

4.SYNOPSYS' STD_LOGIC_ARITH

4.1 PREDEFINED TYPES

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

4.2 OVERLOADED OPERATORS

Left	Op	Right	Return
	abs	sg	sg,lv
	-	sg	sg,lv
un	+*,*	un	un,lv
sg	+*,*	sg	sg,lv
sg	+*,*	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-extend

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_UNSIGNED

5.1 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

5.2 CONVERSION FUNCTIONS

From	To	Function
lv	in	CONV_INTEGER (from)

6.SYNOPSYS' STD_LOGIC_SIGNED

6.1 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

6.2 CONVERSION FUNCTIONS

From	To	Function
lv	in	CONV_INTEGER (from)

7.SYNOPSYS' STD_LOGIC_MISC

7.1 PREDEFINED FUNCTIONS

AND_REDUCE(lv | uv) u/l
[X]OR_REDUCE(lv | uv) u/l
[N]AND_REDUCE(lv | uv) UX01
OR_REDUCE(lv | uv) UX01
NOR_REDUCE(lv | uv) UX01
XOR_REDUCE(lv | uv) UX01
XNOR_REDUCE(lv | uv) UX01

8.EXEMPLAR'S STD_LOGIC_ARITH

8.1 OVERLOADED OPERATORS

Left	Op	Right	Return
	+*,*	u/l	u/l
	abs	u/l	u/l

8.2 PREDEFINED FUNCTIONS

sl(u/l, in) u/l
sl2(u/l, in) u/l
sr(u/l, in) u/l
sr2(u/l, in) u/l
add(u/l) u/l
add2(u/l) u/l
sub(u/l) u/l
sub2(u/l) u/l
mult(u/l) u/l
mult2(u/l) u/l
extend(u/l, in) u/l
extend2(u/l, in) u/l
comp2(u/l) u/l

8.3 CONVERSION FUNCTIONS

From	To	Function
bool	uv	bool2elb
uv	bool	elb2bool
u/l	na	evect2int
in	u/l	int2evect (size)
uv	na	elb2int

9.MENTOR'S STD_LOGIC_ARITH

9.1 PREDEFINED TYPES

UNSIGNED(na to | downto na) Array of STD_LOGIC
SIGNED(na to | downto na) Array of STD_LOGIC

9.2 OVERLOADED OPERATORS

Left	Op	Right	Return
	abs	sg	sg
	-	sg	sg
u/l	+*,*	u/l	u/l
uv	+*,*,mod,rem,**	uv	uv
lv	+*,*,mod,rem,**	lv	lv
un	+*,*,mod,rem,**	un	un
sg	+*,*,mod,rem,**	sg	sg
un	<,>,<=,>=,/=	un	bool
sg	<,>,<=,>=,/=	sg	bool
	not	un	un
	not	sg	sg
un	and,nand,or,nor,xor	un	un
sg	and,nand,or,nor,xor,xnor	sg	sg
uv	sla,sra,slr,srl,rol,ror	uv	uv
lv	sla,sra,slr,srl,rol,ror	lv	lv
un	sla,sra,slr,srl,rol,ror	un	un
sg	sla,sra,slr,srl,rol,ror	sg	sg

9.3 PREDEFINED FUNCTIONS

ZERO_EXTEND(uv | lv | un, na) same
ZERO_EXTEND(u/l, na) lv
SIGN_EXTEND(sg, na) sg
AND_REDUCE(uv | lv | un | sg) u/l
OR_REDUCE(uv | lv | un | sg) u/l
XOR_REDUCE(uv | lv | un | sg) u/l

9.4 CONVERSION FUNCTIONS

From	To	Function
u/l,uv,lv,un,sg	in	TO_INTEGER (from)
u/l,uv,lv,un,sg	in	CONV_INTEGER (from)
bool	u/l	TO_STDLOGIC (from)
na	un	TO_UNSIGNED (from,size)
na	un	CONV_UNSIGNED (from,size)
in	sg	TO_SIGNED (from,size)
in	sg	CONV_SIGNED (from,size)
na	lv	TO_STDLOGICVECTOR (from,size)
na	uv	TO_STDLOGICVECTOR (from,size)

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