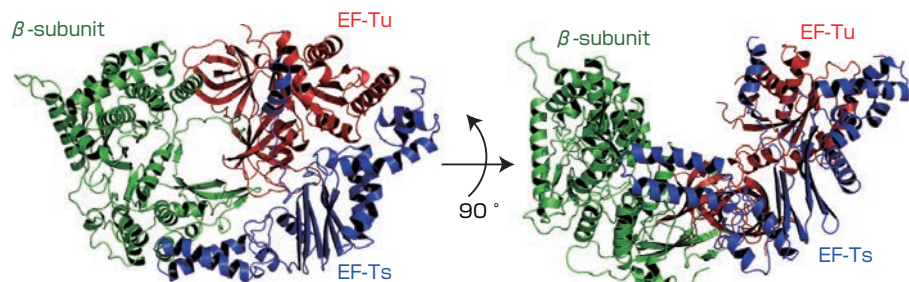


Elucidation of complex structure of viral RNA polymerase with host-proteins

Expectations for a new anti-RNA virus drug development

RNA viruses rely on the host-donated factors for replication and transcription of their genomic RNAs. In some RNA viruses, the virus-encoded RNA-dependent RNA polymerase (RdRp) forms a complex with host-donated translational factors. The formation of a complex between the virus-encoded RdRps and the host-donated translational factors is required for RNA replication and transcription of viral genomic RNAs in the host cells. We have determined the complex structure of Q β virus RdRp and host-donated translational elongation factors. This is the first complex structure of virus RdRp and host-donated proteins. The structure has clarified detailed mechanisms for assembly of an active complex of Q β virus RdRp with host-donated translational factors, and suggested new functions of host translational factors beyond their established functions in the cell.



Structure of core Q β replicase. Virus RdRp (β -subunit, green) and host-donated translational elongation factors EF-Tu (red) and EF-Ts (blue)

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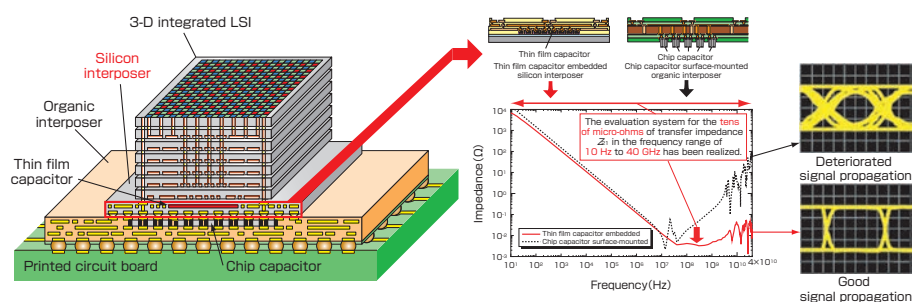
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Ultrawideband ultralow impedance evaluation technology for power distribution network

Design and measurement technology of power distribution network for very low power consumption driving electronic circuits

We have developed an impedance analyzer system with a wide frequency range for evaluating ultralow impedance. The system can evaluate tens of micro-ohms of transfer impedance Z_{21} in the frequency range of 10 Hz to 40 GHz.

To realize the future very low-power-consumption driving electronic circuit, power supply voltage is required to be lowered. Rapid current change causes instantaneous power supply voltage lowering when high-speed and simultaneous switching of a large number of transistors occurs. This is the high-frequency power supply noise in power distribution network (PDN). It is required to reduce the power supply noise up to a high-frequency range by introducing the decoupling capacitors embedded interposers that show low PDN impedance. By developing the ultrawideband ultralow impedance evaluation system, it is expected that the accurate and wideband PDN impedance evaluation of the very low-power-consumption driving electronic circuit can be realized.



3-D LSI integrated system and relationship between power distribution network impedance of decoupling capacitor embedded interposer and high-speed signal propagation characteristics

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