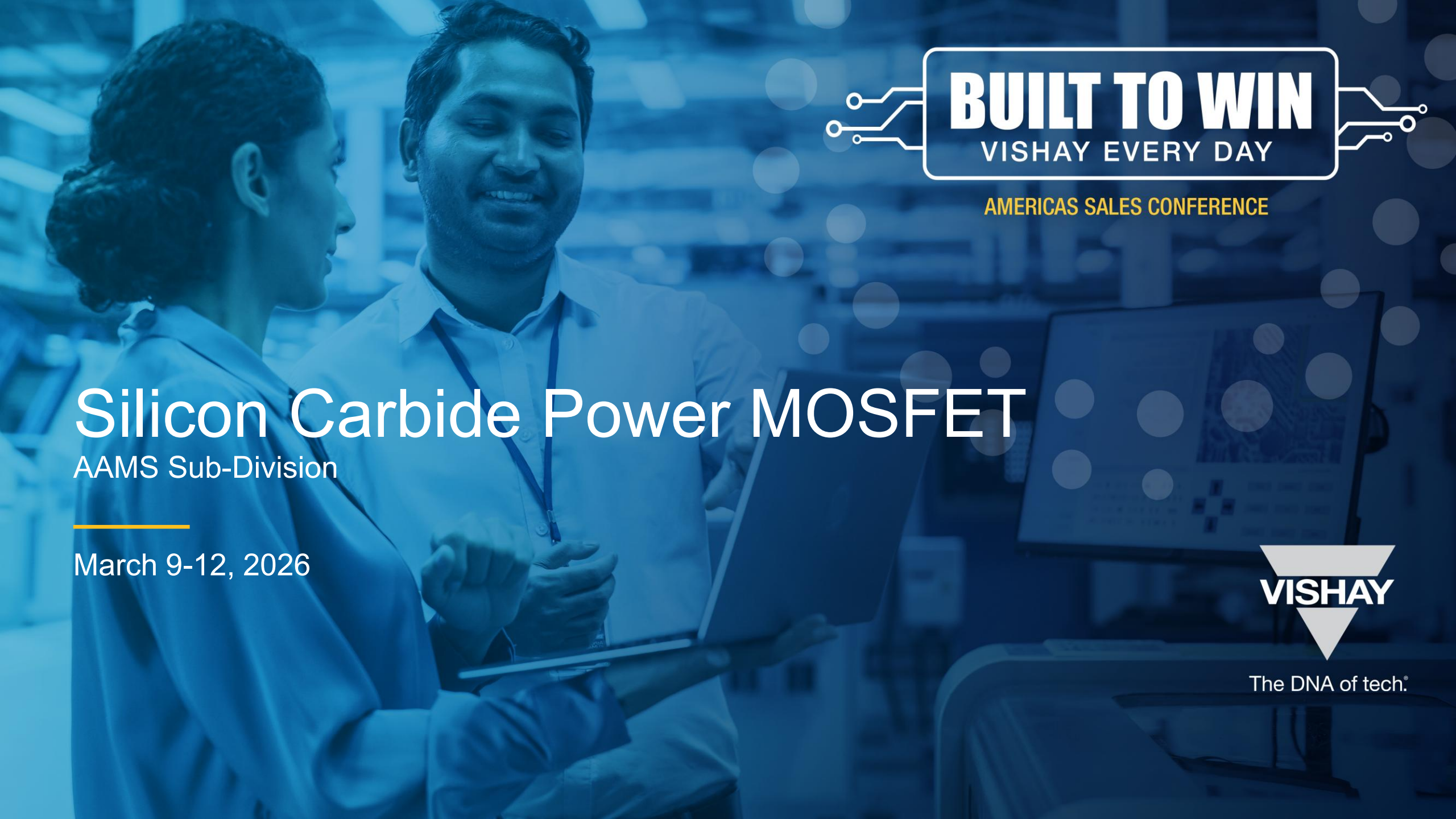

Silicon Carbide Power MOSFET

AAMS Sub-Division

March 9-12, 2026

VISHAY

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SiC MOSFET Operations

Advancing Toward Vertical Integration for Long Term Strategic Growth

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Newport SiC Front-End Vertical Integration

Wafer Cleaning ➔ Epi Growth ➔ Lithography ➔ Etch

Planar and Trench SiC Technologies

BUILDING

3650 m^2 • Fab

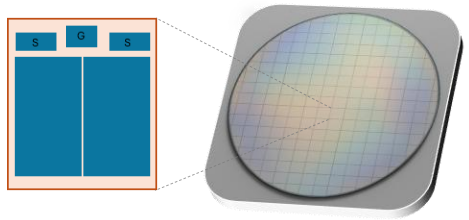
PRODUCTS

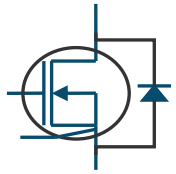
MOSFETs, SiC, GaN,
Opto, and Thin Film Resistors

SiC MOSFET PRODUCTION START	
Commercial	Q1 ‘27
Automotive	Q1 ‘27

Vishay Silicon Carbide Solutions

Silicon Carbide Die





N-Ch MOSFET
750 V, 1200 V, 1700 V

Custom DFFR & KGD
T&R / Waffle Pack

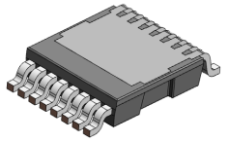
> 134 Patents
94 USA
40 International

Discrete Packages

Single Die Discrete Leaded Packages

Through-Hole and SMD with Kelvin-Pin Connection

Top-Side Cooled Packages for High Thermal Efficiency

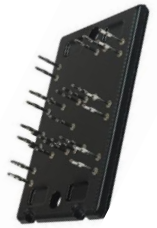


Power Modules

SiC Power Modules Transfer-Molded

Addressing Various Power Stage Configurations and Topologies

Achieving Higher Power Density Through Die Paralleling on Single Substrate



SiC Die and Package Solutions

Accelerating Advanced Packaging and Front-End Technology Innovation

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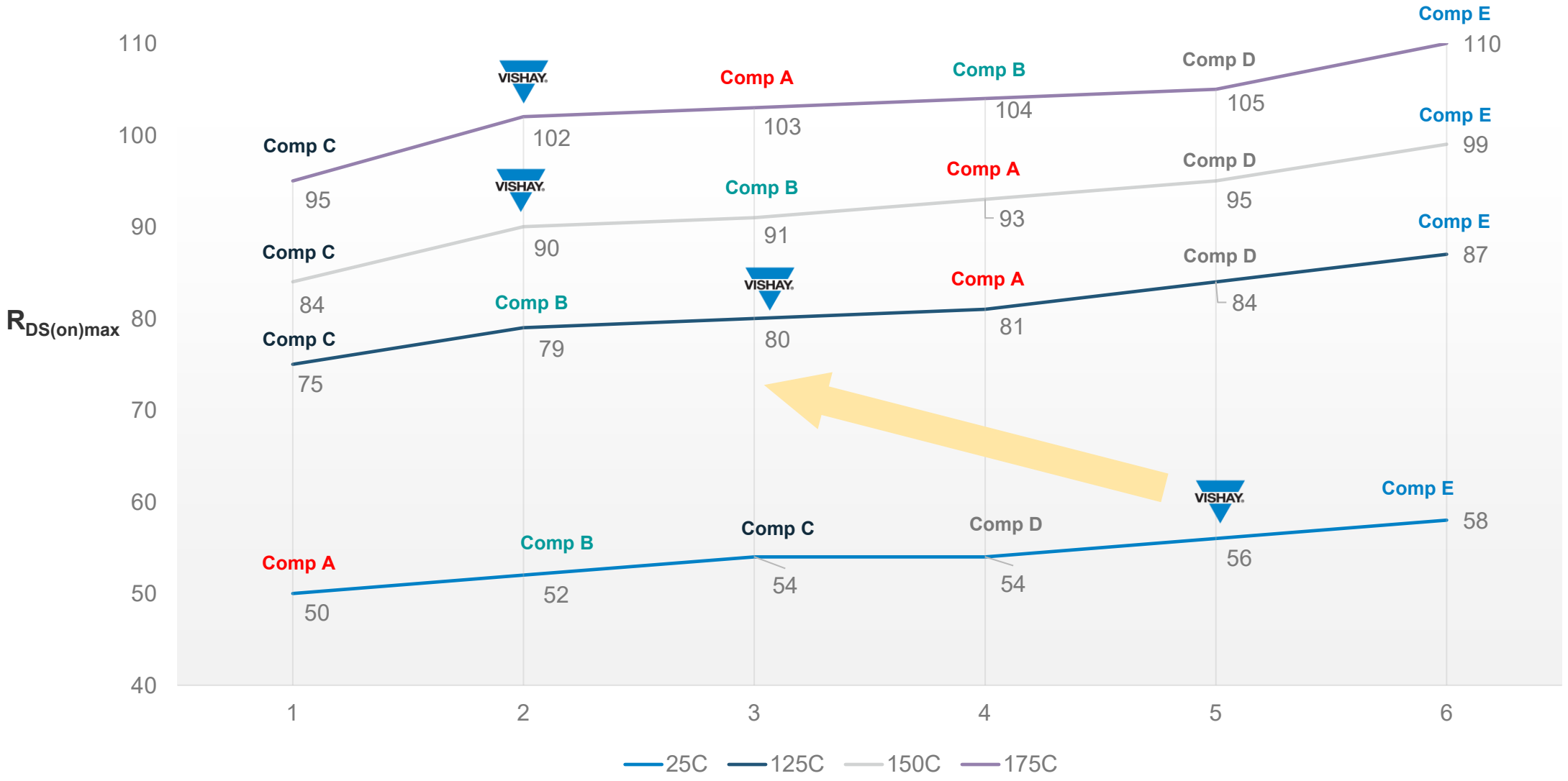
Vishay MaxSiC Planar MOSFET – $R_{DS(on)}$ Comparison @ High $T_{junction}$

1200V $R_{DS(on)typ}$ = 40-45mΩ vs Temperature



Vishay MaxSiC Device Ruggedness

SCWT Capability

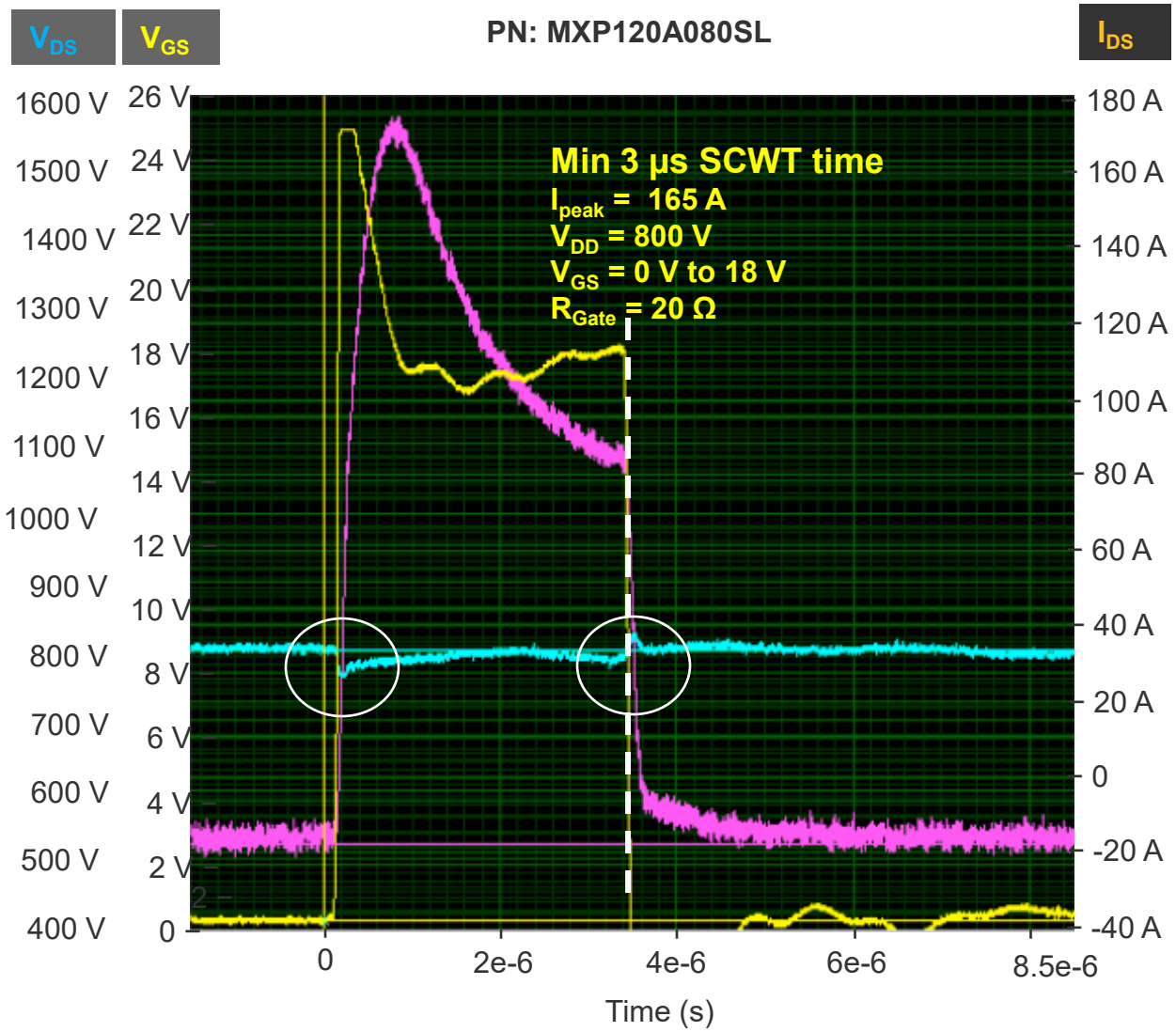
Benefits of Higher SCWT

Extended Fault Detection Window
Gate driver can detect and respond to short-circuit events earlier. This simplifies the desaturation detection or overcurrent sensing circuits without needing ultrafast response time

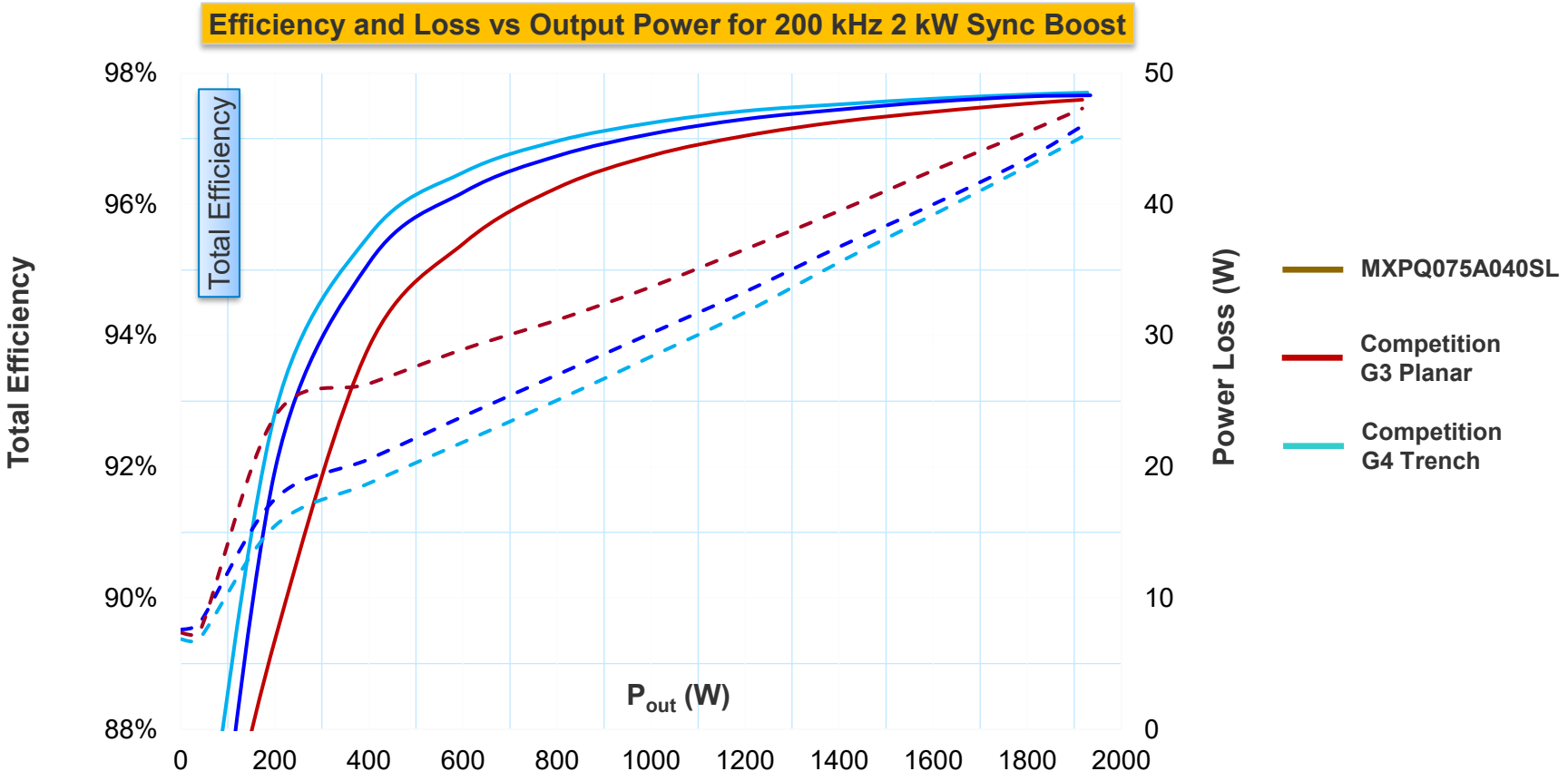
Simplified Protection Circuitry
Gate driver doesn't need to shut down the MOSFET within a hundred nanoseconds and reduces the need for high speed comparators, fast ADC, or complex logic

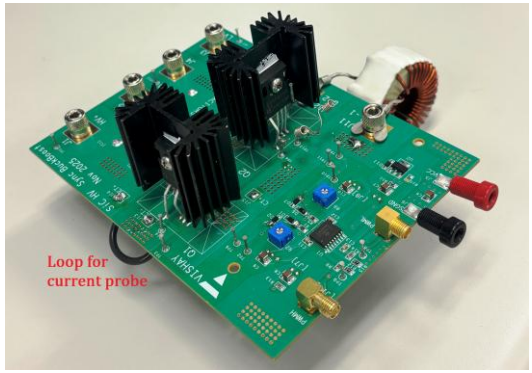
Improved Soft Turn-Off for Reliable Protection
Soft turn-off helps prevent voltage spikes during fault shutdown. With more SCWT, designers have greater flexibility in choosing gate resistance and shaping the turn-off profile, making the system more robust and less affected by layout parasitics

Noise-Tolerant Fault Protection
In noisy systems with switching transients, a longer short-circuit withstand time (SCWT) helps avoid false fault detection, leading to better system stability



Vishay MaxSiC2 Planar 750V Application-Level Comparison





Synchronous Boost Topology	
V_{in}	250V
V_{out}	400V
P_{out}	~2kW
F_{sw}	200kHz
L	300µH
V_{GS}	0V/18V
DUT	MXPQ075A40SL

- **MXPQ075A040SL (Planar)** outperforms Competition 650V 40mΩ Gen 3 Planar.
- **MXPQ075A040SL (Planar)** achieves same efficiency performance at full load compared to Competition 750V 45mΩ Gen 4 Trench
- **Vishay MaxSiC 3 750V Trench process**, now in qualification, is engineered to outperform current trench processes in both efficiency and performance (ENGR sample in Aug 2026, MP Dec 2026)

TO-247-4L

Vishay MaxSiC Package Roadmap

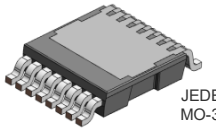
2028

2027

2026

2025

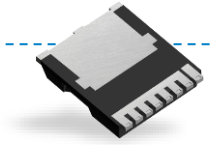
PPAK
10x15LR
Tentative



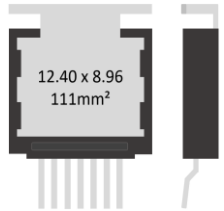
JEDEC:
MO-332

PPAK
8x8SW
Tentative

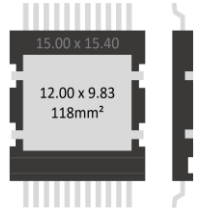
PPAK
10x12
Tentative



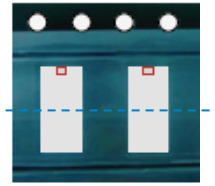
LRPAK



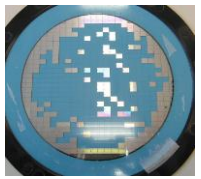
PPAK 15x21LR



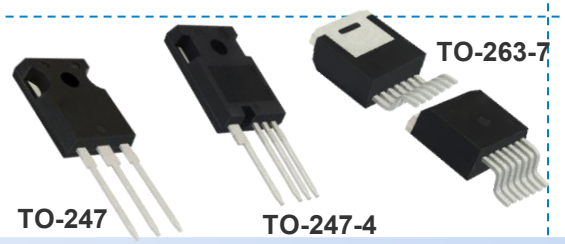
JEDEC:
MO-354



Known Good Die (KGD)



Sawn Wafer on Frame (DFFR)



Baseline / Qual Vehicles

Advanced Surface-Mount

Top-Side Cooling

Chip Scale

Vishay MaxSiC Released Datasheets

Total of 19 parts released on the web (11 industrial + 8 automotive)
1200V 40mΩ Trench in TO-247-3L released on the web

Series	Package	Drain-Source Breakdown Voltage V_{DS} (V)	Typ. $R_{DS(on)}$ at 25 °C (mΩ)	Total Gate Ch (nC)	ation
MXP120A045SE	D2PAK 7L (TO-263 7L)	1200	45	82	trial
MXP120A045SL	TO-247AD 4L	1200	45	83	trial
MXP120A045SW	TO-247AD 3L	1200	45	84	trial
MXP120A063SE	D2PAK 7L (TO-263 7L)	1200	63	58	trial
MXP120A063SL	TO-247AD 4L	1200	63	61	trial
MXP120A080SE	D2PAK 7L (TO-263 7L)	1200	80	47	trial
MXP120A080SL	TO-247AD 4L	1200	80	45	trial
MXP120A160SE	D2PAK 7L (TO-263 7L)	1200	160	25	trial
MXP120A160SL	TO-247AD 4L	1200	160	25	trial
MXP120A250SE	D2PAK 7L (TO-263 7L)	1200	250	15	trial
MXP120C040W	TO-247AD 3L	1200	40	69	trial
MXPQ120A045SE	D2PAK 7L (TO-263 7L)	1200	45	82	otive
MXPQ120A045SL	TO-247AD 4L	1200	45	83	otive
MXPQ120A045SW	TO-247AD 3L	1200	45	84	otive
MXPQ120A063SE	D2PAK 7L (TO-263 7L)	1200	63	58	otive
MXPQ120A063SL	TO-247AD 4L	1200	63	61	otive
MXPQ120A080SE	D2PAK 7L (TO-263 7L)	1200	80	47	otive
MXPQ120A080SL	TO-247AD 4L	1200	80	45	otive
MXPQ120C040W	TO-247AD 3L	1200	40	69	otive

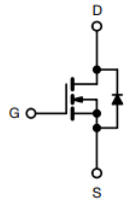
VISHAY
www.vishay.com

MXP120C040W

Vishay MaxPower Semiconductor

MaxSiC® 1200 V N-Channel SiC MOSFET

TO-247AD 3L



N-Channel MOSFET

Marking Code: 120C040W

FEATURES

- MaxSiC® 1200 V Gen3 Trench MOSFET
- Fast switching speed
- Short circuit withstand time 2 µs
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Solar inverters
- Energy storage systems
- UPS (uninterruptible power supplies)

PRODUCT SUMMARY		
V_{DS} (V) at T_J max.	1200	
$R_{DS(on)}$ typ. (mΩ) at 25 °C	V_{GS} = 18 V	40
Q_g typ. (nC)	69	
I_D (A)	53	
C_{oss} typ. (pF)	72	
P_D (W)	288	
Configuration	Single	

ORDERING INFORMATION	
Package	TO-247AD 3L
Lead (Pb)-free and halogen-free	MXP120C040W-GE3

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Vishay MaxSiC TO-263-7 Product Family

Package	V_{DS} (V)	Part Number	Grade	Technology	$R_{DS(ON)}$ (mΩ) @ V_{GS} = 18 V	Qualifiable Samples*	Release to Production*
 TO-263-7	**1200**	**MXPQ120A045SE**	**Automotive**	**SiC 2 – Planar**	**45**	**Available**	**Released**
		MXP120A045SE	**Industrial**				
	1200	**MXPQ120A063SE**	**Automotive**	**SiC 2 – Planar**	**63**	**Available**	**Released**
		MXP120A063SE	**Industrial**				
	1200	**MXPQ120A080SE**	**Automotive**	**SiC 2 – Planar**	**80**	**Available**	**Released**
		MXP120A080SE	**Industrial**				
	1200	MXPQ120A160SE	Automotive	SiC 2 – Planar	160	**Available**	May 2026
		MXP120A160SE	Industrial				**Released**
	1200	MXPQ120A250SE	Automotive	SiC 2 – Planar	250	**Available**	May 2026
		MXP120A250SE	Industrial				**Released**
	1700	MXPQ170A560SE	Automotive	SiC 2 – Planar	560	*Limited Samples Available*	Jul 2026
		MXP170A560SE	Industrial				Apr 2026

*Timeline is tentative and subject to change. Please check with local FAE/Sales on latest timeline.

Vishay MaxSiC TO-247 Product Family

Package	V_{DS} (V)	Part Number	Grade	Technology	$R_{DS(ON)}$ (mΩ) @ V_{GS} = 18 V	Qualifiable Samples*	Release to Production*
 TO-247-4L	1200	MXPQ120A045SL	Automotive	SiC 2 – Planar	45	Available	Released
		MXP120A045SL	Industrial				Released
	1200	MXPQ120A063SL	Automotive	SiC 2 – Planar	63	Available	Released
		MXP120A063SL	Industrial				
	1200	MXPQ120A080SL	Automotive	SiC 2 – Planar	80	Available	Released
		MXP120A080SL	Industrial				
	1200	MXPQ120A160SL	Automotive	SiC 2 – Planar	160	Available	May 2026
		MXP120A160SL	Industrial				Released
	750	MXPQ075A040SL	Automotive	SiC 2 – Planar	40	Available	May 2026
		MXP075A040SL	Industrial				Mar 2026
 TO-247-3L	1200	MXPQ120A045SW	Automotive	SiC 2 – Planar	45	Available	Released
		MXP120A045SW	Industrial				
	1200	MXPQ120C040W	Automotive	SiC 3 – Trench	40	Available	Released
		MXP120C040W	Industrial				Released

*Timeline is tentative and subject to change. Please check with local FAE/Sales on latest timeline.

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BUILT TO WIN

VISHAY EVERY DAY

AMERICAS SALES CONFERENCE