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## STM32MP1 Series lifetime estimates

### Introduction

This application note presents lifetime estimates for STM32MP1 Series microprocessors. The presented profiles are dependent on the device voltage operating selection (VOS) and on the maximum supported junction temperature ( $T_j$ ).

The product lifetimes presented in this document are estimated and do not represent the guaranteed lifetime for the product.

## 1 General information

This document applies to Arm® Cortex® core-based microprocessors of the STM32MP1 Series.

*Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.*



The table below presents voltage and maximum Tj range supported by the STM32MP1 Series microprocessors.

**Table 1. Frequency and voltage scaling relation**

Operating level	Tj max (°C)	Cortex-A7 frequency (MHz)	Cortex-M4 frequency (MHz)	V <sub>DDCORE</sub> min (V)
VOS1	125	650	209	1.18
VOS2		600		
VOS3	105	650		
VOS4		800		1.3

## 2 Lifetime estimation

The STM32MP1 Series lifetime estimates depending on voltage and junction temperature, the table below details these lifetimes versus the applied voltage that is translated by VOS (voltage scaling).

**Table 2. Lifetime estimates versus the mission profiles (Operating ratio = 100 %,  $V_{DD}$  max Domain 2 = 3.6 V)**

Operating level	Mission profile	Lifetime (Years)	$V_{DDCORE}$ max Domain 1 (V)	$T_J$ max (°C)
VOS1	General purpose	2	1.25 (60 %)/1.21 (40%)	125
VOS2	Industrial profile-1	10	1.25	
VOS3	Industrial profile-2	10	1.25	105
VOS4	Enhanced profile	2	1.38	

1. Covered by product qualification.

The junction temperature ( $T_J$ ) of the device is an important variable influencing the product lifetime (as shown in the figures below). Hence, it is recommended to keep a low  $T_J$  of the device with an appropriate thermal management.

**Figure 1. Lifetime estimates (VOS1)**

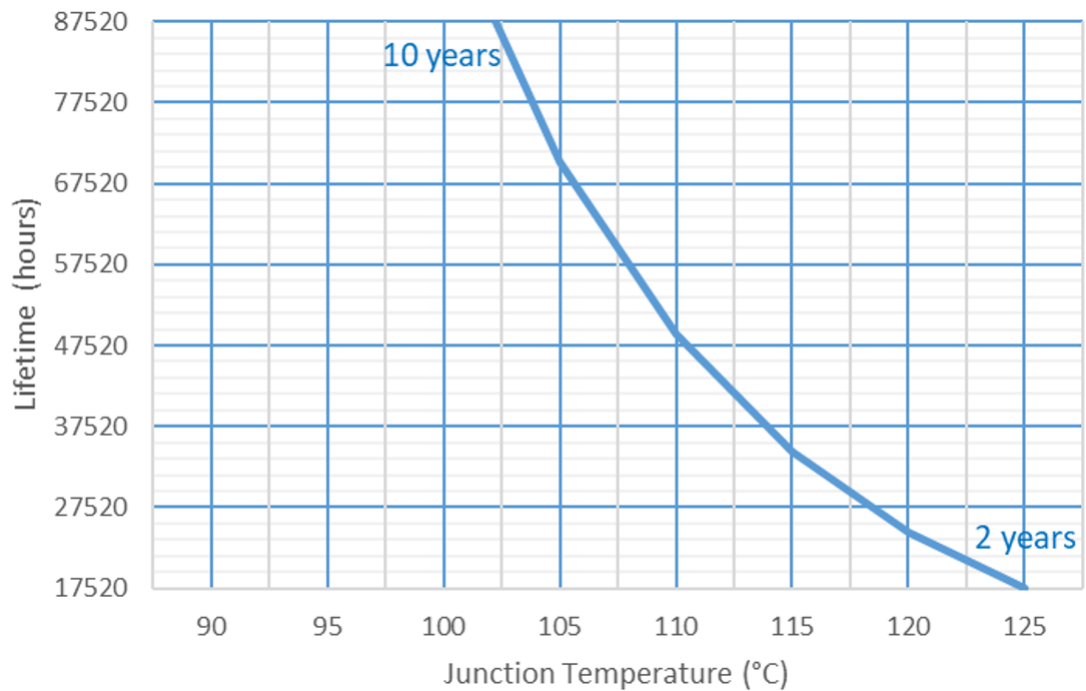


Figure 2. Lifetime estimates (VOS2)

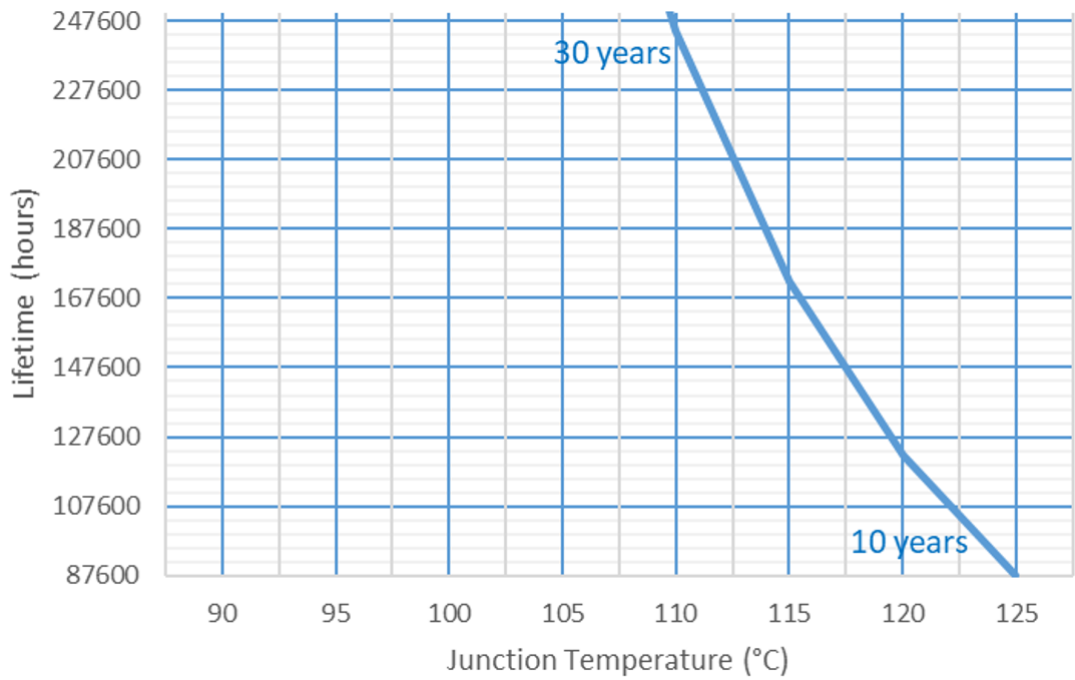


Figure 3. Lifetime estimates (VOS3)

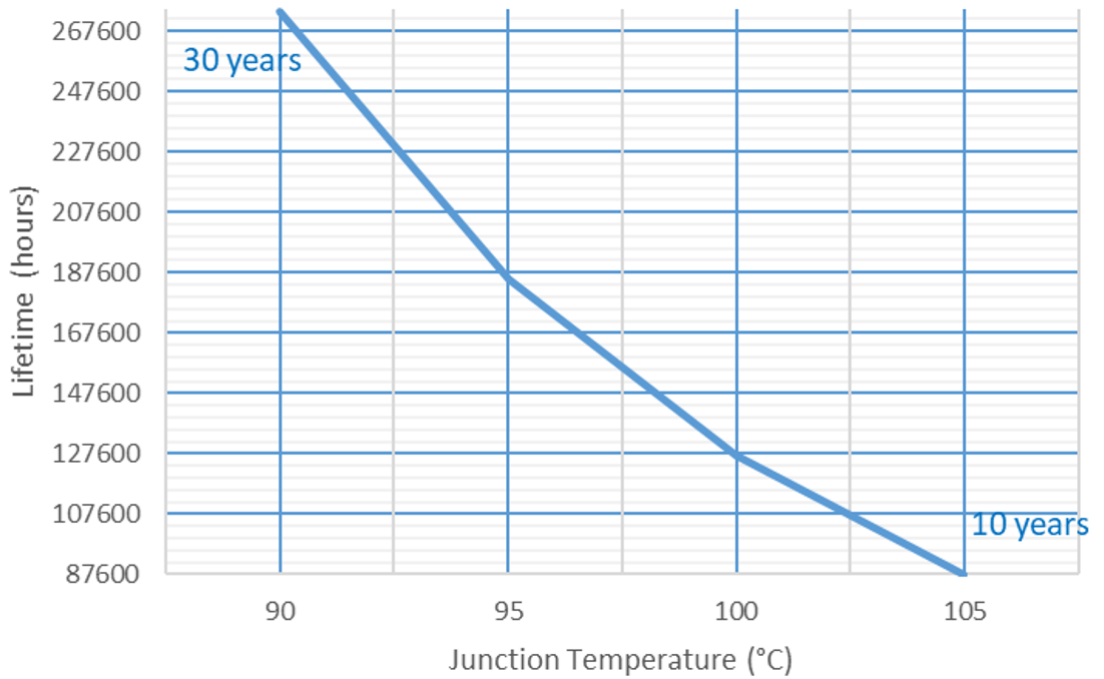
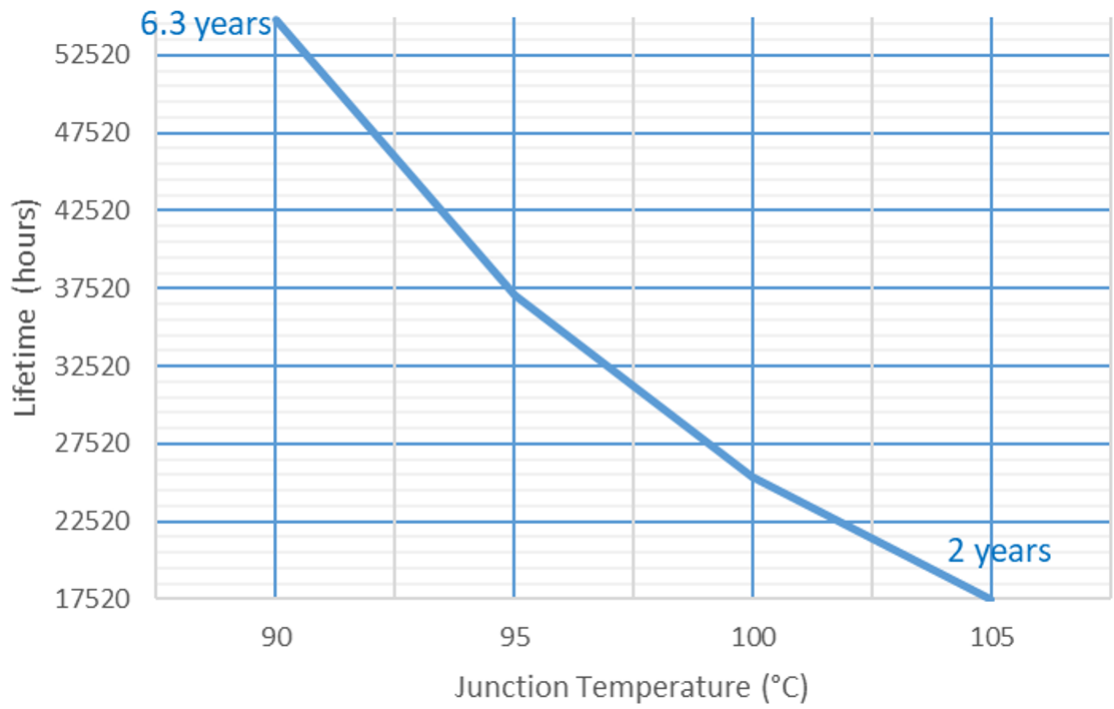


Figure 4. Lifetime estimates (VOS4)



## Revision history

**Table 3. Document revision history**

Date	Version	Changes
27-jan-2020	1	Initial release.

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