SEMiX241DH16s

SEMiX® 13

Bridge Rectifier Module (halfcontrolled)

SEMiX241DH16s

Features

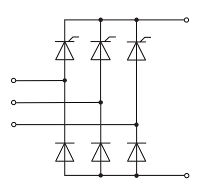
- Terminal height 17 mm
- Chips soldered directly to isolated substrate
- UL recognised file no. E63532

Typical Applications*

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

Remarks

- For storage and case temperature with TIM see document “TP(*) SEMiX 13”



DH

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
Module				
I_D	T_j = 130 °C rec. 120°	T_c = 85 °C	392	A
		T_c = 100 °C	298	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 = 85 °C	138	A
		T_c = 100 °C	104	A
I_{TSM}	10 ms	T_j = 25 °C	2000	A
		T_j = 130 °C	1800	A
i^2t	10 ms	T_j = 25 °C	20000	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 = 85 °C	160	A
		T_c = 100 °C	135	A
I_{FSM}	10 ms	T_j = 25 °C	2000	A
		T_j = 150 °C	1650	A
i^2t	10 ms	T_j = 25 °C	20000	A^2s
		T_j = 150 °C	13612	A^2s
V_{RSM}			1700	V
V_{RRM}			1600	V
T_j			-40 ... 150	°C

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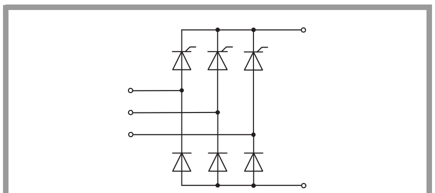


DH

Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Thyristor					
V_T	T_j = 130 °C, I_T = 300 A, chiplevel		1.40	1.53	V
$V_{T(TO)}$	T_j = 130 °C, chiplevel		0.84	0.85	V
r_T	T_j = 130 °C, chiplevel		1.85	2.3	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			220	mA
I_L	T_j = 25 °C, R_G = 33 Ω			550	mA
V_{GT}	T_j = 25 °C, d.c.	2			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		0.05		K/W

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Diode						
V_F	I_F = 300 A chiplevel	T_j = 25 °C		1.22	1.63	V
		T_j = 125 °C		1.21	1.59	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 = 145 °C, V_{RD} = V_{RRM}				1.1	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))			0.075		K/W
$R_{th(c-s)}$	per Diode, pre-applied phase change material			0.063		K/W

Characteristics

Symbol	Conditions		min.	typ.	max.	Unit
Module						
L_{CE}				20		nH
$R_{CC'+EE'}$	measured per switch	T_C = 25 °C		0.7		mΩ
		T_C = 125 °C		1		mΩ
$R_{th(c-s)1}$	calculated without thermal coupling			0.012		K/W
$R_{th(c-s)2}$	including thermal coupling, Ts underneath module (λ_{grease}=0.81 W/(m*K))			0.018		K/W
$R_{th(c-s)2}$	including thermal coupling, Ts underneath module, pre-applied phase change material			0.014		K/W
M_s	to heat sink (M5)		3		5	Nm
M_t	to terminals (M6)		2.5		5	Nm
w					350	g

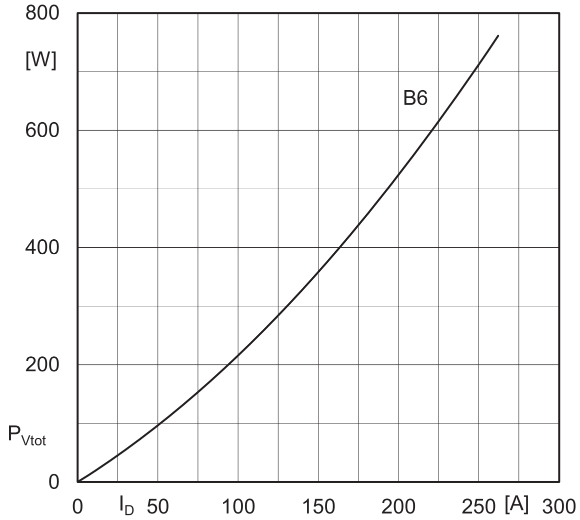


Fig. 4L: Power dissipation per module vs. direct current

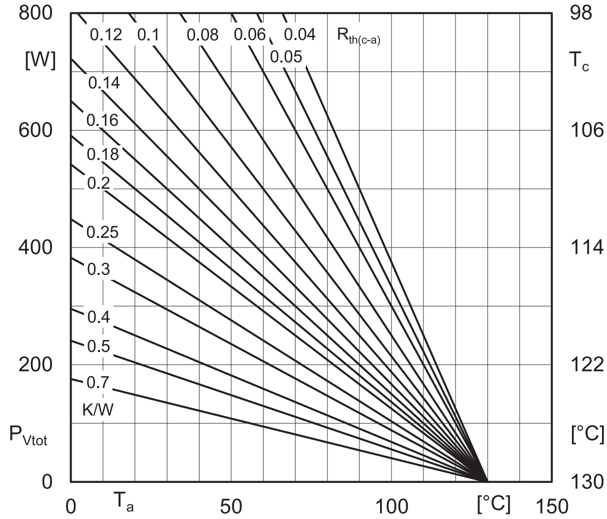


Fig. 4R: Power dissipation per module vs. ambient temperature

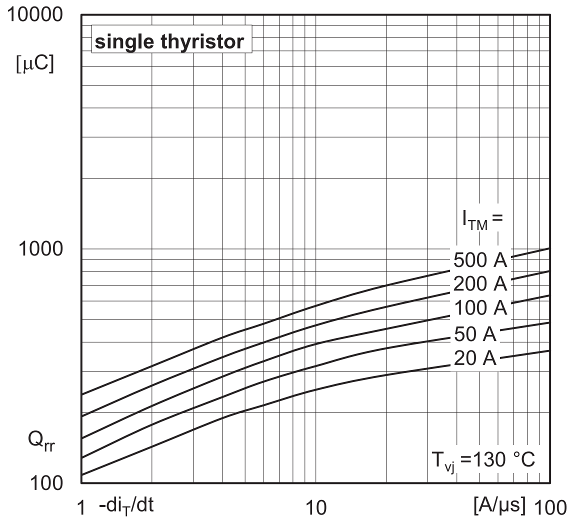


Fig. 5: Recovered charge vs. current decrease

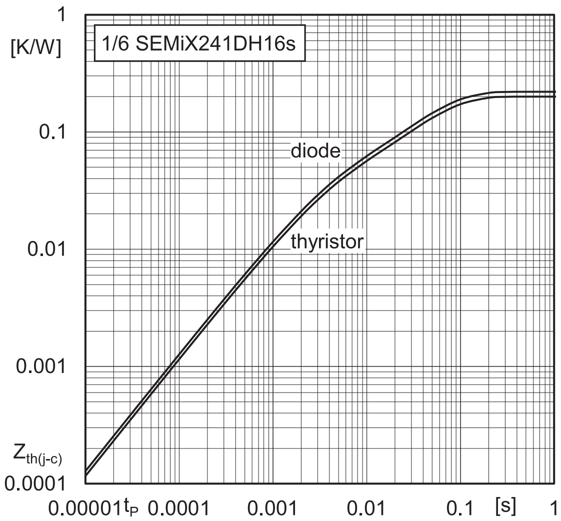


Fig. 6: Transient thermal impedance vs. time

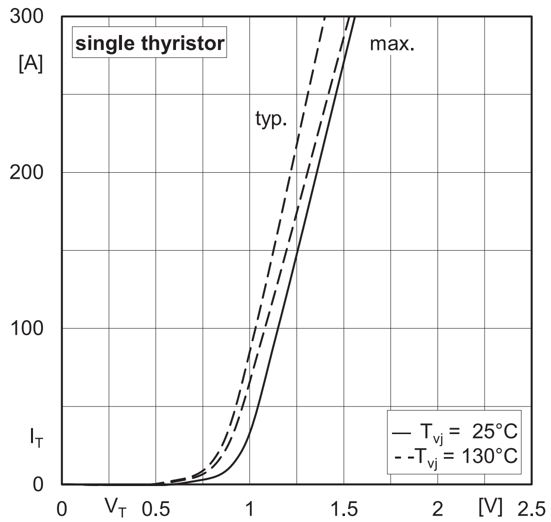


Fig. 7: On-state characteristics

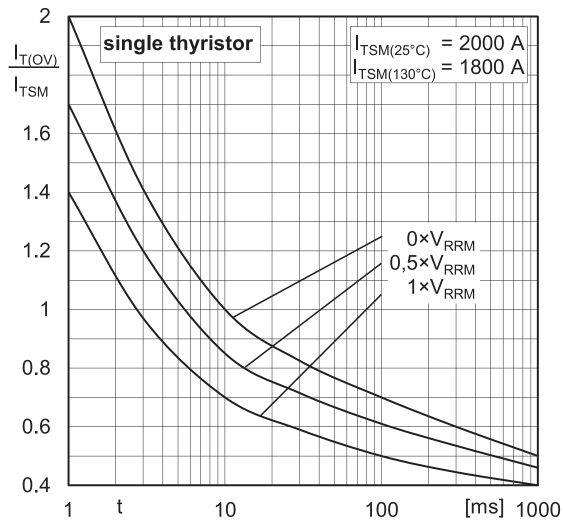


Fig. 8: Surge overload current vs. time

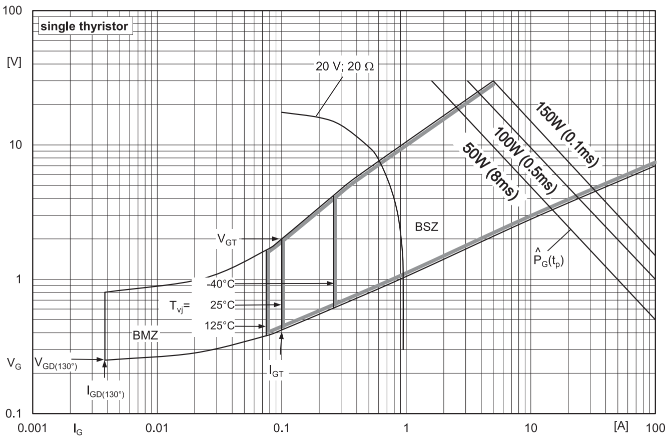
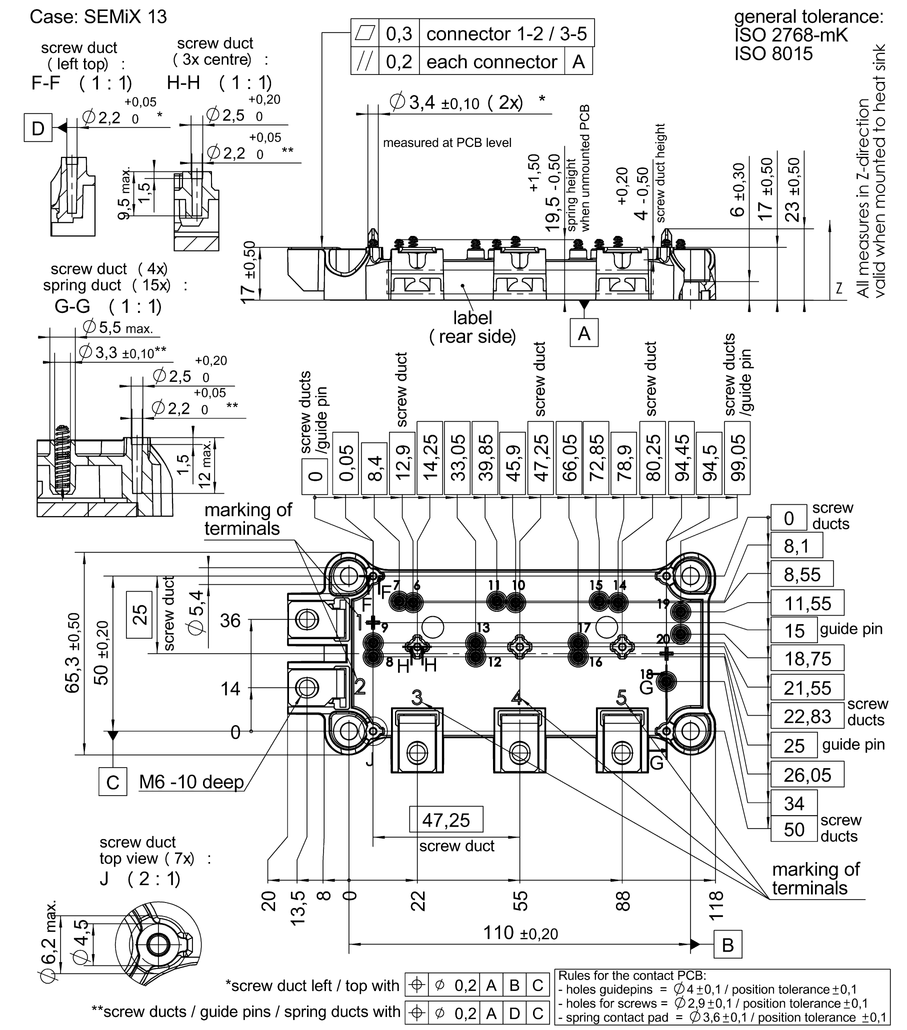


Fig. 9: Gate trigger characteristics



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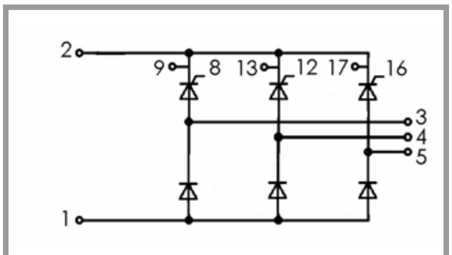

spring configuration

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

***IMPORTANT INFORMATION AND WARNINGS**

The specifications of SEMIKRON products may not be considered as guarantee or assurance of product characteristics ("Beschaffenheitsgarantie"). The specifications of SEMIKRON products describe only the usual characteristics of products to be expected in