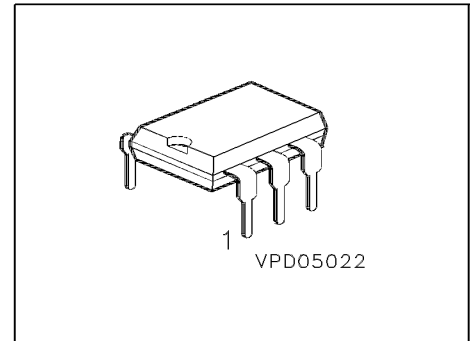


SITAC® AC Switches Without Zero Voltage Switch

- AC switch with zero-voltage detector
- Electrically insulated between input and output circuit
- Microcomputer-compatible by very low trigger current
- UL-tested (file no. E 52744), code letter "J"
- Available with the following options:
 - Option 1: VDE 0884-approved
 - Option 6: Pins in 10.16 mm spacing
 - Option 7: Pins for surface mounting



Type	Opt.	V_{DRM}	I_{TRMS}	I_{FT}	dv/dt_{cr}	Marking	Ordering Code
BRT 11 H	-	400 V	300 mA	2 mA	10 kV/ μ s	BRT 11 H	C67079-A1000-A6
BRT 11 M	-	400 V	300 mA	3 mA	10 kV/ μ s	BRT 11 M	C67079-A1000-A10
BRT 12 H	-	600 V	300 mA	2 mA	10 kV/ μ s	BRT 12 H	C67079-A1001-A6
BRT 12 H	1	600 V	300 mA	2 mA	10 kV/ μ s	BRT 12 H	C67079-A1041-A5
BRT 12 H	6	600 V	300 mA	2 mA	10 kV/ μ s	BRT 12 H	C67079-A1041-A8
BRT 12 H	7	600 V	300 mA	2 mA	10 kV/ μ s	BRT 12 H	C67079-A1041-A11
BRT 12 H	1 + 6	600 V	300 mA	2 mA	10 kV/ μ s	BRT 12 H	C67079-A1041-A14
BRT 12 M	-	600 V	300 mA	3 mA	10 kV/ μ s	BRT 12 M	C67079-A1001-A10
BRT 12 M	1	600 V	300 mA	3 mA	10 kV/ μ s	BRT 12 M	C67079-A1041-A6
BRT 13 H	-	800 V	300 mA	2 mA	10 kV/ μ s	BRT 13 H	C67079-A1002-A6
BRT 13 H	6	800 V	300 mA	2 mA	10 kV/ μ s	BRT 13 H	C67079-A1042-A8
BRT 13 H	7	800 V	300 mA	2 mA	10 kV/ μ s	BRT 13 H	C67079-A1042-A11
BRT 13 M	-	800 V	300 mA	3 mA	10 kV/ μ s	BRT 13 M	C67079-A1002-A10

Information	Package	Pin Configuration					
		1	2	3	4	5	6
50 pcs per tube	P-DIP-6	Anode	Cathode	not connected	A1	do not connect	A2

Maximum Ratings, at $T_j = 25\text{ °C}$, unless otherwise specified.

AC Switch

Parameter	Symbol	Value	Unit
Max. Power dissipation	P_{tot}	630	mW
Chip or operating temperature	T_j	-40 ...+ 100	°C
Storage temperature	T_{stg}	-40 ...+ 150	
Insulation test voltage ¹⁾ between input/output circuit (climate in acc. with DIN 40046, part2, Nov.74)	V_{IS}	5300	V_{RMS}
Reference voltage in acc. with VDE 0110 b (insulation group C)	V_{ref}	500 600	V_{RMS} V_{DC}
Creepage tracking resistance (in acc. with DIN IEC 112/VDE 0303, part 1)	C_{TI}	175	(group IIIa acc. to DIN VDE 0109)
Insulation resistance $V_{\text{IO}} = 500\text{ V}$, $T_A = 25\text{ °C}$ $V_{\text{IO}} = 500\text{ V}$, $T_A = 100\text{ °C}$	R_{is}	$\geq 10^{12}$ $\geq 10^{11}$	Ω
DIN humidity category, DIN 40 040	-	F	-
Creepage distance (input/output circuit)	-	≥ 7.2	mm
Clearance (input/output circuit)	-	≥ 7.2	

Input Circuit

Parameter	Symbol	Value	Unit
Param VR	V_R	6	V
Continuous forward current	I_F	20	mA
Surge forward current	$I_{\text{FSM(I)}}$	1.5	A
Max. power dissipation, $t \leq 10\text{ }\mu\text{s}$	P_{tot}	30	mW

Output Circuit

Parameter	Symbol	BRT 11	BRT 12	BRT 13	Unit
Repetitive peak off-state voltage	V_{DRM}	400	600	800	V
RMS on-state current	I_{TRMS}	300			mA
Single cycle surge current (50 Hz)	$I_{\text{TSM(I)}}$	3			A
Max. power dissipation	P_{tot}	600			mW

Characteristics

at $T_j = 25\text{ °C}$, unless otherwise specified.

Input Circuit

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Forward Voltage, $I_F = 10\text{ mA}$	V_F	-	1.1	1.35	V
Reverse current, $V_R = 6\text{ V}$	I_R	-	-	10	μA
Thermal resistance 2) junction - ambient	R_{thJA}	-	-	750	K/W

Output Circuit

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Critical rate of rise of off-state voltage $V_D = 0.67\text{ }V_{DRM}$, $T_j = 25\text{ °C}$ $V_D = 0.67\text{ }V_{DRM}$, $T_j = 80\text{ °C}$	dv/dt_{cr}	10 5	- -	- -	kV/ μs
Critical rate of rise of voltage at current commutation $V_D = 0.67\text{ }V_{DRM}$, $T_j = 25\text{ °C}$, $di/dt_{crq} \leq 15\text{ A/ms}$ $V_D = 0.67\text{ }V_{DRM}$, $T_j = 80\text{ °C}$, $di/dt_{crq} \leq 15\text{ A/ms}$	dv/dt_{crq}	10 5	- -	- -	
Critical rate of rise of on-state current	di/dt_{cr}	8	-	-	A/ μs
Pulse current $t_p \leq 5\text{ }\mu\text{s}$, $f = 100\text{ Hz}$, $di_{tp}/dt \leq 8\text{ A}/\mu\text{s}$	I_{tp}	-	-	2	A
On-state voltage, $I_T = 300\text{ mA}$	V_T	-	-	2.3	V
Off-state current $T_C = 100\text{ °C}$, V_{DRM}	I_D	-	0.5	100	μA
Holding current, $V_D = 10\text{ V}$	I_H	-	80	500	
Thermal resistance 2) junction - ambient	R_{thJA}	-	-	125	K/W

Response Characteristics

at $T_j = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Trigger current $V_D = 10\text{ V}$ type H type M	I_{FT}	0.4 0.8	- -	2 3	mA
Trigger current temperature gradient	$\Delta I_{FT}/\Delta T_j$	-	7	14	$\mu\text{A/K}$
Capacitance between input and output circuit $V_R = 0\text{ V}$, $f = 1\text{ kHz}$	C_{IO}	-	-	2	pF

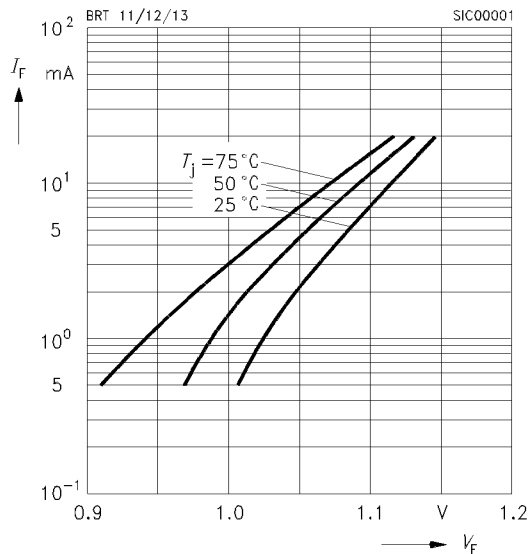
- 1) Test AC voltage in acc. with DIN 57883, June 1980
- 2) Static air, SITAC soldered in pcb or base plate.
- 3) The SITAC switch is soldered in pcb or base plate.
- 4) Thermocouple measurement has to be performed potentially separated to A1 and A2. The measuring junction should be as near as possible at the case.

Characteristics

at $T_j = 25^\circ\text{C}$, unless otherwise specified.

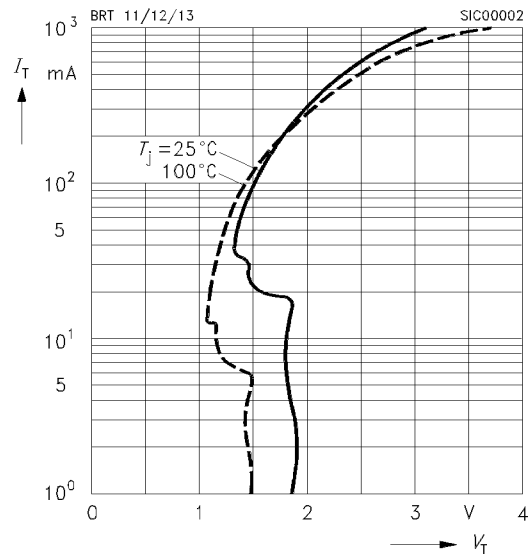
Typical input characteristics

$$I_F = f(V_F)$$



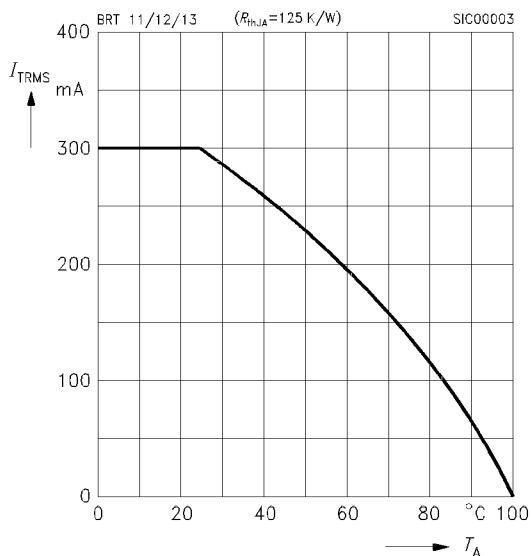
Typical output characteristics

$$I_T = f(V_T)$$



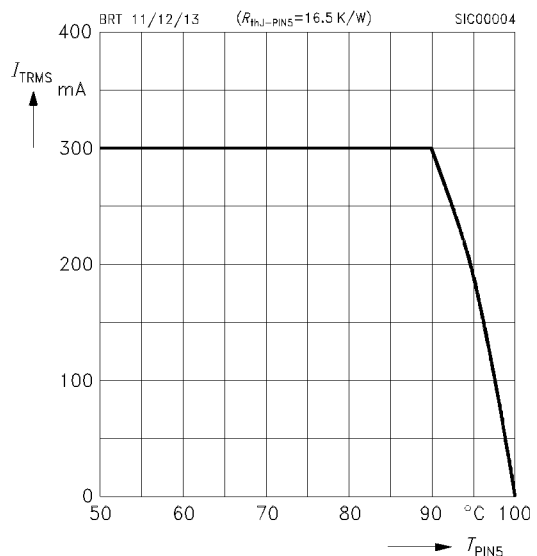
Current reduction $I_{TRMS} = f(T_A)$

$$R_{thJA} = 125 \text{ K/W } ^3)$$

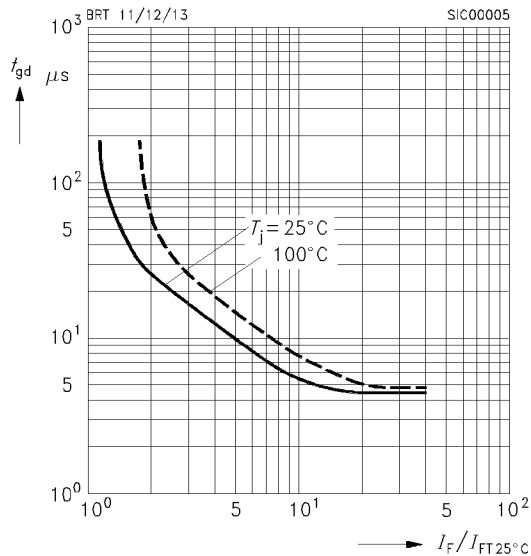


Current reduction $I_{TRMS} = f(T_{PIN5})$

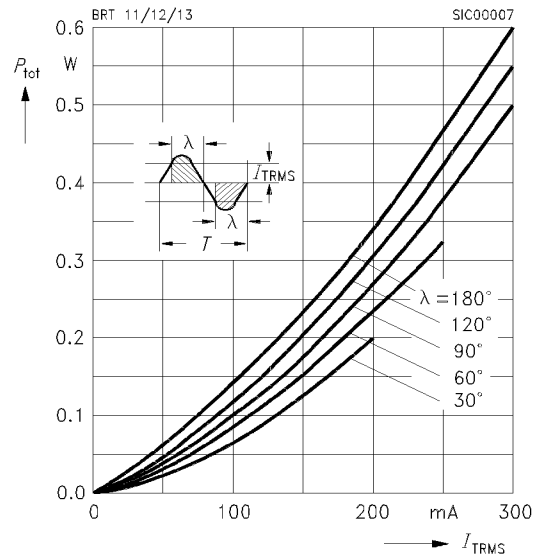
$$R_{thJ-PIN5} = 16,5 \text{ K/W } ^4)$$



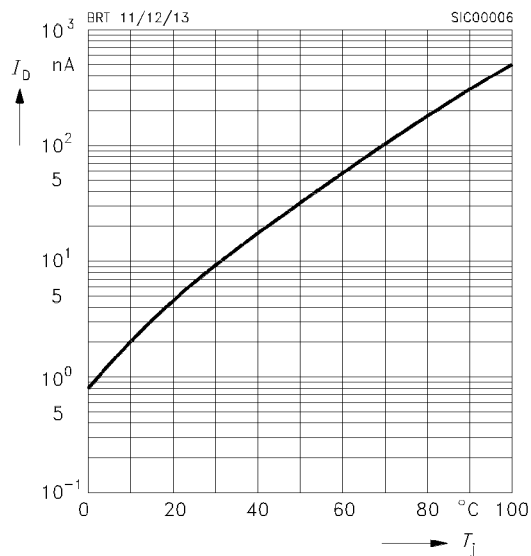
Typical trigger delay time $t_{gd} = f(I_F/I_{FT25^\circ C})$
 $V_D = 200V$



Power dissipation for 40 ... 60 Hz
 line operation
 $P_{tot} = f(I_{TRMS})$



Typical off-state current $I_D = f(T_j)$
 $V_D = 800V$



Pulse trigger current $I_{FTN} = f(t_{pIF})$
 I_{FTN} normalized to I_{FT} referring to $t_{pIF} \geq 1$ ms
 $V_{op} = 220 V$, $f = 40 \dots 60$ Hz typ.

