1. Description

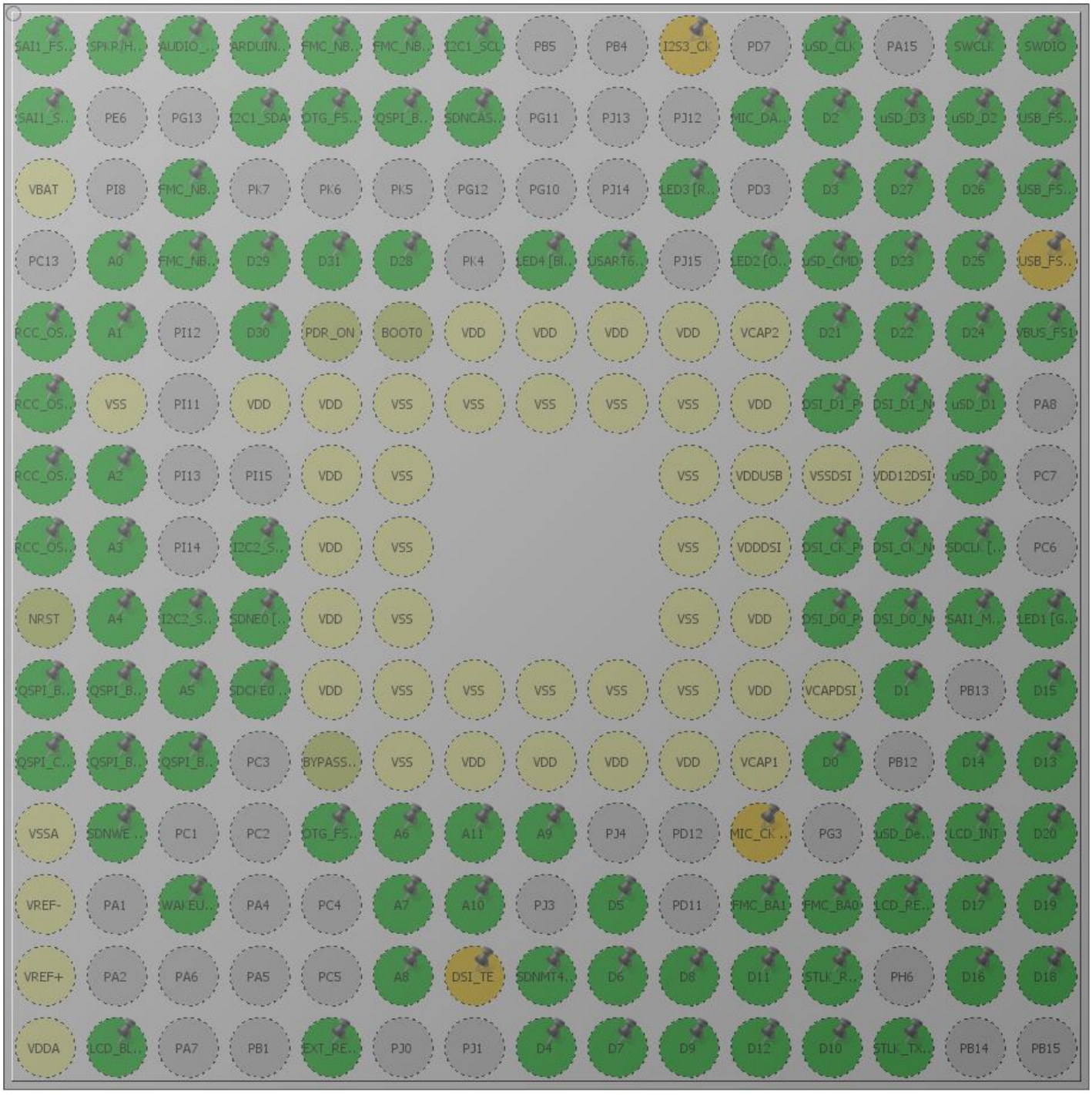
1.1. Project

Project Name	F469_Disco
Board Name	32F469IDISCOVERY
Generated with:	STM32CubeMX 4.24.0
Date	01/26/2018

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F469/479
MCU name	STM32F469NIHx
MCU Package	TFBGA216
MCU Pin number	216

2. Pinout Configuration



STM32F469NIHx
TFBGA216 (Top view)

3. Pins Configuration

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
A1	PE4	I/O	SAI1_FS_A	SAI1_FSA [CS43L22_LRCK]
A2	PE3 *	I/O	GPIO_Output	SPKR/HP [CS43L22_SPKR/HP]
A3	PE2 *	I/O	GPIO_Output	AUDIO_RST [CS43L22_RESET]
A4	PG14	I/O	USART6_TX	ARDUINO USART6_TX
A5	PE1	I/O	FMC_NBL1	FMC_NBL1 [MT48LC4M32B2B5-6A_DQM1]
A6	PE0	I/O	FMC_NBL0	FMC_NBL0 [MT48LC4M32B2B5-6A_DQM0]
A7	PB8	I/O	I2C1_SCL	I2C1_SCL
A10	PB3 **	I/O	I2S3_CK	I2S3_CK
A12	PC12	I/O	SDIO_CK	uSD_CLK
A14	PA14	I/O	SYS_JTCK-SWCLK	SWCLK
A15	PA13	I/O	SYS_JTMS-SWDIO	SWDIO
B1	PE5	I/O	SAI1_SCK_A	SAI1_SCKA [CS43L22_CLK]
B4	PB9	I/O	I2C1_SDA	I2C1_SDA
B5	PB7	I/O	GPIO_EXTI7	OTG_FS1_OverCurrent [STMPS2151STR_FAULT]
B6	PB6	I/O	QUADSPI_BK1_NCS	QSPI_BK1_NCS [N25Q128A13EF840F_S]
B7	PG15	I/O	FMC_SDNCAS	SDNCAS [MT48LC4M32B2B5-6A_CAS]
B11	PD6	I/O	SAI1_SD_A	MIC_DATA [MP34DT01TR_DOUT]
B12	PD0	I/O	FMC_D2	D2
B13	PC11	I/O	SDIO_D3	uSD_D3
B14	PC10	I/O	SDIO_D2	uSD_D2
B15	PA12	I/O	USB_OTG_FS_DP	USB_FS1_P
C1	VBAT	Power		
C3	PI4	I/O	FMC_NBL2	FMC_NBL2 [MT48LC4M32B2B5-6A_DQM2]
C10	PD5 *	I/O	GPIO_Output	LED3 [Red]

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
C12	PD1	I/O	FMC_D3	D3
C13	PI3	I/O	FMC_D27	D27
C14	PI2	I/O	FMC_D26	D26
C15	PA11	I/O	USB_OTG_FS_DM	USB_FS1_N
D2	PF0	I/O	FMC_A0	A0
D3	PI5	I/O	FMC_NBL3	FMC_NBL3 [MT48LC4M32B2B5-6A_DQM3]
D4	PI7	I/O	FMC_D29	D29
D5	PI10	I/O	FMC_D31	D31
D6	PI6	I/O	FMC_D28	D28
D8	PK3 *	I/O	GPIO_Output	LED4 [Blue]
D9	PG9	I/O	USART6_RX	USART6_RX
D11	PD4 *	I/O	GPIO_Output	LED2 [Orange]
D12	PD2	I/O	SDIO_CMD	uSD_CMD
D13	PH15	I/O	FMC_D23	D23
D14	PI1	I/O	FMC_D25	D25
D15	PA10 **	I/O	USB_OTG_FS_ID	USB_FS1_ID
E1	PC14/OSC32_IN	I/O	RCC_OSC32_IN	
E2	PF1	I/O	FMC_A1	A1
E4	PI9	I/O	FMC_D30	D30
E5	PDR_ON	Reset		
E6	BOOT0	Boot		
E7	VDD	Power		
E8	VDD	Power		
E9	VDD	Power		
E10	VDD	Power		
E11	VCAP2	Power		
E12	PH13	I/O	FMC_D21	D21
E13	PH14	I/O	FMC_D22	D22
E14	PI0	I/O	FMC_D24	D24
E15	PA9	I/O	USB_OTG_FS_VBUS	VBUS_FS1
F1	PC15/OSC32_OUT	I/O	RCC_OSC32_OUT	
F2	VSS	Power		
F4	VDD	Power		
F5	VDD	Power		
F6	VSS	Power		
F7	VSS	Power		
F8	VSS	Power		
F9	VSS	Power		

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
F10	VSS	Power		
F11	VDD	Power		
F12	DSIHOST_D1P	MonoIO	DSIHOST_D1P	DSI_D1_P
F13	DSIHOST_D1N	MonoIO	DSIHOST_D1N	DSI_D1_N
F14	PC9	I/O	SDIO_D1	uSD_D1
G1	PH0/OSC_IN	I/O	RCC_OSC_IN	
G2	PF2	I/O	FMC_A2	A2
G5	VDD	Power		
G6	VSS	Power		
G10	VSS	Power		
G11	VDDUSB	Power		
G12	VSSDSI	Power		
G13	VDD12DSI	Power		
G14	PC8	I/O	SDIO_D0	uSD_D0
H1	PH1/OSC_OUT	I/O	RCC_OSC_OUT	
H2	PF3	I/O	FMC_A3	A3
H4	PH4	I/O	I2C2_SCL	I2C2_SCL [CS43L22_SCL]
H5	VDD	Power		
H6	VSS	Power		
H10	VSS	Power		
H11	VDDDSI	Power		
H12	DSIHOST_CKP	MonoIO	DSIHOST_CKP	DSI_CK_P
H13	DSIHOST_CKN	MonoIO	DSIHOST_CKN	DSI_CK_N
H14	PG8	I/O	FMC_SDCLK	SDCLK [MT48LC4M32B2B5-6A_CLK]
J1	NRST	Reset		
J2	PF4	I/O	FMC_A4	A4
J3	PH5	I/O	I2C2_SDA	I2C2_SDA [CS43L22_SDA]
J4	PH3	I/O	FMC_SDNE0	SDNE0 [MT48LC4M32B2B5-6A_CS]
J5	VDD	Power		
J6	VSS	Power		
J10	VSS	Power		
J11	VDD	Power		
J12	DSIHOST_D0P	MonoIO	DSIHOST_D0P	DSI_D0_P
J13	DSIHOST_D0N	MonoIO	DSIHOST_D0N	DSI_D0_N
J14	PG7	I/O	SAI1_MCLK_A	SAI1_MCLKA [CS43L22_MCLK]

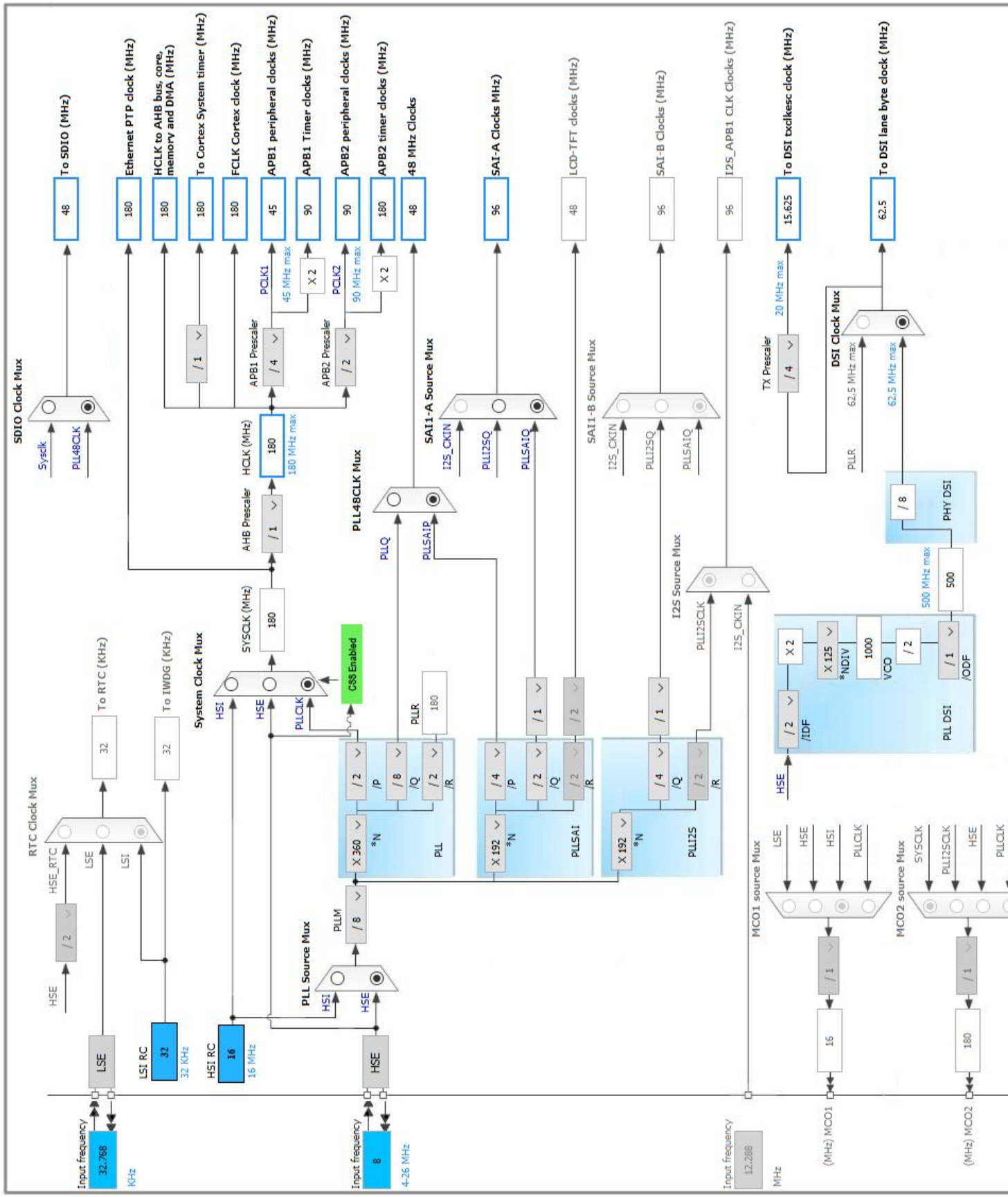
Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
J15	PG6 *	I/O	GPIO_Output	LED1 [Green]
K1	PF7	I/O	QUADSPI_BK1_IO2	QSPI_BK1_IO2 [N25Q128A13EF840F_DQ2]
K2	PF6	I/O	QUADSPI_BK1_IO3	QSPI_BK1_IO3 [N25Q128A13EF840F_DQ3]
K3	PF5	I/O	FMC_A5	A5
K4	PH2	I/O	FMC_SDCKE0	SDCKE0 [MT48LC4M32B2B5-6A_CKE]
K5	VDD	Power		
K6	VSS	Power		
K7	VSS	Power		
K8	VSS	Power		
K9	VSS	Power		
K10	VSS	Power		
K11	VDD	Power		
K12	VCAPDSI	Power		
K13	PD15	I/O	FMC_D1	D1
K15	PD10	I/O	FMC_D15	D15
L1	PF10	I/O	QUADSPI_CLK	QSPI_CLK [N25Q128A13EF840F_C]
L2	PF9	I/O	QUADSPI_BK1_IO1	QSPI_BK1_IO1 [N25Q128A13EF840F_DQ1]
L3	PF8	I/O	QUADSPI_BK1_IO0	QSPI_BK1_IO0 [N25Q128A13EF840F_DQ0]
L5	BYPASS_REG	Reset		
L6	VSS	Power		
L7	VDD	Power		
L8	VDD	Power		
L9	VDD	Power		
L10	VDD	Power		
L11	VCAP1	Power		
L12	PD14	I/O	FMC_D0	D0
L14	PD9	I/O	FMC_D14	D14
L15	PD8	I/O	FMC_D13	D13
M1	VSSA	Power		
M2	PC0	I/O	FMC_SDNWE	SDNWE [MT48LC4M32B2B5-6A_WE]
M5	PB2/BOOT1 *	I/O	GPIO_Output	OTG_FS1_PowerSwitchOn [STMPS2151STR_En]

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
M6	PF12	I/O	FMC_A6	A6
M7	PG1	I/O	FMC_A11	A11
M8	PF15	I/O	FMC_A9	A9
M11	PD13 **	I/O	TIM4_CH2	MIC_CK [MP34DT01TR_CLK]
M13	PG2 *	I/O	GPIO_Input	uSD_Detect
M14	PJ5	I/O	GPIO_EXTI5	LCD_INT
M15	PH12	I/O	FMC_D20	D20
N1	VREF-	Power		
N3	PA0/WKUP	I/O	SYS_WKUP	WAKEUP [B2]
N6	PF13	I/O	FMC_A7	A7
N7	PG0	I/O	FMC_A10	A10
N9	PE8	I/O	FMC_D5	D5
N11	PG5	I/O	FMC_BA1	
N12	PG4	I/O	FMC_BA0	
N13	PH7 *	I/O	GPIO_Output	LCD_RESET
N14	PH9	I/O	FMC_D17	D17
N15	PH11	I/O	FMC_D19	D19
P1	VREF+	Power		
P6	PF14	I/O	FMC_A8	A8
P7	PJ2 **	I/O	DSIHOST_TE	DSI_TE
P8	PF11	I/O	FMC_SDNRAS	SDNMT48LC4M32B2B5-6A_RAS]RAS [
P9	PE9	I/O	FMC_D6	D6
P10	PE11	I/O	FMC_D8	D8
P11	PE14	I/O	FMC_D11	D11
P12	PB10	I/O	USART3_TX	STLK_RX [STLINK V2-1_U2_RX]
P14	PH8	I/O	FMC_D16	D16
P15	PH10	I/O	FMC_D18	D18
R1	VDDA	Power		
R2	PA3 *	I/O	GPIO_Output	LCD_BL_CTRL [STLD40DPUR_EN]
R5	PB0 *	I/O	GPIO_Output	EXT_RESET
R8	PE7	I/O	FMC_D4	D4
R9	PE10	I/O	FMC_D7	D7
R10	PE12	I/O	FMC_D9	D9
R11	PE15	I/O	FMC_D12	D12
R12	PE13	I/O	FMC_D10	D10

Pin Number TFBGA216	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
R13	PB11	I/O	USART3_RX	STLK_TX [STLINK V2-1_U2_TX]

* The pin is affected with an I/O function
** The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. CRC

mode: Activated

5.2. DMA2D

mode: Activated

5.2.1. Parameter Settings:

Basic Parameters:

Transfer Mode	Memory to Memory
Color Mode	ARGB8888
Output Offset	0

Foreground layer Configuration:

DMA2D Input Color Mode	ARGB8888
DMA2D ALPHA MODE	No modification of the alpha channel value
Input Alpha	0
Input Offset	0

5.3. DSIHOST

DSIHost: Command Mode via APB Interface

5.3.1. DSI Clocks:

from PLLDSI:

Pllndiv	125
Pllodf	DSI_PLL_OUT_DIV1
Pllidf	DSI_PLL_IN_DIV2
High Speed Clock - PLLDSI Output	500000
Lane Byte Clock	62500
Tx Escape Ckdiv	4
Transmission Escape Clock	15625
Time Out Clock	62500

from PLLR:

Lane Byte Clock	180000

Transmission Escape Clock	45000
Time Out Clock	180000

5.3.2. Timeout Counters:

Time Out Clock Setting:

Time Out Clock Divider	1
Time Out Clock - from PLLDSI	62500

Contention Error Detection:

High-speed transmission time-out	0
No High-speed transmission time-out	
Low-power reception time-out	0
No Low-power reception time-out	

Peripheral Response:

High-speed read time-out	0
Resulting Timing High-speed read time-out	0
Low-power read time-out	0
Resulting Timing Low-power read time-out	0
High-speed write time-out	0
Resulting Timing High-speed write time-out	0
Low-power write time-out	0
Resulting Timing Low-power write time-out	0
BTA time-out	0
Resulting Timing for BTA time-out	0

5.3.3. Data and Clock Lanes:

Basic Settings:

Number of Lanes	One Data Lane
Automatic Clock Lane Control	Clock Data lane is always provided
Bus Turn Around Request is	Enabled

Flow Control - Configuration:

CRC Reception	Disabled
ECC Reception	Disabled
EoTP Reception is	Disabled
EoTP Transmission is	Disabled
Acknowledge Request after Each Transmission	Disabled

Flow Control - Packet Analyzer Configuration:

CRC Error Interrupt	Disable
ECC Errors Interrupt	Disable
EoTP Error Interrupt	Disable

Packet Size Error Interrupt	Disable
Acknowledge Errors Interrupt	Disable
PHY related Errors Interrupt	Disable

5.3.4. PHY Timings:

5.3.5. Commands:

APB Interface Error Configuration:

Generic Command Error Interrupt	Disable

Transmission Mode for Commands::

Generic Short Write Zero Parameter	High Speed Transmission
Generic Short Write One Parameter	High Speed Transmission
Generic Short Write Two parameters	High Speed Transmission
Generic Short Read Zero parameter	High Speed Transmission
Generic Short Read One parameter	High Speed Transmission
Generic Short Read Two parameters	High Speed Transmission
Generic Long Write	High Speed Transmission
DCS Short Write Zero parameter	High Speed Transmission
DCS Short Write One parameter	High Speed Transmission
DCS Short Read Zero parameter	High Speed Transmission
DCS Long Write	High Speed Transmission
Maximum Read Packet Size Command	High Speed Transmission

5.4. FMC

SDRAM 1

Clock and chip enable: SDCKE0+SDNE0

Internal bank number: 4 banks

Address: 12 bits

Data: 32 bits

Byte enable: 32-bit byte enable

5.4.1. SDRAM 1:

SDRAM control:

Bank	SDRAM bank 1

Number of column address bits	8 bits
Number of row address bits	12 bits
CAS latency	1 memory clock cycle
Write protection	Disabled
SDRAM common clock	Disabled
SDRAM common burst read	Disabled
SDRAM common read pipe delay	0 HCLK clock cycle

SDRAM timing in memory clock cycles:

Load mode register to active delay	16
Exit self-refresh delay	16
Self-refresh time	16
SDRAM common row cycle delay	16
Write recovery time	16
SDRAM common row precharge delay	16
Row to column delay	16

5.5. I2C1

I2C: I2C

5.5.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

5.6. I2C2

I2C: I2C

5.6.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

5.7. QUADSPI

QuadSPI Mode: Bank1 with Quad SPI Lines

5.7.1. Parameter Settings:

General Parameters:

Clock Prescaler	255
Fifo Threshold	1
Sample Shifting	No Sample Shifting
Flash Size	1
Chip Select High Time	1 Cycle
Clock Mode	Low
Flash ID	Flash ID 1
Dual Flash	Disabled

5.8. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.8.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1
Power Over Drive	Enabled

5.9. SAI1

Mode: Master with Master Clock Out

5.9.1. Parameter Settings:

SAI A:

Basic Parameters	
Protocol	Free
Audio Mode	Master Transmit
Frame Length	8 bits
Data Size	24 Bits
Slot Size	DataSize
Output Mode	Stereo
Companding Mode	No companding mode
SAI SD Line Output Mode	Driven
Frame Parameters	
First Bit	MSB First
Frame Synchro Active Level Length	1
Frame Synchro Definition	Start Frame
Frame Synchro Polarity	Active Low
Frame Synchro Offset	First Bit
Slot Parameters	
First Bit Offset	0
Number of Slots	1
Slot Active Final Value	0x00000000
Slot Active	Neither
Clock Parameters	
Master Clock Divider	Enabled
Audio Frequency	192 KHz
Real Audio Frequency	**188.802 KHz ***
Error between Selected	**-1.66 % ***
Clock Strobing	Falling Edge

Advanced Parameters	
Fifo Threshold	Empty
Output Drive	Disabled
Synchronization External	Disabled

5.10. SDIO

Mode: SD 4 bits Wide bus

5.10.1. Parameter Settings:

SDIO parameters:

Clock transition on which the bit capture is made	Rising transition
SDIO Clock divider bypass	Disable
SDIO Clock output enable when the bus is idle	Disable the power save for the clock
SDIO hardware flow control	The hardware control flow is disabled
SDIOCLK clock divide factor	0

5.11. SYS

Debug: Serial Wire
mode: System Wake-Up
Timebase Source: TIM14

5.12. USART3

Mode: Asynchronous

5.12.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.13. USART6

Mode: Asynchronous

5.13.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.14. USB_OTG_FS

Mode: Host_Only

mode: Activate_VBUS

5.14.1. Parameter Settings:

Speed	Full Speed 12MBit/s
Enable internal IP DMA	Disabled
Signal start of frame	Disabled

5.15. FATFS

mode: SD Card

5.15.1. Set Defines:

Version:

FATFS version	R0.12c

Function Parameters:

FS_READONLY (Read-only mode)	Disabled

FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	Enabled
USE_EXPAND (Use f_expand function)	Disabled
USE_CHMOD (Change attributes function)	Disabled
USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Latin 1
USE_LFN (Use Long Filename)	Disabled
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_TINY (Tiny mode)	Disabled
FS_EXFAT (Support of exFAT file system)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
NORTC_YEAR (Year for timestamp)	2015
NORTC_MON (Month for timestamp)	6
NORTC_MDAY (Day for timestamp)	4
FS_REENTRANT (Re-Entrancy)	Enabled
FS_TIMEOUT (Timeout ticks)	1000
SYNC_t (O/S sync object)	osSemaphoreId
FS_LOCK (Number of files opened simultaneously)	2

5.15.2. IPs instances:

SDIO/SDMMC:

SDIO instance	SDIO
Use dma template	Enabled

5.16. FREERTOS

mode: Enabled

5.16.1. Config parameters:

Versions:

FreeRTOS version	9.0.0
CMSIS-RTOS version	1.02

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Disabled
USE_COUNTING_SEMAPHORES	Disabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Enabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled

Memory management settings:

Memory Allocation	Dynamic
TOTAL_HEAP_SIZE	15360
Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled

USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

5.16.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Disabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled

5.17. PDM2PCM

mode: Enabled

5.17.1. Parameter Settings:

Version:

PDM2PCM version	3.0.0

PDM2PCM:

How many channel do you use ?	**2 ***

5.17.2. CHANNEL1:

PDM2PCM_Channel:

Initialisation	
bit_order (define the bit order)	PDM_FILTER_BIT_ORDER_LSB
endianness (define the byte order)	PDM_FILTER_ENDIANNESS_BE
high_pass_tap (the high pass filter alpha)	2104533974
in_ptr_channels (the channels number in the input PDM stream)	2
out_ptr_channels (the channels number in the output PCM stream)	2
Initial Configuration	
decimation_factor (the factor to adapt PDM frequency to PCM frequency)	PDM_FILTER_DEC_FACTOR_64
output_samples_number (the number of samples by request)	16
mic_gain (the microphone gain in dB)	0

5.17.3. CHANNEL2:

PDM2PCM_Channel:

Initialisation	
bit_order (define the bit order)	PDM_FILTER_BIT_ORDER_LSB
endianness (define the byte order)	PDM_FILTER_ENDIANNESS_BE
high_pass_tap (the high pass filter alpha)	2104533974
in_ptr_channels (the channels number in the input PDM stream)	2
out_ptr_channels (the channels number in the output PCM stream)	2
Initial Configuration	
decimation_factor (the factor to adapt PDM frequency to PCM frequency)	PDM_FILTER_DEC_FACTOR_64
output_samples_number (the number of samples by request)	16
mic_gain (the microphone gain in dB)	0

5.18. USB_HOST

Class for FS IP: Communication Host Class (Virtual Port Com)

5.18.1. Parameter Settings:

Host Configuration:

USBH_MAX_NUM_ENDPOINTS (Maximum number of endpoints)	2
USBH_MAX_NUM_INTERFACES (Maximun number of interfaces)	2
USBH_MAX_NUM_SUPPORTED_CLASS (Maximun number of supported class)	1
USBH_MAX_NUM_CONFIGURATION (Maximun number of supported configuration)	1
USBH_KEEP_CFG_DESCRIPTOR (Keep the configuration into RAM)	Enabled
USBH_MAX_SIZE_CONFIGURATION (Maximun size in bytes for the Configuration Descriptor)	256
USBH_MAX_DATA_BUFFER (Maximun size of temporary data)	512
USBH_DEBUG_LEVEL (USBH Debug Level)	0: No debug message

CMSIS_RTOS:

USBH_USE_OS (Enable the support of an RTOS)	Enabled
USBH_PROCESS_PRIO (The CMSIS-RTOS osPriority value specifies the priority for the USB Host thread)	priority: normal (default)
USBH_PROCESS_STACK_SIZE (The CMSIS-RTOS stack size requirements in words)	128

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
DSIHOST	DSIHOST_D1P	DSIHOST_D1P	n/a	n/a	n/a	DSI_D1_P
	DSIHOST_D1N	DSIHOST_D1N	n/a	n/a	n/a	DSI_D1_N
	DSIHOST_CKP	DSIHOST_CKP	n/a	n/a	n/a	DSI_CK_P
	DSIHOST_CKN	DSIHOST_CKN	n/a	n/a	n/a	DSI_CK_N
	DSIHOST_D0P	DSIHOST_D0P	n/a	n/a	n/a	DSI_D0_P
	DSIHOST_D0N	DSIHOST_D0N	n/a	n/a	n/a	DSI_D0_N
FMC	PE1	FMC_NBL1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	FMC_NBL1 [MT48LC4M32B2B5-6A_DQM1]
	PE0	FMC_NBL0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	FMC_NBL0 [MT48LC4M32B2B5-6A_DQM0]
	PG15	FMC_SDNCAS	Alternate Function Push Pull	No pull-up and no pull-down	Very High	SDNCAS [MT48LC4M32B2B5-6A_CAS]
	PD0	FMC_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D2
	PI4	FMC_NBL2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	FMC_NBL2 [MT48LC4M32B2B5-6A_DQM2]
	PD1	FMC_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D3
	PI3	FMC_D27	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D27
	PI2	FMC_D26	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D26
	PF0	FMC_A0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A0
	PI5	FMC_NBL3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	FMC_NBL3 [MT48LC4M32B2B5-6A_DQM3]
	PI7	FMC_D29	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D29
	PI10	FMC_D31	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D31
	PI6	FMC_D28	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D28
	PH15	FMC_D23	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D23
	PI1	FMC_D25	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D25

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PF1	FMC_A1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A1
	PI9	FMC_D30	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D30
	PH13	FMC_D21	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D21
	PH14	FMC_D22	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D22
	PI0	FMC_D24	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D24
	PF2	FMC_A2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A2
	PF3	FMC_A3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A3
	PG8	FMC_SDCLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	SDCLK [MT48LC4M32B2B5-6A_CLK]
	PF4	FMC_A4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A4
	PH3	FMC_SDNE0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	SDNE0 [MT48LC4M32B2B5-6A_CS]
	PF5	FMC_A5	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A5
	PH2	FMC_SDCKE0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	SDCKE0 [MT48LC4M32B2B5-6A_CKE]
	PD15	FMC_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D1
	PD10	FMC_D15	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D15
	PD14	FMC_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D0
	PD9	FMC_D14	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D14
	PD8	FMC_D13	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D13
	PC0	FMC_SDNWE	Alternate Function Push Pull	No pull-up and no pull-down	Very High	SDNWE [MT48LC4M32B2B5-6A_WE]
	PF12	FMC_A6	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A6
	PG1	FMC_A11	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A11
	PF15	FMC_A9	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A9
	PH12	FMC_D20	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D20
	PF13	FMC_A7	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A7
	PG0	FMC_A10	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A10
	PE8	FMC_D5	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D5
	PG5	FMC_BA1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG4	FMC_BA0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH9	FMC_D17	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D17
	PH11	FMC_D19	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D19
	PF14	FMC_A8	Alternate Function Push Pull	No pull-up and no pull-down	Very High	A8
	PF11	FMC_SDNRAS	Alternate Function Push Pull	No pull-up and no pull-down	Very High	SDNMT48LC4M32B2B5-6A_RAS]RAS [
	PE9	FMC_D6	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D6
	PE11	FMC_D8	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D8

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE14	FMC_D11	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D11
	PH8	FMC_D16	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D16
	PH10	FMC_D18	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D18
	PE7	FMC_D4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D4
	PE10	FMC_D7	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D7
	PE12	FMC_D9	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D9
	PE15	FMC_D12	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D12
	PE13	FMC_D10	Alternate Function Push Pull	No pull-up and no pull-down	Very High	D10
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	I2C1_SCL
	PB9	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	I2C1_SDA
I2C2	PH4	I2C2_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	I2C2_SCL [CS43L22_SCL]
	PH5	I2C2_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	I2C2_SDA [CS43L22_SDA]
QUADSPI	PB6	QUADSPI_BK1_NCS	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	QSPI_BK1_NCS [N25Q128A13EF840F_S]
	PF7	QUADSPI_BK1_IO2	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	QSPI_BK1_IO2 [N25Q128A13EF840F_DQ2]
	PF6	QUADSPI_BK1_IO3	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	QSPI_BK1_IO3 [N25Q128A13EF840F_DQ3]
	PF10	QUADSPI_CLK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	QSPI_CLK [N25Q128A13EF840F_C]
	PF9	QUADSPI_BK1_IO1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	QSPI_BK1_IO1 [N25Q128A13EF840F_DQ1]
	PF8	QUADSPI_BK1_IO0	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	QSPI_BK1_IO0 [N25Q128A13EF840F_DQ0]
RCC	PC14/OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15/OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	PH0/OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1/OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SAI1	PE4	SAI1_FS_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	SAI1_FSA [CS43L22_LRCK]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE5	SAI1_SCK_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	SAI1_SCKA [CS43L22_CLK]
	PD6	SAI1_SD_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	MIC_DATA [MP34DT01TR_DOUT]
	PG7	SAI1_MCLK_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	SAI1_MCLKA [CS43L22_MCLK]
SDIO	PC12	SDIO_CK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	uSD_CLK
	PC11	SDIO_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	uSD_D3
	PC10	SDIO_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	uSD_D2
	PD2	SDIO_CMD	Alternate Function Push Pull	No pull-up and no pull-down	Very High	uSD_CMD
	PC9	SDIO_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	uSD_D1
	PC8	SDIO_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	uSD_D0
SYS	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA0/WKUP	SYS_WKUP	n/a	n/a	n/a	WAKEUP [B2]
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	**Very High ***	STLK_RX [STLINK V2-1_U2_RX]
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	**Very High ***	STLK_TX [STLINK V2-1_U2_TX]
USART6	PG14	USART6_TX	Alternate Function Push Pull	*	**Very High ***	ARDUINO USART6_TX
	PG9	USART6_RX	Alternate Function Push Pull	*	**Very High ***	USART6_RX
USB_OTG_FS	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	USB_FS1_P
	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	USB_FS1_N
	PA9	USB_OTG_FS_VBUS	*	No pull-up and no pull-down	**n/a**	VBUS_FS1
Single Mapped Signals	PB3	I2S3_CK	Alternate Function Push Pull	No pull-up and no pull-down	Low	I2S3_CK
	PA10	USB_OTG_FS_ID	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	USB_FS1_ID
	PD13	TIM4_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	MIC_CK [MP34DT01TR_CLK]
	PJ2	DSIHOST_TE	Alternate Function Push Pull	No pull-up and no pull-down	Very High	DSI_TE
GPIO	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SPKR/HP [CS43L22_SPKR/HP]
	PE2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	AUDIO_RST [CS43L22_RESET]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB7	GPIO_EXTI7	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	OTG_FS1_OverCurrent [STMPS2151STR_FAULT]
	PD5	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	LED3 [Red]
	PK3	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	LED4 [Blue]
	PD4	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	LED2 [Orange]
	PG6	GPIO_Output	**Output Open Drain ***	No pull-up and no pull-down	Low	LED1 [Green]
	PB2/BOOT1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OTG_FS1_PowerSwitchOn [STMPS2151STR_En]
	PG2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	uSD_Detect
	PJ5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	LCD_INT
	PH7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_RESET
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_BL_CTRL [STLD40DPUR_EN]
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXT_RESET

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Pre-fetch fault, memory access fault	true	0	0
Undefined instruction or illegal state	true	0	0
System service call via SWI instruction	true	0	0
Debug monitor	true	0	0
Pendable request for system service	true	15	0
System tick timer	true	15	0
TIM8 trigger and commutation interrupts and TIM14 global interrupt	true	0	0
USB On The Go FS global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line[9:5] interrupts	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
I2C2 event interrupt	unused		
I2C2 error interrupt	unused		
USART3 global interrupt	unused		
FMC global interrupt	unused		
SDIO global interrupt	unused		
USART6 global interrupt	unused		
FPU global interrupt	unused		
SAI1 global interrupt	unused		
DMA2D global interrupt	unused		
QUADSPI global interrupt	unused		
DSI global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F469/479
MCU	STM32F469NIHx
Datasheet	028196_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	F469_Disco
Project Folder	C:\Users\jroch\git\F469_Disco
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F4 V1.19.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No

9. Software Pack Report