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Pavel Bleher* (pbleher@iupui.edu), Department of Mathematical Sciences, IUPUI,
Indianapolis, IN 46202. *Dimer Model: Full Asymptotic Expansion of the Partition Function.*

We give a complete rigorous proof of the full asymptotic expansion of the partition function of the dimer model on a square lattice on a torus for general weights z_h, z_v of the dimer model and arbitrary dimensions of the lattice m, n . We assume m is even and we show that the asymptotic expansion depends on the parity of n . We review and extend the results of Ivashkevich, Izmailian, and Hu [E. V. Ivashkevich, N. Sh. Izmailian, and Chin-Kun Hu, J. Phys. A: Math. Gen., 35, 5543 (2002)] on the full asymptotic expansion of the partition function of the dimer model. The coefficients of the asymptotic expansion are given in terms of the Jacobi theta functions, Dedekind eta function, and the Kronecker double series. We give a rigorous estimate of the error term in the asymptotic expansion of the partition function.

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