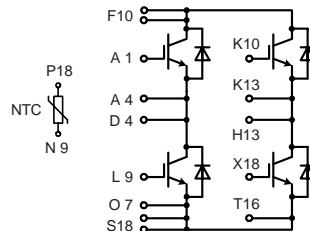


IGBT Modules in ECO-PAC 2 H-Bridge configuration

Short Circuit SOA Capability
Square RBSOA

$I_{C25} = 49 \text{ A}$
 $V_{CES} = 1200 \text{ V}$
 $V_{CE(sat) \text{ typ.}} = 3.1 \text{ V}$



Pin arrangement see outlines

IGBTs		
Symbol	Conditions	Maximum Ratings
V_{CES}	$T_{VJ} = 25^\circ\text{C to } 150^\circ\text{C}$	1200 V
V_{GES}		± 20 V
I_{C25}	$T_C = 25^\circ\text{C}$	49 A
I_{C80}	$T_C = 80^\circ\text{C}$	33 A
I_{CM} V_{CEK}	$V_{GE} = \pm 15 \text{ V}; R_G = 47 \Omega; T_{VJ} = 125^\circ\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	50 A
		V_{CES}
t_{SC} (SCSOA)	$V_{CE} = V_{CES}; V_{GE} = \pm 15 \text{ V}; R_G = 47 \Omega; T_{VJ} = 125^\circ\text{C}$ non-repetitive	10 μs
P_{tot}	$T_C = 25^\circ\text{C}$	208 W

Features

- NPT IGBT technology
- low saturation voltage
- low switching losses
- 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
- package with copper base plate

Advantages

- space savings
- reduced protection circuits
- package designed for wave soldering

Typical Applications

- motor control
 - DC motor armature winding
 - DC motor excitation winding
 - synchronous motor excitation winding
- supply of transformer primary winding
 - power supplies
 - welding
 - X-ray
 - UPS
 - battery charger

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 50 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		3.1 3.5	3.7 V V	
$V_{GE(th)}$	$I_C = 1 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V	
I_{CES}	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$			1.1 mA 4.2 mA	
I_{GES}	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			180 nA	
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	Inductive load, $T_{VJ} = 125^\circ\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 30 \text{ A}$ $V_{GE} = 15/0 \text{ V}; R_G = 47 \Omega$		100 70 500 70 4.6 3.4	ns ns ns ns mJ mJ	
C_{ies}		$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$		1.65	nF
R_{thJC} R_{thJH}		(per IGBT) with heatsink compound (0.42 K/m.K; 50 μm)		1.2	0.6 K/W K/W

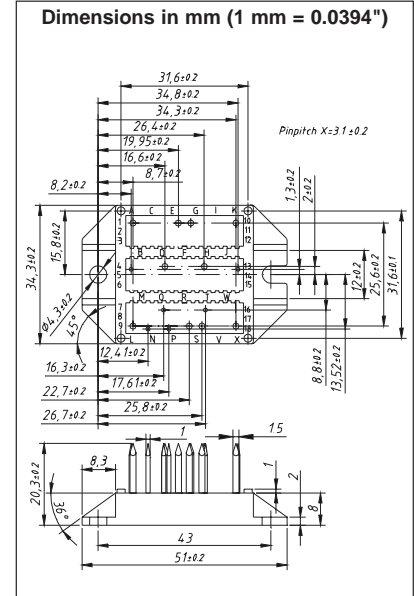
IXYS reserves the right to change limits, test conditions and dimensions.

Reverse diodes (FRED)			
Symbol	Conditions	Maximum Ratings	
I_{F25}	$T_C = 25^\circ\text{C}$	49	A
I_{F80}	$T_C = 80^\circ\text{C}$	31	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 30\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		2.4 1.77	V V
I_{RM} t_{rr}	$I_F = 30\text{ A}; di_F/dt = 500\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = 0\text{ V}$		27 150	A ns
R_{thJC} R_{thJH}	with heatsink compound (0.42 K/m.K; 50 μm)		2.6	1.3 K/W K/W

Temperature Sensor NTC				
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R_{25}	$T = 25^\circ\text{C}$	455	470	485 k Ω
$B_{25/50}$			3474	K

Module				
Symbol	Conditions	Maximum Ratings		
T_{VJ}		-40...+150	$^\circ\text{C}$	
T_{stg}		-40...+150	$^\circ\text{C}$	
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	3000	V~	
M_d	mounting torque (M4)	1.5 - 2.0 14 - 18	Nm lb.in.	
a	Max. allowable acceleration	50	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
Weight		24		g



Data according to IEC 60747 and refer to a single transistor or diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions.

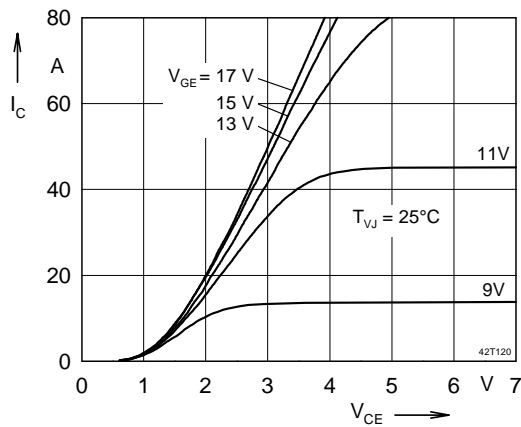


Fig. 1 Typ. output characteristics

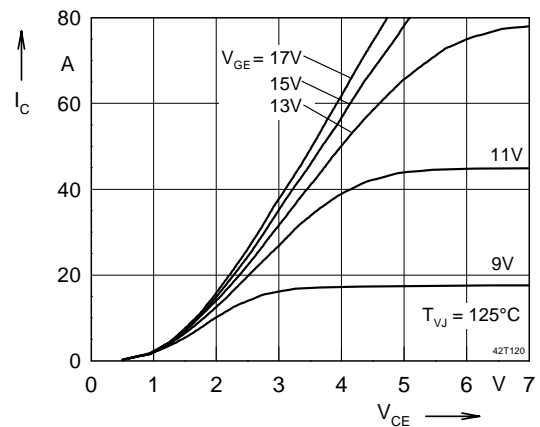


Fig. 2 Typ. output characteristics

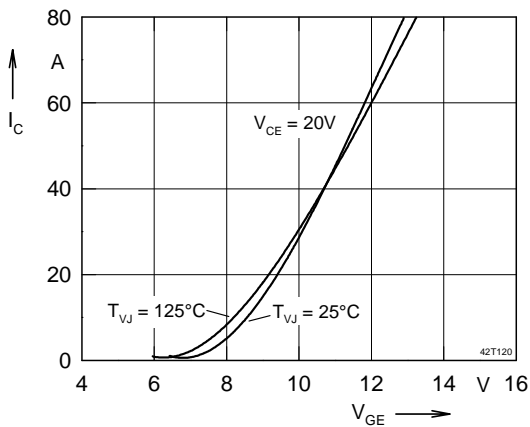


Fig. 3 Typ. transfer characteristics

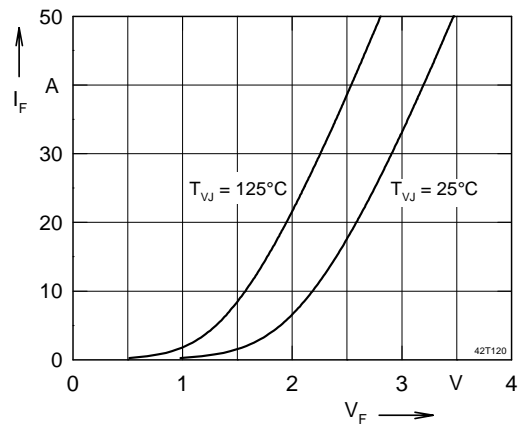


Fig. 4 Typ. forward characteristics of free wheeling diode

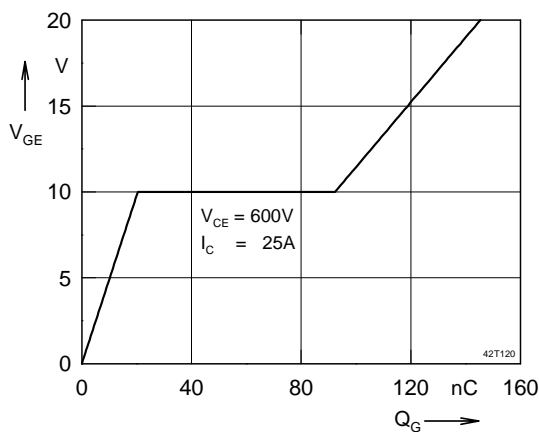


Fig. 5 Typ. turn on gate charge

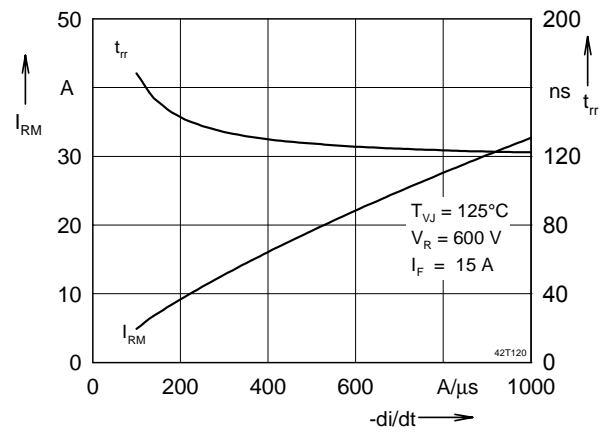


Fig. 6 Typ. turn off characteristics of free wheeling diode

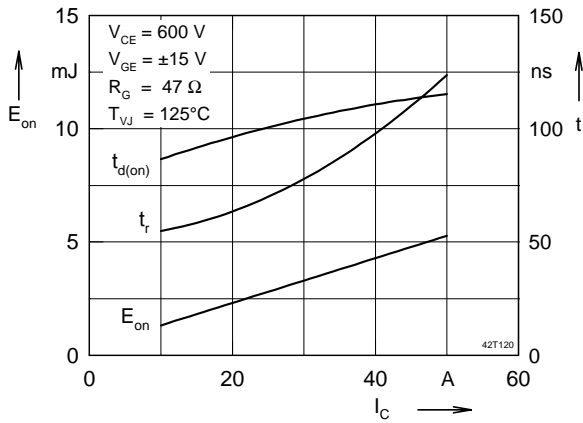


Fig. 7 Typ. turn on energy and switching times versus collector current times versus collector current

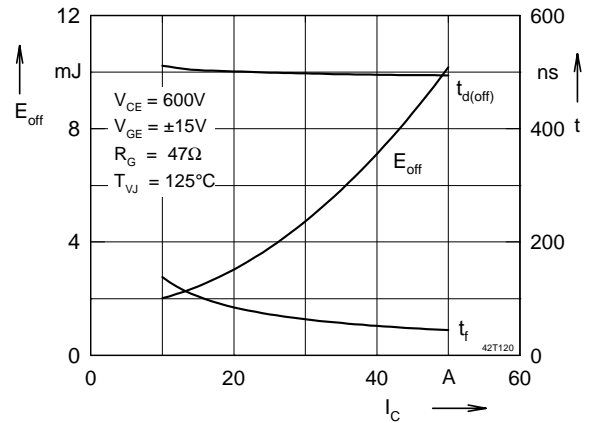


Fig. 8 Typ. turn off energy and switching times versus collector current times versus collector current

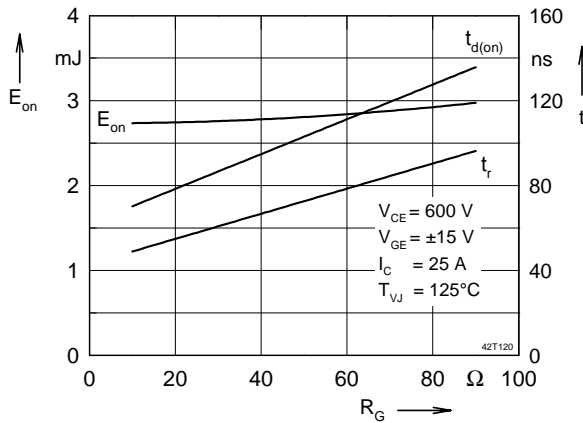


Fig. 9 Typ. turn on energy and switching times versus gate resistor times versus gate resistor

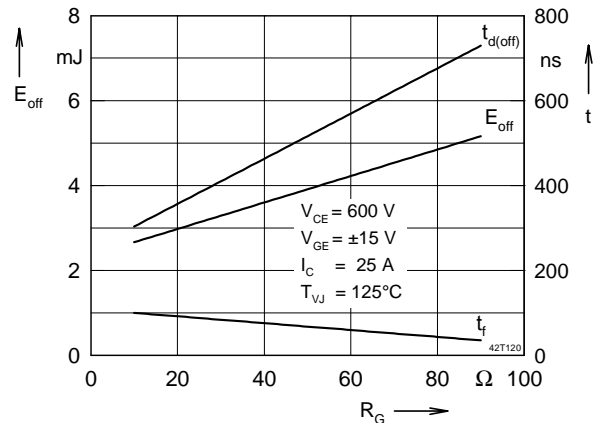


Fig. 10 Typ. turn off energy and switching times versus gate resistor times versus gate resistor

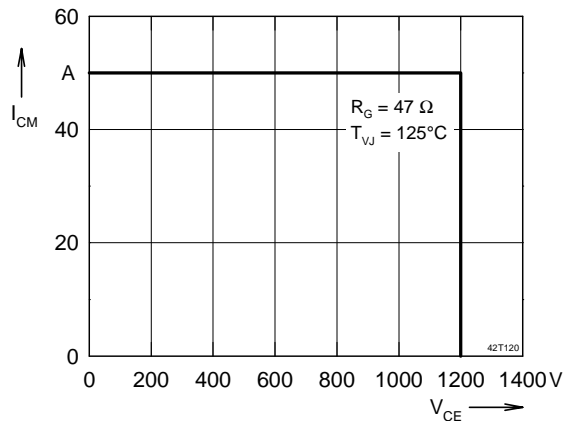


Fig. 11 Reverse biased safe operating area

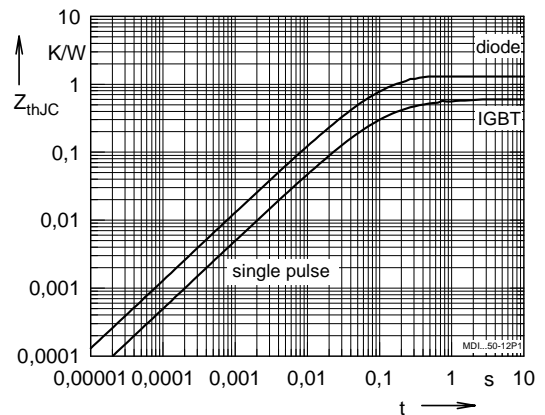


Fig. 12 Typ. transient thermal impedance RBSOA