

### FEATURES

- Low Forward Voltage Drop
- Isolated Copper Baseplate

### APPLICATIONS

- Inverters
- Motor Controllers

The Powerline range of modules includes half bridge, chopper, bi-directional, dual and single switch configurations covering voltages from 600V to 3300V and currents up to 3600A.

The DIM375WHS06-S000 is a half bridge 600V n channel enhancement mode insulated gate bipolar transistor (IGBT) module. The module is suitable for a variety of medium voltage applications in motor drives and power conversion.

The IGBT has a wide reverse bias safe operating area (RBSOA) for ultimate reliability in demanding applications.

These modules incorporate electrically isolated base plates and low inductance construction enabling circuit designers to optimise circuit layouts and utilise earthed heat sinks for safety.

Typical applications include dc motor drives, ac pwm drives and ups systems..

### ORDERING INFORMATION

Order as: **DIM375WHS06-S000**

Note: When ordering, use complete part number.

### KEY PARAMETERS

$V_{CES}$		<b>600V</b>
$V_{CE(sat)}$	<b>(typ)</b>	<b>2.1V</b>
$I_C$	<b>(max)</b>	<b>375A</b>
$I_{C(PK)}$	<b>(max)</b>	<b>750A</b>

\*(measured at the power busbars and not the auxiliary terminals)

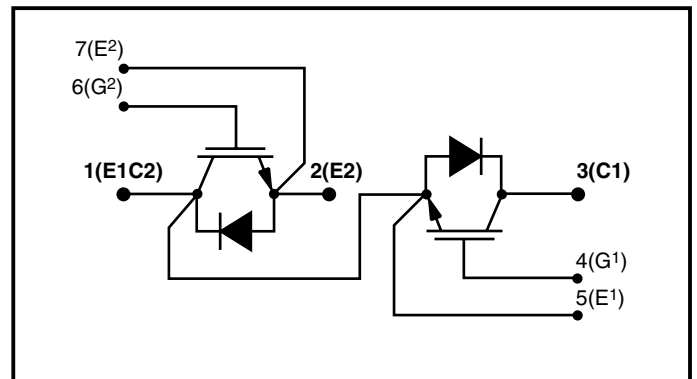


Fig. 1 Half bridge circuit diagram



Outline type code: W

(See package details for further information)

Fig. 2 Electrical connections - (not to scale)

Caution: This device is sensitive to electrostatic discharge. Users should follow ESD handling procedures.



**ELECTRICAL CHARACTERISTICS**
 **$T_{case} = 25^{\circ}\text{C}$  unless stated otherwise.**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$I_{CES}$	Collector cut-off current	$V_{GE} = 0\text{V}, V_{CE} = V_{CES}$	-	-	2	mA
		$V_{GE} = 0\text{V}, V_{CE} = V_{CES}, T_{case} = 125^{\circ}\text{C}$	-	-	10	mA
$I_{GES}$	Gate leakage current	$V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}$	-	-	2	$\mu\text{A}$
$V_{GE(TH)}$	Gate threshold voltage	$I_C = 15\text{mA}, V_{GE} = V_{CE}$	4.5	5.5	7.5	V
$V_{CE(sat)}^{\dagger}$	Collector-emitter saturation voltage	$V_{GE} = 15\text{V}, I_C = 350\text{A}$	-	2.1	2.6	V
		$V_{GE} = 15\text{V}, I_C = 350\text{A}, T_{case} = 125^{\circ}\text{C}$	-	2.3	2.8	V
$I_F$	Diode forward current	DC	-	-	375	A
$I_{FM}$	Diode maximum forward current	$t_p = 1\text{ms}$	-	-	750	A
$V_F^{\dagger}$	Diode forward voltage	$I_F = 350\text{A}$	-	1.5	1.8	V
		$I_F = 350\text{A}, T_{case} = 125^{\circ}\text{C}$	-	1.5	1.8	V
$C_{ies}$	Input capacitance	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	-	40	-	nF
$L_M$	Module inductance	-	-	20	-	nH
$R_{INT}$	Internal transistor resistance - per arm	-	-	0.23	-	m $\Omega$

**Note:**
 $\dagger$  Measured at the power busbars and not the auxiliary terminals.

 $L^*$  is the circuit inductance +  $L_M$

## ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$t_{\text{d(off)}}$	Turn-off delay time	$I_{\text{C}} = 375\text{A}$ $V_{\text{GE}} = \pm 15\text{V}$ $V_{\text{CE}} = 300\text{V}$ $R_{\text{G(ON)}} = R_{\text{G(OFF)}} = 4.7\Omega$ $L \sim 100\text{nH}$	-	600	-	ns
$t_{\text{f}}$	Fall time		-	250	-	ns
$E_{\text{OFF}}$	Turn-off energy loss		-	26	-	mJ
$t_{\text{d(on)}}$	Turn-on delay time		-	200	-	ns
$t_{\text{r}}$	Rise time		-	150	-	ns
$E_{\text{ON}}$	Turn-on energy loss		-	16	-	mJ
$Q_{\text{g}}$	Gate charge		-	3	-	$\mu\text{C}$
$Q_{\text{rr}}$	Diode reverse recovery charge	$I_{\text{F}} = 375\text{A}, V_{\text{R}} = 300\text{V},$ $di_{\text{F}}/dt = 3000\text{A}/\mu\text{s}$	-	20	-	$\mu\text{C}$
$I_{\text{rr}}$	Diode reverse current		-	200	-	A
$E_{\text{REC}}$	Diode reverse recovery energy		-	5	-	mJ

 $T_{\text{case}} = 125^{\circ}\text{C}$  unless stated otherwise

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$t_{\text{d(off)}}$	Turn-off delay time	$I_{\text{C}} = 375\text{A}$ $V_{\text{GE}} = \pm 15\text{V}$ $V_{\text{CE}} = 300\text{V}$ $R_{\text{G(ON)}} = R_{\text{G(OFF)}} = 4.7\Omega$ $L \sim 100\text{nH}$	-	650	-	ns
$t_{\text{f}}$	Fall time		-	500	-	ns
$E_{\text{OFF}}$	Turn-off energy loss		-	40	-	mJ
$t_{\text{d(on)}}$	Turn-on delay time		-	200	-	ns
$t_{\text{r}}$	Rise time		-	100	-	ns
$E_{\text{ON}}$	Turn-on energy loss		-	15	-	mJ
$Q_{\text{rr}}$	Diode reverse recovery charge		$I_{\text{F}} = 375\text{A}, V_{\text{R}} = 300\text{V},$ $di_{\text{F}}/dt = 3000\text{A}/\mu\text{s}$	-	30	-
$I_{\text{rr}}$	Diode reverse current	-		230	-	A
$E_{\text{REC}}$	Diode reverse recovery energy	-		8	-	mJ

TYPICAL CHARACTERISTICS

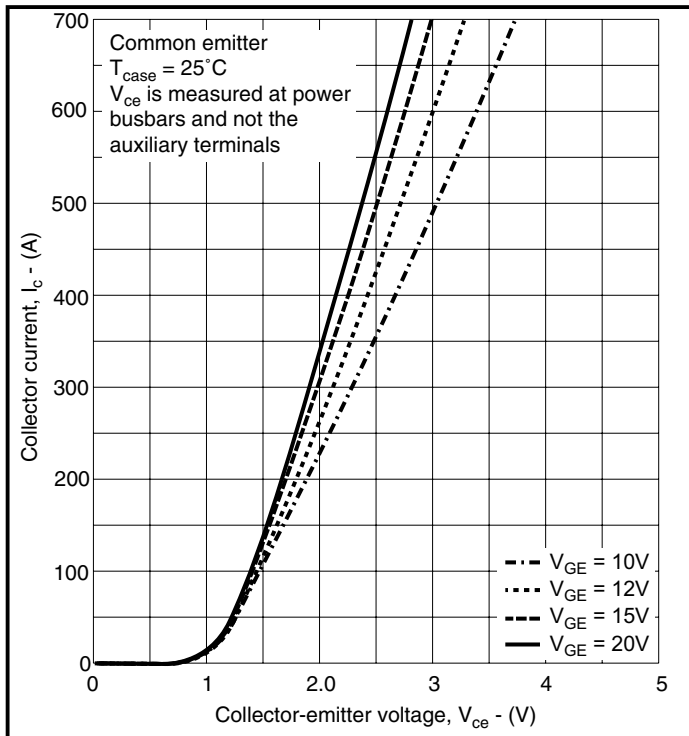


Fig.3 Typical output characteristics

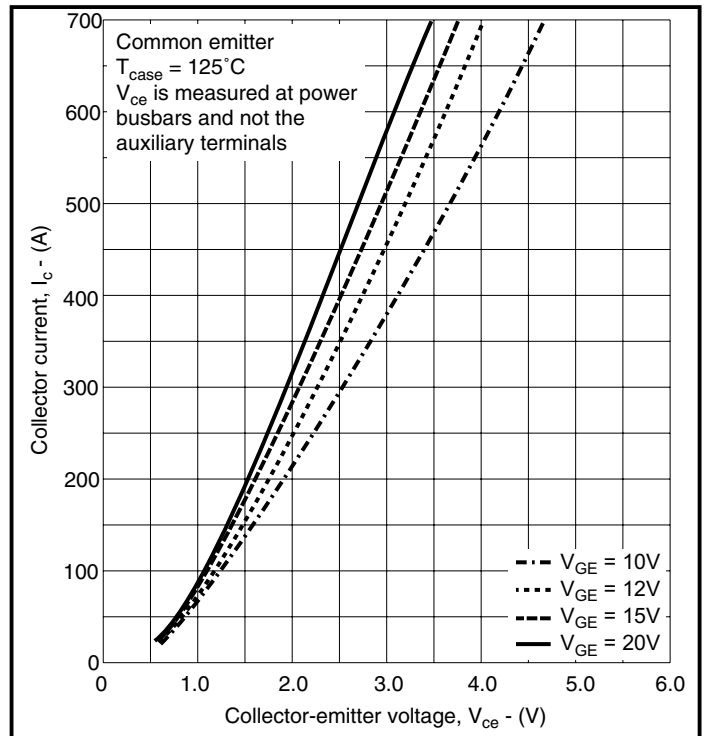


Fig.4 Typical output characteristics

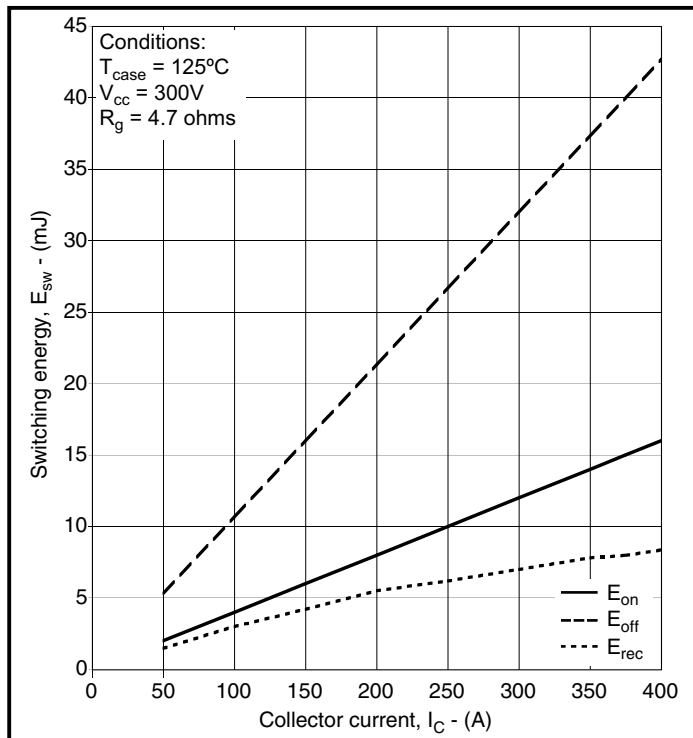


Fig.4 Typical switching energy vs collector current

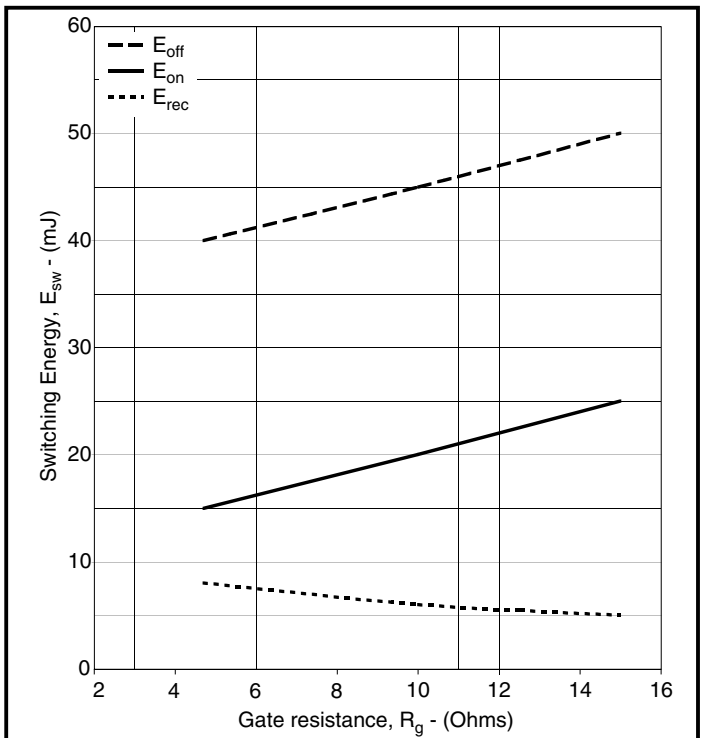


Fig.5 Typical switching energy vs gate resistance

Caution: This device is sensitive to electrostatic discharge. Users should follow ESD handling procedures.

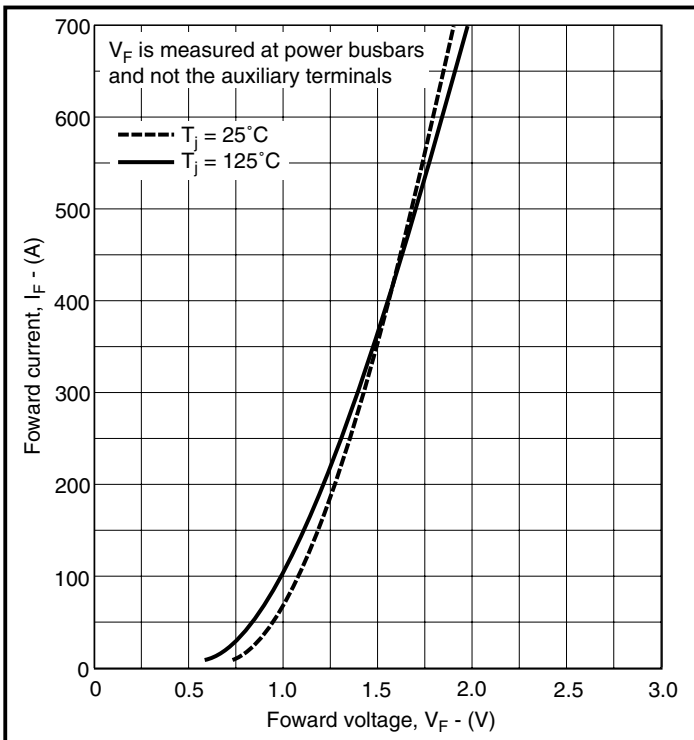


Fig.6 Diode typical forward characteristics

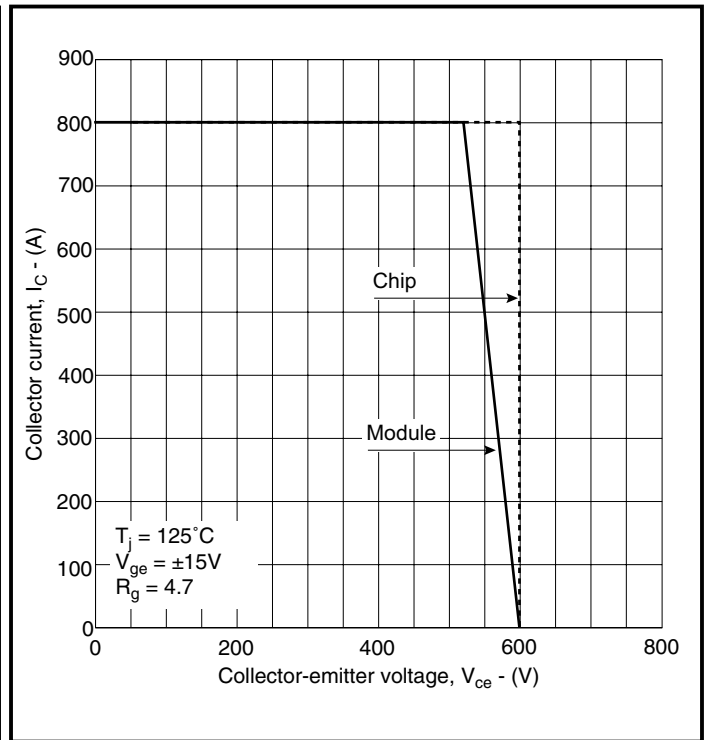


Fig.7 Reverse bias safe operating area

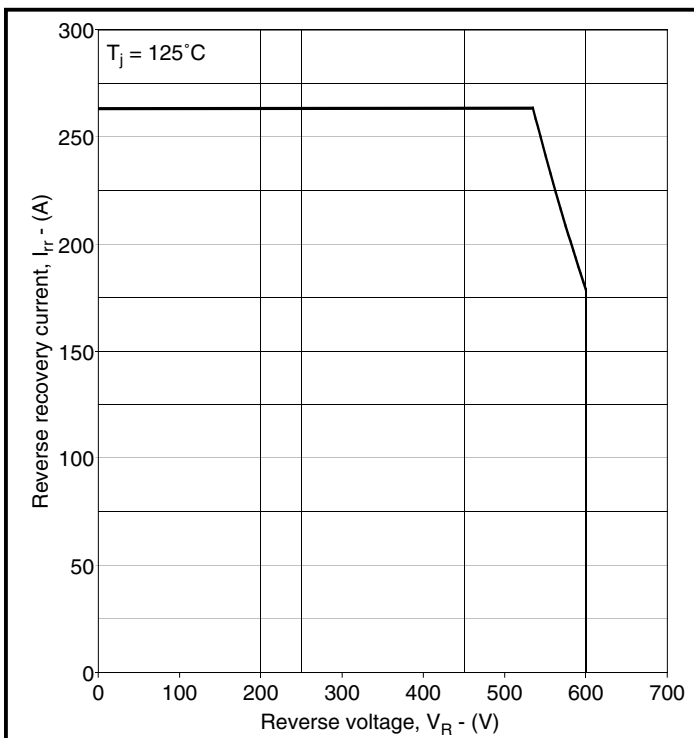


Fig.7 Diode reverse bias safe operating area

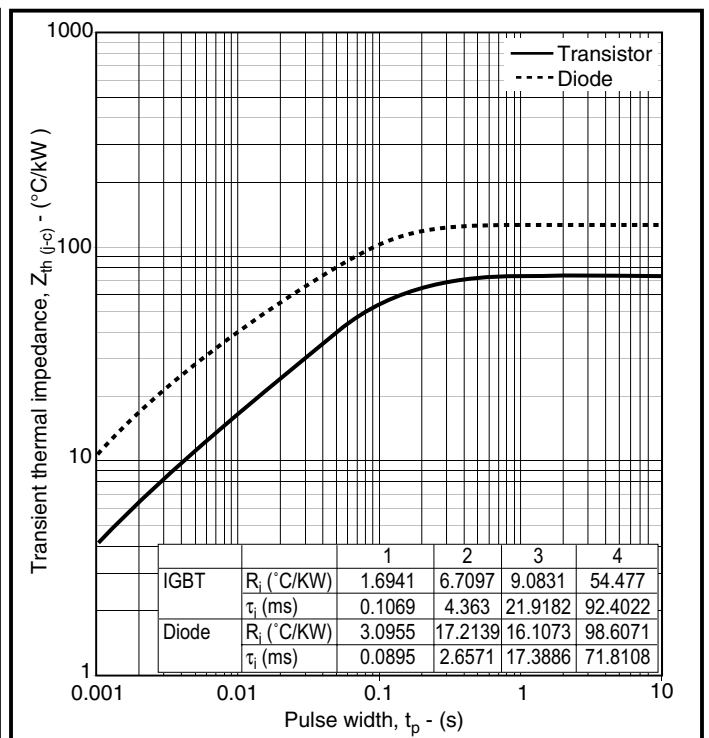
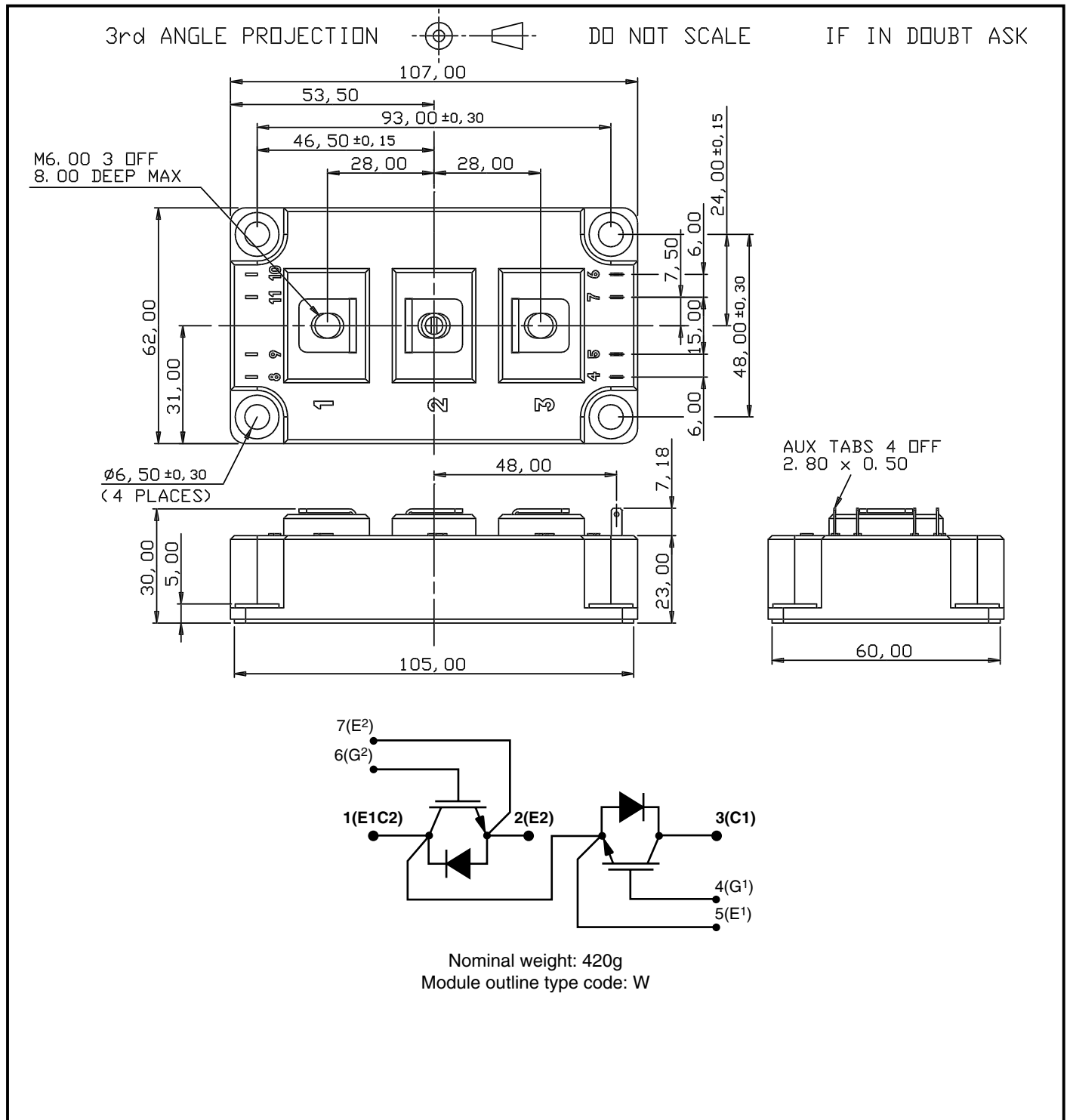


Fig.8 Transient thermal impedance

**PACKAGE DETAILS**

For further package information, please visit our website or contact Customer Services. All dimensions in mm, unless stated otherwise. DO NOT SCALE.


**Fig. 15 Package details**

Caution: This device is sensitive to electrostatic discharge. Users should follow ESD handling procedures.

## POWER ASSEMBLY CAPABILITY

The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

We offer an extensive range of air and liquid cooled assemblies covering the full range of circuit designs in general use today. The Assembly group offers high quality engineering support dedicated to designing new units to satisfy the growing needs of our customers.

Using the latest CAD methods our team of design and applications engineers aim to provide the Power Assembly Complete Solution (PACs).

## HEATSINKS

The Power Assembly group has its own proprietary range of extruded aluminium heatsinks which have been designed to optimise the performance of Dynex semiconductors. Data with respect to air natural, forced air and liquid cooling (with flow rates) is available on request.

For further information on device clamps, heatsinks and assemblies, please contact your nearest sales representative or Customer Services.



<http://www.dynexsemi.com>

**e-mail: [power\\_solutions@dynexsemi.com](mailto:power_solutions@dynexsemi.com)**

HEADQUARTERS OPERATIONS  
**DYNEX SEMICONDUCTOR LTD**  
Doddington Road, Lincoln.  
Lincolnshire. LN6 3LF. United Kingdom.  
Tel: +44-(0)1522-500500  
Fax: +44-(0)1522-500550

CUSTOMER SERVICE  
Tel: +44 (0)1522 502753 / 502901. Fax: +44 (0)1522 500020

SALES OFFICES  
**Benelux, Italy & Switzerland:** Tel: +33 (0)1 64 66 42 17. Fax: +33 (0)1 64 66 42 19.  
**France:** Tel: +33 (0)2 47 55 75 53. Fax: +33 (0)2 47 55 75 59.  
**Germany, Northern Europe, Spain & Rest Of World:** Tel: +44 (0)1522 502753 / 502901.  
Fax: +44 (0)1522 500020  
**North America:** Tel: (440) 259-2060. Fax: (440) 259-2059. Tel: (949) 733-3005. Fax: (949) 733-2986.

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