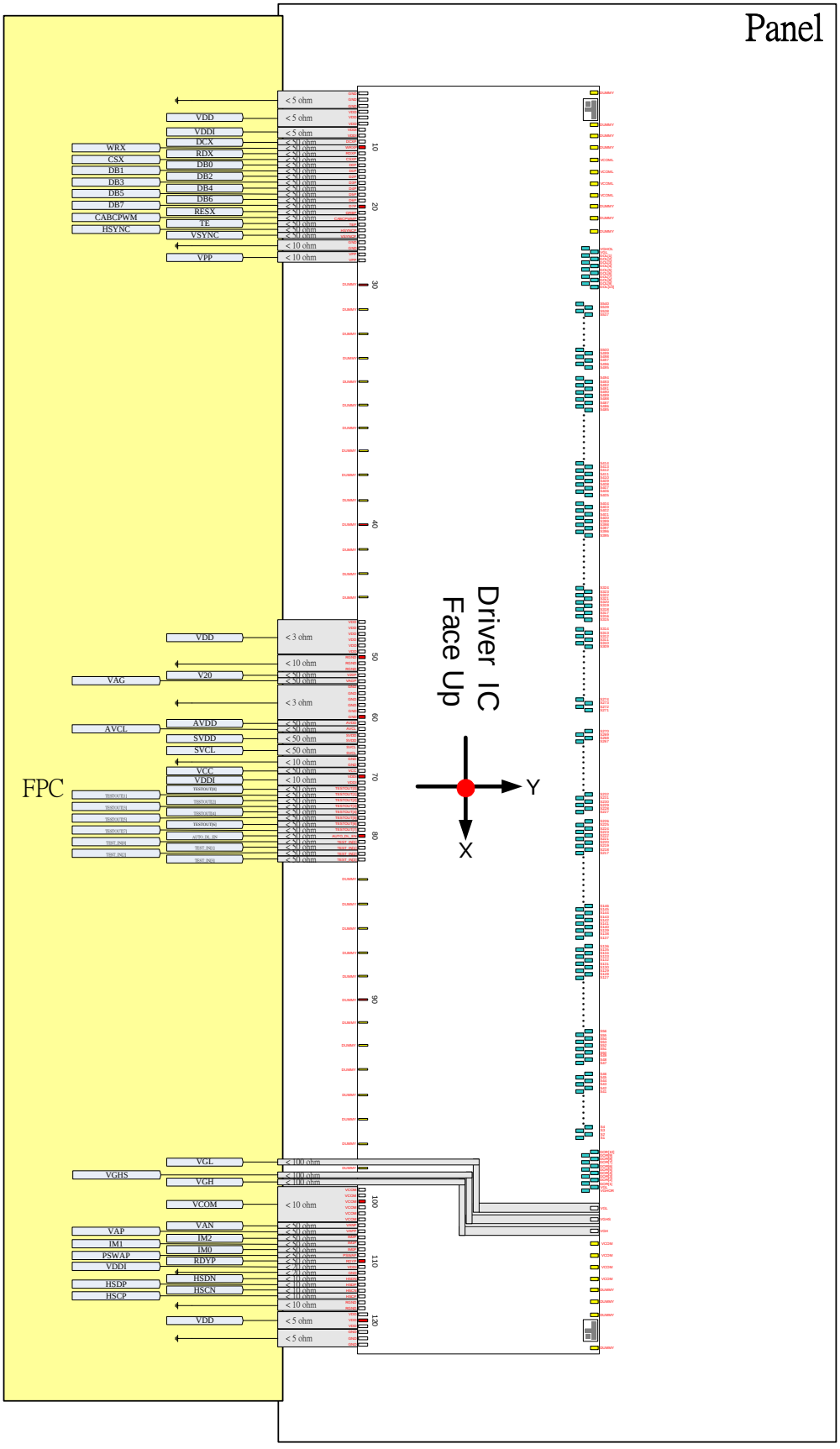
12 APPLICATION NOTE

12.1 Layout Resistance Suggestion



13 COMMAND

13.1 Page Set Table

PAGE SET Table														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
CSC	0	↑	1	-	1	1	1	1	0	0	0	0	(F0h)	Command Set Ctrl
	1	↑	1		-	CDC_EN	-	GIP_EN	TEST_EN	-	GAM_EN	CMD2_EN		
CSC	0	↑	1	-	1	1	1	1	0	0	0	1	(F1h)	Command Set Ctrl
	1	↑	1		-	-	-	CMD2_xPROT2	-	-	-	CMD2_PROT1		
CSC	0	↑	1	-	1	1	1	1	0	0	1	0	(F2h)	Command Set Ctrl
	1	↑	1		TST_xPROT1	CDC_PROT1	-	-	TST_PROT1	CDC_xPROT1	-	-		
CSC	0	↑	1	-	1	1	1	1	0	0	1	1	(F3h)	Command Set Ctrl
	1	↑	1		-	-	-	GIP_PROT2	-	-	-	GIP_xPROT1		
SPIOR	0	↑	1		1	1	1	1	0	1	0	0	(F4h)	SPI Others Read

CSC1 (F0h): Command Set Ctrl 1

F0H	Command Set Ctrl 1												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CK	0	↑	1	-	1	1	1	1	0	0	0	0	(F0h)
parameter	1	↑	1	-	-	CDC_EN	-	GIP_EN	TEST_EN	-	GAM_EN	CMD2_EN	(00h)

Description

F0	F1	F2	F3	Description
00	-	-	-	Command2 disable、Gamma Command disable、Test Command disable、CDC Command disable、GIP Command disable
02	-	-	-	Gamma enable
01	01	-	-	Command2 page enable
08	-	08	-	Test Command page enable
80	-	40	-	CDC Command page enable
10	-	-	10	GIP Command page enable

'-': Don't care.

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	00h
S/W Reset	00h
H/W Reset	00h

CSC2 (F1h): Command Set Ctrl 2

F1H	Command Set Ctrl 2												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CK	0	↑	1	-	1	1	1	1	0	0	0	1	(F1h)
parameter	1	↑	1	-	-	-	-	CMD2_xPROT2	-	-	-	CMD2_PROT1	(10h)

Description

F0	F1	F2	F3	Description
00	-	-	-	Command2 disable、Gamma Command disable、Test Command disable、CDC Command disable、GIP Command disable
02	-	-	-	Gamma enable
01	01	-	-	Command2 page enable
08	-	08	-	Test Command page enable
80	-	40	-	CDC Command page enable
10	-	-	10	GIP Command page enable

'-': Don't care.

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	10h
S/W Reset	10h
H/W Reset	10h

CSC3 (F2h): Command Set Ctrl 3

F2H	Command Set Ctrl 3												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CK	0	↑	1	-	1	1	1	1	0	0	1	0	(F2h)
parameter	1	↑	1	-	TST_xPROT2	CDC_PROT2	-	-	TST_PROT1	CDC_xPROT1	-	-	(84h)

Description

F0	F1	F2	F3	Description
00	-	-	-	Command2 disable、Gamma Command disable、Test Command disable、CDC Command disable、GIP Command disable
02	-	-	-	Gamma enable
01	01	-	-	Command2 page enable
08	-	08	-	Test Command page enable
80	-	40	-	CDC Command page enable
10	-	-	10	GIP Command page enable

	'-': Don't care.
Register availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>
Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>84h</td></tr><tr><td>S/W Reset</td><td>84h</td></tr><tr><td>H/W Reset</td><td>84h</td></tr></table>

CSC4 (F3h): Command Set Ctrl 4

F3H	Command Set Ctrl 4												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CK	0	↑	1	-	1	1	1	1	0	0	1	1	(F3h)
parameter	1	↑	1	-	-	-	-	GIP_PROT2	-	-	-	GIP_xPROT1	(01h)
Description	<table><tr><th>F0</th><th>F1</th><th>F2</th><th>F3</th><th>Description</th></tr><tr><td>00</td><td>-</td><td>-</td><td>-</td><td>Command2 disable、Gamma Command disable、Test Command disable、CDC Command disable、GIP Command disable</td></tr><tr><td>02</td><td>-</td><td>-</td><td>-</td><td>Gamma enable</td></tr><tr><td>01</td><td>01</td><td>-</td><td>-</td><td>Command2 page enable</td></tr><tr><td>08</td><td>-</td><td>08</td><td>-</td><td>Test Command page enable</td></tr><tr><td>80</td><td>-</td><td>40</td><td>-</td><td>CDC Command page enable</td></tr><tr><td>10</td><td>-</td><td>-</td><td>10</td><td>GIP Command page enable</td></tr></table> '-': Don't care.												

Register availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>
Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>01h</td></tr><tr><td>S/W Reset</td><td>01h</td></tr><tr><td>H/W Reset</td><td>01h</td></tr></table>

SPIOR (F4h): SPI Others Read

F4H	SPIOR (SPI Others Read)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
SPIOR	0	↑	1	-	1	1	1	1	0	1	0	0	(F4h)
Parameter	No Parameter												-
Description	- SPI read enable/disable for command table 2 Example : a.) Write Cmd 0xF4 (Enable) -> Read Cmd 1st -> Write Cmd 0xF4 (Disable)、Write Cmd 0xF4 (Enable) -> Read Cmd 2nd -> Write Cmd 0xF4 (Disable)、、、 b.) Write Cmd 0xF4 (Enable) -> Read Cmd 1st -> Read Cmd 2nd -> Write Cmd 0xF4 (Disable) "-" Don't care												
Register Availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>												
Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>N/A</td></tr><tr><td>S/W Reset</td><td>N/A</td></tr><tr><td>H/W Reset</td><td>N/A</td></tr></table>												

13.2 Command Table 1

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
NOP	0	↑	1	-	0	0	0	0	0	0	0	0	(00h)	No Operation
SWRESET	0	↑	1	-	0	0	0	0	0	0	0	1	(01h)	Software Reset
RDDID	0	↑	1	-	0	0	0	0	0	1	0	0	(04h)	Read Display ID
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	ID1.6-0								ID1 read
	1	1	↑		-	ID2.6-0								ID2 read
	1	1	↑		-	ID3.6-0								ID3 read
RDDST	0	↑	1	-	0	0	0	0	1	0	0	1	(09h)	Read Display Status
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		BSTON	MY	MX	MV	ML	RGB	MH	HSD		
	1	1	↑		-	IFPF.2-0			IDMON	-	SLOUT	NORON		
	1	1	↑		VSSON	-	INVON	-	-	DISON	TEON	-		
	1	1	↑		-	-	TELOM	-	-	-	-	-		
RDDPM	0	↑	1	-	0	0	0	0	1	0	1	0	(0Ah)	Read Display Power Mode
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		BSTON	IDMON	-	SLPOUT	NORON	DISON	-	-		
RDD MADCTL	0	↑	1	-	0	0	0	0	1	0	1	1	(0Bh)	Read Display MADCTL
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		MY	MX	MV	ML	BGR	MH	HSD	-		

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
RDD COLMOD	0	↑	1	-	0	0	0	0	1	1	0	0	(0Ch)	Read Display Pixel Format
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	VIPF.2-0			-	IFPF.2-0				
RDDIM	0	↑	1	-	0	0	0	0	1	1	0	1	(0Dh)	Read Display Image Mode
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		VSSON	-	INVON	-	-	-	-	-		
RDDSM	0	↑	1	-	0	0	0	0	1	1	1	0	(0Eh)	Read Display Signal Mode
	1	1	↑		-	-	-	-	-	-	-	-	-	Dummy read
	1	1	↑		TEON	TELOM	-	-	-	-	-	-		
RDBST	0	↑	1	-	0	0	0	0	1	1	1	1	(0Fh)	Read Busy Status
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	-	-	-	-	-	-	RDY		
SLPIN	0	↑	1	-	0	0	0	1	0	0	0	0	(10h)	Sleep in
SLPOUT	0	↑	1	-	0	0	0	1	0	0	0	1	(11h)	Sleep out
NOROFF	0	↑	1	-	0	0	0	1	0	0	1	0	(12h)	Normal off
NORON	0	↑	1	-	0	0	0	1	0	0	1	1	(13h)	Normal On
INVOFF	0	↑	1	-	0	0	1	0	0	0	0	0	(20h)	Display inversion off

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
INVON	0	↑	1	-	0	0	1	0	0	0	0	1	(21h)	Display inversion on
DISPOFF	0	↑	1	-	0	0	1	0	1	0	0	0	(28h)	Display off
DISPON	0	↑	1	-	0	0	1	0	1	0	0	1	(29h)	Display on
CASET	0	↑	1	-	0	0	1	0	1	0	1	0	(2Ah)	Column Address Set
	1	↑	1		XS15	XS14	XS13	XS12	XS11	XS10	XS9	XS8		X address start: 0≦XS≦X
	1	↑	1		XS7	XS6	XS5	XS4	XS3	XS2	XS1	XS0		
	1	↑	1		XE15	XE14	XE13	XE12	XE11	XE10	XE9	XE8		X address start: S≦XE≦X
	1	↑	1		XE7	XE6	XE5	XE4	XE3	XE2	XE1	XE0		
RASET	0	↑	1	-	0	0	1	0	1	0	1	1	(2Bh)	Row Address Set
	1	↑	1		YS15	YS14	YS13	YS12	YS11	YS10	YS9	YS8		Y address start: 0≦YS≦Y
	1	↑	1		YS7	YS6	YS5	YS4	YS3	YS2	YS1	YS0		
	1	↑	1		YE15	YE14	YE13	YE12	YE11	YE10	YE9	YE8		Y address start: S≦YE≦Y
	1	↑	1		YE7	YE6	YE5	YE4	YE3	YE2	YE1	YE0		
RAMWR	0	↑	1	-	0	0	1	0	1	1	0	0	(2Ch)	Memory Write
	1	↑	1		D1.7-0									Write data
	1	↑	1		Dx.7-0									
	1	↑	1		Dn.7-0									
RAMRD	0	↑	1	-	0	0	1	0	1	1	1	0	(2Eh)	Memory Read
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		D1.7-0									Read data
	1	1	↑		Dx.7-0									
	1	1	↑		Dn.7-0									

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
VSCRDEF	0	↑	1	-	0	0	1	1	0	0	1	1	(33h)	Vertical Scrolling Definition
	1	↑	1		-	-	-	-	-	-	-	TFA.8		
	1	↑	1		TFA.7-0									
	1	↑	1		-	-	-	-	-	-	-	VSA.8		
	1	↑	1		VSA.7-0									
	1	↑	1		-	-	-	-	-	-	-	BFA.8		
	1	↑	1		BFA.7-0									
TEOFF	0	↑	1	-	0	0	1	1	0	1	0	0	(34h)	Tearing Effect Line off
TEON	0	↑	1	1	0	0	1	1	0	1	0	1	(35h)	Tearing Effect Line on
	1	↑	1		-	-	-	-	-	-	-	TE_MD		
MADCTL	0	↑	1	1	0	0	1	1	0	1	1	0	(36h)	Memory Data Access Control
	1	↑	1		MY	MX	MV	ML	RGB	MH	HSD	-		
VSCRSADD	0	↑	1	-	0	0	1	1	0	1	1	1	(37h)	Vertical Scrolling Start Address
	1	↑	1		-	-	-	-	-	-	-	VSP.8		
	1	↑	1		VSP.7-0									
IDMOFF	0	↑	1	-	0	0	1	1	1	0	0	0	(38h)	Idle Mode off
IDMON	0	↑	1	-	0	0	1	1	1	0	0	1	(39h)	Idle Mode on
COLMOD	0	↑	1	1	0	0	1	1	1	0	1	0	(3Ah)	Interface Pixel Format
	1	↑	1		-	VIPF.2-0			-	IFPF.2-0				
RAMWRC	0	↑	1	-	0	0	1	1	1	1	0	0	(3Ch)	Memory Write Continue
	1	↑	1		D1.7-0									Write data
	1	↑	1		Dx.7-0									
	1	↑	1		Dn.7-0									

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
RAMRDC	0	↑	1	-	0	0	1	1	1	1	1	0	(3Eh)	Memory Write Continue
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		D1.7-0									Read data
	1	1	↑		Dx.7-0									
	1	1	↑		Dn.7-0									
HSCRDEF	0	↑	1	-	0	0	1	1	0	0	1	1	(43h)	Horizontal Scrolling Definition
	1	↑	1		-	-	-	-	-	-	-	LFA8		
	1	↑	1		LFA.7-0									
	1	↑	1		-	-	-	-	-	-	-	HSA8		
	1	↑	1		HSA.7-0									
	1	↑	1		-	-	-	-	-	-	-	RFA8		
	1	↑	1		RFA.7-0									
TESLWR	0	↑	1	2	0	1	0	0	0	1	0	0	(44h)	Write Tear Scan Line
	1	↑	1		-	-	-	-	N.11-8					
	1	↑	1		N.7-0									
TESLRD	0	↑	1	-	0	1	0	0	0	1	0	1	(45h)	Read Tear Scan Line
	1	1	↑		-	-	-	-	N.11-8				(00h)	
	1	1	↑		N.7-0								(00h)	
HSCRSADD	0	↑	1	-	0	1	0	0	0	1	1	1	(47h)	Horizontal Scrolling Start Address
	1	↑	1		-	-	-	-	-	-	-	HSP.8		
	1	↑	1		HSP.7-0									
RAMCLACT	0	↑	1	-	0	1	0	0	1	1	0	0	(4Ch)	Memory Clear Act
	1	↑	1		-	-	-	-	-	-	-	FILLEN		
RAMCLSETR	0	↑	1	-	0	1	0	0	1	1	0	1	(4Dh)	Memory Clear Set R
	1	↑	1		R.5-0						-	-		
RAMCLSETG	0	↑	1	-	0	1	0	0	1	1	1	0	(4Eh)	Memory Clear Set G
	1	↑	1		G.5-0						-	-		
RAMCLSETB	0	↑	1	-	0	1	0	0	1	1	1	1	(4Fh)	Memory

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
	1	↑	1		B.5-0						-	-		Clear Set G
CDCCTR	0	↑		-	0	1	0	1	0	0	0	0	(50h)	CDC Control
	1	↑	1		CDC_EN	CDC_COMP_EN	CDC_COMP_M	CDC_SIDE_M	CDC_NOTCH1_EN	CDC_NOTCH2_EN	-	-		
WRDISBV	0	↑	1	-	0	1	0	1	0	0	0	1	(51h)	Write Display Brightness
	1	↑	1		DBV.7-0									
RDDISBV	0	↑	1	-	0	1	0	1	0	0	1	0	(52h)	Read Display Brightness
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		DBV.7-0									
WRCTRLD	0	↑	1	-	0	1	0	1	0	0	1	1	(53h)	Write CTRL Display
	1	↑	1		-	-	-	-	-	BL	-	-		
RDCTRLD	0	↑	1	-	0	1	0	1	0	1	0	0	(54h)	Read CTRL Display
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	-	-	-	-	BL	-	-		
CPRAMWR	0	↑	1	-	0	1	1	0	1	1	0	0	(6Ch)	Compress Memory Write
	1	↑	1		Write data stream									
CPRAMWRC	0	↑	1	-	0	1	1	0	1	1	0	1	(6Dh)	Compress Continue Write
	1	↑	1		Write data stream									
CPCTRL	0	↑	1	-	0	1	1	0	1	1	1	1	(6Fh)	Compress CTRL
	1	↑	1		GCOMPR_C262	-	-	GCOMPR_EN	-	-	-	RDY		
RDID1	0	↑	1	-	1	1	0	1	1	0	1	0	(DAh)	Read ID1
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	ID1.6-0								

COMMAND Table 1														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
RDID2	0	↑	1	-	1	1	0	1	1	0	1	1	(DBh)	Read ID2
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	ID2.6-0								
RDID3	0	↑	1	-	1	1	0	1	1	1	0	0	(DCh)	Read ID3
	1	1	↑		-	-	-	-	-	-	-	-		Dummy read
	1	1	↑		-	ID3.6-0								

NOP (00h)

00H	NOP (No Operation)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
NOP	0	↑	1	-	0	0	0	0	0	0	0	0	(00h)
Parameter	No Parameter												-
Description	This command is empty command. "-" Don't care												
Restriction													

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	N/A
S/W Reset	N/A
H/W Reset	N/A

Flow Chart

SWRESET (01h): Software Reset

01H	SWRESET (Software Reset)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
SWRESET	0	↑	1	-	0	0	0	0	0	0	0	1	(01h)
Parameter	No Parameter												-
Description	"-" Don't care - When the Software Reset command is written, it causes software reset. It resets the commands and parameters to their S/W Reset default values. - Frame memory contents are unaffected by this command.												
Restriction	It will be necessary to wait 5msec before sending new command following software reset. The display module loads all display suppliers' factory default values to the registers during this 5msec. If software reset is sent during sleep in mode, it will be necessary to wait 120msec before sending sleep out command. Software reset command cannot be sent during sleep out sequence.												

Register Availability

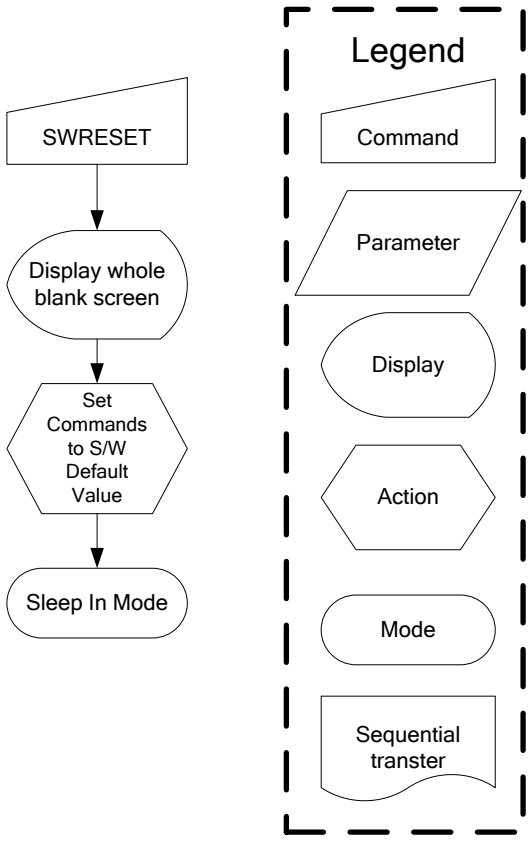
Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes

	Partial Mode On, Idle Mode On, Sleep Out	Yes
	Sleep In	Yes

Default

Status	Default Value
Power On Sequence	N/A
S/W Reset	N/A
H/W Reset	N/A

Flow Chart



RDDID (04h): Read Display ID

04H	RDDID (Read Display ID)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDID	0	↑	1	-	0	0	0	0	0	1	0	0	(04h)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-		ID1.6-0							(7Fh)
3rd parameter	1	1	↑	-		ID2.6-0							(7Fh)
4th parameter	1	1	↑	-		ID3.6-0							(7Fh)
Description	-This read byte returns 24-bit display identification information. -The 1st parameter is dummy data -The 2nd parameter (ID1.6-0): LCD module's manufacturer ID. -The 3rd parameter (ID2.6-0): LCD module/driver version ID -The 4th parameter (ID3.6-0): LCD module/driver ID. -Commands RDID1/2/3(DAh, DBh, DCh) read data correspond to the parameters 2,3,4 of the command 04h, respectively. "-" Don't care												
Restriction													

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value		
	ID1	ID2	ID3
Power On Sequence	See description	See description	See description
S/W Reset	See description	See description	See description
H/W Reset	See description	See description	See description

RDDST (09h): Read Display Status

09H	RDDST (Read Display Status)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDST	0	↑	1	-	0	0	0	0	1	0	0	1	(09h)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	BSTON	MY	MX	MV	ML	RGB	MH	HSD	(00h)
3rd parameter	1	1	↑	-	-	IFPF.2-0			IDMON	-	SLOUT	NORON	(61h)

4th parameter	1	1	↑	-	VSSON	-	INVON	-	-	DISON	TEON	-	(00h)
5th parameter	1	1	↑	-	-	-	TELOM	-	-	-	-	-	(00h)

Description

This command indicates the current status of the display as described in the table below:

Bit	Description	Value
BSTON	Booster Voltage Status	'1' =Booster on, '0' =Booster off
MY	Row Address Order (MY)	'1' =Decrement, (Bottom to Top, when MADCTL (36h) D7='1') '0' =Increment, (Top to Bottom, when MADCTL (36h) D7='0')
MX	Column Address Order (MX)	'1' =Decrement, (Right to Left, when MADCTL (36h) D6='1') '0' =Increment, (Left to Right, when MADCTL (36h) D6='0')
MV	Row/Column Exchange (MV)	'1' = Row/column exchange, (when MADCTL (36h) D5='1') '0' = Normal, (when MADCTL (36h) D5='0'
ML	Scan Address Order (ML)	'0' =Decrement, (LCD refresh Top to Bottom, when MADCTL (36h) D4='0') '1'=Increment, (LCD refresh Bottom to Top, when MADCTL (36h) D4='1')
RGB	RGB/ BGR Order (RGB)	'1' =BGR, (When MADCTL (36h) D3='1') '0' =RGB, (When MADCTL (36h) D3='0')
MH	Horizontal Order	'0' =Decrement, (LCD refresh Left to Right, when MADCTL (36h) D2='0') '1' =Increment, (LCD refresh Right to Left, when MADCTL (36h) D2='1')
IFPF.2-0	Interface Color Pixel Format Definition	"101" = 16-bit / pixel, "110" = 18-bit / pixel, "111" = 16M truncated, others are not defined.
IDMON	Idle Mode On/Off	'1' = On, "0" = Off
SLPOUT	Sleep In/Out	'1' = Out, "0" = In
NORON	Display Normal Mode On/Off	'1' = Normal Display,
INVON	Inversion Status	'1' = On, "0" = Off
DISON	Display On/Off	'1' = On, "0" = Off
TEON	Tearing effect line on/off	'1' = On, "0" = Off
TELOM	Tearing effect line mode	'0' = mode1, '1' = mode2

"-" Don't care

RDDPM (0Ah): Read Display Power Mode

0AH	RDDPM (Read Display Power Mode)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDPM	0	↑	1	-	0	0	0	0	1	0	1	-	(0Ah)

1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	BSTON	IDMON	-	SLPOUT	NORON	DISON	-	-	(08h)

Description

This command indicates the current status of the display as described in the table below:

Bit	Description	Value
BSTON	Booster Voltage Status	'1' =Booster on, '0' =Booster off
IDMON	Idle mode on/off	'1' = Idle Mode On, '0' = Idle Mode Off
PTLON	Partial mode on/off	'1' =Partial mode on, '0' =Partial mode off,
SLPOUT	Sleep in/out	'1' =Sleep out, '0' =Sleep in,
NORON	Display normal mode on/off	'1' = Normal display, '0' = Partial display,
DISON	Display on/off	'1' =Display on, '0' =Display off,

"-" Don't care

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value (D7 to D0)
Power On Sequence	0000-1000(08h)
S/W Reset	0000-1000(08h)
H/W Reset	0000-1000(08h)

RDDMADCTL (0Bh): Read Display MADCTL

0BH	RDDMADCTL (Read Display MADCTL)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDMADCTL	0	↑	1	-	0	0	0	0	1	0	1	1	(0Bh)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	MY	MX	MV	ML	RGB	MH	HSD	-	(00h)

Description

This command indicates the current status of the display as described in the table below:

Bit	Description	Value

	MY	Row Address Order (MY)	‘1’ =Decrement, (Bottom to Top, when MADCTL (36h) D7=’1’) ‘0’ =Increment, (Top to Bottom, when MADCTL (36h) D7=’0’)
	MX	Column Address Order (MX)	‘1’ =Decrement, (Right to Left, when MADCTL (36h) D6=’1’) ‘0’ =Increment, (Left to Right, when MADCTL (36h) D6=’1’)
	MV	Row/Column Exchange (MV)	‘1’ = Row/column exchange, (when MADCTL (36h) D5=’1’) ‘0’ = Normal, (when MADCTL (36h) D5=’0’
	ML	Scan Address Order (ML)	‘0’ =Decrement, (LCD refresh Top to Bottom, when MADCTL (36h) D4=’0’) ‘1’=Increment, (LCD refresh Bottom to Top, when MADCTL (36h) D4=’1’)
	RGB	RGB/ BGR Order (RGB)	‘1’ =BGR, (When MADCTL (36h) D3=’1’) ‘0’ =RGB, (When MADCTL (36h) D3=’0’)
	MH	Horizontal Order	‘0’ =Decrement, (LCD refresh Left to Right, when MADCTL (36h) D2=’0’) ‘1’ =Increment, (LCD refresh Right to Left, when MADCTL (36h) D2=’1’)

“-“ Don’t care

Restriction: There is one dummy parameter when using Parallel interface.

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value (D7 to D0)
Power On Sequence	0000-0000 (00h)
S/W Reset	No change
H/W Reset	0000-0000 (00h)

RDDCOLMOD (0Ch): Read Display Pixel Format

0CH	RDDCOLMOD (Read Display Pixel Format)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDCOLMOD	0	↑	1	-	0	0	0	0	1	1	0	0	(0Ch)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	-	VIPF.2-0			-	IFPF.2-0			(66h)

Description

This command indicates the current status of the display as described in the table below:

Bit	Description	Value
D7	-	Set to '0'
VIPF.2-0	RGB interface color format	'101' = 16 bit/pixel '110' = 18 bit/pixel
D3	-	Set to '0'
IFPF.2-0	Control interface color format	'101' = 16 bit/pixel '110' = 18 bit/pixel

"-" Don't care

Restriction

There is one dummy parameter when using Parallel interface.

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000-0110 (18 bit/pixel)
S/W Reset	No change
H/W Reset	0000-0110 (18 bit/pixel)

RDDIM (0Dh): Read Display Image Mode

0DH	RDDIM (Read Display Image Mode)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDIM	0	↑	1	-	0	0	0	0	1	1	0	1	(0Dh)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	VSSON	-	INVON	-	-	-	-	-	(00h)
Description	This command indicates the current status of the display as described in the table below: -VSSON: Vertical scrolling on/off -INVON: Inversion on/off Others are no define and invalid "-" Don't care												
Restriction	There is one dummy parameter when using Parallel interface.												

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000-0000
S/W Reset	0000-0000
H/W Reset	0000-0000

RDDSM (0Eh): Read Display Signal Mode

0EH	RDDSM (Read Display Signal Status)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDSM	0	↑	1	-	0	0	0	0	1	1	1	0	(0Eh)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	TEON	TELOM	-	-	-	-	-	-	(00h)

Description

This command indicates the current status of the display as described in the table below:

Bit	Description	Value
TEON	Tearing effect line on/off	'1' = ON, '0' = OFF,
TELOM	Tearing effect line mode	'1' = mode2, '0' = mode1,

"-" Don't care

Restriction	There is one dummy parameter when using Parallel interface.
Register availability	Status / Availability Normal Mode On, Idle Mode Off, Sleep Out: Yes Normal Mode On, Idle Mode On, Sleep Out: Yes Partial Mode On, Idle Mode Off, Sleep Out: Yes Partial Mode On, Idle Mode On, Sleep Out: Yes Sleep In: Yes
Default	Status / Default Value Power On Sequence: 0000-0000 S/W Reset: 0000-0000 H/W Reset: 0000-0000

RDBST (0Fh): Read Busy Status

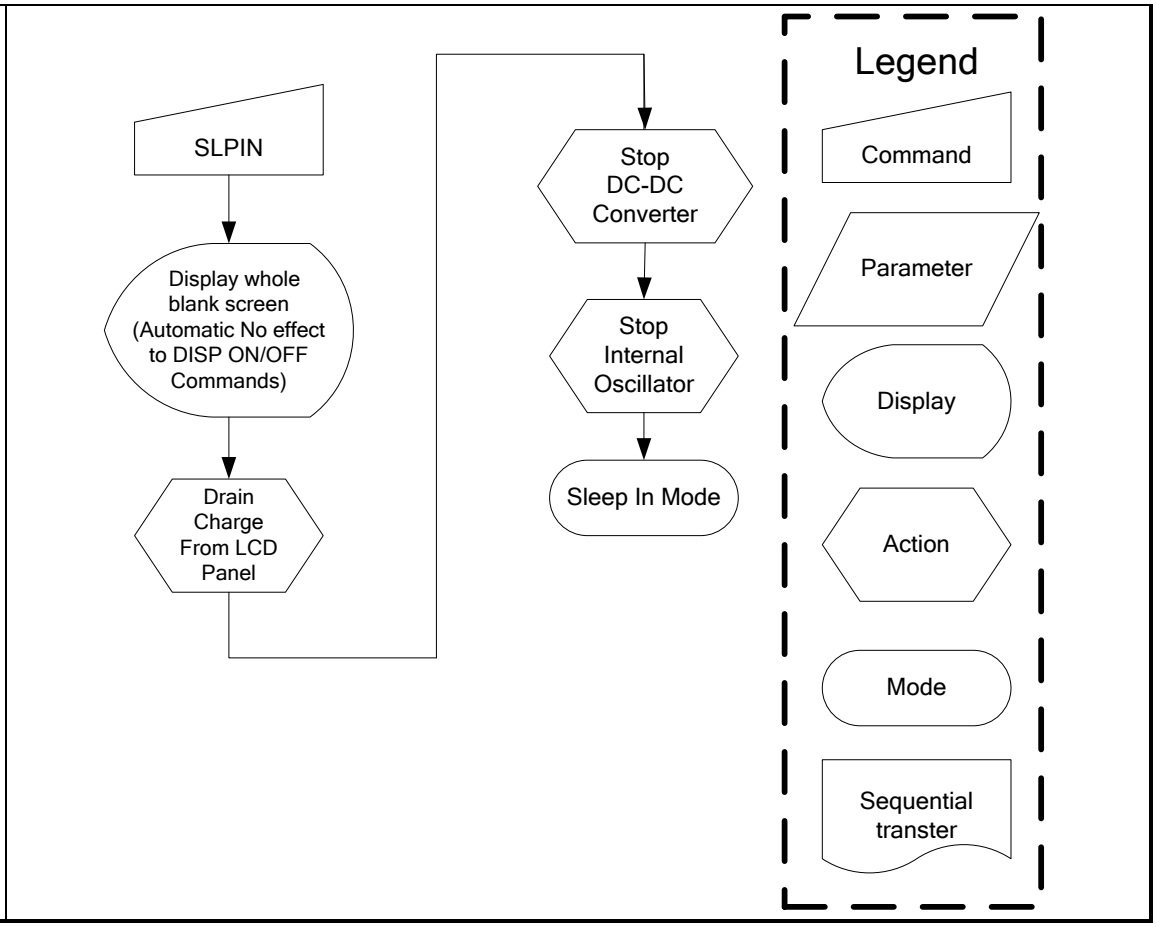
0FH	RDBST (Read Busy Status)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDBST	0	↑	1	-	0	0	0	0	1	1	1	1	(0Fh)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	-	-	-	-	-	-	-	RDY	(00h)
Description	This command indicates the current status of the display self-diagnostic result after sleep out command as described below: -CSCMP: Checksum comparison: '0' checksum the same; '1': checksum not the same. "-" Don't care												
Restriction	There is one dummy parameter when using Parallel interface.												
Register availability	Status / Availability Normal Mode On, Idle Mode Off, Sleep Out: Yes Normal Mode On, Idle Mode On, Sleep Out: Yes Partial Mode On, Idle Mode Off, Sleep Out: Yes Partial Mode On, Idle Mode On, Sleep Out: Yes Sleep In: Yes												
Default	Status / Default Value Power On Sequence: 0000-0000 S/W Reset: 0000-0000 H/W Reset: 0000-0000												

SLPIN (10h): Sleep in

10H	SLPIN (Sleep In)

<table>
<tr><td>Inst / Para</td><td>D/CX</td><td>WRX</td><td>RDX</td><td>D17-8</td><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td><td>HEX</td></tr>
<tr><td>SLPIN</td><td>0</td><td>↑</td><td>1</td><td>-</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>(10h)</td></tr>
<tr><td>parameter</td><td colspan="13">No Parameter</td></tr>
<tr><td>Description</td><td colspan="13">-This command causes the LCD module to enter the minimum power consumption mode.
-In this mode the DC/DC converter is stopped, internal oscillator is stopped, and panel scanning is stopped.
-MCU interface and memory are still working and the memory keeps its contents.
-Dimming function does not work when there is changing mode from Sleep OUT to Sleep IN.
“-“ Don’t care</td></tr>
<tr><td>Restriction</td><td colspan="13">-This command has no effect when module is already in sleep in mode. Sleep in mode can only be left by the sleep out command (11h).
-It will be necessary to wait 5msec before sending any new commands to a display module following this command to allow time for the supply voltages and clock circuits to stabilize.
-It will be necessary to wait 120msec after sending sleep out command (when in sleep in mode) before sending an sleep in command.</td></tr>
<tr><td>Register availability</td><td colspan="13"><table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table></td></tr>
<tr><td>Default</td><td colspan="13"><table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>Sleep in mode</td></tr><tr><td>S/W Reset</td><td>Sleep in mode</td></tr><tr><td>H/W Reset</td><td>Sleep in mode</td></tr></table></td></tr>
</table>

Flow Chart



SLPOUT (11h): Sleep Out

11H	SLPOUT (Sleep Out)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
SLPOUT	0	↑	1	-	0	0	0	1	0	0	0	1	(11h)
parameter	No Parameter												
Description	-This command turn off sleep mode. -In this mode the DC/DC converter is enabled, internal display oscillator is started, and panel scanning is started.												
Restriction	-This command has no effect when module is already in sleep out mode. Sleep out mode can only be left by the sleep in command (10h). -It will be necessary to wait 5msec before sending any new commands to a display module following this command to allow time for the supply voltages and clock circuits to stabilize. -It will be necessary to wait 120msec after sending sleep out command (when in sleep in mode) before sending an sleep in command. -The display module runs the self-diagnostic functions after this command is received.												

Register availability

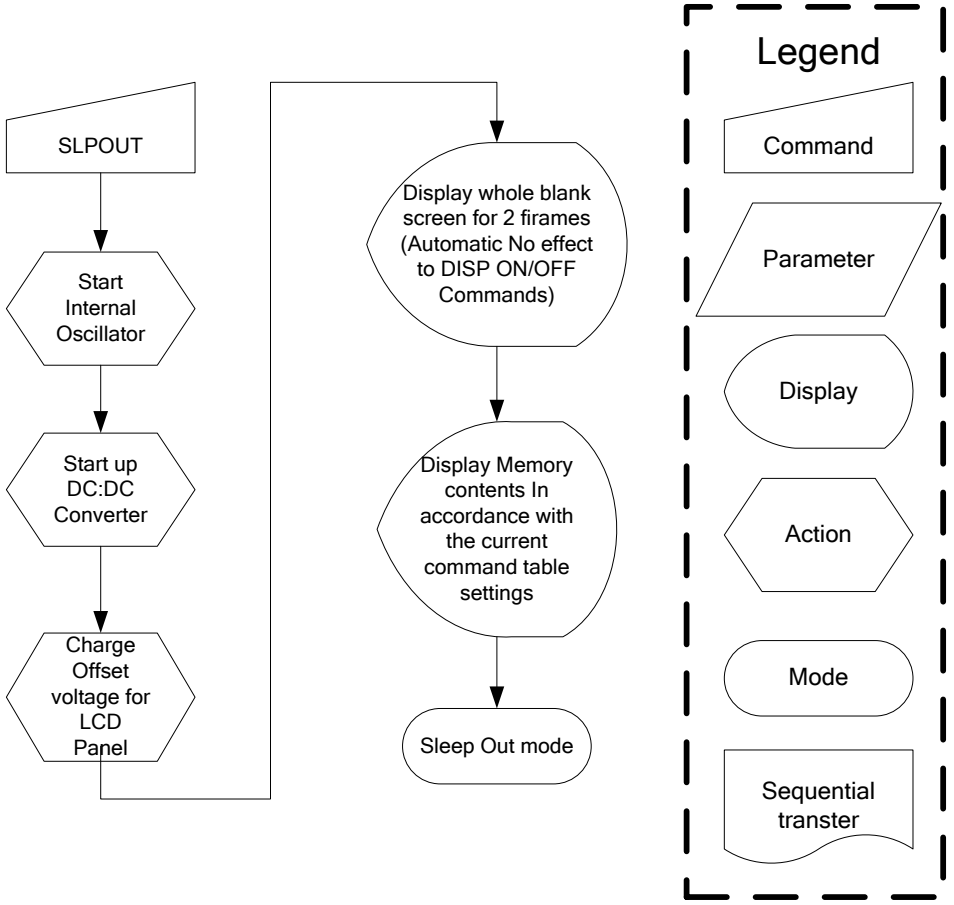
Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes

Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Sleep in mode
S/W Reset	Sleep in mode
H/W Reset	Sleep in mode

Flow Chart



NOROFF (12h): Normal Off

12H	NOROFF (Normal Off)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
NOROFF	0	↑	1	-	0	0	0	1	0	0	1	0	(12h)
parameter	No Parameter												
Description	-This command turns on Normal Off mode. The Normal Off mode will not enter Idle mode, but use Idle mode setting. -To leave Normal Off mode, the Normal On command (13h) should be written. "-" Don't care												
Restriction	This command has no effect when Normal off mode is active.												
Register													

availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Normal display mode on
S/W Reset	Normal display mode on
H/W Reset	Normal display mode on

Flow Chart

NORON (13h): Normal On

12H	NORON (Normal On)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
NORON	0	↑	1	-	0	0	0	1	0	0	1	1	(13h)
parameter	No Parameter												
Description	-This command turns the display to Normal On mode. -Normal display mode on means Normal off mode off. -Exit from NORON by the NOROFF command. "-" Don't care												
Restriction	This command has no effect when Normal On mode is active.												
Register availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

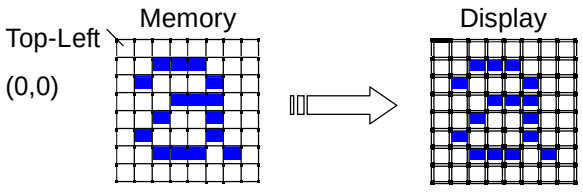
Status	Default Value
Power On Sequence	Normal display mode on
S/W Reset	Normal display mode on
H/W Reset	Normal display mode on

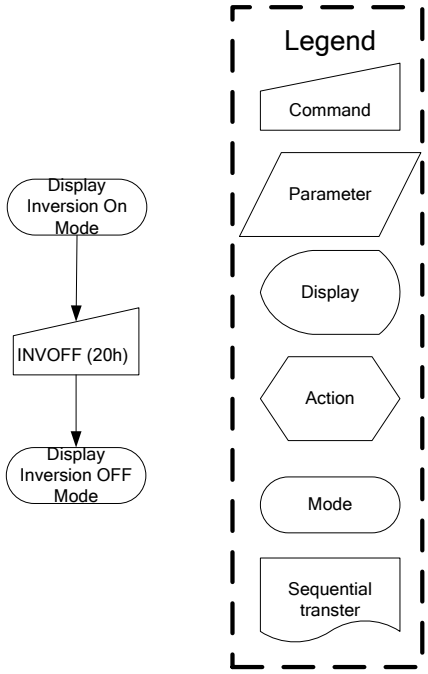
Flow Chart

INVOFF (20h): Display Inversion Off

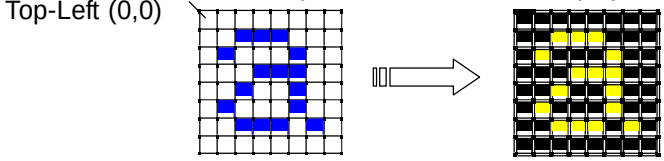
20H	INVOFF (Display Inversion Off)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
INVOFF	0	↑	1	-	0	0	1	0	0	0	0	0	(20h)
parameter	No Parameter												
Description	-This command is used to recover from display inversion mode. "-" Don't care												

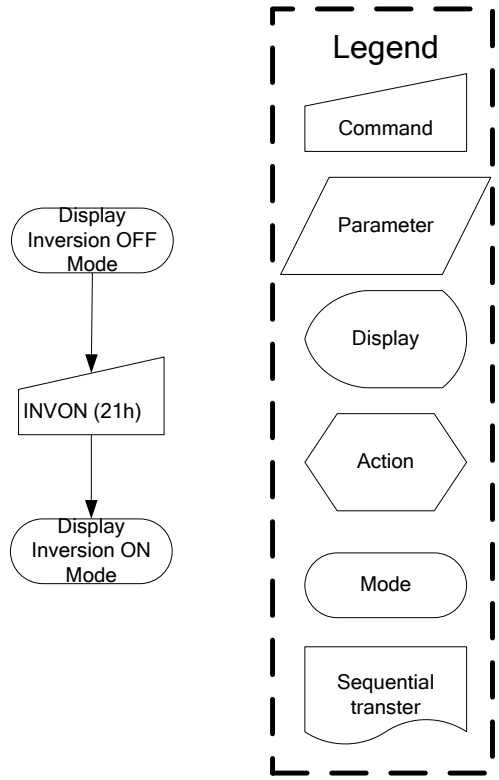
(Example)



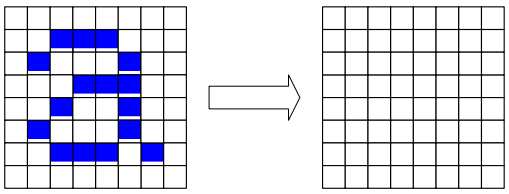
<table>
<tr><td>Restriction</td><td>This command has no effect when module is already in inversion off mode.</td></tr>
<tr><td>Register availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>Display inversion off</td></tr>
<tr><td>S/W Reset</td><td>Display inversion off</td></tr>
<tr><td>H/W Reset</td><td>Display inversion off</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

INVON (21h): Display Inversion On

<table>
<tr><td>21H</td><td colspan="12">INVON (Display Inversion On)</td></tr>
<tr><td>Inst / Para</td><td>D/CX</td><td>WRX</td><td>RDX</td><td>D17-8</td><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td><td>HEX</td></tr>
<tr><td>INVON</td><td>0</td><td>↑</td><td>1</td><td>-</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>(21h)</td></tr>
<tr><td>parameter</td><td colspan="12">No Parameter</td></tr>
<tr><td>Description</td><td colspan="12">-This command is used to recover from display inversion mode.
“-“ Don’t care
(Example)
Top-Left (0,0) Memory Display
  </td></tr>
<tr><td>Restriction</td><td colspan="12">This command has no effect when module is already in inversion on mode.</td></tr>
<tr><td>Register availability</td><td colspan="12"><table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table></td></tr>
<tr><td>Default</td><td colspan="12"><table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>Display inversion off</td></tr><tr><td>S/W Reset</td><td>Display inversion off</td></tr><tr><td>H/W Reset</td><td>Display inversion off</td></tr></table></td></tr>
</table>

Flow Chart	

DISPOFF (28h): Display Off

28H	DISPOFF (Display Off)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
DISPOFF	0	↑	1	-	0	0	1	0	1	0	0	0	(28h)
parameter	No Parameter												
Description	- This command is used to enter into DISPLAY OFF mode. In this mode, the output from Frame Memory is disabled and blank page inserted. - This command makes no change of contents of frame memory. - This command does not change any other status. - There will be no abnormal visible effect on the display. - Exit from this command by Display On (29h) **(Example)** **Memory** **Display** 												
Restriction	This command has no effect when module is already in display off mode.												

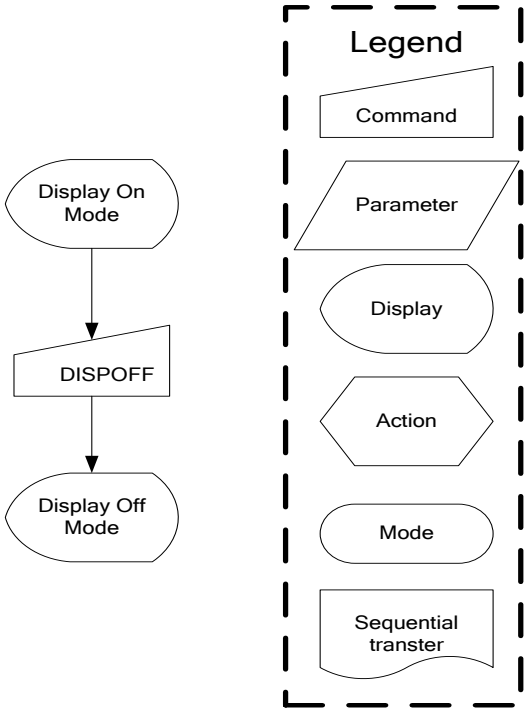
Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

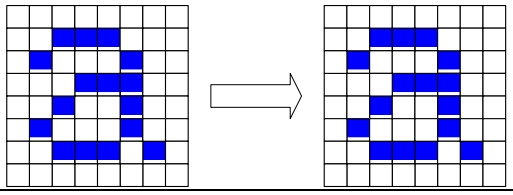
Status	Default Value
Power On Sequence	Display off
S/W Reset	Display off
H/W Reset	Display off

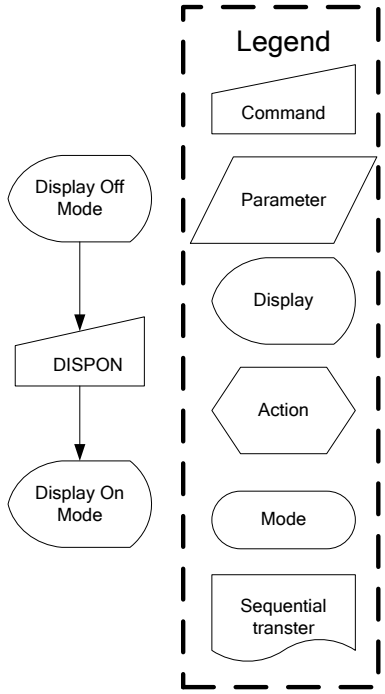
Flow Chart



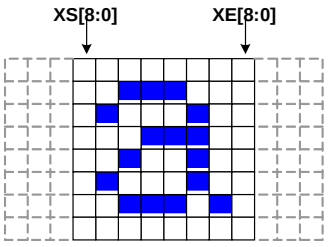
DISPON (29h): Display On

<table>
<tr><td>29H</td><td colspan="13">DISPON (Display On)</td></tr>
<tr><td>Inst / Para</td><td>D/CX</td><td>WRX</td><td>RDX</td><td>D17-8</td><td>D7</td><td>D6</td><td>D5</td><td>D4</td><td>D3</td><td>D2</td><td>D1</td><td>D0</td><td>HEX</td></tr>
<tr><td>DISPO N</td><td>0</td><td>↑</td><td>1</td><td>-</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>(29h)</td></tr>
<tr><td>parameter</td><td colspan="13">No Parameter</td></tr>
<tr><td>Description</td><td colspan="13">- This command is used to recover from DISPLAY OFF mode.
- Output from the Frame Memory is enabled.
- This command makes no change of contents of frame memory.
- This command does not change any other status.

(Example)
Memory Display
  </td></tr>
<tr><td>Restriction</td><td colspan="13">This command has no effect when module is already in display on mode.</td></tr>
<tr><td>Register availability</td><td colspan="13"><table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table></td></tr>
<tr><td>Default</td><td colspan="13"><table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>Display off</td></tr><tr><td>S/W Reset</td><td>Display off</td></tr><tr><td>H/W Reset</td><td>Display off</td></tr></table></td></tr>
</table>

Flow Chart	

CASET (2Ah): Column Address Set

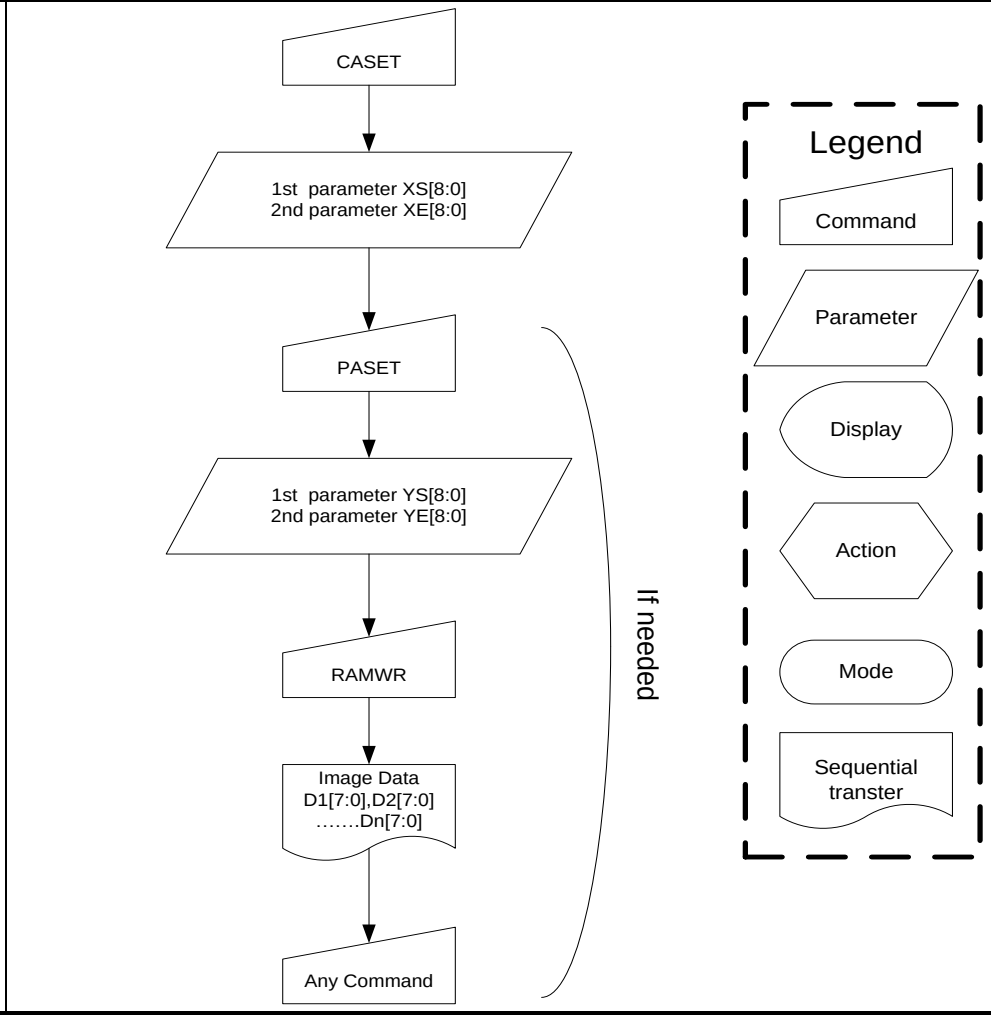
2AH	CASET (Column Address Set)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CASET	0	↑	1	-	0	0	1	0	1	0	1	0	(2Ah)
1st parameter	1	↑	1	-	-	-	-	-	-	-	-	XS.8	(00h)
2nd parameter	1	↑	1	-	XS.7-0								(00h)
3rd parameter	1	↑	1	-	-	-	-	-	-	-	-	XE.8	(01h)
4th parameter	1	↑	1	-	XE.7-0								(67h)
Description	-The value of XS [8:0] and XE [8:0] are referred when RAMWR command comes. -Each value represents one column line in the Frame Memory. 												
Restriction	XS [8:0] always must be equal to or less than XE [8:0] When XS [8:0] or XE [8:0] is greater than maximum address like below, data of out of range will be ignored. (Parameter range: 0 < XS [8:0] < XE [8:0] < 359 (0167h)): MV="0") (Parameter range: 0 < XS [8:0] < XE [8:0] < 389 (0185h)): MV="1")												
Register availability	Status | Availability												

	Normal Mode On, Idle Mode Off, Sleep Out	Yes
	Normal Mode On, Idle Mode On, Sleep Out	Yes
	Partial Mode On, Idle Mode Off, Sleep Out	Yes
	Partial Mode On, Idle Mode On, Sleep Out	Yes
	Sleep In	Yes

Default

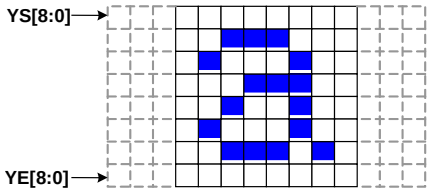
Status	Default Value	
Power On Sequence	XS[8:0]=0x00	XE[8:0]=0167h
S/W Reset	XS[8:0]=0x00	When MV=0: XE[8:0]=0167h, When MV=1: XE[8:0]=0185h
H/W Reset	XS[8:0]=0x00	XE[8:0]=0167h

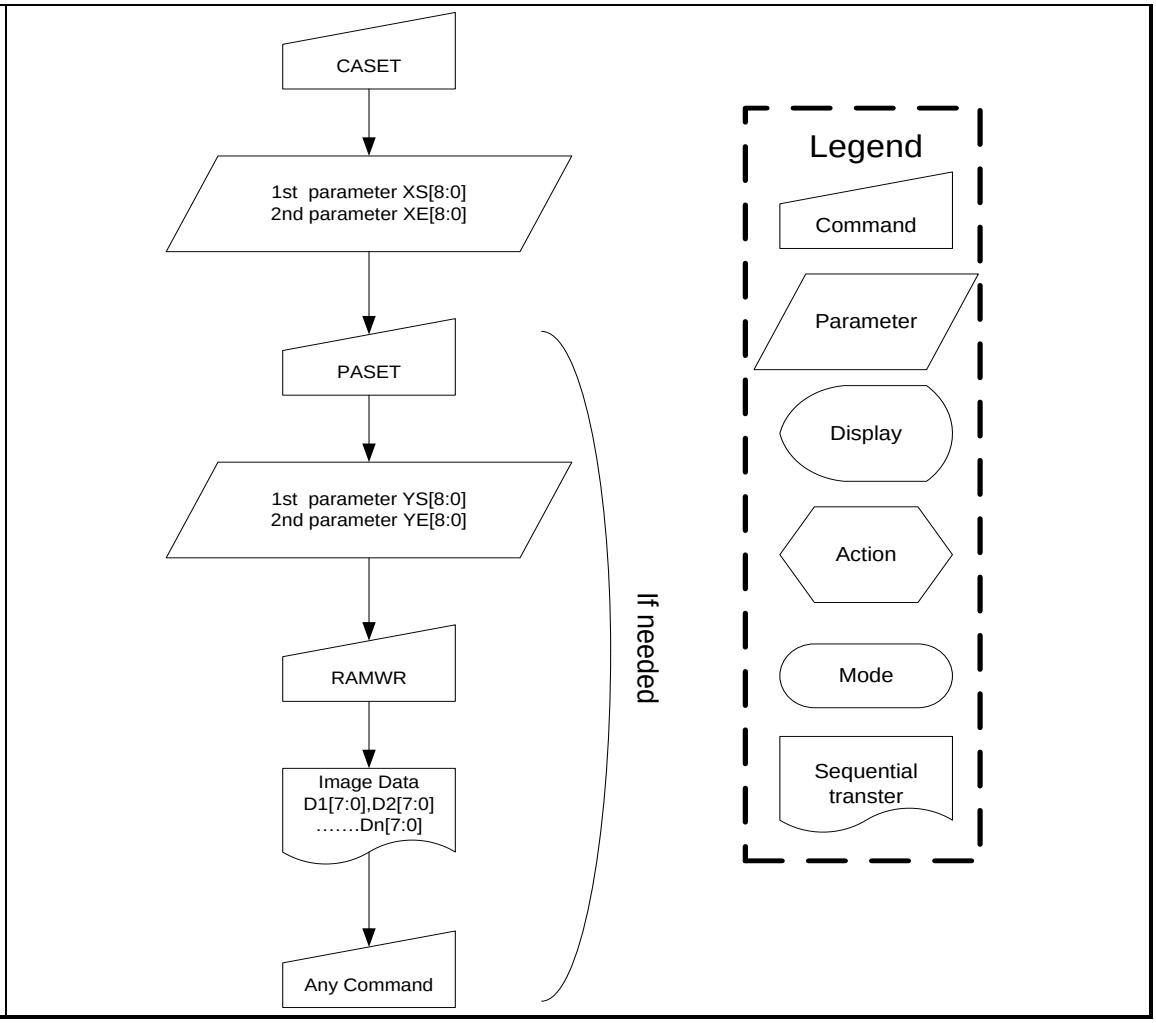
Flow Chart



RASET (2Bh): Row Address Set

2BH	RASET (Row Address Set)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RASET	0	↑	1	-	0	0	1	0	1	0	1	1	(2Bh)
1st parameter	1	↑	1	-	-	-	-	-	-	-	-	YS.8	(00h)

<table>
<tr><td>2nd parameter</td><td>1</td><td>↑</td><td>1</td><td>-</td><td colspan="8">YS.7-0</td><td>(00h)</td></tr>
<tr><td>3rd parameter</td><td>1</td><td>↑</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>YE.8</td><td>(01h)</td></tr>
<tr><td>4th parameter</td><td>1</td><td>↑</td><td>1</td><td>-</td><td colspan="8">YE.7-0</td><td>(85h)</td></tr>
<tr><td>Description</td><td colspan="13">-This command is used to define area of frame memory where MCU can access.
-The value of YS [8:0] and YE [8:0] are referred when RAMWR command comes.
-Each value represents one page line in the Frame Memory.
 
</td></tr>
<tr><td>Restriction</td><td colspan="13">YS [8:0] always must be equal to or less than YE [8:0]
When YS [8:0] or YE [8:0] is greater than maximum address like below, data of out of range will be ignored.
(Parameter range: 0 < YS [8:0] < YE [8:0] < 389 (0185h)): MV=”0”)
(Parameter range: 0 < YS [8:0] < YE [8:0] < 359 (0167h)): MV=”1”)</td></tr>
<tr><td>Register availability</td><td colspan="13"><table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table></td></tr>
<tr><td>Default</td><td colspan="13"><table><tr><th>Status</th><th colspan="2">Default Value</th></tr><tr><td>Power On Sequence</td><td>YS[8:0]=0000h</td><td>YE[8:0]=0185h</td></tr><tr><td>S/W Reset</td><td>YS[8:0]=0000h</td><td>When MV=0: YE[8:0]=0185h,
When MV=1: YE[8:0]=0167h</td></tr><tr><td>H/W Reset</td><td>YS[8:0]=0000h</td><td>YE[8:0]=0167h</td></tr></table></td></tr>
</table>

Flow Chart	

RAMWR (2Ch): Memory Write

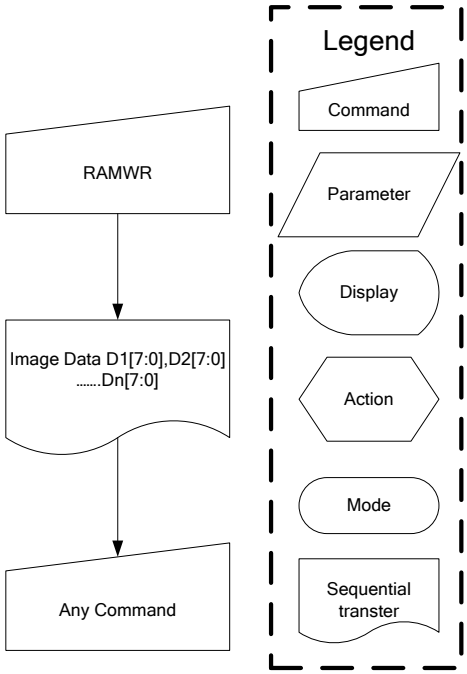
2CH	RAMWR (Memory Write)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RAMWR	0	↑	1	-	0	0	1	0	1	1	0	0	(2Ch)
1st parameter	1	↑	1	-	D1.7-0								-
…	1	↑	1	-	Dx.7-0								-
N parameter	1	↑	1	-	Dn.7-0								-
Description	-This command is used to transfer data from MCU to frame memory. -When this command is accepted, the column register and the page register are reset to the start column/start page positions. -The start column/start page positions are different in accordance with MADCTL setting. -Sending any other command can stop frame write.												
Restriction	In all color modes, there is no restriction on length of parameters.												
Register availability	Status: Normal Mode On, Idle Mode Off, Sleep Out — Availability: Yes												

Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Contents of memory is set randomly
S/W Reset	Contents of memory is not cleared
H/W Reset	Contents of memory is not cleared

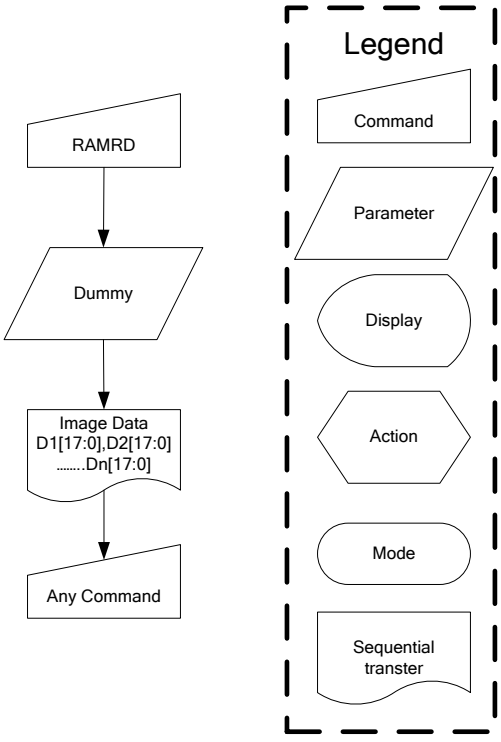
Flow Chart



RAMRD (2Eh): Memory Read

2CH	RAMRD (Memory Read)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RAMRD	0	↑	1	-	0	0	1	0	1	1	1	0	(2Eh)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	D1.7-0								-
:	1	1	↑	:	:								:
(N+1)th parameter	1	1	↑	-	Dn.7-0								-
Description	-This command is used to transfer data from frame memory to MCU. -When this command is accepted, the column register and the row register are reset to the Start Column/Start Row positions. -The Start Column/Start Row positions are different in accordance with MADCTL setting. -Then D[8:0] is read back from the frame memory and the column register and the row register incremented												

<table>
<tr><td></td><td>-Frame Read can be cancelled by sending any other command.
-The data color coding is fixed to 18-bit in reading function. Please see section 9.8 “Data color coding” for color coding (18-bit cases), when there is used 8, 9 data lines for image data.

Note1: The Command 3Ah should be set to 66h when reading pixel data from frame memory.</td></tr>
<tr><td>Restriction</td><td></td></tr>
<tr><td>Register availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>Contents of memory is set randomly</td></tr>
<tr><td>S/W Reset</td><td>Contents of memory is not cleared</td></tr>
<tr><td>H/W Reset</td><td>Contents of memory is not cleared</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

VSCRDEF (33h): Vertical Scrolling Definition

33H	VSCRDEF (Vertical Scrolling Definition)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX

VSCRDEF	0	↑	1	-	0	0	1	1	0	0	1	1	(33h)
1st parameter	1	↑	1	-	-	-	-	-	-	-	-	TFA.8	(00h)
2nd parameter	1	↑	1	-	TFA.7-0								(00h)
3rd parameter	1	↑	1	-	-	-	-	-	-	-	-	VSA.8	(01h)
4th parameter	1	↑	1	-	VSA.7-0								(86h)
5th parameter	1	↑	1		-	-	-	-	-	-	-	BFA.8	(00h)
6th parameter	1	↑	1		BFA.7-0								(00h)

Description

-This command just defines the Vertical Scrolling Area of the display and not performs vertical scroll

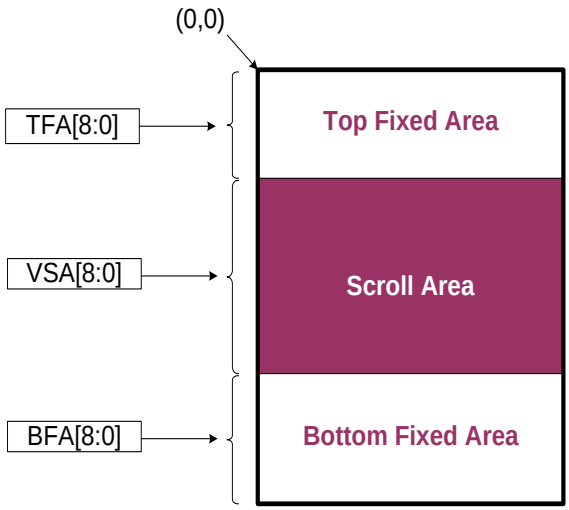
-When MADCTL MV=0

-The 1st & 2nd parameter TFA [8:0] describes the Top Fixed Area (in No. of lines from Top of the Frame Memory and Display).

-The 3rd & 4th parameter VSA [8:0] describes the height of the Vertical Scrolling Area (in No. of lines of the Frame Memory [not the display] from the Vertical Scrolling Start Address) The first line appears immediately after the bottom most line of the Top Fixed Area.

-The 5th & 6th parameter BFA [8:0] describes the Bottom Fixed Area (in No. of lines from Bottom of the Frame Memory and Display).

TFA, VSA and BFA refer to the Frame Memory Line Pointer



Restriction

The condition is TFA+VSA+BFA = 390, otherwise Scrolling mode is undefined.

In Vertical Scrolling Mode, MADCTL parameter MV should be set to '0' – this only affects the Frame Memory write.

Register availability

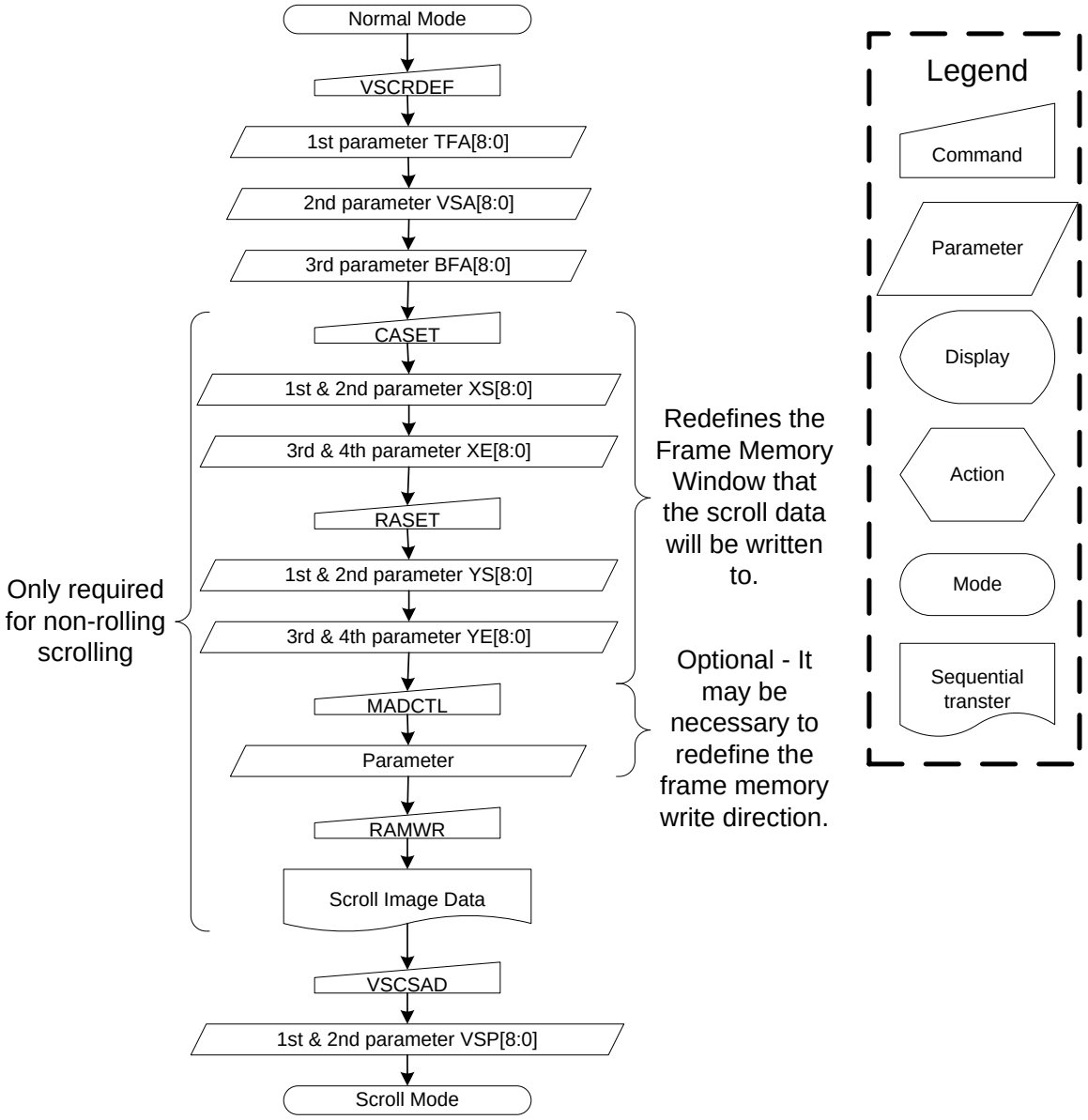
Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value		
Power On Sequence	TFA[8:0] = 0000h	VSA[8:0] = 0186h	BFA[8:0] = 0000h
S/W Reset	TFA[8:0] = 0000h	VSA[8:0] = 0186h	BFA[8:0] = 0000h
H/W Reset	TFA[8:0] = 0000h	VSA[8:0] = 0186h	BFA[8:0] = 0000h

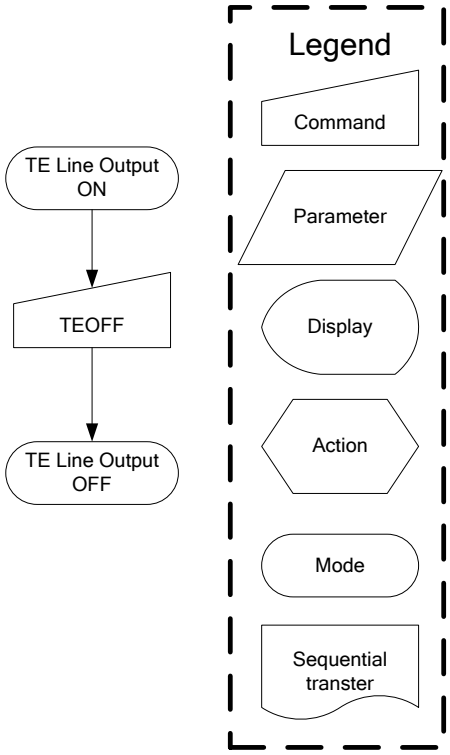
Flow Chart

1. TO Enter Vertical Scroll Mode:



TEOFF (34h): Tearing Effect Line OFF

34H	TEOFF (Tearing Effect Line OFF)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
TEOFF	0	↑	1	-	0	0	1	1	0	1	0	0	(34h)

<table>
<tr><td>parameter</td><td>No Parameter</td></tr>
<tr><td>Description</td><td>-This command is used to turn OFF (Active Low) the Tearing Effect output signal from the TE signal line.</td></tr>
<tr><td>Restriction</td><td>This command has no effect when tearing effect output is already off..</td></tr>
<tr><td>Register availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>Off</td></tr>
<tr><td>S/W Reset</td><td>Off</td></tr>
<tr><td>H/W Reset</td><td>Off</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

TEON (35h): Tearing Effect Line On

35H	TEON (Tearing Effect Line On)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
TEON	0	↑	1	-	0	0	1	1	0	1	0	1	(35h)
parameter	1	↑	1	-	0	0	0	0	0	0	0	TE_MD	(00h)

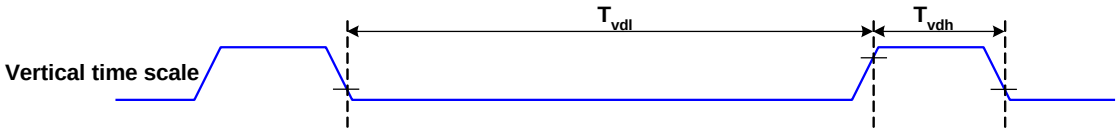
Description

-This command is used to turn ON the Tearing Effect output signal from the TE signal line.

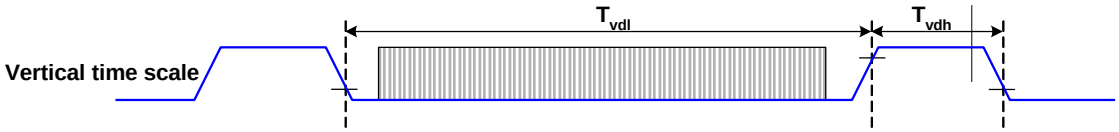
-This output is not affected by changing MADCTL bit ML.

-The Tearing Effect Line On has one parameter, which describes the mode of the Tearing Effect Output Line:

-When TEM ='0': The Tearing Effect output line consists of V-Blanking information only



-When TEM ='1': The Tearing Effect output Line consists of both V-Blanking and H-Blanking information



Note: During Sleep In Mode with Tearing Effect Line On, Tearing Effect Output pin will be active Low.

Restriction

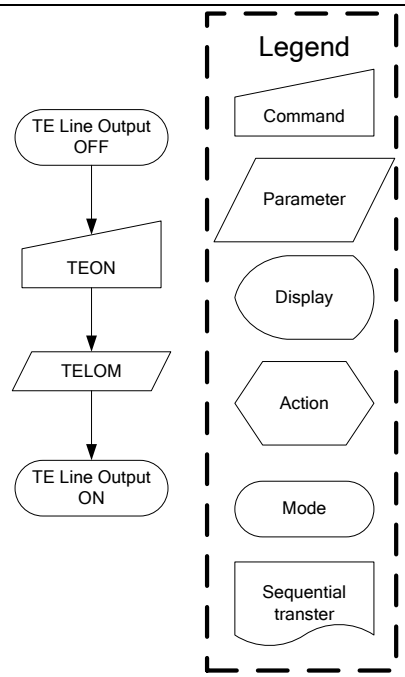
This command has no effect when tearing effect output is already on.

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Off
S/W Reset	Off
H/W Reset	Off

Flow Chart	

MADCTL (36h): Memory Data Access Control

36H	MADCTL (Memory Data Access Control)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
MADCTL	0	↑	1	-	0	0	1	1	0	1	1	0	(36h)
parameter	1	↑	1	-	MY	MX	MV	ML	RGB	MH	HSD	-	(00h)

Description

-This command defines read/ write scanning direction of frame memory.

Bit	NAME	DESCRIPTION
D7	MY	Page Address Order
D6	MX	Column Address Order
D5	MV	Page/Column Order
D4	ML	Line Address Order
D3	RGB	RGB/BGR Order
D2	MH	Display Data Latch Order
D1	HSD	Horizontal Scroll Address Order

-Bit Assignment

Bit D7- Page Address Order

“0” = Top to Bottom (When MADCTL D7=”0”).

“1” = Bottom to Top (When MADCTL D7=”1”).

Bit D6- Column Address Order

“0” = Left to Right (When MADCTL D6=”0”).

“1” = Right to Left (When MADCTL D6=”1”).

Bit D5- Page/Column Order

“0” = Normal Mode (When MADCTL D5=”0”).

“1” = Reverse Mode (When MADCTL D5=”1”)

Note: Bits D7 to D5, also refer to section 8.12 Address Control

Bit D4- Line Address Order

“0” = LCD Refresh Top to Bottom (When MADCTL D4=”0”)

“1” = LCD Refresh Bottom to Top (When MADCTL D4=”1”)

Bit D3- RGB/BGR Order

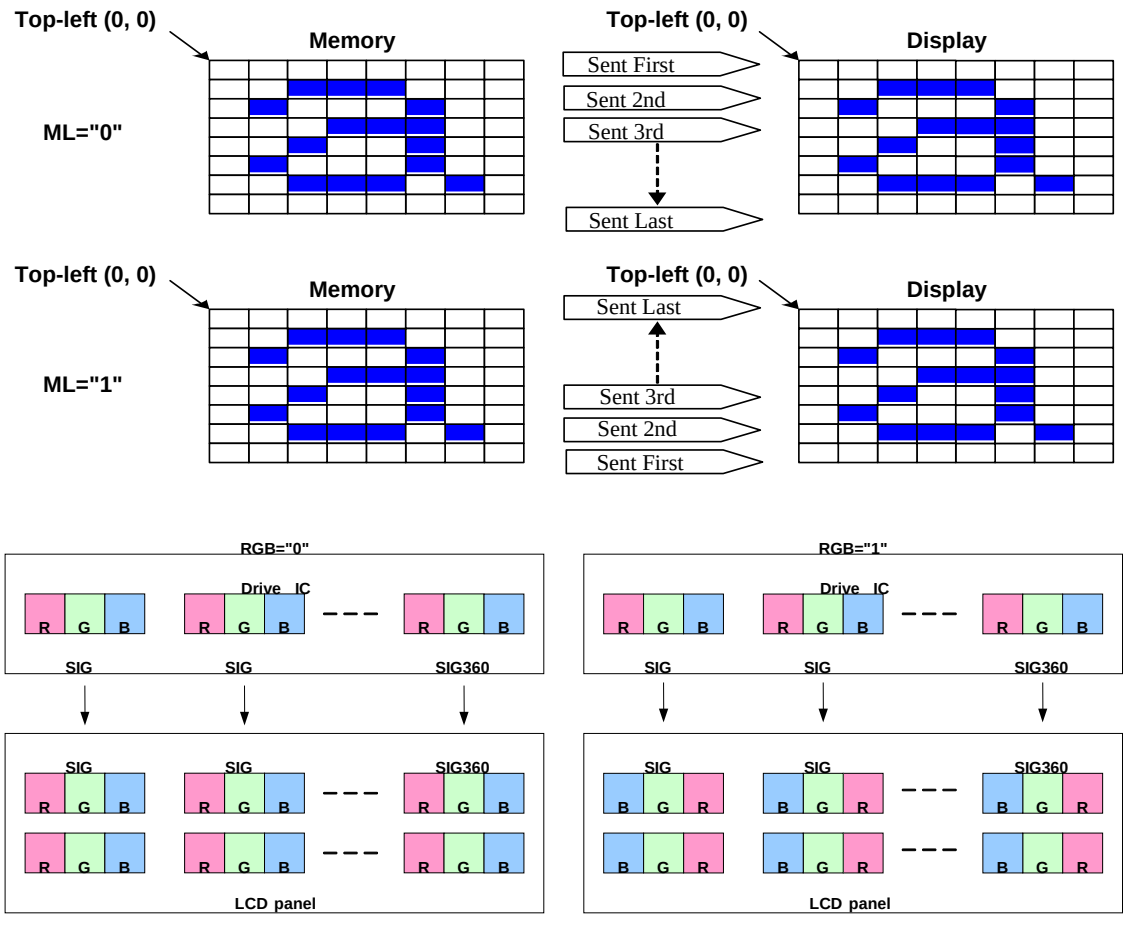
“0” = RGB (When MADCTL D3=”0”)

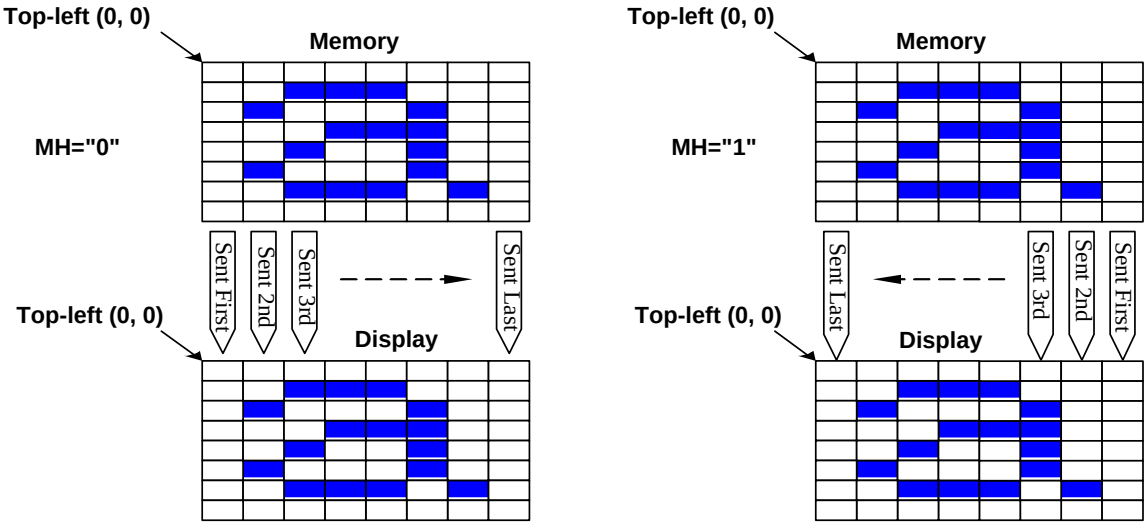
“1” = BGR (When MADCTL D3=”1”)

Bit D2- Display Data Latch Data Order

“0” = LCD Refresh Left to Right (When MADCTL D2=”0”)

“1” = LCD Refresh Right to Left (When MADCTL D2=”1”)



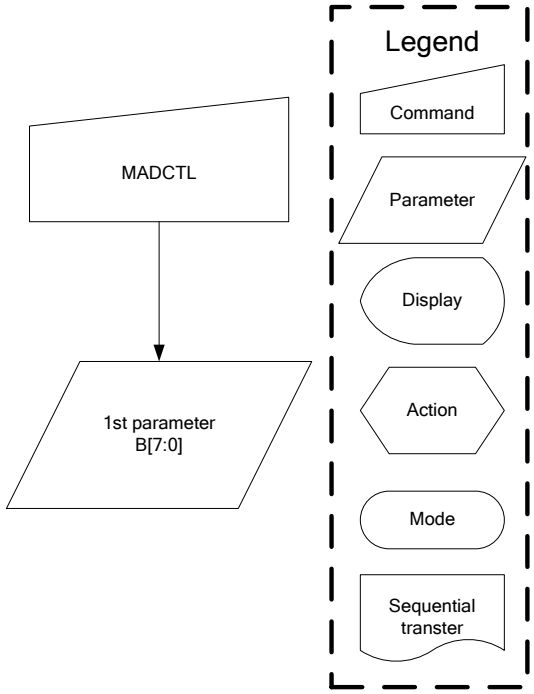


Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000h
S/W Reset	No change
H/W Reset	0000h

Flow Chart	

VSCSAD (37h): Vertical Scroll Start Address of RAM

37H	VSCSAD (Vertical Scroll Start Address of RAM)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
VSCSAD	0	↑	1	-	0	0	1	1	0	1	1	1	(37h)
1ST parameter	1	↑	1	-	-	-	-	-	-	-	-	VSP.8	(00h)
2ND parameter	1	↑	1	-	VSP.7-0								(00h)

Description

-This command is used together with Vertical Scrolling Definition (33h).

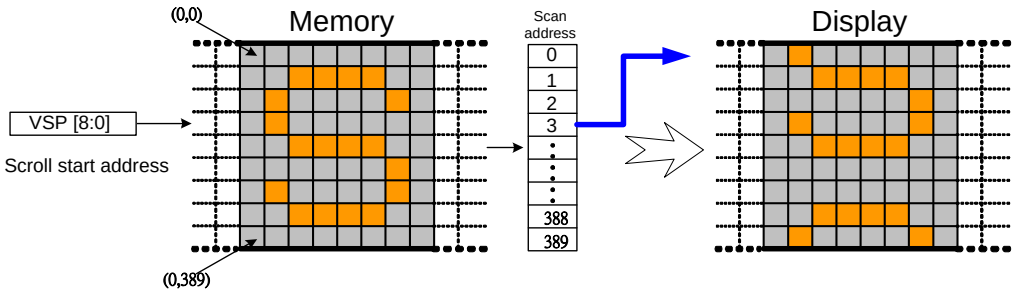
-These two commands describe the scrolling area and the scrolling mode.

-The Vertical Scrolling Start Address command has one parameter which describes which line in the Frame Memory will be written as the first line after the last line of the Top Fixed Area on the display as illustrated below:

When ML=0

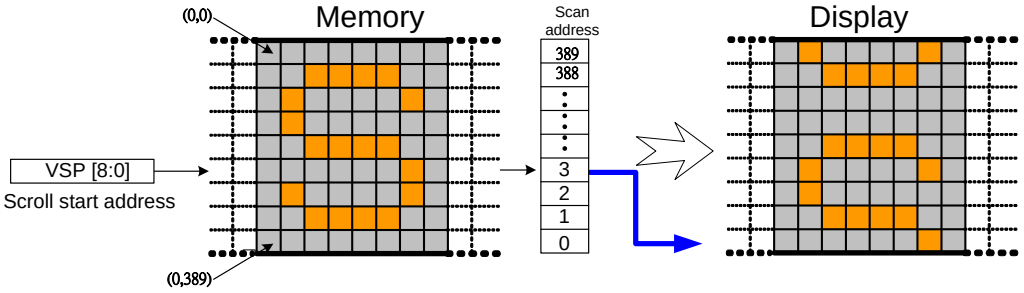
Example:

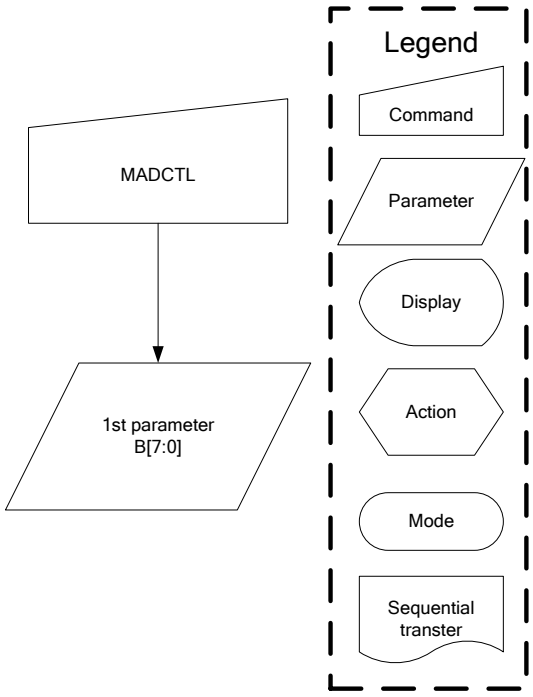
When Top Fixed Area = Bottom Fixed Area = 00, vertical Scrolling Area = 390 and VSP = '3'



When ML=1

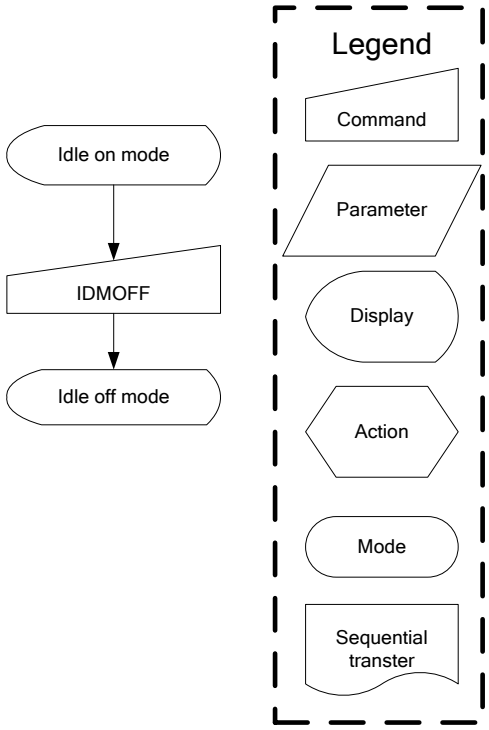
Example:

<table>
<tr><td></td><td>When Top Fixed Area = Bottom Fixed Area = 00, vertical Scrolling Area = 390 and VSP = ‘3’
 

NOTE: When new Pointer position and Picture Data are sent, the result on the display will happen at the next Panel Scan to avoid tearing effect.
VSP refers to the Frame Memory line Pointer</td></tr>
<tr><td>Register availability</td><td>Since the value of the vertical scrolling start address is absolute (with reference to the frame memory), it must not enter the fixed area (defined by Vertical Scrolling Definition (33h)- otherwise undesirable image will be displayed on the panel)</td></tr>
<tr><td>Default</td><td><table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>0000h</td></tr>
<tr><td>S/W Reset</td><td>No change</td></tr>
<tr><td>H/W Reset</td><td>0000h</td></tr>
</table></td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

IDMOFF (38h): Idle Mode Off

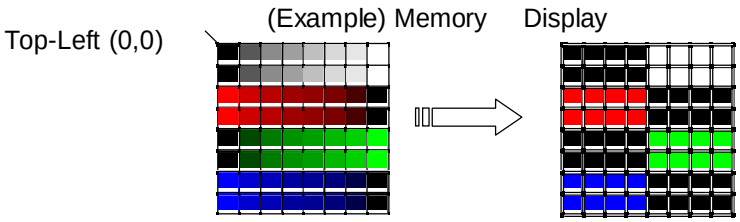
38H	IDMOFF (Idle Mode Off)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
IDMOFF	0	↑	1	-	0	0	1	1	1	0	0	0	(38h)

<table>
<tr><td>parameter</td><td>No Parameter</td></tr>
<tr><td>Description</td><td>-This command is used to recover from Idle mode on.
-In the idle off mode,
1. LCD can display 65k or 262k colors.
2. Normal frame frequency is applied.</td></tr>
<tr><td>Restriction</td><td>This command has no effect when module is already in idle off mode</td></tr>
<tr><td>Register availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>Idle mode off</td></tr>
<tr><td>S/W Reset</td><td>Idle mode off</td></tr>
<tr><td>H/W Reset</td><td>Idle mode off</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

IDMON (39h): Idle Mode On

39H	IDMON (Idle Mode On)

Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
IDMON	0	↑	1	-	0	0	1	1	1	0	0	1	(39h)
parameter	No Parameter												
Description	-This command is used to enter into Idle mode on. -There will be no abnormal visible effect on the display mode change transition. -In the idle on mode, 1. Color expression is reduced. The primary and the secondary colors using MSB of each R,G and B in the Frame Memory, 8 color depth data is displayed. 2. 8-Color mode frame frequency is applied. 3. Exit from IDMON by Idle Mode Off (38h) command												
Restriction	This command has no effect when module is already in idle off mode												
Register availability													



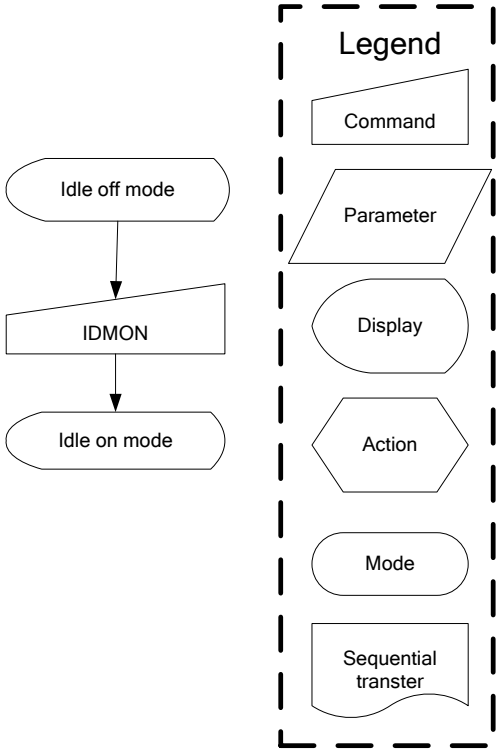
Color	R5 R4 R3 R2 R1 R0	G5 G4 G3 G2 G1 G0	B5 B4 B3 B4 B1 B0
Black	0xxxxx	0xxxxx	0xxxxx
Blue	0xxxxx	0xxxxx	1xxxxx
Red	1xxxxx	0xxxxx	0xxxxx
Magenta	1xxxxx	0xxxxx	1xxxxx
Green	0xxxxx	1xxxxx	0xxxxx
Cyan	0xxxxx	1xxxxx	1xxxxx
Yellow	1xxxxx	1xxxxx	0xxxxx
White	1xxxxx	1xxxxx	1xxxxx

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Idle mode off
S/W Reset	Idle mode off
H/W Reset	Idle mode off

Flow Chart



MOLMOD (3Ah): Interface Pixel Format

3AH	COLMOD (Interface Pixel Format)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
COLMOD	0	↑	1	-	0	0	1	1	1	0	1	0	(3Ah)
Parameter	1	↑	1	-	-	VIPF.2-0			-	IFPF.2-0			(66h)

Description

This command is used to define the format of RGB picture data, which is to be transferred via the MCU interface. The formats are shown in the table:

1st parameter:

Bit	Name	Description
D7	-	Set to '0'
VIPF.2-0	RGB interface color format	'101' = 65K of RGB interface '110' = 262K of RGB interface
D3	-	Set to '0'
IFPF.2-0	Control interface color format	'101' = 16bit/pixel '110' = 18bit/pixel

Note1: In 16-bit/Pixel or 18-bit/Pixel mode, the LUT is applied to transfer data into the Frame Memory.

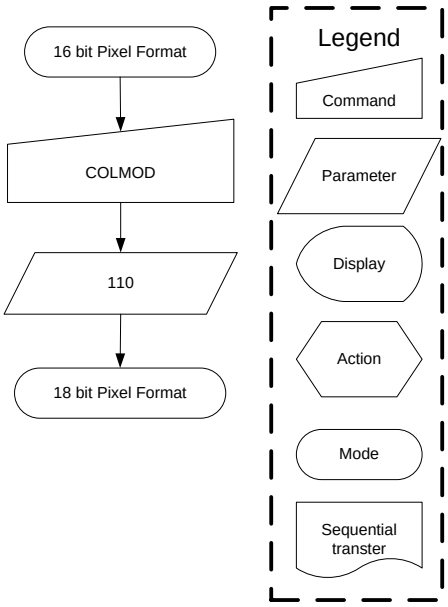
Note2: The Command 3Ah should be set at 55h when writing 16-bit/pixel data into frame memory, but 3Ah should be re-set to 66h when reading pixel data from frame memory.

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

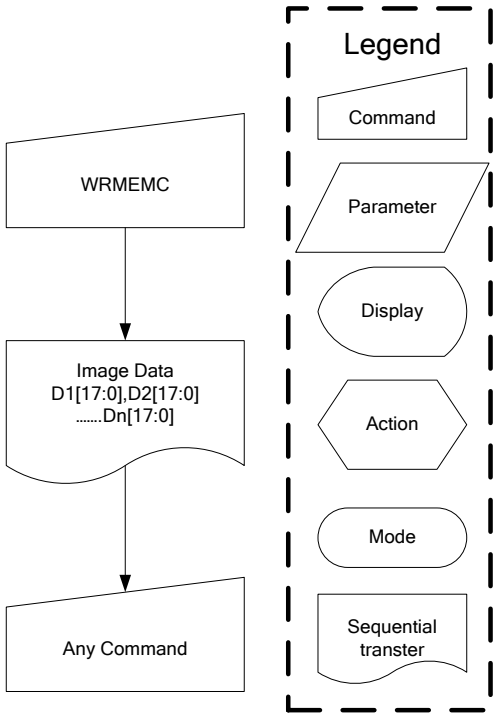
Default

Status	Default Value
Power On Sequence	18bit/pixel
S/W Reset	No change
H/W Reset	18bit/pixel

Flow Chart	

WRMEMC (3Ch): Write Memory Continue

3CH	WRMEMC (Write Memory Continue)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
WRMEMC	0	↑	1	-	0	0	1	0	1	1	0	0	(3Ch)
1ST parameter	1	↑	1	-	D1.7-0								-
⋮	1	↑	1	-	Dx.7-0								-
Nth parameter	1	↑	1	-	Dn.7-0								-
Description	-This command transfers image data from the host processor to the display module's frame memory continuing from the pixel location following the previous write memory continue or memory write command. -If MV=0: Data is written continuing from the pixel location after the write range of the previous memory write or write memory continue. The column register is then incremented and pixels are written to the frame memory until the column register equals the end column (XE) value. The column register is then reset to XS and the page register is incremented. Pixels are written to the frame memory until the page register equals the end page (YE) value and the column register equals the XE value, or the host processor sends another command. If the number of pixels exceeds (XE-XS+1)*(YE-YS+1) the extra pixels are ignored. If MV=1: Data is written continuing from the pixel location after the write range of the previous memory write or write memory continue. The page register is then incremented and pixels are written to the frame memory until the page register equals the end page (YE) value. The page register is then reset to YS and the column register is incremented. Pixels are written to the frame memory until the column register equals the end column (XE) value and the page register equals the YE value, or the host processor sends another command. If the number of pixels exceeds (XE-XS+1)*(YE-YS+1) the extra pixels are ignored.												

	<table><tr><th>Condition</th><th>Column</th><th>Page</th></tr><tr><td>Command 2C is accepted</td><td>Return to “Start Column”</td><td>Return to “Start Page”</td></tr><tr><td>Read/Write RAM action</td><td>Increment by 1</td><td>No change</td></tr><tr><td>Column value is large than “End Column”</td><td>Return to “Start Column”</td><td>Increment by 1</td></tr><tr><td>Page value is large than “End Page”</td><td>Return to “Start Column”</td><td>Return to “Start Page”</td></tr></table>
Restriction	A memory write should follow a column address set or page address set to define the write address. Otherwise, data written with write memory continue is written to undefined addresses.
Register availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>
Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>Contents of memory is set randomly</td></tr><tr><td>S/W Reset</td><td>Contents of memory is not cleared</td></tr><tr><td>H/W Reset</td><td>Contents of memory is not cleared</td></tr></table>
Flow Chart	

RDMEMC (3Eh): Read Memory Continue

3EH	RDMEMC (Read Memory Continue)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDMEMC	0	↑	1	-	0	0	1	1	1	1	1	0	(3Eh)
1ST parameter	1	1	↑	-	-	-	-	-	-	-	-	-	-
2nd parameter	1	1	↑	-	D1.7-0								-
⋮	1	1	↑		Dx.7-0								
(N+1)th parameter	1	1	↑	-	Dn.7-0								-

Description

-This command transfers image data from the host processor to the display module's frame memory continuing from the pixel location following the previous read memory continue or memory read command.

-If MV=0:

Pixels are read continuing from the pixel location after the read range of the previous memory read or read memory continue. The column register is then incremented and pixels are read from the frame memory until the column register equals the end column (XE) value. The column register is then reset to XS and the page register is incremented. Pixels are read from the frame memory until the page register equals the end page (YE) value and the column register equals the XE value, or the host processor sends another command.

If MV=1:

Pixels are read continuing from the pixel location after the read range of the previous memory read or read memory continue. The page register is then incremented and pixels are read from the frame memory until the page register equals the end page (YE) value. The page register is then reset to YS and the column register is incremented. Pixels are read from the frame memory until the column register equals the end column (XE) value and the page register equals the YE value, or the host processor sends another command

Restriction

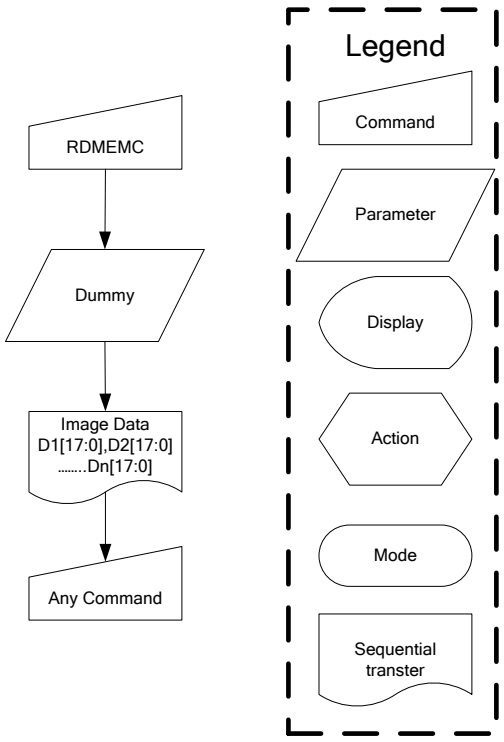
Regardless of the color mode set in interface pixel format, the pixel format returned by read memory continue is always 18-bit so there is no restriction on the length of data

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Contents of memory is set randomly
S/W Reset	Contents of memory is not cleared
H/W Reset	Contents of memory is not cleared

Flow Chart	

HSCRDEF (43h): Horizontal Scrolling Definition

43H	HSCRDEF (Horizontal Scrolling Definition)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
HSCRDEF	0	↑	1	-	0	0	1	1	0	0	1	1	(43h)
1st parameter	1	↑	1	-	-	-	-	-	-	-	-	LFA.8	(00h)
2nd parameter	1	↑	1	-	LFA.7-0								(00h)
3rd parameter	1	↑	1	-	-	-	-	-	-	-	-	HSA.8	(01h)
4th parameter	1	↑	1	-	HSA.7-0								(68h)
5th parameter	1	↑	1		-	-	-	-	-	-	-	RFA.8	(00h)
6th parameter	1	↑	1		RFA.7-0								(00h)

Description

-This command just defines the Vertical Scrolling Area of the display and not performs vertical scroll

-When MADCTL HSD=0

-The 1st & 2nd parameter LFA [8:0] describes the Left Fixed Area (in No. of columns from Left of the Frame Memory and Display).

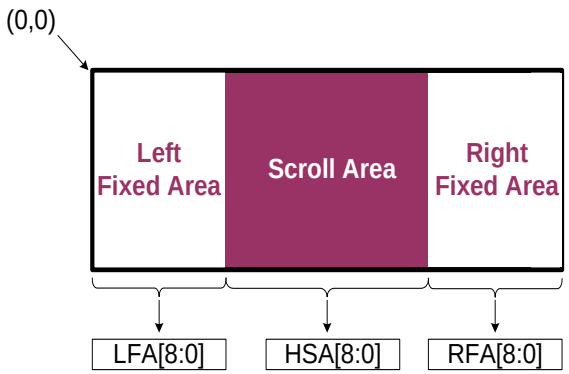
-The 3rd & 4th parameter HSA [8:0] describes the width of the Horizontal Scrolling Area (in No. of columns of the Frame Memory [not the display] from the Horizontal Scrolling Start Address) The first columns appears immediately after the right most columns of the Left Fixed Area.

-The 5th & 6th parameter RFA [8:0] describes the Right Fixed Area (in No. of columns from Right of the Frame Memory and Display).

- If DUAL_EN set 0, the LFA [8:0]、HSA [8:0] and RFA [8:0] only can be set to times of 12. (0, 12, 24, 36,…., 324, 336, 348, 360)

- If DUAL_EN set 1, the LFA [8:0]、HSA [8:0] and RFA [8:0] only can be set to times of 24. (0, 24, 48, 72,…., 288, 312, 336, 360)

LFA, HSA and RFA refer to the Frame Memory columns Pointer



Restriction

The condition is LFA+HSA+RFA = 360, otherwise Scrolling mode is undefined.

In Horizontal Scrolling Mode, MADCTL parameter MV should be set to '0' – this only affects the Frame Memory write.

Register

availability

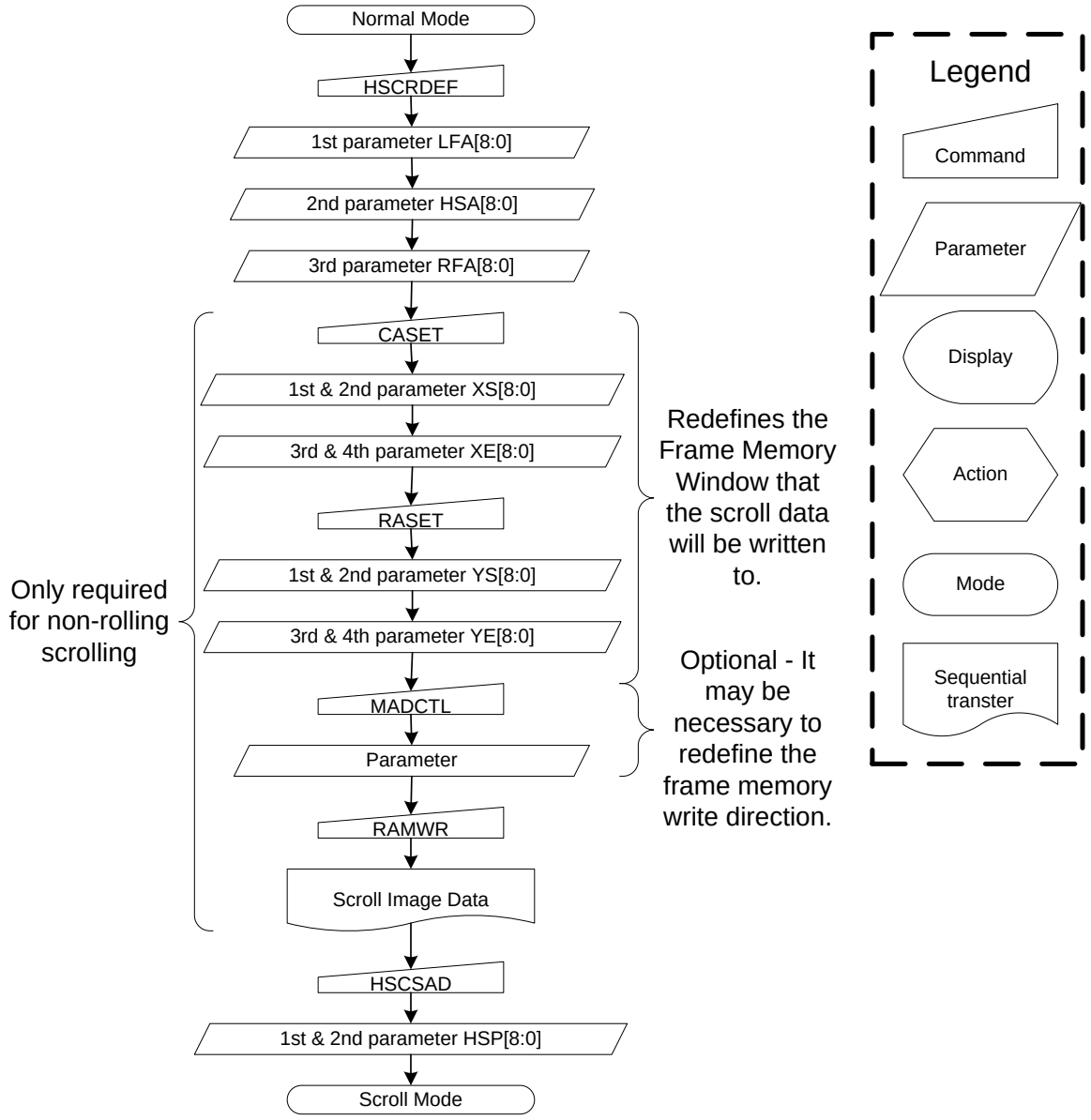
Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value		
Power On Sequence	LFA[8:0] = 0000h	HSA[8:0] = 0168h	RFA[8:0] = 0000h
S/W Reset	LFA[8:0] = 0000h	HSA[8:0] = 0168h	RFA[8:0] = 0000h
H/W Reset	LFA[8:0] = 0000h	HSA[8:0] = 0168h	RFA[8:0] = 0000h

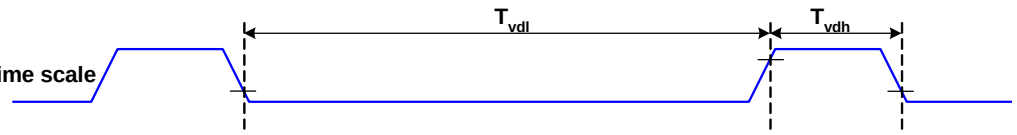
Flow Chart

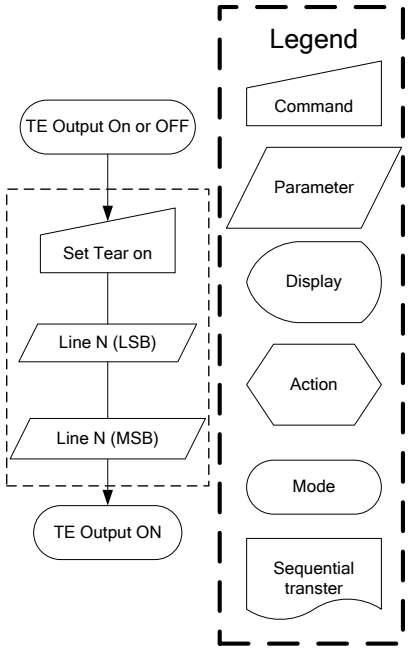
1. TO Enter Horizontal Scroll Mode:



TESLWR (44h): Write Tear Scanline

44H	STE (Write Tear Scanline)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
TESLWR	0	↑	1	-	0	1	0	0	0	1	0	0	(44h)
1st parameter	1	↑	1	-	-	-	-	-	N.11-8				(00h)
2nd parameter	1	↑	1	-	N.7-0								(00h)
Description	-This command turns on the display module's Tearing Effect output signal on the TE signal line when the display module reaches line N. The TE signal is not affected by changing MV. -The tearing effect line on has one parameter that describes the tearing effect output line mode. -The tearing effect output line consist of V-blanking information only.												

<table>
<tr><td></td><td>Vertical time scale
 

Note that set tear scanline with N=0 is equivalent to tearing effect line on with TEM=0.
The tearing effect output line shall be active low when the display module is in sleep mode</td></tr>
<tr><td>Restriction</td><td>This command takes effect on the frame following the current frame. Therefore, if the tear effect (TE) output is already on, the TE output shall continue to operate as programmed by the previous tearing effect line on or set tear scanline command until the end of the frame</td></tr>
<tr><td>Register availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>0000h</td></tr>
<tr><td>S/W Reset</td><td>0000h</td></tr>
<tr><td>H/W Reset</td><td>0000h</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

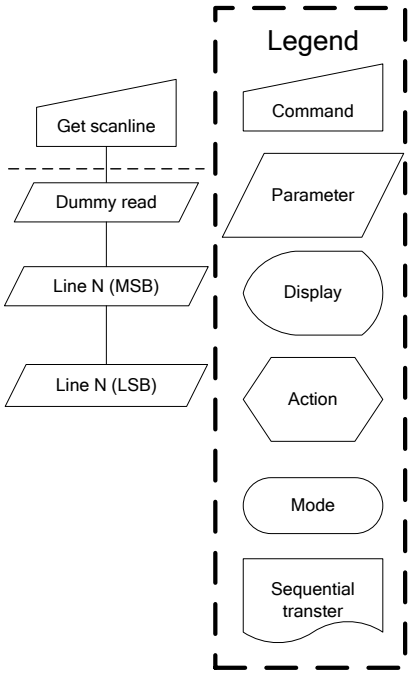
TESLRD (45h): Read Tear Scanline

45H	TESLRD (Read Tear Scanline)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
TESLRD	0	↑	1	-	0	1	0	0	0	1	0	1	(45h)
1st parameter	1	1	↑	-	-	-	-	-	N.11-8				(00h)
2nd parameter	1	1	↑	-	N.7-0								(00h)
Description	-The display module returns the current scanline ,N, used to update the display device. The total number of scanlines on a display device is defined as VSYNC+VBP+VACT+VFP. The first scanline is defined as the first line of V Sync and is denoted as Line 0. -When in sleep in mode, the value returned by get scanline is undefined. Note: that Set Tear Scan Line with N = 0 is equivalent to Tearing Effect Line ON with M = 0.												
Restriction	-												
Register availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000h
S/W Reset	0000h
H/W Reset	0000h

Flow Chart	

HSCSAD (47h): Horizontal Scroll Start Address of RAM

47H	HSCSAD (Horizontal Scroll Start Address of RAM)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
HSCSAD	0	↑	1	-	0	1	0	0	0	1	1	1	(47h)
1ST parameter	1	↑	1	-	0	0	0	0	0	0	0	HSP.8	(00h)
2ND parameter	1	↑	1	-	HSP.7-0								(00h)

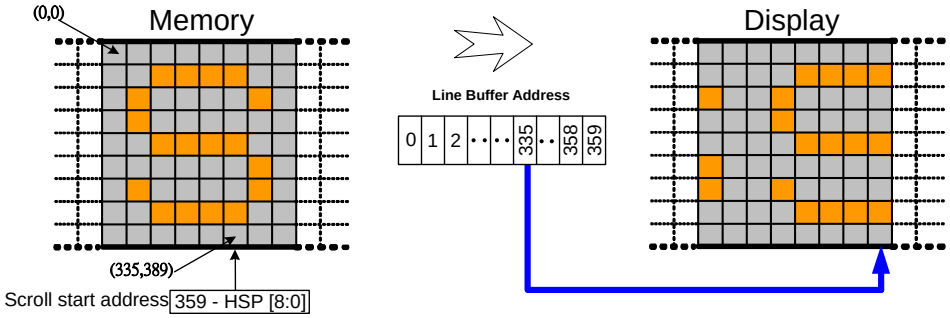
Description

- If DUAL_EN set 0, the HSP[8:0] only can be set to times of 12. (0, 12, 24, 36,…., 324, 336, 348, 360)
- If DUAL_EN set 1, the HSP[8:0] only can be set to times of 24. (0, 24, 48, 72,…., 288, 312, 336, 360)

When HSD=0

Example:

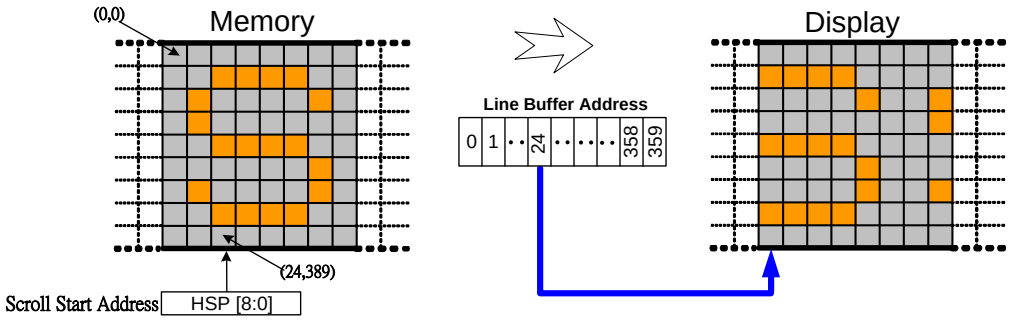
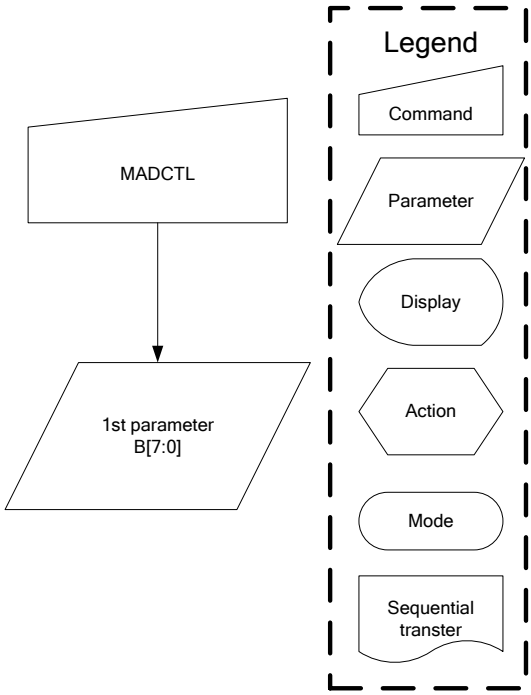
When HSP[7:0] = 24



When HSD=1

Example:

When HSP[7:0] = 24

<table>
<tr><td></td><td> 
</td></tr>
<tr><td>Register availability</td><td>Since the value of the horizontal scrolling start address is absolute (with reference to the frame memory), it must not enter the fixed area (defined by Horizontal Scrolling Definition (43h)- otherwise undesirable image will be displayed on the panel)</td></tr>
<tr><td>Default</td><td><table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>0000h</td></tr>
<tr><td>S/W Reset</td><td>No change</td></tr>
<tr><td>H/W Reset</td><td>0000h</td></tr>
</table></td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

RAMCLACT (4Ch): Memory Clear Act

4CH	RAMCLACT (Memory Clear Act)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RAMCLACT	0	↑	1	-	0	1	0	0	1	1	0	0	(4Ch)
parameter	1	↑	1	-	-	-	-	-	-	-	-	FILLEN	(00h)
Description	**FILLEN:**												

	"0": No Function. "1": Trigger IC to fill all pixels data in RAM.
Restriction	
Register availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	0000-0000
S/W Reset	0000-0000
H/W Reset	0000-0000

Flow Chart	

RAMCLSETR (4Dh): Memory Clear Set R

4DH	RAMCLSETR (Memory Clear Set R)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RAMCLSETR	0	↑	1	-	0	1	0	0	1	1	0	1	(4Dh)
parameter	1	↑	1	-	R.5-0						-	-	(00h)
Description	R[5:0]: Red subpixel data setting												
Register availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	0000-0000
S/W Reset	0000-0000
H/W Reset	0000-0000

Flow Chart	

RAMCLSETG (4Eh): Memory Clear Set G

4EH	RAMCLSETG (Memory Clear Set G)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RAMCLSETG	0	↑	1	-	0	1	0	0	1	1	1	0	(4Eh)
parameter	1	↑	1	-	G.5-0						-	-	(00h)
Description	G[5:0]: Green subpixel data setting												

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000-0000
S/W Reset	0000-0000
H/W Reset	0000-0000

Flow Chart

RAMCLSETB (4Fh): Memory Clear Set B

4FH	RAMCLSETB (Memory Clear Set B)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RAMCLSETB	0	↑	1	-	0	1	0	0	1	1	1	1	(4Fh)
parameter	1	↑	1	-	B.5-0						-	-	(00h)
Description	B[5:0]: Blue subpixel data setting												

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

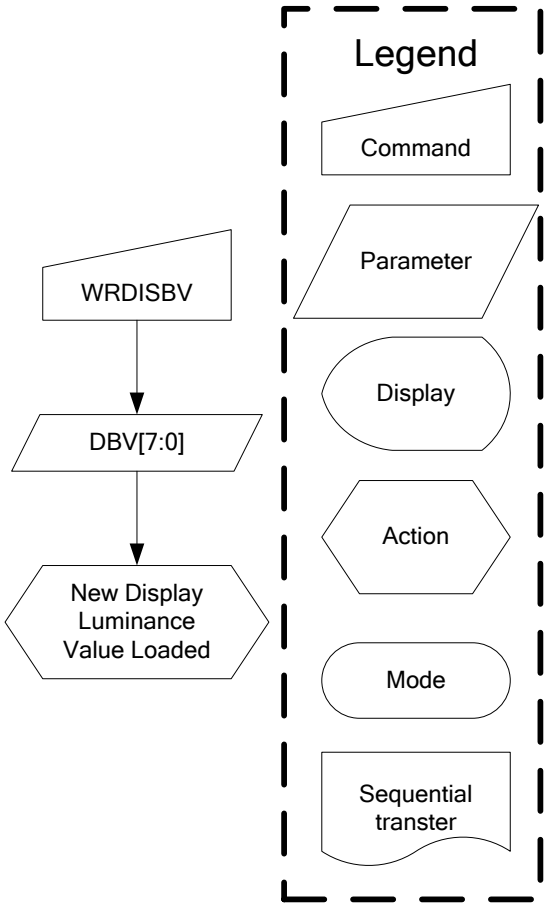
Default	Status: Power On Sequence — Default Value: 0000-0000 Status: S/W Reset — Default Value: 0000-0000 Status: H/W Reset — Default Value: 0000-0000
Flow Chart	

CDCCTR (50h): CDC Control

50H	CDCCTR (CDC Control)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CDCCTR	0	↑	1	-	0	1	0	1	0	0	0	0	(50h)
1st parameter	1	↑	1	-	CDC_EN	CDC_COMP_EN	CDC_COMP_MODE	CDC_SIDE_EN	CDC_NOTCH1_EN	CDC_NOTCH2_EN	-	-	(50h)
Description													
Restriction													
Register availability	Status: Normal Mode On, Idle Mode Off, Sleep Out — Availability: Yes Status: Normal Mode On, Idle Mode On, Sleep Out — Availability: Yes Status: Partial Mode On, Idle Mode Off, Sleep Out — Availability: Yes Status: Partial Mode On, Idle Mode On, Sleep Out — Availability: Yes Status: Sleep In — Availability: Yes												
Default	Status: Power On Sequence — Default Value: Status: S/W Reset — Default Value: Status: H/W Reset — Default Value:												
Flow Chart													

WRDISBV (51h): Write Display Brightness

51H	WRDISBV (Write Display Brightness)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
WRDISBV	0	↑	1	-	0	1	0	1	0	0	0	1	(51h)
Parameter	1	↑	1	-	DBV.7-0								(00h)
Description	-This command is used to adjust the brightness value of the display.												

<table>
<tr><td></td><td>-It should be checked what the relationship between this written value and output brightness of the display is. This relationship is defined on the display module specification.
-In principle relationship is that 00h value means the lowest brightness and FFh value means the highest brightness.</td></tr>
<tr><td>Restriction</td><td></td></tr>
<tr><td>Register availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>0000h</td></tr>
<tr><td>S/W Reset</td><td>0000h</td></tr>
<tr><td>H/W Reset</td><td>0000h</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td> 
</td></tr>
</table>

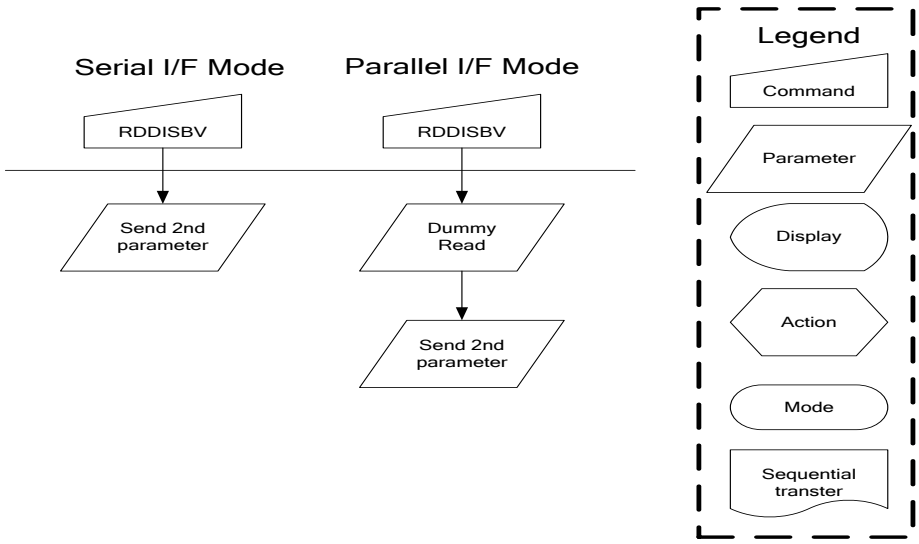
RDDISBV (52h): Read Display Brightness

52H	RDDISBV (Read Display Brightness Value)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDDISBV	0	↑	1	-	0	1	0	1	0	0	1	0	(52h)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	
2nd parameter	1	1	↑	-	DBV.7-0								(00h)
Description	-This command returns the brightness value of the display. -It should be checked what the relationship between this returned value and output brightness of the display. This relationship is defined on the display module specification is. -In principle the relationship is that 00h value means the lowest brightness and FFh value means the highest brightness. -DBV[7:0] is reset when display is in sleep in mode. -DBV[7:0] is '0' when bit BCTRL of write CTRL display command (53h) is '0' -DBV[7:0] IS manual set brightness specified with write CTRL display command (53h) when bit BCTRL is '1'												
Restriction	-												
Register availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000h
S/W Reset	0000h
H/W Reset	0000h

Flow Chart	

WRCTRLD (53h): Write CTRL Display

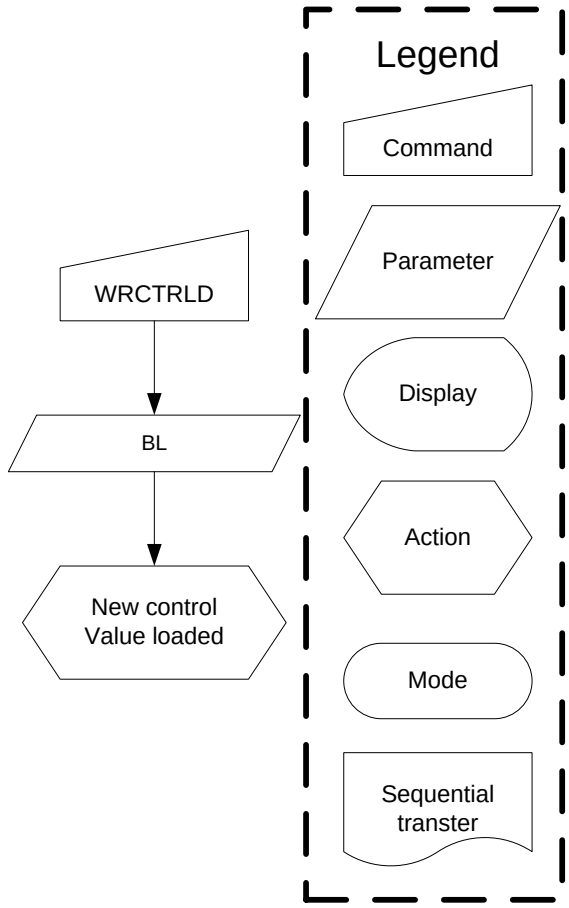
53H	WRCTRLD (Write CTRL Display)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
WRCTRLD	0	↑	1	-	0	1	0	1	0	0	1	1	(53h)
Parameter	1	↑	1	-	-	-	-	-	-	BL	-	-	(00h)
Description	-This command is used to control display brightness. -BL: Backlight Control On/Off 0 = Off (Completely turn off backlight circuit. Control lines must be low.) 1 = On												
Restriction													

Register availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	0000h
S/W Reset	0000h
H/W Reset	0000h

Flow Chart	

RDCTRLD (54h): Read CTRL Display

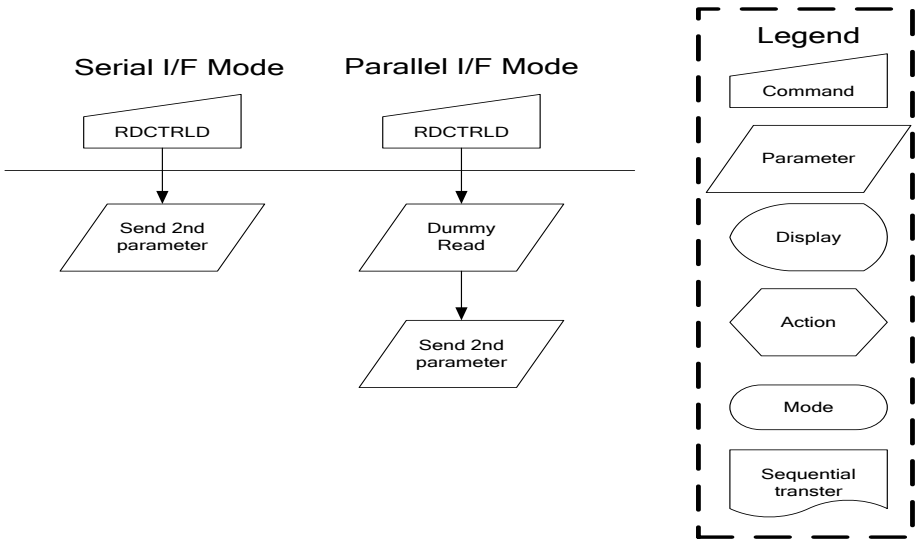
54H	RDCTRLD (Read CTRL value Display)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDCTRLD	0	↑	1	-	0	1	0	1	0	1	0	0	(54h)
1st parameter	1	1	↑	-	-	-	-	-	-	-	-	-	
2nd parameter	1	1	↑	-	-	-	-	-	-	BL	-	-	(00h)
Description	-This command returns ambient light and brightness control values. -BL: Backlight Control On/Off 0 = Off 1 = On												
Restriction	-												
Register availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes

		Sleep In	Yes
Default			

Status	Default Value
Power On Sequence	0000h
S/W Reset	0000h
H/W Reset	0000h

Flow Chart



CPRAMWR (6Ch): Compress Memory Write

6CH	CPRAMWR (Compress Memory Write)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CPRAMWR	0	↑	1	-	0	1	1	0	1	1	0	0	(6Ch)
parameter	1	↑	1	-	Write data stream								(00h)
Description	-For 262K Color Format: (when GCOMPR_C262 = 1 in command 6Fh) **D[7:2]:** 6-bit Red subpixel data setting **D[15:10]:** 6-bit Green subpixel data setting **D[23:18]:** 6-bit Blue subpixel data setting **D[31:24]:** Pixel number N = D[31:24] + 1. (N = 1~256) Trigger IC to fill N pixels (the pixel data is depend on D[23:2] setting) to RAM when D[31:24] is set. -For 65K Color Format: (when GCOMPR_C262 = 0 in command 6Fh) **D[7:3]:** 5-bit Red subpixel data setting **D[2:0] + MCW[15:13]:** 6-bit Green subpixel data setting **D[12:8]:** 5-bit Blue subpixel data setting **D[23:16]:** Pixel number N = D[23:16] + 1. (N=1~256) Trigger IC to fill N pixels (the pixel data is depend on D[15:0] setting) to RAM when D[23:16] is set.												

	D[31:24]: No function.
Restriction	
Register availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Contents of memory is set randomly
S/W Reset	Contents of memory is not cleared
H/W Reset	Contents of memory is not cleared

Flow Chart

CPRAMWRC (6Dh): Compress Continue Write

6DH	CPRAMWRC (Compress Continue Write)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CPRAMWRC	0	↑	1	-	0	1	1	0	1	1	0	1	(6Dh)
parameter	1	↑	1	-	Write data stream								(00h)

Description

-For 262K Color Format: (when GCOMPR_C262 = 1 in command 6Fh)

D[7:2]: 6-bit Red subpixel data setting

D[15:10]: 6-bit Green subpixel data setting

D[23:18]: 6-bit Blue subpixel data setting

D[31:24]: Pixel number N = D[31:24] + 1. (N = 1~256)

Trigger IC to fill N pixels (the pixel data is depend on D[23:2] setting) to RAM when D[31:24] is set.

-For 65K Color Format: (when GCOMPR_C262 = 0 in command 6Fh)

D[7:3]: 5-bit Red subpixel data setting

D[2:0] + MCW[15:13]: 6-bit Green subpixel data setting

D[12:8]: 5-bit Blue subpixel data setting

D[23:16]: Pixel number N = D[23:16] + 1. (N=1~256)

Trigger IC to fill N pixels (the pixel data is depend on D[15:0] setting) to RAM when D[23:16] is set.

D[31:24]: No function.

Restriction

Register availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>
Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>Contents of memory is set randomly</td></tr><tr><td>S/W Reset</td><td>Contents of memory is not cleared</td></tr><tr><td>H/W Reset</td><td>Contents of memory is not cleared</td></tr></table>
Flow Chart	

CPCTRL (6Fh): Compress CTRL

6FH	CPCTRL (Compress CTRL)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CPCTRL	0	↑	1	-	0	1	1	0	1	1	1	1	(6Fh)
parameter	1	↑	1	-	GCOMPR_C262	-	-	GCOMPR_EN	-	-	-	RDY	(00h)
Description	**GCOMPR_EN:** "0": disable Memory Compression Write function. "1": enable Memory Compression Write function. **GCOMPR_C262 :** "0": 65K color for command 6Ch and 6Dh "1": 262K color for command 6Ch and 6Dh												
Restriction													
Register availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>												

Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td></td></tr><tr><td>S/W Reset</td><td></td></tr><tr><td>H/W Reset</td><td></td></tr></table>
Flow Chart	

RDID1 (DAh): Read ID1

DAH	RDID1 (Read ID1)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDID1	0	↑	1	-	1	1	0	1	1	0	1	0	(DAh)
parameter	1	1	↑	-	-	ID1.6-0							(7Fh)
Description	-This read byte identifies the LCD module's manufacturer. '-': Don't care.												
Register availability	<table><tr><th>Status</th><th>Availability</th></tr><tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr><tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr><tr><td>Sleep In</td><td>Yes</td></tr></table>												
Default	<table><tr><th>Status</th><th>Default Value</th></tr><tr><td>Power On Sequence</td><td>7Fh</td></tr><tr><td>S/W Reset</td><td>7Fh</td></tr><tr><td>H/W Reset</td><td>7Fh</td></tr></table>												

RDID2 (DBh): Read ID2

DBH	RDID2 (Read ID2)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDID2	0	↑	1	-	1	1	0	1	1	0	1	1	(DBh)
1st parameter	1	1	↑	-	-	ID2.6-0							(7Fh)
Description	This read byte is used to track the LCD module/driver IC version. '-': Don't care.												
Register availability													

		Status	Availability
		Normal Mode On, Idle Mode Off, Sleep Out	Yes
		Normal Mode On, Idle Mode On, Sleep Out	Yes
		Partial Mode On, Idle Mode Off, Sleep Out	Yes
		Partial Mode On, Idle Mode On, Sleep Out	Yes
		Sleep In	Yes
Default			

Status	Default Value
Power On Sequence	7Fh
S/W Reset	7Fh
H/W Reset	7Fh

RDID3 (DCh): Read ID3

DCH	RDID3 (Read ID3)												
Inst / Para	D/CX	WRX	RDX	D17-8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RDID3	0	↑	1	-	1	1	0	1	1	1	0	0	(DCh)
1st parameter	1	1	↑	-	-	ID3.6-0							(7Fh)
Description	This read byte identifies the LCD module/driver. '-': Don't care.												
Register availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	7Fh
S/W Reset	7Fh
H/W Reset	7Fh

13.3 Command Table 2

COMMAND Table 2														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
OTP MODE SEL	0	↑	1	-	1	0	1	0	0	0	0	0	(A0h)	OTP MODE SEL
	1	↑	1		OTP_DUMP	BIT_PROG	PTM.1-0		EXT_VPP	INT_VPP	OTP_EN	RDY		
OTP PAGE ADDR	0	↑	1	-	1	0	1	0	0	0	1	1	(A3h)	OTP PAGE ADDR
	1	↑	1		PA.7-0									
OTP DATA IN (DUMP RD)	0	↑	1	-	1	0	1	0	0	1	0	0	(A4h)	OTP DATA IN (DUMP RD)
	1	↑	1		PDIN.7-0									
OTP CMD ACK	0	↑	1	-	1	0	1	0	0	1	0	1	(A5h)	OTP CMD ACK
	1	↑	1		-	-	-	-	-	-	-	-		
GVDD SET	0	↑	1	-	1	0	1	1	0	0	0	0	(B0h)	GVDD SET
	1	↑	1		-	VRHP.6-0								
GVCL SET	0	↑	1	-	1	0	1	1	0	0	0	1	(B1h)	GVCL SET
	1	↑	1			VRHN.6-0								
VCOM GND SET	0	↑	1	-	1	0	1	1	0	0	1	0	(B2h)	VCOM GND SET
	1	↑	1			VCM.6-0								
GVDD_GVEE_SET	0	↑	1		1	0	1	1	0	1	0	0	(B4h)	GVDD_GVEE_SET
	1	↑	1		GVEE_AD.3-0				GVDD_AD.3-0					
STEP SET1	0	↑	1	-	1	0	1	1	0	1	0	1	(B5h)	STEP SET1
	1	↑	1		-	AVCLS.2-0			-	AVDDS.2-0				

COMMAND Table 2														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
STEP SET2	0	↑	1	-	1	0	1	1	0	1	1	0	(B6h)	STEP SET2
	1	↑	1		VGLS.3-0				VGHS.3-0					
SVDD_SVCL_SET	0	↑	1	-	1	0	1	1	0	1	1	1	(B7h)	SVDD_SVCL_SET
	1	↑	1		-	SELN.2-0			-	-	SELP.1-0			
TCON_SET	0	↑	1	-	1	0	1	1	1	0	1	0	(BAh)	TCON_SET
	1	↑	1		-	GATE_TUNE.2-0			-	-	NLINE.1-0			
RGB_VBP	0	↑	1	-	1	0	1	1	1	0	1	1	(BBh)	RGB_VBP
	1	↑	1		-	VBP.6-0								
RGB_HBP	0	↑	1	-	1	0	1	1	1	1	0	0	(BCh)	RGB_HBP
	1	↑	1		-	HBP.6-0								
RGB_SET	0	↑	1	-	1	0	1	1	1	1	0	1	(BDh)	RGB_SET
	1	↑	1		WO	-	-	RCM	RGB_VDPOL_XOR	RGB_HDPOL_XOR	RGB_DEPOL_XOR	RGB_DCLKPOL_XOR		
CABC_SET1	0	↑	1	-	1	0	1	1	1	1	1	0	(BEh)	CABC_SET1
	1	↑	1		-	-	-	LED_PWM_OEX	-	DSPOFFPWM_MD	PWM_FIXON	PWM_POLAR		
CABC_SET2	0	↑	1	-	1	0	1	1	1	1	1	1	(BFh)	CABC_SET2
	1	↑	1		-	PWM_SEGMENT[2]	PWM_SEGMENT[1]	PWM_SEGMENT[0]	-	PWM_CLK_SEL[2]	PWM_CLK_SEL[1]	PWM_CLK_SEL[0]		
FRCTRA1	0	↑	1	-	1	1	0	0	0	0	0	0	(C0h)	FRCTRA1
	1	↑	1		NLA	-	-	BPFPA.12-8						
FRCTRA2	0	↑	1	-	1	1	0	0	0	0	0	1	(C1h)	FRCTRA2
	1	↑	1		BPFPA.7-0									
FRCTRA3	0	↑	1	-	1	1	0	0	0	0	1	0	(C2h)	FRCTRA3
	1	↑	1		RTNA.7-0									
FRCTRB1	0	↑	1	-	1	1	0	0	0	0	1	1	(C3h)	FRCTRB1
	1	↑	1		NLB	-	-	BPFPB.12-8						
FRCTRB2	0	↑	1	-	1	1	0	0	0	1	0	0	(C4h)	FRCTRB2
	1	↑	1		BPFPB.7-0									
FRCTRB3	0	↑	1	-	1	1	0	0	0	1	0	1	(C5h)	FRCTRB3
	1	↑	1		RTNB.7-0									
PWRCTRA1	0	↑	1	-	1	1	0	0	0	1	1	0	(C6h)	PWRCTRA1
	1	↑	1		DCA3.1-0		DCA2S.1-0		DCA2.1-0		DCA1.1-0			

COMMAND Table 2														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
PWRCTRA2	0	↑	1	-	1	1	0	0	0	1	1	1	(C7h)	PWRCTRA2
	1	↑	1		-	APA.2-0			SAPA.1-0		DCA4.1-0			
PWRCTRA3	0	↑	1	-	1	1	0	0	1	0	0	0	(C8h)	PWRCTRA3
	1	↑	1		CLK_SNA.1-0		CLK_SPA.1-0		-	-	CLK_HYA.1-0			
PWRCTRB1	0	↑	1	-	1	1	0	0	1	0	0	1	(C9h)	PWRCTRB1
	1	↑	1		DCB3.1-0		DCB2S.1-0		DCB2.1-0		DCB1.1-0			
PWRCTRB2	0	↑	1	-	1	1	0	0	1	0	1	0	(CAh)	PWRCTRB2
	1	↑	1		-	APB.2-0			SAPB.1-0		DCB4.1-0			
PWRCTRB3	0	↑	1	-	1	1	0	0	1	0	1	1	(CBh)	PWRCTRB3
	1	↑	1		CLK_SNB.1-0		CLK_SPB.1-0		-	-	CLK_HYB.1-0			
DSTB_DSLP	0	↑	1	-	1	1	0	0	1	1	1	1	(CFh)	DSTB_DSLP
	1	↑	1		-	-	-	-	-	-	DSTB_EN	DSLP_EN		
RES_SET1	0	↑	1	-	1	1	0	1	0	0	0	0	(D0h)	RES_SET1
	1	↑	1		DUAL_EN	SSI	-	X_RES.8	-	Y_RES.10-8				
RES_SET2	0	↑	1	-	1	1	0	1	0	0	0	1	(D1h)	RES_SET2
	1	↑	1		X_RES.7-0									
RES_SET3	0	↑	1	-	1	1	0	1	0	0	1	0	(D2h)	RES_SET3
	1	↑	1		Y_RES.7-0									
Flicker_ADJ	0	↑	1	-	1	1	0	1	1	1	0	1	(DDh)	Flicker_ADJ
	1	↑	1		-	VMF.6-0								
Flicker_ADJ_NEW	0	↑	1	-	1	1	0	1	1	1	1	0	(DEh)	Flicker_ADJ_NEW
	1	↑	1		-	VMF_NEW.6-0								
GAMCTRP1	0	↑	1		1	1	1	0	0	0	0	0	(E0)	GAMCTRP1
	1	↑	1		VC63P.3-0				VC0P.3-0					
	1	↑	1		-	-	VC1P.5-0							
	1	↑	1		-	-	VC2P.5-0							
	1	↑	1		-	-	-	VC4P.4-0						
	1	↑	1		-	-	-	VC6P.4-0						
	1	↑	1		-	AJ0P.2-0			VC13P.3-0					
	1	↑	1		-	VC20P.6-0								
	1	↑	1		-	VC36P.2-0			-	VC27P.2-0				
	1	↑	1		-	VC43P.6-0								
	1	↑	1		-	AJ1P.2-0			VC50P.3-0					
	1	↑	1		-	-	-	VC57P.4-0						

COMMAND Table 2														
Instruction	**D/CX**	**WRX**	**RDX**	**PNUM**	**D7**	**D6**	**D5**	**D4**	**D3**	**D2**	**D1**	**D0**	**Hex**	**Function**
	1	↑	1		-	-	-	VC59P.4-0						
	1	↑	1		-	-	VC61P.5-0							
	1	↑	1		-	-	VC62P.5-0							
	0	↑	1		1	1	1	0	0	0	0	1	(E1)	
	1	↑	1		VC63N.3-0				VC0N.3-0					
	1	↑	1		-	-	VC1N.5-0							
	1	↑	1		-	-	VC2N.5-0							
	1	↑	1		-	-	-	VC4N.4-0						
	1	↑	1		-	-	-	VC6N.4-0						
	1	↑	1		-	AJ0N.2-0			VC13N.3-0					
GAMCTRN1	1	↑	1		-	VC20N.6-0								GAMCTRN1
	1	↑	1		-	VC36N.2-0			-	VC27N.2-0				
	1	↑	1		-	VC43N.6-0								
	1	↑	1		-	AJ1N.2-0			VC50N.3-0					
	1	↑	1		-	-	-	VC57N.4-0						
	1	↑	1		-	-	-	VC59N.4-0						
	1	↑	1		-	-	VC61N.5-0							
	1	↑	1		-	-	VC62N.5-0							

VRHPS (B0h): VRHP Set

B0H	VRHPS (VRHP Set)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
VRHP SET	0	↑	1	-	1	0	1	1	0	0	0	0	(B0h)
1st Parameter	1	↑	1	-	-	VRHP.6-0							(66h)

Description

VRHP[6:0]: VRHP Set.

VRHP[6:0]	VAP(GVDD) (V)	VRHP[6:0]	VAP(GVDD) (V)
00h	3.650 + (vcom offset)	40h	5.250 + (vcom offset)
01h	3.675 + (vcom offset)	41h	5.275 + (vcom offset)
02h	3.700 + (vcom offset)	42h	5.300 + (vcom offset)
03h	3.725 + (vcom offset)	43h	5.325 + (vcom offset)
04h	3.750 + (vcom offset)	44h	5.350 + (vcom offset)
05h	3.775 + (vcom offset)	45h	5.375 + (vcom offset)

06h	3.800 + (vcom offset)	46h	5.400 + (vcom offset)
07h	3.825 + (vcom offset)	47h	5.425 + (vcom offset)
08h	3.850 + (vcom offset)	48h	5.450 + (vcom offset)
09h	3.875 + (vcom offset)	49h	5.475 + (vcom offset)
0Ah	3.900 + (vcom offset)	4Ah	5.500 + (vcom offset)
0Bh	3.925 + (vcom offset)	4Bh	5.525 + (vcom offset)
0Ch	3.950 + (vcom offset)	4Ch	5.550 + (vcom offset)
0Dh	3.975 + (vcom offset)	4Dh	5.575 + (vcom offset)
0Eh	4.000 + (vcom offset)	4Eh	5.600 + (vcom offset)
0Fh	4.025 + (vcom offset)	4Fh	5.625 + (vcom offset)
10h	4.050 + (vcom offset)	50h	5.650 + (vcom offset)
11h	4.075 + (vcom offset)	51h	5.675 + (vcom offset)
12h	4.100 + (vcom offset)	52h	5.700 + (vcom offset)
13h	4.125 + (vcom offset)	53h	5.725 + (com offset)
14h	4.150 + (vcom offset)	54h	5.750 + (vcom offset)
15h	4.175 + (vcom offset)	55h	5.775 + (vcom offset)
16h	4.200 + (vcom offset)	56h	5.800 + (vcom offset)
17h	4.225 + (vcom offset)	57h	5.825 + (vcom offset)
18h	4.250 + (vcom offset)	58h	5.850 + (vcom offset)
19h	4.275 + (vcom offset)	59h	5.875 + (vcom offset)
1Ah	4.300 + (vcom offset)	5Ah	5.900 + (vcom offset)
1Bh	4.325 + (vcom offset)	5Bh	5.925 + (vcom offset)
1Ch	4.350 + (vcom offset)	5Ch	5.950 + (vcom offset)
1Dh	4.375 + (vcom offset)	5Dh	5.975 + (vcom offset)
1Eh	4.400 + (vcom offset)	5Eh	6.000 + (vcom offset)
1Fh	4.425 + (vcom offset)	5Fh	6.025 + (vcom offset)
20h	4.450 + (vcom offset)	60h	6.050 + (vcom offset)
21h	4.475 + (vcom offset)	61h	6.075 + (vcom offset)
22h	4.500 + (vcom offset)	62h	6.100 + (vcom offset)
23h	4.525 + (vcom offset)	63h	6.125 + (vcom offset)
24h	4.550 + (vcom offset)	64h	6.150 + (vcom offset)
25h	4.575 + (vcom offset)	65h	6.175 + (vcom offset)
26h	4.600 + (vcom offset)	66h	6.200 + (vcom offset)
27h	4.625 + (vcom offset)	67h	6.225 + (vcom offset)
28h	4.650 + (vcom offset)	68h	6.250 + (vcom offset)
29h	4.675 + (vcom offset)	69h	6.275 + (vcom offset)
2Ah	4.700 + (vcom offset)	6Ah	6.300 + (vcom offset)

2Bh	4.725 + (vcom offset)	6Bh	6.325 + (vcom offset)
2Ch	4.750 + (vcom offset)	6Ch	6.350 + (vcom offset)
2Dh	4.775 + (vcom offset)	6Dh	6.375 + (vcom offset)
2Eh	4.800 + (vcom offset)	6Eh	6.400 + (vcom offset)
2Fh	4.825 + (vcom offset)	6Fh	6.425 + (vcom offset)
30h	4.850 + (vcom offset)	70h	6.450 + (vcom offset)
31h	4.875 + (vcom offset)	71h	6.475 + (vcom offset)
32h	4.900 + (vcom offset)	72h	6.500 + (vcom offset)
33h	4.925 + (vcom offset)	73h	6.525 + (vcom offset)
34h	4.950 + (vcom offset)	74h	6.550 + (vcom offset)
35h	4.975 + (vcom offset)	75h	6.575 + (vcom offset)
36h	5.000 + (vcom offset)	76h	6.600 + (vcom offset)
37h	5.025 + (vcom offset)	77h	6.625 + (vcom offset)
38h	5.050 + (vcom offset)	78h	6.650 + (vcom offset)
39h	5.075 + (vcom offset)	79h	6.675 + (vcom offset)
3Ah	5.100 + (vcom offset)	7Ah	6.700 + (vcom offset)
3Bh	5.125 + (vcom offset)	7Bh	6.725 + (vcom offset)
3Ch	5.150 + (vcom offset)	7Ch	6.750 + (vcom offset)
3Dh	5.175 + (vcom offset)	7Dh	6.775 + (vcom offset)
3Eh	5.200 + (vcom offset)	7Eh	6.800 + (vcom offset)
3Fh	5.225 + (vcom offset)	7Fh	6.825 + (vcom offset)

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	66h
S/W Reset	66h
H/W Reset	66h

VRHNS (B1h): VRHN Set

B1H	VRHNS (VRHN Set)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
VRHN SET	0	↑	1	-	1	0	1	1	0	0	0	1	(B1h)
1st Parameter	1	↑	1	-	-	VRHN.6-0							(4Dh)

Description

VRHN[6:0]: VRHN Set.

VRHN[6:0]	VAN(GVCL) (V)	VRHN[6:0]	VAP(GVCL) (V)
00h	-1.875 + (vcom offset)	40h	-3.475 + (vcom offset)
01h	-1.900 + (vcom offset)	41h	-3.500 + (vcom offset)
02h	-1.925 + (vcom offset)	42h	-3.525 + (vcom offset)
03h	-1.950 + (vcom offset)	43h	-3.550 + (vcom offset)
04h	-1.975 + (vcom offset)	44h	-3.575 + (vcom offset)
05h	-2.000 + (vcom offset)	45h	-3.600 + (vcom offset)
06h	-2.025 + (vcom offset)	46h	-3.625 + (vcom offset)
07h	-2.050 + (vcom offset)	47h	-3.650 + (vcom offset)
08h	-2.075 + (vcom offset)	48h	-3.675 + (vcom offset)
09h	-2.100 + (vcom offset)	49h	-3.700 + (vcom offset)
0Ah	-2.125 + (vcom offset)	4Ah	-3.725 + (vcom offset)
0Bh	-2.150 + (vcom offset)	4Bh	-3.750 + (vcom offset)
0Ch	-2.175 + (vcom offset)	4Ch	-3.775 + (vcom offset)
0Dh	-2.200 + (vcom offset)	4Dh	-3.800 + (vcom offset)
0Eh	-2.225 + (vcom offset)	4Eh	-3.825 + (vcom offset)
0Fh	-2.250 + (vcom offset)	4Fh	-3.850 + (vcom offset)
10h	-2.275 + (vcom offset)	50h	-3.875 + (vcom offset)
11h	-2.300 + (vcom offset)	51h	-3.900 + (vcom offset)
12h	-2.325 + (vcom offset)	52h	-3.925 + (vcom offset)
13h	-2.350 + (vcom offset)	53h	-3.950 + (vcom offset)
14h	-2.375 + (vcom offset)	54h	-3.975 + (vcom offset)
15h	-2.400 + (vcom offset)	55h	-4.000 + (vcom offset)
16h	-2.425 + (vcom offset)	56h	-4.025 + (vcom offset)
17h	-2.450 + (vcom offset)	57h	-4.050 + (vcom offset)
18h	-2.475 + (vcom offset)	58h	-4.075 + (vcom offset)
19h	-2.500 + (vcom offset)	59h	-4.100 + (vcom offset)
1Ah	-2.525 + (vcom offset)	5Ah	-4.125 + (vcom offset)
1Bh	-2.550 + (vcom offset)	5Bh	-4.150 + (vcom offset)
1Ch	-2.575 + (vcom offset)	5Ch	-4.175 + (vcom offset)
1Dh	-2.600 + (vcom offset)	5Dh	-4.200 + (vcom offset)

1Eh	-2.625 + (vcom offset)	5Eh	-4.225 + (vcom offset)
1Fh	-2.650 + (vcom offset)	5Fh	-4.250 + (vcom offset)
20h	-2.675 + (vcom offset)	60h	-4.275 + (vcom offset)
21h	-2.700 + (vcom offset)	61h	-4.300 + (vcom offset)
22h	-2.725 + (vcom offset)	62h	-4.325 + (vcom offset)
23h	-2.750 + (vcom offset)	63h	-4.350 + (vcom offset)
24h	-2.775 + (vcom offset)	64h	-4.375 + (vcom offset)
25h	-2.800 + (vcom offset)	65h	-4.400 + (vcom offset)
26h	-2.825 + (vcom offset)	66h	-4.425 + (vcom offset)
27h	-2.850 + (vcom offset)	67h	-4.450 + (vcom offset)
28h	-2.875 + (vcom offset)	68h	-4.475 + (vcom offset)
29h	-2.900 + (vcom offset)	69h	-4.500 + (vcom offset)
2Ah	-2.925 + (vcom offset)	6Ah	-4.525 + (vcom offset)
2Bh	-2.950 + (vcom offset)	6Bh	-4.550 + (vcom offset)
2Ch	-2.975 + (vcom offset)	6Ch	-4.575 + (vcom offset)
2Dh	-3.000 + (vcom offset)	6Dh	-4.600 + (vcom offset)
2Eh	-3.025 + (vcom offset)	6Eh	-4.625 + (vcom offset)
2Fh	-3.050 + (vcom offset)	6Fh	-4.650 + (vcom offset)
30h	-3.075 + (vcom offset)	70h	-4.675 + (vcom offset)
31h	-3.100 + (vcom offset)	71h	-4.700 + (vcom offset)
32h	-3.125 + (vcom offset)	72h	-4.725 + (vcom offset)
33h	-3.150 + (vcom offset)	73h	-4.750 + (vcom offset)
34h	-3.175 + (vcom offset)	74h	-4.775 + (vcom offset)
35h	-3.200 + (vcom offset)	75h	-4.800 + (vcom offset)
36h	-3.225 + (vcom offset)	76h	-4.825 + (vcom offset)
37h	-3.250 + (vcom offset)	77h	-4.850 + (vcom offset)
38h	-3.275 + (vcom offset)	78h	-4.875 + (vcom offset)
39h	-3.300 + (vcom offset)	79h~7Fh	-4.900 + (vcom offset)
3Ah	-3.325 + (vcom offset)	-	-
3Bh	-3.350 + (vcom offset)	-	-
3Ch	-3.375 + (vcom offset)	-	-
3Dh	-3.400 + (vcom offset)	-	-
3Eh	-3.425 + (vcom offset)	-	-
3Fh	-3.450 + (vcom offset)	-	-

'-': Don't care

Register Availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	4Dh
S/W Reset	4Dh
H/W Reset	4Dh

VCOMS (B2h): VCOM GND SET

B2H	VCOMS (VCOM GND SET)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
VCOM GND SET	0	↑	1	-	1	0	1	1	0	0	1	0	(B2h)
1st Parameter	1	↑	1	-	-	VCM.6-0							(2Ch)

Description

VCM[6:0]: VCM Set.

VCM[6:0]	VSF (V)	VCM[6:0]	VSF (V)
00h	0.100	40h	1.700
01h	0.125	41h	1.725
02h	0.150	42h	1.750
03h	0.175	43h	1.775
04h	0.200	44h	1.800
05h	0.225	45h	1.825
06h	0.250	46h	1.850
07h	0.275	47h	1.875
08h	0.300	48h	1.900
09h	0.325	49h	1.925
0Ah	0.350	4Ah	1.950
0Bh	0.375	4Bh	1.975
0Ch	0.400	4Ch	2.000
0Dh	0.425	4Dh	2.025
0Eh	0.450	4Eh	2.050
0Fh	0.475	4Fh	2.075

10h	0.500	50h	2.100
11h	0.525	51h	2.125
12h	0.550	52h	2.150
13h	0.575	53h	2.175
14h	0.600	54h	2.200
15h	0.625	55h~7Fh	-
16h	0.650	-	-
17h	0.675	-	-
18h	0.700	-	-
19h	0.725	-	-
1Ah	0.750	-	-
1Bh	0.775	-	-
1Ch	0.800	-	-
1Dh	0.825	-	-
1Eh	0.850	-	-
1Fh	0.875	-	-
20h	0.900	-	-
21h	0.925	-	-
22h	0.950	-	-
23h	0.975	-	-
24h	1.000	-	-
25h	1.025	-	-
26h	1.050	-	-
27h	1.075	-	-
28h	1.100	-	-
29h	1.125	-	-
2Ah	1.150	-	-
2Bh	1.175	-	-
2Ch	1.200	-	-
2Dh	1.225	-	-
2Eh	1.250	-	-
2Fh	1.275	-	-
30h	1.300	-	-
31h	1.325	-	-
32h	1.350	-	-
33h	1.375	-	-
34h	1.400	-	-

	35h	1.425	-	-
	36h	1.450	-	-
	37h	1.475	-	-
	38h	1.500	-	-
	39h	1.525	-	-
	3Ah	1.550	-	-
	3Bh	1.575	-	-
	3Ch	1.600	-	-
	3Dh	1.625	-	-
	3Eh	1.650	-	-
	3Fh	1.675	-	-

Note:

1. VCOMS is used for feed through voltage compensation.
2. Setting limitation: VCOMS = 0.1V~2.2V.

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	2Ch
S/W Reset	2Ch
H/W Reset	2Ch

GAMOPPS (B4h): GVDD_GVEE_SET

B4H	GAMOPPS (GVDD_GVEE_SET)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
GVDD_GVEE_SET	0	↑	1	-	1	0	1	1	0	1	0	0	(B4h)
1st Parameter	1	↑	1	-	GVEE_AD.3-0				GVDD_AD.3-0				(88h)

Description

GVEE_AD[3:0]: Negative Gamma OP Power Set.

GVEE_AD [3:0]	**VNDAC (V)**	**GVEE_AD [3:0]**	**VNDAC (V)**
00h	-3.4	08h	-4.2

	01h	-3.5	09h	-4.3
	02h	-3.6	0Ah	-4.4
	03h	-3.7	0Bh	-4.5
	04h	-3.8	0Ch	-4.6
	05h	-3.9	0Dh	-4.7
	06h	-4.0	0Eh	-4.8
	07h	-4.1	0Fh	-4.9

GVDD_AD[3:0]: Positive Gamma OP Power Set.

GVDD_AD [3:0]	**VPDAC (V)**	**GVDD_AD [3:0]**	**VPDAC (V)**
00h	5.5	08h	6.3
01h	5.6	09h	6.4
02h	5.7	0Ah	6.5
03h	5.8	0Bh	6.6
04h	5.9	0Ch	6.7
05h	6.0	0Dh	6.8
06h	6.1	0Eh	6.9
07h	6.2	0Fh	7.0

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	88h
S/W Reset	88h
H/W Reset	88h

STEP14S (B5h): STEP SET1

B5H	STEP14S (STEP SET 1)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX

STEP SET1	0	↑	1	-	1	0	1	1	0	1	0	1	(B5h)
1st Parameter	1	↑	1	-	-	AVCLS.2-0			-	AVDDS.2-0			(45h)

Description

AVCLS[2:0]: AVCL Set.

AVCLS [1:0]	**AVCL (V)**
00h	-3.08
01h	-3.32
02h	-3.59
03h	-4.05
04h	-4.40
05h	-4.58
06h	-4.78
07h	-5.00

AVDDS[2:0]: AVDD Set.

AVDDS[1:0]	**AVDD (V)**
00h	5.52
01h	5.80
02h	6.09
03h	6.25
04h	6.42
05h	6.60
06h	6.79
07h	6.99

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	45h
S/W Reset	45h
H/W Reset	45h

STEP23S (B6h): STEP SET2

B6H	STEP23S (STEP SET 2)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
STEP SET2	0	↑	1	-	1	0	1	1	0	1	1	0	(B6h)
1st Parameter	1	↑	1	-	VGLS.3-0				VGHS.3-0				(89h)

Description

VGLS[3:0]: VGL Set.

VGLS[3:0]	VGL (V)	VGLS[3:0]	VGL (V)
00h	-6.80	08h	-10.00
01h	-7.20	09h	-10.40
02h	-7.60	0Ah	-10.80
03h	-8.00	0Bh	-11.30
04h	-8.40	0Ch	-11.70
05h	-8.78	0Dh	-12.00
06h	-9.15	0Eh	-12.52
07h	-9.56	0Fh	-12.75

VGHS[3:0]: VGH/VGHS Set.

VGHS[3:0]	VGH/VGHS (V)	VGHS[3:0]	VGH/VGHS (V)
00h	7.5	08h	13.5
01h	8.0	09h	14.0
02h	8.5	0Ah	14.5
03h	9.0	0Bh	15.0
04h	11.0	0Ch	15.5
05h	12.0	0Dh	16.0
06h	12.5	0Eh	16.5
07h	13.0	0Fh	17.0

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	89h
S/W Reset	89h
H/W Reset	89h

SBSTS (B7h): SVDD_SVCL_SET

B6H	SBSTS (SVDD_SVCL_SET)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
SVDD_SVCL_SET	0	↑	1	-	1	0	1	1	0	1	1	1	(B7h)
1st Parameter	1	↑	1	-	-	SELN.2-0			-	-	SELP.1-0		(62h)

Description

SELN[2:0]: SVCL Set.

SELN[2:0]	SVCL (V)
00h	-3.346
01h	-3.500
02h	-3.663
03h	-3.835
04h	-4.220
05h	-4.400
06h	-4.588
07h	-4.788

SELP[1:0]: SVDD Set.

SELP[1:0]	SVDD (V)
00h	6.243
01h	6.420
02h	6.600
03h	6.794

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes

		Sleep In	Yes	
Default				

Status	Default Value
Power On Sequence	62h
S/W Reset	62h
H/W Reset	62h

TCONS (BAh): TCON_SET

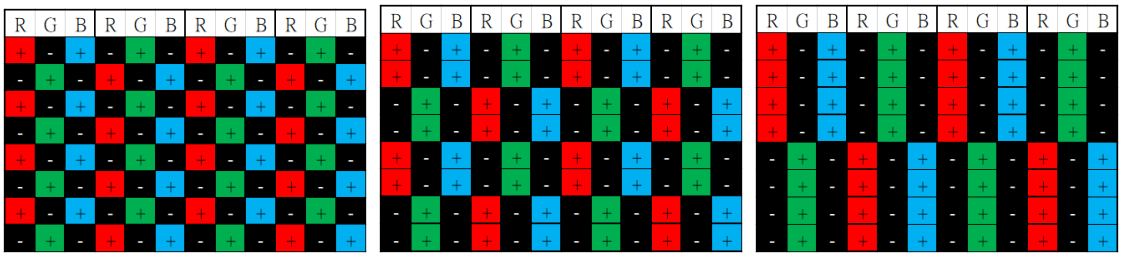
BAH	TCONS (TCON_SET)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
TCON_SET	0	↑	1	-	1	0	1	1	1	0	1	0	(BAh)
1st Parameter	1	↑	1	-	-	GATE_TUNE.2-0			-	-	NLINE.1-0		(00h)

Description

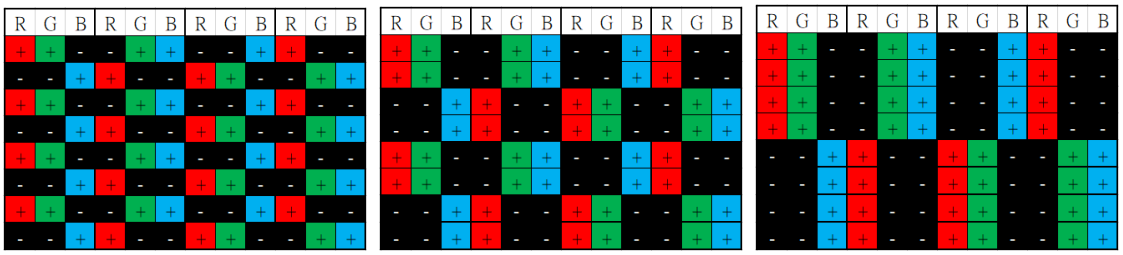
NLINE[1:0]: dot inversion select

NLINE[1:0]	Dot Inversion Select
00h	1 line
01h	2 line
02h	4 line

-Single Gate: (when DUAL_EN = 0 in command D0h)



-Dual Gate: (when DUAL_EN = 1 in command D0h)



'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	00h
S/W Reset	00h
H/W Reset	00h

RGBVBP (BBh): RGB_VBP

BBH	RGBVBP (RGB_VBP)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RGB_VBP	0	↑	1	-	1	0	1	1	1	0	1	1	(BBh)
1st Parameter	1	↑	1	-	-	VBP.6-0							(08h)
Description	**VBP[6:0]:** RGB interface Vsync back porch setting. '-': Don't care												
Register Availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	08h
S/W Reset	08h
H/W Reset	08h

RGBHBP (BCh): RGB_HBP

BCBH	RGBHBP (RGB_HBP)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RGB_HBP	0	↑	1	-	1	0	1	1	1	0	1	1	(BCh)
1st Parameter	1	↑	1	-	-	HBP.6-0							(08h)
Description	**HBP[6:0]:** RGB interface Hsync back porch setting. '-': Don't care												
Register Availability													

		Status	Availability
		Normal Mode On, Idle Mode Off, Sleep Out	Yes
		Normal Mode On, Idle Mode On, Sleep Out	Yes
		Partial Mode On, Idle Mode Off, Sleep Out	Yes
		Partial Mode On, Idle Mode On, Sleep Out	Yes
		Sleep In	Yes
Default			

Status	Default Value
Power On Sequence	08h
S/W Reset	08h
H/W Reset	08h

RGBSET (BDh): RGB_SET

BDH	RGBSET (RGB_SET)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RGB_SET	0	↑	1	-	1	0	1	1	1	0	1	1	(BDh)
1st Parameter	1	↑	1	-	WO	-	-	RCM	RGB_ VDPO L_XO R	RGB_ HDPO L_XO R	RGB_ DEPO L_XO R	RGB_ DCLK POL_ XOR	(00h)

Description

WO: Direct RGB mode.

WO	Mode
0	Memory
1	Shift register

RCM: RGB I/F enable mode selection.

RCM	Mode
0	RGB DE mode
1	RGB HV mode

RGB_VDPOL_XOR : Sets the signal polarity of the VSYNC pin.

VSPL="0", Low active

VSPL="1", High active

RGB_HDPOL_XOR : Sets the signal polarity of the HSYNC pin.

HSPL="0", Low active

HSPL="1", High active

RGB_DCLKPOL_XOR : Sets the signal polarity of the DOTCLK pin.

	DPL = “0” The data is input on the positive edge of DOTCLK DPL = “1” The data is input on the negative edge of DOTCLK **RGB_DEPOL_XOR :** Sets the signal polarity of the ENABLE pin. EPL = “0” The data DB.7-0 is written when ENABLE = “1”. Disable data write operation when ENABLE = “0”. EPL = “1” The data DB.7-0 is written when ENABLE = “0”. Disable data write operation when ENABLE = “1”. ‘-’: Don’t care
Register Availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	00h
S/W Reset	00h
H/W Reset	00h

CABCSET1 (BEh): CABC_SET1

BEH	CABCSET1 (CABC_SET1)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CABC_SET1	0	↑	1	-	1	0	1	1	1	1	1	0	(BEh)
1st Parameter	1	↑	1	-	-	-	-	LED_ PWM_ OEX	-	DSPO FFPW M_MD	PWM_ FIXON	PWM_ POLA R	(00h)
Description	**LED_PWM_OEX:** LEDPWM Signal. “0”: Output to CABCPWMP. “1”: CABCPWMP is Floating. **DSPOFFPWM_MD:** initial state control of LEDPWM. “0”: The initial state of LEDPWM is low. “1”: The initial state of LEDPWM is high. **PWM_FIXON:** LEDPWM fix control. “0”: LEDPWM control by CABC.												

	“1”: fix LEDPWM in “ON” status. **PWM_POLAR:** LEDPWM polarity control. “0”: polarity high. “1”: polarity low. ‘-’: Don’t care
Register Availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	00h
S/W Reset	00h
H/W Reset	00h

CABCSET2 (BFh): CABC_SET2

BFH	CABCSET2 (CABC_SET2)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
CABC_SET2	0	↑	1	-	1	0	1	1	1	1	1	1	(BFh)
1st Parameter	1	↑	1	-	-	PWM_SEGMENT[2]	PWM_SEGMENT[1]	PWM_SEGMENT[0]	-	PWM_CLK_SEL[2]	PWM_CLK_SEL[1]	PWM_CLK_SEL[0]	(07h)

Description

PWM_SEGMENT[2:0] / PWM_CLK_SEL[2:0]:

PWM_CLK_SEL[2:0] \ PWM_SEGMENT[2:0]	00h	01h	02h	03h	04h	05h
00h	39.2	78.7	158.7	322.6	666.7	1428.6
01h	19.6	39.4	79.4	161.3	333.3	714.3
02h	9.8	19.7	39.7	80.6	166.7	357.1
03h	4.9	9.8	19.8	40.3	83.3	178.6
04h	2.45	4.9	9.9	20.2	41.7	89.3
05h	1.23	2.5	5	10.1	20.8	44.6
06h	0.61	1.23	2.48	5	10.4	22.3
07h	0.31	0.62	1.24	2.5	5.2	11.2

	Unit: kHz '-': Don't care
Register Availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	07h
S/W Reset	07h
H/W Reset	07h

FRCTRA1 (C0h): Frame Rate Control A1 in Normal Mode

C0H	FRCTRA1 (Frame Rate Control A1 in Normal Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
FRCTRA1	0	↑	1	-	1	1	0	0	0	0	0	0	(C0h)
1st Parameter	1	↑	1	-	NLA	-	-	BPFPA.12-8					(80h)

Description

NLA : Inversion selection in normal mode.

0 : column inversion.

1 : dot inversion.

BPFPA[12:0]: Back porch and Front porch setting in normal mode. The minimum setting is 0x04.

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	80h
S/W Reset	80h
H/W Reset	80h

FRCTRA2 (C1h): Frame Rate Control A2 in Normal Mode

C1H	FRCTRA2 (Frame Rate Control A2 in Normal Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
FRCTRA2	0	↑	1	-	1	1	0	0	0	0	0	1	(C1h)
1st Parameter	1	↑	1	-	BPFPA.7-0								(20h)
Description	**BPFPA[12:0]:** Back porch and Front porch setting in normal mode. The minimum setting is 0x04. '-': Don't care												
Register Availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	20h
S/W Reset	20h
H/W Reset	20h

FRCTRA3 (C2h): Frame Rate Control A3 in Normal Mode

C2H	FRCTRA3 (Frame Rate Control A3 in Normal Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
FRCTRA3	0	↑	1	-	1	1	0	0	0	0	1	0	(C2h)

1st Parameter	1	↑	1	-	RTNA.7-0	(30h)

Description

RTNA[7:0]: Frame rate control in normal mode.

RTNA[7:0]	FR (Hz)	RTNA[7:0]	FR (Hz)	RTNA[7:0]	FR (Hz)	RTNA[7:0]	FR (Hz)
00h	-	40h	46.28	80h	23.14	C0h	15.43
01h	-	41h	45.57	81h	22.96	C1h	15.35
02h	-	42h	44.88	82h	22.79	C2h	15.27
03h	-	43h	44.21	83h	22.61	C3h	15.19
04h	-	44h	43.56	84h	22.44	C4h	15.11
05h	-	45h	42.93	85h	22.27	C5h	15.04
06h	-	46h	42.32	86h	22.11	C6h	14.96
07h	-	47h	41.72	87h	21.94	C7h	14.88
08h	-	48h	41.14	88h	21.78	C8h	14.81
09h	-	49h	40.58	89h	21.62	C9h	14.74
0Ah	-	4Ah	40.03	8Ah	21.46	CAh	14.66
0Bh	-	4Bh	39.49	8Bh	21.31	CBh	14.59
0Ch	-	4Ch	38.97	8Ch	21.16	CCh	14.52
0Dh	-	4Dh	38.47	8Dh	21.01	CDh	14.45
0Eh	-	4Eh	37.98	8Eh	20.86	CEh	14.38
0Fh	-	4Fh	37.49	8Fh	20.71	CFh	14.31
10h	-	50h	37.03	90h	20.57	D0h	14.24
11h	-	51h	36.57	91h	20.43	D1h	14.17
12h	-	52h	36.12	92h	20.29	D2h	14.11
13h	-	53h	35.69	93h	20.15	D3h	14.04
14h	-	54h	35.26	94h	20.01	D4h	13.97
15h	-	55h	34.85	95h	19.88	D5h	13.91
16h	-	56h	34.44	96h	19.75	D6h	13.84
17h	-	57h	34.05	97h	19.62	D7h	13.78
18h	-	58h	33.66	98h	19.49	D8h	13.71
19h	-	59h	33.28	99h	19.36	D9h	13.65
1Ah	-	5Ah	32.91	9Ah	19.23	DAh	13.59
1Bh	-	5Bh	32.55	9Bh	19.11	DBh	13.53
1Ch	-	5Ch	32.20	9Ch	18.99	DCh	13.46
1Dh	-	5Dh	31.85	9Dh	18.87	DDh	13.40
1Eh	-	5Eh	31.51	9Eh	18.75	DEh	13.34
1Fh	-	5Fh	31.18	9Fh	18.63	DFh	13.28
20h	-	60h	30.86	A0h	18.51	E0h	13.22
21h	-	61h	30.54	A1h	18.40	E1h	13.16

22h	-	62h	30.23	A2h	18.28	E2h	13.11
23h	-	63h	29.92	A3h	18.17	E3h	13.05
24h	-	64h	29.62	A4h	18.06	E4h	12.99
25h	-	65h	29.33	A5h	17.95	E5h	12.93
26h	-	66h	29.04	A6h	17.84	E6h	12.88
27h	-	67h	28.76	A7h	17.74	E7h	12.82
28h	74.05	68h	28.48	A8h	17.63	E8h	12.77
29h	72.25	69h	28.21	A9h	17.53	E9h	12.71
2Ah	70.53	6Ah	27.94	AAh	17.42	EAh	12.66
2Bh	68.89	6Bh	27.68	ABh	17.32	EBh	12.60
2Ch	67.32	6Ch	27.43	ACh	17.22	ECh	12.55
2Dh	65.82	6Dh	27.18	ADh	17.12	EDh	12.50
2Eh	64.39	6Eh	26.93	AEh	17.02	EEh	12.45
2Fh	63.02	6Fh	26.69	AFh	16.93	EFh	12.39
30h	61.71	70h	26.45	B0h	16.83	F0h	12.34
31h	60.45	71h	26.21	B1h	16.73	F1h	12.29
32h	59.24	72h	25.98	B2h	16.64	F2h	12.24
33h	58.08	73h	25.76	B3h	16.55	F3h	12.19
34h	56.96	74h	25.54	B4h	16.46	F4h	12.14
35h	55.89	75h	25.32	B5h	16.37	F5h	12.09
36h	54.85	76h	25.10	B6h	16.28	F6h	12.04
37h	53.86	77h	24.89	B7h	16.19	F7h	11.99
38h	52.89	78h	24.68	B8h	16.10	F8h	11.94
39h	51.97	79h	24.48	B9h	16.01	F9h	11.90
3Ah	51.07	7Ah	24.28	BAh	15.93	FAh	11.85
3Bh	50.20	7Bh	24.08	BBh	15.84	FBh	11.80
3Ch	49.37	7Ch	23.89	BCh	15.76	FCh	11.75
3Dh	48.56	7Dh	23.70	BDh	15.67	FDh	11.71
3Eh	47.78	7Eh	23.51	BEh	15.59	FEh	11.66
3Fh	47.02	7Fh	23.32	BFh	15.51	FFh	11.62

Note:

1. Frame rate = 1000 / ((2 * Y_Res. + 2 * BPFPA[12:0]) * RTNA[7:0] * tcon_clk / 1000000)).

2. BPFPA[12:0] are in command C0h、C1h

3. In this frame rate table, Y_Res. = 390，BPFPA[12:0] = 20h，tcon_clk = 400

4. The deviation of frame rate is +/- 5%.

	'-': Don't care
Register Availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	30h
S/W Reset	30h
H/W Reset	30h

FRCTRB1 (C3h): Frame Rate Control B1 in Idle Mode

C3H	FRCTRB1 (Frame Rate Control B1 in Idle Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
FRCTRB1	0	↑	1	-	1	1	0	0	0	0	1	1	(C3h)
1st Parameter	1	↑	1	-	NLB	-	-	BPFPB.12-8					(00h)
Description	**NLB :** Inversion selection in idle mode. 0 : column inversion. 1 : dot inversion. **BPFPB[12:0]:** Back porch and Front porch setting in idle mode. The minimum setting is 0x04. '-': Don't care												
Register Availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	00h
S/W Reset	00h
H/W Reset	00h

FRCTRB2 (C4h): Frame Rate Control B2 in Idle Mode

C4H	FRCTRB2 (Frame Rate Control B2 in Idle Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
FRCTRB2	0	↑	1	-	1	1	0	0	0	1	0	0	(C4h)
1st Parameter	1	↑	1	-	BPFPB.7-0								(21h)
Description	**BPFPB[12:0]:** Back porch and Front porch setting in idle mode. The minimum setting is 0x04. '-': Don't care												
Register Availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	21h
S/W Reset	21h
H/W Reset	21h

FRCTRB3 (C5h): Frame Rate Control B3 in Idle Mode

C5H	FRCTRB3 (Frame Rate Control B3 in Idle Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
FRCTRB3	0	↑	1	-	1	1	0	0	0	1	0	1	(C5h)
1st Parameter	1	↑	1	-	RTNB.7-0								(31h)

Description

RTNB[7:0]: Frame rate control in idle mode.

RTNB[7:0]	FR (Hz)	RTNB[7:0]	FR (Hz)	RTNB[7:0]	FR (Hz)	RTNB[7:0]	FR (Hz)
00h	-	40h	46.28	80h	23.14	C0h	15.43
01h	-	41h	45.57	81h	22.96	C1h	15.35
02h	-	42h	44.88	82h	22.79	C2h	15.27
03h	-	43h	44.21	83h	22.61	C3h	15.19
04h	-	44h	43.56	84h	22.44	C4h	15.11
05h	-	45h	42.93	85h	22.27	C5h	15.04
06h	-	46h	42.32	86h	22.11	C6h	14.96
07h	-	47h	41.72	87h	21.94	C7h	14.88
08h	-	48h	41.14	88h	21.78	C8h	14.81
09h	-	49h	40.58	89h	21.62	C9h	14.74
0Ah	-	4Ah	40.03	8Ah	21.46	CAh	14.66
0Bh	-	4Bh	39.49	8Bh	21.31	CBh	14.59
0Ch	-	4Ch	38.97	8Ch	21.16	CCh	14.52
0Dh	-	4Dh	38.47	8Dh	21.01	CDh	14.45
0Eh	-	4Eh	37.98	8Eh	20.86	CEh	14.38
0Fh	-	4Fh	37.49	8Fh	20.71	CFh	14.31
10h	-	50h	37.03	90h	20.57	D0h	14.24
11h	-	51h	36.57	91h	20.43	D1h	14.17
12h	-	52h	36.12	92h	20.29	D2h	14.11
13h	-	53h	35.69	93h	20.15	D3h	14.04
14h	-	54h	35.26	94h	20.01	D4h	13.97
15h	-	55h	34.85	95h	19.88	D5h	13.91
16h	-	56h	34.44	96h	19.75	D6h	13.84
17h	-	57h	34.05	97h	19.62	D7h	13.78
18h	-	58h	33.66	98h	19.49	D8h	13.71
19h	-	59h	33.28	99h	19.36	D9h	13.65
1Ah	-	5Ah	32.91	9Ah	19.23	DAh	13.59
1Bh	-	5Bh	32.55	9Bh	19.11	DBh	13.53
1Ch	-	5Ch	32.20	9Ch	18.99	DCh	13.46
1Dh	-	5Dh	31.85	9Dh	18.87	DDh	13.40

1Eh	-	5Eh	31.51	9Eh	18.75	DEh	13.34
1Fh	-	5Fh	31.18	9Fh	18.63	DFh	13.28
20h	-	60h	30.86	A0h	18.51	E0h	13.22
21h	-	61h	30.54	A1h	18.40	E1h	13.16
22h	-	62h	30.23	A2h	18.28	E2h	13.11
23h	-	63h	29.92	A3h	18.17	E3h	13.05
24h	-	64h	29.62	A4h	18.06	E4h	12.99
25h	-	65h	29.33	A5h	17.95	E5h	12.93
26h	-	66h	29.04	A6h	17.84	E6h	12.88
27h	-	67h	28.76	A7h	17.74	E7h	12.82
28h	74.05	68h	28.48	A8h	17.63	E8h	12.77
29h	72.25	69h	28.21	A9h	17.53	E9h	12.71
2Ah	70.53	6Ah	27.94	AAh	17.42	EAh	12.66
2Bh	68.89	6Bh	27.68	ABh	17.32	EBh	12.60
2Ch	67.32	6Ch	27.43	ACh	17.22	ECh	12.55
2Dh	65.82	6Dh	27.18	ADh	17.12	EDh	12.50
2Eh	64.39	6Eh	26.93	AEh	17.02	EEh	12.45
2Fh	63.02	6Fh	26.69	AFh	16.93	EFh	12.39
30h	61.71	70h	26.45	B0h	16.83	F0h	12.34
31h	60.45	71h	26.21	B1h	16.73	F1h	12.29
32h	59.24	72h	25.98	B2h	16.64	F2h	12.24
33h	58.08	73h	25.76	B3h	16.55	F3h	12.19
34h	56.96	74h	25.54	B4h	16.46	F4h	12.14
35h	55.89	75h	25.32	B5h	16.37	F5h	12.09
36h	54.85	76h	25.10	B6h	16.28	F6h	12.04
37h	53.86	77h	24.89	B7h	16.19	F7h	11.99
38h	52.89	78h	24.68	B8h	16.10	F8h	11.94
39h	51.97	79h	24.48	B9h	16.01	F9h	11.90
3Ah	51.07	7Ah	24.28	BAh	15.93	FAh	11.85
3Bh	50.20	7Bh	24.08	BBh	15.84	FBh	11.80
3Ch	49.37	7Ch	23.89	BCh	15.76	FCh	11.75
3Dh	48.56	7Dh	23.70	BDh	15.67	FDh	11.71
3Eh	47.78	7Eh	23.51	BEh	15.59	FEh	11.66
3Fh	47.02	7Fh	23.32	BFh	15.51	FFh	11.62

Note:

1. Frame rate = 1000 / ((2 * Y_Res. + 2 * BPFPA[12:0]) * RTNA[7:0] * tcon_clk / 1000000)).

<table>
<tr><td></td><td>2. BPFPA[12:0] are in command C0h、C1h
3. In this frame rate table, Y_Res. = 390，BPFPA[12:0] = 20h，tcon_clk = 400
4. The deviation of frame rate is +/- 5%.

‘-’: Don’t care</td></tr>
<tr><td>Register Availability</td><td>
<table>
<tr><th>Status</th><th>Availability</th></tr>
<tr><td>Normal Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Normal Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode Off, Sleep Out</td><td>Yes</td></tr>
<tr><td>Partial Mode On, Idle Mode On, Sleep Out</td><td>Yes</td></tr>
<tr><td>Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><th>Status</th><th>Default Value</th></tr>
<tr><td>Power On Sequence</td><td>31h</td></tr>
<tr><td>S/W Reset</td><td>31h</td></tr>
<tr><td>H/W Reset</td><td>31h</td></tr>
</table>
</td></tr>
</table>

PWRCTRA1 (C6h): Power Control A1 in Normal Mode

C6H	PWRCTRA1 (Power Control A1 in Normal Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
PWRCTRA1	0	↑	1	-	1	1	0	0	0	1	1	0	(C6h)
1st Parameter	1	↑	1	-	DCA3.1-0		DCA2S.1-0		DCA2.1-0		DCA1.1-0		(A9h)

Description

DCA3[1:0]: STP3(VGL) booster clock selection in normal mode.

DCA3[1:0]	CK_STP3 (MHz)
00h	9
01h	6.67 (from osc1)
02h	5 (from osc1)
03h	4.5

DCA2S[1:0]: STP2S(VGHS) booster clock selection in normal mode.

DCA2S[1:0]	CK_STP2S (MHz)
00h	6.67 (from osc1)
01h	6
02h	5 (from osc1)
03h	4.5

DCA2[1:0]: STP2(VGH) booster clock selection in normal mode.

DCA2[1:0]	CK_STP2 (MHz)
00h	6.67 (from osc1)
01h	6
02h	5 (from osc1)
03h	4.5

DCA1[1:0]: STP1(AVDD) booster clock selection in normal mode.

DCA1[1:0]	CK_STP1 (MHz)
00h	18
01h	13 (from osc1)
02h	10 (from osc1)
03h	5 (from osc1)

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes

		Normal Mode On, Idle Mode On, Sleep Out: Yes Partial Mode On, Idle Mode Off, Sleep Out: Yes Partial Mode On, Idle Mode On, Sleep Out: Yes Sleep In: Yes
Default		Status: Default Value Power On Sequence: A9h S/W Reset: A9h H/W Reset: A9h

PWRCTRA2 (C7h): Power Control A2 in Normal Mode

C7H	PWRCTRA2 (Power Control A2 in Normal Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
PWRCTRA2	0	↑	1	-	1	1	0	0	0	1	1	1	(C7h)
1st Parameter	1	↑	1	-	-	APA.2-0			SAPA.1-0		DCA4.1-0		(41h)

Description

APA[2:0]: Adjust OPAMP input differential-pair bias current in normal mode.

APA[2:0]	
00h	Stops
01h	1.0x
02h	1.5x
03h	2.0x
04h	2.5x
05h	3.0x
06h	3.5x
07h	4.0x

SAPA[1:0]: Adjust OPAMP output mos bias current in normal mode.

SAPA[1:0]	
00h	0.1x
01h	0.2x
02h	0.3x
03h	0.4x

DCA4[1:0]: STP4(AVCL) booster clock selection in normal mode.

DCA4[1:0]	**CK_STP4 (MHz)**
00h	18

01h	13 (from osc1)
02h	10 (from osc1)
03h	5 (from osc1)

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	41h
S/W Reset	41h
H/W Reset	41h

PWRCTRA3 (C8h): Power Control A3 in Normal Mode

C8H	PWRCTRA3 (Power Control A3 in Normal Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
PWRCTRA3	0	↑	1	-	1	1	0	0	1	0	0	0	(C8h)
1st Parameter	1	↑	1	-	CLK_SNA.1-0		CLK_SPA.1-0		-	-	CLK_HYA.1-0		(51h)

Description

CLK_SNA[1:0]: Source(SVCL) booster clock selection in normal mode.

CLK_SNA[1:0]	**CLKN**
00h	10 (from osc1)
01h	9
02h	6.67 (from osc1)
03h	6

CLK_SPA[1:0]: Source(SVDD) booster clock selection in normal mode.

CLK_SPA[1:0]	**CLKP**
00h	10 (from osc1)
01h	9
02h	6.67 (from osc1)
03h	6

CLK_HYA[1:0]:

CLK_HYA[1:0]	CLKHY
00h	10 (from osc1)
01h	9
02h	6.67 (from osc1)
03h	6

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	51h
S/W Reset	51h
H/W Reset	51h

PWRCTRB1 (C9h): Power Control B1 in Idle Mode

C9H	PWRCTRB1 (Power Control B1 in Idle Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
PWRCTRB1	0	↑	1	-	1	1	0	0	1	0	0	1	(C9h)
1st Parameter	1	↑	1	-	DCB3.1-0		DCB2S.1-0		DCB2.1-0		DCB1.1-0		(A9h)

Description

DCB3[1:0]: STP3(VGL) booster clock selection in idle mode.

DCB3[1:0]	CK_STP3 (MHz)
00h	9
01h	6.67 (from osc1)
02h	5 (from osc1)
03h	4.5

DCB2S[1:0]: STP2S(VGHS) booster clock selection in idle mode.

DCB2S[1:0]	CK_STP2S (MHz)
00h	6.67 (from osc1)

01h	6
02h	5 (from osc1)
03h	4.5

DCB2[1:0]: STP2(VGH) booster clock selection in idle mode.

DCB2[1:0]	CK_STP2 (MHz)
00h	6.67 (from osc1)
01h	6
02h	5 (from osc1)
03h	4.5

DCB1[1:0]: STP1(AVDD) booster clock selection in idle mode.

DCB1[1:0]	CK_STP1 (MHz)
00h	18
01h	13 (from osc1)
02h	10 (from osc1)
03h	5 (from osc1)

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	A9h
S/W Reset	A9h
H/W Reset	A9h

PWRCTRB2 (CAh): Power Control B2 in Idle Mode

CAH	PWRCTRB2 (Power Control B2 in Idle Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
PWRCTRB2	0	↑	1	-	1	1	0	0	1	0	1	0	(CAh)
1st Parameter	1	↑	1	-	-	APB.2-0			SAPB.1-0		DCB4.1-0		(41h)

Description

APB[2:0]: Adjust OPAMP input differential-pair bias current in idle mode.

APB[2:0]	
00h	Stops
01h	1.0x
02h	1.5x
03h	2.0x
04h	2.5x
05h	3.0x
06h	3.5x
07h	4.0x

SAPB[1:0]: Adjust OPAMP output mos bias current in idle mode.

SAPB[1:0]	
00h	0.1x
01h	0.2x
02h	0.3x
03h	0.4x

DCB4[1:0]: STP4(AVCL) booster clock selection in idle mode.

DCB4[1:0]	CK_STP4 (MHz)
00h	18
01h	13 (from osc1)
02h	10 (from osc1)
03h	5 (from osc1)

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default	

Status	Default Value
Power On Sequence	41h
S/W Reset	41h
H/W Reset	41h

PWRCTRB3 (CBh): Power Control B3 in Idle Mode

CBH	PWRCTRB3 (Power Control B3 in Idle Mode)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
PWRCTRB3	0	↑	1	-	1	1	0	0	1	0	1	1	(CBh)
1st Parameter	1	↑	1	-	CLK_SNB.1-0		CLK_SPB.1-0		-	-	CLK_HYB.1-0		(51h)

Description

CLK_SNB[1:0]: Source(SVCL) booster clock selection in idle mode.

CLK_SNB[1:0]	CLKN
00h	10 (from osc1)
01h	9
02h	6.67 (from osc1)
03h	6

CLK_SPB[1:0]: Source(SVDD) booster clock selection in idle mode.

CLK_SPB[1:0]	CLKP
00h	10 (from osc1)
01h	9
02h	6.67 (from osc1)
03h	6

CLK_HYB[1:0]:

CLK_HYB[1:0]	CLKHY
00h	9
01h	6.67 (from osc1)
02h	6
03h	4.5 (from osc1)

'-': Don't care

Register Availability	

		Status	Availability
		Normal Mode On, Idle Mode Off, Sleep Out	Yes
		Normal Mode On, Idle Mode On, Sleep Out	Yes
		Partial Mode On, Idle Mode Off, Sleep Out	Yes
		Partial Mode On, Idle Mode On, Sleep Out	Yes
		Sleep In	Yes

Default		Status	Default Value
		Power On Sequence	51h
		S/W Reset	51h
		H/W Reset	51h

DSTBDSLP (CFh): DSTB_DSLP

CFH	DSTBDSLP (DSTB_DSLP)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
DSTBDSLP	0	↑	1	-	1	1	0	0	1	0	1	1	(CFh)
1st Parameter	1	↑	1	-	-	-	-	-	-	-	DSTB_EN	DSLP_EN	(00h)
Description	**DSTB_EN:** "0": No Function. "1": Deep Standby mode. **DSLP_EN:** "0": Sleep In mode. "1": Deep Sleep In mode. *Note1: It will be necessary to stay at sleep in mode before enter deep sleep in mode if P80、SPI and QSPI is used.* *Note2: It will be necessary to stay at ULPS mode before enter deep sleep in mode if MIPI is used.* *Note3: No matter what status is, it is allowed to enter deep standby mode.* *Note4: It will be necessary to set HWRST or toggle CSX 7~8 times to leave deep standby mode.* *Note5: It will be necessary to set HWRST or set DSLP_EN=0 to leave deep sleep in mode.* *Note6: It will be necessary to wait 10msec after set DSLP_EN=0 to leave deep sleep in mode before sending the other commands.* '-': Don't care												
Register Availability													

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	00h
S/W Reset	00h
H/W Reset	00h

RESSET1 (D0h): Resolution Set 1

D0H	RESSET1 (Resolution Set 1)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RESSET1	0	↑	1	-	1	1	0	1	0	0	0	0	(D0h)
1st Parameter	1	↑	1	-	DUAL_EN	SSI	-	X_RES.8	-	Y_RES.10-8			(91h)

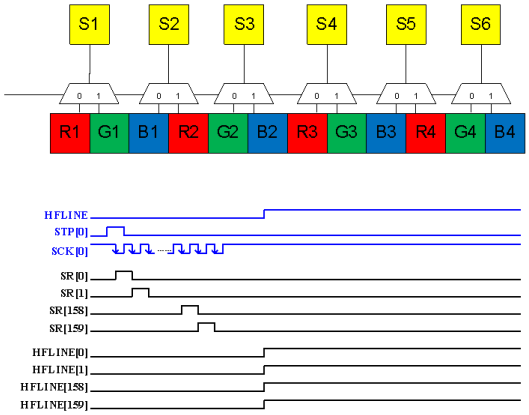
Description

DUAL_EN:

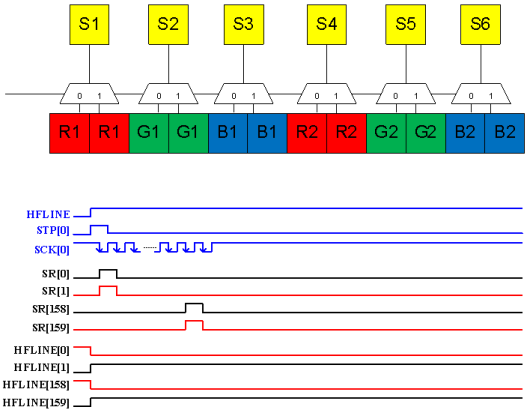
"0": Single gate.

"1": Dual gate.

Dual-Gate



Single-Gate



SSI:

"0": Normal mode.

"1": Partial off Source OP mode.

X_RES.8-0: Set X-Resolution(Source).

Y_RES.10-0: Set Y-Resolution(Gate).

Note1: If DUAL_EN set 0 and Horizontal Scroll isn't applied,

the X_RES must be a multiple of 4 pixel and no fewer than 92 pixel.

Note2: If DUAL_EN set 1 and Horizontal Scroll isn't applied,

the X_RES must be a multiple of 8 Pixel and no fewer than 184 pixel.

Note3: If DUAL_EN set 0 and Horizontal Scroll is applied,

the X_RES must be a multiple of 12 pixel and no fewer than 96 pixel.

Note4: If DUAL_EN set 1 and Horizontal Scroll is applied,

the X_RES must be a multiple of 24 Pixel and no fewer than 192 pixel.

	Note5: The Y_RES must be more than or equal to 10 pixel. '-': Don't care
Register Availability	

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	91h
S/W Reset	91h
H/W Reset	91h

RESSET2 (D1h): Resolution Set 2

D1H	RESSET2 (Resolution Set 2)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RESSET2	0	↑	1	-	1	1	0	1	0	0	0	1	(D1h)
1st Parameter	1	↑	1	-	X_RES.7-0								(68h)
Description	**X_RES.8-0:** Set X-Resolution(Source). *Note1: If DUAL_EN set 0 and Horizontal Scroll isn't applied,* *the X_RES must be a multiple of 4 pixel and no fewer than 92 pixel.* *Note2: If DUAL_EN set 1 and Horizontal Scroll isn't applied,* *the X_RES must be a multiple of 8 Pixel and no fewer than 184 pixel.* *Note3: If DUAL_EN set 0 and Horizontal Scroll is applied,* *the X_RES must be a multiple of 12 pixel and no fewer than 96 pixel.* *Note4: If DUAL_EN set 1 and Horizontal Scroll is applied,* *the X_RES must be a multiple of 24 Pixel and no fewer than 192 pixel.* '-': Don't care												
Register Availability													

Status	Availability

		Normal Mode On, Idle Mode Off, Sleep Out	Yes
		Normal Mode On, Idle Mode On, Sleep Out	Yes
		Partial Mode On, Idle Mode Off, Sleep Out	Yes
		Partial Mode On, Idle Mode On, Sleep Out	Yes
		Sleep In	Yes

Default

Status	Default Value
Power On Sequence	68h
S/W Reset	68h
H/W Reset	68h

RESSET3 (D2h): Resolution Set 3

D2H	RESSET3 (Resolution Set 3)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
RESSET3	0	↑	1	-	1	1	0	1	0	0	1	0	(D2h)
1st Parameter	1	↑	1	-	Y_RES.7-0								(86h)

Description

Y_RES.8-0: Set Y-Resolution(Gate).

Note1: The Y_RES must be more than or equal to 10.

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	86h
S/W Reset	86h
H/W Reset	86h

VCMOFSET (DDh): VCOM OFFSET SET

DDH	VCMOFSET (VCOM OFFSET SET)

Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
VCMOFSET	0	↑	1	-	1	1	0	1	1	1	0	1	(DDh)
1st Parameter	1	↑	1	-	-	VMF.6-0							(40h)

Description

VMF[6:0]: VCOMS offset setting

VMF[6]	VMF[5:0]	GVDD	GVCL	VSF	VCOM
0	000000	VRHP-64d	VRHN+64d	VCM-64d	0
0	000001	VRHP-63d	VRHN+63d	VCM-63d	0
0	000010	VRHP-62d	VRHN+62d	VCM-62d	0
0	|	|	|	|	0
0	111110	VRHP-2d	VRHN+2d	VCM-2d	0
0	111111	VRHP-1d	VRHN+1d	VCM-1d	0
1	000000	VRHP	VRHN	VCM	0
1	000001	VRHP+1d	VRHN-1d	VCM+1d	0
1	000010	VRHP+2d	VRHN-2d	VCM+2d	0
1	|	|	|	|	0
1	111110	VRHP+62d	VRHN-62d	VCM+62d	0
1	111111	VRHP+63d	VRHN-63d	VCM+63d	0

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	40h
S/W Reset	40h
H/W Reset	40h

VCMOFNSET (DEh): VCOM OFFSET NEW SET

DEH	VCMOFNSET (VCOM OFFSET NEW SET)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
VCMOFNSET	0	↑	1	-	1	1	0	1	1	1	1	0	(DEh)

1st Parameter	1	↑	1	-	-	VMF_NEW.6-0	(40h)

Description

VMF_NEW[6:0]: VCOMS offset new setting

VMF_NEW[6]	VMF_NEW[5:0]	GVDD	GVCL	VSF	VCOM
0	000000	VRHP-64d	VRHN+64d	VCM-64d	0
0	000001	VRHP-63d	VRHN+63d	VCM-63d	0
0	000010	VRHP-62d	VRHN+62d	VCM-62d	0
0	|	|	|	|	0
0	111110	VRHP-2d	VRHN+2d	VCM-2d	0
0	111111	VRHP-1d	VRHN+1d	VCM-1d	0
1	000000	VRHP	VRHN	VCM	0
1	000001	VRHP+1d	VRHN-1d	VCM+1d	0
1	000010	VRHP+2d	VRHN-2d	VCM+2d	0
1	|	|	|	|	0
1	111110	VRHP+62d	VRHN-62d	VCM+62d	0
1	111111	VRHP+63d	VRHN-63d	VCM+63d	0

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	40h
S/W Reset	40h
H/W Reset	40h

GAMCTRP1 (E0h): Positive Voltage Gamma Control

E0H	GAMCTRP1 (Positive Voltage Gamma Control)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
GAMCTRP1	0	↑	1	-	1	1	1	0	0	0	0	0	(E0h)
1st Parameter	1	↑	1	-	VC63P.3-0				VC0P.3-0				(F0h)
2nd Parameter	1	↑	1	-	-	-	VC1P.5-0						(03h)

3rd Parameter	1	↑	1	-	-	-	VC2P.5-0				(05h)
4th Parameter	1	↑	1	-	-	-	-	VC4P.4-0			(09h)
5th Parameter	1	↑	1	-	-	-	-	VC6P.4-0			(0Ch)
6th Parameter	1	↑	1	-	-	AJ0P.2-0		VC13P.3-0			(0Fh)
7th Parameter	1	↑	1	-	-	VC20P.6-0					(3Eh)
8th Parameter	1	↑	1	-	-	VC36P.2-0		-	VC27P.2-0		(77h)
9th Parameter	1	↑	1	-	-	VC43P.6-0					(4Fh)
10th Parameter	1	↑	1	-	-	AJ1P.2-0		VC50P.3-0			(0Fh)
11th Parameter	1	↑	1	-	-	-	-	VC57P.4-0			(17h)
12th Parameter	1	↑	1	-	-	-	-	VC59P.4-0			(17h)
13th Parameter	1	↑	1	-	-	-	VC61P.5-0				(21h)
14th Parameter	1	↑	1	-	-	-	VC62P.5-0				(23h)

Description

Adjust the gamma characteristics of the TFT panel.

Please refer to 9.6.

Default value:

Register	Value(hex)
VC0P[3:0]	0
VC1P[5:0]	3
VC2P[5:0]	5
VC4P[4:0]	9
VC6P[4:0]	C
VC13P[3:0]	F
VC20P[6:0]	3E
VC27P[2:0]	7
VC36P[2:0]	7
VC43P[6:0]	4F
VC50P[3:0]	F
VC57P[4:0]	17
VC59P[4:0]	17
VC61P[5:0]	21
VC62P[5:0]	23
VC63P[3:0]	F
AJ0P[1:0]	0
AJ1P[1:0]	0

'-': Don't care

Register Availability

		Status	Availability
		Normal Mode On, Idle Mode Off, Sleep Out	Yes
		Normal Mode On, Idle Mode On, Sleep Out	Yes
		Partial Mode On, Idle Mode Off, Sleep Out	Yes
		Partial Mode On, Idle Mode On, Sleep Out	Yes
		Sleep In	Yes
Default			

Status	Default Value
Power On Sequence	Refer to description
S/W Reset	Refer to description
H/W Reset	Refer to description

GAMCTRN1 (E1h): Negative Voltage Gamma Control

E1H	GAMCTRN1 (Negative Voltage Gamma Control)												
Inst / Para	D/CX	WRX	RDX	D8	D7	D6	D5	D4	D3	D2	D1	D0	HEX
GAMCTRN1	0	↑	1	-	1	1	1	0	0	0	0	1	(E1h)
1st Parameter	1	↑	1	-	VC63N.3-0				VC0N.3-0				(F0h)
2nd Parameter	1	↑	1	-	-	-	VC1N.5-0						(03h)
3rd Parameter	1	↑	1	-	-	-	VC2N.5-0						(05h)
4th Parameter	1	↑	1	-	-	-	-	VC4N.4-0					(09h)
5th Parameter	1	↑	1	-	-	-	-	VC6N.4-0					(0Ch)
6th Parameter	1	↑	1	-	-	AJ0N.2-0			VC13N.3-0				(0Fh)
7th Parameter	1	↑	1	-	-	VC20N.6-0							(3Eh)
8th Parameter	1	↑	1	-	-	VC36N.2-0			-	VC27N.2-0			(77h)
9th Parameter	1	↑	1	-	-	VC43N.6-0							(4Fh)
10th Parameter	1	↑	1	-	-	AJ1N.2-0			VC50N.3-0				(0Fh)
11th Parameter	1	↑	1	-	-	-	-	VC57N.4-0					(17h)
12th Parameter	1	↑	1	-	-	-	-	VC59N.4-0					(17h)
13th Parameter	1	↑	1	-	-	-	VC61N.5-0						(21h)
14th Parameter	1	↑	1	-	-	-	VC62N.5-0						(23h)

Description

Adjust the gamma characteristics of the TFT panel.

Please refer to 9.6.

Default value:

Register	Value(hex)
VC0N[3:0]	0
VC1N[5:0]	3
VC2N[5:0]	5
VC4N[4:0]	9
VC6N[4:0]	C
VC13N[3:0]	F
VC20N[6:0]	3E
VC27N[2:0]	7
VC36N[2:0]	7
VC43N[6:0]	4F
VC50N[3:0]	F
VC57N[4:0]	17
VC59N[4:0]	17
VC61N[5:0]	21
VC62N[5:0]	23
VC63N[3:0]	F
AJ0N[1:0]	0
AJ1N[1:0]	0

'-': Don't care

Register Availability

Status	Availability
Normal Mode On, Idle Mode Off, Sleep Out	Yes
Normal Mode On, Idle Mode On, Sleep Out	Yes
Partial Mode On, Idle Mode Off, Sleep Out	Yes
Partial Mode On, Idle Mode On, Sleep Out	Yes
Sleep In	Yes

Default

Status	Default Value
Power On Sequence	Refer to description
S/W Reset	Refer to description
H/W Reset	Refer to description