



ADKOMunity II, February 2019

Last week China celebrated its New Year and our congratulations go traditionally to our partners and friends in Asia. On February 5 the New Year started under the sign of zodiac “SWINE”. Referring to Chinese astrology it happens to stand inter alia for positive traits like tolerance, affection and optimism, attributes which encroach on various actions and discussions. We will see.



Associated with the current temperatures we would like to present a topic in part 2 of our ADKOMunity by means of a given example i. e. switching behavior of an ASTN LDCs at minus degrees.

The third part will continue with the presentation of another colleague, namely Oliver Kreiter, of our team.

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Case study ASTN LCD at sub-zero temperatures

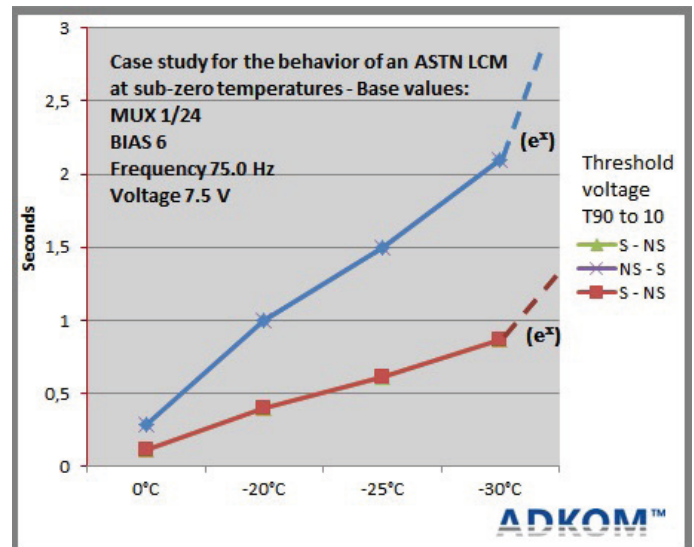


Somehow, this topic just turns up at the right time. Outside frost and fierce coldness hold sway which is getting on us- not unlike most of the displays.

Not a small number of customers' projects require due to operational conditions and locations very deep temperatures. Some technologies of LCDs allow functionality at -30°C or -40°C (TN displays e. g. can cover up to -55°C) if the liquid is designed afore. However, basic physical laws cannot be denied as they are effective for all displays in the market.

In order to get a statement of the display speed, the time between the non-visible (NS) and the visible (S) virtual level will be taken. In the process the time of the threshold voltage between T10 (10 % of the threshold voltage) and T90 (90 % of the threshold voltage) is measured. The adjoining graphic shows the switching time of a segment proportional to ambient temperature. You can clearly see that dropping temperature causes plummeting speed. The chart below delivers the corresponding values. We measured the time (in ms) between appearance of segment (NS-S) and disappearance of segment (S-NS).

Due to the pure physical characteristics of the liquid crystal this ASTN exemplification requires exponentially more time to display information the lower the temperature.



Temperature	0°C		-20°C		-25°C		-30°C	
Threshold Voltage	S - NS	NS - S	S - NS	NS - S	S - NS	NS - S	S - NS	NS - S
Response time - Measurement Values in Milliseconds								
T10	5,6	166,8	33,3	551,1	56,1	822,4	151,4	1585,6
T30	23,9	227,1	108,0	713,5	172,3	1067,3	315,4	1968,6
T50	44,8	264,3	188,0	878,1	296,5	1316,8	497,0	2367,7
T90	114,2	448,4	431,6	1548,4	672,5	2323,5	1019,7	3687,5
T90 bis T10	108,5	282,0	398,3	997,3	616,5	1501,1	868,3	2101,9
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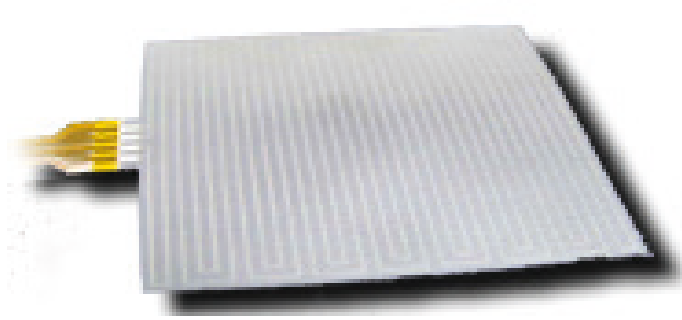
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Under which operational conditions a product can be used is mostly defined by the application or selling region. Corresponding to these application circumstances the required temperature range of a display can be defined. Important here is, which time can be accepted for change of data. That is for example an admittedly grave factor in regard to quickly changing values.



However, you can take steps during development to improve behaviour of inertia at extreme temperatures – for instance heating foils installed under the display.

The thickness of those foils is generally in a range of decimillimeters and in their shape customized producible. These foils are similar to FPCs in haptics and composition. We will pick up this topic gladly and make it subject of a future newsletter..

For 20 years member of ADKOM sales team

Oliver Kreiter: „Creative systems, which cooperate with humans”

“We are in the middle of the goings-on” says Oliver Kreiter, since 1999 at home at ADKOM Elektronik GmbH. For 20 years the 46-years-old has been working at ADKOM – then until now in the sales department. “What is fascinating me, is that up until now we have preserved prompt and speedy decisions – and have always been a personal counterpart for our customers.”



Oliver Kreiter has got in re electronic his finger at the pulse of developments. “We will yet experience a lot of changes. In the process the focus will shift to feelings and feeling creating systems. An extremely exciting topic. It demands from us to stay tuned to the matter and progress in order to keep pace with pulsating environment. Thus Oliver Kreiter has got clear ideas, on which looks will be directed at. “For me, creative and fabricating systems which cooperate and act with humans and in doing so develop nearly imaginable results in an aesthetic and artistic level are imaginable. The coming decade will reach alongside the progressing of virtual reality and new step of evolution. However, it is important for him, to know the “human” as “watchdog” with sanity and reason.

No wonder that his hobbies represent a clear balance to the computer and display world: „I love animals, sports and I like to listen to music, I enjoy going out, driving convertibles and look forward to long walks in nature.” Therefore, he does not shy away from the more and more faster speed in the industry of ADKOM. „Let’s just see it from a different angle: If the pace is high, we save time. Time that we can use for relaxation and rest.” He also gives a tip: “Everyone should live and lead the life in the speed that feels good for themselves.”

If you have questions about our topics, please [contact](#) us.

In the sense of our technical subject – we are happy to be here for you, even at temperatures below freezing.

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