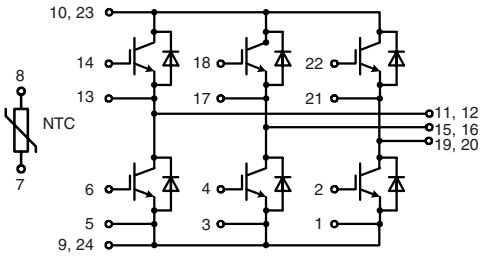
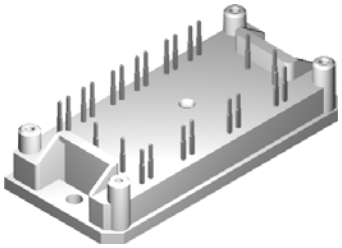
IGBT Module

Sixpack

Short Circuit SOA Capability
Square RBSOA

I_{C25} = 58 A
V_{CES} = 1200 V
$V_{CE(sat)\ typ.}$ = 1.9 V





IGBTs

Symbol	Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25°C to 150°C	1200	V
V_{GES}		± 20	V
I_{C25}	T_C = 25°C	58	A
I_{C80}	T_C = 80°C	41	A
I_{CM}	V_{GE} = ±15 V; R_G = 27 Ω; T_{VJ} = 125°C	70	A
V_{CEK}	RBSOA; clamped inductive load; L = 100 µH	V_{CES}	
t_{SC}	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 27 Ω; T_{VJ} = 125°C SCSOA; non-repetitive	10	µs
P_{tot}	T_C = 25°C	200	W

Symbol	Conditions	Characteristic Values (T_{VJ} = 25°C, unless otherwise specified) min.	typ.	max.	
$V_{CE(sat)}$	I_C = 35 A; V_{GE} = 15 V; T_{VJ} = 25°C		1.9	2.3	V
	T_{VJ} = 125°C		2.2		V
$V_{GE(th)}$	I_C = 1.5 mA; V_{GE} = V_{CE}	4.5		6.5	V
I_{CES}	V_{CE} = V_{CES}; V_{GE} = 0 V; T_{VJ} = 25°C			0.5	mA
	T_{VJ} = 125°C		0.8		mA
I_{GES}	V_{CE} = 0 V; V_{GE} = ± 20 V			400	nA
$t_{d(on)}$	Inductive load, T_{VJ} = 125°C		90		ns
t_r	V_{CE} = 600 V; I_C = 35 A		50		ns
$t_{d(off)}$	V_{GE} = ±15 V; R_G = 27 Ω		520		ns
t_f			90		ns
E_{on}			3.5		mJ
E_{off}			4.8		mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz		2530		pF
Q_{Gon}	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 35 A		330		nC
R_{thJC}	(per IGBT)			0.62	K/W
R_{thCH}			0.25		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.

440

Diodes

Symbol	Conditions	Maximum Ratings	
I_{F25}	T_C = 25°C	49	A
I_{F80}	T_C = 80°C	32	A

Symbol	Conditions	Characteristic Values min.	typ.	max.	
V_F	I_F = 35 A; V_{GE} = 0 V; T_{VJ} = 25°C		2.6	2.9	V
	T_{VJ} = 125°C		1.8		V
I_{RM}	I_F = 35 A; di_F/dt = -600 A/µs; T_{VJ} = 100°C		35		A
t_{rr}	V_R = 600 V; V_{GE} = 0 V		150		ns
R_{thJC}	(per diode)			0.9	K/W
R_{thCH}			0.3		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

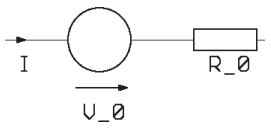
Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-40...+125	°C
T_{VJM}		-40...+150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	$I_{ISOL} \leq$ 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

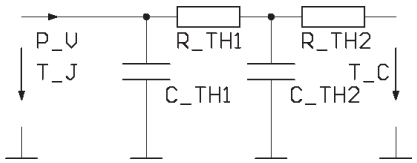
Conduction



IGBT (typ. at V_{GE} = 15 V; T_J = 125°C)
V_0 = 1.0 V; R_0 = 31 mΩ

Free Wheeling Diode (typ. at T_J = 125°C)
V_0 = 1.5 V; R_0 = 14 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")