Properties of a *Switching Algebra*

P1 commutative:

(a) $a + b = b + a$

(b) $ab = ba$

P2 associative:

(a) $a + (b + c) = (a + b) + c$

(b) $a(bc) = (ab)c$

P3 identity:

(a) $a + 0 = a$

(b) $a \cdot 1 = a$

P4 null:

(a) $a + 1 = 1$

(b) $a \cdot 0 = 0$

P5 complement:

(a) $a + a^{'} = 1$

(b) $a \cdot a^{'} = 0$

P6 idempotency:

(a) $a + a = a$

(b) $a \cdot a = a$

P7 involution: $(a^{'})^{'} = a$

P8 distributive:

(a) $a(b + c) = ab + ac$

(b) $a + bc = (a + b)(a + c)$

P9 adjacency:

(a) $ab + ab^{'} = a$

(b) $(a + b)(a + b^{'}) = a$

P10 simplification:

(a) $a + a^{'}b = a + b$

(b) $a(a' + b) = ab$

P11 DeMorgan's Theorem:

(a) $(a + b)^{'} = a^{'}b^{'}$

(b) $(ab)^{'} = a^{'} + b^{'}$

P12 absorption:

(a) $a + ab = a$

(b) $a(a + b) = a$

P13 consensus: $at_1 \not{c}\ a^{'}t_2 = t_1t_2$

(a) $at_1 + a^{'}t_2 + t_1t_2 = at_1 + a^{'}t_2$

(b) $(a + t_1)(a^{'} + t_2)(t_1 + t_2) = (a + t_1)(a^{'} + t_2)$

P14 swap:

(a) $ab + a^{'}c = (a + c)(a^{'} + b)$

(b) $(a + c)(a^{'} + b) = ab + a^{'}c$