SOM605 User Manual

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1 Introduction

1.1 Purpose

This document is datasheet specification and user guide to InSSignal's SOM605-4058-X System on Module.

1.2 Scope

This document is limited to technical details of SOM605-4058 and does not include the detailed descriptions of the internal parts.

1.3 Applicable Documents

SOM605 4058 EVK User Manual	
SOM605 4058 DVK datasheet	SOM605 DVK datasheet
T.B.D	T.B.D

1.4 Reference Documents

SOM605 DVK carrier Board Schematics	ORCAD DSN file, PDF file
SOM605 DVK carrier Board Layout	PADS Layout PCB file
SOM605 DVK carrier Board DXF files	
SOM605 DVK carrier Board BOM	

2 General Specifications

2.1 SOM605 Specification

Main components of SOM605 are as below.

- QCS605 Main Processor
- Memory : eMMC 5.1 and LPDDR4x eMCP package
- PMIC : PM670 + PM670L
- SMB1355 Parallel charger
- WCN3990 Atheros Wi-Fi + BT +FM combo chip over SLIMbus, Analog IQ, UART
- Embedded AK4678 Audio Codec IC is optional
  *WLAN 2.4 GHz, 5 GHz and Bluetooth except BLE 1M/2M are disabled by SW.

The functions of the above components are summarized in the Table 2-1 SOM605 Specification below.

Table 2-1 SOM605 Specification

SOM605 4058	
Processors	Qualcomm® QCS605 Octacore 64 bit Kryo 300 CPU Customized, 64-bit ARM v-8 2x 2.5GHz Kyro Gold cores, 6x 1.8GHz Kyro Silver cores Qualcomm® Hexagon™ DSP with dual Qualcomm® Hexagon™ Vector eXtensions (HVX), 1.2 GHz Qualcomm® Adreno™ 615 GPU with 64-bit addressing; 780 MHz
Memory/Storage	1866GHz LPDDR4x 4GB / eMMC V5.x 64GB for SoM605 4058
Wireless	Qualcomm® Wi-Fi 802.11a/b/g/n/ac 2.4/5Ghz 2X2 MIMO (WCN3990) with u.FL antenna connector Bluetooth 5.x + BLE
Video	Multi-format codec up to 5.7K30/4K60 video encode. Multi-stream codec (5.7K30/4K60, 1080p)
Graphics	Adreno 615, 3D graphics accelerator with 64-bit addressing, 780 MHz (max freq.) OpenGL ES 3.2, Vulkan, DX 12.x OpenCL 2.x, Microsoft DirectCompute, RenderScript
Audio	24bits Stereo CODEC, AsahiKASEI AK4678
Power Management	Qualcomm® Power and battery management (PM670 + PM670L + SMB1355)
Display	2 MIPI DSI 4Lane Ports and Touch
Camera	Dual 14-bit image signal processing (ISP) MIPI CSI ISP + Lite ISP: 32 MP (2x ISP, 16 + 16 MP), 5.7K30/4K60
Location	No Recommendation
Connectors	POS 80 x 3, Panasonic AXT380124 x 3
OS support	Android™ 9 Pie™
AI support	TensorFlow™
Size	40x58

2.2 Product Types

SOM605-4058 can be ordered by different memory options as below.

모델명	구분	비고
SOM605-4058-D	4GB LPDDR4x, 64GB eMMC option	Main option
SOM605-4058-C	3GB LPDDR4x, 32GB eMMC option	Please check when ordering

The detailed specifications and usage guidelines for each of them will be described throughout this entire document.

2.3 Absolute Maximum Ratings

When supplying power, the USB power line should not exceed a direct current (DC) voltage of 15V and should maintain voltage of at least 0V or higher.

The battery voltage should be at maximum of 4.4V and should not drop below 0V.

2.4 Operating Conditions

2.4.1 Operating Power

Please refer to Table 2-2 below for operating power. It follows USB-C VBUS power condition.

However, the initial supply voltage should be 5V.

Table 2-2Operating Power

Description	Min.	Typ.	Max.
USB-C V BUS [V]	4.7	5.0	
VBATT+ [V]	3.3	3.7	4.3

2.4.2 Operating Temperature

Description	unit	Min.	Typ.	Max.
All Qualcomm chipsets	℃	-30	+25	+125
XTAL/RF components/etc	℃	-30		+85
eMCP	℃	-25		+85
B2B Connectors	℃	-55		+85
RF Connectors	℃	-50		+90
SOM605	℃	-20		+80

2.5 Power Consumption

Power consumption varies due to numerous factors. When OS is an Android, designed for mobile devices, it becomes extremely challenging to recommend an appropriate value, due to the significant difference between the max upper limit and the min lower limit, depending on the load conditions. These varied conditions are determined by the operating usage of the cores within the AP, depending on the running apps and configured sensor responses. The usage conditions of components such as 3D engine, integrated DSP and NSP, ISP, est., also vary. Furthermore, even if the internal test conditions are the same, when using the camera and display, the internal algorithms operate differently based on factors such as ambient light, subject distance and color around focus area, and presence of AF. In addition, external wireless connections such WiFi or Bluetooth further contributes to the variability based on surrounding RF environment. Therefore, we cannot provide specific values for max limit. Instead, we will provide an estimation of power condition based on typical conditions. Average power consumptions are indicated in Table 2-3 Operating CurrentsTable 2-3.

Table 2-3 Operating Currents

Operating Modes	Descriptions	Power (mA)
Idle	Android launcher only, LCD ON	200mA
Audio Playback	Android Music App playback MP3, LCD ON	TBD

Suspend (BT On)	Android Bluetooth Scan	TBD
Suspend (Wi-Fi On)	Android WIFI Scan	TBD
Camera Playback (TBD)	Camera App On	500mA
Video Record (TBD)	Camera App Video Record	TBD

3 Pin Descriptions

4.1 SOM605 Pin Descriptions

As explained in Chapter 3, SOM605 has 3 Board-to-Board connectors. Please refer to section 3.5 for detailed connector location. The description of each connector pins is explained here. The names and functions of the pins in these connectors are derived from Qualcomm chipset.

4.1.1 CON1

#	Pin Name	Power	IN/OUT	Description
1	USB_VBUS_CONN	5.0V	I	USB VBUS INPUT POWER
3	USB_VBUS_CONN	5.0V	I	USB VBUS INPUT POWER
5	USB_VBUS_CONN	5.0V	I	USB VBUS INPUT POWER
7	USB_VBUS_CONN	5.0V	I	USB VBUS INPUT POWER
9	USB_VBUS_CONN	5.0V	I	USB VBUS INPUT POWER
11	VREG_L2B_SDC2	2.85V	O	SDCARD POWER OUTPUT
13	USB3_HS_DET_DM		I/O	USB HIGH SPEED DATA DETECTION -, MUST BE CONNECTED 1K WITH USB D-
15	USB3_HS_DET_DP		I/O	USB HIGH SPEED DATA DETECTION -, MUST BE CONNECTED 1K WITH USB D+
17	DP_AUX_P		O	USB-C DP AUX OUTPUT
19	DP_AUX_N		O	USB-C DP AUX OUTPUT
21	GND		I	
23	USB3_SS_TX1_M		O	USB 3.0 CH1 DATA TX-, NEEDED 0.22uF Series in front of USB common mode filter
25	USB3_SS_TX1_P		O	USB 3.0 CH1 DATA TX+, NEEDED 0.22uF Series in front of USB common mode filter
27	USB3_SS_RX1_M		I	USB 3.0 CH1 DATA RX-, NEEDED 0.33uF Series in front of USB common mode filter
29	USB3_SS_RX1_P		I	USB 3.0 CH1 DATA RX+ NEEDED 0.33uF Series in front of USB common mode filter
31	GND		I	
33	USB3_HS_DM		I/O	USB HIGH SPEED DATA -, MUST USE COMMON MODE DIFFERENTIAL FILTER
35	USB3_HS_DP		I/O	USB HIGH SPEED DATA +, MUST USE COMMON MODE DIFFERENTIAL FILTER
37	GND		I	
39	USB3_SS_TX0_M		O	USB 3.0 CH0 DATA TX-, NEEDED 0.22uF Series in front of USB common mode filter
41	USB3_SS_TX0_P		O	USB 3.0 CH0 DATA TX+, NEEDED 0.22uF Series in front of USB common mode filter
43	USB3_SS_RX0_M		I	USB 3.0 CH0 DATA RX-, NEEDED 0.33uF Series in front of USB common mode filter
45	USB3_SS_RX0_P		I	USB 3.0 CH0 DATA RX+, NEEDED 0.33uF Series in front of USB common mode filter
47	GND		I	
49	USB_CC1		I	USB-C CC1
51	USB_CC2		I	USB-C CC2
53	GND		I	

55	QUP4_2_GP91	1.8V	O	GENERAL USE QUP4
57	QUP4_3_GP92	1.8V	I	GENERAL USE QUP4
59	QUP4_0_GP89	1.8V	I	GENERAL USE QUP4
61	QUP4_1_GP90	1.8V	O	GENERAL USE QUP4
63	2ND_BCLK	1.8V	O	AUX I2S FOR MAX 48KHz BIT CLOCK
65	2ND_LRCLK	1.8V	O	AUX I2S FOR MAX 48KHz FRAME CLOCK
67	2ND_DIN	1.8V	I	AUX I2S FOR MAX 48KHz DATA IN
69	2ND_DOUT	1.8V	O	AUX I2S FOR MAX 48KHz DATA OUT
71	GND		I	
73	GND		I	
75	GND		I	
77	GND		I	
79	GND		I	

#	Pin Name	Power	IN/OUT	Description
2	GND		I	
4	SDC2_CMD		I/O	SDIO CMD
6	SD_CARD_DET_N		I	SDIO CARD DETECTION
8	SDC2_DATA_3		I/O	SDIO DATA 3
10	SDC2_DATA_2		I/O	SDIO DATA 2
12	SDC2_DATA_1		I/O	SDIO DATA 1
14	SDC2_DATA_0		I/O	SDIO DATA 0
16	SDC2_CLK		O	SDIO CLOCK
18	GND		I	
20	VREG_L7B_3P125	3.09V	O	USB BIASING POWER OUTPUT
22	VREG_L7B_3P125	3.09V	O	USB BIASING POWER OUTPUT
24				DO NOT USE THIS PIN, TBD
26				DO NOT USE THIS PIN, TBD
28	SBU_SW_OE	1.8V	O	USB-C AUX FUNCTION OUTPUT EN (ACTIVE LOW)
30	DCJACK_DET	5.0V	I	DETECTION OF DCPOWER JACK INSERT
32	BOOT_PWR_1P8	1.8V	O	ALWAYS 1.8V OUTPUT
34	BOOT_PWR_1P8	1.8V	O	ALWAYS 1.8V OUTPUT
36	FORCED_USB_BOOT	1.8V	I	BOOT OPTION FOR FUSE FOR PC. PLSEASE OPEN IF NOT USE
38				DO NOT USE THIS PIN, TBD
40				DO NOT USE THIS PIN, TBD
42				DO NOT USE THIS PIN, TBD
44				DO NOT USE THIS PIN, TBD
46	USBC_ORIENT	1.8V	O	USB-C AUX FUNCTION ORIENT SELECTION
48	USB_CONN_TEMP		I	FOR SENSING TEMPERATURE OF USB-C CONNECTOR, 100K PD IF NOT USE
50	GND		I	
52	CABC		I	CABC
54				DO NOT USE THIS PIN, TBD
56	GND		I	
58	MIC_IN	2.0V	I	ANALOG MICROPHONE INPUT, INTERNAL MIC BIAS

60	GND		I	
62	HPL		O	ANALOG HEADPHONE OUT LEFT, Class G AMP 25mW @ 32ohm
64	HPR		O	ANALOG HEADPHONE OUT RIGHT, Class G AMP 25mW @ 32ohm
66	HSDET_L	1.8V	I	DETECTION OF HEADPHONE JACT INSERT
68	PWMSPK_P	3.3V	O	MONO CLASS D PWM SPEAKER OUT BTL +, 0.6W @ 8ohm
70	PWMSPK_P	3.3V	O	MONO CLASS D PWM SPEAKER OUT BTL +, 0.6W @ 8ohm
72	PWMSPK_N	3.3V	O	MONO CLASS D PWM SPEAKER OUT BTL -, 0.6W @ 8ohm
74	PWMSPK_N	3.3V	O	MONO CLASS D PWM SPEAKER OUT BTL -, 0.6W @ 8ohm
76	GND		I	
78	LINE_OL	TBD	O	ANALOG LINE OUT Stereo Left
80	LINE_OR	TBD	O	ANALOG LINE OUT Stereo Right

4.1.2 CON2

#	Pin Name	Power	IN/OUT	Description
1	GND		I	
3	MIPI_CSI0_LANE1_P		I	MIPI CSI CH 0 LANE 1 +
5	MIPI_CSI0_LANE1_M		I	MIPI CSI CH 0 LANE 1 -
7	GND		I	
9	MIPI_CSI0_LANE2_P		I	MIPI CSI CH 0 LANE 2 +
11	MIPI_CSI0_LANE2_M		I	MIPI CSI CH 0 LANE 2 -
13	GND		I	
15	MIPI_CSI0_LANE3_P		I	MIPI CSI CH 0 LANE 3 +
17	MIPI_CSI0_LANE3_M		I	MIPI CSI CH 0 LANE 3 -
19	GND		I	
21	RESET_IN		I	RESET_N INPUT
23	CCI_I2C_SDA0		I/O	MIPI CSI CH0 I2C, Needed PU 2.2K ohm with 1.8V
25	CCI_I2C_SCL0		O	MIPI CSI CH0 I2C Needed PU 2.2K ohm with 1.8V
27	GND		I	
29	MIPI_CSI2_CLK_P		I	MIPI CSI CH 1 CLOCK LANE +
31	MIPI_CSI2_CLK_M		I	MIPI CSI CH 1 CLOCK LANE -
33	GND		I	
35	MIPI_CSI2_LANE3_P		I	MIPI CSI CH 3 LANE 3 +
37	MIPI_CSI2_LANE3_M		I	MIPI CSI CH 3 LANE 3 -
39	GND		I	
41	MIPI_CSI2_LANE2_P		I	MIPI CSI CH 2 LANE 2 +
43	MIPI_CSI2_LANE2_M		I	MIPI CSI CH 2 LANE 2 -
45	GND		I	
47	GND		I	
49	GND		I	
51	GPIO_77	1.8V	I/O	GPIO
53	GPIO_78	1.8V	I/O	GPIO, GP_CLK1B
55	GPIO_79	1.8V	I/O	GPIO
57	GPIO_134	1.8V	I/O	GPIO or another function be added for the next gen.

59	GND		I	
61	QUP2_I2C_SDA	1.8V	I/O	GENERAL USE I2C QUP2 needed PU, or GPIO_27
63	QUP2_I2C_SCL	1.8V	O	GENERAL USE I2C QUP2 needed PU, or GPIO_28
65	QUP3_0_GP41	1.8V	I	GENERAL USE QUP3
67	QUP3_1_GP42	1.8V	O	GENERAL USE QUP3
69	QUP3_2_GP43	1.8V	O	GENERAL USE QUP3
71	QUP3_3_GP44	1.8V	I	GENERAL USE QUP3
73	QUP8_0_GP65	1.8V	I/O	GENERAL USE QUP8
75	QUP8_1_GP66	1.8V	O	GENERAL USE QUP8
77	QUP8_2_GP67	1.8V	I/O	GENERAL USE QUP8
79	QUP8_3_GP68	1.8V	I/O	GENERAL USE QUP8

#	Pin Name	Power	IN/OUT	Description
2	GND		I	
4	MIPI_CSI0_LANE0_P		I/O	MIPI CSI CH 0 LANE 0 +
6	MIPI_CSI0_LANE0_M		I/O	MIPI CSI CH 0 LANE 0 -
8	GND		I	
10	MIPI_CSI0_CLK_P		O	MIPI CSI CH 0 CLOCK LANE +
12	MIPI_CSI0_CLK_M		O	MIPI CSI CH 0 CLOCK LANE -
14	GND		I	
16	CAM_MCLK0	1.8V	O	MIPI CSI CH0 MCLOCK
18	CAM0_PWRON	1.8V	O	MIPI CSI CH0 POWER ON
20	CAM0_RST_N	1.8V	O	MIPI CSI CH0 RESET RELEASE HIGH
22	GPIO_29		I/O	GPIO
24	GND		I	
26	MIPI_CSI2_LANE0_P		I/O	MIPI CSI CH 2 LANE 0 +
28	MIPI_CSI2_LANE0_M		I/O	MIPI CSI CH 2 LANE 0 -
30	GND		I	
32	MIPI_CSI2_LANE1_P		I	MIPI CSI CH 2 CLOCK LANE +
34	MIPI_CSI2_LANE1_M		I	MIPI CSI CH 2 CLOCK LANE -
36	GND		I	
38	CAM_MCLK2		O	MIPI CSI CH2 MCLOCK
40	CAM2_RST_N	1.8V	O	MIPI CSI CH2 POWER ON
42	CAM2_PWRON	1.8V	O	MIPI CSI CH2 RESET RELEASE HIGH
44	GPIO_49	1.8V	O	GPIO
46	GND		I	
48	CCI_I2C_SDA1	1.8V	I/O	MIPI CSI CH2 I2C, Needed PU 2.2K ohm with 1.8V, Not for use other I2C
50	CCI_I2C_SCL1	1.8V	O	MIPI CSI CH2 I2C, Needed PU 2.2K ohm with 1.8V, Not for use other I2C
52	FSTROBE_3	1.8V	O	STOBE EN or GPIO 109
54	GND		I	
56	QUP15_1_GP82	1.8V	O	GENERAL USE QUP15
58	QUP15_0_GP81	1.8V	I	GENERAL USE QUP15
60	QUP15_2_GP83	1.8V	O	GENERAL USE QUP15

62	QUP15_3_GP84	1.8V	O	GENERAL USE QUP15
64	GND		I	
66	SNSR_I2C_ASDx	1.8V	I/O	SENSOR USE I2C, INTERNAL PU / Acc,Gyro,Geo,Prox,Temp,Amb,Hapt
68	SNSR_I2C_ASCx	1.8V	O	SENSOR USE I2C, INTERNAL PU / Acc,Gyro,Geo,Prox,Temp,Amb,Hapt
70	LPI_SPI_1_MISO_SNSR	1.8V	I	SENSOR USE SPI / Acc,Gyro,Geo,Prox,Temp,Amb,Hapt / I2C SDA / LPI_GPIO2
72	LPI_SPI_1_MOSI_SNSR	1.8V	O	SENSOR USE SPI / Acc,Gyro,Geo,Prox,Temp,Amb,Hapt / I2C SCL / LIP_GPIO3
74	LPI_SPI_1_CLK_SNSR	1.8V	O	SENSOR USE SPI / Acc,Gyro,Geo,Prox,Temp,Amb,Hapt
76	LPI_SPI_1_CS0_N_SNSR	1.8V	O	SENSOR USE SPI / Acc,Gyro,Geo,Prox,Temp,Amb,Hapt
78	GPIO_12	1.8V	I/O	GPIO
80	GND		I	

4.1.3 CON3

#	Pin Name	Power	IN/OUT	Description
1	GND		I	
3	KEY_INT1	1.8V	I/O	WAKEUP INTERRUPT 1(IRQ_16), or GPIO_124
5	KEY_INT2	1.8V	I/O	WAKEUP INTERRUPT 2(IRQ_15), or GPIO_123
7	KEY_INT3	1.8V	I/O	WAKEUP INTERRUPT 3(IRQ_14), or GPIO_122
9	KEY_INT4	1.8V	I/O	WAKEUP INTERRUPT 4(IRQ_13), or GPIO_121
11	KEY_WCSS_N	1.8V	I/O	WAKEUP INTERRUPT 5(IRQ_12), or GPIO_120
13	KEY_REC_N	1.8V	I/O	WAKEUP INTERRUPT 6(IRQ_11), or GPIO_119
15	GND		I	
17	PM_RESIN_N		I	KEY VOLUME DOWN or PMIC RESET IN, INTERNAL PU
19	KEY_VOLP_N		I	KEY VOLUME UP INTERNAL PU
21	PHONE_ON_N		I	KEY POWER, INTERNAL PU
23	GND	1.8V	I	
25	PWR_LED	1.8V	O	POWER LED ON-OFF / GPIO 111
27	LED_2	1.8V	O	LED 1 ON-OFF / GPIO 106
29	LED_1	1.8V	O	LED 1 ON-OFF / GPIO 106
31	GND		I	
33	GND		I	
35	VREG_WLED_SYNC		I	LCD BACKLIGHT LED DRIVING -
37	VREG_WLED_SYNC		I	LCD BACKLIGHT LED DRIVING -
39	VREG_WLED_LCD		O	LCD BACKLIGHT LED DRIVING +
41	VREG_WLED_LCD		O	LCD BACKLIGHT LED DRIVING +
43	VBIAS+	+5.0V	O	LDO LCD BIAS POSITIVE VOLTAGE
45	VBIAS-	-5.0V	O	LDO LCD BIAS NEGATIVE VOLTAGE
47	GPIO_136	1.8V	I/O	GPIO
49	GND		I	
51	MIPI_DSI0_L3_M		O	MIPI DSI CH0 LANE 3 -
53	MIPI_DSI0_L3_P		O	MIPI DSI CH0 LANE 3 +
55	GND		I	
57	MIPI_DSI0_CLK_M		O	MIPI DSI CH0 CLOCK LANE -
59	MIPI_DSI0_CLK_P		O	MIPI DSI CH0 CLOCK LANE +

61	GND		I	
63	MIPI_DSI0_L0_M		I/O	MIPI DSI CH0 LANE 0 -
65	MIPI_DSI0_L0_P		I/O	MIPI DSI CH0 LANE 0 +
67	GND		I	
69	MIPI_DSI1_L2_M		O	MIPI DSI CH1 LANE 2 -
71	MIPI_DSI1_L2_P		O	MIPI DSI CH1 LANE 2 +
73	GND		I	
75	MIPI_DSI1_L1_M		O	MIPI DSI CH1 LANE 1 -
77	MIPI_DSI1_L1_P		O	MIPI DSI CH1 LANE 1 +
79	GND		I	

#	Pin Name	Power	IN/OUT	Description
2	VBATT-	BATT -	I	BATTERY TERMINAL - or Ground
4	VBATT-	BATT -	I	BATTERY TERMINAL - or Ground
6	VBATT-	BATT -	I	BATTERY TERMINAL - or Ground
8	VBATT-	BATT -	I	BATTERY TERMINAL - or Ground
10	BATT_THERM		I	THERMISTOR TO GROUND or 100K ohm PD for not use
12	VBATT+	BATT +	I	BATTERY TERMINAL +, Li-ION or LiPB 3.3~4.3V
14	VBATT+	BATT +	I	BATTERY TERMINAL +, Li-ION or LiPB 3.3~4.3V
16	VBATT+	BATT +	I	BATTERY TERMINAL +, Li-ION or LiPB 3.3~4.3V
18	VBATT+	BATT +	I	BATTERY TERMINAL +, Li-ION or LiPB 3.3~4.3V
20	GND		I	
22	GND		I	
24			O	DO NOT USE THIS PIN, TBD
26	ACCL_GYRO_EVENT_INT	1.8V	I	SENSOR INTERRUPT, IRQ_10
28	ACCL_GYRO_DRDY_INT	1.8V	I	SENSOR INTERRUPT, IRQ_9
30	DEBUG_UART_TX	1.8V	O	DEBUG UART TXD
32	DEBUG_UART_RX	1.8V	I	DEBUG UART RXD
34	GND		I	
36	LCD_TE	1.8V	I	LCD TE SIGNAL, or GPIO_108
38	TS_RESET_N	1.8V	O	TOUCH SCREEN IC RESET OUT / NOTICE : This SHOULD BE floating in boot, GPIO_126
40	TP_INT	1.8V	I	TOUCH SCREEN INTERRUPT, IRQ_17
42	QUP9_I2C_SCL	1.8V	O	GENERAL USE I2C QUP9, INTERNAL PU RESISTOR
44	QUP9_I2C_SDA	1.8V	I/O	GENERAL USE I2C QUP9, INTERNAL PU RESISTOR
46	LCD_RST_N	1.8V	O	LCD RESET RELEASE HIGH, GPIO_68
48	GPIO_76	1.8V	I/O	GPIO
50	GPIO_137	1.8V	I/O	GPIO
52	GND		I	
54	MIPI_DSI0_L2_M		O	MIPI DSI CH0 LANE 2 -
56	MIPI_DSI0_L2_P		O	MIPI DSI CH0 LANE 2 +
58	GND		I	
60	MIPI_DSI0_L1_M		O	MIPI DSI CH0 LANE 1 -
62	MIPI_DSI0_L1_P		O	MIPI DSI CH0 LANE 1 +

64	GND		I	
66	MIPI_DSI1_L3_M		O	MIPI DSI CH1 LANE 3 -
68	MIPI_DSI1_L3_P		O	MIPI DSI CH1 LANE 3 +
70	GND		I	
72	MIPI_DSI1_CLK_M		O	MIPI DSI CH1 CLOCK LANE -
74	MIPI_DSI1_CLK_P		O	MIPI DSI CH1 CLOCK LANE +
76	GND		I	
78	MIPI_DSI1_L0_M		I/O	MIPI DSI CH1 LANE 0 -
80	MIPI_DSI1_L0_P		I/O	MIPI DSI CH1 LANE 0 +

4 SOM605 Precautions

This chapter provides precautions in using SOM605. We will not be responsible for any modifications made to SOM605 without authorization. If the product is modified without our approval, then applied to other products or distribution, we will not be held liable for any issues or consequences that may arise. We will seek appropriate legal actions to hold the responsible parties accountable for any losses and damages incurred through such product modification or replication without authorization, infringement, etc.

5.1 Anti-Static Handling Procedures

SOM605 components are basically weak against electro-statics as they are basically exposed to users. Please take appropriate precautions to prevent any damages to SOM605 against electro-statics.

Use anti-static mat.

Secure a conductive strap to your wrist and/or ankle, that is connected to a grounding point.

5.2 Connector Connection

It is obvious to connect SOM605 properly in correct position, but it be cautious as the module PCB can bend if you press the module in the center when inserting the module. Small cracks can occur on the BGA components due to this PCB bend, and this can lead to corrosion due to temperature and humidity over prolonged operation and resulting in loss of signal connection at solder joints, etc. Do not press at the center of the PCB when connecting the module to the board. In addition, please take precautionary action mentioned below.

- Do not connect the boards in opposite, rotated or flipped manner. We will not be

liable or provide any warranty in regards to improper connections.

- Please ensure that there is no interference from other components when making board-to-board connection.
- Please make sure that the board-to-board connection is made securely in right direction.
- Please make sure power connection is made after secure board connection.

5.3 Heat Resistance

The amount of heat generation of SOM605 differs upon types of apps run during product operation, and temperature of SOM605 can rise further if this heat is not ventilated. In addition, there are environments where basic temperature is high. The problem is that product reaches fatigue limit with rise in temperature. This can lead to shortening of product life cycle. In order to prevent this, Android system (and/or software) lowers clock cycles, lowering of performance, etc. Therefore, in order to maintain performance, physical heat resistance and prevention measures need to be provided. The following are few suggestions that can be used:

- Heat ventilation and heat exchange using, heat-sheet/heatsink/heat-pipe/air-fan on top of shield can of SOM605
- Providing ventilation for air circulation to heatsink of SOM605 shield can
- Heat extraction through exposed pads/layers of the PCB through the use of thermal pad attachment of board to the bottom side of SOM605

5.4 Product Packaging

The product is packaged on anti-static trays which are wrapped with an anti-static vinyl.

Regulatory Statement (FCC)

FCC Part 15.19 Statements:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.105 statement(Class B)
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Part 15.21 statement
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Supplier's Declaration of Conformity
Responsible Party – **U.S. Contact Information**
Americas Compliance Consulting LLC dba iCertifi
1001 SW Disk Drive, Ste 250
Bend, Oregon 97702 USA
FCC_sDoC@icertifi.com
icertifi.com

Regulatory notice to host manufacturer according to KDB 996369 D03 OEM Manual
This module has been granted modular approval as below listed FCC rule parts.
-FCC Rule parts 15C(15.247)

Summarize the specific operational use conditions
-The OEM integrator should use equivalent antennas which is the same type and equal or less gain then an antenna listed below this instruction manual.

Regulatory Statement (FCC)

RF exposure considerations

-The module has been certified for integration into products only by OEM integrators under the following condition:

-The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

-The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.
-Mobile use

As long as the three conditions above are met, further transmitter testing will not be required.
OEM integrators should provide the minimum separation distance to end users in their end-product manuals.

Antennas list

This module is certified with the following integrated antenna.
-. Max. Antenna gain: 1.95 dBi / Ant. Type: SMA Male Reverse / Dipole antenna

Any new antenna type, higher gain than listed antenna should be met the requirements of FCC rule 15.203 and 2.1043 as permissive change procedure.

End Product Labeling

The module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:
“Contains FCC ID: 2BC3TSOM605

Information on test modes and additional testing requirements

-OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter in the host, etc.).

Additional testing, Part 15 Subpart B disclaimer

-The final host product also requires Part 15 subpart B compliance testing with the modular transmitter installed to be properly authorized for operation as a Part 15 digital device.