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state Diagram

S_1	S_0	p3s	p7s	p37s	req	Q_f	Q_0	resetT	redL	orangeL	GreenL
0	0	X	X	X	0	0	0	1	1	0	0
0	0	X	X	X	1	0	1	1	1	0	0
0	1	0	X	X	X	0	1	0	1	0	0
0	1	1	X	X	X	1	1	0	1	0	0
1	1	X	0	X	X	1	1	0	0	1	0
1	1	X	1	X	X	1	0	0	0	0	0
1	0	X	X	0	X	1	0	0	0	0	1
1	0	X	X	1	X	0	0	0	0	0	1

Q1

$$Q_1 = S_1' S_0 p3s + S_1 S_0 p7s' + S_1 S_0 p7s + S_1 S_0' p37s'$$

$$Q_1 = S_1' S_0 p3s + S_1 S_0 (p7s + p7s') + S_1 S_0' p37s'$$

$$Q_q = S_1' S_0 p3s + S_1 S_0 + S_1 S_0' p37s'$$

$$Q_1 = S_1' S_0 p3s + S_1 (S_0 + S_0 p37s')$$

$$Q_1 = S_1' S_0 p3s + S_1 (S_0 + p37s')$$

$$Q_1 = S_1' S_0 p3s + S_1 S_0 + S_1 p37s'$$

$$Q_1 = S_0 (S_0' p3s + S_1) + S_1 p37s'$$

$$Q_1 = S_0 (p3s + S_1) + S_1 p37s'$$

$$Q_1 = S_1 S_0 + S_0 p3s + S_1 p37s'$$

$$Q_0 = S_1 S_0 req + S_1' Sop3s' + s1' Sop3s + S_1 Sop7s'$$

$Q_0 =$

$$S_1' S_0 (p3s' \text{*} p3s)$$

$$S_1 S_0' req + S_1 S_0 + S_1 Sop7s'$$

$$S_0 (S_1' + S_1 p7s')$$

$$Q_0 = S_1' S_0 req + S_0 (S_1' + p7s')$$
$$Q_0 = S_1' S_0' req + S_0 S_1' + Sop7s'$$
$$Q_0 = S_1' (S_0' req + S_0)$$

$\rightarrow S_1' (req + S_0) + Sop7s'$

$$\boxed{Q_0 = S_1' S_0 + S_1' req + S_-p7s'}$$

Reset L

$$Reset = S_1 S_0 req' + S_1 S_0 req$$

$$S_1 S_0' (req' + req)$$

$$\underline{reset L = S_1 S_0'}$$

red L

$$redL = S_1' S_0' req' + S_1 S_0 req' + S_1' Sop3s' + S_1' Sop3s$$

$$S_1' S_0' + S_1' S_0$$
$$S_1' (S_0' + S_0)$$

$$\underline{red L = S_1'}$$

orange L =

$$orange L = S_1 S_0 p7s' + S_1 S_0 p7s$$

$$S_1 S_0 (p7s' + p7s)$$

$$\underline{orange L = S_1 S_0}$$

green L

$$green L = S_1 S_0' p37s' + S_1 S_0' p37s$$

$$\underline{green L = S_1 S_0'}$$