

电驱研发解决方案

Motor Development Solutions

Inverter x Motor Emulator / Motor Evaluation

Motor

Inverter

Si/SiC/GaN

For Motor & Inverter DV/PV , Power Device EOL & Qualification

30,000 rpm

再现各种高速马达驱动器
最适合逆变算法的研发

Realize all kinds of
high-speed motor drives
for inverter algorithm
development

200~400kw

通过更换功率模块、驱动器
以及动力控制单元，可实现
从200kW起的功率输出

Scalable output from
200kW by replacing
power modules, drivers,
and PCUs

250 kHz

FPGA的高速高精度运算
完美再现电机方程。

Perfectly reproduced motor
FPGA enables high-speed,
high-precision processing



任何尺寸或用途，从电机到车辆均可广泛进行验证。
Comprehensive testing capabilities for everything
from small motors to large vehicles



FOC x Motor Equations

INV & Motor Applications

☆ Inverter x Motor Emulator



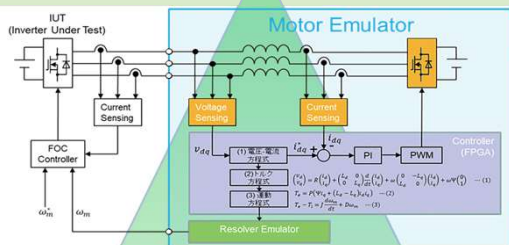
☆ Reference Inverter



Motor
Evaluation

Inverter
Evaluation

Power Module
Evaluation

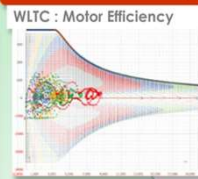
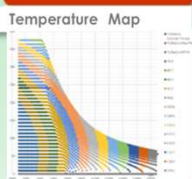
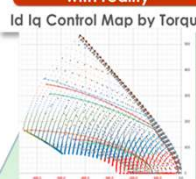


E-Transport Simulator Results

Consistency of theory
with reality

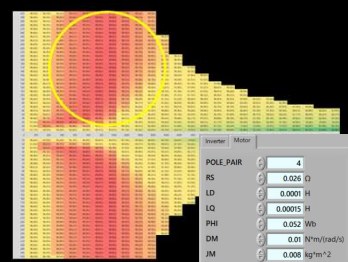
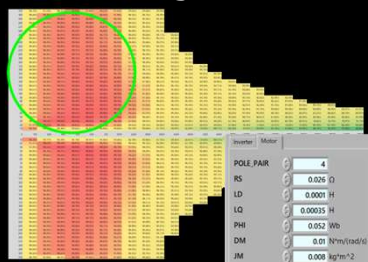
Temperature Map

WLTC : Motor Efficiency



<设计验证、效率优化>

Design Verification & Efficiency Optimization
通过改变参数，可以清晰地确认特性的差异。
Parameter changes reveal distinct performance differences



[Motor Parameter]

Original Motor

Ld 0.00010H
Lq 0.00035H



Revised to SPM

→ Ld 0.00010H
→ Lq 0.00015H

基本规格 Basic Specifications

Main circuit specifications

ITEM	Specification values
DC Voltage	700~800V
DC Current	~292A
AC Current	~300Arms
AC Power	~200kVA
switching frequency	~40kHz (100kHz)

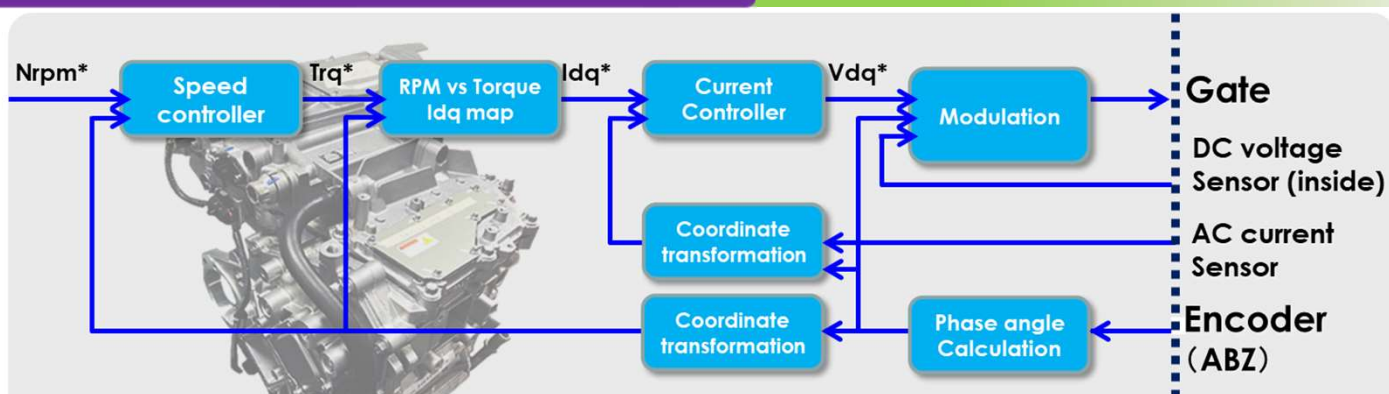
Control Board Specifications

ITEM	Specification values
CPU	TMS320F28377S
FPGA	XC6SLX45

Interface Board Specifications

ITEM	Specification values
Gate Driver	6 leg Optical signal
Analog Digital Converter	Voltage detection 800VF.S., 4ch Current detection Current output type CT, 4ch
Isolation DO	•Mechanical relay for MC drive, 3ch •Photocoupler output for indicator light, 24V, 3ch •Open collector 24V for FAN, 1ch
Isolation DI	•Photocoupler input for MC answer, 24V, 3ch •TTL input for encoder, 5V, 6ch •Photocoupler input for switches, 24V, 2ch
Communication Method	CAN 2ch, RS-485 1ch

电机控制功能图 Motor Control Function Chart



电机性能评估连接示例 Connection example for motor performance evaluation

◆Open loop control:

根据最大调制比和基频指令值控制逆变器。
Controls the inverter according to the command values of maximum modulation ratio and fundamental frequency.

◆Current control:

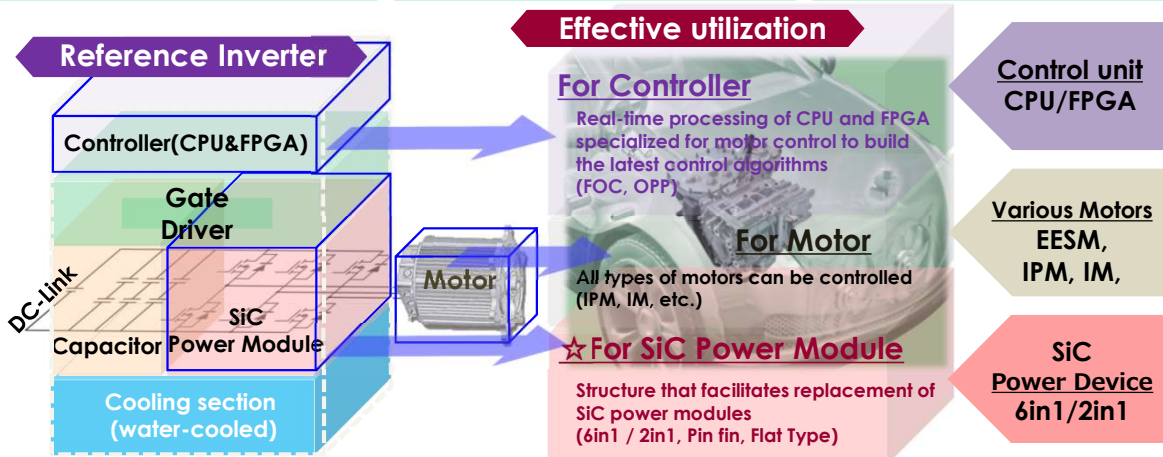
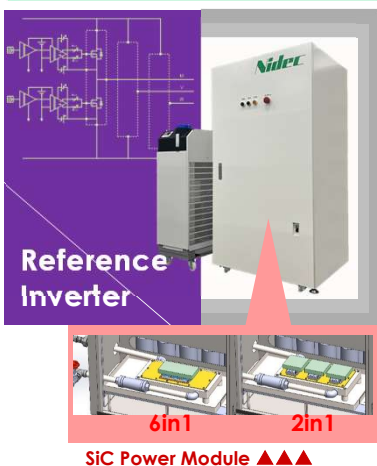
根据 Idq 指令值控制交流电流。根据连接电机调整PI控制器的增益和时间常数。
Controls AC current according to the Idq command value. The gain and time constant of the PI controller must be adjusted according to the motor to be connected.

◆Torque control:

根据扭矩指令值和转速，从 Idq 映射表中计算当前指令值。该 Idq 映射表可通过CAN通信进行设置。
Calculates the current command value from the Idq map based on the torque command value and rotation speed. The Idq map can be set via CAN communication.

◆Speed control:

根据速度指令值控制电机转速。需调整PI控制器的增益与时间常数以匹配电机特性。
Controls the motor speed according to the speed command value. The gain and time constant of the PI controller must be adjusted to match the motor.



可互换的功率模块与控制器及电机平台！

Interchangeable platform for power modules and controllers as well as motors!