

Horizontally reversing a captured image

MB86276 'Lime'

© Fujitsu Microelectronics Europe GmbH

History

Date	Author	Version	Comment
29.06.2009	AvT	V1.00	First version

Warranty and Disclaimer

To the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH restricts its warranties and its liability for **all products delivered free of charge** (e.g. software include or header files, application examples, target boards, evaluation boards, engineering samples of IC's etc.), its performance and any consequential damages, on the use of the Product in accordance with (i) the terms of the License Agreement and the Sale and Purchase Agreement under which agreements the Product has been delivered, (ii) the technical descriptions and (iii) all accompanying written materials. In addition, to the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH disclaims all warranties and liabilities for the performance of the Product and any consequential damages in cases of unauthorised decompiling and/or reverse engineering and/or disassembling.

Note that all these products are intended and must only be used in an evaluation laboratory environment.

1. Fujitsu Microelectronics Europe GmbH warrants that the Product will perform substantially in accordance with the accompanying written materials for a period of 90 days from the date of receipt by the customer. Concerning the hardware components of the Product, Fujitsu Microelectronics Europe GmbH warrants that the Product will be free from defects in material and workmanship under use and service as specified in the accompanying written materials for a duration of 1 year from the date of receipt by the customer.
2. Should a Product turn out to be defect, Fujitsu Microelectronics Europe GmbH's entire liability and the customer's exclusive remedy shall be, at Fujitsu Microelectronics Europe GmbH's sole discretion, either return of the purchase price and the license fee, or replacement of the Product or parts thereof, if the Product is returned to Fujitsu Microelectronics Europe GmbH in original packing and without further defects resulting from the customer's use or the transport. However, this warranty is excluded if the defect has resulted from an accident not attributable to Fujitsu Microelectronics Europe GmbH, or abuse or misapplication attributable to the customer or any other third party not relating to Fujitsu Microelectronics Europe GmbH.
3. To the maximum extent permitted by applicable law Fujitsu Microelectronics Europe GmbH disclaims all other warranties, whether expressed or implied, in particular, but not limited to, warranties of merchantability and fitness for a particular purpose for which the Product is not designated.
4. To the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH's and its suppliers' liability is restricted to intention and gross negligence.

NO LIABILITY FOR CONSEQUENTIAL DAMAGES

To the maximum extent permitted by applicable law, in no event shall Fujitsu Microelectronics Europe GmbH and its suppliers be liable for any damages whatsoever (including but without limitation, consequential and/or indirect damages for personal injury, assets of substantial value, loss of profits, interruption of business operation, loss of information, or any other monetary or pecuniary loss) arising from the use of the Product.

Should one of the above stipulations be or become invalid and/or unenforceable, the remaining stipulations shall stay in full effect

Contents

- Warranty and Disclaimer 2
- 1 Horizontally reversing a Captured Image 4
 - 1.1 Specifying the Capture Buffer Area..... 4
 - 1.2 Offset of L1 Display Address 4

1 Horizontally reversing a Captured Image

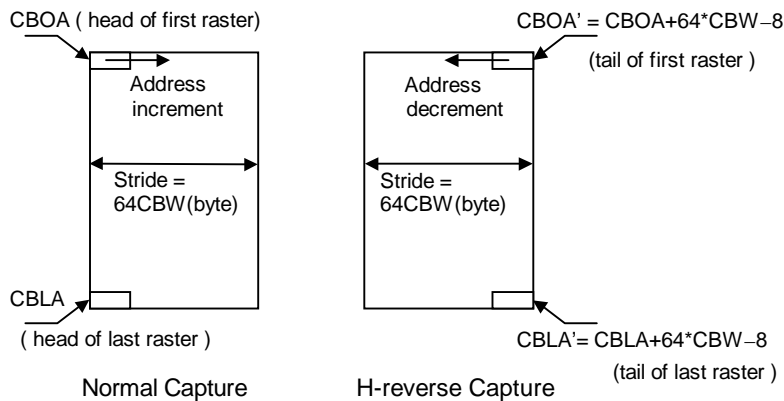
In order to horizontally reverse a captured image, it is necessary to write a '1' to the HRV (H-reverse) bit of the CBM register. Please however, that it is also necessary to make the settings described in the following sections.

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).

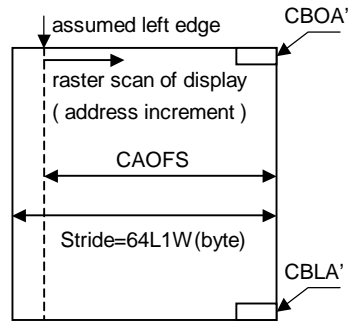


In the case of a horizontal reverse, write operations progress from right to left, i.e, in the direction of decreasing addresses. The data position in 1word=64bit is reversed and written as shown below.

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	R/W	R0	R/W	R/W	R0	R/W	R/W	R/W	R/W	R/W	R0	R/W	R0	R/W	R0	R/W	R/W	R0	R/W	R/W	R/W	R/W	R/W	R/W	R/W	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	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