Innovative Frontiers in Power Module

Selection Guide 2021

Semi PowerEx

GaN Module
SiC Module
LV/HV MOSFET Module
IGBT Module
FRD / Rectifier / SBD Module

SEMIPOWEREX®

www.semi-powerex.com

About SemiPowerEx

History

Jul. 2014	Established
Dec. 2014	Started Mass Production for 7 Industrial Standard Packages
Nov. 2015	Registered as a Venture Company
Dec. 2016	Estabilished R&D Center
Dec. 2016	Patent Registered (10-1692490)
	"Semiconductor Power Module with the structure of Water Cooling"
Jun. 2017	Patent Registered (10-1754923)
	"Power Module based on Transistor for high electron mobility "
Nov. 2020	Patent Registered (10-2176925)
	"Cooing Structure of the Power Module for Automotive Water Cooling Type Inverter

UL 1557(E88153) approved 9 packages **"S1/S3/S7/S8/SA/ST/SM/S4B/S4A"**

Business Area

Power Modules under mass-production

- SiC Modules
- GaN Modules
- MOSFET(LV, HV) Modules
- IGBT Modules
- DIODE(SBD, FRD, Rectifier) Modules
- Customized Modules

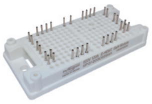
Engineering Service for Power Module Design & Sample Build- up

ODM & OEM for High Power Module

Items in mass-production

Summary

- SiC, GaN, IGBT, LV/HV MOSFET, Fast Recovery Diode, Rectifier, SBD Modules for Power Conversion Systems
- Power Rating : 3KW ~ 250KW
- Switching Frequency : ~ 200KHz

	UL 1557  SM	UL 1557  S4B	UL 1557  S4A	UL 1557  S1 (34mm)	UL 1557  S3 (62mm)	UL 1557  ST (40mm)	 SH (27mm)
SiC	√	√	√	√	√		
GaN	√	√	√				
FRD				√		√	√
SBD				√			
Rectifier				√			√
MOSFET	√	√	√	√	√		
IGBT			√	√	√		

	 S5 (TO-244)	UL 1557  S7 (SOT-227)	 S6 (EconoDUAL3)	UL 1557  S8 (EconoDUAL2 Like)	UL 1557  SA (HybridPACK1 Like)	 SA2 (SEMIX 5 Like)
SiC		√	√	√	√	√
GaN						
FRD		√				
SBD	√	√				
Rectifier		√				
MOSFET		√	√	√	√	√
IGBT		√	√			√

Technology

Chip Interconnection

- Al Round Wire/ Ribbon Bonding
- Cu Round Wire/ Ribbon Bonding
- Al Clad Cu Round Wire Bonding
- Spacer or Clip Sintering

Die & Substrate Attach

- Pb-free Soft Soldering
- Ag Sintering (Pressure & Pressure-less)
- TLPB (Transient Liquid Phase Bonding)

Terminal Interconnection

- Pb-free Soft Soldering
- Wire Interconnection (Cu, Al)
- UltraSonic Welding

Base Plate & Heat Spreader

- Thick Cu Si_3N_4 Substrate (for Base Plate less)
- Flat Type Cu Base Plate
- Flat Type AlSiC Base Plate
- Pin Fin Type AlSiC Base Plate for Direct Water Cooling
- UltraSonic Welded Spiral Cu Pin Fin Base Plate for Direct Water Cooling (patented)

Terminal

- Bolt Type
- Soldering Type
- Press-Fit

Ordering Information

Product Name

SP X 100 GD 120 X S4B

SemiPowerEx (Manufacturer)

Power Semiconductor Device

- X : SiC Module
- G : GaN Module
- S : MOSFET Module
- Y : Hybrid SiC MOSFET Module
- H : Hybrid IGBT Module(IGBT + SiC SBD)
- D : Fast Recovery Diode Module
- R : Rectifier Diode Module
- T : Si Schottky Diode Module
- M : IGBT Module

Current Rating

- 75 : 75A
- 100 : 100A

Configuration

1) SiC/GaN/MOSFET/IGBT

- GA : Single (w/FRD)
- GAL : Chopper (Low Diode)
- GAR : Chopper (Upper Diode)
- GB : 1-leg (Half - Bridge)
- GD : 2-leg (Full - Bridge)
- GE : 3-leg (6-Pack)
- GS : Single (w/o FRD)
- N : NPC
- AN : ANPC

2) FRD/Rectifier/SBD

- KA : Parallel Diode (ST pkg : Single)
- KB : Anti-Parallel Diode
- KD : Full Bridge Diode
- CC : Center Common Cathode
- CA : Center Common Anode
- SC : Side Common Cathode
- SA : Side Common Anode
- SCS : Side Cathode Series
- SCA : Side Cathode Anode
- CCA : Common Cathode Anode
- NCC : Non-Isolation type Common Cathode
- NCA : Non-Isolation type Common Anode

Package Platforms

- SM : 20.6mm(12mm height), UL 1557
- S4B : 32.5mm(12mm height), UL 1557
- S4A : 38.0mm(12mm height), UL 1557
- S1 : 34mm, UL 1557
- S3 : 62mm, UL 1557
- ST : 40mm, UL 1557
- SH : 27mm
- S5: TO-244
- S7 : SOT-227, UL 1557
- S6 : EconoDUAL3 Like
- S8 : EconoDUAL2 Like, UL 1557
- SA : HybridPACK1 Like, UL 1557
- SA2 : SEMIX 5 Like

Semiconductor Technology (Option)

Voltage Rating

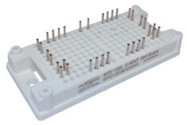
- 08 : 80V
- 60 : 600V
- 120 : 1200V
- 170 : 1700V

Cascode GaN Module

Features

- Industrial Standard Package Platforms
- 650V Cascode GaN Module
- Appropriate for Standard Gate Driver
- AlN(AMB) Substrate
- Stacked Chip (Low Voltage MOSFET onto D-Mode GaN) for low stray Inductance
- Higher G-S Withstand Voltage (+/- 20V), Higher G-S Threshold Voltage (4V)
- Low VSD (1.7V) & Positive Temperature Coefficient
- Cascode GaN Chips from Transphorm (USA)
- UL 1557 Recognized Package Platforms (SM, S4B, S4A)

Package Platforms & Product Information

Package	SM	S4B	S4A
Image			
Topology	2-PACK	2-PACK/4-PACK	2-PACK/4-PACK
Housing	20.6*54.0*12.0mmH	32.5*66.0*12.0mmH	37.4*82.0*12.0mmH
Option	DC Capacitor (0.3uF)	DC Capacitor (0.3uF)	DC Capacitor (0.3uF)

Products Line up

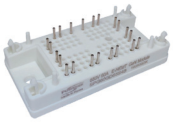
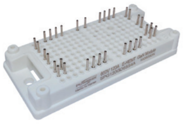
Package	Topology	I_{DS}	$R_{DS(on)}$		Product
			@T_j=25℃	@T_j=150℃	
SM	Half-Bridge	60A	30mΩ	55mΩ	SPG60GB65TSM
	Half-Bridge	100A	15mΩ	26mΩ	SPG100GB65TSM
S4B	Half-Bridge	200A	8mΩ	14mΩ	SPG200GB65TS4B
	Full-Bridge	60A	30mΩ	55mΩ	SPG60GD65TS4B
	Full-Bridge	100A	15mΩ	26mΩ	SPG100GD65TS4B
S4A	Full-Bridge	100A	15mΩ	26mΩ	SPG100GD65TS4A

E-HEMT GaN Module & IPM

Features

- Superior Performance from GaN Systems E-HEMT Devices
- G-S Withstand Voltage (-10V/+7V), G-S Threshold Voltage (1.2V)
- Ultra Low Thermal Resistance ($R_{th(j\text{-}c)}$) using High Strength AlN(AMB) Substrate
- Ultra Low System Form Factor
- High Efficiency & High Switching Applications : PV, ESS, DC-DC, UPS, OBC
- UL 1557 Recognized Package Platforms (SM, S4B, S4A)

Package Platforms & Product Information

Package	SM	S4B	S4A
Image			
Topology	2-PACK	2-PACK/4-PACK	2-PACK/4-PACK
Housing	20.6*54.0*12.0mmH	32.5*66.0*12.0mmH	37.4*82.0*12.0mmH
Option	630V 0.1uF DC Capacitor	630V 0.3uF DC Capacitor	630V 0.3uF DC Capacitor

Products Line up

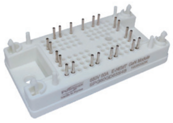
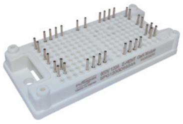
Category	Package	Topology	I_{DS}	$R_{DS(on)}$		Product
				@T_j=25℃	@T_j=150℃	
Module	SM	Full-Bridge	30A	50mΩ	110mΩ	SPG30GD65SM
		Half-Bridge	80A	20mΩ	40mΩ	SPG80GB65SM
	S4B	Full-Bridge	80A	20mΩ	40mΩ	SPG80GD65S4B
	S4A	Full-Bridge	150A	10mΩ	20mΩ	SPG150GD65S4A
IPM	S4A	Half-Bridge	30A	50mΩ	110mΩ	SPG30GB65S4A_IPM
		Half-Bridge	80A	20mΩ	40mΩ	SPG80GB65S4A_IPM
		Half-Bridge	150A	10mΩ	20mΩ	SPG150GB65S4A_IPM

Cascode SiC Module

Features

- Industrial Standard Package Platforms
- 650V & 1200V Cascode SiC Modules
- Higher G-S Withstand Voltage (+/- 20V), Higher G-S Threshold Voltage (4V)
- Low VSD (1.7V) & Positive Temperature Coefficient
- ESD Protected (HBM Class 2)
- Stacked Chip (Low Voltage MOSFET onto JFET) for low stray Inductance
- Cascode SiC Chips from UnitedSiC (USA)
- AlN(AMB) Substrate
- UL 1557 Recognized Package Platforms (SM, S4B, S4A, S7)

Package Platforms & Product Information

Package	SM	S4B	S4A	S7
Image				
Topology	2-PACK/4-PACK	2-PACK/4-PACK	2-PACK/4-PACK	1-PACK
Housing	20.6*54.0*12.0mmH	32.5*66.0*12.0mmH	37.4*82.0*12.0mmH	38.3*26.3*11.7mmH

Products Line up (w/o Switch Node RC Snubber)

Package	Topology	BV_{DSS}	$R_{DS(ON)}$		Product
			@T_j=25℃	@T_j=150℃	
SM	Half-Bridge	1200V	35mΩ	60mΩ	SPX50GB120USM
	Half-Bridge	1200V	16mΩ	27mΩ	SPX100GB120USM
	Full-Bridge	1200V	35mΩ	60mΩ	SPX50GD120USM
S4B	Half-Bridge	1200V	8mΩ	13mΩ	SPX200GB120US4B
	Full-Bridge	1200V	35mΩ	60mΩ	SPX50GD120US4B
	Full-Bridge	1200V	16mΩ	26mΩ	SPX100GD120US4B
	Full-Bridge	650V	31mΩ	44mΩ	SPX60GD65US4B
S7	Single	650V	31mΩ	45mΩ	SPX60GS65US7
	Single	650V	8mΩ	13mΩ	SPX220GS65US7
	Single	1200V	16mΩ	26mΩ	SPX120GS120US7
	Single	1200V	9mΩ	14mΩ	SPX200GS120US7

Cascode SiC Module

Features

- Industrial Standard Package Platforms
- 650V & 1200V Cascode SiC Modules
- Higher G-S Withstand Voltage (+/- 20V), Higher G-S Threshold Voltage (4V)
- Low VSD (1.7V) & Positive Temperature Coefficient
- ESD Protected (HBM Class 2)
- Stacked Chip (Low Voltage MOSFET onto JFET) for low stray Inductance
- Cascode SiC Chips from UnitedSiC (USA)
- Switch Node RC Snubber is integrated for suppressing voltage surge
- Decoupling Capacitor or DC RC Snubber → Customer side
- Internal Layout of S1 Package Platform was tuned for High Frequency Switching Applications
- AlN(AMB) Substrate
- UL 1557 Recognized Package Platforms (S1, S3)

Package Platforms & Product Information

Package	S1	S3
Image		
Topology	2-PACK	2-PACK
Housing	94.0*34.0*29.0mmH	107.6*62.6*29mmH

Products Line up (w/ Switch Node RC Snubber)

Package	Topology	BV_{DSS}	$R_{DS(ON)}$		Product	Switch Node RC Snubber
			$@T_j=25℃$	$@T_j=150℃$		
S1	Half-Bridge	1200V	16mΩ	26mΩ	SPX120GB120US1	Built-in
	Half-Bridge	1200V	9mΩ	14mΩ	SPX200GB120US1	Built-in
	Half-Bridge	1200V	8mΩ	13mΩ	SPX240GB120US1	Built-in
	Half-Bridge	1200V	5mΩ	7mΩ	SPX350GB120US1	Built-in
	Half-Bridge	650V	16mΩ	26mΩ	SPX120GB65US1	Built-in
	Half-Bridge	650V	4mΩ	6mΩ	SPX400GB65US1	Built-in
S3	Half-Bridge	1200V	8mΩ	13mΩ	SPX240GB120US3	Built-in
	Half-Bridge	1200V	5mΩ	7mΩ	SPX350GB120US3	Built-in

SiC Module (SOT-227)

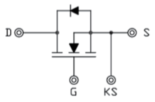
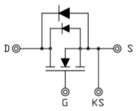
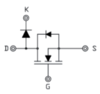
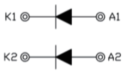
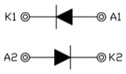
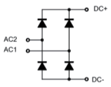
Features

- Standard Package Platform (SOT-227)
- Ultra Low Thermal Resistance using AlN Substrate
- Full Line-up (650V ~ 1200V)
- 2.5KV Isolation Structure
- Kelvin Connection for SiC MOSFET
- UL 1577 Recognized Package

Package Platform & Product Information

Package	S7
Image	
Topology	1-PACK
Housing	38.3*26.3*11.7mmH

Products Line up

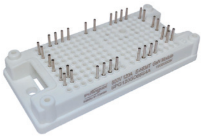
Category	Topology		BV_{DSS} / V_{RRM}	Product	$R_{DS(ON)}$ / V_F @25℃
SiC MOSFET	Single (w/o Diode)		650V	SPX60GS065S7	20mΩ
			1200V	SPX30GS120S7	72mΩ
			1200V	SPX50GS120S7	30mΩ
			1200V	SPX100GS120S7	15mΩ
	Single (w/ Diode)		650V	SPX60GA065S7	20mΩ / 1.8V
			1200V	SPX30GA120S7	72mΩ / 1.9V
			1200V	SPX50GA120S7	30mΩ / 1.9V
	Boost		650V	SPX60GAL065S7	20mΩ / 1.8V
			1200V	SPX30GAL120S7	72mΩ / 1.9V
			1200V	SPX50GAL120S7	30mΩ / 1.9V
SiC DIODE	2-Separated		650V	SPX60KA65S7	1.6V
			650V	SPX100KA65S7	1.6V
			1200V	SPX35KA120S7	1.6V
			1200V	SPX60KA120S7	1.6V
	Anti-Parallel		1200V	SPX35KB120S7	1.6V
			1200V	SPX60KB120S7	1.6V
	Full-Bridge		1200V	SPX35KD120S7	1.6V
			1200V	SPX60KD120S7	1.6V

Active NPC SiC Module

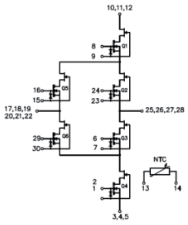
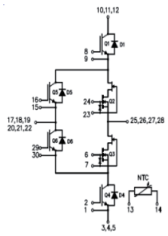
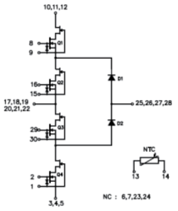
Features

- 2 Types of Active-NPC Power Modules
  - Full Cascode SiC Power Module
  - Hybrid Cascode SiC Power Module
- 3-Level Applications
- High Frequency Switching Applications
- Increased DC Link Voltage (1500V)
- General Gate Driver applicable
- Integrated NTC sensor

Package Platform & Product Information

Package	S4A
Image	
Topology	A-NPC / NPC
Housing	37.4*82.0*12.0mmH

A-NPC & NPC Products

Topology	Active NPC		NPC
Device	SPX100AN120US4A	SPY100AN120US4A	SPX100N120US4A
Remark	Full Cascode SiC	Hybrid Cascode SiC	Full Cascode SiC
Package	S4A	S4A	S4A
Circuit			

Products Line up

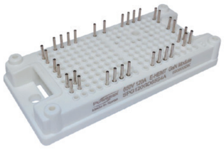
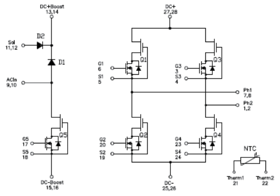
Package	Topology	Device Group	BV_{DSS} / BV_{CES} / V_{RRM}	I_D / $I_{C(AV)}$ / $I_{F(AV)}$	$R_{DS(ON)}$ or $V_{CE(SAT)}$ / V_F	Product
S4A	A-NPC (Full SiC)	SiC FET	1200V	100A	8.5mΩ / 1.5V	SPX100AN120US4A
	A-NPC (Hybrid Type)	SiC FET	1200V	100A	8.5mΩ / 1.5V	SPY100AN120US4A
		IGBT	1200V	100A	1.9V / 2.0V	
	NPC (Full SiC)	SiC FET	1200V	100A	8.5mΩ / 1.5V	SPX100N120US4A
		SiC Diode	1200V	100A	1.9V	

1-Phase Solar SiC Module

Features

- 4 ~ 5KW 1-Phase Solar Inverter Applications
- Booster : Cascode SiC JFET & SiC Diode
- Inverter : Cascode SiC JFET
- Bypass Diode
- General Gate Driving is applicable
- Integrated NTC sensor
- H-AlN(AMB) Substrate
- ESD Protected (HBM Class 2)
- Improved Gate Noise Immunity & +/-20V G-S Withstand Voltage, Vgs(th) = 4.5V

Package Platform & Product Information

Package	S4A
Image	
Housing	37.4*82.0*12.0mmH
Circuit (Internal Block)	

Product Line up

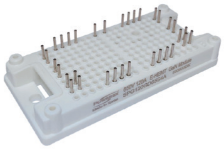
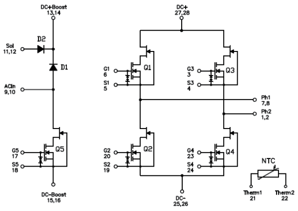
Package	BV_{DSS}	I_{DS}		$R_{DS(ON)}$		Product
		$@T_c$=25℃	$@T_c$=100℃	$@T_j$=25℃	$@T_j$=150℃	
S4A	650V	51A	36A	31mΩ	45mΩ	SPX45PV65US4A

1-Phase Solar GaN Module

Features

- 4 ~ 5KW 1-Phase Solar Inverter Applications
- Booster - Cascode GaN + SiC Diode
- Inverter - Cascode GaN
- Bypass Diode
- Improved Gate Noise Immunity & +/- 20V G-S Withstand Voltage, Vgs(th) = 4.0V
- General Gate Driving is applicable
- NTC integrated
- H-AlN(AMB) Substrate

Package Platform & Product Information

Package	S4A
Image	
Housing	37.4*82.0*12.0mmH
Circuit (Internal Block)	

Product Line up

Package	V_{DSS}	I_{DS}		$R_{DS(ON)}$		Product
		@T_c=25℃	@T_c=100℃	@T_j=25℃	@T_j=150℃	
S4A	650V	66A	42A	30mΩ	55mΩ	SPG45PV65TS4A

Low Voltage MOSFET Module

Features

- Applications : Low Voltage Battery Powered Power Conversion Systems
- Ultra Low $R_{DS(ON)}$
- Better Thermal Cycle Ruggedness & Package Flatness using AlSiC Base Plate (S8)
- UL 1557 Recognized Package Platforms (S3, S4A, S7, S8)

Package Platform

Package	S7	S4A	S3	S8
Image				
Topology	1-PACK	6-PACK	2-PACK	2-PACK
Housing	38.3*26.3*11.7mmH	82.0*37.4*16.1mmH	107.6*62.6*29.0mmH	102.0*44.6*15.5mmH

Products Line up

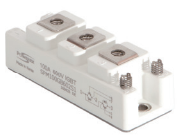
Package	BV_{DSS}	Topology	Product	I_D		$R_{DS(ON)}$	
				@T_c=25℃	@T_c=80℃	@T_j=25℃	@T_j=150℃
S7	100V	Single	SPS300GS10S7	468A	372A	1.2mΩ	1.9mΩ
	150V	Single	SPS150GS15S7	219A	164A	4.0mΩ	7.0mΩ
S4A	80V	6-PACK	SPS150GE08S4A	254A	202A	2.2mΩ	3.1mΩ
	80V	6-PACK	SPS250GE08S4A	441A	330A	1.0mΩ	1.5mΩ
S3	100V	Half-Bridge	SPS550GB10S3	680A	540A	0.8mΩ	1.3mΩ
	100V	Half-Bridge	SPS700GB10S3	720A	720A	0.7mΩ	1.0mΩ
	150V	Half-Bridge	SPS450GB15S3	530A	420A	1.5mΩ	2.3mΩ
	150V	Half-Bridge	SPS600GB15S3	720A	570A	1.2mΩ	1.9mΩ
S8	100V	Half-Bridge	SPS600GB10S8	877A	697A	1.0mΩ	1.3mΩ
	150V	Half-Bridge	SPS500GB15S8	668A	531A	1.3mΩ	2.4mΩ

High Voltage MOSFET Module

Features

- Industrial Standard Package Platforms
- Low $R_{DS(ON)}$
- High dv/dt Ruggedness
- Low Switching Loss
- NTC included (S3, S4A)
- 650V Super junction MOSFET (Fast Recovery Body Diode)
- UL 1557 Recognized

Package Platform

Package	S7	S4A	S1	S3
Image				
Topology	1-PACK	4-PACK	2-PACK	2-PACK
Housing	38.3*26.3*11.7mmH	82.0*37.4*16.1mmH	94.0*34.0*29.0mmH	107.6*62.6*29.0mmH

Products Line up

Package	BV_{DSS}	Topology	Product	I_D		$R_{DS(ON)}$	
				@T_c=25℃	@T_c=80℃	@T_j=25℃	@T_j=150℃
S7	650V	Single	SPS50GS65S7	62A	46A	40mΩ	85mΩ
S4A	650V	Full-Bridge	SPS60GD65S4A	90A	63A	40mΩ	85mΩ
S1	650V	Half-Bridge	SPS100GB65S1	124A	92A	20mΩ	43mΩ
S3	650V	Half-Bridge	SPS200GB65S3	245A	183A	10mΩ	22mΩ
	650V	Half-Bridge	SPS300GB65S3	350A	261A	7mΩ	15mΩ

Schottky Barrier Diode / Rectifier Diode Module

Features_Schottky Barrier Diode

- Standard Package Platforms (SOT-227, TO-244)
- Positive Temperature Coefficient
- EAS Ruggedness

Features_Rectifier Diode

- Standard Package Platforms (S1, SH, SOT-227)
- High Surge Current

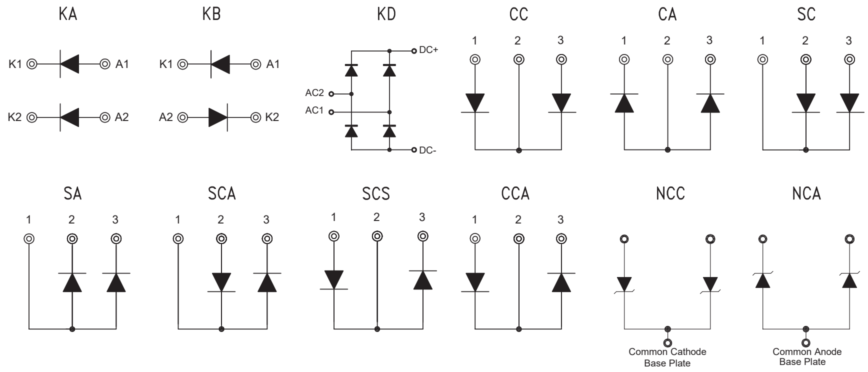
Package Platform

Package	S7 (SOT-227)	S5 (TO-244)	SH	S1
Image				
Housing	38.3*26.3*11.7mmH	93.0*21.0*16.7mmH	94.0*27.0*27.0mmH	94.0*34.0*29.0mmH

Products Line up

Group	Package	BV_{RRM}	$I_{F(AV)}$	Topology	V_F	Product
			@T_c=80℃		@T_j=25℃	
SBD	S7	150V	100A	Dual & Anti-parallel	0.9V	SPT100KA15YS7
		150V	100A		0.9V	SPT100KB15YS7
		200V	100A		0.9V	SPT100KA20YS7
		200V	100A		0.9V	SPT100KB20YS7
	S5	150V	400A	Common Cathode /Common Anode (Non-Isolation)	0.9V	SPT400NCC15YS5
		200V	400A		1.0V	SPT400NCC20YS5
		200V	400A		1.0V	SPT400NCA20YS5
Rectifier	S7	1200V	60A	KA	1.05V	SPR60KA120S7
		1600V	60A	KA	1.05V	SPR60KA160S7
	SH	1600V	120A	SAC	1.00V	SPR120SAC160SH
	S1	1600V	200A	CC/CA/SC/SA	1.00V	SPR200xx160S1

Diode Topology



Fast Recovery Diode Module

Products Line up

Package	BV_{RRM}	Topology	V_F	$I_{F(AV)}$	Product
			@T_j=25℃	@T_j=150℃	
S7 (SOT-227)	400V	KA	1.20V	93A	SPD100KA401S7
	400V	KA	1.10V	161A	SPD150KA401S7
	400V	KB	1.10V	161A	SPD150KB401S7
	1200V	KA	2.20V	60A	SPD60KA120S7
	1200V	KA	2.20V	100A	SPD100KA120S7
ST (40mm)	600V	Single	1.23V	300A	SPD300KA60ST
	1200V	Single	2.00V	200A	SPD200KA120ST
	1600V	Single	1.00V	250A	SPD250KA160ST
S5 (TO-244)	400V	Common Base Plate	1.10V	400A	SPD400NCC401S5
	600V	Common Base Plate	1.30V	400A	SPD400NCC60S5
	1200V	Common Base Plate	2.25V	200A	SPD400NCC120S5
SH (27mm)	400V	CC/CA/SC/SA	1.20V	100A	SPD100XX401SH
	400V	CC/CA/SC/SA	1.20V	150A	SPD150XX401SH
	600V	CC/CA/SC/SA	1.20V	100A	SPD100XX60SH
	650V	CC/CA/SC/SA	1.40V	100A	SPD100XX65SH
	1200V	CC/CA/SC/SA	1.40V	100A	SPD100XX120SH
S1 (34mm)	400V	CC/CA/SC/SA	1.20V	150A	SPD150XX401S1
	400V	CC/CA/SC/SA	1.20V	200A	SPD200XX401S1
	400V	CC/CA/SC/SA	1.20V	300A	SPD300XX401S1
	600V	CC/CA/SC/SA	1.35V	150A	SPD150XX60S1
	600V	CC/CA/SC/SA	1.35V	200A	SPD200XX120S1
	1200V	CC/CA/SC/SA	2.10V	60A	SPD60XX120S1
	1200V	CC/CA/SC/SA	2.10V	100A	SPD100XX1201S1
	1200V	CC/CA/SC/SA	2.10V	120A	SPD120XX120S1
	1200V	CC/CA/SC/SA	2.10V	200A	SPD200XX120S1
	1200V	Single	2.10V	349A	SPD400KA120S1
	1700V	KA	1.70V	250A	SPD250KA170S1
	1700V	SCA	1.80V	250A	SPD250SCA170S1

IGBT Module

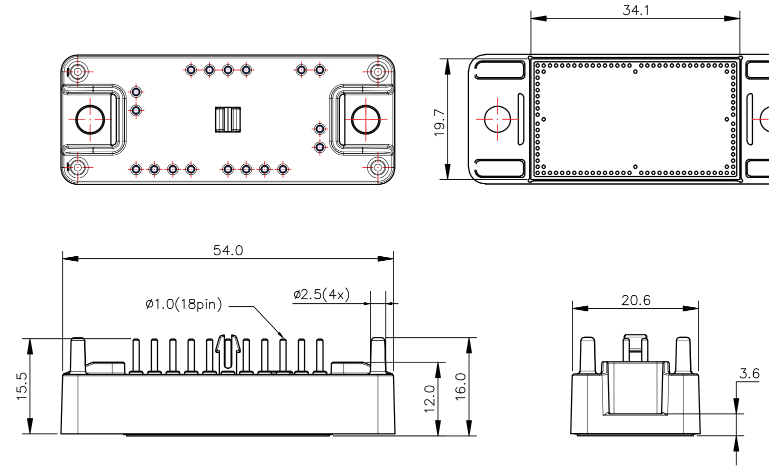
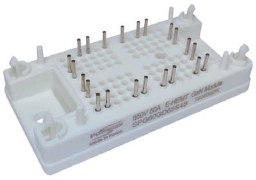
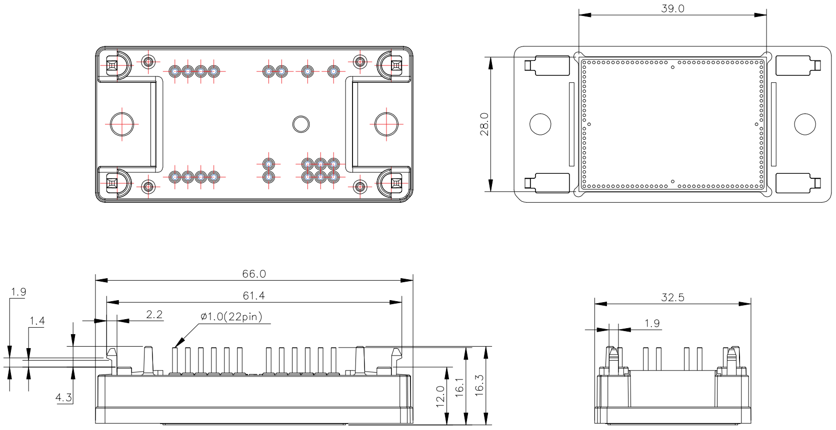
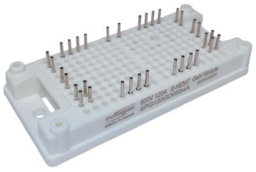
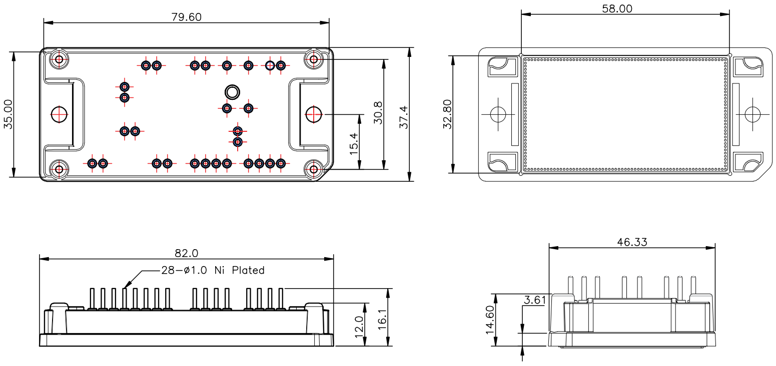
Products Line up

Package	BV_{CES}	$I_{C(AV)}$	Product				Curcuit
		@T_c=80℃	NPT1	NPT2	SPT+	Trench F/S	
S1 (34mm)	600V	75A	SPM75GB601S1	SPM75GB602S1	-	SPM75GB603S1	Half-Bridge Chopper Single
		100A	SPM100GB601S1	SPM100GB602S1	-	SPM100GB603S1	
		150A	-	SPM150GB602S1	-	-	
		200A	-	SPM200GB602S1	-	-	
	1200V	50A	-	-	SPM50GB1201S1	-	
		75A	-	-	SPM75GB1201S1	SPM75GB1204S1	
		100A	-	-	SPM100GB1201S1	SPM100GB1204S1	
		150A	-	-	SPM150GB1201S1	-	
S3 (62mm)	600V	300A	-	SPM300GB602S3	-	-	Hal-Bridge Chopper Single
		400A	-	SPM400GB602S3	-	-	
	1200V	150A	-	-	SPM150GB1201S3	-	
		200A	-	-	SPM200GB1201S3	SPM200GB1204S3	
		300A	-	-	SPM300GB1201S3	SPM300GB1204S3	
		400A	-	-	SPM400GB1201S3	SPM400GB1204S3	
S7 (SOT-227)	600V	100A	-	SPM100GA602S7	-	-	Single
		150A	-	SPM150GA602S7	-	-	
	1200V	50A	-	-	SPM50GA1201S7	-	
		75A	-	-	SPM75GA1201S7	-	
		100A	-	-	SPM100GA1201S7	-	

Remarks
- Customerized Available Packages : SM, S4B, S4A, S6, S8, SA2

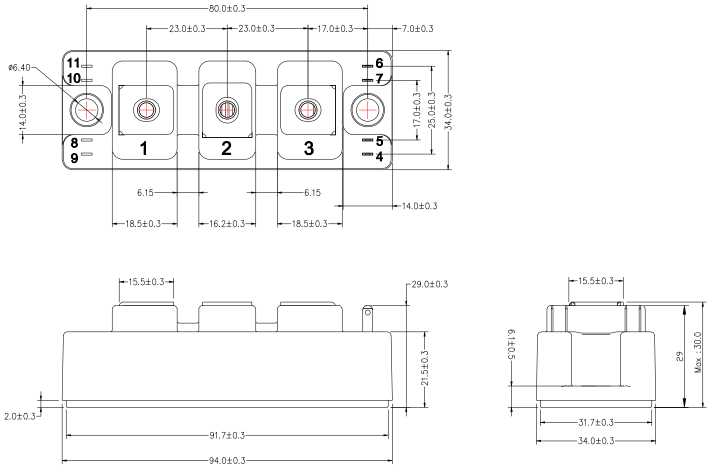
Package Dimension_1

Package Platform

Package	Image	Dimensions in mm
SM		
S4B		
S4A		

Package Dimension_2

Package Platform

<table>
<tr><th>Package</th><th>Image</th><th>Dimensions in mm</th></tr>
<tr><td>S1
(34mm)</td><td></td><td>
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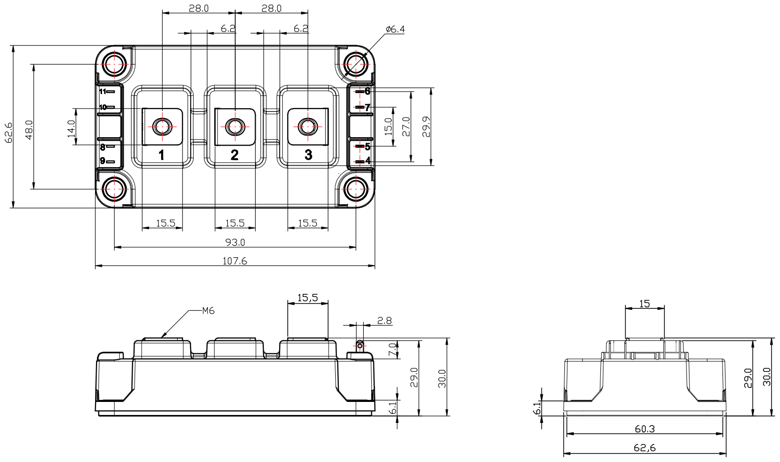
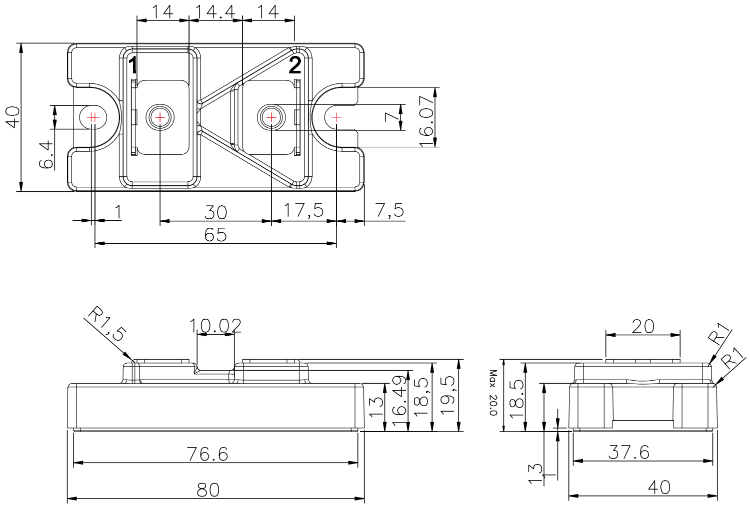
<tr><td>S3
(62mm)</td><td></td><td>
</td></tr>
<tr><td>ST
(40mm)</td><td></td><td>
</td></tr>
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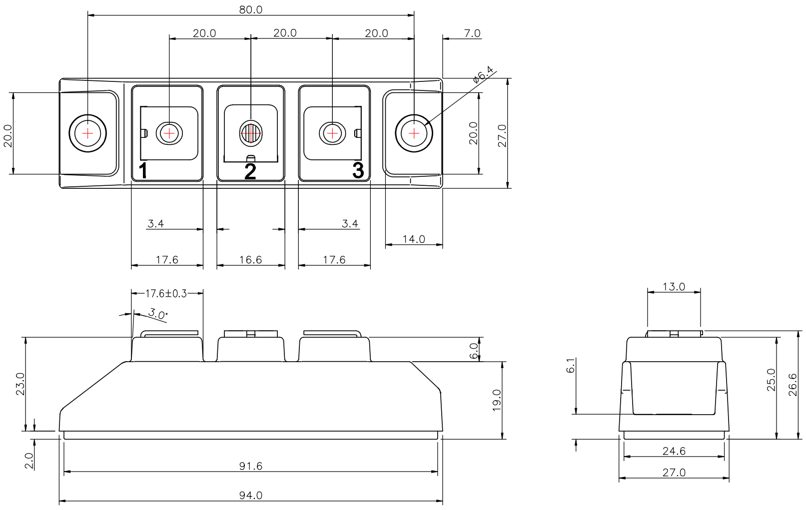
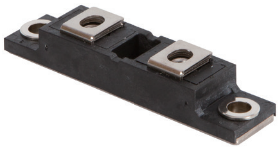
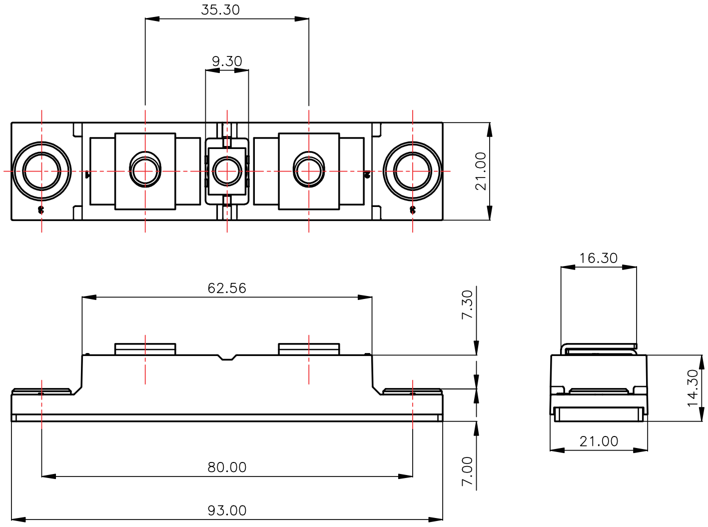
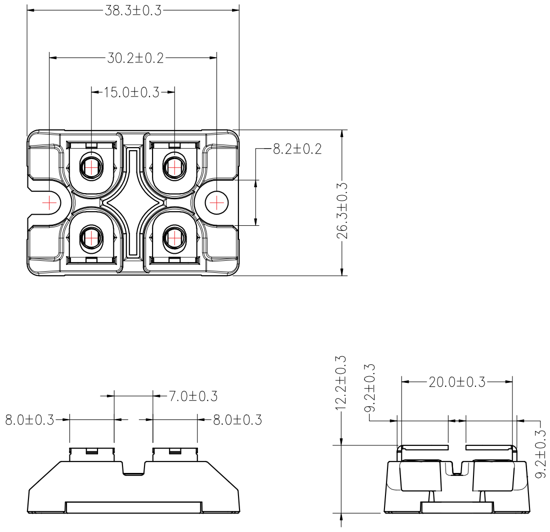
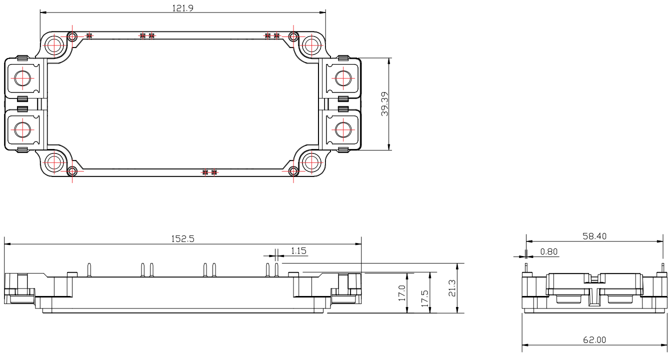
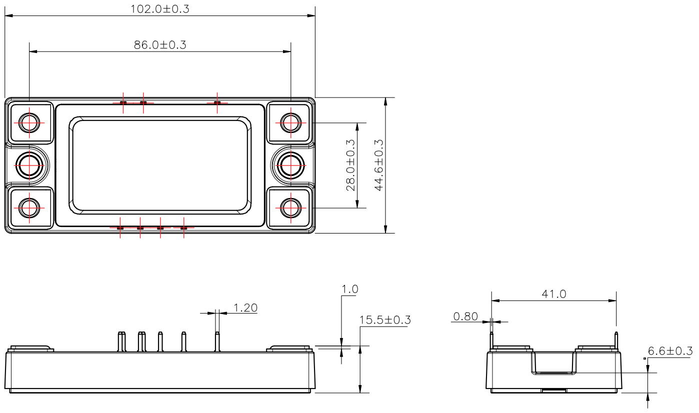
Package Dimension_3

Package Platform

Package	Image	Dimensions in mm
SH (27mm)		
S5 (TO-244)		
S7 (SOT-227)		

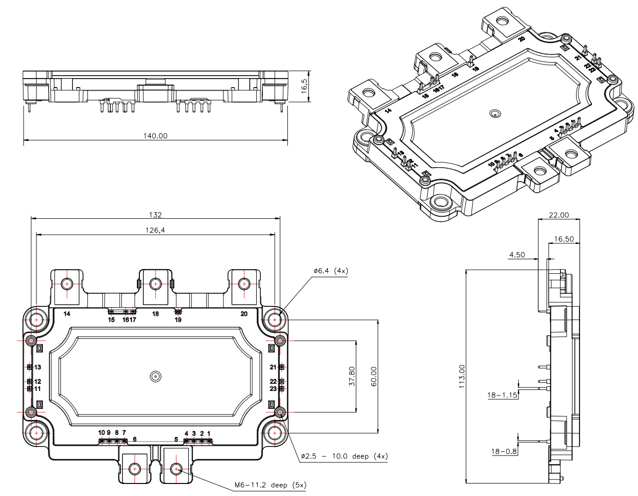
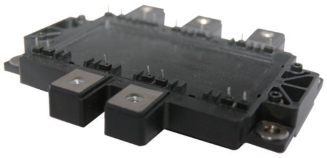
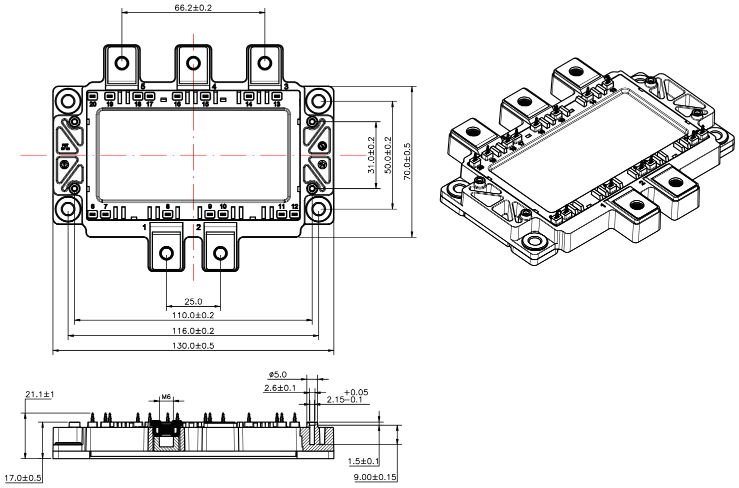
Package Dimension_4

Package Platform

Package	Image	Dimensions in mm
S6 (EconoDUAL3)		
S8 (EconoDUAL2 Like)		

Package Dimension_5

Package Platform

Package	Image	Dimensions in mm
SA (HybridPACK1 Like)		
SA2 (SEMIX 5 Like)		

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