

OLMS63K SERIES 4-bit Low Power MCU CHECK LIST**Part No.: MSM63188A -**

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

Chip Form : 176-pin LQFP Form : GS-BK

(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 ($V_{DD}=1.8V$ 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 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

Crystal oscillation frequency 30k to 35kHz ($V_{DD}=0.9V$ to $5.5V$)

High-speed oscillation

When ceramic oscillation is used

When backup is used 300k to 500kHz ($V_{DD}=1.2V$ to $2.7V$)
200k to 1MHz ($V_{DD}=1.5V$ to $2.7V$)

When backup is not used 300k to 500kHz ($V_{DD}=1.8V$ to $5.5V$)
300k to 1MHz ($V_{DD}=2.2V$ to $5.5V$)
200k to 2MHz ($V_{DD}=2.7V$ to $5.5V$)

When RC oscillation is used

When backup is used 100k to 300k Ω ($V_{DD}=1.2V$ to $2.7V$)
50k to 300k Ω ($V_{DD}=1.5V$ to $2.7V$)

When backup is not used 100k to 300k Ω ($V_{DD}=1.8V$ to $5.5V$)
50k to 300k Ω ($V_{DD}=2.2V$ to $5.5V$)
30k to 300k Ω ($V_{DD}=2.7V$ to $5.5V$)

(4) BATTERY LOW DETECTION CIRCUIT (BLD)

Enable BLD only when battery check is carried out.

Read the BLDF flag 1ms or more after setting the ENBL to "1".

Four levels of judgment voltage can be selected by the BLDCON bits.

Judgment voltage values :

$1.05 \pm 0.10V$, $1.30 \pm 0.15V$, $2.20 \pm 0.20V$, $2.80 \pm 0.30V$

(5) HIGH SPEED CLOCK OSCILLATION CIRCUIT

RC Oscillation Mode (OSCSEL=0)

T_{WAIT} =300 μ 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.

(6) USABLE ROM SIZE

16352 \times 16 bits

(7) USABLE STACK SIZE

Call stack : 16 levels

Register stack : 16 levels

(8) INITIALIZATION OF RAM

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

(9) INITIALIZATION OF DISPLAY REGISTER

Display Register content is undefined after power up - remember to do initialization.

(10) LCD DRIVER

When the LCD driver is not used, select the power down mode (PDWN=1)

V_{DD2} : To connect 0.1 μ F capacitance between V_{DD2} and V_{SS} level.

V_{DD1} , V_{DD3} , V_{DD4} , V_{DD5} , C1, C2 : Open

BIAS selection

1/5 bias

1/4 bias

To connect V_{DD3} to V_{DD2} .

(11) INPUT PORTS AND I/O PORTS

When selecting High impedance input, the port should be connected to " V_{DD} " or " V_{SS} ".

(12) MELODY DRIVER

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

*** Program part ***

```
DI ; (1) Disable master interrupt.
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 ; (5) Enable master interrupt(MIE)
EI
```

*** ROM table data part ***

*** Provide two items 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
```

We, _____, hereby confirm that all the points stated above have been checked.

Signature

Date