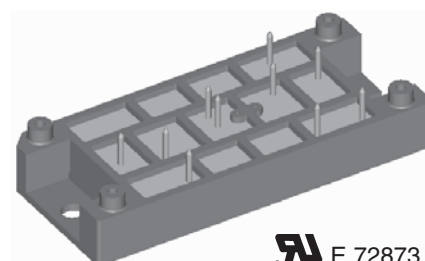
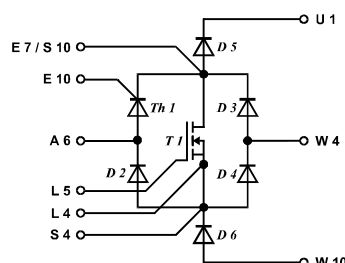


Rectifier Module for Three Phase Power Factor Correction

$$\begin{aligned} V_{DSS} &= 500 \text{ V} \\ I_{D25} &= 130 \text{ A} \\ R_{DS(on)} &= 36 \text{ m}\Omega \end{aligned}$$

Preliminary data

V_{RRM} (FAST Diode) V	$V_{RRM, DRM}$ (Diode, Thyr.) V	V_{DSS} (MOSFET) V	Type
600	500	500	VUM 85-05A



Symbol	Conditions	Maximum Ratings	
MOSFET T 1			
V _{DSS}	T _{VJ} = 25°C to 150°C	500	V
V _{DGR}	T _{VJ} = 25°C to 150°C; R _G = 1 MΩ	500	V
V _{GSM}	Transient	±30	V
V _{GS}	Continuous	±20	V
I _D	T _C = 100°C, T _{VJ} = 125°C	60	A
I _{D25}	T _C = 25°C, T _{VJ} = 150°C	130	A
I _{DM}	T _C = 25°C, T _{VJ} = 150°C	520	A
E _{AR}	T _C = 25°C	60	mJ
P _{tot}	T _C = 25°C	1380	W
Single Phase Bridge Th1, D2, D3, D4			
V _{RRM} , V _{DRM}		500	V
I _{DAV}	T _{VJ} = 150°C, T _C = 100°C	47	A
I _{FSM} , I _{TSM}	T _{VJ} = 45°C, t = 10 ms (50 Hz)	320	A
	t = 8.3 ms (60 Hz)	340	A
	T _{VJ} = 150°C, t = 10 ms (50 Hz)	280	A
	t = 8.3 ms (60 Hz)	300	A
P _{tot}	T _C = 25°C; per diode	90	W
Fast Diodes D5, D6			
V _{RRM}		600	V
I _{FAV}	T _{VJ} = 150°C, T _C = 100°C, rectangular δ = 0.5	31	A
I _{FSM}	T _{VJ} = 45°C, t = 10 ms (50 Hz)	250	A
P _{tot}	T _C = 25°C	95	W
Module			
T _{VJ}		-40...+150	°C
T _{JM}		150	°C
T _{stg}		-40...+125	°C
V _{ISOL}	I _{ISOL} ≤ 1 mA 50/60 Hz	3600	V~
M _d	Mounting torque (M5)	2-2.5/18-22	Nm/lb.in.
Weight		80	g

Features

- Package with DCB ceramic base plate
- Soldering connections for PCB mounting
- Isolation voltage 3600 V~
- Low $R_{DS(on)}$ HDMOS™ process
- Low package inductance for high speed switching
- Ultrafast diodes
- Kelvin source for easy drive
- UL recognized

Applications

- Three phase PFC by Kolar circuit
- Three phase input rectifier with power factor correction consisting of three modules VUM 85-05
- For power supplies, UPS, SMPS, drives, welding etc.

Advantages

- Reduced harmonic content of input currents corresponding to standards
- Rectifier generates maximum DC power with a given AC fuse
- Wide input voltage range
- No external isolation
- Easy to mount with two screws
- Suitable for wave soldering
- High temperature and power cycling capability

Symbol	Conditions	Characteristic Values (T _{VJ} = 25°C, unless otherwise specified)				
		min.	typ.	max.		
MOSFET T 1						
V _{GS(th)}	V _{DS} = ±20 V, I _D = 30 mA	2	3	4 V		
I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±1.5 μA		
I _{DSS}	V _{DS} = V _{DSS} , V _{GS} = 0 V V _{DS} = 0,8•V _{DSS} , V _{GS} = 0 V, T _{VJ} = 125°C		0.5 1	1.4 mA 7 mA		
R _{DS(on)}	I _D = ½ I _{D25} , V _{GS} = 10 V, pulse test t ≤ 300 μs, d ≤ 2%			36 mΩ		
g _{fs}	V _{DS} = 10 V, I _D = ½ I _{D25} , t = < 300 μs	75	145	S		
t _{d(on)} t _r t _{d(off)} t _f	V _{DS} = ½ V _{DSS} , I _D = ½ I _{D25} , V _{GS} = 15 V R _G = 1 Ω, L = 100 μH, T _{VJ} = 125°C		16 33 65 30	25 ns 45 ns 80 ns 40 ns		
C _{iss} C _{oss} C _{rss}		V _{DS} = 25 V, f = 1 MHz, V _{GS} = 0 V		30 3 1	nF nF nF	
Q _{g(on)} Q _{gs} Q _{gd}			V _{DS} = ½ V _{DSS} , I _D = ½ I _{D25} , V _{GS} = 10 V		945 195 435	1120 nC 280 nC 595 nC
R _{thJC} R _{thCH}					0.05	0.09 K/W K/W
Single Phase Bridge Th1, D2, D3, D4						
V _F , V _T	I _F , I _T = 45 A, T _{VJ} = 25°C T _{VJ} = 125°C			1.50 V 1.55 V		
I _{RRM} , I _{DRM}	V _D , V _R = V _{DRM} , V _{RRM} , T _{VJ} = 25°C V _D , V _R = 0,8•V _{DRM} , V _{RRM} , T _{VJ} = 125°C		0.5 1	1.4 mA 7 mA		
V _{T0} r _T	For power-loss calculations only T _{VJ} = 150°C			0.85 V 14 mΩ		
V _{GT} I _{GT}	V _D = 6 V			1.5 V 100 mA		
V _{GD} I _{GD}	V _D = 2/3 V _{DRM} , T _{VJ} = 150°C			0.2 V 5 mA		
V _{RGM}				10 V		
I _H	V _D = 6 V, R _{GK} = ∞			200 mA		
I _L	I _G = 0.45 A, di _G /dt = 0.45 A/μs, t _p = 10 μs			450 mA		
(di/dt) _{cr}	I _G = 0.45A, di _G /dt = 0.45A/μs, t _p = 200μs, f = 50Hz V _D = 2/3 V _{DRM} , T _{VJ} = 150°C, I _T = 45 A, repetitive			150 A/μs		
	I _G = 0.45A, di _G /dt = 0.45A/μs, t _p = 200μs, f = 50Hz V _D = 2/3 V _{DRM} , T _{VJ} = 150°C, I _T = I _{DAV} , non-repetitive			500 A/μs		
t _{gd}	I _G = 0.45 A, di _G /dt = 0.45 A/μs, V _D = ½ V _{DRM}			2 μs		
t _q	I _T = 20 A, di/dt = -10 A/μs, V _R = 100 V, V _D = 2/3V _{DRM} t _p = 200 μs, dv/dt = 15 V/μs, T _{VJ} = 150°C	150		μs		
P _{GM}	I _T = I _{d(AV)} , T _{VJ} = 150°C t _p = 30 μs t _p = 300 μs			10 W 5 W 0,5 W		
P _{GAVM}						
R _{thJC} R _{thCH}	DC per diode / thyristor DC per diode / thyristor		0.4	1.3 K/W K/W		

Symbol	Conditions	Characteristic Values (T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
Fast Diodes D 5, D 6				
V _F	I _F = 30 A; T _{VJ} = 25°C T _{VJ} = 125°C			2.70 V 1.85 V
I _R	V _R = 600 V, T _{VJ} = 25°C T _{VJ} = 125°C			0.5 mA 1 mA
V _{T0}	For power-loss calculations only			1.23 V
r _T	T _{VJ} = 150°C			9.8 mΩ
I _{RM}	I _F = 50 A; di/dt = 100 A/μs V _R = 100 V, T _{VJ} = 100°C	3		3.5 A
t _{rr}	I _F = 1 A, V _R = 30 V, di/dt = 200 A/μs	25		30 ns
R _{thJC}	DC per diode			1.3 K/W
R _{thCH}	DC per diode	0.4		K/W

Dimensions in mm (1 mm = 0.0394")

