IGBT Module

Sixpack

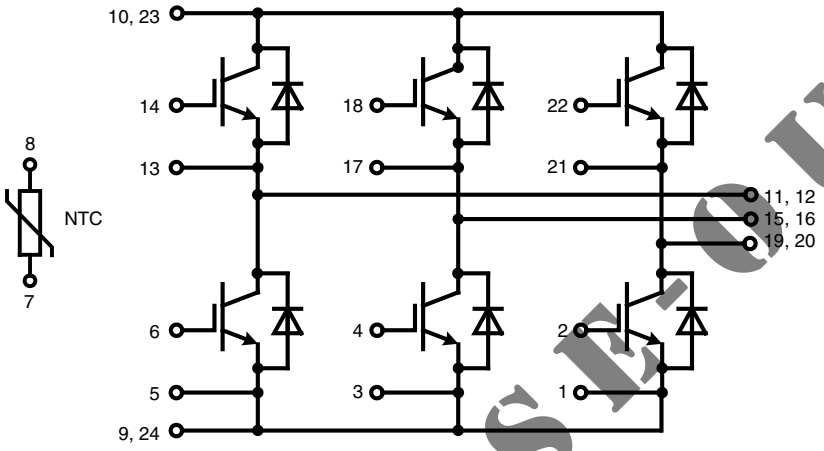
Short Circuit SOA Capability
Square RBSOA

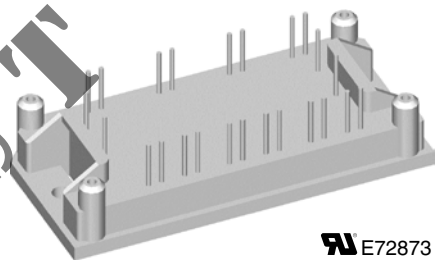
I_{C25} = 29 A
V_{CES} = 1200 V
$V_{CE(sat)\ typ.}$ = 2.5 V

Preliminary data

Part name (Marking on product)

MWI 30-12E6K





E72873

Pin configuration see outlines.

PHASE OUT

Features:

- SPT 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

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IGBTs

Symbol	Definitions	Conditions		Ratings 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			29	A
I_{C80}			T_C = 80°C			21	A
P_{tot}	*total power dissipation*		T_C = 25°C			130	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 20 A; V_{GE} = 15 V	T_{VJ} = 25°C		2.5	2.9	V
			T_{VJ} = 125°C		2.9		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 0.6 mA; V_{GE} = V_{CE}	T_{VJ} = 25°C	4.5		6.5	V
I_{CES}	*collector emitter leakage current*	V_{CE} = V_{CES}; V_{GE} = 0 V	T_{VJ} = 25°C			1	mA
			T_{VJ} = 125°C		0.6		mA
I_{GES}	*gate emitter leakage current*	V_{CE} = 0 V; V_{GE} = ±20 V				200	nA
C_{ies}	*input capacitance*	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz			1180		pF
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 20 A			100		nC
$t_{d(on)}$	*turn-on delay time*	inductive load	T_{VJ} = 125°C		90		ns
t_r	*current rise time*	V_{CE} = 600 V; I_C = 20 A			50		ns
$t_{d(off)}$	*turn-off delay time*	V_{GE} = ±15 V; R_G = 56 Ω			320		ns
t_f	*current fall time*				90		ns
E_{on}	*turn-on energy per pulse*				2.8		mJ
E_{off}	*turn-off energy per pulse*				1.8		mJ
I_{CM}	*reverse bias safe operating area*	RBSOA; V_{GE} = ±15 V; R_G = 56 Ω			45		A
		L = 100 µH; clamped induct. load	T_{VJ} = 125°C				
		V_{CEmax} = V_{CES} - L_S·di/dt					
t_{SC} (SCSOA)	*short circuit safe operating area*	V_{CE} = 900 V; V_{GE} = ±15 V;	T_{VJ} = 125°C		10		µs
		R_G = 56 Ω; non-repetitive					
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				0.95	K/W
R_{thCH}	*thermal resistance case to heatsink*	(per IGBT)			0.35		K/W

Diodes

Symbol	Definitions	Conditions		Maximum Ratings	
V_{RRM}	*max. repetitive reverse voltage*			1600	V
I_{F25}	*forward current*		T_C = 25°C	24	A
I_{F80}			T_C = 80°C	16	A

Symbol	Conditions		Characteristic Values min.	typ.	max.	
V_F	*forward voltage*	I_F = 20 A	T_{VJ} = 25°C	2.6	2.9	V
			T_{VJ} = 125°C	2.0		V
I_{RM}	*max. reverse recovery current*	V_R = 600 V; I_F = 20 A		18		A
t_{rr}	*reverse recovery time*	di_F/dt = -400 A/µs	T_{VJ} = 100°C	130		ns
R_{thJC}	*thermal resistance junction to case*	(per diode)	T_{VJ} = 25°C		1.6	K/W
R_{thCH}	*thermal resistance case to heatsink*	(per diode)		0.55		K/W

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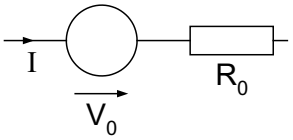
Temperature Sensor NTC

Symbol	Definitions	Conditions	Ratings min.	typ.	max.	Unit
R_{25}	*resistance*	T_C = 25°C	4.45	4.7	5.0	kΩ
$B_{25/85}$				3510		K

Module

Symbol	Definitions	Conditions	Ratings min.	typ.	max.	Unit
T_{VJ}	*operating temperature*		-40		125	°C
T_{VJM}	*max. virtual junction temperature*				150	°C
T_{stg}	*storage temperature*		-40		125	°C
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq$ 1 mA; 50/60 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

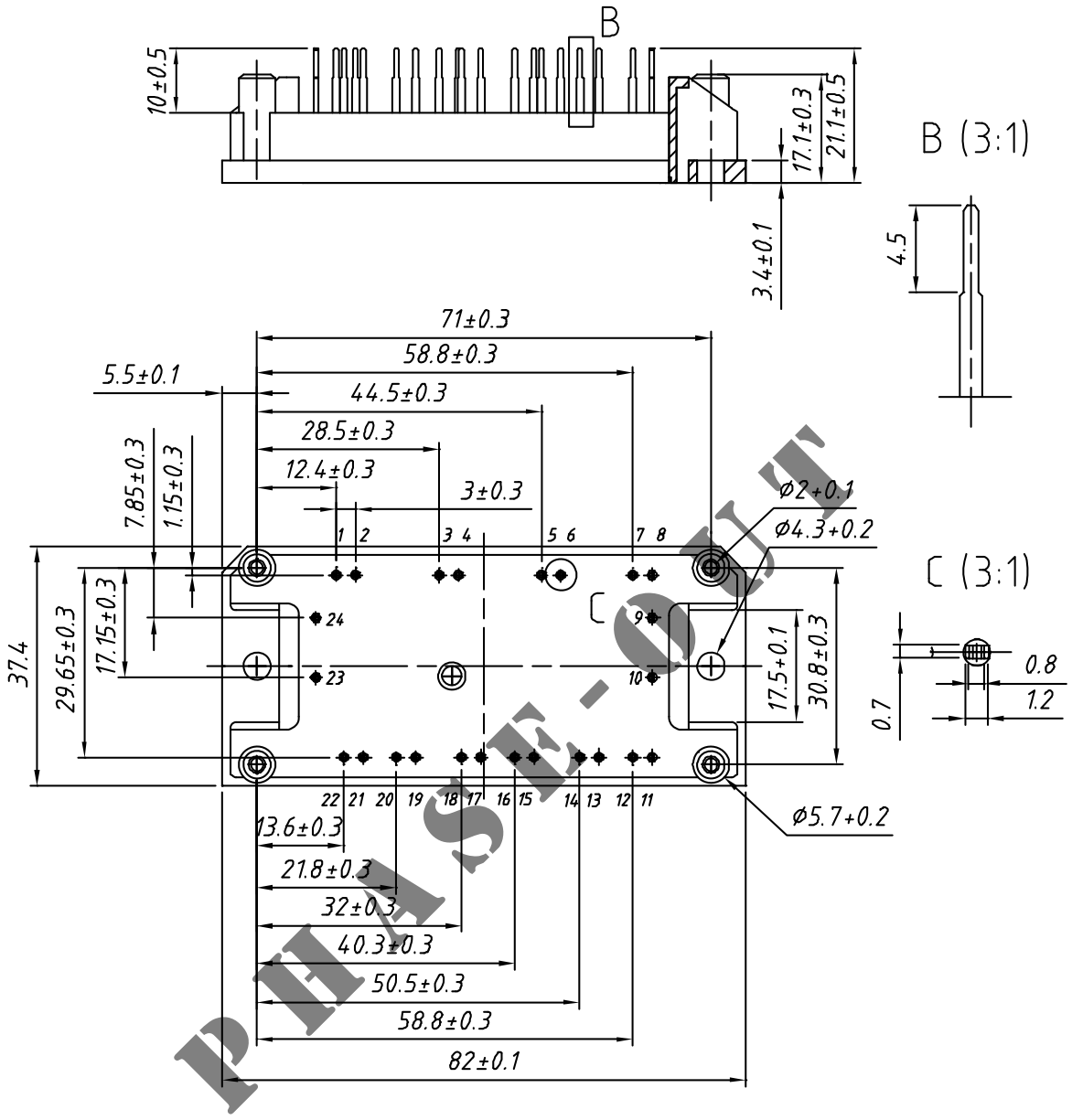


Symbol	Definitions	Conditions	Ratings min.	typ.	max.	Unit
V_0	*IGBT*	T_{VJ} = 125°C		1.1		V
R_0				83		mΩ
V_0	*free wheeling diode*	T_{VJ} = 125°C		1.45		V
R_0				38		mΩ

PHASE-OUT

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Outline Drawing Dimensions in mm (1 mm = 0.0394“)



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Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MWI 30-12E6K	MWI30-12E6K	Box	10	500 138

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