4. SYNOPSYS' STD_LOGIC_ARITH

4.1. PREDEFINED TYPES

UNSIGNED(na **to** | **downto** na)	
SIGNED(na **to** | **downto** na)	
	Arrays of STD_LOGIC
SMALL_INT	Integer, 0 or 1

4.2. OVERLOADED OPERATORS

Left	Op	Right	Return
	abs	sg	sg,lv
	+	un	un,lv
	+,-	sg	sg,lv
un	**+,-,*,/**	un	un,lv
sg	**+,-,*,/**	sg	sg,lv
sg	**+,-,*,/** c	un	sg,lv
un	**+,-** c	in	un,lv
sg	**+,-** c	in	sg,lv
un	**+,-** c	u/l	un,lv
sg	**+,-** c	u/l	sg,lv
un	**<,>,<=,>=,=,/=**	un	bool
sg	**<,>,<=,>=,=,/=**	sg	bool
un	**<,>,<=,>=,=,/=** c	in	bool
sg	**<,>,<=,>=,=,/=** c	in	bool

4.3. PREDEFINED FUNCTIONS

SHL(un, un)	un	
SHR(un, un)	un	
SHL(sg, un)	sg	
SHR(sg, un)	sg	
EXT(lv, in)	lv	zero-extend
SEXT(lv, in)	lv	sign-exten

4.4. CONVERSION FUNCTIONS

From	To	Function
un,lv	sg	**SIGNED**(from)
sg,lv	un	**UNSIGNED**(from)
sg,un	lv	**STD_LOGIC_VECTOR**(from)
un,sg	in	**CONV_INTEGER**(from)
in,un,sg,u	un	**CONV_UNSIGNED**(from, size)
in,un,sg,u	sg	**CONV_SIGNED**(from, size)
in,un,sg,u	lv	**CONV_STD_LOGIC_VECTOR**(from, size)

5. SYNOPSYS' STD_LOGIC_MISC

5.1. PREDEFINED FUNCTIONS

AND_REDUCE(lv | uv)	u/l
OR_REDUCE(lv | uv)	u/l
XOR_REDUCE(lv | uv)	u/l

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6. SYNOPSYS' STD_LOGIC_UNSIGNED

6.1. OVERLOADED OPERATORS

Left	Op	Right	Return
	+	lv	lv
lv	**+,-,***	lv	lv
lv	**+,-** c	in	lv
lv	**+,-** c	u/l	lv
lv	**<,>,<=,>=,=,/=**	lv	bool
lv	**<,>,<=,>=,=,/=** c	in	bool

6.2. CONVERSION FUNCTIONS

From	To	Function
lv	in	**CONV_INTEGER**(from)

7. SYNOPSYS' STD_LOGIC_SIGNED

7.1. OVERLOADED OPERATORS

Left	Op	Right	Return
	abs	lv	lv
	+,-	lv	lv
lv	**+,-,***	lv	lv
lv	**+,-** c	in	lv
lv	**+,-** c	u/l	lv
lv	**<,>,<=,>=,=,/=**	lv	bool
lv	**<,>,<=,>=,=,/=** c	in	bool

7.2. CONVERSION FUNCTIONS

From	To	Function
lv	in	**CONV_INTEGER**(from)

8. SYNOPSYS' STD_LOGIC_TEXTIO

Read/write binary values
- **READ**(line, u/l, [good]);
- **READ**(line, uv, [good]);
- **READ**(line, lv, [good]);
- **WRITE**(line, u/l, [justify], [width]);
- **WRITE**(line, uv, [justify], [width]);
- **WRITE**(line, lv, [justify], [width]);

Read/write octal values
- **OREAD**(line, uv, [good]);
- **OREAD**(line, lv, [good]);
- **OWRITE**(line, uv, [justify], [width]);
- **OWRITE**(line, lv, [justify], [width]);

Read/write hexadecimal values
- **HREAD**(line, uv, [good]);
- **HREAD**(line, lv, [good]);
- **HWRITE**(line, uv, [justify], [width]);
- **HWRITE**(line, lv, [justify], [width]);

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9. CADENCE'S STD_LOGIC_ARITH

9.1. OVERLOADED OPERATORS

Left	Op	Right	Return
	+	uv	uv
	+	lv	lv
u/l	**+,-,*,/**	u/l	u/l
lv	**+,-,*,/**	lv	lv
lv	**+,-,*,/** c	u/l	lv
lv	**+,-** c	in	lv
uv	**+,-,***	uv	uv
uv	**+,-,*** c	u/l	uv
uv	**+,-** c	in	uv
lv	**<,>,<=,>=,=,/=** c	in	bool
uv	**<,>,<=,>=,=,/=** c	in	bool

9.2. PREDEFINED FUNCTIONS

C-like ?: replacements:

COND_OP(bool, lv, lv)	lv
COND_OP(bool, uv, uv)	uv
COND(bool, u/l, u/l)	u/l

Shift operations:

SH_LEFT(lv, na)	lv
SH_LEFT(uv, na)	uv
SH_RIGHT(lv, na)	lv
SH_RIGHT(uv, na)	uv

Resize functions:

ALIGN_SIZE(lv, na)	lv
ALIGN_SIZE(uv, na)	uv
ALIGN_SIZE(u/l, na)	lv
ALIGN_SIZE(u/l, na)	uv

9.3. CONVERSION FUNCTIONS

From	To	Function
lv,uv,u/l	in	**TO_INTEGER**(from)
in	lv	**TO_STDLOGICVECTOR**(from, size)
in	uv	**TO_STDULOGICVECTOR**(from, size)

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