

FCC ID: SWN-TD40UT

According to KDB 447498 D01 General RF Exposure Guidance v06.

For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C).

- 1) For test separation distance > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in setp b) is mutiplied by $[1 + \log(100/f_{\text{MHz}})]$
- 2) For test separation distance ≤ 50 mm, the power threshold determined by the equation in C) 1) for 50mm and 100 MHz is multiplied by $1/2$

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \times [\sqrt{f_{\text{MHz}}}] \leq 3.0$$

1. SAR test exclusion threshold: 3.0

Step a): at 100 MHz and 50 mm, power threshold = $(3.0 * 50) / \sqrt{0.1} = 474.342$ mW

Step b1): $474.342 + (50 - 50) \times (27.145/150) = 474.342$ mW

Step c1): $474.342 \times [1 + \log(100/27.145)] = 742.967$ mW

Step c2): $742.967/2 = 371.484$ mW

Frequency	Max. tune-up tolerance	Duty	Duty Factor	Result	Limit
27.145 MHz	794.328 mW (29.00 dBm)	45.85	6.77	167.109 mW (22.23 dBm)	371.484 mW

Note;

The EUT has two buttons (Constant, Nick) and each button transmits with same duty cycle.

The only difference is transmission time.

Nick : one pulse with duty cycle.

Constant : press and hold the button to automatically stop for up to 12 seconds with duty cycle.

Calculation;

$t_1 = 3.05$ ms, $t_2 = 0.95$ ms, $t_3 = 0.85$ ms, $t_4 = 1.35$ ms, $t_5 = 1.75$ ms, $t_6 = 1.65$ ms, $t_7 = 0.75$ ms, $t_8 = 1.55$ ms, $t_9 = 1.15$ ms, $t_{10} = 1.45$ ms, $t_{11} = 1.05$ ms, $t_{12} = 2.45$ ms

$$T_{\text{on}} = \{ t_1 + (2 * t_2) + t_3 + (3 * t_4) + t_5 + (4 * t_6) + t_7 + (3 * t_8) + (2 * t_9) + (5 * t_{10}) + t_{11} + t_{12} \}$$

$$T_{\text{on}} = 36.65 \text{ ms.}$$

$$T_{\text{on+off}} = 79.93 \text{ ms.}$$

$$\text{Duty Cycle} = 20\log(T_{\text{on}} / T_{\text{on+off}}) = 20\log(0.4585) = -6.77 \text{ dB}$$

2. Conclusion: No SAR is required.

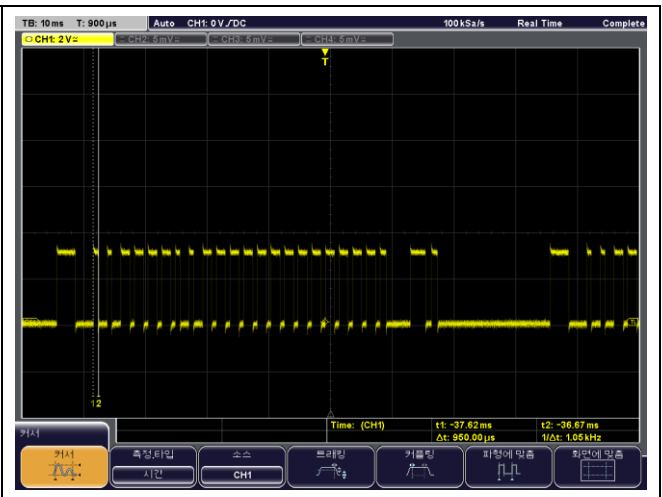
Note: Measured maximum output power : 26.30 dBm / Tune-up tolerance : 27 dBm \pm 2 dB

Test Plots;

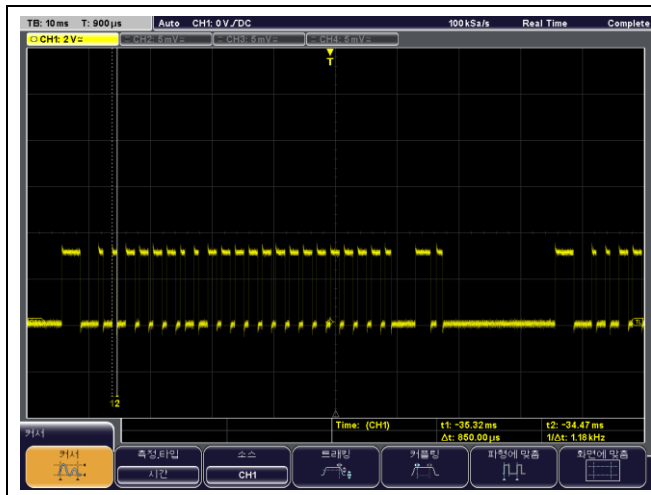
t1



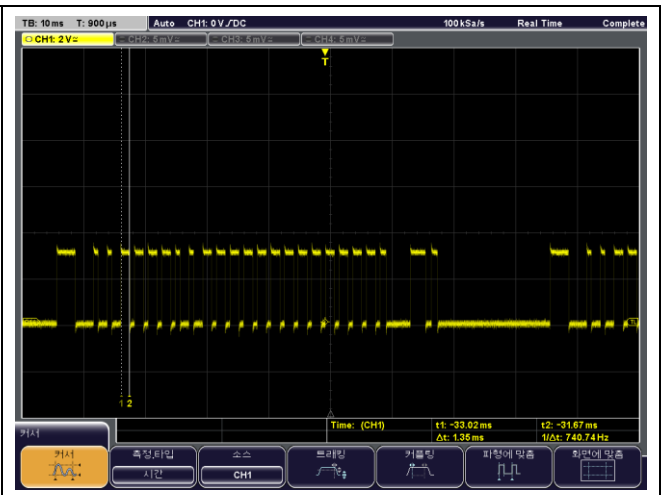
t2



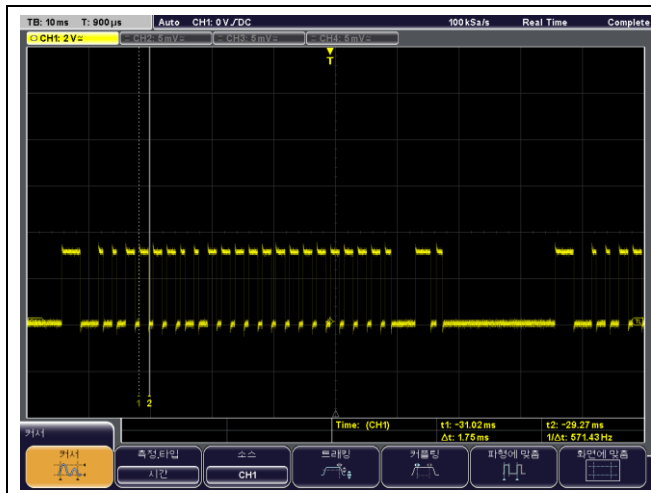
t3



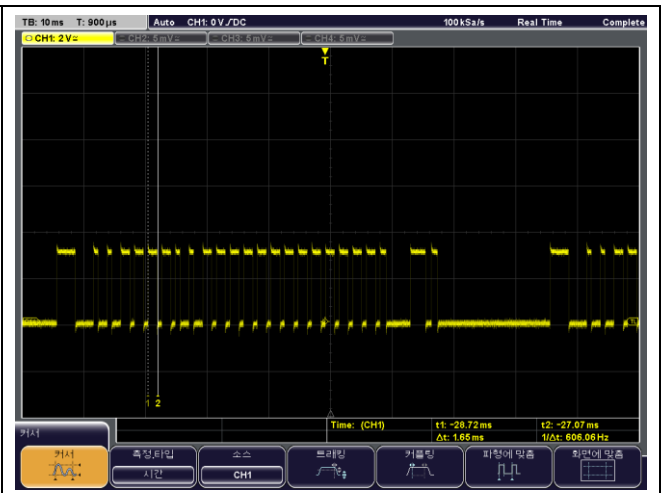
t4



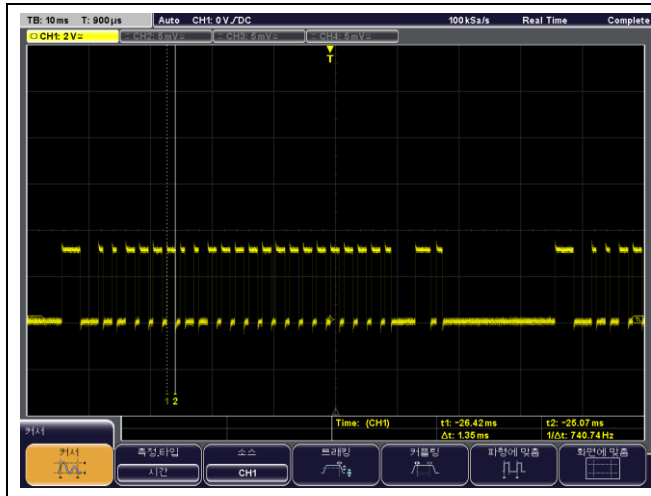
t5



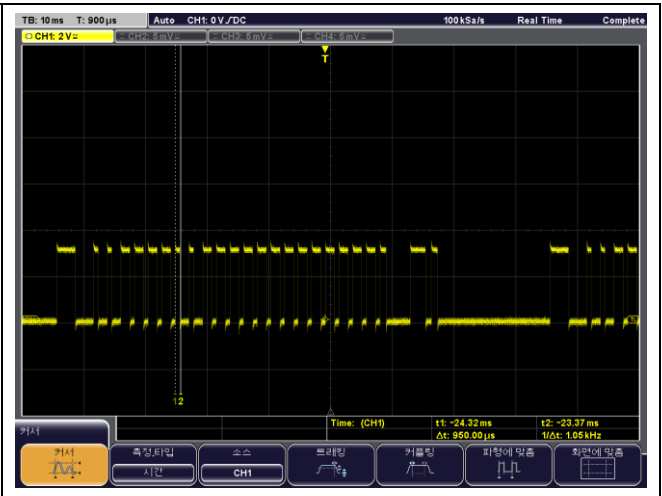
t6



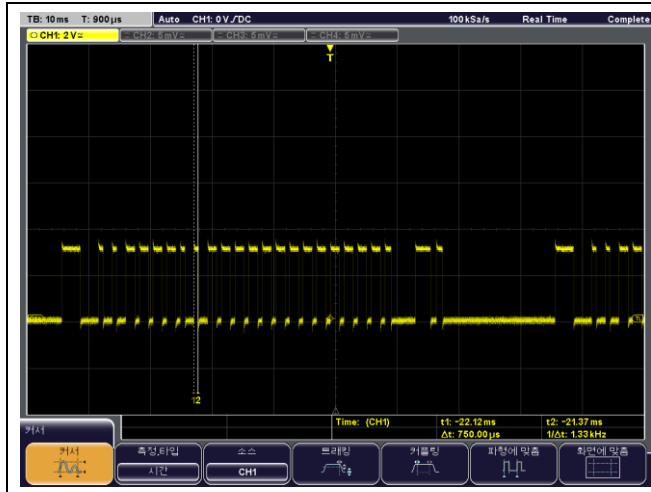
t4



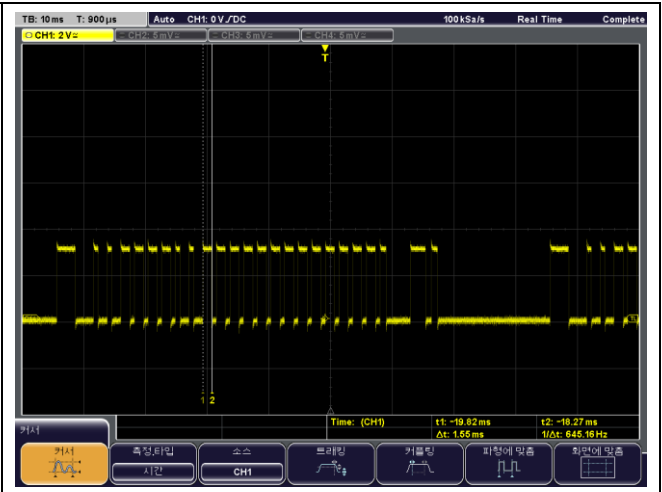
t2



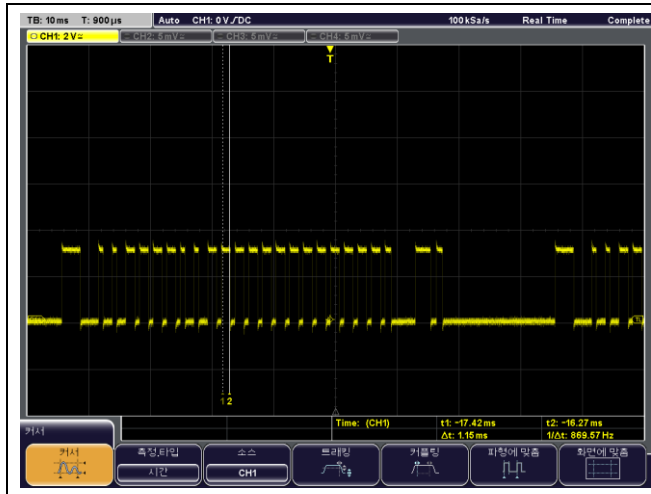
t7



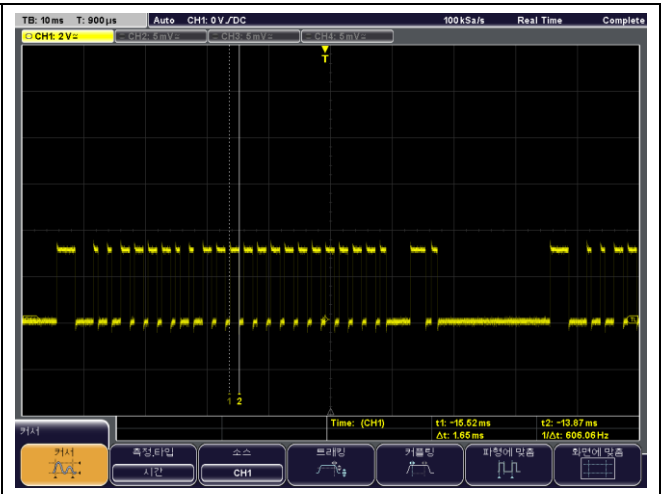
t8



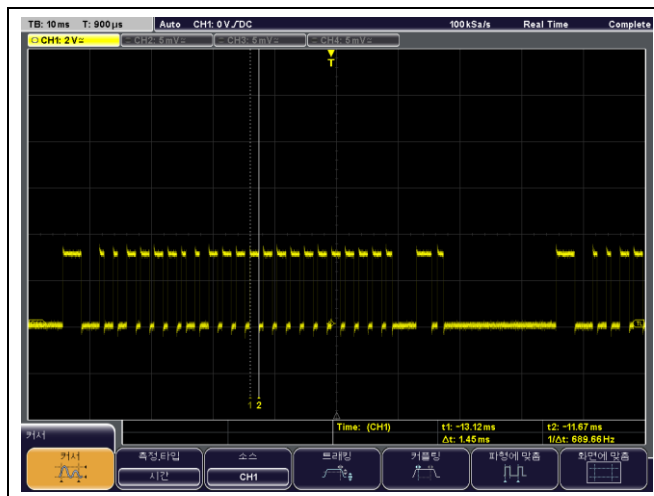
t9



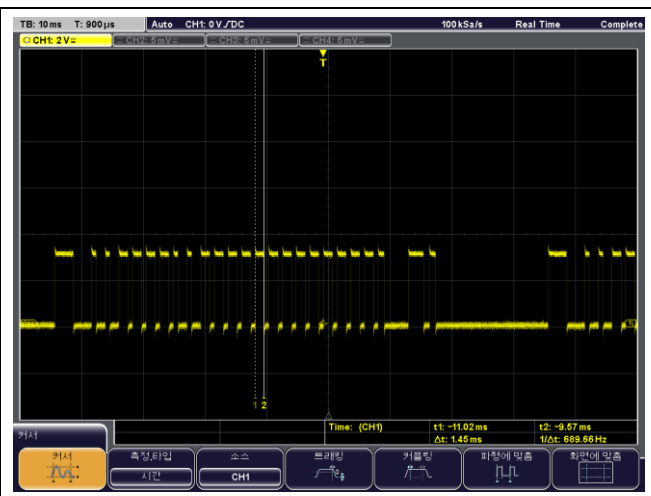
t6



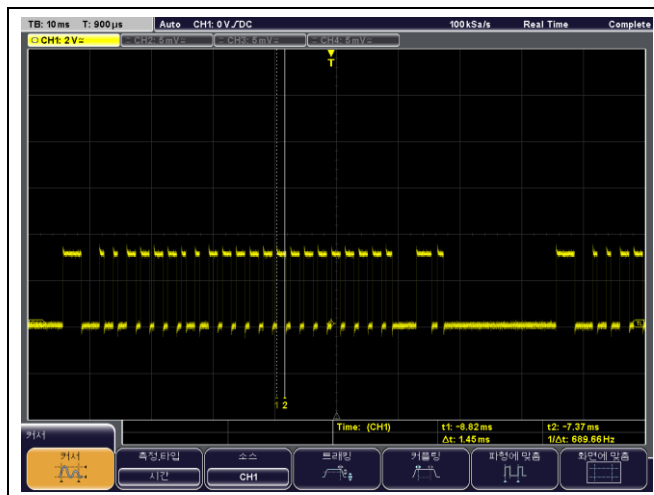
t10



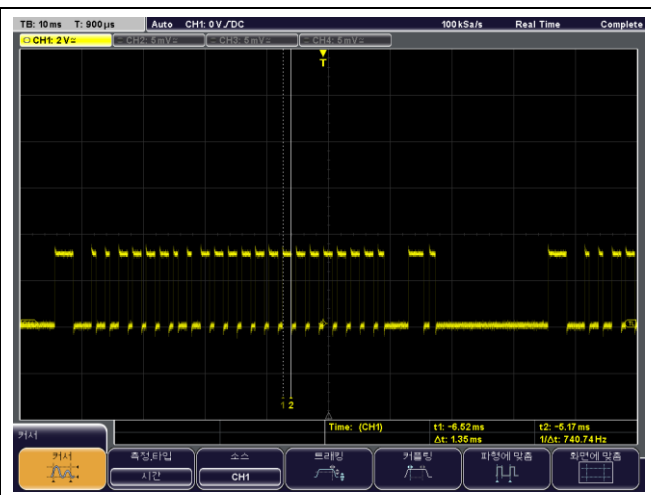
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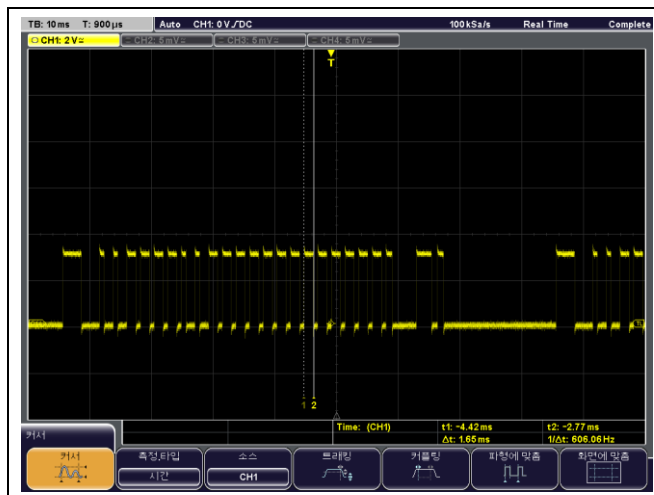
t10



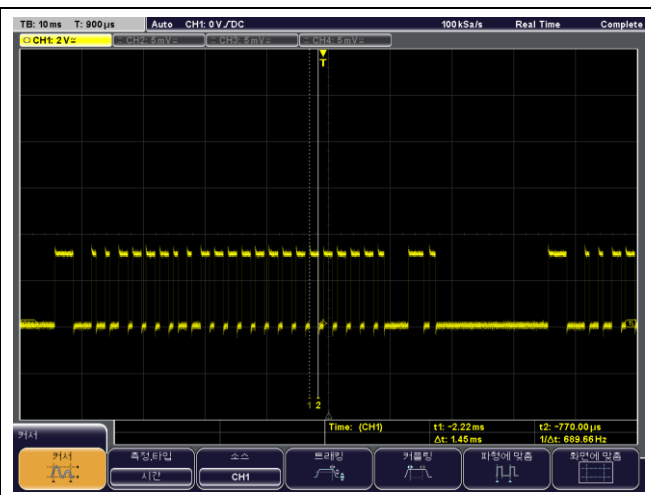
t4



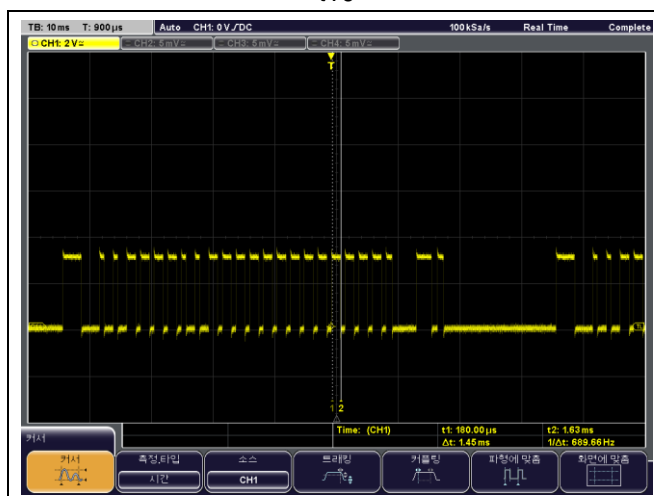
t6



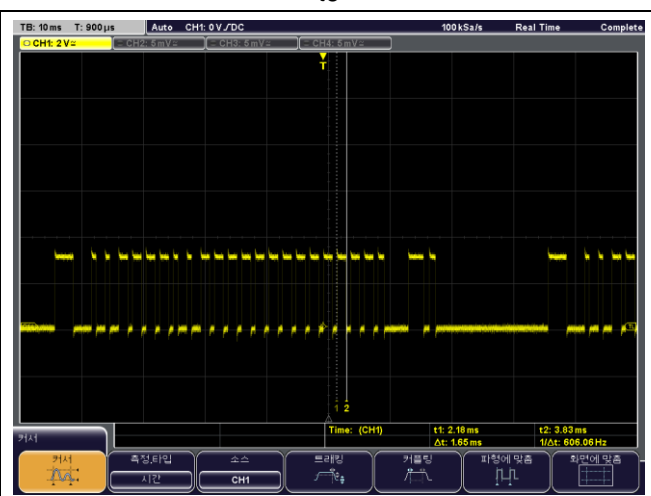
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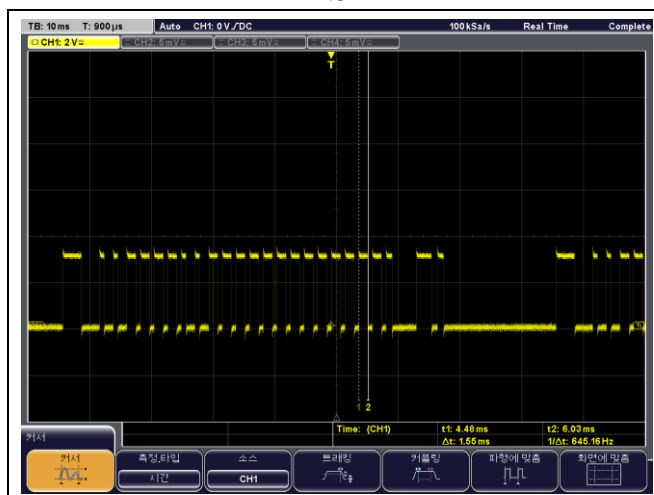
t10



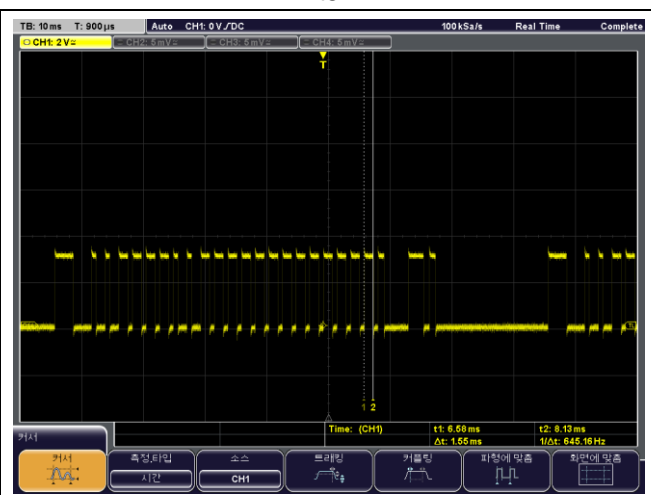
t6



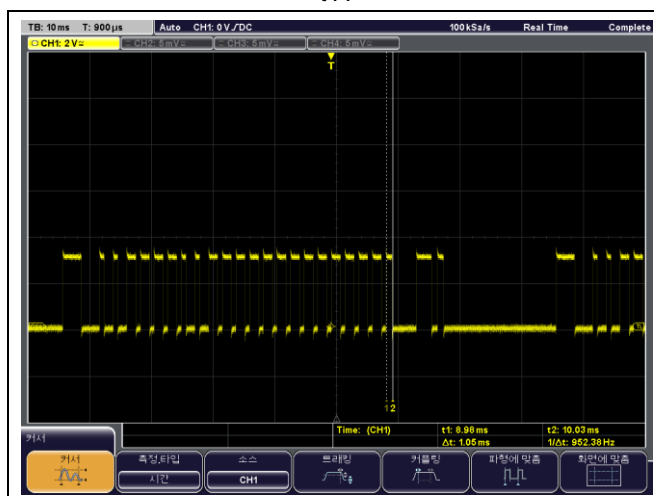
t8



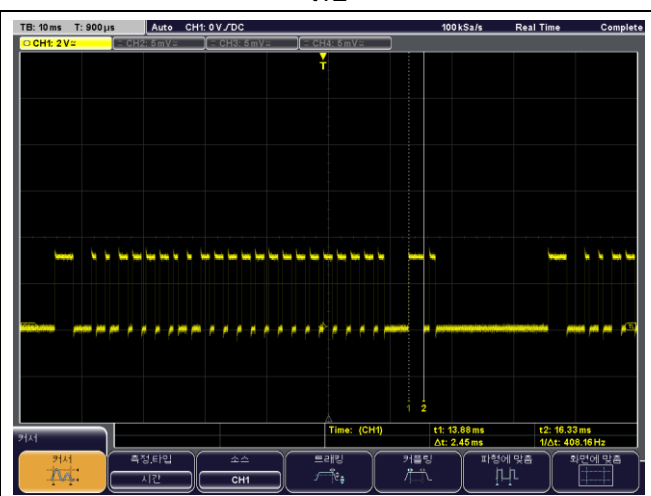
t8



t11

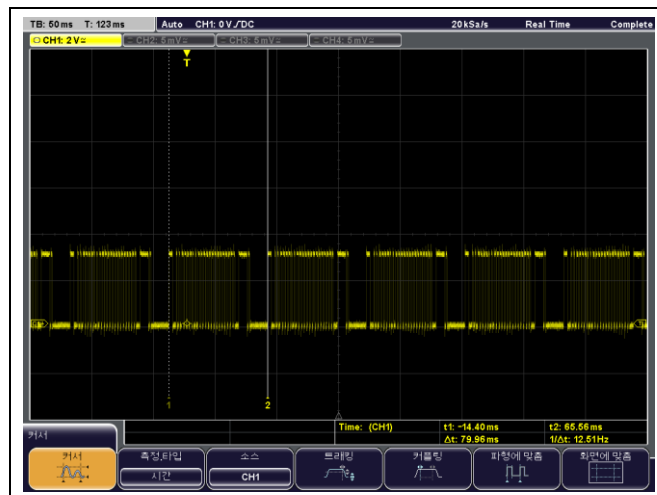
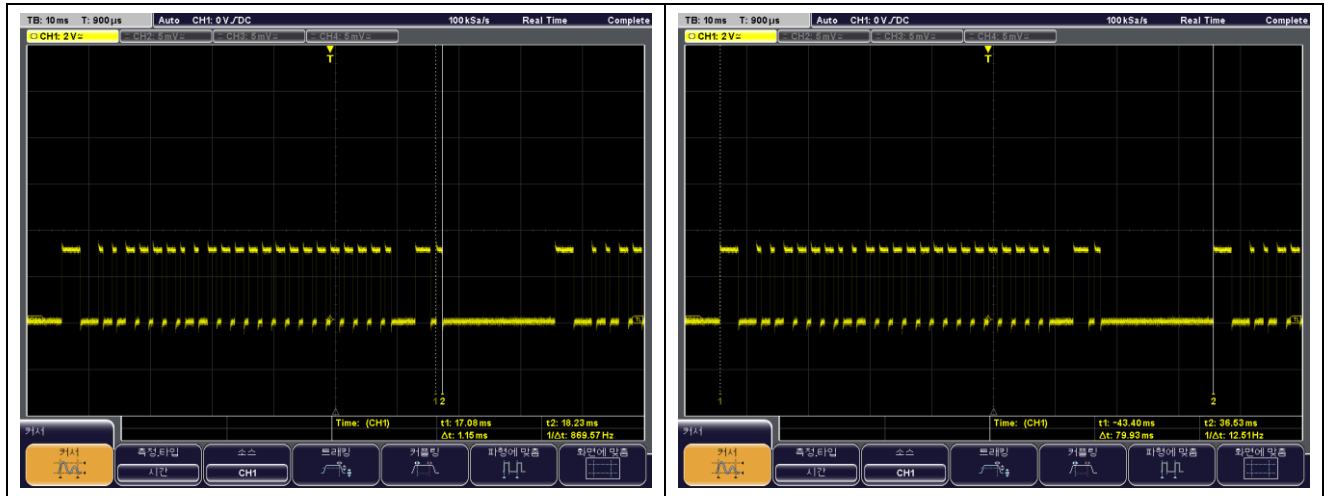


t12



t₉

T_{on+off}



Period