

OBSELETE PRODUCT

Last time buy: August 31, 2014.

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FEATURES

- For high performance termination of DDR computer memory busses
- Compatible to JEDEC JESD 79 and 8-9 DDR specifications
- Ideal for active wideband termination of SSTL-2 logic
- Non-isolated design with 1.25V typ. @ ± 9 Amps output
- 3-5.5V input with 85% (typ.) efficiency
- Miniature industry standard 1.6 x 0.5 x 0.2 inch surface mount or SIP package
- Offers unique source/sink DDR requirements plus automatic reference tracking
- Retains controlled impedances and minimizes distortion of DDR digital data and double-side clocks
- Operates over -40 to $+65^{\circ}\text{C}$ with 200 lfm airflow
- Standard vertical mount, optional horizontal mount

termination of SSTL-2 (Series Stub Terminated Logic) (Data Rate) memories, the DDR series non-isolated is powered by the bus supply of 3 to 5.5 Volts and are compatible to industry-standard JEDEC JESD specifications for DDR memories.

PRODUCT OVERVIEW

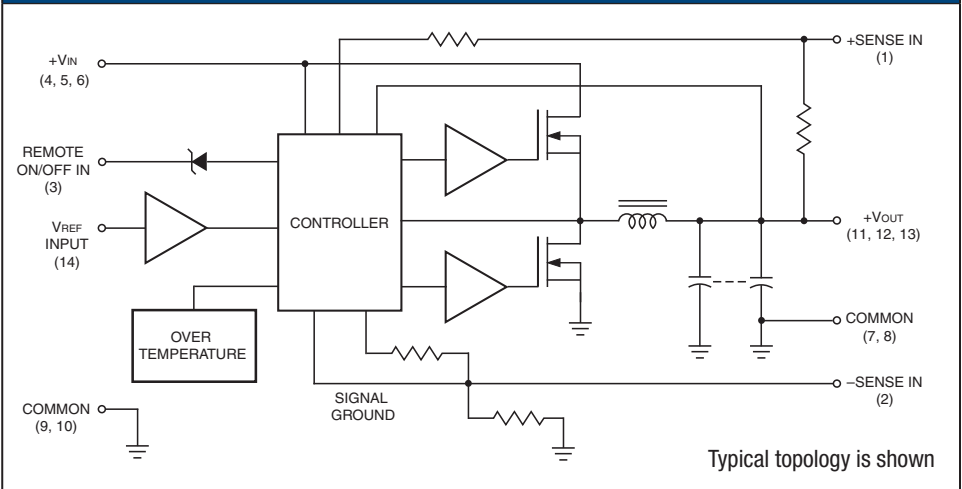
The DDR terminators are supplied in a 1.6 by 0.5 inch surface-mount or SIP package measuring only 0.2 inches high. Full output power ($3.3V_{IN}$) is available up to $+65^{\circ}\text{C}$ with only 200 LFM (linear feet per minute) of cooling airflow. No heat-sink is required.

Modern SSTL-2 logic uses reduced power voltages (typically 2.5 Volts), high switching currents and a relatively narrow voltage threshold window for logic switching. These factors contribute to the 266MHz data transfer rate. The V_{IT} termination voltage output of the DDR operates approximately at the midpoint voltage of the bus (i.e., about 1.25V) and therefore will either source or sink current up to 9 Amps. To maintain a reliable window in the logic threshold, the design tracks the V_{REF} input voltage at high bandwidth, operating typically at

one half the bus V_{DDQ} voltage of 2.5V. In addition, the DDR series features a very high current slew rate of up to 40 Amps per microsecond and fast settling while switching from source to sink or sink to source. These features insure no data errors on the memory bus.

The DDR is supplied either in a vertical SIP (Single Inline Package) mount or a horizontal pinned mount. The converter meets UL 60950-1, CSA and IEC safety certifications and both conducted and radiated EMI (electromagnetic interference) specifications. The output is rated for continuous short circuit protection and the on-board controller will shut down the converter if the temperature reaches 110°C or output current exceeds 11 Amps. The DDR-9-W3H-C is available with RoHS reduction of hazardous substance compliance.

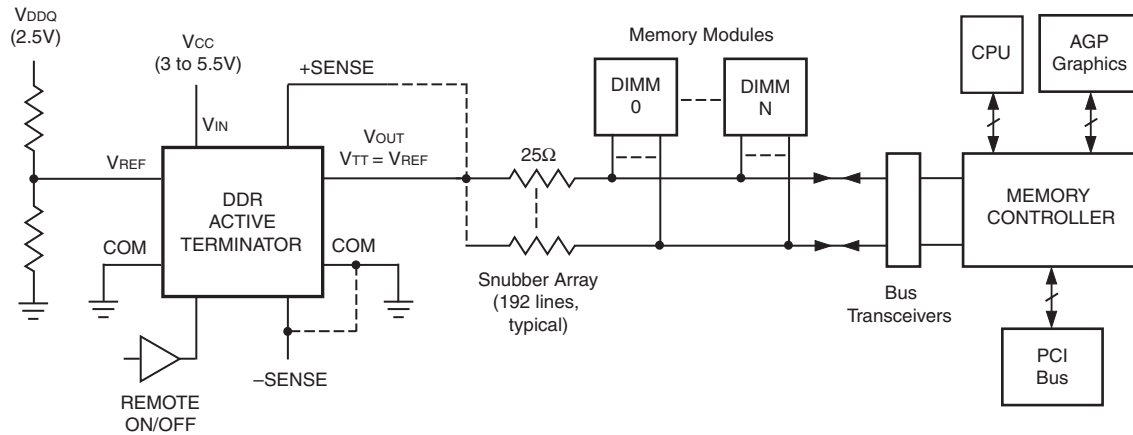
SIMPLIFIED SCHEMATIC



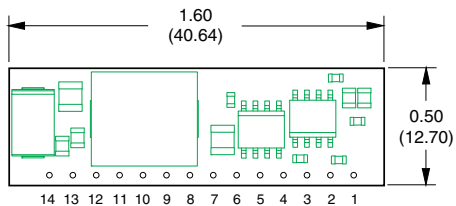
DDR Series

9A Active Power Power Terminator for DDR Memories

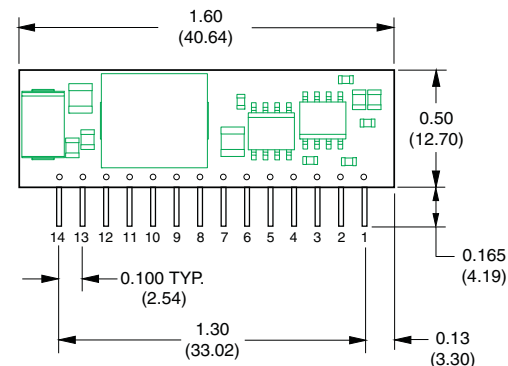
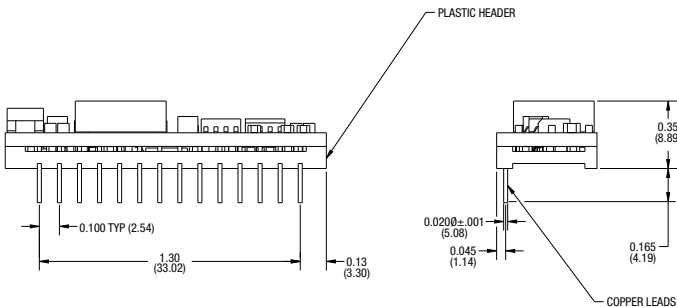
DDR MEMORY APPLICATION



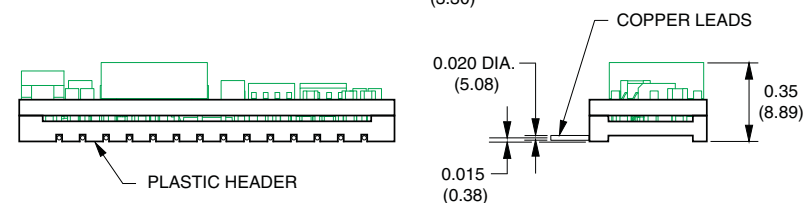
MECHANICAL SPECIFICATIONS



HORIZONTAL MOUNT
Case B9



VERTICAL MOUNT
Case B10



INPUT/OUTPUT CONNECTIONS			
Pin	Function P66	Pin	Function P66
1	+Sense Input	8	Common
2	-Sense Input	9	Common
3	On/Off Input	10	Common
4	+Input	11	-Output
5	+Input	12	-Output
6	+Input	13	-Output
7	Common	14	VREF Input

Component locations are typical.
Actual units may vary slightly.

Dimensions in inches (mm)

9A Active Power Power Terminator for DDR Memories

Performance/Functional Specifications

Typical at T_A = +25°C under nominal line voltage, V_{OUT} = 1.25V, full-load conditions unless noted.

Input	
Input Voltage Range ①	3 to 5.5 Volts (3.3V nominal)
Start-Up Threshold	2 Volts min., 2.5 Volts typ.
Input Current , Current Sourcing Mode	
At 3.3V _{IN} , 1.25V _{OUT}	4.15 Amps max.
At 3.3V _{IN} , 0.9V _{OUT}	3.18 Amps max.
At 5V _{IN} , 1.25V _{OUT}	2.75 Amps max.
At 5V _{IN} , 0.9V _{OUT}	2.13 Amps max.
Inrush Transient	0.003A ² /sec, maximum
No-load Input Current	70mA typ., 100mA max.
Short Circuit Current	4 Amps
Shut Down Mode Input Current	7mA
Input Reflected Ripple Current ②	10mA _{p-p}
V_{REF} Input Range	0.7 to 1.45V
V_{REF} External Reference Current	0.1μA (V _{REF} min. to max., I _{OUT} = ±9A)
Remote On/Off Control +Positive Logic	On = no connection, open collector or 0.8V to +V _{IN} max. applied at 60μA. Off = 0 to 0.7V or pulled low.
Remote Sense Range	+ 10% of V _{OUT}
Output	
Maximum Output Power	11.36 Watts (V _{REF} = 1.25V)
Minimum Loading	No minimum load
Maximum Capacitive Loading	2000μF, OSCON low-ESR (0.02Ω) 10,000μF (aluminum electrolytic)
Output Voltage Accuracy	V _{REF} ±1%
Total Accuracy (Line, Load, Temp.)	±5%
Output Current, Source	+9.00 Amps maximum
Output Current, Sink	−9.00 Amps maximum
Short Circuit Current	13 Amps
Short Circuit Duration	Continuous, output shorted to ground
Short Circuit Protection	Fold back technique, autorecovery
Current Limit Inception ③	11 Amps, sourcing mode
Transfer Characteristics	
Efficiency , Current Sourcing Mode, 9A load	
At 3.3V _{IN} , 1.25V _{OUT}	83% typ., 85% max.
At 3.3V _{IN} , 0.9V _{OUT}	78% typ., 80% max.
At 5V _{IN} , 1.25V _{OUT}	82.5% typ., 84.5% max.
At 5V _{IN} , 0.9V _{OUT}	77% typ., 79% max.
Efficiency , Current Sinking Mode, 9A load	
At 3.3V _{IN} , 1.25V _{OUT}	81% typ., 83% max.
At 3.3V _{IN} , 0.9V _{OUT}	74.5% typ., 76.5% max.
At 5V _{IN} , 1.25V _{OUT}	80% typ., 82% max.
At 5V _{IN} , 0.9V _{OUT}	73.5% typ., 75.5% max.
Temperature Coefficient	±0.02%/°C
Switching Frequency	550kHz min., 700kHz max.
Line Regulation (V _{IN} = min. to max.)	±0.75%
Load Regulation (V _{IN} = min. to max.)	±1.5%
Dynamic Characteristics	
Output Slew Rate	40 Amps/μsec
Load Step , 0 to 9A	175mV, peak deviation
Load Step Settling Time , 0 to 9A	200μsec
Ripple and Noise , 20 MHz bandwidth	40mV _{p-p} , typical 60mV _{p-p} , maximum
Turn-On Time (Remote On/Off or V _{IN} to V _{OUT} regulated)	5.5msec

Environmental	
Operating Temperature Range (Ambient) No derating, vertical mount	−40 to +65°C @ 200 lfm airflow
Derating	See derating curves
PCB/Case Temperature Range	−40 to +100°C, no derating.
Thermal Protection/Shutdown	110°C
Storage Temperature Range	−55 to +125°C
Altitude	0 to 10,000 feet
Relative Humidity	10% to 90%, non-condensing
Physical, Safety	
Outline Dimensions	1.60 x 0.50 x 0.20 inches 40.64 x 12.7 x 5.08mm
Weight	0.25 ounces (7g)
Pin Material	Nickel plate over copper alloy
Pin Dimensions	0.02 inches (0.508mm)
Calculated MTBF ④	TBD hours
Electromagnetic Interference	Conducted (FCC part 15, EN55055) Radiated (FCC part 15, EN55055)
Safety	UL/cUL 60950-1, CSA-C22.2 No.234 IEC/EN 60950-1

① See Absolute Maximum Ratings for allowable input voltage.

② Input Ripple Current is tested and specified over a 5-20 MHz bandwidth. Input filtering is C_{IN} = 200μF, C_{BUS} = 1000μF, L_{BUS} = 1μH.

③ Current limit inception is given at either cold start-up or after warm-up for V_{REF} = 0.9 or 1.25V.

④ Mean Time Before Failure is calculated using the Telecordia (Bellcore) SR-332 Method 1, Case 3, ground fixed conditions, T_{CASE} = +40°C, Full load.

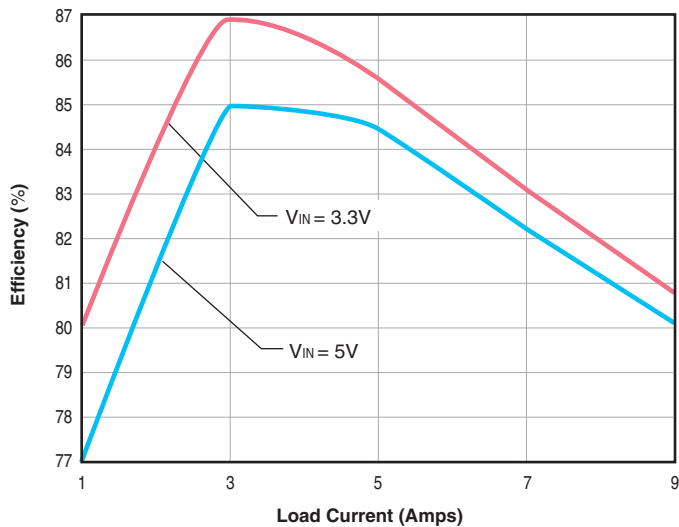
Absolute Maximum Ratings	
Input Voltage	7Vdc max., 100msec duration
Input Reverse Polarity	None
Output Current	Current-limited. Device can withstand indefinite short circuit.
Storage Temperature	−55 to +125 °C
Lead Temperature	+300°C, 10 seconds maximum
Absolute maximums are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. Proper operation under conditions other than those listed in the Performance/Functional Specifications Table is not implied nor recommended.	

Ordering Guide

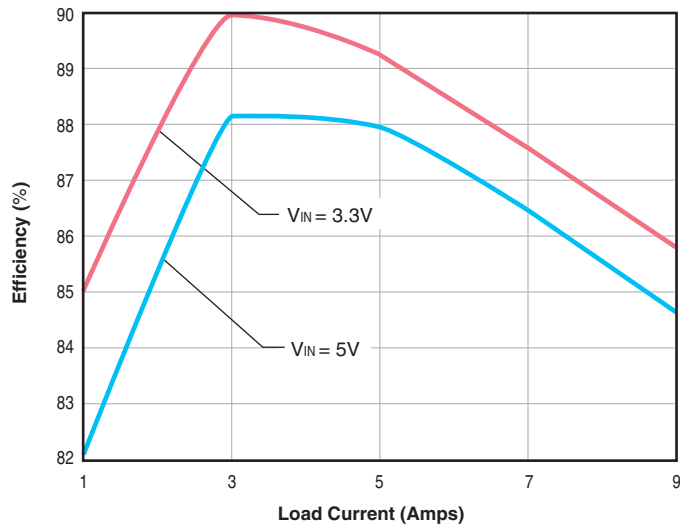
Model Number	Mounting
DDR-9-W3	Single Inline Package (vertical), non-RoHS
DDR-9-W3-C	Single Inline Package (vertical), RoHS compliant
DDR-9-W3H	Horizontal mount, non-RoHS
DDR-9-W3H-C	Horizontal mounting, RoHS compliant

Typical Performance Curves

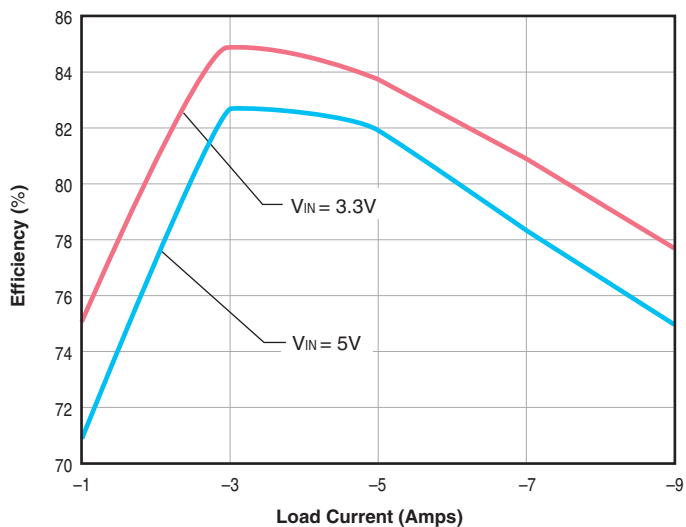
DDR-9-W3
Efficiency vs. Load Current (Current Sourcing Mode, $V_{OUT} = 0.9V$)



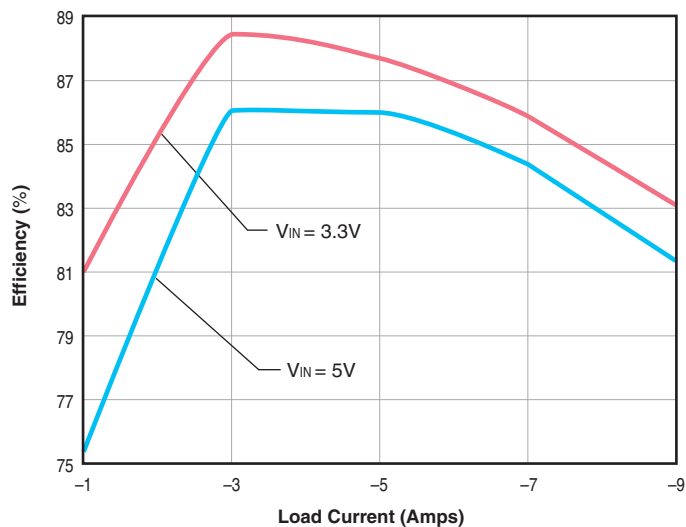
DDR-9-W3
Efficiency vs. Load Current (Current Sourcing Mode, $V_{OUT} = 1.25V$)



DDR-9-W3
Efficiency vs. Load Current (Current Sinking Mode, $V_{OUT} = 0.9V$)

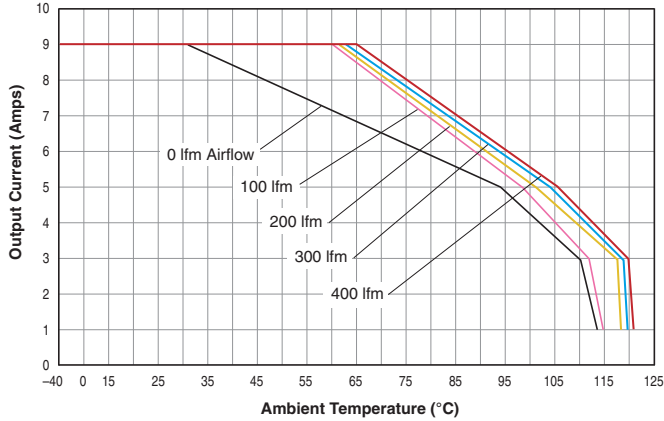


DDR-9-W3
Efficiency vs. Load Current (Current Sinking Mode, $V_{OUT} = 1.25V$)

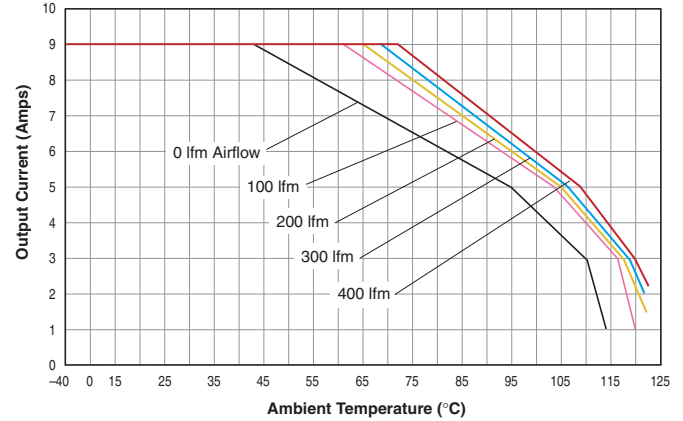


Typical Performance Curves

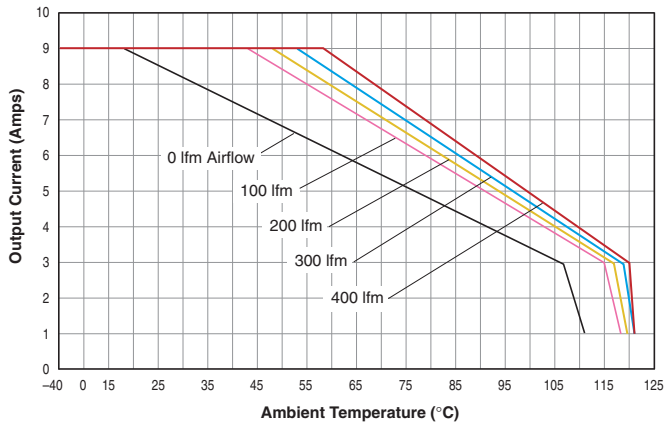
DDR-9-W3 Maximum Current Temperature Derating
(3.3V_{IN}, 0.9V_{OUT}, Current Sourcing Mode)



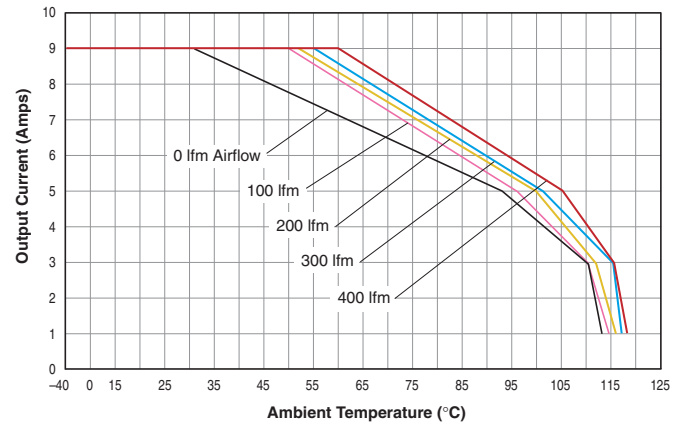
DDR-9-W3 Maximum Current Temperature Derating
(3.3V_{IN}, 1.25V_{OUT}, Current Sourcing Mode)



DDR-9-W3 Maximum Current Temperature Derating
(5V_{IN}, 0.9V_{OUT}, Current Sourcing Mode)



DDR-9-W3 Maximum Current Temperature Derating
(5V_{IN}, 1.25V_{OUT}, Current Sourcing Mode)



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