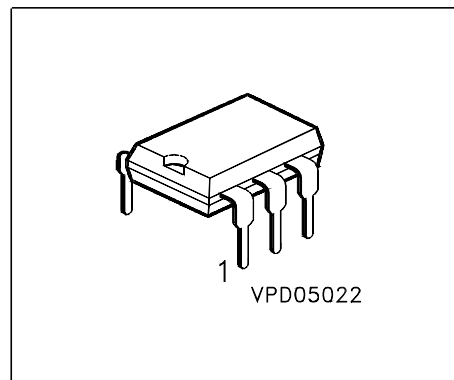


SITAC® AC Switches

Without Zero Voltage Switch

- AC switch without 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 $V_D = 0.67 V_{DRM}$, $T_j = 25\text{ °C}$ $V_D = 0.67 V_{DRM}$, $T_j = 80\text{ °C}$	dv/dt_{cr}	10 5	- -	- -	kV/ μs
Critical rate of rise of voltage at current commutation $V_D = 0.67 V_{DRM}$, $T_j = 25\text{ °C}$, $di/dt_{crq} \leq 15\text{ A/ms}$ $V_D = 0.67 V_{DRM}$, $T_j = 80\text{ °C}$, $di/dt_{crq} \leq 15\text{ A/ms}$	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.

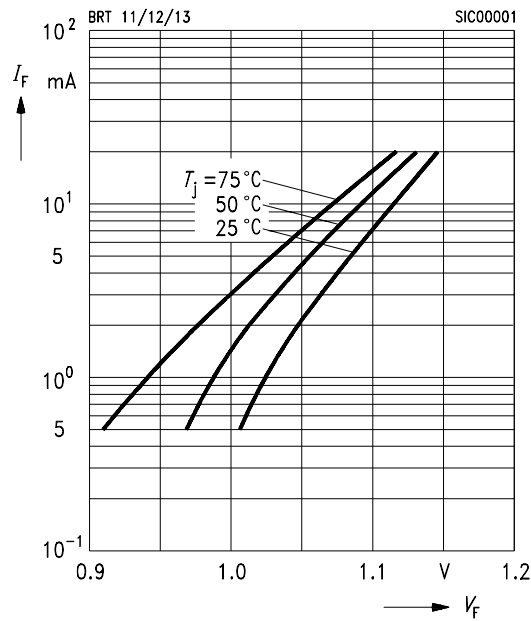
4) Thermocouple measurement has to be performed potentially separated to A1 and A2. The measuring junction should be as near as possible at the case.

Characteristics

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

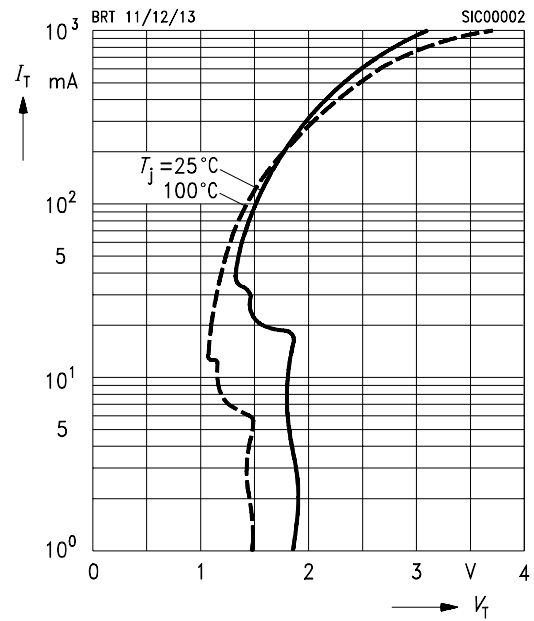
Typical input characteristics

$$I_F = f(V_F)$$



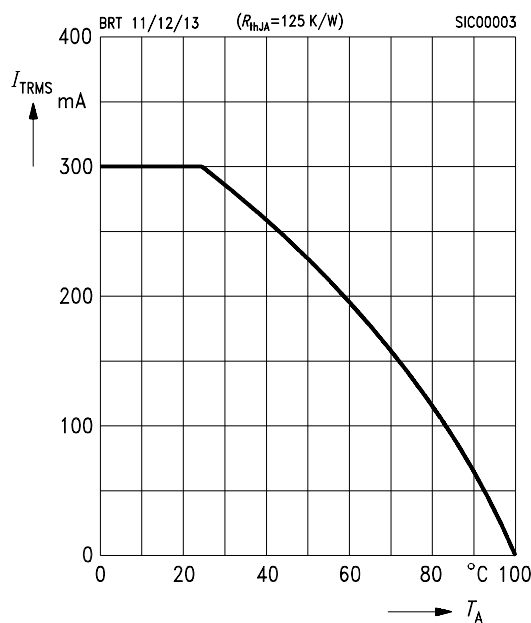
Typical output characteristics

$$I_T = f(V_T)$$



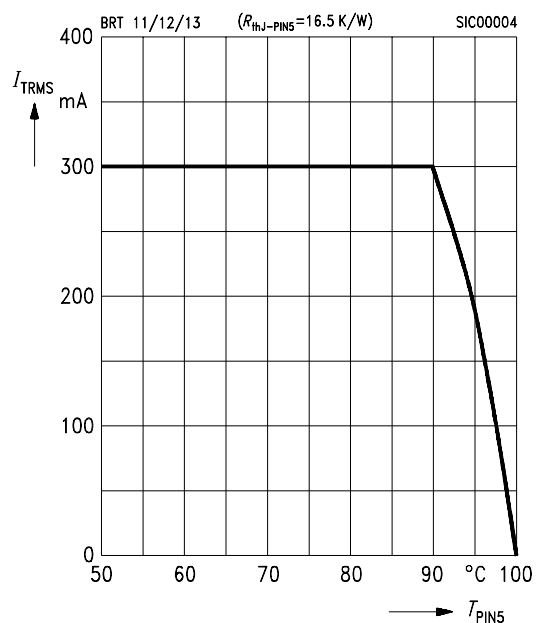
Current reduction $I_{\text{TRMS}} = f(T_A)$

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



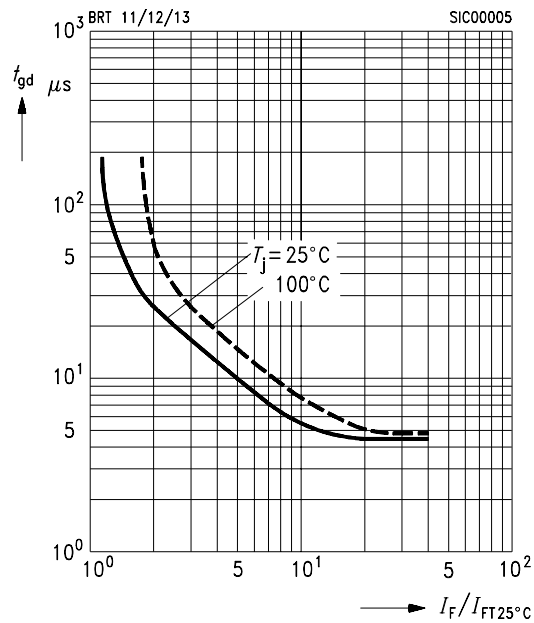
Current reduction $I_{\text{TRMS}} = f(T_{\text{PIN5}})$

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



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

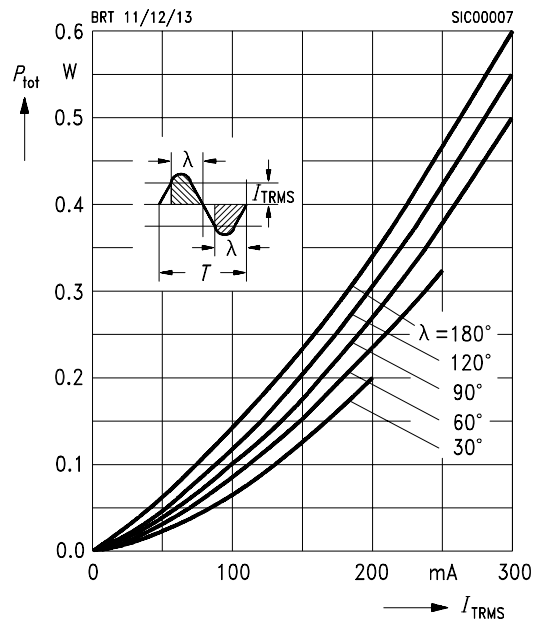
$V_D = 200V$



Power dissipation for 40 ... 60 Hz

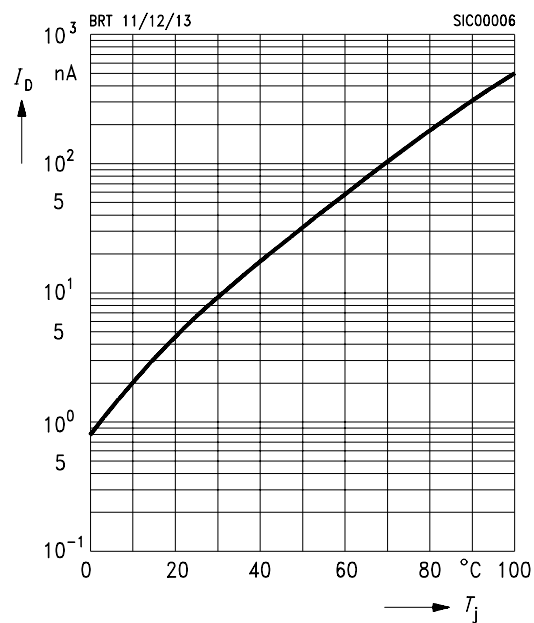
line operation

$P_{tot} = f(I_{TRMS})$



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.

