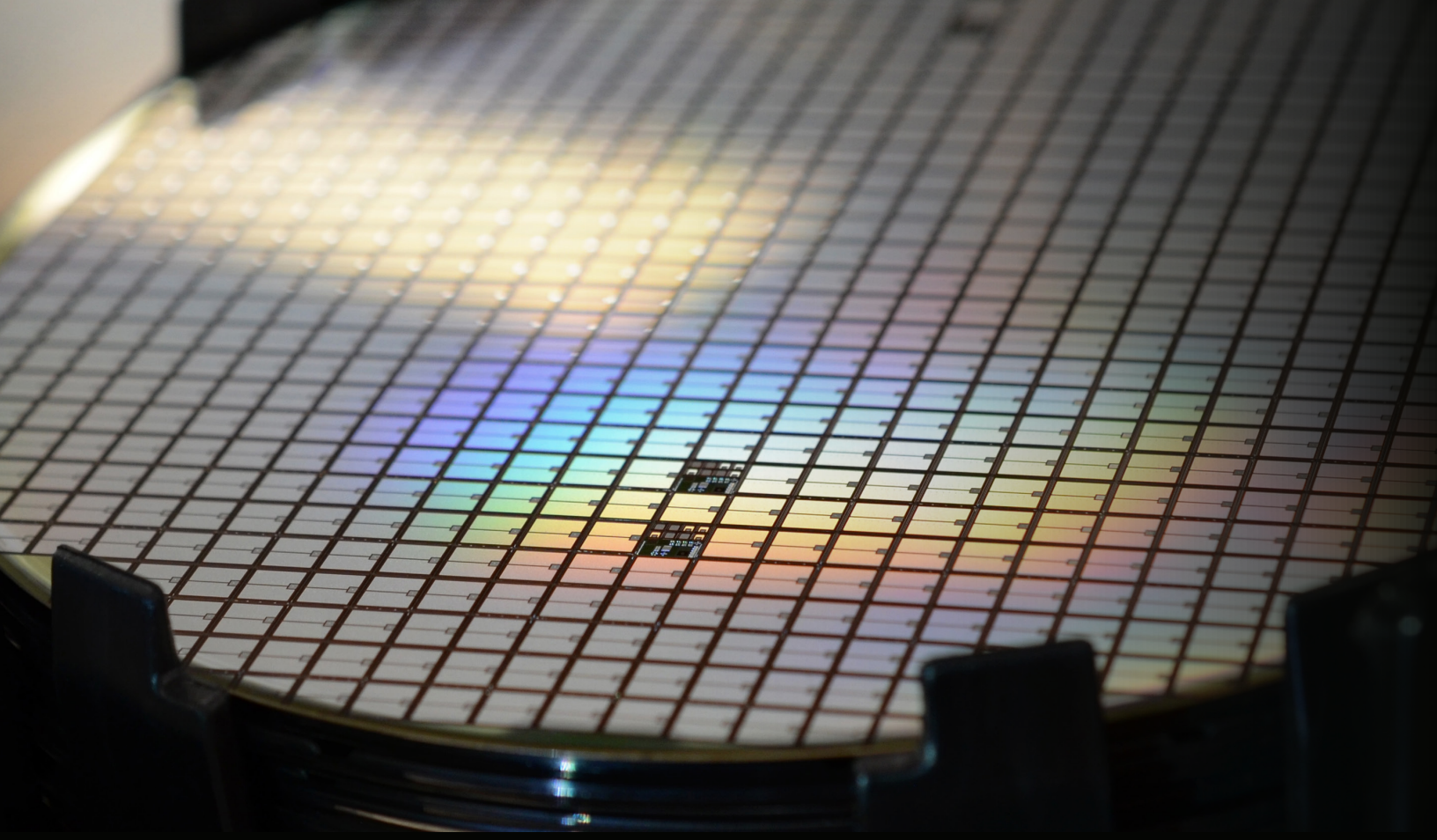
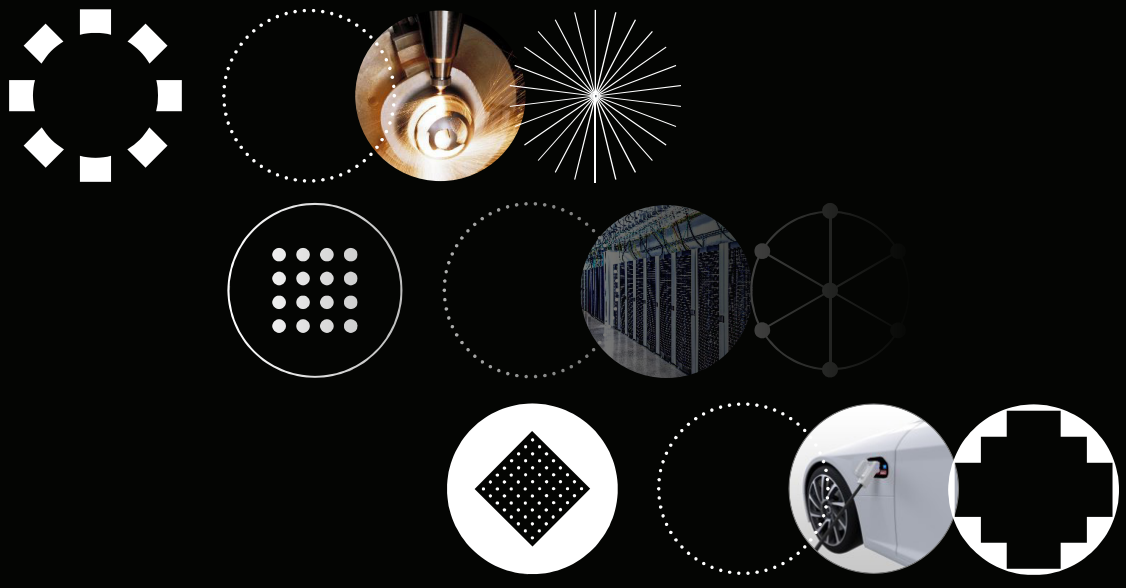
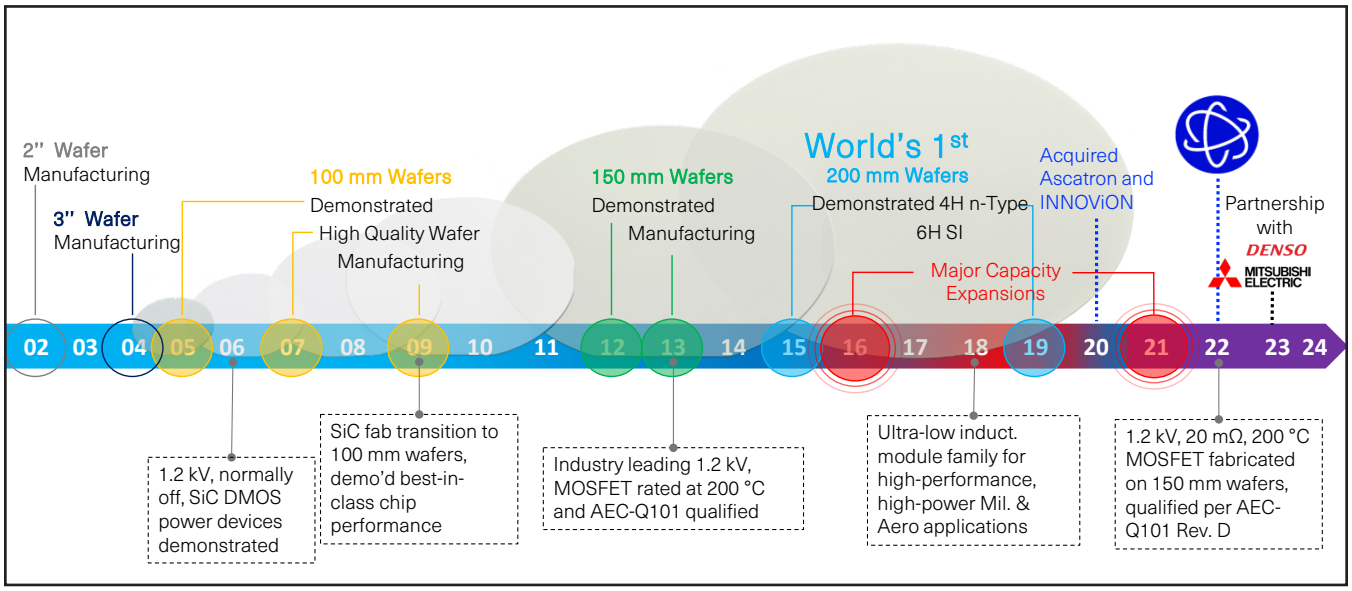


SiC POWER DEVICES AND MODULES

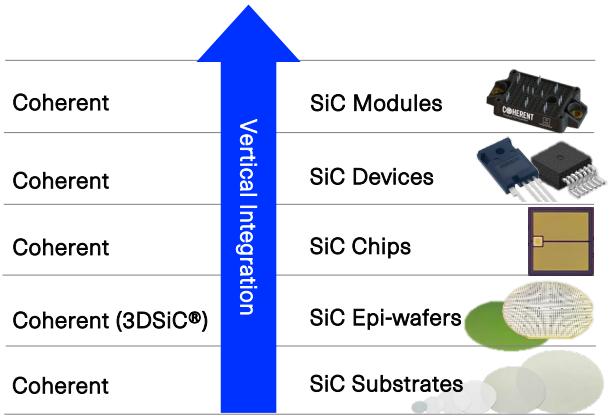


COHERENT

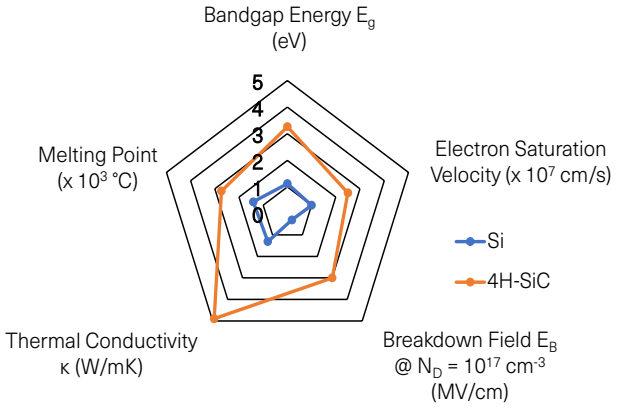
2 DECADES OF EXPERIENCE IN SiC MATERIALS AND DEVICES TECHNOLOGY



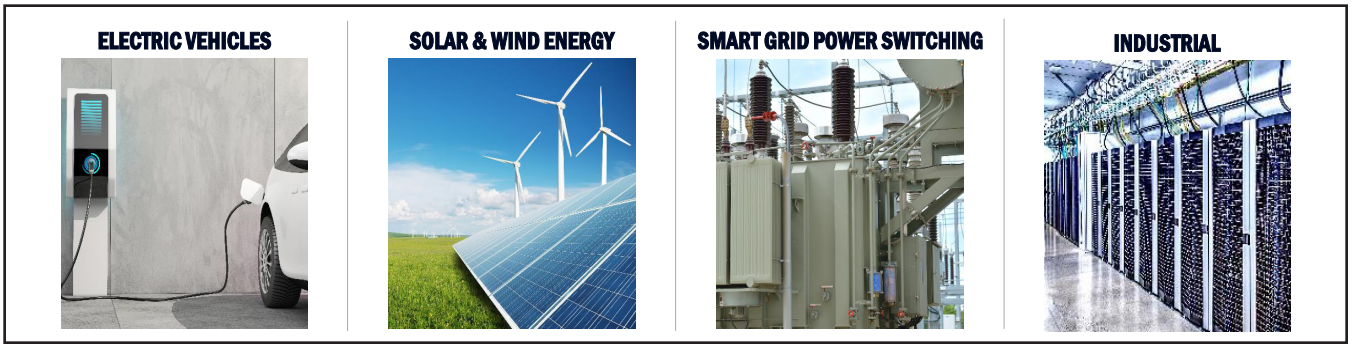
A VERTICALLY INTEGRATED SiC POWER ELECTRONICS TECHNOLOGY ORGANIZATION



BENEFITS OF SiC POWER DEVICES COMPARED TO Si DEVICES



POWER ELECTRONICS FOR GREEN AND CLEAN ENERGY



COHERENT ADVANTAGES AND DIFFERENTIATIONS

Reliability

- 200 °C
- AEC-Q101-REV D1
- GOI
- PBTI, NBTI -15 V → +25 V

Performance

- More robust channel control in blocking mode
- R_{sp} temperature sensitivity ↓
- Lower switching loss
- Stable dynamic characteristic
- Less body diode sensitivity to channel conduction
- Better body diode @ high temperature synchronous switching

Ruggedness

- 4k cycles SCW survivability
- Superior UIS avalanche energy 13 J/cm^2
- Body diode surge

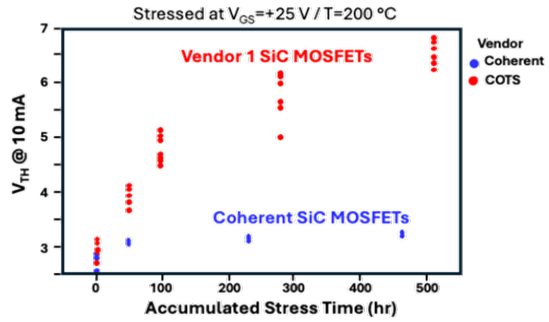
Design for manufacturing uniformity

- Gate dielectric breakdown voltage
- UIS distribution across lots, scalable with die sizes
- SCW across lots and die sizes

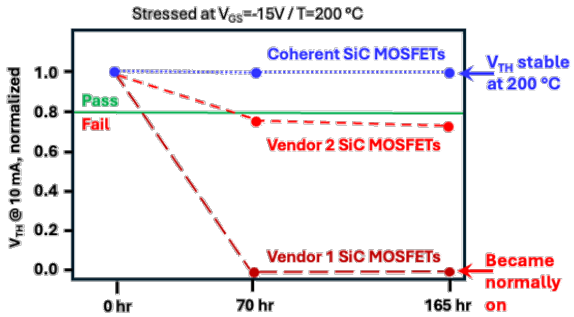
200 °C JUNCTION TEMPERATURE CAPABILITY

Coherent MOSFETs are based on our Gen3+ technology platform, building on 20+ years history in the fabrication of SiC MOSFETs. These devices are AEC-Q101 qualified at 200 °C max junction temperature. This technology platform demonstrates its leading reliability and ruggedness, along with industry-leading avalanche capability.

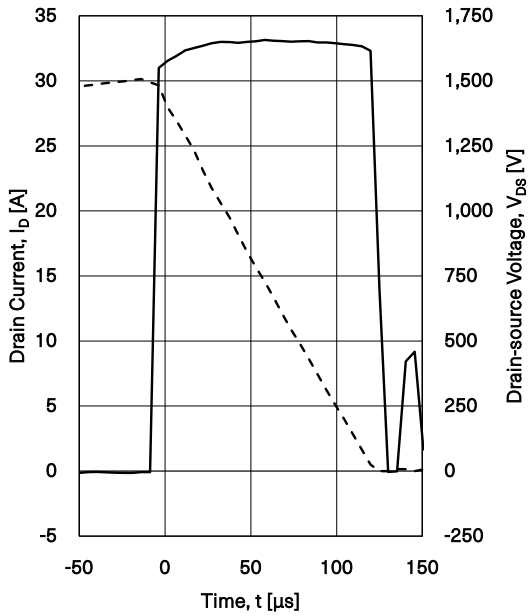
1200 V, 20 mΩ SiC MOSFET
Positive Bias Threshold Instability (PBTI)



1200 V, 20 mΩ SiC MOSFET
Negative Bias Threshold Instability (NBTI)



1200 V, 20 mΩ SiC MOSFET: E_{AS} > 3.5 J
Typical unclamped inductive switching waveforms



SiC DEVICE LINE-UP

Part number	$R_{DS(ON)}$	Package	Blocking voltage	Current rating @ 25 °C	Qualification
*TBM30116120	11.6 mΩ	Bare die	1200 V	-	Automotive
*TM3B0012120A	12 mΩ	TO247-4	1200 V	171 A	Automotive
TBM30200120	20 mΩ	Bare die	1200 V	-	Automotive
TM3B0020120A	20 mΩ	TO247-4	1200 V	115 A	Automotive
*TBM30270120	27 mΩ	Bare die	1200 V	-	Automotive
*TM3B0027120A	27 mΩ	TO247-4	1200 V	83 A	Automotive
*TM3E0027120A	27 mΩ	TO263-7	1200 V	83 A	Automotive
*TBM30390120	39 mΩ	Bare die	1200 V	-	Automotive
*TM3B0039120A	39 mΩ	TO247-4	1200 V	60 A	Automotive
*TM3E0039120A	39 mΩ	TO263-7	1200 V	60 A	Automotive

* In AEC-Q101 qualification
Operating Temperature: -55 °C to 200 °C

SiC MODULE LINE-UP

Part number	Variant	$R_{DS(ON)}$	Topology	Blocking voltage	Housing	Qualification
TMA0100HB120A	AP0101	10 mΩ	Half bridge	1200 V	AlphaPack E1	Automotive
TMA0100HB120A	AP0201	10 mΩ	Half bridge	1200 V	AlphaPack E1	Industrial
TMA0195HB120A	AP0202	19.5 mΩ	Half bridge	1200 V	AlphaPack E1	Industrial
TMA0135HB120A	AP0203	13.5 mΩ	Half bridge	1200 V	AlphaPack E1	Industrial
TMA0200HH120A	AP0301	20 mΩ	Full bridge	1200 V	AlphaPack E1	Industrial
TMA0390HH120A	AP0302	39 mΩ	Full bridge	1200 V	AlphaPack E1	Industrial
TMA0270HH120A	AP0303	27 mΩ	Full bridge	1200 V	AlphaPack E1	Industrial
TMA0390SP120A	AP0401	39 mΩ	Six pack	1200 V	AlphaPack E1	Industrial
TMA0600SP120A	AP0402	60 mΩ	Six pack	1200 V	AlphaPack E1	Industrial
TMA0270SP120A	AP0403	27 mΩ	Six pack	1200 V	AlphaPack E1	Industrial
TMA0050HB120B	BP0001	5 mΩ	Half bridge	1200 V	AlphaPack E2	Industrial
TMA0066HB120B	BP0002	6.6 mΩ	Half bridge	1200 V	AlphaPack E2	Industrial
TMA0029HB120B	BP0003	2.9 mΩ	Half bridge	1200 V	AlphaPack E2	Automotive
TMA0116HH120B	BP0201	11.6 mΩ	Half bridge	1200 V	AlphaPack E2	Industrial
TMA0600SP120B	BP0301	11.6 mΩ	Six pack	1200 V	AlphaPack E2	Industrial

All available with pre-applied TIM material
Plan to get AEC-Q101 qualified, Pin: Barrel press-fit

SALES AND PARTNERS

Coherent Sales	Contact
America	sales@coherent.com
Asia	sales@coherent.com
EMEA	sales@coherent.com

Website

Partners	Capabilities	Contact
SemiDice Inc.	Bare dies	sales@semidice.com
Avnet, Inc.	Devices & Modules	onlinesupportUS@avnet.com
Digi-Key, Corp.	Devices & Modules	sales@digikey.com
Mouser Electronics	Devices & Modules	sales@mouser.com

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sales@coherent.com
www.coherent.com