

MSPM0G3107 Multi-channel Capture Summary

Test Environments

CPU Clock: 80MHz

Timer configuration:

Clock Configuration	
Timer Clock Source	BUSCLK
Timer Clock Divider	Divided by 1
Calculated Timer Clock Source	80000000
Timer Clock Prescaler	128
Calculated Timer Clock Values	
Timer Clock Frequency	625.00 kHz
Timer Period Range And Resolution	1.60 μ s to 104.86 ms w/ resolution of 1.60 μ s
Desired Timer Period	100 ms
Actual Timer Period	100.00 ms
Start Timer	<input type="checkbox"/>

Timer Capture Channel:

TIMA0_CC0: PB8
TIMA0_CC1: PB9
TIMA0_CC2: PB2
TIMA0_CC3: PB4

PinMux Peripheral and Pin Configuration

Capture Timer Peripheral	TIMA0
Capture/Compare Pin 0	PB8/60
Capture/Compare Pin 1	PB9/61
Capture/Compare Pin 2	PB4/52
Capture/Compare Pin 3	PB2/50

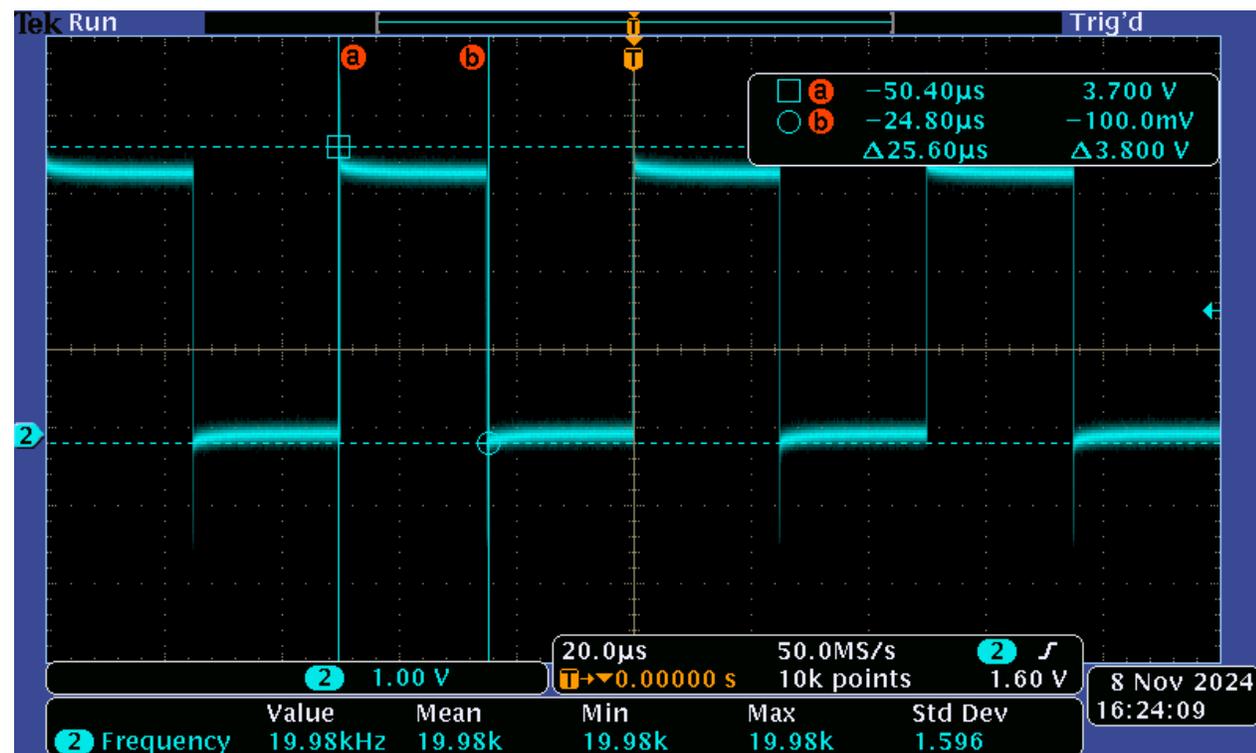
LED Output:

LED1: PA13
LED2: PA12

Test Result – 25us

Expression	Type	Value	Address
edgeCaptureC0	unsigned int[100]	[0,0,0,0, ...]	0x20200000
edgeCaptureC1	unsigned int[100]	[1842,1826,1811,1795,1779, ...]	0x20200190
[0]	unsigned int	1842	0x20200190
[1]	unsigned int	1826	0x20200194
[2]	unsigned int	1811	0x20200198
[3]	unsigned int	1795	0x2020019C
[4]	unsigned int	1779	0x202001A0
[5]	unsigned int	1764	0x202001A4
[6]	unsigned int	1748	0x202001A8
[7]	unsigned int	1733	0x202001AC
[8]	unsigned int	1717	0x202001B0
[9]	unsigned int	1701	0x202001B4
[10]	unsigned int	1686	0x202001B8
[11]	unsigned int	1670	0x202001BC
[12]	unsigned int	1655	0x202001C0
[13]	unsigned int	1639	0x202001C4
[14]	unsigned int	1623	0x202001C8
[15]	unsigned int	1608	0x202001CC
[16]	unsigned int	1592	0x202001D0
[17]	unsigned int	1577	0x202001D4
[18]	unsigned int	1561	0x202001D8
[19]	unsigned int	1546	0x202001DC
[20]	unsigned int	1530	0x202001E0
[21]	unsigned int	1514	0x202001E4
[22]	unsigned int	1499	0x202001E8
[23]	unsigned int	1483	0x202001EC
[24]	unsigned int	1468	0x202001F0

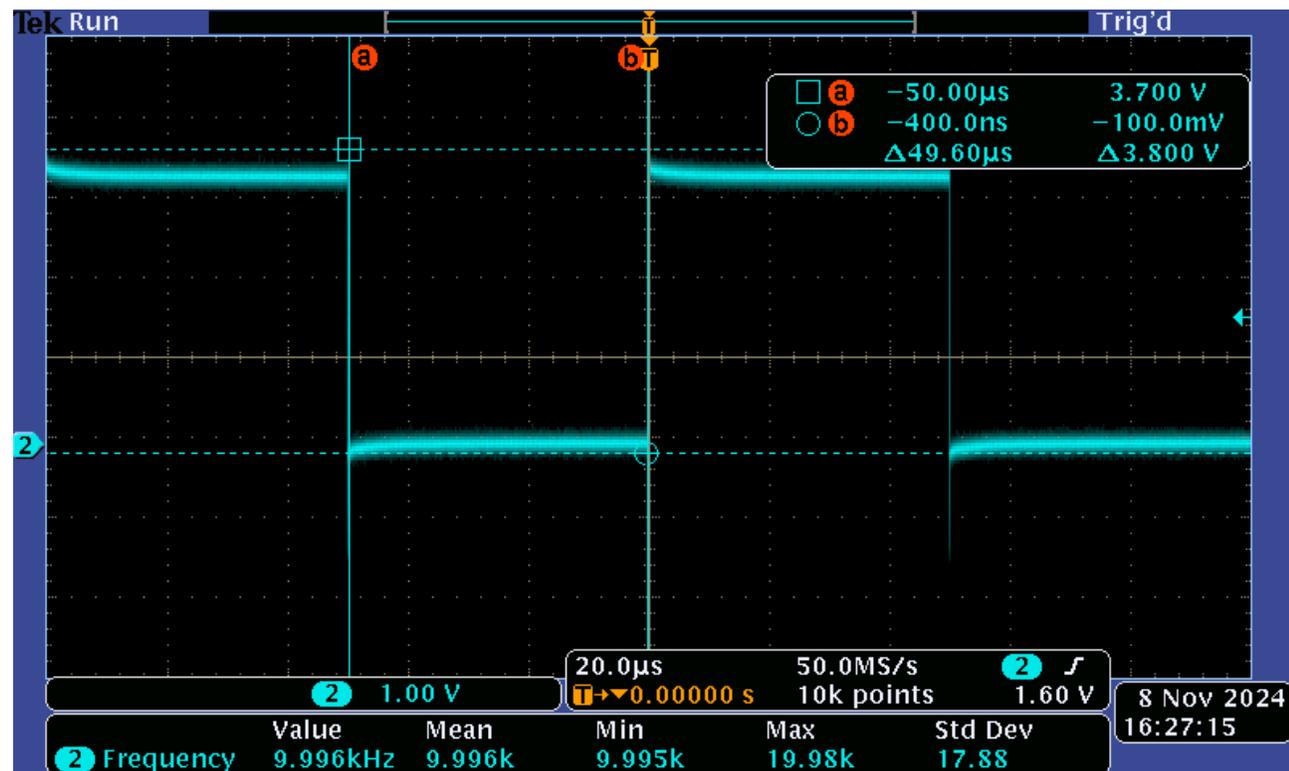
counter diff about 16:
 $16 * 1.6\mu s \rightarrow 25.6\mu s$



Test Result – 50us

Expression	Type	Value	Address
edgeCaptureC0	unsigned int[100]	[0,0,0,0...]	0x20200000
edgeCaptureC1	unsigned int[100]	[45060,45029,44998,44966,44935...]	0x20200190
[0]	unsigned int	45060	0x20200190
[1]	unsigned int	45029	0x20200194
[2]	unsigned int	44998	0x20200198
[3]	unsigned int	44966	0x2020019C
[4]	unsigned int	44935	0x202001A0
[5]	unsigned int	44904	0x202001A4
[6]	unsigned int	44873	0x202001A8
[7]	unsigned int	44842	0x202001AC
[8]	unsigned int	44811	0x202001B0
[9]	unsigned int	44779	0x202001B4
[10]	unsigned int	44748	0x202001B8
[11]	unsigned int	44717	0x202001BC
[12]	unsigned int	44686	0x202001C0
[13]	unsigned int	44655	0x202001C4
[14]	unsigned int	44624	0x202001C8
[15]	unsigned int	44592	0x202001CC
[16]	unsigned int	44561	0x202001D0
[17]	unsigned int	44530	0x202001D4
[18]	unsigned int	44499	0x202001D8
[19]	unsigned int	44468	0x202001DC
[20]	unsigned int	44437	0x202001E0
[21]	unsigned int	44406	0x202001E4
[22]	unsigned int	44374	0x202001E8
[23]	unsigned int	44343	0x202001EC
[24]	unsigned int	44312	0x202001F0

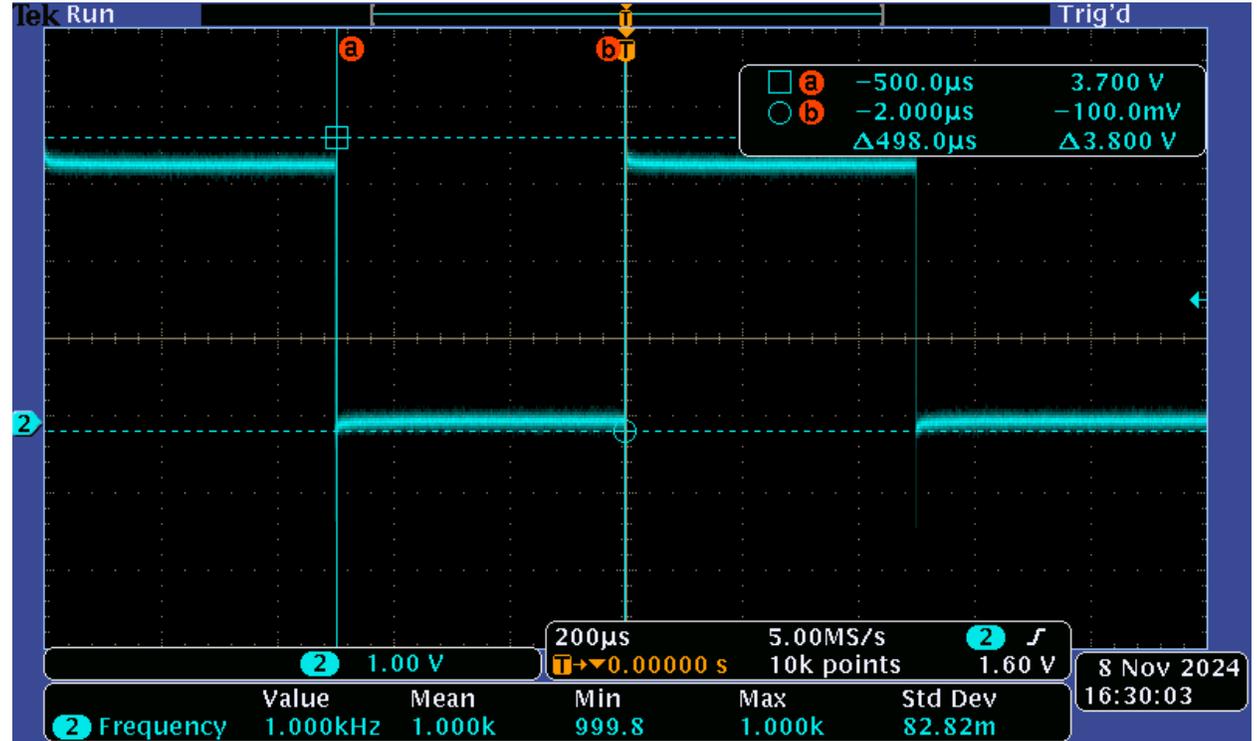
counter diff about 31:
 $31 * 1.6\mu s \rightarrow 49.6\mu s$



Test Result – 500us

Expression	Type	Value	Address
edgeCaptureC0	unsigned int[100]	[0,0,0,0,0...]	0x20200000
edgeCaptureC1	unsigned int[100]	[10391,10080,9768,9457,9145...]	0x20200190
edgeCaptureC1[0]	unsigned int	10391	0x20200190
edgeCaptureC1[1]	unsigned int	10080	0x20200194
edgeCaptureC1[2]	unsigned int	9768	0x20200198
edgeCaptureC1[3]	unsigned int	9457	0x2020019C
edgeCaptureC1[4]	unsigned int	9145	0x202001A0
edgeCaptureC1[5]	unsigned int	8834	0x202001A4
edgeCaptureC1[6]	unsigned int	8522	0x202001A8
edgeCaptureC1[7]	unsigned int	8211	0x202001AC
edgeCaptureC1[8]	unsigned int	7899	0x202001B0
edgeCaptureC1[9]	unsigned int	7588	0x202001B4
edgeCaptureC1[10]	unsigned int	7276	0x202001B8
edgeCaptureC1[11]	unsigned int	6965	0x202001BC
edgeCaptureC1[12]	unsigned int	6653	0x202001C0
edgeCaptureC1[13]	unsigned int	6342	0x202001C4
edgeCaptureC1[14]	unsigned int	6030	0x202001C8
edgeCaptureC1[15]	unsigned int	5719	0x202001CC
edgeCaptureC1[16]	unsigned int	5407	0x202001D0
edgeCaptureC1[17]	unsigned int	5096	0x202001D4
edgeCaptureC1[18]	unsigned int	4784	0x202001D8
edgeCaptureC1[19]	unsigned int	4473	0x202001DC
edgeCaptureC1[20]	unsigned int	4161	0x202001E0
edgeCaptureC1[21]	unsigned int	3849	0x202001E4
edgeCaptureC1[22]	unsigned int	3538	0x202001E8
edgeCaptureC1[23]	unsigned int	3226	0x202001EC
edgeCaptureC1[24]	unsigned int	2915	0x202001F0

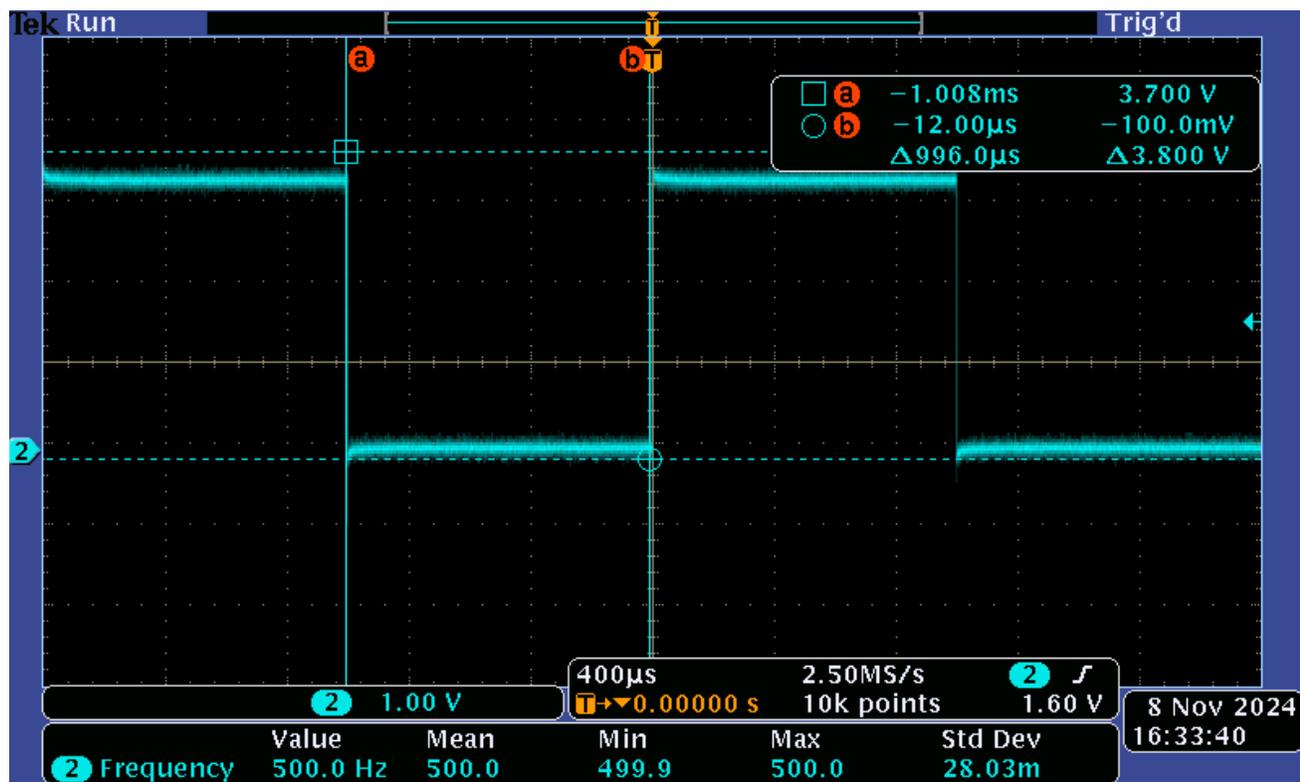
counter diff about 311:
 $311 * 1.6\mu s \rightarrow 497.6\mu s$



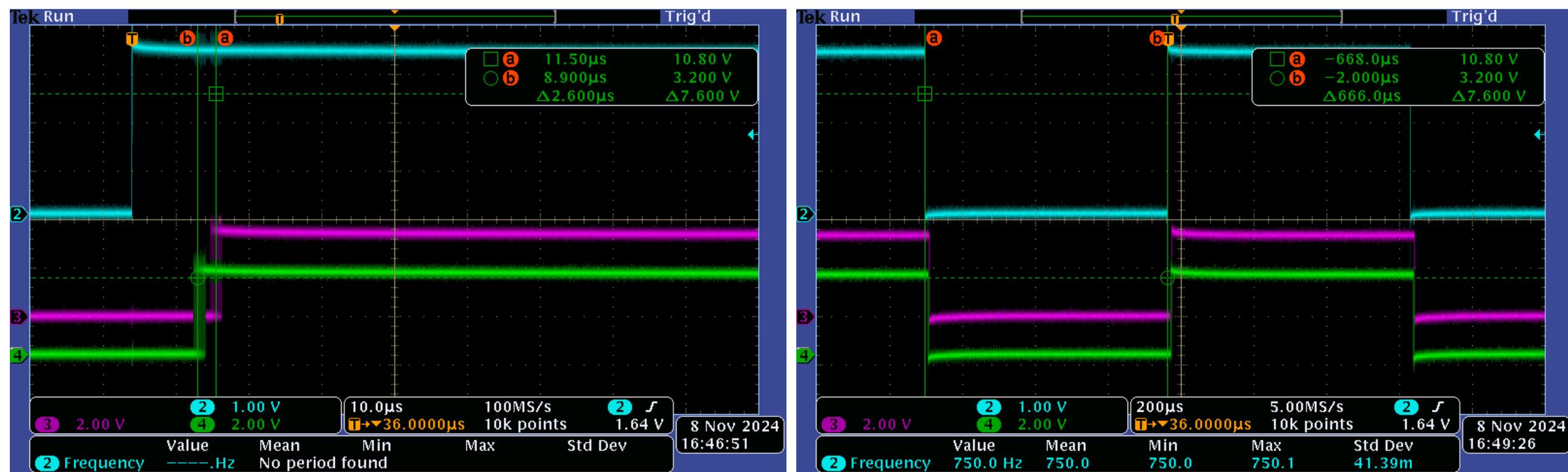
Test Result – 1000us

Expression	Type	Value	Address
edgeCaptureC0	unsigned int[100]	[0,0,0,0,0...]	0x20200000
edgeCaptureC1	unsigned int[100]	[4322,3699,3076,2453,183...]	0x20200190
[0]	unsigned int	4322	0x20200190
[1]	unsigned int	3699	0x20200194
[2]	unsigned int	3076	0x20200198
[3]	unsigned int	2453	0x2020019C
[4]	unsigned int	1830	0x202001A0
[5]	unsigned int	1207	0x202001A4
[6]	unsigned int	584	0x202001A8
[7]	unsigned int	62461	0x202001AC
[8]	unsigned int	61838	0x202001B0
[9]	unsigned int	61215	0x202001B4
[10]	unsigned int	60592	0x202001B8
[11]	unsigned int	59969	0x202001BC
[12]	unsigned int	59346	0x202001C0
[13]	unsigned int	58723	0x202001C4
[14]	unsigned int	58100	0x202001C8
[15]	unsigned int	57477	0x202001CC
[16]	unsigned int	56854	0x202001D0
[17]	unsigned int	56231	0x202001D4
[18]	unsigned int	55608	0x202001D8
[19]	unsigned int	54985	0x202001DC
[20]	unsigned int	54362	0x202001E0
[21]	unsigned int	53739	0x202001E4
[22]	unsigned int	53116	0x202001E8
[23]	unsigned int	52493	0x202001EC
[24]	unsigned int	51870	0x202001F0

counter diff about 623:
 $623 * 1.6\mu s = 996.8\mu s$



Test Result – capture dual channel in same times



Channel 3: CC0 Capture Interrupt Toggle
Channel 4: CC1 Capture Interrupt Toggle

Trigger Interrupt Route will have some delay, but the captured value no any delay.

Test Result – capture dual channel in same times

Debug ×

TIMA0_capture_4_channel_signals [Code Composer Studio - Device Debugging]

↳ Texas Instruments XDS110 USB Debug Probe/CORTEX_M0P (Suspended)

↳ main() at timx_timer_mode_capture_edge_capture.c:93 0x000007C4

Expression	Type	Value	Address
edgeCaptureC0	unsigned int[100]	[16548,16132, 15717,15301,14886...]	0x20200000
edgeCaptureC1	unsigned int[100]	[16548,16132, 15717,15301,14886...]	0x20200000

Variables Expressions Registers

Expression	Type	Value
edgeCaptureC0	unsigned int[100]	[16548,16132, 15717,15301,14886...]
edgeCaptureC1	unsigned int[100]	[16548,16132, 15717,15301,14886...]

Use two channel capture same signal, the CC data is keep same here, no any delay.
416*1.6us -> 665.6us

```
timx_timer_mode_capture_edge_capture.c × timx_timer_mode_capture_edge_capture.syscfg dl_timer.h startup_mspm0g350x_ticlang.c
89 */
90 DL_GPIO_clearPins(
91     GPIO_LEDs_PORT GPIO_LEDs_USER_LED_1_PTN | GPIO_LEDs_USER_LED_2_PTN)
```