



SparkFun THAT 1646 OutSmarts Breakout

BOB-14003 ✨

DESCRIPTION

DOCUMENTS

The THAT 1646 OutSmarts Breakout Board offers an easy solution to adding a balanced audio output to your circuits. The THAT OutSmarts technology has been designed as a high-grade analog line driver and offers a low distortion and high common mode rejection in real-world audio applications. Each breakout board combines the THAT 1646 IC, its supporting components and a 1/4" TRS (Tip Ring Sleeve) socket. With these powers combined, you will find it very easy to use the output drivers on breadboards and in projects!

The THAT 1646 OutSmarts Breakout and its sibling, the [THAT 1206 InGenius Breakout](#), perform mirror-image signal conversion. While the InGenius is a balanced-to-unbalanced input receiver, this OutSmarts is an unbalanced-to-balanced output driver. We have made sure to break out each pin you need to utilize the OutSmarts board including the unbalanced input (IN), the positive and negative power supply rails (V+, V-) and, of course, ground (GND). Additionally, adjacent to each leg of the socket are test points for the signal (T, R, S) and normal (TN, RN, SN) contacts.

GET STARTED WITH THE THAT 1646 OUTSMARTS GUIDE

Tags

AUDIO

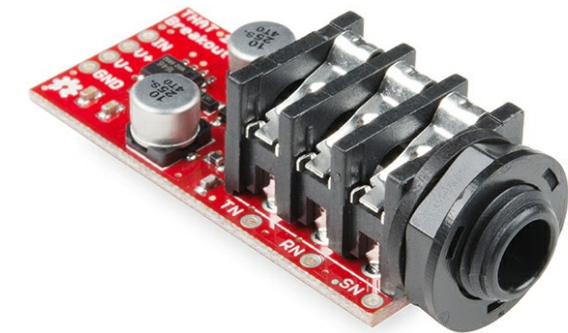
BREAKOUT

OUTSMARTS

THAT

THAT 1646

TRS



images are CC BY 2.0



SparkFun THAT 1646 OutSmarts Breakout Product Help and Resources

TUTORIALS

VIDEOS

SKILLS NEEDED



THAT InGenius and OutSmarts Breakout Hookup Guide

MARCH 30, 2017

Learn about the benefits of balanced signal transmission, and how to apply the THAT InGenius and OutSmarts breakouts.

COMMENTS 3

REVIEWS 0

Customer Comments

[Log in](#) or [register](#) to post comments.



SeanD / last year / ★ 1

This board would be so much more useful if it either came without the TRS jack or had a dual footprint for a TRS and an XLR3. XLR3 is the right way to send balanced audio. ¼" TRS was traditionally reserved only for inserts and returns.



AndyP / last year / ★ 1

I've designed several products with the THAT1646 (and the T1 equivalent, the DRV134) and the part is great. But there is an important caveat noted in the datasheet, under Applications on page 6:

"2. Both devices must be driven from a low- impedance source, preferably directly from opamp outputs, to maintain the specified performance."

Look at the part's internal schematic. It has a moderate input impedance, 5kΩ. The pin labeled "GND" really isn't a power-supply return pin, it is just a side of another 5kΩ resistor whose other side goes to the op-amp's input. The op-amp inside the 1646 is configured as a non-inverting amplifier, so if you look at the common configuration for such an op-amp, you'll see that this second resistor is the Rin part of the feedback network.

What does this mean? It means that if you drive it from a source without low-impedance drive, such as the wiper of a pot, the balance is wrecked. The result is asymmetrical drive, and that asymmetry is a function of the source impedance. This asymmetry might not be a problem in many applications where the connected receiver is a differential amplifier (THAT1200-series, INA217, or a diff-amp built from a pair of op-amps, or a transformer) and in circuits with the standard ±15 V rails and standard line-level (+4 dBu) audio. But if you power the 1646 from reduced rails, like its ±5 V lower limit, you'll clip easily.

So you definitely want to drive this guy with an op-amp.



Member #122195 / last year / ★ 1

This is great, I love it but I need it with an XLR-3 connector. Is the board layout compatible with a board mount XLR connector as well? Perhaps Neutrik? If not, can you offer with the TRS connector unpopulated so I'm not paying for a connector I can't use?



START
SOMETHING.



SUBSCRIBE TO NEWSLETTER

In 2003, CU student Nate Seidle blew a power supply in his dorm room and, in lieu of a way to order easy replacements, decided to start his own company. Since then, SparkFun has been committed to sustainably helping our world achieve electronics literacy from our headquarters in Boulder, Colorado.

No matter your vision, SparkFun's products and resources are designed to make the world of electronics more accessible. In addition to over 2,000 open source components and widgets, SparkFun offers curriculum, training and online tutorials designed to help demystify the wonderful world of embedded electronics. We're here to help you start something.

About Us

[About SparkFun](#)
[SparkFun Education](#)
[Feeds](#)
[Jobs](#)
[Contact](#)

Programs

[Become a Community Partner](#)
• [Community Stories](#)
[Custom Kit Requests](#)
[Tell Us About Your Project](#)
[Sell Your Widget on SparkFun](#)
[Become a SparkFun Distributor](#)

Help

[Customer Service](#)
[Shipping](#)
[Return Policy](#)
[FAQ](#)
[Chat With Us](#)

Community

[Forum](#)
[SparkFun IRC Channel](#)
[Take the SparkFun Quiz](#)
[SparkFun Kickstarter Projects](#)
[Distributors](#)

What's on your mind?

For which department?

General

Please include your email address if you'd like us to respond to a specific question.

SUBMIT

Questions? Feedback? powered by [Olark live chat software](#)