

VLSI Front End Functions

General Functions	
csine	Cordic Sine and Cosine of i/p as done by VLSI component
memfile	Create Memory Initialization file for Altera Chips

Common Function Inputs

xxxx xxxxxxxxxxxxxx

General Functions

csine

double *csine(DWORD d180, DWORD scf, DWORD sco, DWORD nitr, DWORD angl, FILE *bhnd, DWORD fwrt)

Description

Calculate Cordic Sine and Cosine of input angle as done by the CORDIC VHDL component and create a text file with simulation outputs for the VHDL component

Parameters

d180- 180° in radians* <scf>

scf- Input scale factor

sco- Output scale factor

nitr- Number of iterations

angl- Input angle in radians* <scf>

bhnd- Simulation results File handle

fwrt- Write(1)/Don't write(0) Simulation results File

Returns

Address of dynamic **new result array**, used by the calling function to delete it.

Element	Nemonic	Description
0	yo	Scaled Sine of i/p angle
1	xo	Scaled Cosine of i/p angle
2	k	Total Magnitude Scale Factor
3	wd	Bit width of absolute value of maximum Sine and Cosine

Sample Usage

```
FILE *frd=fopen("x.txt","wb");
```

```
double *y =csine(8192,2607,2040,13,2048,frd,1);
```

```
fclose(frd);
```

```
//Returns: y[0]=2375,y[1]=2375,y[2]=2.183,y[3]=32
```

x.txt

```
ANGL.....: 2048
```

ZX	SGMA	SHFT	TANM	XPRO	YPRO	XJ	YJ	ZJ
-2048	1	1	2048	2040	0	0	2040	0
0	0	2	1209	1020	-1020	-2040	2040	2048
-1209	1	4	639	765	-255	-1020	3060	839
-570	1	8	324	350	-223	-1785	2805	1478
-246	1	16	163	161	-133	-2135	2582	1802
-83	1	32	81	76	-71	-2296	2449	1965
-2	1	64	41	37	-37	-2372	2378	2046
39	0	128	20	18	-18	-2409	2341	2087
19	0	256	10	9	-9	-2391	2359	2067
9	0	512	5	4	-4	-2382	2368	2057
4	0	1024	3	2	-2	-2378	2372	2052
1	0	2048	1	1	-1	-2376	2374	2049
0	0	4096	1	0	0	-2375	2375	2048
-1	1	8192	1	0	0	-2375	2375	2047

memfile

void memfile(DWORD dtw, char *fil, char *drv, char *pth, char **dat, DWORD ard, DWORD drd)

Description

Create memory initialization file for Altera chips.

Parameters

dtw -Bit width of data to file
fil -Name string of output (.MIF) file
drv -Drive letter string of output file
pth -Path string of output file
dat -content of data to file: A string array, each element a string of integer data. Last element must be zero.
ard -radix of addr to file: 0-DEC, 1-HEX, 2-BIN
drd -radix of data to file: 0-DEC, 1-HEX, 2-BIN

Sample Usage

```
char *x[]={"1", "2", "3", "4", "5", "6", "7", "8", "9", "10", 0}; //data in string array
memfile(11, "x", "", "", x, 0, 2);
```

x.MIF

```
WIDTH=11;
DEPTH= 10;

ADDRESS_RADIX=DEC;
DATA_RADIX =BIN;

CONTENT BEGIN
    0:000000000000;
    1:000000000001;
    2:000000000010;
    3:000000000011;
    4:000000000100;
    5:000000000101;
    6:000000000110;
    7:000000000111;
    8:000000001000;
    9:000000001001;
END;
```