



PowerPC™

Freescale Semiconductor, Inc.

PID7v-603e PS 970707

Motorola Part Numbers Affected:
XPC603PFE160/180/200LC
XPC603PRX180/200/225/240/250LD
XPC603PRX160/180/200LE
XPC603PFE166/200TE
XPC603PRX166/200TE

Application-Specific Information

PowerPC 603e™ RISC Microprocessor Family:
PID7v-603e (Valiant) Part Number Specifications

This document defines a unique part number for a PowerPC PID7v-603e microprocessor manufactured by Motorola. It describes changes to recommended operating conditions and revised electrical specifications, as applicable, from those described in the PowerPC 603e RISC Microprocessor Family: PID7v-603e Hardware Specifications. Any functional differences (errata) for these parts from the functional description provided in the PowerPC™ 603e RISC Microprocessor User's Manual (order # MPC603EUM/AD) or its addendum (order # MPC603EUMAD/AD) are described in a separate Errata List available from your local Motorola sales office.

Specifications provided in this data sheet supersede those in Revision 1 (11/96) of the PID7v-603e Hardware Specifications (order #: MPC603EV7VEC/D); specifications not addressed herein are unchanged.

Note that headings and table numbers in this data sheet are not consecutively numbered. They are intended to correspond to the heading or table affected in the general hardware specifications.

Part numbers addressed in this document are listed in Table A. For more detailed ordering information see Table 14.

Table A. Part Numbers Addressed by this Data Sheet

Table with 5 columns: Motorola Part Number, CPU Frequency, Vdd, Tj (°C), and Significant Differences. It lists various part numbers like XPC603PFE160LC, XPC603PRX180LD, etc., with their respective operating conditions and differences.

Note: The X prefix in a Motorola PowerPC part number designates a "Pilot Production Prototype" as defined by Motorola SOP 3-13. These are from a limited production volume of prototypes manufactured, tested and Q.A. inspected on a qualified technology to simulate normal production. These parts have only preliminary reliability and characterization data. Before pilot production prototypes may be shipped, written authorization from the customer must be on file in the applicable sales office acknowledging the qualification status and the fact that product changes may still occur while shipping pilot production prototypes

1.4.1 DC Electrical Characteristics

Table 2 describes the changed DC operating conditions for the PID7v-603e part numbers described herein.

Table 2. Recommended Operating Conditions

Table with 5 columns: Characteristic, Symbol, Value, Unit, and Notes. It lists characteristics like Core supply voltage, PLL supply voltage, and Junction temperature with their symbols and values.

Note: TE suffix parts only.

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Table 4 provides the changed DC electrical characteristics for the PID7v-603e part numbers described herein (with the exception of the extended temperature (-40 to 105) devices).

**Table 4. DC Electrical Specifications**

Vdd = 2.5 ± 5% V dc, OVdd = 3.3 ± 5% V dc, GND = 0 V dc

Characteristic	Symbol	Min	Max	Unit	Notes
Input leakage current, V <sub>in</sub> = 3.465 V	I <sub>in</sub>	—	30	μA	1
	I <sub>in</sub>	—	50	μA	2

**Notes:**

1. Applicable to Rev 2.1 and Rev 2.1.1 parts processed in PPC2.0. See Table 14 for corresponding part numbers.
2. Applicable to Rev 2.1 parts processed in PPC2.2. See Table 14 for corresponding part numbers.

Table 5 provides the power dissipation for these changed operating conditions.

**Table 5. Power Dissipation**

Vdd = 2.5 ± 5% V dc, OVdd = 3.3 ± 5% V dc, GND = 0 V dc

	Processor CPU Frequency						Unit	Notes
	160 MHz	180 MHz	200 MHz	220, 225 MHz	233, 240 MHz	250 MHz		
<b>Full-On Mode (DPM Enabled)</b>								
Typical	2.9	3.5	4.0	4.4	4.8	5.2	W	
Max.	3.8	4.5	5.0	5.5	6.0	6.5	W	
<b>Doze Mode</b>								
Typical	1.2	1.4	1.5	1.7	1.8	1.9	W	
<b>Nap Mode</b>								
Typical	75	100	120	132	140	150	mW	
<b>Sleep Mode</b>								
Typical	65	80	100	110	120	130	mW	
<b>Sleep Mode—PLL Disabled</b>								
Typical	60	60	60	60	60	60	mW	
<b>Sleep Mode—PLL and SYCLK Disabled</b>								
Maximum	40	40	40	40	40	40	mW	1
Maximum	60	60	60	60	60	60	mW	2

**Notes:**

1. XPE603PRX180RE and XPE603PRX200RE are screened to meet this low sleep power value.
2. All others (L Application modifier).

## 1.9 Ordering Information

Table 14 provides the ordering information for the PID7v-603e part numbers described herein.

**Table 14. Ordering Information for the Apple-unique PID7v-603e Microprocessor**

Package Type	Device Rev	Process	Mask Code	CPU Frequency (MHz)	Motorola Part Number
240 CQFP	2.1	PPC2.0	02G96M	160	XPC603PFE160LC
				180	XPC603PFE180LC
	200		XPC603PFE200LC		
	2.1.1		03G96M	166	XPC603PFE166TE
200	XPC603PFE200TE				
255 CBGA	2.1	PPC2.2	52G96M	180	XPC603PRX180LD
				200	XPC603PRX200LD
				225	XPC603PRX225LD
				240	XPC603PRX240LD
				250	XPC603PRX250LD
				2.1.1	PPC2.0
	180	XPC603PRX180LE			
	200	XPC603PRX200LE			
	180	XPC603PRX180RE			
	200	XPC603PRX200RE			
	166	XPC603PRX166TE			
	200	XPC603PRX200TE			

## 1.10 Part Marking

This section provides information on Motorola device marking standards. Parts are marked as shown in Figure A. Extended temperature parts are marked as shown in Figure B.



**Notes:**  
 MMMMMM is the 6-digit mask number  
 ATWLYYWWA or YWWLA is the traceability code  
 CCCC is the country of assembly (this space is left blank if parts are assembled in the United States)

**Figure A. Motorola Part Marking for CQFP and BGA Devices**



**Notes:**  
 MMMMMM is the 6-digit mask number  
 ATWLYYWWA or YWWLA is the traceability code  
 CCCC is the country of assembly (this space is left blank if parts are assembled in the United States)

**Figure B. Motorola Part Marking for Extended Temperature CQFP and BGA Devices**

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