ROHM RB-D62Q2504TB32 Development Support System User Manual

ROHM RB-D62Q2504TB32 Development Support System

Contents

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This manual describes about the ML62Q2504 Reference Board : RB-D62Q2504TB32.
Refer to following documents when necessary.

- ML62Q2500 Group User's Manual

  Provides the detailed information about the microcontroller ML62Q2500 Group.

- EASE1000 V2 User's Manual Provides the information on how to use the On-chip emulator EASE1000 V2.

Overview

Features

The RB-D62Q2504TB32 can be used for learning 'how to use' the ML62Q2504, on which the user needs to provide additional external components if necessary. By using the RB-D62Q2504TB32 together with the LAPIS Technology's on-chip emulator EASE1000 V2 and the provided software development environment, the user can develop software, debug and program the Flash. Also, by connecting an external power supply to RB-D62Q2504TB32, it can be used independently without connecting a EASE1000 V2.

Before using RB-D62Q2504TB32, be sure to understand and keep in mind the following information.

- The board is provided with ML62Q2504 32pin TQFP.
- Mounted with the linked connector to EASE1000 V2.
- Through-holes for connecting the pins of LSI to external peripheral boards.
- Power supply is selectable; supplied from the on-chip emulator EASE1000 V2 or CN1_3pin.
- Mounted with Crystal (32.768KHz)
- Mounted with LED (P20,P21,P22).
- Foot pattern with components for Successive Approximation Type A/D Converter is available (P30,P31,P32,P33).

Hardware specifications

Table 1 shows the hardware specifications of RB-D62Q2504TB32.

Table 1 Hardware specifications

Mounted LSI	U1 : ML62Q2504 32pin TQFP
Other Mounted components	PWR: Jumper for selecting the power supply input (3pin pin-header and short pin)
	J1: Jumper for selecting TEST1_N pin (3pin pin-header and short pin)
	J2: Jumper for selecting P00/TEST0 pin (3pin pin-header and short pin)
	P20-P22: LEDs
	R1-R3: Resistors for LEDs by P20 to P22
	J3-J5: Jumper Chip for connecting LEDs
	X1, C3, C4: Crystal Oscillator (32.768kHz) and capacitors
	CNE: Connector for EASE1000 V2(14pin connector)
	C1, C3: Capacitors for VDD and VDDL
	R4: Pull-up resistor for RESET_N
Pads (or/and) Through holes for mounting components	CN1-CN2: Connectors for user application system (24pin, 2.54mm pitch, φ0.9mm)
	C2: Capacitors for VDD
	C6-C10, J8: Capacitors and jumper chip for Successive Approximation Type A/D Converter
	J6-J7: CN1 connection jumper chip
Power check pin	VDD, VSS, UVDD: φ0.8mm
Operating voltage	+1.8V to +5.5V
Board size	55.88 mm x 93.98 mm

For more information about the connection of the mounted components, see the schematic.

Outline Diagram

Fig. 1 shows the RB-D62Q2504TB32.

Fig. 1   Outline Diagram

Function

Power Circuit

The input to VDD can be selected from 3.3VOUT of EASE1000 V2 or CN1_3pin by PWR jumper.

Fig. 2   Power Circuit

[Note]

The power supply ON/OFF procedure in case of setting PWR jumper to the USR-side when using EASE1000 V2.

- The procedure of power supply ON

1. The USB cable of EASE1000 V2 is connected.
2. The power supply of user's target system is turned on.

- The procedure of power supply OFF

1. The power supply of user's target system is turned off
2. The USB cable of EASE1000 V2 is removed

Connection for EASE1000 V2 (CNE)

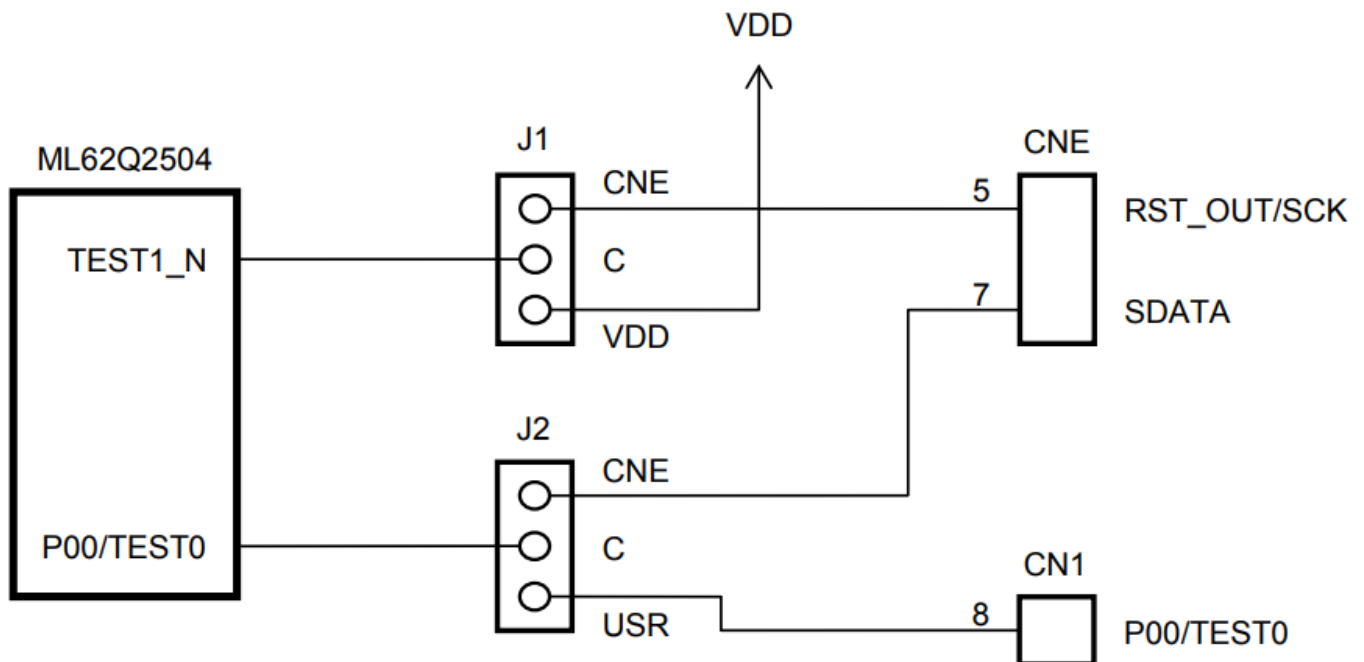EASE1000 V2 can be used if J1 and J2 jumper are set to "CNE".

Fig. 3   EASE1000 V2 Interface

[Note]

P00/TEST0 pin:
P00/TEST0 pin of ML62Q2504 is initially set as a pull-up input mode
When using EASE1000 V2, do not set it as an output mode by using an application program, otherwise
EASE1000 V2 cannot communicate with the ML62Q2504.

LED (P20, P21, P22)

The P20-P22 pins are ports that can directly drive LED. The Ports are connected to the LEDs through jumper-chip.
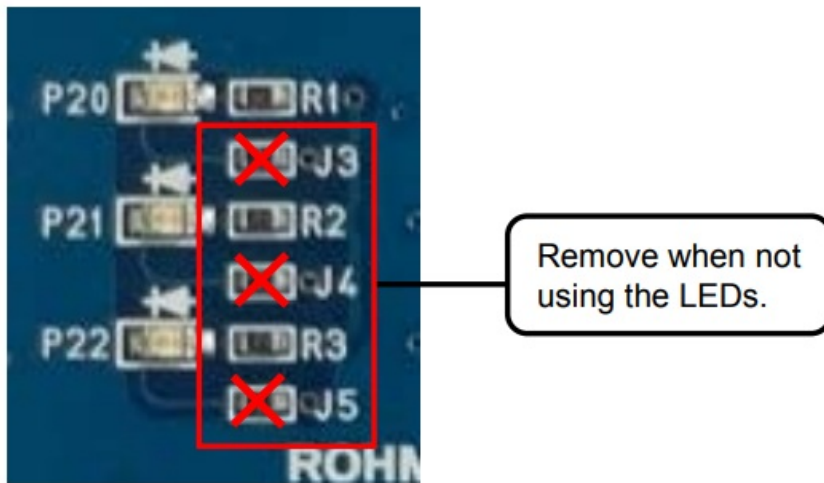Remove the jumper-chip when not using the LEDs

Fig. 4 Jumper-chip removal of LEDs

XT0/PIO0 XT1/PIO1

RB-D62Q2504TB32 can be mounted with cylinder type or SMD type crystal oscillator.

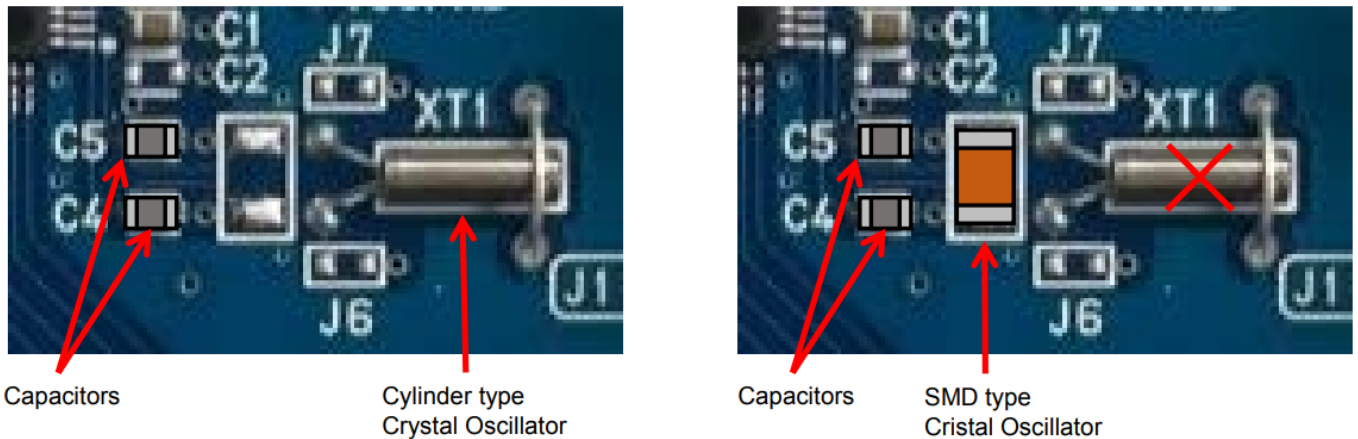| Capacitors | Cylinder type Crystal Oscillator | Capacitors | SMD type Cristal Oscillator |

Fig. 5 Example of processing of Crystal Oscillator

P30, P31, P32, P33

When the P30 pin is used as VREF function of the successive approximation type A/D converter, C6, C7 can implement a
bypass capacitor. In addition, VDD can be connected by mounting the J8 jumper chip.
When P31, P32, P33 pin is used as AIN8, AIN9, AIN10 function of the successive approximation type A/D converter, the
C8 and C9, C10 can implement a by-pass capacitor.
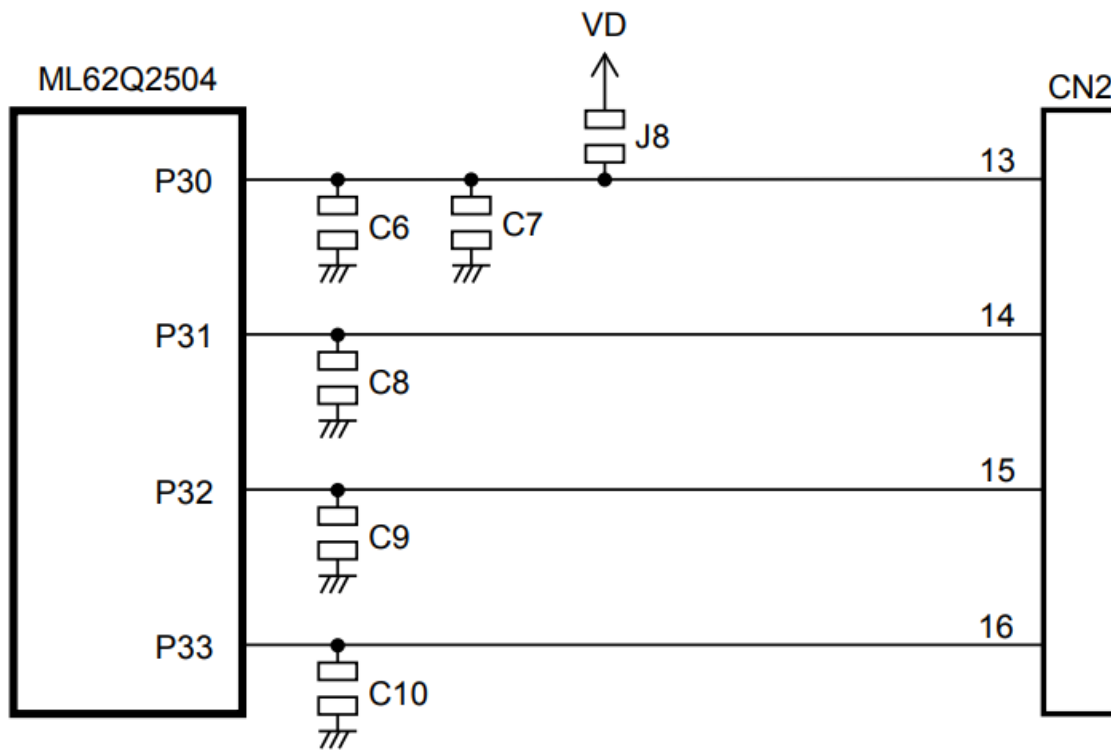Fig. 6 shows the connection diagram.

Fig. 6   P30, P31, P32, P33 Circuit

User Interface

CN1, CN2

Table 2 shows the pin list of the RB-D62Q2504TB32 user interface connection CN1 and CN2.

Table 2 CN1, CN2

CN1 Pin No.	Connection destination			CN2 Pin No.	Connection destination		
	Device	Pin No.	Name		Device	Pin No.	Name
1	J6	1	XT0	1	–	–	N.C.
2	J7	1	XT1	2	ML62Q2504	26	P20
3	PWR	USR	VDD	3	ML62Q2504	27	P21
4	–	–	VSS	4	ML62Q2504	28	P22
5	–	–	N.C.	5	ML62Q2504	29	P23
6	ML62Q2504	6	RESET_N	6	ML62Q2504	30	P24
7	–	–	N.C.	7	ML62Q2504	31	P25
8	J2	USR	P00/TEST0	8	ML62Q2504	32	P26
9	–	–	N.C.	9	ML62Q2504	33	P27
10	–	–	N.C.	10	–	–	N.C.
11	–	–	N.C.	11	–	–	N.C.
12	–	–	N.C.	12	–	–	N.C.
13	–	–	N.C.	13	ML62Q2504	37	P30
14	–	–	N.C.	14	ML62Q2504	38	P31
15	–	–	N.C.	15	ML62Q2504	39	P32
16	–	–	N.C.	16	ML62Q2504	40	P33
17	ML62Q2504	17	P04	17	–	–	N.C.
18	ML62Q2504	18	P05	18	–	–	N.C.
19	ML62Q2504	19	P06	19	–	–	N.C.
20	ML62Q2504	20	P07	20	–	–	N.C.
21	ML62Q2504	21	P10	21	ML62Q2504	45	P70
22	ML62Q2504	22	P11	22	ML62Q2504	46	P71
23	ML62Q2504	23	P12	23	ML62Q2504	47	P72
24	ML62Q2504	24	P13	24	ML62Q2504	48	P73

N.C. : Not Connected

CNE

Table 3 shows the pin list of the RB-D62Q2504TB32 user interface connection CNE.

CNE		Connection		
Pin No.	Name	Parts	Pin No.	ML62Q2504 Pin Name
1	VT ref	–	–	VDD
2	GND	–	–	VSS
3	VPP	–	–	N.C.
4	GND	–	–	VSS
5	RST_OUT/SCK	J1	CNE	TEST1_N
6	GND	–	–	VSS
7	SDATA	J2	CNE-	P00/TEST0
8	GND	–	–	VSS
9	VDDL	–	–	N.C.
10	GND	–	–	VSS
11	N.C.	–	–	N.C.
12	GND	–	–	VSS
13	3.3VOUT	PWR	CNE	VDD
14	N.C.	–	–	N.C.

N.C. : Not Connected

Precaution for usage

1. The RB-D62Q2504TB32 is an unfinished product and intended for research and development and for expert use in the research and development facility only. The RB-D62Q2504TB32 is not intended to be used for volume
production or parts thereof.
2. Since the content specified herein is subject to change for improvement without notice, confirm the latest content when using the board.
3. See the other documents, the ML62Q2500 group user's manual and EASE1000 V2 user's manual when using the RB-D62Q2504TB32.
4. Confirm the final electrical characteristics by using the mass production parts on your mass production boards.
5. LAPIS supports replacing the board for an initial failure soon after the shipment. However LAPIS doesn't support repairing the board.
6. RB-D62Q2504TB32 have signal patterns on the underside, it might work abnormally if using on conductive materials. Use it on insulating materials or having any preventable parts.

PCB specification, BOM list and Schematic

PCB specification

Fig. 7 shows the PCB dimensional outline diagram and layout of components.
PCB part number:
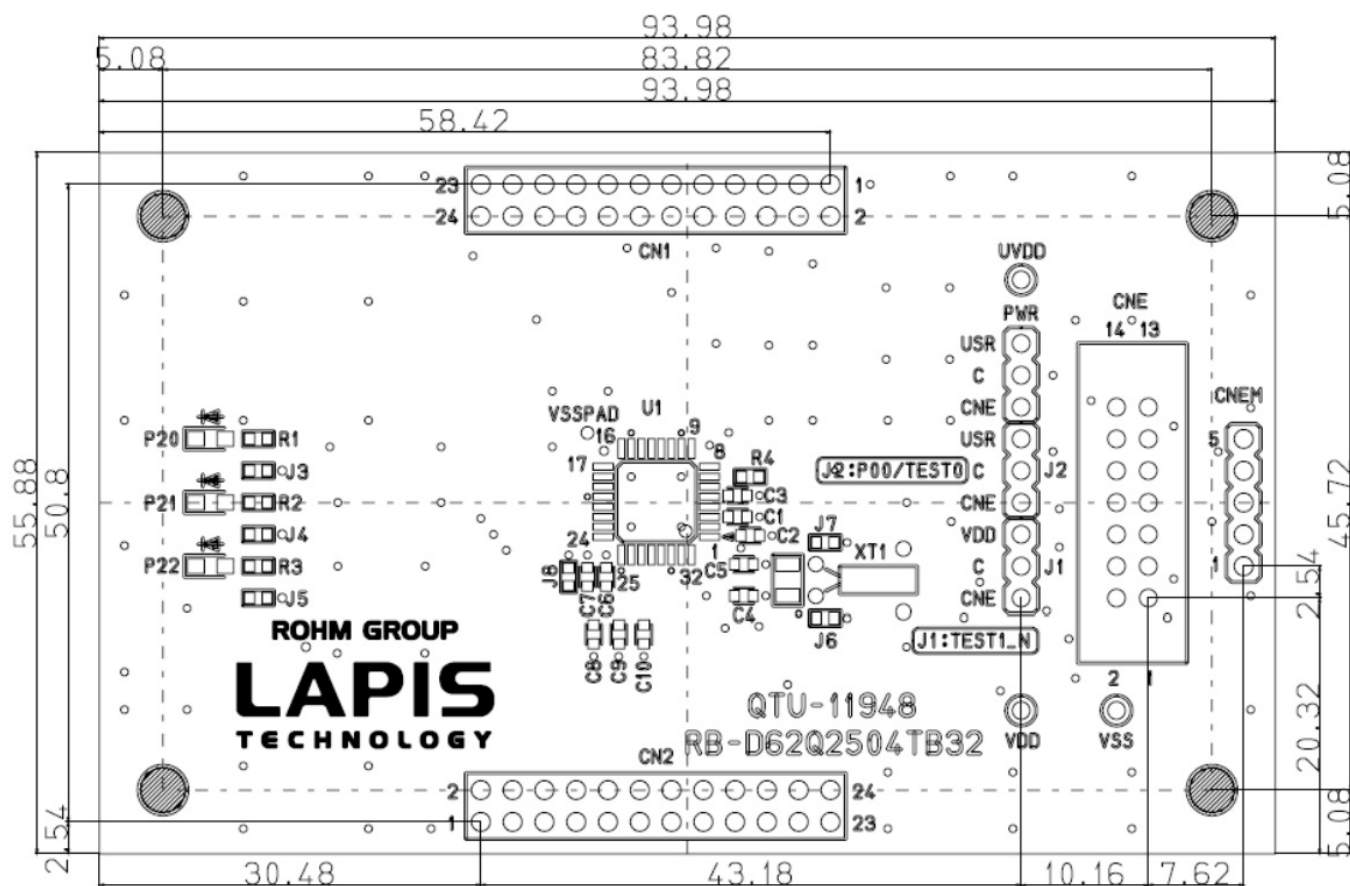RB-D62Q2504TB32
Dimension:
55.88mm x 93.98mm

Fig. 7   PCB dimensional outline diagram and layout of components (Top view)

BOM list

Table 4 BOM list

|	Parts Number	Symbol	Contents	Qty.	Vendor
1	QTU-11948	RB-D62Q2504TB32	PCB	1	LAPIS Technology Co., Ltd.
2	C1608X7R1E105K080AB	C1, C3	Ceramic Capacitor 1.0μF/25V X7R	2	TDK Corporation
3	–	C2, C6, C7, C8, C9, C10	Unmounted	6	–
4	GRM1885C1H220JA01	C4, C5	Ceramic Capacitor 22pF/50V C0G	2	Murata Manufacturing Co., Ltd.
5	A1-24PA-2.54DSA(71)	CN1, CN2	Unmounted	2	Hirose Electric Co., Ltd.
6	HIF3FC-14PA-2.54DSA(71)	CNE	14pin Header Connector	1	Hirose Electric Co., Ltd.
7	–	CNEM	Unmounted	1	–
8	A2-3PA-2.54DSA	J1, J2, PWR	3pin Header Connector	3	Hirose Electric Co., Ltd.
9	MCR03ERTJ000	J3, J4, J5	Resistor 0Ω	3	Rohm Co., Ltd.
10	–	J6, J7, J8	Unmounted	3	–
11	SML-H12P8T	P20, P21, P22	LED Green	3	Rohm Co., Ltd.
12	MCR03EZPJ271	R1, R2, R3	Resistor 270Ω ±5%	3	Rohm Co., Ltd.
13	MCR03EZPJ103	R4	Resistor 10kΩ ±5%	1	Rohm Co., Ltd.
14	ML62Q2504-NNNTB	U1	16-bit Microcontroller	1	LAPIS Technology Co., Ltd.
15	–	UVDD, VDD, VSS	Unmounted	3	–
16	–	VSSPAD	Unmounted	1	–
17	VT-200-F 12.5pF	XT1	X'tal 32.768kHz 12.5pF	1	Seiko Instruments Inc.
18	HIF3GA-2.54SP	–	Short pin	3	Hirose Electric Co., Ltd.

[Note]

- The diameter of through hole of CN1 and CN2 is 0.9 mm.

Using CN1 and CN2, the diameter of connector pin should use the connector below 0.9mm, such as 0.5mm.

- The parts may be changed into another parts with equivalent part special quality

Schematic

The next page shows the schematic of RB-D62Q2504TB32
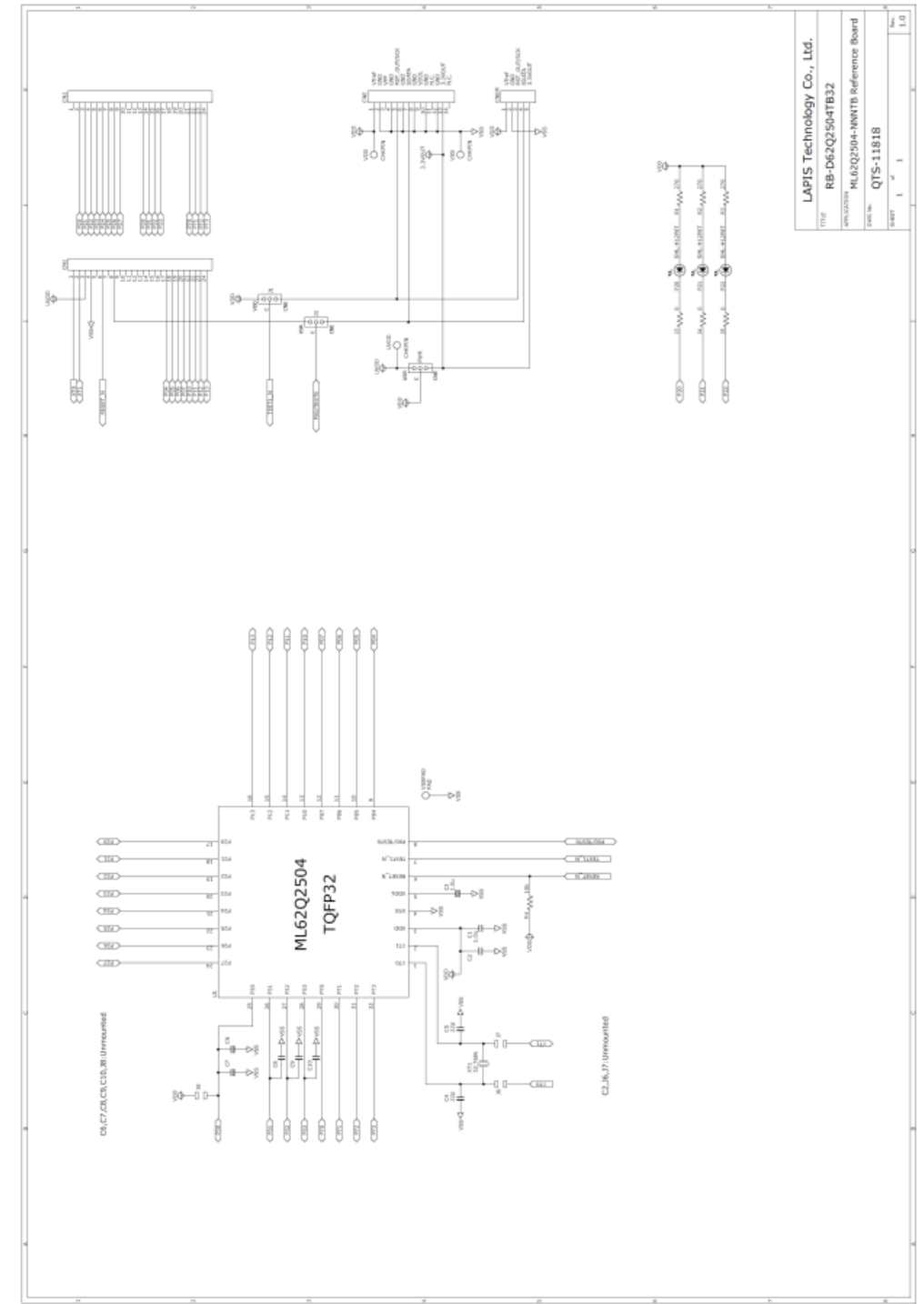
Revision History

Document No.	Issue Date	Page		Description
		Previous Edition	New Edition	
FEBL62Q2504RB-01	March 8, 2022	–	–	First edition.

Documents / Resources

ROHM RB-D62Q2504TB32 Development Support System [pdf] User Manual
RB-D62Q2504TB32 Development Support System, RB-D62Q2504TB32, Development Support System, Support System, System

References

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- **User Manual**