Electronic Supplementary Material (ESI) for Nanoscale.
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Supplementary Information for

All Metal Nanoelectromechanical Switch working at 300 °C for Rugged Electronics Application

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Table S1 The comparison of this work with other recent works

	Actuation direction	Primary material	Footprint of active area	Pull-in voltage	Off-state leakage	Reliability (cycles)	Fabrication method	Temperature of operation	Contact resistance
Ref 1	Vertically	W/TiW	3μm×0.3μm	0.4 V	1 pA	20	Two Photolithography	Room temperature	-
Ref 2	Laterally	Polysilicon/ Platinum	16μm×0.5μm	8 V	10 pA	10^8	Two photolithography	Room temperature	3 kΩ
Ref 3	Laterally	SiC	8μm×0.2μm	10.2 V	10 pA~100 pA	$10^5 \sim 10^6$	One EBL	500 °C	700 kΩ
Ref 4	Vertically	W/SiGe	75μm×38μm	10V	-	$10^6 \sim 10^8$	Four photolithography	Room temperature	1 kΩ
This work	Laterally	Mo	28μm×0.3μm	8.1V	10 pA	2×10^4	One photolithography	300 °C	2.7 kΩ

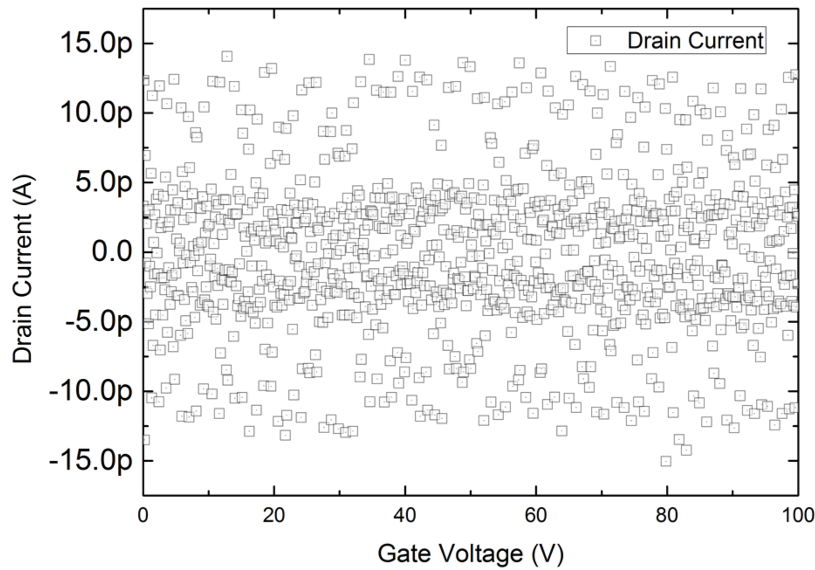

Fig S1. Measurement setup noise level test (Drain terminal) for with gate terminal voltage up to 100V, all probes are lifted up from contact pad.

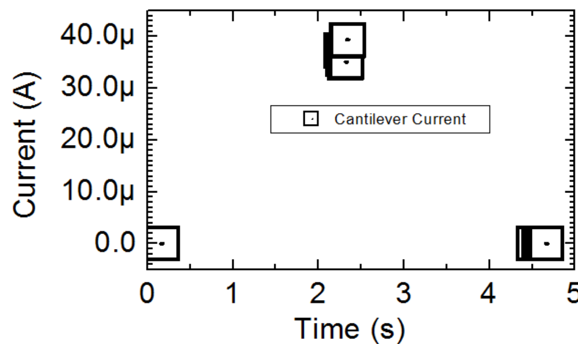

Fig S2. Contact resistance measurement with 0.1V drain to beam voltage and no current compliance, the contact resistance extracted from this figure is around 2.7 kΩ.

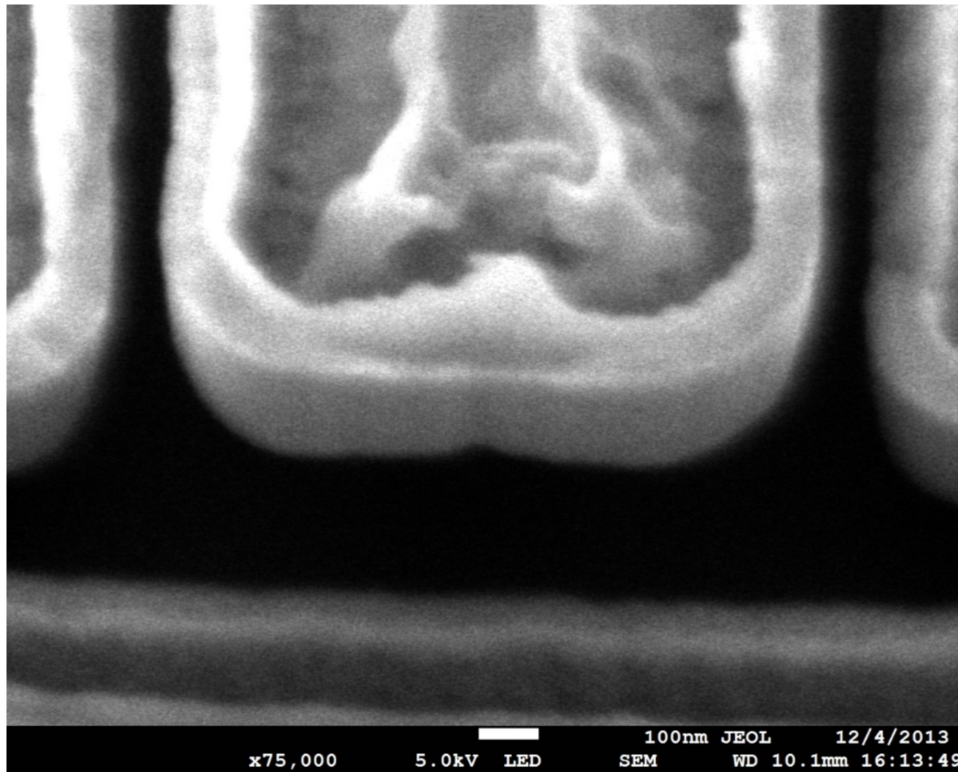

Fig S3 Drain contact area after cycling test, the beam is attracted by electron charging to another side

References:

1. J. O. Lee, Y.-H. Song, M.-W. Kim, M.-H. Kang, J.-S. Oh, H.-H. Yang and J.-B. Yoon, *Nature nanotechnology*, 2013, **8**, 36-40.
2. R. Parsa, W. S. Lee, M. Shavezipur, J. Provine, R. Maboudian, S. Mitra, H.-S. P. Wong and R. T. Howe, *Journal of Microelectromechanical Systems*, 2013, **22**, 768-778.
3. T. He, R. Yang, S. Rajgopal, M. A. Tupta, S. Bhunia, M. Mehregany and P. X.-L. Feng, in *2013 IEEE 26th International Conference on Micro Electro Mechanical Systems (MEMS)*, IEEE, 2013, pp. 516-519.
4. Y. Chen, R. Nathanael, J. Jeon, J. Yaung, L. Hutin and T.-j. K. Liu, *Journal of Microelectromechanical Systems*, 2012, 1-3.