1022-05-91 **Felix Lazebnik*** (lazebnik@math.udel.edu), Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, **Oleg Pikhurko** (pikhurko@cmu.edu), Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213, and **Andrew J. Woldar** (andrew.woldar@villanova.edu), Department of Mathematical Sciences, Villanova Unversity, Villanova, PA 10085. *Maximum Number of Colorings of* $(2k, k^2)$*-Graphs.*

Let $\mathcal{F}_{2k,k^2}$ consist of all simple graphs on $2k$ vertices and $k^2$ edges. For a simple graph $G$ and a positive integer $\lambda$, let $P_G(\lambda)$ denote the number of proper vertex colorings of $G$ in at most $\lambda$ colors, and let $f(2k, k^2, \lambda) = \max\{P_G(\lambda) : G \in \mathcal{F}_{2k,k^2}\}$. Let $K_{k,k}$ denote the complete bipartite graph with each partition having $k$ vertices. We prove that $f(2k, k^2, 3) = P_{K_{k,k}}(3)$ and $K_{k,k}$ is the only extremal graph. We also prove that $f(2k, k^2, 4) = (6 + o(1))4^k$ as $k \to \infty$. (Received September 10, 2006)