

GRAPHICS

Enhanced Video Display Processor

V9958 E-VDP II

■ OUTLINE

V9958 (E-VDP II) is a video display processor using an N-channel silicon gate MOS and a 64-pin shrink DIL plastic package. It is software compatible with TMS9918A and V9938.

■ FEATURES

- 5V power supply.
- Outputs linear RGB.
- Built-in color palette for display in up to 512 colors.
- Capable of simultaneous display of 19,268 colors by using YJK system display.
- Capable of displaying up to 512 × 424 pixels and 16 colors.
- Bit mapped graphics.
- Capable of displaying maximum of 256 colors simultaneously.
- 16K byte ~ 128K byte useable for display memory.
- 16K × 1b, 16K × 4b, 64K × 1b and 64K × 4b DRAMs are useable.
- 256 addresses, 4ms auto refresh function of DRAM.
- Expansion video memory can be connected.
- Eight sprites can be displayed for each horizontal line.
- Colors for sprites can be specified for each horizontal line.
- Area move, line, search and other commands.
- Command function usable in every display mode.
- Logical operation function.
- Addresses can be specified by coordinates.
- Capable of external synchronization.
- Capable of superimposition.
- Capable of digitization.
- Multi E-VDP II configurations are possible.
- External color palettes can be added by utilizing color-bus output.
- Vertical and horizontal scroll function.
- Wait function to CPU.

■ ELECTRICAL CHARACTERISTICS

1. Maximum Ratings

Symbol	Item	Rating	Unit
V _{DD}	Power supply voltage	-0.5 ~ +7.0	V
V _{in}	Input voltage	-0.5 ~ +7.0	V
T _s	Storage temperature	-50 ~ +125	°C
T _o	Operating temperature	0 ~ +70	°C

2. Recommended Operating Conditions

Symbol	Item	Minimum	Typical	Maximum	Unit
V _{DD}	Power supply voltage	4.75	5.00	5.25	V
V _{SS}	Power supply voltage		0		V
T _A	Operating ambient temperature	0		70	°C
V _{IL} 1	Low level input voltage (group 1)	-0.3		0.8	V
V _{IL} 2	Low level input voltage (group 2)	-0.3		0.8	V
V _{IL} 3	External clock low level input voltage (group 3)	-0.3		0.8	V
V _{IH} 1	High level input voltage (group 1)	2.2		V _{DD}	V
V _{IH} 2	High level input voltage (group 2)	2.2		V _{DD}	V
V _{IH} 3	External clock high level input voltage (group 3)	3.5		V _{DD}	V

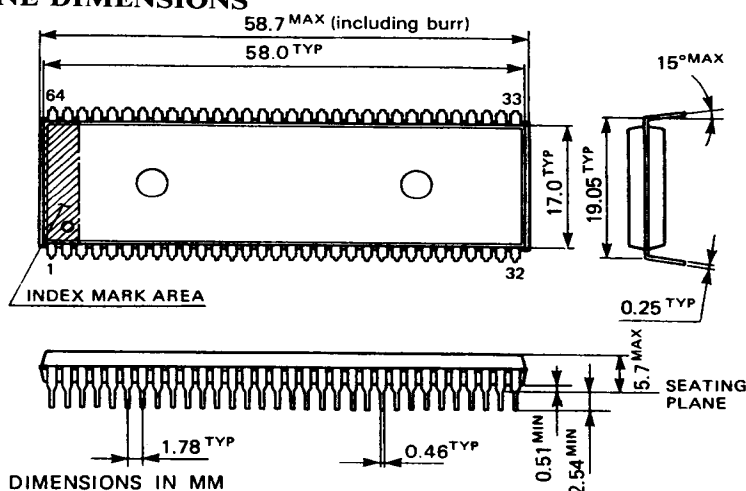
Note: Group 1 CS_R, RD0-7, C0-7, LPS, LPD, RESET, DLCLK, VRESET, HRESET
Group 2 CD0-7, MODE 0, MODE 1, CSW
Group 3 XTAL 1, XTAL 2

3. DC Characteristics

Symbol	Item	Condition	Minimum	Typical	Maximum	Unit
VOL 4	Low level output voltage (group 4)	$I_{OL} = 1.6\text{mA}$			0.4	V
VOL 5	Low level output voltage (group 5)	$I_{OL} = 1.6\text{mA}$			0.4	V
VOL 6	Low level output voltage (group 6)	$I_{OL} = 10\text{mA}$			0.4	V
VOL 7	Low level output voltage (group 7)	$I_{OL} = 1.6\text{mA}$			0.4	V
VOL 4	High level output voltage (group 4)	$I_{OH} = 100\mu\text{A}$	2.4			V
VOL 5	High level output voltage (group 5)	$I_{OH} = 60\mu\text{A}$	2.7			V
ILI	Input leak current				10	μA
ILO	Output leak current (when floating)				25	μA
IDD	Current consumption				230	mA

Note: Group 4 CD0-7, RD0-7, AD0-7, VDS, CBDR, CPUCLK/VDS, C0-7, HSYNC, CSYNC, WAIT, YS
 Group 5 RAS, CAS 0, CAS 1, CASX, R/W
 Group 6 DLCLK, DHCLK
 Group 7 INT

■ OUTLINE DIMENSIONS



■ BLOCK DIAGRAM

