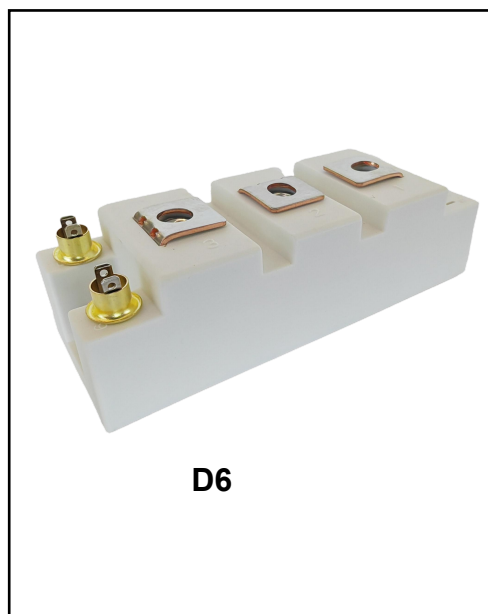


D6 module with AIKO IGBT and emitter controlled diode

Features

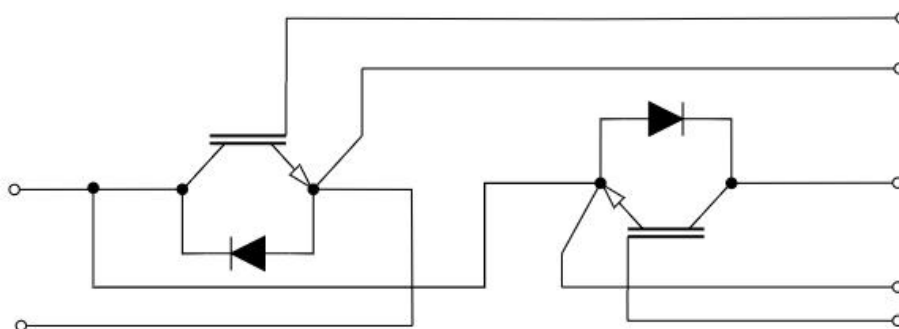
- Electrical features
 - $V_{CES} = 1200\text{ V}$
 - $I_{C\text{ nom}} = 150\text{ A} / I_{CRM} = 300\text{ A}$
 - V_{CESat} with positive temperature coefficient
 - $10\mu\text{s}$ short circuit capability
- Mechanical features
 - Standard housing
 - 2.5 kV AC 1 min insulation
 - High creepage and clearance distances
 - Isolated base plate



Typical Applications

- Inverters
- UPS (Uninterruptible Power Supplies)
- Motor Drives
- Welding Machine

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	17.0	mm
d_{creep}	Creepage distance	terminal to terminal	20.0	mm
d_{clear}	Clearance	terminal to heatsink	17.0	mm
d_{clear}	Clearance	terminal to terminal	9.5	mm
CTI	Comparative tracking index (electrical)		≥175	

Package Characteristic values

Symbol	Description	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
L_{sCE}	Stray Inductance			--	30	--	nH
$R_{CC'+EE'}$	Module Lead Resistance, Terminal to Chip	$T_C=25^{\circ}\text{C}$, per switch		--	0.75	--	mΩ
T_{stg}	Storage temperature			-40	--	125	°C
M	Mounting torque for module mounting	-Mounting according to valid application note	M5, Screw	2.5	--	5.0	Nm
M	Terminal connection torque	-Mounting according to valid application note	M6, Screw	3.0	--	5.0	Nm
G	Weight			--	150	--	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} = 175°C	600	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	--	1.65	2.50	V
			T _j =125°C	--	1.75	--	
			T _j =150°C	--	1.85	--	
V _{GE(TH)}	Gate-Emitter Threshold Voltage	I _C = 3 mA, V _{CE} = V _{GE}		5.0	6.0	7.0	V
I _{CES}	Collector-Emitter Cutoff Current	V _{GE} = 0V, V _{CE} =1200V, T _{vj} = 25°C		--	--	400	uA
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		--	0.4	--	Ω
C _{ies}	Input Capacitance	V _{CE} =30V, V _{GE} =0V, f=1MHz, T _{vj} = 25°C		--	15.58	--	nF
C _{oes}	Output Capacitance			--	0.35	--	
C _{res}	Reverse Transfer Capacitance			--	0.078	--	
Q _g	Total Gate Charge	V _{CC} =960V, I _C =150A, V _{GE} =15V, T _{vj} = 25°C		--	0.73	--	uC
Q _{ge}	Gate to Emitter Charge			--	0.06	--	
Q _{gc}	Gate to Collector Charge			--	0.25	--	
t _{d(ON)}	Turn-on Delay Time	V _{CE} =600V, I _C =150A, V _{GE} =15/-5V, R _g =25Ω Inductive Load		--	180	--	ns
t _r	Rise Time			--	122	--	
t _{d(OFF)}	Turn-Off Delay Time			--	608	--	
t _f	Fall Time			--	90	--	
E _{on}	Turn-On Switching Loss			--	8.34	--	mJ

E_{off}	Turn-Off Switching Loss	$V_{GE}=15V, V_{CC}=600V, t_{SC} \leq 10\mu s, T_{vj} \leq 150^\circ C$	--	4.20	--	
E_{ts}	Total Switching Loss		--	12.54	--	
$I_{C(SC)}$	Short circuit collector current		--	700	--	A
R_{thJC}	Thermal resistance, junction to case	per IGBT	--	0.22	--	K/W
$T_{vj op}$	Temperature under switching conditions		-40	--	150 ¹⁾	$^\circ C$

¹⁾ $T_{vj op} > 150^\circ C$ is only allowed for operation at overload conditions. For detailed specifications please refer to AN 2018-14.

Diode

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

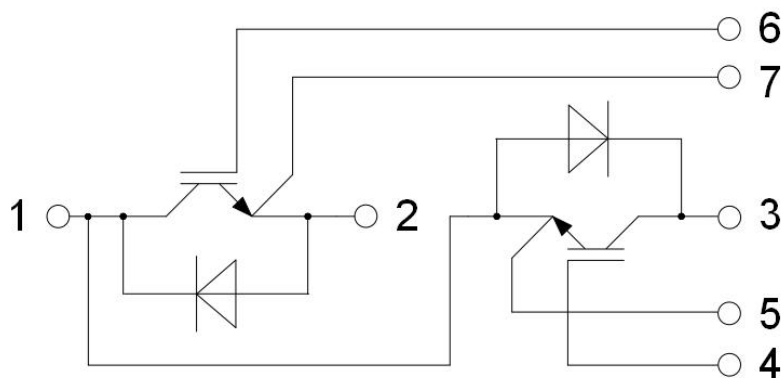
Symbol	Description	Note or test condition	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	$T_{vj} = 25^\circ C$	1200	V
I_F	Continuous DC forward current		150	A
I_{FRM}	Repetitive peak forward current	$t_p = 1 ms$	300	A

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

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_F	Diode Forward Voltage	$I_F=150A$	--	1.7	2.7	V
T_{rr}	Reverse Recovery Time	$V_{CE}=600V, I_F=150A,$ $V_{GE}=15/-5V$ $R_g=25\Omega$	--	192	--	ns
I_{RRM}	Diode Peak Reverse Recovery Current		--	29.7	--	A
Q_{rr}	Reverse Recovery Charge		--	1.36	--	μC
E_{rec}	Reverse Recovery Energy		--	1.35	--	mJ
R_{thJC}	Thermal resistance, junction to case	per Diode	--	0.4	--	K/W
$T_{vj op}$	Temperature under switching conditions		-40	--	150 ²⁾	$^\circ C$

²⁾ $T_{vj op} > 150^\circ C$ is only allowed for operation at overload conditions. For detailed specifications please refer to AN 2018-14.

Circuit Diagram



Package Dimensions

Dimensions in Millimeters

