Mstar Introduction
For
PQ Adjustment

Brightness description

Base Address	Bank	High Address	Low Address	Loc MSB	Loc LSB	Name	Description
2F	1A	**h0008** (h0004*2)		7 (6)		reg_main_curve_fit_en	**Main (Sub) window luma curve enable(DLC Switch)**
		h00D0 (h0068*2)		0		reg_debug_show_pixel_en	show pixel value for debug
		h00D0 (h0068*2)		[7:4]		reg_debug_locate	debug location: // 0000 : input data (y,cb,cr) // 0001 : vip_noise_mask_top (y,cb,cr) // 0010 : vip_v_noise_mask_filter (y,cb,cr) // 0011 : vip_fcc (y,cb,cr) // 0100 : vip_IHC (y,u,v) // 0101 : vip_ICC (y,u,v) // 0110 : vip_y_switch (y,u,v) // 0111 : vip_ble/wle (y,u,v)
		h00D2 (h0069*2)		[10:0]		reg_debug_loc_h	debug pixel Horizontal location
		h00D4 (h006a*2)		[10:0]		reg_debug_loc_v	debug pixel Vertical location
		h00D6 (h006b*2)		[9:0]		reg_debug_show_pixel_y	debug value for Y
		h00D8 (h006c*2)		[9:0]		reg_debug_show_pixel_cb_u	debug value for Cb
		h00DA (h006d*2)		[9:0]		reg_debug_show_pixel_cr_v	debug value for Cr
		h001C(h000E*2)		[1:0]		reg_main_bri_adjust_lsb	Main window Y adjust low bit
		h001E(h000F*2)		[7:0]		reg_main_bri_adjust	Main window Y adjust

2F	1A	**h002E** (h0017*2)	**[1:0]**	**reg_main_post_bri_adjust_lsb**	**Main window post Y adjust low bit (2's complement)**
		h0030 (h0018*2)	**[7:0]**	**reg_main_post_bri_adjust**	**Main window post Y adjust**
2F	1A	**h0020**(h0010*2)	[6:0]	reg_main_black_start	Main window black start
			[15:8]	reg_main_black_slop	Main window black slope
		h0022(h0011*2)	[6:0]	reg_main_white_start	Main window white start
			[15:8]	reg_main_white_slop	Main window white slope
		h0028(h0014*2)	[7:0]	reg_main_y_gain	Main window Y gain
			[15:8]	reg_main_c_gain	Main window C gain
	1A	**h002C** (h0016*2)	**[7:0]** **[15:8]**	**reg_main_pre_y_gain** **reg_sub_pre_y_gain**	**Main window pre- Y gain** **Sub window pre- Y gain**

Color description

Base Address	Bank	High Address	Low Address	Loc MSB	Loc LSB	Name	Description
2F	18	h0060 (h0030*2)		2		reg_sub_icc_en	Sub window ICC enable
				6		reg_main_icc_en	Main window ICC enable
		h0062 (h0031*2)		[3:0]		reg_main_sa_user_r	Main window ICC saturation adjustment of R
				[11:8]		reg_main_sa_user_g	Main window ICC saturation adjustment of G
		h0064 (h0032*2)		[3:0]		reg_main_sa_user_b	Main window ICC saturation adjustment of B
				[11:8]		reg_main_sa_user_c	Main window ICC saturation adjustment of C
		h0066 (h0033*2)		[3:0]		reg_main_sa_user_m	Main window ICC saturation adjustment of M
				[11:8]		reg_main_sa_user_y	Main window ICC saturation adjustment of Y
		h0068 (h0034*2)		[7:4]		reg_main_sa_user_f	Main window ICC saturation adjustment of F
2F	18	h0080 (h0040*2)		7		reg_main_ibc_en	Main window IBC enable
		h0082 (h0041*2)		[5:0]		reg_main_yr_adj	Main window IBC Y adjustment of R
				[13:8]		reg_main_yg_adj	Main window IBC Y adjustment of G
		h0084 (h0042*2)		[5:0]		reg_main_yb_adj	Main window IBC Y adjustment of B
				[13:8]		reg_main_yc_adj	Main window IBC Y adjustment of C
		h0086 (h0043*2)		[5:0]		reg_main_ym_adj	Main window IBC Y adjustment of M
				[13:8]		reg_main_yy_adj	Main window IBC Y adjustment of Y
		h0088 (h0044*2)		[5:0]		reg_main_yf_adj	Main window IBC Y adjustment of F
2F	18	h00C0 (h0060*2)		6		reg_sub_ihc_en	Sub window IHC enable
				7		reg_main_ihc_en	Main window IHC enable
		h00C2 (h0061*2)		[6:0]		reg_main_hue_user_r	Main window IHC hue adjustment of R
				[14:8]		reg_main_hue_user_g	Main window IHC hue adjustment of G
		h00C4 (h0062*2)		[6:0]		reg_main_hue_user_b	Main window IHC hue adjustment of B
				[14:8]		reg_main_hue_user_c	Main window IHC hue adjustment of C
		h00C6		[6:0]		reg_main_hue_user_m	Main window IHC hue adjustment of M

		(h0063*2)	[14:8]	reg_main_hue_user_y	Main window IHC hue adjustment of Y
		h00C8(h0064*2)	[6:0]	reg_main_hue_user_f	Main window IHC hue adjustment of F

Peaking Description

Base Address	Bank	High Address	Low Address	Loc MSB	Loc LSB	Name	Description
		h0020 (h0010*2)		0		reg_main_post_peaking_en	Main window 2D peaking enable
				1		reg_hlpf_dither_en	H Low pass filter dither bit enable
				2		reg_main_show_edge_mode	Main window show edge mode
				[6:4]		reg_main_y_lpf_coef	Main window horizontal Y low pass filter coefficient
				7		reg_vps_sram_act	2D peaking line-buffer sram active
				8		reg_main_band1_peaking_en	Main window band1 peaking enable
				9		reg_main_band2_peaking_en	Main window band2 peaking enable
				10		reg_main_band3_peaking_en	Main window band3 peaking enable
				11		reg_main_band4_peaking_en	Main window band4 peaking enable
				12		reg_main_band5_peaking_en	Main window band5 peaking enable
				13		reg_main_band6_peaking_en	Main window band6 peaking enable
				14		reg_main_band7_peaking_en	Main window band7 peaking enable
				15		reg_main_band8_peaking_en	Main window band8 peaking enable
		h0018 (h000C*2)		0		reg_main_band9_peaking_en	Main window band9 peaking enable
				1		reg_main_band10_peaking_en	Main window band10 peaking enable
				2		reg_main_band11_peaking_en	Main window band11 peaking enable
				3		reg_main_band12_peaking_en	Main window band12 peaking enable
				8		reg_main_band9_adaptive_en	Main window band9 differential adaptive enable
				9		reg_main_band10_adaptive_en	Main window band10 differential adaptive enable
				10		reg_main_band11_adaptive_en	Main window band11 differential adaptive enable
				11		reg_main_band12_adaptive_en	Main window band12 differential adaptive enable
				[1:0]		reg_main_band1_coef_step	Main window band1 coefficient step
				[3:2]		reg_main_band2_coef_step	Main window band2 coefficient step

2F	19	**h0022** (h0011*2)	[5:4]	reg_main_band3_coef_step	Main window band3 coefficient step
			[7:6]	reg_main_band4_coef_step	Main window band4 coefficient step
			[9:8]	reg_main_band5_coef_step	Main window band5 coefficient step
			[11:10]	reg_main_band6_coef_step	Main window band6 coefficient step
			[13:12]	reg_main_band7_coef_step	Main window band7 coefficient step
			[15:14]	reg_main_band8_coef_step	Main window band8 coefficient step
		h001C (h000E*2)	**[1:0]**	**reg_main_band9_coef_step**	**Main window band9 coefficient step**
			[3:2]	**reg_main_band10_coef_step**	**Main window band10 coefficient step**
			[5:4]	**reg_main_band11_coef_step**	**Main window band11 coefficient step**
			[7:6]	**reg_main_band12_coef_step**	**Main window band12 coefficient step**
		h0024 (h0012*2)	15	reg_vlpf_dither_en	Vertical Low pass filter dither bit enable
			[10:8]	reg_main_v_lpf_coef_1	Main window vertical up-dwon pixel Y LPF coefficient
			[14:12]	reg_main_v_lpf_coef_2	Main window vertical central pixel Y LPF coefficient
		h0026 (h0013*2)	[3:0]	reg_main_coring_thrd_1	Main window coring threshold 1
			[7:4]	reg_main_coring_thrd_2	Main window coring threshold 2
			[13:8]	reg_main_osd_sharpness_ctrl	**Main window user sharpness adjust(OSD control)**
		h0030 (h0018*2)	[6:0]	reg_main_band1_coef	Main window band1 coefficient(Sxxx.xxx)
			[14:8]	reg_main_band2_coef	Main window band2 coefficient(Sxxx.xxx)
		h0032 (h0019*2)	[6:0]	reg_main_band3_coef	Main window band3 coefficient(Sxxx.xxx)
			[14:8]	reg_main_band4_coef	Main window band4 coefficient(Sxxx.xxx)
		h0034 (h001a*2)	[6:0]	reg_main_band5_coef	Main window band5 coefficient(Sxxx.xxx)
			[14:8]	reg_main_band6_coef	Main window band6 coefficient(Sxxx.xxx)
		h0036 (h001b*2)	[6:0]	reg_main_band7_coef	Main window band7 coefficient(Sxxx.xxx)
			[14:8]	reg_main_band8_coef	Main window band8 coefficient(Sxxx.xxx)

		h00D0 (h0068*2)	[6:0]	reg_main_band9_coef	Main window band9 coefficient(Sxxx.xxx)
			[14:8]	reg_main_band10_coef	Main window band10 coefficient(Sxxx.xxx)
		h00D2 (h0069*2)	[6:0]	reg_main_band11_coef	Main window band11 coefficient(Sxxx.xxx)
			[14:8]	reg_main_band12_coef	Main window band12 coefficient(Sxxx.xxx)
		h0038 (h001C*2)	[3:0]	reg_main_peaking_term1_select	Main window peaking term1 select
			[7:4]	reg_main_peaking_term2_select	Main window peaking term2 select
			[11:8]	reg_main_peaking_term3_select	Main window peaking term3 select
			[15:12]	reg_main_peaking_term4_select	Main window peaking term4 select
		h003A (h001d*2)	[3:0]	reg_main_peaking_term5_select	Main window peaking term5 select
			[7:4]	reg_main_peaking_term6_select	Main window peaking term6 select
			[11:8]	reg_main_peaking_term7_select	Main window peaking term7 select
			[15:12]	reg_main_peaking_term8_select	Main window peaking term8 select
2F		**h003C** (h001e*2)	[3:0]	reg_main_peaking_term9_select	Main window peaking term9 select
			[7:4]	reg_main_peaking_term10_select	Main window peaking term10 select
			[11:8]	reg_main_peaking_term11_select	Main window peaking term11 select
			[15:12]	reg_main_peaking_term12_select	Main window peaking term12 select
		h003D (h001f*2)	[3:0]	reg_main_peaking_term13_select	Main window peaking term13 select
			[7:4]	reg_main_peaking_term14_select	Main window peaking term14 select
			[11:8]	reg_main_peaking_term15_select	Main window peaking term15 select
			[15:12]	reg_main_peaking_term16_select	Main window peaking term16 select
		h0040 (h0020*2)	[7:0]	reg_band1_overshoot_limit	Main window band1 overshoot limit(最高頻)
			[15:8]	reg_band2_overshoot_limit	Main window band2 overshoot limit(次高頻)
		h0042 (h0021*2)	[7:0]	reg_band3_overshoot_limit	Main window band3 overshoot limit(三高頻)
			[15:8]	reg_band4_overshoot_limit	Main window band4 overshoot limit(四高頻)
		h0044 (h0022*2)	[7:0]	reg_band5_overshoot_limit	Main window band5 overshoot limit
			[15:8]	reg_band6_overshoot_limit	Main window band6 overshoot limit
		h0046 (h0023*2)	[7:0]	reg_band7_overshoot_limit	Main window band7 overshoot limit
			[15:8]	reg_band8_overshoot_limit	Main window band8 overshoot limit
		h00E0 (h0070*2)	[7:0]	reg_band9_overshoot_limit	Main window band9 overshoot limit
			[15:8]	reg_band10_overshoot_limit	Main window band10 overshoot limit

2F	19	**h00E2** (h0071*2)	[7:0]	reg_band11_overshoot_limit	Main window band11 overshoot limit
			[15:8]	reg_band12_overshoot_limit	Main window band12 overshoot limit
		h0048 (h0024*2)	[7:0]	reg_band1_undershoot_limit	Main window band1 undershoot limit(最高頻)
			[15:8]	reg_band2_undershoot_limit	Main window band2 undershoot limit(次高頻)
		h004A (h0025*2)	[7:0]	reg_band3_undershoot_limit	Main window band3 undershoot limit(三高頻)
			[15:8]	reg_band4_undershoot_limit	Main window band4 undershoot limit(四高頻)
		h004C (h0026*2)	[7:0]	reg_band5_undershoot_limit	Main window band5 undershoot limit
			[15:8]	reg_band6_undershoot_limit	Main window band6 undershoot limit
		h004E (h0027*2)	[7:0]	reg_band7_undershoot_limit	Main window band7 undershoot limit
			[15:8]	reg_band8_undershoot_limit	Main window band8 undershoot limit
2F	19	**h00E4** (h0072*2)	[7:0]	reg_band9_undershoot_limit	Main window band9 undershoot limit
			[15:8]	reg_band10_undershoot_limit	Main window band10 undershoot limit
		h00E6 (h0073*2)	[7:0]	reg_band11_undershoot_limit	Main window band11 undershoot limit
			[15:8]	reg_band12_undershoot_limit	Main window band12 undershoot limit

CTI description					
2F	23	**h00C0 (h0060*2)**	[2:0]	reg_cti_lpf_coef	CTI low-pass filter coefficient
			[7:4]	reg_cti_step	CTI filter step
			[13:8]	reg_cti_band_coef	CTI band-pass filter coefficient
		h00C2 (h0061*2)	15	reg_cti_en	CTI enable
		h0040 (h0020*2)	0 (4)	reg_main_cti_en	Main (Sub) window CTI enable
			1 (5)	reg_main_cti_median_en	Main (Sub) window CTI median enable
			2 (6)	reg_main_cti_auto_no_med	Main (Sub) window CTI ouptut no median

2F	27		3 (7)	reg_main_cti_gray_adj_en	Main (Sub) window CTI gray patch enable
		h0042 (h0021*2)	[2:0]	reg_main_cti_lpf_coef	Main window CTI low pass filter coefficient
			[5:4]	reg_main_cti_step	Main window CTI step
			[11:8]	reg_main_cti_coring_thrd	Main window CTI coring threshold
		h0044 (h0022*2)	[5:0]	reg_main_cti_band_coef	Main window CTI band coefficient

NR description

Base Address	Bank	High Address	Low Address	Loc MSB	Loc LSB	Name	Description
2F	18	**h00AA** (h0055*2)		[5:0]		reg_main_y_noise_mask_gain	Main window horizontal Y noise-masking gain
				7		reg_main_y_noise_masking_en	Main window horizontal Y noise-masking enable
				[13:8]		reg_main_c_noise_mask_gain	Main window horizontal C noise-masking gain
				15		reg_main_c_noise_masking_en	Main window horizontal C noise-masking enable
2F	19	**h0024** (h0012*2)		[5:0]		reg_main_v_noise_mask_gain	Main window vertical Y noise-masking gain
				7		reg_main_v_noise_masking_en	Main window vertical Y noise-masking enable
2F	**6**	**h0042** (h0021*2)		0		reg_f2_dnr_en	F2 DNR All (PRESNR+MED+CORE) Function Enable
				1		reg_f2_dnr_core_en	F2 DNR Core Function Enable
2F	**6**	**h0080**(h0040*2)		[15:0]		reg_dnr_tabley_0	DNR TABLEY_0
		h0082(h0041*2)		[15:0]		reg_dnr_tabley_1	DNR TABLEY_1
		h0084(h0042*2)		[15:0]		reg_dnr_tabley_2	DNR TABLEY_2
		h0086(h0043*2)		[11:0]		reg_dnr_tabley_3	DNR TABLEY_3
		h0088(h0044*2)		[15:0]		reg_dnr_tablec_0	DNR TABLEC_0
		h008A(h0045*2)		[15:0]		reg_dnr_tablec_1	DNR TABLEC_1
		h008C(h0046*2)		[15:0]		reg_dnr_tablec_2	DNR TABLEC_2
		h008E(h0047*2)		[15:0]		reg_dnr_tablec_3	DNR TABLEC_3
		h0090(h0048*2)		[11:0]		reg_dnr_tabley_lsb	DNR TABLEY_LSB
		h0092(h0049*2)		[11:0]		reg_dnr_tablec_lsb	DNR TABLEC_LSB

Scaler description

Base Address	Bank	High Address	Low Address	Loc MSB	Loc LSB	Name	Description
2F	23	**h0016**(h000B*2)		0		reg_mode_y_ho_f2	main window horizontal Y scaling filter mode 0: Bypass 1: Bilinear
				[3:1]		reg_mode_c_ho_f2	main window horizontal C scaling filter mode 0: Bypass 1: Bilinear 2: C SRAM 1 3: C SRAM 2 4: C SRAM 3 5: C SRAM 4
				4		reg_c_ram_en_ho_f2	main window horizontal C scaling filter SRAM usage enable
				5		reg_c_ram_sel_ho_f2	main window horizontal C scaling filter SRAM selection 0: Y SRAM 1 1: Y SRAM 2
				6		reg_y_ram_en_ho_f2	main window horizontal Y scaling filter SRAM usage
				7		reg_y_ram_sel_ho_f2	main window horizontal Y scaling filter SRAM selection 0: Y SRAM 1 1: Y SRAM 2
				8		reg_mode_y_ve_f2	main window vertical Y scaling filter mode 0: Bypass 1: Bilinear

			[11:9]	reg_mode_c_ve_f2	main window vertical C scaling filter mode 0: Bypass 1: Bilinear 2: C SRAM 1 3: C SRAM 2 4: C SRAM 3 5: C SRAM 4
			12	reg_c_ram_en_ve_f2	main window vertical C scaling filter SRAM usage enable
			13	reg_c_ram_sel_ve_f2	main window vertical C scaling filter SRAM selection 0: Y SRAM 1 1: Y SRAM 2
			14	reg_y_ram_en_ve_f2	main window vertical Y scaling filter SRAM usage enable
			15	reg_y_ram_sel_ve_f2	main window vertical Y scaling filter SRAM selection 0: Y SRAM 1 1: Y SRAM 2

Comb description

Base Address	High Address	Low Address	Loc MSB	Loc LSB	Name	Value	Description
36	h10	h10	4	4	reg_new_comb_en		New Comb enable
36	h10	h10	2	0	reg_workmd		Working mode: 0/1: 1D, 2: 2D, other: reserved
36	h31	h31	7	0	MotYThU		Upper bound motionY threshold.
36	h32	h32	7	0	MotYThL		Lower bound motionY threshold.
36	h33	h33	7	0	MotCThU		Upper bound motionC threshold.
36	h34	h34	7	0	MotCThL		Lower bound motionC threshold.
36	h72	h72	7	0	reg_regbsthght		Burst height for auto chroma gain, 0: auto, 112 for NTSC and 117 for PAL; other: use RegBstHght/DetBstHght as C gain
36	h73	h73	7	0	reg_regctst		Contrast adjustment coefficient
36	h74	h74	7	0	reg_regbrht		Brightness adjustment coefficient
36	h75	h75	7	0	reg_regsat		Saturation adjustment coefficient
36	h80	h80	7	0	reg_ygain		Luma gain for U/V demodulation
36	h81	h81	7	0	reg_cbgain		Cb gain for U/V demodulation
36	h82	h82	7	0	reg_crgain		Cr gain for U/V demodulation
36	h83	h83	7	6	reg_ctiirmd		IIR coeficient for CTI
36	h83	h83	5	4	reg_ctimode		CTI mode 00: off 01: weak 10: normal 11: strong
36	h83	h83	3	2	reg_ypipdly		Luma pipe delay
36	h83	h83	1	0	reg_cbcrlpmd		Cb/Cr low pass mode 00: off 01: weak 10: normal 11: strong
36	hC0	hC0	1	0	reg_lumaout_mode		Luma Output Mode ([00]: Normal [01]: 1DH [10]: 1DV [11]: 2D)
36	hC0	hC0	3	2	reg_crmaout_mode		Chroma Output Mode ([00]: Normal [01]: 1DH [10]: 1DV [11]: 2D)
36	hC0	hC0	5	4	reg_luma2d_sel		Luma 2D Select (5x5/5x5/adp/adp)
36	hC0	hC0	7	6	reg_crma2d_sel		Chroma 2D Select (5x5/5x5/adp/DEMbld)