

POWER SEMICONDUCTOR

- / FRD Modules
- / IGBT Modules
- / FET Modules
- / Rectifier Modules



About EcoSemitek



*"High Power
Semiconductor
Modules Leader"*

KIBO 벤처기업인증



EcoSemitek is sharing better tomorrow with customers by providing long lasting solutions in order to grow together.

We are committed to business for building human-oriented management based on mutual benefit sharing system. We do our best in every aspect of business from customers' perspective in order to offer appropriate products as an industry-leading supplier of high power semiconductors. EcoSemitek make a great effort in R&D by developing new products and enhancing devices to make customer satisfaction. We are doing our best for supply high quality solutions by matching customers' preference and requirement.

EcoSemitek, one of the most competitive high power semiconductor manufacturers in Korea.

Our power modules and devices are key to a better products
- FRD, IGBT, SBD, Rectifier, MOSFET and IPM

Designed for inverter which used in welding, solar & wind power energy systems, battery charger, UPS and automotive.

History



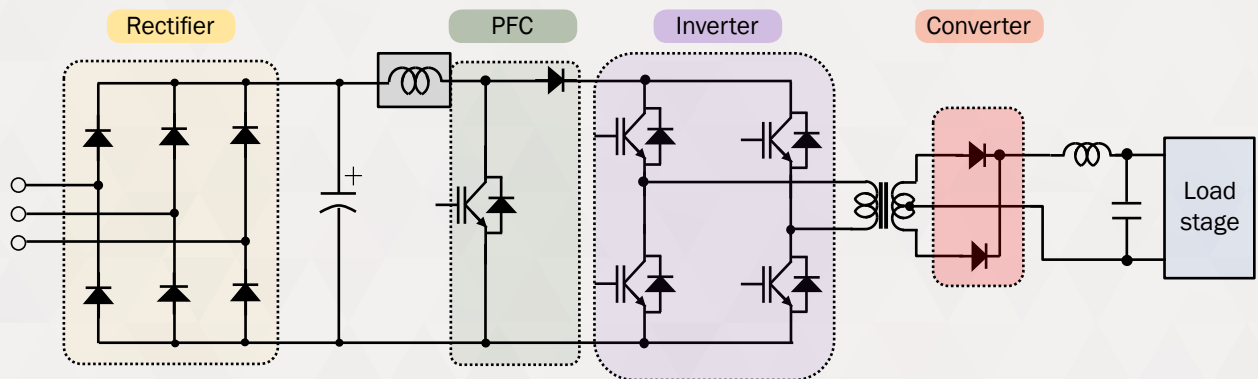
- 2020** — May | Head office and factory relocation
 July | Develop MOSFET Module
- 2018** — Sep | Develop Rectifier Module
- 2017** — Oct | Build additional Production Line (100Kpcs/Month)
 Nov | Company Logo Change EcoSemitek→EST
- 2016** — Jun | Build additional Production Line (70Kpcs/Month)
- 2015** — Mar | Established EcoSemitek Co., Ltd.
 May | Set-up Mass Production Line (50Kpcs/M)
 Jun | ISO 9001/14001 Certification
 Begin mass production of FRD Module
 Aug | Made agency contract (Korea/ China)
 Oct | Begin mass production of IGBT Module
 Certificated Venture Business Authorization (and Authentication)
 Dec | Certificated UL for every package
 Establish company R&D center

Device characteristics

High Power Module Series of Ecosemitek will make your position illustrious as a leader in HIGH POWER ELECTRIC SYSTEM.

We recommend this product group for your system that it requires wide SOA and reduces total power loss seeking for system trend oriented to high frequency with the things of installation more compact.

Inverter-Converter Basic topology



Rectifier Key Performances

- Improved Avalanche Characteristic
- High Isolation Voltage
- Very low Leakage Current



Rectifier modules

IGBT Key Performances

- High Speed Switching
- Low Conduction
- Loss Fast & Soft Anti-Parallel FWD
- Short Circuit rated
- Reduced EMI and RFI
- Isolation Type Package



IGBT/FET modules

FRD Key Performances

- Improved Avalanche Characteristic
- Realized Ultra-Soft and Fast Reverse Recovery Time
- High Isolation Voltage
- Very Low Leakage Current



FRD modules

EcoSemitek Target application

Application for industrial inverter systems

(Medium power and High power)

- Welding Machines, UPS
- High Power SMPS
- Solar/Wind Power system
- Elevator, Industrial Motor
- Industrial Heavy Electronic system
- Telecommunication Power Supply
- Various Switching Electric Railway
- Induction Heater
- Automotive and etc.



1. Battery Charger

2. Solar Inverter

3. Welder

4. Induction Heating

5. Casting Machine

6. Elevator

7. UPS

Ordering Information

FRD Module Series



- ① Maker — EcoSemitek
- ② Package — A : FD2, B : FD3, C : FD4, D : FD5, E : FD6, M : FD8, T : SOT-227, F : TO-247
- ③ Current Rating (x1) — 75 : 75A, 100 : 100A, 150 : 150A, 200 : 200A, 300 : 300A
- ④ Internal Circuit — N : Cathode Common, P : Anode Common, B : Not Common S : Single, F : 4-Pack
- ⑤ Output Common — C : Center, S : Side, H : Heatsink, N : None, B : Bridge
- ⑥ Voltage Class (x10) — 40 : 400V, 60 : 600V, 120 : 1200V
- ⑦ Option 1 — S : Ultra Fast & Soft Recovery, K : High EAS
- ⑧ Option 2 — E : Economic Type.

IGBT&MOSFET Module Series



- ① Maker — EcoSemitek
- ② Package — J : FD7, M : FD8, K : FD9, Q : FQ34, N : FN20, P : Q20
- ③ Current Rating (x1) — 75 : 75A, 100 : 100A, 150 : 150A, 200 : 200A, 300 : 300A, 400 : 400A
- ④ Product Family — S : Short Circuit Rated IGBT, M : MOSFET
- ⑤ Internal Circuit — H : Half Bridge, L : Chopper(Lower IGBT), R : Chopper(Upper IGBT), Relay(MOSFET)
- ⑥ Voltage Class (x10) — 60 : 600~650V, 120 : 1200~1250V
- ⑦ Option 1 — Changed by IGBT series

FRD Modules

EcoSemitek offers an extensive range of FRDs from 400V to 1200V in both isolated and non-isolated(FD3) housings. These power modules are ideally suited for applications requiring fast switching and soft recovery for low EMI/RFI.



Circuit

BN	SS	NH	NC	NS	PC	PS
Parallel	Single	H/S Common	N Center	N Side	P Center	P Side

Package

FD2	FD3	FD4	FD5	FD8	SOT-227
78(W) x 40(L) x 21(H)	92(W) x 27(L) x 17(H)	95(W) x 27.5(L) x 24(H)	93(W) x 35.5(L) x 32(H)	95(W) x 48(L) x 31(H)	38.1(W) x 25.2(L) x 12(H)

FRD Modules

600V Series

Package	Part No	V_{RRM} [V]	I_F [A] @ 100°C	V_F [V] @ 25°C	t_{rr} [ns] @ 25°C	I_{rrm} [mA] @ 100°C	Circuit
FD2 	ESA 300 BN 60K	600	300 x 1	1.2	180	15.0	SS
	ESB 100 NH 60S	600	100 x 2	1.3	140	1.0	NH
FD3 	ESB 150 NH 60S	600	150 x 2	1.3	120	1.0	NH
	ESC 100 NC 60S	600	100 x 2	1.3	140	1.0	NC
FD4 	ESC 100 PC 60S	600	100 x 2	1.3	140	1.0	PC
	ESC 100 NC 60K	600	100 x 2	1.2	140	1.0	NC
	ESC 100 NS 60K	600	100 x 2	1.2	140	1.0	NS
	ESC 100 PC 60K	600	100 x 2	1.2	140	1.0	PC
	ESC 100 PS 60K	600	100 x 2	1.2	140	1.0	PS
	ESC 150 NC 60K	600	150 x 2	1.3	150	1.0	NC
	ESC 150 PC 60K	600	150 x 2	1.3	150	1.0	PC
	ESD 150 NC 60K	600	150 x 2	1.3	150	1.0	NC
FD5 	ESD 150 NS 60K	600	150 x 2	1.3	150	1.0	NS
	ESD 150 PC 60K	600	150 x 2	1.3	150	1.0	PC
	ESD 150 PS 60K	600	150 x 2	1.3	150	1.0	PS
	ESD 200 NC 60K	600	200 x 2	1.3	160	6.0	NC
	ESD 200 NS 60K	600	200 x 2	1.3	160	6.0	NS
	ESD 200 PC 60K	600	200 x 2	1.3	160	6.0	PC
	ESD 200 PS 60K	600	200 x 2	1.3	160	6.0	PS
	ESD 300 NC 60K	600	300 x 2	1.35	200	15.0	NC
	ESD 300 PC 60K	600	300 x 2	1.35	200	15.0	PC
	ESD 300 SS 60K	600	300 x 1	1.35	200	15.0	SS
FD8 	ESM 300 NC 60K	600	300 x 2	1.35	200	15.0	NC
	ESM 300 PC 60K	600	300 x 2	1.35	200	15.0	PC
SOT-227 	EST 100 BN 60S	600	100 x 2	1.3	140	1.0	BN
	EST 100 BN 60SN	600	100 x 2	1.3	140	1.0	BN
	EST 100 BN 60K	600	100 x 2	1.3	140	1.0	BN
	EST 100 BN 60KA	600	100 x 2	1.3	140	1.0	BN

* Final electrical specification can be changed.

FRD Modules

400V Series

Package	Part No	V_{RRM} [V]	I_F [A] @ 100°C	V_F [V] @ 25°C	t_{rr} [ns] @ 25°C	I_{rrm} [mA] @ 25°C	Circuit
FD3 	ESB 100 NH 40S	400	100 x 2	1.05	90	1	NH
	ESB 150 NH 40S	400	150 x 2	1.05	100	1	NH
	ESB 200 NH 40S	400	200 x 2	1.05	150	1	NH
FD4 	ESC 100 NC 40SE	400	90 x 2	1.05	90	1	NC
	ESC 100 NC 40S	400	100 x 2	1.05	90	1	NC
	ESC 100 NS 40S	400	100 x 2	1.05	90	1	NS
	ESC 160 NC 40SE	400	160 x 2	1.1	100	1	NC
FD5 	ESD 150 NC 40S	400	150 x 2	1.05	100	1	NC
	ESD 150 NS 40S	400	150 x 2	1.05	100	1	NS
	ESD 200 NC 40S	400	200 x 2	1.05	150	2	NC
	ESD 200 NS 40S	400	200 x 2	1.05	150	2	NS
SOT-227 	EST 100 BN 40S	400	100 x 2	1.05	90	1	BN
	EST 100 BN 40SN	400	100 x 2	1.05	90	1	BN

* Final electrical specification can be changed.

1200V Series

Package	Part No	V_{RRM} [V]	I_F [A] @ 100°C	V_F [V] @ 25°C	t_{rr} [ns] @ 25°C	I_{rrm} [mA] @ 100°C	Circuit
FD4 	ESC 75 NC 120S	1,200	75 x 2	2.15	125	3	NC
	ESC 75 NS 120S	1,200	75 x 2	2.15	125	3	NS
	ESC 75 PC 120S	1,200	75 x 2	2.15	125	3	PC
	ESC 75 PS 120S	1,200	75 x 2	2.15	125	3	PS
	ESC 100 NC 120S	1,200	100 x 2	1.6	180	2	NC
	ESC 100 NS 120S	1,200	100 x 2	1.6	180	2	NS
	ESC 100 PC 120S	1,200	100 x 2	1.6	180	2	PC
	ESC 100 PS 120S	1,200	100 x 2	1.6	180	2	PS
FD5 	ESD 100 NS 120S	1,200	100 x 2	1.6	180	2	NS
	ESD 150 NC 120S	1,200	150 x 2	2.2	110	6	NC
	ESD 150 PC 120S	1,200	150 x 2	2.2	110	6	PC
	ESD 150 NS 120S	1,200	150 x 2	2.2	110	6	NS
	ESD 150 PS 120S	1,200	150 x 2	2.2	110	6	PS
	ESD 200 NC 120S	1,200	200 x 2	1.75	200	9	NC
	ESD 200 PC 120S	1,200	200 x 2	1.75	200	9	PC
SOT-227 	EST 60 BN 120S	1,200	60 x 2	1.7	170	3	BN
	EST 75 BN 120S	1,200	75 x 2	2.15	125	3	BN
	EST 100 BN 120S	1,200	100 x 2	1.6	180	2	BN
	EST 125 BN 120S	1,200	125 x 2	1.7	190	2	BN

* Final electrical specification can be changed.

IGBT Modules

EcoSemitek 2pack IGBT series offer three standard package types [FD7(34mm), FD8(48mm), FD9(62mm)] with two kinds of IGBT technology And Eco module cover the current range from 75A to 400A [$T_c \geq 80^\circ\text{C}$] at 600V, 1200V.



Circuit

2-Pack	1-Pack (R)	1-Pack (L)	4-Pack	MNPC	3-level
Half-Bridge	Chopper (Upper IGBT)	Chopper (Lower IGBT)	Full-Bridge	FN20	Q20

* Chopper modules could be manufactured as out IGBT line-up list. (L : Lower IGBT, R : Upper IGBT)

Package

FD7	FD8	FD9	FQ34	FN20	Q20
93(W) x 35(L) x 31(H)	95(W) x 48(L) x 31(H)	108.3(W) x 62.3(L) x 31(H)	82(W) x 37.2(L) x 22(H)	68(W) x 32(L) x 16(H)	107(W) x 39(L) x 17(H)

IGBT Modules

60FA Series (FST - Ruggedness type)

Package	Part No	V _{CES} [V]	I _C [A] @ 80°C	V _{CE(sat)} [V] @ 25°C	t _r [ns] @ 25°C	Circuit
FD7 	ESJ 75 SH 60FA	650	75 x 2	1.65	60	2-Pack
	ESJ 100 SH 60FA	650	100 x 2	1.65	70	2-Pack
	ESJ 150 SH 60FA	650	150 x 2	1.65	80	2-Pack
	ESJ 200 SH 60FA	650	200 x 2	1.65	95	2-Pack
FD8 	ESM 150 SH 60FA	650	150 x 2	1.65	80	2-Pack
	ESM 200 SH 60FA	650	200 x 2	1.65	95	2-Pack
FD9 	ESK 300 SH 60FA	650	300 x 2	1.65	110	2-Pack
	ESK 400 SH 60FA	650	400 x 2	1.65	130	2-Pack
FQ34 	ESQ 75 SH 60FA	650	75 x 4	1.65	60	4-Pack
	ESQ 100 SH 60FA	650	100 x 4	1.65	70	4-Pack

* Final electrical specification can be changed.

* 75A & 150A device is under developed.

65F series (FST)

Package	Part No	V _{CES} [V]	I _C [A] @ 80°C	V _{CE(sat)} [V] @ 25°C	t _r [ns] @ 25°C	Circuit
FD7 	ESJ 75 SH 65F	650	75 x 2	1.8	45	2-Pack
	ESJ 100 SH 65F	650	100 x 2	1.8	50	2-Pack
	ESJ 150 SH 65F	650	150 x 2	1.8	70	2-Pack
	ESJ 200 SH 65F	650	200 x 2	1.8	75	2-Pack
FD8 	ESM 150 SH 65F	650	150 x 2	1.8	70	2-Pack
	ESM 200 SH 65F	650	200 x 2	1.8	75	2-Pack
	ESM 300 SR 65F	650	300 x 1	1.8	85	1-Pack
	ESM 300 SL 65F	650	300 x 1	1.8	85	1-Pack
FD9 	ESK 300 SH 65F	650	300 x 2	1.8	100	2-Pack
	ESK 400 SH 65F	650	400 x 2	1.8	140	2-Pack
FQ34 	ESQ 75 SH 65F	650	75 x 4	1.8	45	4-Pack

* Final electrical specification can be changed.

IGBT Modules

120K Series (FST - Ruggedness type)

Package	Part No	V_{CES} [V]	I_c [A] @ 80°C	$V_{CE(sat)}$ [V] @ 25°C	t_f [ns] @ 25°C	Circuit
FD7 	ESJ 75 SH 120K	1,250	75 x 2	2.2	30	2-Pack
	ESJ 100 SH 120K	1,250	100 x 2	2.2	45	2-Pack
	ESJ 150 SH 120K	1,250	150 x 2	2.2	55	2-Pack
FD8 	ESM 100 SH 120K	1,250	100 x 2	2.2	45	2-Pack
	ESM 150 SH 120K	1,250	150 x 2	2.2	55	2-Pack
	ESM 200 SH 120K	1,250	200 x 2	2.2	65	2-Pack
FD9 	ESK 100 SH 120K	1,250	100 x 2	2.2	45	2-Pack
	ESK 150 SH 120K	1,250	150 x 2	2.2	55	2-Pack
	ESK 200 SH 120K	1,250	200 x 2	2.2	65	2-Pack
	ESK 300 SH 120K	1,250	300 x 2	2.2	85	2-Pack

* Final electrical specification can be changed.

IGBT Modules

120F series (FST)

Package	Part No	V _{CES} [V]	I _C [A] @ 80°C	V _{CE(sat)} [V] @ 25°C	t _r [ns] @ 25°C	Circuit
FD7 	ESJ 75 SH 120F	1250	75 x 2	2.1	65	2-Pack
	ESJ 100 SH 120F	1250	100 x 2	2.1	65	2-Pack
	ESJ 150 SH 120F	1250	150 x 2	2.1	75	2-Pack
FD8 	ESM 150 SH 120F	1250	150 x 2	2.1	75	2-Pack
	ESM 200 SH 120F	1250	200 x 2	2.1	75	2-Pack
FD9 	ESK 100 SH 120F	1250	100 x 2	2.1	65	2-Pack
	ESK 150 SH 120F	1250	150 x 2	2.1	75	2-Pack
	ESK 200 SH 120F	1250	200 x 2	2.1	75	2-Pack
	ESK 300 SH 120F	1250	300 x 2	2.1	80	2-Pack
	ESK 400 SH 120F	1250	400 x 2	2.1	80	2-Pack
	ESK 300 SL 120F	1250	300 x 1	2.1	80	1-Pack
	ESK 400 SL 120F	1250	400 x 1	2.1	80	1-Pack

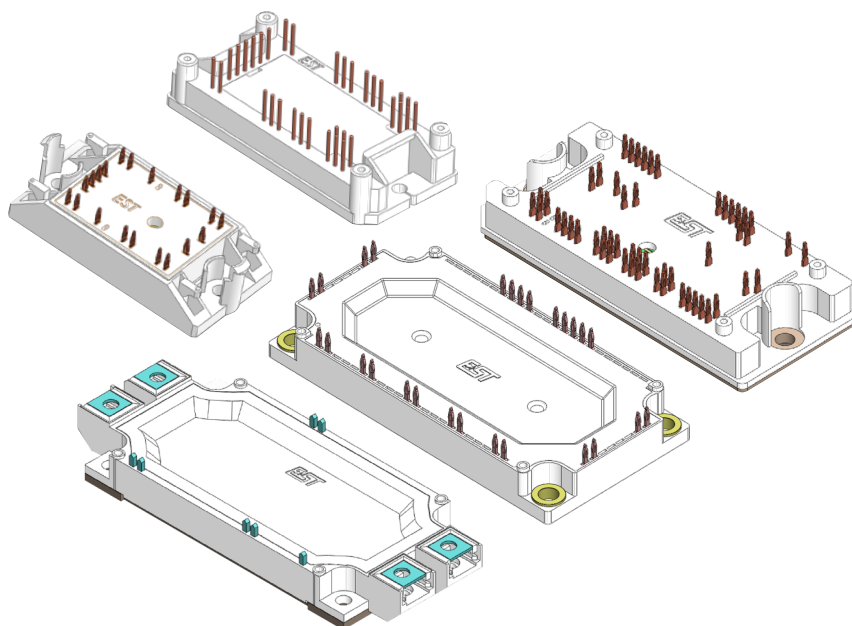
* Final electrical specification can be changed.

120FE series (FST- Enhance Ruggedness)

Package	Part No	V _{CES} [V]	I _C [A] @ 80°C	V _{CE(sat)} [V] @ 25°C	t _r [ns] @ 25°C	Circuit
FD7 	ESJ 75 SH 120FE	1250	75 x 2	2.1	65	2-Pack
	ESJ 100 SH 120FE	1250	100 x 2	2.1	65	2-Pack
	ESJ 150 SH 120FE	1250	150 x 2	2.1	75	2-Pack
FD8 	ESM 150 SH 120FE	1250	150 x 2	2.1	75	2-Pack
	ESM 200 SH 120FE	1250	200 x 2	2.1	75	2-Pack
FD9 	ESK 100 SH 120FE	1250	100 x 2	2.1	65	2-Pack
	ESK 150 SH 120FE	1250	150 x 2	2.1	75	2-Pack
	ESK 200 SH 120FE	1250	200 x 2	2.1	75	2-Pack
	ESK 300 SH 120FE	1250	300 x 2	2.1	80	2-Pack
	ESK 400 SH 120FE	1250	400 x 2	2.1	80	2-Pack

* Final electrical specification can be changed.

IGBT Modules_Solar Inverter



P : Press-fit, S : Solder pin

* These Packages are under development.

3 level Series

Package	Part No	V_{CES} [V]	I_C [A] @ 80°C	$V_{CE(sat)}$ [V] @ 25°C	t_f [ns] @ 25°C	Circuit
FN20 	ESN 80 SNP 120F-P	1,250	80 x 2	2.1	60	MNPC
Q20 	ESP 160 TL 120F-P	1,250	160 x 2	1.7	60	3-level
	ESP 160 TL 120F-S	1,250	160 x 2	1.7	60	3-level
	ESP 80 TL 120F-P	1,250	80 x 2	2.2	35	3-level
	ESP 80 TL 120F-S	1,250	80 x 2	2.2	35	3-level

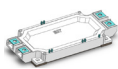
* Final electrical specification can be changed.

4-Pack

Package	Part No	V_{CES} [V]	I_C [A] @ 80°C	$V_{CE(sat)}$ [V] @ 25°C	t_f [ns] @ 25°C	Circuit
FD10 	ESV 100 SH 120K-P	1,250	100 x 4	2.2	45	4-Pack
	ESV 150 SH 120K-P	1,250	150 x 4	2.2	55	4-Pack

* FD10 is capable of various topology configurations.

2-Pack

Package	Part No	V_{CES} [V]	I_C [A] @ 80°C	$V_{CE(sat)}$ [V] @ 25°C	t_f [ns] @ 25°C	Circuit
FD11 	ESL 450 SH 120F	1,250	450 * 2	2.2	45	2-Pack

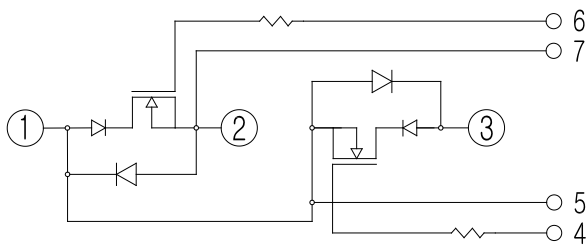
* FD11 is capable of various topology configurations.

FET Modules

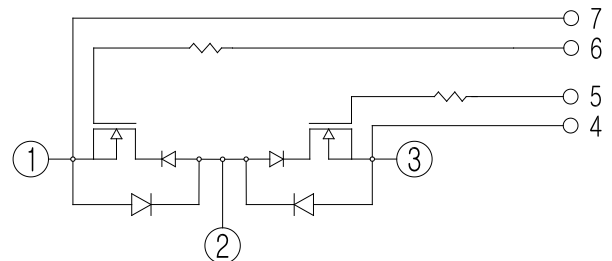
EcoSemitek 2pack FET series offer two standard package types [FD7 34mm), FD9(62mm)]. EcoSemitek module cover the current range from 85A to 140A at 500V. SIC FET & other package could be developed depends on requests.



Circuit



Half-Bridge



Two way-Switch

Package	Part No	$BV_{DSS}[V]$	$I_D[A]$	$R_{DS(on)}[m\Omega]$	$t_f[ns]$	Circuit
FD7 	ESJ 85 MH 50	500	85 x 2	50	22	Half bridge
FD9 	ESK 140 MH 50	500	140 x 2	25	43	Half bridge
	ESK 150 MR 50	500	150 x 2	25	43	Two way- Switch

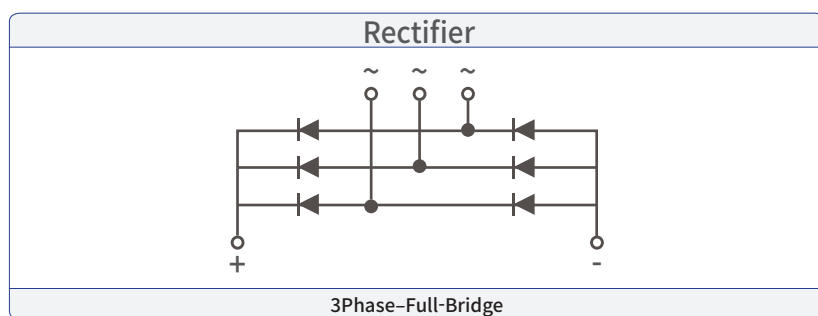
* Final electrical specification can be changed.

Rectifier Modules

Ecosemitek Rectifier module series offer five kinds of package.
Rectifier module cover the current range from 75A to 400A at 1600V.



Circuit



Package

M18G	M52	M10	M16G	M23G
				
80(W) x 40(L) x 26.5(H)	81(W) x 40(L) x 22(H)	110(W) x 50(L) x 29(H)	72(W) x 42(L) x 30(H)	94(W) x 54(L) x 30(H)

Rectifier Modules

1600V series (Standard type)

Package	Part No	V_{RRM} [V]	I_F [A] @ 100°C	V_F [V] @ 25°C	I_{rrm} [mA] @ 100°C	Circuit
M52 	ESR 75 FB 160	1600	75 x 6	0.95	5	FB
	ESR 100 FB 160	1600	100 x 6	1	5	FB
M10 	ESR 150 FB 160	1600	150 x 6	1.05	8	FB
	ESR 200 FB 160	1600	200 x 6	1	8	FB
M18G 	ESR 100 FB 160E	1600	100 x 6	1	5	FB

* Final electrical specification can be changed.

1600V series (Advanced type)

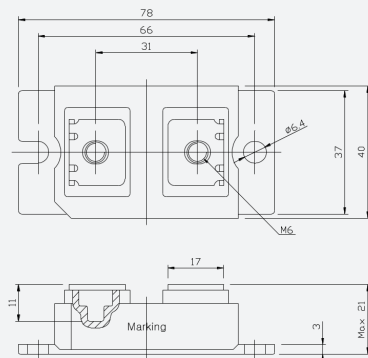
Package	Part No	V_{RRM} [V]	I_F [A] @ 100°C	V_F [V] @ 25°C	I_{rrm} [mA] @ 100°C	Circuit
M16G 	ESR 75 FB 160A	1600	75 x 6	1.3	5	FB
	ESR 100 FB 160A	1600	100 x 6	1.3	5	FB
M23G 	ESR 100 FB 160AL	1600	100 x 6	1.3	5	FB
	ESR 150 FB 160AL	1600	150 x 6	1.42	8	FB
	ESR 200 FB 160AL	1600	200 x 6	1.45	8	FB

* Final electrical specification can be changed.

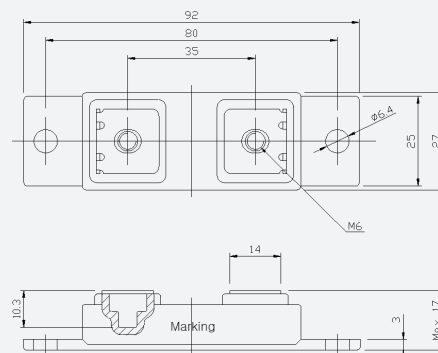
Package Dimension

Unit : mm

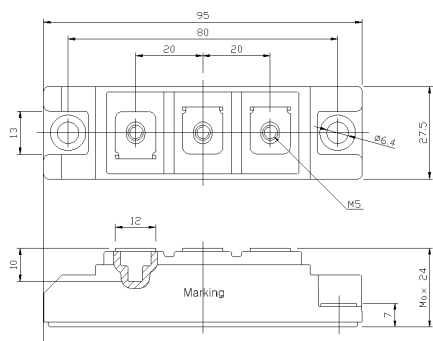
FD2



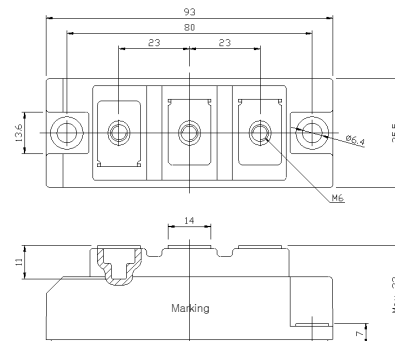
FD3



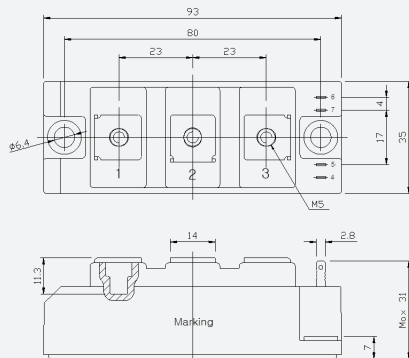
FD4



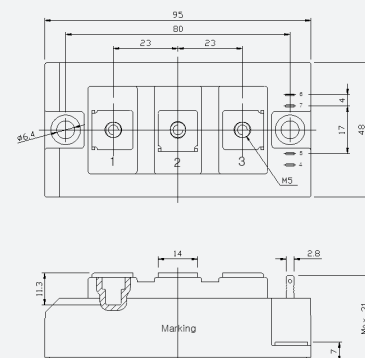
FD5



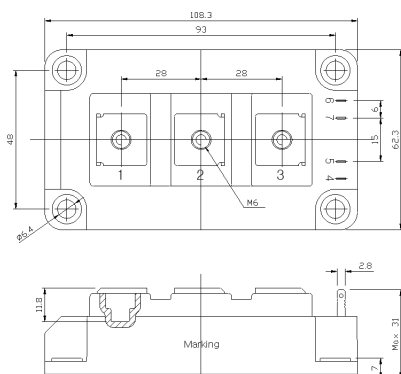
FD7



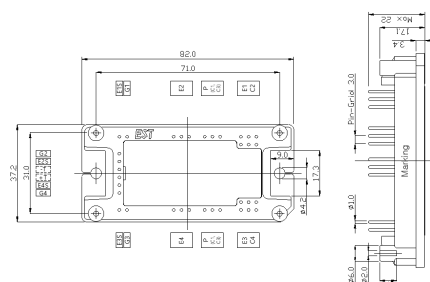
FD8



FD9

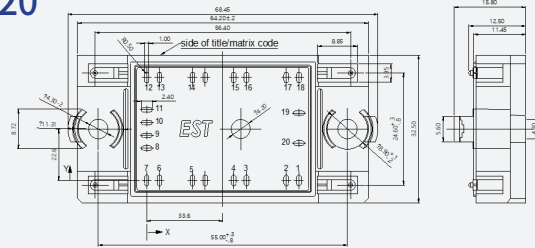


FQ34

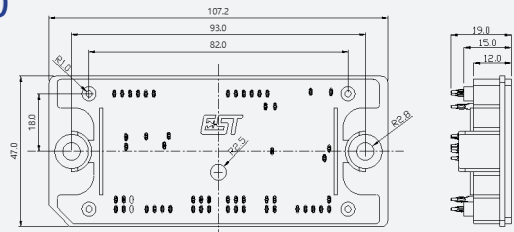


Package Dimension

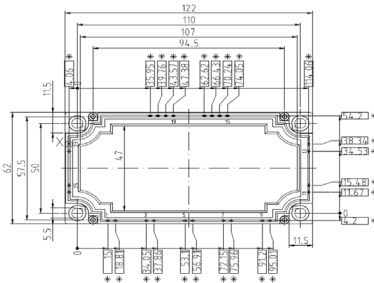
FN20



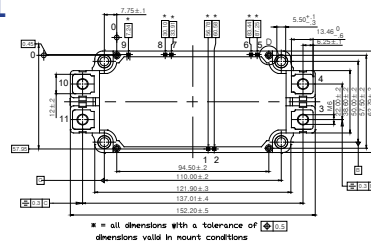
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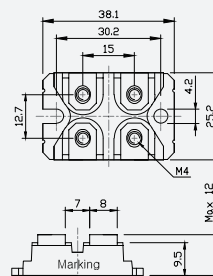
FD10



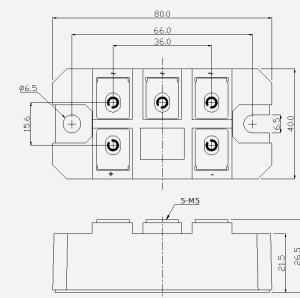
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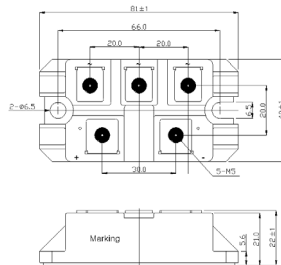
SOT-227



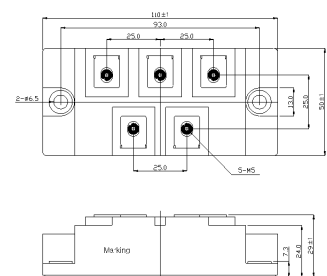
M18G



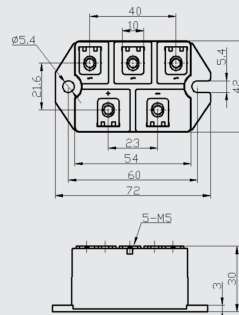
M52



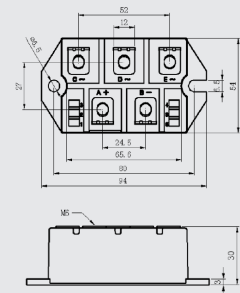
M10



M16G



M23G





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