



Specifications and Mode Tables

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XPERT Product Line

Specifications

System Requirements

PCI-version XPERT product — Pentium/Pentium Pro, or compatible system with PCI Local Bus expansion slot

AGP-version XPERT product — Pentium/Pentium Pro, or compatible system with Accelerated Graphics Port expansion slot

Operating Environments — one of:

- DOS 5.0 or higher, Windows 3.1x, Windows 95, or Windows NT



Video BIOS

- PCI 2.1 compliant
- AGP 1.0 compliant

Available Memory Configurations

- 2MB upgradable to 4MB (*XPERT XL*)
- 2MB upgradable to 4MB or 6MB
- 4MB upgradable to 6MB or 8MB, or 8MB

Sync Signals

- Separate horizontal and vertical sync at TTL levels

Video interrupt (Reserved for future use):

- Auto-configured by system for PCI or AGP, as required.



Display Connector

- 15-pin D shell (Female), IBM standard.

TV Output Connectors (not available in all configurations)

- Composite Output (NTSC or PAL standard)
- S-Video Output

AMC Connector

- 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

Power

- +5V \pm 5%, @ 1.3A typical.



Ambient Temperature

- Operating — 50° to 122° F (10° to 50° C).
- Storage — 32° to 162° F (0° to 70° C).

Relative Humidity

- Operating — 5% to 90% non-condensing.
- Storage — 0% to 95%.

MTBF

- 360,000 hours.

EMC Certification

- FCC Class B.



XPERT@WORK / XPERT@PLAY Video Mode Table

XPERT@WORK / XPERT@PLAY															
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)											
				2 MB				4 MB				6 MB or 8 MB			
				8	16	24	*32	8	16	24	*32	8	16	24	*32
640x480	60	31.5	25.2	*	*	*	*	*	*	*	*	*	*	*	*
640x480	72	37.4	32.0	*	*	*	*	*	*	*	*	*	*	*	*
640x480	75	37.5	31.5	*	*	*	*	*	*	*	*	*	*	*	*
640x480	85	43.3	36.0	*	*	*	*	*	*	*	*	*	*	*	*
640x480	90	48.0	39.9	*	*	*	*	*	*	*	*	*	*	*	*
640x480	100	52.9	44.9	*	*	*	*	*	*	*	*	*	*	*	*
640x480	120	63.7	55.0	*	*	*	*	*	*	*	*	*	*	*	*
640x480	160	81.0	70.0	*	*	*	*	*	*	*	*	*	*	*	*
640x480	200	100.2	81.0	*	*	*	*	*	*	*	*	*	*	*	*
800x600	48	33.8	36.0	*	*	*	*	*	*	*	*	*	*	*	*
800x600	56	35.2	36.0	*	*	*	*	*	*	*	*	*	*	*	*
800x600	60	37.8	39.9	*	*	*	*	*	*	*	*	*	*	*	*
800x600	70	44.5	44.9	*	*	*	*	*	*	*	*	*	*	*	*
800x600	72	48.0	50.0	*	*	*	*	*	*	*	*	*	*	*	*



XPERT@WORK / XPERT@PLAY

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)											
				2 MB				4 MB				6 MB or 8 MB			
				8	16	24	*32	8	16	24	*32	8	16	24	*32
800x600	75	46.9	49.5	*	*	*	*	*	*	*	*	*	*	*	*
800x600	85	53.7	56.3	*	*	*	*	*	*	*	*	*	*	*	*
800x600	90	56.6	56.6	*	*	*	*	*	*	*	*	*	*	*	*
800x600	100	63.9	67.5	*	*	*	*	*	*	*	*	*	*	*	*
800x600	120	76.1	81.0	*	*	*	*	*	*	*	*	*	*	*	*
800x600	160	101.9	110.0	*	*	*	*	*	*	*	*	*	*	*	*
800x600	200	125.9	135.0	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	43	35.5	44.9	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	60	48.4	65.0	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	70	56.1	75.0	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	72	57.9	75.0	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	75	60.0	78.8	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	85	68.7	94.5	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	90	76.2	100.0	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	100	80.4	110.0	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	120	96.7	130.0	*	*	*	*	*	*	*	*	*	*	*	*



XPERT@WORK / XPERT@PLAY

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)													
				2 MB				4 MB				6 MB or 8 MB					
				8	16	24	*32	8	16	24	*32	8	16	24	*32		
1024x768	140	113.1	157.5	*	*					*	*	*	*	*	*	*	*
1024x768	150	120.6	160.0	*	*					*	*	*	*	*	*	*	*
1152x864	43	45.9	65.0	*	*					*	*	*	*	*	*	*	*
1152x864	47	44.9	65.0	*	*					*	*	*	*	*	*	*	*
1152x864	60	54.9	80.0	*	*					*	*	*	*	*	*	*	*
1152x864	70	66.1	100.0	*	*					*	*	*	*	*	*	*	*
1152x864	75	75.1	110.0	*	*					*	*	*	*	*	*	*	*
1152x864	80	76.4	110.0	*	*					*	*	*	*	*	*	*	*
1152x864	85	77.1	121.5	*	*					*	*	*	*	*	*	*	*
1152x864	100	90.2	135.0	*	*					*	*	*	*	*	*	*	*
1152x864	120	108.6	172.0	*	*					*	*	*	*	*	*	*	*
1280x1024	43	50.0	80.0	*	*					*	*	*	*	*	*	*	*
1280x1024	47	50.0	80.0	*	*					*	*	*	*	*	*	*	*
1280x1024	60	64.0	110.0	*	*					*	*	*	*	*	*	*	*
1280x1024	70	74.6	126.0	*	*					*	*	*	*	*	*	*	*
1280x1024	74	77.9	135.0	*	*					*	*	*	*	*	*	*	*



XPERT@WORK / XPERT@PLAY

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)												
				2 MB				4 MB				6 MB or 8 MB				
				8	16	24	*32	8	16	24	*32	8	16	24	*32	
1280x1024	75	80.0	135.0	*					*	*	*		*	*	*	*
1280x1024	85	91.2	157.5	*					*	*	*		*	*	*	*
1280x1024	90	96.2	160.0	*					*	*	*		*	*	*	*
1280x1024	100	106.4	172.0	*					*	*	*		*	*	*	*
1600x1200	52	68.0	135.0	*					*	*			*	*	*	8 MB
1600x1200	58	75.0	135.0	*					*	*			*	*	*	8 MB
1600x1200	60	76.2	156.0	*					*	*			*	*	*	8 MB
1600x1200	66	82.7	172.0	*					*	*			*	*	*	
1600x1200	72	89.7	194.4	*					*	*			*	*	*	
1600x1200	75	93.8	202.5	*					*	*			*	*	*	
1600x1200	76	95.2	198.0	*					*	*			*	*	*	
1600x1200	85	106.2	229.5	*					*	*			*	*	*	

*32 - 24bpp color data is processed using a 32bpp data format.



XPERT XL Video Mode Table

XPERT XL											
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4 MB			
				8	16	24	*32	8	16	24	*32
320x200	70	31.5	12.6	•	•	•	•	•	•	•	•
320x240	60	31.5	12.6	•	•	•	•	•	•	•	•
400x300	60	37.9	20.0	•	•	•	•	•	•	•	•
512x384	70	31.5	21.2	•	•	•	•	•	•	•	•
640x350	70	31.5	25.2	•	•	•	•	•	•	•	•
640x400	70	31.5	25.2	•	•	•	•	•	•	•	•
640x480	60	31.5	25.2	•	•	•	•	•	•	•	•
640x480	72	37.4	32.0	•	•	•	•	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•	•	•	•	•
640x480	90	48.0	39.9	•	•	•	•	•	•	•	•
640x480	100	52.9	44.9	•	•	•	•	•	•	•	•
640x480	120	63.7	55.0	•	•	•	•	•	•	•	•
640x480	160	81.0	70.0	•	•	•	•	•	•	•	•
640x480	200	100.2	81.0	•	•	•	•	•	•	•	•



XPERT XL

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4 MB			
				8	16	24	*32	8	16	24	*32
800x600	48	33.8	36.0	•	•	•	•	•	•	•	•
800x600	56	35.2	36.0	•	•	•	•	•	•	•	•
800x600	60	37.8	39.9	•	•	•	•	•	•	•	•
800x600	70	44.5	44.9	•	•	•	•	•	•	•	•
800x600	72	48.0	50.0	•	•	•	•	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•	•	•	•	•
800x600	85	53.7	56.2	•	•	•	•	•	•	•	•
800x600	90	57.1	56.6	•	•	•	•	•	•	•	•
800x600	100	62.5	67.5	•	•	•	•	•	•	•	•
800x600	120	76.1	81.0	•	•	•	•	•	•	•	•
800x600	160	101.9	110.0	•	•	•	•	•	•	•	•
800x600	200	125.9	135.0	•	•	•	•	•	•	•	•
1024x768	43	35.5	44.9	•	•			•	•	•	•
1024x768	60	48.4	65.0	•	•			•	•	•	•
1024x768	70	56.5	75.0	•	•			•	•	•	•
1024x768	72	58.2	75.0	•	•			•	•	•	•



XPERT XL

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4 MB					
				8	16	24	*32	8	16	24	*32		
1024x768	75	60.0	78.8	•	•					•	•	•	•
1024x768	85	68.7	94.5	•	•					•	•	•	•
1024x768	90	76.2	100.0	•	•					•	•	•	•
1024x768	100	79.0	110.0	•	•					•	•	•	•
1024x768	120	96.7	130.0	•	•					•	•	•	•
1024x768	140	113.1	157.5	•	•					•	•	•	
1024x768	150	120.6	160.0	•	•					•	•	•	
1152x864	43	45.9	65.0	•	•					•	•	•	•
1152x864	47	44.9	65.0	•	•					•	•	•	•
1152x864	60	54.9	80.0	•	•					•	•	•	•
1152x864	70	66.1	100.0	•	•					•	•	•	•
1152x864	75	75.1	110.0	•	•					•	•	•	•
1152x864	80	76.4	110.0	•	•					•	•	•	•
1152x864	85	77.1	121.5	•	•					•	•	•	•
1152x864	100	90.2	135.0	•	•					•	•	•	
1152x864	120	108.6	172.0	•	•					•	•	•	



XPERT XL

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4 MB					
				8	16	24	*32	8	16	24	*32		
1152x870	75	68.7	100.0	•	•					•	•	•	•
1280x1024	43	50.0	80.0	•						•	•	•	
1280x1024	47	50.0	80.0	•						•	•	•	
1280x1024	60	64.0	110.0	•						•	•	•	
1280x1024	70	74.6	126.0	•						•	•	•	
1280x1024	74	78.9	135.0	•						•	•	•	
1280x1024	75	80.0	135.0	•						•	•	•	
1280x1024	85	91.2	157.5	•						•	•	•	
1280x1024	90	96.2	160.0	•						•	•	•	
1280x1024	100	106.4	172.0	•						•	•	•	
1600x1024	76	81.3	170.4	•						•	•	•	
1600x1200	52	68.0	135.0	•						•	•		
1600x1200	58	75.0	135.0	•						•	•		
1600x1200	60	76.2	156.0	•						•	•		
1600x1200	66	82.7	172.0	•						•	•		
1600x1200	72	89.7	194.4	•						•	•		



XPERT XL

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				2 MB				4 MB				
				8	16	24	*32	8	16	24	*32	
1600x1200	75	93.8	202.0	•					•	•		
1600x1200	76	95.2	198.0	•					•	•		
1600x1200	85	106.2	229.5	•					•	•		

*32 - 24bpp color data is processed using a 32bpp data format.

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3D PRO TURBO PC2TV and 3D PRO TURBO

Specifications

System Requirements — Pentium/Pentium Pro, or compatible systems with PCI Local Bus.

Operating Environments — one of:

- DOS 5.0 or higher, Windows 3.1x, Windows 95, or Windows NT, OS/2 2.1 or OS/2 Warp

Video Display Buffer

- 4MB upgradable to 6MB or 8MB, 8MB



Sync Signals

- Separate horizontal and vertical sync at TTL levels

Video BIOS

- PCI 2.1 compliant

Video Output Connector

- 15-pin D shell (Female), IBM standard.

AMC Connector

- 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

Video interrupt (Reserved for future use):

- PCI — system auto-configurable.



TV Output Connectors (not available in all configurations)

- S-Video and Composite (NTSC or PAL standard)

Power

- +5V \pm 5%, @ 1.3A typical.

Ambient Temperature

- Operating — 50° to 122° F (10° to 50° C).
- Storage — 32° to 162° F (0° to 70° C).

Relative Humidity

- Operating — 5% to 90% non-condensing.
- Storage — 0% to 95%.

MTBF

- 120,000 hours.



Video Mode Table

3D PRO TURBO PC2TV and 3D PRO TURBO												
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				4 MB				6 MB or 8 MB				
				8	16	24	*32	8	16	24	*32	
640x480	60	31.5	25.1	•	•	•	•	•	•	•	•	•
640x480	72	37.4	32.0	•	•	•	•	•	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•	•	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•	•	•	•	•	•
640x480	90	48.0	39.9	•	•	•	•	•	•	•	•	•
640x480	100	52.9	44.9	•	•	•	•	•	•	•	•	•
640x480	120	63.7	55.0	•	•	•	•	•	•	•	•	•
640x480	160	84.1	70.0	•	•	•	•	•	•	•	•	•
640x480	200	100.2	81.0	•	•	•	•	•	•	•	•	•
800x600	48	33.8	36.0	•	•	•	•	•	•	•	•	•
800x600	56	35.2	36.0	•	•	•	•	•	•	•	•	•
800x600	60	37.8	39.9	•	•	•	•	•	•	•	•	•
800x600	70	44.5	44.9	•	•	•	•	•	•	•	•	•
800x600	72	48.0	50.0	•	•	•	•	•	•	•	•	•



3D PRO TURBO PC2TV and 3D PRO TURBO

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				4 MB				6 MB or 8 MB			
				8	16	24	*32	8	16	24	*32
800x600	75	46.9	49.5	*	*	*	*	*	*	*	*
800x600	85	53.7	56.2	*	*	*	*	*	*	*	*
800x600	90	57.1	56.6	*	*	*	*	*	*	*	*
800x600	100	62.5	67.5	*	*	*	*	*	*	*	*
800x600	120	76.0	81.0	*	*	*	*	*	*	*	*
800x600	160	99.6	106.0	*	*	*	*	*	*	*	*
800x600	200	125.9	135.0	*	*	*	*	*	*	*	*
1024x768	43	35.5	44.9	*	*	*	*	*	*	*	*
1024x768	60	48.4	65.0	*	*	*	*	*	*	*	*
1024x768	70	56.5	75.0	*	*	*	*	*	*	*	*
1024x768	72	58.2	75.0	*	*	*	*	*	*	*	*
1024x768	75	60.0	78.8	*	*	*	*	*	*	*	*
1024x768	85	68.7	94.5	*	*	*	*	*	*	*	*
1024x768	90	76.2	100.0	*	*	*	*	*	*	*	*
1024x768	100	79.0	110.0	*	*	*	*	*	*	*	*
1024x768	120	96.7	130.0	*	*	*	*	*	*	*	*



3D PRO TURBO PC2TV and 3D PRO TURBO

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				4 MB				6 MB or 8 MB					
				8	16	24	*32	8	16	24	*32		
1024x768	140	113.3	157.5	•	•					•	•		
1024x768	150	120.6	160.0	•						•			
1152x864	43	45.9	65.0	•	•	•	•	•	•	•	•	•	•
1152x864	47	44.9	65.0	•	•	•	•	•	•	•	•	•	•
1152x864	60	54.9	80.0	•	•	•	•	•	•	•	•	•	•
1152x864	70	66.1	100.0	•	•	•	•	•	•	•	•	•	•
1152x864	75	75.1	110.0	•	•	•	•	•	•	•	•	•	•
1152x864	80	76.4	110.0	•	•	•	•	•	•	•	•	•	•
1152x864	85	77.1	121.5	•	•	•				•	•	•	
1152x864	100	90.2	135.0	•	•					•	•		
1152x864	120	108.7	172.0	•	•					•	•		
1280x1024	43	50.0	80.0	•	•	•				•	•	•	•
1280x1024	47	50.0	80.0	•	•	•				•	•	•	•
1280x1024	60	64.0	110.0	•	•	•				•	•	•	•
1280x1024	70	74.6	126.0	•	•	•				•	•	•	
1280x1024	74	77.9	135.0	•	•	•				•	•	•	



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Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				4 MB				6 MB or 8 MB				
				8	16	24	*32	8	16	24	*32	
1280x1024	75	80.0	135.0	•	•	•			•	•	•	
1280x1024	85	91.2	157.5	•	•				•	•		
1280x1024	90	96.1	160.0	•	•				•	•		
1280x1024	100	106.7	194.4	•					•			
1600x1200	52	68.0	135.0	•	•				•	•		
1600X1200	58	75.0	135.0	•	•				•	•		
1600x1200	60	76.2	156.0	•	•				•	•		
1600x1200	72	89.7	194.4	•	•				•	•		
1600x1200	75	93.8	202.0	•	•				•	•		

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3D XPRESSION + PC2TV and 3D XPRESSION +

Specifications

System Requirements — Pentium/Pentium Pro, or compatible systems with PCI Local Bus.

Operating Environments — one of:

- DOS 5.0 or higher, Windows 3.1x, Windows 95, or Windows NT
- OS/2 2.1 or OS/2 Warp

Video Display Buffer

- 2 MB, 2 MB upgradable to 4 MB, or 4 MB



Sync Signals

- Separate horizontal and vertical sync at TTL levels

Video BIOS

- PCI 2.1 compliant

Video Output Connector

- 15-pin D shell (Female), IBM standard.

AMC Connector

- 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

Video interrupt (Reserved for future use):

- PCI — system auto-configurable.



TV Output Connectors (not available in all configurations)

- S-Video and Composite Output (NTSC or PAL standard)

Power

- +5V \pm 5%, @ 1.3A typical.

Ambient Temperature

- Operating — 50° to 122° F (10° to 50° C).
- Storage — 32° to 162° F (0° to 70° C).

Relative Humidity

- Operating — 5% to 90% non-condensing.
- Storage — 0% to 95%.

MTBF

- 120,000 hours.



Video Mode Table

3D XPRESSION + PC2TV and 3D XPRESSION +											
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4MB			
				8	16	24	*32	8	16	24	*32
640x480	60	31.5	25.1	•	•	•	•	•	•	•	•
640x480	72	37.4	32.0	•	•	•	•	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•	•	•	•	•
640x480	90	48.0	39.9	•	•	•	•	•	•	•	•
640x480	100	52.9	44.9	•	•	•	•	•	•	•	•
640x480	120	63.7	55.0	•	•	•	•	•	•	•	•
640x480	160	84.1	70.0	•	•	•	•	•	•	•	•
640x480	200	100.2	81.0	•	•	•	•	•	•	•	•
800x600	48	33.8	36.0	•	•	•	•	•	•	•	•
800x600	56	35.2	36.0	•	•	•	•	•	•	•	•
800x600	60	37.8	39.9	•	•	•	•	•	•	•	•
800x600	70	44.5	44.9	•	•	•	•	•	•	•	•
800x600	72	48.0	50.0	•	•	•	•	•	•	•	•



3D XPRESSION + PC2TV and 3D XPRESSION +

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4MB			
				8	16	24	*32	8	16	24	*32
800x600	75	46.9	49.5	•	•	•	•	•	•	•	•
800x600	85	53.7	56.2	•	•	•	•	•	•	•	•
800x600	90	57.1	56.6	•	•	•	•	•	•	•	•
800x600	100	62.5	67.5	•	•	•	•	•	•	•	•
800x600	120	76.0	81.0	•	•	•	•	•	•	•	•
800x600	160	99.6	106.0	•	•	•		•	•	•	
800x600	200	125.9	135.0	•					•		
1024x768	43	35.5	44.9	•	•			•	•	•	•
1024x768	60	48.4	65.0	•	•			•	•	•	•
1024x768	70	56.5	75.0	•	•			•	•	•	•
1024x768	72	58.2	75.0	•	•			•	•	•	•
1024x768	75	60.0	78.8	•	•			•	•	•	•
1024x768	85	68.7	94.5	•	•			•	•	•	•
1024x768	90	76.2	100.0	•	•			•	•	•	•
1024x768	100	79.0	110.0	•	•			•	•	•	•
1024x768	120	96.7	130.0	•	•			•	•	•	



3D XPRESSION + PC2TV and 3D XPRESSION +

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4MB					
				8	16	24	*32	8	16	24	*32		
1024x768	140	113.3	157.5	•	•					•	•		
1024x768	150	120.6	160.0	•						•			
1152x864	43	45.9	65.0	•	•					•	•	•	•
1152x864	47	44.9	65.0	•	•					•	•	•	•
1152x864	60	54.9	80.0	•	•					•	•	•	•
1152x864	70	66.1	100.0	•	•					•	•	•	•
1152x864	75	75.1	110.0	•	•					•	•	•	•
1152x864	80	76.4	110.0	•	•					•	•	•	•
1152x864	85	77.1	121.5	•	•					•	•	•	
1152x864	100	90.2	135.0	•	•					•	•		
1280x1024	43	50.0	80.0	•						•	•	•	
1280x1024	47	50.0	80.0	•						•	•	•	
1280x1024	60	64.0	110.0	•						•	•	•	
1280x1024	70	74.6	126.0	•						•	•	•	
1280x1024	74	77.9	135.0	•						•	•	•	
1280x1024	75	80.0	135.0	•						•	•	•	



3D XPRESSION + PC2TV and 3D XPRESSION +												
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				2 MB				4MB				
				8	16	24	*32	8	16	24	*32	
1280x1024	85	91.2	157.5	•						•	•	
1600x1200	52	68.0	135.0	•						•	•	
1600x1200	58	75.0	135.0	•						•	•	
1600x1200	60	76.2	156.0	•						•	•	

*32 - 24bpp color data is processed using a 32bpp data format.

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3D XPRESSION

Specifications

System Requirements — Pentium/Pentium Pro, or compatible systems with PCI Local Bus.

Operating Environments — one of:

- DOS 5.0 or higher, Windows 3.1x, Windows 95, or Windows NT
- OS/2 2.1 or OS/2 Warp

Video Display Buffer

- 3D XPRESSION — 2MB DRAM



Sync Signals

- Separate horizontal and vertical sync at TTL levels

Video BIOS

- PCI 2.1 compliant

Video Output Connector

- 15-pin D shell (Female), IBM standard.

AMC Connector

- 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

Video interrupt (Reserved for future use):

- PCI — system auto-configurable.



Power

- +5V \pm 5%, @ 1.3A typical.

Ambient Temperature

- Operating — 50° to 122° F (10° to 50° C).
- Storage — 32° to 162° F (0° to 70° C).

Relative Humidity

- Operating — 5% to 90% non-condensing.
- Storage — 0% to 95%.

MTBF

- 120,000 hours.



Video Mode Table

3D XPRESSION								
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)				
				2MB Display Memory				
				4	8	16	24	*32
640x480	60	31.4	25.2	•	•	•	•	•
640x480	72	37.7	31.2	•	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•	•
640x480	90	47.9	39.9	•	•	•	•	
640x480	100	52.9	44.9	•	•	•		
640x480	120	63.7	55.0	•	•	•		
800x600	48 <i>int.</i>	33.8	36.0	•	•	•	•	
800x600	56	35.1	36.0	•	•	•	•	
800x600	60	37.8	40.0	•	•	•	•	
800x600	70	44.5	44.9	•	•	•		
800x600	72	48.0	50.0	•	•	•		
800x600	75	46.8	49.5	•	•	•		
800x600	90	57.0	56.6	•	•			
800x600	100	62.5	67.5	•	•			



3D XPRESSION

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)				
				2MB Display Memory				
				4	8	16	24	*32
1024x768	43 <i>int.</i>	35.5	44.9	•	•	•		
1024x768	60	48.3	65.0	•	•	•		
1024x768	70	56.4	75.0	•	•	•		
1024x768	72	58.2	75.0	•	•	•		
1024x768	75	60.0	78.8	•	•	•		
1024x768	90	76.2	100	•	•			
1024x768	100	79.0	110	•	•			
1152x864	43 <i>int.</i>	45.9	65.0	•	•	•		
1152x864	47 <i>int.</i>	44.8	65.0	•	•			
1152x864	60	54.9	80.0	•	•			
1152x864	70	66.1	100	•	•			
1152x864	75	75.1	110	•	•			
1152x864	80	75.1	110	•	•			
1280x1024	43 <i>int.</i>	50.0	80.0	•	•			
1280x1024	47 <i>int.</i>	50.0	80.0	•	•			
1280x1024	60	63.9	110	•	•			



3D XPRESSION									
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)					
				2MB Display Memory					
				4	8	16	24	*32	
1280x1024	70	74.6	126	•	•				
1280x1024	74	78.8	135	•	•				
1280x1024	75	79.9	135	•	•				

*32-24bpp color data is processed using a 32bpp data format
†Modes subject to change.

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VIDEO XPRESSION +

Specifications

System Requirements — 486/Pentium/Pentium Pro, or compatible systems with PCI Local Bus.

Operating Environments — one of:

- DOS 5.0 or higher, Windows 3.1x, Windows 95, or Windows NT
- OS/2 2.1 or OS/2 Warp

Video Display Buffer

- VIDEO XPRESSION + — 1MB (upgradable) or 2MB



Sync Signals

- Separate horizontal and vertical sync at TTL levels

Video BIOS

- PCI 2.1 compliant

Video Output Connector

- 15-pin D shell (Female), IBM standard.

VGA Feature Connector

- 2x13 pin header, VGA Out only, VESA standard. Shares the same footprint with the 2x20 pin AMC connector.

Video interrupt (Reserved for future use):

- PCI — system auto-configurable.



Power

- +5V \pm 5%, @ 1.3A typical.

Ambient Temperature

- Operating — 50° to 122° F (10° to 50° C).
- Storage — 32° to 162° F (0° to 70° C).

Relative Humidity

- Operating — 5% to 90% non-condensing.
- Storage — 0% to 95%.

MTBF

- 120,000 hours.



Video Mode Table

VIDEO XPRESSION +														
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)										
				1MB					2MB					
				4	8	16	24	*32	4	8	16	24	*32	
640x480	60	31.5	25.1	*	*	*	*			*	*	*	*	*
640x480	72	37.4	32.0	*	*	*	*			*	*	*	*	*
640x480	75	37.5	31.5	*	*	*	*			*	*	*	*	*
640x480	85	43.3	36.0	*	*	*	*			*	*	*	*	*
640x480	90	48.0	39.9	*	*	*				*	*	*	*	*
640x480	100	52.9	44.9	*	*	*				*	*	*	*	
640x480	120	63.7	55.0	*	*	*				*	*	*		
800x600	48	33.8	36.0	*	*	*				*	*	*	*	*
800x600	56	35.2	36.0	*	*	*				*	*	*	*	*
800x600	60	37.8	39.9	*	*	*				*	*	*	*	*
800x600	70	44.5	44.9	*	*	*				*	*	*	*	*
800x600	72	48.0	50.0	*	*	*				*	*	*	*	*
800x600	75	46.9	49.5	*	*	*				*	*	*	*	*
800x600	85	53.7	56.2	*	*					*	*			



VIDEO XPRESSION +

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)										
				1MB					2MB					
				4	8	16	24	*32	4	8	16	24	*32	
800x600	90	57.1	56.6	•	•						•	•		
800x600	100	62.5	67.5	•	•						•	•		
800x600	120	76.0	81.0	•	•						•	•		
1024x768	43	35.5	44.9	•	•						•	•	•	
1024x768	60	48.4	65.0	•	•						•	•	•	
1024x768	70	56.5	75.0	•	•						•	•	•	
1024x768	72	58.2	75.0	•	•						•	•	•	
1024x768	75	60.0	78.8	•	•						•	•	•	
1024x768	85	68.7	94.5	•	•						•	•		
1024x768	90	76.2	100.0	•	•						•	•		
1024x768	100	79.0	110.0	•	•						•	•		
1024x768	120	96.7	130.0	•	•						•	•		
1152x864	43	45.9	65.0	•	•						•	•	•	
1152x864	60	54.9	80.0	•	•						•	•	•	
1152x864	70	66.1	100.0								•	•	•	
1152x864	75	75.1	110.0								•	•	•	



VIDEO XPRESSION +													
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				1MB					2MB				
				4	8	16	24	*32	4	8	16	24	*32
1152x864	80	76.4	110.0								•	•	•
1152x864	85	77.1	121.5								•	•	
1280x1024	43	50.0	80.0	•							•	•	
1280x1024	47	50.0	80.0	•							•	•	
1280x1024	60	64.0	110.0								•	•	
1280x1024	70	74.6	126.0								•	•	
1280x1024	74	77.9	135.0								•	•	
1280x1024	75	80.0	135.0								•	•	

*32 - 24bpp color data is processed using a 32bpp data format

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3D CHARGER PC2TV, 3D CHARGER and 3D CHARGER AGP

Specifications

3D CHARGER PC2TV and 3D CHARGER — Pentium/Pentium Pro, or compatible system with PCI Local Bus expansion slot

3D CHARGER AGP — Pentium/Pentium Pro, or compatible system with Accelerated Graphics Port expansion slot

Operating Environments — one of:

- DOS 5.0 or higher, Windows 3.1x, Windows 95, or Windows NT
- OS/2 2.1 or OS/2 Warp



Video Display Buffer

- 3D CHARGER Products— 2 MB, 2 MB upgradable to 4 MB, or 4 MB

Sync Signals

- Separate horizontal and vertical sync at TTL levels

Video BIOS

- PCI 2.1 compliant
- AGP 1.0 compliant

Video Output Connector

- 15-pin D shell (Female), IBM standard.

Video interrupt (Reserved for future use):

- PCI — system auto-configurable.



AMC Feature Connector

- 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

TV Output Connectors (not available in all configurations)

- Composite Output (NTSC or PAL standard)
- S-Video Output

Power

- +5V \pm 5%, @ 1.3A typical.

Ambient Temperature

- Operating — 50° to 122° F (10° to 50° C).
- Storage — 32° to 162° F (0° to 70° C).



Relative Humidity

- Operating — 5% to 90% non-condensing.
- Storage — 0% to 95%.

MTBF

- 120,000 hours.



3D CHARGER PC2TV / 3D CHARGER – Video Mode Table

3D CHARGER PC2TV and 3D CHARGER											
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4MB			
				8	16	24	*32	8	16	24	*32
640x480	60	31.5	25.1	•	•	•	•	•	•	•	•
640x480	72	37.4	32.0	•	•	•	•	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•	•	•	•	•
640x480	90	48.0	39.9	•	•	•	•	•	•	•	•
640x480	100	52.9	44.9	•	•	•	•	•	•	•	•
640x480	120	63.7	55.0	•	•	•	•	•	•	•	•
640x480	160	84.1	70.0	•	•	•		•	•	•	
640x480	200	100.2	81.0	•	•	•		•	•	•	
800x600	48	33.8	36.0	•	•	•	•	•	•	•	•
800x600	56	35.2	36.0	•	•	•	•	•	•	•	•
800x600	60	37.8	39.9	•	•	•	•	•	•	•	•
800x600	70	44.5	44.9	•	•	•	•	•	•	•	•



3D CHARGER PC2TV and 3D CHARGER

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4MB			
				8	16	24	*32	8	16	24	*32
800x600	72	48.0	50.0	•	•	•	•	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•	•	•	•	•
800x600	85	53.7	56.2	•	•	•	•	•	•	•	•
800x600	90	57.1	56.6	•	•	•	•	•	•	•	•
800x600	100	62.5	67.5	•	•	•		•	•	•	
800x600	120	76.0	81.0	•	•	•		•	•	•	
800x600	160	99.6	106.0	•	•			•	•		
800x600	200	125.9	135.0	•				•			
1024x768	43	35.5	44.9	•	•			•	•	•	
1024x768	60	48.4	65.0	•	•			•	•	•	
1024x768	70	56.5	75.0	•	•			•	•	•	
1024x768	72	58.2	75.0	•	•			•	•	•	
1024x768	75	60.0	78.8	•	•			•	•	•	
1024x768	85	68.7	94.5	•	•			•	•		
1024x768	90	76.2	100.0	•	•			•	•		
1024x768	100	79.0	110.0	•	•			•	•		



3D CHARGER PC2TV and 3D CHARGER

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4MB					
				8	16	24	*32	8	16	24	*32		
1024x768	120	96.7	130.0	•					•				
1024x768	140	113.3	157.5	•					•				
1024x768	150	120.6	160.0	•					•				
1152x864	43	45.9	65.0	•	•				•	•	•		
1152x864	47	44.9	65.0	•	•				•	•	•		
1152x864	60	54.9	80.0	•	•				•	•	•		
1152x864	70	66.1	100.0	•	•				•	•			
1152x864	75	75.1	110.0	•	•				•	•			
1152x864	80	76.4	110.0	•	•				•	•			
1152x864	85	77.1	121.5	•	•				•	•			
1152x864	100	90.2	135.0	•					•				
1280x1024	43	50.0	80.0	•					•	•	•		
1280x1024	47	50.0	80.0	•					•	•	•		
1280x1024	60	64.0	110.0	•					•	•			
1280x1024	70	74.6	126.0	•					•	•			
1280x1024	74	77.9	135.0	•					•				



3D CHARGER PC2TV and 3D CHARGER

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4MB					
				8	16	24	*32	8	16	24	*32		
1280x1024	75	80.0	135.0	•					•				
1280x1024	85	91.2	157.5	•					•				

*32 - 24bpp color data is processed using a 32bpp data format.



3D CHARGER AGP – Video Mode Table

3D CHARGER AGP											
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4 MB			
				8	16	24	*32	8	16	24	*32
320x200	70	31.5	12.6	•	•	•	•	•	•	•	•
320x240	60	31.5	12.6	•	•	•	•	•	•	•	•
400x300	60	37.9	20.0	•	•	•	•	•	•	•	•
512x384	70	31.5	21.2	•	•	•	•	•	•	•	•
640x350	70	31.5	25.2	•	•	•	•	•	•	•	•
640x400	70	31.5	25.2	•	•	•	•	•	•	•	•
640x480	60	31.5	25.2	•	•	•	•	•	•	•	•
640x480	72	37.4	32.0	•	•	•	•	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•	•	•	•	•
640x480	90	48.0	39.9	•	•	•	•	•	•	•	•
640x480	100	52.9	44.9	•	•	•	•	•	•	•	•
640x480	120	63.7	55.0	•	•	•	•	•	•	•	•
640x480	160	81.0	70.0	•	•	•	•	•	•	•	•
640x480	200	100.2	81.0	•	•	•	•	•	•	•	•



3D CHARGER AGP

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4 MB			
				8	16	24	*32	8	16	24	*32
800x600	48	33.8	36.0	*	*	*	*	*	*	*	*
800x600	56	35.2	36.0	*	*	*	*	*	*	*	*
800x600	60	37.8	39.9	*	*	*	*	*	*	*	*
800x600	70	44.5	44.9	*	*	*	*	*	*	*	*
800x600	72	48.0	50.0	*	*	*	*	*	*	*	*
800x600	75	46.9	49.5	*	*	*	*	*	*	*	*
800x600	85	53.7	56.2	*	*	*	*	*	*	*	*
800x600	90	57.1	56.6	*	*	*	*	*	*	*	*
800x600	100	62.5	67.5	*	*	*	*	*	*	*	*
800x600	120	76.1	81.0	*	*	*	*	*	*	*	*
800x600	160	101.9	110.0	*	*	*	*	*	*	*	*
800x600	200	125.9	135.0	*	*	*	*	*	*	*	*
1024x768	43	35.5	44.9	*	*			*	*	*	*
1024x768	60	48.4	65.0	*	*			*	*	*	*
1024x768	70	56.5	75.0	*	*			*	*	*	*
1024x768	72	58.2	75.0	*	*			*	*	*	*



3D CHARGER AGP

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4 MB					
				8	16	24	*32	8	16	24	*32		
1024x768	75	60.0	78.8	•	•					•	•	•	•
1024x768	85	68.7	94.5	•	•					•	•	•	•
1024x768	90	76.2	100.0	•	•					•	•	•	•
1024x768	100	79.0	110.0	•	•					•	•	•	•
1024x768	120	96.7	130.0	•	•					•	•	•	•
1024x768	140	113.1	157.5	•	•					•	•	•	
1024x768	150	120.6	160.0	•	•					•	•	•	
1152x864	43	45.9	65.0	•	•					•	•	•	•
1152x864	47	44.9	65.0	•	•					•	•	•	•
1152x864	60	54.9	80.0	•	•					•	•	•	•
1152x864	70	66.1	100.0	•	•					•	•	•	•
1152x864	75	75.1	110.0	•	•					•	•	•	•
1152x864	80	76.4	110.0	•	•					•	•	•	•
1152x864	85	77.1	121.5	•	•					•	•	•	•
1152x864	100	90.2	135.0	•	•					•	•	•	
1152x864	120	108.6	172.0	•	•					•	•	•	



3D CHARGER AGP

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2 MB				4 MB					
				8	16	24	*32	8	16	24	*32		
1152x870	75	68.7	100.0	•	•					•	•	•	•
1280x1024	43	50.0	80.0	•						•	•	•	
1280x1024	47	50.0	80.0	•						•	•	•	
1280x1024	60	64.0	110.0	•						•	•	•	
1280x1024	70	74.6	126.0	•						•	•	•	
1280x1024	74	78.9	135.0	•						•	•	•	
1280x1024	75	80.0	135.0	•						•	•	•	
1280x1024	85	91.2	157.5	•						•	•	•	
1280x1024	90	96.2	160.0	•						•	•	•	
1280x1024	100	106.4	172.0	•						•	•	•	
1600x1024	76	81.3	170.4	•						•	•	•	
1600x1200	52	68.0	135.0	•						•	•		
1600x1200	58	75.0	135.0	•						•	•		
1600x1200	60	76.2	156.0	•						•	•		
1600x1200	66	82.7	172.0	•						•	•		
1600x1200	72	89.7	194.4	•						•	•		



3D CHARGER AGP

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2 MB				4 MB			
				8	16	24	*32	8	16	24	*32
1600x1200	75	93.8	202.0	•				•	•		
1600x1200	76	95.2	198.0	•				•	•		
1600x1200	85	106.2	229.5	•				•	•		

*32 - 24bpp color data is processed using a 32bpp data format.

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