

Company Profile

Version: H2 2023

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2 Corporate Strategy

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1. Company Overview



High-Performance & High-Reliability Analog & Mixed Signal Chip Company



2013

Establishment



~750

Employees

(As of Jul 31, 2023)



~\$242 million

Revenue

(2022)



A leading IC Provider
for all-category ISO
devices



A leading IC Provider
for automotive
applications

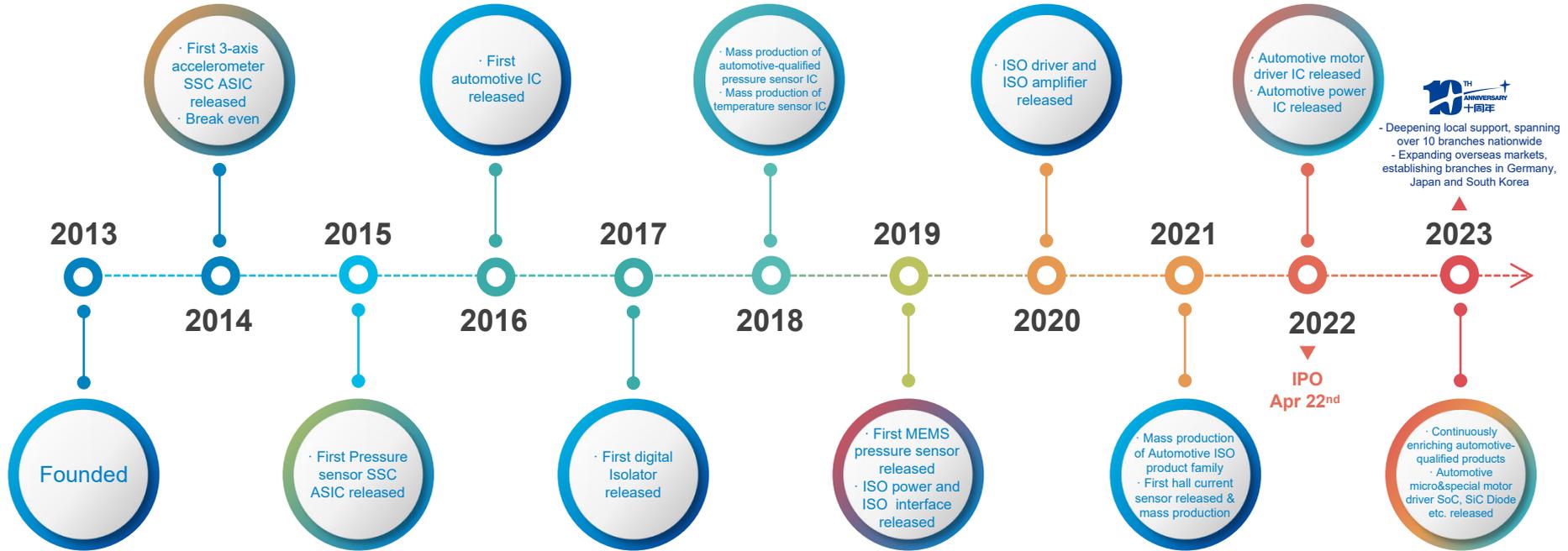


An IoT Sensing IC Provider
with complete product
categories



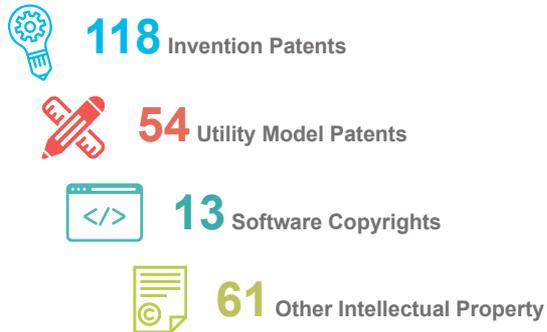
*As of Jul 31, 2023



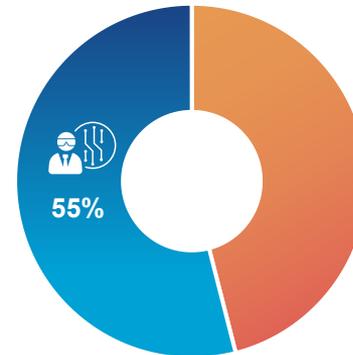


NOVOSENSE adheres to technological innovation, maintains a consistent focus on increasing R&D investments, places importance on intellectual property accumulation, and builds a strong technological barrier and talent pool. These efforts collectively construct a protective moat for the company's rapid development. According to the semi-annual report of 2023, the proportion of revenue invested in R&D of company is **46.23%**.

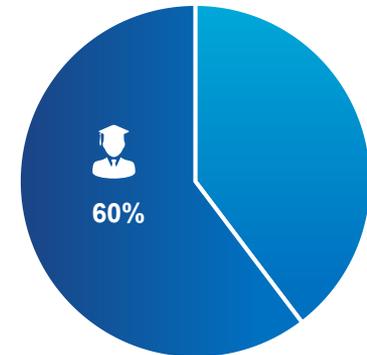
Accumulated Intellectual Property Applications:



Proportion of R&D Personnel Among Company Employees



Proportion of R&D Personnel with Master's Degree or Above



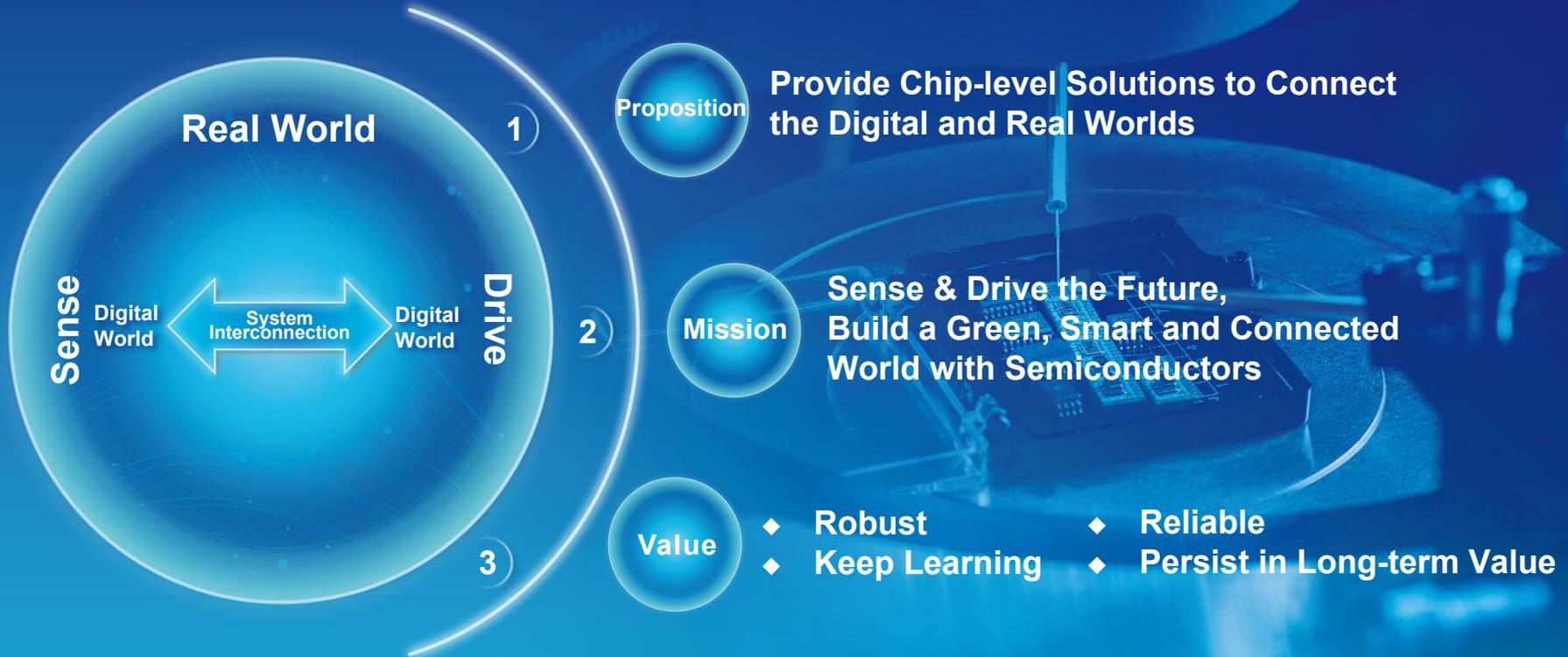
- As of Jun 30, 2023, the company and its subsidiaries have accumulated a total of 246 intellectual property projects applied for.

- As of Jun 30, 2023, the company has 341 R&D personnel, accounting for 55% of the total company workforce. Among the R&D personnel, 60% held a master's degree or above.

(Note: the total company workforce mentioned here does not include plant personnel)

2. Corporate Strategy





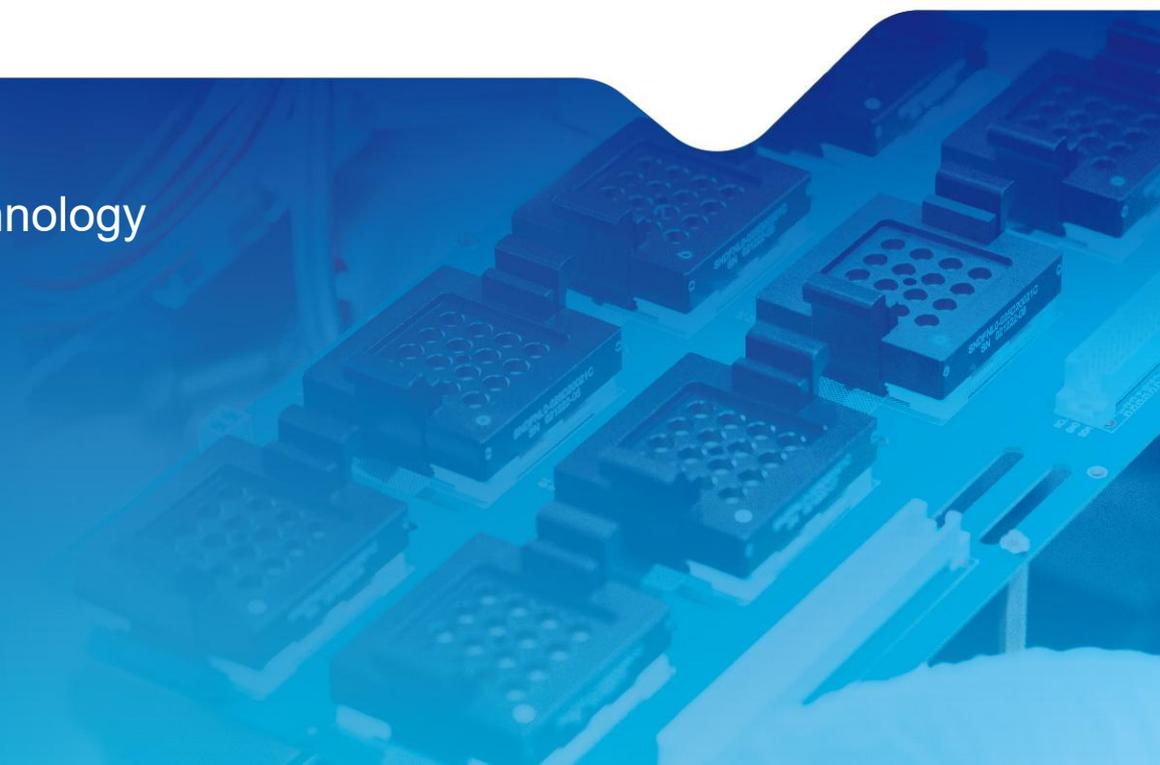
3. Business Portfolio

3-1 Application · Product · Technology

3-2 Product Profile

3-3 System Solution

3-4 Customer · Partner





Automotive

- New energy vehicle power train
- Thermal management system
- Body electronics and lighting
- Battery management system
- Smart driving
- Chassis control and safety
- Infotainment & Instrument
- Fuel car powertrain
- Body/Vehicle (Domain) Controller



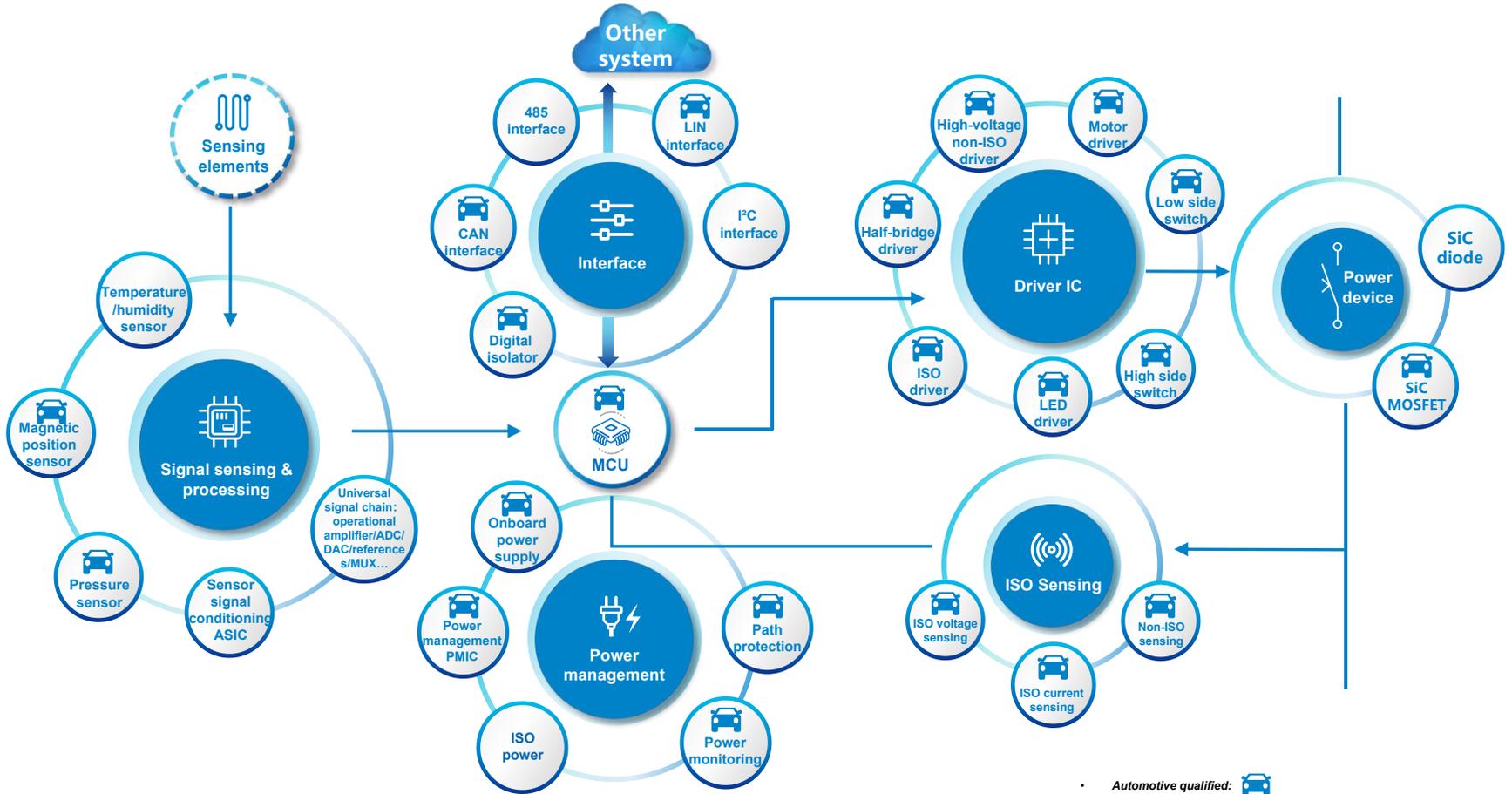
Industry & Energy

- Photovoltaic & wind power
- Smart grids
- Energy storage systems
- User energy storage PCS
- Charging pile
- Uninterruptible power supply
- Power supply for servers
- Communication power supply
- Industrial motor drive
- Industrial automation



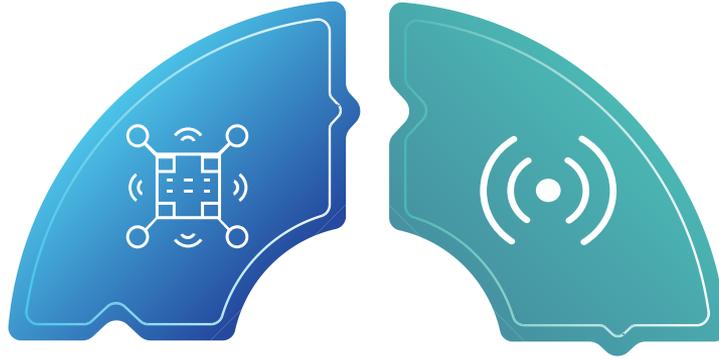
Consumer Electronics

- White goods/ Home appliances
- Mobile, PAD & peripherals
- Personal health & care
- Personal portables
- Data storage
- Computer & peripherals
- Audio & video entertainment



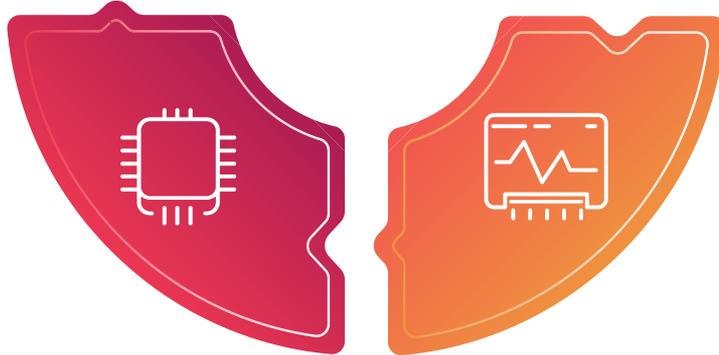
Sensor Technology

- MEMS pressure sensor process platform
- Humidity sensor process platform
- Integrated Hall sensor process platform
- AMR/TMR sensor process platform
- High-precision sensor signal conditioning circuit techniques
- Overvoltage protection/reverse polarity protection techniques



Isolator & Interface Technology

- >10kV isolation process platform
- Adaptive OOK® modulation technology
- Isolated power converter technology with integrated micro-transformer
- Automotive interface technology with robust EMC



Signal Chain Technology

- High-precision reference technology (<5ppm/C)
- High-precision low-noise amplifier technology (<1uV offset)
- High-precision (24-bit ENOB) ADC technology
- High-precision (16-bit) DAC technology
- Digital signal processing technology
- Automotive SoC development technology

Power & Drive Technology

- High current gate driver technology (Isolated/Non-isolated)
- SiC/IGBT driver technology with functional safety
- Automotive motor drive technology
- Automotive Buck/Boost/LDO technology (sophisticated control modes, advanced packaging, and spread spectrum techniques, etc.)
- Automotive LED drive with thermal sharing technology
- Automotive high/low-side switch technology
- SiC MOSFET and diode technology

Circuit/ESD IP platform

High-voltage BCD process platform

EMC design capability

Functional safety capability

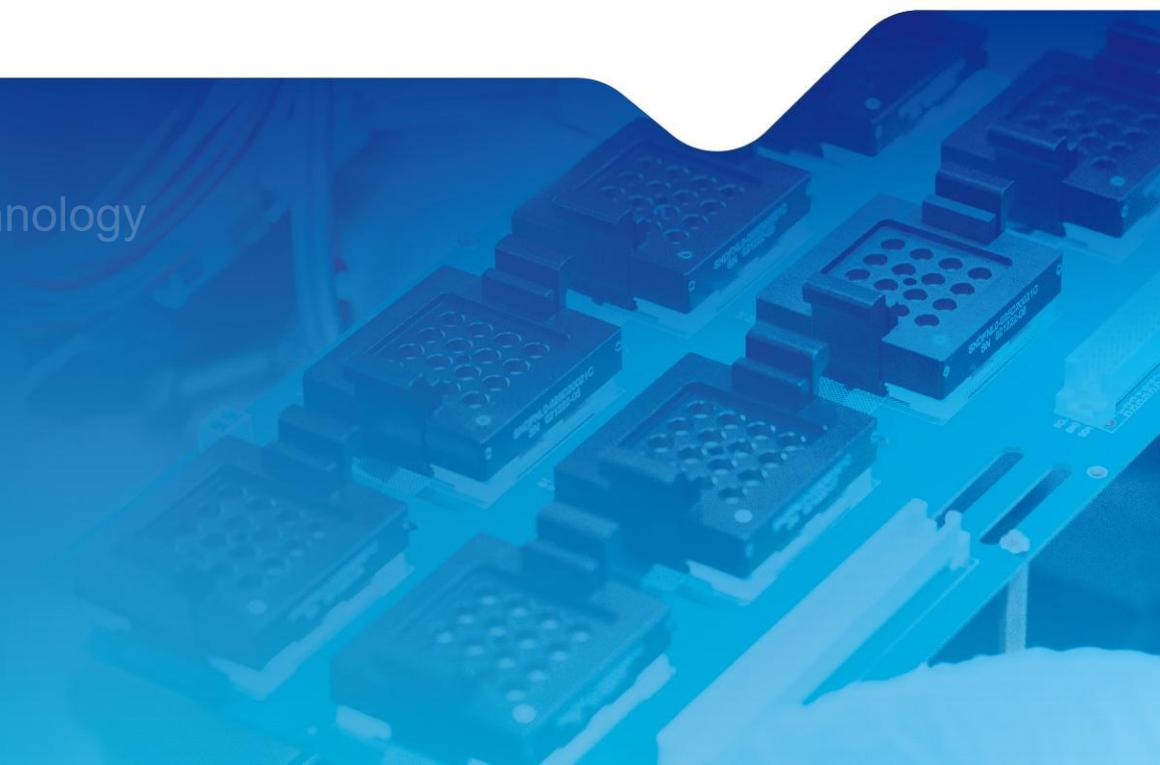
3. Business Portfolio

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3-4 Customer · Partner



**Automotive Electronics
Solutions**



Smart Cockpit/Autonomous Driving

- Large screen rear light driver
- Antenna/camera load protection
- Universal power Buck/LDO
- Voltage monitoring
- Seat air bag MEMS pressure sensor
- High current pre-driver
- Digital relay

Body/Domain Control

- High and low side switch
- e-Fuse
- Magnetic switch position sensor
- Digital relay
- Multichannel half-bridge drive, pre-driver
- BDC/BLDC/stepping motor driver

Automotive Lighting

- Rear light & front light driver
- Ambient lighting driver
- Interior lighting drive
- Stepping motor driver

Fuel/Hybrid: Powertrain

- Engine intake manifold MEMS pressure sensor
- Fuel vapor MEMS pressure sensor
- Crankshaft ventilator MEMS pressure sensor
- Canister desorption MEMS pressure sensor
- Exhaust gas re-circulation MEMS pressure sensor
- GPF/DPF differential pressure MEMS pressure sensor

New Energy Vehicle: Inverter/Powertrain

- Smart ISO drive/functional safety driver
- Digital isolator
- CAN/LIN/MiniSBC interface
- Magnetic current sensor
- Rotary transformer drive power amplifier
- Vacuum boost servo MEMS pressure sensor

New Energy Vehicle: BMS

- ISO & non-ISO power drive
- Digital isolator
- CAN/LIN/MiniSBC interface
- ISO digital relay
- ISO current and voltage sensing
- BPS battery pack thermal runaway MEMS pressure sensor

New Energy Vehicle: DCDC/OBC/PDU

- ISO & non-ISO power drive
- Digital isolator
- ISO current and voltage sensing
- CAN/LIN/MiniSBC interface
- Magnetic current sensor
- Current sense amplifier
- High/low side driver & motor driver

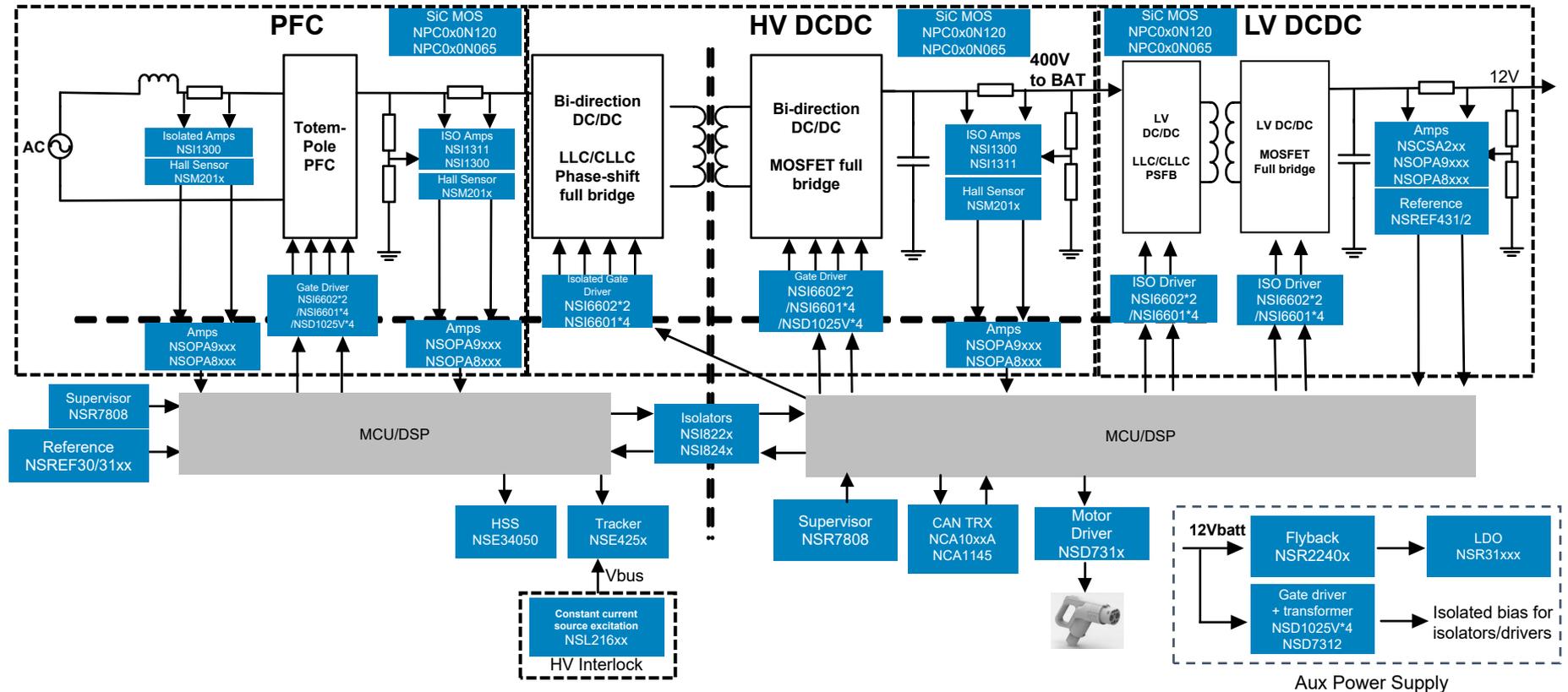
Thermal Management

- CAN/LIN/MiniSBC interface device - SiC
- ISO & non-ISO power drive
- Digital isolator
- Electronic water valve, water pump and fan special motor drive
- Magnetic angle sensor
- Magnetic switch position sensor
- Multichannel half-bridge driver, pre-driver
- BDC/BLDC/stepping motor driver
- Pressure sensor signal conditioning chip
- Automotive micro special motor driver SoC



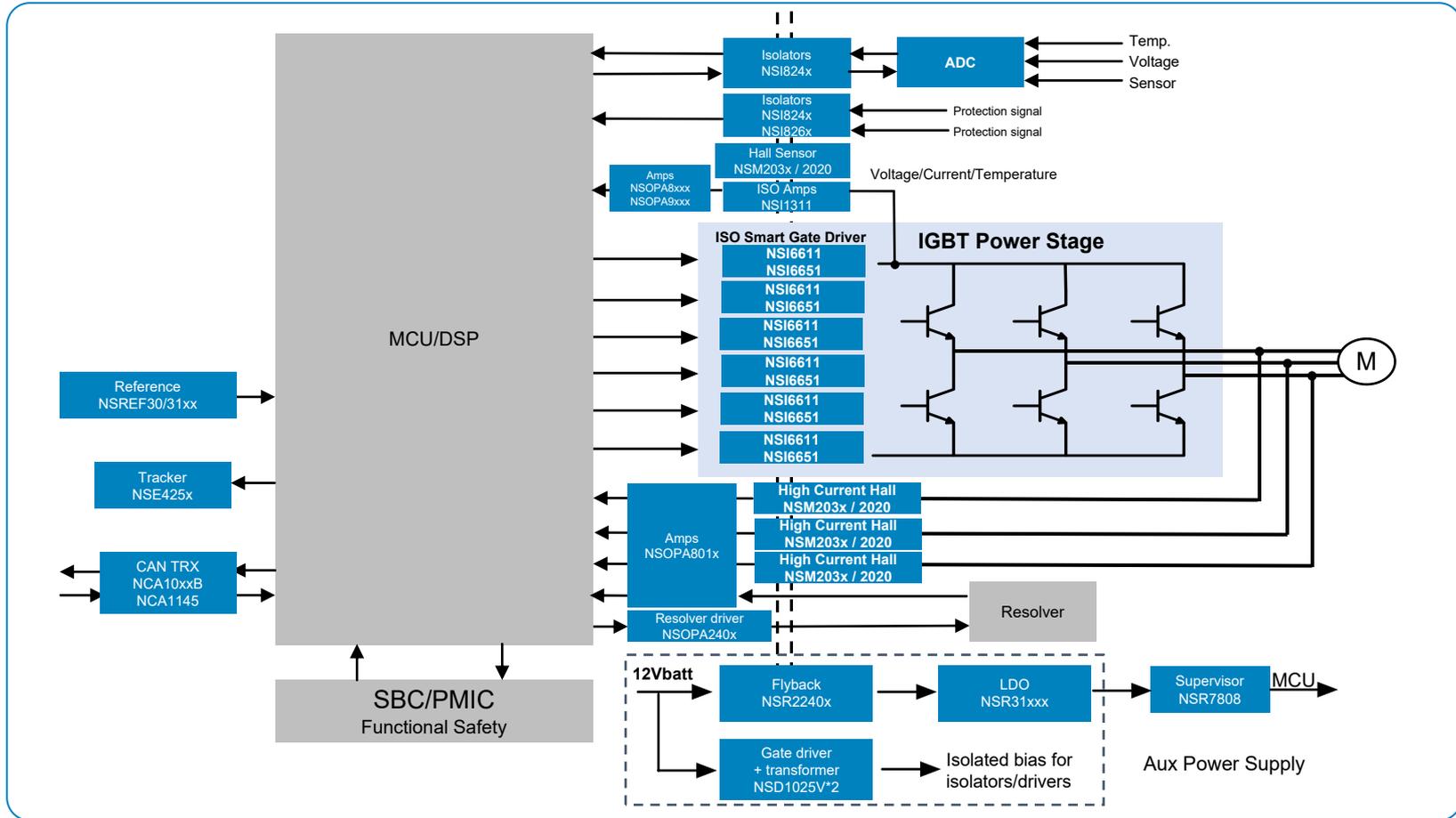


**Automotive OBC/DCDC, Traction Inverter,
BMS Solution**

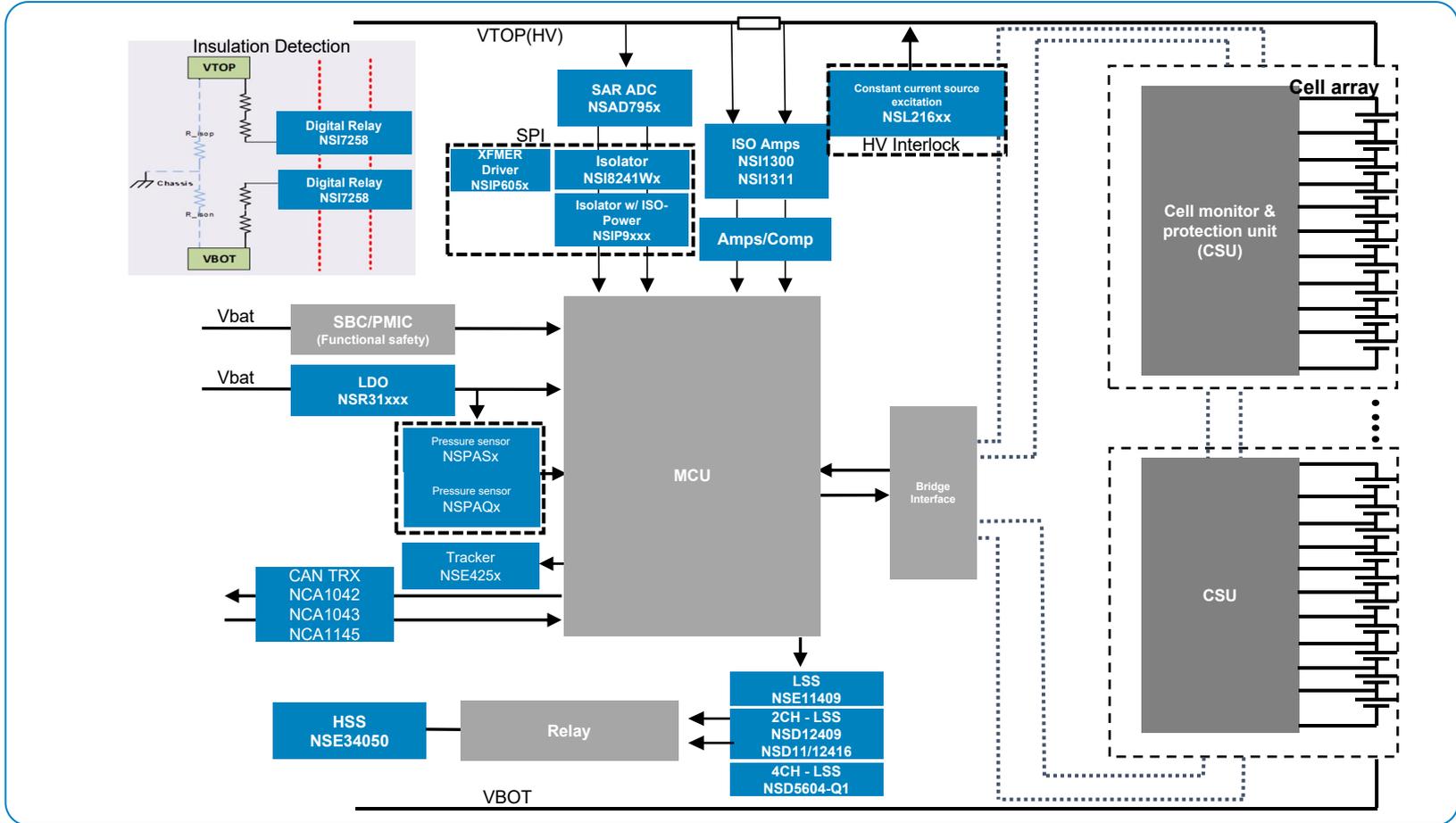


NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSI1300D25/05	±250mV ISO current sensing	PFC/DC-DC current sensing	Mass production	AMC1300/02, ACPL-C79x
NSI1311	0.1~2.1V ISO voltage sensing	PFC/DC-DC current sensing	Mass production	AMC1311, ACPL-C87x
NSM2011/NSM2013/NSM2015	Hall current sensor	PFC/DC-DC current sensing	Mass production	ACS72x, ACS3700x
NSI6602/6622	4A ISO half-bridge driver	MOS/IGBT/SiC isolated driver	Mass production	Si83xx, UCC215xx
NSI6602V	6A ISO half-bridge driver	MOS/IGBT/SiC isolated driver	Pre-production	Si83xx, UCC215xx
NSI6601M	Single-channel gate driver with miller clamp	MOS/IGBT/SiC isolated driver	Mass production	UCC53xx
NSD1624	120V half-bridge driver	MOS/IGBT/SiC half-bridge driver	Mass production	UCC27282, UCC27211, UCC27201
NSD1025V	5A low-side gate driver	Isolation bias voltage of isolators/drivers	Sample: 2023Q3	UCC27524, UCC27524A, UCC27624
NSI82xx	Channel isolation	UART/SPI/CAN communication	Mass production	ISO77xx, Si86xx, ISO67xx
NSD7312	DC brush motor driver	E-lock, DC/DC isolated bias	Mass production	DRV8872-Q1
NSR31xxx	Low-power consumption LDO	Power supply	Sampling	TPS7B69xx, MPQ2019, TLE42644, NCV8664
NSR2240x	Flyback controller	Aux power supply	Sample: 2023Q1	LM3478, LM3481, NCV8871
NCA1042B	Automotive CAN FD TRX	CAN network	Mass production	TJA1040, TJA1042, TCAN1042
NCA1051A	Automotive CAN FD TRX	CAN network	Mass production	TJA1050, TJA1051, TCAN1051
NCA1043B	Automotive CAN FD TRX	CAN network	Sample: 2023Q2	TJA1043, TCAN1043
NCA1145	Automotive CAN FD TRX	CAN network	Sample: 2023Q1	TJA1145, TCAN11145

NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSR7808	Voltage supervisor	MCU core voltage supervisor	Sampling	TPS3808, TPV8308
NSREF30/31xx	Voltage reference	Voltage, current, temp sensing	Sampling	REF30xx/31xx, MAX6035, TPR33/35xx, SGM4027
NSE34050	High-side switch	Relay control	Sample: 2023Q3	VNQ7050
NSE425x	Voltage tracker	Sensor power supply	Sampling	TLE425x/TPS425x
NPC0x0N120/065	SiC MOSFET	PFC, DCDC power conversion	Sampling	IMZ120/A065R0xxM1H, NTH4L0x0N120/065SC1, C3M00xx120/065K



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSI1300D25/05	±250mV ISO current amps	Bus/phase current sensing	Mass production	AMC1300/02, ACPL-C79x
NSM203x	Hall current sensor	Bus/phase current sensing	Sampling	A136x, ACS7031x, MLX91217, MLX91209
NSM2020	Coreless Hall current sensor	Bus/phase current sensing	Sampling	ACS3761x
NSI6602/6622	4A Half-bridge ISO gate driver	MOS/IGBT/SiC isolated driver	Mass production	Si83xx, UCC215xx
NSI6611/6651	Isolated smart gate driver	MOS/IGBT/SiC isolated driver	Mass production	UCC21750, UCC5451, UCC5851, 1ED020112F
NSD1025V	30V 5A dual-channel low-side gate driver	Isolated bias for isolators/drivers	Sample: 2023Q3	UCC27524, UCC27524A, UCC27624
NSI82xx	Channel ISO	UART/SPI/CAN communication	Mass production	ISO77xx, Si86xx, ISO67xx
NSR31xxx	Low power consumption LDO	Power supply	Sampling	TPS7B69xx, MPQ2019, TLE42644, NCV8664
NSR2240x	Flyback controller	Aux power supply	Sample: 2023Q1	LM3478, LM3481, NCV8871
NSI1311	0.1~2.1V input ISO voltage amps	Bus voltage sensing	Mass production	AMC1311
NCA1042B	Automotive CAN FD TRX	CAN network	Mass production	TJA1040, TJA1042, TCAN1042
NCA1051A	Automotive CAN FD TRX	CAN network	Mass production	TJA1050, TJA1051, TCAN1051
NCA1043B	Automotive CAN FD TRX	CAN network	Sampling	TJA1043, TCAN1043
NCA1145	Automotive CAN FD TRX	CAN network	Sampling	TJA1145, TCAN11145
NSR7808	Voltage reference	MCU voltage monitoring	Mass production	TPS3808, TPV8308
NSREF30/31xx	Voltage reference	Voltage,current,temp sensing	Sampling	REF30xx/31xx,MAX6035,TPR33/35xx,SG M4027
NSE425x	Voltage tracker	Sensor power supply	Sampling	TLE425x/TPS425x



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSI1300D25/05	±250mV ISO current sensing	PFC/DC-DC current sensing	Mass production	AMC1300/02
NSI1311	0.1~2.1V ISO voltage sensing	Bus voltage sensing	Mass production	AMC1311
NSI82xx	Channel ISO	UART/SPI/CAN ISO communication	Mass production	ISO77xx, Si86xx, ISO67xx,
NSE34050	High side switch	Relay control	Sample: 2023Q3	VNQ7050
NSE11409	Low side switch	Relay control	Mass production	VNL5090, BTS3134N, VNL5160, NCV8402
NSD12409	90m Ohm 2 Channel low side switch	Relay control	Sampling	VNLD5090
NSD12/11416	160m Ohm 1 Channel low side switch	Relay control	Sampling	VNLD5160, VNL5160, NCV8402, NCV8402D, VNL5300
NSD5604	260m Ohm 4 Channel low side switch	Relay control	Mass production(Auto Version 2023 Q3)	
NCA1021S	Automotive LIN bus transceiver	LIN communication network	Sampling	TJA1021, TLIN1021
NCA1042B	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1040, TJA1042, TCAN1042
NCA1051A	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1050, TJA1051, TCAN1051
NCA1043B	Frame-awaken Automotive CAN FD transceiver	CAN communication network	Sampling	TJA1043, TCAN1043
NCA1145	Local-awaken Automotive CAN FD transceiver	CAN communication network	Sampling	TJA1145, TCAN1145
NSPASx	MEMS absolute pressure sensor	Battery pack	Mass production	MPHZ6115 series, KP21x series
NSPAQ1	MEMS absolute pressure transducer with algorithm	Battery pack	Sample in 2023Q2	NBPx

NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSI7258	Digital relay	Insulation detection	Sampling	QCPL-A58, AQV258
NSIP6051/6055	Push-pull topology transformer driver	Isolated power supply	Sampling	SN6501/6505
NSIP9xxx	2/4-channel isolator with integrated isolated power supply	UART/SPI/CAN isolated communication	Sample: 2023Q4	ADUM540x, ADUM640x, ISOW78xx
NSE425x	Voltage tracker	Sensor power supply	Sampling	TLE425x/TPS425x

NOVOSENSE



Automotive Thermal Management System

NOVOSENSE Solution

SPI/UART/IO digital ISO

- NSI82xx

Half-bridge driver

- NSI6602
- NSD1624-Q

Single valve ISO driver

- NSI6601

Voltage & current sensing

- NSM201x
- NSI1311
- NSI1300

CAN Bus

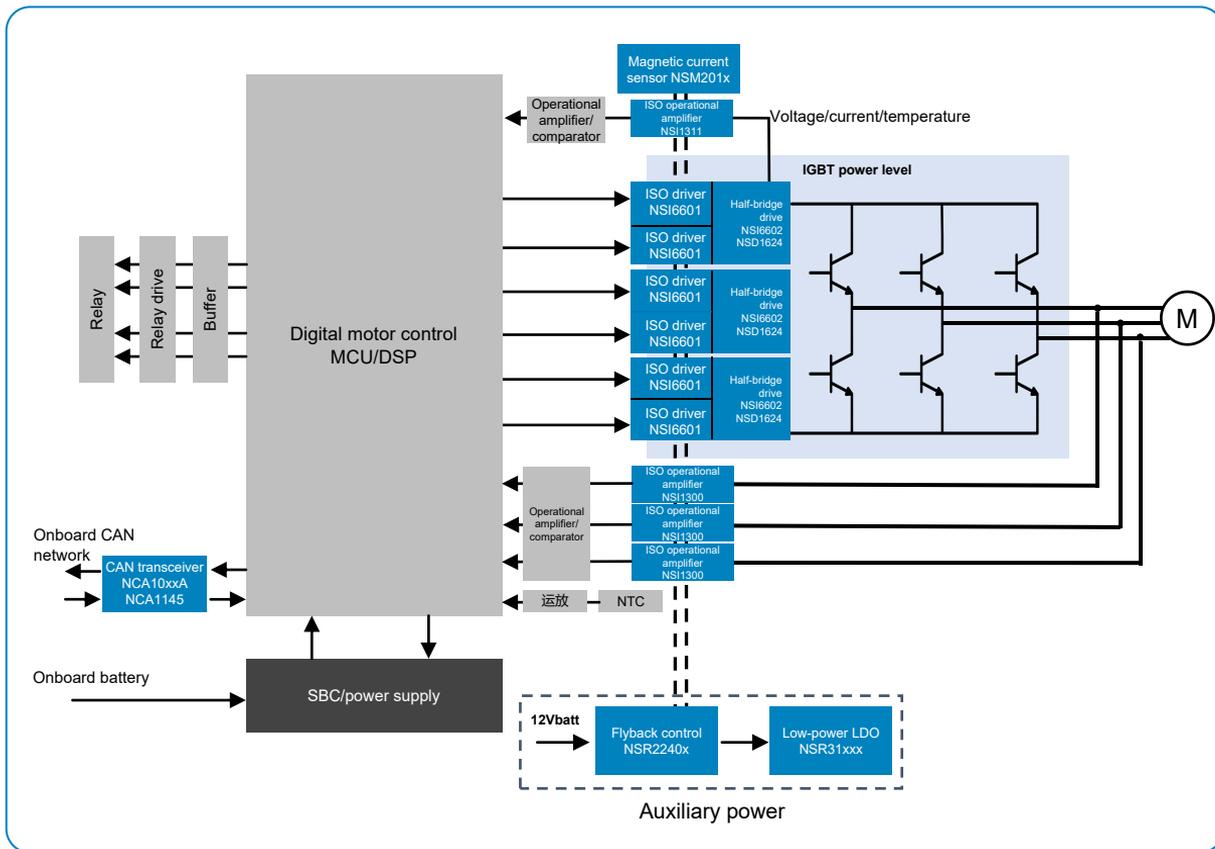
- NCA1042A/1051A/1043/1145

Auxiliary power supply

- Flyback control NSR2240x
- Low-power LDO NSR31xxx

Buffer

- NCA8244/4245/8T245



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSI1300D25/05	±250mV ISO current sensing	PFC/DC-DC current sensing	Mass production	AMC1300/02, ACPL-C79x
NSM2011/NSM2013 /NSM2015	Hall current sensor	Motor bus current Phase current detection	Mass production	ACS72x, ACS3700x
NSI1311	0.1~2.1V ISO voltage sensing	Bus voltage sensing	Mass production	AMC1311, ACPL-C87x
NSI82xx	Channel ISO	UART/SPI/CAN ISO communication	Mass production	ISO77xx, Si86xx, ISO67xx,
NSR31xxx	Low power consumption LDO	Low-voltage domain power supply	Mass production	TPS7B69xx, MPQ2019, TLE42644, NCV8664
NSR2240x	Auxiliary power flyback control	Auxiliary power supply	Sample: 2022Q3	LM3478, LM3481, NCV8871
NSI6601	Single valve ISO driver	Power valve driver	Mass production	UCC53xx, UCC53xxM, 1EDIx012MF
NSI6602	4A ISO high-bridge driver	MOS/IGBT/SiC ISO driver	Mass production	Si83xx, UCC215xx
NSI6602V	6A ISO high-bridge driver	MOS/IGBT/SiC ISO driver	Pre-production	Si83xx, UCC215xx
NSD1624	Non-ISO half-bridge driver	Power valve driver	Mass production	UCC27714, NCV5183
NCA1042B	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1040, TJA1042, TCAN1042
NCA1051A	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1050, TJA1051, TCAN1051
NCA1043B	Frame-awaken Automotive CAN FD transceiver	CAN communication network	Sampling	TJA1043, TCAN1043
NCA1145	Local-awaken Automotive CAN FD transceiver	CAN communication network	Sampling	TJA1145, TCAN11145
NCA8T245	Buffer	PWM buffer, level switch	Sampling	SN74LVC8T245, SN74LVC4245

NOVOSENSE Solution**SPI/UART/IO digital ISO**

- NSI82xx

ISO driver

- NSI6602
- NSI6601

Non-ISO driver

- NSD10151

Voltage and current sensing

- NSI1311
- NSI1300

CAN Bus

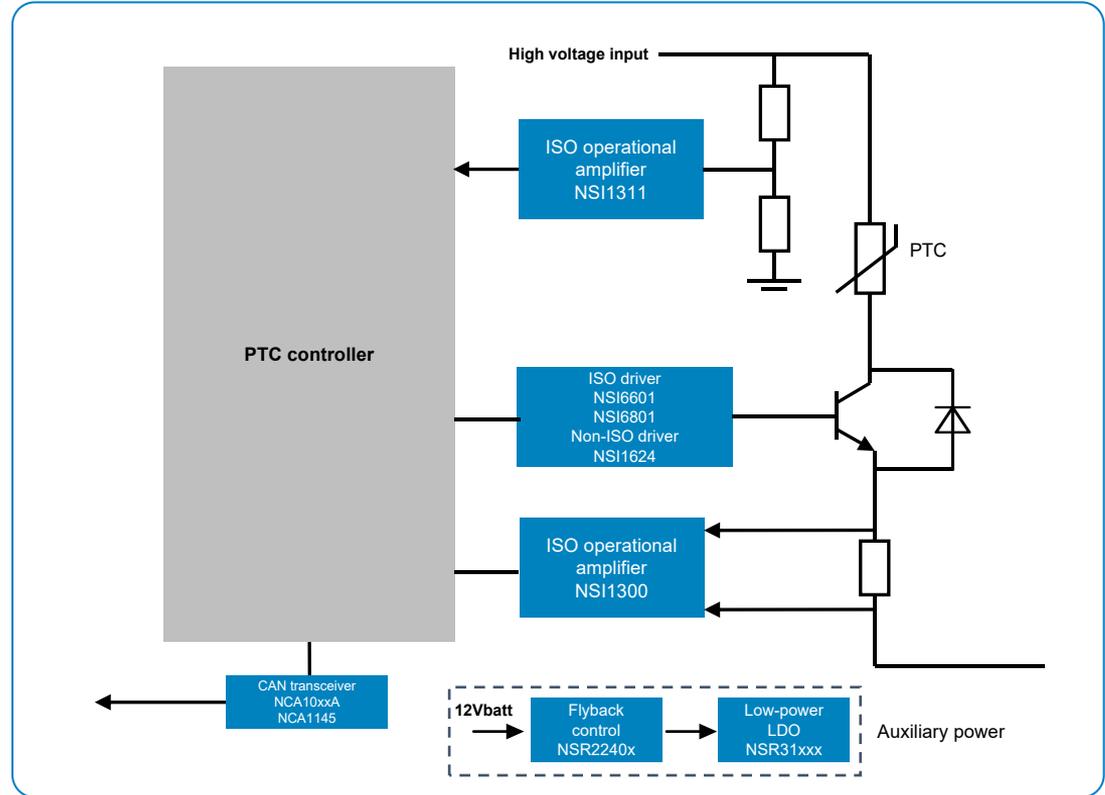
- NCA1042A/1051A/1043/1145

Current sensor

- NSM2011/2013/2015

Auxiliary power supply

- Flyback control NSR2240x
- Low-power LDO NSR31xxx



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSI1300D25/05	±250mV ISO current sensing	PFC/DC-DC current sensing	Mass production	AMC1300/02, ACPL-C79x
NSI1311	0.1~2.1V ISO voltage sensing	Bus voltage sensing	Mass production	AMC1311, ACPL-C87x
NSI82xx	Channel ISO	UART/SPI/CAN ISO communication	Mass production	ISO77xx, Si86xx, ISO67xx,
NSR31xxx	Low-power LDO	Low-voltage domain power supply	Mass production	TPS7B69xx, MPQ2019, TLE42644, NCV8664
NSR2240x	Auxiliary power flyback control	Auxiliary power supply	Sample: 2023Q2	LM3478, LM3481, NCV8871
NSI6601	Single valve ISO driver	Power valve driver	Mass production	UCC53xx, UCC53xxM, 1EDIx0112MF
NSD10151	Non-ISO single-channel low-side driver	Power valve driver	Sample: 2023Q3	UCC27531
NCA1042B	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1040, TJA1042, TCAN1042
NCA1051A	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1050, TJA1051, TCAN1051
NCA1043B	Frame-awaken Automotive CAN FD transceiver	CAN communication network	Sampling	TJA1043, TCAN1043
NCA1145	Local-awaken Automotive CAN FD transceiver	CAN communication network	Sampling	TJA1145, TCAN11145
NSM2011/13/15	Hall current sensor	PTC current detection	Mass production	ACS72x, ACS3700x

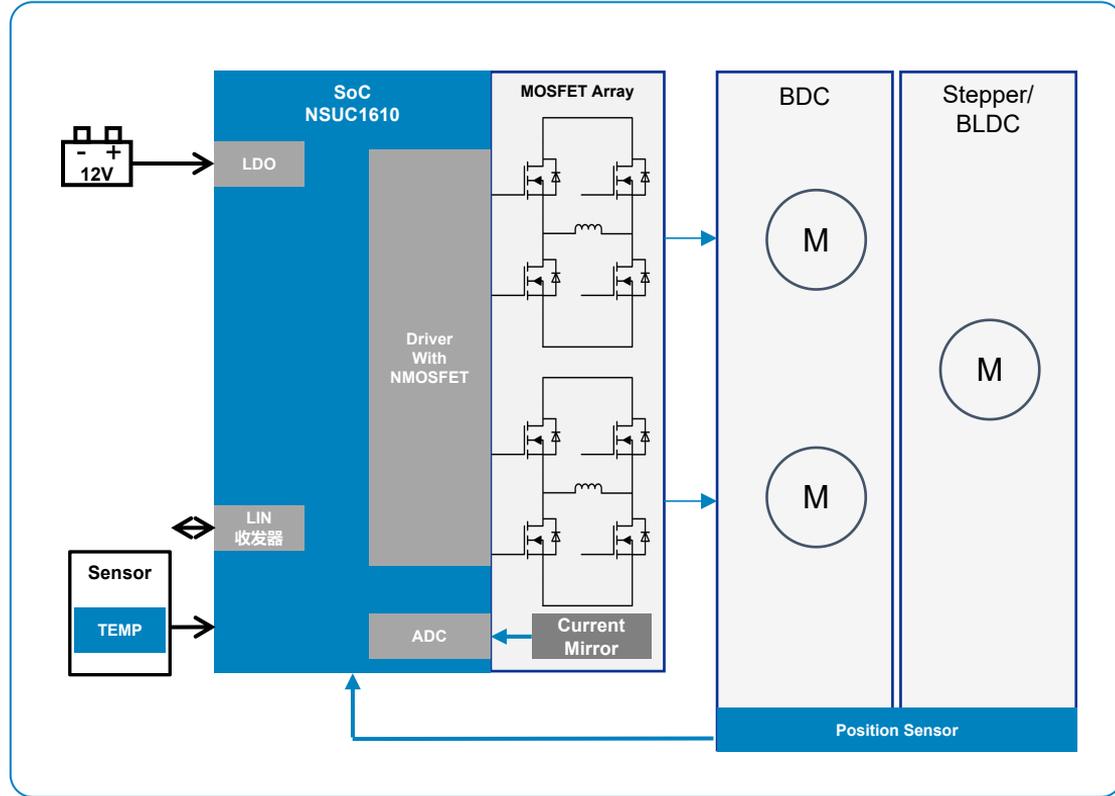
NOVOSENSE Solution

SoC Solution

- NSUC1610: Cortex M3 integrated 4 half-bridge SoC
- NSUC1602: Cortex M3 three-phase brushless pre-driver SoC

Position Sensor

- NSM3012
- NSM101x



NOVOSENSE Solution

CAN transceiver

- NCA1042-Q1: CAN transceiver
- NCA1021-Q1: LIN transceiver

Motor drive

- NSD8308-Q1: 8-channel half-bridge integrated driver
- NSD8381-Q1: Bipolar stepper motor driver

Position sensor

- NSM3012
- NSM101x

High side switch

- NSE34050Q-Q1

Low side switch

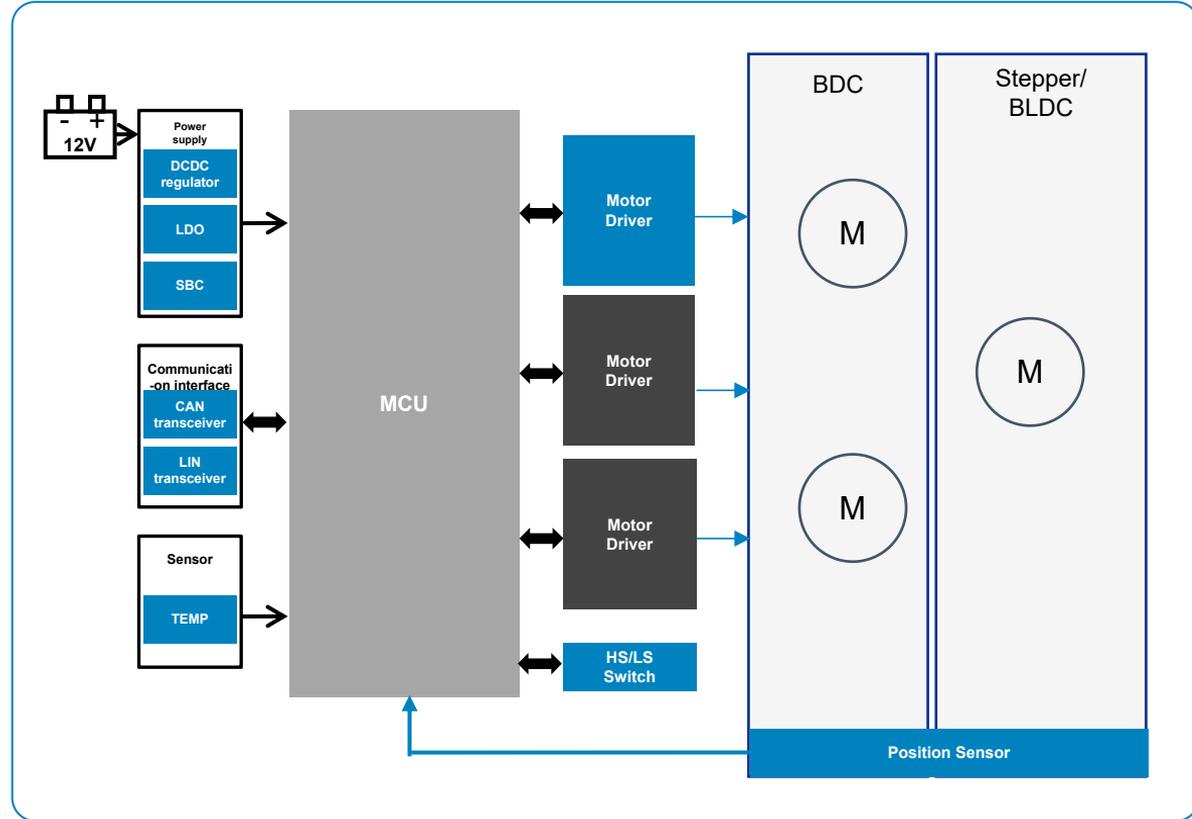
- NSE11409-Q1

DCDC

- NSR114xx-Q1

LDO

- NSR35/33/31xxx-Q1



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts	Other Similar Parts
NCA1021S-Q1	Supports INH wake-up LIN transceiver	Automotive general	Sampling	TJA1021, TLIN1021	
NCA1042B	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1040, TJA1042, TCAN1042	
NCA1051A	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1050, TJA1051, TCAN1051	
NCA1043B	Frame-awaken automotive CAN FD transceiver	CAN communication network	Sampling	TJA1043, TCAN1043	
NCA1145	Local-awaken automotive CAN FD transceiver	CAN communication network	Sampling	TJA1145, TCAN11145	
NSD8308-Q1	40V 8-channel half-bridge driver	Domain controller, A/C controller	Mass production	DRV8908, TLE94108	NCV7719, NCV7724
NSD8306/8/10/12-Q1	40V 6/8/10/12-channel half-bridge driver	Domain controller, air conditioning controller	Mass production	DRV8906/8/10/12, TLE94106/8/10/12	NCV7719, NCV7724
NSD8381-Q1	40V 1/32 microstepping driver	Domain controller, air conditioning controller, electronic expansion valve	Sampling	L99SM81	DRV8889-Q1
NSUC1610	Integrated LIN and Power MOSFET array, Automotive motor controller processor with 12V battery directed powered for 20W below BDC/BLDC/Step Motor	TMS Electrical valve	Sampling	MLX82310, MLX82315 MLX82325, HVC4223	
NSUC1602	Integrated LIN and MOS pre-driver, automotive motor controller processor with 12V battery directed powered for 1500W below BDC and BLDC Motor	TMS Electrical pump	In Design Sample: 2023Q2	MLX81340, TLE987X E523.06, MC9S12Z	
NSR35/33/31xxx-Q1	500mA/300mA/150mA 40-V, Low Iq	Automotive	Sampling	TPS7B69xx; MPQ2013; TPS7B82xx, TPS7B86xx TPS7A61xx	
NSR114xx-Q1	40V .6A/1.5A/2.5A/3.5A/5A/6A low power consumption/low EMI/synchronous buck DC-DC	Automotive	In Design	LMR140x0-Q1 LMR336x0-Q1	

NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts	Other Similar Parts
NSE11409-Q1	40V 90mohm single channel low-side drive	Relay/Solenoid valve/Load switch	Sampling	VNL5090; VNL5050	
NSE34050S/D/Q-Q1	40V 50mohm single/dual/four channel high-side drive	Relay/Solenoid valve/Load switch	In Design	VNQ7050	
NSM3011/12	Hall based angular sensor	TMS Electrical valve	Mass production	MLX90365	
NSM101X	Hall Switch/Latch with fixed sensitivity or user programmable	TMS Electrical valve and pump	In Design Sample: 2023/05	APS12200/10/20 MLX92232	

NOVOSENSE Solution

CAN transceiver

- NSA1042: CAN transceiver

Motor driver

- NSD8308: 8-channel half-bridge integrated driver

High side switch

- NSE34050Q-Q1

Low side switch

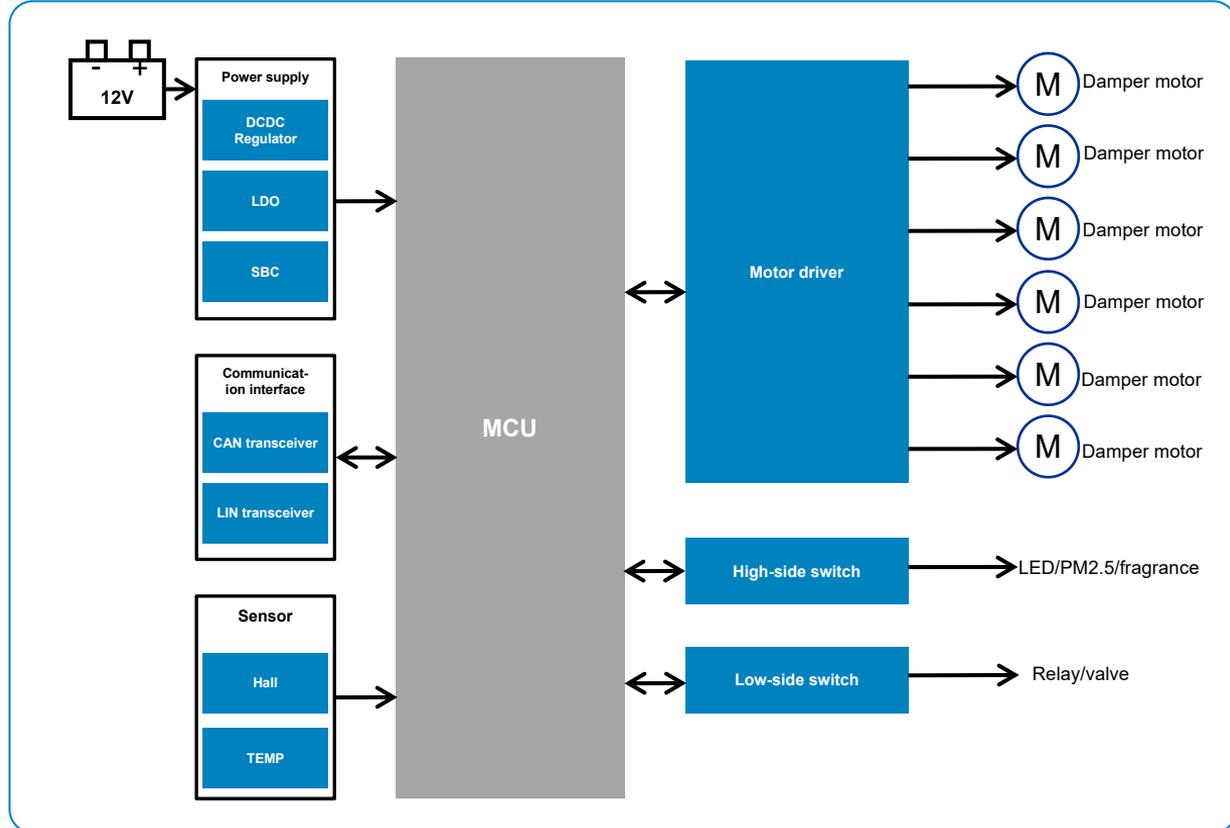
- NSE11409-Q1

DCDC

- NSR114xx-Q1

LDO

- NSR35/33/31xxx-Q1



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts	Other Similar Parts
NCA1021S-Q1	Support INH to wake up LIN transceiver	Universal for Automotive	Sampling	TJA1021, TLIN1021	
NCA1042B	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1040, TJA1042, TCAN1042	
NCA1051A	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1050, TJA1051, TCAN1051	
NCA1043B	Frame-awaken automotive CAN FD transceiver	CAN communication network	Sampling	TJA1043, TCAN1043	
NCA1145	Local-awaken automotive CAN FD transceiver	CAN communication network	Sampling	TJA1145, TCAN11145	
NSD8306/8/10/12-Q1	40V 6/8/10/12-channel half-bridge driver	Domain controller, air conditioning controller	Mass production	DRV8906/8/10/12, TLE94106/8/10/12	NCV7719, NCV7724
NSD8381-Q1	40V 1/32 microstepping driver	Domain controller, air conditioning controller, electronic expansion valve	Sampling	L99SM81	DRV8889-Q1
NSR35/33/31XXX-Q1	40V 500MA/300MA/150MA 40-V, Low quiescent current LDO	Universal for automotive	Sampling	TPS7B69xx; MPQ2013; TPS7B82xx; TPS7B86xx; TPS7A61xx	
NSR114XX-Q1	40V .6A/1.5A/2.5A/3.5A/5A/6A low-power/low EMI Synchronous Buck DC-DC	Universal for automotive	In Design	LMR140x0-Q1 LMR336x0-Q1	
NSE11409-Q1	40V 90mohm single-channel low side driver	Relay/solenoid valve/load switch	Sampling	VNL5090; VNL5050	
NSD12409-Q1	40V 90mohm dual-channel low-side driver	Relay/solenoid valve/load switch	Sampling	VNLD5090	
NSD11/12416-Q1	40V 160mohm single/dual-channel low-side driver	Relay/solenoid valve/load switch	Sampling	VNLD5160	
NSE34050S/D/Q-Q1	40V 50mohm single/dual/four-channel high-side driver	Relay/solenoid valve/load switch	In Design	VNQ7050	



Automotive LED Driver Solution

NOVOSENSE Solution

Classic Rear Lighting

- 1CH linear, NSL2161x, sampling
- 3CH linear, NSL2163x, sampling
- 3CH linear, NSL2363x, in-design

Through Rear Lighting

- 12/16/24 linear, NSL219xx, in-design

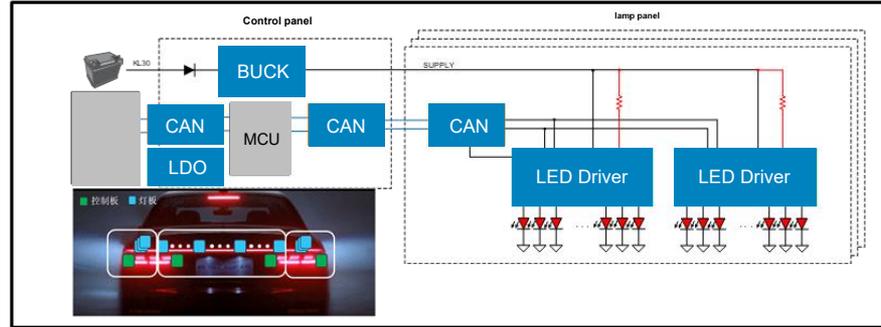
Auxiliary Power Supply

- 40VLDO, NSR31/3/5xxx
- 40VBuck, in-design

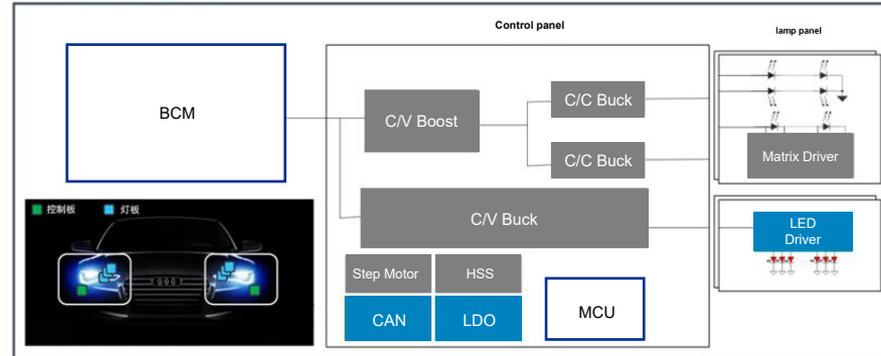
CAN Transceiver

- NCA1042A/1051A/1043/1145

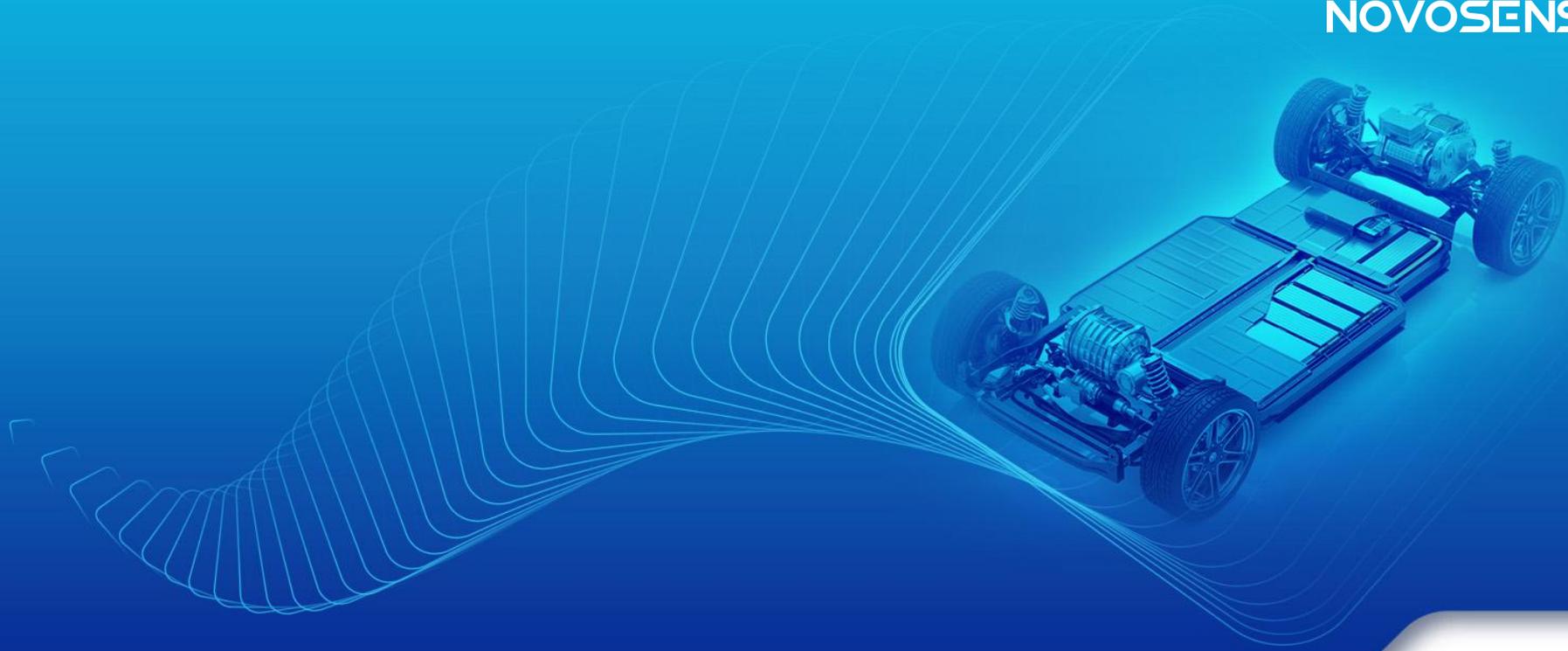
Rear light block diagram:



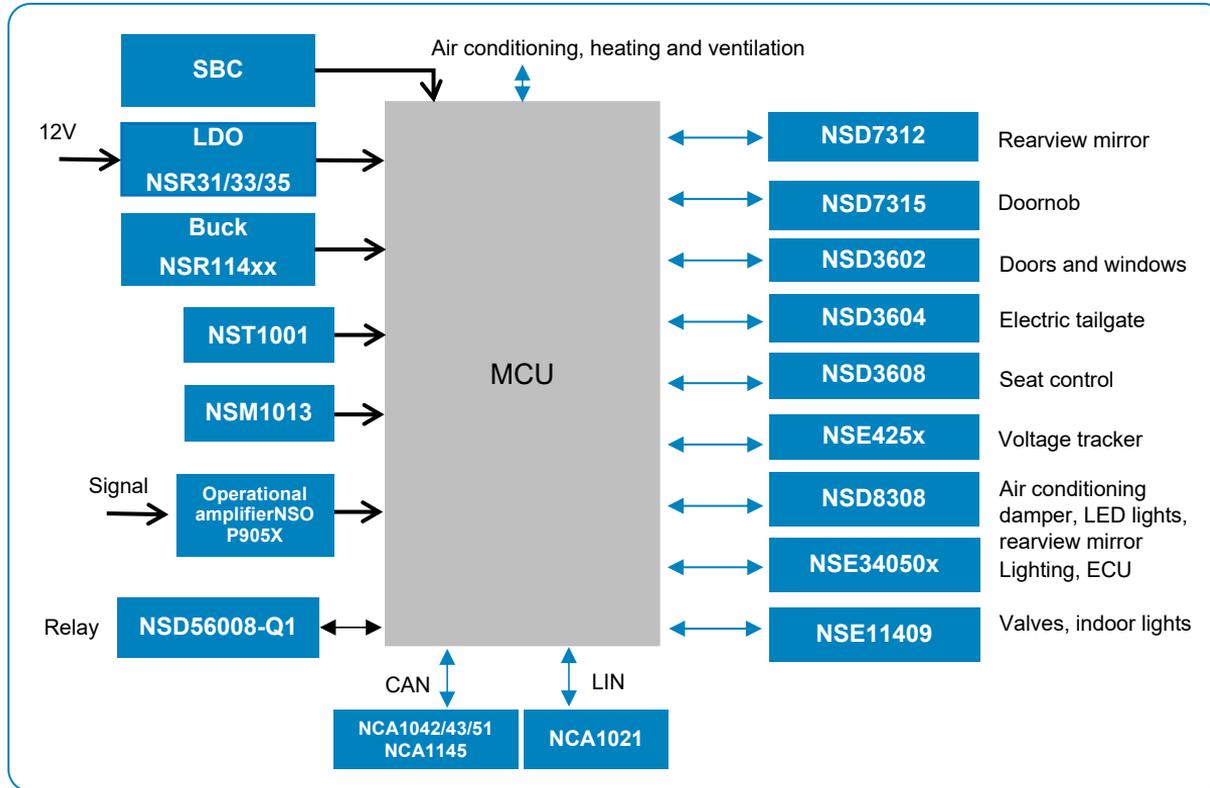
Front light block diagram:



NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSL2161x	1CH linear LED driver	Rear light driver, width light driver	Mass production	TPS92611
NSL2163x	3CH linear LED driver	Rear light driver, width light driver	Mass production	TPS92623
NSL2363x	3CH linear LED driver	Rear light drive, width light driver	Sample: 2023Q2	TPS92630
NSL21912	12CH through rear light LED driver	Through rear light	Sample: 2023Q1	TPS929120
NSR31/3/5xxx	40V low power LDO	MCU power supply	Mass production	TPS7B69xx, MPQ2019, TLE42644, NCV8664
NCA1021S-Q1	Supports INH wake-up LIN transceiver	Automotive general	Sampling	TJA1021, TLIN1021
NCA1042B	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1040, TJA1042, TCAN1042
NCA1051A	Automotive CAN FD transceiver	CAN communication network	Mass production	TJA1050, TJA1051, TCAN1051
NCA1043B	Frame-awaken automotive CAN FD transceiver	CAN communication network	Sampling	TJA1043, TCAN1043
NSE34050	High-side switch	Relay control	Sample: 2023Q3	VNQ7050



Body Control Module (BCM)



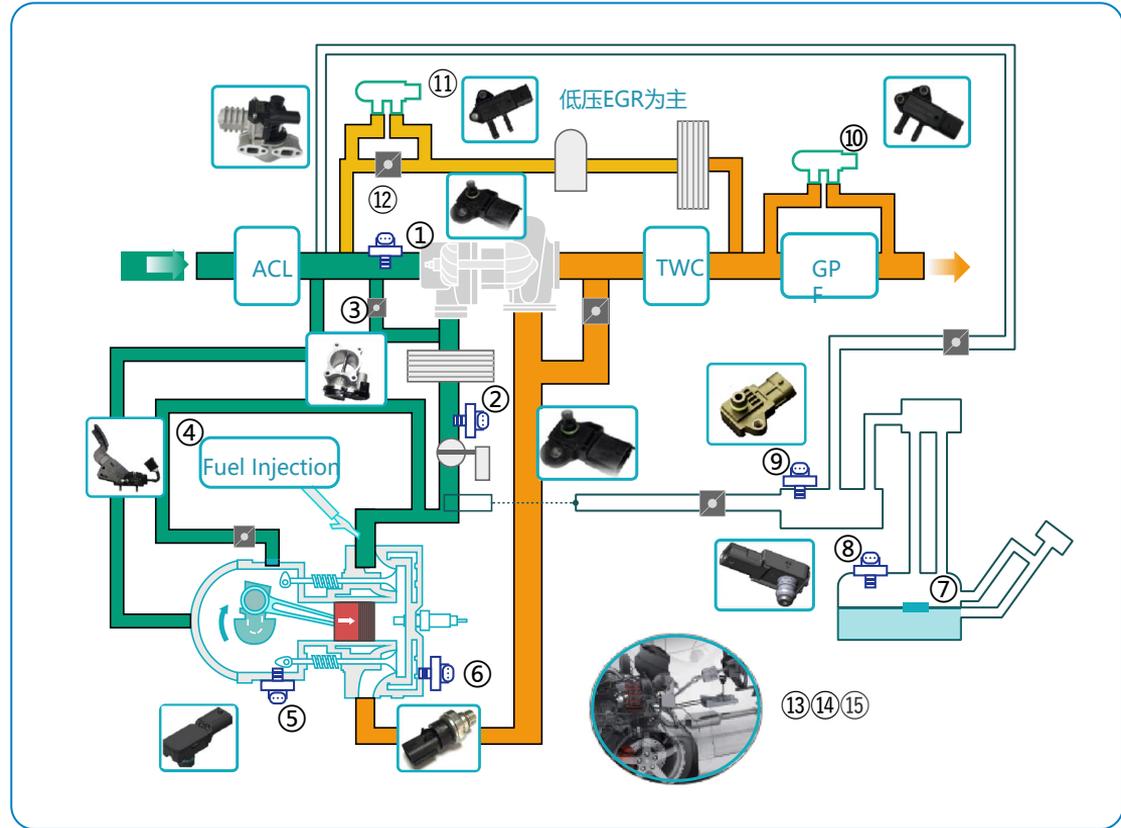
NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSD731x	40V brush DC motors	Body control	Mass production	DRV887x
NSD8308	8-channel bridge drive	Air conditioning damper, rearview mirror	Sampling	DRV8908, TLE94108
NSD360x	Multi-channel half-bridge pre-driver	Seat control	Sampling	DRV8908, TLE94108
NSE34050x	1/2/4-channel high side switch	Lighting, ECU	Sample: 2023Q2	VNQ7050
NSD11409	Single-channel low side switch	Relay, valve	Sampling	VNL5090
NSD12409-Q1	40V 90mohm dual-channel low-side driver	Relay/solenoid valve/load switch	Sampling	VNLD5090
NSD11/12416-Q1	40V 160mohm single/dual-channel low-side driver	Relay/solenoid valve/load switch	Sampling	VNLD5160
NSD56008	8-channel low side switch	Relay, valve	Sample: 2023Q3	TLE75008
NSR31/3/5xx	40V 150/300/500mA LDO	Dashboard, in-board charging, body controls	Sampling	TPS7B69xx, TPS7A66xx, TPS7B86xx
NSR114x	40V 2.5/3.5/5/6A BUCK	Instrument panel, body control	Sample: 2023Q1	LMR14030, LMR33630, LM61460
NSE425x	Voltage tracker	Sensor power supply	Sampling	TLE425x/TPS425x
NSM1013	Hall Latch	Seat control	Sample: 2023Q1	A1212, MLX92211
NST1001	Temperature sensor	Temperature detection	Mass production	LMT01
NSOP905x	High voltage operational amplifier	Body control	Sample: 2023Q2	OPAx171/OPAx991
NCA1042B	CAN FD transceiver	CAN communication	Sampling	TJA1042, TCAN1042
NCA1021S	LIN transceiver	LIN communication	Sample: 2023Q2	TJA1021, TLIN1021



Fuel Powertrain & Fuel Supply System Solution

NOVOSENSE Solution

1. Intake manifold pressure sensor
2. EGR-TMAP pressure sensor
3. Throttle position sensor
4. Accelerator pedal position sensor
5. Positive crankcase ventilation pressure sensor
6. Oil pressure sensor
7. Oil tank level detection sensor
8. EVAP/FTPS pressure sensor
9. Canister desorption pressure sensor
 - Pressure sensor IC: NSPAS1, NSPAS3
 - Pressure sensor MEMS: NSP1630/1, NSP1632(Pt)
 - Signal conditioning ASIC: NSA/C9260X(analog), NSA/C9264(SENT)
10. GPF/DPF differential pressure sensor
11. EGR valve differential pressure sensor
 - Pressure sensor module: NSPGM1, NSPGM2, NSPDC1
 - Pressure sensor MEMS: NSP1831, NSP1832(Pt)
 - Signal conditioning ASIC: NSA/C9260X(analog), NSA/C9264(SENT)
12. Exhaust gas circulation valve position sensor
 - Magnetic angle sensor IC: NSM3011/12
13. VBS Vacuum boost pressure sensor
 - Pressure sensor IC: NSPAS1, NSPAS3
 - Pressure sensor module: NSPGM1, NSPGM2
 - Signal conditioning ASIC: NSA/C9260X(analog), NSA/C9264(SENT)
14. Brake pressure sensor
 - Signal conditioning ASIC: NSA/C9260X(analog), NSA/C9264(SENT)
15. ECU atmospheric pressure sensor (BAP)

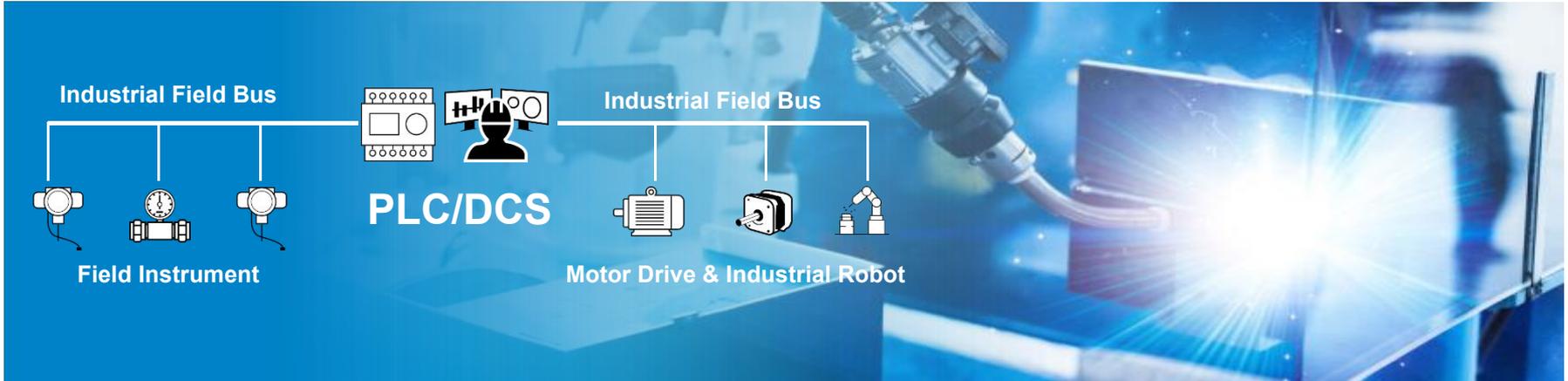


NOVOSENSE Part Number	Product	Application	Availability	Market P2P Parts
NSPAS1/3	Absolute pressure sensor	TMAP, VBS, Canister desorption	Mass production	MPHZ6115 series, KP21x series, MLX90817/8 series
NSPGM1/2	Differential pressure sensor	FTPS, KPS, GPF, VBS, EGR valve	Mass production/pre-mass production	MLX90809 series, MLX90821 series
NSPDC1	Differential pressure sensor	GPF/DPF, EGR valve	Sampling	
NSM3011/12	Hall angle sensor	EGR valve, throttle, accelerator pedal, oil level detection	Mass production	MLX90365
NSA9260x	Pressure sensor resistive conditioning ASIC (analog output)	Oil/brake pressure, TMAP, VBS, Canister desorption, FTPS, KPS, etc	Mass production	MLX90328, ZSC31150
NSA9264	Pressure transducer resistive conditioning ASIC (SENT output)	Oil/brake pressure, TMAP, VBS, Canister desorption, FTPS, KPS, etc	Mass production	MLX9032, ZSSC4169
NSC9260x	Pressure sensor capacitive conditioning ASIC (analog output)	A/C pressure, oil/brake pressure, TMAP, VBS, Canister desorption, FTPS, KPS, etc	Mass production	ZSSC3123
NSC9264	Pressure sensor capacitive conditioning ASIC (SENT output)	Oil/brake pressure, TMAP, VBS, Canister desorption, FTPS, KPS, etc	Mass production	
NSC9262	Pressure sensor capacitive conditioning ASIC (LIN output)	A/C pressure	Mass production	
NSP1630/1	Absolute pressure MEMS wafer	TMAP, VBS, Canister desorption	Mass production	0~500kPa absolute pressure MEMS wafer
NSP1632	Precious-metal absolute pressure MEMS wafer	TMAP, VBS, Canister desorption, EGR-Turbo	Mass production	0~200kPa precious-metal absolute pressure MEMS wafer
NSP1830/1	Differential pressure MEMS wafer	FTPS, KPS, GPF, VBS	Mass production	±5kPa~±100kPa, 0~+500kPa differential pressure MEMS wafer
NSP1832	Precious-metal differential pressure MEMS wafer	FTPS, KPS, GPF/DPF, VBS, EGR valve	Mass production	±5kPa~±100kPa precious-metal differential pressure MEMS wafer
NSE425x	Voltage tracker	Sensor power supply	Sampling	TLE425x/TPS425x

NOVOSENSE

Industrial Control Solution





Field Instrument

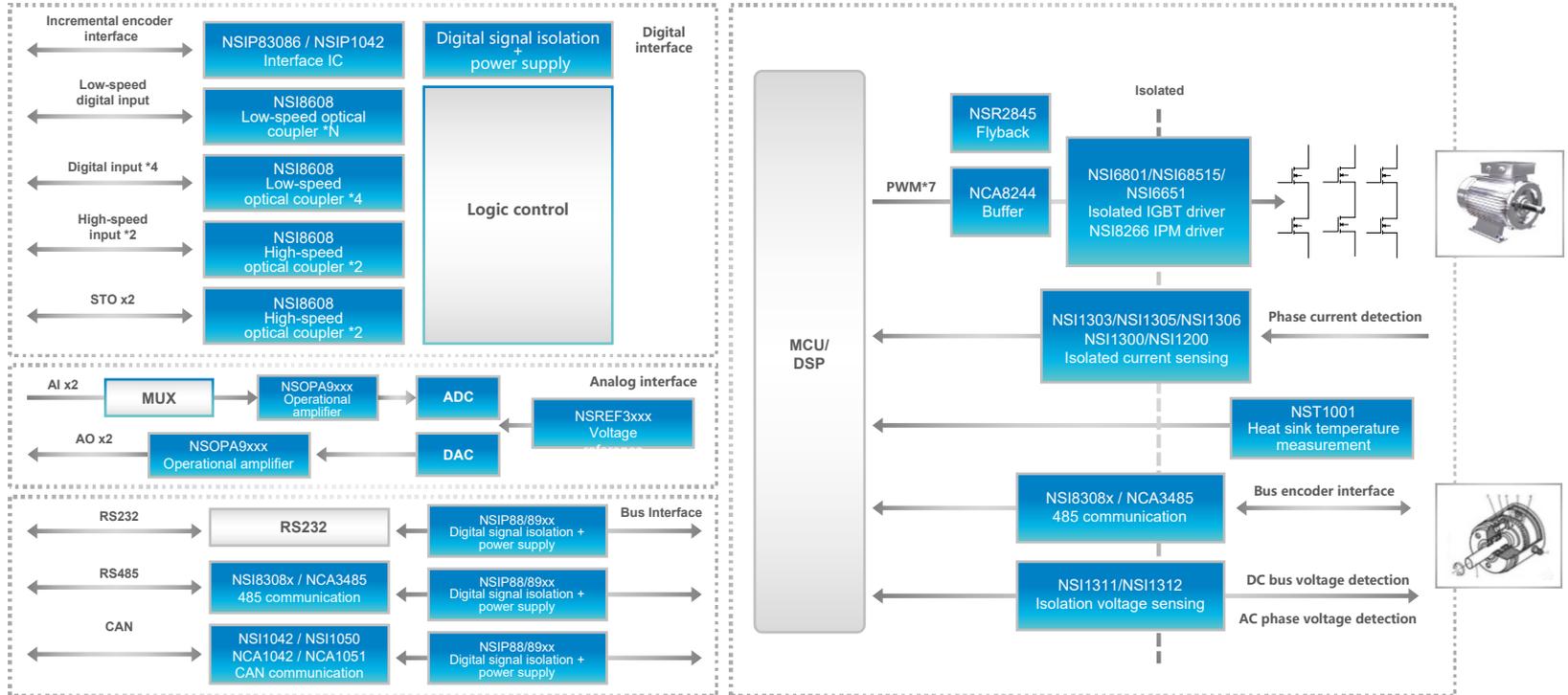
- ▶ 4~20mA industrial transmitter ASIC
- ▶ Industrial field bus interface IC
- ▶ Digital isolator/Isolated power
- ▶ Temperature sensor /MEMS pressure sensor/ Magnetic position sensor
- ▶ Buck/LDO/Voltage supervisor
- ▶ General operational amplifier
- ▶ High-precision voltage reference

PLC/DCS Controller

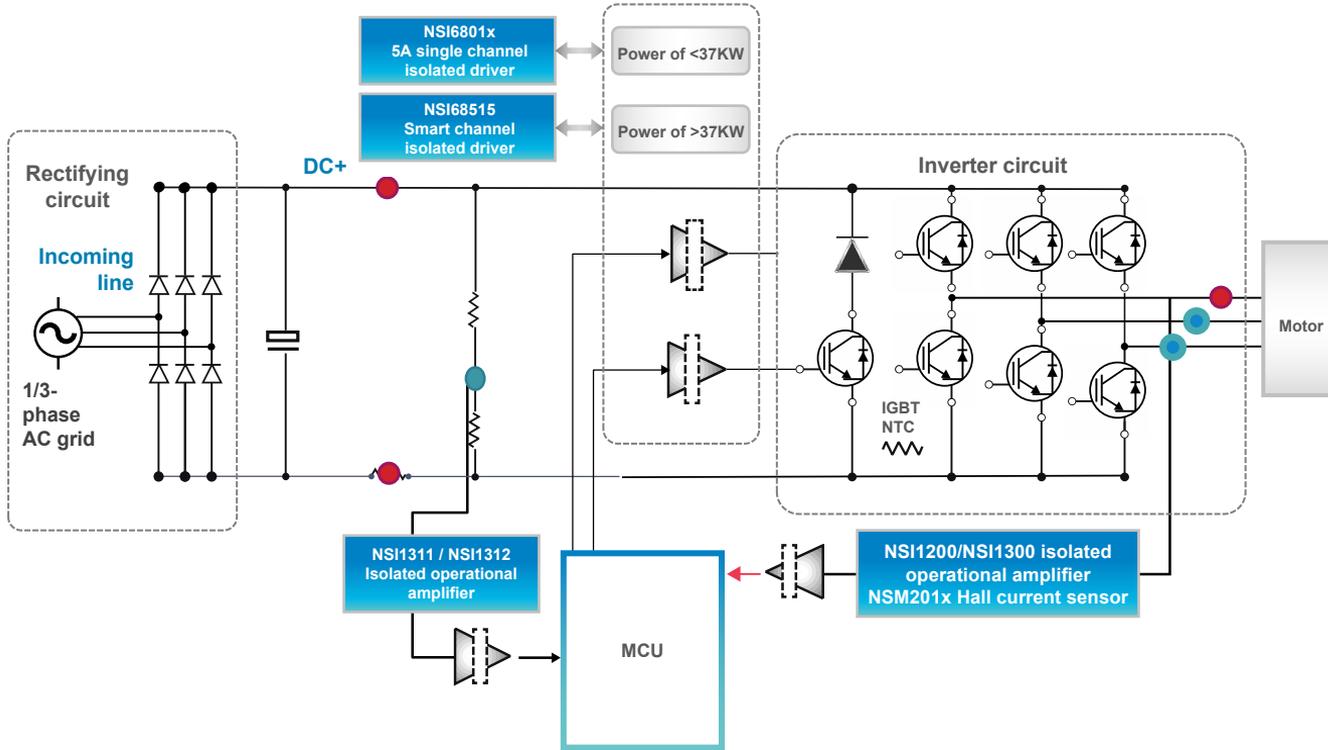
- ▶ Analog input/output AFE
- ▶ ISO digital input and output
- ▶ Back plane board interface: mLVDS, eFuse, Hot swap
- ▶ Industrial field bus interface IC
- ▶ Digital isolation & power isolation
- ▶ Temperature sensor
- ▶ Buck/LDO/Voltage supervisor
- ▶ General operational amplifier

Motor Driver & Industrial Robot

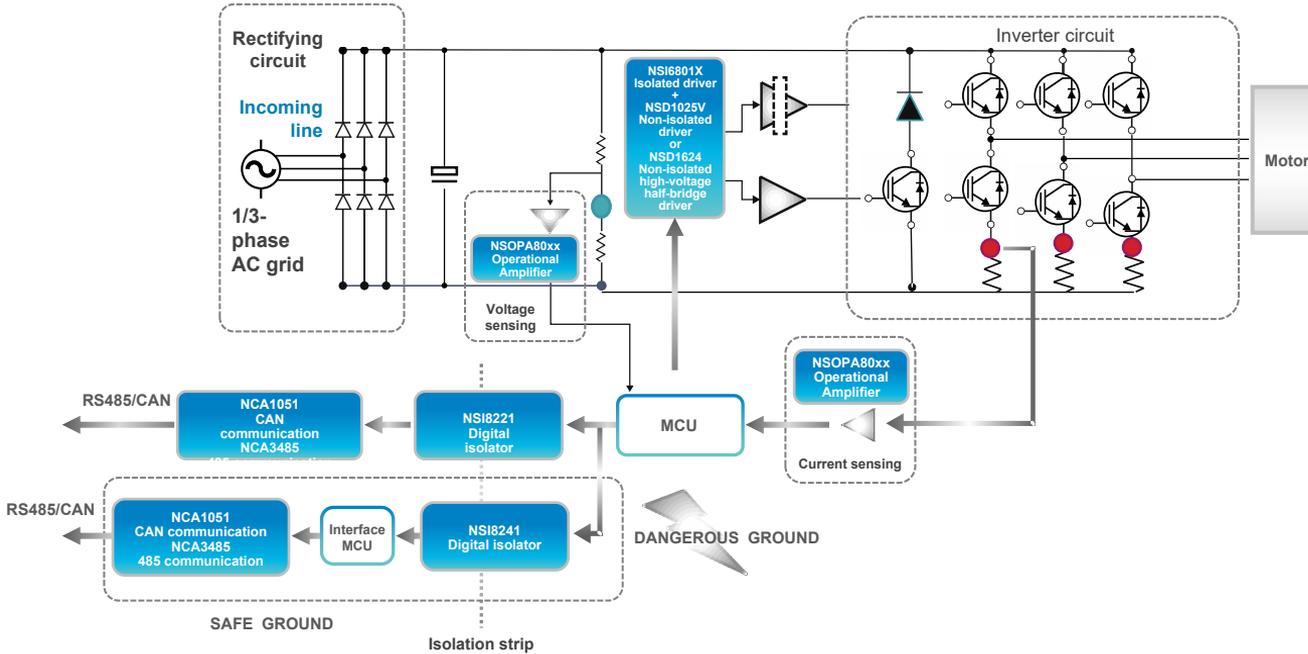
- ▶ IGBT & MOSFET gate driver
- ▶ ISO voltage & current sensing (ISO operational amplifier & ISO ADC)
- ▶ High-speed digital isolator
- ▶ Industrial field bus and encoder bus interface IC
- ▶ General operational amplifier
- ▶ High-precision voltage reference
- ▶ Analog input/output AFE
- ▶ ISO digital input and output
- ▶ Temperature sensor
- ▶ Magnetic encoder sensor & TMR switch
- ▶ Buck/LDO/Voltage supervisor



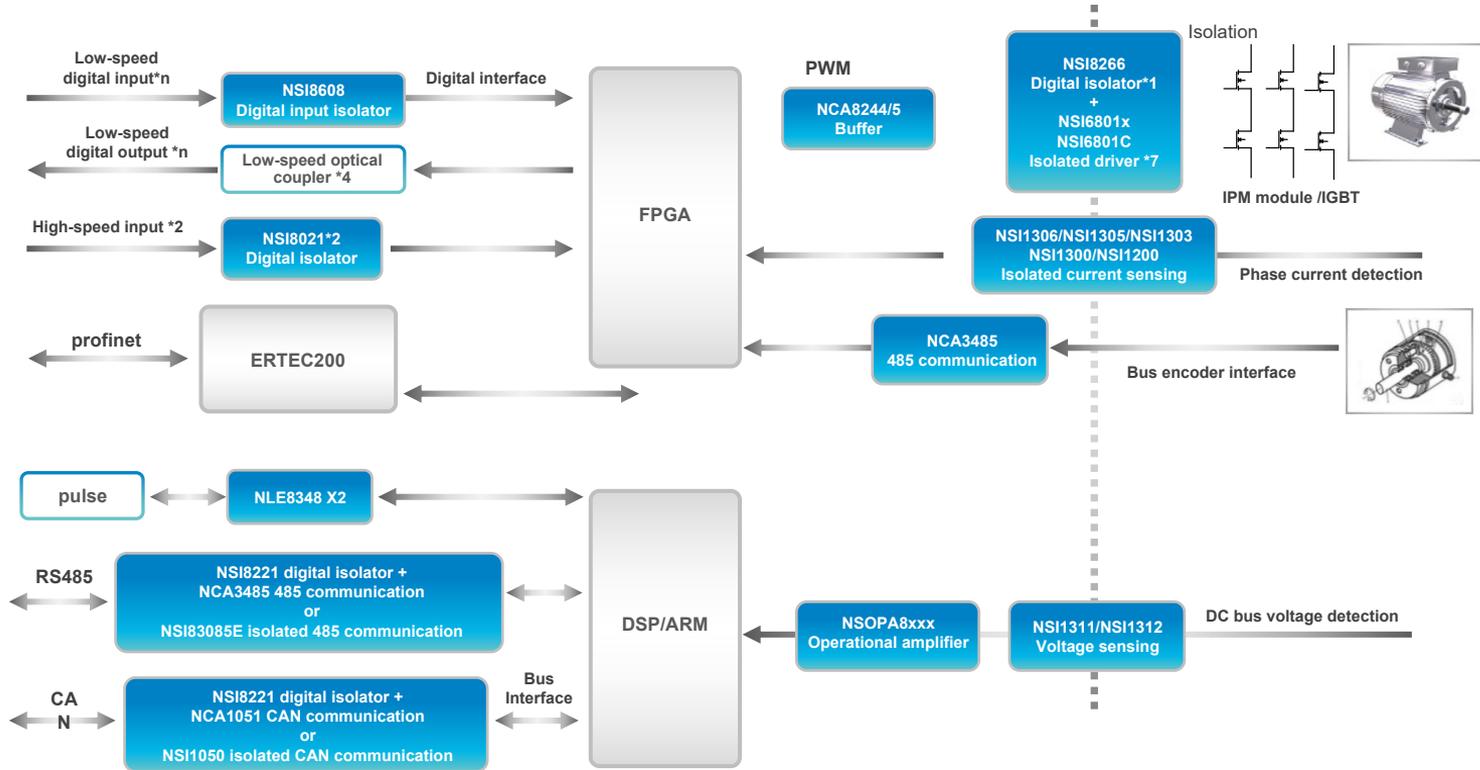
NOVOSENSE Part Number	Product	Application
NSI6801x	5A single channel isolated driver	MOS/IGBT/SiC driver
NSI68515/NSI6651	Smart single channel isolated driver	IGBT/SiC driver
NSI1042 / NSI1050	Isolated CAN	CAN communication
NSI8308x	Isolated 485	485 communication
NSIP83086/ NSIP1042	Isolated 485/CAN + Isolated power supply	485/CAN communication
NSIP88/89xx	Isolated power supply + Digital isolator	Digital signal isolation + Power supply
NCA1042 / NCA1051	CAN transceiver	CAN communication
NCA3485	485 transceiver	485 communication
NLE8348	Ethernet PHY	PHY communication
NSI8608	8-channel high-speed digital input isolator	Multi-channel isolation - high- and low-speed optical coupler replacement
NSAD124x/NSAD114x	Multi-channel ADC	Analog acquisition
NSREF30xx/31xx	High precision voltage reference	Analog acquisition
NSOPA9xxx	40V high voltage operational amplifier	Analog acquisition
NSI8266	6-channel interlock isolator	IPM input isolation
NSI1306 / NSI1305 / NSI1303	Isolated ADC	Isolated current sensing
NSI1300 / NSI1200	Isolated operational amplifier	Isolated current sensing
NSI1311 / NSI1312	Isolated operational amplifier	Isolated voltage sensing
NSM201x	Hall current sensor	Isolated current sensing
NCA8244	PWM Buffer	Current-type driver input buffer
NST1001	Digital NTC	Temperature detection
NSR2845	FLYBACK	Flyback
NSR10320	BUCK	Flyback
NSR31x	LDO	Flyback



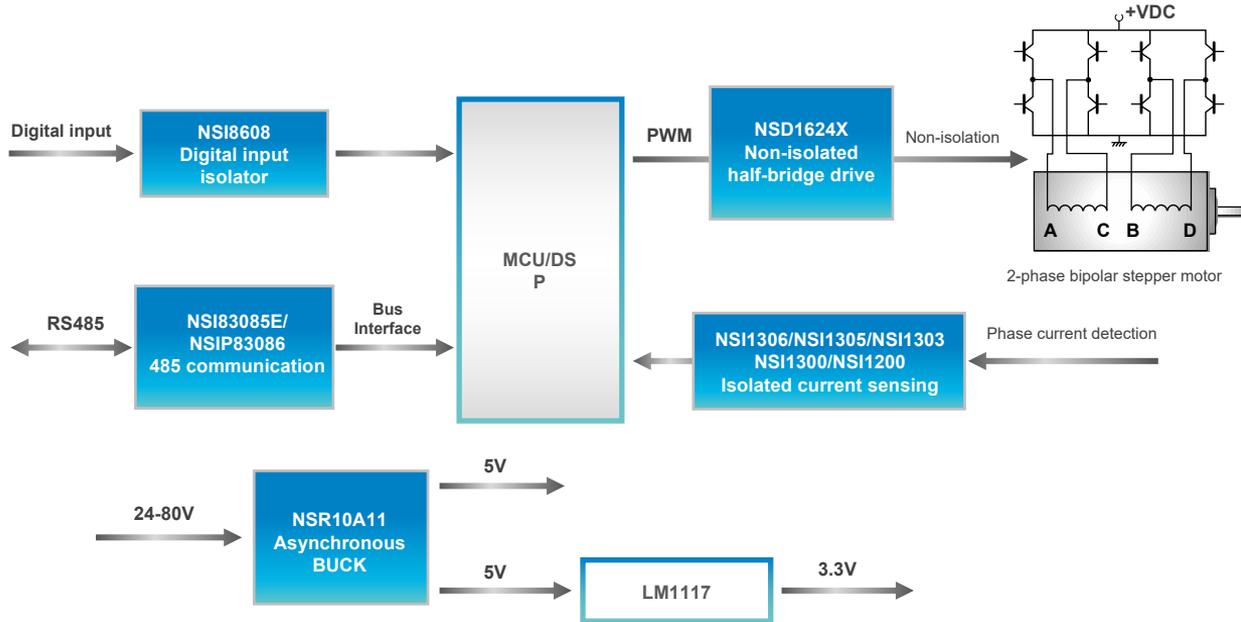
NOVOSENSE Part Number	Product	Application
NSI6801x	5A single channel isolated driver	MOS/IGBT/SiC driver
NSI68515	Smart isolated single channel driver	MOS/IGBT/SiC driver
NSI1311 / NSI1312	Isolated operational amplifier	Isolated voltage sensing
NSI1300 / NSI1200	Isolated operational amplifier	Isolated current sensing
NSM201x	Hall current sensor	Isolated current sensing



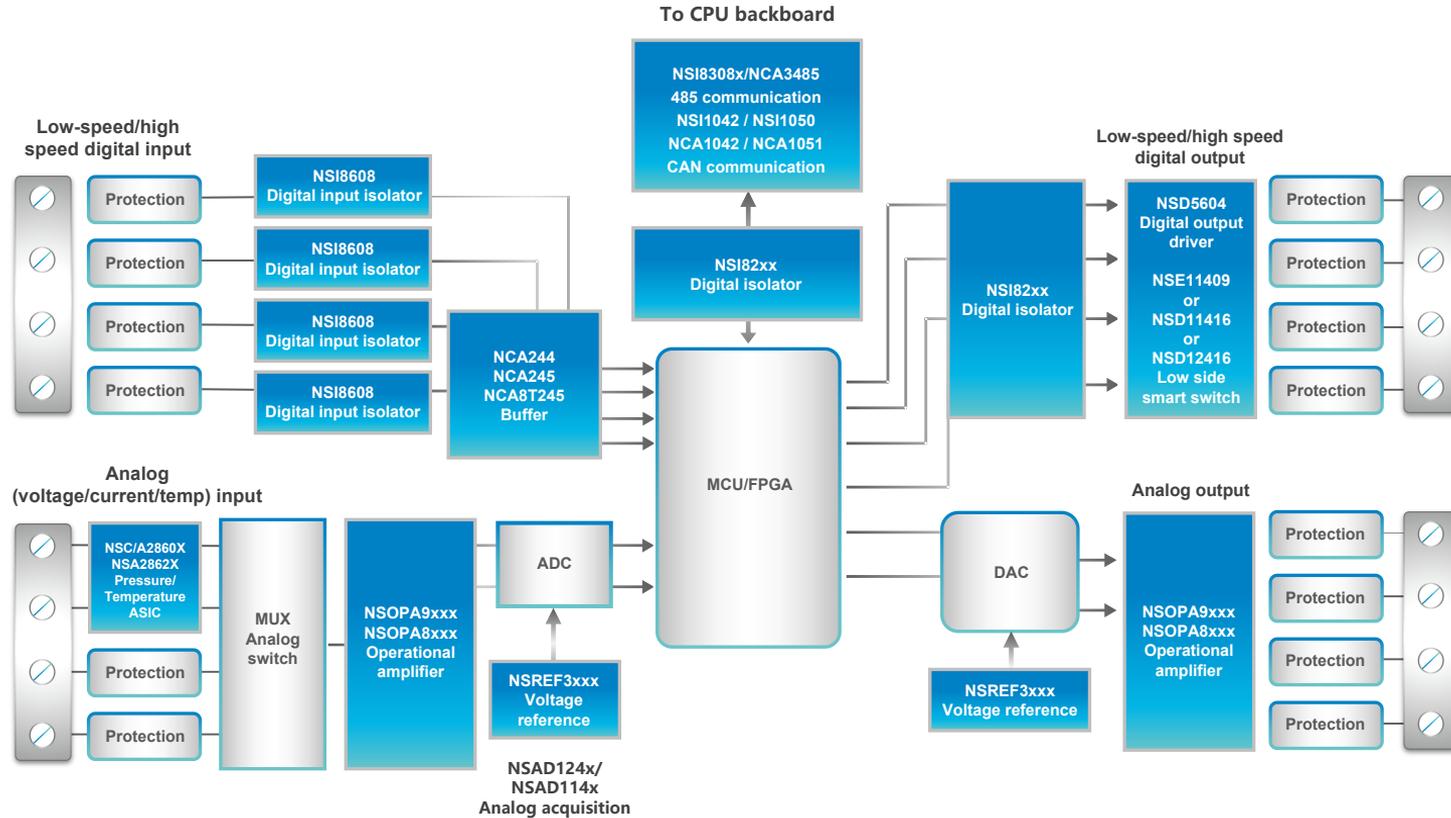
NOVOSENSE Part Number	Product	Application
NSI6801x	5A single channel isolated driver	MOS/IGBT/ SiC driver
NSD1025V	Un-isolated two channel low-side driver	MOSFET/ IGBT driver
NSD1624	Non-isolated high-voltage half-bridge driver	MOSFET/ IGBT driver
NSI8221	Dual-channel digital isolator	Digital isolation
NSI8241	Four-channel digital isolator	Digital isolation
NCA1051	CAN transceiver	CAN communication
NCA3485	485 transceiver	485 communication
NSOPA8xxx	5.5V low voltage operational amplifier	Current/voltage sensing



NOVOSENSE Part Number	Product	Application
NSI6801x	5A single channel isolated driver	MOS/IGBT/SiC driver
NSI68515LC	Isolated single channel driver	MOS/IGBT/SiC driver
NSI8260	Six channel digital isolator	Digital isolation
NSI8266	Six channel digital isolator	Digital isolation
NSI1303 / NSI1305 / NSI1306	Isolated ADC	Isolated current sensing
NSI1200 / NSI1300	Isolated operational amplifier	Isolated current sensing
NSM201x	Hall current sensor	Isolated current sensing
NSI1311 / NSI1312	Isolated operational amplifier	Isolated voltage sensing
NSI1050	Isolated CAN transceiver	CAN communication
NCA1050	CAN transceiver	CAN communication
NSI8221	Dual-channel digital isolator	Digital isolation
NSI83085E / NSI83086E	Isolated half-duplex/full-duplex 485 transceiver	485 communication
NCA3485	485 transceiver	485 communication
NCA8244/NCA8245	Buffer	Motor drive, servo control
NSOPA8xxx	5.5V low voltage operational amplifier	Current/voltage sensing



NOVOSENSE Part Number	Product	Application
NSD1624x	Non-isolated half-bridge drive	MOSFET/ IGBT driver
NSI83085E / NSI83086E	Isolation half-duplex/ full-duplex 485 transceiver	485 communication
NSIP83086	Isolated 485 + Isolated power supply	485/CAN communication
NSI8608	8-channel high-speed digital input isolator	Multi-channel isolation - high- and low-speed optical coupler replacement
NSR10A11	BUCK	Asynchronous BUCK
NSI1303 / NSI1305 / NSI1306	Isolated ADC	Isolated current sensing
NSI1200 / NSI1300	Isolated operational amplifier	Isolated current sensing
NSM2012	Hall current sensor	Isolated current sensing



NOVOSENSE Part Number	Product	Application
NSI1042/NSI1050	Isolated CAN	CAN communication
NSI8308x	Isolated 485	485 communication
NCA1042/NCA1051	CAN transceiver	CAN communication
NCA3485	485 transceiver	485 communication
NSIP83086	Isolated 485 + Isolated power supply	485/CAN communication
NSIP1042	Isolated CAN + Isolated power supply	485/CAN communication
NSIP88/89xx	Isolated power supply + Digital isolator	Digital signal isolation + Power supply
NLE8348	Ethernet PHY	PHY communication
NSI8608	8-channel high-speed digital input isolator	Multi-channel isolation - high- and low-speed optical coupler replacement
NSI82xx	Digital isolator	Digital isolation
NSD5604	4-channel low side driver	High-speed digital driver circuit
NSD11416/NSD12416	40V, 160mΩ smart low side switch	Low side switch
NSE11409	40V, 90mΩ smart low side switch	Low side switch
NSA124x/NSA114x	Multi-channel ADC	Analog acquisition
NSAD124x/NSAD114x	Multi-channel ADC	Analog acquisition
NSA/C2860(X), NSA2862X	Industrial transmitter signal conditioning chip	Pressure/Temperature ASIC
NSR2845	FLYBACK	Flyback
NSR10320	BUCK	Flyback
NSR31x	LDO	Flyback
NSREF30xx/31xx	High precision voltage reference	Analog acquisition
NSOPA9xxx	40V high voltage operational amplifier	Analog acquisition
NSOPA8xxx	5.5V low voltage operational amplifier	Current/voltage sensing

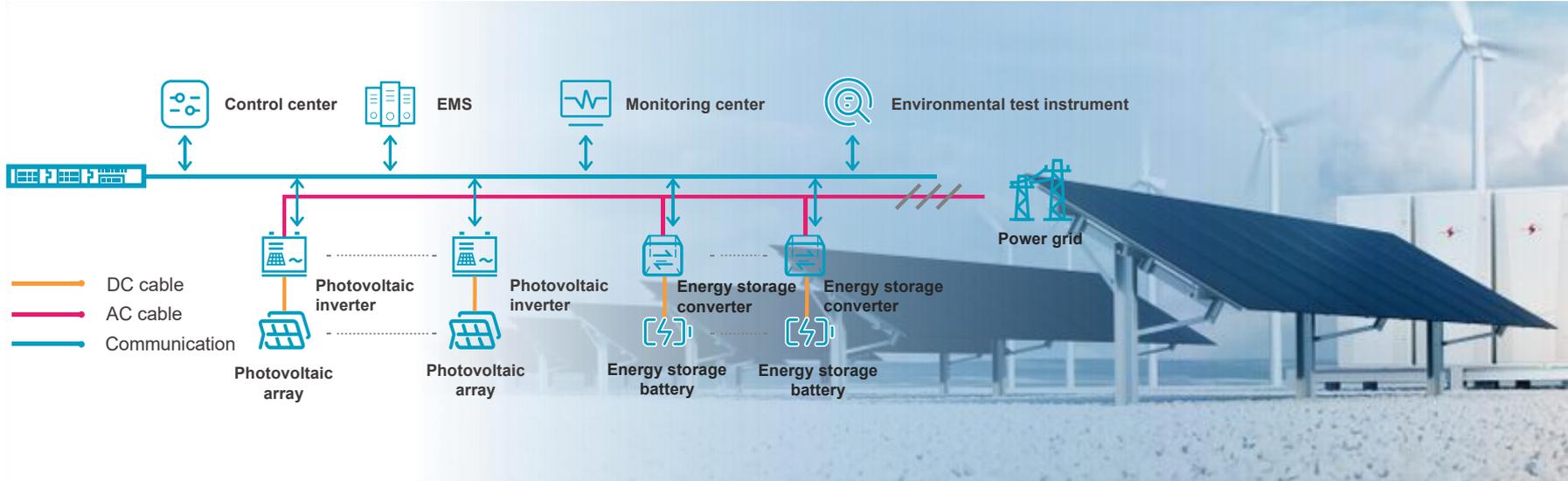
Photovoltaic, Energy Storage, EV Charger Application Solution



NOVOSENSE



NOVOSENSE PV & Energy Storage Solution



Solar Inverter/Energy Storage Converter

- ▶ ISO/Non-ISO driver IC
- ▶ ISO current/Voltage sensing IC, Hall current sensor
- ▶ Digital isolator, ISO interface (w/o ISO power) IC
- ▶ Buck/LDO/power monitoring IC
- ▶ General operational amplifier
- ▶ High-precision voltage reference

PV Array/Optimizer

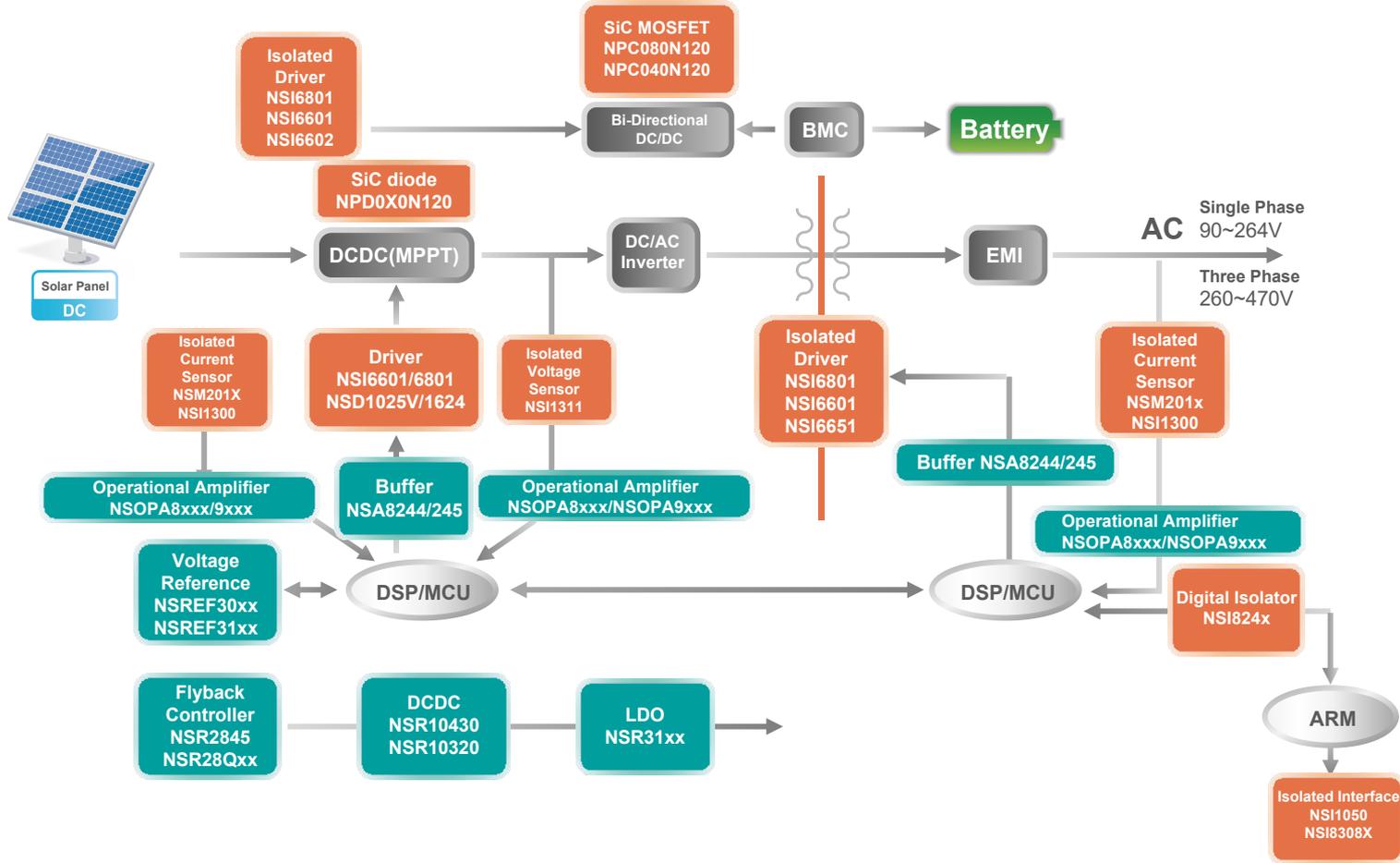
- ▶ ISO current/Voltage sensing IC, Hall current sensor
- ▶ Digital isolator/ISO interface/ISO power/Interface IC
- ▶ Buck/LDO/power monitoring IC
- ▶ General operational amplifier
- ▶ Smart diode
- ▶ Temperature sensor

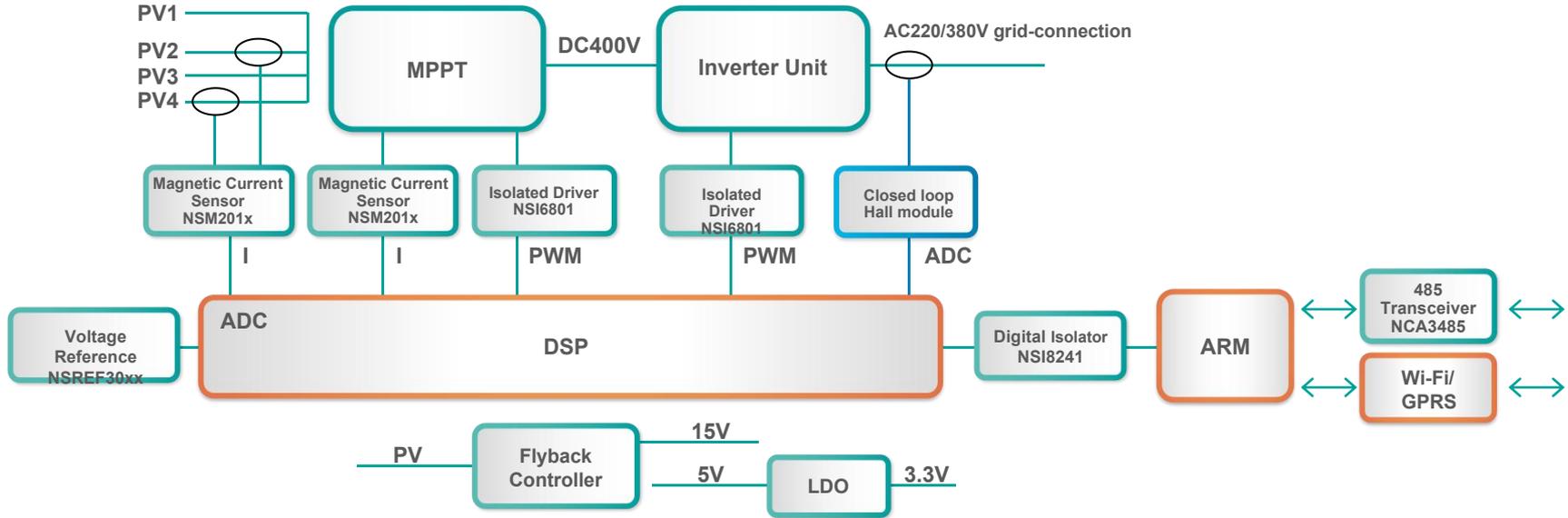
Energy Storage Battery /BMS

- ▶ ISO current/Voltage sensing IC, Hall current sensor
- ▶ Digital isolator/ISO interface/ISO power/Interface IC
- ▶ Buck/LDO/power monitoring IC
- ▶ General operational amplifier
- ▶ High-precision voltage reference
- ▶ Temperature/Humidity sensor and pressure sensor

- ### Isolated IC
- ▶ Driver
 - ▶ Sensing
 - ▶ Digital isolator
 - ▶ Isolated interface

- ### Other Analog IC
- ▶ Power (Flyback/DC)
 - ▶ Voltage reference
 - ▶ Buffer
 - ▶ Amplifier





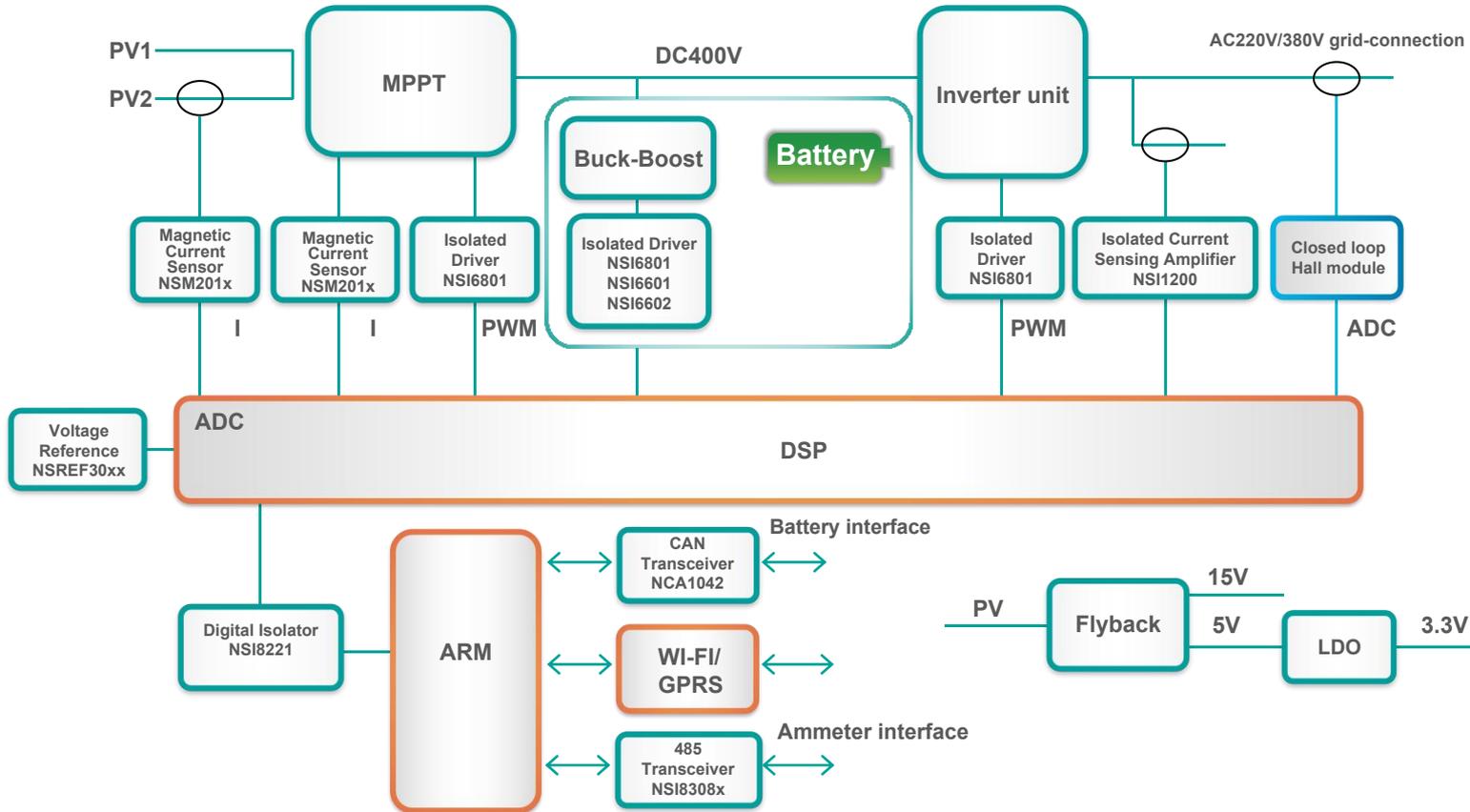
MPPT current sensing and inverting topology

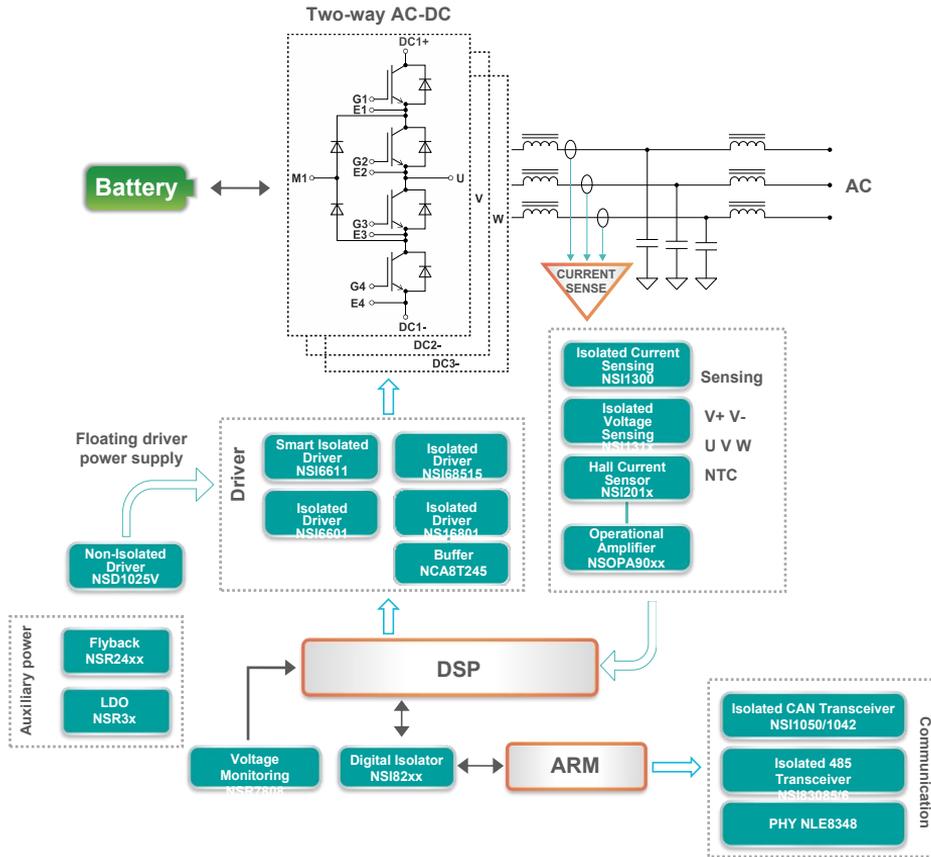
Single-phase single-channel PV grid-connection inverter, outputting single-phase AC 220V

- 1 KW-3.3 KW topology: 1-channel PV input + single-channel boost + Inverter H4 bridge
- 3KW-6KW topology: 2-channel PV input + two-channel boost + Inverter H6 bridge
- 7KW-1.5KW topology: 3-channel PV input + 2-channel boost + Inverter H6 bridge

Multi-channel MPPT+ multi-channel PV boost + three-level inverter, outputting 380V

- 3KW-12KW 2-channel PV+ 2-channel MPPT boost +3 level inverter
- 15KW-24KW 3/4 PV+2-channel MPPT+2-channel Boost +3-level inverter
- 25KW-50KW 6/8PV+3/4 MPPT+Boost+3-level inverter
- 60KW-80KW 12/14PV+6/8MPPT+Boost+3-level inverter

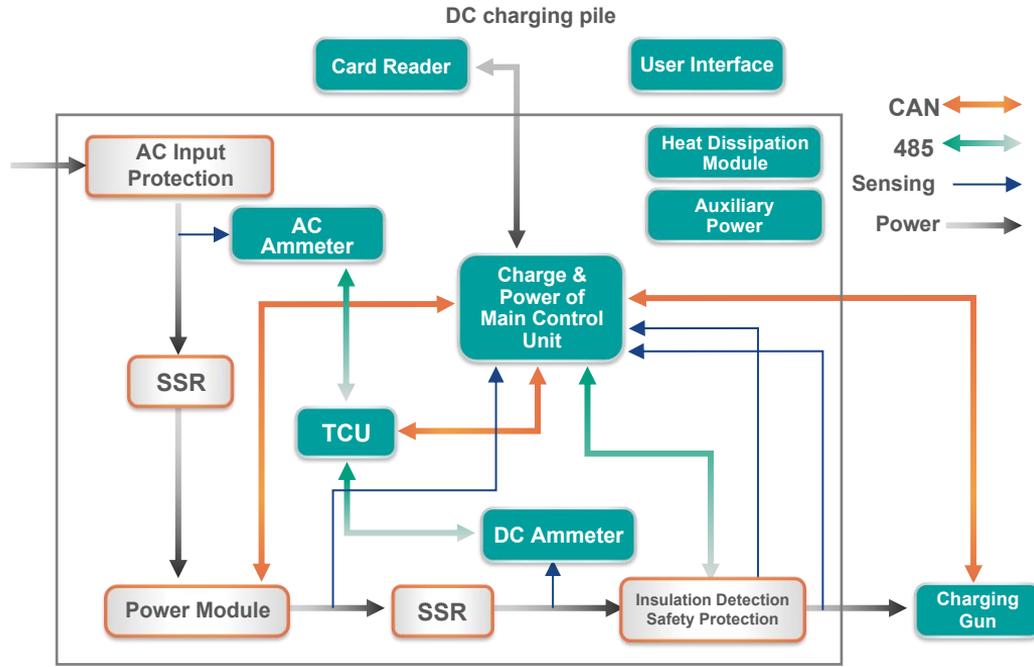




NOVOSENSE Part Number	Product	Application
NSI1200/1300	±250mV isolated current sensing	Voltage, current, temperature sensing
NSI1311/NSI1312	0.1~2.1V isolated voltage sensing	Voltage sensing
NSM201x	Hall current sensor	Current sensing
NSI83085/6	Isolation 485	485 communication network
NSI1050/1042	Isolation CAN	CAN communication network
NSI82xx/NSI82xxC	Digital isolator	485/CAN isolation communication
NSIP88xx/89xx	Isolated power supply	Isolation power supply
NSIP83085/1042	Integrated power supply isolated 485/CAN	485/CAN communication network
NSD1025V	5A dual-channel non-isolated driver	MOS driver or floating driver power supply
NSI6601M	5A isolated single channel driver with Miller Clamp function	IGBT/SiC driver
NSI6801/68011	5A/1A single channel isolated driver	MOS/IGBT/SiC driver
NSI6602/6622	4A isolated half-bridge driver	MOS/IGBT/SiC driver
NSI6611	Single channel smart isolated driver	IGBT/SiC driver
NSR7808	Voltage Monitoring Reset IC	MCU voltage monitoring
NSR31xxx	Low power consumption LDO	Auxiliary power
NSR2240x	Auxiliary power Flyback controller	Auxiliary power
NLE8348	PHY	Ethernet

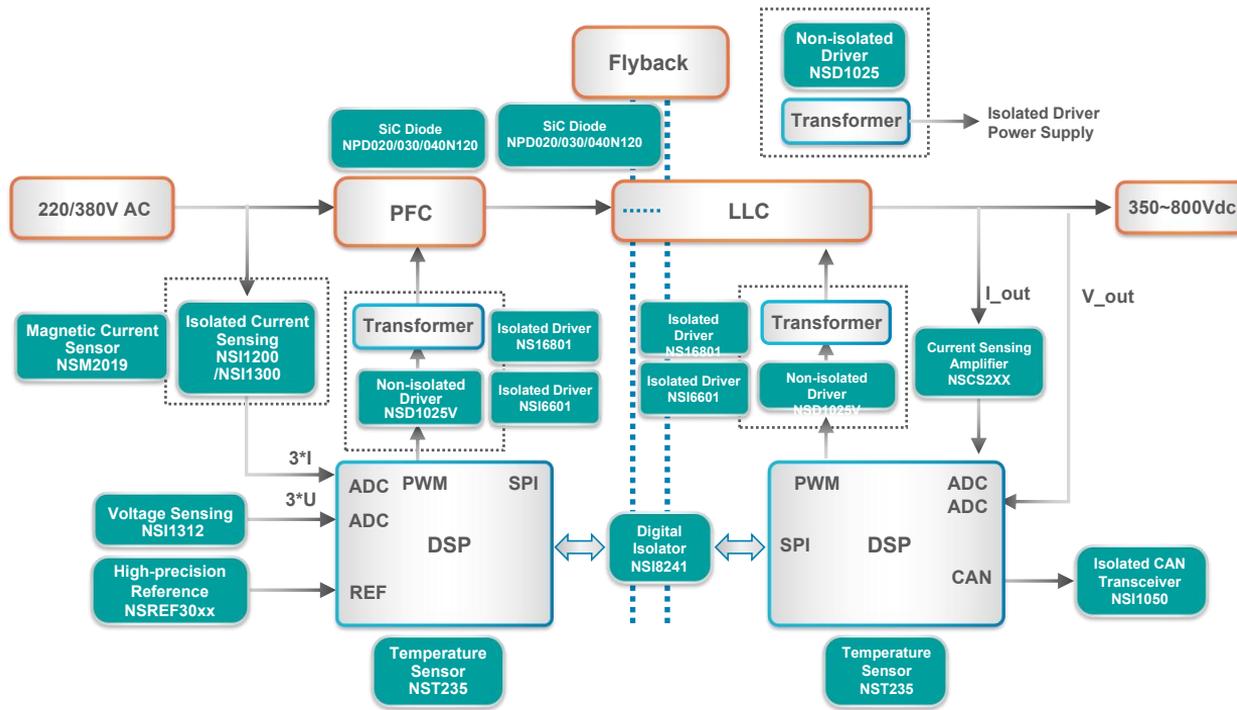
NOVOSENSE

NOVOSENSE EV Charger Solution

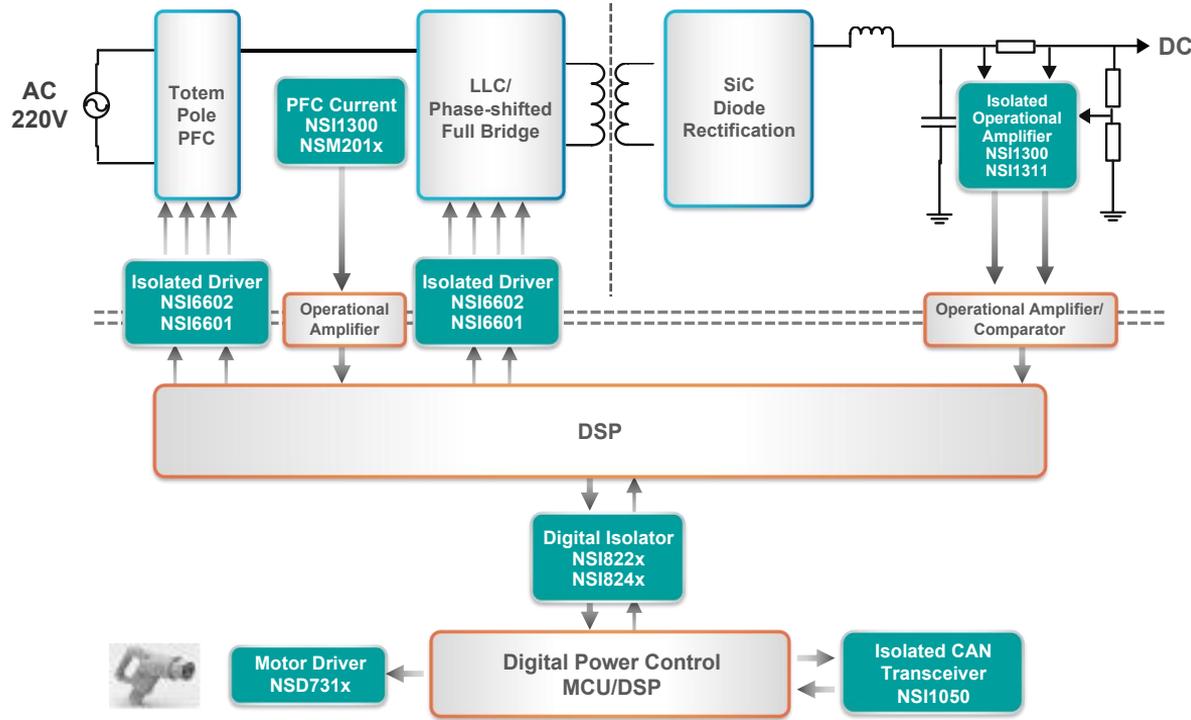


- ▶ Isolation Sensing: inside and outside voltage of DC contactor, output current, insulation, guide voltage, auxiliary power voltage, temperature of positive and negative anodes of the gun, etc. (Single gun)
- ▶ Transaction Control Unit (TCUs): 2 isolated 485, 1 isolated 232, 1 debugging 232, and 2 isolated CAN. (Single gun)
- ▶ Heat dissipation control unit: temperature data collection (four channels), one for humidity data collection (one channel), and fan status data collection (four channels). (Single gun)

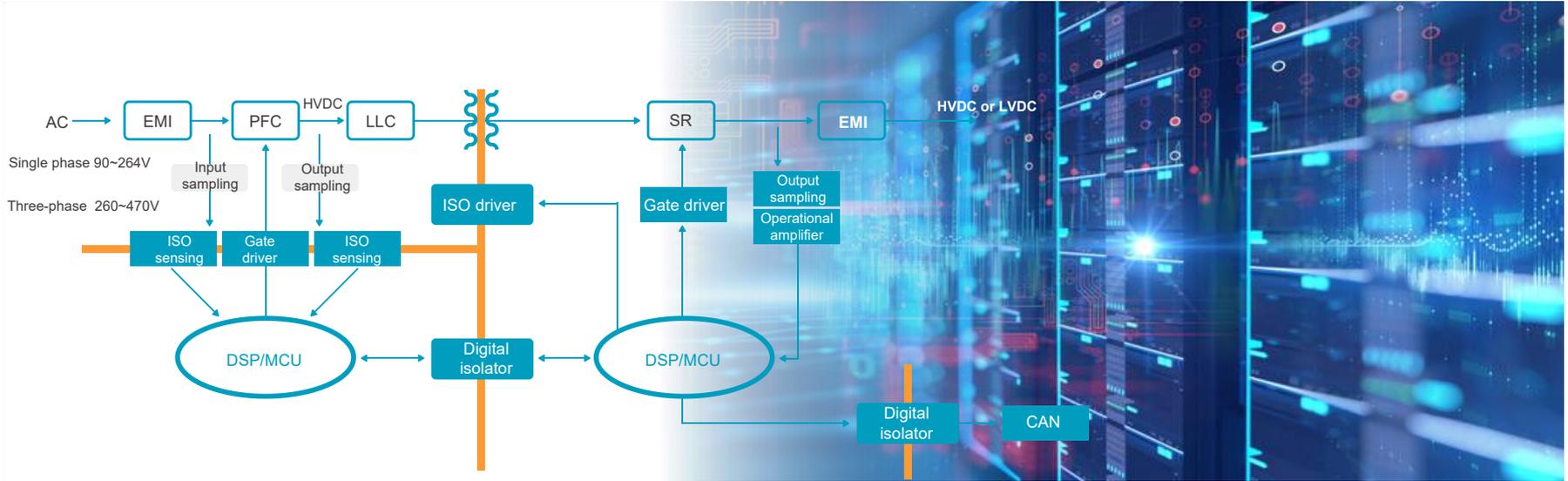
NOVOSENSE Part Number	Product	Application
NSI1200D25/05	± 250mV isolated current sensing	Voltage, current, temperature sensing
NSI1300D25/05	± 250mV isolated current sensing	Voltage, current, temperature sensing
NSI1311/NSI1312	0.1~2.1V isolated voltage sensing	Voltage sensing
NSM201x	Hall current sensor	Current sensing
NSD7312	DC (with brush) motor drive	Electronic lock
NSI82xx/NSI82xxC	Digital isolator	485/CAN isolation communication
NSIP88xx/89xx	Isolated power supply	Isolation power supply
NSIP31	Small cost-effective isolated power supply	Isolation power supply
NCA3485	Non-isolated 485 transceiver	485 communication network
NSI83085/6	Isolated 485 transceiver	485 communication network
NCA1042B	CAN FD transceiver	CAN communication network
NCA1051A	CAN FD transceiver	CAN communication network
NSI1050	Isolated CAN	CAN communication network
NSI1042	Isolated CAN	CAN communication network
NSIP83085	Integrated power supply isolation 485	485 communication network
NSIP1042	Integrated power supply isolation CAN	CAN communication network



NOVOSENSE Part Number	Product	Application
NSI1200D25/05	± 250mV isolated current sensing	Voltage and current sensing
NSI1300D25/05	± 250mV isolated current sensing	Voltage and current sensing
NSI1311/NSI1312	0.1~2.1V isolated voltage sensing	Voltage sensing
NSM201x	Hall current sensor	Current sensing
NSD1025V	5A dual-channel non-isolated driver	MOS driver or floating driver power supply
NSI6601M	5A isolated single channel driver with Miller Clamp	MOS/IGBT/SIC driver
NSI6801/68011	5A/1A single channel isolated driver	MOS/IGBT/SIC driver
NSI6602/6622	4A isolation half-bridge driver	MOS/IGBT/SIC driver
NSI6611	Single channel smart isolated driver	Main power valve driver
NCA824x/854x	Buffer	Current-driven pre-amplifier
NSI82xx	Channel isolator	UART/SPI/CAN isolation communication
NSI1050/1042	Isolated CAN	CAN communication network
NSI82xx/NSI82xxC	Digital isolator	485/CAN communication
NST235	Temperature sensor	Temperature sensing
NSD7312	Brushed DC motor driver	Electronic lock



NOVOSENSE Part Number	Product	Application
NSI82xx	Digital isolator	485/CAN isolation communication
NSI6602	4A isolated half-bridge driver	MOS/IGBT/SiC driver
NSI6601	5A isolated single valve driver	MOS/IGBT/SiC driver
NSD1025V	5A single channel isolated driver	MOS driver or floating driver power supply
NSI1311/NSI1312	0.1~2.1 V isolated voltage sensing	Voltage sensing
NSI1200/NSI1300	± 250mV isolated current sensing	Voltage and current sensing
NSM201x	Hall current sensor	Current sensing
NSI1050	Isolated CAN transceiver	CAN communication network
NSD731x	Brushed DC motor driver	Electronic lock drive



Digital Power: Communication/Server/Secondary power

- ▶ ISO/Non-ISO driver IC
- ▶ ISO current/Voltage sensing IC
Hall current sensor
- ▶ Digital isolator, ISO interface (w/o ISO power) IC
- ▶ Buck/LDO/Power monitoring IC
- ▶ General operational amplifier
- ▶ Current amplifier
- ▶ High-precision voltage reference
- ▶ PWM buffer/Level shifter



Universal interface



Temperature sensor



MEMS microphone ASIC



Current sensor



Humidity sensor



DCDC/LDO



Backlight driver



Position sensor



ISO Interface



Hall sensor



Motor drive



Pressure sensor



Voltage & current sensing



Blood oxygen PPG

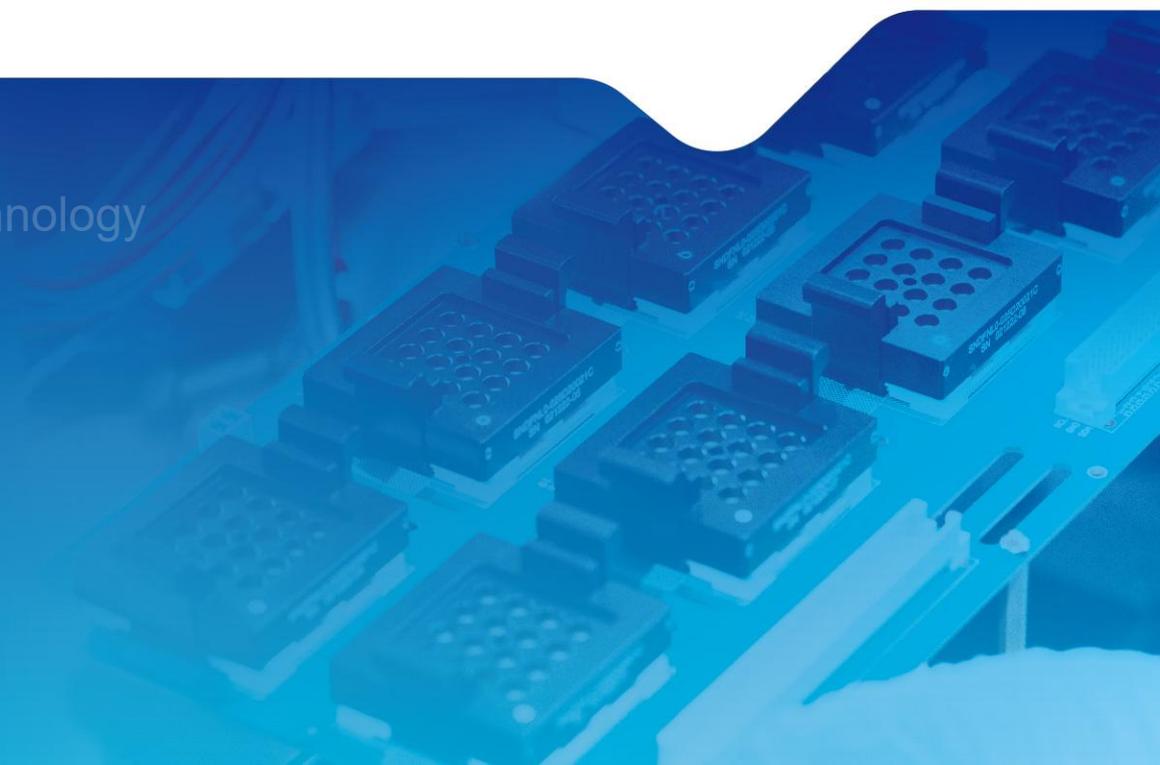
3. Business Portfolio

3-1 Application · Product · Technology

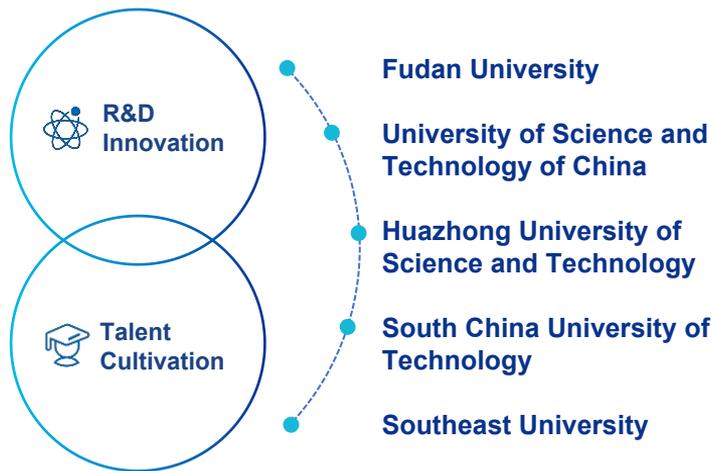
3-2 Product Profile

3-3 System Solution

3-4 Customer · Partner



University-Enterprise Collaboration



Engage in university-enterprise collaboration with universities in areas such as technological innovation and talent development, actively undertake R&D as well as industrialization of cutting-edge technologies, recruit and nurture outstanding talents to contribute to the semiconductor industry.

Association Collaboration



As a member of the China Electric Vehicle 100-People Forum, NOVOSENSE contributes to the development of electric vehicle electrification and intelligence.



As one of the research institutions contributing to the construction of the automotive chip standard system, NOVOSENSE supports the high-quality development of both the chip and automotive industries.



As a council member of the China Power Supply Society, NOVOSENSE continuously expands its products and technologies in the field of power supply, driving advancements in power science and technology, as well as the development of the power supply industry in China.



4. Quality System





Our Flag
Quality Policy



Our Way
Total Quality
Management



Our Goal
Zero Defect



Robust

Implement TQM from product development to manufacturing, and provide customer with robust products

“R&R Policy”

Robust & Reliable ”



Reliable

Continuously improve our products and service, meet customer satisfaction, and make sure NOVOSENSE as the reliable and trusted supplier of customers

Comprehensive quality management system

- ▶ Overall system: ISO9001 + IATF16949 (partially applied)
- ▶ Professional system:
 - ✓ ISO26262 (Functional safety)
 - ✓ ISO/IEC17025 (Lab)
 - ✓ ISO14001 (Environmental Management System)

Quality awareness of all staff

- ▶ Quality policy promotion
- ▶ Quality system and quality tools training
- ▶ Quality KPI assessment
- ▶ Quality improvement project proposal and evaluation

Quality management starts from customer requirements and ends with customer satisfaction

- ▶ Customer requirements:
 - ✓ Customized requirements for product development
 - ✓ Manufacturing and shipping
 - ✓ Agreement review & implementation
 - ✓ Customer feedback, complaints, claims and returns
 - ✓ Customer audit, etc.
- ▶ Customer satisfaction:
 - ✓ Customer satisfaction survey
 - ✓ Customer Complaint Process
 - ✓ Failure analysis process



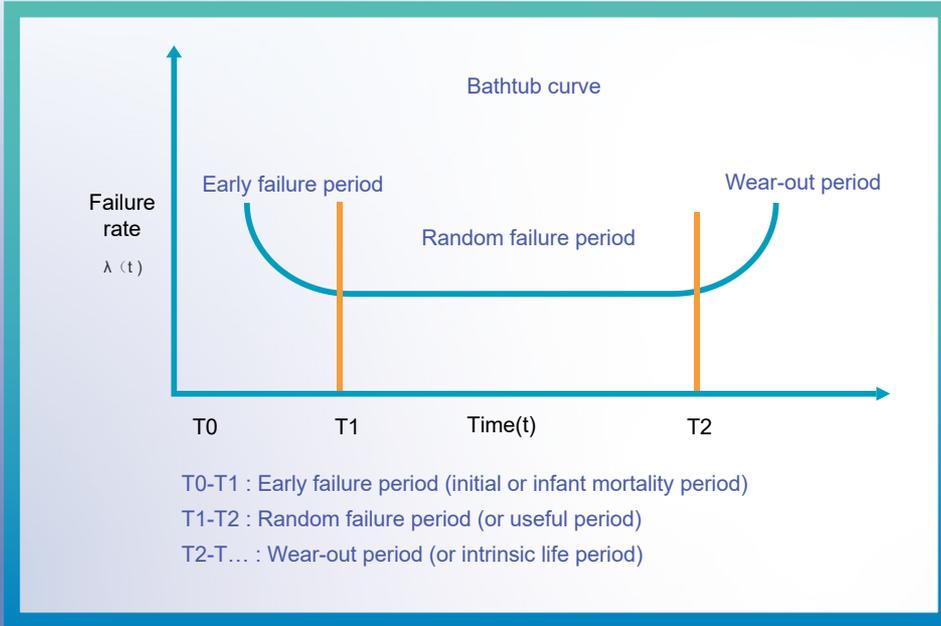
Starting from the R&D stage, quality management runs through the entire product life cycle

Informationization of quality management process

- ▶ Establish the information system of the whole business flow to connect the professional and the comprehensive, to improve the efficiency

Quality assurance from process

- ▶ Supplier management
- ▶ Process decomposition and control
- ▶ Mechanism for process exception handling
- ▶ Regular summary and review



Reliability qualified by AEC-Q is not enough!

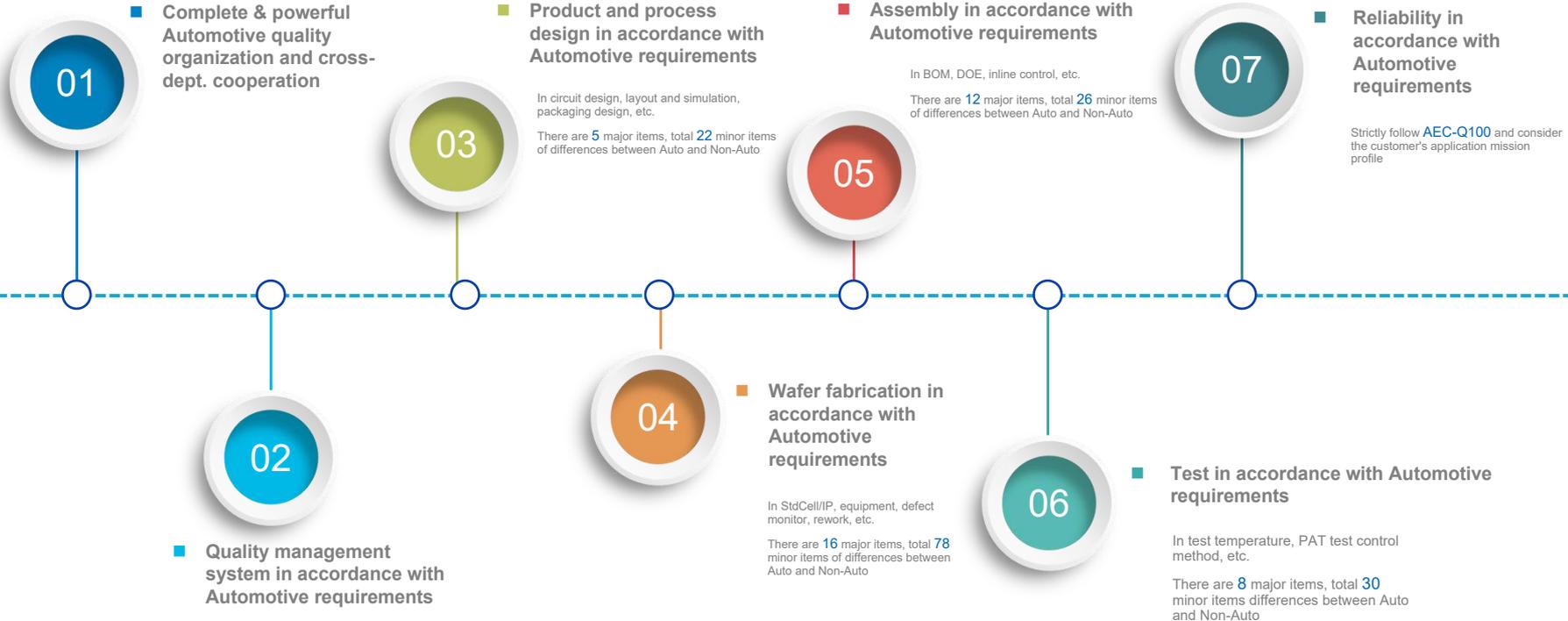


Extrinsic: T_0 - T_1
 Automotive standardized process and manufacturing



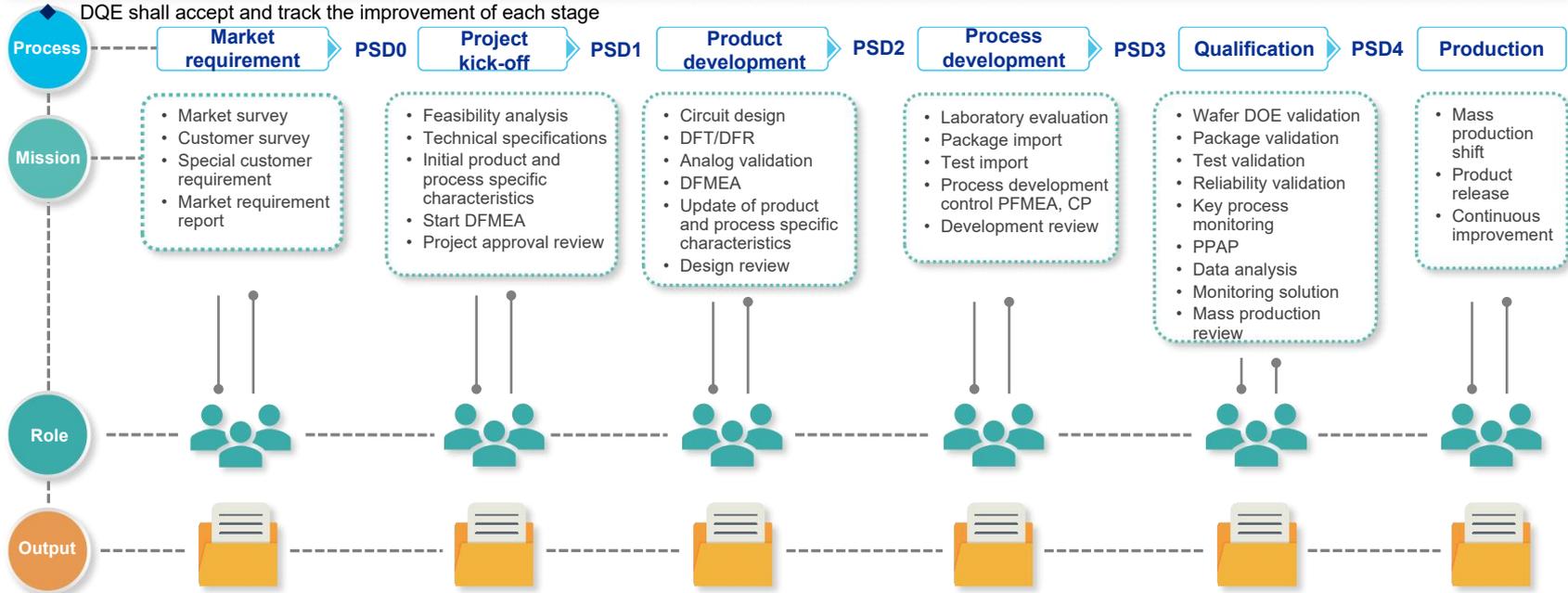
Intrinsic: T_1 ~
 Automotive standardized product & process design

- Identify the differences between Auto and non-Auto quality requirements, and implement in process quality control
- Auto-qualified products are not only subjected to AEC-Q100 reliability certification. The full product life cycle must also be considered extrinsically and intrinsically, so as to meet the Automotive requirements comprehensively



Quality management system in accordance with Automotive requirements

- ◆ The R&D process is managed according to APQP: six stages, five reviews
- ◆ At the end of each phase, a PSD preview shall be performed, only after passing the evaluation can the next stage be proceeded
- ◆ PM shall coordinate the progress and resource allocation of the whole project
- ◆ DQE shall accept and track the improvement of each stage



5. Qualification & Award





2021
Outstanding Supplier of the year from **ASIWEI**



2021
Excellent Strategic Partner from **EMPOWER**



2021
Outstanding Technical Innovation Award from **UAES**



2021
Excellent Supplier of the year from **FinDreams Powertrain (BYD)**



2022
Excellent Supplier of the year from **FinDreams Powertrain (BYD)**



2022
Strategic Supplier of the year from **Deye**



2022
Excellent Cooperation Award of the year from **VMAX**



2022
Concerted Effort Award from **ZTE**



2022
Excellent Strategic Partner from **SAJ**



2022
Delivery Excellence Award from **Growatt**



2023
Win-Win Partnership Award from **HYCET**



2023
Excellent Supplier Recognition from **INOVANCE**





2022
Outstanding Market Performance
Product Award
by isolation half bridge driver **NSI6602**
from **CCID**



2023
Outstanding Technical Innovation
Product Award
by high voltage half bridge gate driver
NSD1624
from **CCID**



2018, 2019, 2020, 2021
Five Innovative IC Design Companies of
China IC Design Achievement Award
from **ASPENCORE**



2020
China Analog
Semi Leap Achievement Award
from **Elecfans**



2023
China Analog
Semi Outstanding Enterprise Award
from **Elecfans**



2022
OBC&DC/DC High-quality
Supplier
from **Gasgoo**



2023
China Electric Drive Industry
Technological Innovation Award
from **NE Times**



2023
Annual Influential Photovoltaic Parts
and Electrical Supporting Brand
from **BJX.com**



2023
The Sensor Entrepreneur of the Year
Award
from **Sensor China**



2023
Gasgoo Award by SoC
NSUC1610
from **Gasgoo**

6. Customer/Partner Case



Xiaomi Watch S2 with NOVOSENSE Temperature Sensor



Xiaomi released its S2 smart watch in December 2022. The watch is equipped with two NOVOSENSE temperature sensors: NST112C-CWLR and NST112D-CWLR.

NOVOSENSE temperature sensor can well meet the needs of smart wearable products in terms of power consumption, volume and performance.

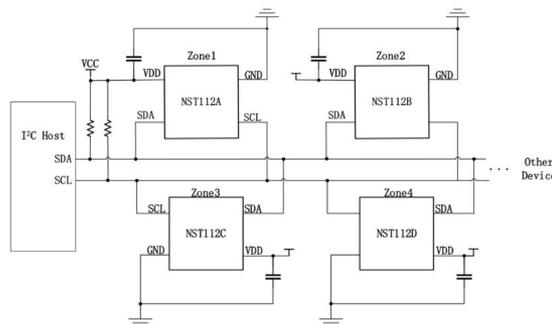
With the rapid development of the Internet of Things, temperature sensors will see a surge in demand for personal health care, smart homes and more.

NOVOSENSE NST112x series

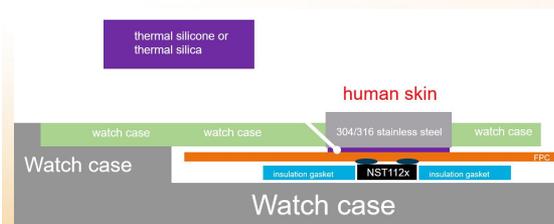
- ✓ High integration: almost no additional circuits are required
- ✓ High linearity: reduce the software linearization workload with high precision
- ✓ High output precision: $\pm 0.1^{\circ}\text{C}$
- ✓ Ultra-low static power consumption:
 - ✓ 2.9 μA @1Hz
 - ✓ 6.5 μA @4Hz
- ✓ Small size: 0.75*0.75mm



NST112x typical application circuit



Heat conduction path from the skin of the wrist to the sensor chip



Xiaotiancai Z9 with NOVOSENSE Temperature Sensor



In May 2023, Xiaotiancai unveiled its latest flagship product, the Z9 smartwatch. This watch is equipped with NOVOSENSE temperature sensor: NST112x-CWLR.

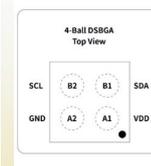
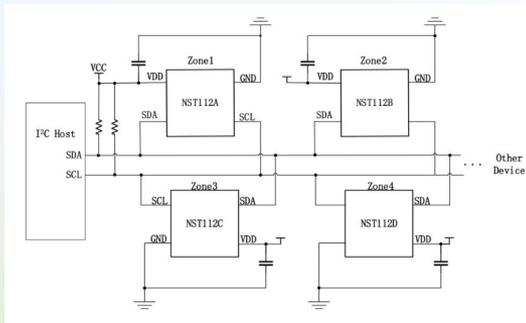
The NST112x series boasts features like a compact form factor, low power consumption, and high accuracy, making it suitable for wearable electronic products with high integration. It is compatible with both I²C and SMBus interfaces, offering programmable alerts and SMBus reset functions, and supporting up to 4 devices on a single bus.

Since its launch, the NST112x series has gained significant popularity in the market and has found applications in various areas such as smartwatches, smart wristbands, AI smart glasses, Bluetooth TWS earphones, and Bluetooth skin-contact temperature measurement.

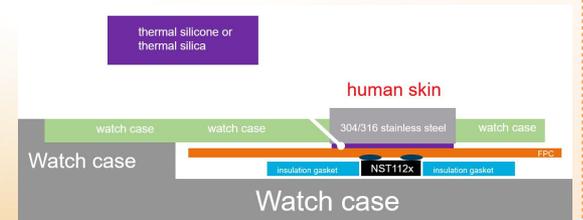
NOVOSENSE high-precision digital temperature sensor NST112x-CWLR offers a contact-based temperature measurement solution

- ✓ Fast temperature response time, low power consumption, short measurement time, high accuracy, and minimal self-heating.
- ✓ At a 4Hz sampling rate, the typical average power consumption is only 5.7μA.
- ✓ The package utilizes a wafer-level chip size package (DSBGA 0.75mmX0.75mm), suitable for SMT process production. It offers strong assembly precision tolerance, making it suitable for large-scale batch production.
- ✓ The response time to reach 63% of the temperature change is 0.1 seconds, and the time to reach body temperature (99%) is 12.73 seconds.

NST112x typical application circuit



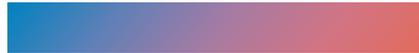
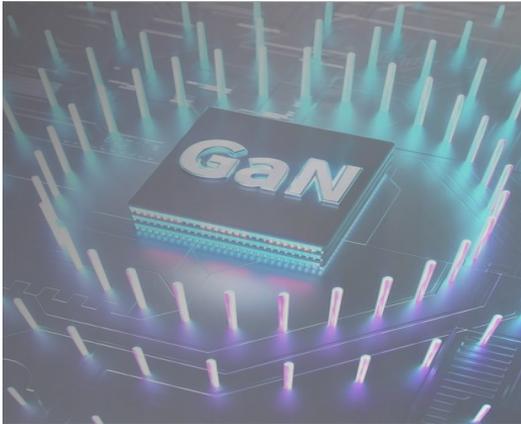
Heat conduction path from the skin of the wrist to the sensor chip



Advanced GaN application of NOVOSENSE + GaNext

The combination of NOVOSENSE isolated driver NSI6602 and GaNext compact cascaded GaN device ensures effective protection of GaN devices under abnormal working conditions, perfectly demonstrates the core value of high efficiency and low loss of GaN in advanced applications, and helps energy conservation, emission reduction and high-efficiency electric energy conversion.

GaNext normalizes the half-bridge GaN driver circuit, and adopts NOVOSENSE NSI6602 isolated driver.



[GaN bi-directional inverter for portable energy storage](#)



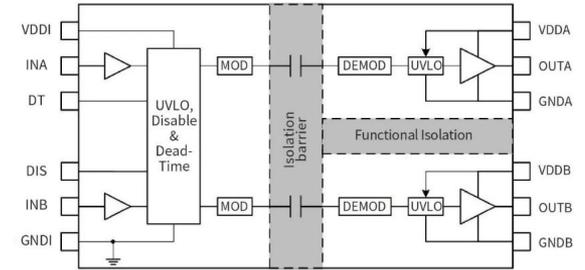
[2.5kW High-efficiency high-power and high-density digital conduction cooling server power supply](#)



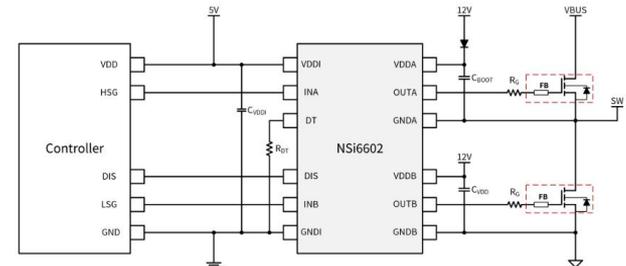
[High-power and high-efficiency LED driving power supply](#)



[3.6kW high-efficiency calculation power supply](#)



Block diagram of NSI6602 Isolated driver system



NSI6602 typical application diagram

NOVOSENSE Works with Blue Yonder to Improve Business Planning Capabilities



- Improve the efficiency of supply chain management processes
- Improve the product quality management system
- Enhance the overall competitiveness of the enterprise

----“Thanks to the Blue Yonder supply planning solution, NOVOSENSE looks at its supply chain planning process from a holistic intercommunication perspective. Balance will be achieved by meeting the objectives of global needs. In the planning scenarios such as material shortage, NOVOSENSE provides coordination and makes accurate decisions quickly in the manufacturing and distribution networks with guiding suggestions, so as to minimize stock shortages, maximize inventory turnover and ultimately achieve the purpose of optimizing customer experience.”

Optimize supply, improve customer service, and increase asset utilization

- Develop a comprehensive supply chain upgrade strategy focusing on supply planning solutions
- Generate more accurate, collaborative, and insightful plans
- Focus on organizational efficiency, business growth and production expansion



**NOVOSENSE
Selects to Improve
Business Planning
Capabilities with
Blue Yonder**



NOVOSENSE assists the formulation of LIN transceiver chip standard, promoting the high-quality development of the automotive chip industry

In the end of May, 2023, the automotive electronics and electromagnetic compatibility sub-committee (SAC/TC114/SC29) of the National Technical Committee of Auto Standardization (hereinafter referred to as "NTCAS") held the "2023 First Series Meeting of the Automotive Chip Standard Research Working Group" in Jinan. Meanwhile, the Standard Drafting Group Meeting on the Technical Requirements and Test Methods for Auto Local Interconnect Network (LIN) Transceiver Chips led by NOVOSENSE was officially held.



NOVOSENSE discussed and communicated with industry experts from more than ten automotive OEM, tier 1 suppliers, and industry organizations on the **control mode and function, electrical characteristics, EMC requirements and environmental reliability, LIN communication protocol and consistency testing of LIN transceiver chips.**

NOVOSENSE participates in the construction of the standard system, adheres to the combination of collaborative innovation and independent research and development, and continues to introduce automotive chips that meet the needs of the market and customers, helping the high-quality development of the chip industry and the automobile industry.

- Taking LIN transceiver chip as an example, there are generally about 15-20 LIN transceiver chips on a vehicle, and as many as 30 LIN chips on a vehicle that uses more controllers.
- LIN, as one of the common vehicle-mounted networks, aims to transmit low-speed data from control devices at the lowest possible cost. LIN bus can eliminate as much wiring as possible and is implemented using a single wire in each node.
- LIN is typically used in rearviews, window lifters, door switches, door locks, car seats, engine sensors, engine cooling fans, wiper controls, rain sensors, light controls, sunroofs, etc.

7. Contact Info.



★ Robust

★ Reliable

★ Keep Learning

★ Persist in Long-term Value



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Company Brochure



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NOVOSENSE Microelectronics



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Product Selection Guide



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Automotive Solution



NOVOSENSE
PV, Storage and EV
Charger Solution



NOVOSENSE
Industrial Control
Solution



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NOVOSENSE Microelectronics



NOVOSENSE Microelectronics



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Reliability Items	Test Condition	Reference Standard	Sample Quantities(ea)/lot	Lot Quantities
Precondition	MSL Level perform in PC stress per JA113 Check point: SAT&FT test	AEC-Q100	231	3lots
HAST	130°C/85%RH/33.3/230psia/kPa, Vccmax End point: 96hrs	AEC-Q100	77	3lots
UHAST	130°C/85%RH/33.3/230psia/kPa End point: 96hrs	AEC-Q100	77	3lots
TC	-65°C to+150°C for 500 cycles End point: 250/500 cycles	AEC-Q100	77	3lots
Solderability	>95% lead coverage	AEC-Q100	15	1lot
HTSL	+150°C Ta for 1000 hours End point: 500/1000hrs	AEC-Q100	45	1lot
HTOL	+125°C Ta for 1000 hours, Vccmax End point: 168/500/1000hrs	AEC-Q100	77	3lots
LTOL(optional)	-40°C Ta for 1000 hours, Vccmax End point: 168/500/1000hrs	AEC-Q100	32	1lot
ELFR	+125°C Ta for 1000 hours, Vccmax End point: 48hrs	AEC-Q100	800	3lots
ESD	Human Body Model Charged Device Model	AEC-Q100-002 AEC-Q100-011	3/split	1lot
Latch-up	AEC-Q100-004	AEC-Q100-004	3/split	1lot