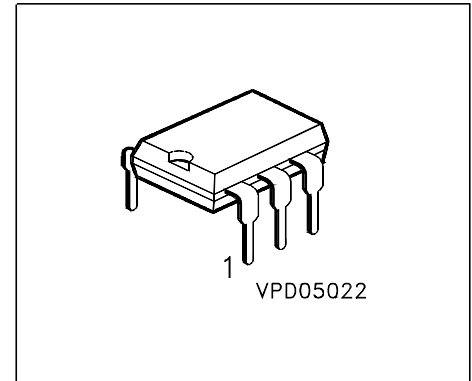


SITAC® AC Switches Without Zero Voltage Switch

- 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/μs | BRT 11 H | C67079-A1000-A6 |
| BRT 11 M | - | 400 V | 300 mA | 3 mA | 10 kV/μs | BRT 11 M | C67079-A1000-A10 |
| BRT 12 H | - | 600 V | 300 mA | 2 mA | 10 kV/μs | BRT 12 H | C67079-A1001-A6 |
| BRT 12 H | 1 | 600 V | 300 mA | 2 mA | 10 kV/μs | BRT 12 H | C67079-A1041-A5 |
| BRT 12 H | 6 | 600 V | 300 mA | 2 mA | 10 kV/μs | BRT 12 H | C67079-A1041-A8 |
| BRT 12 H | 7 | 600 V | 300 mA | 2 mA | 10 kV/μs | BRT 12 H | C67079-A1041-A11 |
| BRT 12 H | 1 + 6 | 600 V | 300 mA | 2 mA | 10 kV/μs | BRT 12 H | C67079-A1041-A14 |
| BRT 12 M | - | 600 V | 300 mA | 3 mA | 10 kV/μs | BRT 12 M | C67079-A1001-A10 |
| BRT 12 M | 1 | 600 V | 300 mA | 3 mA | 10 kV/μs | BRT 12 M | C67079-A1041-A6 |
| BRT 13 H | - | 800 V | 300 mA | 2 mA | 10 kV/μs | BRT 13 H | C67079-A1002-A6 |
| BRT 13 H | 6 | 800 V | 300 mA | 2 mA | 10 kV/μs | BRT 13 H | C67079-A1042-A8 |
| BRT 13 H | 7 | 800 V | 300 mA | 2 mA | 10 kV/μs | BRT 13 H | C67079-A1042-A11 |
| BRT 13 M | - | 800 V | 300 mA | 3 mA | 10 kV/μs | 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 | BRT | BRT | Unit |
|------------------------------------|---------------------|-----|-----|-----|------|
| | | 11 | 12 | 13 | |
| 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 | - | - | kV/ μs |
| | | 5 | - | - | |
| 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 $t_p \leq 5\text{ }\mu\text{s}$, $f = 100\text{ Hz}$, $di_p/dt \leq 8\text{ A}/\mu\text{s}$ | 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 |

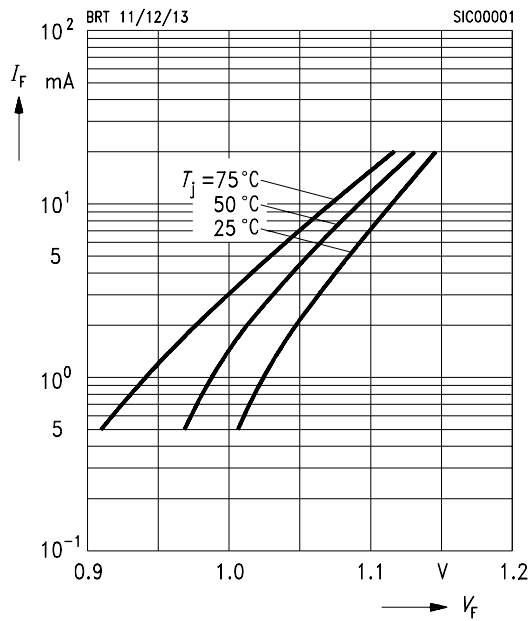
- 1) Test AC voltage in acc. with DIN 57883, June 1980
- 2) Static air, SITAC soldered in pcb or base plate.
- 3) The SITAC switch is soldered in pcb or base plate.
- 4) Thermocouple measurement has to be performed potentially separated to A1 and A2. The measuring junction should be as near as possible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

Characteristics

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

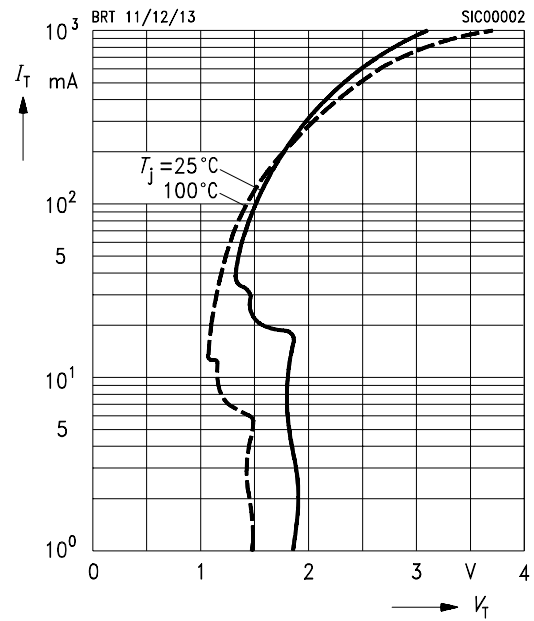
Typical input characteristics

$$I_F = f(V_F)$$



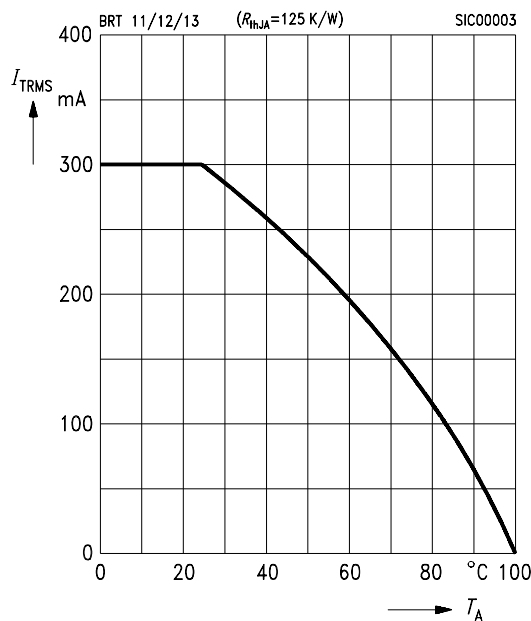
Typical output characteristics

$$I_T = f(V_T)$$



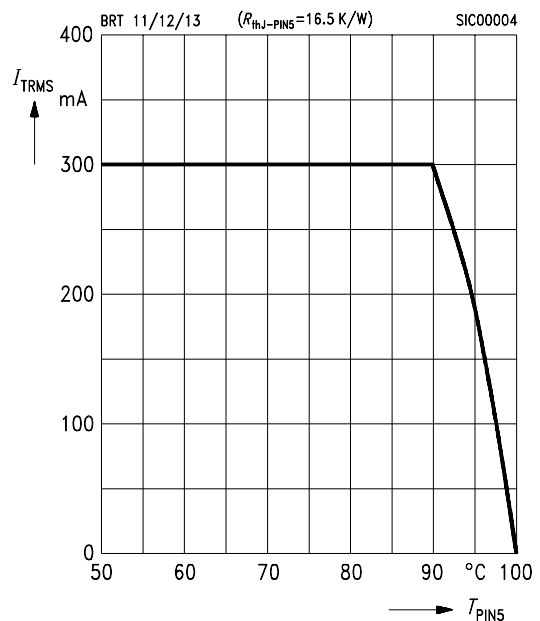
Current reduction $I_{TRMS} = f(T_A)$

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

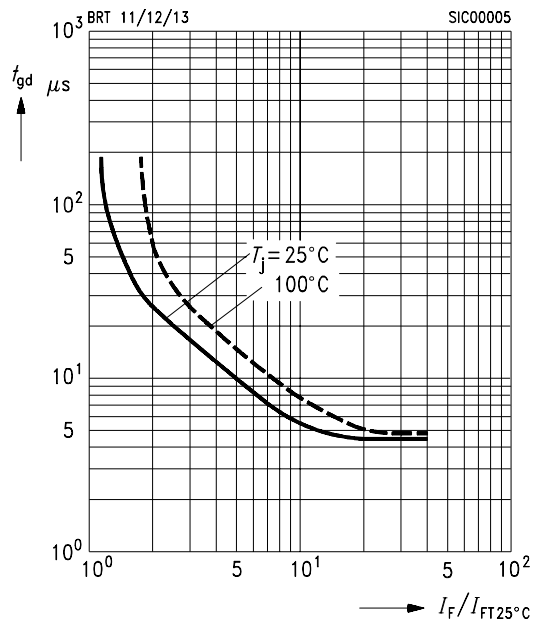


Current reduction $I_{TRMS} = f(T_{PIN5})$

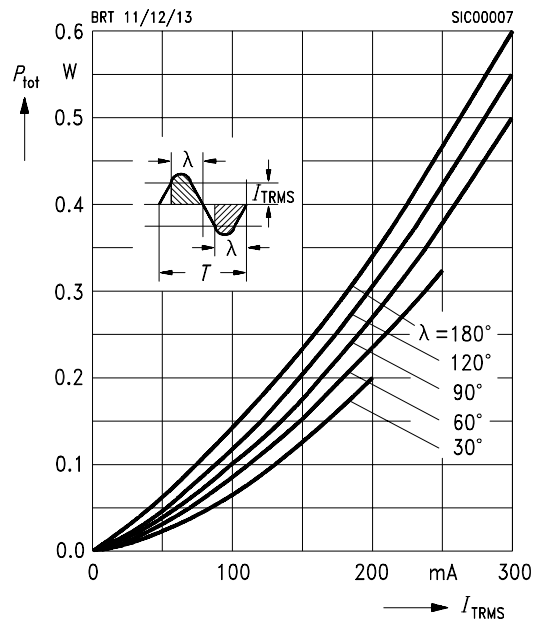
$$R_{thJ-PIN5} = 16,5\text{ K/W }^4$$



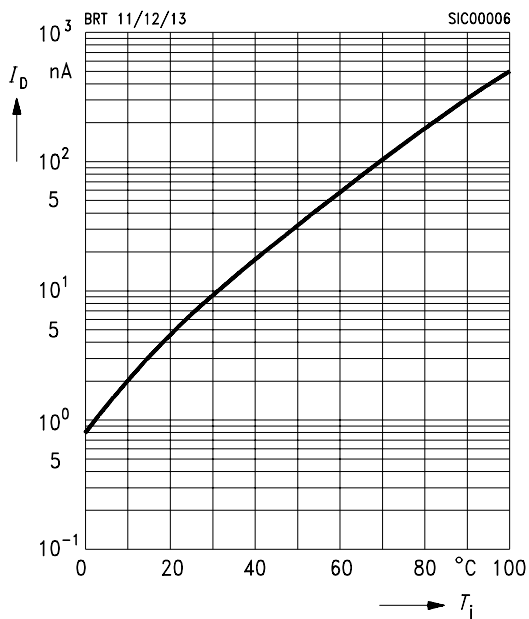
Typical trigger delay time $t_{gd} = f(I_F/I_{FT25^\circ C})$
 $V_D = 200V$



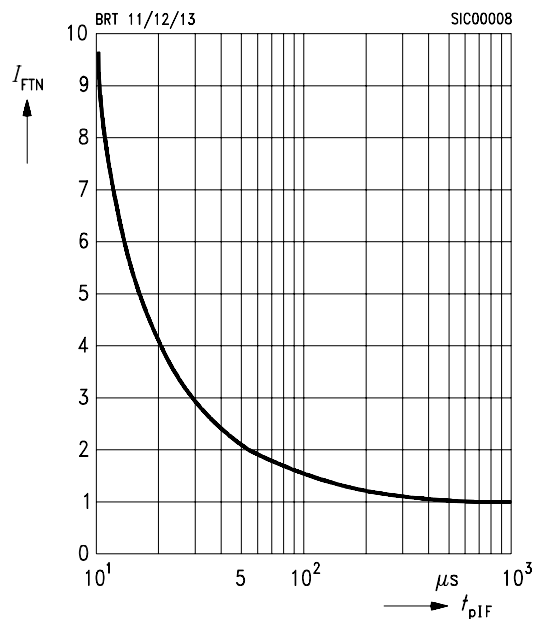
Power dissipation for 40 ... 60 Hz
 line operation
 $P_{tot} = f(I_{TRMS})$



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.





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