LU1014 (Mis-) Matching

XEN Audio

November 2012

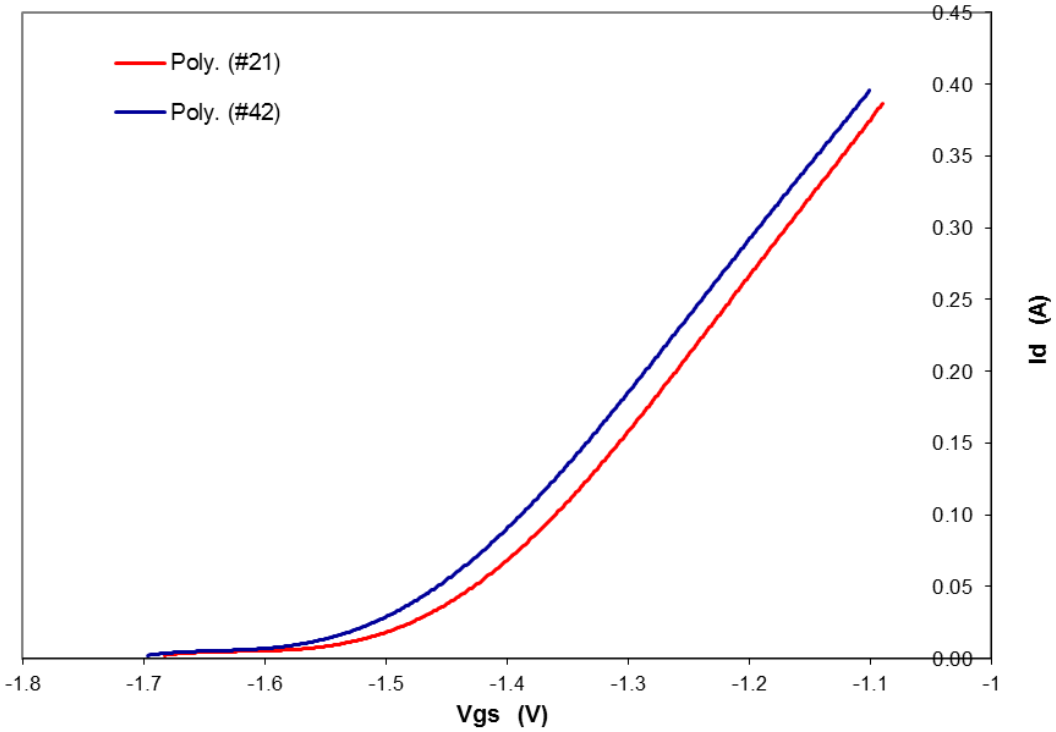
Quite a few years ago, when Nelson Pass drew the attention of the DIY community to the triode characteristics of the LU1014 power jfet, they were made available by Grey Rollins as matched devices. The matching was done according to the Pass method, at a single point at around 1.3A Id.

This method has now been copied by Deep Surplus, who managed to secure the last batches of LU1014 after the product became obsolete, so that it is still possible to obtain such devices, but only as “matched” devices.

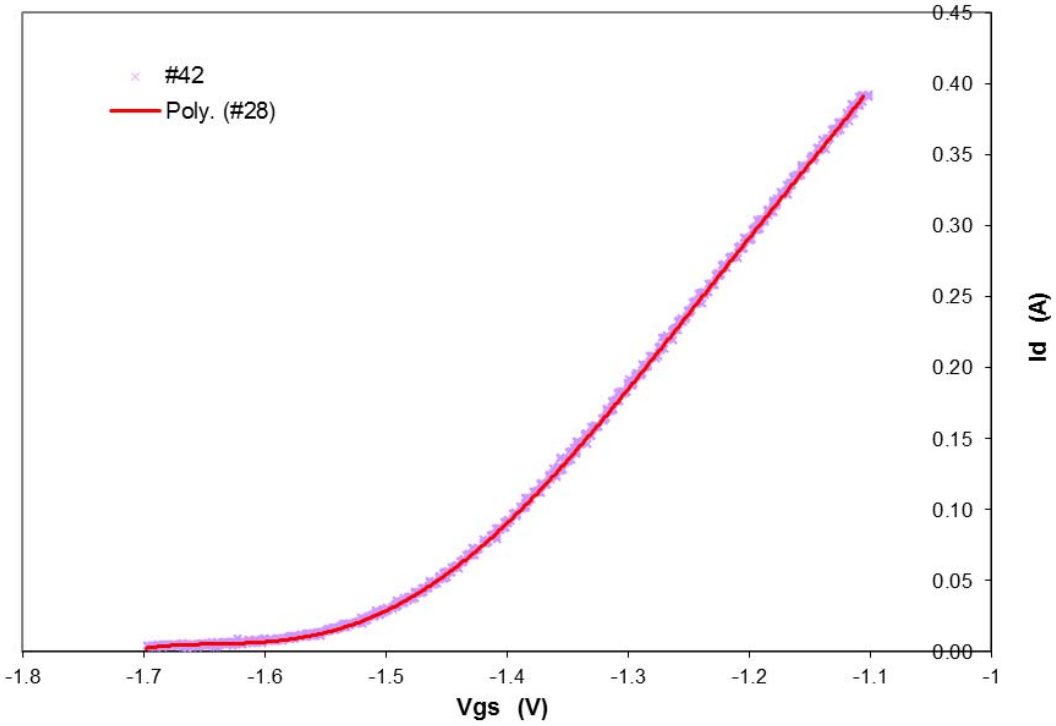
Also quite a few years ago, we published another triode curve based on the LU1014, but with higher source degeneration. This setup allows the use of this device at a lower bias current for, e.g., headphone amplifier applications.

To see how relevant the “Pass” matching method is to this low current (0.2A) bias, we curve traced all the “matched” devices in our procession in the low current triode mode. To our surprise, the matching is nowhere near as good as it should be.

Here we show two devices picked at random from a batch of 50. And one can see, there is a Vgs difference of some 0.04V, as well as a 4% difference in transconductance at 0,2A.



However, given a large enough matching pool, it is possible to find perfectly matched pairs over the entire operating region, as is obvious below. The curve for device #42 will disappear behind that of #28, so that we had to plot the data for the former as “x” rather than as trend line.



So once again, **not all "matched" devices are born equal**.

But how about unmatched devices ? How poorly matched could they look like ?
Here is a collection of some we bought as "unmatched" :