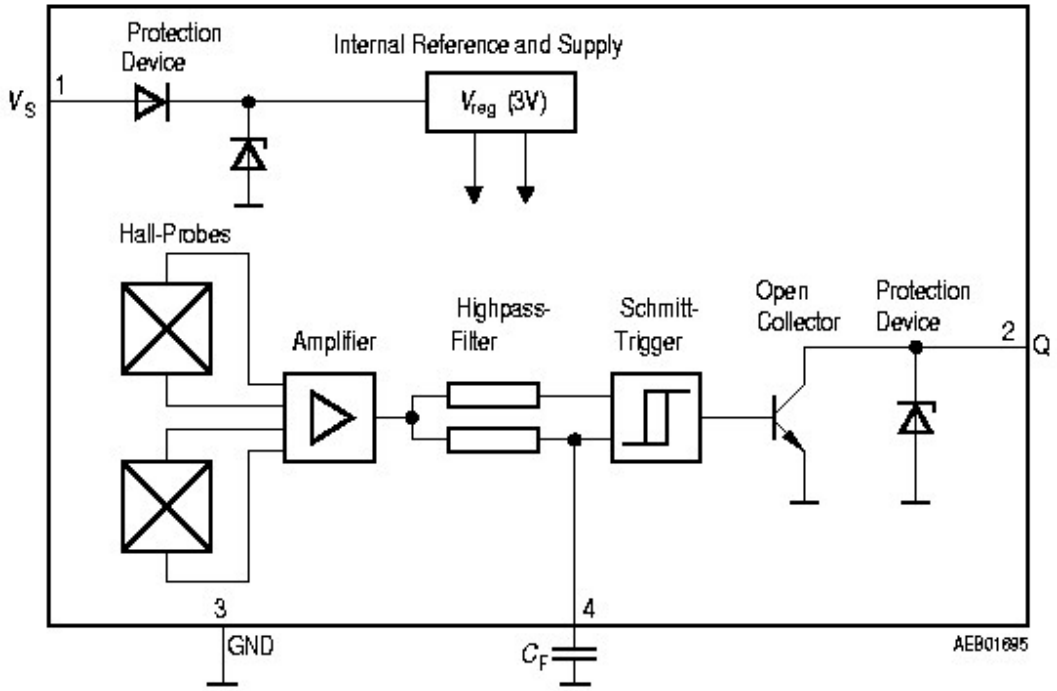
Product change information of TLE 4921-3U to TLE 4921-5U V 1.2

This document shows the relevant changes from the 3U to the 5U from the application point of view and gives a general overview of this PCN. Therefore this document contains typical curves and also measurements to show possible interesting behaviour of the IC which is partly not covered by the datasheet.

1. Block Diagram TLE 4921-3U, TLE 4921-5U



TLE 4921-3U and TLE 4921-5U have *identical* architecture.

Minor differences are mentioned in section 1 of this document.

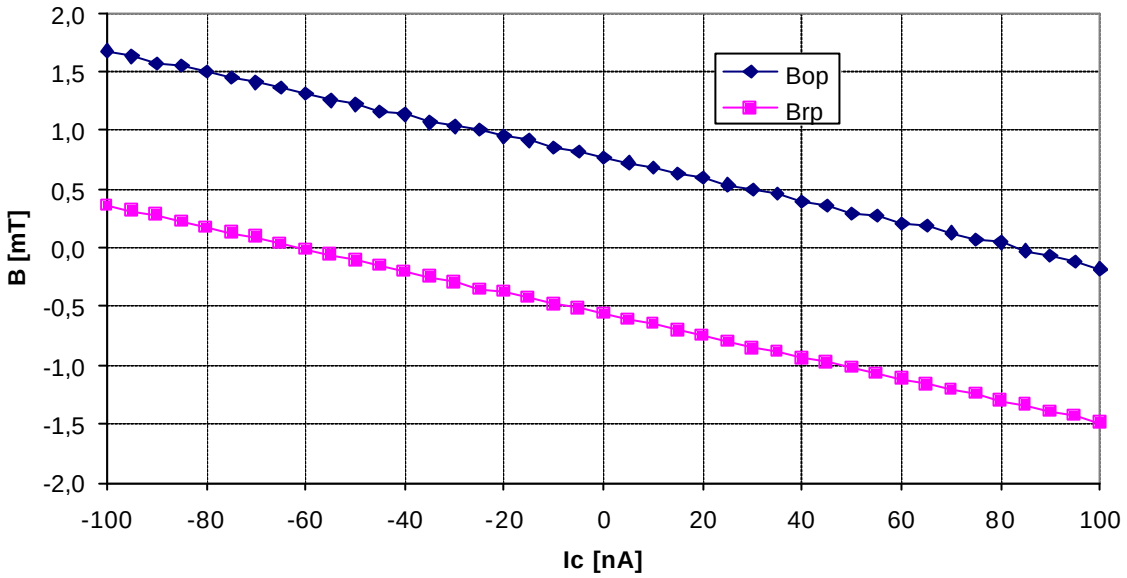
2. Design comparison of electrical parameters:

Topic	TLE 4921-3U	TLE 4921-5U	Reason	Influence
No. of Hall plates	2*2 parallel	2*4 parallel	to achieve the same resistance and signal to noise ratio	No change of performance and spec
Clamping structure	3 Zener diodes in series, with a breakthrough voltage of 10 V, total clamping voltage 30V	6 Zener diodes in series, with a breakthrough voltage of 5 V, total clamping voltage 30V	Due to different technology only different types of diodes available	No change of performance of clamping structure but influence on leakage current, lower breakthrough voltage results in a larger leakage (tunnel) current
Leakage current at output	10 µA < 24V	50 µA < 16V	Due to different clamping structure	Increased max. leakage spec change necessary, see also typical curve attached
Supply current VQ High VQ Low	 4.7/6.1/8.0 5.1/6.7/8.8	 3.8/5.3/8.0 4.3/5.9/8.8	Due to different technology	Reduced current consumption is a benefit but spec change necessary, influence on wire breakage detection and two wire applications to be checked
Hysteresis vs. temperature		Improved		Less temperature influence on hysteresis
Jitter vs. temperature		Improved		Decrease of app. 30%
Filter bias voltage (typ.)	1.8V	2V	TLE 4923 concept and structures have been used	No change of performance but reduced temperature dependency. Only influence on testing when forcing an IC switching with the filter bias voltage (limits to be adapted)
Filter sensitivity (typical)	-4mV/mT	-5mV/mT	TLE 4923 concept and structures have been used	Higher sensitivity, less noise sensitive
Influence of leakage current on magn. threshold	11 µT/nA	8.8 µT/nA		Less influence of filter leakage, because of higher filter sensitivity
Filter resistance	32/40/48 kOhm	35/43/52 kOhm	TLE 4923 concept and structures have been used	Reduced temperature dependency, reduced cut off frequency (app. 7%), power on: spec limit times unchanged
Initial behaviour after power on	Output high for app. 5-10µs	Output high for app. 40-50 ms	Defined status when filter capacitor completely unloaded	Output of the 5U is for a longer time high as the 3U. Output information should be locked out until filter capacitor is fully loaded (>5*R*C) for both types.

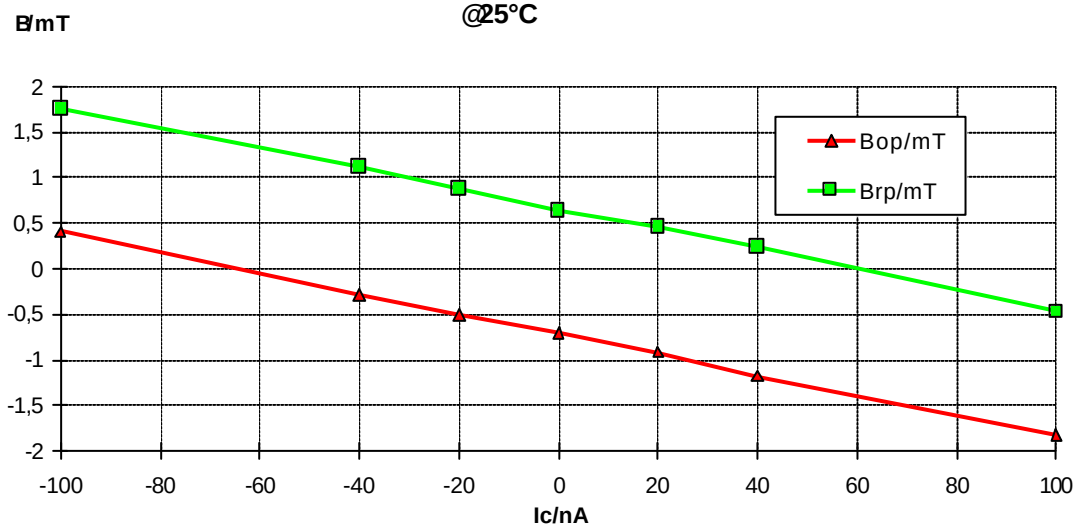
3. Comparison of typical diagrams of TLE 4921-5U and 3U:

Influence of Filter leakage:
(Definition: Positive currents leave the IC, similar to leakage on filter capacitor)

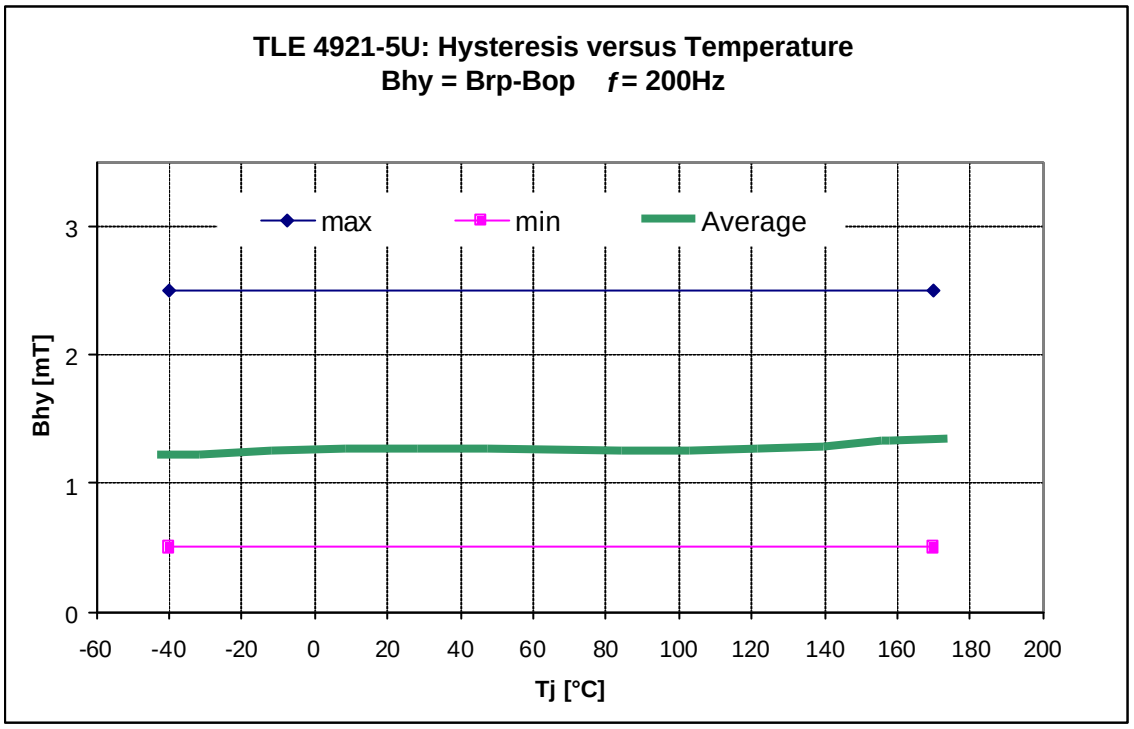
TLE 4921-5U: Threshold shift vs. filter leakage current Ic @25°C

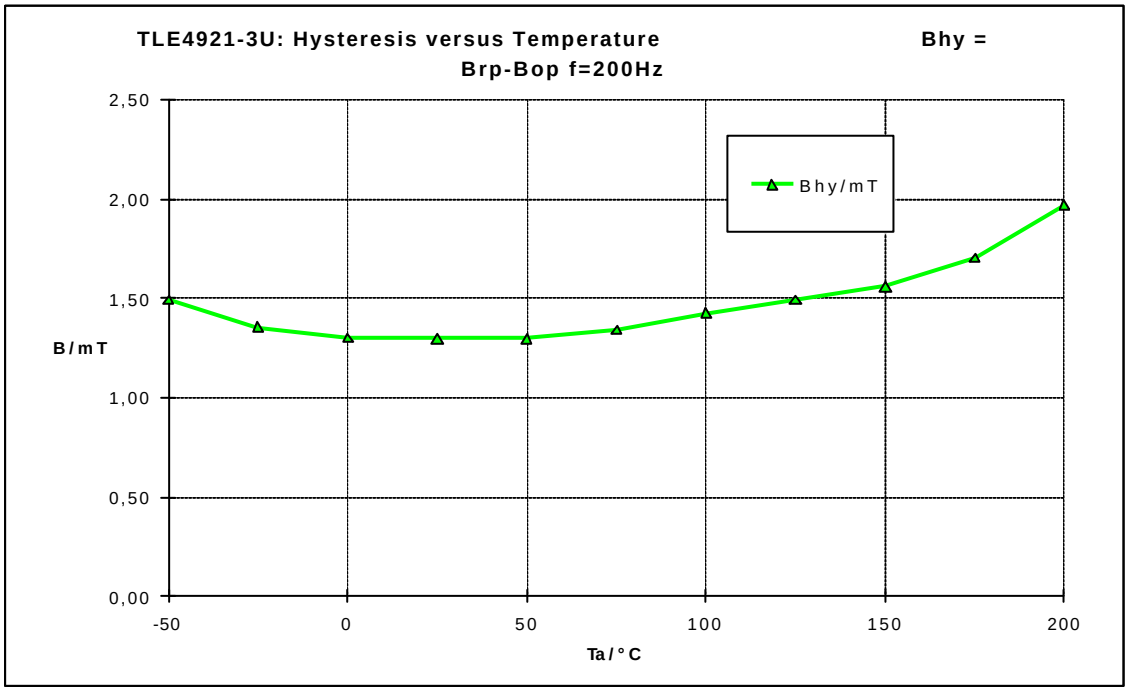


TLE4921-3U: Threshold shift vs. filter leakage current Ic @25°C

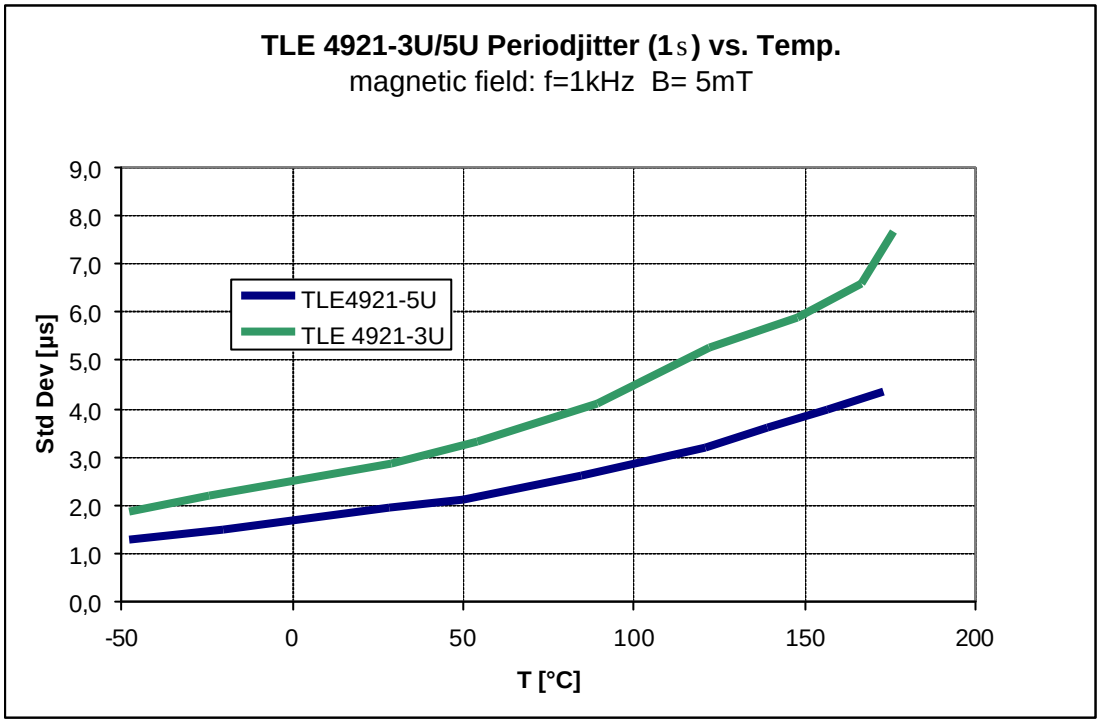


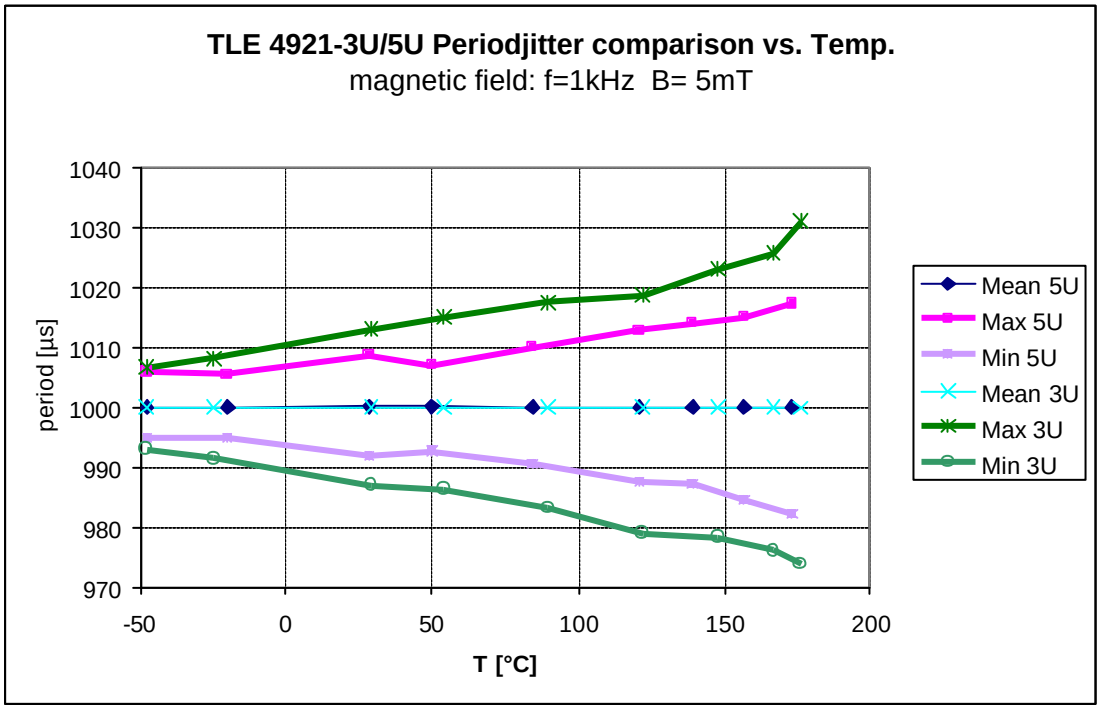
Magnetic hysteresis:





Jitter vs. Temperature:





Output leakage vs. temperature & output voltage (TLE 4921-5U):