H.D.L Design for Ultra High Multi Frequency Rate P.R.B.S Generator for Identification of Property of Different P.R.B.S Pattern Sequences for Ultra High Speed Wireless Communication Products/Applications

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I. INTRODUCTION

In the latest Modern Hi-tech Information Technology & Communication Engineering world, I speed is a major constraint factor for V.L.S.I Chip Designs. Now Giga Hertz speed (G.b.p.s) based wireless &communication products came to the market. Now I Designed New Tera Hertz Speed (Tbps Rate) P.R.B.S Carrier Generator for All Latest new Innovative & future generative Hi-tech Wireless Portable Smart Computing Products & Cards. In Modern Hi-tech Communication Engineering world, High Speed based Portable Communication System Hardware & Software Products Came to the market, speed is an important factor and is in terms of Giga bits per second for all Hi-tech Real time Smart Computing Portable wireless Communication System Software products like Cloud Computing, wireless Internet Data Packets Transceivers Computing, Tablets, Pocket Mobile Multimedia Systems, Note Book Computers, Wireless Routers, N.O.C.s, Network Cards/Racks, Wi-Fi, Gi-Fi, Wi-max, G.P.S, G.S.M, Q.C.D.M.A Transceivers. For that purpose I Designed Giga Bits Per Second ,Tera Bits Per Second & Peta Bits Per Second High Speed PRBS is Pseudo Random Binary Sequence Frequency Generators, Generate & Received Random Frequency Data in the form of Random frequency numbers of different speed w.r.t specific data tapping sequence points for both signal & carrier wave generation. PRBS Generators, Receivers, Transceivers Designed for HiFi Wireless Internet Data Packets Computing and Cloud Computing etc. Transmission, Reception of Data is in the RANDOM Sense, This P.R.B.S Generator, Receiver is Designed for Identification property of Different Tapped P.R.B.S Sequences like 7, 10,15,23,31 at a Clock carrier frequency speed of G.b.p.s/T.b.p.s/P.b.p.s. the Length of P.R.B.S sequence is $2^1-1$, $2^2-1$ times repeated the sequences. this is mainly suit for multiple users to transmit and received data in accurate time for very long distance communications like G.P.S Data Acquisition, G.S.M Communication Systems, Wi-Fi, Gi-Fi, L.T.E, Wireless O.F.D.M.A , C.D.M.A.Q.C.D.M.A Computing, wireless internet computing, cloud computing etc because of Ultra High speed Communication Rate in terms g.b.p.s, t.b.p.s, p.b.p.s . All these P.R.B.S L.F.S.R Sequences are designed by tapping different points according to ITU O.150, O.151, and O.152 Standards. This P.R.B.S Design Consists of Multiplexer, P.R.B.S Registers of different tapped sequence points, Clock Frequency Generators of G.b.p.s/T.b.p.s/P.b.p.s Speed. The Advantages of these P.R.B.S Generators having In
Built Checkers, Bit Error Rate Detection & Correction by using P.R.B.S Checkers. these are simply Linear Polynomial Checkers & C.R.C.

<table>
<thead>
<tr>
<th>P.R.B.S TYPE</th>
<th>STANDARD</th>
<th>SUGGESTED DATA RATE(Kilo Bits Per Second)</th>
<th>FEED BACK TAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2^n-1$</td>
<td>ITU-T O.150</td>
<td>14.4</td>
<td>7.6</td>
</tr>
<tr>
<td>$2^{10}-1$</td>
<td>ITU-T O.150</td>
<td>64</td>
<td>10.3</td>
</tr>
<tr>
<td>$2^{11}-1$</td>
<td>ITU-T O.150</td>
<td>1544, 2048, 6312, 8448, 32064, 44736</td>
<td>14,15</td>
</tr>
<tr>
<td>$2^{15}-1$</td>
<td>ITU-T O.150</td>
<td>34368, 44736, 139264</td>
<td>18,23</td>
</tr>
<tr>
<td>$2^{20}-1$</td>
<td>ITU-T O.150/151/152</td>
<td>28,31</td>
<td></td>
</tr>
<tr>
<td>$2^{23}-1$</td>
<td>ITU-T O.150/151/152</td>
<td>48,42</td>
<td></td>
</tr>
<tr>
<td>$2^{31}-1$</td>
<td>ITU-T O.150/151/152/153</td>
<td>52,47</td>
<td></td>
</tr>
<tr>
<td>$2^{35}-1$</td>
<td>ITU-T O.150/151/152/153</td>
<td>48,63</td>
<td></td>
</tr>
</tbody>
</table>

Table (1): PRBS bit-pattern are generated in a linear feed-back shift-register. This is a shift-register with a XORed feedback of the output-values of specific flip-flops to the input of the first flip-flop.

II. P.R.B.S DESIGN ARCHITECTURES

A) $2^{31}-1$ Tera PRBS

B) $2^{31}-1$ Tera PRBS

C) $2^{31}-1$ Tera PRBS

D) $2^{31}-1$ Tera PRBS

E) $2^{31}-1$ Tera PRBS
III. HIGH SPEED MULTI CHANNEL MULTI SPEED P.R.B.S DATA SERDES/TRANSCEIVER ARCHITECTURE.

A) Description:
The P.R.B.S Transmitter Consists of 8:1 Multiplexer, D-FF Register, Different P.R.B.S Pattern Generators - (2^7-1,2^30-1,2^31-1,2^31-1 etc.), the multiplexer select the one of the different P.R.B.S Pattern Sequence and feed the same to D-FF Register and send the same in serial output/ parallel output form.

IV. MULTI FREQUENCY P.R.B.S
Figure 2. Multi Frequency Multi Channel P.R.B.S

V. EDA SOFTWARE – V.L.S.I LC DESIGN FLOW
VI. SIMULATION RESULTS-MULTI FREQUENCY RATE P.R.B.S OF DIFFERENT TAPPED SEQUENCE PATTERNS

Figure 4. Multi Speed P.R.B.S of Different Tapped Sequences

VII. MULTI FREQUENCY P.R.B.S

Figure 5. Simulation Waveform – Multi frequency P.R.B.S
VIII. F.P.G.A DESIGN FLOW REPORTS

A) R.T.L Design Architecture

![Figure 6](image1.png)

Figure 6. Multi Frequency P.R.B.S R.T.L

B) R.T.L-Design-Schematic

![Figure 7](image2.png)

Figure 7. Multi Frequency P.R.B.S R.T.L Schematic

C) F.P.G.A Placed Design Layout

![Figure 8](image3.png)

Figure 8. Multi Frequency P.R.B.S Placed Design Layout

D) F.P.G.A Routed Design Report

![Figure 9](image4.png)

Figure 9. Multi frequency P.R.B.S Routed Design Layout
IX. CONCLUSION


Note: No References

Bibliography


Dr. D.N Rao B.Tech, M.E, Ph.D, principal of JBREC, Hyderabad. His carrier spans nearly three decades in the field of teaching, administration,R&D, and other diversified in-depth experience in academics and administration. He has actively involved in organizing various conferences and workshops. He has published over 11 international journal papers out of his research work. He presented more than 15 research papers at various national and international conferences. He is currently approved reviewer of IASTED International journals and conferences from the year 2006. He is also guiding the projects of PG/Ph.D students of various universities

Dr.Vathsal Currently working as a Professor & Dean- R&D & EEE,JBIET,He Obtained PhD from I.I.S.C,Bangalore,also Did Post Doctoral Research in DFVLR,Germany and NASA Goddard Space Flight Centre,USA,and also he worked with keen Designations Scientist E.F.G from Reputed Govt R&D Industry Organizations over past years and closely worked with Dr.A.P.J Abdul Kalam He Published lot of various national, international journals & conferences, He guiding 5 PhD Students from Various universities. He Got Prestigious awarded as a Noble Son of India.