

23.13 FLASH Memory Characteristics

Characteristic	Symbol	Min	Max	Unit
FLASH program bus clock frequency	—	1	—	MHz
FLASH read bus clock frequency	$f_{\text{Read}}^{(1)}$	32k	8.4M	Hz
FLASH page erase time	$t_{\text{Erase}}^{(2)}$	1	—	ms
FLASH mass erase time	$t_{\text{MErase}}^{(3)}$	4	—	ms
FLASH PGM/ERASE to HVEN set up time	t_{nvs}	10	—	μs
FLASH high-voltage hold time	t_{nvhl}	5	—	μs
FLASH high-voltage hold time (mass erase)	t_{nvhl}	100	—	μs
FLASH program hold time	t_{pgs}	5	—	μs
FLASH program time	t_{PROG}	30	40	μs
FLASH return to read time	$t_{\text{rcv}}^{(4)}$	1	—	μs
FLASH cumulative program hv period	$t_{\text{HV}}^{(5)}$	—	4	ms
FLASH row erase endurance ⁽⁶⁾	—	10,000	—	Cycles
FLASH row program endurance ⁽⁷⁾	—	10,000	—	Cycles
FLASH data retention time ⁽⁸⁾	—	10	—	Years

Notes:

- f_{Read} is defined as the frequency range for which the FLASH memory can be read.
- If the page erase time is longer than t_{Erase} (Min), there is no erase-disturb, but it reduces the endurance of the FLASH memory.
- If the mass erase time is longer than t_{MErase} (Min), there is no erase-disturb, but it reduces the endurance of the FLASH memory.
- t_{rcv} is defined as the time it needs before the FLASH can be read after turning off the high voltage charge pump, by clearing HVEN to logic 0.
- t_{HV} is defined as the cumulative high voltage programming time to the same row before next erase.
 t_{HV} must satisfy this condition: $t_{\text{nvs}} + t_{\text{nvhl}} + t_{\text{pgs}} + (t_{\text{PROG}} \times 64) \leq t_{\text{HV}} \text{ max.}$
- The minimum row endurance value specifies each row of the FLASH memory is guaranteed to work for at least this many erase / program cycles.
- The minimum row endurance value specifies each row of the FLASH memory is guaranteed to work for at least this many erase / program cycles.
- The FLASH is guaranteed to retain data over the entire operating temperature range for at least the minimum time specified.



Section 24. Mechanical Specifications

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24.2 Introduction

This section gives the dimensions for:

- 64-pin plastic quad flat pack (case 840B-01)

Figure 24-1 shows the latest package drawing at the time of this publication. To make sure that you have the latest package specifications, please visit the Freescale website at <http://freescale.com>. Follow the World Wide Web on-line instructions to retrieve the current mechanical specifications.

24.3 64-Pin Plastic Quad Flat Pack (QFP)

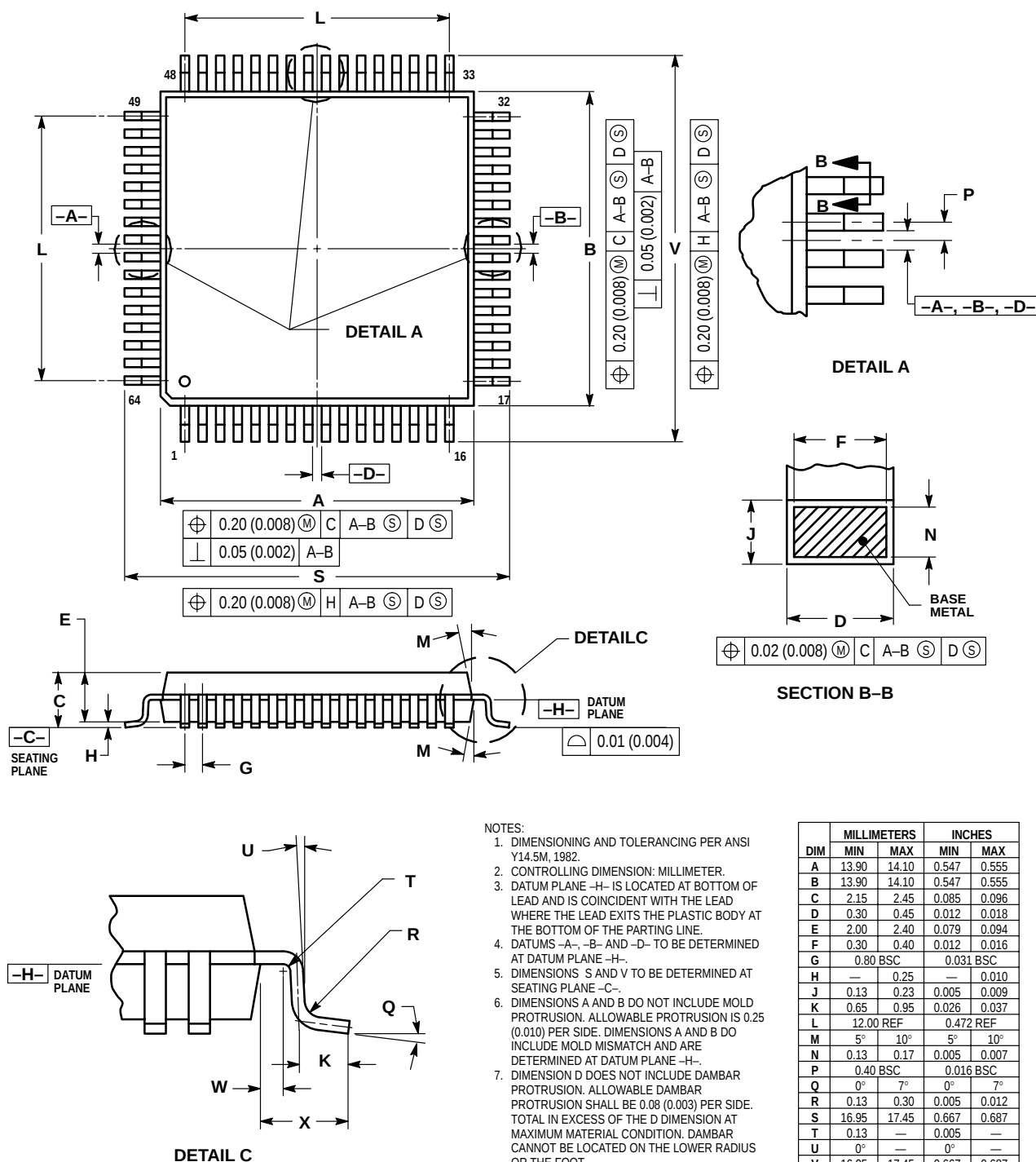


Figure 24-1. 64-Pin Plastic Quad Flat Pack (QFP)

Section 25. Ordering Information

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25.2 Introduction

This section contains ordering numbers for the MC68HC908AB32.

25.3 MC Order Numbers

Table 25-1. MC Order Numbers

MC order number ⁽¹⁾	Operating temperature range
MC68HC908AB32CFU	–40 °C to +85 °C
MC68HC908AB32MFU	–40 °C to +125 °C

Notes:

- 1. FU = Quad Flat Pack
- C = Operating temperature range: –40 °C to +85 °C
- M = Operating temperature range: –40 °C to +125 °C



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