



Evaluation Kit for the Single-Phase ADE IC with 8052 MCU, RTC, and LCD Driver

Preliminary Technical Data

EVAL-ADE7166/ADE7169/ADE7566/ADE7569

FEATURES

**Full Evaluation Kit including Reference Design Hardware,
Firmware, evaluation software and development tools
Designed to Class 1 Meter Accuracy based on IEC
Specifications**

**Full featured energy meter based on the ADE7569
Energy metering firmware written in C**

**Supported By Keil and IAR development tools for assembly
and C code development.**

Single Pin emulation for debugging

Isolated USB to UART communication

**LabVIEW™ evaluation software for evaluation of meter
performance**

GENERAL DESCRIPTION

The ADE7166/ADE7169/ADE7566/ADE7569 evaluation kit includes a full energy metering reference design with Class 1 meter accuracy. Firmware, developed in C, is provided to demonstrate a fully working single phase energy metering design. The kit comes with a UART connection, single pin emulation pod and an isolated USB to UART converter for communication and debugging purposes. Both IAR and Keil development tool are provided with this evaluation kit.

The evaluation kit includes a CD that provides all of the associated documentation, tools and drivers to set up and use the ADE7166/ADE7169/ADE7566/ADE7569 reference meter. This CD should be used along with the evaluation kit. In addition AN-916 provides a description of the reference design hardware.



Figure 1. The ADE71xx/ADE75xx Evaluation Meter

Rev. PrA

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One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781.329.4700 www.analog.com
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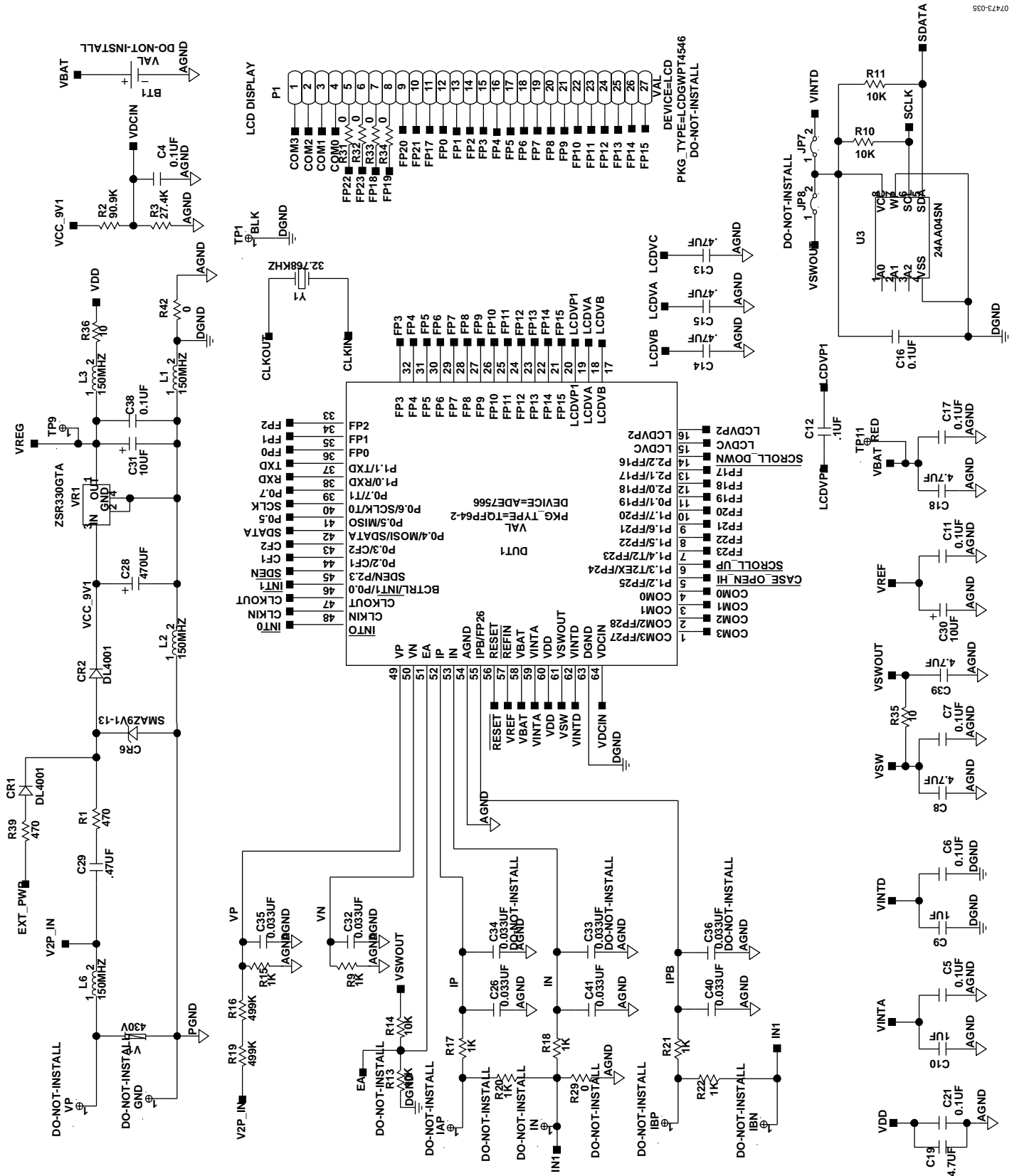


Figure 3: Schematic of ADE7166/ADE7169/ADE7566/ADE7569 Reference Meter

INTERRUPT CIRCUITS

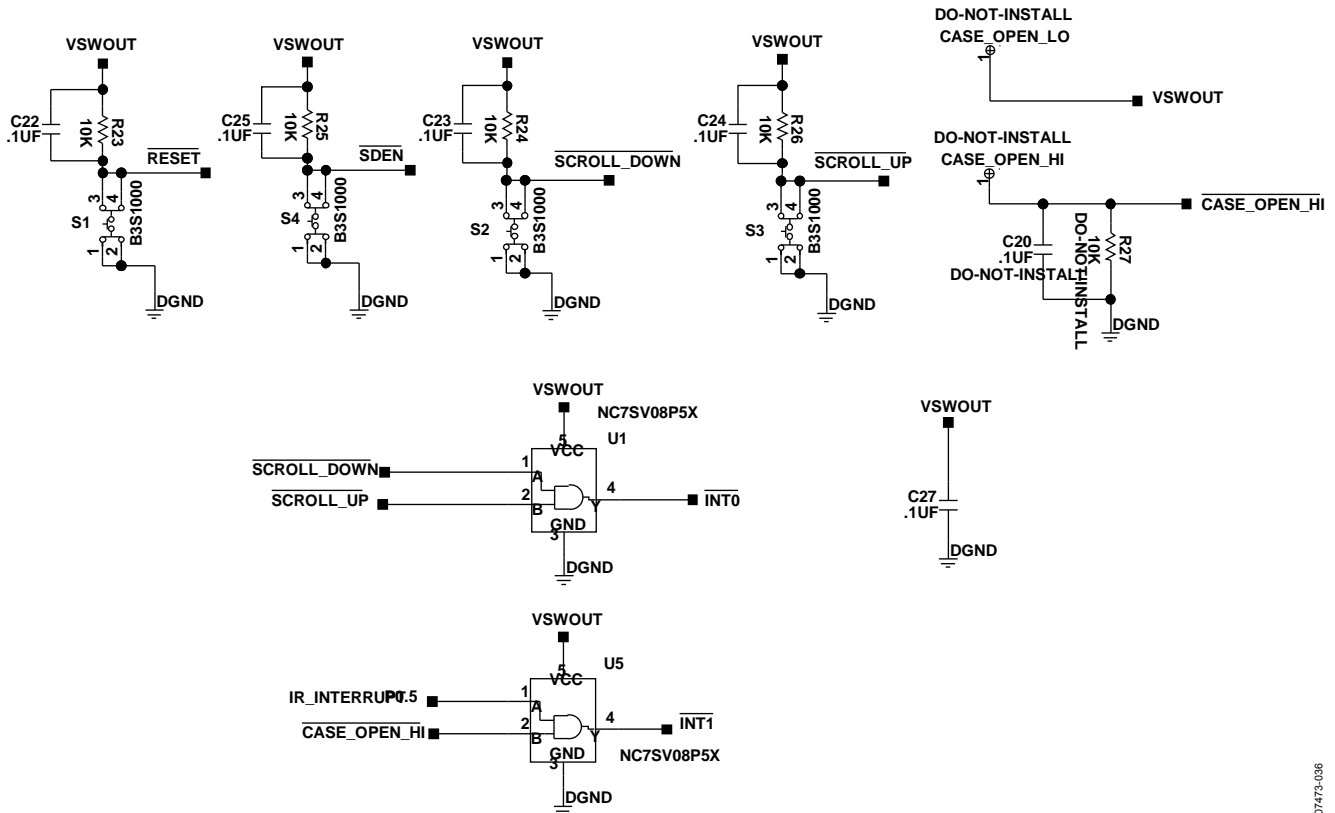


Figure 4. Schematic of ADE7166/ADE7169/ADE7566/ADE7569 Reference Meter

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ORDERING INFORMATION**BILL OF MATERIALS**

Table 1. Components Listing

Qty.	Reference Designator	Description	Details	Supplier/Number
1	A1	Isolator IC	Digital isolator IC dual 8-lead SOIC	Digi-Key: ADUM1200ARZ-RL7CT-ND
1	BT1	Battery	Lithium battery ½ AA 3.6 V cylinder with leads	Digi-Key: 439-1003-ND
10	C1 to C3, C12, C20, C22 to C25, C27	.1 µF	.1 µF 5 V ceramic X7R 0805 capacitor	Digi-Key: PCC1828CT-ND
3	C13 to C15	.47 µF	.47 µF 16 V ceramic 0805 capacitor	Digi-Key: PCC1847CT-ND
1	C28	470 µF	470 µF 35 V electrolytic NHG radial capacitor	Digi-Key: P5554-ND
1	C29	.47 µF	.47 µF/630 VDC metal poly capacitor	Digi-Key: EF6474-ND
2	C30, C31	10 µF	Tantalum 10 µF 6.3 V 20% SMD capacitor	Digi-Key: 493-2340-1-ND
3	C33, C34, C36	0.033 µF	33000 PF 50 V ceramic X7R 1206 capacitor	Digi-Key: 311-1177-1-ND
5	C8, C18, C19, C37, C39	4.7 µF	4.7 µF 10 V ceramic 0805 capacitor	Digi-Key: PCC1842CT-ND
2	C9, C10	1 µF	1 µF 16 V ceramic 0805 capacitor	Digi-Key: PCC1849CT-ND
2	CR1, CR2	DL4001	Passivated rectifier 1 A 50 V SMD MELF	Digi-Key: DL4001-TPMSCT-ND
1	CR3	IR emitter	IR emitter diode 5 mm IR clr lens	Digi-Key: 67-1001-ND
2	CR4, CR5	LED	Clear red LED LC gull wing SMD	Digi-Key: L62711CT-ND
1	CR6	Zener diode	Zener diode 1 W 9.1 V SMA	Digi-Key: SMAZ9V1-FDICT-ND
1	DUT1	Metering IC	Analog Devices ADE7569F16	
16	JP1, JP2, JP5 to JP8, R5, R29 to R34, R37, R38, R40, R41	0	0.0 Ω 1/8 W 5% 0805 SMD	Digi-Key: P0.0ACT-ND
4	L1 to L3, L6	Ferrite bead	Ferrite 300 mA 150 Ω 1806 SMD.	Digi-Key: 240-1030-1-ND
1	P1	LCD display	5 V LCD	Shantou Goworld Display Co., Ltd
1	P2	Power jack	Power jack connector 2.1 × 5.5 mm hi cur	Digi-Key: CP-002AHPJCT-ND
1	P3	Header	Right angle 3-position header .100 tin	Digi-Key: A19451-ND
1	P4	Header	Header .100	Digi-Key: 929835E-01-36-ND
1	P5, P6	Header	Vertical 4-position header .100 tin	Digi-Key: A1912-ND
3	Q1 to Q3	Transistor	P-Channel MOSFET 25 V 120 mA SOT-23	Digi-Key: FDV302PCT-ND
1	R1	470	470 Ω 1 W 5% metal oxide resistor	Digi-Key: P470W-1BK-ND
2	R16, R19	499 k	499 k Ω ¼ W 1% 1206 SMD resistor	Digi-Key: P499KFCT-ND
1	R2	90.9 k	90.9 k Ω ⅛ W 1% 0805 SMD resistor	Digi-Key: P90.9KCCT-ND
1	R3	27.4 k	27.4 k Ω ⅛ W 1% 0805 SMD resistor	Digi-Key: P27.4KCCT-ND
2	R35, R36	10	10.0 Ω ⅛ W 1% 0805 SMD resistor	Digi-Key: P10.0CCT-ND
2	R4, R39	470	470 Ω ⅛ W 5% 0805 SMD resistor	Digi-Key: P470ACT-ND
2	R6, R7	1.6 k	1.6 k Ω ⅛ W 5% 0805 SMD resistor	Digi-Key: P1.6KACT-ND
12	R8, R10 to R14, R23 to R28	10 k	10.0 k Ω ⅛ W 1% 0805 SMD resistor	Digi-Key: P10.0KCCT-ND
7	R9, R15, R17, R18, R20 to R22	1 k	1.00 k Ω ⅛ W 1% 0805 SMD resistor	Digi-Key: P1.00KCCT-ND
4	S1 to S4	Switch	Tactile switch 6 mm SMD	Digi-Key: SW415-ND
1	Shunt		350 µΩ shunt	Shanghai BST Electrical Appliance Manufacturing: BST-904, M415-2-19.5 D4.5
2	U1, U5	AND gate	Fairchild Tiny Logic 2-input AND gate	Mouser: 512-NC7SP08P5X
1	U2	RS-485 IC	IC TX/RX RS485 HS FD 3.3 V 14 SOIC	Digi-Key: ADM3491ARZ-ND
1	U3	24AA04SN	Microchip serial EEPROM 512×8, 1.8 V	Mouser: 579-24AA04/SN

Qty.	Reference Designator	Description	Details	Supplier/Number
1	U4	IR receiver	Vishay semiconductor 38 kHz 2.7 V to 5.5 V IR receiver	Mouser: 782-TSOP34838
1	V1	MOV	275 V rms 20 mm radial varistor	Digi-Key: 495-1417-ND
1	VR1	Regulator	3.3 V 200 mA SOT-223 voltage regulator	Digi-Key: ZSR330GCT-ND
1	Y1	Crystal	32.768 kHz 12.5 pF cylinder crystal	Digi-Key: X1123-ND
1	Meter Case			Taizhou Huangyang Wanfeng Electrical Co., Ltd. Type: 202-8

ORDERING GUIDE


Model	Description
EVAL-ADE7169F16EBZ ^{1,2}	Evaluation Board
EVAL-ADE7569F16EBZ ^{1,3}	Evaluation Board

¹ Z = RoHS Compliant Part.

² For part number ADE7166, order EVAL-ADE7169F16EBZ.

³ For part number ADE7566, order EVAL-ADE7569F16EBZ.

ESD CAUTION

	<p>ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.</p>
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