

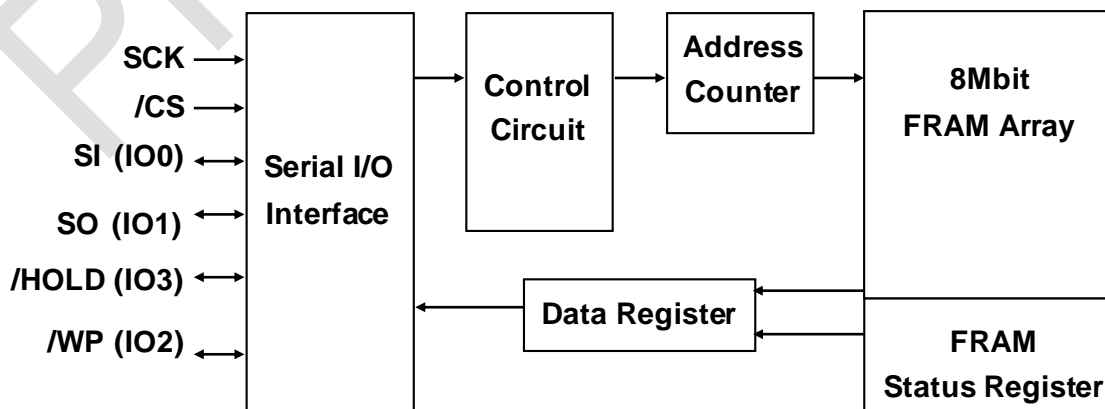
## 8Mbit High Speed Quad I/O SPI FRAM

- **8M Quad SPI FRAM has high bandwidth of 54MB/s using four bi-directional pins(Quad I/O), comparable to SRAM with an access time of 45ns.**
- **This feature allows replacement of SRAM with a parallel interface without compromising memory performance.**
- **16-pin package enables to reduce BOM cost.**
- **Application: Industrial computing, Networking, Router, Storage devices, RAID controllers, Metering, etc.**
- **Schedule: ES : Dec., 2021(Operating Power supply voltage: 1.8V)  
CS : June, 2022**

### FEATURES:

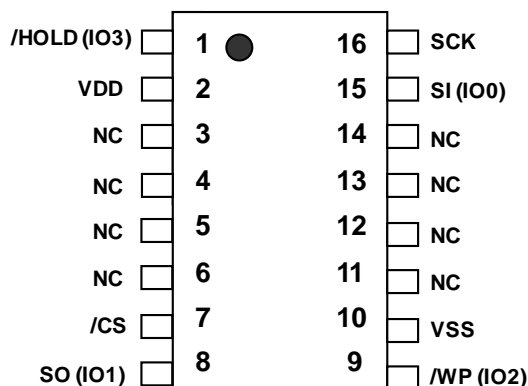
- **Bit configuration :** 1,048,576 words × 8 bits
- **Serial Peripheral Ingerface :** SPI (Serial Peripheral Interface) / Dual SPI / Quad SPI  
Correspondent to SPI mode 0(0,0)/mode 3(1,1)
- **Operating frequency :** 108 MHz (except READ command at read)
- **High endurance :** 10<sup>13</sup> Read/Write per byte (+105°C)
- **Data retention :** 10 years (+105°C)
- **Operating power supply voltage :** 1.70V to 1.95V / 2.7V to 3.6V (ES : Feb.2022)
- **Active current (Target Spec.):** 18mA @Quad I/O 108MHz
- **Standby current (Target Spec.):** 180uA
- **Operation ambient temperature :** -40°C to +105°C
- **Package :** 16-pin plastic SOIC 300mil  
24-pin BGA(6mm x 8mm) (Future Planning)

### BLOCK DIAGRAM



## PIN ASSIGNMENT

TOP VIEW



Plastic SOIC 16-pins

**Note**  
NC = Not Connect

PIN No. (TYPE-1)	PIN Name	Description
7	/CS	Chip Select pin
9	/WP (IO2)	Write Protect pin (Serial Data InputOutput 2)
1	/HOLD (IO3)	Hold pin (Serial Data InputOutput 3)
16	SCK	Serial Clock pin
15	SI (IO0)	Serial Data Input pin (Serial Data InputOutput 0)
8	SO (IO1)	Serial Data Output pin (Serial Data InputOutput 1)
2	VDD	Supply Voltage pin
10	VSS	Ground pin

## OP-CODE

Mode	OPCODE(hex)	Instruction	Description
SPI Mode	06	WREN	Set Write Enable Latch
	04	WRDI	Reset Write Enable Latch
	05	RDSR	Read Status Register
	01	WRSR	Write Status Register
	03	READ	Read Memory Code
	02	WRITE	Write Memory Code
	9F	RDID	Read Device ID
	4C	RUID	Read Unique ID
	0B	FSTRD	Fast Read Memory Code
	FF	ESPI	Disable DPI/QPI Mode
Dual SPI Mode	3B	FRDO	Fast Read Dual Output
	BB	FRDAD	Fast Read Dual Address and Data
	A2	WDD	Write Dual Data
	A1	WDAD	Write Dual Address and Data
	37	EDPI	Enable DPI mode
	6B	FRQO	Fast Read Quad Output
Quad SPI Mode	EB	FRQAD	Fast Read Quad Address and Data
	32	WQD	Write Quad Data
	12	WQAD	Write Quad Address and Data
	38	EQPI	Enable QPI mode