

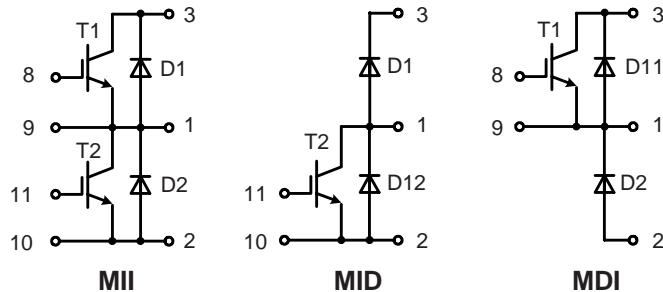
IGBT Module

phaseleg and chopper topologies

MII 400-12E4
MID 400-12E4
MDI 400-12E4

I_{C25} = 420 A
V_{CES} = 1200 V
V_{CE(sat)} typ. = 2.2 V

Preliminary



IGBTs T1-T2

Symbol	Conditions	Maximum Ratings		
V _{CES}	T _{VJ} = 25°C to 150°C	1200		V
V _{GES}		± 20		V
I _{C25}	T _C = 25°C	420		A
I _{C80}	T _C = 80°C	300		A
I _{CM}	V _{GE} = ±15 V; R _G = 4.7 Ω; T _{VJ} = 125°C	450		A
V _{CEK}	RBSOA, Clamped inductive load; L = 100 μH	V _{CES}		
t _{sc} (SCSOA)	V _{CE} = 900 V; V _{GE} = ±15 V; R _G = 4.7 Ω; T _{VJ} = 125°C non repetitive	10		μs
P _{tot}	T _C = 25°C	1700		W

Symbol	Conditions	Characteristic Values		
		(T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
V _{CE(sat)}	I _C = 300 A; V _{GE} = 15 V; T _{VJ} = 25°C T _{VJ} = 125°C	2.2	2.8	V
		2.6		V
V _{GE(th)}	I _C = 10 mA; V _{GE} = V _{CE}	4.5		V
I _{CES}	V _{CE} = V _{CES} ; V _{GE} = 0 V; T _{VJ} = 25°C T _{VJ} = 125°C	0.8	3.3	mA
		3.5		mA
I _{GES}	V _{CE} = 0 V; V _{GE} = ± 20 V		600	nA
t _{d(on)} t _r t _{d(off)} t _f E _{on} E _{off}	Inductive load, T _{VJ} = 125°C V _{CE} = 600 V; I _C = 300 A V _{GE} = ±15 V; R _G = 4.7 Ω	150		ns
		60		ns
		680		ns
		50		ns
		36		mJ
		30		mJ
C _{ies}	V _{CE} = 25 V; V _{GE} = 0 V; f = 1 MHz	17		nF
Q _{Gon}	V _{CE} = 600 V; V _{GE} = 15 V; I _C = 300 A	2.25		μC
R _{thJC}	(per IGBT)		0.08	K/W
R _{thJH}	with heatsink compound	0.15		K/W

Features

- IGBT
 - low saturation voltage
 - positive temperature coefficient
 - fast switching
 - short tail current for optimized performance in resonant circuits
- HiPerFRED™ diodes
 - fast and soft reverse recovery
 - low operating forward voltage
 - low leakage current
- Package
 - low inductive current path
 - screw connection to high current main terminals
 - use of non interchangeable connectors for auxiliary terminals possible
 - kelvin emitter terminal for easy drive
 - isolated ceramic base plate

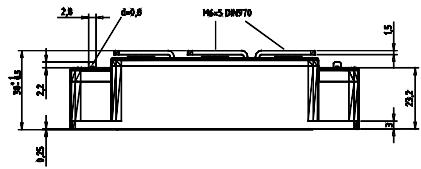
Applications

- drives
 - AC
 - DC
- power supplies
 - rectifiers with power factor correction and recuperation capability
 - UPS

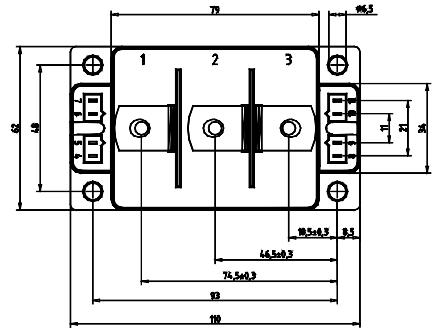
Free wheeling diodes D1-D2

Symbol	Conditions	Maximum Ratings		
I_{F25}	$T_C = 25^\circ C$	450	A	
I_{F80}	$T_C = 80^\circ C$	290	A	

Dimensions in mm (1 mm = 0.0394")



Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 300 A; V_{GE} = 0 V; T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$	2.3 1.7	2.7 V	V
I_{RM} t_{rr}	$\left. \begin{array}{l} I_F = 225 A; dI_F/dt = -2000 A/\mu s; T_{VJ} = 125^\circ C \\ V_R = 600 V; V_{GE} = 0 V \end{array} \right\}$	240 220	A ns	
R_{thJC} R_{thJH}	(per diode) with heatsink compound	0.15 0.3	K/W K/W	


Chopper anti parallel diodes D11-D12

Symbol	Conditions	Maximum Ratings		
I_{F25}	$T_C = 25^\circ C$	150	A	
I_{F80}	$T_C = 80^\circ C$	95	A	

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 100 A; V_{GE} = 0 V; T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$	2.3 1.7	2.7 V	V
I_{RM} t_{rr}	$\left. \begin{array}{l} I_F = 75 A; dI_F/dt = -750 A/\mu s; T_{VJ} = 125^\circ C \\ V_R = 600 V; V_{GE} = 0 V \end{array} \right\}$	80 220	A ns	
R_{thJC} R_{thJH}	(per diode) with heatsink compound	0.45 0.9	K/W K/W	

Module

Symbol	Conditions	Maximum Ratings		
T_{VJ}		-40...+150		°C
T_{stg}		-40...+125		°C
V_{ISOL}	$I_{ISOL} \leq 1 mA; 50/60 Hz$	4000	V~	
M_d	Mounting torque (module, M6) (terminals, M6)	2.25 - 2.75 4.5 - 5.5	Nm	

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
d_s	Creepage distance on surface	2		mm
d_A	Strike distance in air	2		mm

Weight		250	g

Optional accessories for modules

keyed twin plugs
(UL758, style 1385, CSA class 5851, guide 460-1-1)

- Type ZY180L with wire length 350mm
 - for pins 4 (yellow wire) and 5 (red wire)
 - for pins 11 (yellow wire) and 10 (red wire)
- Type ZY180R with wire length 350mm
 - for pins 7 (yellow wire) and 6 (red wire)
 - for pins 8 (yellow wire) and 9 (red wire)