

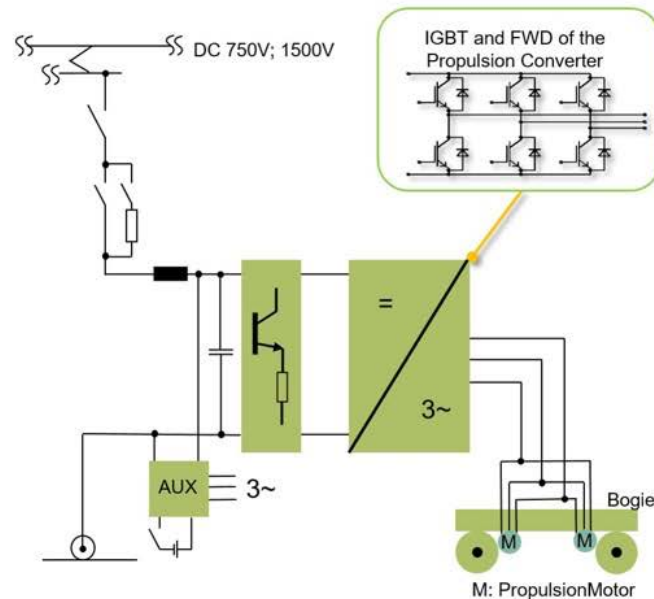
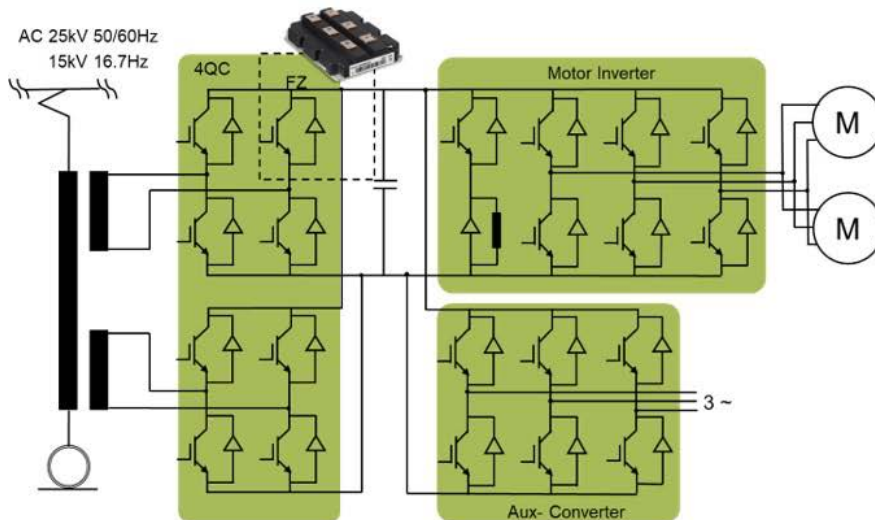
Benefits of high-density IHV modules in traction



인피니언 전력반도체 솔루션
가상부스에 오신 걸 환영합니다!



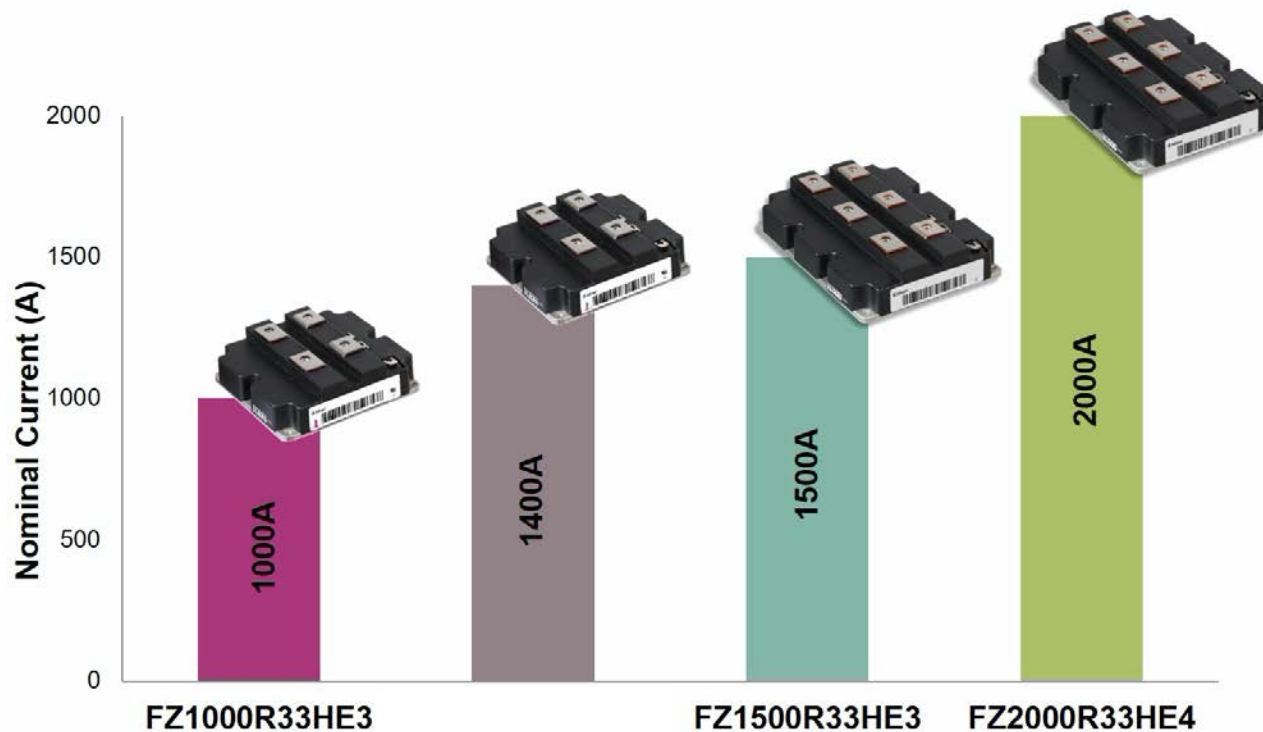
Typical topologies in traction applications



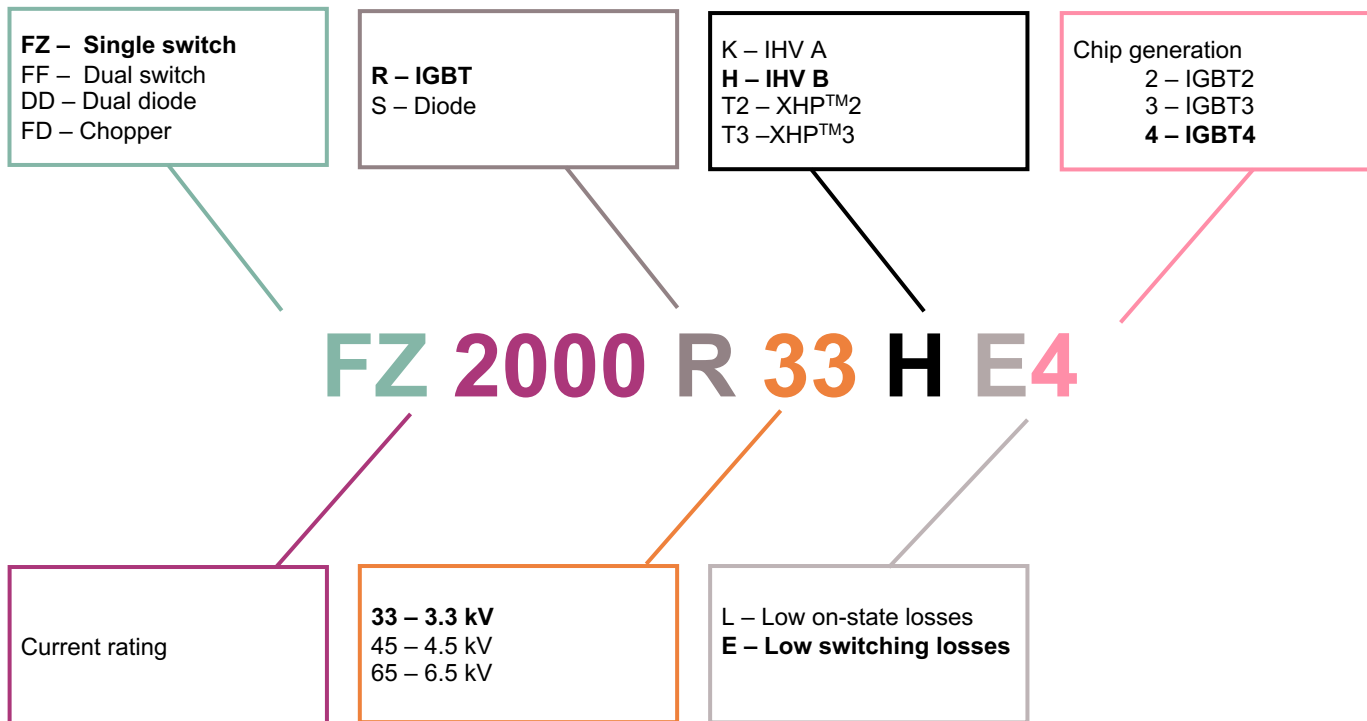
Key requirements of traction applications

- › High power density (A/cm²) @ reduced system cost
- › High reliability and proven track record
- › Enhanced lifetime

Portfolio extension to include 3.3 kV IHV package



Introducing the new



FZ2000R33HE4: What's new?

IGBT4 EC4

New 3.3 kV chip generation in 8" wafer technology with enhanced edge termination

Optimized substrate layout

Symmetrical substrate layout with increased chip area and redesigned control signal metallization

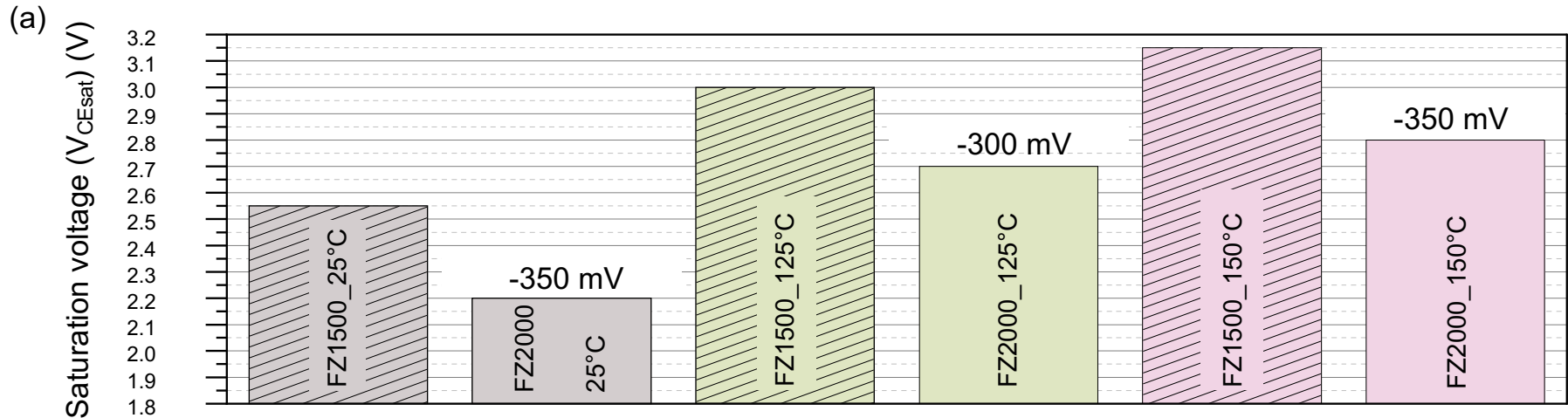
Improved PC

Power cycling is improved by a factor of 2 in comparison with IGBT3 PC curve

IGBT4 chip offers lower saturation voltage (V_{CEsat}) in comparison with IGBT3 (E3)

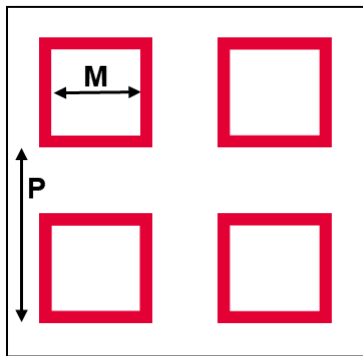
IGBT4 EC4

New 3.3 kV chip generation in 8" wafer technology with enhanced edge termination

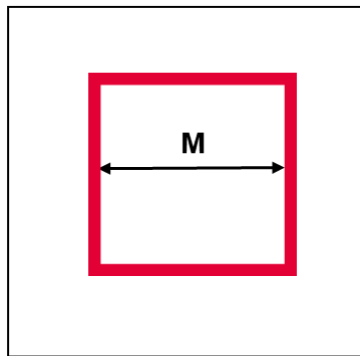


IGBT4 chip reduces saturation voltage (V_{CEsat}) by 300~350 mV

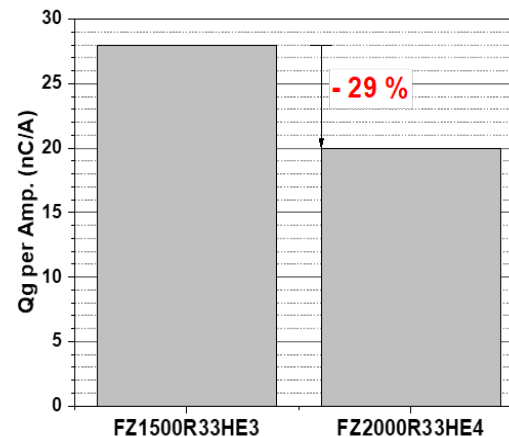
How high is the gate charge?



a) IGBT3 Cell Design



b) IGBT4 Cell Design



New IGBT cell structure provides 29% lower gate charge (Q_g) per ampere

FZ2000R33HE4 has a Q_g of 40 μC – which is 2 μC < FZ1500R33HE3

Only a minor adaptation to the gate driver electronics is required

Path towards high power density & lower system cost

FZ1500R33HE3



New

FZ2000R33HE4



New

- › 1500 A installed IGBT current
- › Blocking voltage: 3.3 kV
- › 190x140 → 266 cm²
- › Power density: 5.64 A/cm²

- › 2000 A installed IGBT current
- › Blocking voltage: 3.3 kV
- › 190x140 → 266 cm²
- › Power density: 7.52 A/cm²

Path towards high power density & lower system cost

FZ1500R33HE3



New

FZ2000R33HE4



FZ2000R33HE4 offerings

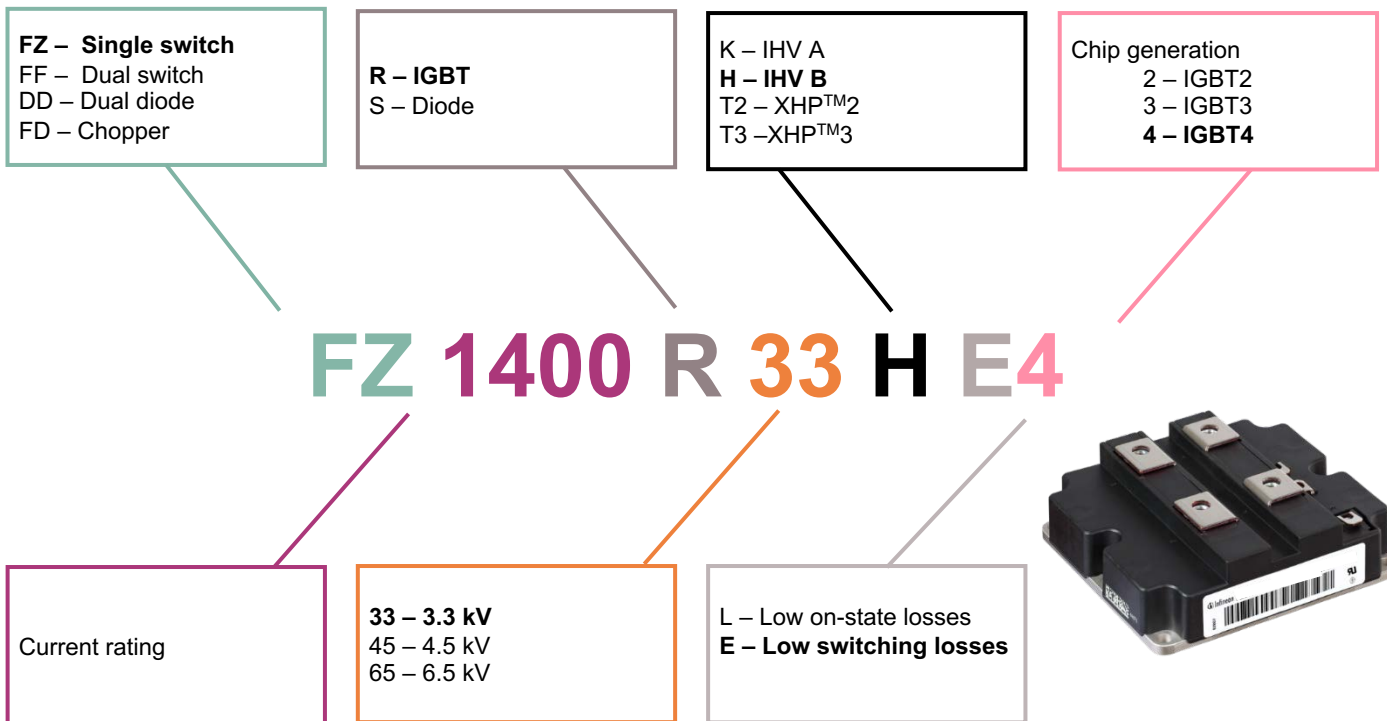
~33%

Higher power density

~35-45%

Higher RMS current

Introducing...



FZ1400R33HE4

Path to high power density

FZ1500R33HE3



New

FZ1400R33HE4



- › 1500 A installed IGBT current
- › Blocking voltage: 3.3 kV
- › 190x140 → 266 cm²
- › Power density: 5.64 A/cm²

New

- › 1400 A installed IGBT current
- › Blocking voltage: 3.3 kV
- › 130x140 → 182 cm²
- › Power density: 7.69 A/cm²

Product path to higher capacity

Less capacity needed for same performance

FZ1500R33HE3



New

FZ1400R33HE4



FZ1400R33HE4 offerings

~33%

Lower weight

~30%

Lower footprint

~36%

Higher power density

~12-15%

Higher RMS current
with dual power cycling



Part of your life. Part of tomorrow.