

Horizontally reversing a captured image

MB86276 'Lime'

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History

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1 Horizontally reversing a Captured Image

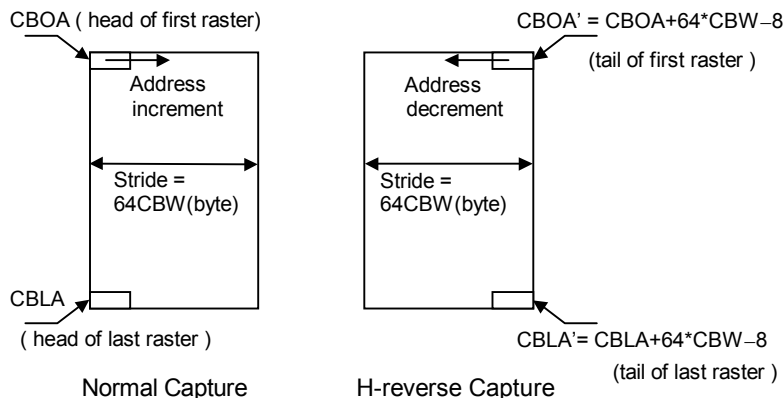
In order to horizontally reverse a captured image, it is necessary to write a '1' to the HRV (H-reverse) bit of the CBM register. Please however, that it is also necessary to make the settings described in the following sections.

1.1 Specifying the Capture Buffer Area

The method used to specify the range in the capture buffer is little different for a horizontally reversed image. The same method is used to specify the first raster and the last raster in the capture buffer.

If the horizontal reverse function is not used, the first address of the raster is specified.

If the horizontal reverse function is used, the last address of the raster is specified. The head of the raster corresponds to the left edge of the image. The tail of the raster corresponds to the right edge of the image (see below).

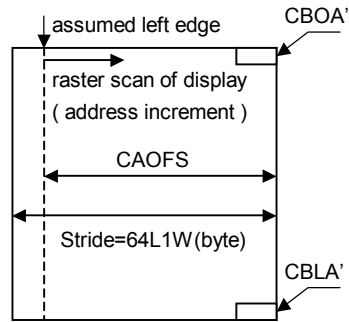


In the case of a horizontal reverse, write operations progress from right to left, i.e, in the direction of decreasing addresses. The data position in 1word=64bit is reversed and written as shown below.

Bit position	63-56	55-48	47-40	39-32	31-24	23-16	15-8	7-0
No reverse	Y3	Cr1	Y2	Cb1	Y1	Cr0	Y0	Cb0
Reversed	Y0	Cr0	Y1	Cb0	Y2	Cr1	Y3	Cb1

1.2 Offset of L1 Display Address

When the capture image is displayed, the read operations always progress in the direction of increasing addresses. In order to display the image horizontally reversed, it is necessary to specify the offset value based on the right side edge. A pixel where the given offset is subtracted is assumed to be the left edge (head) of the screen for display and pixels are displayed in the order of increasing addresses. The offset value is specified in the CAOFS (Capture Address Offset) field of L1 extended mode register (L1EM).



Display of H-reversed image

In this example it is assumed that the stride is 1024byte (512pixel). If the address of the left edge of the first raster in the capture buffer is 0, the address of the right edge becomes 0x3F8. In this case, if CAOFS=0x3F8 is given, the left edge of the capture buffer corresponds to the left edge of the display.

L1EM (L1-layer Extended Mode)

Register address	DisplayBaseAddress + 120h																											
Bit number	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	...	4	3	2	1	0
Bit field name	L1EC		Resv	L1YCF		Resv	VMAG		L1PB			Reserve		Reserve		CAOFS												
R/W	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0	R/W	R0
Initial value	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Bit12-0 CAOFS (Capture Offset)
In order to reverse the capture image horizontally, the offset value is specified. Specify zero if horizontally reverse is not used.
- Bit23-20 L1PB (L1-layer Pallet Base)
Set the value added to the index when subtracting palette of L1 layer. 16 times of setting value is added.
- Bit25-24 VMAG (Video Magnify)
The scaling up of the capture image is specified.
00 Up scaling function is not used
01 Reserved
10 Up scaling function is used
11 Reserved
- Bit28 L1YCF (L1-layer YC full amplitude)
The conversion coefficient when the data of the YcbCr form is displayed by RGB is selected.
0 With amplitude limitation (ITU-RBT.656)
1 Without amplitude limitation (JPEG)
- Bit31-30 L1EC (L1-layer Extended Color mode)
Sets extended color mode for L1 layer
00 Mode determined by L1C
01 Direct color (24 bits/pixel) mode
1x Reserved

1.3 Special Setting for YCbCr to RGB Conversion

If the video input to be reversed is captured in YCbCr mode, and then converted to RGB, bit CSW (bit 12) of the CBM register must be set to 1. Otherwise the reversed output could show undesired effects. Please refer to the Hardware Manual for more information on the CBM register.