SEMiX245DH16

SEMiX® 5

Bridge Rectifier Module (halfcontrolled)

SEMiX245DH16

Features

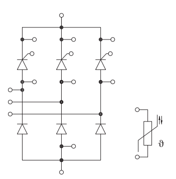
- Terminal height 17 mm
- Solderless assembling solution with PressFIT signal pins and screw power terminals
- NTC temperature sensor inside

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”



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Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Module				
I_D	T_j = 130 °C rec. 120°	T_c = 96 °C	336	A
		T_c = 80 °C	440	A
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 sinus 180°	T_c = 80 °C	154	A
		T_c = 100 °C	107	A
I_{TSM}	10 ms	T_j = 25 °C	2050	A
		T_j = 130 °C	1800	A
i^2t	10 ms	T_j = 25 °C	21013	A^2s
		T_j = 130 °C	16200	A^2s
V_{RSM}			1700	V
V_{RRM}			1600	V
V_{DRM}			1600	V
$(di/dt)_{cr}$	T_j = 130 °C		100	A/µs
$(dv/dt)_{cr}$	T_j = 130 °C		1000	V/µs
T_j			-40 ... 130	°C

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Diode				
I_{FAV}	T_j = 150 °C sin. 180°	T_c = 80 °C	167	A
		T_c = 100 °C	135	A
I_{FSM}	10 ms	T_j = 25 °C	2100	A
		T_j = 130 °C	1700	A
i^2t	10 ms	T_j = 25 °C	22050	A^2s
		T_j = 130 °C	14450	A^2s
V_{RSM}			1700	V
V_{RRM}			1600	V
T_j			-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%		K

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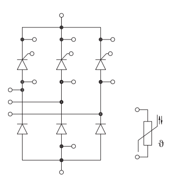

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Characteristics					
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
Thyristor					
V_T	T_j = 130 °C, I_T = 140 A, chiplevel		1.10	1.17	V
$V_{T(TO)}$	T_j = 130 °C, chiplevel		0.84	0.91	V
r_T	T_j = 130 °C, chiplevel		1.85	1.87	mΩ
I_{DD};I_{RD}	T_j = 130 °C, V_{DD} = V_{DRM}; V_{RD} = V_{RRM}			21	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
I_H	T_j = 25 °C		150	220	mA
I_L	T_j = 25 °C, R_G = 33 Ω		300	550	mA
V_{GT}	T_j = 25 °C, d.c.	1.65			V
I_{GT}	T_j = 25 °C, d.c.	100			mA
V_{GD}	T_j = 130 °C, d.c.			0.25	V
I_{GD}	T_j = 130 °C, d.c.			3.8	mA
$R_{th(j-c)}$	per thyristor, sin. 180°			0.2	K/W
$R_{th(c-s)}$	per thyristor (λ_{grease}=0.81 W/(m*K))		0.072		K/W
$R_{th(c-s)}$	per thyristor, pre-applied phase change material		0.053		K/W

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Diode						
V_F	I_F = 140 A chiplevel	T_j = 25 °C		1.04	1.28	V
		T_j = 150 °C		0.95	1.19	V
$V_{(TO)}$	chiplevel	T_j = 25 °C		0.88	0.98	V
		T_j = 125 °C		0.73	0.83	V
r_T	chiplevel	T_j = 25 °C		1.13	2.2	mΩ
		T_j = 125 °C		1.60	2.5	mΩ
I_{RD}	T_j = 130 °C, V_{RD} = V_{RRM}				2	mA
$R_{th(j-c)}$	per diode, sin. 180°				0.22	K/W
$R_{th(c-s)}$	per Diode (λ_{grease}=0.81 W/(m*K))			0.072		K/W
$R_{th(c-s)}$	per Diode, pre-applied phase change material			0.053		K/W

Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
Module						
L_{CE}				20		nH
$R_{CC'+EE'}$	measured per switch	T_C = 25 °C		0.8		mΩ
		T_C = 125 °C		1.1		mΩ
$Rth_{(c-s)1}$	calculated without thermal coupling			0.012		K/W
$Rth_{(c-s)2}$	including thermal coupling, Ts underneath module (λ_{grease}=0.81 W/(m*K))			0.020		K/W
$Rth_{(c-s)1}$	calculated without thermal coupling; pre-applied phase change material			0.009		K/W
$Rth_{(c-s)2}$	including thermal coupling, Ts underneath module, pre-applied phase change material			0.015		K/W
M_s	to heat sink (M5)		3		6	Nm
M_t	to terminals (M6)		3		6	Nm
w				398		g

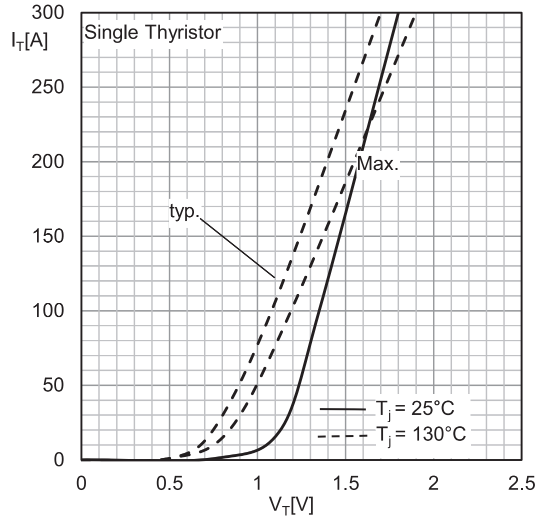


Fig. 1: Thyristor typ. on-state characteristic, incl. $R_{CC'+EE'}$

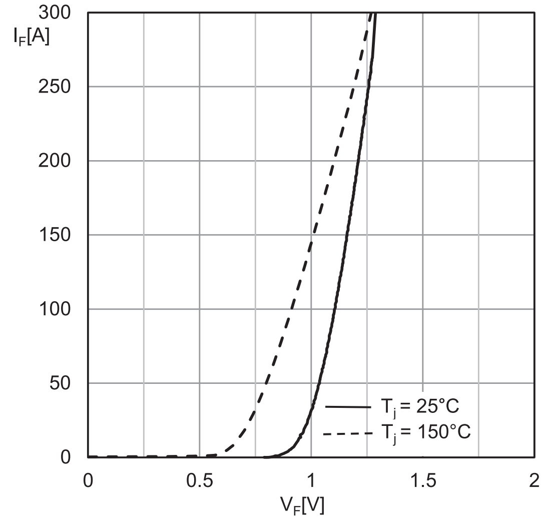


Fig. 2: Diode typ. on-state characteristic, incl. $R_{CC'+EE'}$

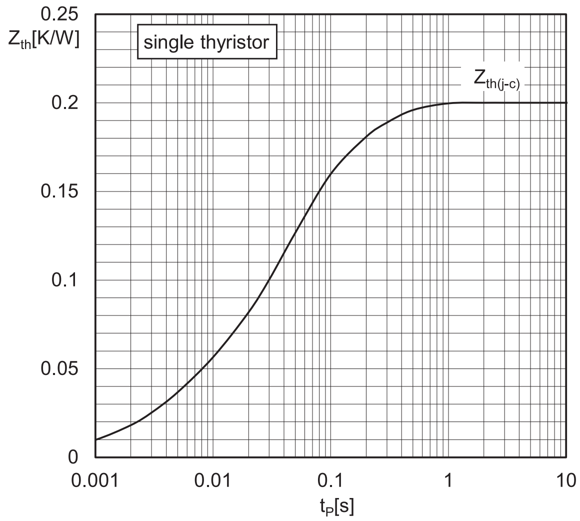


Fig. 3: Thyristor transient thermal impedance vs. time

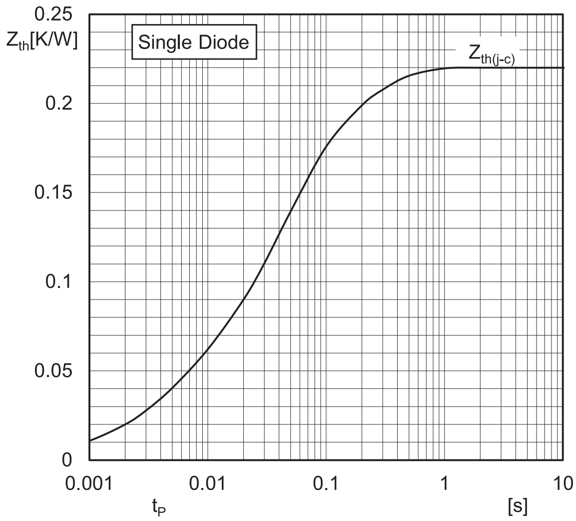


Fig. 4: Diode transient thermal impedance vs. time

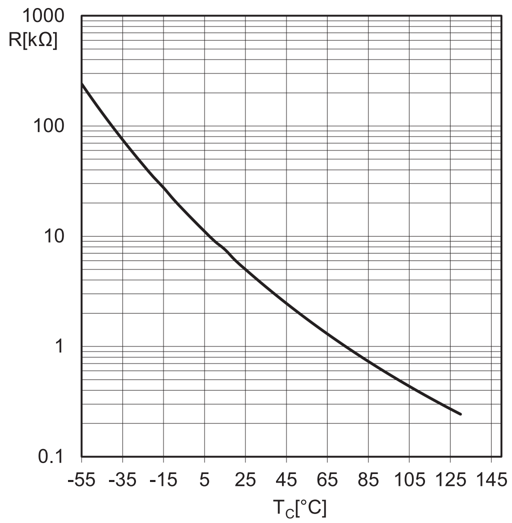
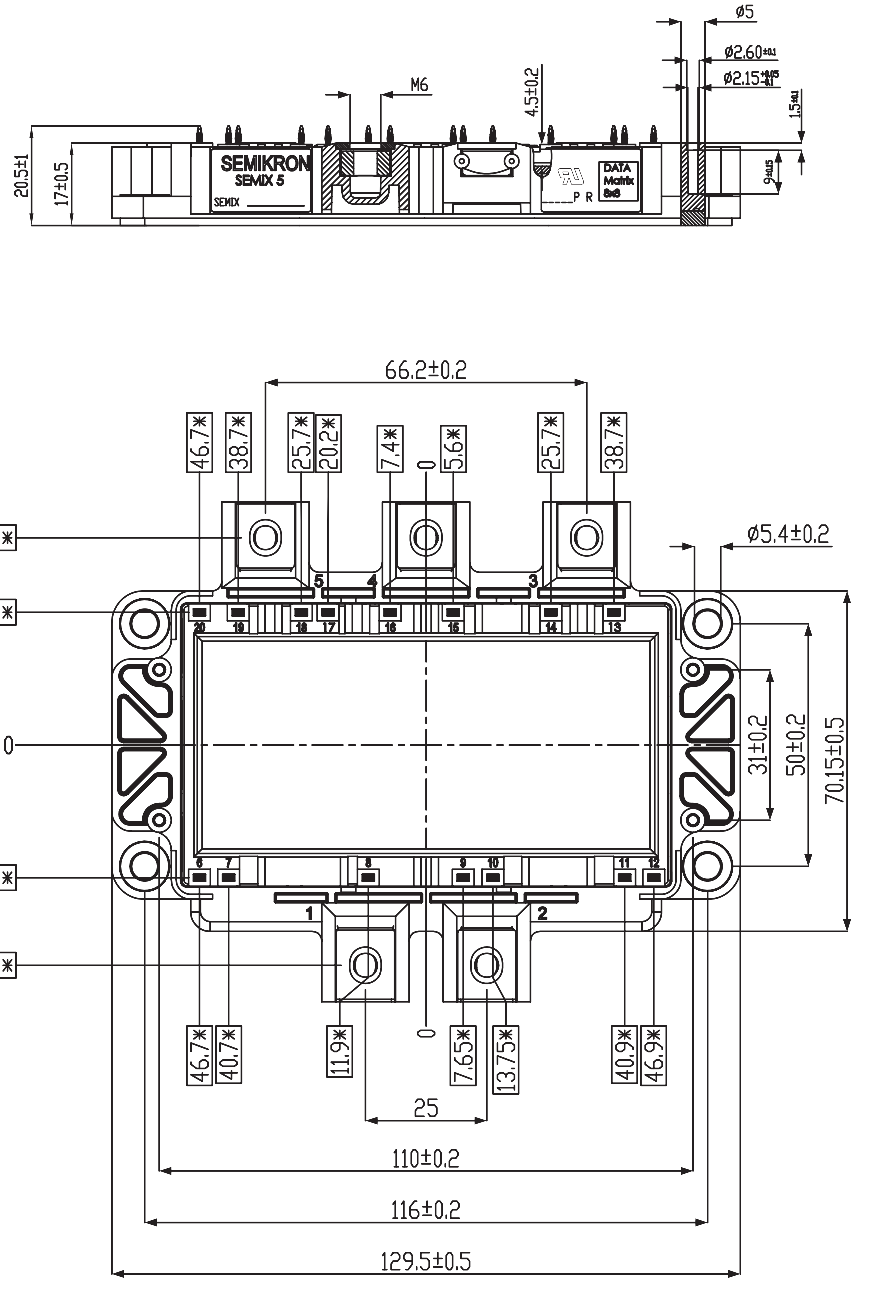


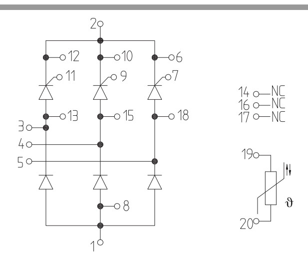
Fig. 5: Typ. NTC-temperature characteristics



* = All dimensions with tolerance of ⌖ Ø 0.4

For technical details please refer to SEMiX(R)5 Mounting Instruction

SEMiX5p



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

***IMPORTANT INFORMATION AND WARNINGS**