

Dear customers

July 4, 2022

Toshiba Electronic Devices & Storage Corporation

Toshiba Electronic Device Solutions Corporation

## **Errata notice: missing description regarding power down slope**

Thank you very much for using Toshiba microcontrollers usually.

We found one missing description in the datasheet, regarding power down procedure. We are really sorry for your inconvenience, but please refer the following errata. Please ask our sales staff if you have any unclear points. Please visit the following web site if you have no idea on your sales contact.

<https://toshiba.semicon-storage.com/ap-en/contact> (Asia-Pacific)

<https://www.toshiba.com/taec/support/techquestions> (Americas)

<https://toshiba.semicon-storage.com/eu/contact> (Europe (FMEA))

## 1. Applicable products

Family	Group	Products
TXZ+	M4M(1)	TMPM4MNFYAFG, TMPM4MNFWAFG TMPM4MNFYADFG, TMPM4MNFWADFG TMPM4MMFYAFG, TMPM4MMFWAFG TMPM4MLFYAUG, TMPM4MLFWAUG TMPM4MLFYAFG, TMPM4MLFWAFG
	M4K(2)	TMPM4KNFYAFG, TMPM4KNFWAFG TMPM4KNFYADFG, TMPM4KNFWADFG TMPM4KMFYAFG, TMPM4KMFWAFG TMPM4KLFYAUG, TMPM4KLFWAUG TMPM4KLFYAFG, TMPM4KLFWAFG TMPM4KHFYAUG, TMPM4KHFWAU

## 2. Details

### 2.1. Details on the missing description

Description on power down slope is missing in the datasheet, "Power gradient" parameter in "7.7. Characteristics of internal processing at RESET" subsection of "7. Electrical characteristics" section, while power up slope specification is described. Please let us add power down slope specification as described in "2.2. Description added."

In general system, there are capacitors between power and ground in order to remove noise or make power supply stable. It is not thought that steeper power down is generally happened than specification on power down slope, but please follow the specification, the max condition of falling slope, so that power is down with gentler slope than the specification.

## 2.2. Description added

### 7. Electrical Characteristics

#### 7.7 Characteristics of Internal processing at RESET

(Old)

DVSSA=DVSSB=DVSSC=AVSS=0V

Ta= -40 to 105°C

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Internal Initialized time	t <sub>INIT</sub>	Power On	-	-	1.85	ms
Internal processing time for Reset	t <sub>IRST</sub>	-	0.15	-	1.12	
Waiting time till CPU running (Note)	t <sub>CPUWT</sub>	Power-on Reset operation by LVD in STOP1 mode Reset operation by RESET_N pin in STOP1 mode	12	-	15	μs
		Reset operation by LVD in NORMAL or IDLE mode Reset operation by RESET_N pin in NORMAL or IDLE mode Reset operation by WDT, OFD, LOCKUP, or SYSRESET in NORMAL or IDLE mode	132	-	137	
Power-on rising gradient	V <sub>PON</sub>	-	0.3	-	100	mV/μs

Note: Except reset operation by WDT, OFD, LOCKUP, or SYSRESET, when reset factor repeats, t<sub>CPUWT</sub> (Waiting time till CPU running) starts measuring elapse time after releasing this factor.

(New)

DVSSA=DVSSB=DVSSC=AVSS=0V

Ta= -40 to 105°C

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Internal Initialized time	t <sub>INIT</sub>	Power On	-	-	1.85	ms
Internal processing time for Reset	t <sub>IRST</sub>	-	0.15	-	1.12	
Waiting time till CPU running (Note)	t <sub>CPUWT</sub>	Power-on Reset operation by LVD in STOP1 mode Reset operation by RESET_N pin in STOP1 mode	12	-	15	μs
		Reset operation by LVD in NORMAL or IDLE mode Reset operation by RESET_N pin in NORMAL or IDLE mode Reset operation by WDT, OFD, LOCKUP, or SYSRESET in NORMAL or IDLE mode	132	-	137	
Power gradient	V <sub>PON</sub>	Rising slope	0.3	-	100	mV/μs
	V <sub>POFF</sub>	Falling slope	-	-	10	

Note: Except reset operation by WDT, OFD, LOCKUP, or SYSRESET, when reset factor repeats, t<sub>CPUWT</sub> (Waiting time till CPU running) starts measuring elapse time after releasing this factor.

## 2.3. Problems when not following the specification

If power is down with steep slope which is not satisfied with the power down slope specification, it is possible that the shutdown process, protecting the flash memory from any damages, is not properly done. In this case, some damages are applied to the embedded flash memory to write, erase or so may be accidentally happened in worst case. Please be sure to check if your power supply circuit or system has gentler power down slope than the max condition defined in "Falling slope ( $V_{POFF}$ )" of "Electrical characteristics" when power off.

By the way, please do not cut the power during flash is in write or erase operation, as already described in the datasheet as similar notes.