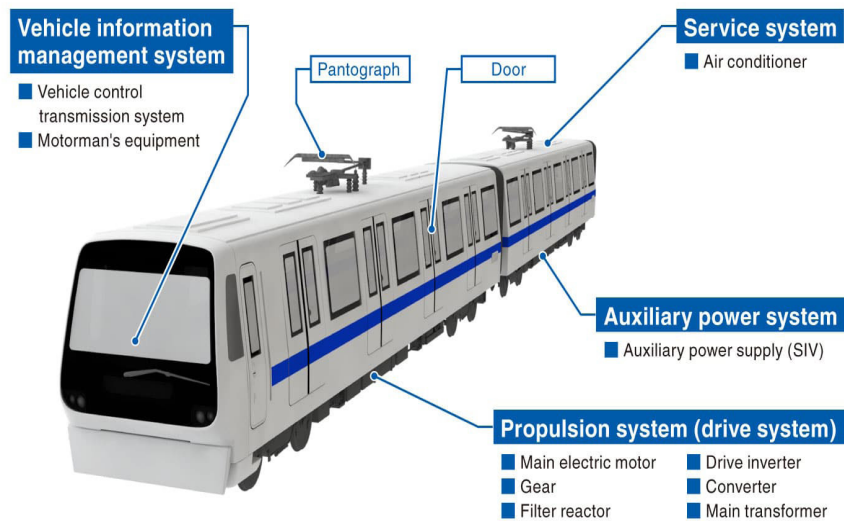


Reach the PINNACLE of Performance and Reliability

Transit

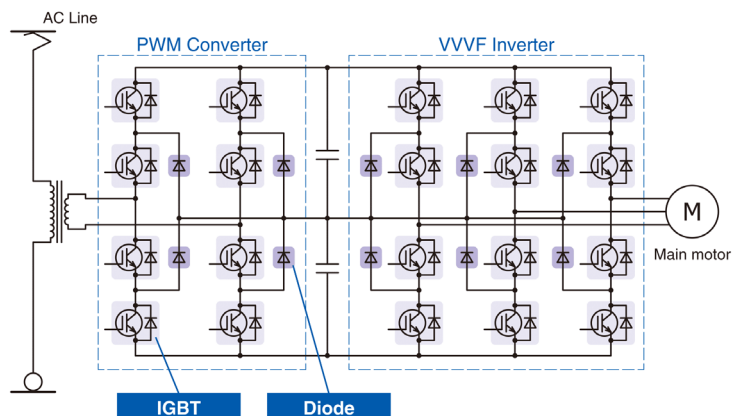
Rolling stock use many different types of power electronic equipment such as main motor drives, auxiliary power supply units, air conditioning equipment and door operating devices. This page provides information on Fuji Electric power semiconductor products that are ideal for the power electronics of railroad cars.



Main Converter Circuit

These are examples of the main motor drive circuit configuration. The voltage may be either AC or DC. For AC, after passing through the transformer, the power is converted to DC by the PWM converter and then the main motor is driven by the VVVF inverter.

Example of Main Converter for AC Powered Trains

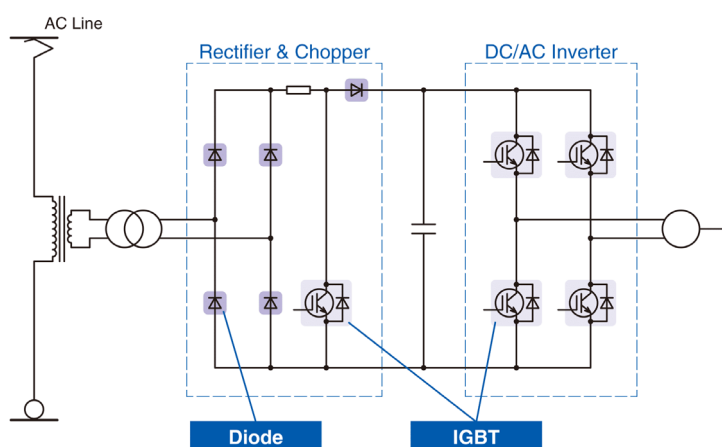


Example of Feeding Voltage

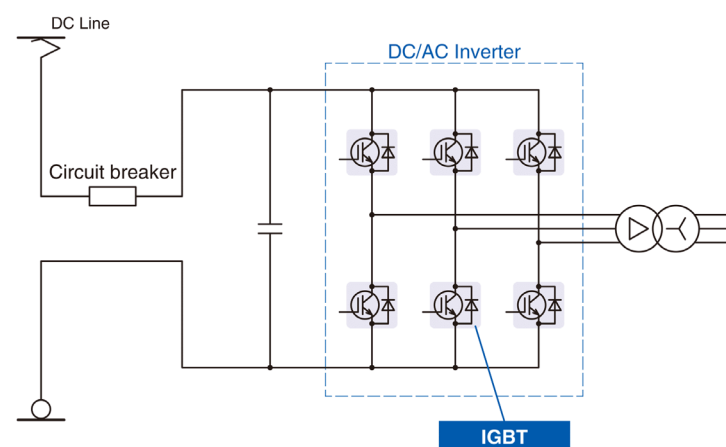
Segment	City Railroads	Intercity Railroads	
Area	Subway & LRV	Electric Trains	High-speed Vehicles
Europe	DC600V/DC750V/DC825V/DC1500V	DC1500V/DC3000V/AC15kV/AC25kV	AC25kV
Western Europe	DC600V/DC750V/DC1500V	DC1500V/DC3000V/AC15kV/AC25kV	AC15kV/AC25kV
Eastern Europe	DC600V/DC750V	DC1500V/DC3000V/AC25kV	-
CIS	DC600V/DC750V/DC825V	DC1500V/DC3000V/AC25kV	AC25kV
North America	DC600V/DC750V	AC25kV	-
Central and South America	DC600V/DC750V/DC1500V/DC3000V	DC3000V	-
Asia & Pacific Region	DC600V/DC750V/DC1500V	DC1500V/AC20kV/AC25kV	AC25kV
Middle East & Africa	DC750V/DC1500V	DC3000V/AC25kV	-
Global	DC750V/DC1500V	DC1500V/AC25kV	AC25kV

Auxiliary Power Supply Circuit

Example of Auxiliary Power Supply for AC Powered Trains



Example of Auxiliary Power Supply for DC Powered Trains

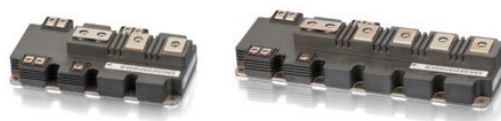


Segment	City Railroads		Intercity Railroads	
Specifications	Subway & LRV	Subway	Electric Trains	High-Speed Vehicles
Specifications	Asia specifications (China, Southeast Asia)	North America specifications (NYCT)	Asia specifications (Australia and Japan)	Global specifications
Input Voltage	DC750V	DC600V	DC1500V	AC440V (Main transformer tertiary)
Output Voltage	AC440V, 3φ, 60Hz	AC120V, 1φ, 60Hz × 15kVA	AC440V, 3φ, 60Hz	AC440V, 3φ, 60Hz
Capacity	90kVA/160kVA	40kVA	180kVA/260kVA	180kVA/210kVA
Cooling System	Self-cooling	Forced air cooling	Self-cooling	Forced air cooling
Efficiency	95% or higher	95% or higher	95% or higher	95% or higher
Noise	62dB(A)	70dB(A)	62dB(A)	68dB(A)
Miniaturization	≥ 80 kVA/m ³	≥ 100 kVA/m ³	≥ 120 kVA/m ³	≥ 120 kVA/m ³

Fuji Electric Power Semiconductor Products

PrimePACK™

$V_{CES} = 1200V$



2-pack	V Series	X Series
600A	2MBI600VXA-120E-50 2MBI600VXA-120E-54	-
900A	2MBI900VXA-120E-50 2MBI900VXA-120E-54 2MBI900VXA-120P-50 2MBI900VXA-120P-54	2MBI900XXA120P-50
1200A	-	2MBI1200XXE120P-50
1400A	2MBI1400VXB-120E-50 2MBI1400VXB-120E-54 2MBI1400VXB-120P-50 2MBI1400VXB-120P-54	2MBI1400XXB120P-50
1800A	-	2MBI1800XXF120P-50
2400A	-	2MBI2400XRXG120-50

$V_{CES} = 1700V$

2-pack	V Series	X Series
650A	2MBI650VXA-170E-50 2MBI650VXA-170E-54 2MBI650VXA-170EA-50 2MBI650VXA-170EA-54	2MBI650XXA170-50
1000A	2MBI1000VXB-170E-50 2MBI1000VXB-170E-54 2MBI1000VXB-170EA-50 2MBI1000VXB-170EA-54	2MBI1000XXB170-50
1200A	-	2MBI1200XXE170-50
1400A	2MBI1400VXB-170E-50 2MBI1400VXB-170E-54 2MBI1400VXB-170P-50 2MBI1400VXB-170P-54	2MBI1400XXB170-50
1800A	-	2MBI1800XXF170-50 2MBI1800XXG170-50

IGBT 1-pack

1-pack	1200V		1700V
	Aluminium Oxide DCB	Aluminium Nitride DCB	Aluminium Oxide DCB
300A	-	-	1MBI300V-170-50
400A	1MBI400V-120-50	1MBI400VF-120-50	1MBI400V-170-50
600A	1MBI600V-120-50	1MBI600VF-120-50	1MBI600V-170-50
900A	1MBI900V-120-50	-	-

IGBT 2-pack

Standard 2in1 $V_{CES} = 1200V$

2-pack	V Series	X Series
75A	2MBI75VA-120-50	-
100A	2MBI100VA-120-50	2MBI100XAA120-50
150A	2MBI150VA-120-50 2MBI150VB-120-50	2MBI150XAA120-50
200A	2MBI200VB-120-50 2MBI200VH-120-50	2MBI200XAA120-50 2MBI200XBE120-50
300A	2MBI300VD-120-50 2MBI300VH-120-50 2MBI300VE-120-50	2MBI300XBE120-50 2MBI300XHA120-50
400A	2MBI400VD-120-50	2MBI400XDE120-50
450A	2MBI450VH-120-50 2MBI450VE-120-50	2MBI450XHA120-50 2MBI450XEE120-50
600A	2MBI600VE-120-50	2MBI600XEE120-50

Standard 2in1 $V_{CES} = 1700V$

2-pack	V Series	X Series
75A	2MBI75VA-170-50	2MBI75XAA170-50
100A	2MBI100VA-170-50	2MBI100XAA170-50
150A	2MBI150VH-170-50	2MBI150XAA170-50 2MBI150XHA170-50
200A	2MBI200VH-170-50	2MBI200XHA170-50
300A	2MBI300VH-170-50 2MBI300VE-170-50	2MBI300XHA170-50 2MBI300XEE170-50
400A	2MBI400VE-170-50	2MBI400XHA170-50 2MBI400XEE170-50

Dual XT $V_{CES} = 1200V$

2-pack	V Series	V Series with SiN-Substrate	X Series
225A	2MBI225VN-120-50 2MBI225VX-120-50	2MBI225VN-120S-50	2MBI225XNA120-50 2MBI225XNB120-50
300A	2MBI300VN-120-50 2MBI300VX-120-50	2MBI300VN-120S-50	2MBI300XNA120-50 2MBI300XNB120-50
450A	2MBI450VN-120-50 2MBI450VX-120-50	2MBI450VN-120S-50	2MBI450XNA120-50 2MBI450XNB120-50
600A	-	2MBI600VN-120-50 2MBI600VX-120-50	2MBI600XNG120-50 2MBI600XNE120-50 2MBI600XNH120-50 2MBI600XNF120-50
800A	-	-	2MBI800XNE120-50 2MBI800XNF120-50
1000A	-	-	2MBI1000XRNE120-50 2MBI1000XRNF120-50

Dual XT $V_{CES} = 1700V$

2-pack	V Series	V Series with SiN-Substrate	X Series
225A	2MBI225VX-170-50	-	2MBI225XNA170-50 2MBI225XNB170-50
300A	2MBI300VN-170-50 2MBI300VX-170-50	-	2MBI300XNA170-50 2MBI300XNB170-50
450A	2MBI450VN-170-50 2MBI450VX-170-50	-	2MBI450XNA170-50 2MBI450XNB170-50
550A	-	2MBI550VN-170-50 2MBI550VX-170-50	-
600A	-	-	2MBI600XNG170-50 2MBI600XNE170-50 2MBI600XNH170-50 2MBI600XNF170-50

HPnC

2-pack	1700V	3300V
450A	-	2MBI450XVF330-50 2MBI450XYF330-50
1000A	2MBI1000XVF170-50 2MBI1000XYF170-50	-
1200A	2MBI1200XVF170-50 2MBI1200XYF170-50	-

Chopper

High Speed IGBT Modules

Chopper $V_{CES} = 1200V$

	V Series
50A	-
75A	-
100A	-
150A	1MBI150VA-120L-50
200A	1MBI200VA-120L-50