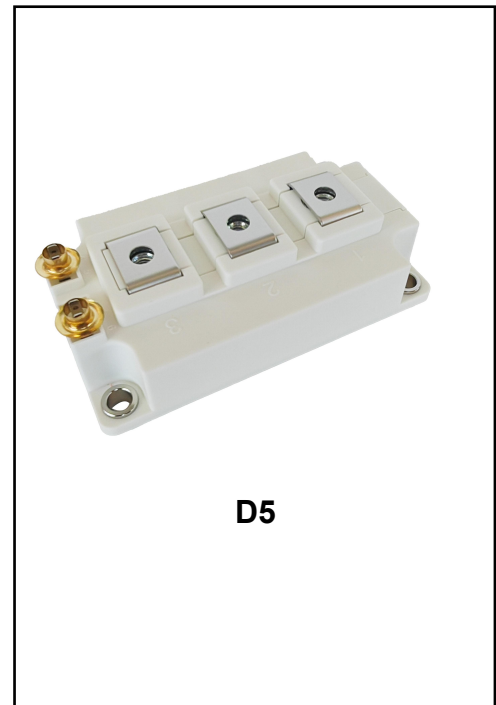


D5 module with Aiko IGBT and emitter controlled diode

Features

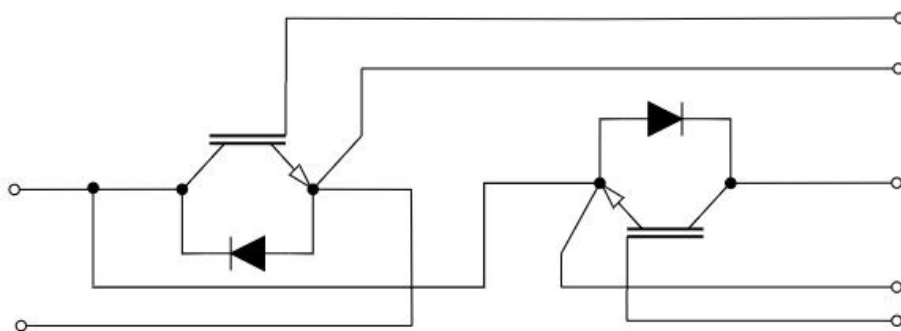
- Electrical features
 - $V_{CES} = 1200\text{ V}$
 - $I_{C\text{ nom}} = 150\text{ A} / I_{CRM} = 300\text{ A}$
 - V_{CESat} with positive temperature coefficient
- Mechanical features
 - Standard housing
 - High creepage and clearance distances
 - Isolated base plate
 - Package with CTI >500



Typical Applications

- High Frequency Switching Application
- Medical Applications
- Motor Drives
- Resonant Inverter Applications
- Servo Drives
- UPS Systems

Description



Package Insulation coordination

Symbol	Parameter	Note or test condition	Values	Unit
V_{ISOL}	Isolation test voltage	RMS, f=50Hz, t=60s	2.5	kV
d_{creep}	Creepage distance	terminal to heatsink	29.0	mm
d_{creep}	Creepage distance	terminal to terminal	23.0	mm
d_{clear}	Clearance	terminal to heatsink	23.0	mm
d_{clear}	Clearance	terminal to terminal	11.0	mm
CTI	Comparative tracking index (electrical)		>500	

Package Characteristic values

Symbol	Description	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
L_{sCE}	Stray Inductance			--	20	--	nH
$R_{CC'+EE'}$	Module Lead Resistance, Terminal to Chip	$T_C=25^{\circ}\text{C}$, per switch		--	0.7	--	m Ω
T_{stg}	Storage temperature			-40	--	125	$^{\circ}\text{C}$
M	Mounting torque for module mounting	-Mounting according to valid application note	M5, Screw	3	--	6	Nm
M	Terminal connection torque	-Mounting according to valid application note	M6, Screw	2.5	--	5.0	Nm
G	Weight			--	340	--	g

IGBT

Absolute Maximum Ratings (T_c = 25°C unless otherwise noted)

Symbol	Description	Note or test condition	Value	Unit
V _{CES}	Collector-Emitter Voltage	T _{vj} = 25 °C	1200	V
I _{CDC}	Continuous Collector Current @ T _C = 80°C (T _{JMAX} = 175°C)		150	A
I _{CRM}	Repetitive peak collector current	Peak Collector Current@ tp=1ms	300	A
P _{tot}	Total power dissipation	T _C = 25°C, T _{vj max} = 150°C	874	W
V _{GES}	Gate-emitter peak voltage		±30	V

Characteristics (T_c = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition		Rating			Unit
				Min	Typ	Max	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =150A V _{GE} =15V	T _J =25°C T _J =150°C	--	2.2 2.6	3.0 --	V
V _{GE(TH)}	Gate-Emitter Threshold Voltage	I _C =3mA, V _{CE} =V _{GE} , T _{vj} = 25°C		4.0	--	6.5	V
I _{CES}	Collector-Emitter Cutoff Current	V _{GE} =0V, V _{CE} =1200V, T _{vj} = 25°C		--	--	3.0	mA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = ±20V , V _{CE} = 0 V, T _{vj} = 25°C		--	--	100	nA
R _{Gint}	Internal Gate Resistance	T _{vj} = 25 °C		--	0.8	--	Ω
C _{ies}	Input Capacitance	V _{CE} =30V, V _{GE} =0V, f=1MHz, T _{vj} = 25°C		--	24.76	--	nF
C _{oes}	Output Capacitance			--	0.74	--	
C _{res}	Reverse Transfer Capacitance			--	0.532	--	
Q _g	Total Gate Charge	V _{CC} =960V, I _C =150A, V _{GE} =15V, T _{vj} = 25°C		--	0.96	--	uC
Q _{ge}	Gate to Emitter Charge			--	0.20	--	
Q _{gc}	Gate to Collector Charge			--	0.46	--	
t _{d(ON)}	Turn-on Delay Time	V _{CE} =600V, I _C =150A, V _{GE} =15/-5V, R _g =6.8Ω Inductive Load		--	140	--	ns
t _r	Rise Time			--	98	--	
t _{d(OFF)}	Turn-Off Delay Time			--	504	--	
t _f	Fall Time			--	217	--	
E _{on}	Turn-On Switching Loss			--	7.35	--	mJ
E _{off}	Turn-Off Switching Loss			--	4.20	--	

E_{ts}	Total Switching Loss		--	11.55	--	
R_{thJC}	Thermal resistance, junction to case	per IGBT	--	0.13	--	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40	--	150	°C

Diode

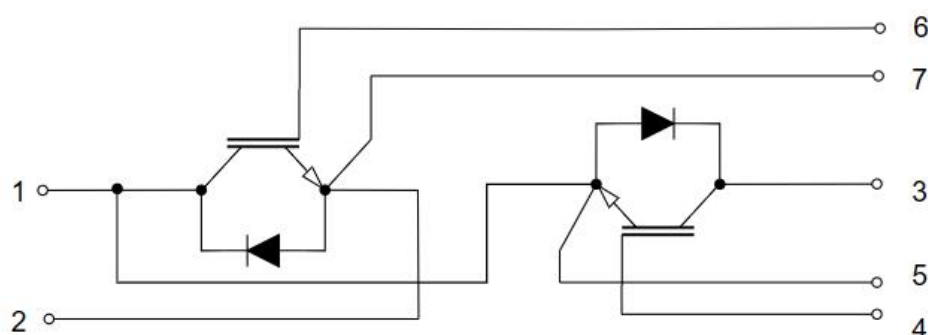
Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Description	Note or test condition	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	$T_{vj} = 25^\circ\text{C}$	1200	V
I_F	Continuous DC forward current		150	A
I_{FRM}	Repetitive peak forward current	$t_P = 1\text{ ms}$	300	A

Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_F	Diode Forward Voltage	$I_F = 150\text{A}$	--	3.3	4.2	V
T_{rr}	Reverse Recovery Time	$V_{CE} = 600\text{V}, I_F = 150\text{A},$ $V_{GE} = 15/0\text{V}$ $R_g = 6.8\Omega$	--	402	--	ns
I_{RRM}	Diode Peak Reverse Recovery Current		--	49	--	A
Q_{rr}	Reverse Recovery Charge		--	3.67	--	μC
E_{rec}	Reverse Recovery Energy		--	1.75	--	mJ
R_{thJC}	Thermal resistance, junction to case	Per Diode	--	0.2	--	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40	--	150	°C

Circuit Diagram



Package Dimensions

Dimensions in Millimeters

