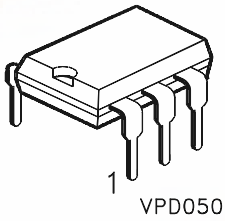
SITAC® AC Switches
With Zero Voltage Switch

- 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 sourface mounting



Type	Opt.	V_{DRM}	I_{TRMS}	I_{FT}	dv/dt_{cr}	Marking	Ordering Code
BRT 21 H	-	400 V	300 mA	2 mA	10 kV/µs	BRT 21 H	C67079-A1020-A6
BRT 21 H	1 + 6	400 V	300 mA	2 mA	10 kV/µs	BRT 21 H	C67079-A1050-A16
BRT 22 H	-	600 V	300 mA	2 mA	10 kV/µs	BRT 22 H	C67079-A1021-A6
BRT 22 H	1	600 V	300 mA	2 mA	10 kV/µs	BRT 22 H	C67079-A1051-A5
BRT 22 H	7	600 V	300 mA	2 mA	10 kV/µs	BRT 22 H	C67079-A1051-A11
BRT 22 H	1 + 6	600 V	300 mA	2 mA	10 kV/µs	BRT 22 H	C67079-A1051-A16
BRT 22 H	1 + 7	600 V	300 mA	2 mA	10 kV/µs	BRT 22 H	C67079-A1051-A17
BRT 22 M	-	600 V	300 mA	3 mA	10 kV/µs	BRT 22 M	C67079-A1021-A10
BRT 22 M	1	600 V	300 mA	3 mA	10 kV/µs	BRT 22 M	C67079-A1051-A6
BRT 23 H	-	800 V	300 mA	2 mA	10 kV/µs	BRT 23 H	C67079-A1022-A6
BRT 23 H	6	800 V	300 mA	2 mA	10 kV/µs	BRT 23 H	C67079-A1052-A8
BRT 23 H	7	800 V	300 mA	2 mA	10 kV/µs	BRT 23 H	C67079-A1052-A11
BRT 23 H	1 + 6	800 V	300 mA	2 mA	10 kV/µs	BRT 23 H	C67079-A1052-A14
BRT 23 M	-	800 V	300 mA	3 mA	10 kV/µs	BRT 23 M	C67079-A1022-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 °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_{IO} = 500 V, T_A = 25 °C V_{IO} = 500 V, T_A = 100 °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	$I_{FSM(I)}$	1.5	A
Max. power dissipation, $t \leq 10$ µs	P_{tot}	30	mW

Output Circuit

Parameter	Symbol	BRT 21	BRT 22	BRT 23	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)	$I_{TSM(I)}$	3			A
Max. power dissipation	P_{tot}	600			mW

Characteristics

at T_j = 25 °C, unless otherwise specified.

Input Circuit

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Forward Voltage, I_F = 10 mA	V_F	-	1.1	1.35	V
Reverse current, V_R = 6 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	dv/dt_{cr}				kV/µs
V_D = 0.67 V_{DRM}, T_j = 25 °C		10	-	-	
V_D = 0.67 V_{DRM}, T_j = 80 °C		5	-	-	
Critical rate of rise of voltage at current commutation	dv/dt_{crq}				
V_D = 0.67 V_{DRM}, T_j = 25 °C, $di/dt_{crq} \leq$ 15 A/ms		10	-	-	
V_D = 0.67 V_{DRM}, T_j = 80 °C, $di/dt_{crq} \leq$ 15 A/ms		5	-	-	
Critical rate of rise of on-state current	di/dt_{cr}	8	-	-	A/µs
Pulse current $t_p \leq$ 5 µs, f = 100 Hz, $di_{tp}/dt \leq$ 8 A/ms	I_{tp}	-	-	2	A
On-state voltage, I_T = 300 mA	V_T	-	-	2.3	V
Off-state current	I_D				µA
T_C = 25 °C, V_{DRM}		-	7	30	
T_C = 80 °C, V_{DRM}		-	12	100	
Holding current, V_D = 10 V	I_H	-	80	500	
Thermal resistance 2) junction - ambient	R_{thJA}	-	-	125	K/W

Response Characteristics

at T_j = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Trigger current 1 V_D = 6 V	I_{FT1}				mA
type H		0.4	-	2	
type M		0.4	-	3	
Trigger current 2 V_{op} = 220 V, f = 50 Hz, T_j = 100°C t_{pF} > 10 ms	I_{FT2}				
type H		-	-	6	
type M		-	-	9	
Trigger current temperature gradient	$\Delta I_{FT1}/\Delta T_j$ $\Delta I_{FT2}/\Delta T_j$	-	7	14	µA/K
Inhibit voltage, $I_F = I_{FT1}$	V_{DINH}	-	8	12	V
Inhibit voltage temperature gradient	$\Delta V_{DINH}/\Delta T_j$	-	-20	-	mV/K
Off-state current in inhibit state $I_F = I_{FT1}$, V_{DRM}	I_{DINH}	7	50	200	µA
Capacitance between input and output circuit V_R = 0 V, f = 1 kHz	C_{IO}	-	-	2	pF

1) Static air, SITAC soldered in pcb or base plate.

2) Test AC voltage in acc. with DIN 57883, June 1980.

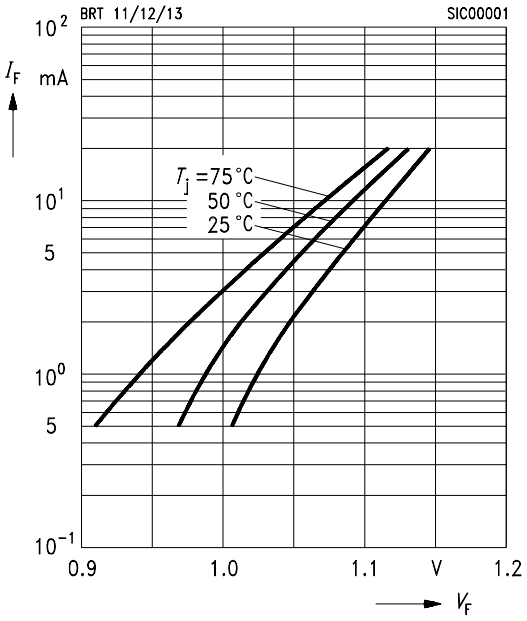
3) The SITAC switch is soldered in pcb or base plate.

4) Termocouple measurement has to be performed potentially separated to A1 and A2.
The measuring junction should be as near as possible at the case.

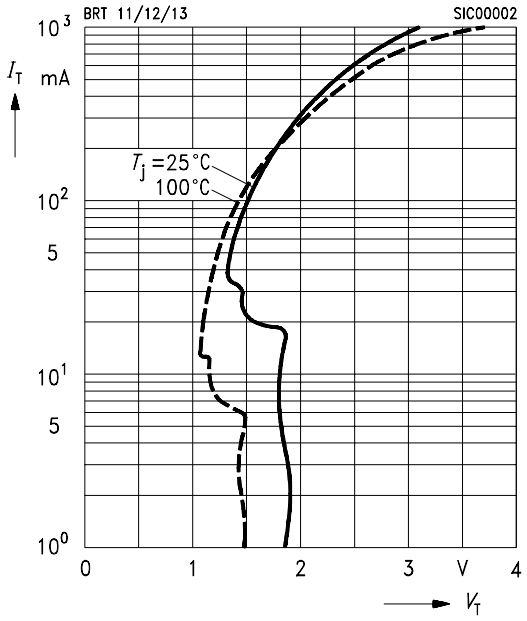
5) The SITAC zero voltage switch can be triggered only in the hatched area below the T_j curves.

Characteristics
at T_j = 25 °C, unless otherwise specified.

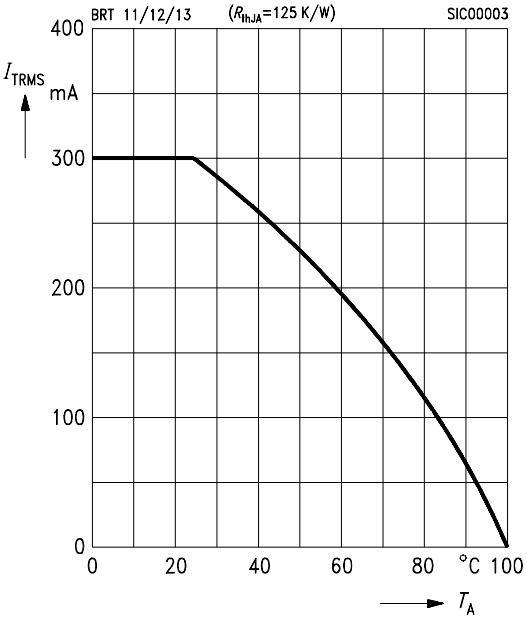
Typical input characteristics
$I_F = f(V_F)$



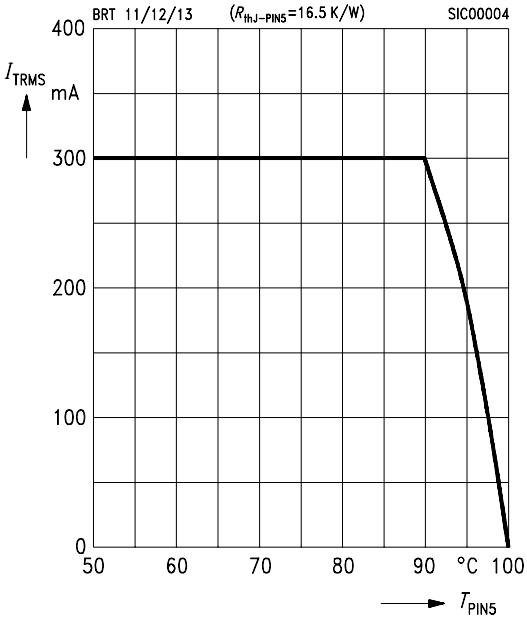
Typical output characteristics
$I_T = f(V_T)$



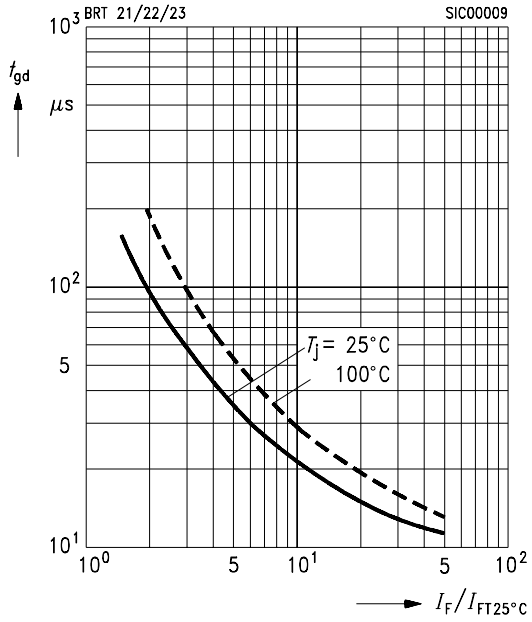
Current reduction $I_{TRMS} = f(T_A)$
R_{thJA} = 125 K/W 3)



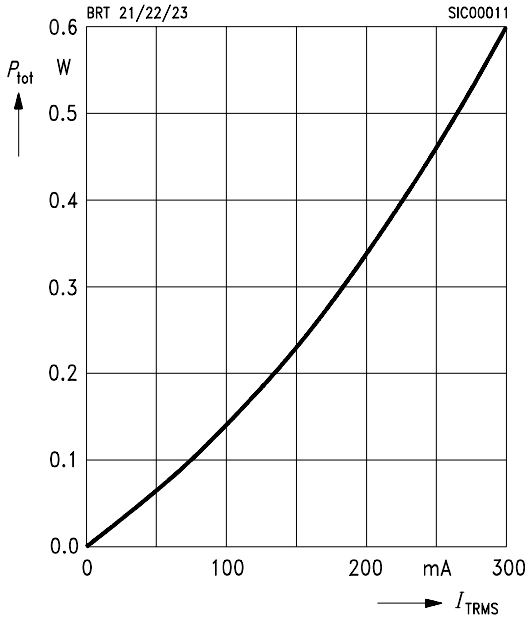
Current reduction $I_{TRMS} = f(T_{PIN5})$
$R_{thJ\text{-}PIN5}$ = 16,5 K/W 4)



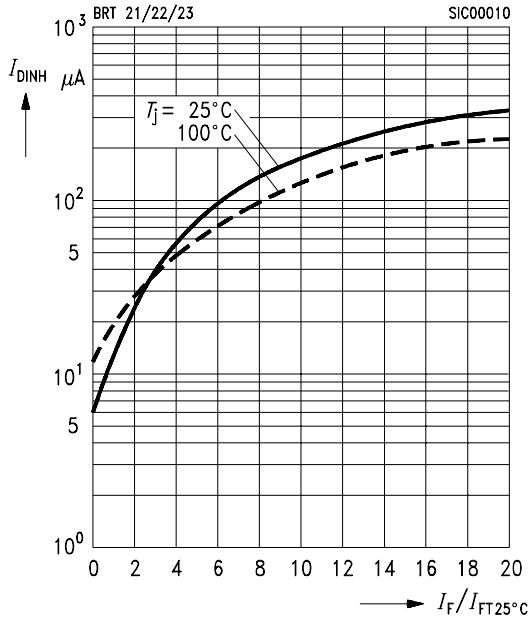
Typical trigger delay time $t_{gd} = f(I_F/I_{FT25°C})$
V_D = 200V



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



Typ. inhibit current $I_{DINH} = f(I_F/I_{FT\ 25°C})$
V_D = 800 V



Typ.static inhibit voltage limit 5)
$V_{DINHmin} = f(I_F/I_{FT\ 25°C})$,parameter: T_j