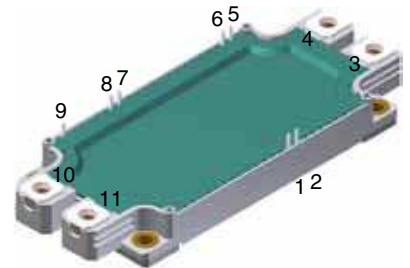
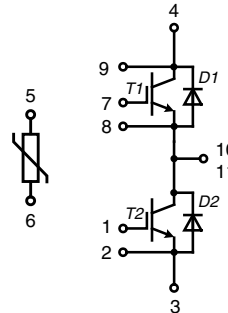


IGBT Modules

XPT IGBT

$$\begin{aligned} I_{C80} &= 450 \text{ A} \\ V_{CES} &= 1200 \text{ V} \\ V_{CE(sat) \text{ typ.}} &= 2.0 \text{ V} \end{aligned}$$



IGBTs			
Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_{VJ} = 25^{\circ}\text{C}$ to 125°C	1200	V
V_{GES}		± 20	V
I_{C80}	$T_C = 80^{\circ}\text{C}$	450	A
RBSOA	$R_G = 1.6 \Omega$; $T_{VJ} = 125^{\circ}\text{C}$ Clamped inductive load; $L = 100 \mu\text{H}$	$I_{CM} = 900$ $V_{CEK} \leq V_{CES}$	A
t_{SC} (SCSOA)	$V_{CE} = 900 \text{ V}$; $V_{GE} = \pm 15 \text{ V}$; $R_G = 1.6 \Omega$ $T_{VJ} = 125^{\circ}\text{C}$; non-repetitive; $V_{CEmax} \leq V_{CES}$	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	2.2	kW

Symbol	Conditions	Characteristic Values			
		(T _{VJ} = 25°C, unless otherwise specified)			
		min.	typ.	max.	
$V_{CE(sat)}$	$I_C = 450 \text{ A}$; $V_{GE} = 15 \text{ V}$				
					$T_{VJ} = 25^{\circ}\text{C}$
					$T_{VJ} = 125^{\circ}\text{C}$
$V_{GE(th)}$	$I_C = 18 \text{ mA}$; $V_{GE} = V_{CE}$	5.4		6.5	V
I_{CES}	$V_{CE} = V_{CES}$; $V_{GE} = 0 \text{ V}$		0.1	1	mA
			6		mA
I_{GES}	$V_{CE} = 0 \text{ V}$; $V_{GE} = \pm 20 \text{ V}$			1.5	μA
$t_{d(on)}$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}$; $I_C = 450 \text{ A}$ $V_{GE} = \pm 15 \text{ V}$; $R_G = 1.6 \Omega$		70		ns
t_r			40		ns
$t_{d(off)}$			250		ns
t_f			100		ns
E_{on}			42		mJ
E_{off}			48		mJ
Q_{Gon}	$V_{CE} = 600 \text{ V}$; $V_{GE} = 15 \text{ V}$; $I_C = 450 \text{ A}$		1.5		μC
R_{thJC}				0.057	K/W

Features

- XPT 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

- AC motor control
- AC servo and robot drives
- power supplies

Diodes			
Symbol	Conditions	Maximum Ratings	
I_{F80}	$T_C = 80^\circ\text{C}$	450	A
I_{FRM}	$t_p = 1\text{ ms}$	900	A
I^2t	$T_{VJ} = 125^\circ\text{C}; t = 10\text{ ms}; V_R = 0\text{ V}$	35000	A ² s

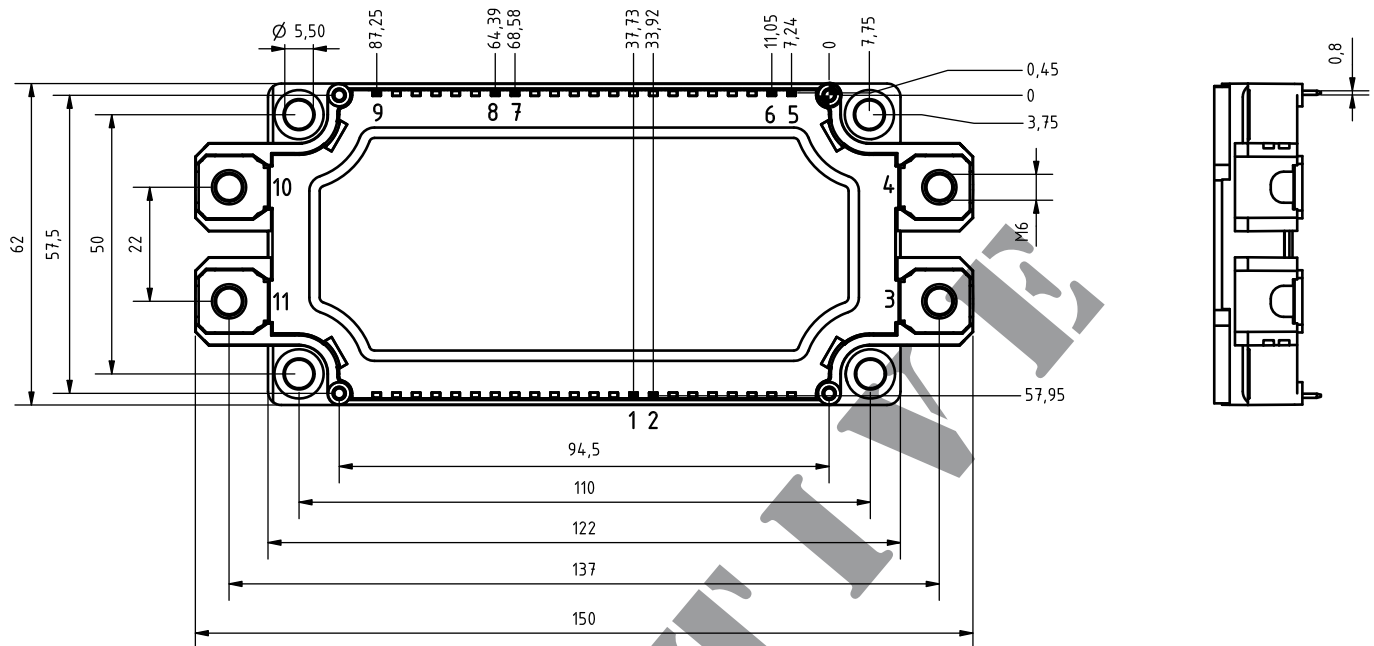
Symbol	Conditions	Characteristic Values			
		(T _{VJ} = 25°C, unless otherwise specified)			
		min.	typ.	max.	
V_F	$I_F = 450\text{ A}; V_{GE} = 0\text{ V}; T_{VJ} = 25^\circ\text{C}$			2.3	V
I_{RM}	$I_F = 450\text{ A}; di_F/dt = 3500\text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}; V_R = 800\text{ V}$		200		A
R_{thJC}			0.075		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	kΩ
$B_{25/50}$			3375		K

Module			
Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-40...+125	°C
T_{JM}		+150	°C
T_{stg}		-40...+125	°C
V_{ISO}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	3400	V~
M_d	Mounting torque (M5)	3 - 6	Nm
	Terminal connection torque (M6)	3 - 6	Nm

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
$R_{therm-chip}^{*)}$	Resistance terminal to chip		0.55		mΩ
R_{thCH}	with heatsink compound		0.03		K/W
Weight			350		g

*) $V = V_{CEsat} + 2x R_{therm-chip} \cdot I_C$ resp. $V = V_F + 2x R \cdot I_F$



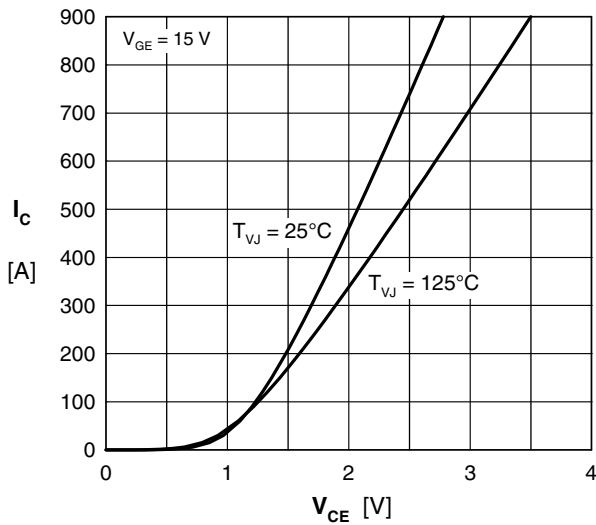


Fig. 1 Typ. output characteristics

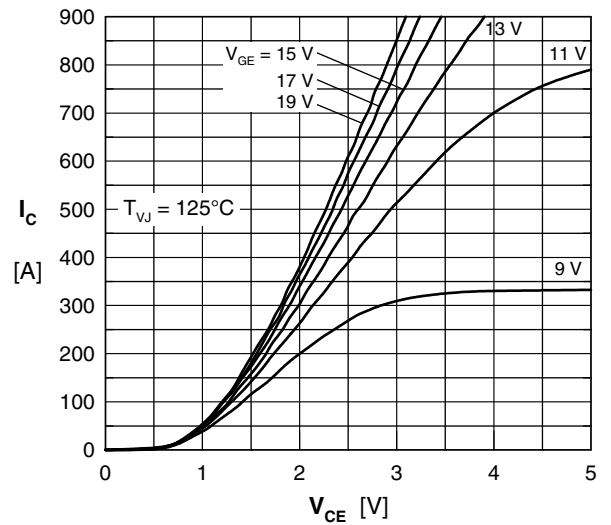


Fig. 2 Typ. output characteristics

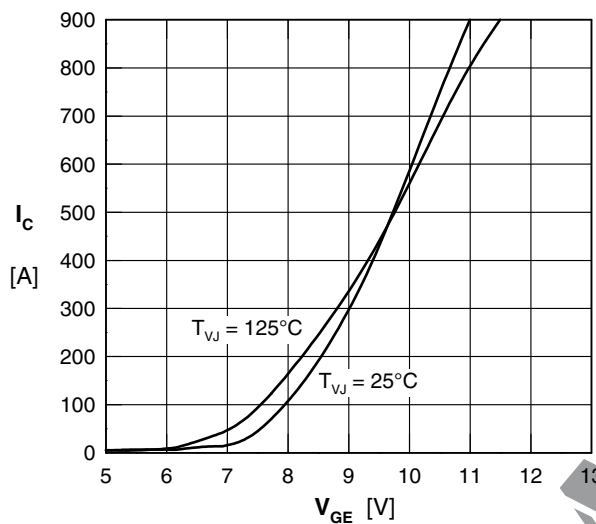


Fig. 3 Typ. transfer characteristics

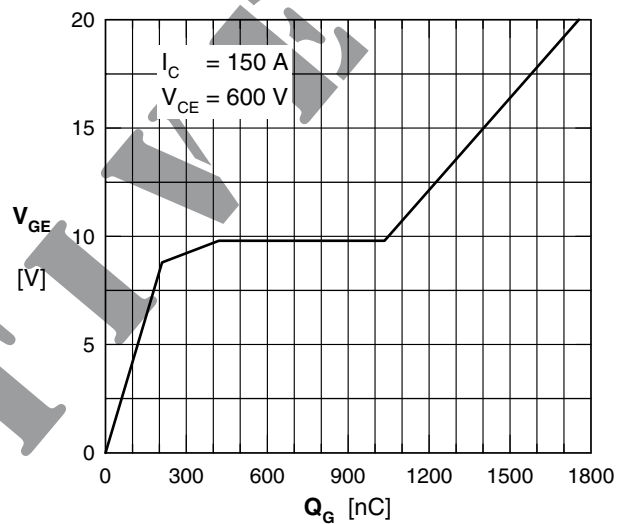


Fig. 4 Typ. turn-on gate charge

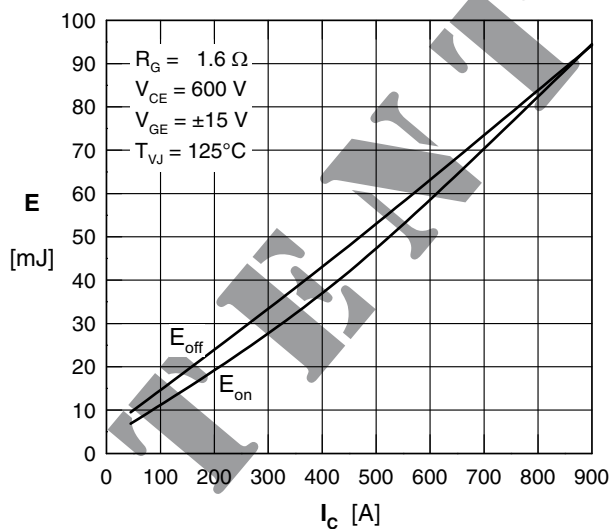


Fig. 5 Typ. switching energy vs. collector current

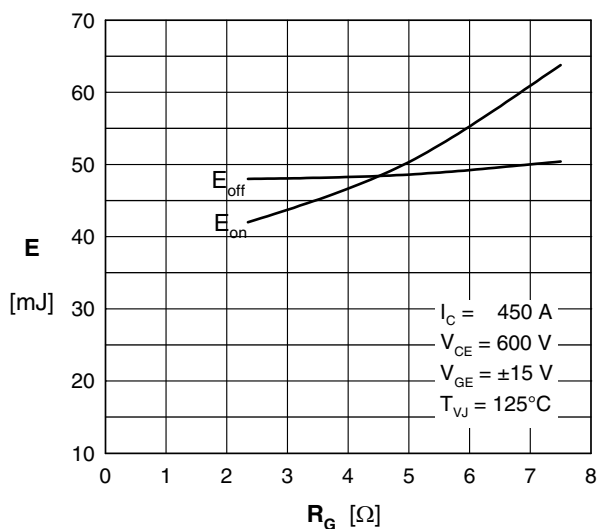


Fig. 6 Typ. switching energy vs. gate resistance

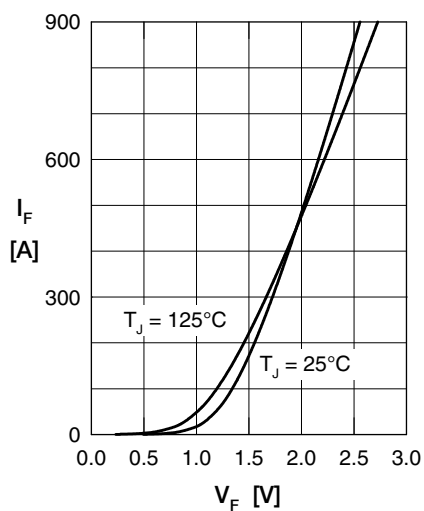


Fig. 7 Typ. forward characteristics of free wheeling diode