⌂IXYS

IGBT Module
phaseleg

I_{C25} = 280 A
V_{CES} = 1200 V
$V_{CE(sat)\,typ.}$ = 2.2 V

Preliminary data
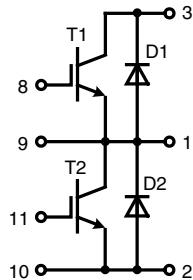
IGBTs T1 - T2		
Symbol	**Conditions**	**Maximum Ratings**
V_{CES}	T_{VJ} = 25°C to 125°C	1200 V
V_{GES}		± 20 V
I_{C25}	T_C = 25°C	280 A
I_{C80}	T_C = 80°C	200 A
I_{CM}	V_{GE} = ±15 V; R_G = 7.5 Ω; T_{VJ} = 125°C	300 A
V_{CEK}	**RBSOA** Clamped inductive load; L = 100 µH	V_{CES}
t_{SC} (SCSOA)	V_{CE} = 900 V; V_{GE} = ±15 V; R_G = 7.5 Ω; T_{VJ} = 125°C; non-repetitive	10 µs
P_{tot}	T_C = 25°C	1100 W

Symbol	Conditions			Characteristic Values	
				(T_{VJ} = 25°C, unless otherwise specified)	
		min.	**typ.**	**max.**	
$V_{CE(sat)}$	I_C = 200 A; V_{GE} = 15 V; T_{VJ} = 25°C		2.2	2.8	V
	T_{VJ} = 125°C		2.6		V
$V_{GE(th)}$	I_C = 6 mA; V_{GE} = V_{CE}	4.5	5.5	6.5	V
I_{CES}	V_{CE} = V_{CES}; V_{GE} = 0 V; T_{VJ} = 25°C		0.8	3.3	mA
	T_{VJ} = 125°C		3.5		mA
I_{GES}	V_{CE} = 0 V; V_{GE} = ± 20 V			400	nA
$t_{d(on)}$			170		ns
t_r	Inductive load, T_{VJ} = 125°C		60		ns
$t_{d(off)}$	V_{CE} = 600 V; I_C = 200 A		680		ns
t_f	V_{GE} = ±15 V; R_G = 7.5 Ω		50		ns
E_{on}			29		mJ
E_{off}			20		mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V; f = 1 MHz		11		nF
Q_{Gon}	V_{CE} = 600 V; V_{GE} = 15 V; I_C = 200 A		1.16		µC
R_{thJC}	(per IGBT)			0.11	K/W
R_{thJH}	with heatsink compound		0.22		K/W

Features

- NPT[3] IGBT
  - low saturation voltage
  - positive temperature coefficient
  - fast switching
  - short tail current for optimized performance in resonant circuits
- HiPerFRED™ diodes
  - fast and soft reverse recovery
  - low operating forward voltage
  - low leakage current
- Package
  - low inductive current path
  - screw connection to high current main terminals
  - use of non interchangeable connectors for auxiliary terminals possible
  - kelvin emitter terminal for easy drive
  - isolated ceramic base plate

Applications

- drives
  - AC
  - DC
- power supplies
 - rectifiers with power factor correction and recuperation capability
  - UPS

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

0645

Free wheeling diodes D1 - D2

Symbol	Conditions			Maximum Ratings	
I_{F25}	$T_C = 25°C$			300	A
I_{F80}	$T_C = 80°C$			190	A

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
V_F	$I_F = 200$ A; $V_{GE} = 0$ V; $T_{VJ} = 25°C$		2.3	2.7	V
	$T_{VJ} = 125°C$		1.7		V
I_{RM}	$I_F = 150$ A; $di_F/dt = 1500$ A/µs;		160		A
t_{rr}	$V_R = 600$ V; $V_{GE} = 0$ V; $T_{VJ} = 125°C$		220		ns
R_{thJC}	(per IGBT)			0.23	K/W
R_{thJH}	with heatsink compound		0.45		K/W

Module

Symbol	Conditions		Maximum Ratings	
T_{VJ}	operating		-40...+150	°C
T_{stg}			-40...+125	°C
V_{ISO}	$I_{ISOL} \leq 1$ mA; 50/60 Hz		4000	V~
M_d	Mounting torque (module, M6)		2.25 - 2.75	Nm
	(terminal, M6)		4.5 - 5.5	Nm

Symbol	Conditions	Characteristic Values			
		min.	typ.	max.	
d_S	Creepage distance on surface	2			mm
d_A	Strike distance in air	2			mm
Weight			250		g

Dimensions in mm (1 mm = 0.0394")
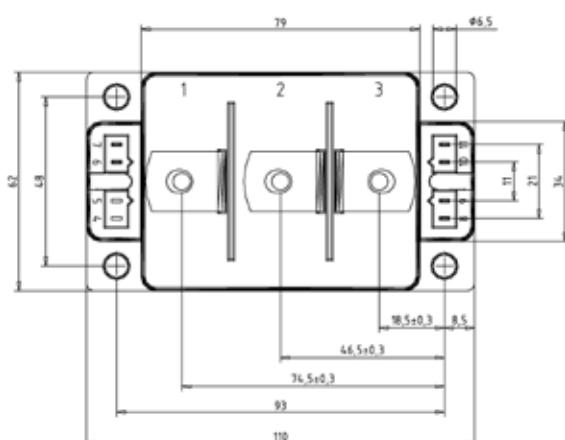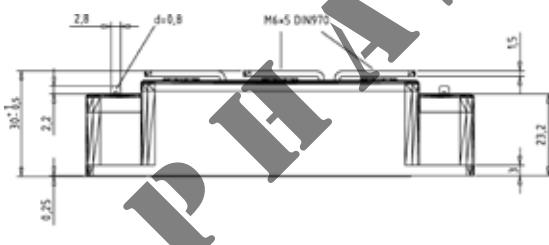
Equivalent Circuits for Simulation

Conduction
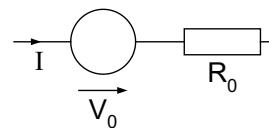
IGBT (typ. at $V_{GE} = 15$ V; $T_J = 125°C$)
$V_0 = 1.0$ V; $R_0 = 8$ mΩ

Free Wheeling Diode D1-D2 (typ. at $T_J = 125°C$)
$V_0 = 1.3$ V; $R_0 = 2$ mΩ

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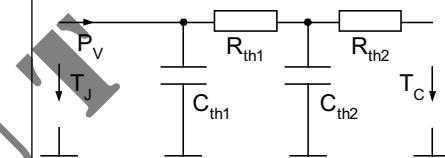
IGBT (typ.)
$C_{th1} = tbd$ J/K; $R_{th1} = tbd$ K/W
$C_{th2} = tbd$ J/K; $R_{th2} = tbd$ K/W

Free Wheeling Diode D1-D2 (typ.)
$C_{th1} = tbd$ J/K; $R_{th1} = tbd$ K/W
$C_{th2} = tbd$ J/K; $R_{th2} = tbd$ K/W

Optional accessories for modules

keyed twin plugs
(UL758, style 1385, CSA class 5851,
guide 460-1-1)

- Type ZY180L with wire length 350mm
  – for pins 4 (yellow wire) and 5 (red wire)
  – for pins 11 (yellow wire) and 10 (red wire)

- Type ZY180R with wire length 350mm
  – for pins 7 (yellow wire) and 6 (red wire)
  – for pins 8 (yellow wire) and 9 (red wire)

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