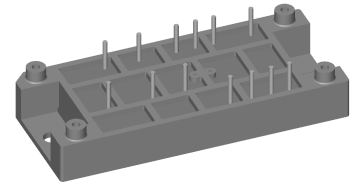
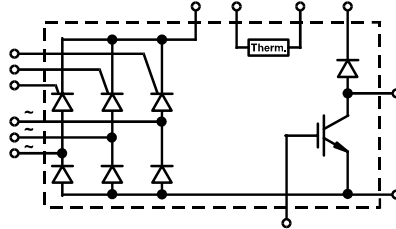


Three Phase Half Controlled Rectifier Bridge

with IGBT and Fast Recovery Diode for Braking System

$V_{RRM} = 1200-1600\text{ V}$
 $I_{dAV} = 120\text{ A}$

V_{RRM} V	Type
1200	VVZB 120-12 io1
1400	VVZB 120-14 io1
1600	VVZB 120-16 io1



Symbol	Conditions	Maximum Ratings		
I_{dAV} I_{FRMS}/I_{TRMS}	$T_{case} = 80^{\circ}\text{C}$, sinusoidal 120°	120	A	
	$T_{case} = 80^{\circ}\text{C}$, per leg	77	A	
I_{FSM}/I_{TSM}	$T_{VJ} = 25^{\circ}\text{C}$, $t = 10\text{ ms}$, $V_R = 0\text{ V}$	750	A	
	$T_{VJ} = 150^{\circ}\text{C}$, $t = 10\text{ ms}$, $V_R = 0\text{ V}$	670	A	
I^2t	$T_{VJ} = 25^{\circ}\text{C}$, $t = 10\text{ ms}$, $V_R = 0\text{ V}$	2810	A	
	$T_{VJ} = 150^{\circ}\text{C}$, $t = 10\text{ ms}$, $V_R = 0\text{ V}$	2240	A	
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ repetitive, $I_T = 150\text{ A}$ $f = 50\text{ Hz}$, $t_p = 200\text{ }\mu\text{s}$	150	A/ μs	
	$V_D = \frac{2}{3} V_{DRM}$ $I_G = 0.45\text{ A}$, non repetitive, $I_T = I_{d(AV)}/3$ $di_G/dt = 0.45\text{ A}/\mu\text{s}$	500	A/ μs	
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $V_{DR} = \frac{2}{3} V_{DRM}$ $R_{GK} = \infty$; method 1 (linear voltage rise)	1000	V/ μs	
P_{GM}	$T_{VJ} = T_{VJM}$ $t_p = 30\text{ }\mu\text{s}$	10	W	
	$I_T = I_{d(AV)}/3$ $t_p = 300\text{ }\mu\text{s}$	5	W	
	$t_p = 10\text{ ms}$	1	W	
P_{GAVM}		0.5	W	
V_{CES} V_{GE}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	1200	V	
	Continuous	± 20	V	
I_{C25} I_{C80} I_{CM} P_{tot}	IGBT	$T_{case} = 25^{\circ}\text{C}$, DC	78	A
		$T_{case} = 80^{\circ}\text{C}$, DC	52	A
		$t_p = \text{Pulse width limited by } T_{VJM}$	140	A
		$T_{case} = 80^{\circ}\text{C}$	222	W
V_{RRM}	Fast Recovery Diode		1200	V
$I_{F(AV)}$		$T_{case} = 80^{\circ}\text{C}$, rectangular $d = 0.5$	27	A
$I_{F(RMS)}$		$T_{case} = 80^{\circ}\text{C}$, rectangular $d = 0.5$	38	A
I_{FRM}		$T_{case} = 80^{\circ}\text{C}$, $t_p = 10\text{ }\mu\text{s}$, $f = 5\text{ kHz}$	tbd	A
I_{FSM}		$T_{VJ} = 45^{\circ}\text{C}$, $t = 10\text{ ms}$	200	A
	$T_{VJ} = 150^{\circ}\text{C}$, $t = 10\text{ ms}$	180	A	
P_{tot}	$T_{case} = 80^{\circ}\text{C}$	64	W	

Features

- Soldering connections for PCB mounting
- Isolation voltage 3600 V~
- Ultrafast freewheel diode
- Convenient package outline

Applications

- Drive Inverters with brake system

Advantages

- 2 functions in one package
- No external isolation
- Easy to mount with two screws
- Suitable for wave soldering
- High temperature and power cycling capability

Data according to IEC 60747
 IXYS reserves the right to change limits, test conditions and dimensions.

Symbol	Conditions	Characteristic Values		
		(T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
I _R , I _D	V _R = V _{RRM} /V _{DRM} ,			0.3 mA
	V _R = V _{RRM} /V _{DRM} , T _{VJ} = 150°C			5 mA
V _F , V _T	I _F = 100 A,			1.47 V
V _{T0}	For power-loss calculations only			0.85 V
r _T	T _{VJ} = 150°C			5 mΩ
V _{GT}	V _D = 6 V; T _{VJ} = 25°C			1.5 V
I _{GT}	T _{VJ} = -40°C			1.6 V
	V _D = 6 V; T _{VJ} = 25°C			100 mA
V _{GD}	T _{VJ} = -40°C			200 mA
	T _{VJ} = T _{VJM} ; V _D = 2/3 V _{DRM}			0.2 V
I _{GD}	T _{VJ} = T _{VJM} ; V _D = 2/3 V _{DRM}			10 mA
I _L	V _D = 6 V; t _G = 30 μs di _G /dt = 0.45 A/μs; I _G = 0.45 A			450 mA
I _H	T _{VJ} = T _{VJM} ; V _D = 6 V; R _{GK} = ∞			200 mA
t _{gd}	V _D = 1/2 V _{DRM} di _G /dt = 0.45 A/μs; I _G = 0.45 A			2 μs
t _q	T _{VJ} = T _{VJM} ; V _R = 100 V; V _D = 2/3 V _{DRM} ; t _p = 200 μs dv/dt = 10 V/μs; I _T = 120 A; -di/dt = 10 A/μs			150 μs
Q _S	} T _{VJ} = T _{VJM}			90 μC
I _{RM}		-di/dt = 0.64 A/μs; I _T /I _F = 50 A		
R _{thJC}	per thyristor / diode; sine 120° el.			1 K/W
R _{thJH}	per thyristor / diode; sine 120° el.			1.3 K/W
V _{BR(CES)}	V _{GS} = 0 V, I _C = 1 mA	1200		V
V _{GE(th)}	I _C = 10 mA	5		8 V
I _{GES}	V _{GE} = ± 20 V			500 nA
I _{CES}	V _{CE} = 0.8 V _{CES}			0.5 mA
	V _{CE} = 0.8 V _{CES} , T _{VJ} = 150°C			3 mA
V _{CEsat}	V _{GE} = 15 V, I _C = 50 A			3.35 V
t _{SC} (SCSOA)	V _{GE} = 15 V, V _{CE} = 0.6 V _{CES} , T _{VJ} = 125°C, R _G = 11 Ω, non repetitive			10 μs
RBSOA	V _{GE} = 15 V, V _{CE} = 0.8 V _{CES} , T _{VJ} = 125°C, R _G = 11 Ω, Clamped Inductive load, L = 100 μH			100 A
C _{ies}	V _{CE} = 25 V, f = 1 MHz, V _{GE} = 0 V		9	nF
t _{d(on)}	} V _{CE} = 0.6 V _{CES} , I _C = 25 A V _{GE} = 15 V, R _G = 11 Ω Inductive load; L = 100 μH T _{VJ} = 125°C		65	ns
t _{d(off)}			200	ns
t _{ri}			tbd	ns
t _{fi}			tbd	ns
E _{on}			4.1	mJ
E _{off}			5.7	mJ
R _{thJC}				0.32 K/W
R _{thJH}				0.45 K/W

Symbol	Conditions	Characteristic Values		
		(T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
I _R	V _R = V _{RRM} , T _{VJ} = 25°C			0.75 mA
	V _R = 0.8 V _{RRM} , T _{VJ} = 150°C		3	7 mA
V _F	I _F = 30 A, T _{VJ} = 25°C			2.55 V
V _{TO}	For power-loss calculations only			1.65 V
r _T	T _{VJ} = 150°C			18.2 mΩ
I _{RM}	I _F = 30 A, -di _F /dt = 240 A/μs V _R = 100 V		16	18 A
t _{rr}	I _F = 1 A, -di _F /dt = 100 A/μs V _R = 30 V		40	60 ns
R _{thJC}				1.1 KW
R _{thJH}				1.5 KW
		Fast Recovery Diode		
		Module		
		Common Specification		Maximum Ratings
T _{VJ}			-40...+150	°C
T _{VJM}			150	°C
T _{stg}			-40...+125	°C
V _{ISOL}	50/60 Hz	t = 1 min	3000	V~
	I _{ISOL} ≤ 1 mA	t = 1 s	3600	V~
M _d	Mounting torque (M5) (10-32 unf)		2-2.5	Nm
			18-22	lb.in.
Weight	typ.		80	g
d _s	Creep distance on surface		12.7	mm
d _A	Strike distance in air		11	mm
a	Maximum allowable acceleration		50	m/s ²
R ₂₅	Thermistor		2.1	kΩ
B _{25/100}			3560	K

Dimensions in mm (1 mm = 0.0394")

