

附錄一

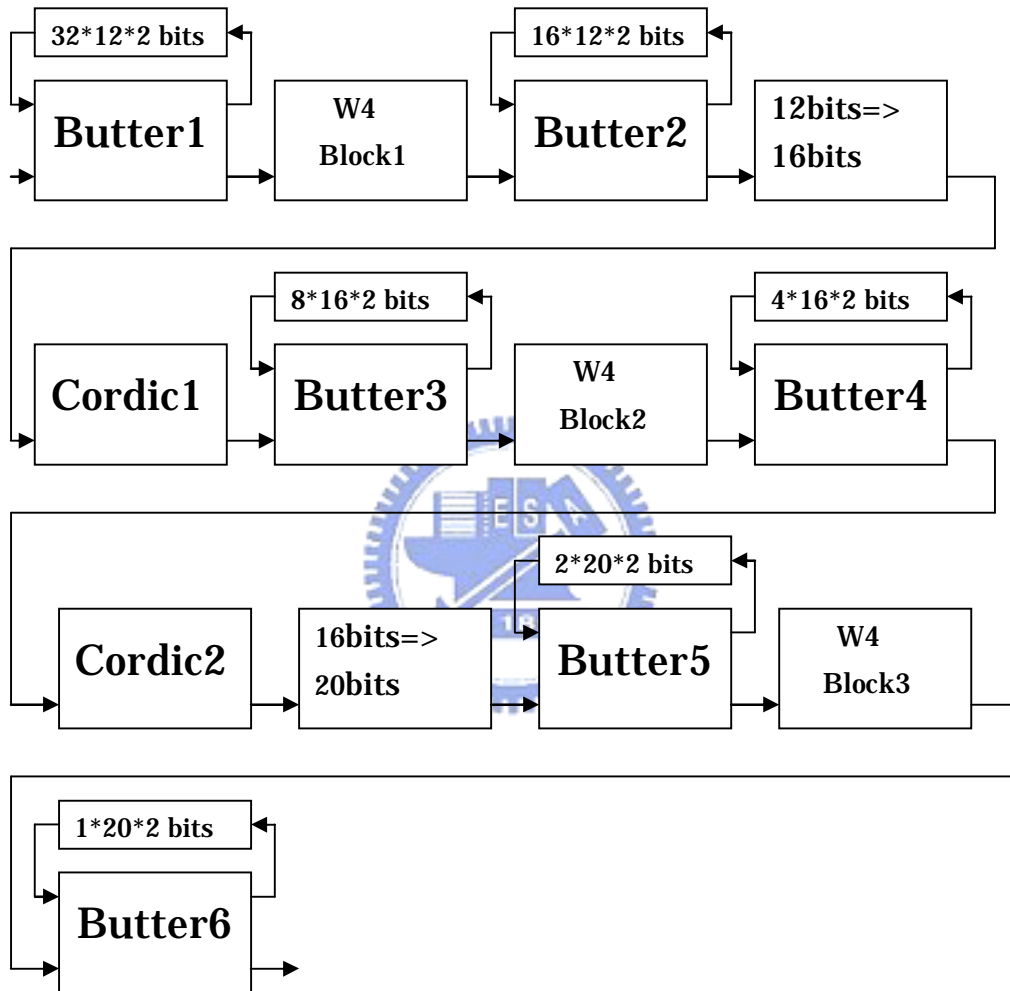


Fig.1 Radix- $2^2$  64-point FFT(SDF) with Cordic 的硬體架構

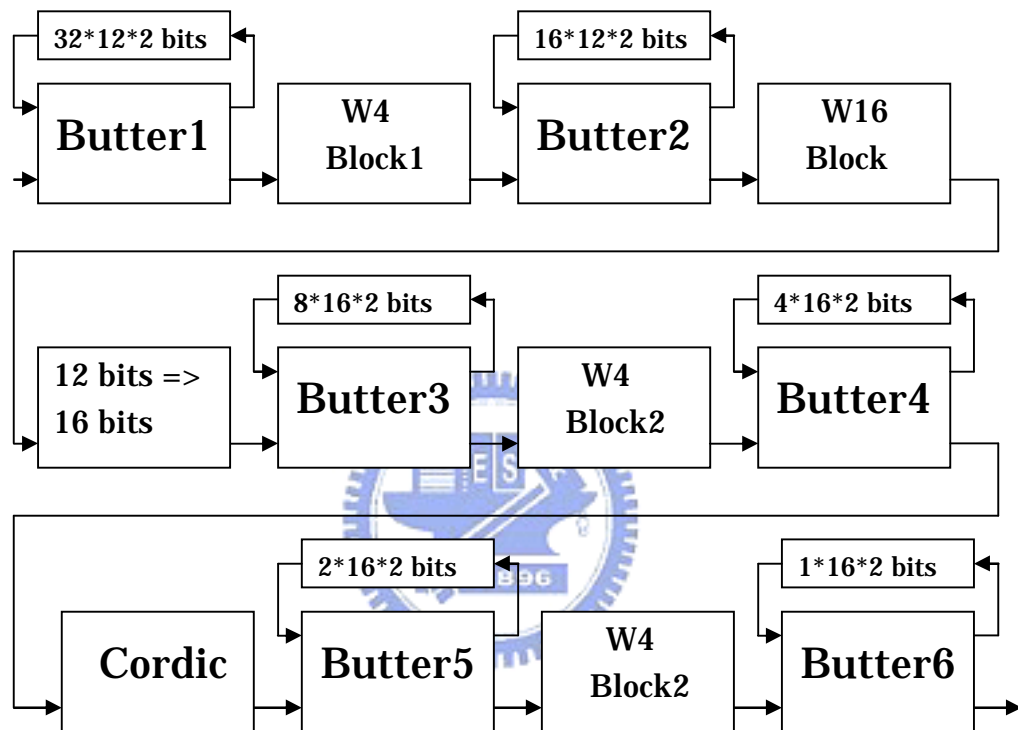


Fig. 2 Radix- $2^2$  64-point FFT(SDF) with W16 Block and Cordic 的硬體架構

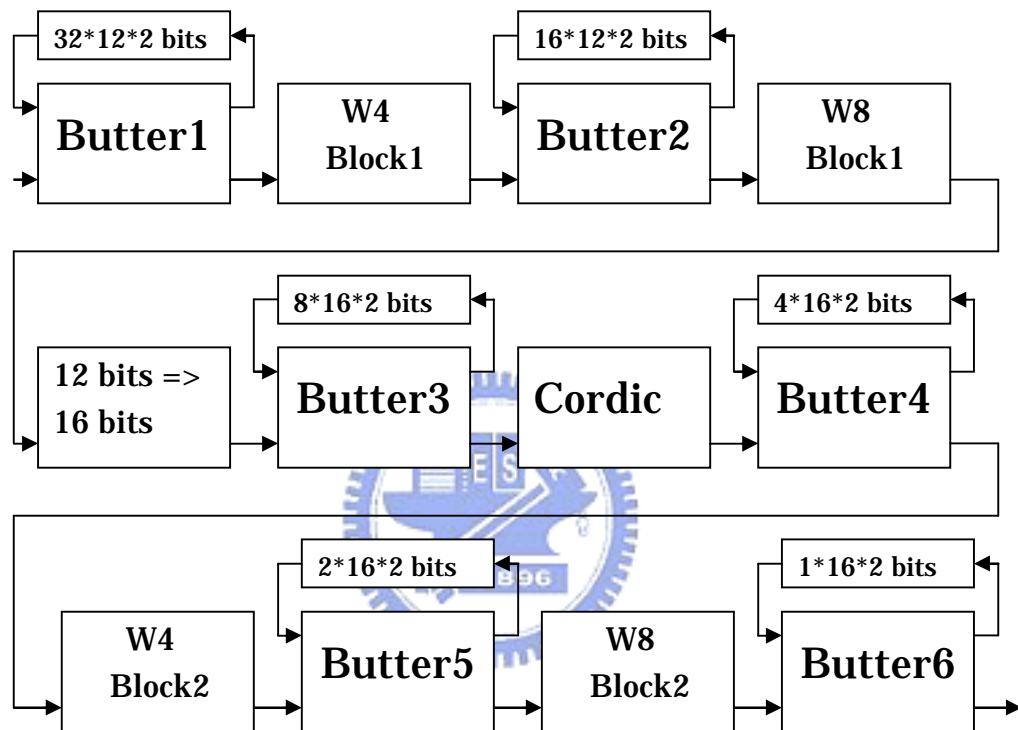


Fig. 3 Radix- $2^3$  64-point FFT(SDF) with W8 Block and Cordic 的硬體架構

## 附錄二

Stage	Bi t 數	stage	Bi t 數	stage	Bi t 數
Butter1	11bi ts	Butter3	14bi ts	Butter5	17bi ts
W4 Block1	11bi ts	W4 Block2	14bi ts	W4 Block3	17bi ts
Butter2	12bi ts	Butter4	15bi ts	Butter6	18bi ts
Cordic 1	13bi ts	Cordic 2	16bi ts		

Table. 1: Radix-2<sup>2</sup> 64-point FFT(SDF) with Cordic system 各階至少所需要的 bi t 數

Stage	Bi t 數	stage	Bi t 數	stage	Bi t 數
Butter1	11bi ts	Butter3	13bi ts	Butter5	16bi ts
W4 Block1	11bi ts	W4 Block2	13bi ts	W4 Block3	16bi ts
Butter2	12bi ts	Butter4	14bi ts	Butter6	17bi ts
W16 Block	12bi ts	Cordic	15bi ts		

Table. 2: Radix-2<sup>2</sup> 64-point FFT(SDF) with W16 block and Cordic system 各階至少所需要的 bi t 數

Stage	Bi t 數	stage	Bi t 數	stage	Bi t 數
Butter1	11bi ts	Butter3	13bi ts	Butter5	16bi ts
W4 Block1	11bi ts	cordic	14bi ts	W8 Block2	16bi ts
Butter2	12bi ts	Butter4	15bi ts	Butter6	17bi ts
W8 Block1	12bi ts	W4 Block2	15bi ts		

Table. 3: Radix-2<sup>3</sup> 64-point FFT(SDF) with W8 block and Cordic system 各階至少所需要的 bi t 數

### 附錄三

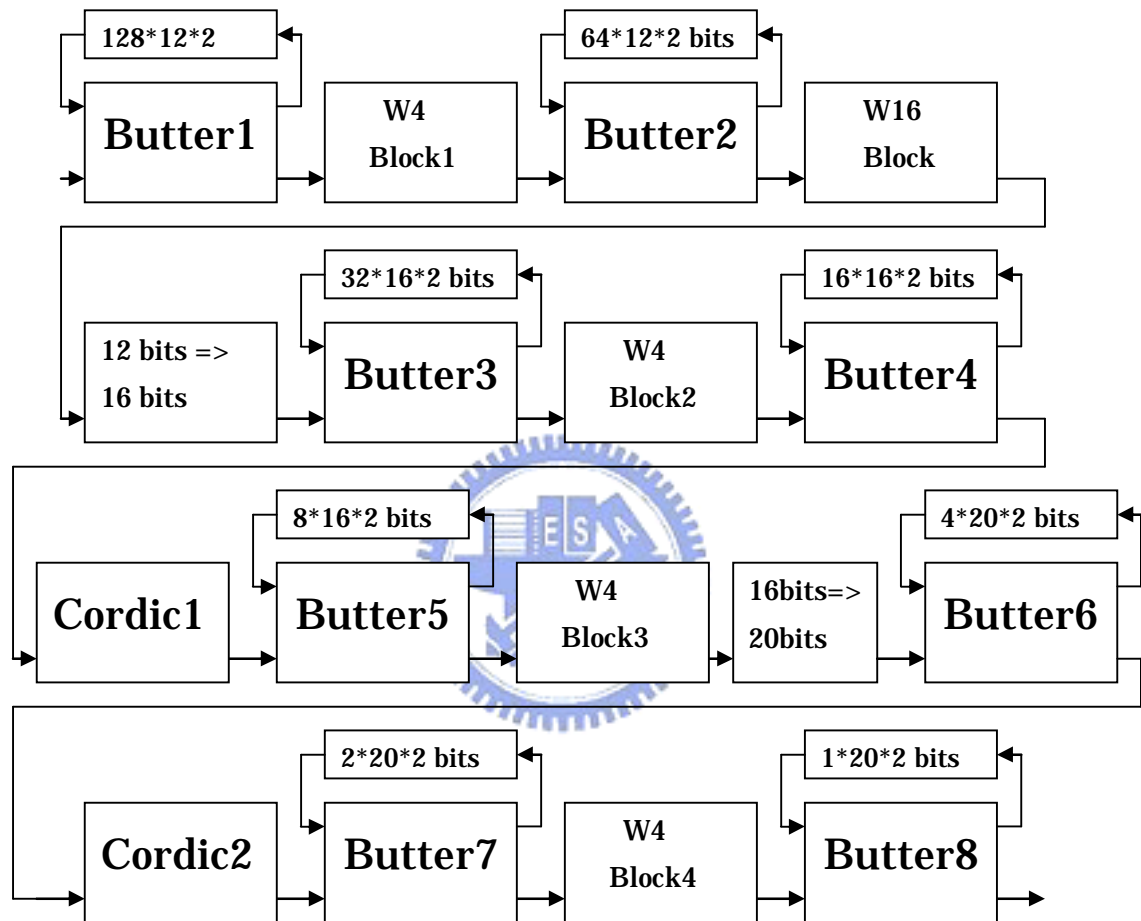


Fig. 4 Radix- $2^2$  256-point FFT(SDF) with W8 Block and Cordic 的硬體架構

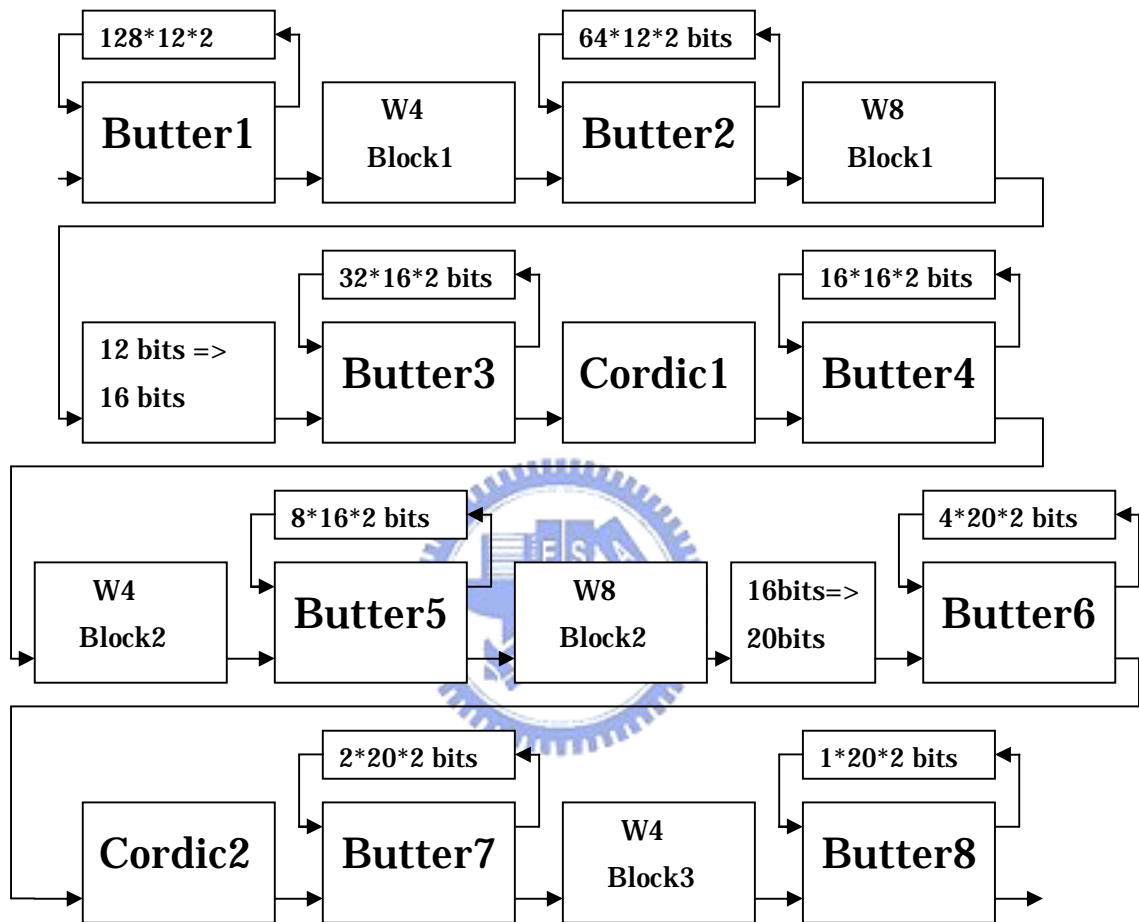


Fig. 5 Radix-2<sup>3</sup> mix Radix-2<sup>2</sup> 256-point FFT(SDF)  
with Cordic 的硬體架構

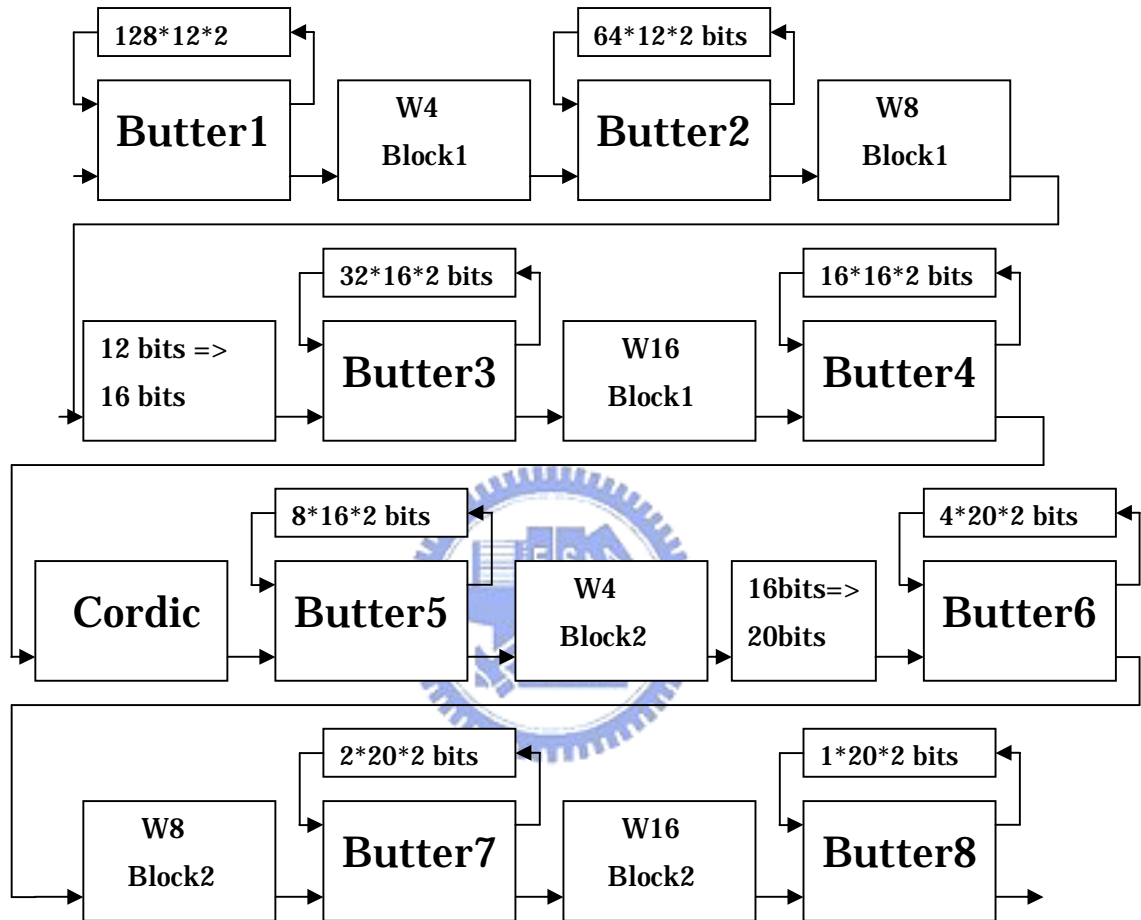


Fig.6 Radix-2<sup>4</sup> 256-point FFT(SDF) with W16 block and Cordic 的硬體架構

#### 附錄四

Stage	Bit 數	Stage	Bit 數	Stage	Bit 數
Butter1	11bits	W4 block2	13bits	Butter6	17bits
W4 block1	11bits	Butter4	14bits	Cordic2	18bits
Butter2	12bits	Cordic1	15bits	Butter7	19bits
W16 block	12bits	Butter5	16bits	W4 block4	19bits
Butter3	13bits	W4 block3	16bits	Butter8	20bits

Table. 4 Radix-2<sup>2</sup> 256-point FFT(SDF) with W16 block and Cordic system 各階層至少所需要的 bit 數

Stage	Bit 數	Stage	Bit 數	Stage	Bit 數
Butter1	11bits	Cordic1	14bits	Butter6	17bits
W4 block1	11bits	Butter4	15bits	Cordic2	18bits
Butter2	12bits	W4 block2	15bits	Butter7	19bits
W8 block1	12bits	Butter5	16bits	W4 block3	19bits
Butter3	13bits	W8 block2	16bits	Butter8	20bits

Table. 5 Radix-2<sup>3</sup> mix Radix-2<sup>2</sup> 256-point FFT(SDF) with Cordic system 各階層至少所需要的 bit 數

Stage	Bit 數	Stage	Bit 數	Stage	Bit 數
Butter1	11bits	W16block1	13bits	Butter6	17bits
W4 block1	11bits	Butter4	14bits	W8 block2	17bits
Butter2	12bits	Cordic	15bits	Butter7	18bits
W8 block1	12bits	Butter5	16bits	W16block2	18bits
Butter3	13bits	W4 block2	16bits	Butter8	19bits

Table. 6 Radix-2<sup>4</sup> 256-point FFT(SDF) with W16 block and Cordic system 各階層至少所需要的 bit 數



# 附錄五

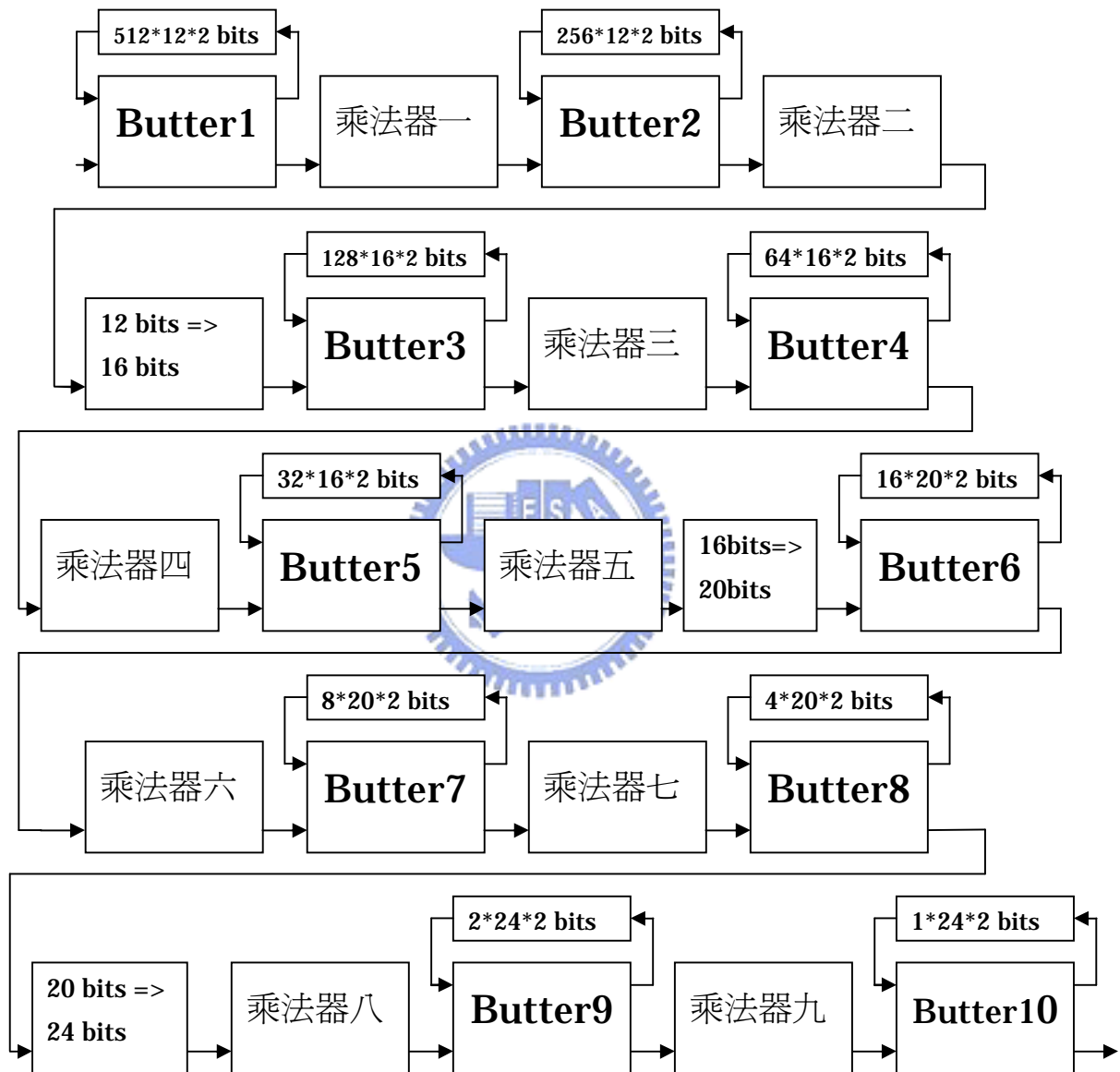
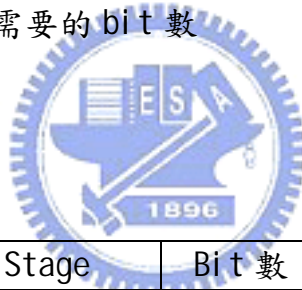


Fig. 9 1K-point FFT(SDF)架構

## 附錄六

Stage	Bit 數	Stage	Bit 數	Stage	Bit 數
Butter1	11bits	W4 block2	15bits	Butter8	20bits
W4 block1	11bits	Butter5	16bits	W8 block3	20bits
Butter2	12bits	W8 block2	16bits	Butter9	21bits
W8 block1	12bits	Butter6	17bits	Cordic 3	22bits
Butter3	13bits	Cordic 2	18bits	Butter10	23bits
Cordic 1	14bits	Butter7	19bits		
Butter4	15bits	W4 block3	19bits		

Table.7 1K-point FFT(SDF)with radix-2<sup>3</sup> and mix radix  
各階層至少所需要的 bit 數



Stage	Bit 數	Stage	Bit 數	Stage	Bit 數
Butter1	11bits	Cordic 1	15bits	Butter8	19bits
W4 block1	11bits	Butter5	16bits	Cordic 2	20bits
Butter2	12bits	W4 block3	16bits	Butter9	21bits
W16block1	12bits	Butter6	17bits	W4 block5	21bits
Butter3	13bits	W16block2	17bits	Butter10	22bits
W4 block2	13bits	Butter7	18bits		
Butter4	14bits	W4 block4	18bits		

Table.8 1K-point FFT(SDF)with radix-2<sup>4</sup> and mix radix  
改良版(use W16 block)各階層至少所需要的 bit 數

# 附錄七

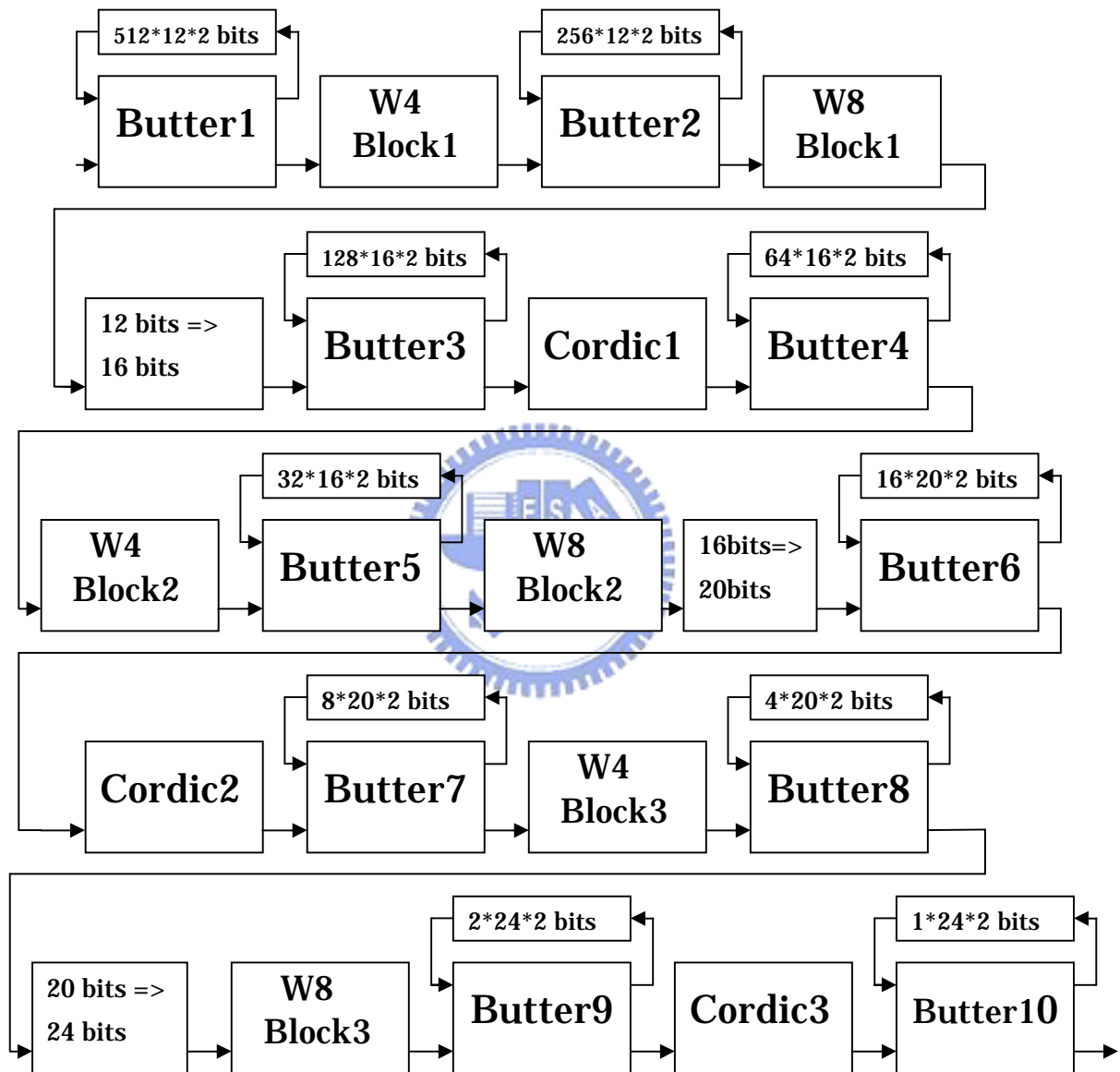


Fig. 9 1K-point FFT(SDF)with radix- $2^3$  and mixed radix

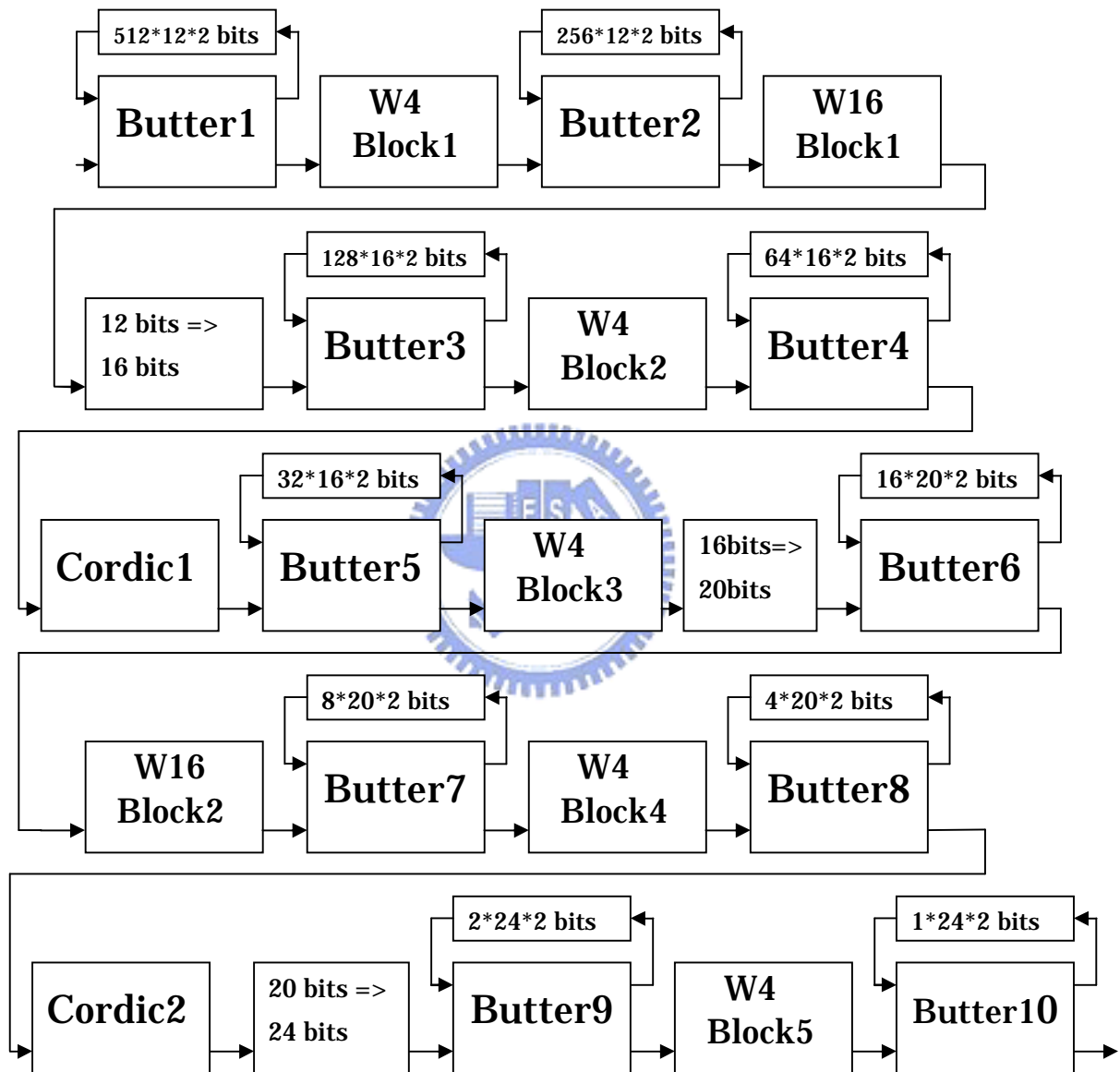


Fig. 10 1K-point FFT(SDF)with radix-2<sup>4</sup> and  
mix radix 改良版(use W16 block)