

IGBT Module

Sixpack

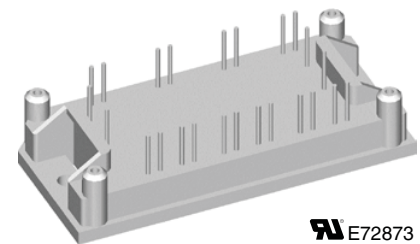
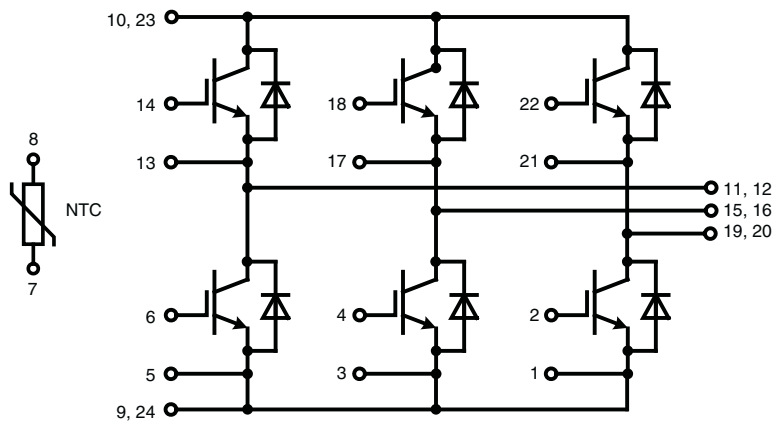
Short Circuit SOA Capability
Square RBSOA

$$\begin{aligned} I_{C25} &= 19\text{ A} \\ V_{CES} &= 1200\text{ V} \\ V_{CE(sat) \text{ typ.}} &= 3.0\text{ V} \end{aligned}$$

Preliminary data

Part name (Marking on product)

MWI15-12A6K



E72873

Pin configuration see outlines.

Features:

- NPT IGBTs
 - low saturation voltage
 - positive temperature coefficient for easy paralleling
 - fast switching
 - short tail current for optimized performance also in resonant circuits
- HiPerFRED™ diode:
 - fast reverse recovery
 - low operating forward voltage
 - low leakage current
- Industry Standard Package
 - solderable pins for PCB mounting
 - isolated copper base plate

Application:

- AC drives
- UPS
- Welding

Package:

- UL registered
- Industry standard E1-pack

IGBTs

				Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.	Unit	
V _{CES}	collector emitter voltage	T _{VJ} = 25°C to 150°C			1200	V	
V _{GES}	max. DC gate voltage	continuous			±20	V	
V _{GEM}	max. transient collector gate voltage	transient			±30	V	
I _{C25}	collector current	T _C = 25°C			19	A	
I _{C80}		T _C = 80°C			13	A	
P _{tot}	total power dissipation	T _C = 25°C			90	W	
V _{CE(sat)}	collector emitter saturation voltage	I _C = 15 A; V _{GE} = 15 V		3.0 3.5	3.4	V V	
V _{GE(th)}	gate emitter threshold voltage	I _C = 0.35 mA; V _{GE} = V _{CE}	4.5		6.5	V	
I _{CES}	collector emitter leakage current	V _{CE} = V _{CES} ; V _{GE} = 0 V		0.8	0.9	mA mA	
I _{GES}	gate emitter leakage current	V _{CE} = 0 V; V _{GE} = ±20 V			100	nA	
C _{ies}	input capacitance	V _{CE} = 25 V; V _{GE} = 0 V; f = 1 MHz		600		pF	
Q _{G(on)}	total gate charge	V _{CE} = 600 V; V _{GE} = 15 V; I _C = 10 A		45		nC	
t _{d(on)}	turn-on delay time	inductive load V _{CE} = 600 V; I _C = 10 A V _{GE} = ±15 V; R _G = 82 Ω	T _{VJ} = 125°C	50		ns	
t _r	current rise time			40		ns	
t _{d(off)}	turn-off delay time			290		ns	
t _f	current fall time			60		ns	
E _{on}	turn-on energy per pulse			1.2		mJ	
E _{off}	turn-off energy per pulse			1.1		mJ	
I _{CM}	reverse bias safe operating area	RBSOA; V _{GE} = ±15 V; R _G = 82 Ω L = 100 μH; clamped induct. load V _{CEmax} = V _{CES} - L _S ·di/dt	T _{VJ} = 125°C	30		A	
t _{SC} (SCSOA)	short circuit safe operating area	V _{CE} = 1200 V; V _{GE} = ±15 V; R _G = 82 Ω; non-repetitive	T _{VJ} = 125°C	10		μs	
R _{thJC}	thermal resistance junction to case	(per IGBT)			1.37	K/W	
R _{thCH}	thermal resistance case to heatsink	(per IGBT)		0.5		K/W	

Diodes

						Ratings			
Symbol	Definitions	Conditions	min.	typ.	max.	Unit			
V_{RRM}	<i>max. repetitive reverse voltage</i>		$T_{VJ} = 150^{\circ}\text{C}$		1200	V			
I_{F25}	<i>forward current</i>		$T_C = 25^{\circ}\text{C}$		24	A			
I_{F80}			$T_C = 80^{\circ}\text{C}$		16	A			
V_F	<i>forward voltage</i>	$I_F = 15\text{ A}; V_{GE} = 0\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.4 1.7	2.7	V V			
I_{RM}	<i>max. reverse recovery current</i>	$V_R = 600\text{ V}$ $di_F/dt = -400\text{ A}/\mu\text{s}$ $I_F = 15\text{ A}; V_{GE} = 0\text{ V}$	$T_{VJ} = 125^{\circ}\text{C}$	16		A			
t_{rr}	<i>reverse recovery time</i>			130		ns			
$E_{rec(off)}$	<i>reverse recovery energy</i>			tbd		μJ			
R_{thJC}	<i>thermal resistance junction to case</i>	(per diode)			1.6	K/W			
R_{thCH}	<i>thermal resistance case to heatsink</i>	(per diode)		0.55		K/W			

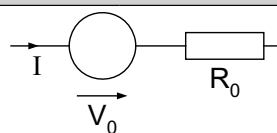
 $T_C = 25^{\circ}\text{C}$ unless otherwise stated

Temperature Sensor NTC

Symbol	Definitions	Conditions	Ratings			
			min.	typ.	max.	Unit
R_{25}	resistance	$T_c = 25^{\circ}\text{C}$	4.45	4.7	5.0	k Ω
$B_{25/85}$				3510		K

Module

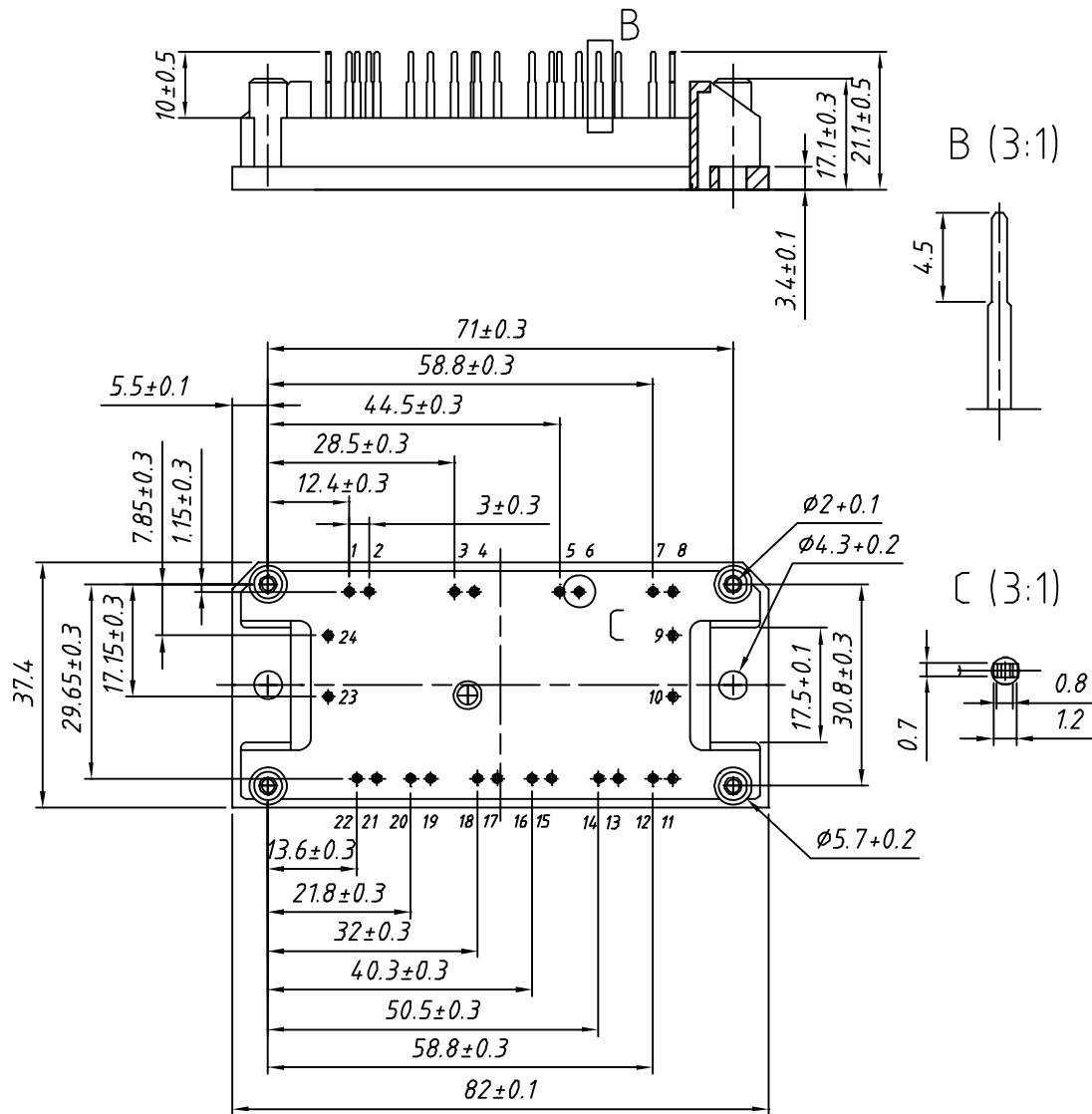
Symbol	Definitions	Conditions	Ratings			
			min.	typ.	max.	Unit
T_{VJ}	operating temperature		-40		125	$^{\circ}\text{C}$
T_{VJM}	max. virtual junction temperature				150	$^{\circ}\text{C}$
T_{stg}	storage temperature		-40		125	$^{\circ}\text{C}$
V_{ISOL}	isolation voltage	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$			2500	V~
M_d	mounting torque	(M4)	2.0		2.2	Nm
d_s	creep distance on surface		12.7			mm
d_A	strike distance through air		12.7			mm
Weight				40		g

Equivalent Circuits for Simulation

Ratings

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
V_0	IGBT	$T_{VJ} = 125^{\circ}\text{C}$		tbd		V
R_0				tbd		m Ω
V_0	free wheeling diode	$T_{VJ} = 125^{\circ}\text{C}$		1.38		V
R_0				40		m Ω

Outline Drawing

Dimensions in mm (1 mm = 0.0394")


Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MWI 15-12A6K	MWI15-12A6K	Box	10	500308