

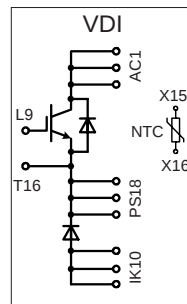
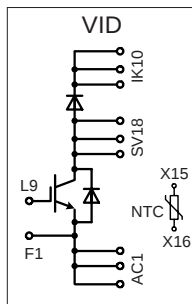
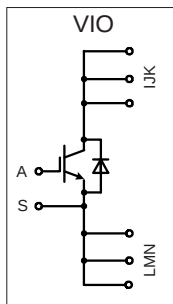
IGBT Modules in ECO-PAC 2

Short Circuit SOA Capability

Square RBSOA

Preliminary data sheet

$$\begin{aligned} I_{C25} &= 138 \text{ A} \\ V_{CES} &= 1200 \text{ V} \\ V_{CE(sat) \text{ typ.}} &= 2.8 \text{ V} \end{aligned}$$



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}	$T_C = 25^{\circ}\text{C}$	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 V_{CES}	A
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

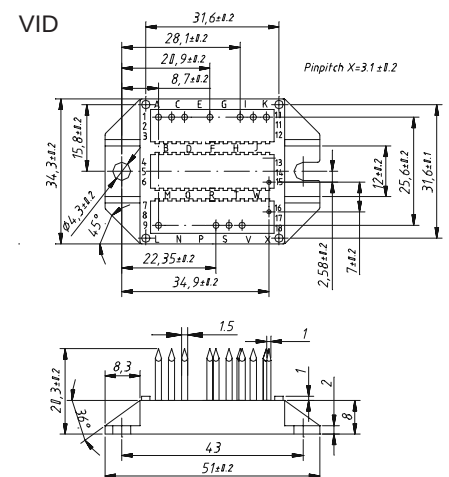
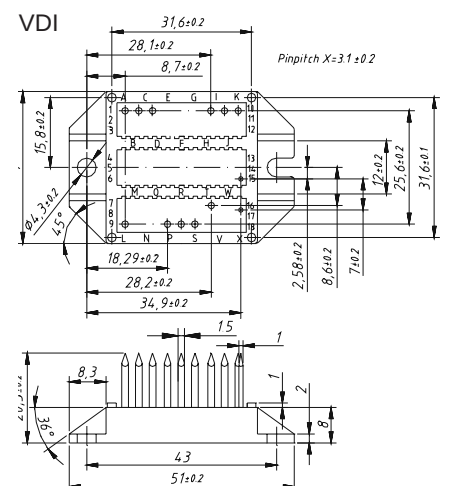
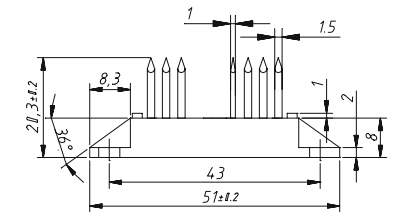
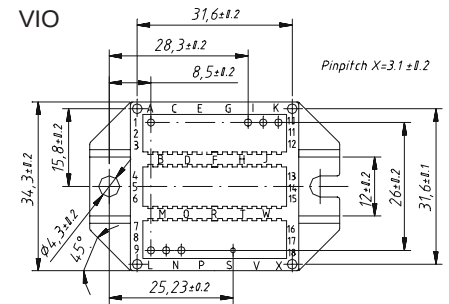
Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 125 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.8 3.2	3.4 V
$V_{GE(th)}$	$I_C = 3 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$			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 ($0.42 \text{ K/m.K}; 50 \mu\text{m}$)		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°C	154	A	
I _{F80}	T _C = 80°C	97	A	
Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V _F	I _F = 75 A; T _{VJ} = 25°C T _{VJ} = 125°C		2.2 1.6	2.5 V _F
I _{RM} t _{rr}	} I _F = 75 A; di _F /dt = 750 A/μs; T _{VJ} = 125°C V _R = 600 V; V _{GE} = 0 V		79 220	A _{RM} ns
R _{thJC} R _{thJH}		with heatsink compound (0.42 K/m.K; 50 μm)		0.9

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	°C	
T _{stg}		-40...+150	°C	
V _{ISOL}	I _{ISOL} ≤ 1 mA; 50/60 Hz	3000	V-	
M _d	mounting torque (M4)	1.5 - 2.0 14 - 18	Nm lb.in	
a	Max. allowable acceleration	50	m/s²	
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.
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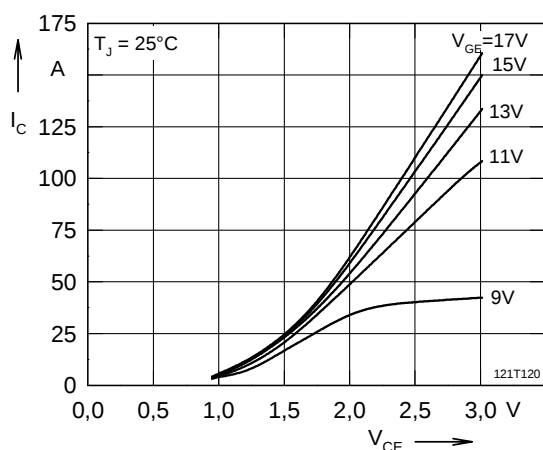


Fig. 1 Typ. output characteristics

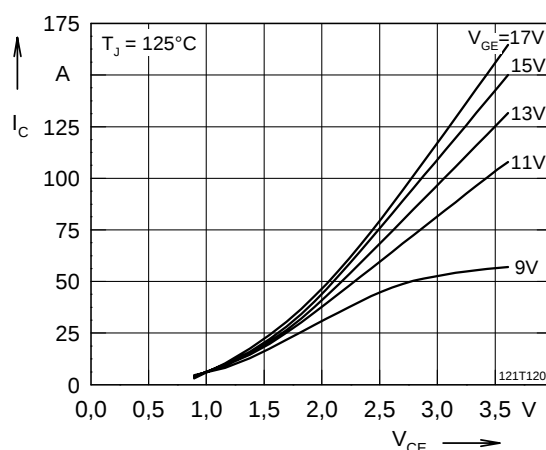


Fig. 2 Typ. output characteristics

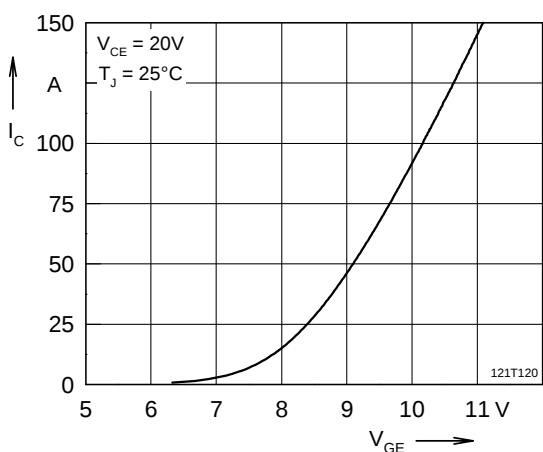


Fig. 3 Typ. transfer characteristics

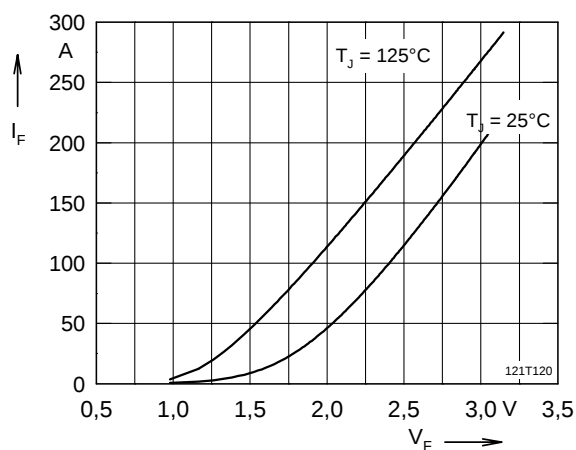


Fig. 4 Typ. forward characteristics of free wheeling diode

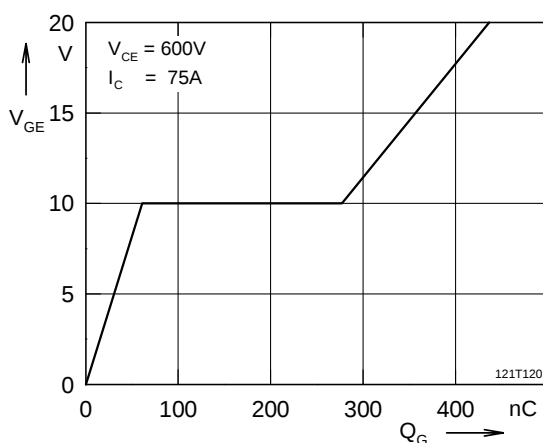


Fig. 5 Typ. turn on gate charge

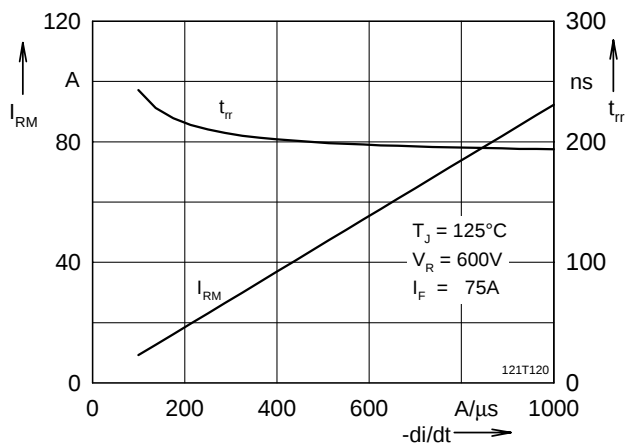


Fig. 6 Typ. turn off characteristics of free wheeling diode

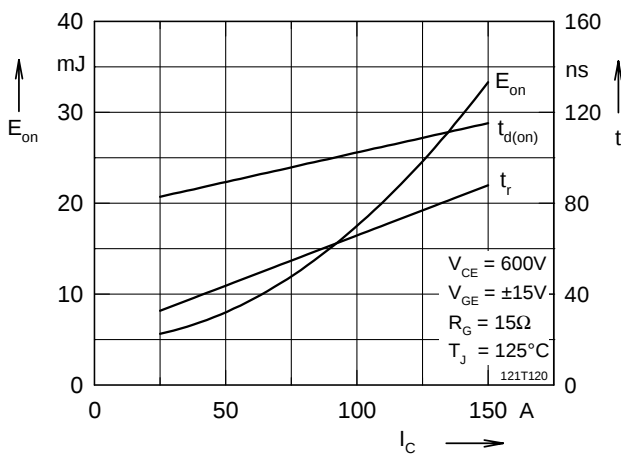


Fig. 7 Typ. turn on energy and switching times versus collector current

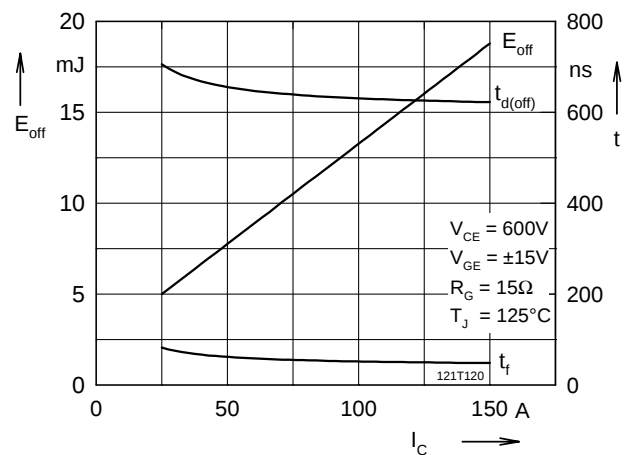


Fig. 8 Typ. turn off energy and switching times versus collector current

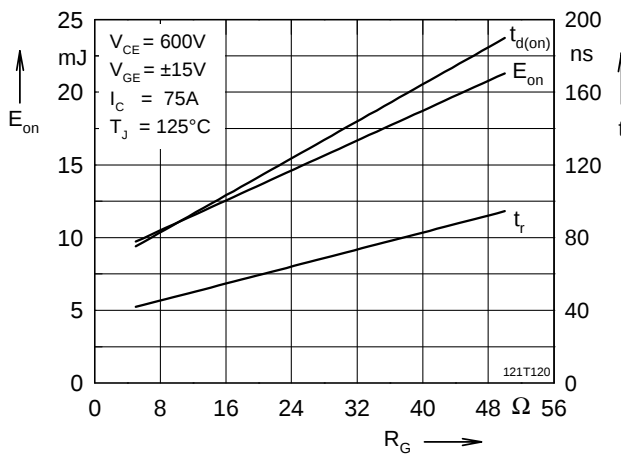


Fig. 9 Typ. turn on energy and switching times versus gate resistor

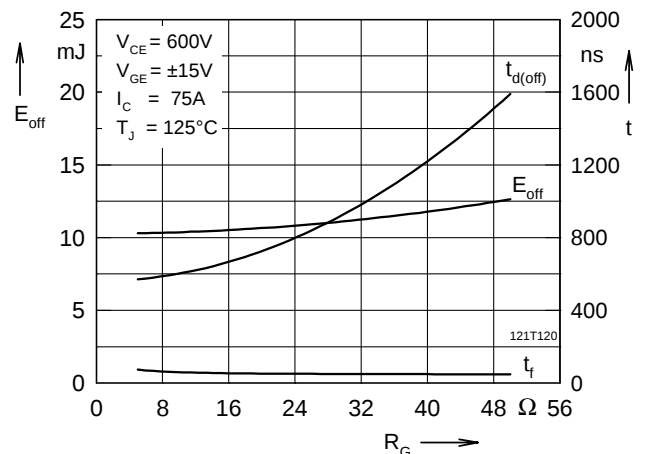


Fig. 10 Typ. turn off energy and switching times versus gate resistor

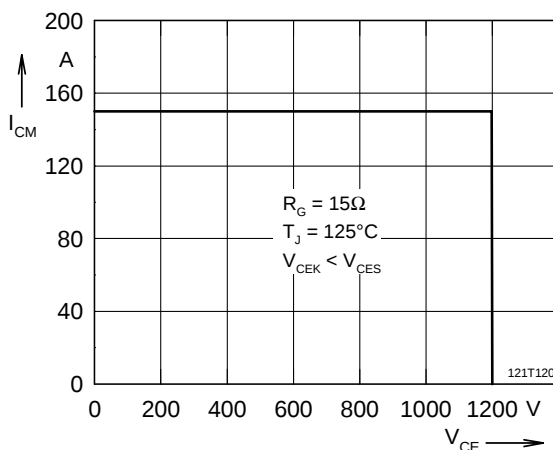


Fig. 11 Reverse biased safe operating area RBSOA

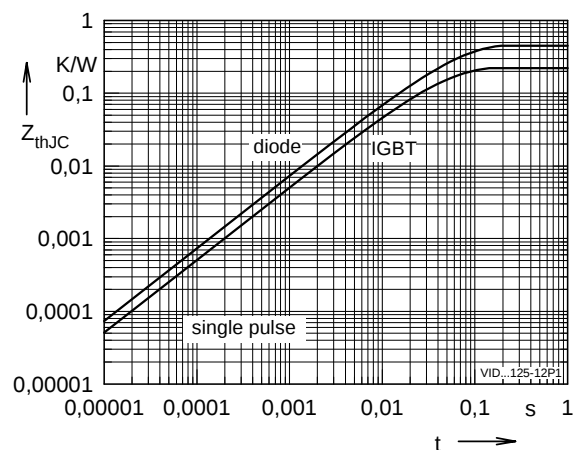


Fig. 12 Typ. transient thermal impedance

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