Supply Record
Mobility Solutions

JR Central: N700S Shinkansen (planned)
-24 cars, 600 km/h, 267 km/h
Total number of modules/1 rabbits: 32 modules
Rated Power: 310 kW
Rated Capacity: 310 kAh
Total Capacity: 27,150 kWh
Type of rail: 2,500mm
Effective length: 2,000 m per supply

Tokyo Metro: 1000 Series
-4 car, 84 km/h
Total number of modules/1 rabbits: 24 modules
Rated Power: 350 kW
Rated Capacity: 350 kAh
Total Capacity: 28,800 kWh
Type of rail: 2,500mm
Effective length: 2,000 m per supply

DB Cargo HELMS BR244 (2 prototypes)
-8 car, 100 km/h
Total number of modules/1 rabbits: 48 modules
Rated Power: 370 kW
Rated Capacity: 370 kAh
Total Capacity: 28,560 kWh
Type of rail: 1,435mm
Effective length: 2,000 m per supply

JR West: TWILIGHT EXPRESS Mizukaze
-6 car, 140 km/h
Total number of modules/1 rabbits: 40 modules
Rated Power: 410 kW
Rated Capacity: 410 kAh
Total Capacity: 28,800 kWh
Type of rail: 1,435mm
Effective length: 2,000 m per supply

Power Supply Solutions

Tokyo Metro - Ayase Substation
-120 kVdc, 1,060 kVA
Rated Power: 1,060 kW
Rated Capacity: 1,060 MVar
Purpose: Emergency Power Supply

Tokyo Railway - Omiya-Awaichō Battery Post
-100 kVdc, 1,060 kVA
Rated Power: 1,060 kW
Rated Capacity: 1,060 MVar
Purpose: Energy Saving

Okinawa Urban Monorail - Sueyoshi Substation
-120 kVdc, 120 kVA
Rated Power: 120 kW
Rated Capacity: 120 MVar
Purpose: Energy Saving

Hiroshima Electric Railway - Chuo Substation
-120 kVdc, 1,060 kVA
Rated Power: 1,060 kW
Rated Capacity: 1,060 MVar
Purpose: Energy Saving & Peak Cut

Ratings and Specifications

Battery Module
Type: Toshiba SCiB™ Module
-40 Ah
-25 Vdc
-Total voltage: 750 Vdc
-Total capacity: 800 kAh
-Weight: Approx. 24 kg

SSU: Safety Supervisor Unit
-Input voltage: 12 Vdc
-Communication Interface: 1/0
-Dimensions: Width = 430mm, Height = 210mm

BMU: Battery Management Unit
-Input voltage: 12 Vdc
-Communication Interface: CAN 2.0 A & CANopen
-Dimensions: Width = 430mm, Height = 210mm

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Railway Systems Division: TEL: +81-44-725-1211

TOSHIBA
Mobility Solutions × SCiB™
Power Supply Solutions

TESS
Traction Energy Storage System
Innovative Railway Systems Powered by SCiB™

Toshiba combines its expertise in railway systems with its innovative SCiB™ battery technology, in designing next generation products to promote a more safe, reliable, sustainable and environment-friendly railway system.

SCiB™ is suitable for Railway Applications

### Safety

Battery systems consisting of Toshiba’s SCiB™ and ESS components fulfill the qualitative and quantitative safety requirements according to the IEC 61850 and IEC 61557 standards. This unique SCiB™ excellent safety characteristics include use of non-flammable and non-toxic electrolyte.

### Long Life

Type test confirmed that SCiB™ cells have minimal capacity degradation even after more than 30,000 cycles at a nominal charge/discharge rate. Long life characteristics are ideal for railway applications that require long-term reliability and cost-effective maintenance throughout the specific service life.

### High Input & Output

SCiB™ has high input and output characteristics making it suitable for railway applications which demand high power to support various customer benefits such as hybrid rolling stocks, as well as battery power for alternative power supply sources.

### Mobility Solutions

**Traction Battery with SCiB™**

Innovation SCiB™ battery technology is coupled with regular traction systems for railways. A wide range of onboard applications are possible, such as - Emergency running, Catenary-free, Hybrid DMU/DMU, TESS, SCiB™ Locomotive.

### Key Benefits

**Environment-friendly**
- Reduction of CO₂ emissions and noise (one of the most renewable energy and silent operation function).

**Catenary-free Operation**
- Seamless operation with or without catenary.

**Emergency Power Supply**
- Able to run train with onboard auxiliary power, reduce power back-up.

**Flexible Solutions**
- Applicable not only to new system but also to retrofit for trains/locos/equipment with engine.

### System Line-up

<table>
<thead>
<tr>
<th>Hybrid DMU/DMU Train</th>
<th>New or converted/identified tracks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traction Assistance</strong></td>
<td><strong>Deceleration Regeneration</strong></td>
</tr>
<tr>
<td><strong>Craving/Charge at standstill</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hybrid Locomotive</th>
</tr>
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</tr>
</tbody>
</table>

### Emergency Power Supply

- Power train to evacuate passengers to safety location.

### Ratings and Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Rating/Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Power</td>
<td>540 kW / 485 kW</td>
</tr>
<tr>
<td>Rated Capacity</td>
<td>345 kWh / 373 kWh</td>
</tr>
<tr>
<td>Rated line voltage</td>
<td>699 VDC / 750 VDC / 822 VDC / 1150 VDC</td>
</tr>
</tbody>
</table>

### Power Supply Solutions

**Traction Energy Storage System with SCiB™**

Traction Energy Storage System (TESS) efficiently stores and regenerates regenerative energy into the SCiB™ and discharges it to another accelerating train to achieve optimum customer benefits.

### Key Benefits

**Energy Saving**
- Efficient use of energy to prevent waste and promote power demand peak cut.

**Line Voltage Stabilization**
- magnesium trajectory power quality through voltage stabilization.

**Emergency Power Supply**
- Able to provide power to train with a section in safety to enable passengers to reach station.

**Better Regenerative Braking Operation**
- Electric energy can be absorbed thus preventing regenerative braking failure.