

## MAX8796, MAX8797, MAX17401

# 1-Phase, Quick-PWM Intel IMVP-6/GMCH Controllers

1-Phase, Intel IMVP-6/6+ Controllers Ideal for Atom CPU and UMPC Designs

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## Status

Part Number	Status
MAX17401	Active: In Production.
MAX8796	Active: In Production.
MAX8797	Custom Order: Minimum order quantities and other restrictions may apply.

## Data Sheet

[Request Full Data Sheet](#)  
Custom Order

## Description

The MAX8796/MAX8797/MAX17401 are 1-phase Quick-PWM™ step-down VID power-supply controllers for Intel notebook CPUs and graphics. The Quick-PWM control provides instantaneous response to fast load current steps. Active voltage positioning reduces power dissipation and bulk output capacitance requirements and allows ideal positioning compensation for tantalum, polymer, or ceramic bulk output capacitors.

The MAX8796/MAX8797/MAX17401 are intended for two different notebook CPU/GPU core applications: either bucking down the battery directly to create the core voltage, or else bucking down the +5V system supply. The single-stage conversion method allows this device to directly step down high-voltage batteries for the highest possible efficiency. Alternatively, 2-stage conversion (stepping down the +5V system supply instead of the battery) at higher switching frequency provides the minimum possible physical size.

A slew-rate controller allows controlled transitions between VID codes. A thermistor-based temperature sensor provides programmable thermal protection. A power monitor provides an analog voltage output proportional to the power consumed by the CPU/GPU.

The MAX8796/MAX17401 implement both the Intel IMVP-6 CPU core specifications, as well as the Intel GMCH graphics core specifications. The MAX8797 implements the Intel GMCH graphics core specifications. The MAX8796/MAX17401 are available in a 32-pin TQFN package. The MAX8797 is available in a 28-pin TQFN package.

## Key Features

- 1-Phase Quick-PWM Controllers
- $\pm 0.5\%$   $V_{OUT}$  Accuracy Over Line, Load, and Temperature
- 7-Bit IMVP-6 DAC (MAX8796/MAX17401 Only)
- 5-Bit GMCH DAC
- Active Voltage Positioning with Adjustable Gain
- Accurate Droop and Current Limit
- Remote Output and Ground Sense
- Adjustable Output-Voltage Slew Rate
- Power-Good Window Comparator
- Power Monitor
- Temperature Comparator
- Drives Large Synchronous Rectifier FETs
- 2V to 26V Power Input Range
- Adjustable Switching Frequency (600kHz max)
- Output Overvoltage Protection (MAX8796/MAX8797 Only)
- Undervoltage and Thermal-Fault Protection
- Soft-Startup and Soft-Shutdown
- Internal Boost Diodes

## Applications/Uses

- 2 to 4 Lithium-Ion (Li+) Cell Battery-to-CPU Core Supply Converters
- Graphics Core Power Supply
- IMVP-6/IMVP-6+ Core Power Supply
- Intel GMCH Crestline/Cantiga
- Notebooks/Desktops/Servers
- Voltage-Positioned Step-Down Converters

# Reliability Reports

Reliability Report: [MAX8796.pdf](#)  
 Show FIT data for: MAX8796

Request Reliability Report for: MAX8797

## Product Change Notices

Device	Issue Date	Area	Product Change Notice
MAX8796GTJ+	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-09-28	ASSEMBLY	<a href="#">Product Change Notice 799</a> (PDF, 52.3kB)
MAX8796GTJ+T	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2011-08-31	WAFER FAB	<a href="#">Product Change Notice 958_PRE-PCN</a>
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-09-28	ASSEMBLY	<a href="#">Product Change Notice 799</a> (PDF, 52.3kB)
MAX8796GTJ+TC8V	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-09-28	ASSEMBLY	<a href="#">Product Change Notice 799</a> (PDF, 52.3kB)
MAX8796GTJ+TG05	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-09-28	ASSEMBLY	<a href="#">Product Change Notice 799</a> (PDF, 52.3kB)
MAX8796GTJ+TG071	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-09-28	ASSEMBLY	<a href="#">Product Change Notice 799</a> (PDF, 52.3kB)
MAX8796GTJ+TGC1	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-09-28	ASSEMBLY	<a href="#">Product Change Notice 799</a> (PDF, 52.3kB)
MAX8797GTI+	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-03-26	ASSEMBLY	<a href="#">Product Change Notice 737</a> (PDF, 282.7kB)
MAX8797GTI+T	2011-11-29	WAFER FAB	<a href="#">Product Change Notice 873</a> (PDF, 112.2kB)
	2010-11-29	ASSEMBLY	<a href="#">Product Change Notice 831</a> (PDF, 46.5kB)
	2010-10-06	WAFER FAB	<a href="#">Product Change Notice 813</a> (PDF, 432.9kB)
	2010-03-26	ASSEMBLY	<a href="#">Product Change Notice 737</a> (PDF, 282.7kB)

### Disclaimer

PCN's displayed are for notification only and are effective on the date distributed.

## Software/Models

none

## Ordering Information

Filters: Part Number Package: Any Temperature: Any Tape and Reel Sample

Part Number	Free Sample	Buy	Status	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
MAX8796EVKIT#			Custom Order	KIT; Land Pattern: Not Available		See data sheet
MAX8796GTJ+			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
				TQFN;32 pin;26 mm <sup>2</sup>		

MAX8796GTJ+C8V	Custom Order	Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+G05	Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet
MAX8796GTJ+G071	Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet
MAX8796GTJ+G1D	Active: Data sheet on request only	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+G51	Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet
MAX8796GTJ+GA4	Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet
MAX8796GTJ+GB4	Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet
MAX8796GTJ+GC1	Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet

Part Number	Free Sample	Buy	Status	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
MAX8796GTJ+T			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TC8V			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +85°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TG05			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TG071			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TG1D			Active: Data sheet on request only	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TG51			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TGA4			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TGB4			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF) Use pkgcode/variation: T3255+3*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8796GTJ+TGC1			Custom Order	TQFN;32 pin;26 mm <sup>2</sup> Outline Drawing: <a href="#">21-0140</a> (PDF) Land Pattern: <a href="#">90-0001</a> (PDF)	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>

Use pkgcode/variation: T3255+3\*

KIT;

Land Pattern: Not Available

MAX8797EVKIT+

Custom Order

See data sheet

Part Number	Free Sample	Buy	Status ?	Package: TYPE PINS FOOTPRINT DRAWING CODE/VAR *	Temp	RoHS/Lead-Free? Materials Analysis
MAX8797GTI+			Custom Order	TQFN;28 pin;16.8 mm <sup>2</sup> Outline Drawing: <a href="#">21-0139</a> (PDF) Land Pattern: <a href="#">90-0035</a> (PDF) Use pkgcode/variation: T2844+1*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8797GTI+GB4			Custom Order	QFN; Land Pattern: Not Available	-40°C to +105°C	See data sheet
MAX8797GTI+T			Custom Order	TQFN;28 pin;16.8 mm <sup>2</sup> Outline Drawing: <a href="#">21-0139</a> (PDF) Land Pattern: <a href="#">90-0035</a> (PDF) Use pkgcode/variation: T2844+1*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>
MAX8797GTI+TGB4			Custom Order	TQFN;28 pin;16.8 mm <sup>2</sup> Outline Drawing: <a href="#">21-0139</a> (PDF) Land Pattern: <a href="#">90-0035</a> (PDF) Use pkgcode/variation: T2844+1*	-40°C to +105°C	RoHS/Lead-Free: <a href="#">Lead Free Materials Analysis</a>

Notes:

- Other options and links for purchasing parts are listed at: <http://www.maximintegrated.com/sales>.
- [Didn't Find What You Need?](#) Ask our applications engineers. Expert assistance in finding parts, usually within one business day.
- Part number suffixes: T or T&R = tape and reel; + = RoHS/lead-free; # = RoHS/lead-exempt; -D = drypack; -U/+U on DS parts = cut tape. More: See [Full Data Sheet](#) or [Maxim Product Naming Conventions](#).
- \* Some packages have variations, listed on the drawing. "PkgCode/Variation" tells which variation the product uses. Note that "+", "#", "-" in the part number suffix describes RoHS status. Package drawings may show a different suffix character.

### Similar Products by Function

[MAX17028](#), [MAX17428](#) 1-Phase Quick-PWM Intel IMVP-6.5/GMCH Controllers  
[MAX17021](#), [MAX17082](#), [MAX17482](#) Dual-Phase, Quick-PWM Controllers for IMVP-6+/IMVP-6.5 CPU Core Power Supplies

### Similar Products by Application

Access Point > [IMVP Power](#)

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