

TFT Model Extraction

For Extreme High Accuracy & Short Delivery Time

Service Project:

For advanced analysis such as flicker and image sticking effects, the customer requires highly accurate TFT models for design optimization. This project goal was to extract best-fit model parameters for all available physical measurements, especially for leakage currents. Legend’s MSIM-TFT Model Extractor was used for this service project.

Measured Data Provided:

The input data required for model extraction are (1) channel length of device, (2) channel width of device, (3) ambient temperature, and (4) device currents.

The set of measurement data are I_{DS} vs V_{GS} at various V_{DS} , and I_{DS} vs V_{DS} at various V_{GS} . Based upon the given technology, the customer provided the measured data with the format shown below

<u>I_{DS} vs V_{GS}</u>		
V_{DS}	V_{GS}	I_{DS}
3	-30	2.00e-14
		:
3	1	3.68e-09
		:
5	-7	8.60e-13
		:
5	6	1.62e-07
		:

<u>I_{DS} vs V_{DS}</u>		
V_{GS}	V_{DS}	I_{DS}
2	5	1.34e-08
		:
2	11	1.52e-08
		:
10	3	4.96e-07
		:
10	13	1.06e-06
		:

Model Extracted:

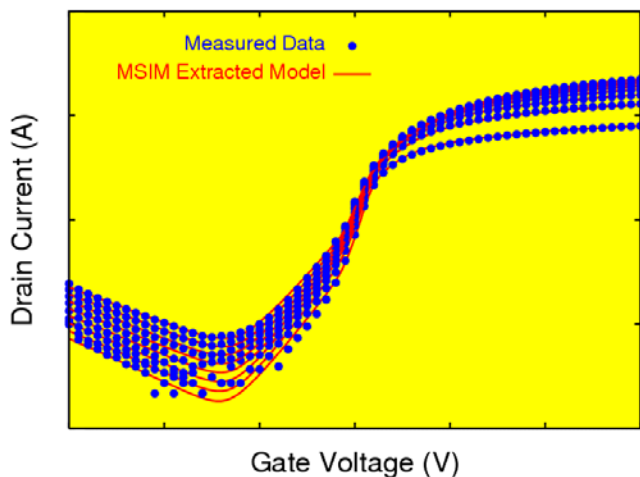


Fig. 1: Accuracy comparison between MSIM extracted model and the measured data of I_{DS} vs V_{GS} at various V_{DS} for that TFT device.

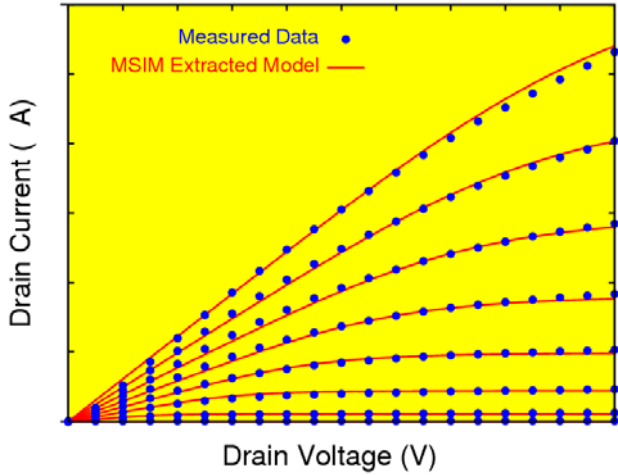


Fig. 2: Accuracy comparison between MSIM extracted model and the measured data of I_{DS} vs V_{DS} at various V_{GS} for that TFT device.

Summary:

As shown in Fig. 1 and Fig. 2, the accuracy of TFT models extracted during this service has been fully proven by comparing with the measurement data. Especially, at low leakage currents, the extracted models are very well fitted with the physical measurements. In summary, the high-accuracy models produced through this model refining service project shall enable the precise simulation and analysis of TFT panel designs for high-quality display products.