

GEM_105,_120 FAMILY

Dual Diode GEM20 Modules

Green Power Easy Module®

- ▶ Electrically insulated metal frame
- ▶ 3000 V_{RMS} insulation voltage
- ▶ Line voltage range up to 700 V_{RMS}
- ▶ High efficiency, high reliability low noise fan
- ▶ Stainless steel frame
- ▶ High reliability
- ▶ Modularity
- ▶ Broad choice of circuit configurations
- ▶ Fully customizable
- ▶ Broad range of accessories
- ▶ Cost effective solution
- ▶ Suitable for heavy duty applications

Description

This new family of high power modules brings to the high power applications the same compactness, ease of use and scalability of the lower power semiconductor modules. In addition to these typical features (i.e. standard dimensions, electrical insulation, various circuit types, etc.) the new Green Power Easy Module (GEM) family includes many features aimed to simplify their adoption allowing the end users to focus on their core business. These features include:

- embedded air cooling system (heatsink and fan)
- optimised snubber circuits
- ducted heat flow.

This GEM family can be used for most of the converter circuits like single and three phase bridges, double wye rectifiers, etc.. Their application range covers line voltage applications up to 700 V_{RMS}.

Maximum Ratings

Part number Parameters	GEM_105	GEM_120	Part number	Conditions	Units
I _{F(AV)}	1050	1200		180° cond, half sine T _a = 40 °C	A
I _{F(RMS)}	1649	1884		180° cond, half sine T _a = 40 °C	A
I _{FSM}	28	28		50 Hz, T _j = T _{jmax} V _R = 0 V	kA
I _{FSM}	29.5	29.5		60 Hz, T _j = T _{jmax} V _R = 0 V	kA
I ² t	3920	3920		50 Hz, T _j = T _{jmax} V _R = 0 V	kA ² s
I ² t	3567	3567		60 Hz, T _j = T _{jmax} V _R = 0 V	kA ² s
V _{RRM}	up to 2200	up to 1000		T _j = T _{jmax}	V
T _{jmax}	170	175			°C

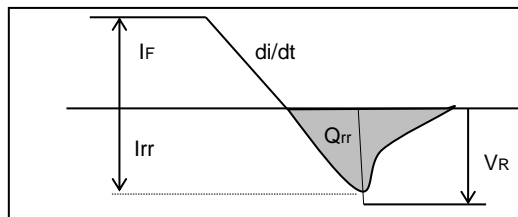
Part Number	V code	VRRM max repetitive reverse and off-state blocking voltage [V]	IRRM @ Tjmax [mA]	VL(RMS) maximum suggested RMS line voltage [V]
GEM_120	08	800	50	204
	10	1000	50	280
GEM_105	16	1600	50	500
	22	2200	70	700

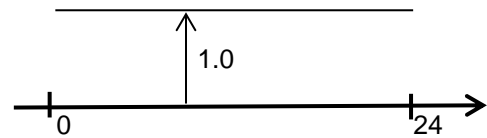
Forward Characteristics

Parameters	GEM_105	GEM_120			Conditions	Units
V _{F(T0)} Threshold voltage	0.8	0.72			T _j = T _{jmax}	V
r _F Forward slope resistance	0.165	0.123			T _j = T _{jmax}	mΩ
V _F Max forward voltage drop at I = I _{FAV}	0.97	0.87			T _j = T _{jmax}	V
P _{MAX} Max power losses	2850	2650			T _A = 40°C	W

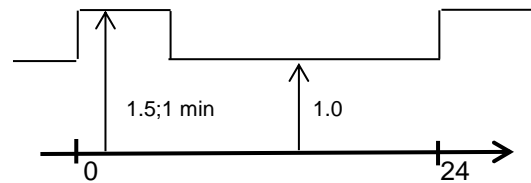
Reverse Recovery Characteristics

	GEM_105	GEM_120			Conditions	Units
Q _{rr} Reverse recovery charge, typ	1500	1000			T _j =T _{jmax} , I _F =1000A di/dt=- 5A/μs V _R =100V	μC



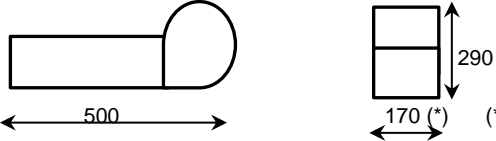

Maximum IEC class 1 currents for typical circuit type

Circuit Type	GEM_105	GEM_120			Conditions	Units
Center tap	2200	2400			T _A = 40 °C	A
Two pulse bridge	2200	2400			T _A = 40 °C	A
Six pulse bridge	3150	3440			T _A = 40 °C	A
Double star with I.P. transformer	6350	6900			T _A = 40 °C	A

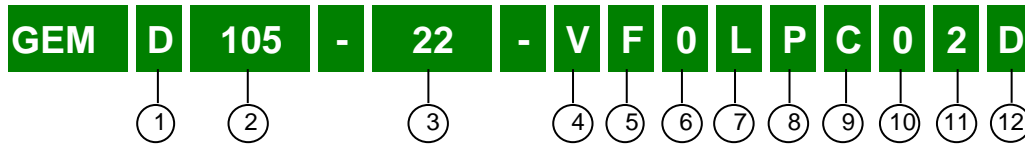

Maximum IEC class 2 currents for typical circuit type

Circuit Type	GEM_105	GEM_120			Conditions	Units
Center tap					T _A = 40 °C	A
Two pulse bridge					T _A = 40 °C	A
Six pulse bridge					T _A = 40 °C	A
Double star with I.P. transformer					T _A = 40 °C	A

Thermal and Mechanical Characteristics

Parameters	GEM_105	GEM_120			Conditions	Units
T _{jmax} Max operating junction temperature	170	175				°C
T _{stg} Storage temperature	-40 +70	-40 +70				°C
R _{thJA} Thermal resistance (junction to ambient)	0.091	0.102			DC operation	°C/W
F Mounting torque - GEM to panel (+/- 10%) Mounting torque - busbar to GEM (+/- 10%)	7	7			M6 mounting screw	N·m
	14	14			M8 mounting screw	N·m
m Mass, typ	22	21			with FAPC options	kg
Overall dimensions						mm

PART-NUMBERING SYSTEM



- ① Circuit configuration
- ② GEM average current / 10
- ③ GEM blocking voltage / 100
- ④ 0 = No fan - V = With 230 VRMS fan - W = With 115 VRMS fan
- ⑤ 0 = No fuse - F = With individual fuse protection
- ⑥ 0 = No standard busbar available for this module; please contact factory in case of specific need
- ⑦ -
- ⑧ -
- ⑨ 0 = No fan loss detection module - C = With fan loss detection module
- ⑩ -
- ⑪ 0 = No snubber - 2 = Two snubbers
- ⑫ 0 = No fan-on-demand thermo-switch - D = Fan-on-demand thermo-switch (trip point 50 °C)

Example >> **GEMD105-22-VF0--C-2D** means:
 GEM20 diode module - bridge leg circuit configuration - 1160 A average current - 2200 V blocking voltage - with 230 Vrms fan - with individual fuse protection - without busbars - with fan loss detection module - with two RC snubbers - with fan-on-demand thermo-switch

