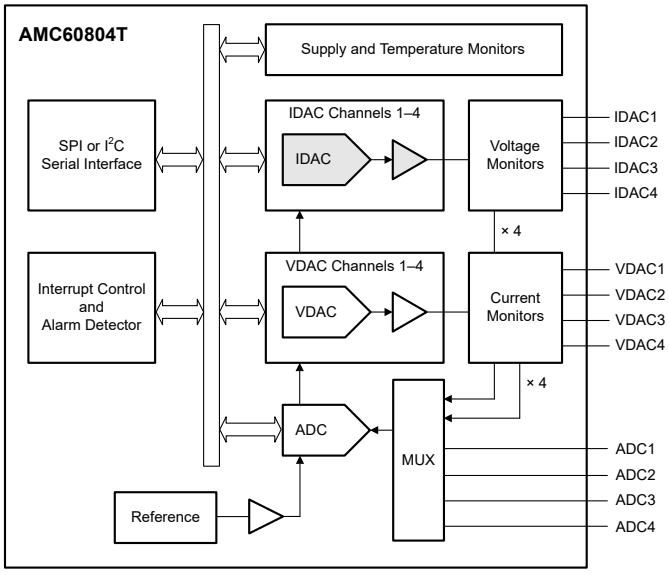
AMC60804T 4-Channel Optical Monitor and Controller With Current and Voltage Output DACs and Multichannel ADC

1 Features

- Four 12-bit current output DACs (IDACs)
  - 200-mA full-scale output range
  - Low supply headroom: 200 mV at 200 mA
- 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
- Multichannel, 12-bit, 1-MSPS SAR ADC
  - Four external inputs: 2.5-V and 5-V 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 I^2C interfaces: 1.7-V to 3.6-V operation
  - SPI: 4-wire interface
  - I^2C: Four target addresses
- Specified temperature range: –40°C to +125°C

2 Applications

- Optical module
- Intra-DC interconnect (metro)



Simplified Schematic

3 Description

The AMC60804T is a highly integrated, low-power analog monitor and controller for optical transceiver applications.

The AMC60804T includes four 12-bit current output digital-to-analog converters (IDACs) and four 12-bit voltage output DACs (VDACs) with programmable output ranges. The device also includes a 12-bit, 1-MSPS analog-to-digital converter (ADC) used for external and internal signal monitoring, supply and temperature alarm monitors, and a high-precision internal reference.

The AMC60804T VDACs support both positive and negative output-range operation and are capable or sourcing and sinking up to 50 mA, making them an excellent choice for biasing optical modulators. Additionally, the AMC60804T IDACs support a full-scale output range of 200 mA with very-low power dissipation. The IDACs eliminate the need for external components to bias laser diodes. In combination, the AMC60804T four VDACs and four IDACs enable accurate biasing of electro-absorption modulated lasers.

The AMC60804T also includes four input pins that are multiplexed to the ADC and incorporate a low-latency window comparator. These features make 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 sinked by the VDACs, thus enabling these outputs to be monitored.

The AMC60804T low power, high integration, very small size, and wide operating temperature range make this device an excellent choice as an all-in-one control circuit for optical modules.

Package Information

PART NUMBER	PACKAGE(1)	BODY SIZE (NOM)
AMC60804T	YBH (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 Documentation Support

Note

TI is transitioning to use more inclusive terminology. Some language may be different than what you would expect to see for certain technology areas.

4.1.1 Related Documentation

For related documentation, see the following: AMC60304EVM user's guide

4.2 Trademarks

All trademarks are the property of their respective owners.

4.3 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.

4.4 Glossary

TI Glossary	This glossary lists and explains terms, acronyms, and definitions.

5 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, 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 part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
AMC60804TYBHR	Active	Production	DSBGA (YBH) | 36	3000 | LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 125	AMC60804T
AMC60804TYBHR.A	Active	Production	DSBGA (YBH) | 36	3000 | LARGE T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-40 to 125	AMC60804T

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts 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.

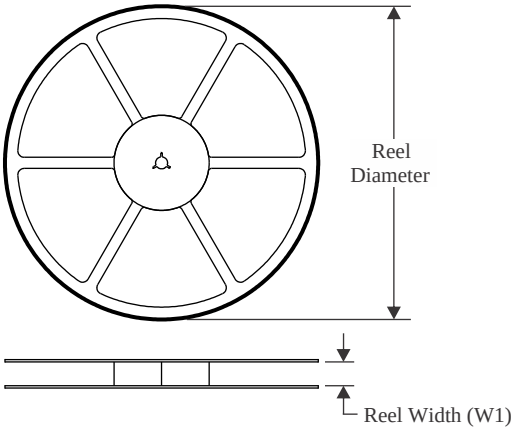
(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

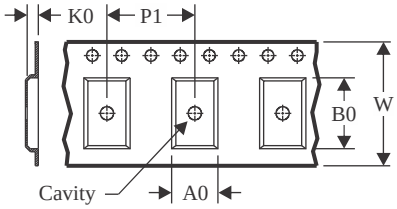
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

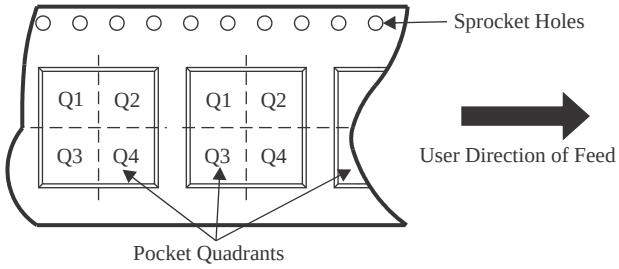


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

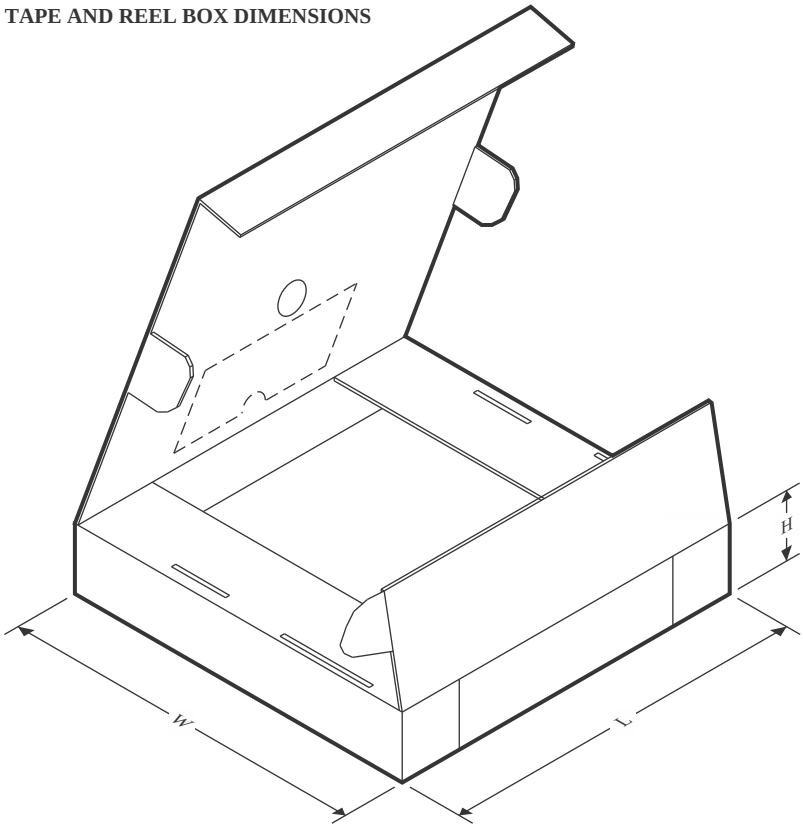
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
AMC60804TYBHR	DSBGA	YBH	36	3000	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)
AMC60804TYBHR	DSBGA	YBH	36	3000	182.0	182.0	20.0

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