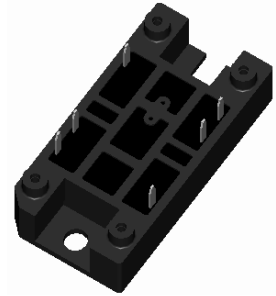
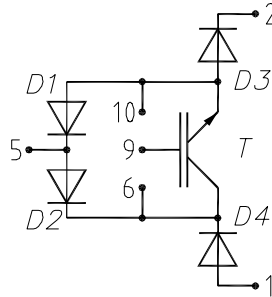


Rectifier Module for Three Phase Power Factor Correction

Typical Rectified Mains Power

P_n = 15 kW

at V_n = 400 V 3~; f_T = 15 kHz; T_C = 80°C



Transistor T

Symbol	Conditions	Maximum Ratings	
V _{CES}	T _{VJ} = 25°C to 150°C	1200	V
V _{GES}		± 20	V
I _{C25}	T _C = 25°C	95	A
I _{C80}	T _C = 80°C	65	A
I _{CM}	V _{GE} = ±15 V; R _G = 22 Ω; T _{VJ} = 125°C	100	A
V _{CEK}	RBSOA; L = 100 μH	V _{CES}	
t _{SC} (SCSOA)	V _{CE} = V _{CES} ; V _{GE} = ±15 V; R _G = 22 Ω; T _{VJ} = 125°C non-repetitive	10	μs

Symbol	Conditions	Characteristic Values (T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
V _{CE(sat)}	I _C = 20 A; V _{GE} = 15 V; T _{VJ} = 25°C T _{VJ} = 125°C		1.7 1.9	2.0 V
V _{GE(th)}	I _C = 2 mA; V _{GE} = V _{CE}	4.5		6.5 V
I _{CES}	V _{CE} = V _{CES} ; V _{GE} = 0 V; T _{VJ} = 25°C T _{VJ} = 125°C		1.8	1.6 mA mA
I _{GES}	V _{CE} = 0 V; V _{GE} = ± 20 V			400 nA
t _{d(on)} t _r t _{d(off)} t _f E _{on} E _{off}	Inductive load, T _{VJ} = 125°C V _{CE} = 600 V; I _C = 20 A V _{GE} = ±15 V; R _G = 22 Ω		100 70 500 70 3.0 2.2	ns ns ns ns mJ mJ
C _{ies}			3.3	nF
Q _{Gon}			240	nC
R _{thJC} R _{thJH}			0.6	0.3 K/W K/W

Features

- NPT IGBT with low saturation voltage
- fast recovery epitaxial diodes (FRED)
- module package:
 - high level of integration
 - solder terminals for PCB mounting
 - isolated DCB ceramic base plate
 - large creepage and strike distances

Applications

Three phase rectifier with power factor correction, set up as follows:

- input from three phase mains
 - wide range of input voltage
 - mains currents approximately sinusoidal in phase with mains voltage
 - topology permits to control overcurrent such as in case of input voltage peaks
- output
 - direct current link
 - buck type converter - reduced output voltage
 - possibility to supply boost converter, inverter etc.
- required components
 - one power semiconductor module per phase
 - one inductor and one capacitor per phase on mains side
 - output inductor, depending on supplied circuit

Diodes D1 - D4

Symbol	Conditions	Maximum Ratings	
V_{RRM}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	1200	V
I_{F25}	$T_C = 25^{\circ}\text{C}$	40	A
I_{F80}	$T_C = 80^{\circ}\text{C}$	25	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 20\text{ A}; T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.2 1.9	2.4	V V
I_R	$V_R = V_{RRM}; T_{VJ} = 25^{\circ}\text{C}$ $V_R = 0.8V_{RRM}; T_{VJ} = 125^{\circ}\text{C}$		0.75	mA mA
I_{RM} t_{rr}	} $I_F = 30\text{ A}; di_F/dt = -250\text{ A}/\mu\text{s}; T_{VJ} = 125^{\circ}\text{C}$ $V_R = 540\text{ V}$	16		A
		400		ns
R_{thJC} R_{thJH}	with heat transfer paste	2.6	1.3	K/W K/W

Module

Symbol	Conditions	Maximum Ratings		
T_{VJ}		-40...+150	°C	
T_{stg}		-40...+125	°C	
V_{ISOL}	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}; t = 1 \text{ min}$	3600	V~	
M_d	Mounting torque (M5)	2 - 2.5	Nm	
Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
d_A, d_S		5		mm
Weight			35	g

Dimensions in mm (1 mm = 0.0394")

