

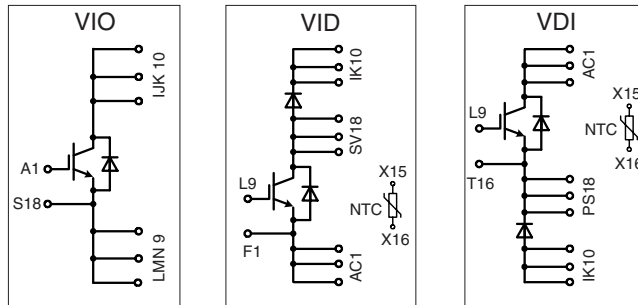
IGBT Modules in ECO-PAC 2

Short Circuit SOA Capability
Square RBSOA

$$I_{C25} = 138 \text{ A}$$

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

$$V_{CE(sat) \text{ typ.}} = 2.8 \text{ V}$$



Pin arrangement see outlines

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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}	$T_C = 25^{\circ}\text{C}$	138	A
I_{C80}	$T_C = 80^{\circ}\text{C}$	94	A
I_{CM} V_{CEK}	$V_{GE} = \pm 15 \text{ V}; R_G = 15 \Omega; T_{VJ} = 125^{\circ}\text{C}$ RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$	150	A
		V_{CES}	
t_{SC} (SCSOA)	$V_{CE} = V_{CES}; V_{GE} = \pm 15 \text{ V}; R_G = 15 \Omega; T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	568	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

Advantages

- space and weight savings
- reduced protection circuits
- leads with expansion bend for stress relief

Typical Applications

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 125 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.8 3.2	V V	
$V_{GE(th)}$	$I_C = 3 \text{ mA}; V_{GE} = V_{CE}$	4.5		V	
I_{CES}	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$			5 mA 16 mA	
I_{GES}	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			320 nA	
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 75 \text{ A}$ $V_{GE} = 15/0 \text{ V}; R_G = 15 \Omega$		100 50 650 50 12.1 10.5	ns ns ns ns mJ mJ	
C_{ies}		$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$		5.5	nF
R_{thJC} R_{thJH}		(per IGBT) with heatsink compound (0.42 K/m.K; 50 μm)		0.44	0.22 K/W K/W

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

Reverse diodes (FRED)

Symbol	Conditions	Maximum Ratings		
I_{F25}	$T_C = 25^\circ\text{C}$	154	A	
I_{F80}	$T_C = 80^\circ\text{C}$	97	A	
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 75\text{ A}; T_{VJ} = 25^\circ\text{C}$	2.2	2.5 V	
		1.6	V	
I_{RM} t_{rr}	$I_F = 75\text{ A}; di/dt = 750\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = 0\text{ V}$	79	A	
		220	ns	
R_{thJC} R_{thJH}	with heatsink compound (0.42 K/m.K; 50 μm)	0.9	0.45 K/W K/W	

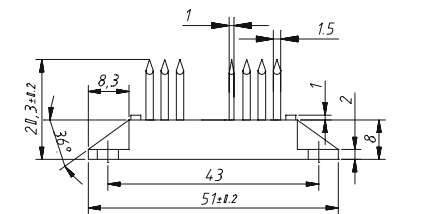
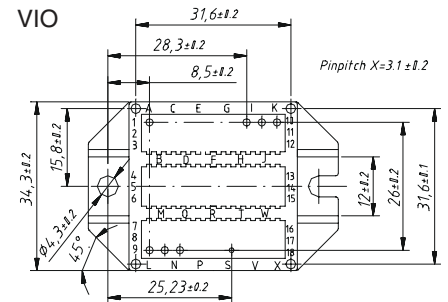
Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R_{25}	$T = 25^\circ\text{C}$	4.75	5.0	5.25 k Ω
$B_{25/50}$			3375	K

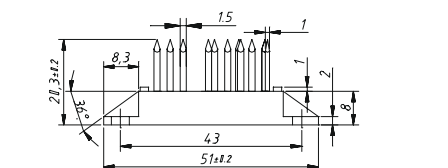
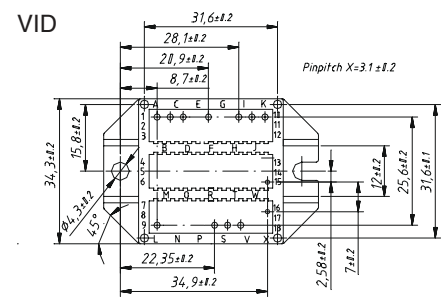
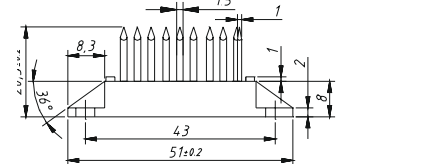
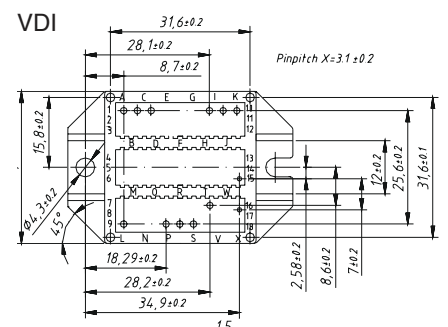
Module

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	Nm	
		14 - 18	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



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Data according to IEC 60747 and refer to a single transistor or diode unless otherwise stated.
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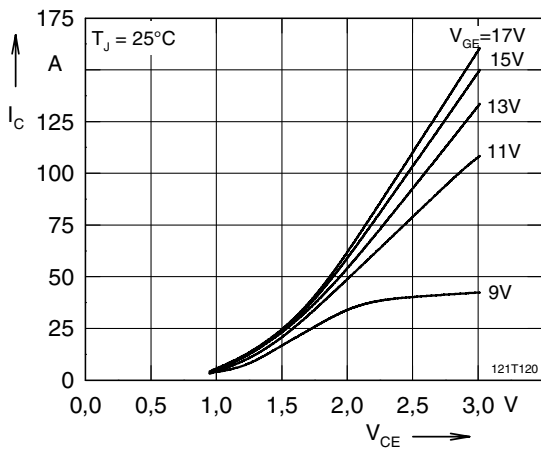


Fig. 1 Typ. output characteristics

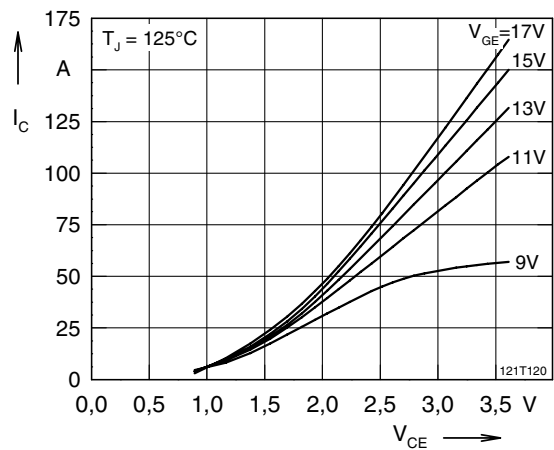


Fig. 2 Typ. output characteristics

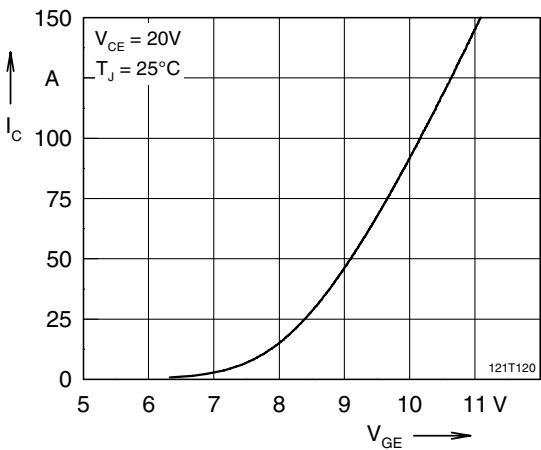


Fig. 3 Typ. transfer characteristics

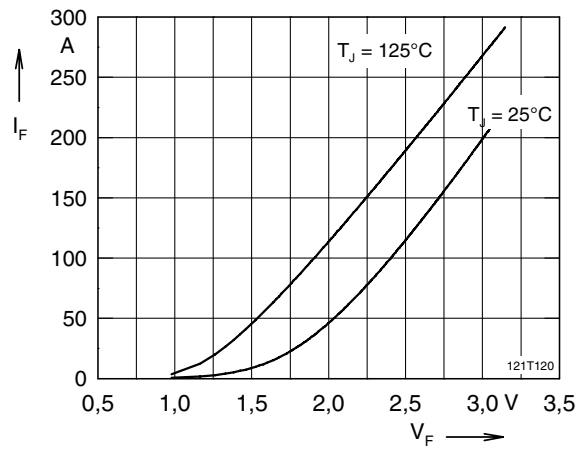


Fig. 4 Typ. forward characteristics of free wheeling diode

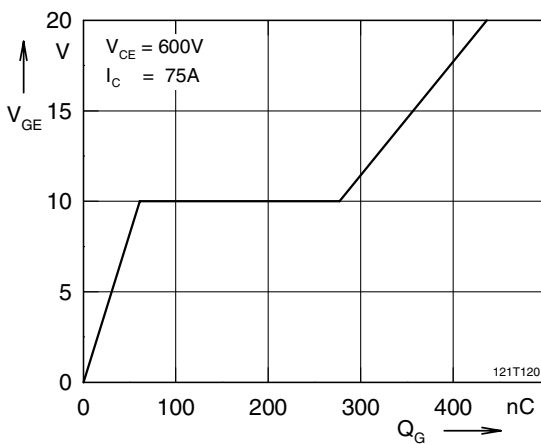


Fig. 5 Typ. turn on gate charge

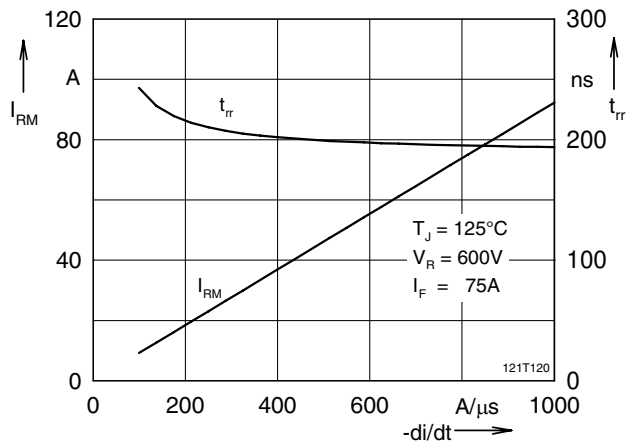


Fig. 6 Typ. turn off characteristics of free wheeling diode

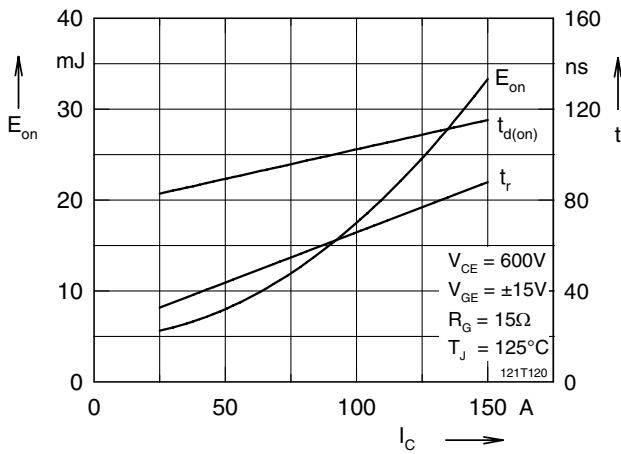


Fig. 7 Typ. turn on energy and switching times versus collector current

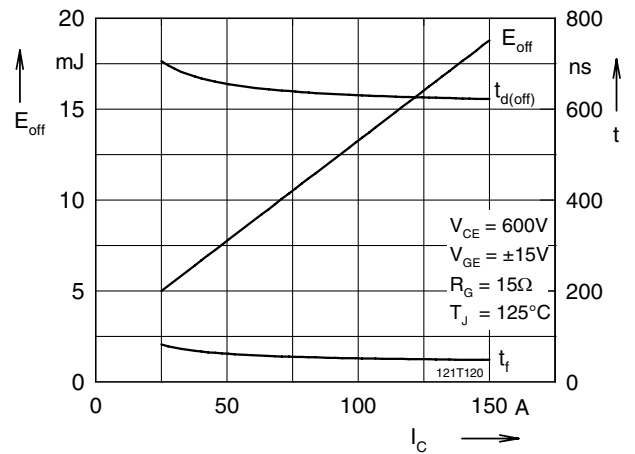


Fig. 8 Typ. turn off energy and switching times versus collector current

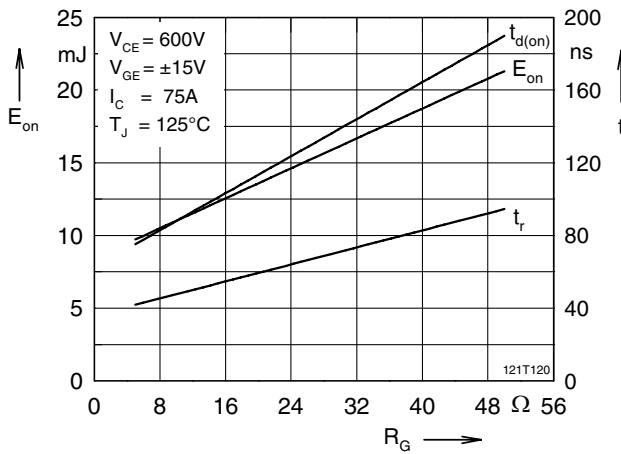


Fig. 9 Typ. turn on energy and switching times versus gate resistor

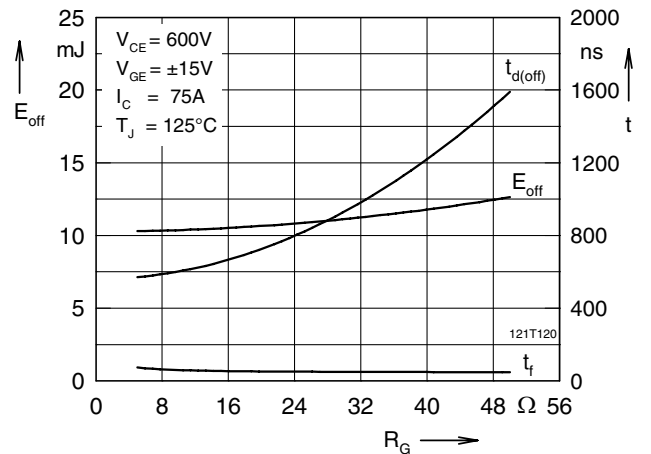


Fig. 10 Typ. turn off energy and switching times versus gate resistor

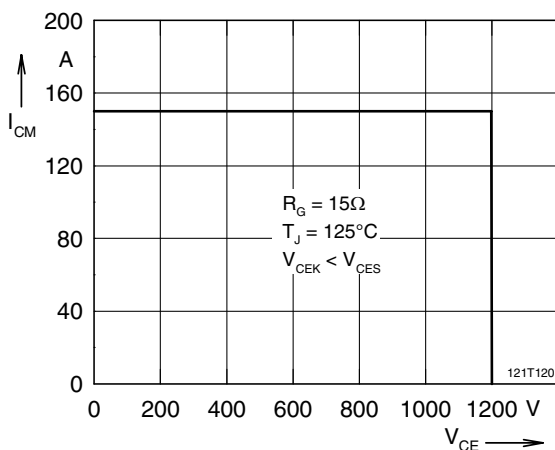


Fig. 11 Reverse biased safe operating area RBSOA

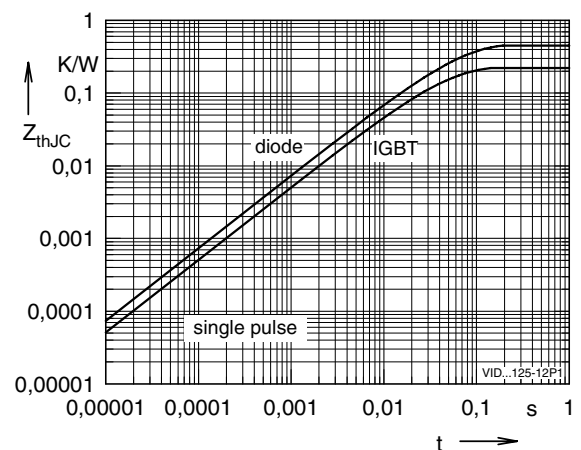


Fig. 12 Typ. transient thermal impedance

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