IGBT Module
Sixpack
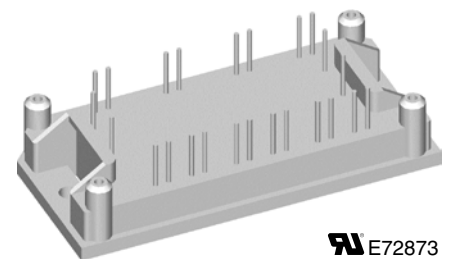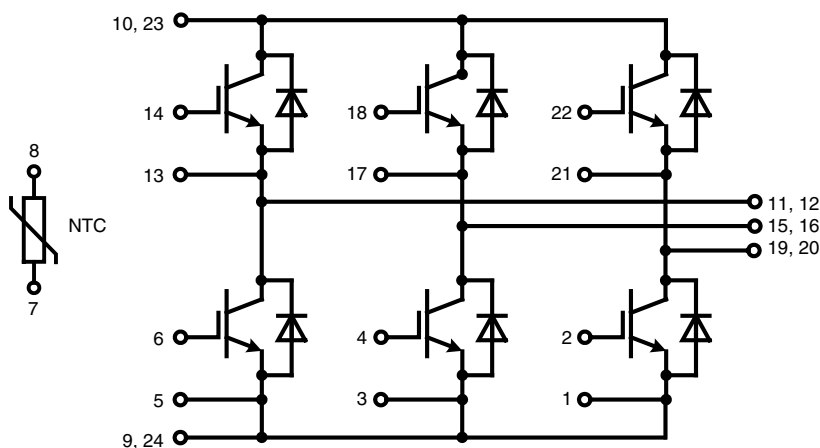Short Circuit SOA Capability
Square RBSOA

I_{C25} = 58 A
V_{CES} = 1200 V
$V_{CE(sat)\ typ.}$ = 1.9 V

Preliminary data

Part name (Marking on product)

MWI 60-12T6K

Pin configuration see outlines.

Features:
- Trench 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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MWI 60-12T6K

IGBTs

Symbol	Definitions	Conditions		min.	typ.	max.	Unit
			Ratings				
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	$T_C = 25°C$				58	A
I_{C80}		$T_C = 80°C$				41	A
P_{tot}	total power dissipation	$T_C = 25°C$				200	W
$V_{CE(sat)}$	collector emitter saturation voltage	$I_C = 35$ A; $V_{GE} = 15$ V	$T_{VJ} = 25°C$		1.9	2.3	V
			$T_{VJ} = 125°C$		2.2		V
$V_{GE(th)}$	gate emitter threshold voltage	$I_C = 1.5$ 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	$T_{VJ} = 25°C$			0.5	mA
			$T_{VJ} = 125°C$		0.8		mA
I_{GES}	gate emitter leakage current	$V_{CE} = 0$ V; $V_{GE} = ±20$ V				400	nA
C_{ies}	input capacitance	$V_{CE} = 25$ V; $V_{GE} = 0$ V; f = 1 MHz			2530		pF
$Q_{G(on)}$	total gate charge	$V_{CE} = 600$ V; $V_{GE} = 15$ V; $I_C = 35$ A			330		nC
$t_{d(on)}$	turn-on delay time				90		ns
t_r	current rise time	inductive load	$T_{VJ} = 125°C$		50		ns
$t_{d(off)}$	turn-off delay time	$V_{CE} = 600$ V; $I_C = 35$ A			520		ns
t_f	current fall time	$V_{GE} = ±15$ V; $R_G = 27$ Ω			90		ns
E_{on}	turn-on energy per pulse				3.5		mJ
E_{off}	turn-off energy per pulse				4.8		mJ
I_{CM}	reverse bias safe operating area	RBSOA; $V_{GE} = ±15$ V; $R_G = 27$ Ω			70		A
		L = 100 µH; clamped induct. load	$T_{VJ} = 125°C$				
		$V_{CEmax} = V_{CES} - L_S \cdot di/dt$					
t_{SC} (SCSOA)	short circuit safe operating area	$V_{CE} = 900$ V; $V_{GE} = ±15$ V; $R_G = 27$ Ω; non-repetitive	$T_{VJ} = 125°C$		10		µs
R_{thJC}	thermal resistance junction to case	(per IGBT)				0.62	K/W
R_{thCH}	thermal resistance case to heatsink	(per IGBT)			0.25		K/W

Diodes

Symbol	Definitions	Conditions		Maximum Ratings	
V_{RRM}	max. repetitive reverse voltage			1600	V
I_{F25}	forward current	$T_C = 25°C$		49	A
I_{F80}		$T_C = 80°C$		32	A

Symbol	Conditions			Characteristic Values		
				min.	typ.	max.
V_F	forward voltage	$I_F = 35$ A	$T_{VJ} = 25°C$		2.6	2.9	V
			$T_{VJ} = 125°C$		1.8		V
I_{RM}	max. reverse recovery current	$V_R = 600$ V; $I_F = 35$ A			35		A
t_{rr}	reverse recovery time	$di_F/dt = -600$ A/µs	$T_{VJ} = 100°C$		150		ns
R_{thJC}	thermal resistance junction to case	(per diode)	$T_{VJ} = 25°C$			0.9	K/W
R_{thCH}	thermal resistance case to heatsink	(per diode)			0.3		K/W

IXYS reserves the right to change limits, test conditions and dimensions.

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Temperature Sensor NTC

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

Module

Symbol	Definitions	Conditions	min.	typ.	max.	Unit
				Ratings		
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
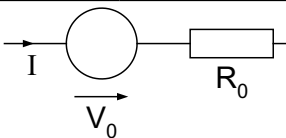
Symbol	Definitions	Conditions	min.	typ.	max.	Unit
				Ratings		
V_0	IGBT	$T_{VJ} =$ 125°C		1.0		V
R_0				31		mΩ
V_0	free wheeling diode	$T_{VJ} =$ 125°C		1.5		V
R_0				14		mΩ

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Outline Drawing | Dimensions in mm (1 mm = 0.0394")
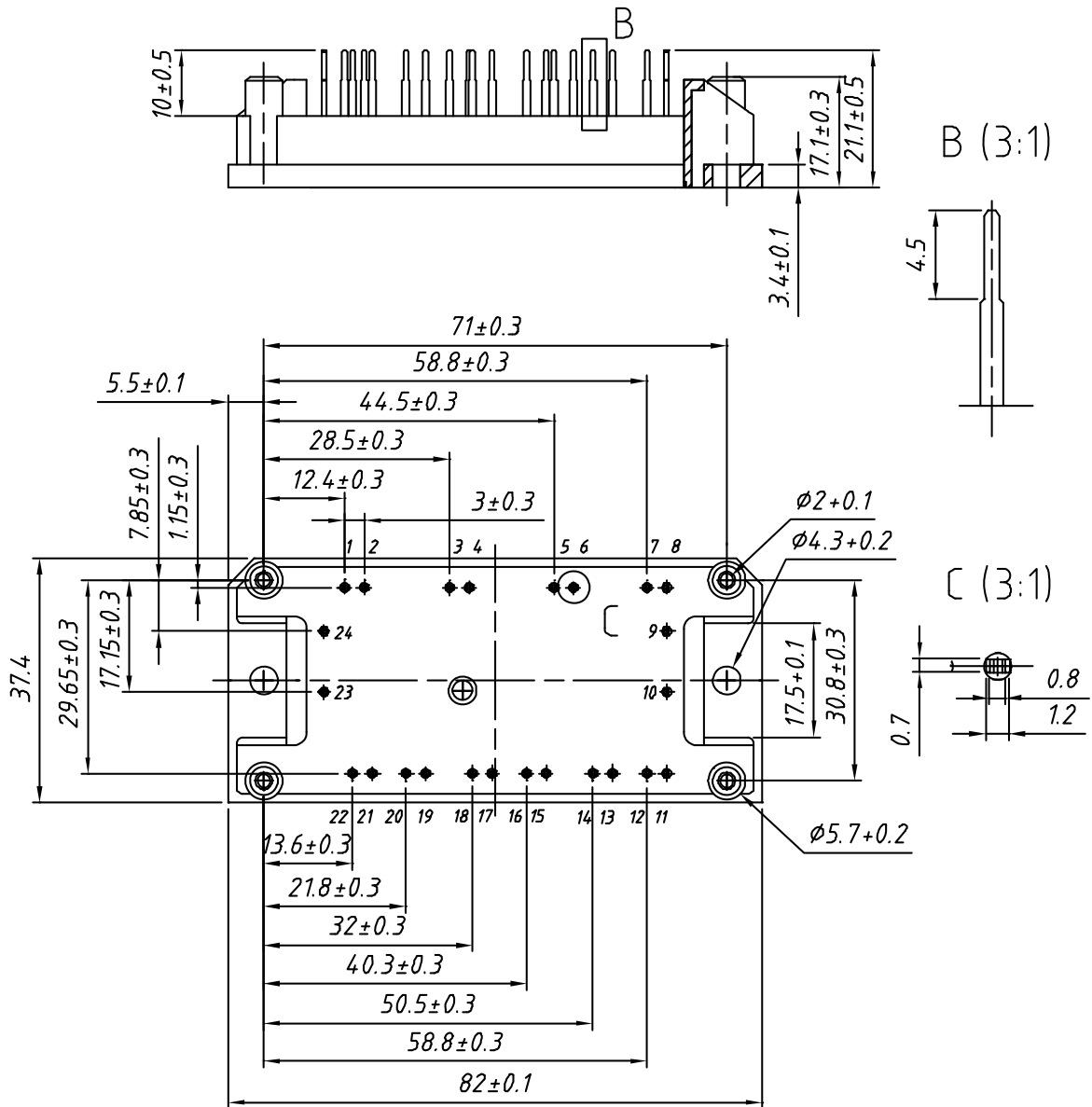
Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MWI 60-12T6K	MWI60-12T6K	Box	10	500 152

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