

SEMiX[®] 5

Bridge Rectifier Module (halfcontrolled)

SEMiX365DH16

Features

- Terminal height 17 mm
- Solderless assembling solution with PressFIT signal pins and screw power terminals
- NTC temperature sensor inside

Typical Applications*

- Input Bridge Rectifier for AC/DC motor control
- Power supply

Remarks

Reliability tests performed at T_{j} = 130°C For storage and case temperature with TIM see document "TP(HALA P8) SEMiX 5p"

Absolute	Maximum Ratings	5		
Symbol	Conditions		Values	Unit
Module				
I _D	T _j = 130 °C	T _c = 96 °C	484	А
	rec. 120°	T _c = 80 °C	629	А
T _{stg}	module without TIM		-40 125	°C
V _{isol}	AC sinus 50Hz, t = 1 min		4000	V

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Thyristor				
I _{T(AV)}	T _j = 130 °C	T _c = 80 °C	221	А
	sinus 180°	T _c = 100 °C	155	А
I _{TSM}	10 mg	T _j = 25 °C	3050	А
	- 10 ms	T _j = 130 °C	2750	А
i ² t	10 ms	T _j = 25 °C	46513	A ² s
		T _j = 130 °C	37813	A²s
V _{RSM}			1700	V
V _{RRM}			1600	V
V _{DRM}			1600	V
(di/dt) _{cr}	T _j = 130 °C		200	A/µs
(dv/dt) _{cr}	T _j = 130 °C		1000	V/µs
Tj			-40 130	°C

Absolute	Maximum Rat	ings		
Symbol	Conditions		Values	Unit
Diode				
I _{FAV}	T _i = 150 °C	T _c = 80 °C	249	А
	sin. 180°	T _c = 100 °C	200	A
I _{FSM}	10 ms	T _j = 25 °C	3300	Α
	101115	T _j = 130 °C	2500	Α
i²t	10 ms	T _j = 25 °C	54450	A ² s
	101115	T _j = 130 °C	31250	A ² s
V _{RSM}			1700	V
V _{RRM}			1600	V
Tj			-40 150	°C

Characteristics								
Symbol	Conditions	min.	typ.	max.	Unit			
Temperature Sensor								
R ₁₀₀	T _c =100°C (R ₂₅ =5 kΩ)	493 ± 5%		Ω				
B _{100/125}	$R_{(T)}=R_{100}exp[B_{100/125}(1/T-1/T_{100})];T[K];$	3550 ±2%		к				





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Characteristics						
Symbol	Conditions	min.	typ.	max.	Unit	
Thyristor						
V _T	$T_j = 130 \ ^\circ C$, $I_T = 210 \ A$, chiplevel		1.05	1.14	V	
V _{T(TO)}	T _j = 130 °C, chiplevel		0.80	0.85	V	
r _T	T _j = 130 °C, chiplevel		1.32	1.4	mΩ	
I _{DD} ;I _{RD}	$T_j = 130 \ ^\circ C$, $V_{DD} = V_{DRM}$; $V_{RD} = V_{RRM}$			54	mA	
t _{gd}	T_j = 25 °C, I_G = 1 A, di_G/dt = 1 A/µs		1		μs	
t _{gr}	V _D = 0.67 * V _{DRM}		2		μs	
t _q	T _j = 130 °C		150		μs	
Ι _Η	T _j = 25 °C		150	220	mA	
ΙL	$T_j = 25 \ ^\circ C, R_G = 33 \ \Omega$		300	550	mA	
V _{GT}	$T_{j} = 25 \ ^{\circ}C, \ d.c.$	1.65			V	
I _{GT}	$T_{j} = 25 \ ^{\circ}C, \ d.c.$	100			mA	
V _{GD}	T _j = 130 °C, d.c.			0.25	V	
I _{GD}	T _j = 130 °C, d.c.			10	mA	
R _{th(j-c)}	per thyristor, sin. 180°			0.14	K/W	
R _{th(c-s)}	per thyristor (λ_{grease} =0.81 W/(m*K))		0.054		K/W	
R _{th(c-s)}	per thyristor, pre-applied phase change material		0.023		K/W	

Characteristics							
Symbol	Conditions		min.	typ.	max.	Unit	
Diode							
V _F	I _F = 210 A	T _j = 25 °C		1.04	1.28	V	
	chiplevel	T _j = 150 °C		0.95	1.18	V	
V _(TO)	chiploval	T _j = 25 °C		0.88	0.98	V	
	chipievei	T _j = 125 °C		0.73	0.83	V	
r _T	chiployol	T _j = 25 °C		0.75	1.44	mΩ	
	chipievei	T _j = 125 °C		1.06	1.69	mΩ	
I _{RD}	$T_j = 130 \text{ °C}, V_{RD} = V_{RRM}$				2	mA	
R _{th(j-c)}	per diode, sin. 180°				0.15	K/W	
R _{th(c-s)}	per Diode (λ _{grease} =0.81 W/(m*K))			0.059		K/W	
R _{th(c-s)}	per Diode, pre-applied phase change material			0.033		K/W	

Characte	ristics					
Symbol	Conditions		min.	typ.	max.	Unit
Module						
L _{CE}				20		nH
R _{CC'+EE'}	measured per	T _C = 25 °C	0.8			mΩ
	switch	T _C = 125 °C	1.1			mΩ
Rth _{(c-s)1}	calculated without	thermal coupling	0.009			K/W
Rth _{(c-s)2}	including thermal coupling, Ts underneath module (λ_{grease} =0.81 W/ (m*K))			0.015		K/W
Rth _{(c-s)1}	calculated without thermal coupling; pre-applied phase change material			0.005		K/W
Rth _{(c-s)2}	including thermal coupling, Ts underneath module, pre-applied phase change material			0.007		K/W
Ms	to heat sink (M5)		3 6		6	Nm
Mt	to terminals (M6)		3 6			Nm
w				398		g









Fig. 2: Diode typ. on-state characteristic, incl. R_{CC'+ EE'}









This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, chapter IX.

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