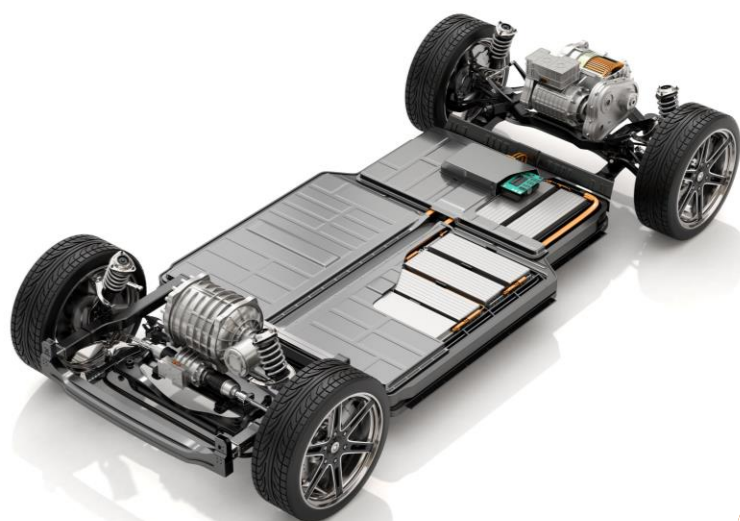


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系统方案指南——预览

## 牵引逆变器



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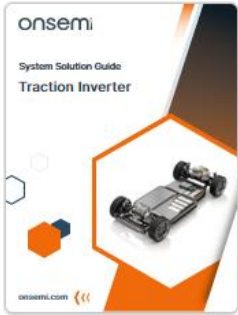


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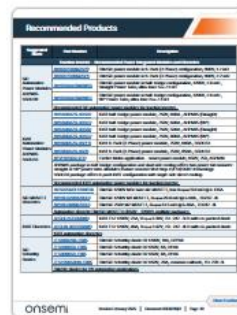
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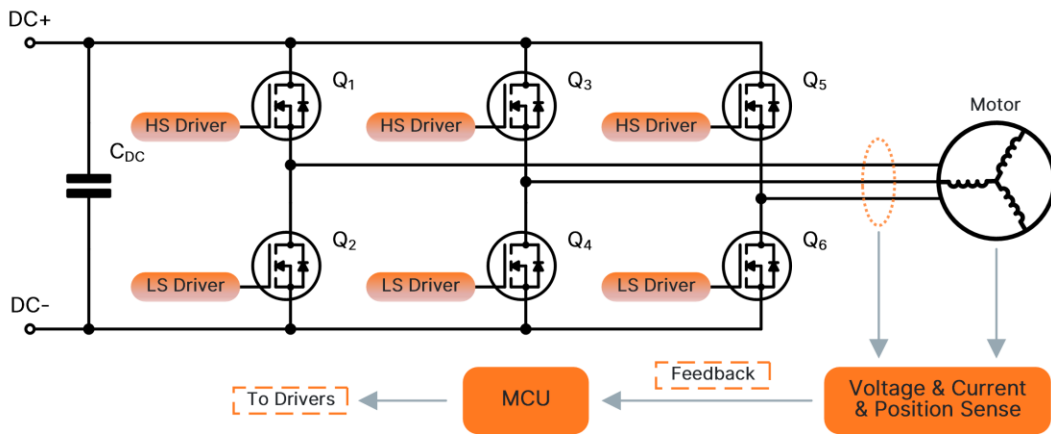
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## 牵引逆变器——功率级

在下面示例的电路图中，MOSFET 是逆变器中最关键的元件，因为它们控制流向电机的电流以产生运动。逆变器的三个桥臂将直流电池电压转换为三相交流电压和电流，以驱动电机。该功率级通过检测运行时的温度、电压和电流来进行监控和保护。MCU 输出的控制信号通过带有电气隔离的栅极驱动器以 PWM 信号的形式传输到功率级。牵引逆变器和电动汽车电机的高效运行，是良好的 MCU 控制、快速的信号反馈与精确的感知相结合的结果。在能量回收制动过程中，MCU 控制会发生变化，此时相同的功率级将能量从电机（作为发电机运行）传输回直流电池。

安森美 (onsemi) 提供三种使用 EliteSiC™ 器件构建高性能功率级的方法：

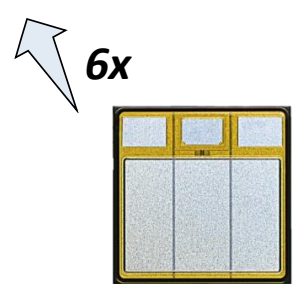
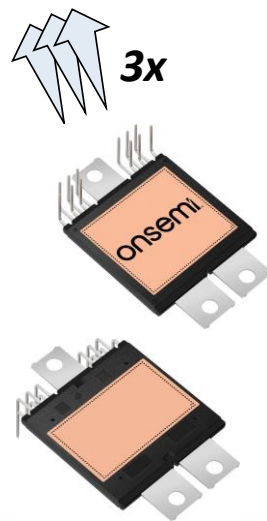
- 使用带有针鳍散热器的[单个6-pack架构模块](#) (SSDC39)，实现最高集成度的解决方案。
- 使用 [3个半桥模块](#) (AHPM15)，在保持性能的同时提供更高的设计灵活性。
- 使用 [6个无封装裸芯形式的 M3e MOSFET](#)，打造您自定义的模块设计。



图：VE-Trac 模块

左图：采用6-pack架构的 SSDC39 EliteSiC 模块 (直接冷却)

右图：采用半桥配置的 AHPM15 EliteSiC 模块



图：可应用于任何自定义模块设计的 EliteSiC M3e MOSFET 裸芯形式

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## 用于牵引逆变器的VE-Trac™ SiC模块

碳化硅 (SiC) 技术通过提升牵引逆变器的效率和性能，正在引领纯电动汽车的革新。SiC 提供卓越的效率和峰值功率，尤其是在更高电压下，这使其成为对续航里程和性能至关重要的电动车的理想选择。SSDC39 6-pack功率模块系列采用行业标准封装，提供更好的性能、更好的效率和更高的功率密度。[NVXR17S90M2SPB](#)模块集成了900V 1.7mΩ的SiC MOSFET，采用6-pack配置的SSDC39封装。

为了便于装配并提高可靠性，新一代的Press-Fit引脚集成到功率模块的信号终端上。为实现直接冷却，采用凝胶填充封装技术，并在底板上集成优化的针鳍散热器。该模块设计符合 AQG324 车规级标准。

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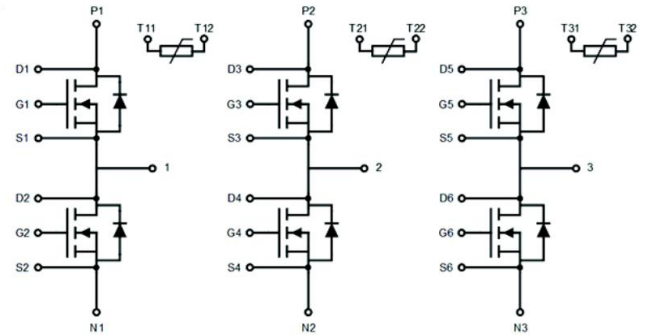


图: SSDC39 功率模块内部的 6-pack MOSFET 配置

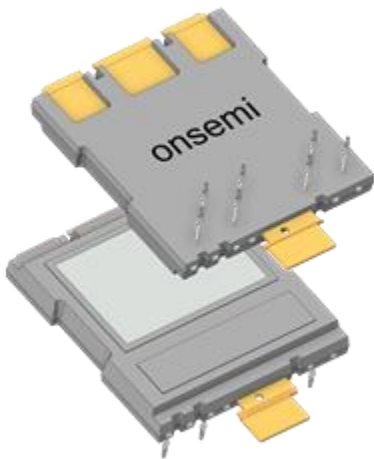
## 新一代 EliteSiC™ 1200 V M3e MOSFET 技术

安森美高性能的第三代 1200 V SiC MOSFET —— [NCS025M3E120NF06X](#)，采用无封装的 5x5 mm 裸芯形式，可灵活应用于任何自定义模块设计中。基于安森美新一代 SiC MOSFET 技术，M3e 系列具有同类产品中最低的导通电阻，典型值为 11.0 mΩ (测试条件:  $V_{GS} = 18 V$ ,  $I_D = 135 A$ ,  $T_J = 25 ^\circ C$ )，使其成为汽车牵引逆变器应用的理想选择。



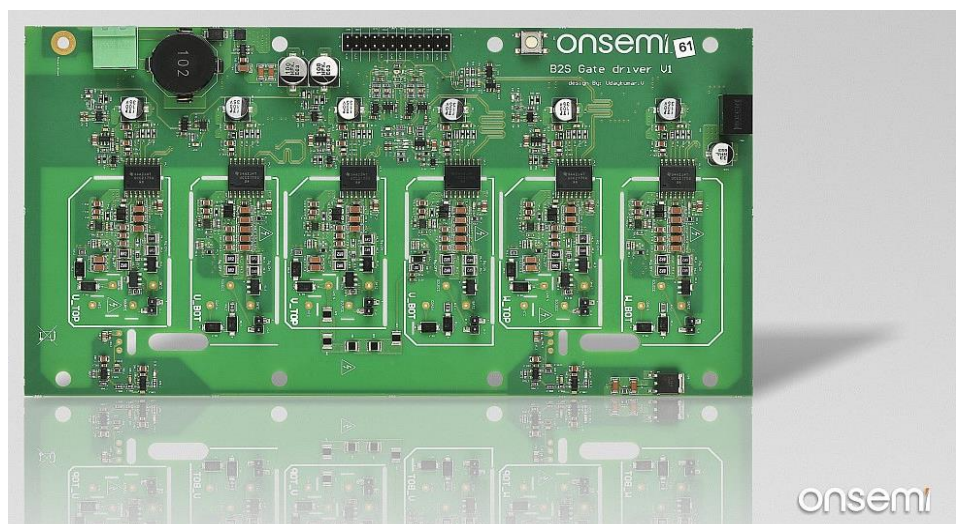
用于牵引逆变器应用的新型 B2S 和 B6S 功率模块工程样品，基于全新的 1200 V SiC M3e 技术。B2S 模块采用可烧结的半桥结构，而 B6S 则是更大尺寸、集成散热器的6-pack模块。如需获取这些模块的首批工程样品，请联系安森美销售团队。

M3e MOSFET 代表了平面技术的最终发展方向，其晶胞间距相比 M1 系列缩小了超过 60%。



上图: B2S 可烧结半桥模块, 尺寸为 58 x 64 x 8.6 mm

右图: 配备安森美最新隔离型栅极驱动器的 B2S 驱动板



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