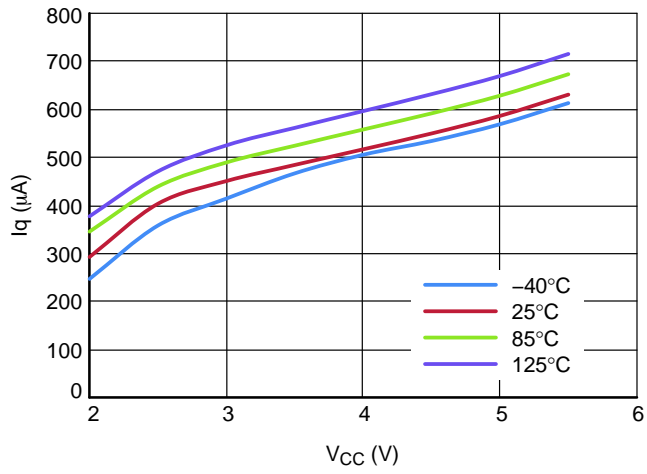


Figure 8.  $I_q$  vs.  $V_{CC}$  over Temperature

## NCP51190, NCV51190

### General

The NCP/NCV51190 is a bus termination, linear regulator designed to meet the JEDEC requirements for DDR-I, DDR-II and DDR-III memory termination. The NCP/NCV51190 is capable of sourcing and sinking current while accurately tracking and regulating the  $V_{TT}$  output voltage equal to  $(V_{DDQ} / 2)$ . The output stage has been designed to maintain excellent load regulation and preventing shoot-through. The NCP/NCV51190 uses two distinct

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**Table 1. ORDERING INFORMATION**

| Device         | Marking | Package           | Shipping †         |
|----------------|---------|-------------------|--------------------|
| NCP51190MNTAG  | A5      | DFN8<br>(Pb-Free) | 3000 / Tape & Reel |
| NCV51190MNTAG* | CC      |                   |                    |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*NCV

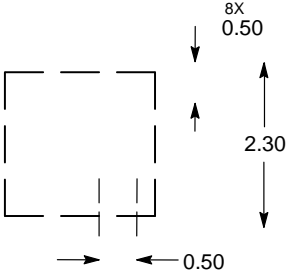


**DFN8 2x2, 0.5P**  
CASE 506AA  
ISSUE F

DATE 04 MAY 2016

1  
SCALE 4:1

**SOLDERING FOOTPRINT\***



DIMENSIONS: MILLIMETERS

\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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