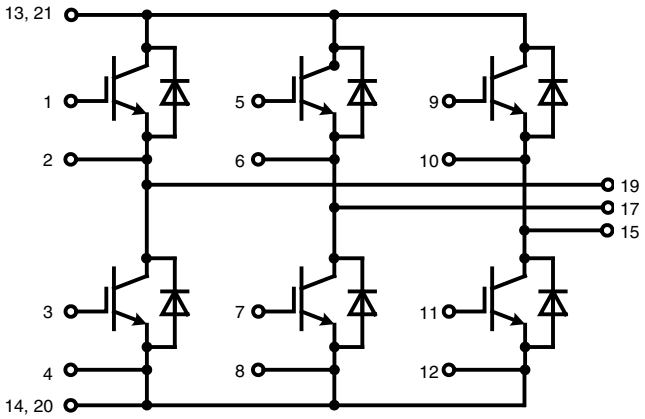
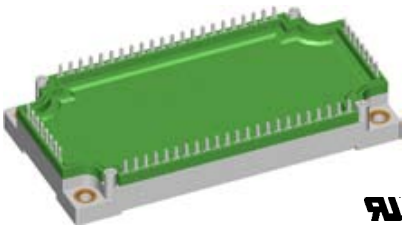
Six-Pack
NPT IGBT

V_{CES} = 1200 V
I_{C25} = 125 A
$V_{CE(sat)\ typ.}$ = 2.2 V

Part name (Marking on product)

MWI 75-12A8





E 72873

Pin configuration see outlines.

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 parallelling
- MOS input, voltage controlled
- ultra fast free wheeling diodes
- solderable pins for PCB mounting
- space savings

Application:

- AC motor control
- AC servo and robot drives
- power supplies

Package:

- designed for wave soldering
- with copper base plate

Ouput Inverter T1 - T6

Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
V_{CES}	*collector emitter voltage*		T_{VJ} = 25°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			125	A
I_{C80}			T_C = 80°C			85	A
P_{tot}	*total power dissipation*		T_C = 25°C			500	W
$V_{CE(sat)}$	*collector emitter saturation voltage*	I_C = 75 A; V_{GE} = 15 V	T_{VJ} = 25°C		2.2	2.6	V
			T_{VJ} = 125°C		2.5		V
$V_{GE(th)}$	*gate emitter threshold voltage*	I_C = 3 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			5	mA
			T_{VJ} = 125°C		3		mA
I_{GES}	*gate emitter leakage current*	V_{GE} = ±20 V				400	nA
C_{ies}	*input capacitance*	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz			5.5		nF
$Q_{G(on)}$	*total gate charge*	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 75 A			350		nC
$t_{d(on)}$	*turn-on delay time*	inductive load V_{CE} = 600 V; I_C = 75 A V_{GE} = ±15 V; R_G = 15 Ω	T_{VJ} = 125°C		100		ns
t_r	*current rise time*				50		ns
$t_{d(off)}$	*turn-off delay time*				650		ns
t_f	*current fall time*				50		ns
E_{on}	*turn-on energy per pulse*				12.1		mJ
E_{off}	*turn-off energy per pulse*				10.5		mJ
RBSOA	*reverse bias safe operating area*	V_{GE} = ±15 V; R_G = 15 Ω;	T_{VJ} = 125°C V_{CEK} ≤ 1200 V			150	A
SCSOA	*short circuit safe operating area*						
t_{SC}	*short circuit duration*	V_{CE} = 1200 V; V_{GE} = ±15 V;	T_{VJ} = 125°C			10	µs
I_{SC}	*short circuit current*	R_G = 15 Ω; non-repetitive			300		A
R_{thJC}	*thermal resistance junction to case*	(per IGBT)				0.25	K/W

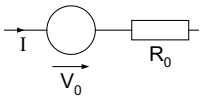
Output Inverter D1 - D6

Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
V_{RRM}	*max. repetitve reverse voltage*		T_{VJ} = 25°C			1200	V
I_{F25}	*forward current*		T_C = 25°C			150	A
I_{F80}			T_C = 80°C			100	A
V_F	*forward voltage*	I_F = 75 A; V_{GE} = 0 V	T_{VJ} = 25°C		2.2	2.6	V
			T_{VJ} = 125°C		1.6		V
I_{RM}	*max. reverse recovery current*	V_R = 600 V; I_F = 75 A; V_{GE} = 0 V			79		A
t_{rr}	*reverse recovery time*	di_F/dt = -750 A/µs	T_{VJ} = 125°C		220		ns
R_{thJC}	*thermal resistance junction to case*	(per diode)				0.41	K/W

Module

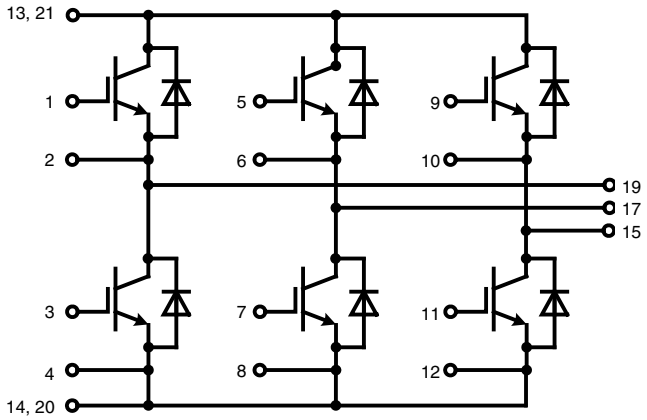
Symbol	Definitions	Conditions	Ratings min.	typ.	max.	Unit
T_{VJ}	*operating temperature*		-40		125	°C
T_{VJM}	*max. virtual junction temperature*				150	°C
T_{stg}	*storage temperature*		-40		125	°C
V_{ISOL}	*isolation voltage*	$I_{ISOL} \leq 1$ mA; 50/60 Hz			2500	V~
M_d	*mounting torque (M5)*		3		6	Nm
d_S	*creep distance on surface*		10			mm
d_A	*strike distance through air*		10			mm
$R_{pin\text{-}chip}$	*resistance pin to chip*			1.8		mΩ
R_{thCH}	*thermal resistance case to heatsink*	with heatsink compound		0.01		K/W
Weight				300		g

Equivalent Circuits for Simulation



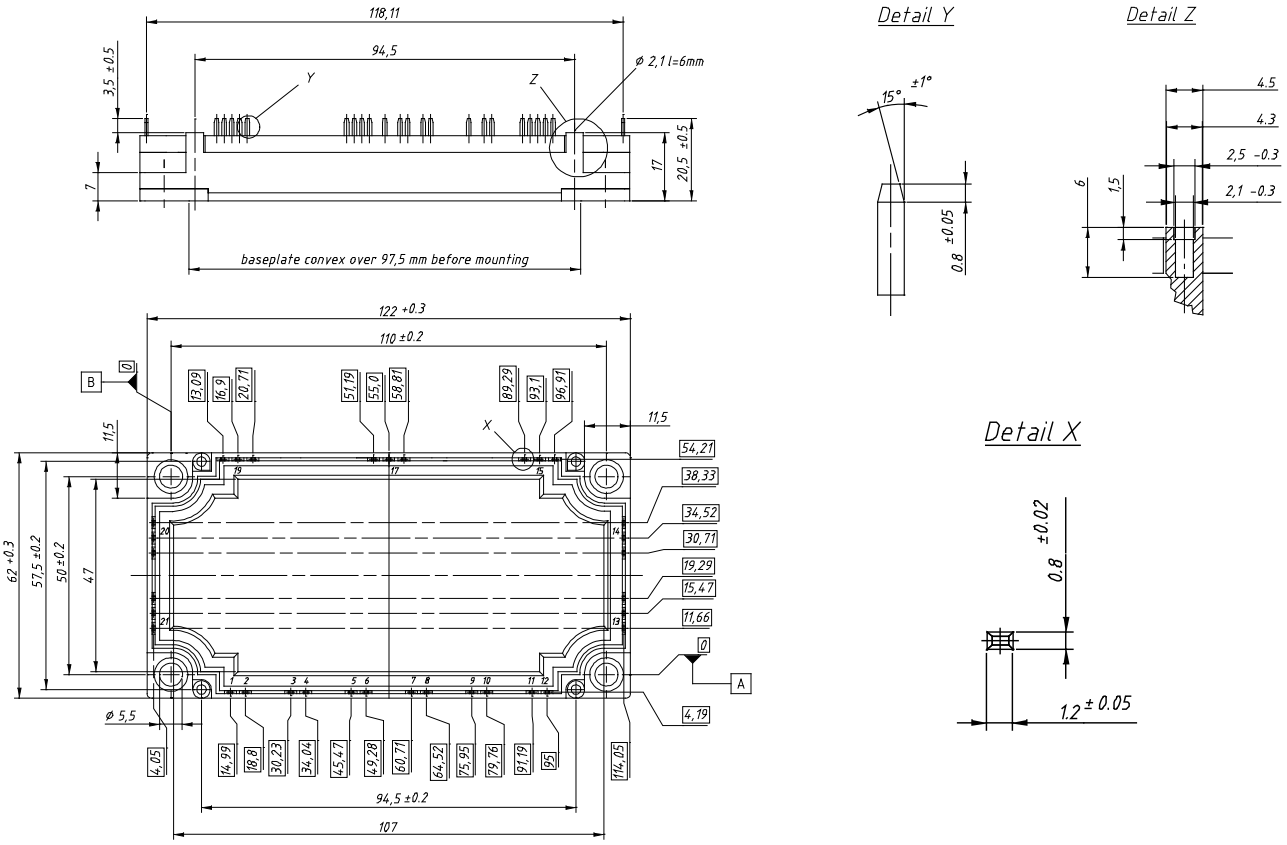
Symbol	Definitions	Conditions		Ratings min.	typ.	max.	Unit
V_0	*IGBT*	T1 - T6	T_{VJ} = 125°C		1.5		V
R_0					13.5		mΩ
V_0	*Diode*	D1 - D6	T_{VJ} = 125°C		1.3		V
R_0					4		mΩ

Circuit Diagram



Outline Drawing

Dimensions in mm (1 mm = 0.0394“)



Product Marking

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Ordering Code
Standard	MWI75-12A8	MWI75-12A8	Box	5	486787

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

20090220b

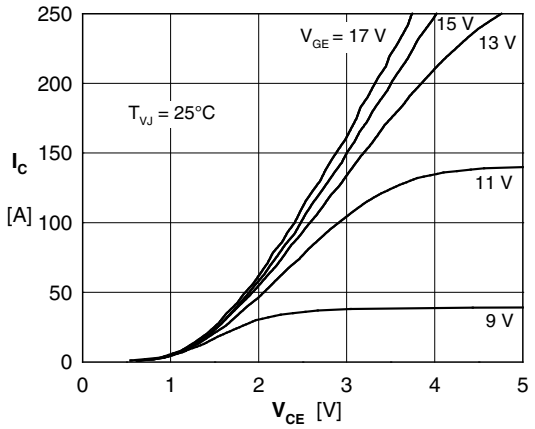


Fig. 1 Typ. output characteristics

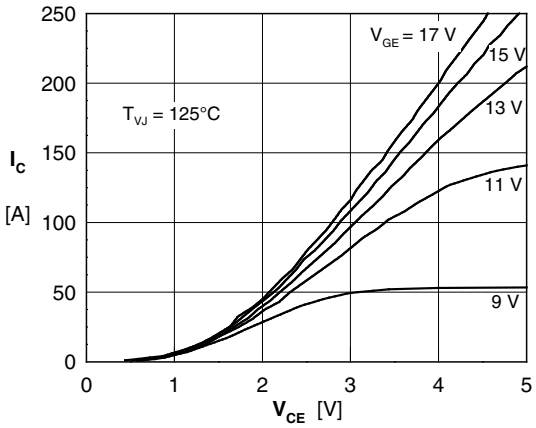


Fig. 2 Typ. output characteristics

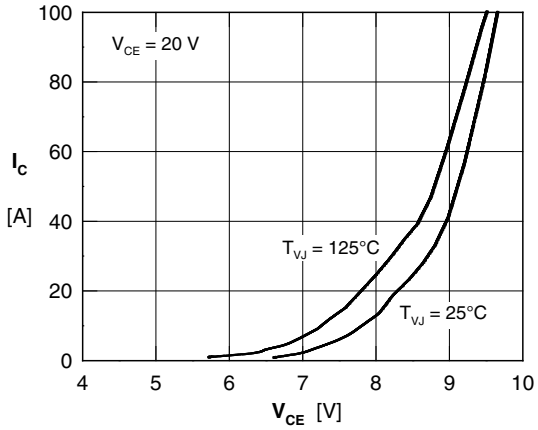


Fig. 3 Typ. transfer characteristics

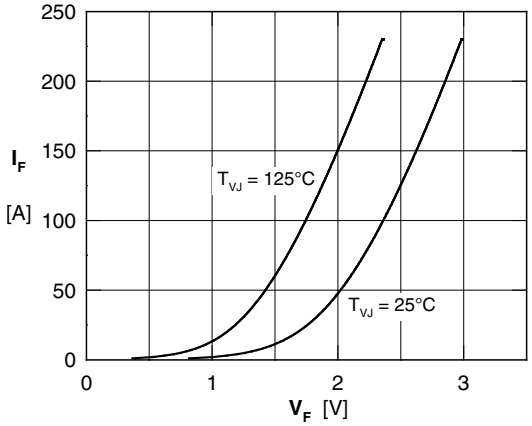


Fig. 4 Typ. forward characteristics of free wheeling diode

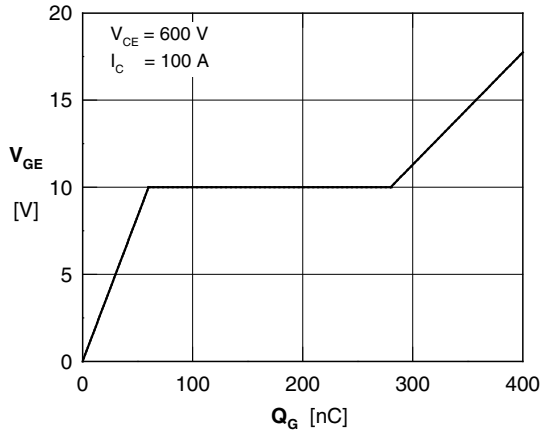


Fig. 5 Typ. turn on gate charge

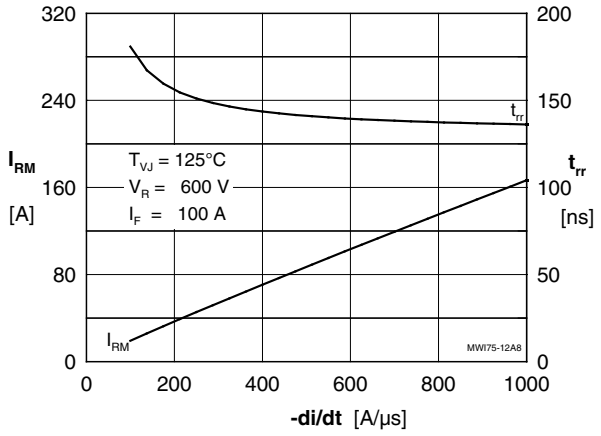


Fig. 6 Typ. turn off characteristics of free wheeling diode

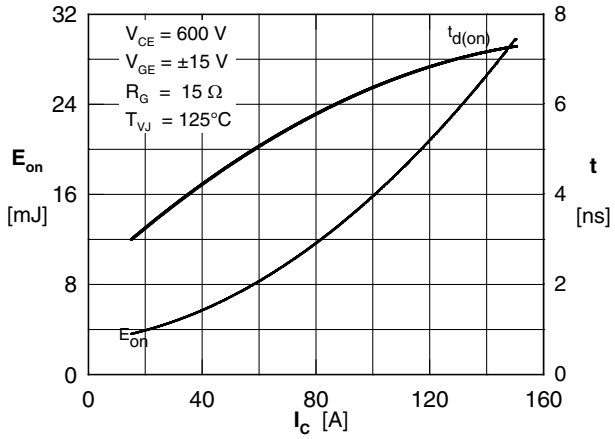


Fig. 7 Typ. turn on energy and switching times versus collector current

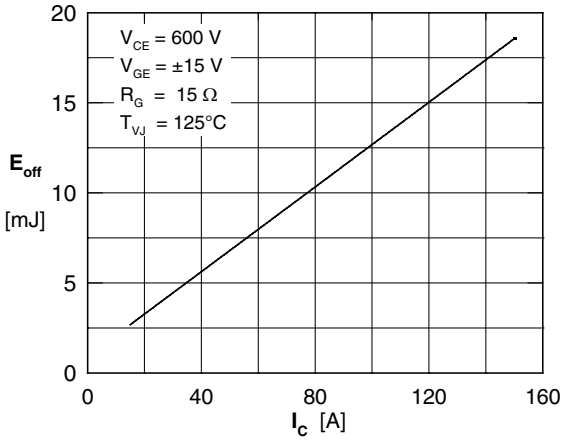


Fig. 8 Typ. turn off energy and switching times versus collector current

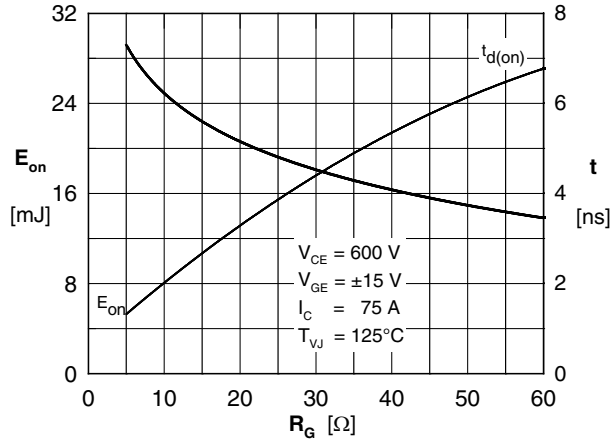


Fig. 9 Typ. turn on energy and switching times versus gate resistor

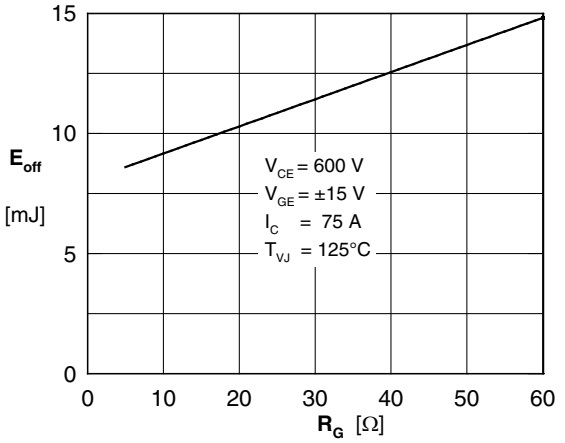


Fig.10 Typ. turn off energy and switching times versus gate resistor

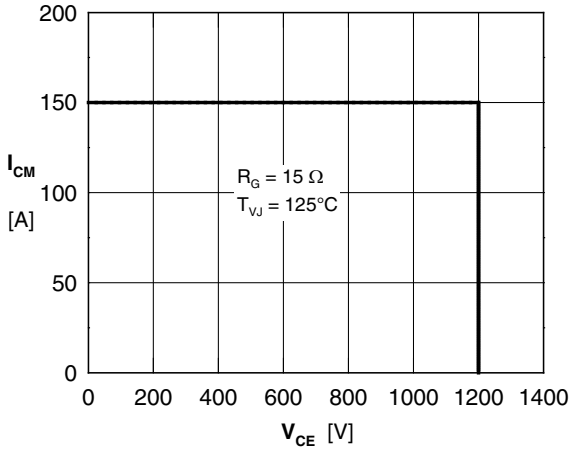


Fig. 11 Reverse biased safe operating area RBSOA

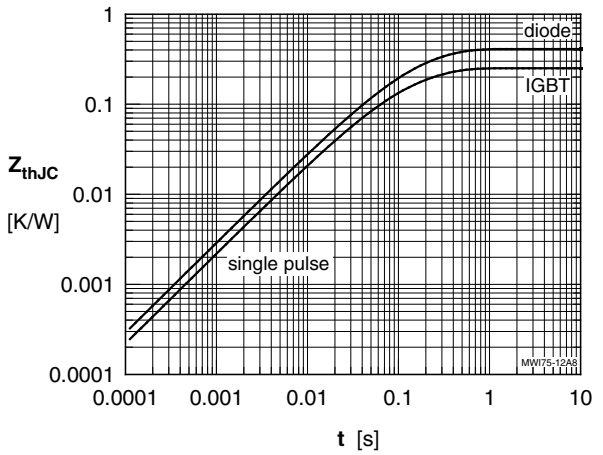


Fig. 12 Typ. transient thermal impedance