

Table 2.1

Comparisons of device characteristics between conventional MILC TFT's and ECTFT with $W/L=20\mu\text{m}/8\mu\text{m}$ at $d=0$ (gate overlapping length).

	μ (cm^2/Vs)	$I_{\text{on}}(10^{-4}\text{A})$ $V_d=5\text{V}$	I_{off} (10^{-10}A) $V_d=5\text{V}$	I_{GIDL} (nA) $V_d=5\text{V}$ $V_g=-20\text{V}$	on/off current rati(10^{-6}), $V_d=5\text{V}$	$V_{\text{th}}(\text{V})$, $V_d=5\text{V}$
AA15	3.704	1.13	4.09	453	0.276	13.941
AA30	5.916	1.16	1.25	2.77	0.419	13.94
AA50	15.038	2.82	1.01	9.4	2.792	12.34
AA100	20.526	2.00	0.712	63	2.81	11.7
ECT30	9.134	1.52	0.71	5.75	2.141	14.026
ECT50	15.866	2.00	1.75	5.14	1.143	12.708
ECT100	20.44667	3.69	2.94	8.59	1.26	12.35
ECT50 NON LDD	17.098	1.85	0.961	3.5	1.925	12.14
ECT50 $5*10^{13}$	16.206	3.18	0.77	8.43	4.13	10.808
ECT50 $1*10^{14}$	15.924	2.53	1.32	6.07	1.92	11.996

* V_{th} defined as the V_g required to induced an I_d of $W/L * 10^{-9}$ A at $V_d=5\text{V}$.

Table 3.1

Comparisons of device characteristics between MILC TFT's and SPC TFT's with $W/L=20\mu/6\mu$ at 600°C .

Sample	I_{on} (10^{-4}A) $V_{\text{d}}=5\text{V}$	I_{off} (10^{-10}A) $V_{\text{d}}=5\text{V}$	$I_{\text{on}}/I_{\text{off}}$ (10^6A) $V_{\text{d}}=5\text{V}$	$V_{\text{th}}(\text{V})$ $V_{\text{d}}=5\text{V}$	μ_{FE} ($\text{cm}^2/\text{V}\cdot\text{sec}$)	$N_{\text{t}}(10^{13})$ (cm^{-2})
Si_3N_4 20nm	4.52	0.67	6.75	13.95	29.77	0.84
Si_3N_4 5nm	4.45	0.86	5.17	11.7	28.23	0.936
Convention	3.58	1.02	3.51	10.55	25.58	0.85
SPC	2.33	0.68	3.43	22.82	20.56	1.51

* V_{th} defined as the V_{g} required to induced an I_{d} of $W/L * 10^{-7}$ A at $V_{\text{d}}=5\text{V}$.

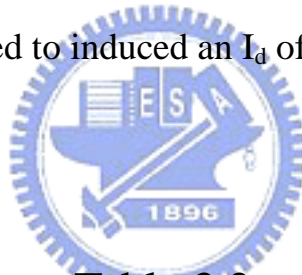


Table 3.2

Comparisons of device characteristics between MILC TFT's and SPC TFT's with $W/L=20\mu/6\mu$ at 900°C .

Sample	I_{on} (10^{-4}A) $V_{\text{d}}=5\text{V}$	I_{off} (10^{-10}A) $V_{\text{d}}=5\text{V}$	$I_{\text{on}}/I_{\text{off}}$ (10^6A) $V_{\text{d}}=5\text{V}$	$V_{\text{th}}(\text{V})$ $V_{\text{d}}=5\text{V}$	μ_{FE} ($\text{cm}^2/\text{V}\cdot\text{sec}$)	$N_{\text{t}}(10^{13})$ (cm^{-2})
Si_3N_4 20nm	11.6	1.46	7.94	6.35	49.31	0.733
Si_3N_4 5nm	11.15	2.01	5.55	7.86	50.27	0.667
Convention	12.1	1.59	7.61	8.32	56.97	0.688
SPC	13.8	2.14	6.45	10.88	68.3	0.767

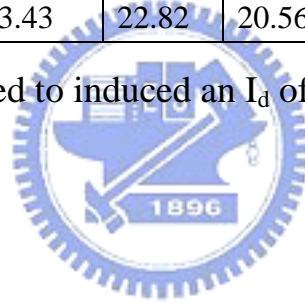
* V_{th} defined as the V_{g} required to induced an I_{d} of $W/L * 10^{-7}$ A at $V_{\text{d}}=5\text{V}$.

Table 3.3

Comparisons of device characteristics between MILC TFT's and SPC TFT's with W/L=20μm/6μm.

Sample	I _{on} (10 ⁻⁴ A) V _d =5V	I _{off} (10 ⁻¹⁰ A) V _d =5V	I _{on} /I _{off} (10 ⁶ A) V _d =5V	V _{th} (V) V _d =5V	μ _{FE} (cm ² /V*sec)	Nt(10 ¹³) (cm ⁻²)
Ge/Ni/a-Si	5.22	0.98	5.33	15.25	31.23	0.92
Ni/Ge/a-Si	3.33	0.98	3.4	15.23	31.29	0.946
Convention	3.58	1.02	3.51	10.55	25.58	0.85
SPC	2.33	0.68	3.43	22.82	20.56	1.51

*V_{th} defined as the V_g required to induced an I_d of W/L * 10⁻⁷ A at V_d=5V.



Tab3.4

Summary of physical properties for different samples

Rate(μm./hr)	500	550	600	Ea(eV)
Ge 5nm/Ni 5nm/a-Si	0.82	7.01	21.25	1.903
Ni 5nm/Ge 5nm/a-Si	1.07	2.74	2.42	0.487
Ni 5nm/Ge 20nm/a-Si	0.96	3.15	1.86	0.406

*V_{th} defined as the V_g required to induced an I_d of W/L * 10⁻⁷ A at V_d=5V.