COMM_TO IP SPEC

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Introduction

Count the interval time between 2 successive FRAME_DONE in active mode. If the time is longer than a threshold, output SET_SCTO or SET_LCTO.

Feature

Key features of the COMM_TO module is:
Count the interval time between 2 successive FRAME_DONE in active mode.
Timout counters support being programmed from 100ms to 1h with 8 steps, accuracy 5%.

Register Definition

Register Map

Table 1 1COMM_TO Register Map

Name	Add	D7	D6	D5	D4	D3	D2	D1	D0	default
COMM_TO	0x0003	LCTO_SEL<1:0>		PROG_LCTO<2:0>			PROG_SCTO<2:0>			0xA3

Functional Details

Block Diagram

The following diagram shows the COMM_TO inputs and outputs.
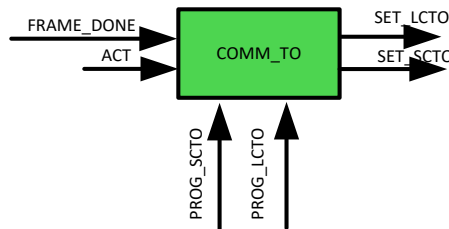
Figure1 COMM_TO diagram

Module input/output list

Name	Dir	Width	Discirption	duration
D2A_LONG_TO	O	1	Scan-muxed long timeout	Level(CLK_REG domain)
SET_SCTO	O	1	Short timeout	Level(CLK_REG domain)
SET_LCTO	O	1	Long timeout	Level(CLK_REG domain)

CLK_REG_SC	I	1	Scan-mux result of 8MHz clock from CLK_32M	8MHz
resetb_CLK	I	1	Asynchronous reset signal(synchronously released)	Level(CLK_32M domain)
pulse_1M	I	1	Pulse with 1us period with 12.5%duty	1 CLK_REG
resetb_CLK	I	1	Short timeout	Level(CLK_REG domain)
rstb_32M_ok_and_sr	I	1	CLK_32M_OK low or soft reset	Level(CLK_32M domain)
FRAME_DONE	I	1	A complete frame is received.	Level(CLK_REG domain)
PROG_LCTO	I	3	Long counter timeout program from COMM_REG	Level(CLK_REG domain)
PROG_SCTO	I	3	Short counter timeout program from COMM_REG	Level(CLK_REG domain)
CLK_32M_OK	I	1	1: CLK_32M usable 0: CLK_32M do not exit, or CLK_32M is not accurate, or CLK_32M will be off within 64us	async
SCAN_MODE	I	1	Scan mode for DFT	level

Clock Domain

The clock for COMM_TO is CLK_REG_SC.

COMM_TO function description

Pulse_5ms is divided from pulse_1M.
Cnt_timeout[20:0] is defined to count for timeout time. It can be reset by rstb_32M_ok_and_sr low, or FRAME_DONE high. The duration is listed in Table2.(HWR001_COMM_TO)
To count to expected time, the maximum number of cnt_timeout is defined in Table2.
When cnt_timeout reaches the max value defined by PROG_SCTO, SET_SCTO is high. (HWR002_COMM_TO)
When cnt_timeout reaches the max value defined by PROG_LCTO, SET_LCTO and D2A_LONG_TO are high. (HWR003_COMM_TO)

PROG_xCTO<2:0>			duration(ms)	cnt_timeout max
0	0	0	100	20
0	0	1	2000	400
0	1	0	10000	2000
0	1	1	60000	12000
1	0	0	180000	36000
1	0	1	600000	120000
1	1	0	1800000	360000
1	1	1	3600000	720000

Table2 maximum value of cnt_timeout