

OLMS63K SERIES 4-BIT LOW POWER MCU CHECK LIST**Part No. : ML63512A - A**

The function of this form is just for reminding the customer to (i) avoid commonly-made programming mistakes and, (ii) notice frequently overlooked or misunderstood hardware features of the caption MCU. The customer is required to fill in this form and submit it with all the other necessary files and documents when the code is released. The actual masking of the MCU is based on the code released by the customer - it is NOT based on the information given in this form. OKI and her distributors are not held liable for any discrepancies between the released code and the information given below.

(1) PACKAGE

- | | |
|--|---------------------|
| <input type="checkbox"/> Chip Form (60 pads) | : ML63512A – Axx WA |
| <input type="checkbox"/> 48-pin TQFP Form | : ML63512A – Axx TB |
| <input type="checkbox"/> 64-pin TQFP Form | : ML63512A – Axx TP |
- (xx indicates a code number.)

(2) VOLTAGE SUPPLY

- When Back up is used ($V_{DD} = 0.9V$ to $2.7V$)
Upon reset, the BACKUP bit is set to 1 to enter the back up state.
- When Back up is not used (When the Level detector and the Comparator are used, $V_{DD} = 1.8V$ to $3.5V$
When the Level detector and the Comparator are not used, $V_{DD} = 1.8V$ to $5.5V$)
To release the back up state, the BACKUP bit should be reset 0.
Connect V_{DD} to V_{DDH} externally.
- Since V_{DDI} is separated from the positive power supply pin (V_{DD}), power must be supplied to the V_{DDI} pin.
If a port 8 is to be connected to an external device that operates on a different power supply, the power supply of the external device must be fed to the V_{DDI} pin.

(3) OSCILLATION & FREQUENCY

Low-speed oscillation

- When Crystal oscillation is used
Crystal oscillation frequency 32.768 k to 76.8 kHz ($V_{DD} = 0.9 V$ to $5.5 V$)
- When RC oscillation is used
RC oscillation frequency 32 kHz \pm 30% ($R_{CRL} = 1.5 M\Omega$ / $V_{DD} = 0.9 V$ to $5.5 V$)

High-speed oscillation

- When ceramic oscillation is used
- | | |
|--|--|
| <input type="checkbox"/> When backup is not used | 200 k to 2 MHz ($V_{DD} = 2.7 V$ to $5.5 V$) |
| | 300 k to 1 MHz ($V_{DD} = 2.2 V$ to $5.5 V$) |
- When RC oscillation is used
- | | |
|--|---|
| <input type="checkbox"/> When backup is used | $R_{CRH} = 100 k$ to $300 k\Omega$ ($V_{DD} = 0.9 V$ to $1.8 V$) |
| | < for example > $840 \pm 30\%$ kHz ($R_{CRH} = 100 k\Omega$ / $V_{DD} = 1.5 V$) |
| <input type="checkbox"/> When backup is not used | $R_{CRH} = 30 k$ to $300 k\Omega$ ($V_{DD} = 1.8 V$ to $5.5 V$) |
| | < for example > $1.8 \pm 30\%$ MHz ($R_{CRH} = 30 k\Omega$ / $V_{DD} = 3.0 V$) |

(4) HIGH SPEED CLOCK OSCILLATION CIRCUIT

- RC Oscillation Mode (OSCSEL=0)
 $T_{WAIT} = 300\mu s$ or longer after ENOSC=1
- Ceramic Oscillation Mode (OSCSEL=1)
 $T_{WAIT} = 10ms$ or longer after ENOSC=1
- When changing the High-speed clock to Low-speed one, reset CPUCLK to 0 first and after that reset ENOSC to 0.
Never reset both at the same time, and follow the above turn.

(5) USABLE INTERNAL MEMORY SPACE

- [] Program memory space : 4064 × 16 bits
- [] Data memory space : 128 × 4 bits

(6) USABLE STACK SIZE

- [] Call stack : 16 levels
- [] Register stack : 16 levels

(7) INITIALIZATION OF RAM

- [] RAM content is undefined after power up - remember to do initialization.

(8) INPUT PORTS AND I/O PORTS

- [] When selecting High impedance input, the port should be connected to V_{DD} or V_{SS}.
- [] For the 48-pin TQFP, Port6, Port9, and PortA are not used.

(9) MELODY DRIVER

- [] When terminating melody playing forcibly, software have to comply with the following description.

(See Chapter 10.3 of ML63512A/514A User's Manual .)

; *** Program part ***

DI ; (1) Disable master interrupt (MIE).

MSA MDSTOP_DATA ; (2) Write melody end data to the melody circuit.

MOV A, #0 ; (3) Set the MSF flag to 0.

MOV MDCON, A

MOV A, #1101b ; (4) Clear melody interrupt request (QMD)

AND IRA0, A

EI ; (5) Enable master interrupt (MIE)

; *** ROM table data part ***

; *** Provide two words of melody data so that a melody will always be terminated

; *** Even if a melody request is issued twice.

MDSTOP_DATA:

DW 8000H ; Silence data 1

DW 8000H ; Silence data 2

; *****

(10) RESET SIGNAL

- [] Since the ML63512A has an internal reset sampling (32 kHz) circuit, keep the RESETB pin (pulse width) set to a " L " level for 1.25 seconds or more.

(11) MASK OPTION

To use the mask option, assign mask option data in the application program in accordance with the formats below.
 The mask option area for the device is an application program execution disabled area.
 (See Chapter Appendix E of ML63512A/514A User's Manual .)

Function	Mask option area	data	Option to be selected
Low-speed clock oscillation circuit (Crystal oscillation / RC oscillation circuit)	0FE0H	0	<input type="checkbox"/> Crystal oscillation circuit
		1	<input type="checkbox"/> RC oscillation circuit
High-speed clock oscillation circuit (Internal capacitor)	0FE1H	0	<input type="checkbox"/> Always set "0". ("1" is invalid.)
Reset (Internal / External pull-up resistor)	0FE2H	0	<input type="checkbox"/> Internal pull-up resistor
		1	<input type="checkbox"/> External pull-up resistor
High-speed clock oscillation circuit (RC oscillation / Ceramic oscillation circuit)	0FE3H	0	<input type="checkbox"/> RC oscillation circuit
		1	<input type="checkbox"/> Ceramic oscillation circuit

We, _____, hereby confirm the correctness of information given in this completed form.

Signature & Company Chop

Date