

SEMI- POWEREX CORP.



Innovative Frontier in Power Module

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SEMIPOWEREX®

About Semi-Powerex Corp.

History

- **07. 2014** Established
- **12. 2014** Started Mass Production for 7 Industrial Standard Packages
- **04. 2015** Set up the Strategic OEM Partnership at Incheon-city, Korea
- **11. 2015** Registered as a Venture Company
- **12. 2016** Established R&D Center
- **12. 2016** Patent Registered
"Semiconductor Power Module with the structure of Water Cooling"
- **12. 2016** UL 1557 approved for ST Package
- **05. 2017** UL 1557 approved for S1(34mm) / S3(62mm) Packages
- **06. 2017** Patent Registered
"Power Module based on Transistor of high electron mobility"
- **05. 2018** UL 1557 approved for S8 Package

Business Area

Power Modules Under Mass Production

- SiC Modules
- GaN Modules
- MOSFET Modules
- IGBT Modules
- Diode | Rectifier | SBD Modules

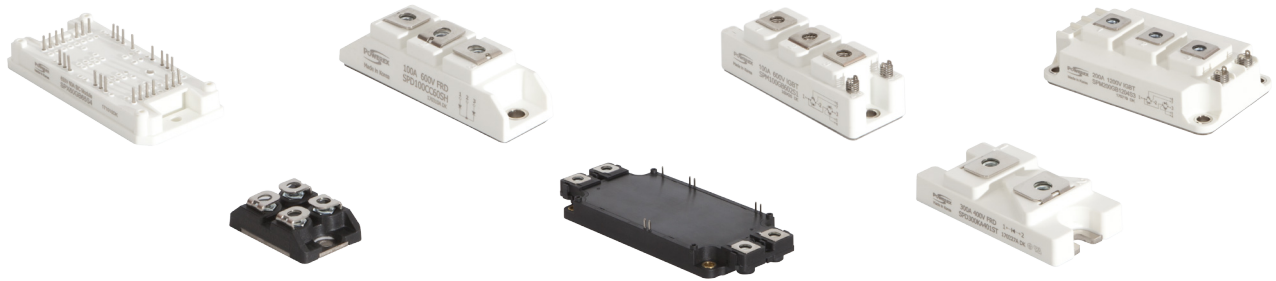
Engineering Services for Customer Specific Module Design & Sample Build-up

ODM & OEM

Product Portfolio

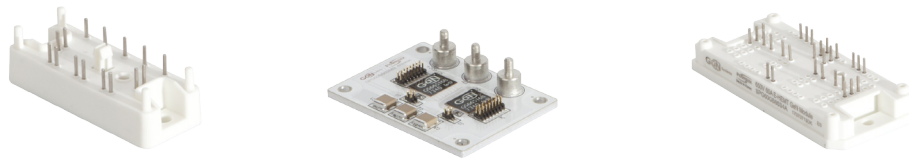
Products Under Mass Production

- IGBT Modules (600V ~ 1700V)
- Diode / Rectifier Modules (400V ~ 1600V)
- Si SBD Modules (100V ~ 200V)
- MOSFET Modules (80V ~ 950V)



Newly Development Products (650V E-HEMT GaN Modules)

- 650V 30A Full-Bridge Module (SPG30GD65SM)
- 650V 60A Full-Bridge Module (SPG60GD65S4A)
- 650V 120A Full-Bridge Module (SPG120GD65S4)
- (SPG60GB65S4A, SPG60GB65S4C) : using 30A GaN Die



Newly Development Products (SiC MOSFET Modules)

- 650V 900A Half-Bridge Module (SPX900GB65S6)
- 1200V 300A Half-Bridge Module (SPX300GB120S6)
- 1200V 450A Half-Bridge Module (SPX450GB120S6)
- 1200V 600A Half-Bridge Module (SPX600GB120S6)
- 650V 60A Full-Bridge Module (SPX60GD65S4A)
- 1700V Common-Source SiC MOSFET Module for SSCB (Solid State Circuit Breaker)

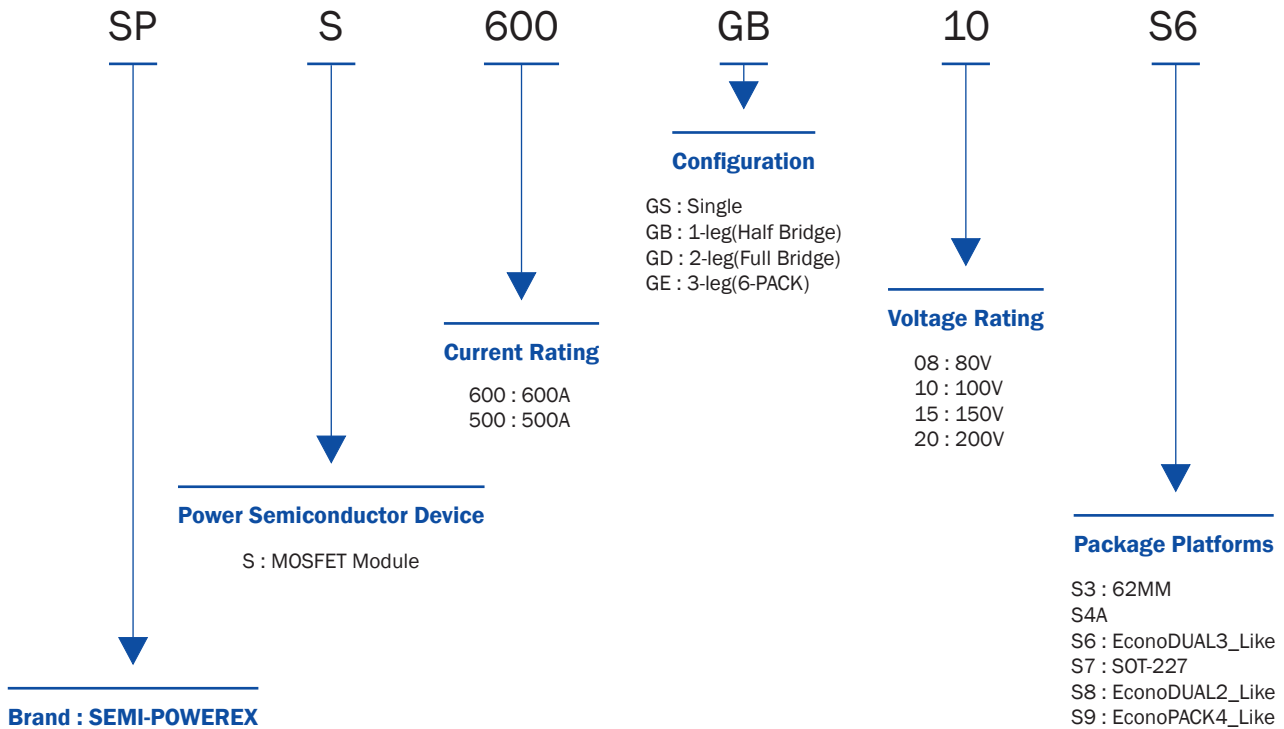


Newly Development Products (Low Voltage MOSFET Modules)

- 100V 300A 1-PACK Module (SPS300GS10S7) : $R_{ds(on)}=1.2m\Omega$, $I_d=372A$ @ $T_c=80^\circ C$
- 100V 150A 6-PACK Module (SPS150GE10S4A) : $R_{ds(on)}=2.2m\Omega$, $I_d=179A$ @ $T_c=80^\circ C$
- 100V 600A 2-PACK Module (SPS600GB10S8) : $R_{ds(on)}=1.0m\Omega$, $I_d=697A$ @ $T_c=80^\circ C$
- 100V 500A 2-PACK Module (SPS500GB10S8) : $R_{ds(on)}=1.4m\Omega$, $I_d=531A$ @ $T_c=80^\circ C$
- 200V 400A 2-PACK Module (SPS400GB20S8) : $R_{ds(on)}=4.4m\Omega$, $I_d=379A$ @ $T_c=80^\circ C$
- 100V 600A 6-PACK Module (SPS600GB10SA) : $R_{ds(on)}=1.0m\Omega$, $I_d=697A$ @ $T_c=80^\circ C$

MOSFET Modules

Ordering Information (MOSFET Module)



* Other Specific Topology of SiC Module is also available

Package Appearance

S7 (38.3*26.3*11.7mm)



S3 (107.6*62.6*29.0mm)



S4A (82.0*37.4*12.0mm)



S8 (102.0*44.6*15.5mm)

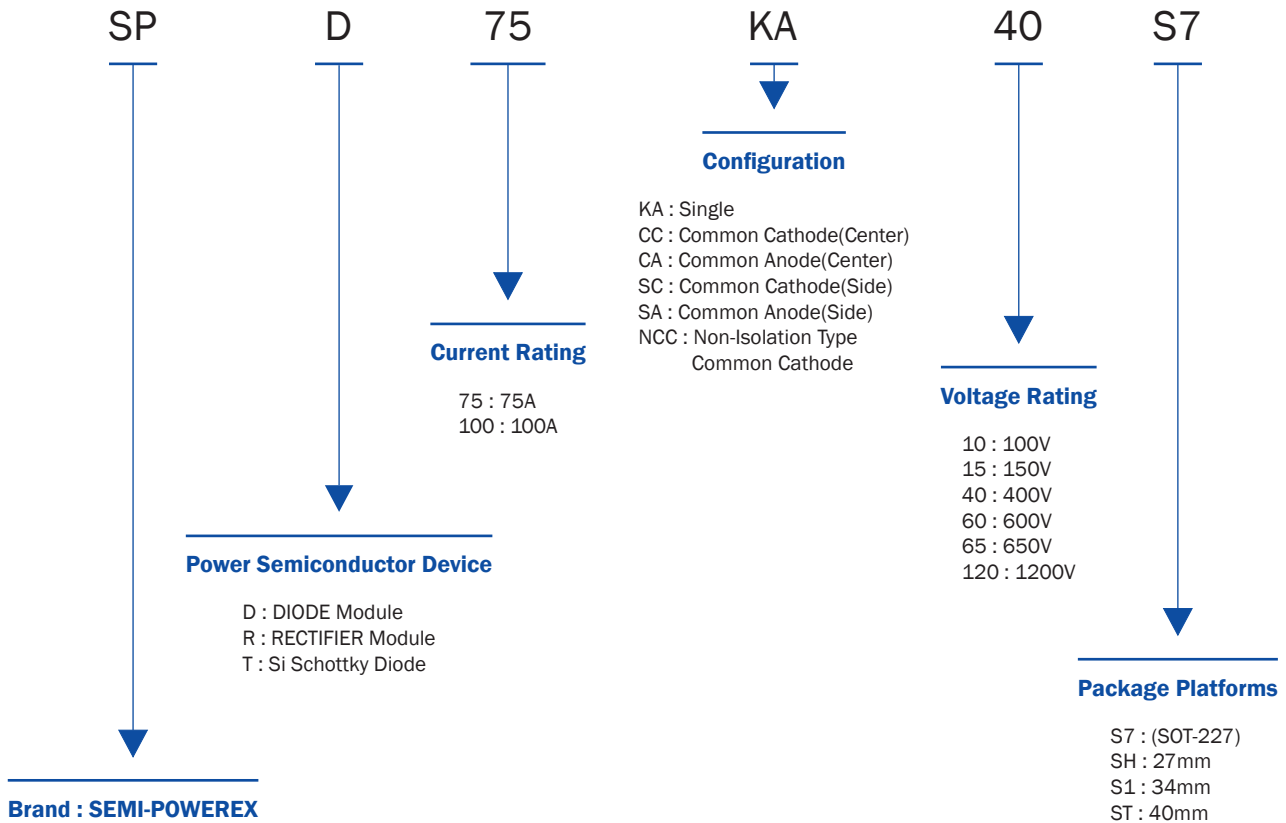


MOSFET Modules

Package	Topology	Voltage	Rds(on) @T _J =25 °C	ID @T _c =80 °C	Product
	Single	100V	1.2mΩ (@ID=300A)	372A	SPS300GS1057
	3-leg (6-PACK)	80V	2.2mΩ (@ID=150A)	179A	SPS150GE0854
	1-leg (Half-bridge)	100V	0.8mΩ (@ID=550A)	540A	SPS550GB1053
			0.75mΩ (@ID=700A)	720A	SPS700GB1053
	1-leg (Half-bridge)	150V	1.5mΩ (@ID=450A)	420A	SPS450GB1553
			1.2mΩ (@ID=600A)	570A	SPS600GB1553
	1-leg (Common Drain)		1.5mΩ (@ID=450A)	420A	SPS450CD1553
	1-leg (Half Bridge)	100V	1.0mΩ (@ID=600A)	697A	SPS600GB1058
		150V	1.35mΩ (@ID=500A)	531A	SPS500GB1558
		200V	4.4mΩ (@ID=400A)	379A	SPS400GB2058

Diode | Rectifier | SBD Modules

Ordering Information (DIODE Module)



* the other configuration also available on request

Package Appearance & Topology

S7 (SOT-227)



SH (94.0*27.0*27.0mm)



S1 (94.0*34.0*30.0mm)



ST (80.0*40.0*20.0mm)



S5 (TO-244, 93.0*21.0*16.7mm)

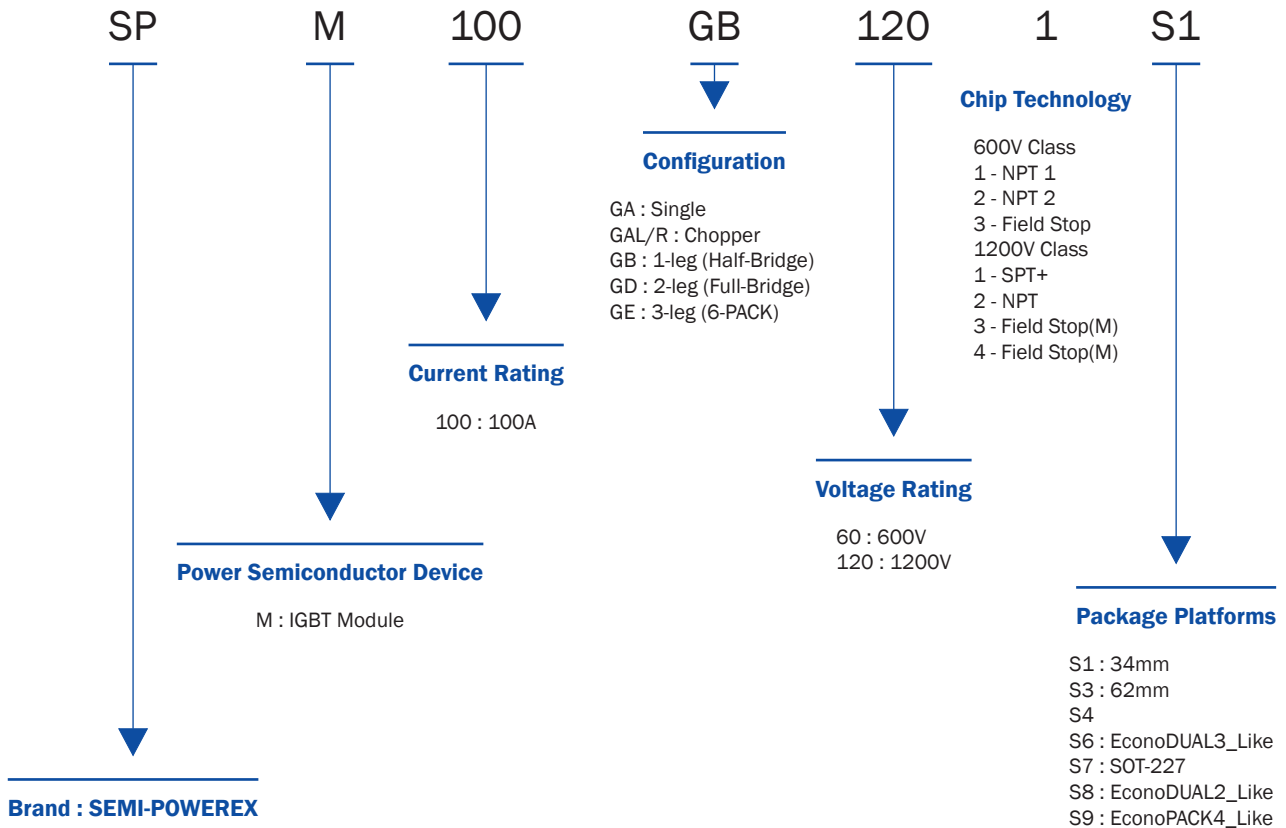


Diode | Rectifier | SBD Modules

Package	Topology	Voltage	VF @Tj=25 °C	IF @Tc=80 °C	Product
	Dual (KA)	100V	0.87V	150A	SPT150KA10S7
		150V	0.90V	150A	SPT150KA15S7
		400V	1.20V	93A	SPD100KA401S7
			1.10V	150A	SPD150KA401S7
	Dual	650V	1.30V	60A	SPD60KA65S7
			1.30V	110A	SPD100KA65S7
		1200V	2.20V	60A	SPD60KA120S7
			2.20V	100A	SPD100KA120S7
	Single	400V	1.20V	300A	SPD300KA401ST
		600V	1.35V	300A	SPD300KA60ST
		1200V	2.0V	200A	SPD200KA120ST
		1600V	1.0V	250A	SPR250KA160ST
	Common Base Plate	100V	0.87V(@200A) 1.05V (@400A)	400A	SPT400NCC10S5
		150V	0.90V(@200A) 1.10V(@400A)	400A	SPT400NCC15S5
		200V	0.95V (@200A) 1.15V (@400A)	400A	SPT400NCC20S5
		400V	1.15V	400A	SPD400NCC401S5
	CC CA SC SA	400V	1.20V	100A	SPD100CC401SH SPD100CA401SH
			1.20V	150A	SPD150CC401SH SPD150CA401SH
		600V	1.35V	100A	SPD100CC60SH SPD100CA60SH
		650V	1.40V	100A	SPD100CC65SH SPD100CA65SH
		1200V	1.40V	100A	SPD100CC120SH SPD100CA120SH
	SAC	1600V	1.0V	120A	SPR120SAC160SH
	CC	150V		300A	SPT300CC15S1
	CC CA SC SA	400V	1.20V	150A	SPD150CC401S1 SPD150CA401S1
			1.20V	200A	SPD200CC401S1 SPD200CA401S1
			1.20V	300A	SPD300CC401S1 SPD300CA401S1
600V		1.35V	150A	SPD150CC60S1 SPD150CA60S1	
		1.35V	200A	SPD200CC60S1 SPD200CA60S1	
CCA		1.35V	300A	SPD300CCA60S1	
CC CA		1200V	2.10V	100A	SPD100CC120S1 SPD100CA120S1
Single		2.10V	349A	SPD400KA120S1	

IGBT Modules

Ordering Information (IGBT Module)



Package Appearance

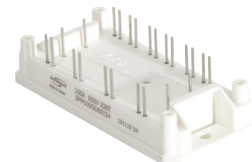
S1 (94.0*34.0*30.0mm)



S3 (107.6*62.6*29.0mm)



S4 (82.0*37.4*17.0mm)



S7 (38.3*26.3*11.7mm)







S8 (102.0*44.6*15.5mm)



S6 (152.4*62*16.5mm)



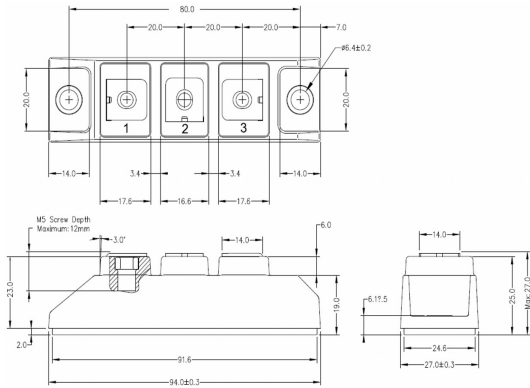
IGBT Modules

PKG Info	Voltage	Current	Product				Circuit	
			NPTI	NPT2	SPT+	Fieldstop		
	600V	75A	SPM75GB601S1	SPM75GB602S1		SPM75GB603S1	Half-Bridge Chopper Single	
		100A	SPM100GB601S1	SPM100GB602S1		SPM100GB603S1		
		150A	SPM150GB601S1	SPM150GB602S1				
		200A	SPM200GB601S1	SPM200GB602S1				
	1200V	50A				SPM50GB1201S1		
		75A		SPM75GB1202S1	SPM75GB1201S1			
		100A		SPM100GB1202S1	SPM100GB1201S1			
		150A				SPM150GB1201S1		
	600V	300A	SPM300GB601S3	SPM300GB602S3			Half-Bridge Chopper Single	
		400A	SPM400GB601S3	SPM400GB602S3				
	1200V	100A				SPM100GB1201S3		SPM100GB1204S3
		150A		SPM150GB1202S3	SPM150GB1201S3	SPM150GB1204S3		SPM150GB1204S3
		200A		SPM200GB1202S3	SPM200GB1201S3	SPM200GB1204S3		SPM200GB1204S3
		300A		SPM300GB1202S3	SPM300GB1201S3	SPM300GB1204S3		SPM300GB1204S3
	400A		SPM400GB1202S3	SPM400GB1201S3	SPM400GB1204S3	SPM400GB1204S3		SPM400GB1204S3
	600V	75A				SPM75GD603S4	Full-Bridge	
		100A	SPM100GD601S4			SPM100GD603S4		
		120A				SPM120GD603S4		
	1200V	50A				SPM50GD1201S4		
		80A				SPM80GD1203S4		
	600V	300A		available			Half-Bridge	
		400A		available				
		450A		available				
		600A		available				
	1200V	225A		available	available	available		available
		300A		available	available	available		available
		450A		available	available	available		available
		600A				available		available
	600V	75A	SPM75GA601S7				Single	
		100A	SPM100GA601S7	SPM100GA602S7				
		150A	SPM150GA601S7	SPM150GA602S7				
	1200V	50A				SPM50GA1201S7		
		75A		SPM75GA1202S7	SPM75GA1201S7			
		100A		SPM100GA1202S7	SPM100GA1201S7			

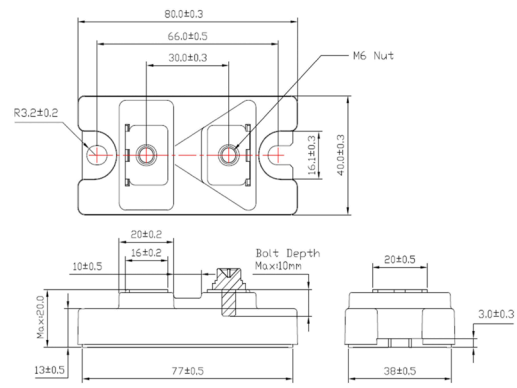
Package Outlines 1/2

Unit : mm

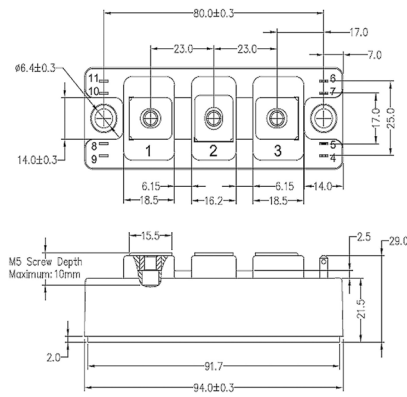
SH_Diode



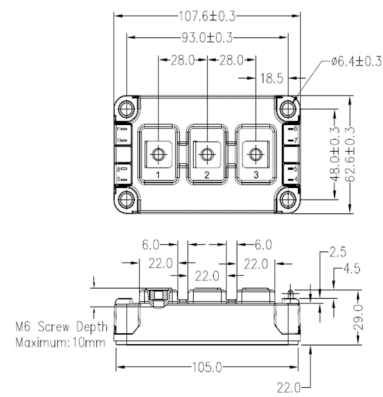
ST_Diode



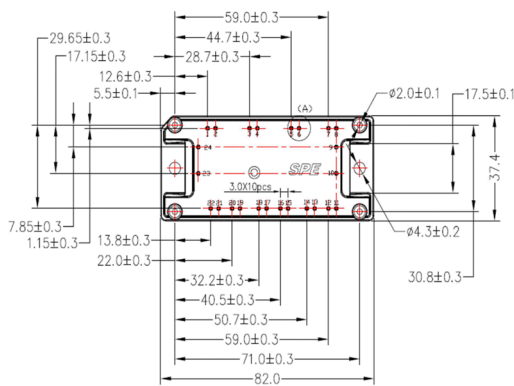
S1_IGBT/Diode



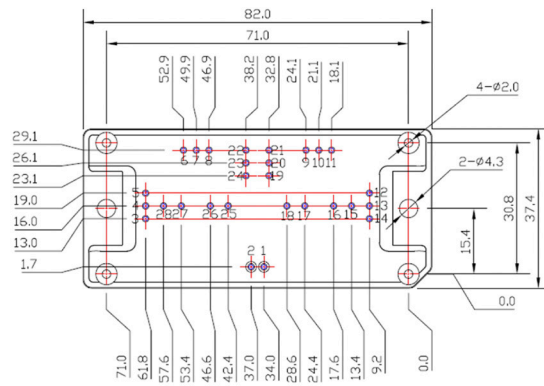
S3_IGBT/MOSFET



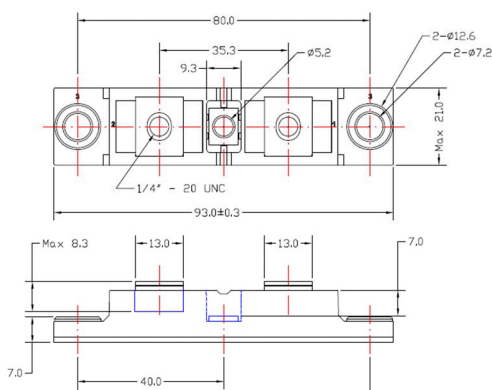
S4_IGBT



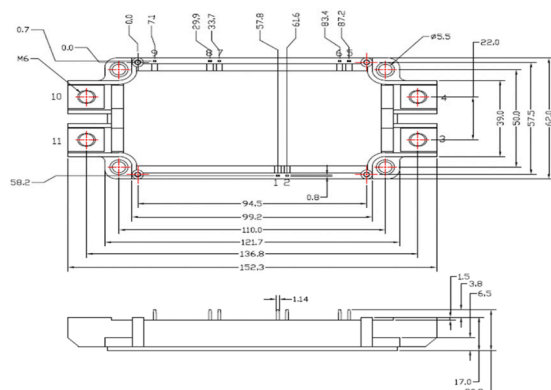
S4A_IGBT/MOSFET



S5_SBD



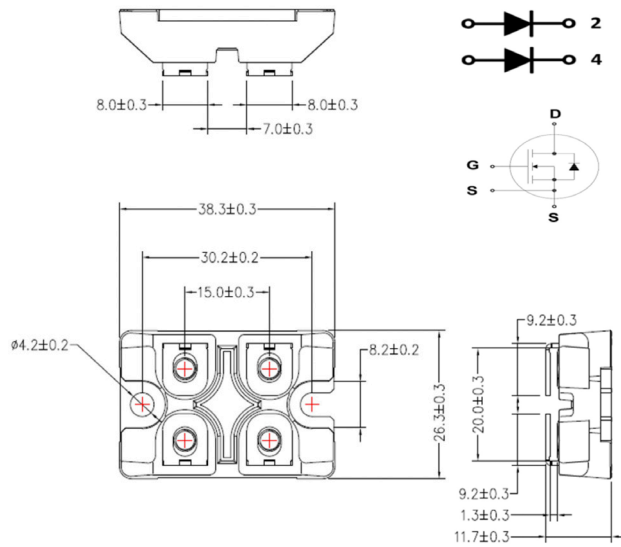
S6_MOSFET/IGBT



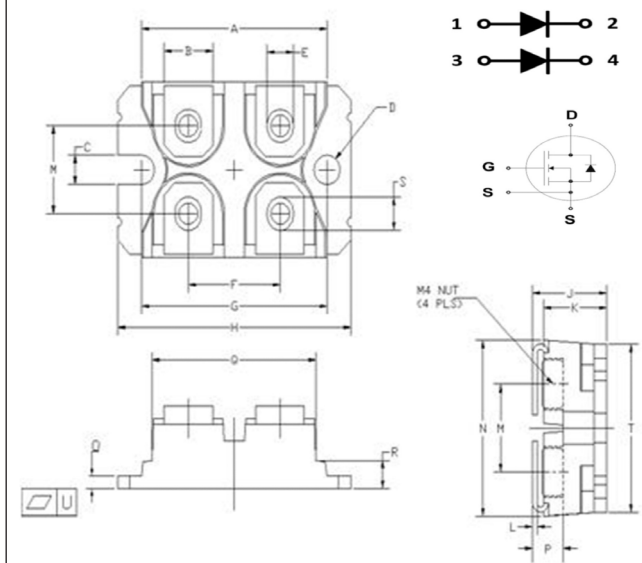
Package Outlines 2/2

Unit : mm

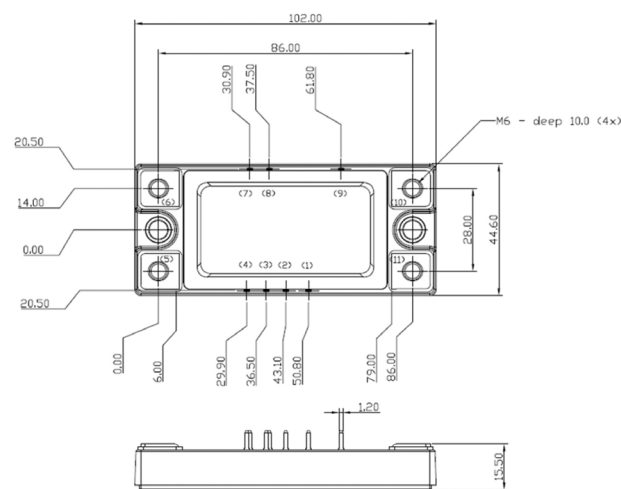
S7_Case_Diode/IGBT/MOSFET



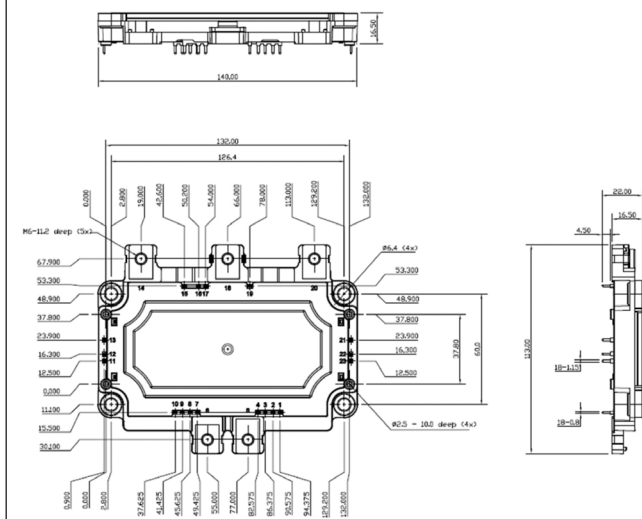
S7(EMC Molding)_Diode/IGBT



S8_MOSFET/IGBT



SA_MOSFET/IGBT





Innovative Frontier in Power Module!!!

- ▶ SiC Modules
- ▶ GaN Modules
- ▶ MOSFET Modules
- ▶ IGBT Modules
- ▶ Diode | Rectifier | SBD Modules
- ▶ Engineering Services for Power Module