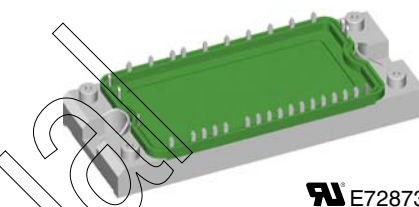
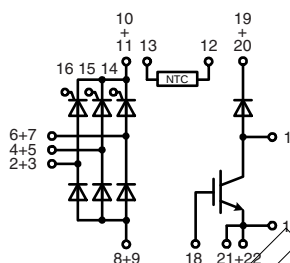


Three Phase Rectifier Bridge with IGBT and Fast Recovery Diode for Braking System

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

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

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



See outline drawing for pin arrangement

Symbol	Conditions	Maximum Ratings	Features
V_{RRM}		1600 V	- Soldering connections for PCB mounting - Convenient package outline - Thermistor
I_{dAVM}	$T_C = 85^\circ\text{C}$; sinusoidal 120°	170 A	
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$	900 A 780 A	
I^2t	$T_{VJ} = 45^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$; $t = 10 \text{ ms}$; $V_R = 0 \text{ V}$	4050 A 3040 A	Applications Drive Inverters with brake system
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; $I_T = 150 \text{ A}$ non repetitive; $I_T = I_{d(AV)}/3$	150 A/ μs 500 A/ μs	Advantages 2 functions in one package - Easy to mount with two screws - Suitable for wave soldering - High temperature and power cycling capability
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $V_{DR} = 2/3 V_{DRM}$; $R_{GK} < \infty$; method 1 (linear voltage rise)	1000 V/ μs	
P_{GM}	$T_{VJ} = T_{VJM}$; $t_p = 30 \mu\text{s}$ $I_T = I_{d(AV)}/3$; $t_p = 300 \mu\text{s}$	10 W 5 W	
P_{GAVM}		0.5 W	
V_{CES}	$T_{VJ} = 25^\circ\text{C}$ to 150°C	1200 V	
V_{GE}	Continuous	$\pm 20 \text{ V}$	
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	

Recommended replacement:

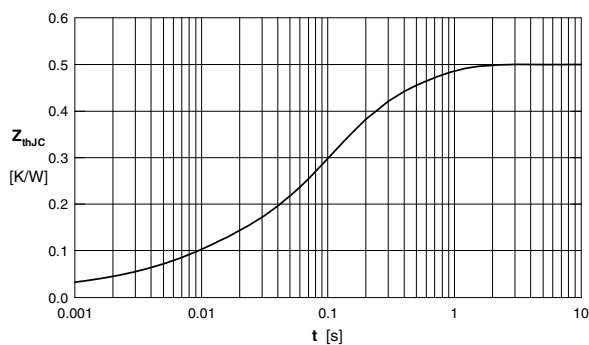
VVZB 170-16ioXT

Data according to IEC 60747

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

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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}	$V_D = \frac{1}{2} V_{DRM};$ $di_G/dt = 0.45 \text{ A}/\mu\text{s}; I_G = 0.45 \text{ A}$			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		6.45 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
$t_{SC}(SCSOA)$	$V_{GE} = 15 \text{ V}; V_{CE} = 900 \text{ V}; T_{VJ} = 125^{\circ}\text{C}$			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
$t_{d(on)}$	$V_{CE} = 720 \text{ V}; I_C = 75 \text{ A};$		150	ns
$t_{d(off)}$	$V_{GE} = 15 \text{ V}; R_G = 15 \Omega;$		680	ns
E_{on}	Inductive load; $L = 100 \mu\text{H};$		9m	J
E_{off}	$T_{VJ} = 125^{\circ}\text{C}$		7.5	mJ
R_{thJC}				0.22 K/W
R_{thJH}		0.4		K/W



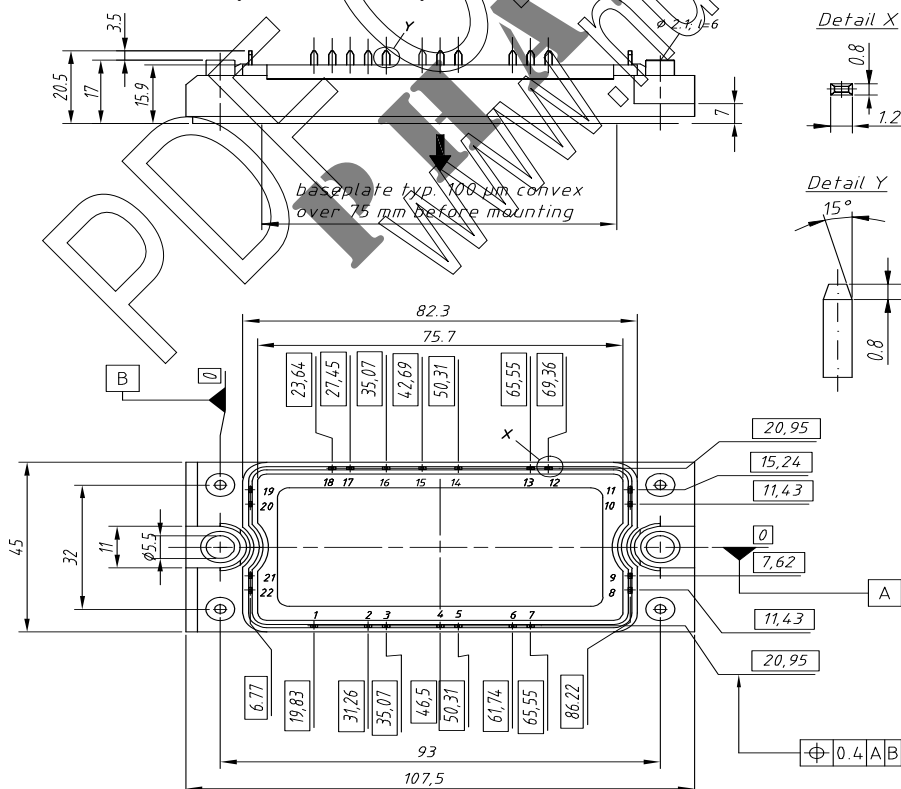
	R_i	τ_i
1	0.02308	0.0004
2	0.06385	0.007
3	0.2777	0.092
4	0.1354	0.44

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

Symbol	Conditions	Characteristic Values		
		(T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
I _R	V _R = V _{RRM} , T _{VJ} = 25°C V _R = 1200 V, T _{VJ} = 125°C		1	0.25 mA mA
V _F	I _F = 30 A, T _{VJ} = 25°C			2.76 V
V _{T0}	For power-loss calculations only			1.3 V
r _T	T _{VJ} = 150°C			16 mΩ
I _{RM}	I _F = 50 A, -di _F /dt = 100 A/μs, V _R = 100 V		5.5	11 A
t _{rr}	I _F = 1 A, -di _F /dt = 200 A/μs, V _R = 30 V		40	ns
R _{thJC}				0.9 K/W
R _{thCH}				0.1 K/W
R ₂₅ B _{25/50}	NTC $\left\{ R(T) = R_{25} \cdot e^{B_{25/100} \left(\frac{1}{T} - \frac{1}{298K} \right)} \right\}$	4.75	5.0 3375	5.25 kΩ K

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} ≤ 1 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

Dimensions in mm (1 mm = 0.0394")



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