Confidential Document

DATA IMAGE CORPORATION

CTP Module Specification

Preliminary

ITEM NO.: SCF0403526GGU38

Table of Contents

Customer Companies	R&D Dept.	Q.C. Dept.	Eng. Dept.	Prod. Dept.
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	3	09/JUL/15’		41

2. RECORD OF REVISION

Rev	Date	Item	Page	Comment	Source
1	07/APR/14’			Initial preliminary	ESR0304001
2	06/DEC/14’	4.2 8.1	3 9	Add LED life time. Add Report rate, Response time&(X,Y)position.	11S-EC0012
3	09/JUL/15’	8.1 11.2 14	9 34 40	Update General Specifications, Add fw Update Inspection Judgment standard Modify OUTLINE DRAWING from Rev 1 to 2.	11S-F70004

3. GENERAL SPECIFICATIONS

Parameter	Specifications	Unit
Display resolution	480X R.G.B x 272	dot
LCD Active area	95.04(W) x 53.856(H)	mm
Sensor A A	98.7(W) x 57.5(H)	
Screen size	4.3(Diagonal)	inch
Pixel pitch	0.198 (W) x 0.198(H)	mm
Color configuration	R.G.B. Stripe	
Overall dimension	110.5 (W) x 72.7(H) x 5.1(D)	mm
Weight	TBD	g
Surface treatment	Glare	
LCM model number	FX04032BDSSWBG01	
View Angle direction(Gray inversion)	6 o'clock	
Our components and processes are compliant to RoHS standard		

4. ELECTRICAL CHARACTERISTICS

4.1 Operating Conditions

GND=0V,Ta=25°C

Parameter	Symbol	MIN.	Typ.	MAX.	Unit	Remark
Power Supply voltage	V_{DD}	3.0	3.3	3.6	V	Note1
Power Supply Current	I_{DD}	--	17	20	mA	V_{DD} =3.3V
Ripple Voltage	V_{RPVDD}	--	--	100	mVp-p	
"H" level logical input voltage	V_{IH}	0.8VDD	--	VDD	V	
"L" level logical input voltage	V_{IL}	0	--	0.2VDD	V	
Operating temperature	Topa	-20	--	70	°C	Ambient temperature
Storage temperature	Tstg	-30	--	80	°C	Ambient temperature

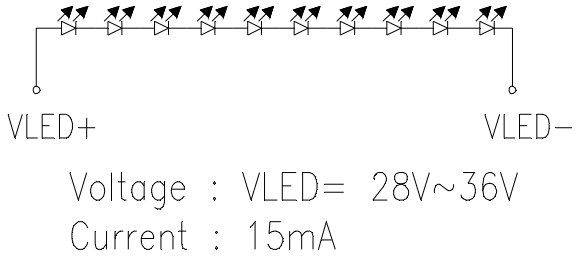
Note1:VDD Absolute Maximum Ratings -0.3V~+6V

4.2 Backlight driving for power conditions

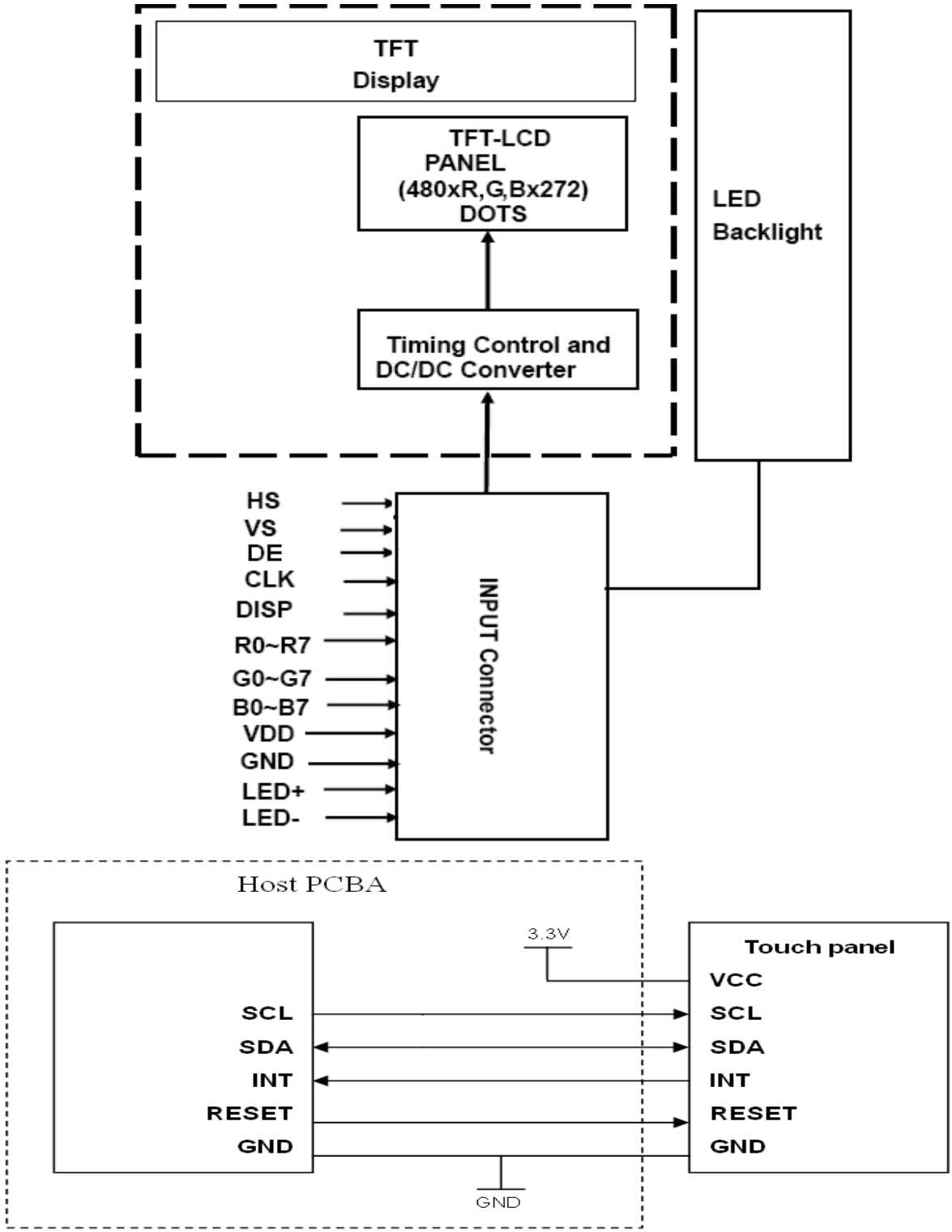
Ta=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I_{LED}	--	15	--	mA	
VLED voltage	V_{LED}	28	--	36	V	$I_{LED=15}$ mA
LED life time		15,000	30,000	--	Hours	Note 1

Note 1 under room temperature (25 °C, Humidity 30-60% RH)and ILED=15mA.



5. BLOCK DIAGRAM



6. PIN CONNECTIONS

6.1 Input Pins Connection

Pin No	Symbol	Function	Remark
1	LED-	LED Power Source input terminal (Cathode side)	
2	LED+	LED Power Source input terminal (Anode side)	
3	NC	No Connect	
4	VDD	Power Supply : +3.3V	
5	R0	Digital data input. R0 is LSB and R7 is MSB	
6	R1		
7	R2		
8	R3		
9	R4		
10	R5		
11	R6		
12	R7		
13	G0	Digital data input. G0 is LSB and G7 is MSB	
14	G1		
15	G2		
16	G3		
17	G4		
18	G5		
19	G6		
20	G7		
21	B0	Digital data input. B0 is LSB and B7 is MSB	
22	B1		
23	B2		
24	B3		
25	B4		
26	B5		
27	B6		
28	B7		
29	GND	Ground	
30	CLK	clock signal to sample each data	
31	DISP	Display ON/OFF Control ON=H(VDD), OFF=L(GND)	
32	HS	Horizontal synchronous signal	
33	VS	Vertical synchronous signal	
34	DE	Data enable	
35	NC	No Connect	
36	GND	Ground	
37	NC	No Connect	
38	NC	No Connect	
39	NC	No Connect	
40	NC	No Connect	

7. AC CHARACTERISTICS

7.1 Input Timing Requirement

(480RGBx272, Ta =25ºC, VDD=3.3V GND= 0V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Clock cycle	$f_{CLK(1)}$	-	9	15	MHz
HS cycle	1/th	-	17.14	-	KHz
VS cycle	1/tv	-	59.94	-	Hz
Horizontal Signal					
Horizontal cycle	th	525	525	605	CLK
Horizontal display period	thd	480	480	480	CLK
Horizontal front porch	thf	2	2	82	CLK
Horizontal pulse width	thp(2)	2	41	41	CLK
Horizontal back porch	thb(2)	2	2	41	CLK
Vertical Signal					
Vertical cycle	tv	285	286	511	H(1)
Vertical display period	tvd	272	272	272	H(1)
Vertical front porch	tvf	1	2	227	H(1)
Vertical pulse width	tvp(2)	1	10	11	H(1)
Vertical back porch	tvb(2)	1	2	11	H(1)

Note: (1) Unit: CLK=1/ fCLK , H=th,
(2) It is necessary to keep tvp+tvb=12 and thp+thb=43 in sync mode.

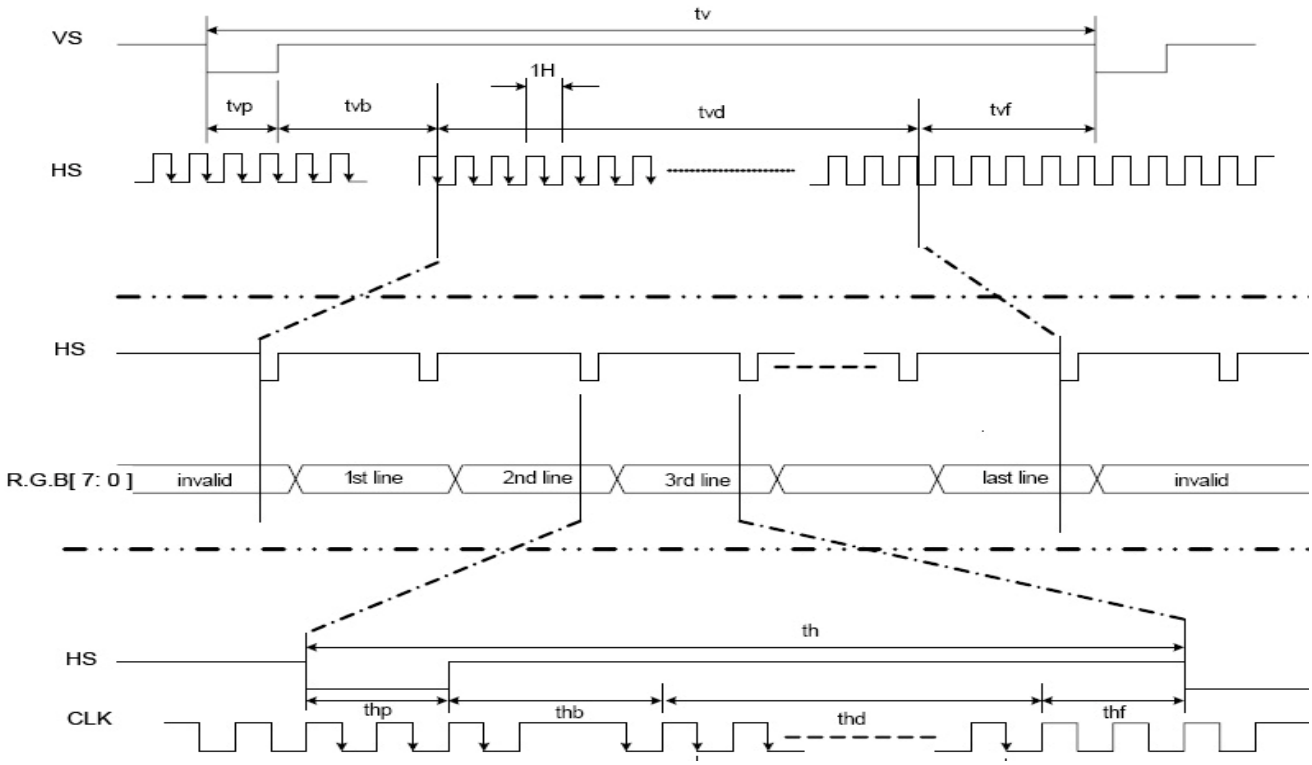


Fig 1. Parallel RGB input timing

7.2 Input Setup Timing Requirement

(Ta =25ºC, VDD=3.3V ,GND= 0V, tr (1)=tf (1)=2ns)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
DISP setup time	t_{diss}	10	-	-	ns
DISP hold time	t_{dish}	10	-	-	ns
Clock period	$PW_{CLK(2)}$	66.7	-	-	ns
Clock pulse high period	$PWH_{(2)}$	26.7	-	-	ns
Clock pulse low period	$PWL_{(2)}$	26.7	-	-	ns
HS setup time	t_{hs}	10	-	-	ns
HS hold time	t_{hh}	10	-	-	ns
Data setup time	t_{ds}	10	-	-	ns
Data hold time	t_{dh}	10	-	-	ns
VS setup time	t_{vhs}	10	-	-	ns
VS hold time	t_{vhh}	10	-	-	ns

Note: (1) tr, tf is defined 10% to 90% of signal amplitude.
(2) For parallel interface, maximum clock frequency is 15MHz.

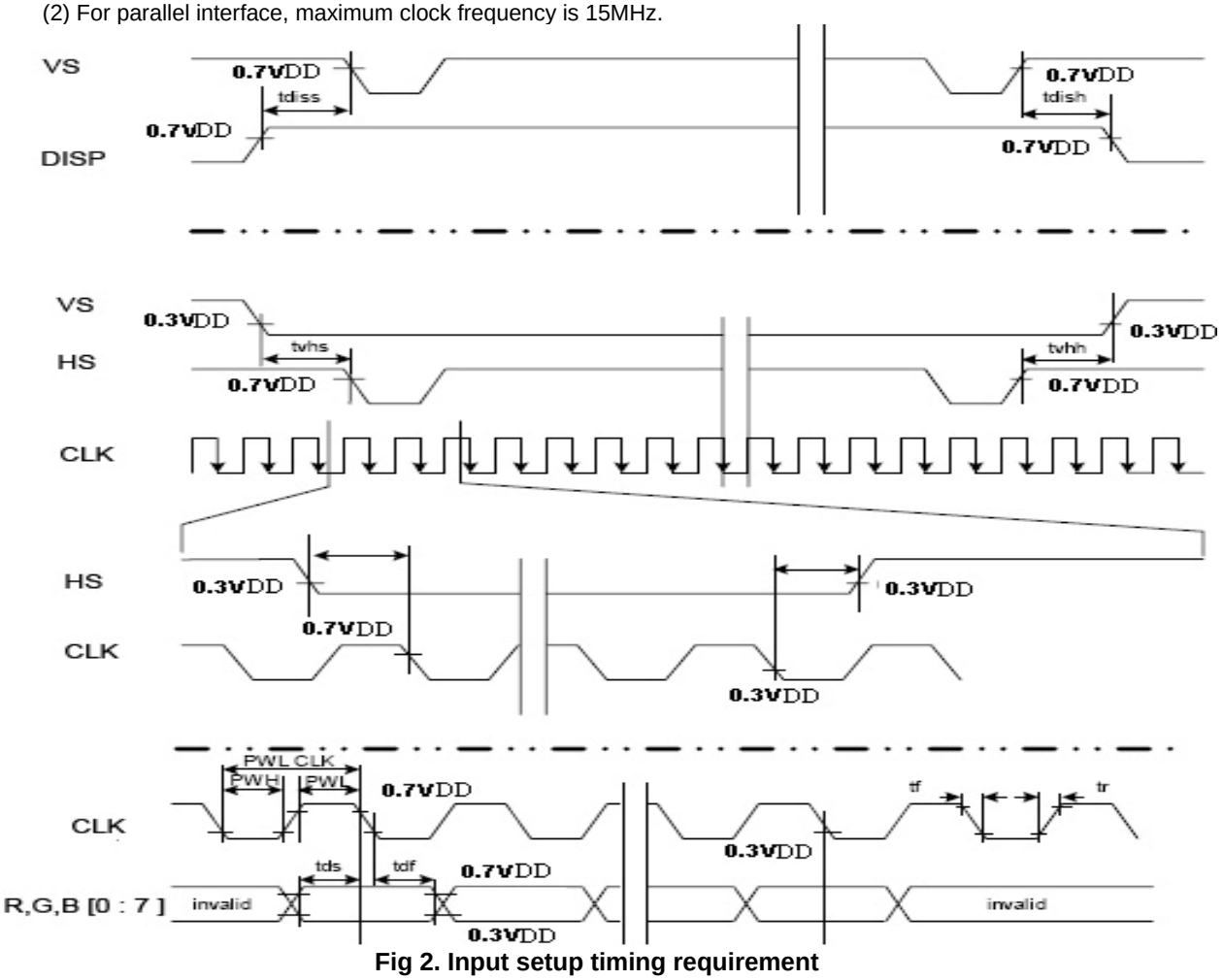


Fig 2. Input setup timing requirement

7.3 TCON Power ON/OFF Control

The TCON IC has a power ON/OFF sequence control function. When DISP pin is pulled "H", blank data is outputted for 10-frames first, from the falling edge of the following VSYNC signal. Similarly, when DISP is pulled "L", 10-frames of blank data will be outputted from the falling edge of the following VSYNC, too.

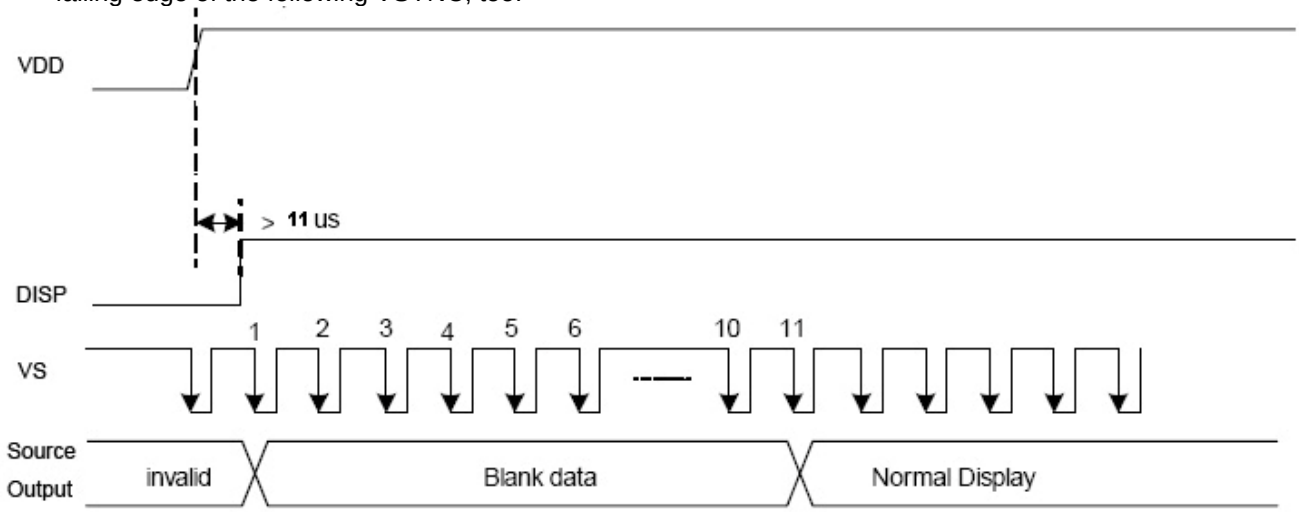


Fig 3. Power On Sequence

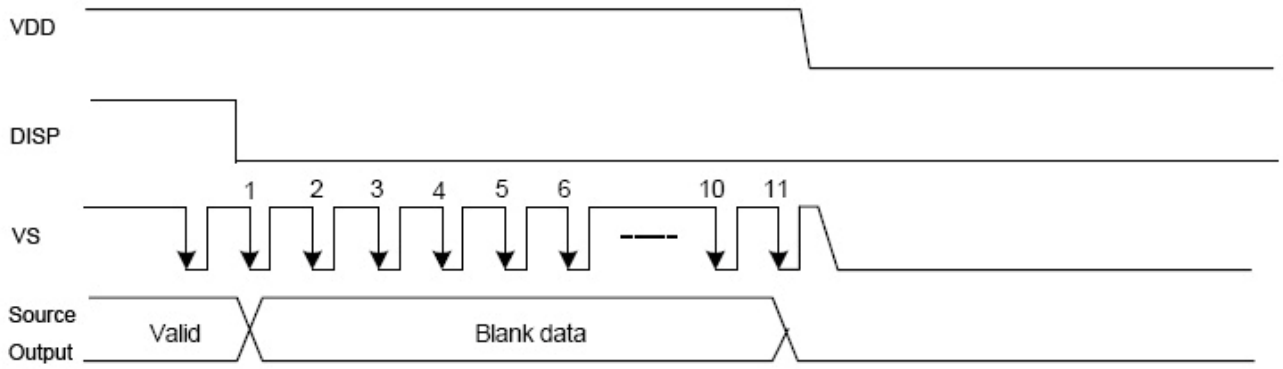
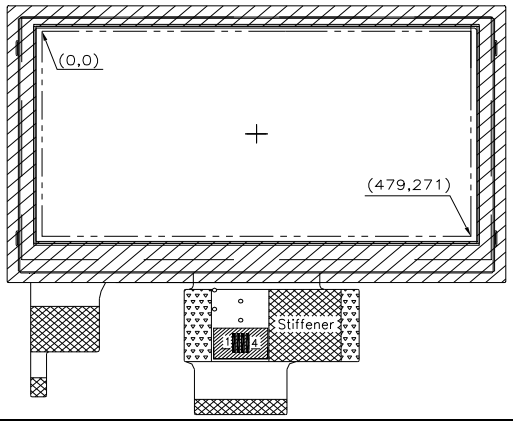


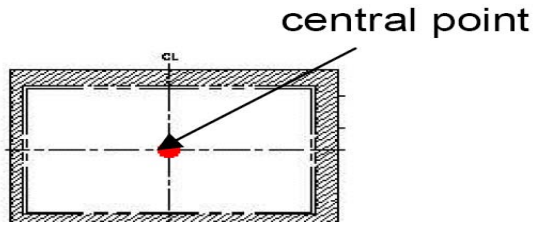
Fig 4. Power Off Sequence

8. CTP INTERFACE AND DATA FORMAT

8.1 GENERAL SPECIFICATIONS

Item	Specification	Unit
Type	Transparent type projected capacitive touch panel	
Input mode	Human's finger	
Multi touch	2	Point
Interface	IIC	
Report rate	Max：122	Points/sec
Response time	15	ms
(X,Y)position		
Point hitting life time	1,000,000 times min.	Note 1
F/W:DataImage_CTP_C12_TEST_C12_2014-04-22_1156.Bin Ver: C12.		

Note 1: Use 8 mm diameter silicon rubber/force 3N to knock on the same point twice per second (no-operating), after test function check pass.



8.2 Electrical Characteristic

8.2.1 Absolute Maximum Rating

Parameter	Symbol	Spec.			Unit
Supply voltage	VCC	-0.3	-	7	V
Switch control signals output current	Output current	-	50	-	mA
Enable control voltage range	Logic Input	-0.3	-	VCC+0.3	V
Output Control Driver	Output voltage	-0.3	-	VCC	V

8.2.2 DC Characteristic

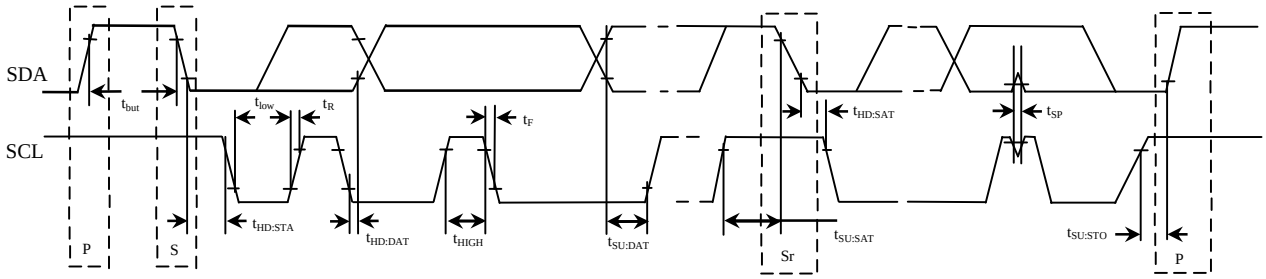
Symbol	Description	Min	Typ.	Max	Unit	Notes
VCC	Supply voltage	2.7	3.3	3.5	V	
IVCC	Supply current		12		mA	
IST	sleep mode		30		uA	

8.3 CTP Pin Connections

No.	Name	I/O	Description
1	VCC	-	Power; VCC=3.3V
2	GND	-	Ground
3	/INT	O	Interrupt, Active low
4	SCL	I	Serial clock
5	SDA	I/O	Serial data
6	/RESET	I	Reset, Active LOW.

8.4 Interface and Data Format (Slave address is 0x94H)

AC characteristics of the SDA and SCL bus lines for I²C-bus devices



Parameter	Symbol	Standard-Mode I²C-BUS		Fast-Mode I²C-BUS		Unit
		Min.	Max.	Min.	Max.	
SCL clock frequency	f_{SCL}	0	100	0	400	KHz
Bus free time between STOP and START condition	t_{BUF}	4.7	-	1.3	-	μs
Hold time (repeated) START condition. After this period, the first clock pulse is generated	$t_{HD:STA}$	4.0	-	0.6	-	μs
LOW period of the SCL clock	t_{LOW}	4.7	-	1.3	-	μs
HIGH period of the SCL clock	t_{HIGH}	4.0	-	0.6	-	μs
Set-up time for a repeated START condition	$t_{SU:STA}$	4.7	-	0.6	-	μs
Data hold time	$t_{HD:DAT}$	0	-	0	0.9	μs
Data set-up time	$t_{SU:DAT}$	250	-	100	-	μs
Rise time of both SDA and SCL signals	t_R	-	1000	$20+0.1C_b$	300	μs
Fall time of both SDA and SCL signals	t_F	-	300	$20+0.1C_b$	300	μs
Set-up time for STOP condition	$t_{SU:STO}$	4.0	-	0.6	-	μs
Capacitive load for each bus line.	C_b	-	400	-	400	pF

Note:

(1) All values are referred to VIH (0.7xVCC) and VIL (0.3xVCC) level.

(2) A device must internally provide a hold time of at least 300ns for the SDA signal (referred to the VIH of the SCL signal) in order to bridge the undefined region of the falling edge of SCL.

(3) The maximum $t_{HD:DAT}$ has only to be met if the device does not stretch the LOW period (t_{LOW}) of the SCL signal.

(4) A fast-mode I²C-bus device can be used in a standard-mode I²C-bus system, but the requirement $t_{SU:DAT} \geqq 250$ns must then be met. This will automatically be the case if the device does not stretch the LOW period of the SCL signal. If such a device does stretch the LOW period of the SCL signal, it must output the next data bit to the SDA line $t_{R\ max}$ $t_{SU:DAT}$ = 1000+250=1250ns (according to the standard-mode I²C-bus specification) before the SCL line is released.

(5) C_b = total capacitance of one bus line in pF.

8.5. Interface and Data Format

8.5.1 Transfer protocol (I²Cinterface)

HX8526-A support I²C interface that need 2 hardware pin – serial data (SDA) and serial clock (SCL), carry information between the devices connected to the bus. The I²C bus supports serial, 8-bit oriented, bi-directional data transferred at a rate up to 100Kbit/s in the standard-mode, or up to 400Kbit/s in the fast-mode.

The data on the SDA line must be stable during the HIGH period of the clock. The HIGH or LOW state of the data line can only change when the clock signal on the SCL line is LOW.

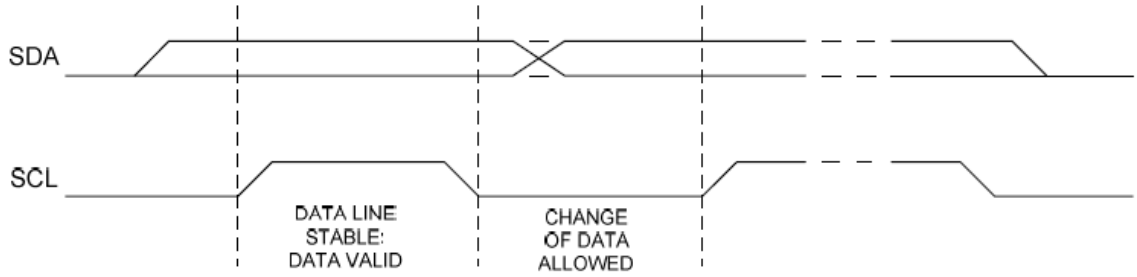


Figure 8.5.1: I²C Signal timing

Within the procedure of the I²C -bus, unique situations arise which are defined as START and STOP conditions. A HIGH to LOW transition on the SDA line while SCL is HIGH is one such unique case. This situation indicates a START condition. A LOW to HIGH transition on the SDA line while SCL is HIGH defines a STOP condition. START and STOP conditions are always generated by the master. The I²C bus is considered to be busy after the START condition. The I²C bus is considered to be free again a certain time after the STOP condition.

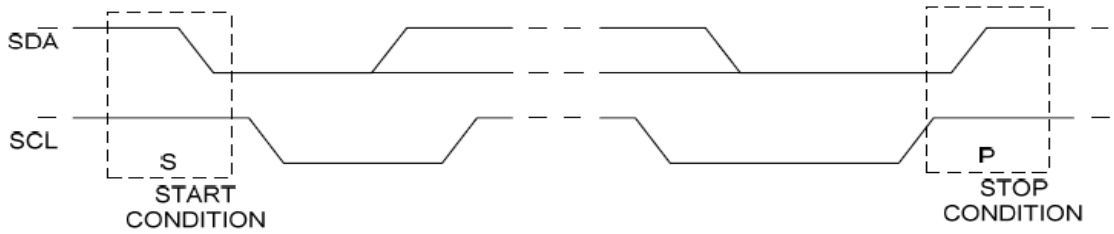


Figure 8.5.2: I²C Start/Stop

The slave address of I²C is defined at the follow description

A. The HX8526-A QFN48 Type 1 and UFBGA Type 1 only support I²C interface and the slave address is 90h.

B. The HX8526-A QFN 48 type 2 , UFBGA Type 2, QFN64 and QFN40 support I²C interface and the slave address is selected by A0. If A0="L", the slaver address is 90h. If A0="H", the slaver address is 92h.

In I²C slave mode, HX8526-A waits for Master reading the data and acknowledges. Every byte put on the SDA line must be 8-bits long. The number of bytes that can be transmitted per transfer is unrestricted. Each byte has to be followed by an acknowledge bit. Data is transferred with the most significant bit (MSB) first. If HX8526-A can't receive or transmit another complete byte of data until it has performed some other function, for example servicing an internal interrupt, it can hold the clock line SCL LOW to force the master into a wait state. Data transfer then continues when the HX8526-A is ready for another

byte of data and releases clock line SCL

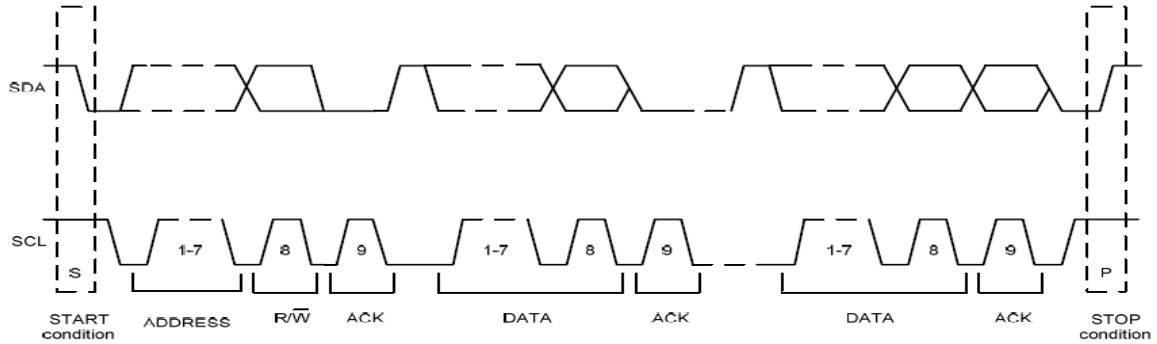


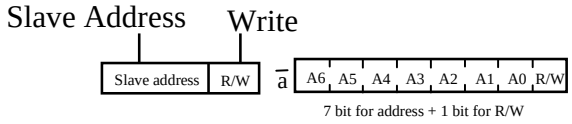
Figure 8.5.3: I²C data transfer

8.5.2 Format of data frame (I²C interface)

When master sends the command which be received by HX8526-A, the HX8526-A will responses the code and data .The format of communication is shown as Figure 11.4. The Command table that is written by master is defined on Table11.1 Command Table. HX8526-A will response the response code first and data later

Write mode

S	Slave Address	0	A	Command Address	A	Parameter	A		Parameter	A/$\overline{A}$	P



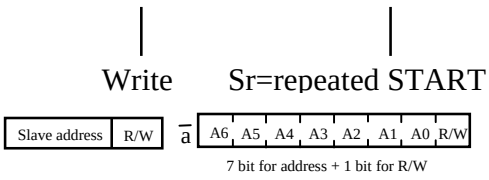
From master to slave From slave to master

A= acknowledge (SDA LOW)
A= not acknowledge (SDA HIGH)
S= START condition
P= STOP condition

Data Format of writing mode

Read mode

S	Slave address	R/$\overline{W}$	A	Com.	A/$\overline{A}$	Sr	Slave address	R/$\overline{W}$	A	Data	A/$\overline{A}$	P



From master to slave From slave to master

A= acknowledge (SDA LOW)
A= not acknowledge (SDA HIGH)
S= START condition
P= STOP condition

Data Format of reading mode

9. COMMAND

9.1 Command list

Hex	Operation Code	D7	D6	D5	D4	D3	D2	D1	D0	Function
0	No operation	0	0	0	0	0	0	0	0	-
80	Sleep IN	1	0	0	0	0	0	0	0	-
81	Sleep Out	1	0	0	0	0	0	0	1	-
82	Sense Off	1	0	0	0	0	0	1	0	-
83	Sense On	1	0	0	0	0	0	1	1	-
85	Read Event	1	0	0	0	0	1	0	1	-
	1st parameter	B31	B30	B29	B28	B27	B26	B25	B24	-
	2nd parameter	B23	B22	B21	B20	B19	B18	B17	B16	-
	3rd parameter	B15	B14	B13	B12	B11	B10	B9	B8	-
	4th parameter	B7	B6	B5	B4	B3	B2	B1	B0	-
86	Read All Events	1	0	0	0	0	1	1	0	-
	1st parameter	B31	B30	B29	B28	B27	B26	B25	B24	-
	2nd parameter	B23	B22	B21	B20	B19	B18	B17	B16	-
	3rd parameter	B15	B14	B13	B12	B11	B10	B9	B8	-
	4th parameter	B7	B6	B5	B4	B3	B2	B1	B0	-
	5th parameter	E3	E2	E1	E0	FI	P2	P1	P0	-
	6th parameter	B23	B22	B21	B20	B19	B18	B17	B16	-
	…	:	:	:	:	:	:	:	:	-
	(n+1)th parameter	B7	B6	B5	B4	B3	B2	B1	B0	-
87	Read Latest Event	1	0	0	0	0	1	1	1	-
	1st parameter	B31	B30	B29	B28	B27	B26	B25	B24	-
	2nd parameter	B23	B22	B21	B20	B19	B18	B17	B16	-
	3rd parameter	B15	B14	B13	B12	B11	B10	B9	B8	-
	4th parameter	B7	B6	B5	B4	B3	B2	B1	B0	-
88	Clear Stack	1	0	0	0	1	0	0	0	-
9E	TS Software Reset	1	0	0	1	1	1	1	0	-

9.2 User define command list table

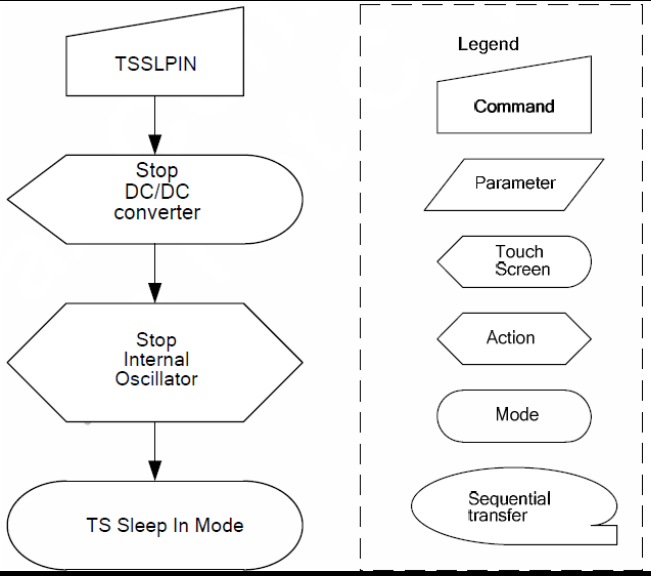
Hex	Operation Code	D7	D6	D5	D4	D3	D2	D1	D0	Function
31h	Device ID	0	0	1	1	0	0	0	1	Response Device ID Code
	1st parameter	85								-
	2nd parameter	26								-
	3nd parameter	01								-
32h	Version ID	0	0	1	1	0	0	0	1	Read Firmware version

9.3CTP COMMAND DESCRIPTION

NOP

00 H	**NOP (No Operation)**									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	0	0	0	0	0	0	0	0	00
Parameter	No parameter									
Description	This command is an empty command and it does not have any effect on the touch screen.									
Restriction										
Register Availability	Status	Availability								
	TS Sleep Out	Yes								
	TS Sleep In	Yes								
Default	Status	Default Value								
	Power Up Sequence	N/A								
	TS S/W Reset	N/A								
	H/W Reset	N/A								
Flow Chart										

TS sleep in (80h)

80H	**TSSLPIN** (Touch Screen Sleep In)									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	1	0	0	0	0	0	0	0	80
parameter	No parameter									
Description	This command causes the touch screen to enter the minimum power consumption mode. MCU interface are register are still working and keeps their contents.									
Restriction	This command has no effect when the touch screen is already in TS Sleep In mode. TS Sleep In Mode can only be left by the TS Sleep Out Command (81h). It will be necessary to wait 5msec before sending next command. This is to allow time for the supply voltages and clock circuits to stabilize. It will be necessary to wait 5msec after sending TS Sleep Out command (when in TS Sleep In Mode) before TS Sleep In command can be sent.									
Register Availability	Status	Availability								
	TS Sleep Out	Yes								
	TS Sleep In	Yes								
Default	Status	Default Value								
	Power Up Sequence	TS Sleep In Mode								
	TS S/W Reset	TS Sleep In Mode								
	H/W Reset	TS Sleep In Mode								
Flow Chart										

TS sleep out (81h)

81H	**TSSLPOUT** (Touch Screen Sleep Out)									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	1	0	0	0	0	0	0	1	81
parameter	No parameter									
Description	This command turns off TS Sleep In mode.									
Restriction	This command has no effect when touch screen is already in TS Sleep Out mode. TS Sleep Out Mode can only be left by the TS Sleep In Command (80h). It will be necessary to wait 5msec before sending next command. This is to allow time for the supply voltages and clock circuits to stabilize. The touch screen loads all touch screen supplier's factory default values to the registers during this 5msec and there cannot be any abnormal effect on the touch screen functionality if factory default and register values are same when this load is done and when the touch screen is already TS Sleep Out – mode. It will be necessary to wait 5msec after sending TS Sleep In command (when in TS Sleep Out mode) before TS Sleep Out command can be sent.									

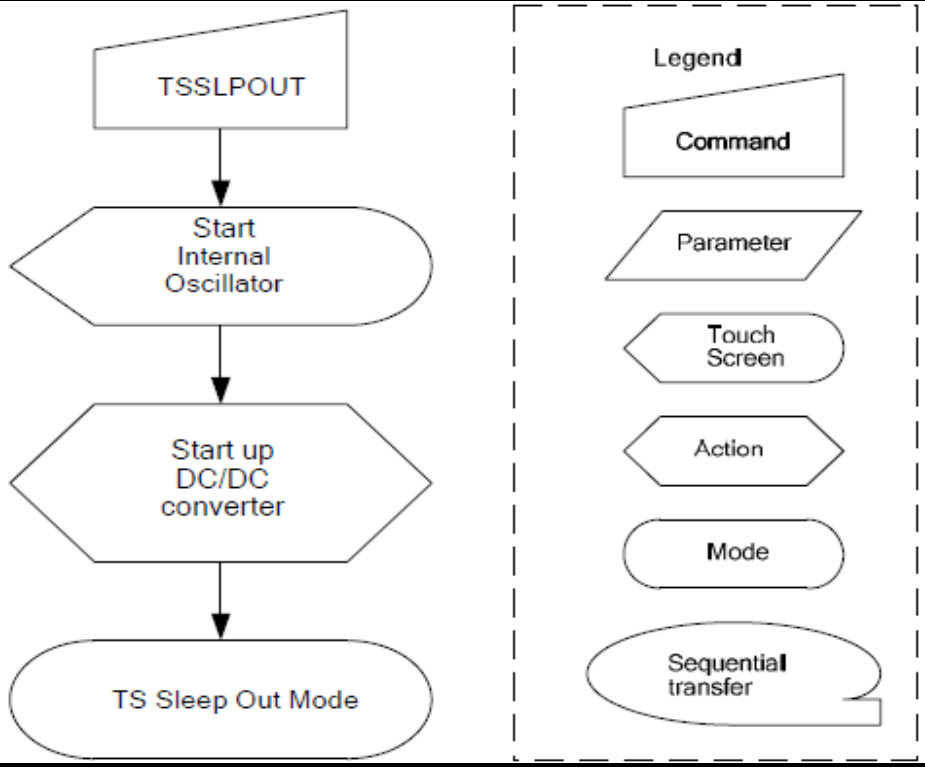
Register Availability

Status	Availability
TS Sleep Out	Yes
TS Sleep In	Yes

Default

Status	Default Value
Power Up Sequence	TS Sleep In Mode
TS S/W Reset	TS Sleep In Mode
H/W Reset	TS Sleep In Mode

Flow Chart



TS sense off (82h)

82H	**TSSOFF** (Touch Screen Sense Off)									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	1	0	0	0	0	0	1	0	82
parameter	No parameter									
Description	The touch screen is not sensing touches (= No new events), but the touch screen is still scanning.									
Restriction										

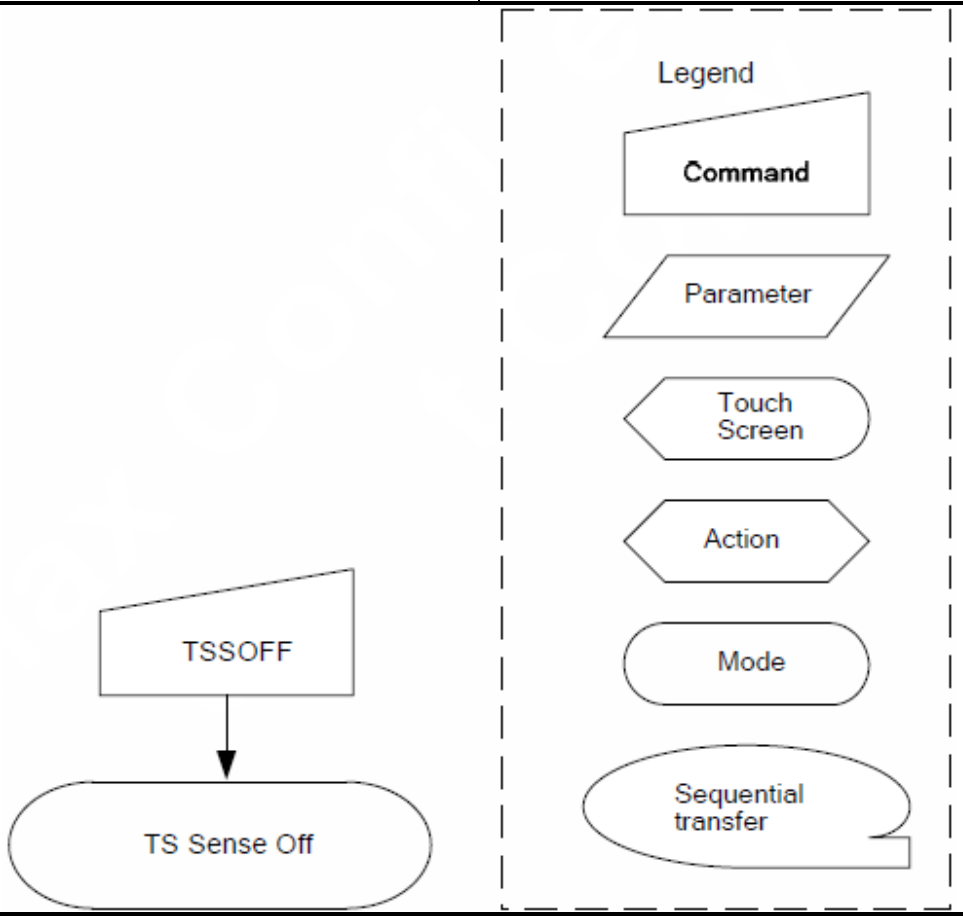
Register Availability

Status	Availability
TS Sleep Out	Yes
TS Sleep In	Yes

Default

Status	Default Value
Power Up Sequence	TS Sense Off
TS S/W Reset	TS Sense Off
H/W Reset	TS Sense Off

Flow Chart



TS sense on (83h)

83H	**TSSON** (Touch Screen Sense On)									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	1	0	0	0	0	0	1	1	83
parameter	No parameter									
Description	The touch screen is sensing touches (= No new events).									
Restriction										

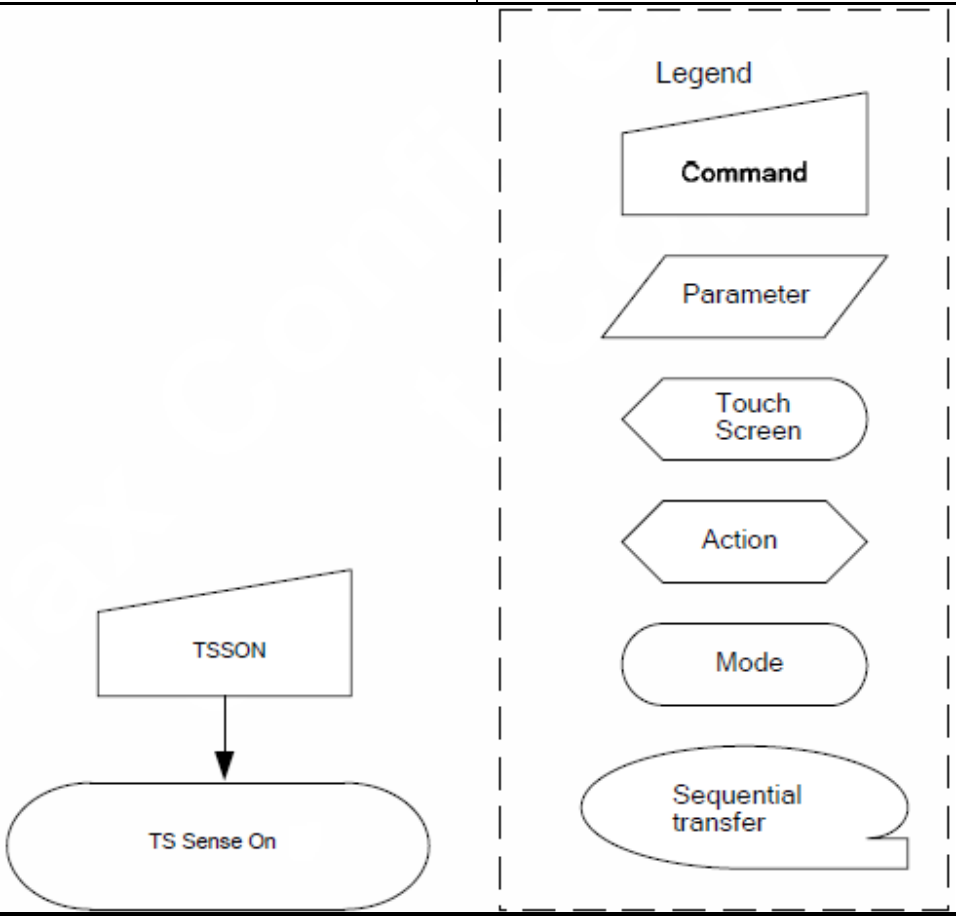
Register Availability

Status	Availability
TS Sleep Out	Yes
TS Sleep In	Yes

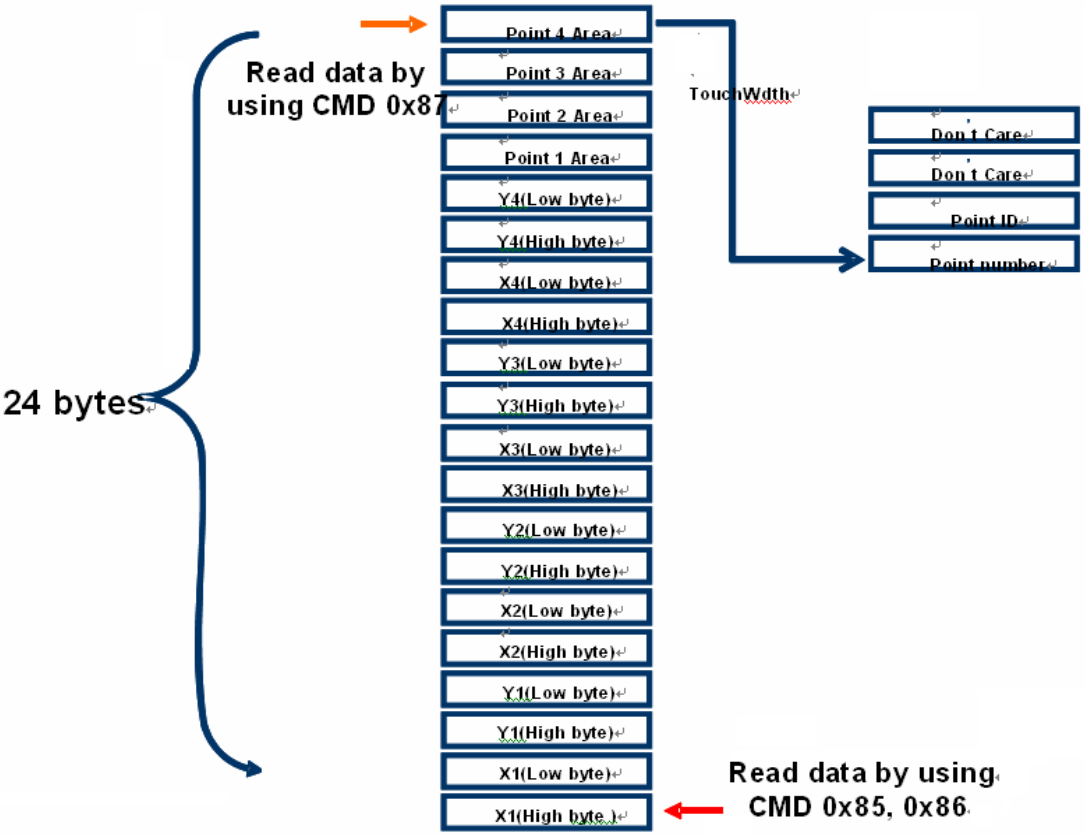
Default

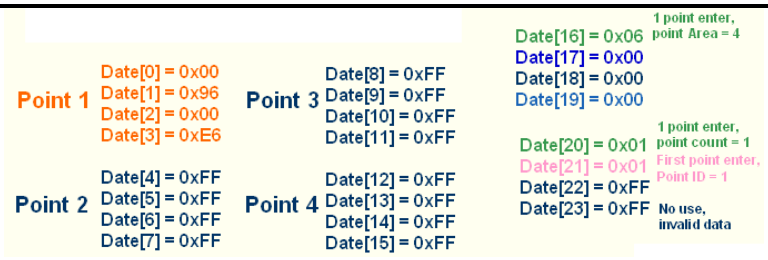
Status	Default Value
Power Up Sequence	TS Sense Off
TS S/W Reset	TS Sense Off
H/W Reset	TS Sense Off

Flow Chart



Read One Event (85h)

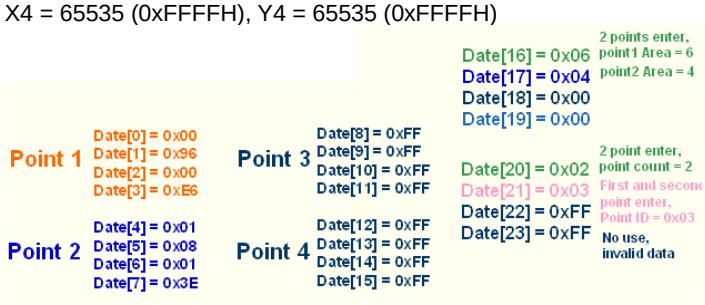
85H		ROE (Read One Event)									
		DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command		0	1	0	0	0	0	1	0	1	85
1	parameter	-	B31	B30	B29	B28	B27	B26	B25	B24	xx
2	parameter	-	B23	B22	B21	B20	B19	B18	B17	B16	xx
3	parameter	-	B15	B14	B13	B12	B11	B10	B9	B8	xx
4	parameter	-	B7	B6	B5	B4	B3	B2	B1	B0	xx
Description		This command returns one touch event what is the oldest co-ordinates or raw counter (dc) values information has been stored on the stock. The event stack is empty after this command. A returning value can be “No Event” if the stock is empty. co-ordinates and related touch information: Touch Width: Report the touched block. For example: if RX=15, TX=10, the total Block is 150 (96h). If it has three touched block, the report value is 03h. Point ID: Report the ID of touched points. Points number: Report the touch number.  When one or more points (but not all) have been touched, other points without touched will be fill invalid data 0xFFFF to let baseband distinguish which point has been touched or not. Example 1: Support 4 points, one point has been touched. X1 = 150 (0x0096H), Y1 = 230 (0x00E6H) X2 = 65535 (0xFFFFH), Y2 = 65535 (0xFFFFH) X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH) X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH) Totally data length = 4 x 4 + 8 = 24 bytes									



Example 2: Support 4 points, 2 points have been touched, and than first point leave.

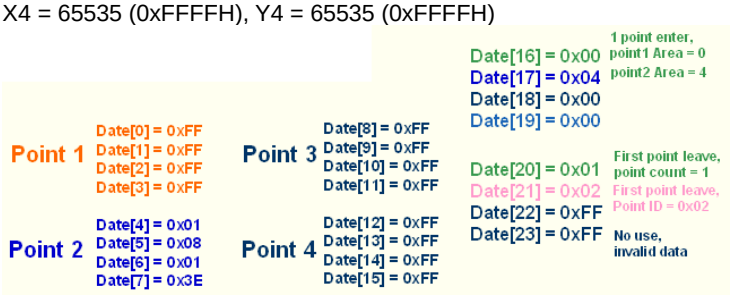
(1) 2 points enter

X1 = 150 (0x0096H), Y1 = 230 (0x00E6H)
X2 = 264 (0x0108H), Y2 = 318 (0x013EH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



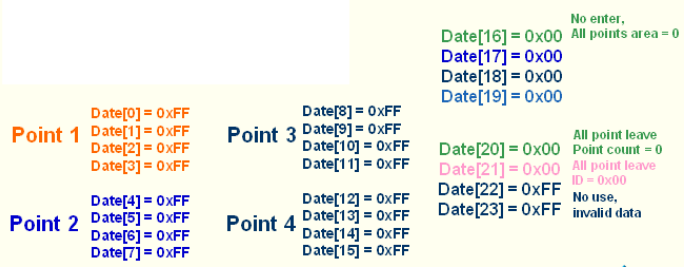
(2) First point leave

X1 = 65535 (0xFFFFH), Y1 = 65535 (0xFFFFH)
X2 = 264 (0x0108H), Y2 = 318 (0x013EH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



(3) All point leave

When all point leave, touch controller will report all point leave event data one time and than stop interru
until next touch.
All point leave data will be fill 0xFFFF and optional information will be fill 0x0000
X1 = 65535 (0xFFFFH), Y1 = 65535 (0xFFFFH)
X2 = 65535 (0xFFFFH), Y2 = 65535 (0xFFFFH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



When one or more points (but not all) have been touched, other points without touched will be fill invalid dat
0xFFFF to let baseband distinguish which point has been touched or not

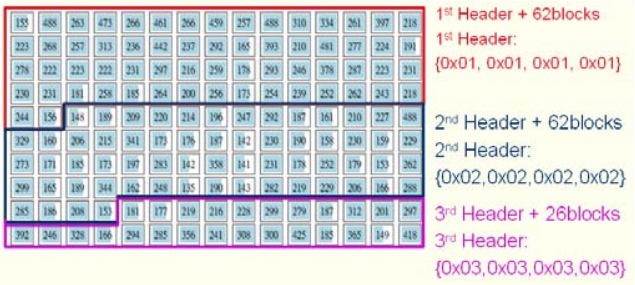
Raw counter:
If we read out the max stacks in once time 32x4 = 128 bytes. The first 4 bytes for header.
Header format : {0x0?, 0x0?, 0x0?, 0x0?} (? is for 1, 2, 3 … N)
After Header then it will follow Raw Count Value, the raw count value contain 2 bytes for each block. So we can read out 31x4 = 124 bytes = 62 blocks
Example: TP1 total block = 150 blocks, It will be separated by 3 time for read out

```
for(j=0;j<STACK_inte;j++)
{
    write_event4 = j+1;
    write_event3 = j+1;
    write_event2 = j+1;
    write_event1 = j+1;

    for(i=(j*31);i<((j+1)*31);i++)
    {
        write_event4 = dc_ex[2*i]>>8;
        write_event3 = dc_ex[2*i];
        write_event2 = dc_ex[2*i+1]>>8;
        write_event1 = dc_ex[2*i+1];
    }

    for(k=0;k<200;k++)
        for(m=0;m<140;m++);
}
```

Header



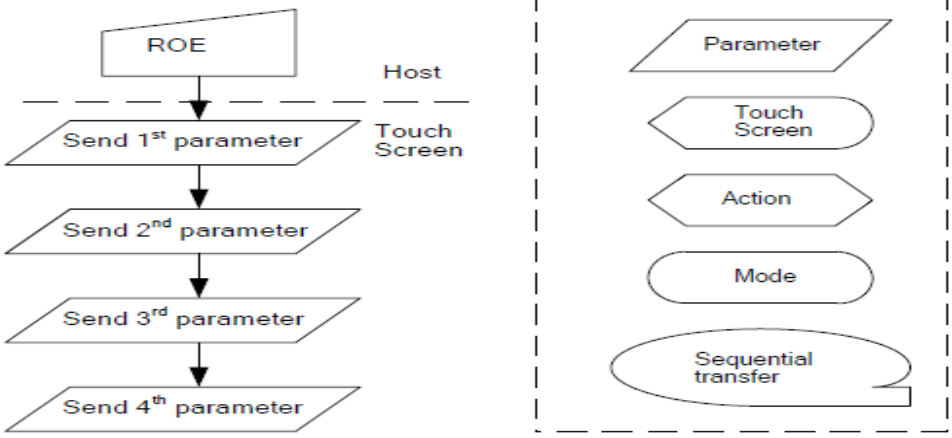
Register Availability

Status	Availability
TS Sleep Out	Yes
TS Sleep In	Yes

Default

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

Flow Chart

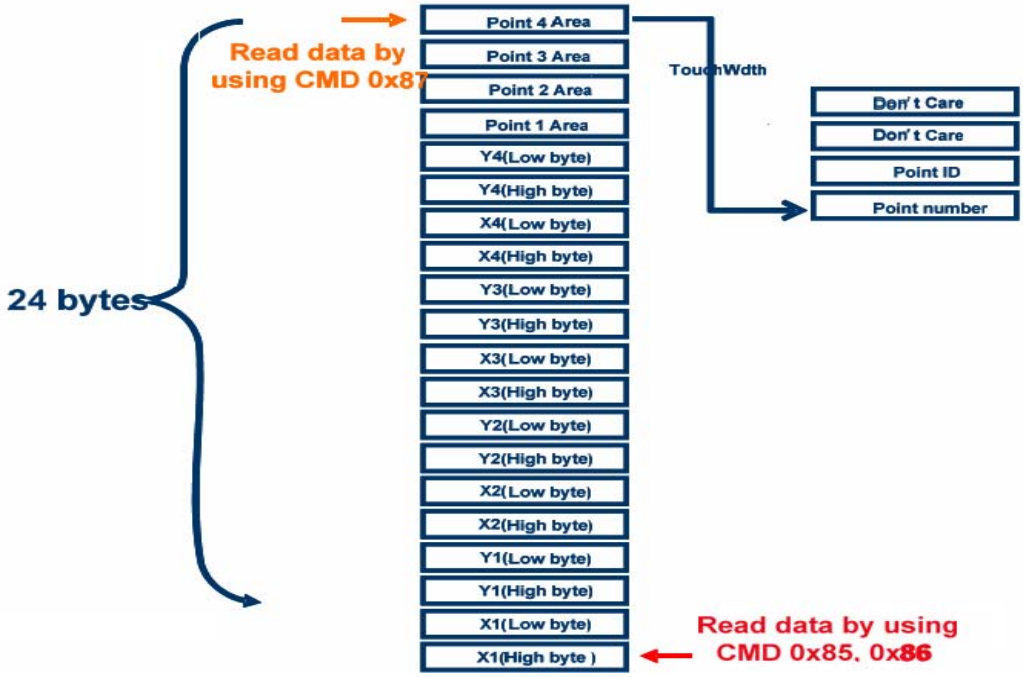


Read All Event (86h)

86H		RAE (Read All Events)									
		DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command		0	1	0	0	0	0	1	1	0	86
1	parameter	-	B31	B30	B29	B28	B27	B26	B25	B24	xx
2	parameter	-	B23	B22	B21	B20	B19	B18	B17	B16	xx
3	parameter	-	B15	B14	B13	B12	B11	B10	B9	B8	xx
4	parameter	-	B7	B6	B5	B4	B3	B2	B1	B0	xx
5	parameter	-	E3	E2	E1	E0	F1	P2	P1	P0	xx
6	parameter	-	B23	B22	B21	B20	B19	B18	B17	B16	xx
:		-	:	:	:	:	:	:	:	:	:
(n+1) Parameter		-	B7	B6	B5	B4	B3	B2	B1	B0	xx

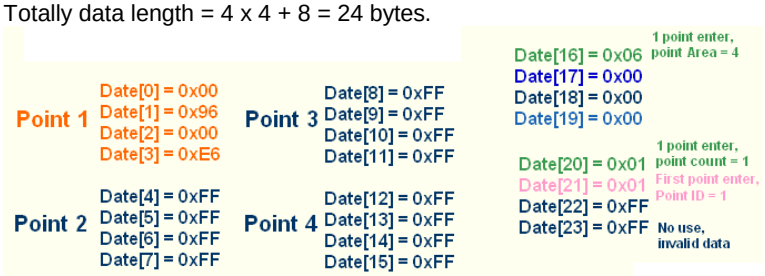
Description

This command returns one touch event what is the oldest co-ordinates or raw counter (dc) values information has been stored on the stock. A returning value can be “No Event” if the stock is empty. co-ordinates and related touch information:
Touch Width: Report the touched block. For example: if RX=15, TX=10, the total Block is 150 (96h). If it has three touched block, the report value is 03h.
Point ID: Report the ID of touched points.
Points number: Report the touch number.



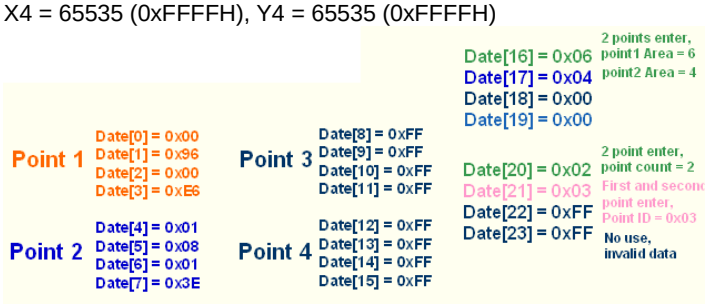
When one or more points (but not all) have been touched, other points without touched will be fill invalid data 0xFFFF to let baseband distinguish which point has been touched or not.
Example 1: Support 4 points, one point has been touched.
X1 = 150 (0x0096H), Y1 = 230 (0x00E6H)
X2 = 65535 (0xFFFFH), Y2 = 65535 (0xFFFFH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)

Totally data length = 4 x 4 + 8 = 24 bytes.



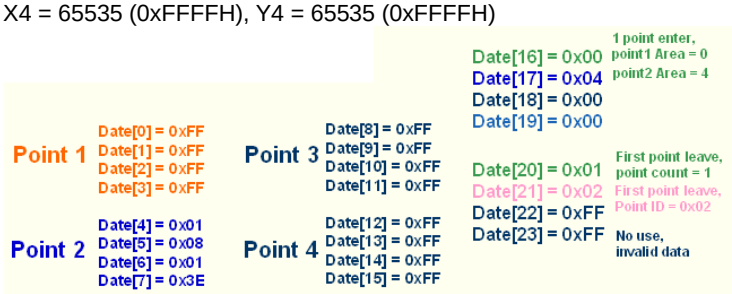
Example 2: Support 4 points, 2 points have been touched, and than first point leave. (2) 2 points enter

X1 = 150 (0x0096H), Y1 = 230 (0x00E6H)
X2 = 264 (0x0108H), Y2 = 318 (0x013EH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



(2) First point leave

X1 = 65535 (0xFFFFH), Y1 = 65535 (0xFFFFH)
X2 = 264 (0x0108H), Y2 = 318 (0x013EH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)

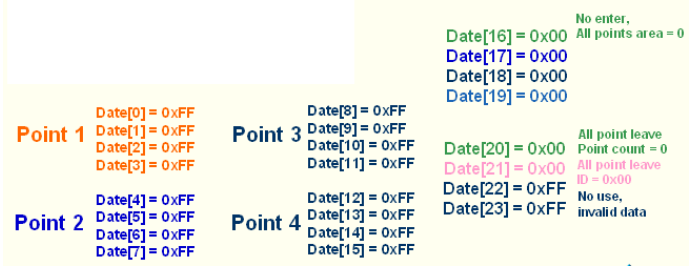


(3) All point leave

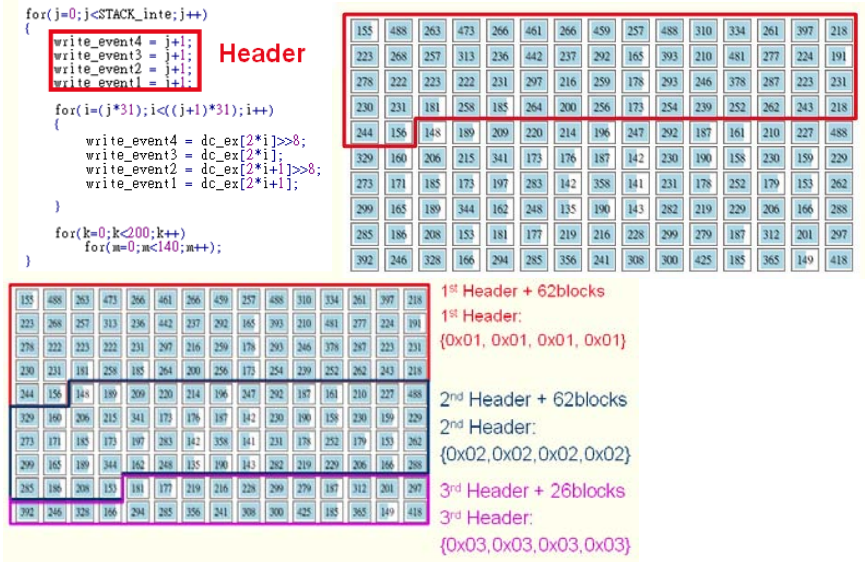
When all point leave, touch controller will report all point leave event data one time and than stop interrupt until next touch.

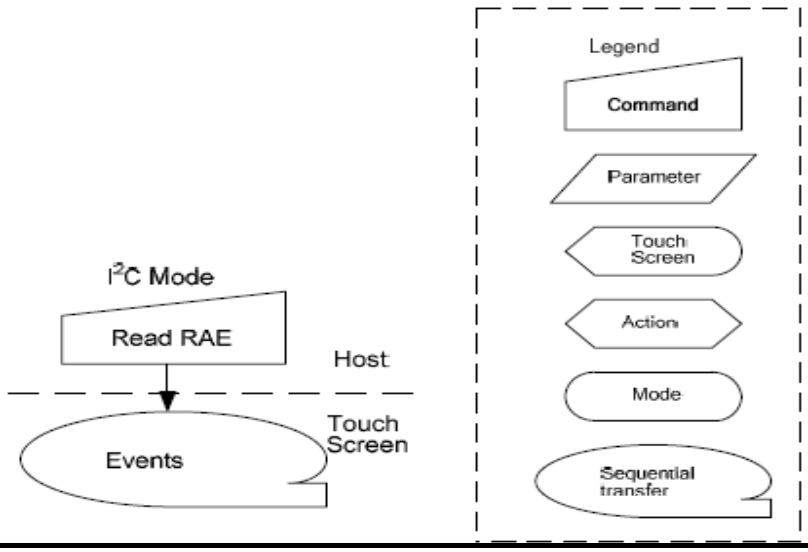
All point leave data will be fill 0xFFFF and optional information will be fill 0x0000.

X1 = 65535 (0xFFFFH), Y1 = 65535 (0xFFFFH)
X2 = 65535 (0xFFFFH), Y2 = 65535 (0xFFFFH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



When one or more points (but not all) have been touched, other points without touched will be fill invalid data 0xFFFF to let baseband distinguish which point has been touched or not.

<table>
<tr><td></td><td>
Raw counter:
If we read out the max stacks in once time 32x4 = 128 bytes. The first 4 bytes for header.
Header format : {0x0?, 0x0?, 0x0?, 0x0?} (? is for 1, 2, 3 … N)
After Header then it will follow Raw Count Value, the raw count value contain 2 bytes for each block. So we can read out 31x4 = 124 bytes = 62 blocks
Example: TP1 total block = 150 blocks, It will be separated by 3 time for read out.


</td></tr>
<tr><td>Register Availability</td><td>
<table>
<tr><td>Status</td><td>Availability</td></tr>
<tr><td>TS Sleep Out</td><td>Yes</td></tr>
<tr><td>TS Sleep In</td><td>Yes</td></tr>
</table>
</td></tr>
<tr><td>Default</td><td>
<table>
<tr><td>Status</td><td>Default Value</td></tr>
<tr><td>Power Up Sequence</td><td>All Values 0000 0000h</td></tr>
<tr><td>TS S/W Reset</td><td>All Values 0000 0000h</td></tr>
</table>
</td></tr>
<tr><td>Flow Chart</td><td>


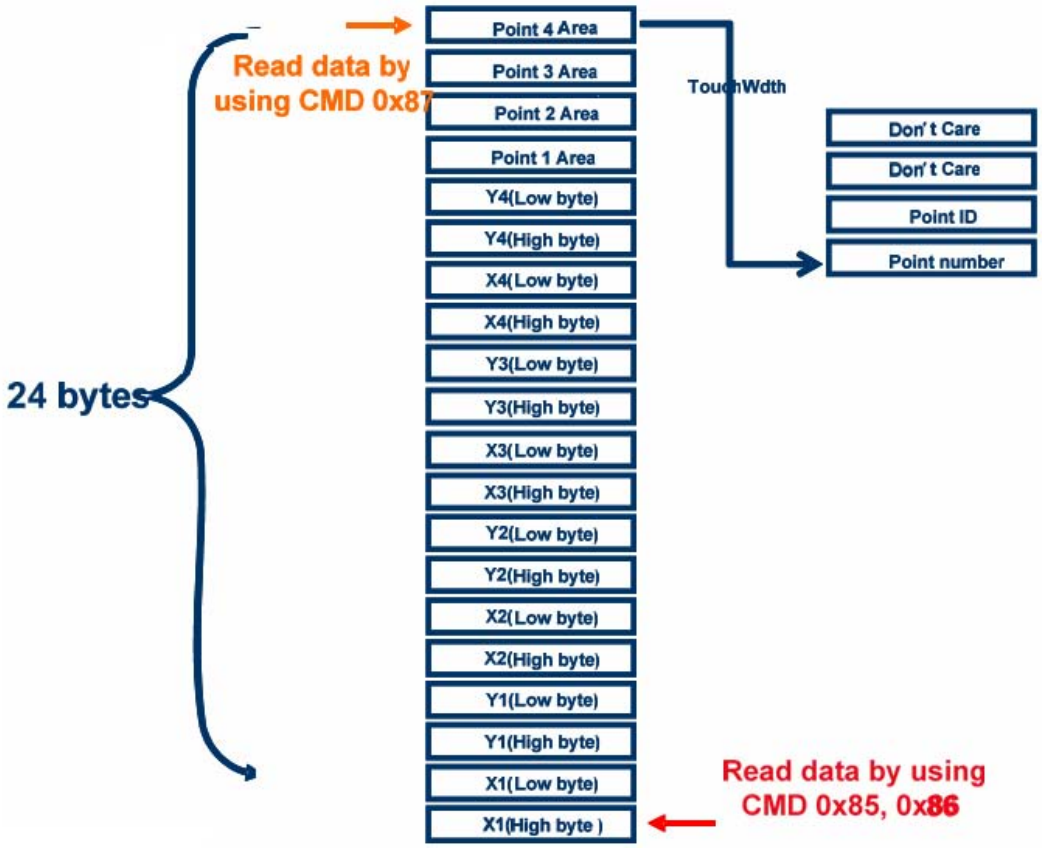
</td></tr>
</table>

Read Latest Event (87h)

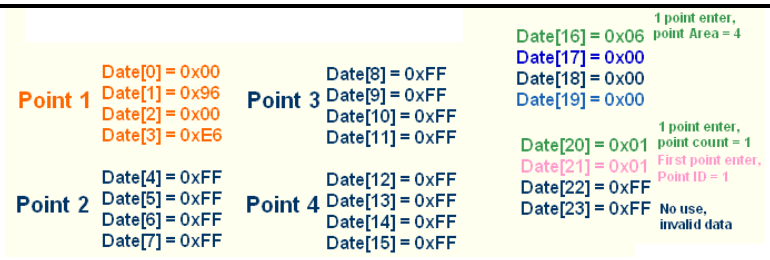
87H		RLE (Read Latest Event)									
		DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command		0	1	0	0	0	0	1	1	1	87
1	parameter	-	B31	B30	B29	B28	B27	B26	B25	B24	xx
2	parameter	-	B23	B22	B21	B20	B19	B18	B17	B16	xx
3	parameter	-	B15	B14	B13	B12	B11	B10	B9	B8	xx
4	parameter	-	B7	B6	B5	B4	B3	B2	B1	B0	xx

Description

This command returns one touch event what is the oldest co-ordinates or raw counter (dc) values information has been stored on the stock. The event stack is empty after this command.
A returning value can be “No Event” if the stock is empty.
co-ordinates and related touch information:
Touch Width: Report the touched block. For example: if RX=15, TX=10, the total Block is 150 (96h). If it has three touched block, the report value is 03h.
Point ID: Report the ID of touched points.
Points number: Report the touch number.



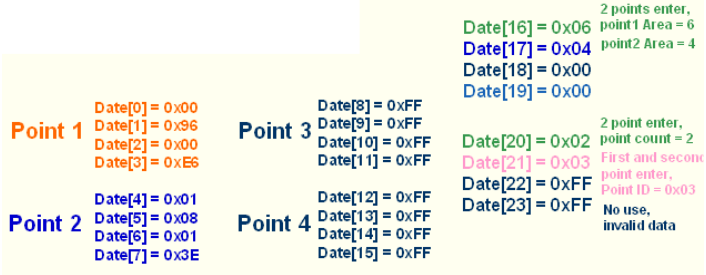
When one or more points (but not all) have been touched, other points without touched will be fill invalid data 0xFFFF to let baseband distinguish which point has been touched or not.
Example 1: Support 4 points, one point has been touched.
X1 = 150 (0x0096H), Y1 = 230 (0x00E6H)
X2 = 65535 (0xFFFFH), Y2 = 65535 (0xFFFFH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)
Totally data length = 4 x 4 + 8 = 24 bytes



Example 2: Support 4 points, 2 points have been touched, and than first point leave.

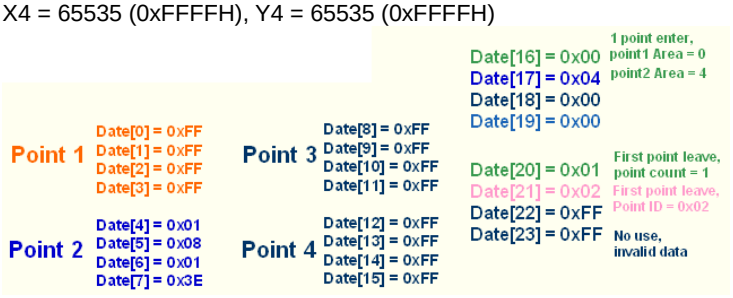
(1) 2 points enter

X1 = 150 (0x0096H), Y1 = 230 (0x00E6H)
X2 = 264 (0x0108H), Y2 = 318 (0x013EH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



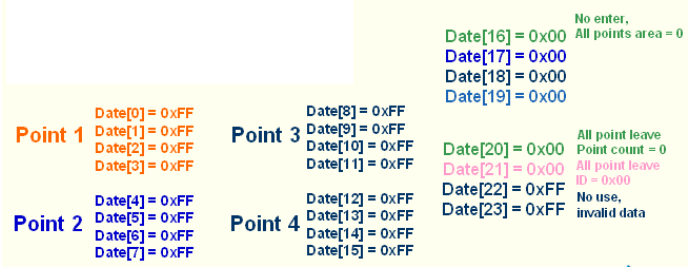
(2) First point leave

X1 = 65535 (0xFFFFH), Y1 = 65535 (0xFFFFH) X2 =
264 (0x0108H), Y2 = 318 (0x013EH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



(3) All point leave

When all point leave, touch controller will report all point leave event data one time and than stop interrupt until next touch.
All point leave data will be fill 0xFFFF and optional information will be fill 0x0000.
X1 = 65535 (0xFFFFH), Y1 = 65535 (0xFFFFH)
X2 = 65535 (0xFFFFH), Y2 = 65535 (0xFFFFH)
X3 = 65535 (0xFFFFH), Y3 = 65535 (0xFFFFH)
X4 = 65535 (0xFFFFH), Y4 = 65535 (0xFFFFH)



When one or more points (but not all) have been touched, other points without touched will be fill invalid data 0xFFFF to let baseband distinguish which point has been touched or not.

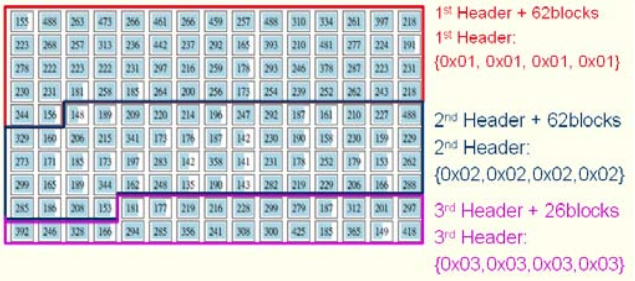
Raw counter:
If we read out the max stacks in once time 32x4 = 128 bytes. The first 4 bytes for header.
Header format : {0x0?, 0x0?, 0x0?, 0x0?} (? is for 1, 2, 3 … N)
After Header then it will follow Raw Count Value, the raw count value contain 2 bytes for each block. So we can read out 31x4 = 124 bytes = 62 blocks
Example: TP1 total block = 150 blocks, It will be separated by 3 time for read out

```
for(j=0;j<STACK_inte;j++)
{
    write_event4 = j+1;
    write_event3 = j+1;
    write_event2 = j+1;
    write_event1 = j+1;

    for(i=(j*31);i<((j+1)*31);i++)
    {
        write_event4 = dc_ex[2*i]>>8;
        write_event3 = dc_ex[2*i];
        write_event2 = dc_ex[2*i+1]>>8;
        write_event1 = dc_ex[2*i+1];
    }

    for(k=0;k<200;k++)
        for(m=0;m<140;m++);
}
```

Header



1st Header + 62blocks
1st Header:
{0x01, 0x01, 0x01, 0x01}

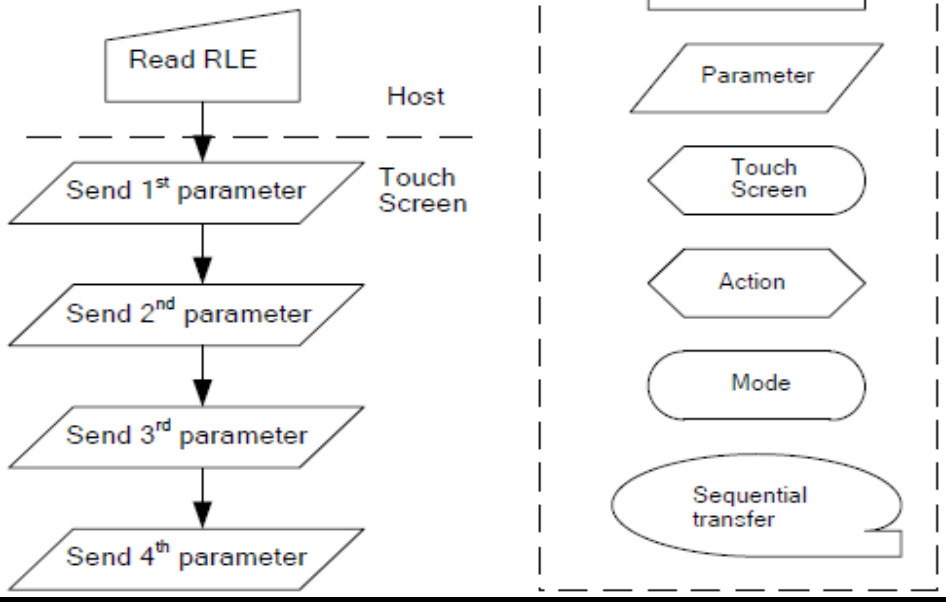
2nd Header + 62blocks
2nd Header:
{0x02,0x02,0x02,0x02}

3rd Header + 26blocks
3rd Header:
{0x03,0x03,0x03,0x03}

Register Availability

Status	Availability
TS Sleep Out	Yes
TS Sleep In	Yes

Flow Chart



Clear Event Stack (88h)

88H	**CLRES** (Clear Event Stack)									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	1	0	0	0	1	0	0	0	88
parameter	No parameter									
Description	This command clears event stack when the only return event can be “No Event”.									
Restriction										

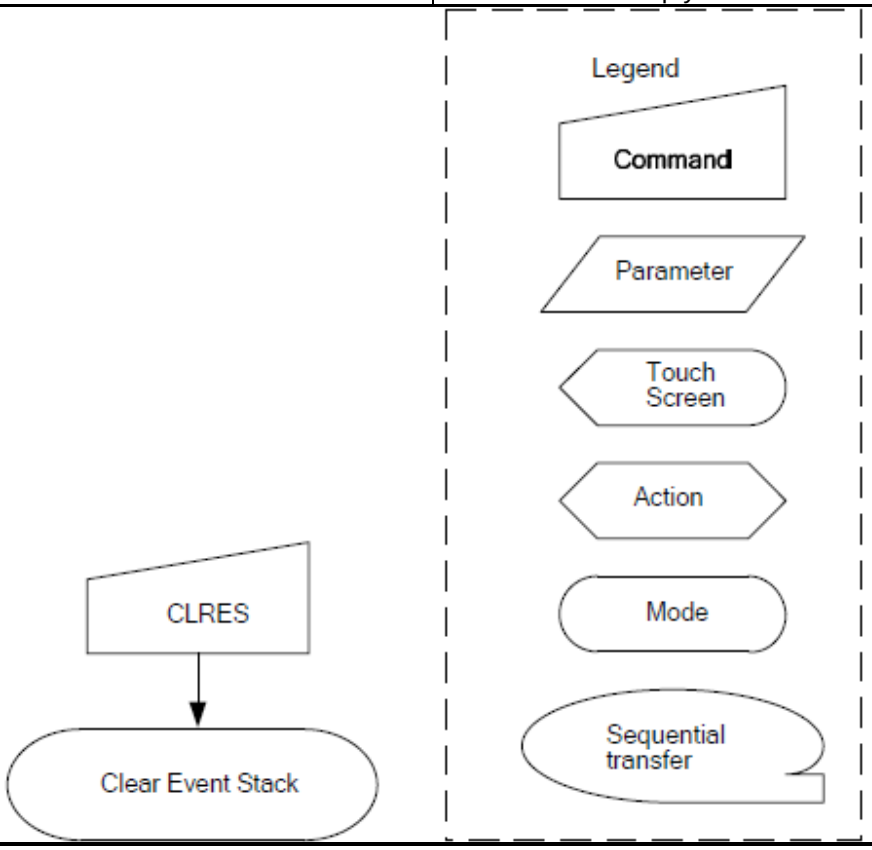
Register Availability

Status	Availability
TS Sleep Out	Yes
TS Sleep In	Yes

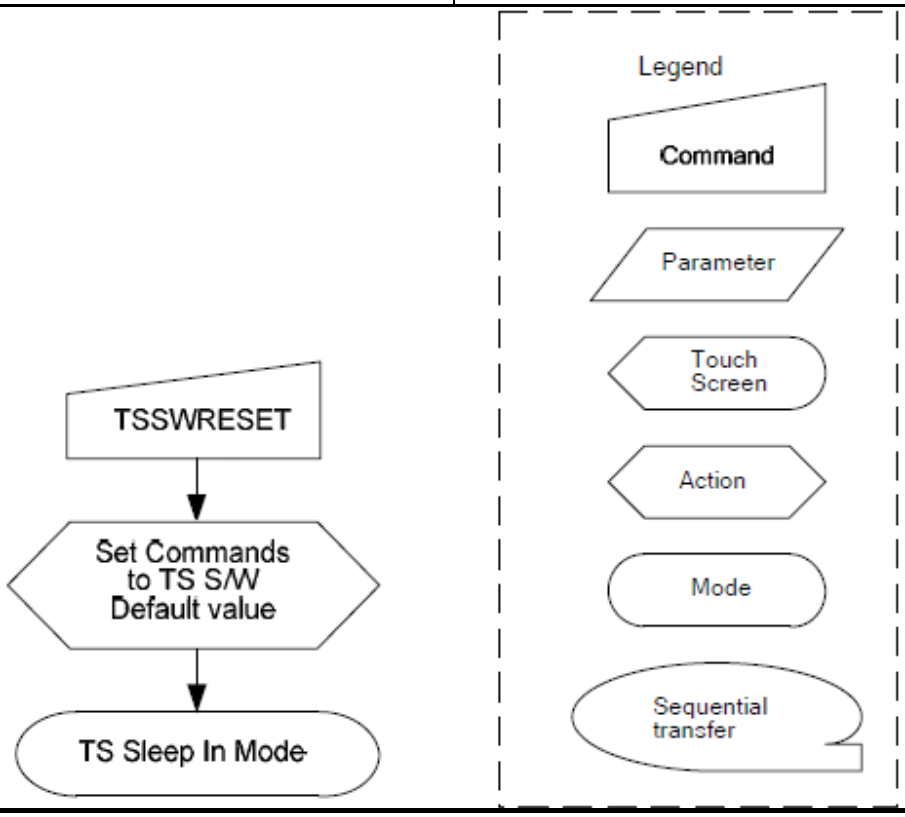
Default

Status	Default Value
Power Up Sequence	Empty Stack
TS S/W Reset	Empty Stack
H/W Reset	Empty Stack

Flow Chart



TS Software Reset (9Eh)

9E H	**TSSWRESET** (Touch Screen Software Reset)									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	1	0	0	1	1	1	1	0	9E
parameter	No parameter									
Description	When the Touch Screen Software Reset command is written, it causes a software reset. It resets the commands and parameters to their TS S/W Reset default values. (See default tables in each command description.) Note: The Memory contents are unaffected by this command									
Restriction	It will be necessary to wait 5msec before sending new command following software reset. The touch screen loads all touch screen supplier's factory default values to the registers during this 5msec. If Software Reset is applied during TS Sleep Out mode, it will be necessary to wait 5msec before sending TS Sleep Out command. Touch Screen Software Reset Command cannot be sent during TS Sleep Out sequence.									
Register Availability	Status	Availability								
	TS Sleep Out	Yes								
	TS Sleep In	Yes								
Default	Status	Default Value								
	Power Up Sequence	N/A								
	TS S/W Reset	N/A								
	H/W Reset	N/A								
Flow Chart										

Device ID Command (31h)

31 H	Device ID									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	0	0	1	1	0	0	0	1	31
1 parameter	1	85								00..FF
2 parameter	1	26								00..FF
3 parameter	1	01								00..FF
Description	When the Device ID command is written, IC will echo the device ID to master. The index of Device ID command is 31h									
Register Availability	Status: TS Sleep Out — Availability: Yes Status: TS Sleep In — Availability: Yes									
Default	Status: Power Up Sequence — Default Value: N/A Status: TS S/W Reset — Default Value: N/A Status: H/W Reset — Default Value: N/A									
Flow Chart										

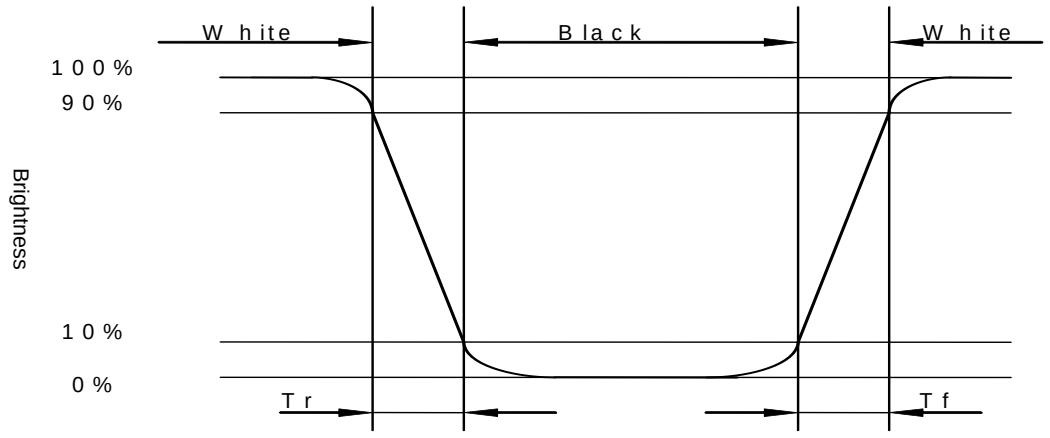
Version ID Command (32h)

32 H	Device ID									
	DNC	D7	D6	D5	D4	D3	D2	D1	D0	HEX
Command	0	0	0	1	1	0	0	1	0	31
1 parameter	1	SF_Version[3:0]				F_Version[3:0]				00..FF
Description	This command will report the ID code of firmware Version. F_Version [3:0]: The firmware version of flash code. SF_Version [3:0]: The firmware version of self test code.									
Register Availability	Status: TS Sleep Out — Availability: Yes Status: TS Sleep In — Availability: Yes									
Default	Status: Power Up Sequence — Default Value: N/A Status: TS S/W Reset — Default Value: N/A Status: H/W Reset — Default Value: N/A									
Flow Chart										

10. OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time	Rise	Tr	θ=0°	--	5	10	ms	Note 4
	Fall	Tf		--	15	20	ms	
Contrast ratio		CR	At optimized viewing angle	200	300	--		Note 5
Viewing angle	Top		CR≥10	40	50	--	Deg.	Note 6
	Bottom			60	70	--		
	Left			60	70	--		
	Right			60	70	-		
Luminance			θ=0°	238	297	--	cd/m^2	Note 7
Uniformity		B-uni		70	80		%	Note 8
White chromaticity		X	θ=0°	0.27	0.32	0.37		Note 7
		y		0.28	0.33	0.38		

Note 1: Ambient temperature =25°C. LED current I_L= 15 mA.
Note 2: To be measured in the dark room.
Note 3: To be measured on the center area of panel with a viewing cone of 1° by Topcon luminance meter BM-7A, after 2 minutes operation.
Note 4: Definition of response time:
The output signals of photo-detector are measured when the input signals are changed from “white” to “black”(rising time) and from “black” to “white”(falling time),respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as shown below.



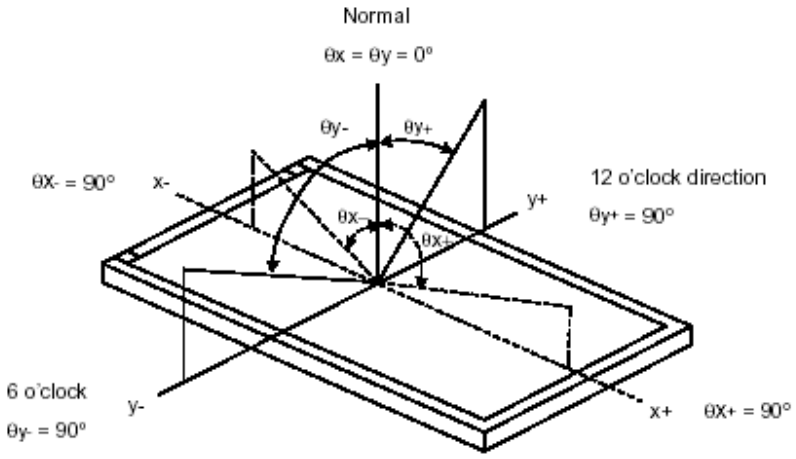
Note5: Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Photo-detector output when LCD is at “White” state}}{\text{Photo-detector output when LCD is at “Black” state}}$$

Note 6: Definition of viewing angle:

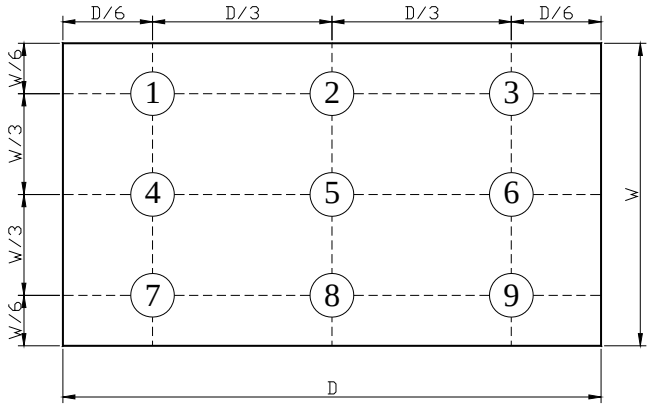
Refer to figure as below.



Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

Note 8: Definition of Brightness Uniformity (B-uni):

Luminance Measuring Points



$$\text{B-uni} = \frac{\text{Minimum luminance of 9 points}}{\text{Maximum luminance of 9points}}$$

11. QUALITY ASSURANCE

11.1 RA Test Condition

11.1.1 Temperature and Humidity(Ambient Temperature)

Temperature : 25 ± 5°C
Humidity : 65 ± 5%

11.1.2 Operation

Unless specified otherwise, test will be conducted under function state.

11.1.3 Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

11.1.4 Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

11.1.5 Test Method

No.	Reliability Test Item & Level	Test Level	Remark
1	High temperature storage test	T=80℃,240H	IEC68-2-2
2	Low temperature storage test	T= -30℃,240H	IEC68-2-1
3	High temperature operation test	T=70℃,240H	IEC68-2-2
4	Low temperature operation test	T=-20℃,240H	IEC68-2-1
5	High temperature and high humidity operation test	T=60℃,90%RH,240H	IEC68-2-3
6	Thermal cycling storage test	-30℃----25℃------80℃ ,200Cycle 30min 5min 30min	IEC68-2-14
7	Vibration Test	Frequency:10 ~ 55 Hz Amplitude:1.5 mm Sweep Time:11min Test Period:6 Cycles for each Direction of X,Y,Z	IEC68-2-6
8	Shock test	100G,6ms,Direction:±X±Y±Z Cycle:3times	IEC68-2-27
9	Drop test	Height :60cm 1 conner,3edges,6surfaces	IEC68-2-32
10	Electrostatic Discharge Test	Location: LCM/TP surface Condition:150pf 330Ω Contact +/- 4kV Air +/-8kV Criteria: Class C	IEC-61000-4-2

11.2 Inspection Judgment standard

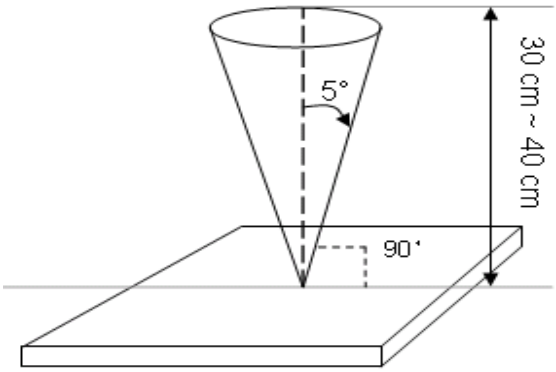
11.2.1 Inspection conditions

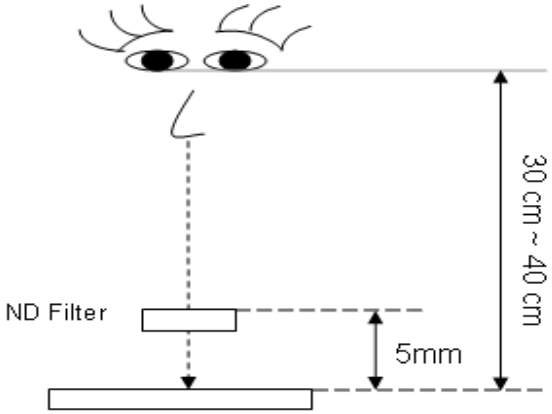
11.2.1.1 Inspection Distance : 35 ± 5 cm

11.2.1.2 View Angle :

(1) Inspection that light pervious to the product: ±5°

(2) Inspection that light reflects on the product: ±45°



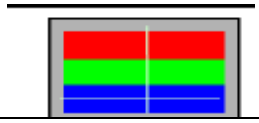


11.2.2 Environment conditions :

Ambient Temperature :	25±5℃
Ambient Humidity :	30~75%RH
Ambient Illumination	600~800 lux

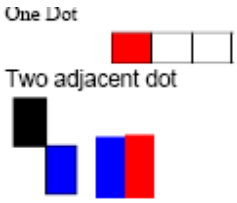
11.2.3 Inspection Parameters

Appearance inspection standard (D: diameter, L: length; W: width, Z: height, T: glass thickness，n：number)

Inspection item	Inspection standard	Description
No image	Prohibited	
Image abnormal	Prohibited	
Bright line	Prohibited	
Mura	It is acceptable that the defect can not be seen with 2% ND filter.	

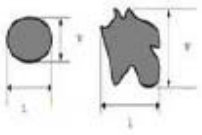
Dot

Item	Acceptable Visible area	Total
Bright dot	2	5
Dark dot	4	
Bright adjacent dots	1	1
Dark adjacent dots	2	2
Adjacent dots with a bright dot and a dark dot	1	1



Foreign material in dot shape

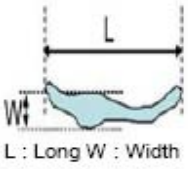
SPEC (unit: mm)	Acceptable
D≦0.3	Ignored
0.3<D≦0.5, distance>5	n≦5
D＞0.5	0



Inspection item	Inspection standard	Description

Foreign material in line shape

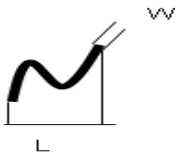
SPEC (unit: mm)	Acceptable
W≦0.05 and L≦7	Ignored
0.05<W≦0.1, L≦7, distance >5	n≦5
W>0.1 or L>7	0



Contamination	It is acceptable if the dirt can be wiped.	
Inspection item	Inspection standard	Description

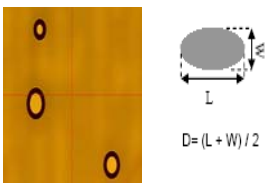
Scratch

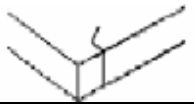
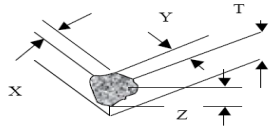
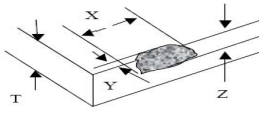
SPEC (unit: mm)	Acceptable
W≦0.05 and L≦7	Ignored
0.05<W≦0.08, L≦7, distance >5	n≦5
0.08<W≦0.1, L≦7, distance >5	n≦3
W>0.1 or L>7	0



Bubble

SPEC (unit: mm)	Acceptable
D≦0.2	Ignored
Non visible area	Ignored
0.2<D≦0.3, distance >5	n≦5
D＞0.3	0



<table>
<tr><td>Insufficient glue</td><td><table><tr><td>SPEC (unit: mm)</td><td>Acceptable</td></tr><tr><td>Non visible area</td><td>Ignored</td></tr><tr><td>Visible area</td><td>0</td></tr></table></td><td></td></tr>
<tr><td>Cover & Sensor Crack</td><td>Prohibited</td><td>  </td></tr>
<tr><td>Sensor angle missing & edge break</td><td><table><tr><td>SPEC (unit: mm)</td><td>Acceptable</td></tr><tr><td>Damage circuit or effect function</td><td>0</td></tr></table></td><td></td></tr>
<tr><td>Cover/Sensor angle missing</td><td><table><tr><td>SPEC (unit: mm)</td><td>Acceptable</td></tr><tr><td>X≦3.0, Y≦3.0, Z≦T</td><td>Ignored</td></tr><tr><td>X>3.0, Y>3.0, Z＞T</td><td>0</td></tr></table></td><td>  </td></tr>
<tr><td>Cover/Sensor edge break</td><td><table><tr><td>SPEC (unit: mm)</td><td>Acceptable</td></tr><tr><td>X≦3.0, Y≦3.0, Z≦T</td><td>Ignored</td></tr><tr><td>X>3.0, Y>3.0, Z＞T</td><td>0</td></tr></table></td><td>  </td></tr>
<tr><td>Inspection item</td><td>SPEC</td><td>Description</td></tr>
<tr><td>Ink</td><td><table><tr><td>SPEC (unit: mm)</td><td>Acceptable</td></tr><tr><td>word unclear, inverted, mistake, break line</td><td>0</td></tr></table></td><td></td></tr>
<tr><td>Bubble under protection film</td><td><table><tr><td>SPEC (unit: mm)</td><td>Acceptable</td></tr><tr><td>NA</td><td></td></tr></table></td><td></td></tr>
<tr><td>Function</td><td>Prohibited</td><td></td></tr>
</table>

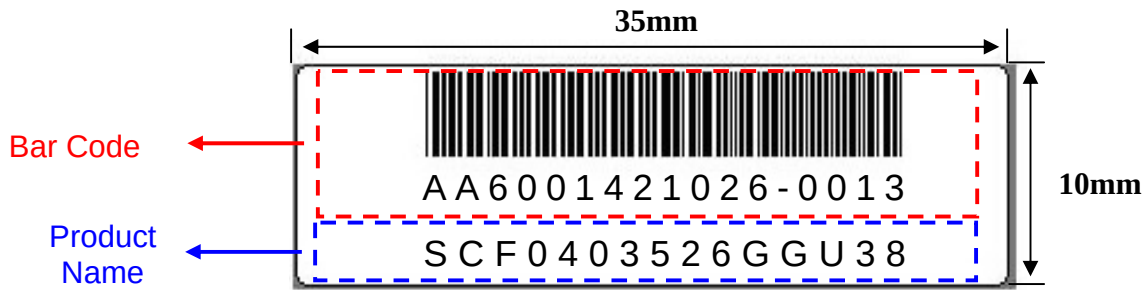
11.3 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.
Lot size: Quantity of shipment lot per model.
Sampling type: normal inspection, single sampling
Sampling table: MIL-STD-105E
Inspection level: Level II

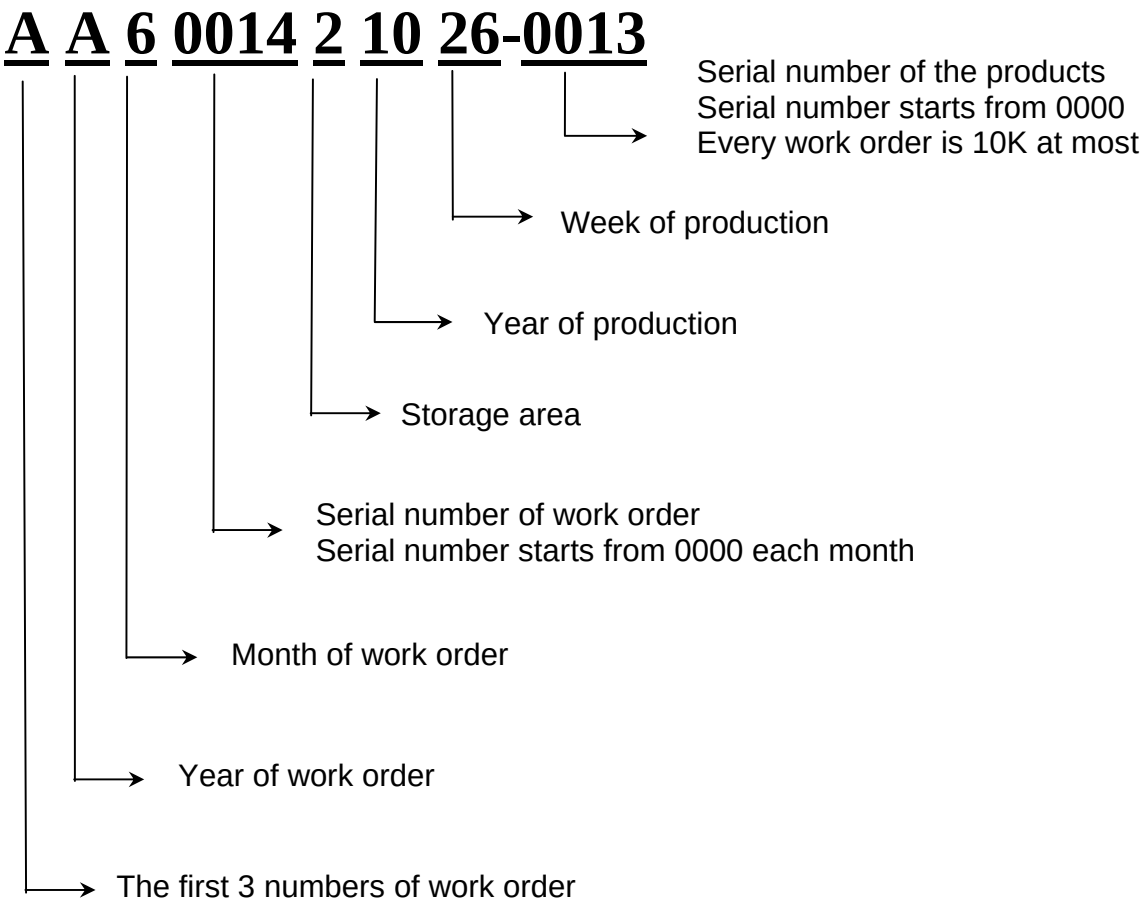
Class of defects	**Definition**		
	Major	AQL 0.65	It is a defect that is likely to result in failure or to reduce materially the usability of the product for the intended function.
	Minor	AQL 1.5	It is a defect that will not result in functioning problem with deviation classified.

12. LCM PRODUCT LABEL DEFINE

Product Label style:



BarCode Define:



Product Name Define:

SC F 0403 526 G G U 38

Serial Number

Material of Glue

N : None

U : UV

C : OCA

R : Other

Material of Cover Lens

N : None

G : Glass

P : PMMA

F : Film

E : PET

R : Other

Material of Sensor

G : Glass

F : Film

R : Other

IC Number

526 : HX8526-A

Size

0403 : 4.3inch

Module Type

N : None LCM

F : Standard TFT Module

X : Custom TFT Module

Capacitive Touch Panel

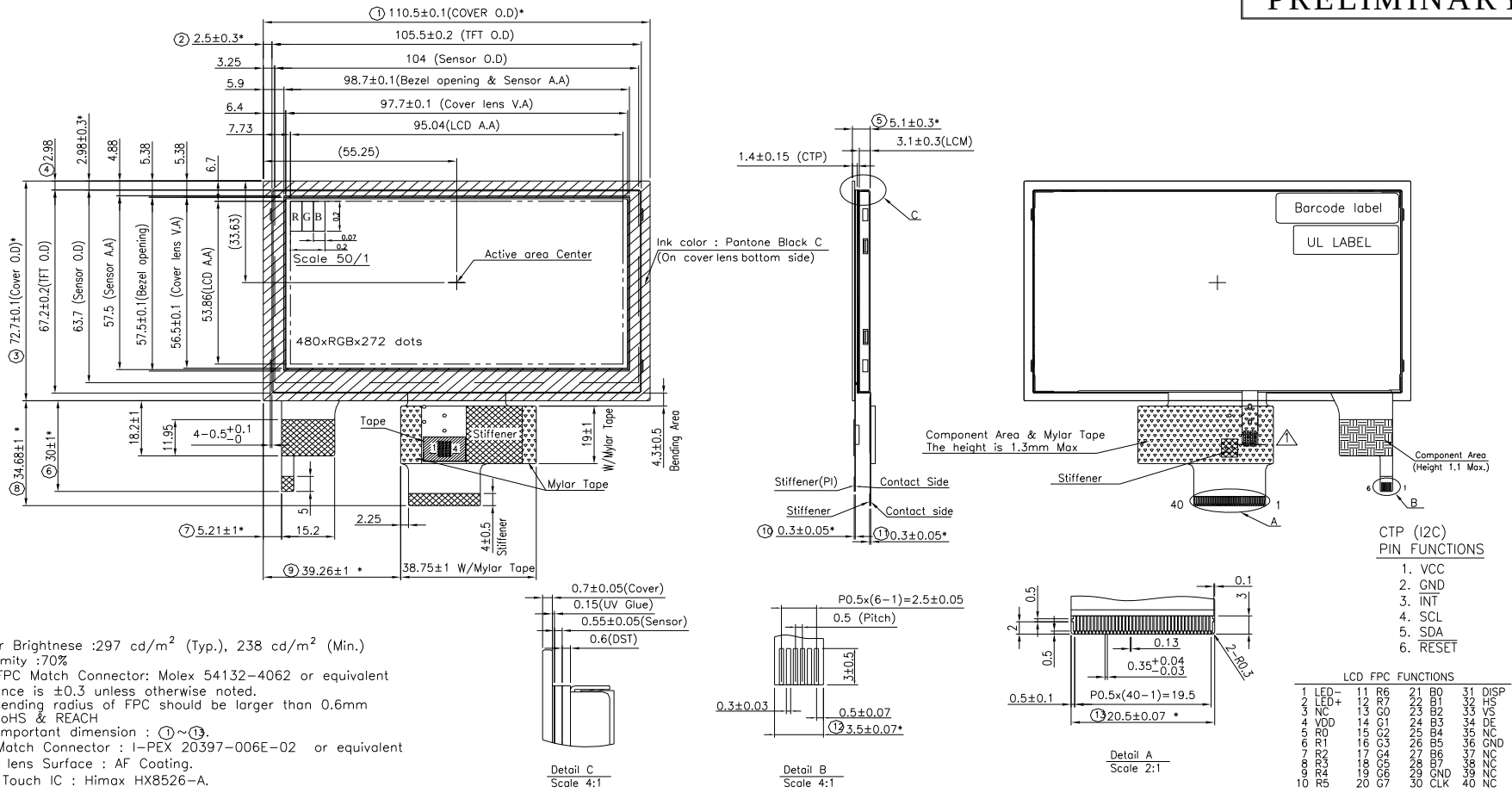
13. PRECAUTION FOR USING LCM

1. ASSEMBLY PRECAUTIONS
   (1) You must mount a module using holes arranged in four corners or four sides.
   (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
   (3) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
   (4) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
   (5) Do not open the case because inside circuits do not have sufficient strength.
   (6) Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.
   (7) Please do not touch metal frames with bare hands and soiled gloves. A color change of the metal frames can happen during a long preservation of soiled LCD modules.
   (8) Please pay attention to handling lead wire of backlight so that it is not tugged in connecting with inverter.
2. OPERATING PRECAUTIONS
   (1) Please be sure to turn off the power supply before connecting and disconnecting signal input cable.
   (2) Please do not change variable resistance settings in LCD module. They are adjusted to the most suitable value. If they are changed, it might happen LCD does not satisfy the characteristics specification
   (3) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
   (4) When fixed patterns are displayed for a long time, remnant image is likely to occur.
   (5) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
   (6) Please consider that LCD backlight takes longer time to become stable of radiation characteristics in low temperature than in room temperature.
3. ELECTROSTATIC DISCHARGE CONTROL
   (1) The operator should be grounded whenever he/she comes into contact with the module. Never touch any of the conductive parts such the copper leads on the PCB and the interface terminals with any parts of the human body.
   (1) The modules should be kept in antistatic bags or other containers resistant to static for storage.
   (2) Only properly grounded soldering irons should be used.
   (3) If an electric screwdriver is used, it should be well grounded and shielded from commutator sparks.
   (4) The normal static prevention measures should be observed for work clothes and working benches; for the latter conductive (rubber) mat is recommended
   (5) Since dry air is inductive to statics, a relative humidity of 50-60% is recommended.
4. STORAGE PRECAUTIONS
   (1) When you store LCDs for a long time, it is recommended to keep the temperature between 0°C-40°C without the exposure of sunlight and to keep the humidity less than 90%RH.
   (2) Please do not leave the LCDs in the environment of high humidity and high temperature such as 60°C 90%RH
   (3) Please do not leave the LCDs in the environment of low temperature; below -20°C.
5. OTHERS
   (1) A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight Land strong UV rays
   (2) Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
   (3) For the packaging box, please pay attention to the followings:
   (4) Please do not pile them up more than 5 boxes. (They are not designed so.) And please do not turn over.
   (5) Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
   (6) Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)
6. LIMITED WARRANTY

Unless otherwise agreed between DATA IMAGE and customer, DATA IMAGE will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with DATA IMAGE acceptance standards, for a period on one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of DATA IMAGE is limited to repair and/or replacement on the terms set forth above. DATA IMAGE will not responsible for any subsequent or consequential events.

14. OUTLINE DRAWING

PRELIMINARY



Note:
1. Center Brightnese :297 cd/m² (Typ.), 238 cd/m² (Min.)
2. Uniformity :70%
3. LCD FPC Match Connector: Molex 54132-4062 or equivalent
4. Tolerance is ±0.3 unless otherwise noted.
5. The bending radius of FPC should be larger than 0.6mm
6. For RoHS & REACH
7. * is important dimension : ①~⑬.
8. CTP Match Connector : I-PEX 20397-006E-02 or equivalent
9. Cover lens Surface : AF Coating.
10. CTP Touch IC : Himax HX8526-A.

CTP (I2C)
PIN FUNCTIONS

1.	VCC
2.	GND
3.	INT
4.	SCL
5.	SDA
6.	RESET

LCD FPC FUNCTIONS

1	LED-	11	R6	21	B0	31	DISP
2	LED+	12	R7	22	B1	32	HS
3	NC	13	G0	23	B2	33	VS
4	VDD	14	G1	24	B3	34	DE
5	R0	15	G2	25	B4	35	NC
6	R1	16	G3	26	B5	36	GND
7	R2	17	G4	27	B6	37	NC
8	R3	18	G5	28	B7	38	NC
9	R4	19	G6	29	GND	39	NC
10	R5	20	G7	30	CLK	40	NC

AUTH	DESCRIPTION	DATE	APPROVED
⚠	Remove the tape at the Backlight welding ECR<11S-F70004>	2015/7/3	
	ESR0304001		

REVISIONS

DATE:	2014/04/03
DRAWN:	
CHECK:	
APPROVE:	

TITLE: 4.3" CTP With Moudle Outline Dimension

DWG. NO.	SCF0403526GGU38		
UNITS M M		REV.	2
SCALE 1 : 1	SHEET 1 OF 1		

DATA IMAGE

15. PACKAGE INFORMATION

TBD