

TS3A226AE TEST Board

User's Guide



Revision 1.1
March 19th, 2013



Table of Content

Table of Content	2
1. TS3A226AE Test Module	3
1.1 Introduction	3
2. Setup	4
2.1 Boards	4
2.2 Setup Procedure.....	5
2.2.1 Equipment required	5
2.2.2 Power up.....	5
3. Evaluating TS3A226AE	6
3.1 Test with different types of Headsets	6
(1) 4-pole standard/ North American Headsets:	6
(2) 4-pole OMTP Headsets:	6
(3) TRS audio headset:	6
4. Schematics	7

List of Figures

Figure 1- TS3A226AE Test Board	4
Figure 2- TS3A226AE Schematic	7

List of Tables

Table 1- TS3A226AE Test Module Signal Connections	4
--	----------



1. TS3A226AE Test Module

This user guide describes the TS3A226AE test module usage. This guide contains the schematics, evaluation examples, and bill of materials to evaluate the performance of the TS3A226AE device.

1.1 Introduction

The TS3A226AE is an audio headset switch that detects 3- or 4- pole 3.5mm accessories. For a 4-pole accessory with a microphone, the TS3A226AE also detects the MIC location and routes the microphone and ground signals automatically. The ground signal is routed through a pair of low-impedance ground FETs (60m Ω typical), resulting minimal impact on audio cross-talk performance. The autonomous detection feature allows end users to plug in accessories with different audio pole configurations into the mobile device and have them operate properly with no added software control and complexity. The ground FETs of the device are designed to allow FM signal pass-through, making it possible to use the ground line of the headset as an FM antenna in mobile audio application.

The TS3A226AE test board is an evaluation module for the Texas Instruments TS3A226AE switch and it provides the basic functionality evaluation for the device.

2. Setup

2.1 Boards

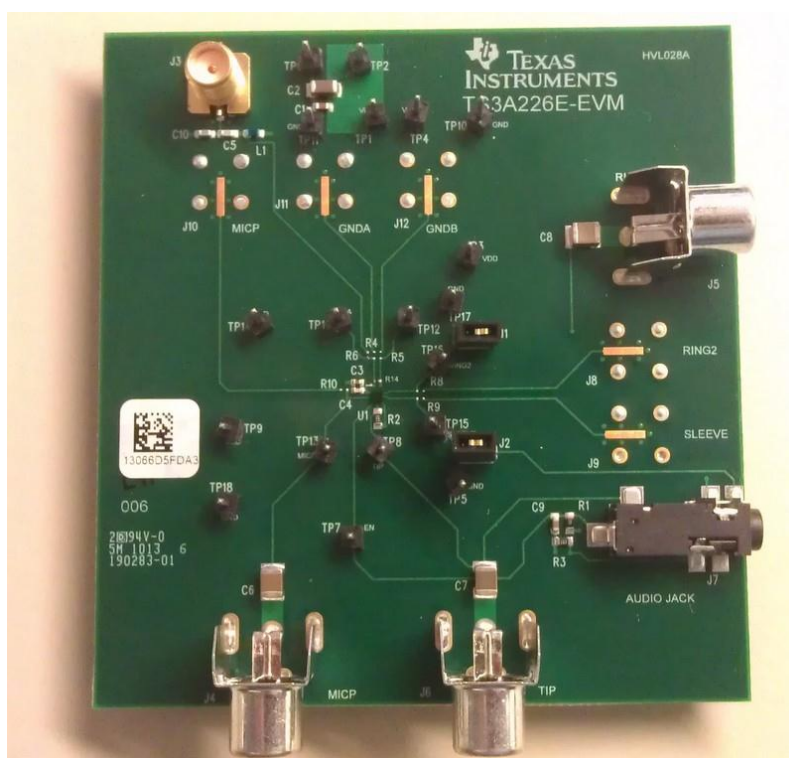


Figure 1- TS3A226AE Test board

This evaluation module provides the following signal connection capabilities:

	Type	Description	Purpose
J3	SMA Connector	FM signal output	If GND is used for FM signal transmission, FM receiver can be connected to this connector for sensitivity test.
J4	RCA Connector	For MIC signal output	Can be connected to Codec for microphone testing.
J5	RCA Connector	RING1 connection	Can be connected to Audio Amplifier (right channel) output for audio testing.
J6	RCA Connector	TIP connection	Can be connected to Audio Amplifier (left channel) output for audio testing.
J7	Audio Jack Connector	Audio Jack for Headset plug in	Plug in different Headset for TS3A226AE function verification

Table 1- TS3A226AE Evaluation Module Signal Connections

Test Point headers are placed throughout the board to provide testing capability for each pin of the device and are labeled with the corresponding pin name beside the header pins.



2.2 Setup Procedure

2.2.1 Equipment required

- Power supply which can provide 2.6V to 4.7V
- Multi-meter

2.2.2 Power up

To provide the VDD to the TS3A226AE. Add the jumper for J1 and J2.

External power supply input are supplied to the VDD test point (TP6) for VDD and GND test points (TP12) for GND.

3. Evaluating TS3A226AE

3.1 Test with different types of Headsets

To evaluate the capability of headset detection for TS3A226AE, plug in different types of headsets (4-pole standard, 4-pole OMTP, or regular TRS) to the headset jack J7, and check the detection result.

(1) 4-pole standard/ North American Headsets:



If a 4-pole standard/North American headset is plugged-in, below table can be used to check the detection result by measuring the resistor through the hand multi-meter.

	Negative Pole	Positive Pole	Measured Value(Ω)
Test points	TP13(MICP)	TP15(SLEEVE)	≤ 10
	TP13(MICP)	TP16(RING2)	$> 1K$
	TP21(GNDA)	TP15(SLEEVE)	$> 1K$
	TP12(GNDB)	TP16(RING2)	≤ 2

(2) 4-pole OMTP Headsets:



If a 4-pole OMTP headset is plugged-in, below table can be used to check the detection result by measuring the resistor through the hand multi-meter.

	Negative Pole	Positive Pole	Measured Value(Ω)
Test points	TP13(MICP)	TP15(SLEEVE)	$> 1K$
	TP13(MICP)	TP16(RING2)	≤ 10
	TP21(GNDA)	TP15(SLEEVE)	≤ 2
	TP12(GNDB)	TP16(RING2)	$> 1K$

(3) TRS audio headset:



If a regular TRS headset without integrated microphone is plugged-in, below table can be used to check the detection result by measuring the resistor through the hand multi-meter.

	Negative Pole	Positive Pole	Measured Value(Ω)
Test points	TP13(MICP)	TP15(SLEEVE)	$> 1K$
	TP13(MICP)	TP16(RING2)	$> 1K$
	TP21(GNDA)	TP15(SLEEVE)	≤ 2
	TP12(GNDB)	TP16(RING2)	≤ 2

Note: These measured resistor values cannot be used to check the Switch R_{ON} since the multi-meter has the internal output resistor.

4. Schematics

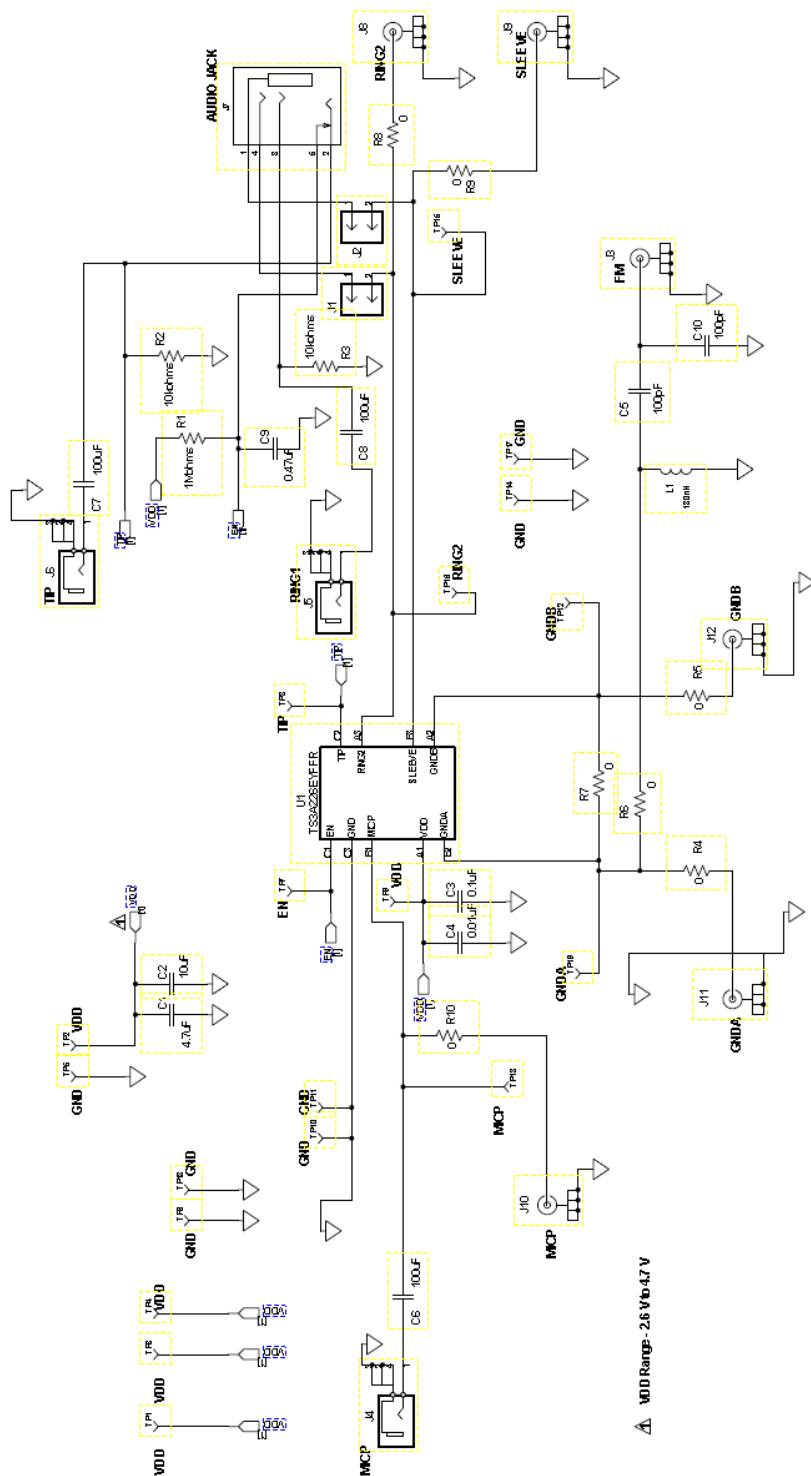


Figure 2- TS3A226AE Schematic

IMPORTANT NOTICE FOR TI REFERENCE DESIGNS

Texas Instruments Incorporated ("TI") reference designs are solely intended to assist designers ("Buyers") who are developing systems that incorporate TI semiconductor products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, evaluation and judgment in designing Buyer's systems and products.

TI reference designs have been created using standard laboratory conditions and engineering practices. **TI has not conducted any testing other than that specifically described in the published documentation for a particular reference design.** TI may make corrections, enhancements, improvements and other changes to its reference designs.

Buyers are authorized to use TI reference designs with the TI component(s) identified in each particular reference design and to modify the reference design in the development of their end products. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY OTHER TI INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN, including but not limited to any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services, or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

TI REFERENCE DESIGNS ARE PROVIDED "AS IS". TI MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE REFERENCE DESIGNS OR USE OF THE REFERENCE DESIGNS, EXPRESS, IMPLIED OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. TI DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO TI REFERENCE DESIGNS OR USE THEREOF. TI SHALL NOT BE LIABLE FOR AND SHALL NOT DEFEND OR INDEMNIFY BUYERS AGAINST ANY THIRD PARTY INFRINGEMENT CLAIM THAT RELATES TO OR IS BASED ON A COMBINATION OF COMPONENTS PROVIDED IN A TI REFERENCE DESIGN. IN NO EVENT SHALL TI BE LIABLE FOR ANY ACTUAL, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES, HOWEVER CAUSED, ON ANY THEORY OF LIABILITY AND WHETHER OR NOT TI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, ARISING IN ANY WAY OUT OF TI REFERENCE DESIGNS OR BUYER'S USE OF TI REFERENCE DESIGNS.

TI reserves the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques for TI components are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

Reproduction of significant portions of TI information in TI data books, data sheets or reference designs is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards that anticipate dangerous failures, monitor failures and their consequences, lessen the likelihood of dangerous failures and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in Buyer's safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed an agreement specifically governing such use.

Only those TI components that TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components that have **not** been so designated is solely at Buyer's risk, and Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.