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The coupling of a single quantum system to a large number of independent degrees of freedom can display very rich physics when pushed to extreme regimes. Such a setup can be implemented using the tools of circuit-QED where an artificial atom made out of Josephson junctions is coupled to a multi-mode microwave cavity. When the coupling strength between the quantum system and the modes becomes comparable to the bare transition energy of the artificial atom (ultra strong coupling USC), modes of the cavity start to interact together via their one to one interaction with the artificial atom. Such interactions lead to processes that do not conserve the number of excitations, which is a hallmark of USC. In this work we report the direct observation of such a process, namely the spontaneous generation of three photons where an incoming photon is spontanously converted into three outgoing photons.