

IGBT Module

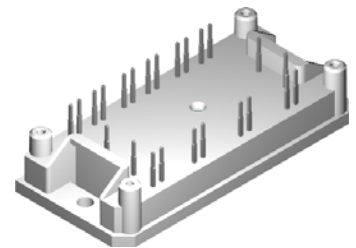
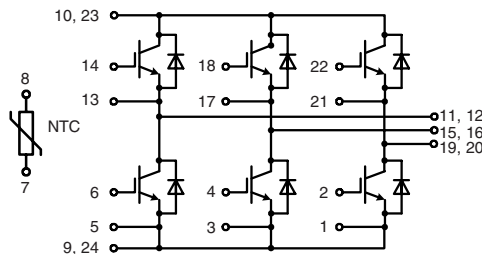
Sixpack

Short Circuit SOA Capability
Square RBSOA

$$I_{C25} = 51 \text{ A}$$

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

$$V_{CE(sat) \text{ typ.}} = 2.4 \text{ V}$$



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}	$T_C = 25^{\circ}\text{C}$	51	A
I_{C80}	$T_C = 80^{\circ}\text{C}$	36	A
I_{CM}	$V_{GE} = \pm 15 \text{ V}; R_G = 39 \Omega; T_{VJ} = 125^{\circ}\text{C}$	70	A
V_{CEK}	RBSOA; clamped inductive load; $L = 100 \mu\text{H}$	V_{CES}	
t_{SC}	$V_{CE} = 900 \text{ V}; V_{GE} = \pm 15 \text{ V}; R_G = 39 \Omega; T_{VJ} = 125^{\circ}\text{C}$ SCSOA; non-repetitive	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	210	W

Features

- NPT³ 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

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 35 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.4	2.9	V
		2.8		V
$V_{GE(th)}$	$I_C = 1 \text{ mA}; V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	1.2		0.3 mA mA
I_{GES}	$V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$			200 nA
$t_{d(on)}$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600 \text{ V}; I_C = 35 \text{ A}$ $V_{GE} = \pm 15 \text{ V}; R_G = 39 \Omega$		90	ns
t_r			50	ns
$t_{d(off)}$			440	ns
t_f			50	ns
E_{on}			5.4	mJ
E_{off}			2.6	mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$	2000		pF
Q_{Gon}	$V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 35 \text{ A}$	150		nC
R_{thJC}	(per IGBT)			0.6 K/W
R_{thCH}		0.2		K/W

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

Diodes

Symbol	Conditions	Maximum Ratings	
I_{F25}	$T_C = 25^\circ\text{C}$	49	A
I_{F80}	$T_C = 80^\circ\text{C}$	32	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 35\text{ A}; V_{GE} = 0\text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	2.6	2.9	V
I_{RM}	$I_F = 35\text{ A}; di_F/dt = -600\text{ A}/\mu\text{s}; T_{VJ} = 100^\circ\text{C}$ $V_R = 600\text{ V}; V_{GE} = 0\text{ V}$	35		A
t_{rr}		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}	$T = 25^\circ\text{C}$	4.45	4.7	5.0 kΩ
$B_{25/85}$			3510	K

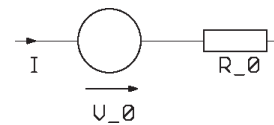
Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}	operating	-40...+125	°C
T_{VJM}		-40...+150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$	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

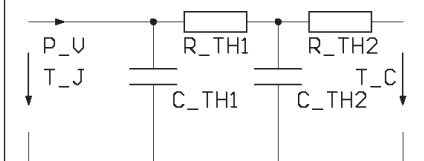
Conduction



IGBT (typ. at $V_{GE} = 15\text{ V}; T_J = 125^\circ\text{C}$)
 $V_o = 1.0\text{ V}; R_o = 44\text{ m}\Omega$

Free Wheeling Diode (typ. at $T_J = 125^\circ\text{C}$)
 $V_o = 1.5\text{ V}; R_o = 14\text{ m}\Omega$

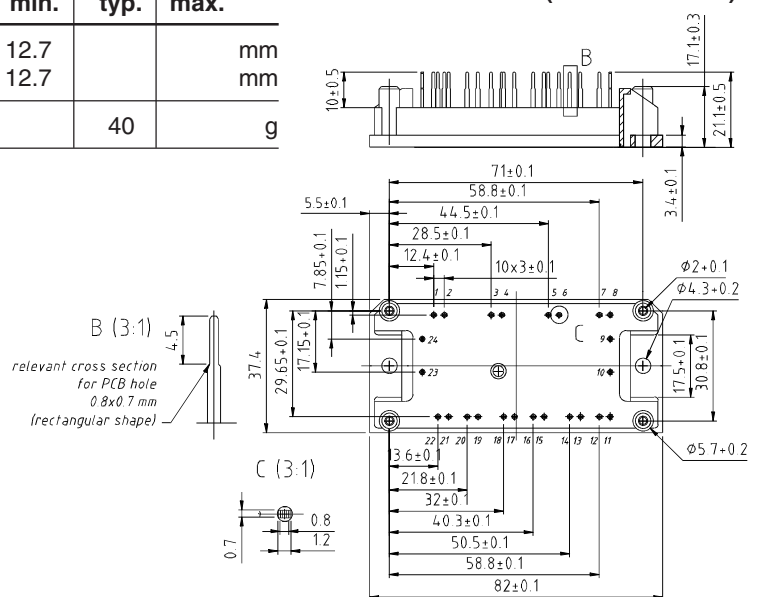
Thermal Response



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

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

Dimensions in mm (1 mm = 0.0394")



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