**Figures:**

*Figure 1. The schematic of the design of BUSDIG engine.*

Figure 2. 1D engine simulation model of BUSDIG engine in Ricardo WAVE.

Figure 3. Schematic diagram of the engine design for B/S ratio study [11].

Figure 4. SR, TR and CTR at 280 ⁰CA with different B/S ratio [11].

Figure 5. Effect of B/S ratio on DR, TE, SE and CE [11].

Figure 6. Definition of the scavenge port angles [13].

Figure 7. SR, TR and CTR with different AIAs [13].

Figure 8. DR, TE, SE and CE with different AIAs [13].

Figure 9. SR, TR and CTR at 280 ⁰ with different SOAs [13].

Figure 10. DR, TE, SE and CE with different SOAs [13].

Figure 11. Schematic of the design of intake plenum [16].

Figure 12. Effect of rI/S on SR, TR and CTR (@ 280 ⁰CA) [16].

Figure 13. Effect of rI/S on DR, TE, SE and CE [16].

Figure 14. Effect of rS/C on DR, TE, SE and CE [16].

Figure 15. Effect of αI/E on SR, TR and CTR @ 280 ⁰CA [16].

Figure 16. Effect of rB/PL on in-cylinder SR, TR and CTR @ 280 ⁰CA [16].

Figure 17. Opening profiles of scavenge ports and exhaust valves [13].

Figure 18. Definitions of ∆open, ∆close and ∆overlap [13].

Figure 19. Definitions of EB, BS, MS and PB stages based on the total mass flow rates and RGF profiles at the outlets of scavenge ports [13].

Figure 20. Effect of ∆open on dEB [13].

Figure 21. Relationships among the opening profiles of scavenge ports and exhaust valves, scavenging periods, in-cylinder flow motions and scavenging performances [13].

Figure 22. The opening profiles of low lift exhaust valves and normalized scavenge port area [15].

Figure 23. Impact of EVO timing on DR/CE and SE (TE=1 for all cases) [15].

Figure 24. Impact of SOI timings on the average fuel/air equivalence ratio in the whole cylinder and spark zone [18].

Figure 25. The distributions of fuel/air equivalence ratio with split injection. Split ratio=0.5, SOI=280/300 °CA. Section A-A: horizontal plane crossing spark plug gap. Section B-B, vertical plane crossing spark plug gap and cylinder axis. Section C-C: vertical plane crossing cylinder axis and vertical to section B-B [18].

Figure 26. Brake thermal efficiency of BUSDIG engine with different techniques.

Figure 27. Brake torque and brake power of 1.0 L BUSDIG engine (Lambda 1 with water injection).

**Tables:**

*Table 1. Specifications of 2-stroke BUSDIG engine.*

Table 2. Design of B/S ratio [11].