Manuals+ — User Manuals Simplified.

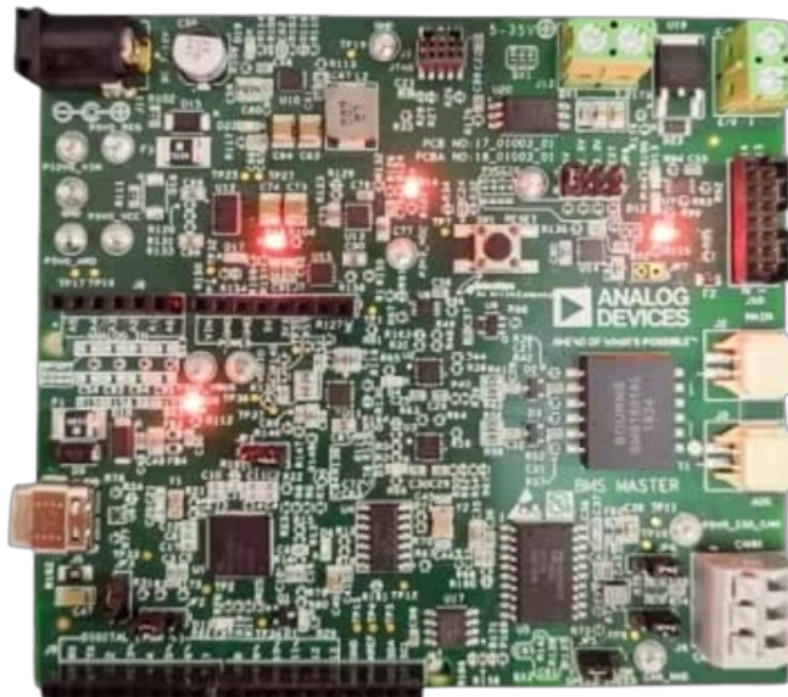# ANALOG DEVICES ADES1754 14 Channel Battery Stack Monitoring Systems User Guide

ANALOG DEVICES ADES1754 14 Channel Battery Stack Monitoring Systems

Contents

General Description

The ADES1754 evaluation kit (EV kit) is used to demonstrate the features and capabilities of the ADES1754/ADES1755/ADES1756 14-channel, highvoltage, smart sensor, data-acquisition interface ICs. The ADES1754 EV kit is coupled with a MAX17851 EV kit to establish communication with a host PC. Once communication is established, control of the ADES1754 EV kit is executed through the EV kit GUI on the host PC. The GUI is Windows XP®-, Windows Vista®-, Windows® 7-, and Windows 10-compatible and is available through your local Analog Devices representative.

The ADES1754 EV kit design provides a convenient platform for evaluating the features and functions of the IC, in addition to the IC's electrical parameters. The EV kit with vertical communication connectors (TXLP CONN, RXLP CONN, TXUP CONN, and RXUP CONN) and snap-and-lock battery pack connector enables the user to quickly build and evaluate a system with up to 32 daisy chain devices. Design files for this circuit board are available.

Features and Benefits

- Provides a Convenient Platform for Evaluating the Features and Functions of the ADES1754
- Versatile GUI Interface for Features Evaluation
- Plug-and-Play Architecture for Rapid System Prototyping
- Force and Sense Pin Headers for Precision Measurement Assessment
- Built-In Resistor Stack for Battery Emulation
- Proven PCB Layout Fully Assembled and Tested

Evaluation Board Contents

- 1x ADES1754EVKIT# Evaluation Board
- 2x Two Wire CLIK™-Mate 2-wire loop cable, 3 inches
- 14x Shunt, 2.54mm Pitch Open Top Grip, Black
- 2x Two Wire CLIK-Mate Crossover Cable, 6 Inches

Required Hardware

- One single-UART MAX17851 EV kit
- 9V to 65V DC power supplies (refer to the ADES1754 IC data sheet for recommended operating range)
- User-supplied Windows XP-, Windows Vista-, Windows 7-, or Windows 10-compatible PC with a spare USB port

Required Software

- Evaluation software for the ADES1754 EV kit

A Windows PC-based graphical user interface is available through the **Software Request Form** on the Analog Devices website. Refer to the MAX17851 EV kit data sheet to find out more about how to allow communication to the ADES1754 EV kit board.

Ordering Information appears at end of data sheet.

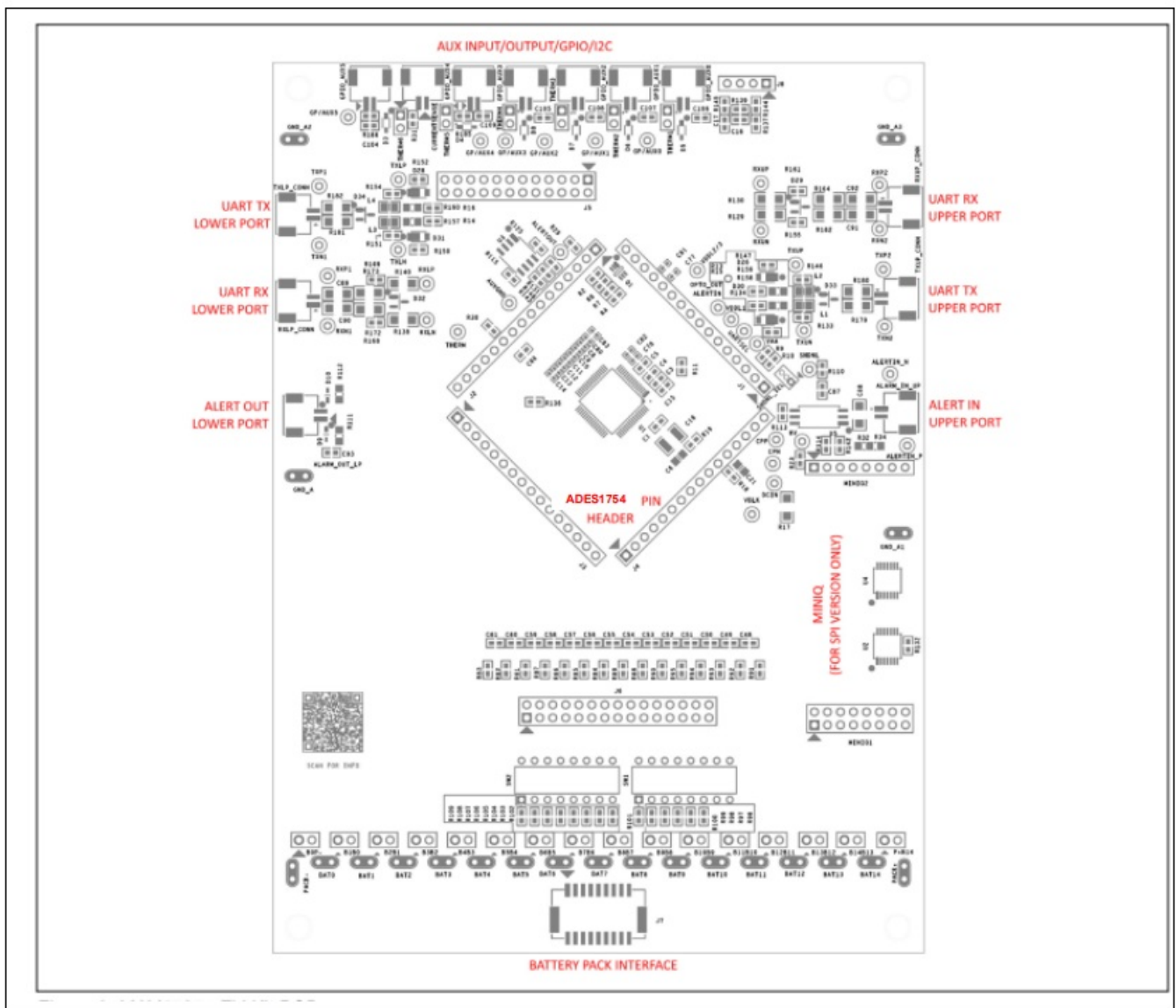## Detailed Description of Hardware

Figure 1. ADES1754 EV Kit PCB

Battery-Pack Connector (J7)

Power is applied to the ADES1754 EV kit through the J7 battery-pack connector, or the PACK+ and PACK- test points. The PACK+ and PACK- test points are provided, should the user prefer to source power from a laboratory power supply.

Caution: Only apply a jumper to B0P- and P+B14 when using a battery pack. Placing a jumper on any battery pin header with a battery pack connected places a direct short on the battery-pack cell.

To power the ADES1754 EV kit using a bench power supply, terminate PACK+ to the positive post and PACK to the negative post of the power supply and install the P+B14 and B0P- jumpers.

Battery-Cell Emulation

For convenience, the ADES1754 EV kit PCB is equipped with a 2kΩ resistor ladder to emulate a battery pack when using a bench power supply. To apply the emulated battery-pack resistor ladder voltages to the ADES1754 cell-voltage measurement inputs (C0–C14), place all SW1 and SW2 switches in the closed or ON position. Pack voltage from a bench power supply applied to the 2kΩ resistor ladder divides equally across the resistors and is measured by the ADES1754 IC.

The battery interface includes a battery force and sense pin header (J6) that can be used for precision measurement testing. A forced simulated-battery voltage between adjacent pins on the J6 pin header can be measured at the pin header and compared with the data conversion values of the ADES1754 IC.

AUX Input/Output/ADC

The auxiliary (AUX) input/output/ADC section of the EV kit PCB (see Figure 1) gives the user access to the ADES1754 AUX GPIO pins and THRM pin. Each GPIO_AUX connector is equipped to interface directly to NTC thermistors for external temperature measurement.
With the THERM jumper installed, the NTC sensor is pulled up through a 10kΩ resistor to the THRM pin on the ADES1754 IC. This feature allows the user to turn on or off the 10kΩ pull-up through the THRM pin for energy conservation.

The AUXIN[1:0] pins on the ADES1754 IC can be configured as an I2C controller interface using the I2CEN bit in the AUXGPIOCFG register. When the I2CEN bit is high, AUXIN0 operates as the SDA pin and AUXIN1 operates as the SCL pin. In this configuration, the device is capable of functioning as an I^{2}Ccompatible controller and can read and write to any number of associated I2C-compatible target devices connected to the 2-wire bus at clock rates of 100kHz or 400kHz. By default, I2CEN is low and the I2C controller is disabled.

GPIO_AUX is instrumented with a block header (J5) that allows the user to perform AUX_GPIO force and sense accuracy measurements. To perform accuracy measurement through the J5 header, a voltage is forced onto a pin header and can be sensed through the adjacent pin on the header. The measurement can then be compared to the conversion measurement of the ADES1754 IC.

UART Ports

The UART communication ports are identified as the upper port (RXU/TXU) and the lower port (RXL/TXL), with reference to the ADES1754 device on the EV kit PCB (see Figure 1). Each UART port comprises a differential transmitter and a differential receiver.

Communication data received on the lower receiver is retransmitted through the upper transmitter to the next EV kit in the daisy chain. Communication received on the upper receiver is retransmitted through the lower transmitter and downward through the chain. Each differential pair includes four test points for observing the communication signals. It is critical to note that the upper port (RXP2, RXN2, TXP2, and TXN2) test points are referenced to the next higher ground-potential EV kit.

The EV kit UART network and components are designed for the automotive environment and are capable of enduring battery-management-system compliance testing. This includes BCI, ESD, radiated emission, pulse testing, and deactivation of the service-disconnect switch. The PCB and UART components are designed and selected for 630VDC (max) isolation between each ADES1754 EV kit in the daisy-chained system. However, isolation capability has not been tested on the ADES1754 EV kit.

ALERT IN/ALERT OUT

The redundant ALERT interface provides an additional channel for notifying the host about potential hazards in the daisy chain. It can be programmed to activate on specific alerts of the IC (for example over- and undervoltage conditions) and can propagate a 2MHz signal through the daisy chain to the host where actions can be taken. The propagation is always DOWN the daisy-chain and, since it is not a differential signal (unlike the UART port), additional isolation measures must be taken on the board level.

The EV kit comes with an optical isolation, thus a simple UART cable (blue/black) can be used to connect multiple devices.

ADES1754 IC Pin Headers (J1–J4)

Each pin on the ADES1754 IC is available for easy monitoring through the J1 IC pin header. Header J1 is terminated to pins 1–16 on the ADES1754 IC, J2 is terminated to pins 17–32, J3 is terminated to pins 33–48, and J4 is terminated to pins 49–64. For convenience, certain IC pins are terminated to test points for monitoring frequently observed device signals. Examples include:
VBLK, DCIN, HV, CPP, CPN, SHDNL _SELSHDNL, VAA UARTSEL, VDDL1, ALERTIN, ALERTOUT, and THERM.

Hardware Set-up Procedure

The ADES1754 EV kit is fully assembled and functionally tested prior to shipment. Use the following steps to become acquainted with the ADES1754 EV kit and initialize the single-UART EV kit communication.

1. Install the ADES1754 EV kit software on your computer by running the MAX1785X_EV kit_Installer.exe.
2. Follow the on-screen instructions shown in the popup window.
3. Click the Install button to confirm the installation of the ADES1754 GUI.
4. Click Next in the device driver installation wizard window.
5. Click Finish.

Note: The ADES1754 EV kit requires a minimum external supply of 12V. Switching all switches to the ON position enables a 2kΩ resistor ladder, connecting from PACK+ to PACK- and enabling a uniform voltage reading across all battery inputs.

MAX17851 EV Kit
To complete the ADES1754 EV kit battery-management evaluation system, it is essential to include the MAX17851_DUAL_ SAFEMON_EVKIT. In this EV kit, we only refer to the ADES1754EVKIT#, as it can use the full potential of the ADI BMS system. It is critical to note that the ADES1754EVKIT# provides the battery management evaluation system with capacitive isolation on connectors J3, J4, J18, and J19.
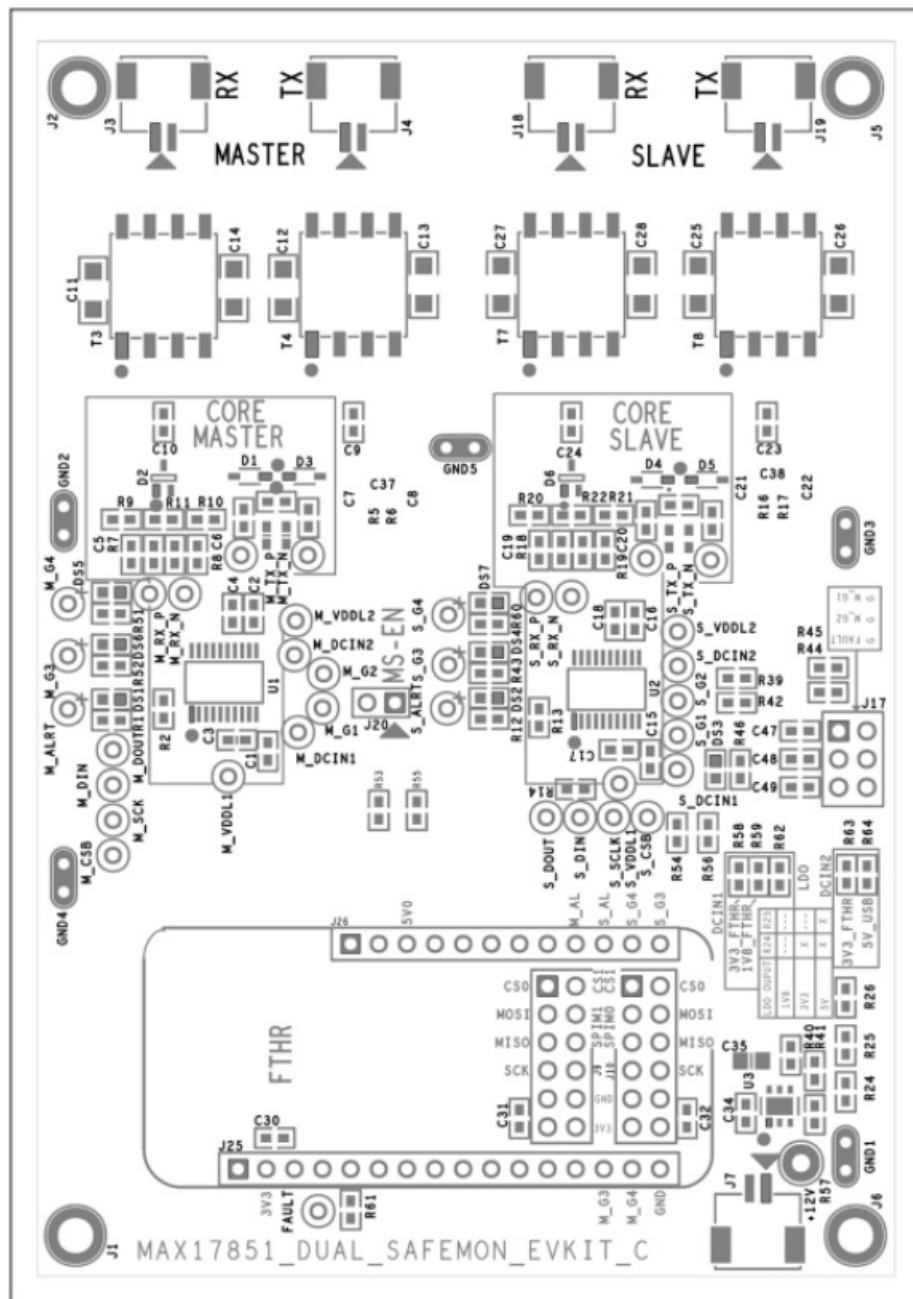
Figure 2. MAX17851 EV Kit PCB

MAX17851 EV Kit to ADES1754 EV Kit— Typical UART Connection

A typical UART connection is generally point to point meaning the transmitter (Tx) and receiver (Rx) are connected directly to each other. To daisy-chain the devices, the device's UART Rx and Tx are connected sequentially in a chain.

Power is applied to the ADES1754 EV kit through the J7 battery-pack connector, or the PACK+ and PACK- test points. The PACK+ and PACK- test points are provided, should the user prefer to source power from a laboratory power supply.

Figure 3 shows the following connections for two boards on a stack interfaced to a PC:

- Connect a USB cable from the PC USB port to the MAX17851 EV kit.
  - Connect the MAX17851 EV kit to the ADES1754 EV kit. This ADES1754 EV kit is the first (or "bottom") board of the stack.

- Connect a 2-wire CLIK-Mate crossover cable to the "bottom" ADES1754 EV kit Rx from the MAX17851 EV kit Tx.
- Connect or daisy-chain the ADES1754 EV kit to another ADES1754 EV kit in UART mode. This ADES1754 EV kit is the last (or "top") board of a twoboard stack. More ADES1754 EV kit "upper" boards can be daisy-chained together in the same manner.
  - Connect a two-wire CLIK-Mate crossover cable from the "bottom" ADES1754 EV kit connector to the next "upper" or "top" ADES1754 EV kit connector.
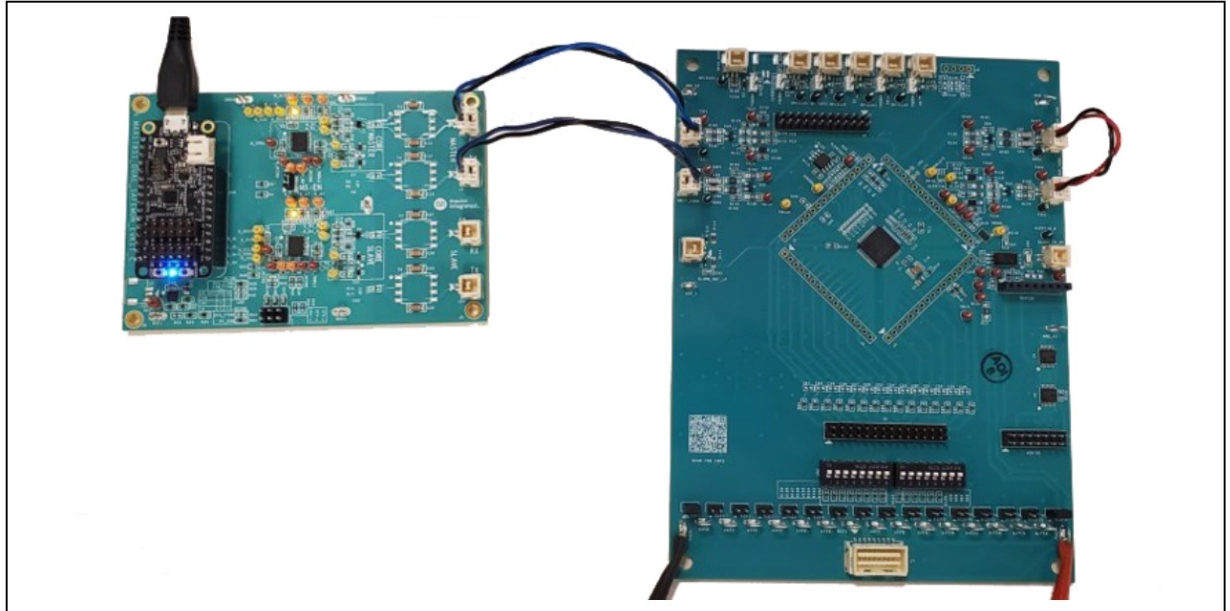

Figure 3. MAX17851 EV Kit to ADES1754 EV Kit Typical Connection

Detailed Description of Software

MAX1785X Evaluation Software GUI

Request the GUI software with the **Software Request Form** on the Analog Devices website.

Ordering Information

PART NUMBER	PACKAGE DESCRIPTION
ADES1754EVKIT#	Evaluation Board for ADES1754

ADES1754 EV Kit Bill of Materials

ITEM#	LOCATION	DNI	QTY	MFG _PN	MFG	VALUE	DESCRIPTION
1	–	–	1	08 _ 075909a	ANALOG DEVICES	–	PCB

2	ALARM_IN_UP.ALARM_OUT_LP.CURREN TSENSE ,GPIO_AUX0 ,GPIO_AUX 1,GPIO_AUX2,GPIO_AUX3,GPIO_AUX 4,GPIO_AUX5 , RX LP_CONN,RXUP_C ONN,TXLP _C ONN,TXUP_CONN	–	13	502584-0270	MOLEX	502584-0270	CONN-PCB 2 POSITION RECEPTACLE CONNECTOR 0.059
3	ALER TIN,ALERTIN_N ,ALER TIN_P ,AL ERTOU T,CPN,CPP ,DCIN,HV,RXLN, RX LP,RXP1,RXP2 , RXUN, RXUP,TXLN ,TX LP,TXP1 ,TXP2 ,TXUN, T XUP ,UAR TSEL ,VAA,VB LK	–	23	5000	KEYSTONE ELECTRONICS	RED	CONN-PCB TEST POINT RED
4	AUXGND ,OPTO_O U T,SHDNL,THERM , VDDL1,VDDL2/3	–	6	5004	KEYSTONE ELECTRONICS	YEL	CONN-PCB TEST POINT YELLOW
5	BOP – ,B1BO, 8281 ,8382,8483,8584,8685 ,87 B6,B887 ,B9 B8,B10B9 ,B11 B10,812811 ,B13812 ,B14813 ,P+B14	–	16	PEC02SAAN	SULLINS	PEC02SAAN	CONN-PCB 2.54MM HEADER SINGLE STR 2POS
6	BAT0,BAT1 ,BAT2,BAT3 ,BAT 4,BAT5,BAT6,BAT7,BAT8 ,BAT9 ,BAT10 ,BAT11 , B AT 12,BAT13 ,BAT 14,GND_A ,GND_A 1, GND_A2 ,GND_ A3,PACK+,PACK-	–	21	9020	WEICO W1RE A ND CABLE INC.	9020	CONN-PCB BUS BAR 20 AWG , CUSTOM MEASURED LENGT H: 7.2 MM (283.465 MIL)
7	C1	–	1	CC0603KRX7R0BB 104	YAGEO	0.1UF	CAP CER 0.1UF 100V 10% X7R 0603
9	C34,C35,C36 ,C37 , C38,C39,C40,C41,C42,C43,C44 ,C45 ,C 46 ,C47 ,C100	–	15	12061C104JAT2A	AVX	0.1uF	CAP CER 0. 1u F 100V 5% X7 R 1206
11	C86 ,C104, C105,C 106,C 107,C108,C1 09	–	7	0603YC 103K AT2A	AVX CO RPORAT ION	0.01uF	CAP CER 0.01uF 16V 10% X7 R 0603
12	C14	–	1	04025A101FAT2A	AVX CO RPORAT ION	100pF	CAP GER 100p F 50V 1% CO G 0402

13	C15	–	1	C0603C392J5GACTU	KEMET	3900pF	CAP GER 3900pF 50V 5% COG 0603 EXTREME LOW ESR
16	C18	–	1	CGA6N3X7R2A225K230AB	TDK	2.2UF	CAP CER 2.2UF 100V 10% X7R 1210 AEC -O200
18	C2	–	1	GRM155R72A102KA01D	MURATA	1000pF	CAP GER 1000pF 100V 10% X7R 0402
19	C20,C22 ,C23 ,C24 ,C25,C26 ,C27 ,C28 ,C 29,C30 ,C31 ,C3 2 ,C33 ,C84	–	14	C32 16X8R2A104K115 AA	TDK	0.1uF	CAP GER 0.1uF 100V 10% X8R 1206
20	C21	–	1	GRM21BR72A474KA73L	MURATA	0.47uF	CAP CER 0.47uF 100V 10% X7R 0805
21	C3,C85	–	2	C0603X105K9RACTU	KEME T	1UF	CAP CER 1UF 6.3V 10% X7R 0603
22	C4,C5,C7	–	3	GRM188R71C474KA88D	MURATA	0.47u F	CAP GER 0.47uF 16V 10% X7R 0603
24	C6	–	1	CGA4J1X7R1V475K125AC	TDK	4.7uF	CAP GER 4.7uF 35V 10% X7R 0805 AEC-Q200 LOW ESR
25	C62 ,C63 ,C64 ,C65 ,C66,C67 ,C68,C69, C 70,C71,C72,C73, C74,C75	–	14	C0603C 104K 3RACTU	KEME T	0.1uF	CAP CER 0.1uF 25V 10% X7R 0603
27	C77,C80,C81,C83	–	4	GJM1555C1H180JB01D	MURATA	18pF	CAP GER 18pF 50V 5% COG 0402
28	C87	–	1	C0603C390K1GACTU	KEMET	39PF	CAP CER 39PF 100V 10% COG 0603 EXTREMELY LOW ESL
29	C88	–	1	C1206C101J1GAC TU	KEME T	100pF	CAP GER 100p F 100V 5% COG 1206 EXTREME LOW ESR
30	C89,C90,C91,C92	–	4	CGA5H4C0G2J222J115 AA	TDK	2200PF	CAP GER 2200PF 630V 5% COG 1206 AEC-O200
31	C93	–	1	06031A150JAT2A	AVX CO RPORAT ION	15pF	CAP CER 15pF 1DOV 5% COG 0603
33	D9,D10	–	2	PESD3V3U1UB,115	NEXPER IA	PESD3V3 U1UB,115	DIO TVS ESD UNIDIRECTIONAL 3.3V SOD-523 AEC- 0101
34	D3,D4,D5,D6,D7,D8 ,D11,D12,D13,D14, D16,D18,D19,D20,D 2 1,D24 ,D25	–	17	SP4021-01 F TG	LITTELF USE, IN C.	SP4021-0 1FTG	D1O TVS UN IDIREC TIONAL 5V 25A 2.5PF AEC-O101

36	D26,D28 ,D30 ,D31	–	4	DF LS1100-7	DIODES INCORP ORATED	DFLS1100 -7	DIO SCHOTTKY BARRIER R ECT IFI ER, COMMERCIA L
37	D29,D32 ,D33 ,D34	–	4	SESDO NCA N1 LT1G	ONSEMI	SESDONC AN1 LT1G	D1O TVS ESD BIDIREC TI O NAL 24V 3A SOT-23
39	GP/AUX0,GP/AUX1 ,GP/AUX2 ,GP/AUX 3,GP/AUX4,GP/AUX 5,RXN 1,RXN2,TX N1,TXN2	–	10	5001	KEYSTO NE ELEC TRONIC S	BLK	CONN-PCB TST PNT BLK
40	J1,J2,J3,J4	–	4	TSW-116-07- G -S	SAMTEC INC.	TSW-116- 07-G-S	CONN-PCB 16POS MALE HE ADER SINGLE ROW ST 0.62 5MM SQ POST, 2.54MM PITC H, 5.84MM POST HEIGHT, 2. 54MM SOLDER TAIL
41	J5	–	1	PEC12DAAN	SULLINS	PEC12DA AN	CONN-PCB 24POS MALE UN SHROUDED HDR DUA L RO W ST, 2.54MM PITCH, 3.05M M SOLDER TAIL, 5.84MM PO ST HEIGHT
42	J6	–	1	PBC15DAAN	SULLINS	PBC15DA AN	CONN-PCB UNSHROUDED HDR VERT DUAL ROW 30PO S 2.54MM PITCH, 5.84MM PO ST HEIGHT, 3.05MM SOLDET TAIL
43	J7	–	1	5031541890	MOLEX	503154189 0	CONN-PCB 18POS FEMALE CLIK-MATE PCB RECEP TAC LE DUAL ROW 1.5MM PITCH NATURAL
45	L1,L2,L3,L4	–	4	MMZ2012S60 1ATD25	TDK	600OHM AT 100ME GHZ	IND FERRITE BEAD, 0.3OHM DCR, 0.5A, 0805
46	MINIQ1	–	1	PEC08DAAN	SULLINS	PEC08DA AN	CONN-PCB 16POS MALE HD R UNS HROUD ED DUA L RO W ST, 5.84MM POST HEIGHT, 3.05MM SOLDER T A IL, 2.54MM PITCH
47	MINIQ2	–	1	SSW- 108-01- G-S	SAMTEC	SSW-108- 01-G-S	CONN-PCB RCPT .100 8POS SNGL GOLD
48	Q1,Q2	–	2	BC857BS-7- F	DIODES INCORP ORATED	BC857BS- 7- F	TRAN BJT DUAL PNP 45V S OT-363 AEC-Q101
51	R96 ,R97 ,R98 ,R99 ,R100,R101,R102 , R1 03,R104,R105,R 106 ,R107,R108 ,R1 09	–	14	RC0603FR- 072KL	YAGEO	2K	RES SMD2KOhm 1% 1/10W0 603

52	R11	–	1	RMC F0603Z T0R00	STACKP OLE ELE CTRONI CS, INC.	0	RES 0 OHM JUMPER 1/10W 0603
53	R110,R 155,R161 , R168,R169	–	5	ERJ-3GEYJ 1 04V	PANASO NIC	100K	RES SMD 100K OHM 5% 1/10W0603 AEC-Q200
54	R111,R112	–	2	CRCW080536 0RFK EA	VISHAY	360	RES SMD 360 OHM 1% 1/8W 0805 AEC-Q200
55	R113	–	1	ERJ-3GEYJ 1 02V	PANASO NIC	1K	RES SMD 1K OHM 5% 1/1O W 0603 AEC-O200
56	R9,R114 ,R115,R12 2,R123,R124 ,R125 , R126,R127,R128 , R132,R133,R134,R1 4 6,R147 ,R150 ,R1 51,R152 ,R154	–	19	CRCW060310 K0FKEA	VISHAY	10K	RES SMD 10K OHM 1/10W 1 % 0603
57	R116 ,R117 ,R118 , R119 ,R120 ,R121	–	6	CRCW06031 K00FKEA HP	VISHAY	1K	RES SMD 1K Ohm 1% 1/3W0 603 AEC-Q200
58	R12	–	1	SFR03EZPF1 003	ROHM	100K	RESSMD 100KOHM 1% 1/10 W0603
59	R129,R130,R138,R1 40,R179,R180,R18 1,R182	–	8	CRCW120600 00Z0EA	VISHAY	0	RES SMD 0 Ohm 5% 1/4W 12 06 AEC-Q200
60	R13 ,R14 ,R15 ,R16 ,R136	–	5	RC0603JR-07 0RL	YAGEO	0	RES SMD 0 Ohm JUMPER 1/ 10W 0603
61	R131	–	1	ERJ-3EKF100 2V	PANASO NIC	10K	RES SMD 10K Ohm 1% 1/10 W0603 AEC-0200
63	R157,R158,R159 ,R 160	–	4	ERJ-6EN F49 R9V	PANASO NIC	49.9	RES SMD 49.9 Ohm 1% 1/8W 0805 AEC-Q200
64	R162,R164,R172 ,R 173	–	4	RC1206 FR-0 71K5L	YAGEO	1.5K	RES SMD 1. 5K Ohm 1% 1/4 W 1206
65	R17	–	1	RNCP1206F TD100R	STACKP OLE ELE C T RON ICS, INC .	100	RES SMD 100 Ohm 1% 1/2W 1206 SULFUR RES IS T AN T
66	R18	–	1	ERA-3AEB10 21V	PANASO NIC	1.02K	RES SMD 1.02KOHM 0.1% 1/ 10W 0603 AEC-Q200
67	R20 ,R27 ,R183,R 1 84	–	4	RC0805FR -0 70R L	YAGEO	0	RES SMD 0 OHM 1% 1/8W 0805
68	R28 ,R185 ,R186	–	3	RCS06030000 Z0EA	VISHAY	0	RES SMD 0 OHM 1/4W JUMP ER 0603 AEC -Q200
70	R19	–	1	ESR03EZPF1 ORO	ROHM	10	RESSMD 10OHM 1% 1/4W 0603 AEC-Q200

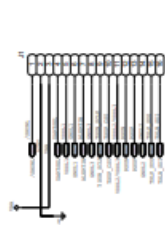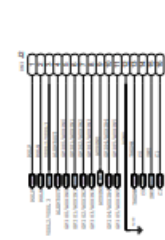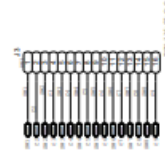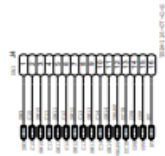|						
71	R21,R25 ,R29 ,R33 ,R35,R36 ,R37,R38, R 39,R40 ,R4 1,R42 ,R43 ,R44 ,R45 ,R4 6 ,R47,R48 ,R49 ,R 50 ,R51,R52,R53,R 54,R55, R56 ,R57 , R58 ,R59 ,R60,R6 1 ,R62 ,R63 ,R 64 ,R6 5 ,R66 ,R67 ,R68 ,R 69 ,R70,R71 ,R7 2, R73,R74,R77	–	45	ERJ- 14YJ220 U	PANASO NIC	22	RES SMD 22 Ohm 5% 1/2W 1 210 AEC-Q200
72	R22	–	1	RMC F0603JT100K	STACKP OLE ELE CTRONI CS, INC.	100K	RES SMD 100K OHM 5% 1/10W 0603 AEC-Q200
75	R5,R6,R7 ,R8	–	4	CRCW060300 00Z0EA HP	VISHAY	0	RES SMD 0 Ohm JUMPER 1/ 4W 0603 AEC-Q200
76	R81,R82 ,R83 ,R84 ,R85,R86 ,R87,R88, R 89,R90,R91,R92, R93,R94,R95	–	15	RC0603FR -0 7 1KL	YAGEO	1K	RES SMD 1K Ohm 1% 1/10W 0603
77	SHDNL_SEL	–	1	FTS-103-01-F -S	SAMTEC	FTS-103-0 1-F-S	CONN-PCB , MICRO LOW PR OFILE TERM STRIPS
78	SW1,SW2	–	2	ADE0804	TYCO (A LCOSWI TCH)	ADE0804	SWITCH 16 DIP SPST
79	THERM1,THERM2, THERM3 ,TH ERM4 , THERM5,THERM6	–	6	3-644456-2	TE CON NECTIVI TY	3-644456- 2	CONN-PCB HDR ST 2.54MM PITCH, 2A
80	U1	–	1	ADES1754GC BN +	ANALOG DEVICE S	ADES1754 GCBN+	PRELIM, IC-ADI 14- CHANNEL HIGH VOLTAGE D ATA- ACQUISITION SYSTEM
81	U2	–	1	MAX3378EEU D+	M AXIM	MAX3378 EEUD+	IC DUAL/QUAD LOW-VOL LV L XLTR
82	U3	–	1	AT24CS08 -S SHM-T	MICROC HIP TEC HNOLO GY	AT24CS08 -SSHM-T	IC I2C COMPATIBLE TWO VV 1RE , SERIAL EEPROM WIT H UNIQUE FACTORY PROGR AMMED 128-BIT SERIAL NU MBER
83	U4	–	1	MAX3390EEU D+	MAXIM I NTEGRA TED	MAX3390 EEUD+	IC QUAD LOW VOLTAGE LEV EL TRANSLATOR, UNIDIREC TIONAL
84	U5	–	1	TLP2770(TP,E)	TOSHIB A	TLP2770(T P,E)	TRAN PHOTOCOUPLER 1-C H 20MBPS LOW-POWER

Mechanical Parts

ITEM#	LOCATION	DNI	QTY	MFG_PN	MFG	VALUE	DESCRIPTION
2	—	—	2	881545-2	TE CONNECTIVITY	—	SHUNT, 2.54MM PITCH OPEN TOP GRIP, BLACK
3	—	—	4	NY PMS 440 0025 PH	B&F FASTENER SUPPLY	—	SCREW, MACHINE NYLON PAN HEAD PHILLIPS 4-40 THREAD, 1/4 INCH LONG
4	—	—	4	1902C	KEYSTONE	—	STANDOFF, NYLON HEX FEMALE 6.35MM O.D, 4-40 THREAD, 1/2 INCH LONG

Parts That Are Part of the PCB or Are NOT to Be Installed

ITEM#	LOCATION	DNI	QTY	MFG_PN	MFG	VALUE	DESCRIPTION
8	C8,C9,C10,C11,C12,C13	DNI	6	VJ0402Y103KXJCW1BC	VISHAY	0.01uF	CAP CER 0.01uF 16V 10% X7R 0402
10	C101,C102	DNI	2	08051A101JAT2A	AVX	100pF	CAP CER 100pF 100V 5% C0G 0805
14	C16	DNI	1	GRM188R71C474KA88D	MURATA	0.47uF	CAP CER 0.47uF 16V 10% X7R 0603
15	C17	DNI	1	0603YC103KAT2A	AVX CORPORATION	0.01uF	CAP CER 0.01uF 16V 10% X7R 0603
17	C19	DNI	1	CGA6N3X7R2A225K230AB	TDK	2.2UF	CAP CER 2.2UF 100V 10% X7R 1210 AEC-Q200
23	C48,C49,C50,C51,C52,C53,C54,C55,C56,C57,C58,C59,C60,C61	DNI	14	CGA3E2X7R1H104K080AA	TDK	0.1uF	CAP CER 0.1uF 50V 10% X7R 0603 AEC-Q200 LOW ESR
26	C76,C78,C79,C82	DNI	4	CL05C150JB5NNNC	SAMSUNG	15pF	CAP CER 15pF 50V 5% C0G 0402
32	CM1,CM2	DNI	2	ACT45B-510-2P-TL003	TDK	2800 OHMS	FLTR COMMON MODE CAN-BUS
35	D15,D22,D23	DNI	3	SP4021-01FTG	LITTELFUSE, INC.	SP4021-01FTG	DIO TVS UNIDIRECTIONAL 5V 25A 2.5PF AEC-Q101
38	D40	DNI	1	BAT20J	Stmicroelectronics	BAT20J	DIODE Schottky BAT20J 23V SOD-323
44	J8	DNI	1	SSW-104-01-G-S	SAMTEC INC.	SSW-104-01-G-S	CONN-PCB SQ POST SOCKET STRIP ST SINGLE ROW, 2.54MM PITCH
49	R1,R2,R3,R4,R23,R24,R26,R141,R143 ,R144,R145,R148	DNI	12	RC0603JR-070RL	YAGEO	0	RES SMD 0 Ohm JUMPER 1/10W 0603
50	R10,R142	DNI	2	CRCW060310K0FKEA	VISHAY	10K	RES SMD 10K OHM 1/10W 1% 0603
62	R137,R139	DNI	2	CRCW060315K0FKEB	VISHAY	15K	RES SMD 15K OHM 1% 1/10W 0603 AEC-Q200
69	R187	DNI	1	CRCW120600000Z0EA	VISHAY	0	RES SMD 0 Ohm 5% 1/4W 1206 AEC-Q200
73	R30,R31	DNI	2	RCS06030000Z0EA	VISHAY	0	RES SMD 0 OHM 1/4W JUMPER 0603 AEC-Q200
74	R32,R34	DNI	2	ERJ-6GEY0R00V	PANASONIC	0	RES SMD 0 Ohm 1/8W 0805 AEC-Q200

ADES1754 EV Kit Schematic

INSTALL OPTIONS:

48V:

HV:

MAIN IC

CHANGE LOG
PAGE 2: ADD D40
PAGE 2: CHANGE C34-C47
PAGE 2: ADD C100
PAGE 4: ADD C101 C102

CELL AND SW INPUT
FILTER NETWORK

SCHEMATIC

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

UART RX UPPER PORT

UART RX LOWER PORT

HALL SENSOR

I2C EEPROM

BATTERY PACK MATE-N-CLICK

CELL BIASING AND
CELL SHORTING NETWORK

ATSW CELL HEADER

AUXIN PORT AND FILTER

SINGLE ENDED ALARM

UART UPPER PORT

REQUESTED FOR 4 PINS LOGICAL SYMBOL

UART LOWER PORT

SPI BUS LEVEL SHIFTER

MINIQ USB HEADERS

HIGH Z MODE UART TX COMPONENTS

LOWER PORT

UPPER PORT

SCHEMATIC

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ADES1754 EV Kit PCB Layout

ADES1754 EV Kit Component Placement Guide—Top Silkscreen
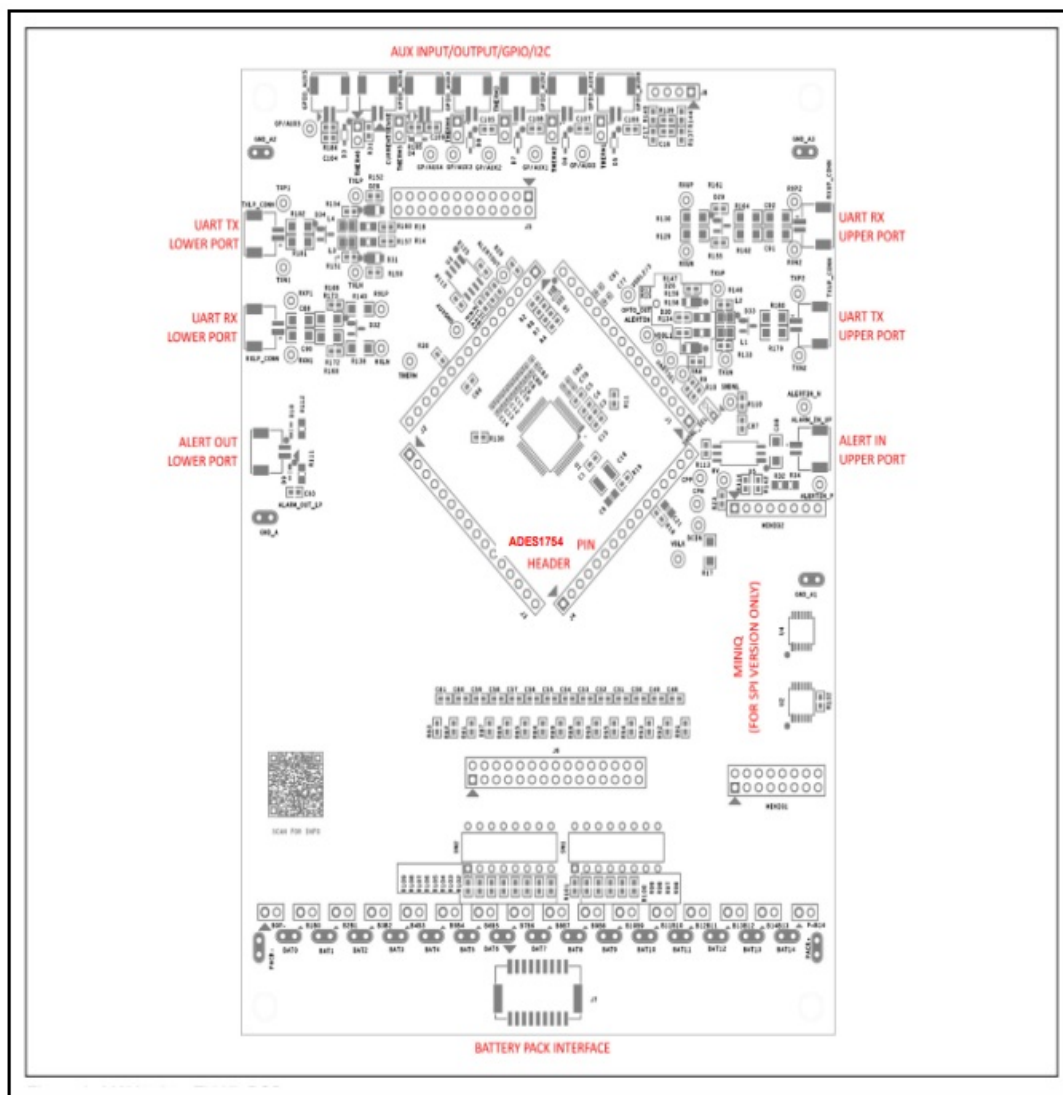
ADES1754 EV Kit PCB Layout—Layer 2
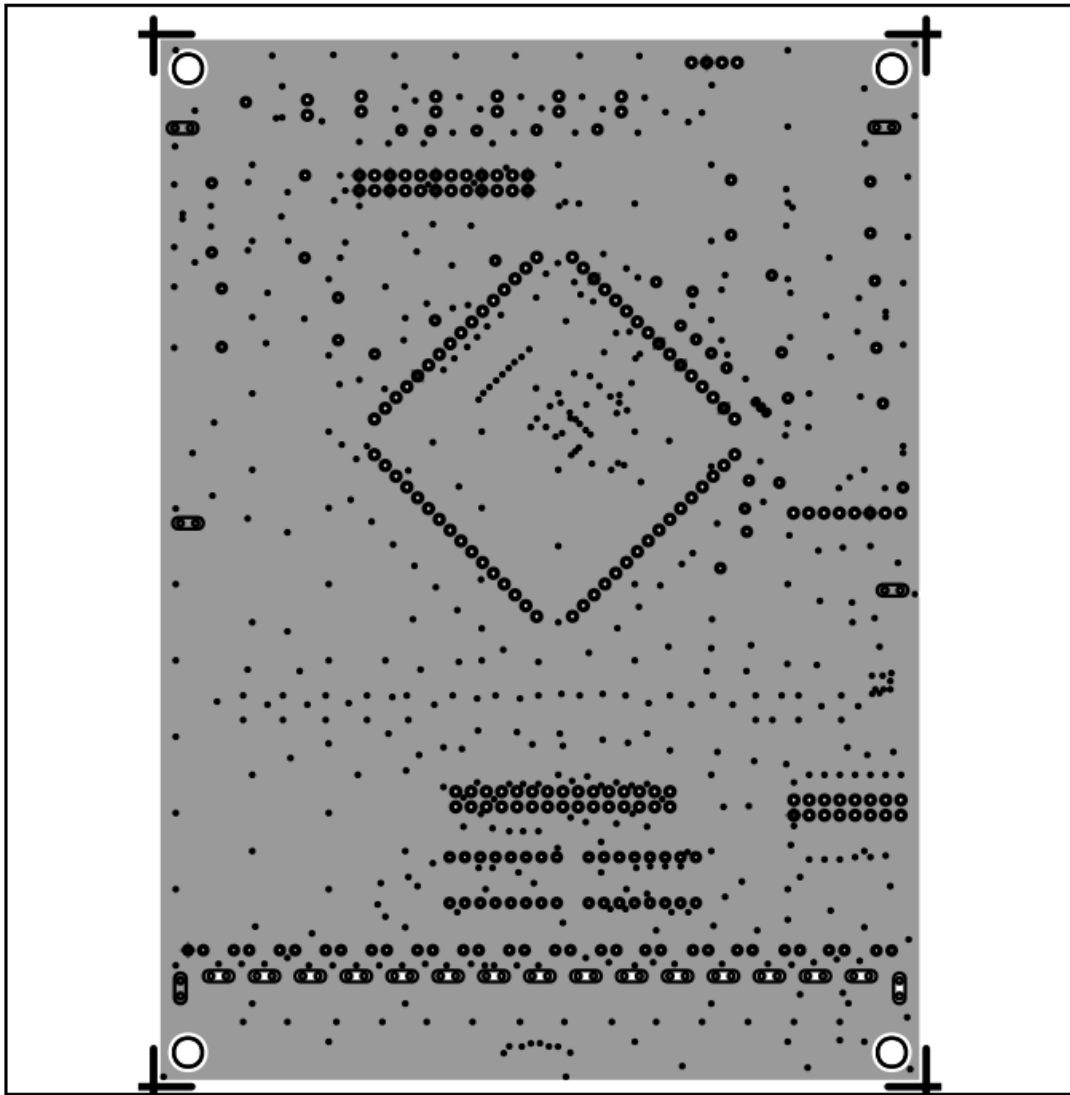
ADES1754 EV Kit PCB Layout—Top
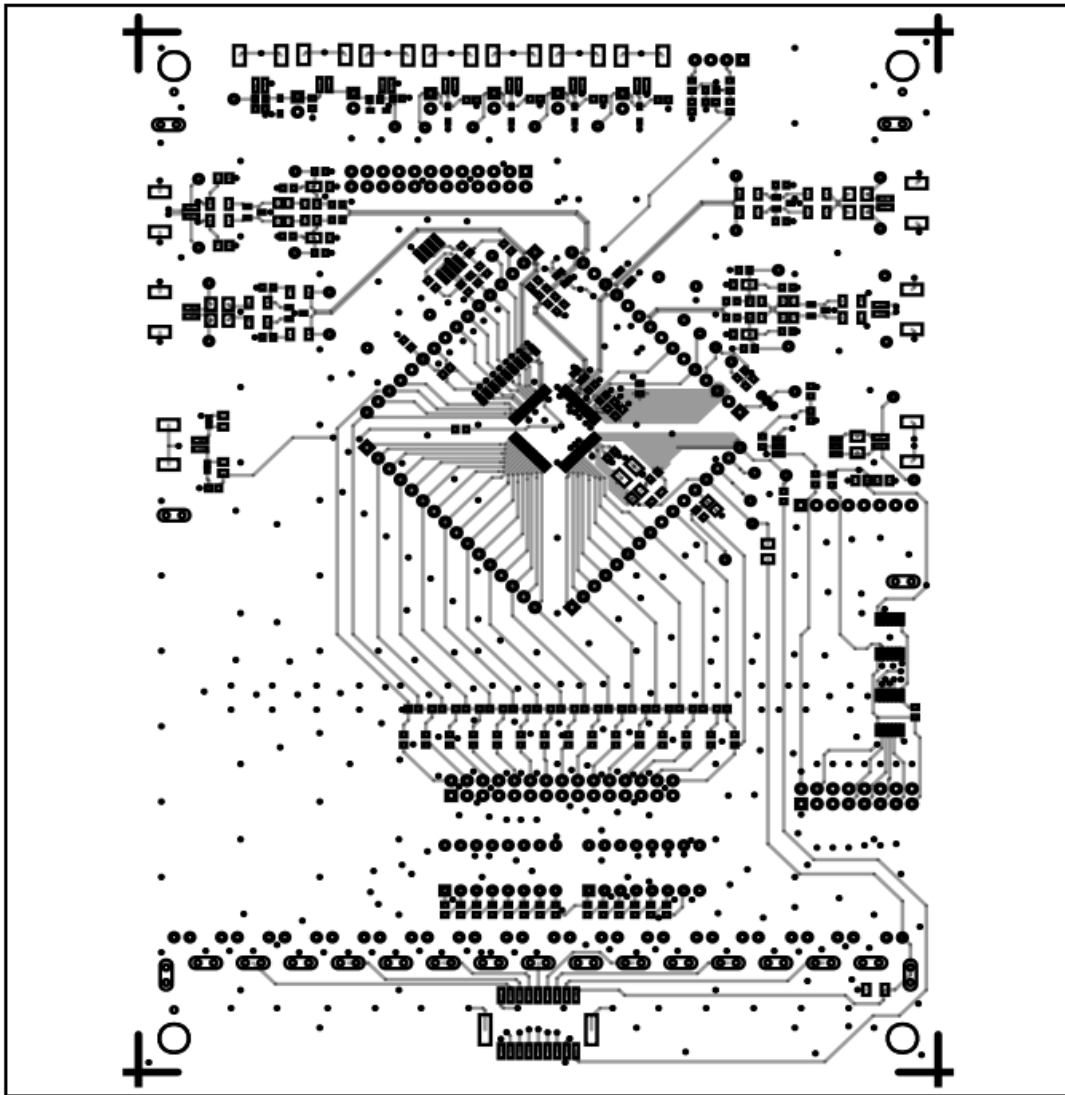
ADES1754 EV Kit PCB Layout—GND 3
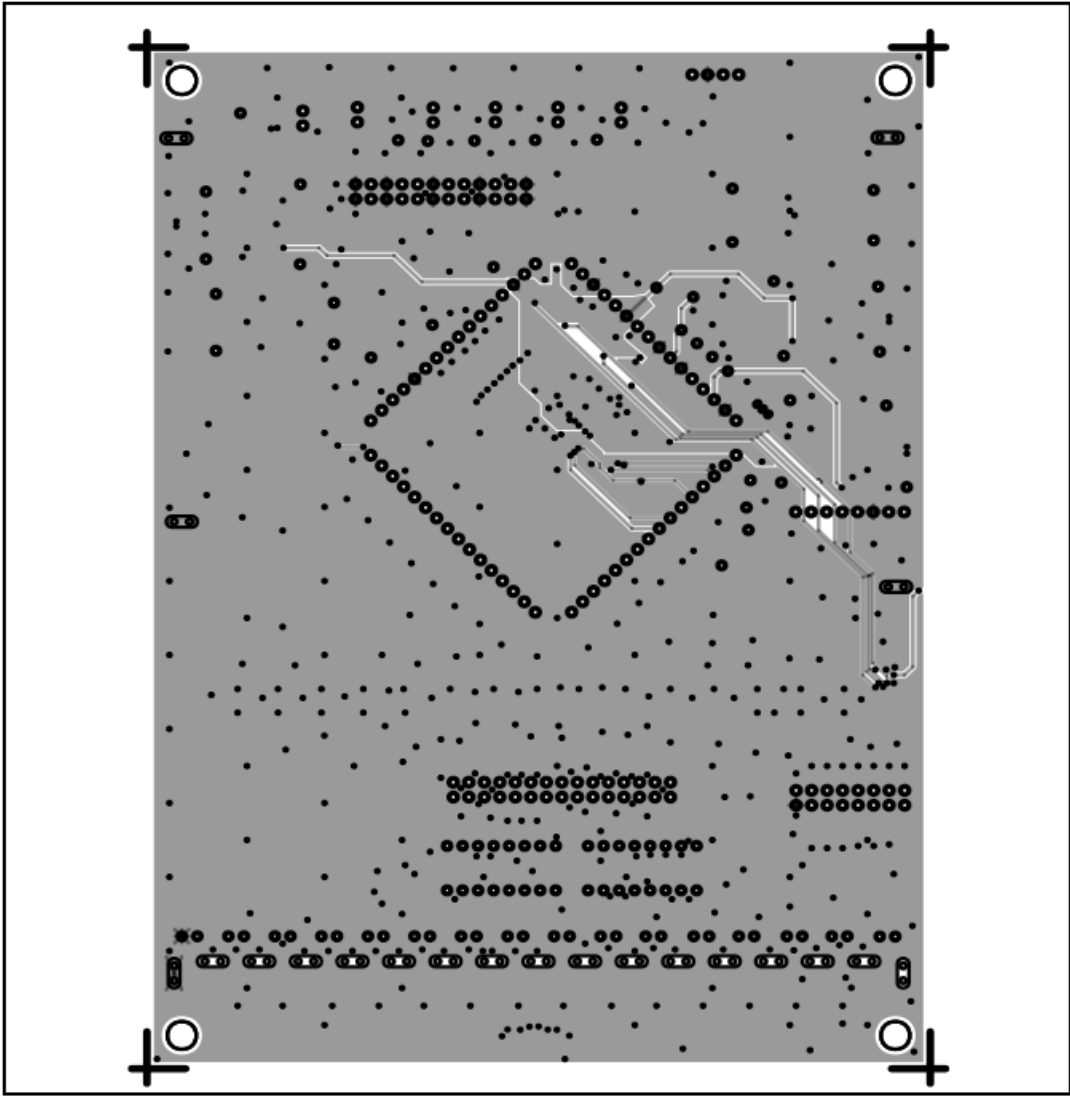
ADES1754 EV Kit PCB Layout—Bottom
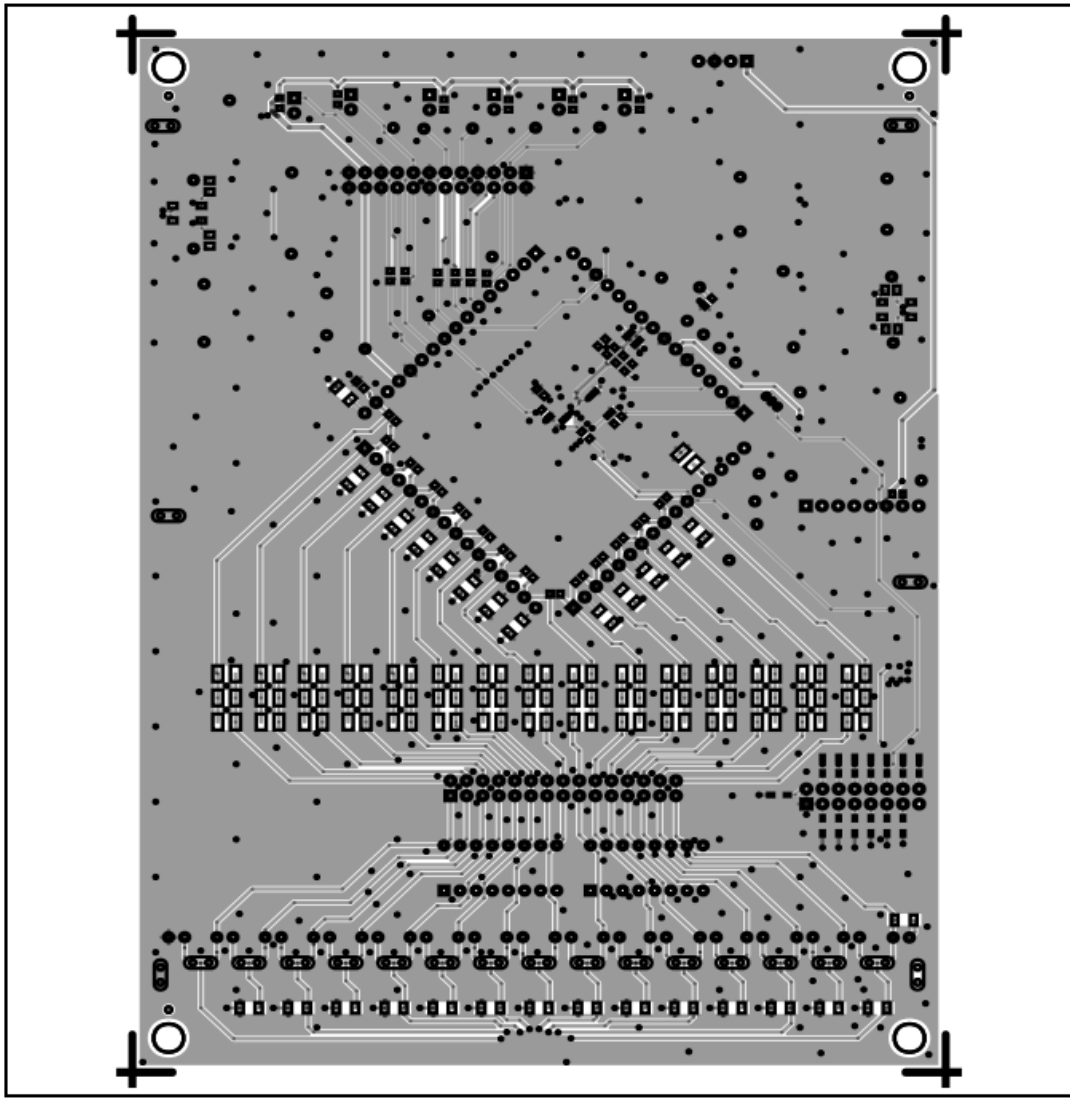
ADES1754 EV Kit Component Placement Guide—Bottom Silkscreen
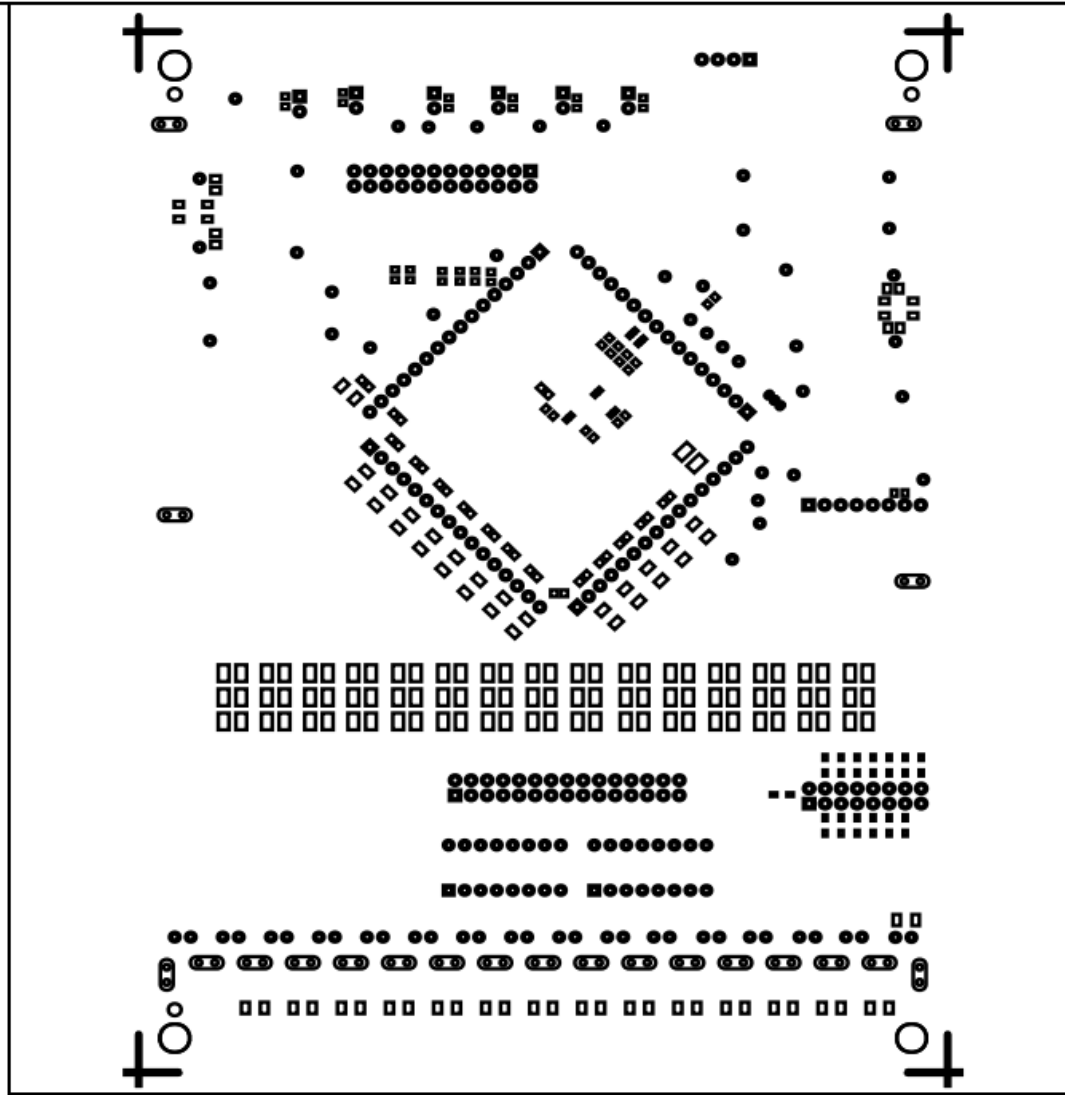
Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/23	Initial release	—

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Documents / Resources

 ANALOG DEVICES ADES1754 14 Channel Battery Stack Monitoring Systems [pdf] User Guide
ADES1754 14 Channel Battery Stack Monitoring Systems, ADES1754, 14 Channel Battery Stack Monitoring Systems, Channel Battery Stack Monitoring Systems, Battery Stack Monitoring Systems, Stack Monitoring Systems, Monitoring Systems

References

- ▶ **Mixed-signal and digital signal processing ICs | Analog Devices**
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- ▶ **Technical Support | Analog Devices**
- **User Manual**