

## Versatile Design Platform for Motor Control System Development

The DesignCore™ Motor Control Reference Design speeds development of motor control systems for performance-critical applications.

We start with this flexible reference design to quickly create custom motor control systems optimized for your application. We create production-ready DVTs (design verification test units) using our proven calculation sheets, Matlab® and Simulink® models, template schematics, and a rich library of software modules for various communications interfaces and commutation schemes.

We have developed dozens of custom motor control systems. We work with customers to bring them to production in automotive, commercial, medical, industrial, and military applications.

D3's embedded system design services and proven DesignCore™ platforms give you the best of design flexibility, speed of development, and cost-effectiveness of your final product.

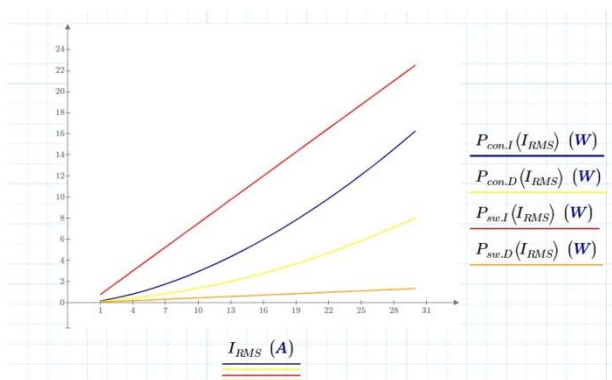


Figure 2 - Individual IGBT/FWD Power Losses vs. RMS current

$$P_{sw.I}(15 A) = 11.259 W \quad P_{con.I}(15 A) = 5.414 W \quad P_{T,loss}(15 A) = 16.673 W$$

$$P_{sw.D}(15 A) = 0.661 W \quad P_{con.D}(15 A) = 2.498 W \quad P_{D,loss}(15 A) = 3.16 W$$

Development tools including our proven calculation sheets support fast, effective system development.

Proven for rapid development of production control systems for PMSM, BLDC, AC induction, DC, and stepper motors

### MOTOR TYPES

Permanent Magnet Synchronous Motor (PMSM)

Brushless Direct (BLDC) Motor

AC Induction Motor

Stepper Motor

DC Motor

### FEATURES

Microcontrollers from Texas Instruments, Infineon, Microchip, and NXP

Low voltage (to 48V) or high voltage (to 1200V typical)

Sensored or sensorless

TI InstaSPIN compatible

Enables rapid development of DVT

Proven in production systems

### APPLICATIONS

This design is used in production systems for:

Non-automotive electric vehicles

Automotive motors

Medical life support systems

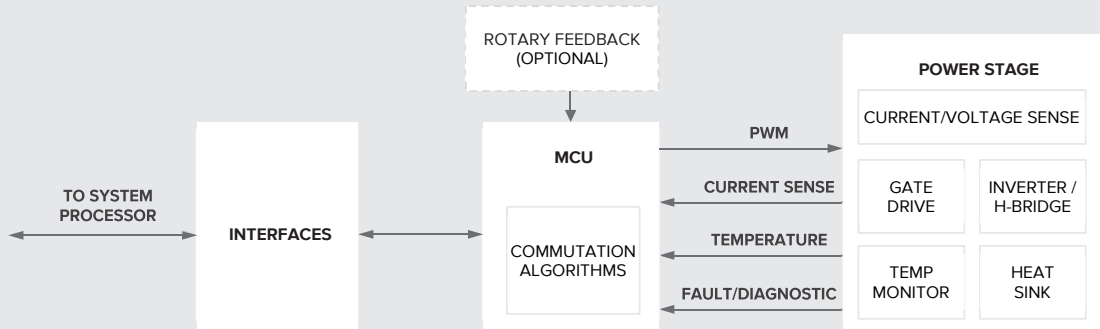
Laboratory robots

HVAC systems

Military and security systems

Many more

DESIGNCORE MOTOR CONTROL REFERENCE DESIGN



FEATURE	DESCRIPTION
Three-Phase Motor Control	Position Control Velocity Control Torque (Current) Control
Processor	Texas Instruments C2000 Texas Instruments TMS570/RM4 Infineon XMC Infineon AURIX NXP Kinetis Microchip dsPIC
Commutation	PMSM (Permanent Magnet Synchronous Motor) - FOC Commutation Sensored: Incremental Encoder, Absolute Encoder, Resolver Sensorless: TI InstaSPIN-FOC FAST (C2000 only), Sliding Mode Observer BLDC (Brushless DC) - Trapezoidal Commutation Sensored: Hall Effect Sensor Sensorless: TI InstaSPIN-BLDC (C2000 only) AC Induction Motor Open Loop: Volt/Hz Sensored (FOC) Sensorless: TI InstaSPIN-FOC FAST (C2000 only) Stepper Motor Microstepping FOC DC Motor BEMF Estimation
Control	Classical PID InstaSPIN-MOTION (C2000 only)
Inverter	Low Voltage: Up to 48V High Voltage: Up to 1200V typical. Higher voltage possible.
Interfaces	CAN LIN Industrial Ethernet RS-232 RS-485 I2C SPI Bluetooth USB Digital I/O Analog I/O

ACCELERATE TIME TO MARKET

D3 Engineering leverages our industry-proven DesignCore™ Platforms to meet your product goals, while minimizing technical and schedule risk for your development program. The DesignCore™ foundation allows you to easily integrate your IP and get your product to market fast. Contact us today about custom embedded product development for motor control applications.

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Connected-Automation