POWERSEM

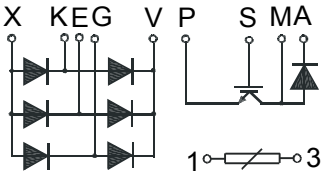
ECO-PAC™ 2

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

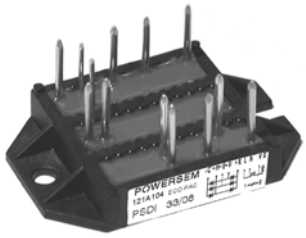
PSDI 33/06

I_{C25} = 44 A
V_{CES} = 600 V
I_{FAV25} = 18 A
V_{RRM} = 1200 V

Preliminary Data Sheet



NTC optional



IGBT

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_{VJ} = 25 °C to 150 °C	600	V
V_{GES}	continuous	±20	V
I_{C25}	T_C = 25 °C	44	A
I_{C80}	T_S = 80 °C	30	A
RBSOA	V_{CE} = 600 V, R_G = 10 Ω, T_{VJ} = 125 °C	I_{CM} = 100	A
	clamped inductive load, L = 100 µH	$V_{CEK} \leq V_{CES}$	
t_{SC}	V_{CE} = 600 V, V_{GE} = ±15 V, R_G = 10 Ω,	10	µs
	T_{VJ} = 125 °C, non-repetitive		

Symbol	Test Conditions		Characteristic Values	
			T_{VJ} = 25 °C, unless otherwise specified	
$V_{CE(sat)}$	V_{GE} = 15 V, I_C = 10 A, T_{VJ} = 25 °C	max.	1.8	V
$V_{CE(sat)}$	V_{GE} = 15 V, I_C = 10 A, T_{VJ} = 25 °C	typ.	1.5	V
$V_{CE(sat)}$	T_{VJ} = 125 °C	typ.	1.6	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1 mA	min.	3	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 1 mA	max.	5	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0 V, T_{VJ} = 25 °C	max.	0.04	mA
I_{CES}	T_{VJ} = 125 °C	typ.	1	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V	max.	100	nA
$t_{d(on)}$	inductive load, T_{VJ} = 125 °C	typ.	31	ns
t_r	V_{CE} = 400 V, I_C = 10 A	typ.	50	ns
$t_{d(off)}$	V_{GE} = ±15 V, R_G = 10 Ω	typ.	291	ns
t_f		typ.	70	ns
E_{on}		typ.	0.60	mJ
E_{off}		typ.	0.31	mJ
C_{ies}	V_{CE} = 25 V, f = 1 MHz, V_{GE} = 0 V	typ.	1600	pF
Q_{Gon}	V_{CE} = 480 V, I_C = 10 A, V_{GE} = 15 V	typ.	140	nC
R_{thJC}		max.	0.96	K/W
R_{thJH}		max.	tbd	K/W

Module

Symbol	Test Conditions		Maximum Ratings	
T_{VJ}			-40...+150	°C
T_{JM}			150	°C
T_{stg}			-40...+150	°C
V_{isol}	50/60 Hz	t = 1 min	3000	V~
	Iisol ≤ 1 mA	t = 1 s	3600	V~
M_d	Mounting torque (M 4)		1.5-2.0	Nm
Weight	typ.		24	g

Features

- High level of integration - only one power semiconductor module required for the whole braking system module
- Isolation voltage 3600 V~
- Planar glass passivated chips
- Ultrafast freewheel diode
- Leads suitable for PC board soldering
- Thermistor (optional)

Applications

- Drive inverters with brake system

Advantages

- Easy to mount with two screws
- Space and weight savings
- high temperature and power cycling capability
- Small and light weight
- 2 functions in one package

Caution: These Devices are sensitive to electrostatic discharge. Users should observe proper ESD handling precautions.

Data according to IEC 60747 refer to a single diode unless otherwise stated

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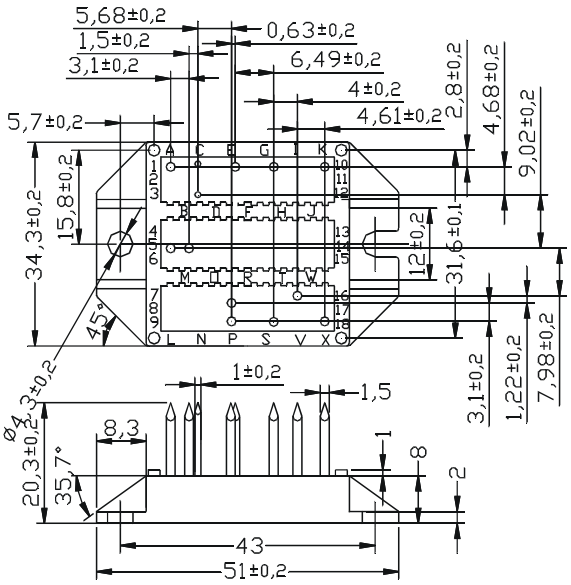
Fast Recovery Diode

Symbol	Test Conditions	Maximum Ratings	
V_{RRM}	T_{VJ} = 25 °C to 150 °C	600	V
I_{F25}	T_C = 25 °C	30	A
I_{F80}	T_C = 80 °C	19	A

Symbol	Test Conditions			Characteristic Values	
		T_{VJ} = 25 °C, unless otherwise specified			
V_F	I_F = 10 A,	T_{VJ} = 25 °C	max.	3.2	V
		T_{VJ} = 25 °C	typ.	2.2	V
		T_{VJ} = 125 °C	max.	2.4	V
I_R	V_R = V_{RRM},	T_{VJ} = 25 °C	max.	0.1	mA
		T_{VJ} = 125 °C	typ.	0.1	mA
I_{RM}	I_F = 10 A, di_F/dt = -400 A/µs, T_{VJ} = 125 °C			tbd	A
t_{rr}	V_R = 400 V			tbd	ns
R_{thJC}			max.	1.15	K/W
R_{thJH}	with heat transfer paste			tbd	K/W

Package style and outline
Dimensions in mm (1mm = 0.0394“)



Rectifier Diodes

Symbol	Test Conditions	Maximum Ratings	
V_{RRM}		1200	V
I_{FAV25}	T_C = 25 °C, sine 180 °	41	A
I_{FAV80}	T_C = 80 °C, sine 180 °	28	A
I_{FSM}	T_{VJ} = 25 °C, T = 10 ms (50Hz)	75	A

Symbol	Test Conditions			Characteristic Values	
		T_{VJ} = 25 °C, unless otherwise specified			
V_F	I_F = 10 A,	T_{VJ} = 25 °C	max.	1.8	V
		T_{VJ} = 25 °C	typ.	1.4	V
		T_{VJ} = 125 °C	typ.	1.6	V
I_R	V_R = V_{RRM},	T_{VJ} = 25 °C	max.	0.05	mA
		T_{VJ} = 125 °C	typ.	0.5	mA
t_{rr}	V_R = 100 V, I_F = 10 A, -di/dt = 5 A/µs		typ.	1	µs
R_{thJC}	per diode		max.	2.5	K/W
R_{thJH}	with heat transfer paste			tbd	K/W

Module

Symbol	Test Conditions	Characteristic Values	
d_s	Creeping distance on surface	11.2	mm
d_A	Creeping distance in air	5	mm
a	Max. allowable acceleration	50	m/s²
R_{25}*	NTC @ 25 °C	470.000	Ω

*NTC will be changed in future
to 5.000 Ω.

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