Photonics is the generation, manipulation, transport, detection, and use of light information and energy whose fundamental particle is the photon. Silicon photonics is a branch of photonics that focuses on the development and integration of photonic devices and circuits using silicon as the primary material. The purpose of the research includes simulation of integrated heaters for a double cavity Fabry-Perot resonator, thermal management and performance Optimization. Methodology adopted for this includes heat conduction, finite element analysis, and thermo-optic effect. Integrated heaters are designed in the resonator to increase thermal efficiency. Thermal efficiency comes to be 16.56 K/mW with an integrated heater of width 0.45μm.Width of the heater changes from 0.45μm to 0.35μm to 0.3μm(that comes to be more thermal efficient than others). After that to increase thermal efficiency an air gap in silicon substrate is introduced with varying depth from 5μm to 10 μm and 15 μm and fixed width 2.05 μm.It turned out there comes no prominent change in thermal efficiency with varying depth and fixed width. Now we fixed the depth of air gap (5 μm)and varying width 2.05 μm to 4.10 μm,6.15 μm, 8.20 μm to 10.25 μm respectively. The thermal efficiency changed from 16.8 K/mW to 29.97 K/mW. There comes a change in wavelength per heat power from 1.57 $^{nm}/_{mW}$ to 2.79 $^{nm}/_{mW}$.