



life.augmented



presented by
EBVElektronik
| An Avnet Company |

Silicon Carbide Power & Drives Samples Kit

Key enablers in the New Strategic
Applications



SiC MOSFET



The Real Breakthrough in high voltage switching

Silicon Carbide: The Enabling Technology for higher power density in Industrial and Automotive application

Based on the advanced and innovative properties of widebandgap materials, ST's silicon carbide (SiC) MOSFETs feature very low RDS(on) per area, with the new SCT*N65G2 650 V product family and the SCT*N120G2 1200 V product family in development, combined with excellent switching performance, reserve efficient and compact designs. These new families feature the industry's highest temperature rating of 200 °C for improved thermal design of power electronics systems.



FEATURES

- Very low switching losses
- Low power losses at high temperatures
- Higher operating temperature (up to 200 °C)
- Body diode with no recovery losses
- Easy to drive

BENEFITS

- Smaller form factor and higher power density
- Reduced size/cost of passive components
- Higher system efficiency
- Reduced cooling requirements and heatsink size

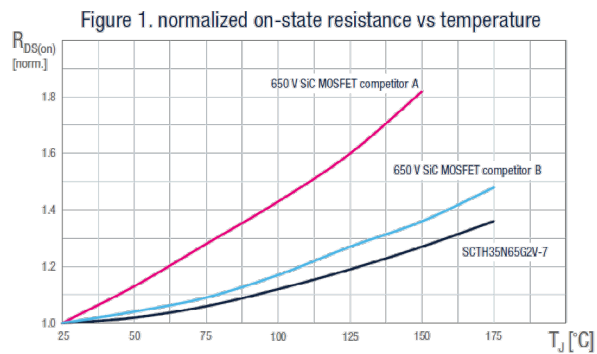
APPLICATIONS

- Traction inverter
- EV charge station
- Photovoltaics
- Factory automation
- Motor drive
- Data center power supply
- OBC & DC/DC converter

SiC MOSFET



The Real Breakthrough in high voltage switching



Commercial Product	VDSS (V)	ID max (A)	RDS(ON) (mΩ) (typ. T _J = 25 °C)	Package
SCTW35N65G2V	650	45	55	HiP247
SCTH35N65G2V-7		45		H2PAK-7
SCTW35N65G2VAG		45		HiP247
SCTW35N65G2VAG		45		H2PAK-7
SCTW90N65G2V		119	18	HiP247
SCTH90N65G2V-7		116		H2PAK-7
SCTW100N65G2AG		95	20	HiP247
SCTH100N65G2-7AG		95		H2PAK-7
SCT10N120	1200	12	500	HiP247
SCT10N120AG		12		
SCT20N120		20		
SCT20N120AG		20	169	H2PAK-2
SCT20N120H		20		
SCTWA20N120		20		HiP247 Long Leads
SCTW40N120G2VAG		33		75
SCTWA40N120G2V-4		33	HiP247 4Leads	
SCTH40N120G2V7AG		33	H2PAK-7	
SCTW70N120G2V		95	22	HiP247

AG = Automotive Grade

SiC DIODES



Ultra-high performance 650 V diodes in PowerFLAT™ 8x8 HV SMDs

The PowerFLAT™ 8x8 HV family eases design in low-space environments, combining compactness with improved total capacitive charge and a market-leading low forward voltage drop (VF).

As a wide band gap material, silicon-carbide diodes are the undisputed technology for increasing the efficiency and robustness of applications such as servers or telecom equipment. ST's 650V SiC diodes in a PowerFLAT™ 8x8 HV packages are offering excellent thermal performance, ease design in low-space environments and are increasing the efficiency and robustness of industrial applications.



FEATURES

- Less-than-1mm height package
- High creepage package
- Temperature independent switching behavior
- Low forward voltage drop
- High forward surge capability
- MSL1
- ECOPACK®2

BENEFITS

- Space saving
- Very low power losses
- High system reliability – Reduced field maintenance
- Increase productivity as MSL1 SMD package

APPLICATIONS

- SMPS for telecoms, servers, factory automation, and renewable energy
- UPS equipment
- DIN Rail
- High frequency inverters for Boost PFC, bootstrap or clamping functions

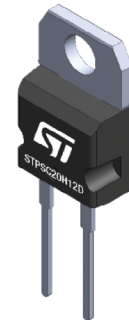


SiC DIODES



Market leading Forward Voltage Drop (V_F) in 650 Volt and 1200 Volt devices

ST proposes a **650 V** and **1200 V** range with single and dual diodes encapsulated in package sizes from DPAK to TO-247, including the ceramic insulated TO-220 as well as the slim and compact PowerFLAT™ 8x8.



Commercial Product	VDSS (V)	IF (AV)	V_F [V] max (per diode) @ 10 ($T_J = 25\text{ }^\circ\text{C}$)	Package
STPSC10065D	650	10 A	1.45	TO-220AC
STPSC12065D		12 A		
STPSC20065D		20 A		
STPSC20065GY-TR		20 A	1.55	D ² PAK
STPSC40065CWY		2 x 20 A		TO-247
STPSC4H065DLF		4 A		PowerFLAT 8x8 HV
STPSC6H065DLF		6 A		
STPSC8H065DLF		8 A		
STPSC10H065DLF		10 A		
STPSC4H065B-TR		4 A		1.75
STPSC2H12D	1200	2 A	1.50	TO-220AC
STPSC2H12B-TR1		2 A		DPAK HV
STPSC5H12D		5 A		TO-220AC
STPSC10H12GY-TR		10 A		D2PAK
STPSC10H12D		10 A		TO-220AC
STPSC15H12D		15 A		
STPSC20H12CWL		2 x 10 A		TO-247 LL
STPSC20H12G-TR		20 A		D2PAK
STPSC30H12CWL		2 x 15 A		TO-247 LL
STPSC40H12CWL		2 x 20 A		

Y = Automotive Grade

STGAP2 family Overview



Galvanically Isolated 4A Gate Driver Enhances Safety, simplifies design

- **Fit high power application :**
 - STGAP2 is a High Voltage rail (up to 1700 V) galvanic isolated driver characterized by 4 A capability, making the device suitable for high power inverter applications such as motor drivers in industrial applications
- **State of the art protections and features :**
 - is available with key protections function such as Dedicated SD and Brake pins, UVLO and thermal shutdown are included to easily design high reliability systems, The input to output propagation delay results contained within 80 ns, providing high PWM control accuracy.
- **Compact package options**
 - Single SO8 (STGAP2Sx)
 - Single SO8 Wide creepage (STGAP2HSx, STGAP2HSiCSx)
 - Dual channel SO16 (STGAP2Dx)
- **Evaluation board available**
 - evaluation board EVALSTGAP2D, EVALSTGAP2S(C)M, EVALSTGAP2HS(C)M and EVALSTGAP2SICS(C) for fast and easy evaluation and prototyping
- **15 years longevity commitment**
 - High reliability



STGAP Portfolio



STGAP State-of-the-Art Gate Driving Protects Your System in Challenging Applications

ST galvanic isolated gate drivers for MOSFETs, SiC MOSFETs & IGBTs deliver outstanding robustness, noise immunity & design flexibility



Commercial Product	Channels	Isolation (kV _{pk})	UVLO (V _{Hon})	Package	Development environment
STGAP1AS(TR)	1	4	10	SO24-W	EVALSTGAP1AS eval board STSW-STGAP001 eval SW
STGAP2SM(TR)	1	4	9.1	SO8-N	EVALSTGAP2SM evaluation board
STGAP2SCM(TR)	1	4	9.1	SO8-N	EVALSTGAP2SCM eval board
STGAP2DM(TR)	2	4	9.1	SO16-N	EVALSTGAP2DM eval board
STGAP2HSM(TR)	1	6	9.1	SO8-W	EVALSTGAP2HSM
STGAP2HSCM(TR)	1	6	15.5	SO8-W	EVALSTGAP2HSCM
STGAP2SiCS(TR)	1	6	15.5	SO8-W	TBD
STGAP2SiCSC(TR)	1	6	15.5	SO8-W	TBD

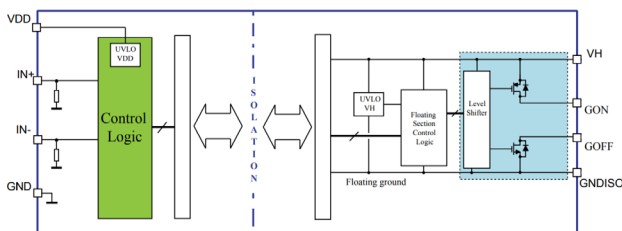
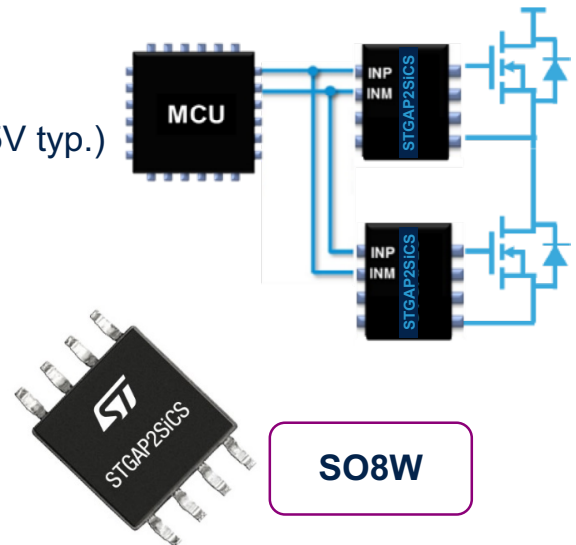
STGAP2HSiCS



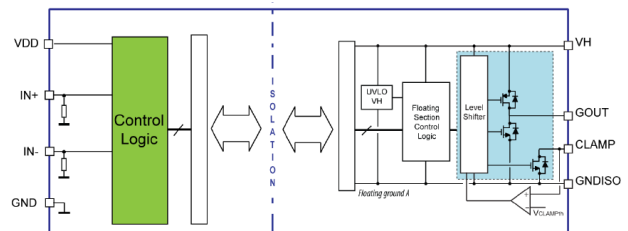
STGAP2HSiCS belongs to the new generation of **6 KV_{pk}** galvanic isolated gate driver. It is made of two galvanically isolated dice which communicate by means of one transformer.

The transformer is used to transmit the PWM commands from the LV die (μ C interface section) to the HV die (gate driving section)

- **6 KV_{pk}** galvanic isolation
- 3V3 / 5 V logic inputs with hysteresis
- **Optimized UVLO** thresholds (VHon = 15.5V typ.)
- Up to 26 V gate driving voltage
- **4 A Sink/Source current capability**
- Short propagation delay: **75 ns**
- 4 A **Miller CLAMP** dedicated pin option
- Stand-by function
- **100 V/ns CMTI**
- High voltage rail up to 1200 V
- Thermal shut-down protection
- **SO8W Package** (8 mm creepage)



Option 1: STGAP2HSiCS
Separated sink/source outputs



Option 2: STGAP2HSiCS
Single output and Miller CLAMP

- Demonstration boards for STGAP2HSiCS
 - Suitable for either separated Outputs and Miller CLAMP variants

EVALSTGAP2HSiCS,
EVALSTGAP2HSiCS

CONTACT

EBV Elektronik GmbH & Co. KG
D-85586 Poing
Im Technologiepark 2-8
Phone: +49 (0)8121 774-0
Fax: +49 (0)8121 774-422