CLAIMS

1. An opto-electronic engine assembly, comprising:

a first substrate that includes:

at least one Field-Programmable Gate Arrays (FPGA), and

a plurality of optoelectronic interconnects;

a second substrate that includes a memory; and

a third substrate that includes a plurality of power sources.

2. The opto-electronic engine assembly of claim 1, wherein the first substrate corresponds to one of silicon interposer or a glass interposer on which the at least one FPGA is mounted.

3. The opto-electronic engine assembly of claim 1, wherein the plurality of optoelectronic interconnects is configured for data transmission and reception via optical communication.

4. The opto-electronic engine assembly of claim 1, wherein the second substrate further includes:

a plurality of multipliers,

a plurality of clock circuitry, and

a plurality of DDR4 RAMs, wherein the plurality of DDR4 RAMs is configured for processing and storing data.

5. The opto-electronic engine assembly of claim 1, wherein the third substrate further includes:

a plurality of voltage regulators,

a plurality of voltage connectors,

one or more dipswitches, and

one or more voltage protection circuits configured to control voltage and current.

6. The opto-electronic engine assembly of claim 1, wherein the first substrate corresponds to a LTCC (Low Temperature Co-Fired Ceramic) substrate on which plurality of FPGAs and the plurality of optoelectronic interconnects are mounted.

7. The opto-electronic engine assembly of claim 1, wherein

the first substrate further includes a hexagonal heatsink on the at least one FPGA, and

the hexagonal heatsink is configured for heat dissipation.