

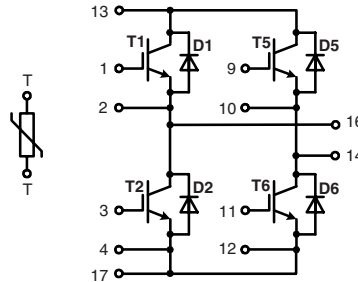
IGBT Modules

H-Bridge

Short Circuit SOA Capability
 Square RBSOA

Type:	NTC - Option:
MKI 65-06 A7	without NTC
MKI 65-06 A7T	with NTC

Preliminary data



IGBTs		
Symbol	Conditions	Maximum Ratings
V_{CES}	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	600 V
V_{GES}		± 20 V
I_{C25}	$T_C = 25^{\circ}\text{C}$	100 A
I_{C80}	$T_C = 80^{\circ}\text{C}$	67 A
RBSOA	$V_{GE} = \pm 15$ V; $R_G = 15$ Ω ; $T_{VJ} = 125^{\circ}\text{C}$ Clamped inductive load; $L = 100$ μH	$I_{CM} = 150$ A $V_{CEK} \leq V_{CES}$
t_{SC} (SCSOA)	$V_{CE} = V_{CES}$; $V_{GE} = \pm 15$ V; $R_G = 15$ Ω ; $T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10 μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	320 W

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 65$ A; $V_{GE} = 15$ V; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.0	2.5	V
$V_{GE(th)}$	$I_C = 1.5$ mA; $V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}$; $V_{GE} = 0$ V; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	0.8		0.8 mA
I_{GES}	$V_{CE} = 0$ V; $V_{GE} = \pm 20$ V			200 nA
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 300$ V; $I_C = 65$ A $V_{GE} = \pm 15$ V; $R_G = 15$ Ω	150		ns
		60		ns
		450		ns
		40		ns
		3.5		mJ
		2.3		mJ
C_{ies}	$V_{CE} = 25$ V; $V_{GE} = 0$ V; $f = 1$ MHz	4200		pF
Q_{Gon}	$V_{CE} = 300$ V; $V_{GE} = 15$ V; $I_C = 100$ A	260		nC
R_{thJC}	(per IGBT)			0.39 K/W

Features

- €NPT IGBT technology
- €low saturation voltage
- €low switching losses
- €switching frequency up to 30 kHz
- €square RBSOA, no latch up
- €high short circuit capability
- €positive temperature coefficient for easy paralleling
- €MOS input, voltage controlled
- €ultra fast free wheeling diodes
- €solderable pins for PCB mounting
- €package with copper base plate
- UL registered, E 72873

Advantages

- €space savings
- €reduced protection circuits
- €package designed for wave soldering

Typical Applications

- €motor control
 - DC motor armature winding
 - DC motor excitation winding
 - synchronous motor excitation winding
- €supply of transformer primary winding
 - power supplies
 - welding
 - X-ray
 - UPS
 - battery charger

Diodes

Symbol	Conditions	Maximum Ratings	
I_{F25}	$T_C = 25^\circ\text{C}$	140	A
I_{F80}	$T_C = 80^\circ\text{C}$	85	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 65\text{ A}; V_{GE} = 0\text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	1.8	2.2	V
I_{RM} t_{rr}	$I_F = 60\text{ A}; di_F/dt = -500\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 300\text{ V}; V_{GE} = 0\text{ V}$	28		A
		100		ns
R_{thJC}	(per diode)			0.61 K/W

Module

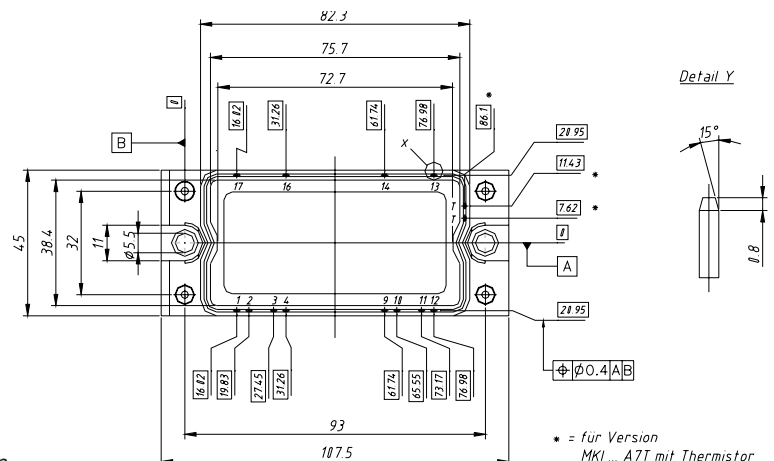
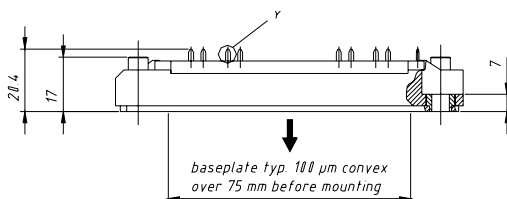
Symbol	Conditions	Maximum Ratings	
T_{VJ}		-40...+150	$^\circ\text{C}$
T_{stg}		-40...+125	$^\circ\text{C}$
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	2500	V~
M_d	Mounting torque (M5)	2.7 - 3.3	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{pin-chip}$			5	m Ω
d_s	Creepage distance on surface	6		mm
d_A	Strike distance in air	6		mm
R_{thCH}	with heatsink compound		0.02	K/W
Weight			180	g

Temperature Sensor NTC

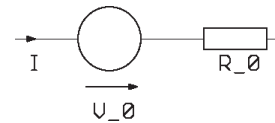
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R_{25}	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k Ω
$B_{25/50}$			3375	K

Dimensions in mm (1 mm = 0.0394")



Equivalent Circuits for Simulation

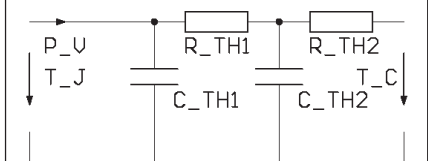
Conduction



IGBT (typ. at $V_{GE} = 15\text{ V}; T_J = 125^\circ\text{C}$)
 $V_0 = 1.2\text{ V}; R_0 = 15\text{ m}\Omega$

Free Wheeling Diode (typ. at $T_J = 125^\circ\text{C}$)
 $V_0 = 1.2\text{ V}; R_0 = 3\text{ m}\Omega$

Thermal Response



IGBT (typ.)
 $C_{th1} = 0.248\text{ J/K}; R_{th1} = 0.343\text{ K/W}$
 $C_{th2} = 1.849\text{ J/K}; R_{th2} = 0.097\text{ K/W}$

Free Wheeling Diode (typ.)
 $C_{th1} = 0.23\text{ J/K}; R_{th1} = 0.483\text{ K/W}$
 $C_{th2} = 1.3\text{ J/K}; R_{th2} = 0.127\text{ K/W}$

IXYS reserves the right to change limits, test conditions and

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* = für Version
MKI ... A7T mit Thermistor

0548