

4 Bill of Materials, Board Layout and Schematics

4.1 Bill of Materials

Table 4. Bill of Materials

bq24610-001	bq24617-002	Bq24630-003	bq24616-004	Value	RefDes	Description	Size	Part Number	Mfr
1	0	0	0	bq24610RGE	U1	Charger Controller IC	QFN-24 (RGE)	bq24610RGE	TI
0	1	0	0	bq24617RGE	U1	Charger Controller IC	QFN-24 (RGE)	bq24617RGE	TI
0	0	1	0	bq24630RGE	U1	Charger Controller IC	QFN-24 (RGE)	bq24630RGE	TI
0	0	0	1	bq24616RGE	U1	Charger Controller IC	QFN-24 (RGE)	bq24616RGE	TI
1	1	1	1	0.1uF	C3	Capacitor, Ceramic, 16V, X7R, 5%,	603	STD	STD
6	6	6	6	0.1uF	C7,C8,C13,C18,C19,C33	Capacitor, Ceramic, 16V, X7R, 10%	603	STD	STD
6	6	6	6	0.1uF	C4,C5,C16,C17,C24,C26	Capacitor, Ceramic, 50V, X7R, 10%	603	STD	STD
1	1	1	1	22p	C22	Capacitor, Ceramic, 50V, X7R, 10%	603	STD	STD
0	0	0	0		C9,C21,C30,C31	Capacitor, Ceramic, 50V, X7R, 10%	603	STD	STD
3	3	3	3	1.0uF	C1,C6,C15	Capacitor, Ceramic, 16V, X7R, 20%	805	STD	STD
0	0	0	0		C34	Capacitor, Ceramic, 50V, X7R, 10%	805	STD	STD
2	2	2	2	1.0uF/50V	C12,C14	Capacitor, Ceramic, 50V, X5R, 20%	1206	STD	STD
1	1	1	1	2.2uF/50V	C2	Capacitor, Ceramic, 50V, X7R, 20%	1206	STD	STD
0	0	0	0		C32	Capacitor, Ceramic, 50V, X7R, 20%	1206	STD	STD
6	6	6	6	10uF/50V	C10,C11,C20,C23,C28,C29	Capacitor, Ceramic, 50V, Y5V, -20/+80%	1812	STD	STD
0	0	0	0		C25,C27	Capacitor, Ceramic, 50V, X5R, 20%	1812	STD	STD
0	0	0	0		D11	Diode, Zener, 7.5V, 350-mW	SOT-23	BZX84C7V5	Diodes
0	0	0	0		D10	Diode, Schottky, 200-mA, 30-V	SOT23	BAT54	Vishay-Liteon
0	0	0	0		D9	Diode, Zener, 7.5V, 350-mW	SOT-23	BZX84C7V5	Diodes
6	6	6	6	Green	D3,D4,D5,D6,D7,D8	Diode, LED, Green, 2.1V, 20mA, 6mcd	603	LTST-C190GKT	Lite On
0	0	0	0		D2	Diode, Schottky, 1A, 40V	DO-214AA	MBRS140	Fairchild
1	1	1	1	ZLLS350	D1	Diode, Schottky, 1.16A, 40-V	SOD-523	ZLLS350	Zetex
1	1	0	1	6.8uH	L1	Inductor, SMT, 9A, 19.8milliohm	0.520 sq inch	IHLP5050CEE R6R8M01	Vishay
0	0	1	0	8.2uH	L1	Inductor, SMT, 9.5A, 18.3milliohm	0.520 sq inch	IHLP5050CEE R8R2M01	Vishay
3	3	3	3	PEC02SAAN	JP2,JP4,JP5	Header, 2 pin, 100mil spacing,	0.100 inch x 2	PEC02SAAN	Sullins

Table 4. Bill of Materials (continued)

bq24610-001	bq24617-002	Bq24630-003	bq24616-004	Value	RefDes	Description	Size	Part Number	Mfr
2	2	2	2	PEC03SAAN	JP1,JP3	Header, 3 pin, 100mil spacing,	0.100 inch x 3	PEC03SAAN	Sullins
4	4	4	4	0	R10,R19,R26, R13	Resistor, Chip, 1/16W, 1%	402	Std	Std
1	1	1	1	10	R22	Resistor, Chip, 1/4W, 1%	1206	Std	Std
1	1	0	0	9.31k	R4	Resistor, Chip, 1/16W, 1%	402	Std	Std
0	0	1	1	2.2k	R4	Resistor, Chip, 1/16W, 1%	402	Std	Std
3	3	3	3	1k	R21,R24,R27	Resistor, Chip, 1/16W, 1%	402	Std	Std
1	1	1	1	100	R8	Resistor, Chip, 1/16W, 1%	402	Std	Std
1	1	0	0	430k	R5	Resistor, Chip, 1/16W, 1%	402	Std	Std
0	0	1	1	6.8k	R5	Resistor, Chip, 1/16W, 1%	402	Std	Std
1	1	1	1	0	R17	Resistor, Chip, 1/16W, 1%	603	Std	Std
6	6	6	6	2.21k	R31,R34,R35, R36,R39,R40	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	1	1	1	10	R14	Resistor, Chip, 1/16W, 1%	603	Std	Std
2	2	2	2	10k	R29,R30	Resistor, Chip, 1/16W, 1%	603	Std	Std
6	6	6	6	100k	R3, R20,R32,R33, R37,R38	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	1	1	1	10k	R16	Resistor, Chip, 1/10W, 1%	805	Std	Std
1	1	1	1	100k	R15	Resistor, Chip, 1/10W, 1%	805	Std	Std
1	1	1	1	22.1k	R12	Resistor, Chip, 1/10W, 1%	805	Std	Std
1	1	1	1	32.4k	R7	Resistor, Chip, 1/10W, 1%	805	Std	Std
4	4	4	4	100k	R6,R11,R23,R 28	Resistor, Chip, 1/10W, 1%	805	Std	Std
1	1	1	1	909k	R25	Resistor, Chip, 1/10W, 1%	805	Std	Std
2	2	2	2	3.9	R1,R2	Resistor, Chip, 1/8W, 5%	1206	Std	Std
2	2	2	2	0.01	R9,R18	Resistor, Chip, 1/2W, 1%	2010	WSL2010R01 00FEA	Vishay
1	1	1	1	ED1515	J2	Terminal Block, 3 pin, 6A, 3.5mm	0.41 x 0.25 inch	ED555/3DS	OST
2	2	2	2	ED1516	J3,J4	Terminal Block, 4 pin, 6A, 3.5mm	0.55 x 0.25 inch	ED555/4DS	OST
1	1	1	1	ED120/2DS	J1	Terminal Block, 2 pin, 15A, 5.1mm	0.40 x 0.35 inch	ED120/2DS	OST
1	1	1	1	ED120/4DS	J5	Terminal Block, 4 pin, 15A, 5.1mm	0.80 x 0.35 inch	ED120/4DS	OST

Table 4. Bill of Materials (continued)

bq24610-001	bq24617-002	Bq24630-003	bq24616-004	Value	RefDes	Description	Size	Part Number	Mfr
1	1	1	1	5001	GND	Test Point, Black, Thru Hole Color Keyed	0.100 x 0.100 inch	5001	Keystone
14	14	14	14	5002	/ACDRV,/BAT DRV,/PG, ACSET,CHGE N,ISET1,ISET 2, REGN, STAT1,STAT2 ,TS,TTC, VCC,VREF	Test Point, White, Thru Hole Color Keyed	0.100 x 0.100 inch	5002	Keystone
5	5	5	5	131-4244-00	TP1,TP2,TP8, TP9,TP12	Adaptor, 3.5-mm probe clip (or 131-5031-00)	0.200 inch	131-4244-00	Tektronix
3	3	3	3	2N7002DICT	Q6,Q8,Q9	MOSFET, N-ch, 60V, 115mA, 1.2Ohms	SOT23	2N7002DICT	Vishay-Liteon
3	3	3	3	SI4401BDY-T1-GE FDS4141	Q1,Q2,Q5 (Note 5)	MOSFET, PChan, -40V, -18A, 9.2millohm	S0-8	SI4401BDY FDS4141	Vishay-Siliconxi Fairchild
2	2	2	2	FDS8447	Q3,Q4	MOSFET, NChan, 40V, 50A, 4.5 millohm	S0-8	FDS8447	Vishay-Siliconix
2	2	2	2	TP0610K	Q7,Q10	Mosfet, P-Ch, 60V, Rds 6 ohms, Id 185 mA	SOT-23	TP0610K	Vishay-Siliconix
1	1	1	1		PCB	4 layer 2oz. PCB		HPA422	
5	5	5	5	929950-00		Shorting jumpers, 2-pin, 100mil spacing		929950-00	3M/ESD
4	4	4	4			STANDOFF M/F HEX 6-32 NYL .500"		4816	Keystone
4	4	4	4			6-32 NYL Hex nuts		NY HN 632	Building Fasteners

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.