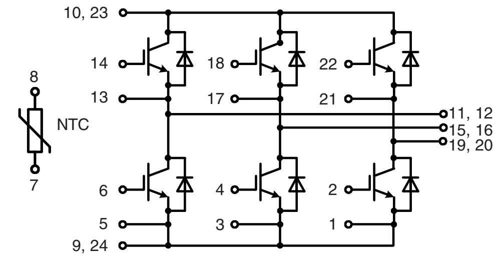
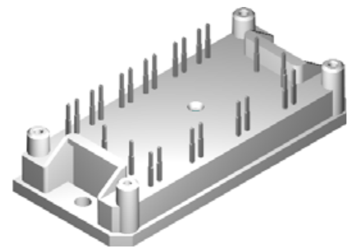
IGBT Module

Sixpack

Short Circuit SOA Capability
Square RBSOA

I_{C25} = 80 A
V_{CES} = 1200 V
$V_{CE(sat)\,typ.}$ = 2.0 V





IGBTs

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25°C to 150°C	1200	V
V_{GES}		± 20	V
I_{C25} I_{C80}	T_C = 25°C T_C = 80°C	80 56	A A
I_{CM} V_{CEK}	V_{GE} = ±15 V; R_G = 18 Ω; T_{VJ} = 125°C RBSOA; clamped inductive load; L = 100 µH	100 V_{CES}	A
t_{SC}	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 18 Ω; T_{VJ} = 125°C SCSOA; non-repetitive	10	µs
P_{tot}	T_C = 25°C	270	W

Characteristic Values (T_{VJ} = 25°C, unless otherwise specified)

Symbol	Conditions	min.	typ.	max.	
$V_{CE(sat)}$	I_C = 50 A; V_{GE} = 15 V; T_{VJ} = 25°C T_{VJ} = 125°C		2.0 2.3	2.4	V V
$V_{GE(th)}$	I_C = 2 mA; V_{GE} = V_{CE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}; V_{GE} = 0 V; T_{VJ} = 25°C T_{VJ} = 125°C		 0.8	1	mA mA
I_{GES}	V_{CE} = 0 V; V_{GE} = ± 20 V			400	nA
$t_{d(on)}$ t_r $t_{d(off)}$ t_f E_{on} E_{off}	Inductive load, T_{VJ} = 125°C V_{CE} = 600 V; I_C = 50 A V_{GE} = ±15 V; R_G = 18 Ω		90 50 520 90 5 6.5		ns ns ns ns mJ mJ
C_{ies} Q_{Gon}	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz V_{CE} = 600 V; V_{GE} = 15 V; I_C = 50 A		3600 470		pF nC
R_{thJC} R_{thCH}	(per IGBT)		 0.2	0.46	K/W K/W

Features

- Trench IGBTs
  - low saturation voltage
  - positive temperature coefficient for easy paralleling
  - fast switching
  - short tail current for optimized performance also in resonant circuits
- HiPerFRED™ diode:
  - fast reverse recovery
  - low operating forward voltage
  - low leakage current
- Industry Standard Package
  - solderable pins for PCB mounting
  - isolated copper base plate

Typical Applications

- AC drives
- power supplies with power factor correction

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

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Diodes

Symbol	Conditions	Maximum Ratings	
I_{F25}	T_C = 25°C	80	A
I_{F80}	T_C = 80°C	51	A

Symbol	Conditions	Characteristic Values min.	typ.	max.	
V_F	I_F = 50 A; V_{GE} = 0 V; T_{VJ} = 25°C		2.3	2.6	V
	T_{VJ} = 125°C		1.6		V
I_{RM}	I_F = 50 A; di_F/dt = -600 A/µs; T_{VJ} = 100°C		35		A
t_{rr}	V_R = 600 V; V_{GE} = 0 V		200		ns
R_{thJC}	(per diode)			0.65	K/W
R_{thCH}			0.25		K/W

Temperature Sensor NTC

Symbol	Conditions	Characteristic Values min.	typ.	max.	
R_{25}	T = 25°C	4.45	4.7	5.0	kΩ
$B_{25/85}$			3510		K

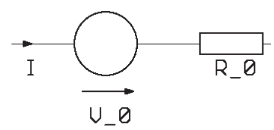
Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-40...+125	°C
T_{VJM}		-40...+150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	I_{ISOL} ≤ 1 mA; 50/60 Hz	2500	V~
M_d	Mounting torque (M4)	2.0 - 2.2	Nm

Symbol	Conditions	Characteristic Values min.	typ.	max.	
d_S	Creepage distance on surface	12.7			mm
d_A	Strike distance in air	12.7			mm
Weight			40		g

Equivalent Circuits for Simulation

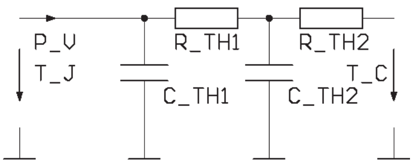
Conduction



IGBT (typ. at V_{GE} = 15 V; T_J = 125°C)
V_0 = tbd; R_0 = tbd

Free Wheeling Diode (typ. at T_J = 125°C)
V_0 = 1.5 V; R_0 = 6 mΩ

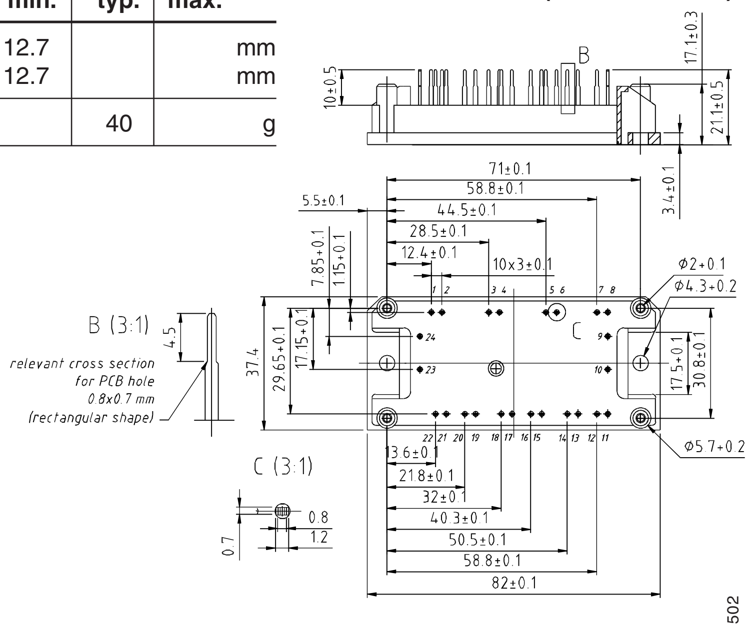
Thermal Response



IGBT (typ.)
C_{th1} = tbd J/K; R_{th1} = tbd K/W
C_{th2} = tbd J/K; R_{th2} = tbd K/W

Free Wheeling Diode (typ.)
C_{th1} = tbd J/K; R_{th1} = tbd K/W
C_{th2} = tbd J/K; R_{th2} = tbd K/W

Dimensions in mm (1 mm = 0.0394")



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