



BZT52H-A series

Voltage regulator diodes

Rev. 1 — 25 January 2022

Product data sheet

1. General description

General-purpose Zener diodes in an SOD123F small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Total power dissipation: ≤ 830 mW
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Small plastic package suitable for surface-mounted design
- Very tight tolerance: $\pm 1\%$

3. Applications

- General regulation functions

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 10$ mA	[1]	-	0.9	V
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[2]	-	375	mW
			[3]	-	830	mW

[1] Pulse test: $t_p \leq 300$ μ s; $\delta \leq 0.02$.

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

5. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode		
2	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BZT52H-A2V4 to BZT52H-A75	-	plastic surface-mounted package; 2 leads	SOD123F

7. Marking

Table 4. Marking codes

Type number	Marking code	Type number	Marking code	Type number	Marking code	Type number	Marking code
BZT52H-A2V4	FT	BZT52H-A6V2	G4	BZT52H-A16	GE	BZT52H-A43	GY
BZT52H-A2V7	FU	BZT52H-A6V8	G5	BZT52H-A18	GF	BZT52H-A47	GR
BZT52H-A3V0	FV	BZT52H-A7V5	G6	BZT52H-A20	GG	BZT52H-A51	GS
BZT52H-A3V3	FW	BZT52H-A8V2	G7	BZT52H-A22	GH	BZT52H-A56	GT
BZT52H-A3V6	FX	BZT52H-A9V1	G8	BZT52H-A24	GJ	BZT52H-A62	GU
BZT52H-A3V9	FY	BZT52H-A10	G9	BZT52H-A27	GK	BZT52H-A68	GV
BZT52H-A4V3	FZ	BZT52H-A11	GA	BZT52H-A30	GL	BZT52H-A75	GW
BZT52H-A4V7	G1	BZT52H-A12	GB	BZT52H-A33	GM	-	-
BZT52H-A5V1	G2	BZT52H-A13	GC	BZT52H-A36	GN	-	-
BZT52H-A5V6	G3	BZT52H-A15	GD	BZT52H-A39	GP	-	-

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
I_F	forward current		-	250	mA
I_{ZSM}	non-repetitive peak reverse current		-	see Table 8,9 and 10	
P_{ZSM}	non-repetitive peak reverse power dissipation		[1] -	40	W
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[2] -	375	mW
			[3] -	830	mW
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-65	+150	°C
T_{stg}	storage temperature		-65	+150	°C

[1] $t_p = 100\ \mu\text{s}$; square wave; $T_j = 25\text{ °C}$ prior to surge.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] -	-	330	K/W
			[2] -	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3] -	-	70	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

[3] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics
 $T_j = 25\text{ °C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 10\text{ mA}$	[1]	-	0.9	V

[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

Table 8. Characteristics per type; BZT52H-A2V4 to BZT52H-A24
 $T_j = 25\text{ °C}$ unless otherwise specified.

BZT52H -xxx	Sel	Working voltage V_Z (V); $I_Z = 5\text{ mA}$		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K); $I_Z = 5\text{ mA}$		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	$I_Z = 1\text{ mA}$	$I_Z = 5\text{ mA}$	Max	V_R (V)	Min	Max	Max	Max
2V4	A	2.37	2.43	400	85	50	1	-3.5	0.0	450	6.0
2V7	A	2.67	2.73	500	83	20	1	-3.5	0.0	450	6.0
3V0	A	2.97	3.03	500	95	10	1	-3.5	0.0	450	6.0
3V3	A	3.26	3.34	500	95	5	1	-3.5	0.0	450	6.0
3V6	A	3.56	3.64	500	95	5	1	-3.5	0.0	450	6.0
3V9	A	3.86	3.94	500	95	3	1	-3.5	0.0	450	6.0
4V3	A	4.25	4.35	500	95	3	1	-3.5	0.0	450	6.0
4V7	A	4.65	4.75	500	78	3	2	-3.5	0.2	300	6.0
5V1	A	5.04	5.16	480	60	2	2	-2.7	1.2	300	6.0
5V6	A	5.54	5.66	400	40	1	2	-2.0	2.5	300	6.0
6V2	A	6.13	6.27	150	10	3	4	0.4	3.7	200	6.0
6V8	A	6.73	6.87	80	8	2	4	1.2	4.5	200	6.0
7V5	A	7.42	7.58	80	10	1	5	2.5	5.3	150	4.0
8V2	A	8.11	8.29	80	10	0.7	5	3.2	6.2	150	4.0
9V1	A	9.00	9.20	100	10	0.5	6	3.8	7.0	150	3.0
10	A	9.90	10.10	70	10	0.2	7	4.5	8.0	90	3.0
11	A	10.89	11.11	70	10	0.1	8	5.4	9.0	85	2.5
12	A	11.88	12.12	90	10	0.1	8	6.0	10.0	85	2.5
13	A	12.87	13.13	110	10	0.1	8	7.0	11.0	80	2.5
15	A	14.85	15.15	110	15	0.05	10.5	9.2	13.0	75	2.0
16	A	15.84	16.16	170	20	0.05	11.2	10.4	14.0	75	1.5
18	A	17.82	18.18	170	20	0.05	12.6	12.4	16.0	70	1.5
20	A	19.80	20.20	220	20	0.05	14	14.4	18.0	60	1.5
22	A	21.78	22.22	220	25	0.05	15.4	16.4	20.0	60	1.25
24	A	23.76	24.24	220	30	0.05	16.8	18.4	22.0	55	1.25

[1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$.

[2] $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$.

Table 9. Characteristics per type; BZT52H-A27 to BZT52H-A51

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

BZT52H -xxx	Sel	Working voltage V_Z (V); $I_Z = 2\text{ mA}$		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K); $I_Z = 2\text{ mA}$		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	$I_Z = 1\text{ mA}$	$I_Z = 5\text{ mA}$	Max	V_R (V)	Min	Max	Max	Max
27	A	26.73	27.27	250	40	0.05	18.9	21.4	25.3	50	1.0
30	A	29.70	30.30	250	40	0.05	21	24.4	29.4	50	1.0
33	A	32.67	33.33	250	40	0.05	23.1	27.4	33.4	45	0.9
36	A	35.64	36.36	250	60	0.05	25.2	30.4	37.4	45	0.8
39	A	38.61	39.39	300	75	0.05	27.3	33.4	41.2	45	0.7
43	A	42.57	43.43	325	80	0.05	30.1	37.6	46.6	40	0.6
47	A	46.53	47.47	325	90	0.05	32.9	42.0	51.8	40	0.5
51	A	50.49	51.51	350	100	0.05	35.7	46.6	57.2	40	0.4

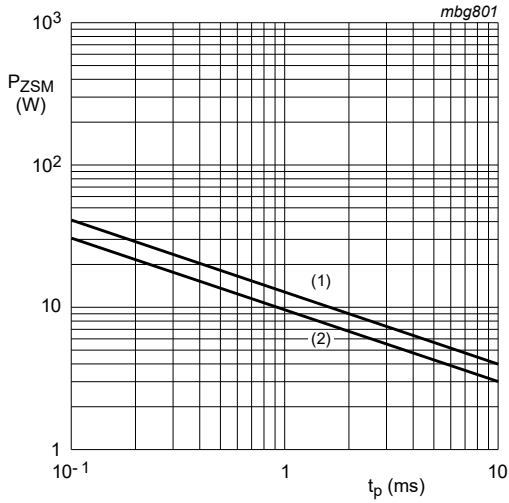
[1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$.[2] $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$.

Table 10. Characteristics per type; BZT52H-A56 to BZT52H-A75

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

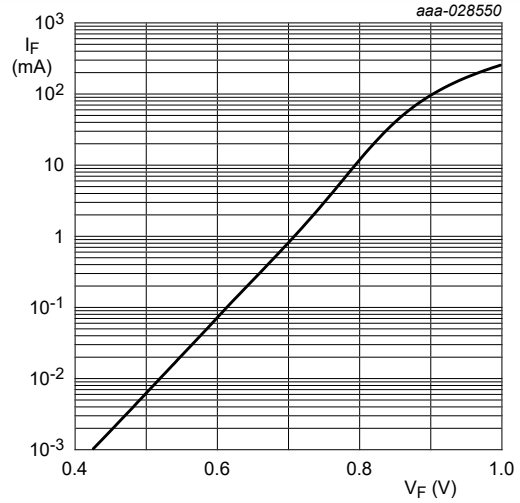
BZT52H -xxx	Sel	Working voltage V_Z (V); $I_Z = 2\text{ mA}$		Maximum differential resistance r_{dif} (Ω)		Reverse current I_R (μA)		Temperature coefficient S_Z (mV/K); $I_Z = 2\text{ mA}$		Diode capacitance C_d (pF) [1]	Non-repetitive peak reverse current I_{ZSM} (A) [2]
		Min	Max	$I_Z = 0.5\text{ mA}$	$I_Z = 2\text{ mA}$	Max	V_R (V)	Min	Max	Max	Max
56	A	55.44	56.56	375	120	0.05	39.2	52.2	63.8	40	0.3
62	A	61.38	62.62	400	140	0.05	43.4	58.8	71.6	35	0.3
68	A	67.32	68.68	400	160	0.05	47.6	65.6	79.8	35	0.25
75	A	74.25	75.75	400	175	0.05	52.5	73.4	88.6	35	0.20

[1] $f = 1\text{ MHz}$; $V_R = 0\text{ V}$.[2] $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$.



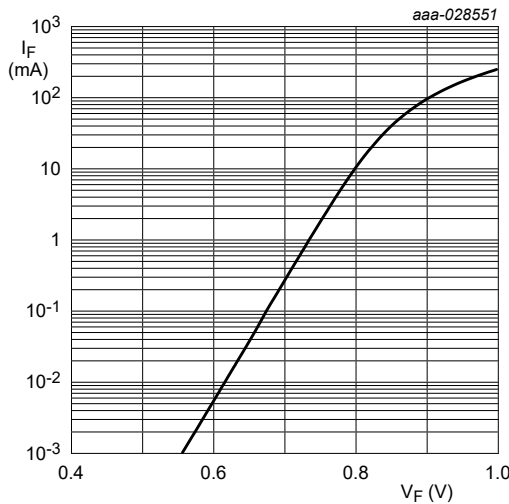
(1) $T_j = 25^\circ\text{C}$ (before surge)
 (2) $T_j = 150^\circ\text{C}$ (before surge)

Fig. 1. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values



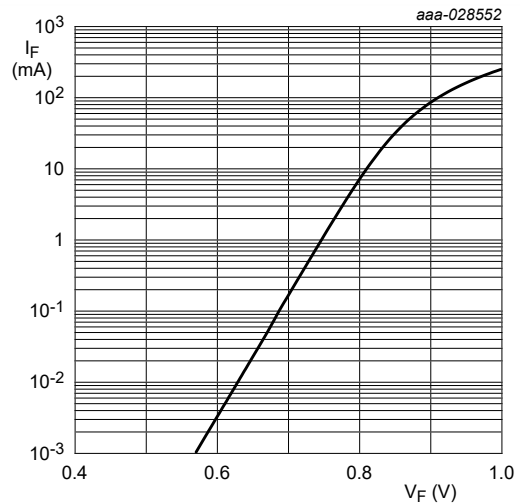
$T_j = 25^\circ\text{C}$

Fig. 2. Forward current as a function of forward voltage; typical values (BZT52H-A2V4)



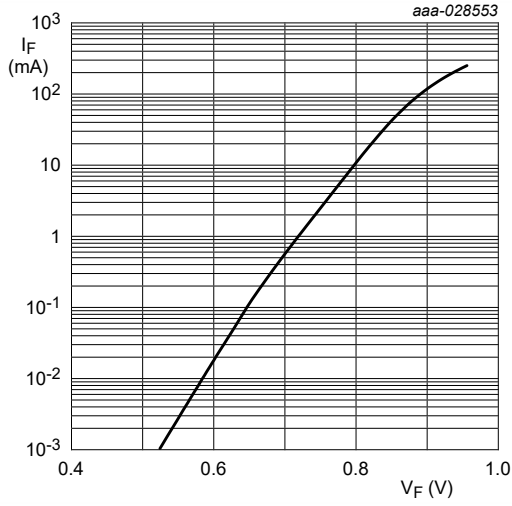
$T_j = 25^\circ\text{C}$

Fig. 3. Forward current as a function of forward voltage; typical values (BZT52H-A6V8)



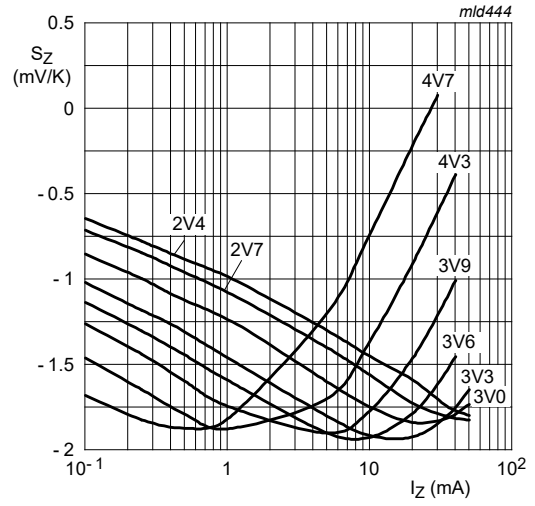
$T_j = 25^\circ\text{C}$

Fig. 4. Forward current as a function of forward voltage; typical values (BZT52H-A7V5)



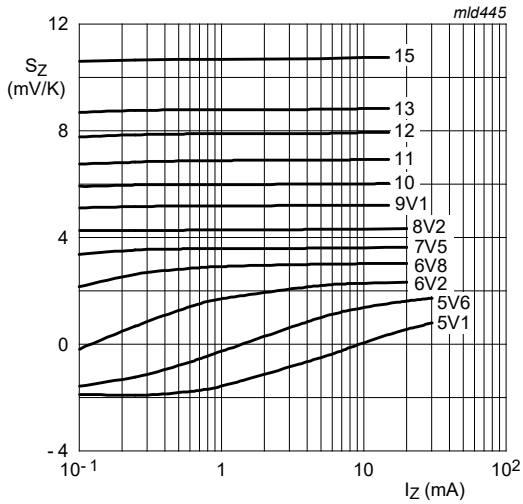
$T_j = 25\text{ °C}$

Fig. 5. Forward current as a function of forward voltage; typical values (BZT52H-A75)



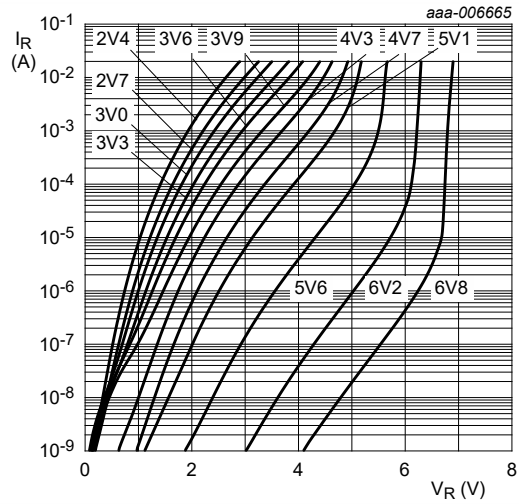
$T_j = 25\text{ °C to }150\text{ °C}$

Fig. 6. Temperature coefficient as a function of working current; typical values (BZT52H-A2V4 to BZT52H-A4V7)



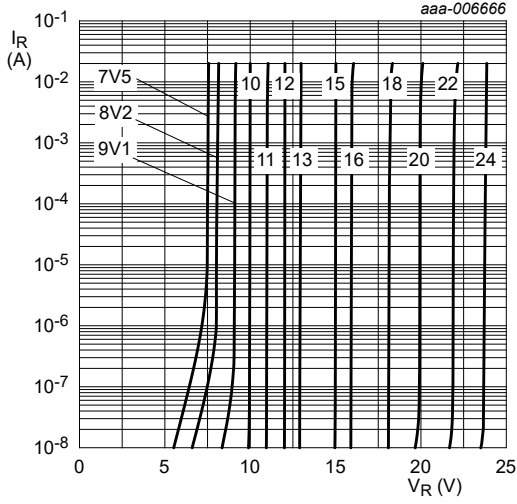
$T_j = 25\text{ °C to }150\text{ °C}$

Fig. 7. Temperature coefficient as a function of working current; typical values (BZT52H-A5V1 to BZT52H-A15)



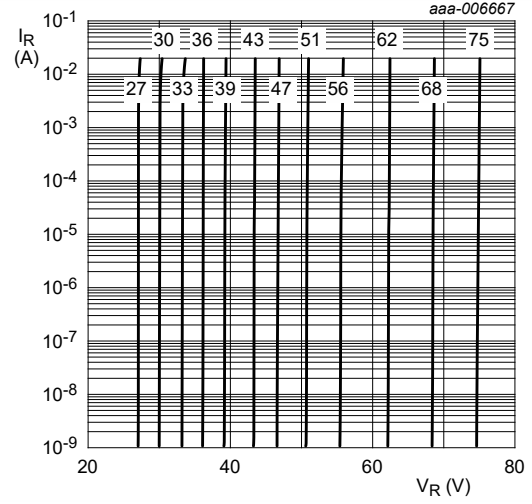
$T_j = 25\text{ °C}$

Fig. 8. Reverse current as a function of reverse voltage; typical values (BZT52H-A2V4 to BZT52H-A6V8)



$T_j = 25\text{ }^\circ\text{C}$

Fig. 9. Reverse current as a function of reverse voltage; typical values (BZT52H-A7V5 to BZT52H-A24)



$T_j = 25\text{ }^\circ\text{C}$

Fig. 10. Reverse current as a function of reverse voltage; typical values (BZT52H-A27 to BZT52H-A75)

11. Package outline

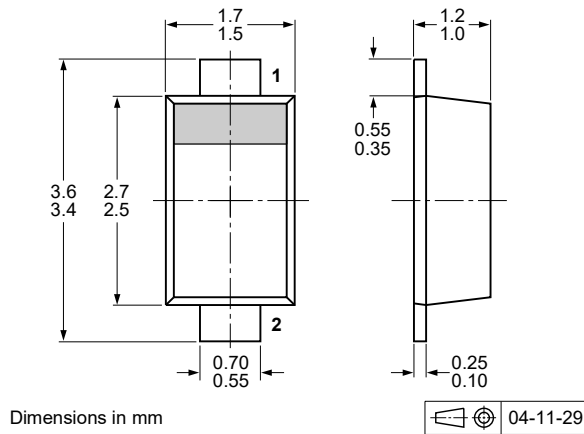
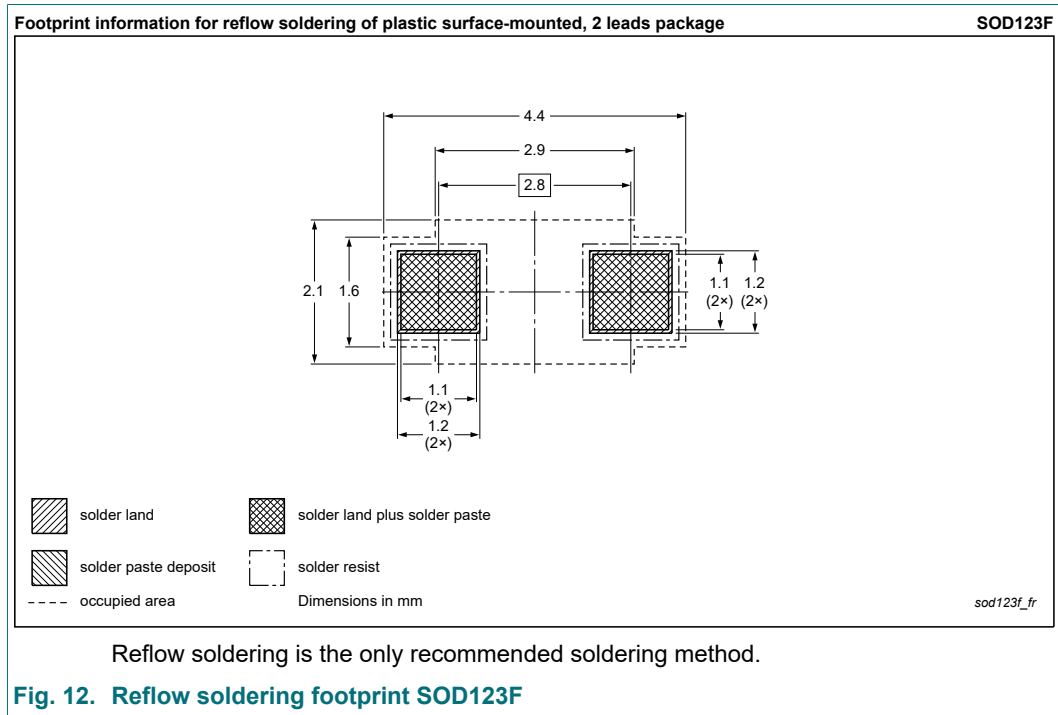


Fig. 11. Package outline SOD123F

12. Soldering



13. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BZT52H-A_SER v.1	20220125	Product data sheet	-	-

14. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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