

AMC60804 4-Channel, EML Monitor and Controller

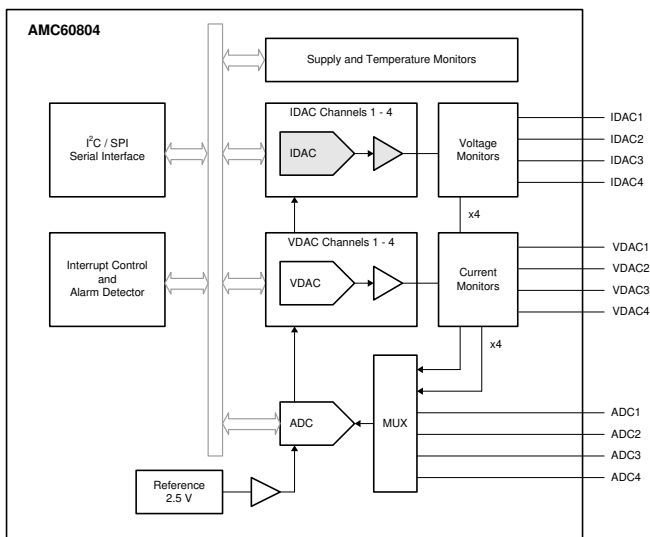
With Current and Voltage Output DACs and Multichannel ADC

1 Features

- Four 12-bit current output DACs (IDACs)
 - 150-mA full-scale output range
- Four 12-bit voltage output DACs (VDACs)
 - Selectable full-scale output ranges: –5 V, –2.5 V, +2.5 V and +5 V
 - High-current drive capability: ± 50 mA
- Twelve channel, 12-bit, 1-MSPS SAR ADC
 - Four external inputs: 2.5-V and 5-V input ranges
 - Four IDAC voltage monitor channels
 - Four VDAC current monitor channels
 - Programmable sequencer
 - Programmable out-of-range alarms
- Internal 2.5-V reference
- Supply and temperature fault alarms
- SPI and I²C interfaces: 1.7-V to 3.6-V operation
 - SPI: 4-wire interface
 - I²C: Four slave addresses
- Specified temperature range: –40°C to +125°C

2 Applications

- [Optical module](#)
- [Intra-dc interconnect \(metro\)](#)



Simplified Schematic

3 Description

The AMC60804 is a highly integrated, low-power analog monitor and controller optimized for electro-absorption modulated lasers (EML).

The AMC60804 includes four 12-bit current output digital-to-analog converters (IDACs) and four 12-bit voltage output DACs (VDACs) with programmable output ranges. The AMC60804 also includes a 12-bit, 1-MSPS analog-to-digital converter (ADC) used for external signal and internal signal monitoring, supply and temperature alarm monitors, and a high-precision internal reference.

The AMC60804 VDACs support both positive and negative output range operation and are capable of sourcing and sinking up to 50 mA, making them an excellent choice for biasing the electro-absorption modulator (EAM) in an EML. Additionally, the AMC60804 IDACs support a full-scale output range of 150 mA with very low power dissipation, thus eliminating the need for external components to bias the EML laser diode. In combination the AMC60804 four VDACs and four IDACs enable accurate biasing of up to four EML lasers.

The AMC60804 includes four input pins that are multiplexed to the ADC and incorporate a low-latency window comparator, making this device an excellent choice for received signal strength indicator (RSSI) and loss-of-signal (LOS) detection. The ADC is also capable of measuring the voltage at the IDAC pins, as well as the current being sourced or sunk by the VDACs, thus enabling monitoring of these outputs.

The AMC60804 low power, high integration, very small size, and wide operating temperature range make the device an excellent choice as an all-in-one, low-cost control circuit for the EML lasers found in optical modules. Contact TI sales for the full data sheet.

Device Information

PART NUMBER	PACKAGE ⁽¹⁾	BODY SIZE (NOM)
AMC60804	DSBGA (36)	2.56 mm × 2.56 mm

- (1) For all available packages, see the package option addendum at the end of the data sheet.



4 Device and Documentation Support

4.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Subscribe to updates* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.2 Support Resources

TI E2E™ [support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

4.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.

All trademarks are the property of their respective owners.

4.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.5 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

5 Mechanical, Packaging, and Orderable Information

The following pages include packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
AMC60804YBHR	ACTIVE	DSBGA	YBH	36	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 105	AMC60804	Samples
AMC60804YBHT	ACTIVE	DSBGA	YBH	36	250	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 105	AMC60804	Samples

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

Important Information and Disclaimer:The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
AMC60804YBHR	DSBGA	YBH	36	3000	180.0	8.4	2.71	2.71	0.6	4.0	8.0	Q1
AMC60804YBHT	DSBGA	YBH	36	250	180.0	8.4	2.71	2.71	0.6	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
AMC60804YBHR	DSBGA	YBH	36	3000	182.0	182.0	20.0
AMC60804YBHT	DSBGA	YBH	36	250	182.0	182.0	20.0

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2025, Texas Instruments Incorporated