



## **Business Overview**

**L&T SEMICONDUCTOR TECHNOLOGIES**

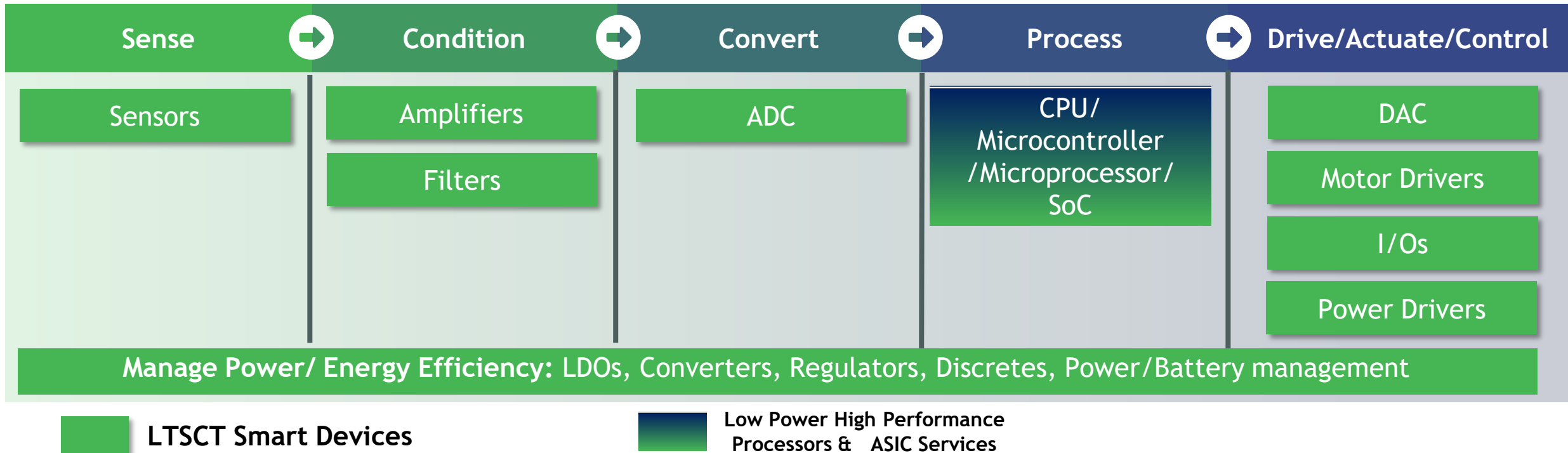
# About L&T Semiconductor Technologies

- A fully owned **Subsidiary of L&T**
- A **fabless company** designing & delivering Smart Devices for Global Customers . Fab in roadmap.
- Initial presence in **Austin, Munich, Tokyo, London, Bangalore and Chennai.**
- Semiconductor Devices and Technology partner helping customers realize **energy efficient, high-performance** systems to benefit from **data, electrification** and **Software defined technology** trends.



# LTSCCT Products and Services Strategy

Smart, Low Power Semiconductor Devices and Solutions Provider, empowering customers build innovative systems to benefit from data, electrification and software defined architectures.



## Differentiating technologies

- 1 Programmable Peripherals
- 2 MEMs Integration with SoC
- 3 Low Power Scalable Processor cores

# Target Industries & Applications



## MOBILITY

Electrification

Automotive Body & Comfort

Software Define Vehicle

Connected ,  
Infotainment & ADAS

Chassis & Safety

Industrial / Rail  
Transport



## INDUSTRIAL

Factory Automation

Lighting & Control

Safety, Surveillance & Security

Industrial Motor Control

Autonomous Mobile  
Robots

Asset Tracking



## ENERGY INFRASTRUCTURE

Battery  
Management  
Systems

Charging  
Infrastructure

Energy Storage

Monitoring /  
Metering

Power Distribution



## COMMUNICATION INFRASTRUCTURE

AC-DC power conversion  
for telecom  
infrastructure

Monitoring/Surveillance/  
Safety Systems

BMS and DC-DC converter

# Energy | Business Verticals

## Energy Storage Systems

### Focus Areas

- Power Conversion systems
- Battery Management system

### Roadmap Product Families

- Battery management IC
- BLDC and Solenoid Drivers

## Charging Infrastructure

### Focus Areas

- Onboard chargers
- Charging Stations
- Wireless Charging

### Roadmap Product Families

- Smart switches , eFuses
- Gate drivers
- Motor drivers
- Transceivers

## Conditioning & Monitoring

### Focus Areas

- Smart meters
- Smart thermal management
- Condition monitoring
- Predictive maintenance

### Roadmap Product Families

- Sensors: Pressure, Temperature ,Environment,
- Accelerometers, Gyroscopes, Magnetometers,
- Current Sensing, Switches, Regulators

## Power Delivery

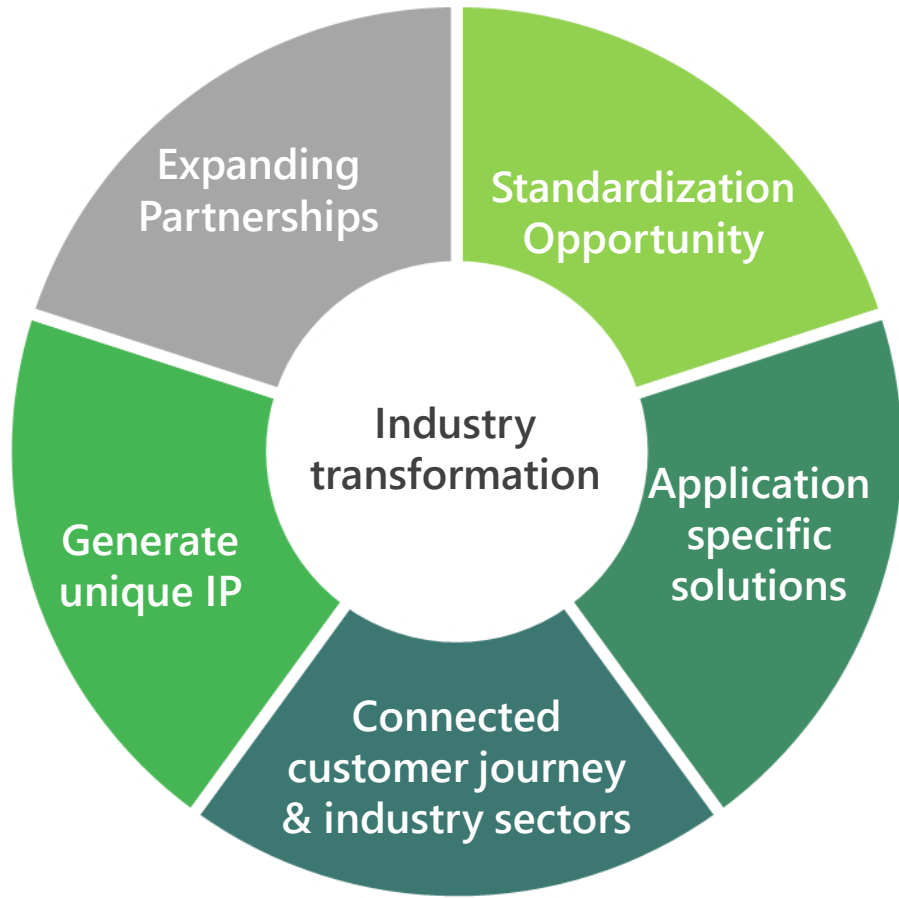
### Focus Areas

- AC/DC power supplies
- UPS
- Power Distribution units

### Roadmap Product Families

- AD-DA, DC-DC Convertors
- Drive MOSFETs, IGBTs, PMIC, Converters

# Enabling our customers with a new generation of smart, efficient and market leading power, sense and control IC



1

## Collaborative Innovation

Cocreate solutions using **customized smart devices** to define new standards and together generate unique IP across partners in the ecosystem.

2

## Customer Empowerment

**Empower customers** to drive sustainable **solutions** throughout entire customer journey and industry sectors like SDV, industry4.0, and smart energy.

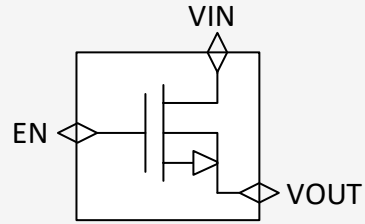
3

## Localized Sourcing

**Multisource** within partner and ecosystem based on customers localization and **value chain security** strategy

# LTSCCT Playing Field | Smart Integration Example

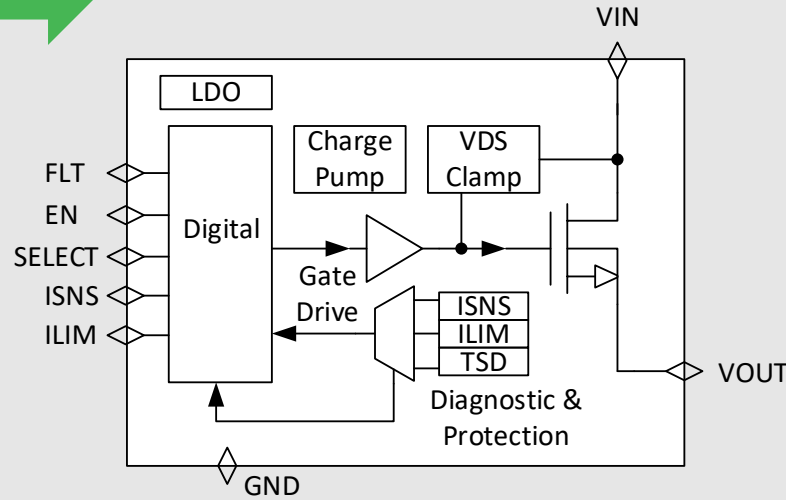
## Basic



### Discrete

- Lacks configurability
- Least cost effective
- Differentiate with cost

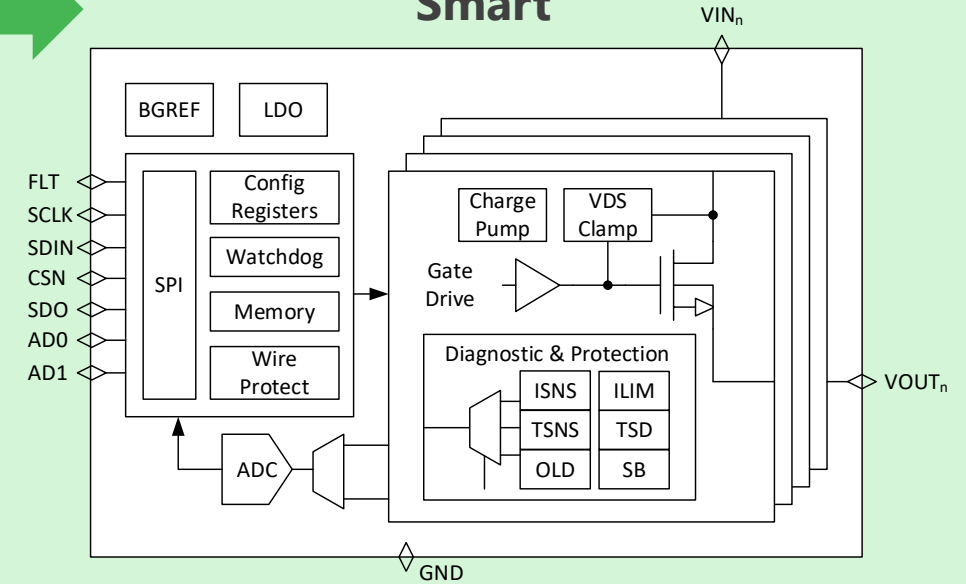
## Standard



### Integration

- Enables hardware configurable systems
- Cost effective and status quo
- Differentiate with cost, customized specifications & near-shoring supply chain

## Smart

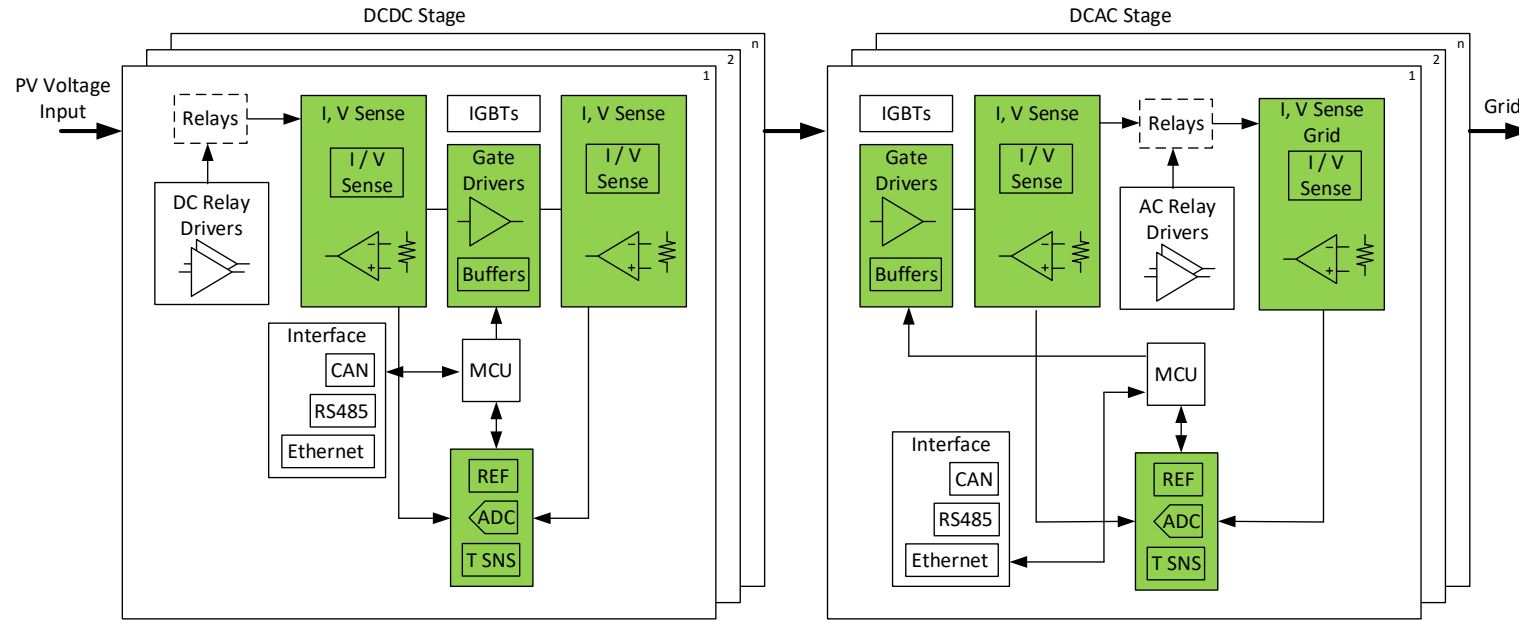


### Integration++

- Enables software configurable systems
- Initially higher cost, decreasing with scaling
- Differentiate with cost, balances (HW/SW) features, specification & near-shoring supply chain

Enable Scalable, Software Centric Platform Architecture

# Power Distribution | Central Inverter



## Market Trends

- Digitalization for easy installation, operation and maintenance
- More flexibility to retrofitting and scalability
- Grid stabilizing inverters for a renewable 24/7 energy supply
- Smart communication and integration

## Product Trends

- Serial interface supporting data transfer
- Pin/Feature/Interface compatibility
- Enhanced diagnostic and predictive maintenance features
- Smarter connectivity for example Bluetooth or other communication standards



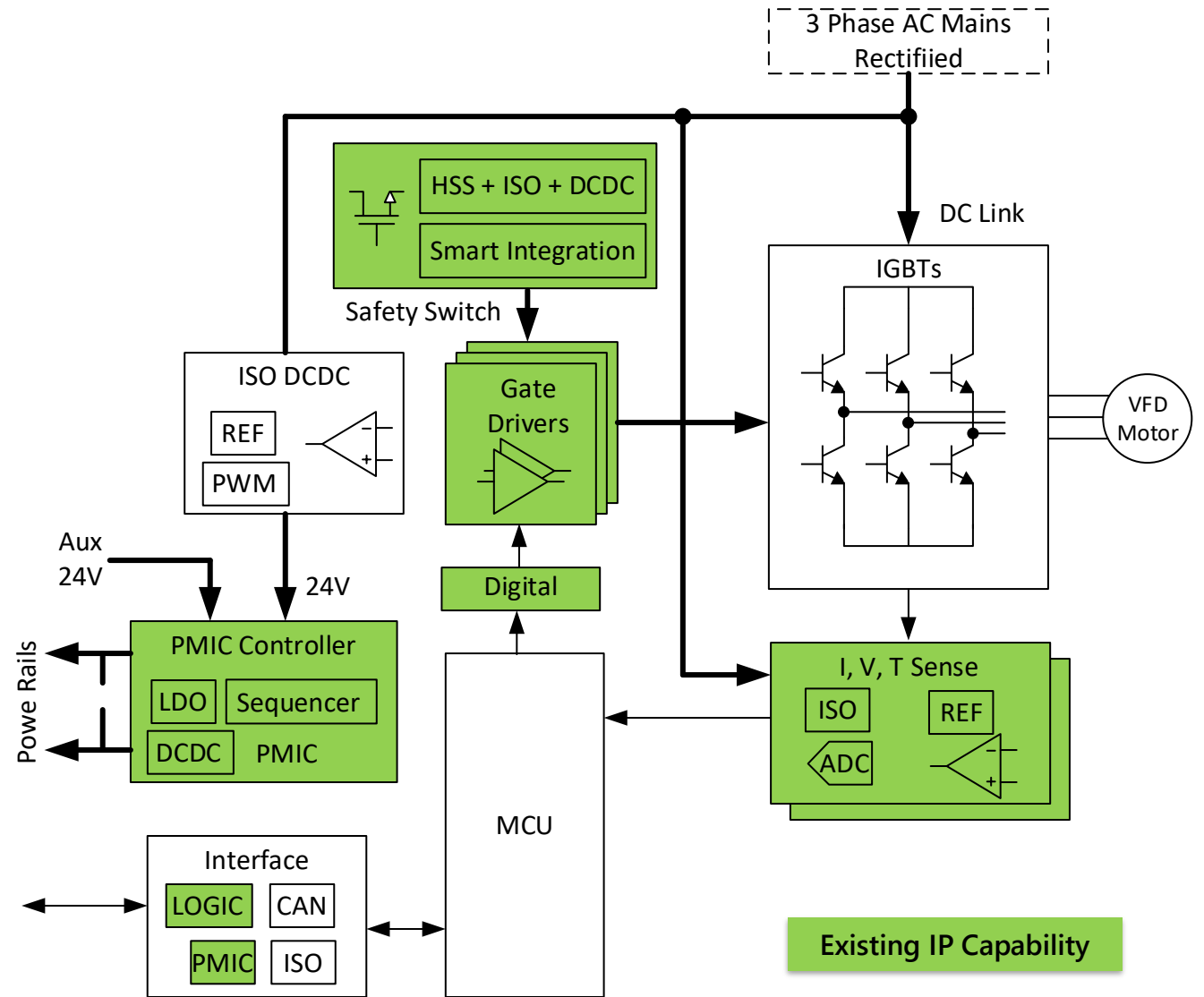
# Motor Drives | Variable Frequency Drives

## Market Trends

- Higher Efficiency
- Power Density
- Lower Maintenance Cost
- Smart Integration

## Product Trends

- Advanced speed control, soft start, etc.
- Smaller packages (IC), Integrated PLCs, IOs etc.
- Enhanced diagnostic and predictive maintenance features
- Smarter connectivity for example Bluetooth or other communication standards



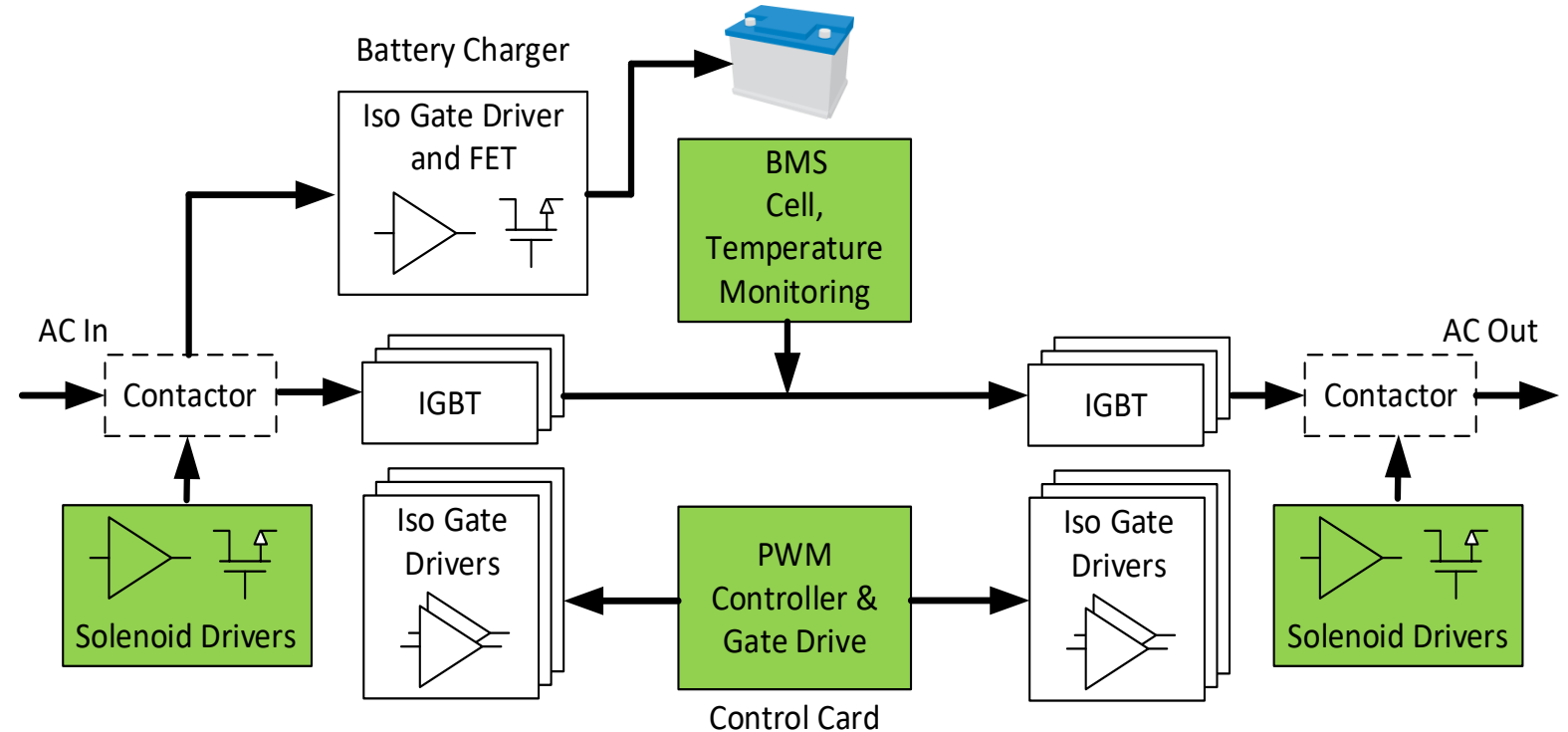
# Power Distribution | Uninterruptible Power Supply

## Market Trends

- Higher Efficiency
- Power Density
- Lower Maintenance Cost

## Product Trends

- Enhanced diagnostic and predictive maintenance features
- Advanced PWM control and gate drive to drive high efficiency from IGBTs
- High accuracy sense (I, V, T) IPs



Existing IP Capability

# HV Smart Gate Drivers | SiC, IGBT



## Certifications

AEC-Q100



## Gate Drive

Single Channel  
Bipolar Drive Supply  
High Side : 15V to 20V  
Low Side : -8V to -10V



## Protection and Features

DESAT monitoring  
Over Voltage (OV)  
Under Voltage (UV)  
Active Miller Clamping



## Operating Junction temperature

-40°C to 150°C



## Logic Voltage

5V logic

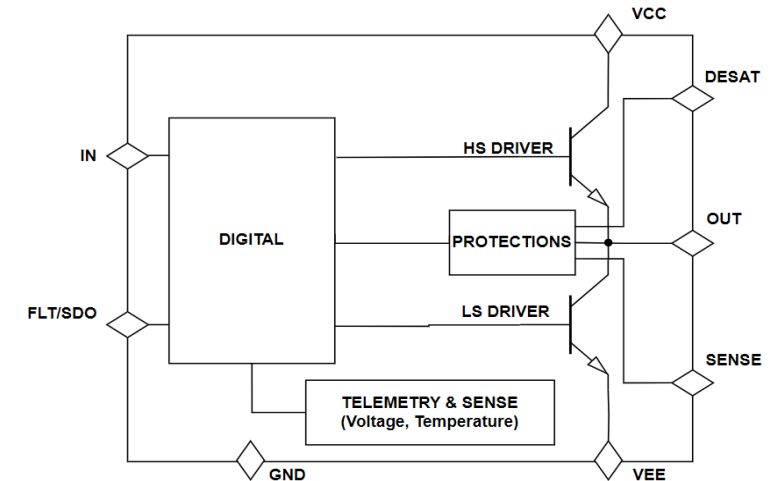


## Telemetry

VCEON, VCEOFF  
OV Events  
UV Events  
Temperature (Internal/External)

## Targeted Hitachi Devices

MBM1000FS17G  
5SNA 3600E170300  
5SNA 3000K452300  
5SJA 3000L520300  
5SFG 0980A12000x



## Known Applications

Solar Power

Wind Power

General Purpose Drives

Tractions

FACTs/Smart Grid

## Supported Voltage Class

1200V

1700V

2000V

2300V

3300V

4500V

6500V

# Product Concept | Smart High Side Switch and eFuse



## Certification

IEC61000-x, ASIL, B



## System Voltage operating range

Up 36V



## Load current support

up to 20A



## Protection

Programmable current limit  
Thermal shutdown  
Integrated inductive discharge clamp  
Overload and short-circuit protection  
UVLO and reverse battery protection



## Operating ambient temperature

-40°C to 125°C



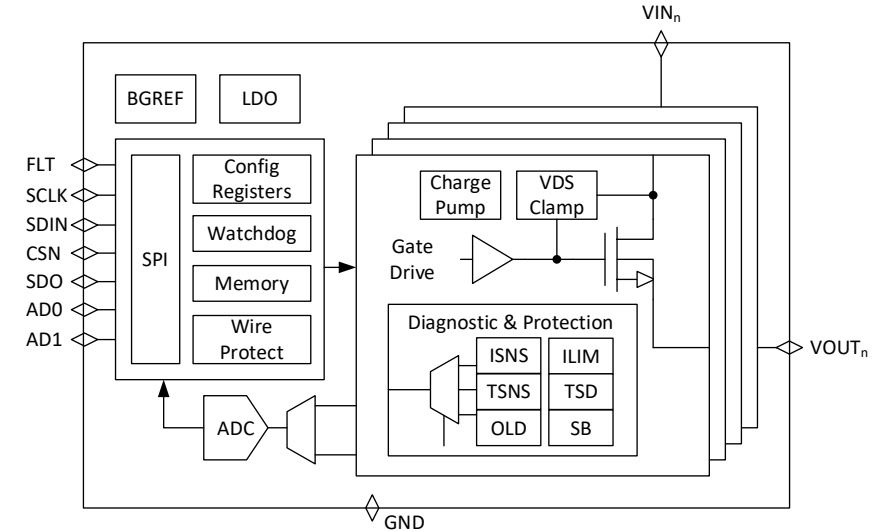
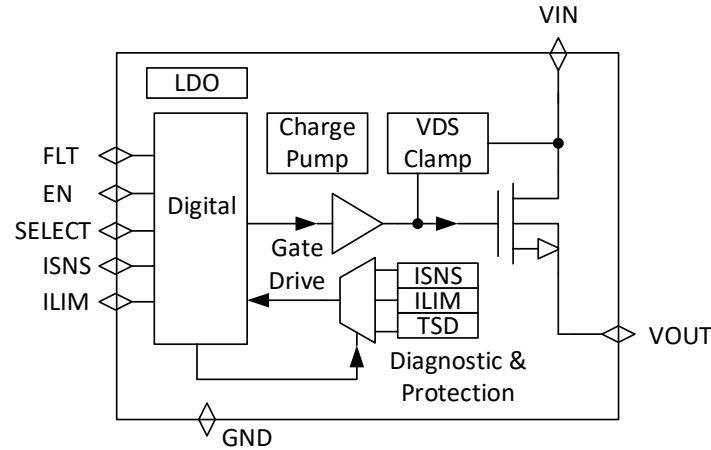
## Logic Voltage

1.8V, 3.3V and 5V logic



## Package

Standard packages (TSSOP and QFN)



## Diagnostic and detect

Open-load and short-to battery  
Overload, short, thermal shut down



## Smart integration

Low quiescent current + Low power mode  
High accuracy current sense  
Digital wire protection (I2t)  
SPI programmable with digital readout  
Nonvolatile memory

## Applications

Digital IO Modules

Motor Drive

SELV systems

Remote IOs

HVAC

Safety Switch

Generic load drive

## Benefits

1

Range of solutions for integration

2

Pin compatible family across loads and voltages

3

Fully software compatible within family

