

# IGBT Module

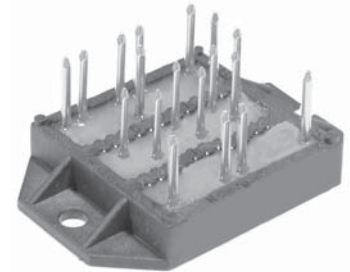
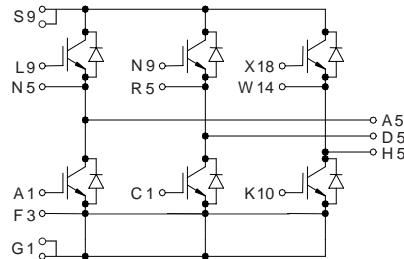
Sixpack in ECO-PAC 2

## VWI 15-12P1

$$I_{C25} = 18 \text{ A}$$

$$V_{CES} = 1200 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 2.3 \text{ V}$$



### IGBTs

Symbol	Conditions	Maximum Ratings	
$V_{CES}$	$T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	1200	V
$V_{GES}$		$\pm 20$	V
$I_{C25}$	$T_C = 25^{\circ}\text{C}$	18	A
$I_{C80}$	$T_C = 80^{\circ}\text{C}$	14	A
$I_{CM}$ $V_{CEK}$	$V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	20	A
		$V_{CES}$	
$t_{SC}$ (SCSOA)	$V_{CE} = 720 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega; T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10	$\mu\text{s}$
$P_{tot}$	$T_C = 25^{\circ}\text{C}$	90	W

### Features

- NPT IGBT's
  - positive temperature coefficient of saturation voltage
  - fast switching
- FRED diodes
  - fast reverse recovery
  - low forward voltage
- Industry Standard Package
  - solderable pins for PCB mounting
  - isolated DCB ceramic base plate

### Typical Applications

- AC drives
- power supplies with power factor correction

Symbol	Conditions	Characteristic Values ( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 10 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.3 2.7	V V	
$V_{GE(th)}$	$I_C = 0.4 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V	
$I_{CES}$	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.8	0.5 mA mA	
$I_{GES}$	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			200 nA	
$t_{d(on)}$ $t_r$ $t_{d(off)}$ $t_f$ $E_{on}$ $E_{off}$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 10 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega$		50 40 290 60	ns ns ns ns	
				1.2 1.1	mJ mJ
$C_{ies}$		$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$		600	pF
$Q_{Gon}$		$V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 10 \text{ A}$		45	nC
$R_{thJC}$		(per IGBT)			1.4 KW
$R_{thJH}$		(per IGBT) with heatsink compound		2.7	KW

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IXYS Semiconductor GmbH  
Edisonstr. 15, D-68623 Lampertheim  
Phone: +49-6206-503-0, Fax: +49-6206-503627

www.ixys.net

IXYS Corporation  
3540 Bassett Street, Santa Clara CA 95054  
Phone: (408) 982-0700, Fax: 408-496-0670

**Diodes**

Symbol	Conditions	Maximum Ratings	
$I_{F25}$	$T_C = 25^\circ\text{C}$	15	A
$I_{F80}$	$T_C = 80^\circ\text{C}$	10	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$V_F$	$I_F = 10\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	2.6	3.0	V
$I_{RM}$ $t_{rr}$	$I_F = 10\text{ A}; di_F/dt = -400\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = 0\text{ V}$		13	A
			110	ns
$R_{thJC}$	(per diode)			3.5 K/W
$R_{thJH}$	(per diode) with heatsink compound	5.0		K/W

**Component**

Symbol	Conditions	Maximum Ratings	
$T_{VJ}$		-40...+150	$^\circ\text{C}$
$T_{stg}$		-40...+125	$^\circ\text{C}$
$V_{ISOL}$	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}; t = 1\text{ s}$	3600	V~
$M_d$	mounting torque (M4)	1.5 - 2.0	Nm
		14 - 18	lb.in.
$a$	Max. allowable acceleration	50	$\text{m/s}^2$

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$d_s$	Creepage distance on surface (Pin to heatsink)	11.2		mm
$d_A$	Strike distance in air (Pin to heatsink)	11.2		mm
<b>Weight</b>		24		g

**Dimensions in mm (1 mm = 0.0394")**
