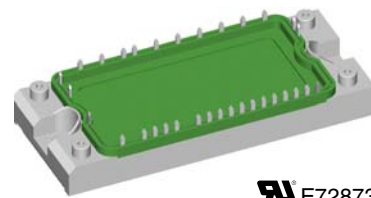
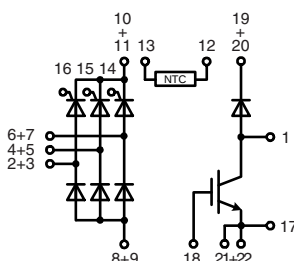


Three Phase Rectifier Bridge with IGBT and Fast Recovery Diode for Braking System

$$V_{RRM} = 1600 \text{ V}$$

$$I_{dAVM} = 170 \text{ A}$$

V_{RRM} V	Type
1600	VVZB 170-16 NO1



E72873

See outline drawing for pin arrangement

Symbol	Conditions	Maximum Ratings	
V_{RRM}		1600	V
I_{dAVM}	$T_C = 85^\circ\text{C}$; sinusoidal 120°	170	A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$	900	A
	$T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$	780	A
I^2t	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$	4050	A
	$T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$	3040	A
P_{tot}	$T_C = 25^\circ\text{C}$ per diode	250	W
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $f = 50 \text{ Hz}$; $t_p = 200 \mu\text{s}$; $V_D = 2/3 V_{DRM}$; $I_G = 0.45 \text{ A}$; $di_G/dt = 0.45 \text{ A}/\mu\text{s}$	repetitive; $I_T = 150 \text{ A}$	150 A/ μs
		non repetitive; $I_T = I_{d(AV)}/3$	500 A/ μs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $V_{DR} = 2/3 V_{DRM}$; $R_{GK} = \infty$; method 1 (linear voltage rise)	1000	V/ μs
P_{GM}	$T_{VJ} = T_{VJM}$; $t_p = 30 \mu\text{s}$	10	W
	$I_T = I_{d(AV)}/3$; $t_p = 300 \mu\text{s}$	5	W
P_{GAVM}		0.5	W
V_{CES}	$T_{VJ} = 25^\circ\text{C}$ to 150°C	1200	V
V_{GE}	Continuous	± 20	V
I_{C25}	$T_C = 25^\circ\text{C}$; DC	141	A
I_{C80}	$T_C = 80^\circ\text{C}$; DC	100	A
I_{CM}	$t_p = \text{Pulse width limited by } T_{VJM}$	150	A
P_{tot}	$T_C = 25^\circ\text{C}$	570	W
V_{RRM}		1200	V
I_{FAV}	$T_C = 80^\circ\text{C}$; rectangular $d = 0.5$	27	A
I_{FRMS}	$T_C = 80^\circ\text{C}$; rectangular $d = 0.5$	38	A
I_{FRM}	$T_C = 80^\circ\text{C}$; $t_p = 10 \mu\text{s}$; $f = 5 \text{ kHz}$	tbd	A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$	200	A
P_{tot}	$T_C = 25^\circ\text{C}$	130	W

Features

- Soldering connections for PCB mounting
- Convenient package outline
- Thermistor

Applications

- Drive Inverters with brake system

Advantages

- 2 functions in one package
- Easy to mount with two screws
- Suitable for wave soldering
- High temperature and power cycling capability

Recommended replacement:

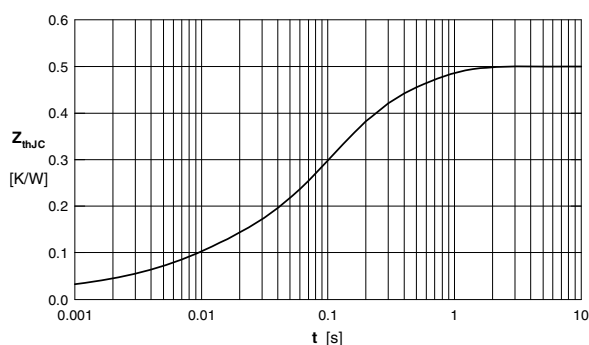
VVZB 170-16ioXT

Data according to IEC 60747

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

20091110b

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_R, I_D	$V_R = V_{RRM}; T_{VJ} = 25^{\circ}\text{C}$ $V_R = V_{RRM}; T_{VJ} = 150^{\circ}\text{C}$			0.1 mA 20 mA
V_F, V_T	$I_F = 150 \text{ A}; T_{VJ} = 25^{\circ}\text{C}$			1.68 V
V_{T0}	for power-loss calculations only			0.85 V
r_T	$T_{VJ} = 150^{\circ}\text{C}$			5.9 m Ω
V_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			1.5 V 1.6 V
I_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			95 mA 200 mA
V_{GD}	$T_{VJ} = T_{VJM}; V_D = \frac{2}{3} V_{DRM}$			0.2 V
I_{GD}	$T_{VJ} = T_{VJM}; V_D = \frac{2}{3} V_{DRM}$			10 mA
I_L	$V_D = 6 \text{ V}; t_G = 10 \mu\text{s};$ $di_G/dt = 0.45 \text{ A}/\mu\text{s}; I_G = 0.45 \text{ A}$			450 mA
I_H	$T_{VJ} = T_{VJM}; V_D = 6 \text{ V}; R_{GK} = \infty$			200 mA
t_{gd}	$V_D = \frac{1}{2} V_{DRM};$ $di_G/dt = 0.45 \text{ A}/\mu\text{s}; I_G = 0.45 \text{ A}$			2 μs
t_q	$T_{VJ} = T_{VJM}; V_R = 100 \text{ V}; V_D = \frac{2}{3} V_{DRM};$ $t_p = 200 \mu\text{s}; dv/dt = 20 \text{ V}/\mu\text{s};$ $I_T = 120 \text{ A}; -di/dt = 10 \text{ A}/\mu\text{s}$			150 μs
R_{thJC}	per rectifier			0.5 K/W
R_{thCH}				0.1 K/W
$V_{BR(CES)}$	$V_{GS} = 0 \text{ V}; I_C = 0.1 \text{ mA}$	1200		V
$V_{GE(th)}$	$I_C = 3 \text{ mA}$	4.5		V
I_{CES}	$V_{CE} = 1200 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$ $V_{CE} = 0.8 \cdot V_{CES}; T_{VJ} = 125^{\circ}\text{C}$			0.1 mA 0.5 mA
V_{CEsat}	$V_{GE} = 15 \text{ V}; I_C = 150 \text{ A}$			3.7 V
$t_{SC}(\text{SCSOA})$	$V_{GE} = 15 \text{ V}; V_{CE} = 900 \text{ V}; T_{VJ} = 125^{\circ}\text{C}$			10 μs
RBSOA	$V_{GE} = 15 \text{ V}; V_{CE} = 1200 \text{ V}; T_{VJ} = 125^{\circ}\text{C};$ clamped inductive load; $L = 100 \mu\text{H};$ $R_G = 15 \Omega$			150 A
C_{ies}	$V_{CE} = 25 \text{ V}; f = 1 \text{ MHz}; V_{GE} = 0 \text{ V}$		5.7	nF
$t_{d(on)}$	$V_{CE} = 720 \text{ V}; I_C = 75 \text{ A};$ $V_{GE} = 15 \text{ V}; R_G = 15 \Omega;$ Inductive load; $L = 100 \mu\text{H};$ $T_{VJ} = 125^{\circ}\text{C}$		150	ns
$t_{d(off)}$			680	ns
E_{on}			9	mJ
E_{off}			7.5	mJ
R_{thJC}				0.22 K/W
R_{thJH}			0.4	K/W



	R_i	τ_i
1	0.02308	0.0004
2	0.06385	0.007
3	0.2777	0.092
4	0.1354	0.44

Fig. 1 Transient thermal impedance junction to case (per thyristor/diode)

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	50/60 Hz, t = 1 min $I_{ISOL} \leq 1 \text{ mA}$, t = 1 s	2500 3000	V~ V~
M_d	Mounting torque	2.7...3.3	Nm
d_s	Creep distance on surface	12.7	mm
d_A	Strike distance in air	9.6	mm
a	Maximum allowable acceleration	50	m/s ²
Weight	typ.	180	g

baseplate typ. 100 µm convex
over 75 mm before mounting

Detail X

Detail Y

0.4 AB