PowerPC™

Application-Specific Information

PID7v-603e PS 970707

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

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 supercede 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 infomation see Table 14.

Table A. Part Numbers Addressed by this Data Sheet

Motorola Part Number	Operating Conditions			Significant Differences
	CPU Frequency	Vdd	T_J (°C)	
XPC603PFE160LC	160 MHz	2.375 to 2.625 V	0 to 105	Full Spec
XPC603PFE180LC	180 MHz	2.375 to 2.625 V	0 to 105	Full Spec
XPC603PFE200LC	200 MHz	2.375 to 2.625 V	0 to 105	Full Spec
XPC603PRX180LD	180 MHz	2.375 to 2.625 V	0 to 105	Increased Input leakage current
XPC603PRX200LD	200 MHz	2.375 to 2.625 V	0 to 105	Increased Input leakage current
XPC603PRX225LD	225 MHz	2.375 to 2.625 V	0 to 105	Increased Input leakage current
XPC603PRX240LD	240 MHz	2.375 to 2.625 V	0 to 105	Increased Input leakage currentc
XPC603PRX250LD	250 MHz	2.375 to 2.625 V	0 to 105	Increased Input leakage current (Rev 1 of PID7v-603e Hardware Specification does not cover this frequency.
XPC603PFE166TE	166 MHz	2.375 to 2.625 V	-40 to 105	Extended temperature
XPC603PFE200TE	200 MHz	2.375 to 2.625 V	-40 to 105	Extended temperature
XPC603PRX166TE	166 MHz	2.375 to 2.625 V	-40 to 105	Extended temperature
XPC603PRX200TE	200 MHz	2.375 to 2.625 V	-40 to 105	Extended temperature
XPC603PRX160LE	160 MHz	2.375 to 2.625 V	0 to 105	Full Spec
XPC603PRX180LE	180 MHz	2.375 to 2.625 V	0 to 105	Full Spec
XPC603PRX200LE	200 MHz	2.375 to 2.625 V	0 to 105	Full Spec
XPC603PRX180RE	180 MHz	2.375 to 2.625 V	0 to 105	Revised Spec; screened for Sleep Power<40mW. See Table 5
XPC603PRX200RE	200 MHz	2.375 to 2.625 V	0 to 105	Revised Spec; screened for Sleep Power<40mW. See Table 5

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

Characteristic	Symbol	Value	Unit	Notes
Core supply voltage	Vdd	2.375 to 2.625	V	
PLL supply voltage	AVdd	2.375 to 2.625	V	
Junction temperature	T_J	0 to 105	°C	
Junction temperature	T_J	-40 to 105	°C	1

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_{in} = 3.465 V	I_{in}	—	30	µA	1
V_{in} = 3.465 V	I_{in}	—	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**		
Full-On Mode (DPM Enabled)									
	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	
Doze Mode									
	Typical	1.2	1.4	1.5	1.7	1.8	1.9	W	
Nap Mode									
	Typical	75	100	120	132	140	150	mW	
Sleep Mode									
	Typical	65	80	100	110	120	130	mW	
Sleep Mode—PLL Disabled									
	Typical	60	60	60	60	60	60	mW	
Sleep Mode—PLL and SYSCLK Disabled									
	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).
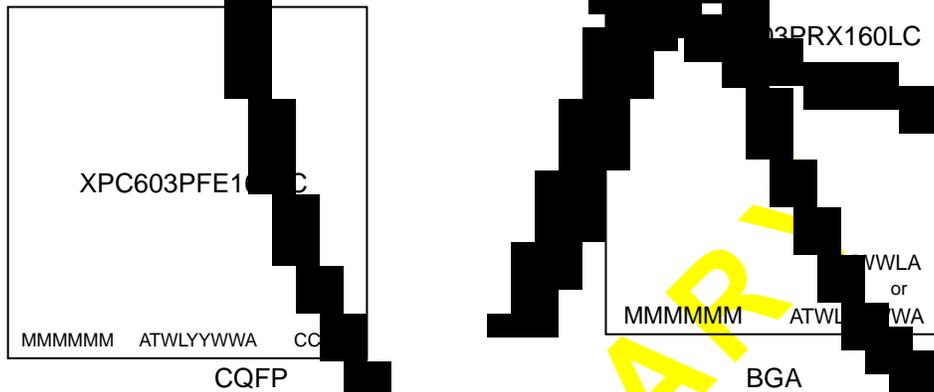
1.9 Ordering Information

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	03G96M	160	XPC603PRX160LE
				180	XPC603PRX180LE
				200	XPC603PRX200LE
				180	XPC603PRX180RE
				200	XPC603PRX200RE
				166	XPC603PRX166TE
				200	XPC603PRX200TE

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1.10 Part Marking

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

CQFP

XPC603PFE16[...]C

MMMMMM   ATWLYYWWA   CC[...]

BGA

[...]3PRX160LC

MMMMMM   ATWL[...]WA

YWWLA
or

Notes:

MMMMMM is the 6-digit mask number

ATWLYYWWA or YWWLA is the traceability [...]

CCCCC is the country of assembly (this space [...] blank if parts are assembled in the United States)

Figure A. Motorola Part Mark[...] [...] CQFP and BGA Devices

CQFP

XPC603PFE160LC
XPC603PFE166TE

MMMMMM   ATWLYYWWA   CCCCC

BGA

C603PRX160LC

XPC603PFE166TE

MMMMMM   ATWLYYWWA

YWWLA
or

Notes:

MMMMMM is the 6-digit mask number

ATWLYYWWA or YWWLA is the traceability code

CCCCC 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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