New Product Seminar-2024

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LOGO Significance

Brückewell

Bruckewell comes from the German "Brücke" , meaning "bridge" and English "well"

To become synonymous with technical innovation and timely marketing partner

The green leaf symbol reflects taking an active part in health & safety and protecting the environment as our responsibility

Our Products

01

Diode
Silicon Diodes

Description:

Standard/ Fast/ Schottky

TVS/ Zener/ ESD Protector

02

Transistor
Silicon MOSFET/IGBT

Description:

Unipolar

20~300V N/P MOSFET

600V up HV MOSFET

Small Signal MOSFET

Bipolar

Low Losses, 650-1200V IGBT

Automotive Grade IGBT

03

Wide Band Gap
Silicon Carbide Gallium Nitride

Description:

SiC-SiC, GaN-Si, GaN-Sapphire

SiC Schottky Diode

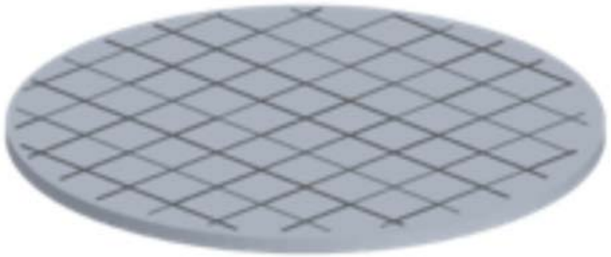
SiC MOSFET

SiC series Module

650V GaN-S HEMT

650V GaN-S **IC**

Supplier Chain Control



Semiconductor Wafer Process

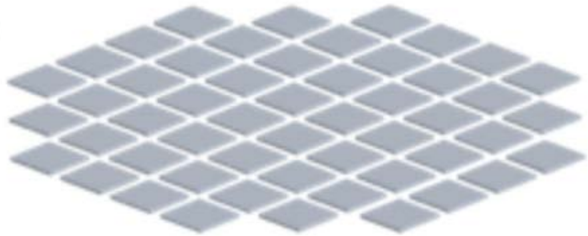
Taiwan/ China

POWERCHIP (Taiwan)

MOSEL / EPISIL(Taiwan)

Vanguard Semi (Taiwan)

GTA (China)

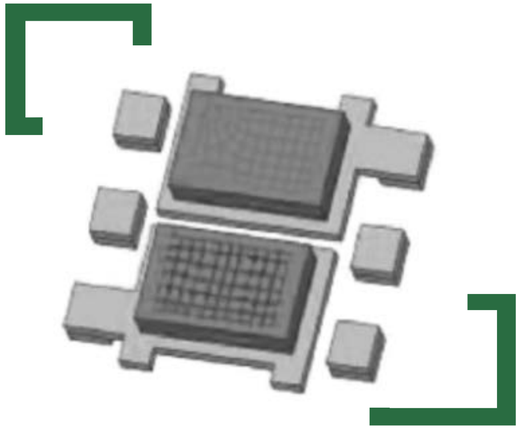


Wafer Testing and dicing

Taiwan/ China

Bruckewell (Taiwan)

Micro Silicon (MSEC) (Taiwan)



Assembly & Package

Taiwan, China/ ASEAM

gEM (China)

HUATIAN (China)

FENGHUA (China)

Cirtek (Philippines)

AIC (Malaysia)

Quality Compliance

RoHS Compliant

Halogen Free

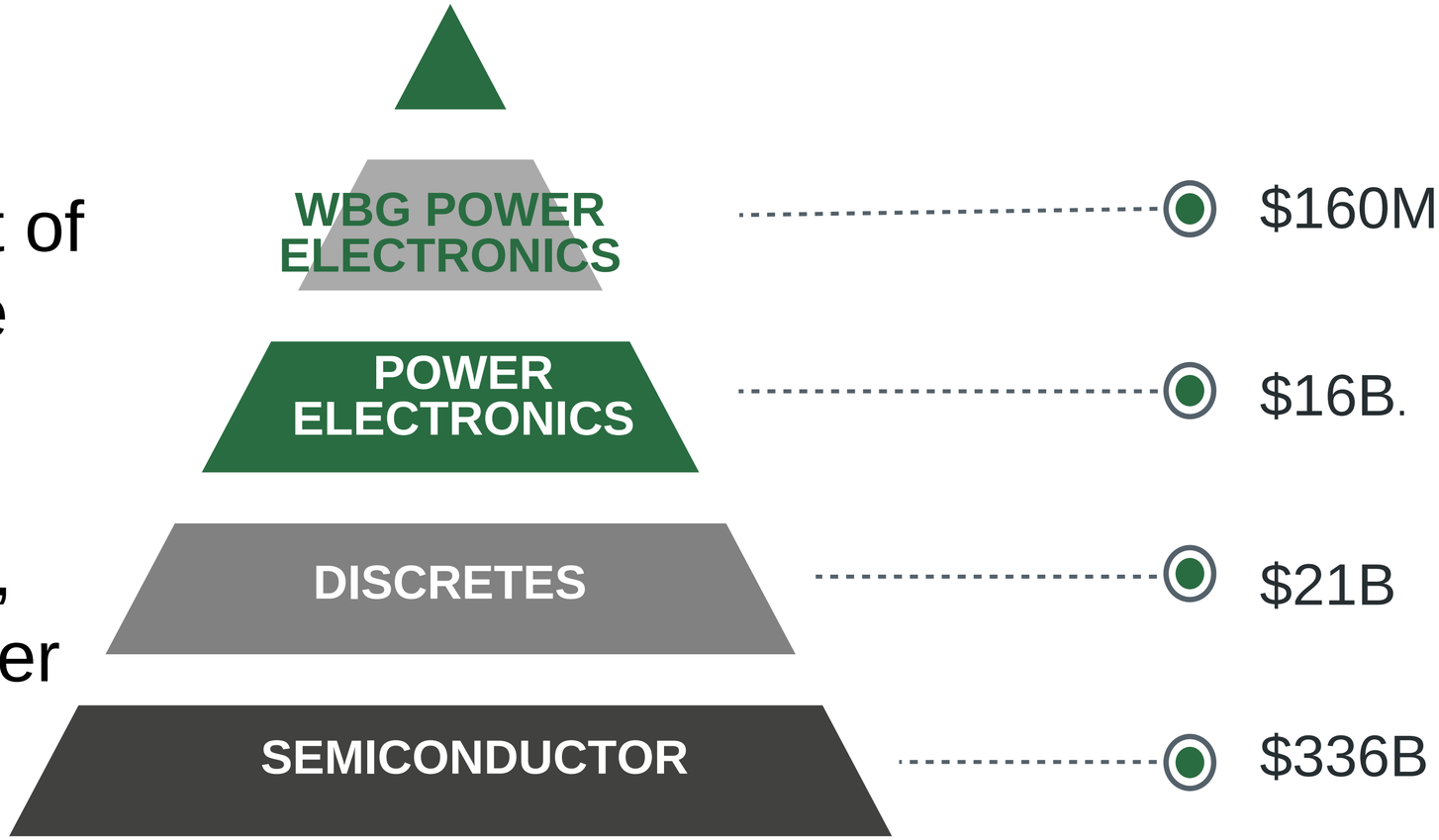
IMDS for Automotive

AEC-Q101 Qualified Available

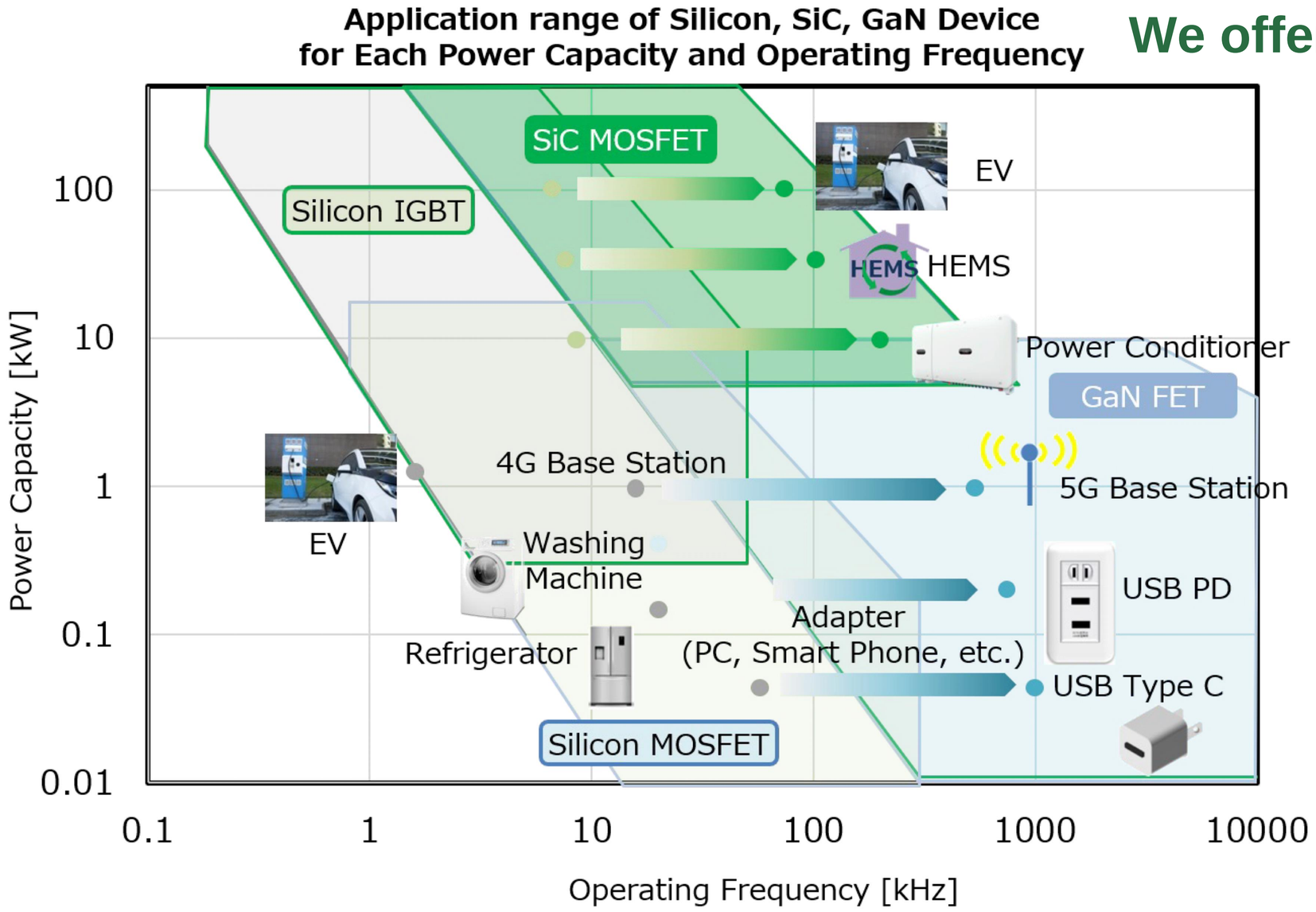
Market Analysis

Global Market Scale by Technology

WBG share is small but increasing.
WBG PE is a small segment of PE, PE is a very small share of total semiconductors.
Growth of WBG devices is driven by smaller packaging, high power density and higher efficiency in Auto and industrial.



What we offer for different Freq. marketing

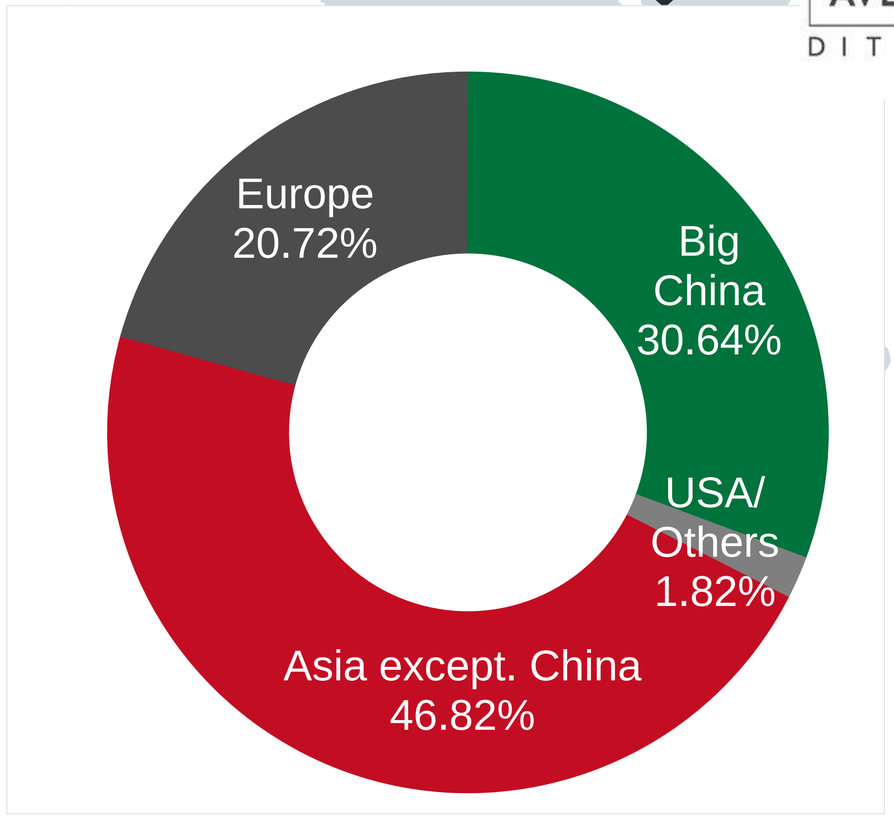


We offer Si/ SiC/ GaN MOSFETs

SiC Device Has Advantages in Motor Drives and Other High-Voltage / High-Current Applications
As power generation systems, HEMS for electric homes, and electric vehicles (EV).

GaN Device Has Advantages in Switching Power Supplies and Other Compact / High-Frequency Applications
As 5G, USB C,
USB Power Delivery (USB-PD)

Sales by regional and key customers



USA

Europe

China

Korea

Japan

Headquarter Taiwan

ASEAN

Key customers

Key EMS

Revenue by key application 銷售與應用分佈-2023

($USD)

Electronics

20%

AC-DC/ DC-DC power supply

Battery power supply

Switched-mode power supply

Home appliance/ multimedia

LED Lighting

Communication

14%

PLC, Power Line Communication

ProE, Power over Ethernet

IP Cam, Internet protocol

Telecommunication

Automotive

51%

Automotive/ EV

Infotainment system

Car Headlight

Industrial

15%

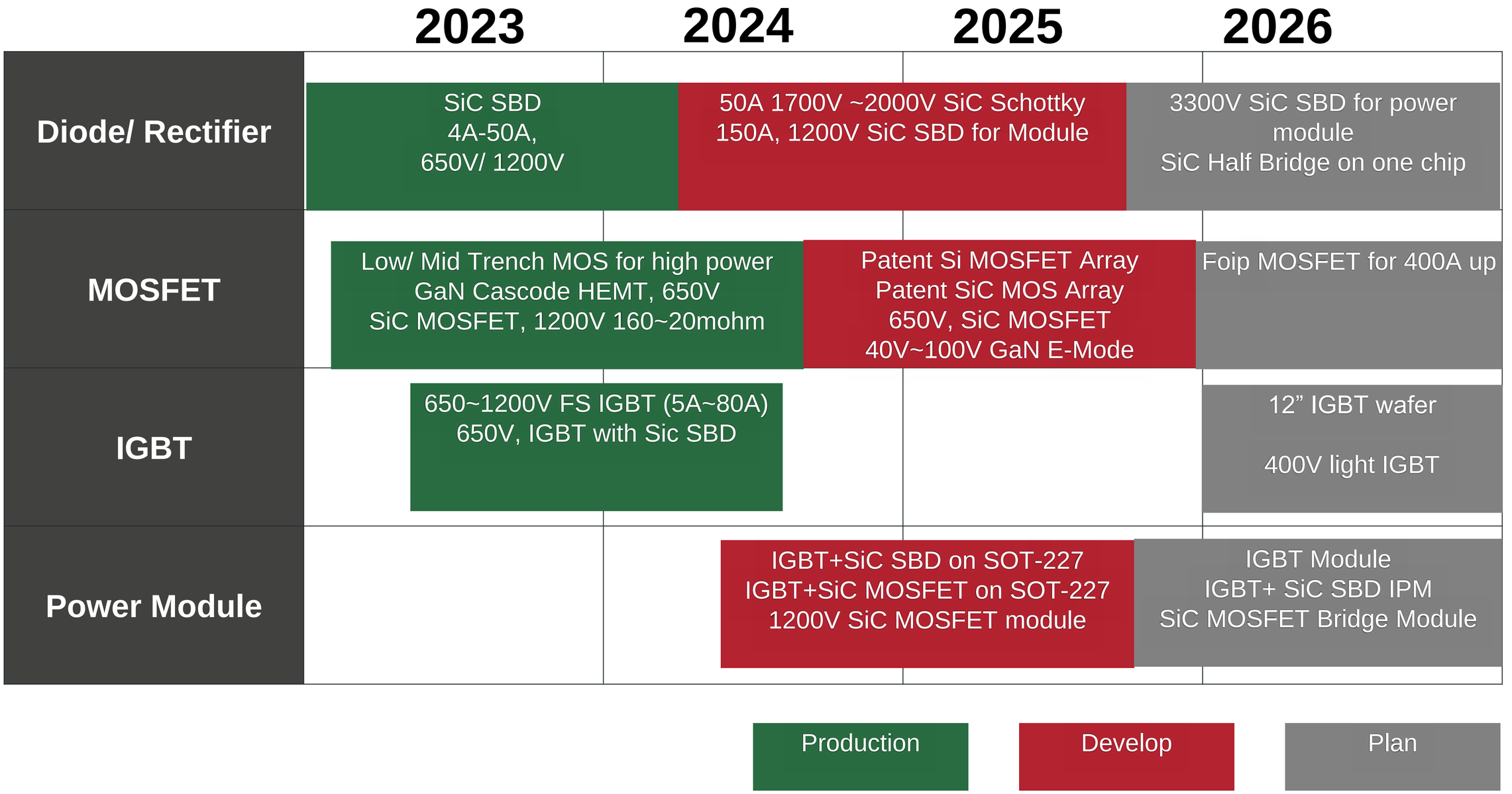
Power Tool

Industrial server

Robot

Solar Application

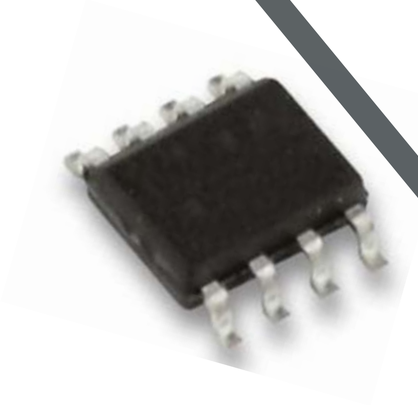
New Product Roadmap



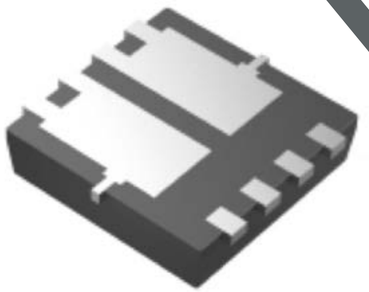
MOSFET for the electric toothbrush

Smaller-DFN 3X3 Dual, Better-Rthjc low, RDS(on) low

SOT-23 X 2 for N-Ch and P-Ch



N-Ch + P-Ch in SO-8



N-Ch + P-Ch in DFN 3X3

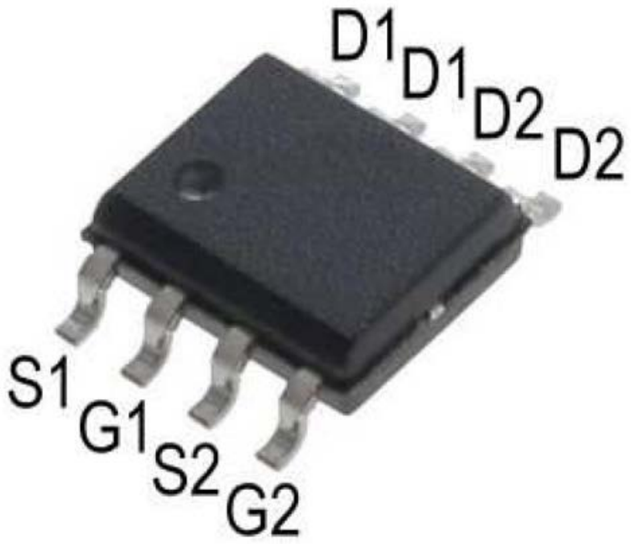
MSHM20C04D

60V Nch+P-Ch fan motors, AMI meters

The MSQ60C04D is a powerful dual Nch + Pch MOSFET designed to handle voltages up to 60V, making it suitable for 24V input systems such as factory automation equipment and base station motors. Also used in AMI smart meter applications

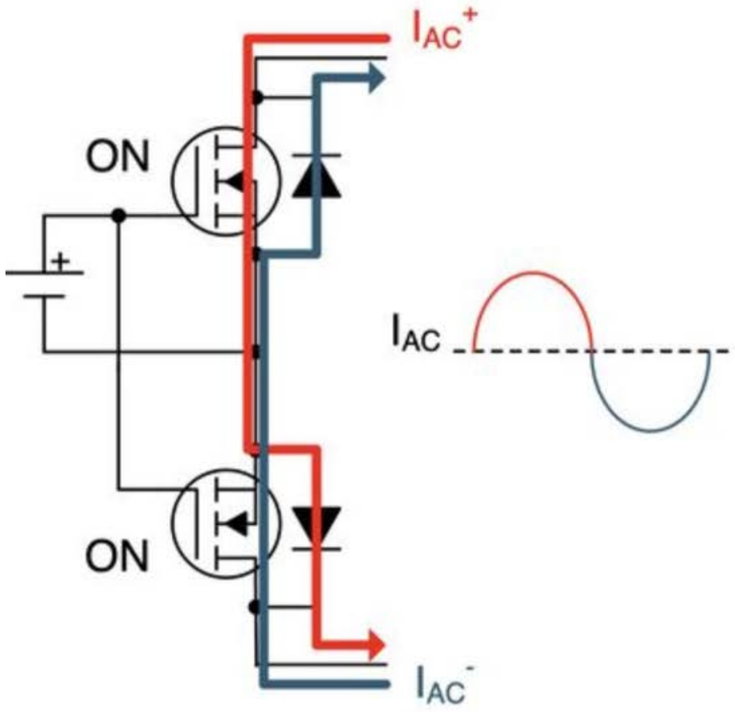
Its Nch MOSFET is 39mohm, Pch MOSFET is 72mohm,

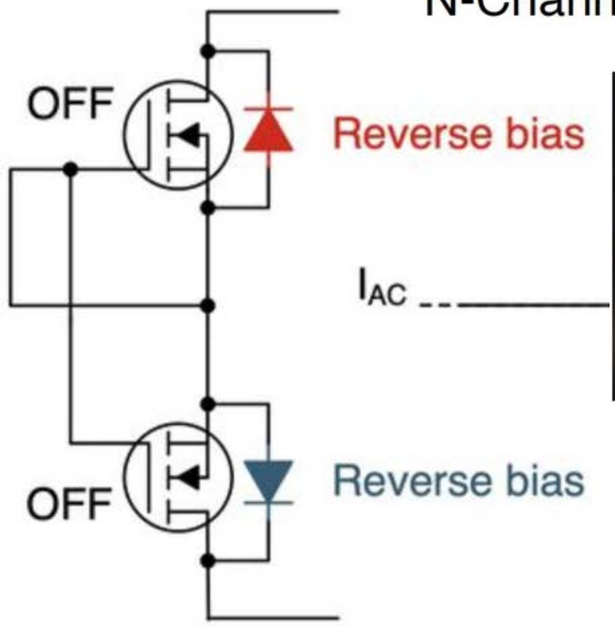
Compared with conventional products, on-resistance is reduced by 50%.



Small 350V MOSFET for SSR application （**Solid State Relay，SSR**）

350V, 15ohm N-Ch MOS SOT-23
Design in for the SSR

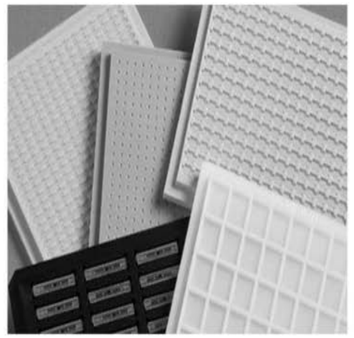




Brückewell

MS350N1500

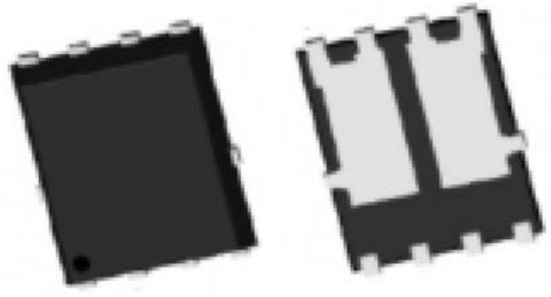
N-Channel 350-V (D-S) MOSFET



Offer
SOT-23 package
KGD by Tray, on Tape
Chip on Reel

Si-MOS, Transistor, SiC Diode/MOS For EV Charging Station

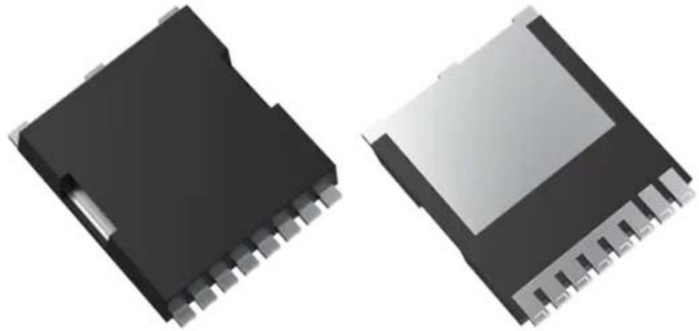
The 60V Dual N-Ch MOS with Low RDS(on) is for **the plug-in of electric cars**
The 650V/ 1200V SiC Diode/ MOSFET to support the **electric vehicle supply equipment, EVSE**



Voltage levels in the automotive sector

Pro- taction class	Name	Upper limit AC Veff	Upper limit DC V	Applicable standard	Other common names	Contact protection	Remarks
III	Functional Extra Low Voltage	25	60	No research result	FELV		No special protection to ensure safe isolation from other electric circuits with higher voltages
III	PELV – Protective Extra Low voltage	25	60	IEC 50178	PELV	without	If equipotential bonding is required between the electric circuits to prevent sparking e.g. in boiler plants with explosi- ve gases as well as for HiFi systems
III	Safety Extra Low voltage	25	60	IEC 61140	SELV	without	Compared to extra-low voltage, special protection required against electric circuits with higher voltages, e.g. safety transformers
III	Extra- Low voltage	25	60	IEC 60449	ELV	without	

TOLL Package Features



TOLL: Transistor Outline Leadless
Dimensions:10 x 11 x 2.3 mm
Thermal Resistance (RthJC):Max < 0.4 °C/W
Size Efficiency:
30% smaller footprint compared to traditional D2PAK products
Height: 2.3 mm, which is half the height of comparable designs
The TOLL package accommodates a range of devices, including MOSFETs, SiC MOSFETs, GaN HEMTs, and IGBTs, highlighting its versatility and readiness for mass production. Additionally, Kelvin source connections enhance the ability for reliable high-speed switching.

- **100V:** MSO100N019IN, 330A, RDS(on) 1.6 mΩ
- **150V:** MSO150N045IN, 188A, RDS(on) 3.7 mΩ
- **600V:** MSO600N480, 48A, RDS(on) 48 mΩ

If TOLL package, better, and same price with DFN 8X8, D2PAK...

High Power MOSFETs
Application

Silicon high power density MOS-40V

BVDSS	RDSON	ID	Wire bonding Tech.
MSH40N065(AU)	5.6mohm	75A	Al Ribbon
MSH40N032(AU)	2.5mohm	90A	Al Ribbon
MSH40N020(AU)	1.5mohm	160A	Al Ribbon
MSH40N01(AU)	1.4mohm	180A	Cu Clip
MSH40N02(AU)	0.8mohm	250A	Cu Clip+Bump

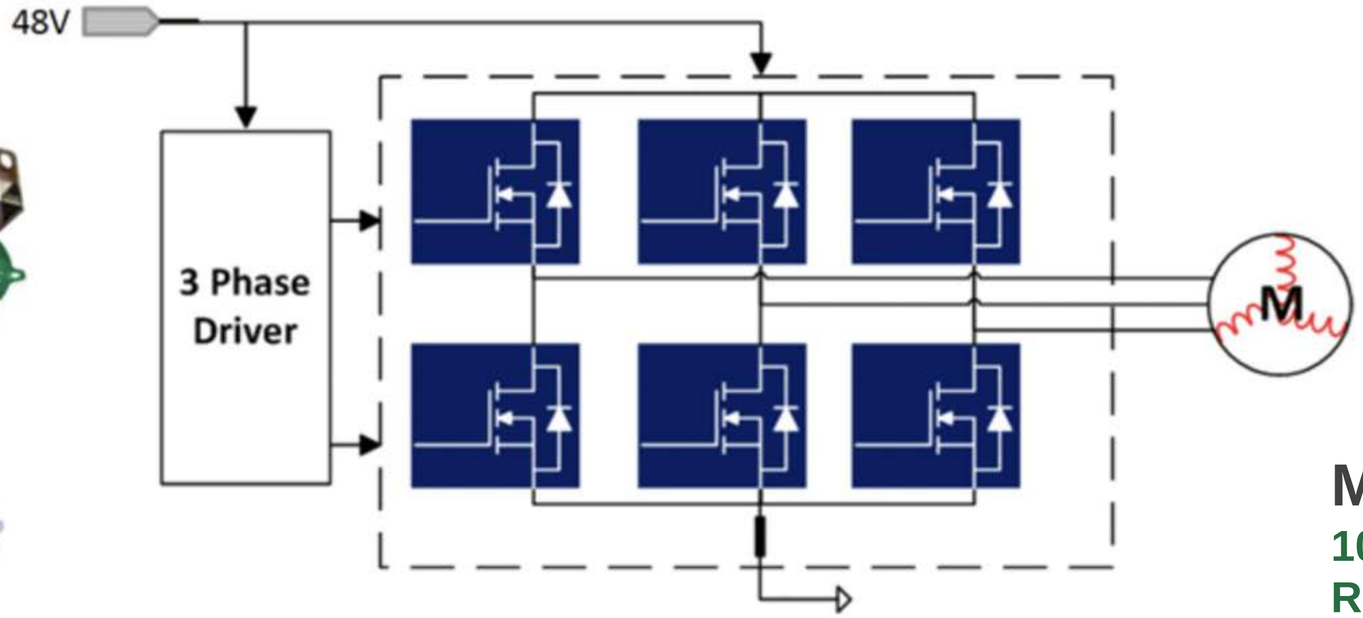
Silicon High current rated TOLL MOSFETs

Feature

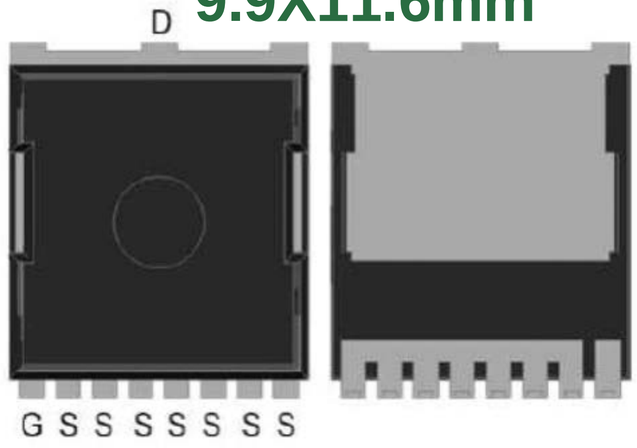
In order to meet the strict CO2 emissions regulations **48V systems** are an increasing trend among Automotive OEMs**. Low voltage, high current MOSFETs are key components** in such applications.

With a solder contact area that is **50%** bigger than the TO263, the TOLL package enables a junction-case thermal impedance of **0.45°C/W**, allowing these MOSFETs to handle currents up to **330A**.

These MOSFETs are qualified to AEC-Q101, PPAP capable, and are manufactured in IATF 16949 certified facilities.



9.9X11.6mm



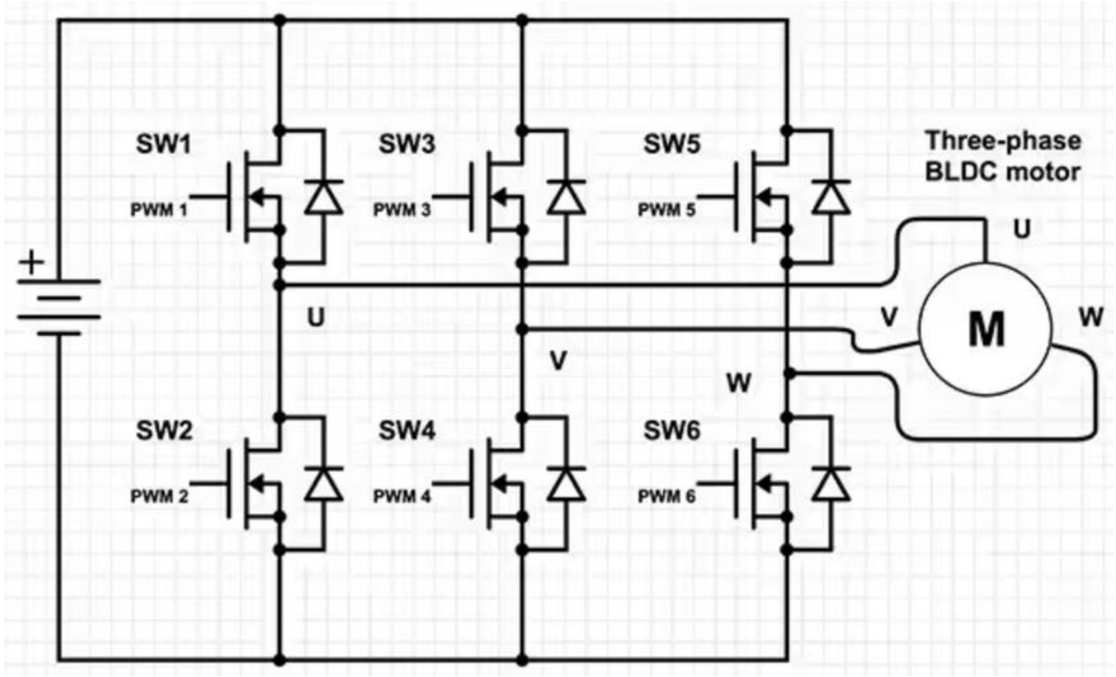
MSO100N019
100V, 330A, TOLL
RDS(on) 1.6mohm,

MSO600N480
600V, 42A, TOLL
48mohm

40V-MOSFET IPM
Application

MOSFET IPM for BLDC Application

three-phase BLDC motor is typically powered by three pairs of MOSFETs arranged in a bridge structure and controlled by PWM. PWM offers precise control over the motor’s speed and torque.
The major space of PCB is from the six MOSFET.
Using the MSIE40N150 that six MOS in one package to save sapce



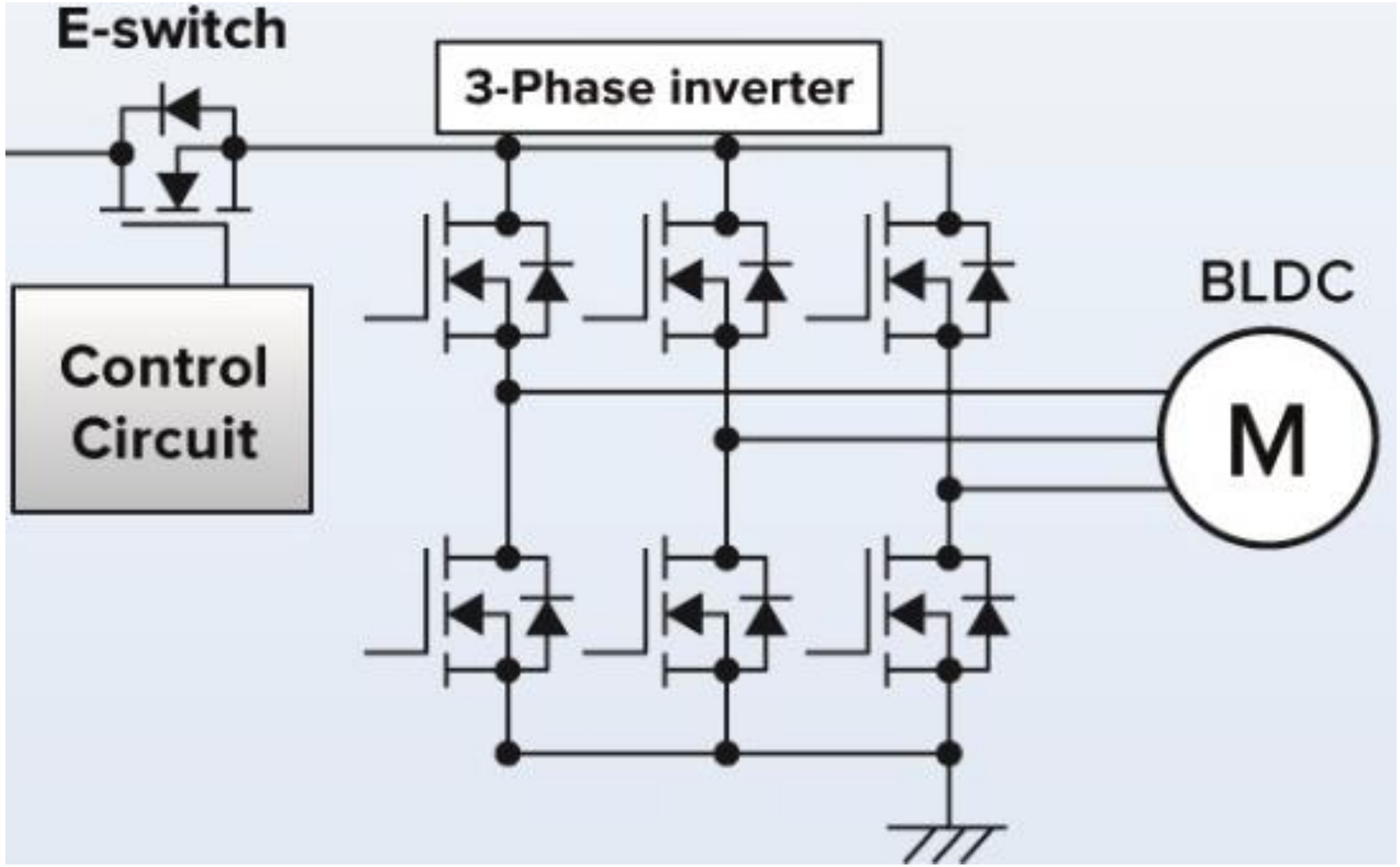
Save Space

14mmX12mm

MOSFET IPM for Power Drill

18~36V

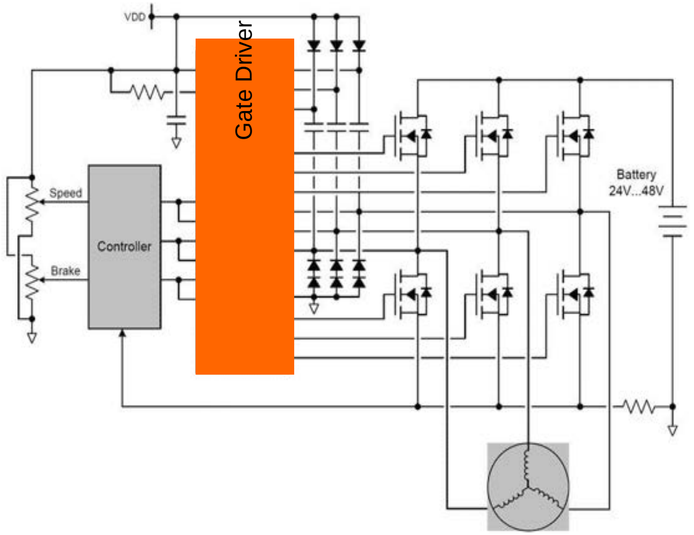
Power Drill



Estimated 6~12pcs 40V MOSFETs
Using one DFN 14X12 to replace it

MOSFET for Power Tools (Target 30V~150V)

3-phase

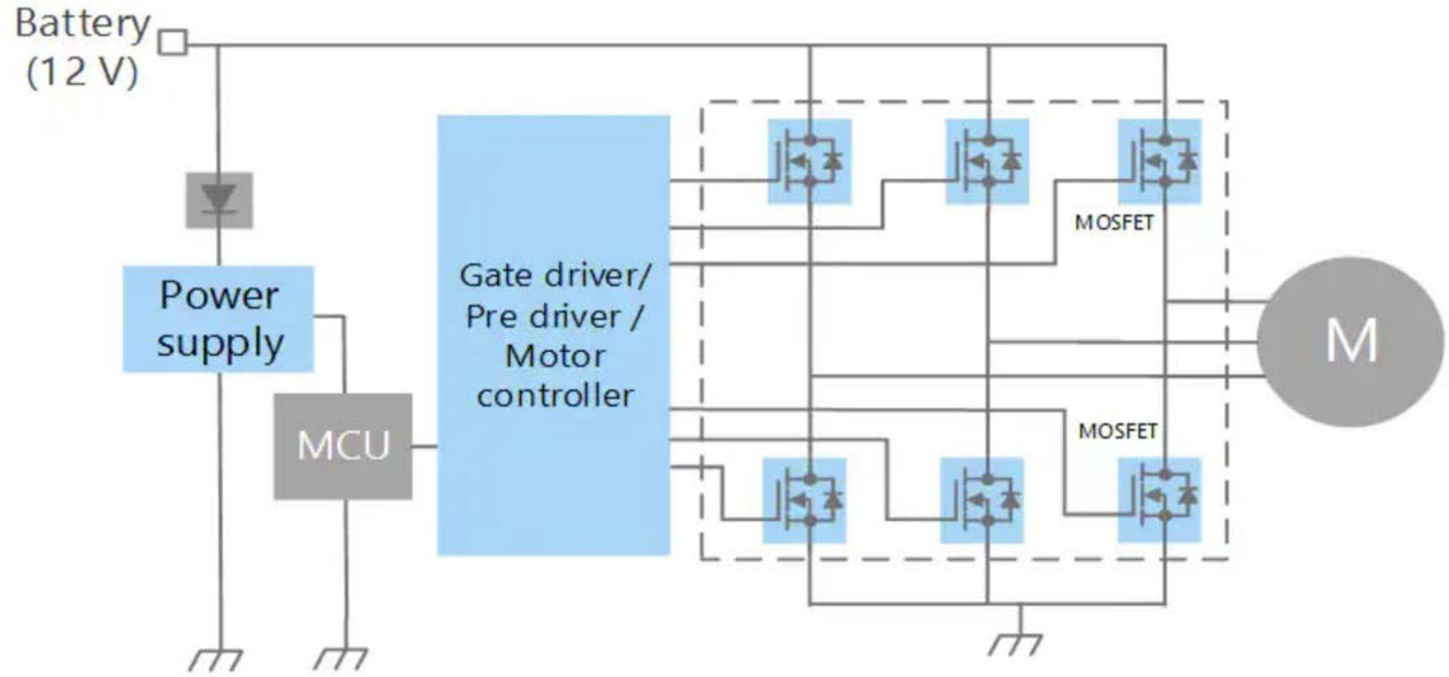


Voltage(V)	Package	PN#	Rds(ON)(mΩ) Vgs@10V	Qg(nC)
30	DFN 5X6		1.9	14
			0.62	48
			2.3	49
			1	64
40	DFN 5X6		2.4	17
			0.9	43
60	DFN 5X6		1.85	27
			2.2	39
			2.5	24
85	TO-220		5.3	74
100	TO-263		2.2	155
			3.7	88
			3.7	105
	DFN 5X6		4.2	71
			7.2	22
			7.5	23
	TO-220		4.5	71
			7.5	22
			8	38
	TOLL		1.2	140
150	TO-263		4.6	64
			11.5	39
	DFN 5X6		16	30
			19	28
	TO-220		4.6	64
			7.2	67

MOSFET Bridge For Automotive

The new MOSFET Bridge is for the Electric Water Pump of EV.
This MOSFET is also suitable for a variety of BLDC

Applications
electric oil pumps, engine cooling fans, electric power steering, and battery cooling fans.

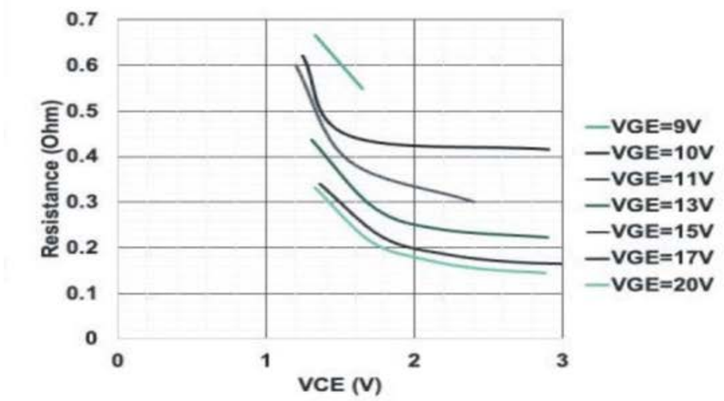


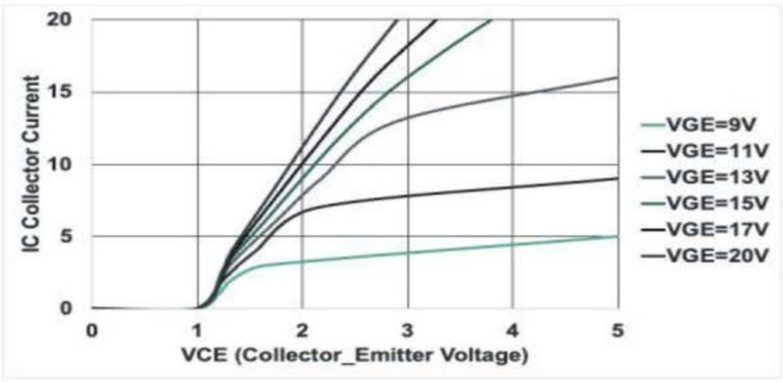
IGBT
Application

IGBT to replace the SJ MOSFET at low cost

P/N	Type	Voltage	Amp	Package	Target
GTD05N060	IGBT+FRED	600	5	TO-252	SJ-10A MOS
GTP20N065	IGBT+FRED	650	20	TO-220	SJ-40A MOS
GTF20N065	IGBT+FRED	650	20	TO-220F	SJ-40A MOS

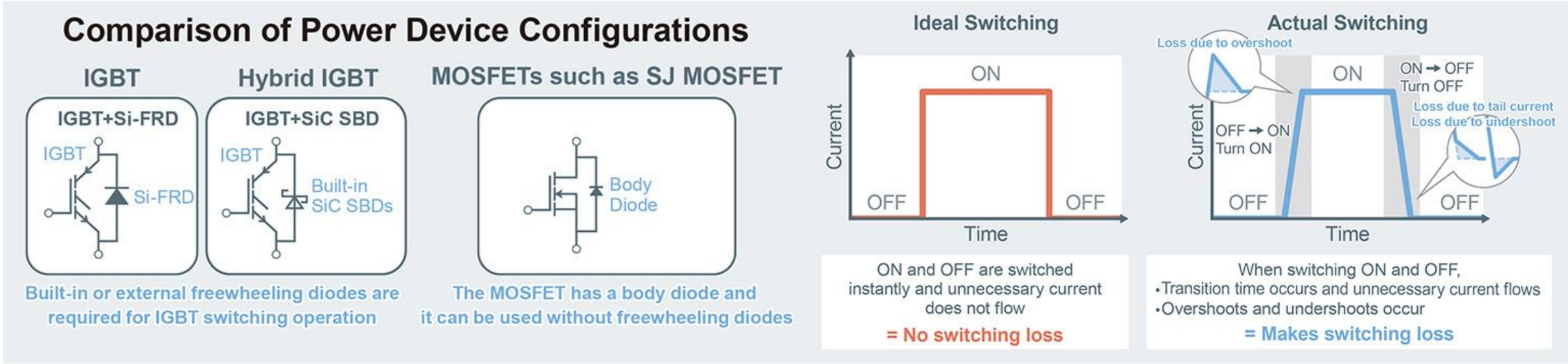
Device	Package Type	VGS/VGE (V)	ID/IC (A)	Resistance (Ohm)		
				Min.	Typ.	Max.
MSF650N420 MOSFET (Super Junction)	TO-220F	10	3.5	-	0.33	0.4
MSF10N65 MOSFET	ITO220 AB	10	3.5		1.94	
GTD05N060 IGBT	TO-252	10	3.5		0.445	





Our IGBT can replace the
C6 Cool MOS
Better RDS(on) than the C3~C5
Low Cost than the C6 SJ MOS

IGBT with SiC SBD



P/N	Type	Voltage	Amp	Package	Target
GTSB20N065	IGBT+SIC SBD	650	20	TO-263	RGW40NL65CHRB
GTSF20N065	IGBT+SIC SBD	650	20	TO-220F	RGW40NL65CHRB
GTSM20N065	IGBT+SIC SBD	650	20	SOT-227	
GTSM40N065D	IGBT+SIC SBD	650	40	SOT-227	

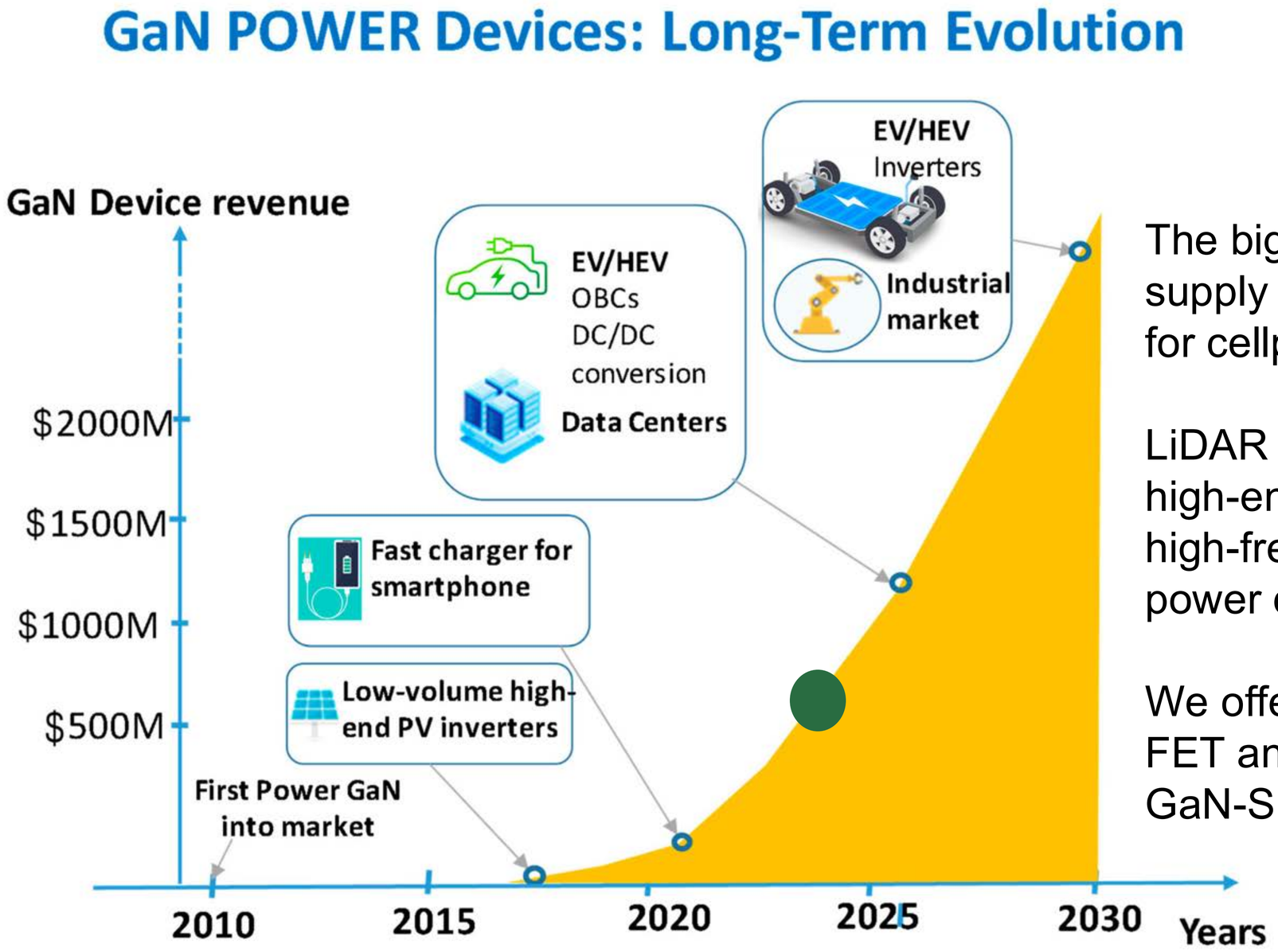
Brückewell
Bruckewell Technology LTD.

20A, 650V IGBT VS Super Junction MOSFET

Device	Temperature (°C)	Package Type	VGS/VGE (V)	ID/IC (A)	Resistance (mOhm)		
					Min.	Typ.	Max.
Bruckewell 20A. 650V IGBT	25	TO-220	10	14.5	126		
	150				137		
	150			**15**	**136**		
IPZ60R099P6-SJ-Si MOS 38A, 600V	25	PG-TO247-4	10	14.5	-	89	99
	150			14.5	-	232	-
IPB60R080P7 SJ-Si MOS 37A, 600V	150	D²PAK	10	11.8	-	161	-

GaN FETs
Application

GaN power devices application



The biggest segment is still power supply applications, i.e. fast charging for cellphones.

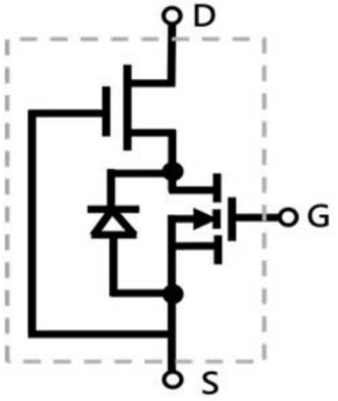
LiDAR applications are the other high-end solutions that benefit from high-frequency switching in GaN power devices.

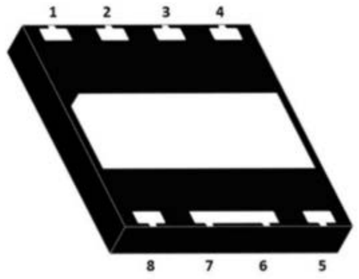
We offer the D-Mode FET, E-Mode FET and D-Mode+Driver IC by 650V GaN-S Devices

Gallium nitride FETs solution

Part#	RDS(on)	VGSS or VPWM (Max. Ratings)	Description
HMHL065N185C	150mohm	-20V ~ +20V	Cascode (D mode GaN + LV MOS
HMHL065N210E	150mohm	-18V ~ +18V	E-mode GaN
HMHL065N170CI	170mohm	-30V~+30V	D mode GaN + Driver IC

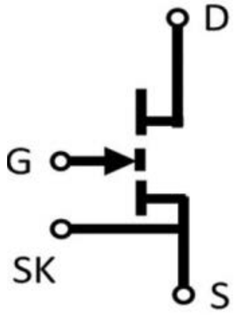
Cascode

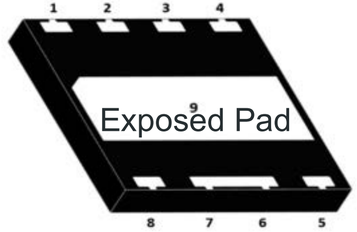




Drain: 1, 2, 3, 4
Source: 5, 6, 7
Gate: 8

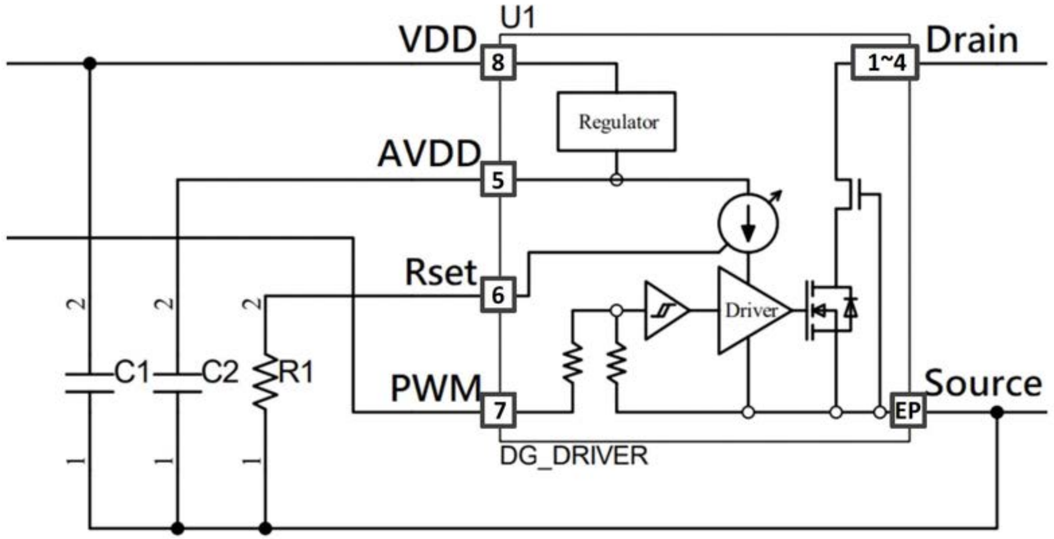
E-Mode

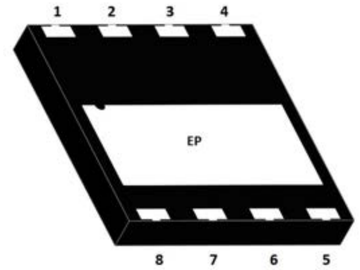




Drain: 1, 2, 3, 4
Source: 5, 6, 7, 9
Gate: 8

GaN-IC





AVDD: 5
RSET: 6
PWM: 7
VDD: 8

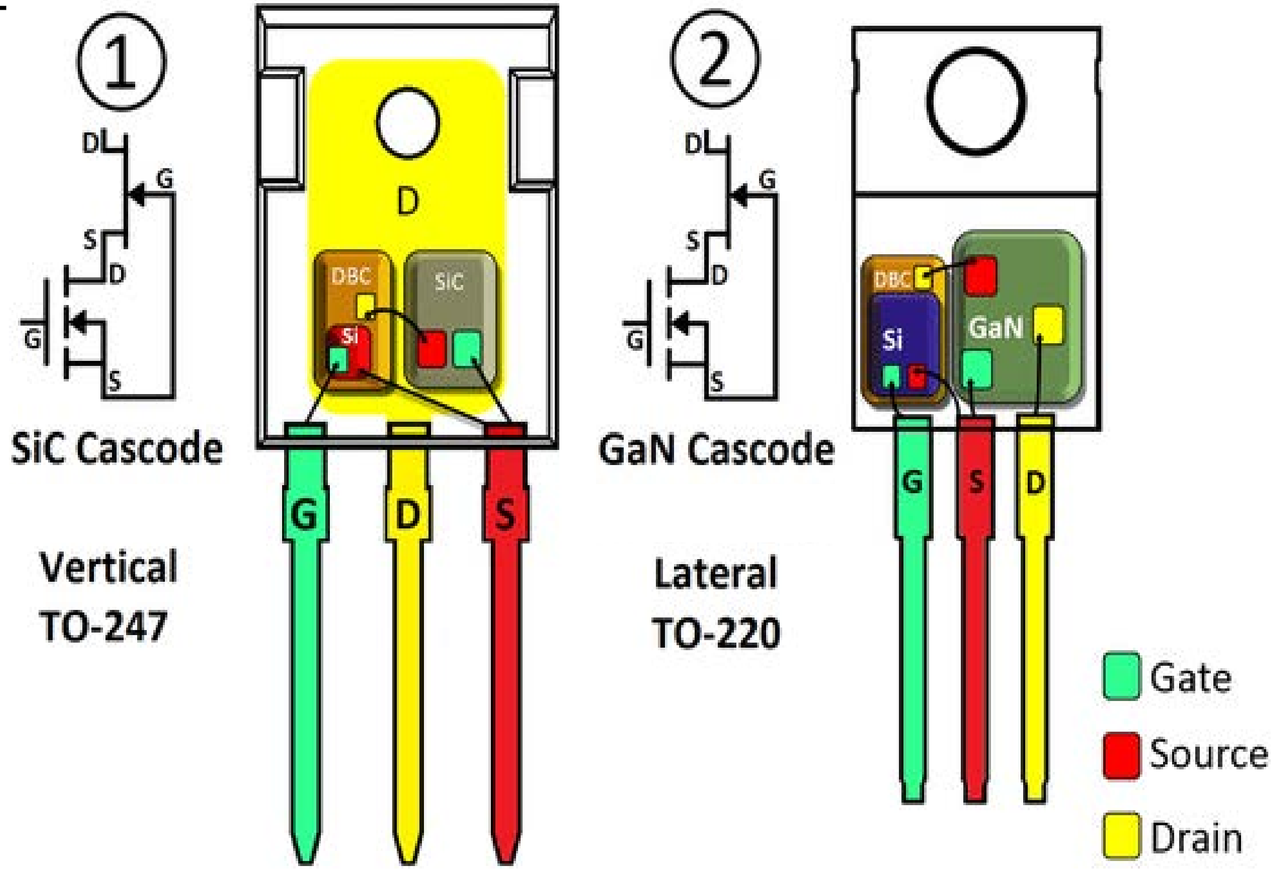
Drain: 1, 2, 3, 4
Source: EP

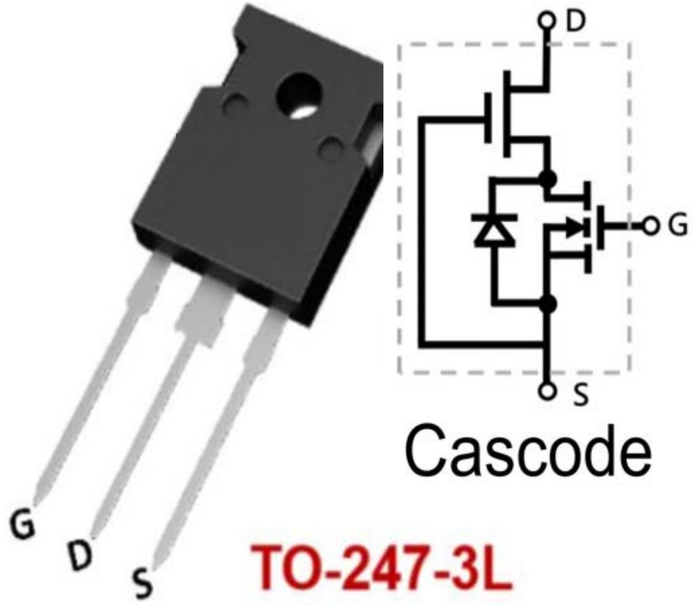
Fast Charger, Automotive Charger, Power server
PV Inverters, EV OBCs

New generation GaN HEMT

Normally the SiC, Si MOSFET has the same Pin assignment GDS,
but the Casocde GaN is different, by GSD
Using the special package design to get the same pin assignment (GDS) for the GaN cascode with Si, SIC MOSFET

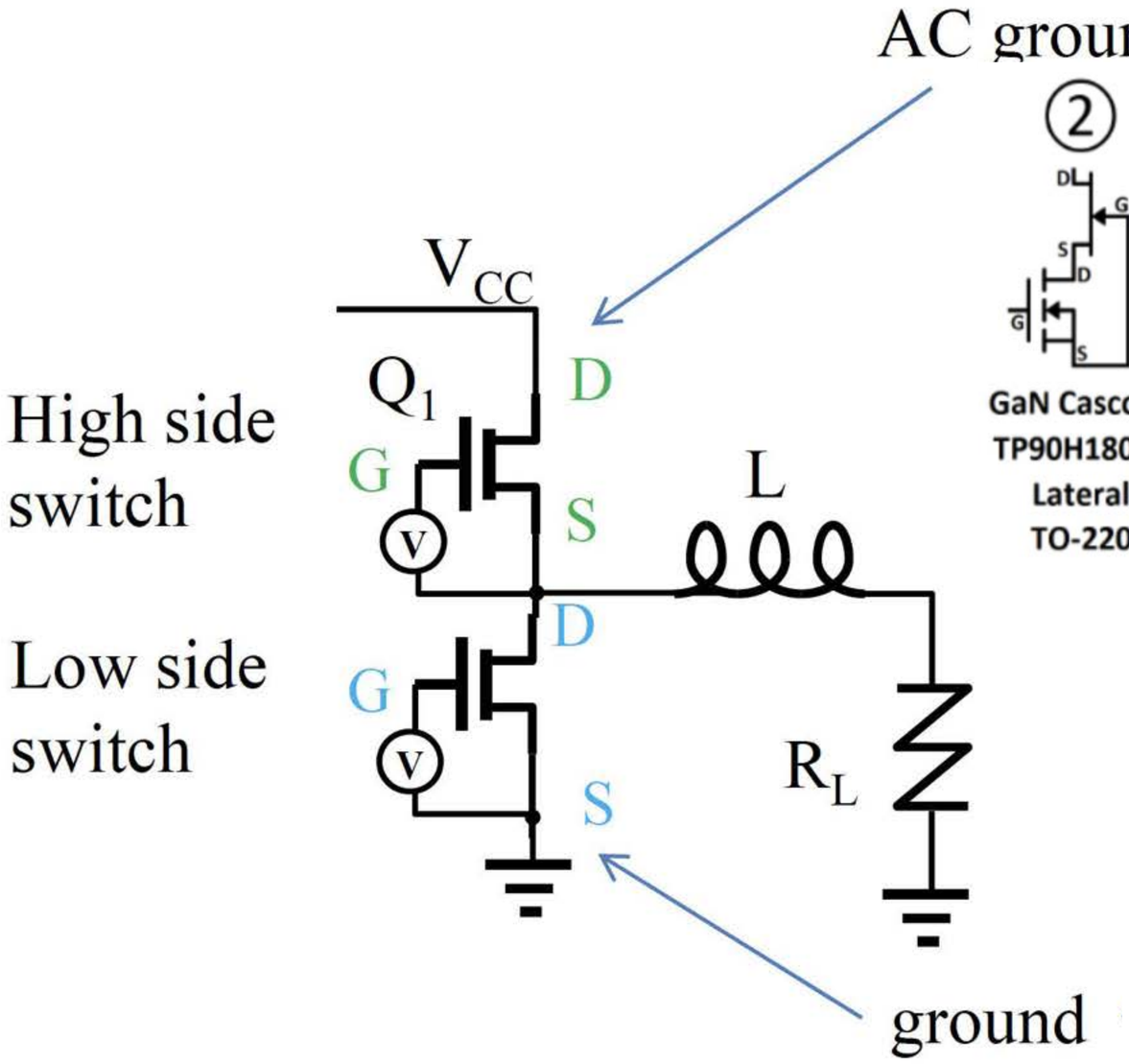
Si SJ MOSFET

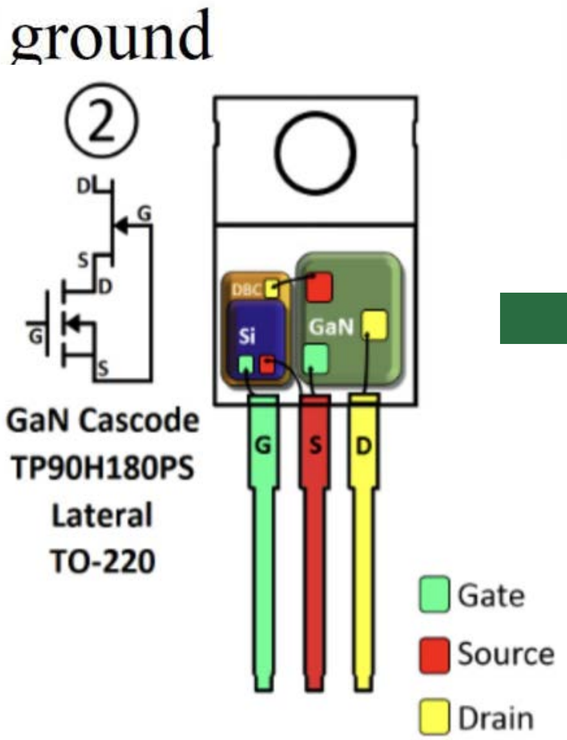




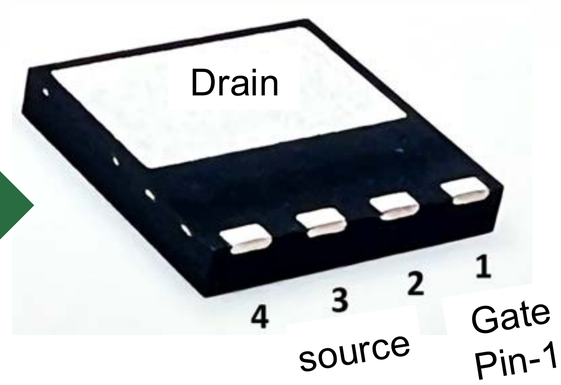
New Gen GaN HEMT

GaN HEMT for the high-side/ Low side circuit





HMHC065N120C

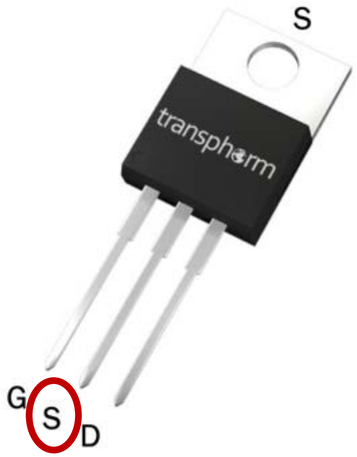


Conventions GaN Cascode use the GSD, Source pin connect with Case, good for low side switching, but not good for high side switching

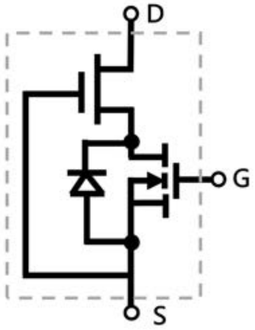
Because the drain come out more thermal, Drain to case make the package Cool.

HMP065N090C
GaN Cascode HEMT
650V, 90mohm

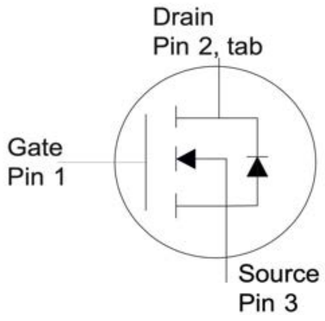
TP65H100G4PS
GaN Cascode HEMT
650V, 92mohm



IPP65R095C7
Si SJ MOSFET, C7
700V, 95mohm

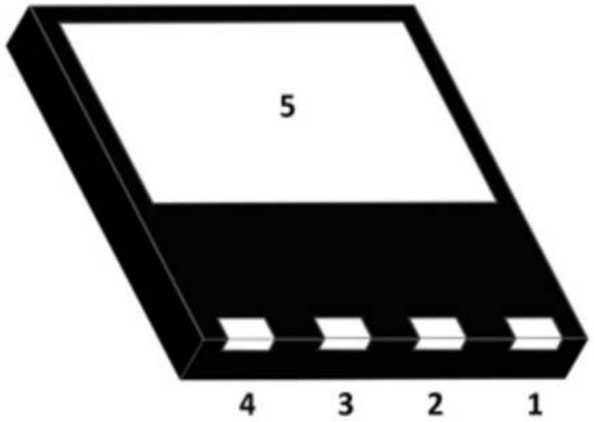


Cascode Device Structure

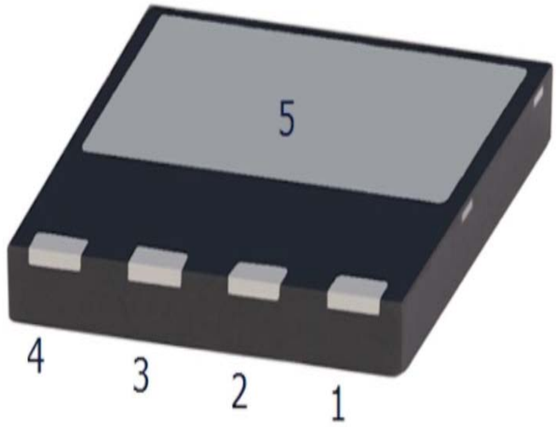


New generation GaN HEMT

Pin to Pin to replace Cool MOSFET (Super Junction)



HMHC065N185C
GaN HEMT
185mohm
650V



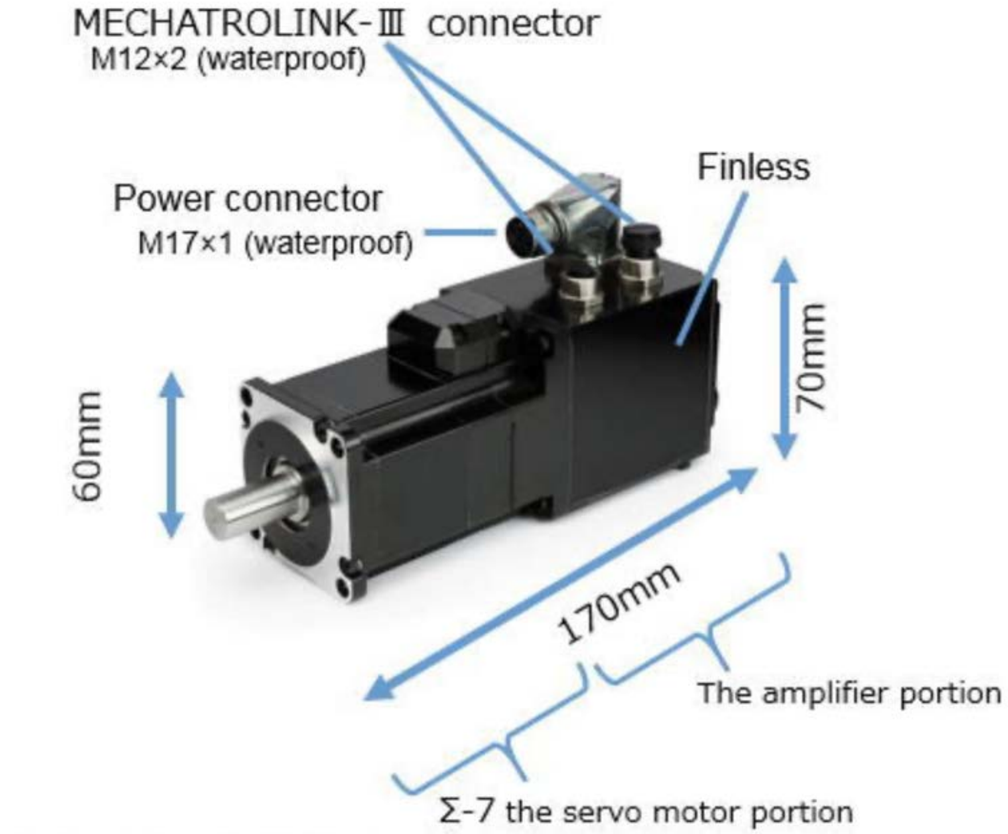
IPL60R199CP
Cool MOS
199mohm
600V

DFN 8X8 Available, will extend to TO-220, TO-247 and TOLL soon

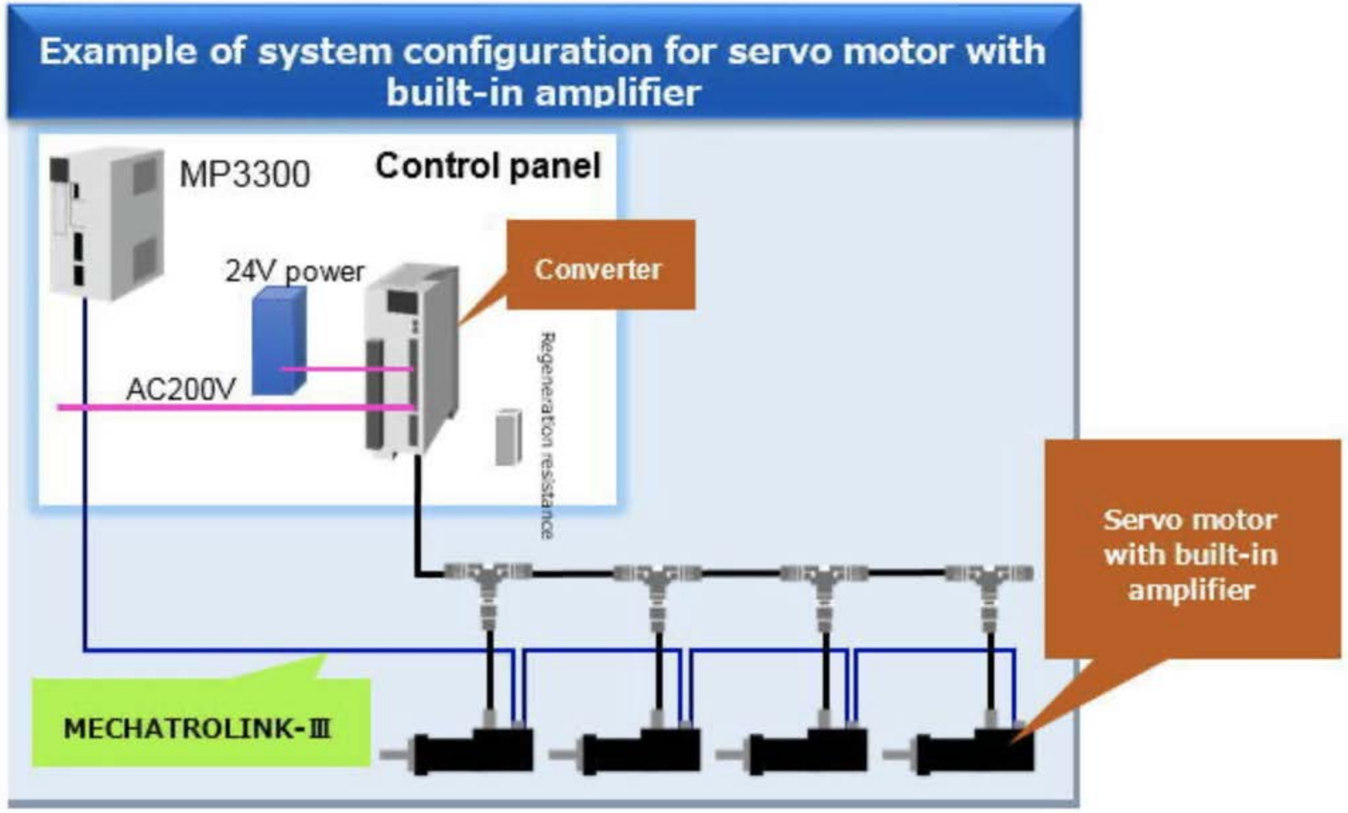
P/N	Voltage	Ampere	RDSon (mohm) Max.	Package
HMHC065N120C	650	13	120	DFN8X8
HMHC065N185C	650	10	185	DFN8X8

GaN on Servo application

Yaskawa to Launch the World's First GaN Power Semiconductor-Equipped Servo Motor with Built-in Amplifier
A New Addition to the AC Servo Drives Σ (Sigma)-7 Series



Servo motor with built-in amplifier Σ (Sigma)-7 F model



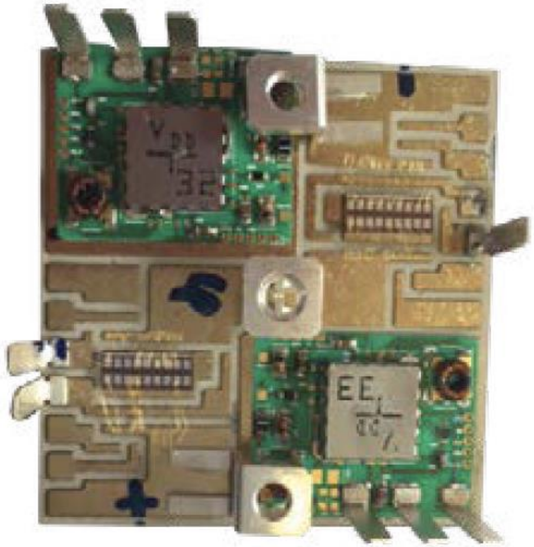
GaN on Laptop

Asus Made the World’s First 300W GaN Charger for its Monster Laptop

GaN FET on LED Application

Smaller, more integrated and more efficient.

© Liten/Ines



© Leti

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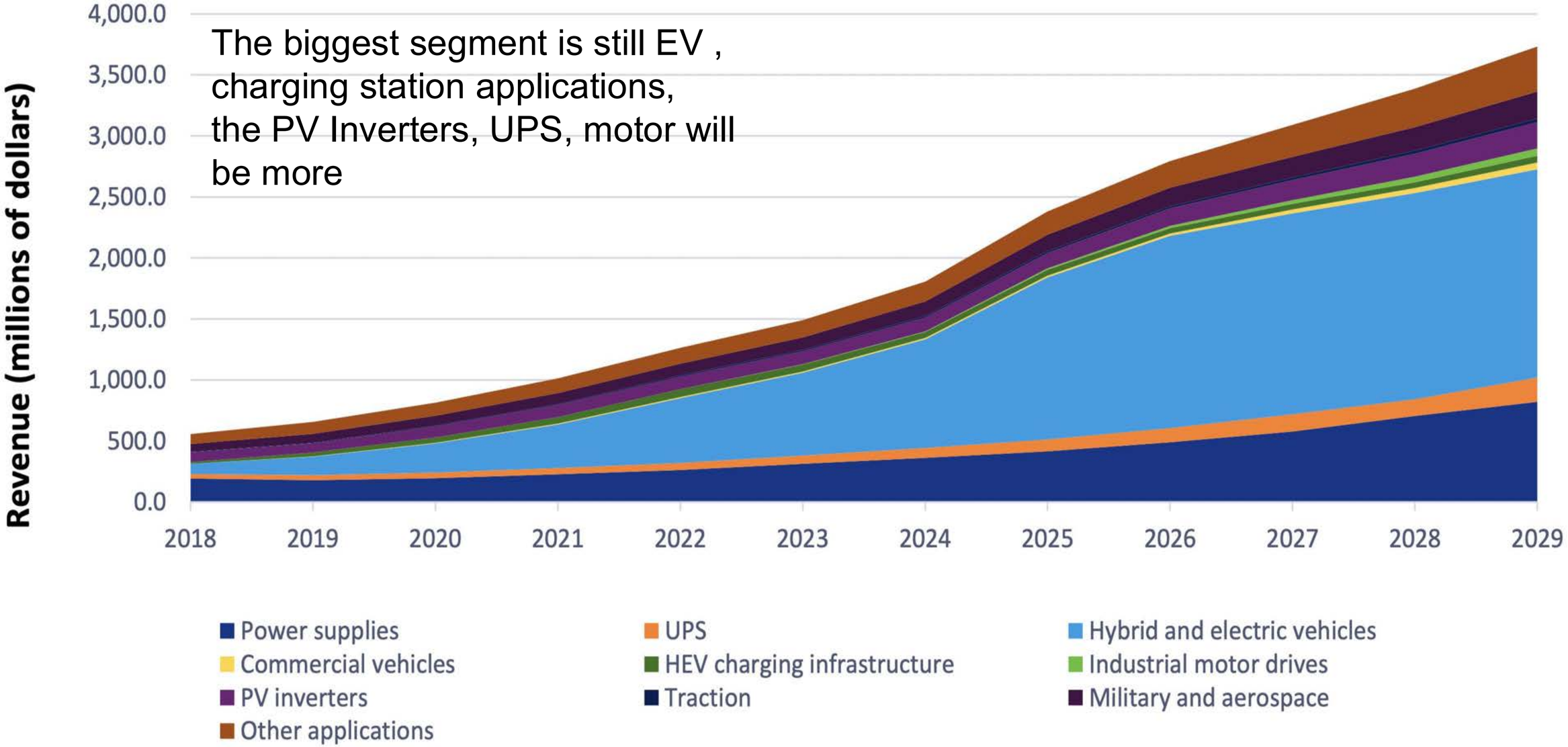
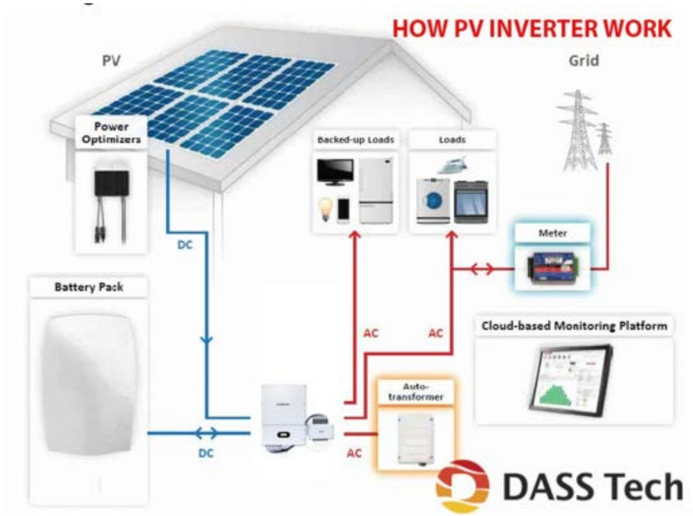
GaN transistors enable the compact design of LED

SiC-MOSFET
Application

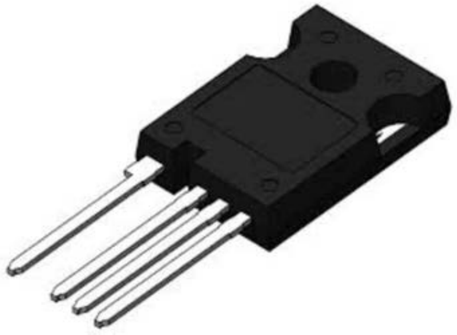
SiC Semiconductor Forecast by Applications



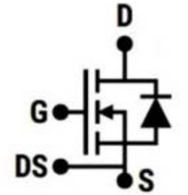
SiC MOSFET Package with different application



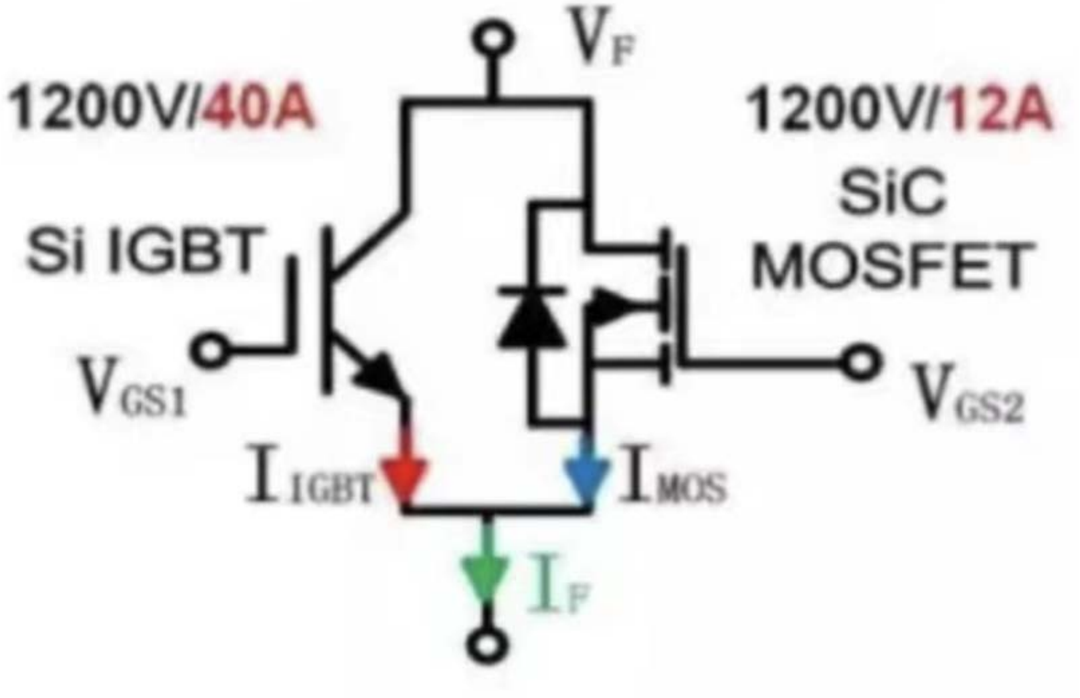
TO-247-3L, 4L, SOT-227, TO-263-7L Packages
1200V, 160mohm, 80mohm, 37mohm available
< 20mohm will be available with in 2024’ Q4



SOT-227 25X33mm



IGBT with SiC MOSFET Module



SOT-227 25X33mm

40A 1200V IGBT with SiC MOSFET will be coming soon
Best cost solution

Isolated Dual-Channel Gate Driver Application

Isolated Dual-Channel Gate Driver-IGD8233 series

P2P compatibility with Skyworks SI8233 and Novosense NSI6602 makes the IGD8233 Series a top choice for replacing scarce materials, especially amidst the surge of cutting-edge technologies in power supplies, motors, and air conditioning drivers.

Designed to optimize Bruckewell MOSFETs and IGBTs,.

Industrial Applications:
- Power Delivery Systems
- Motor Control Systems
- Isolated DC-DC Power Supplies
- Lighting Control Systems
- Plasma Displays
- Solar and Industrial Inverters

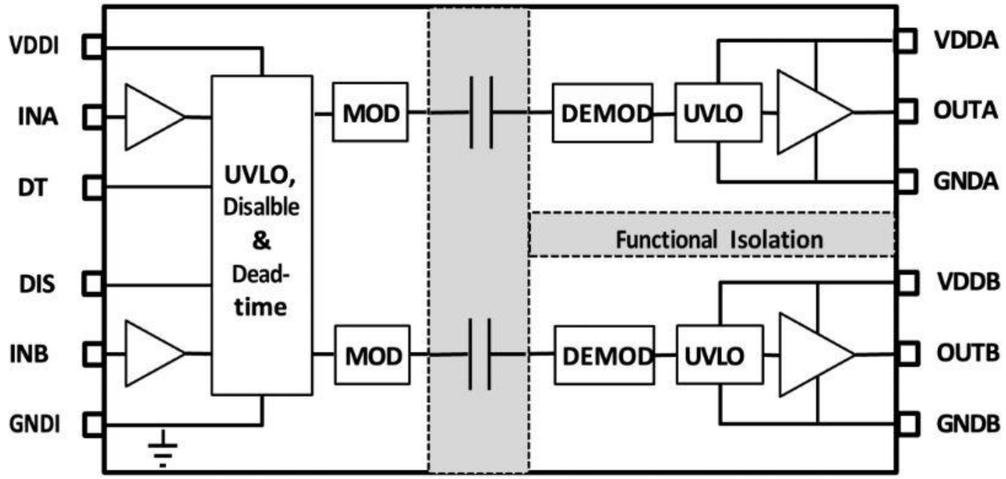
Automotive Applications:
- On-board Chargers
- Battery Management Systems
- Charging Stations
- Traction Inverters
- Hybrid Electric Vehicles
- Battery Electric Vehicles

Isolated Dual-Channel Gate Driver-IGD8233 series

Brückewell

IGD8233 Series

3. Functional Diagram



Part Number	Peak Current	UVLO	DT	DIS	Package
IGD8233AW	+4.0A/-6.0A	6.5V/6.85V	Y	Y	SOW16
IGD 8233BW	+4.0A/-6.0A	8.5V/8.0V	Y	Y	SOW16
IGD 8233CW	+4.0A/-6.0A	13.2V/12.2V	Y	Y	SOW16
IGD 8233AS	+4.0A/-6.0A	6.5V/6.85V	Y	Y	SOP16
IGD 8233BS	+4.0A/-6.0A	8.5V/8.0V	Y	Y	SOP16
IGD 8233CS	+4.0A/-6.0A	13.2V/12.2V	Y	Y	SOP16

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