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HIGH RIPPLE-REJECTION LOW DROPOUT CMOS VOLTAGE REGULATOR WITH RESET FUNCTION

The S-1701 Series, developed based on CMOS technology, is a voltage regulator with a reset function and integrates a high-accuracy voltage detector with on-chip delay circuit and a positive voltage regulator with a low dropout voltage and high output voltage on one chip.

The S-1701 Series is available in many types according to the selection of the voltage detector block of the voltage detector, including a SENSE pin input product. A built-in low on-resistance transistor provides a low dropout voltage and large output current.

Small ceramic capacitors are available and an external capacitor for delay is needless. Small SOT-23-5 and SOT-89-5 packages realize high-density mounting.

■ Features

Regulator block

- Output voltage: 1.5 V to 5.0 V, selectable in 0.1 V steps.
- High-accuracy output voltage: $\pm 1.0\%$
- High peak current capability: 400 mA output is possible (at $V_{IN} \geq V_{OUT(S)} + 2.0 \text{ V}$)^{*1}
- Built-in ON/OFF circuit: Ensures long battery life.
During power-off: 0.1 μA typ., 1.0 μA max.
- Low ESR capacitor can be used: A ceramic capacitor of 1.0 μF or more can be used for the output capacitor.
- High ripple rejection: 70 dB typ. (at 1.0 kHz)
- Built-in overcurrent protector: Overcurrent of output transistor can be restricted.
- Operating voltage range: 2.0 V to 6.5 V

Detector block

- Output voltage: 1.5 V to 5.5 V, selectable in 0.1 V steps.
- High-accuracy output voltage: $\pm 1.0\%$
- Output mode: Nch open-drain active low output
- No need of an external capacitor for delay
- Three delay time settings: No delay (60 μs), 50 ms, 100 ms
- Operating voltage range: 0.8 V to 6.5 V

Whole regulator

- Low current consumption During operation: 85 μA typ.
- Lead-free, Sn 100%, halogen-free^{*2}

*1. Attention should be paid to the power dissipation of the package when the output current is large.

*2. Refer to “■ Product Name Structure” for details.

■ Applications

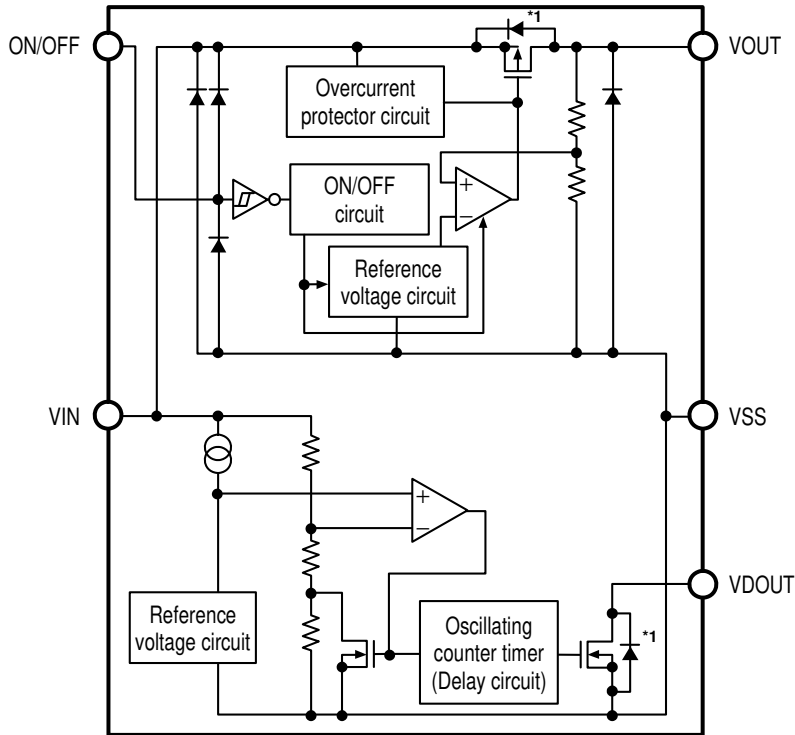
- Power supply and reset circuit for battery-powered devices
- Power supply for personal communication devices
- Power supply for home appliances

■ Packages

- SOT-23-5
- SOT-89-5

■ **Block Diagrams**

1. **S-1701 Series A/B/C/G/H/J types**

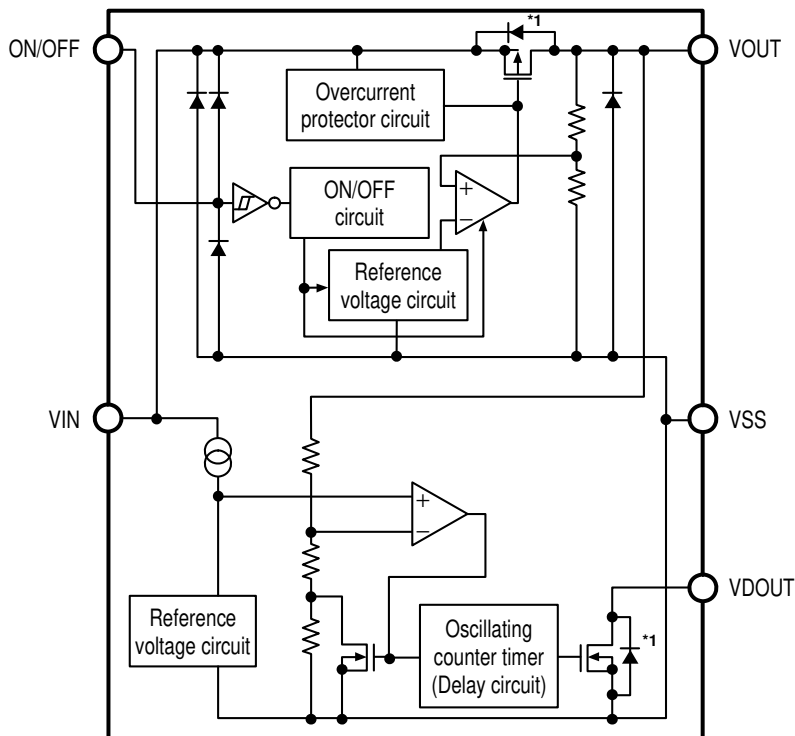


ON/OFF pin :	Provided
SENSE pin :	VIN connection

*1. Parasitic diode

Figure 1

2. **S-1701 Series D/E/F/K/L/M types**

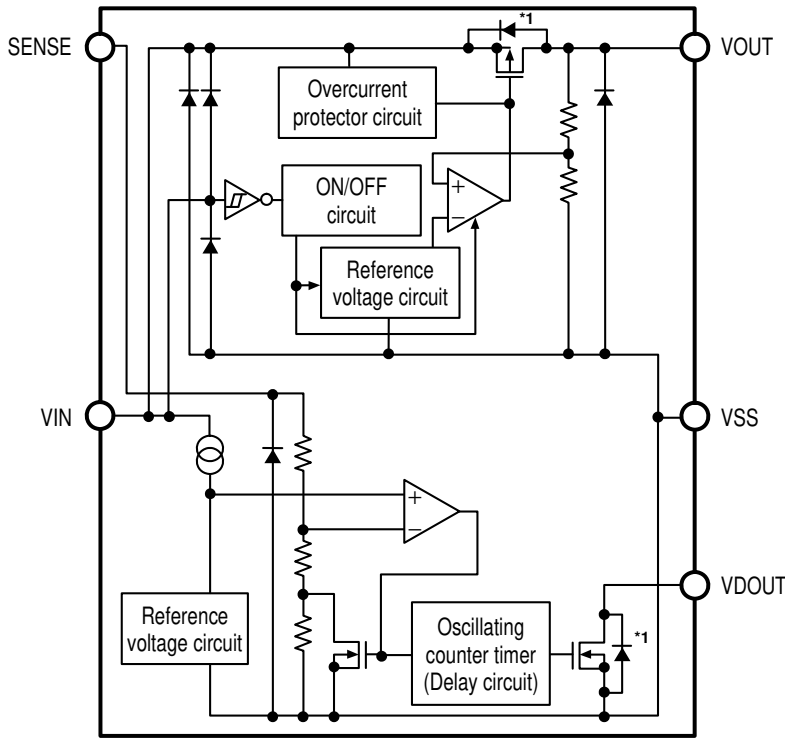


ON/OFF pin :	Provided
SENSE pin :	VOUT connection

*1. Parasitic diode

Figure 2

3. S-1701 Series N/P/Q types

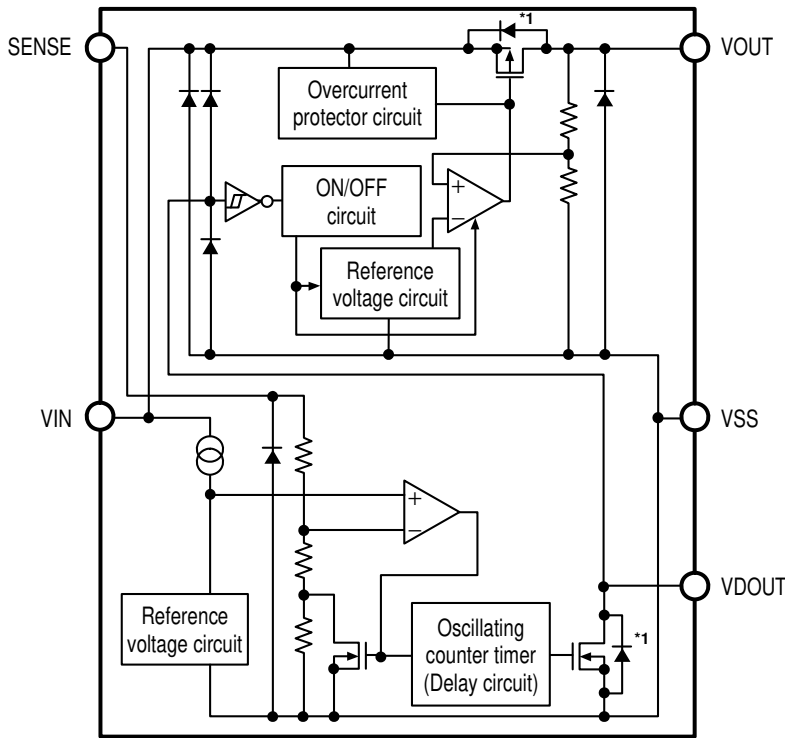


ON/OFF pin :	VIN connection
SENSE pin :	Provided

*1. Parasitic diode

Figure 3

4. S-1701 Series R/S/T types

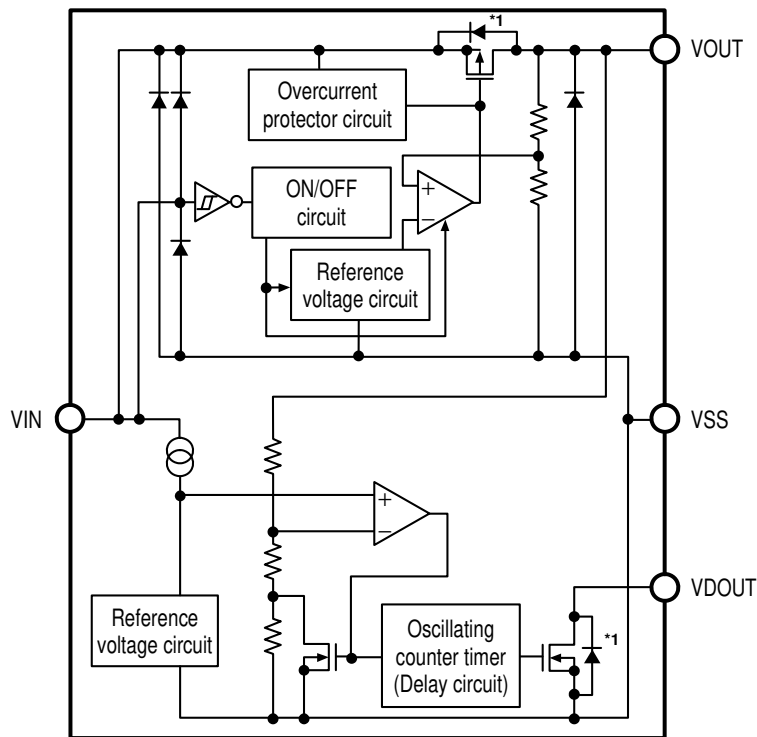


ON/OFF pin :	VDOUT connection
SENSE pin :	Provided

*1. Parasitic diode

Figure 4

5. S-1701 Series U/V/W types

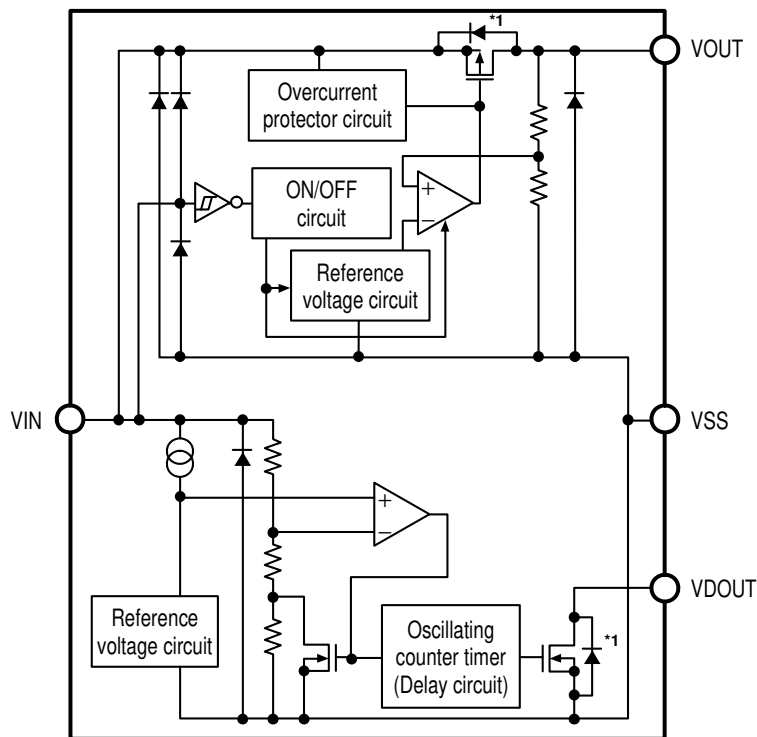


ON/OFF pin :	VIN connection
SENSE pin :	VOUT connection

*1. Parasitic diode

Figure 5

6. S-1701 Series X/Y/Z types



ON/OFF pin :	VIN connection
SENSE pin :	VIN connection

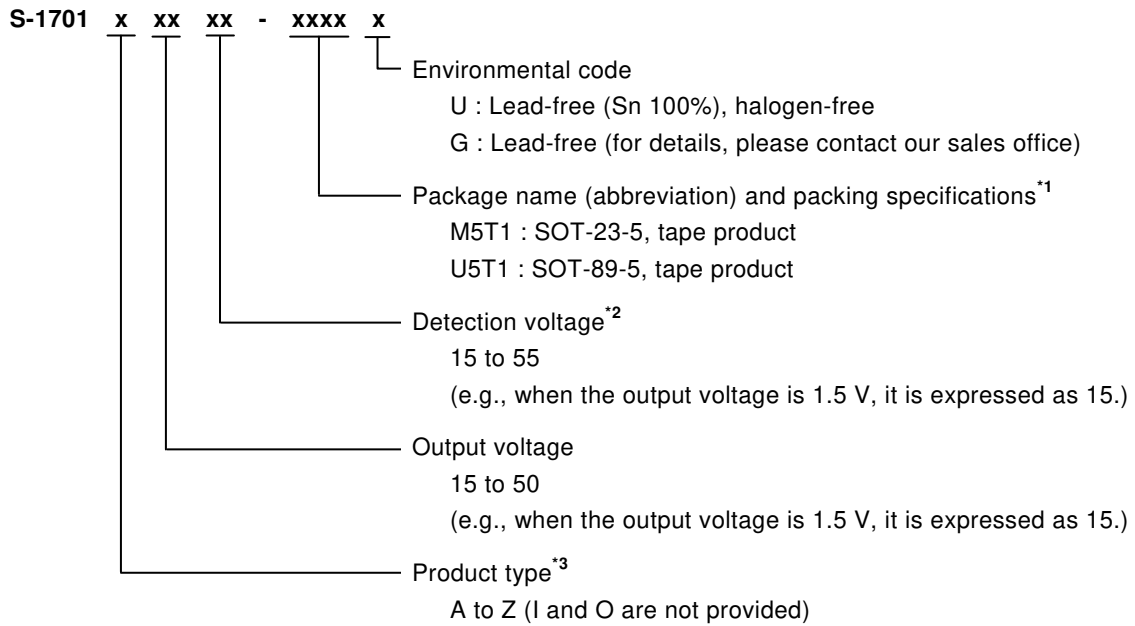
*1. Parasitic diode

Figure 6

■ **Product Name Structure**

The product types, output voltage, detection voltage, and package types for the S-1701 Series can be selected at the user's request. Refer to the "1. Product name" for the meanings of the characters in the product name, "2. Function list according to product type" for product types, "3. Package" regarding the package drawings and "4. Product name list" for the full product names.

1. Product name



*1. Refer to the tape specifications at the end of this book.

*2. In the S-1701D to S-1701F, S-1701K to S-1701M, and S-1701U to S-1701W types (that detect output voltage), a reset signal may be output due to the undershoot of the output voltage when the input voltage or load current changes transiently. Therefore, set the detection voltage after sufficient evaluation using actual devices.

*3. Refer to the "2. Function list according to product type".

2. Function list according to product type

Table 1

Product Type	Regulator Block		Detector Block	
	ON/OFF Pin	ON/OFF Logic	SENSE Pin	Release Delay Time
A	Provided	Active high	VIN connection (pin not provided)	No delay (60 μs)
B	Provided	Active high	VIN connection (pin not provided)	50 ms
C	Provided	Active high	VIN connection (pin not provided)	100 ms
D	Provided	Active high	VOUT connection (pin not provided)	No delay (60 μs)
E	Provided	Active high	VOUT connection (pin not provided)	50 ms
F	Provided	Active high	VOUT connection (pin not provided)	100 ms
G	Provided	Active low	VIN connection (pin not provided)	No delay (60 μs)
H	Provided	Active low	VIN connection (pin not provided)	50 ms
J	Provided	Active low	VIN connection (pin not provided)	100 ms
K	Provided	Active low	VOUT connection (pin not provided)	No delay (60 μs)
L	Provided	Active low	VOUT connection (pin not provided)	50 ms
M	Provided	Active low	VOUT connection (pin not provided)	100 ms
N	VIN connection (pin not provided)	None	Provided	No delay (60 μs)
P	VIN connection (pin not provided)	None	Provided	50 ms
Q	VIN connection (pin not provided)	None	Provided	100 ms
R	VDOUT connection (pin not provided)	None	Provided	No delay (60 μs)
S	VDOUT connection (pin not provided)	None	Provided	50 ms
T	VDOUT connection (pin not provided)	None	Provided	100 ms
U	VIN connection (pin not provided)	None	VOUT connection (pin not provided)	No delay (60 μs)
V	VIN connection (pin not provided)	None	VOUT connection (pin not provided)	50 ms
W	VIN connection (pin not provided)	None	VOUT connection (pin not provided)	100 ms
X	VIN connection (pin not provided)	None	VIN connection (pin not provided)	No delay (60 μs)
Y	VIN connection (pin not provided)	None	VIN connection (pin not provided)	50 ms
Z	VIN connection (pin not provided)	None	VIN connection (pin not provided)	100 ms

3. Package

Package Name	Drawing Code		
	Package	Tape	Reel
SOT-23-5	MP005-A-P-SD	MP005-A-C-SD	MP005-A-R-SD
SOT-89-5	UP005-A-P-SD	UP005-A-C-SD	UP005-A-R-SD

4. Product name list

4.1 S-1701 Series A type

ON/OFF pin : Provided ON/OFF logic : Active high
 SENSE pin : VIN connection Release delay time : No delay (60 μs)

Table 2

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	4.1 V ± 1.0%	S-1701A1541-M5T1x	–
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701A1815-M5T1x	S-1701A1815-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701A2520-M5T1x	S-1701A2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701A2521-M5T1x	S-1701A2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701A2522-M5T1x	S-1701A2522-U5T1x
2.7 V ± 1.0%	2.8 V ± 1.0%	S-1701A2728-M5T1x	–
2.8 V ± 1.0%	2.5 V ± 1.0%	S-1701A2825-M5T1x	–
2.8 V ± 1.0%	3.3 V ± 1.0%	S-1701A2833-M5T1x	–
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701A3024-M5T1x	S-1701A3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701A3025-M5T1x	S-1701A3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701A3026-M5T1x	S-1701A3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701A3326-M5T1x	S-1701A3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701A3327-M5T1x	S-1701A3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701A3328-M5T1x	S-1701A3328-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	S-1701A3330-M5T1x	–
3.3 V ± 1.0%	3.1 V ± 1.0%	S-1701A3331-M5T1x	–
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701A3430-M5T1x	S-1701A3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701A5040-M5T1x	S-1701A5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701A5041-M5T1x	S-1701A5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701A5042-M5T1x	S-1701A5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701A5043-M5T1x	S-1701A5043-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4.2 S-1701 Series B type

ON/OFF pin : Provided ON/OFF logic : Active high
 SENSE pin : VIN connection Release delay time : 50 ms

Table 3

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701B1815-M5T1x	S-1701B1815-U5T1x
1.8 V ± 1.0%	2.3 V ± 1.0%	S-1701B1823-M5T1x	–
1.8 V ± 1.0%	2.8 V ± 1.0%	S-1701B1828-M5T1x	–
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701B2520-M5T1x	S-1701B2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701B2521-M5T1x	S-1701B2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701B2522-M5T1x	S-1701B2522-U5T1x
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701B3024-M5T1x	S-1701B3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701B3025-M5T1x	S-1701B3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701B3026-M5T1x	S-1701B3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701B3326-M5T1x	S-1701B3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701B3327-M5T1x	S-1701B3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701B3328-M5T1x	S-1701B3328-U5T1x
3.3 V ± 1.0%	4.2 V ± 1.0%	–	S-1701B3342-U5T1x
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701B3430-M5T1x	S-1701B3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701B5040-M5T1x	S-1701B5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701B5041-M5T1x	S-1701B5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701B5042-M5T1x	S-1701B5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701B5043-M5T1x	S-1701B5043-U5T1x

4.3 S-1701 Series C type

ON/OFF pin : Provided ON/OFF logic : Active high
 SENSE pin : VIN connection Release delay time : 100 ms

Table 4

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701C1815-M5T1x	S-1701C1815-U5T1x
1.8 V ± 1.0%	3.0 V ± 1.0%	–	S-1701C1830-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701C2520-M5T1x	S-1701C2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701C2521-M5T1x	S-1701C2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701C2522-M5T1x	S-1701C2522-U5T1x
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701C3024-M5T1x	S-1701C3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701C3025-M5T1x	S-1701C3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701C3026-M5T1x	S-1701C3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701C3326-M5T1x	S-1701C3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701C3327-M5T1x	S-1701C3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701C3328-M5T1x	S-1701C3328-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	S-1701C3330-M5T1x	–
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701C3430-M5T1x	S-1701C3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701C5040-M5T1x	S-1701C5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701C5041-M5T1x	S-1701C5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701C5042-M5T1x	S-1701C5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701C5043-M5T1x	S-1701C5043-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4.4 S-1701 Series D type

ON/OFF pin : Provided
 SENSE pin : VOUT connection
 ON/OFF logic : Active high
 Release delay time : No delay (60 μs)

Table 5

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701D1815-M5T1x	S-1701D1815-U5T1x
1.8 V ± 1.0%	1.6 V ± 1.0%	S-1701D1816-M5T1x	–
1.8 V ± 1.0%	1.7 V ± 1.0%	S-1701D1817-M5T1x	–
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701D2520-M5T1x	S-1701D2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701D2521-M5T1x	S-1701D2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701D2522-M5T1x	S-1701D2522-U5T1x
2.5 V ± 1.0%	2.3 V ± 1.0%	S-1701D2523-M5T1x	–
2.5 V ± 1.0%	2.4 V ± 1.0%	S-1701D2524-M5T1x	–
2.5 V ± 1.0%	2.6 V ± 1.0%	S-1701D2526-M5T1x	–
2.7 V ± 1.0%	2.2 V ± 1.0%	S-1701D2722-M5T1x	–
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701D3024-M5T1x	S-1701D3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701D3025-M5T1x	S-1701D3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701D3026-M5T1x	S-1701D3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701D3326-M5T1x	S-1701D3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701D3327-M5T1x	S-1701D3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701D3328-M5T1x	S-1701D3328-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	S-1701D3330-M5T1x	–
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701D3430-M5T1x	S-1701D3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701D5040-M5T1x	S-1701D5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701D5041-M5T1x	S-1701D5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701D5042-M5T1x	S-1701D5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701D5043-M5T1x	S-1701D5043-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4.5 S-1701 Series E type

ON/OFF pin : Provided ON/OFF logic : Active high
SENSE pin : VOUT connection Release delay time : 50 ms

Table 6

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701E1815-M5T1x	S-1701E1815-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701E2520-M5T1x	S-1701E2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701E2521-M5T1x	S-1701E2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701E2522-M5T1x	S-1701E2522-U5T1x
2.7 V ± 1.0%	2.2 V ± 1.0%	S-1701E2722-M5T1x	—
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701E3024-M5T1x	S-1701E3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701E3025-M5T1x	S-1701E3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701E3026-M5T1x	S-1701E3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701E3326-M5T1x	S-1701E3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701E3327-M5T1x	S-1701E3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701E3328-M5T1x	S-1701E3328-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	S-1701E3330-M5T1x	—
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701E3430-M5T1x	S-1701E3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701E5040-M5T1x	S-1701E5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701E5041-M5T1x	S-1701E5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701E5042-M5T1x	S-1701E5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701E5043-M5T1x	S-1701E5043-U5T1x

4.6 S-1701 Series F type

ON/OFF pin : Provided ON/OFF logic : Active high
SENSE pin : VOUT connection Release delay time : 100 ms

Table 7

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701F1815-M5T1x	S-1701F1815-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701F2520-M5T1x	S-1701F2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701F2521-M5T1x	S-1701F2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701F2522-M5T1x	S-1701F2522-U5T1x
2.7 V ± 1.0%	2.2 V ± 1.0%	S-1701F2722-M5T1x	—
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701F3024-M5T1x	S-1701F3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701F3025-M5T1x	S-1701F3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701F3026-M5T1x	S-1701F3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701F3326-M5T1x	S-1701F3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701F3327-M5T1x	S-1701F3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701F3328-M5T1x	S-1701F3328-U5T1x
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701F3430-M5T1x	S-1701F3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701F5040-M5T1x	S-1701F5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701F5041-M5T1x	S-1701F5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701F5042-M5T1x	S-1701F5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701F5043-M5T1x	S-1701F5043-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4.7 S-1701 Series G type

ON/OFF pin : Provided ON/OFF logic : Active low
 SENSE pin : VIN connection Release delay time : No delay (60 μs)

Table 8

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
2.5 V ± 1.0%	2.4 V ± 1.0%	S-1701G2524-M5T1x	–
3.3 V ± 1.0%	3.1 V ± 1.0%	S-1701G3331-M5T1x	–

4.8 S-1701 Series H type

ON/OFF pin : Provided ON/OFF logic : Active low
 SENSE pin : VIN connection Release delay time : 50 ms

Table 9

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
5.0 V ± 1.0%	4.5 V ± 1.0%	–	S-1701H5045-U5T1x

4.9 S-1701 Series M type

ON/OFF pin : Provided ON/OFF logic : Active low
 SENSE pin : VOUT connection Release delay time : 100 ms

Table 10

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701M1815-M5T1x	–

4.10 S-1701 Series N type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : Provided Release delay time : No delay (60 μs)

Table 11

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	1.5 V ± 1.0%	S-1701N1515-M5T1x	S-1701N1515-U5T1x
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701N1815-M5T1x	S-1701N1815-U5T1x
1.8 V ± 1.0%	2.4 V ± 1.0%	–	S-1701N1824-U5T1x
1.8 V ± 1.0%	2.7 V ± 1.0%	S-1701N1827-M5T1x	–
2.5 V ± 1.0%	1.5 V ± 1.0%	S-1701N2515-M5T1x	S-1701N2515-U5T1x
2.7 V ± 1.0%	1.5 V ± 1.0%	S-1701N2715-M5T1x	S-1701N2715-U5T1x
2.7 V ± 1.0%	2.4 V ± 1.0%	S-1701N2724-M5T1x	S-1701N2724-U5T1x
3.0 V ± 1.0%	1.5 V ± 1.0%	S-1701N3015-M5T1x	S-1701N3015-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701N3315-M5T1x	S-1701N3315-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	S-1701N3330-M5T1x	S-1701N3330-U5T1x
5.0 V ± 1.0%	1.5 V ± 1.0%	S-1701N5015-M5T1x	S-1701N5015-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4. 11 S-1701 Series P type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : Provided Release delay time : 50 ms

Table 12

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	1.5 V ± 1.0%	S-1701P1515-M5T1x	S-1701P1515-U5T1x
1.5 V ± 1.0%	2.7 V ± 1.0%	S-1701P1527-M5T1x	–
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701P1815-M5T1x	S-1701P1815-U5T1x
2.5 V ± 1.0%	1.5 V ± 1.0%	S-1701P2515-M5T1x	S-1701P2515-U5T1x
2.7 V ± 1.0%	1.5 V ± 1.0%	S-1701P2715-M5T1x	S-1701P2715-U5T1x
2.8 V ± 1.0%	4.3 V ± 1.0%	–	S-1701P2843-U5T1x
2.8 V ± 1.0%	4.4 V ± 1.0%	–	S-1701P2844-U5T1x
3.0 V ± 1.0%	1.5 V ± 1.0%	S-1701P3015-M5T1x	S-1701P3015-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701P3315-M5T1x	S-1701P3315-U5T1x
5.0 V ± 1.0%	1.5 V ± 1.0%	S-1701P5015-M5T1x	S-1701P5015-U5T1x

4. 12 S-1701 Series Q type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : Provided Release delay time : 100 ms

Table 13

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	1.5 V ± 1.0%	S-1701Q1515-M5T1x	S-1701Q1515-U5T1x
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701Q1815-M5T1x	S-1701Q1815-U5T1x
2.5 V ± 1.0%	1.5 V ± 1.0%	S-1701Q2515-M5T1x	S-1701Q2515-U5T1x
2.7 V ± 1.0%	1.5 V ± 1.0%	S-1701Q2715-M5T1x	S-1701Q2715-U5T1x
3.0 V ± 1.0%	1.5 V ± 1.0%	S-1701Q3015-M5T1x	S-1701Q3015-U5T1x
3.2 V ± 1.0%	2.7 V ± 1.0%	–	S-1701Q3227-U5T1x
3.2 V ± 1.0%	4.2 V ± 1.0%	–	S-1701Q3242-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701Q3315-M5T1x	S-1701Q3315-U5T1x
5.0 V ± 1.0%	1.5 V ± 1.0%	S-1701Q5015-M5T1x	S-1701Q5015-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U
3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4. 13 S-1701 Series R type

ON/OFF pin : VDOUT connection ON/OFF logic : None
 SENSE pin : Provided Release delay time : No delay (60 μs)

Table 14

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	1.5 V ± 1.0%	S-1701R1515-M5T1x	S-1701R1515-U5T1x
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701R1815-M5T1x	S-1701R1815-U5T1x
2.5 V ± 1.0%	1.5 V ± 1.0%	S-1701R2515-M5T1x	S-1701R2515-U5T1x
2.7 V ± 1.0%	1.5 V ± 1.0%	S-1701R2715-M5T1x	S-1701R2715-U5T1x
3.0 V ± 1.0%	1.5 V ± 1.0%	S-1701R3015-M5T1x	S-1701R3015-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701R3315-M5T1x	S-1701R3315-U5T1x
5.0 V ± 1.0%	1.5 V ± 1.0%	S-1701R5015-M5T1x	S-1701R5015-U5T1x

4. 14 S-1701 Series S type

ON/OFF pin : VDOUT connection ON/OFF logic : None
 SENSE pin : Provided Release delay time : 50 ms

Table 15

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	1.5 V ± 1.0%	S-1701S1515-M5T1x	S-1701S1515-U5T1x
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701S1815-M5T1x	S-1701S1815-U5T1x
2.5 V ± 1.0%	1.5 V ± 1.0%	S-1701S2515-M5T1x	S-1701S2515-U5T1x
2.7 V ± 1.0%	1.5 V ± 1.0%	S-1701S2715-M5T1x	S-1701S2715-U5T1x
3.0 V ± 1.0%	1.5 V ± 1.0%	S-1701S3015-M5T1x	S-1701S3015-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701S3315-M5T1x	S-1701S3315-U5T1x
5.0 V ± 1.0%	1.5 V ± 1.0%	S-1701S5015-M5T1x	S-1701S5015-U5T1x

4. 15 S-1701 Series T type

ON/OFF pin : VDOUT connection ON/OFF logic : None
 SENSE pin : Provided Release delay time : 100 ms

Table 16

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	1.5 V ± 1.0%	S-1701T1515-M5T1x	S-1701T1515-U5T1x
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701T1815-M5T1x	S-1701T1815-U5T1x
2.5 V ± 1.0%	1.5 V ± 1.0%	S-1701T2515-M5T1x	S-1701T2515-U5T1x
2.7 V ± 1.0%	1.5 V ± 1.0%	S-1701T2715-M5T1x	S-1701T2715-U5T1x
3.0 V ± 1.0%	1.5 V ± 1.0%	S-1701T3015-M5T1x	S-1701T3015-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701T3315-M5T1x	S-1701T3315-U5T1x
3.3 V ± 1.0%	2.5 V ± 1.0%	S-1701T3325-M5T1x	—
5.0 V ± 1.0%	1.5 V ± 1.0%	S-1701T5015-M5T1x	S-1701T5015-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4. 16 S-1701 Series U type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : VOUT connection Release delay time : No delay (60 μs)

Table 17

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701U1815-M5T1x	S-1701U1815-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701U2520-M5T1x	S-1701U2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701U2521-M5T1x	S-1701U2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701U2522-M5T1x	S-1701U2522-U5T1x
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701U3024-M5T1x	S-1701U3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701U3025-M5T1x	S-1701U3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701U3026-M5T1x	S-1701U3026-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701U3326-M5T1x	S-1701U3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701U3327-M5T1x	S-1701U3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701U3328-M5T1x	S-1701U3328-U5T1x
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701U3430-M5T1x	S-1701U3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701U5040-M5T1x	S-1701U5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701U5041-M5T1x	S-1701U5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701U5042-M5T1x	S-1701U5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701U5043-M5T1x	S-1701U5043-U5T1x

4. 17 S-1701 Series V type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : VOUT connection Release delay time : 50 ms

Table 18

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701V1815-M5T1x	S-1701V1815-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701V2520-M5T1x	S-1701V2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701V2521-M5T1x	S-1701V2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701V2522-M5T1x	S-1701V2522-U5T1x
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701V3024-M5T1x	S-1701V3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701V3025-M5T1x	S-1701V3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701V3026-M5T1x	S-1701V3026-U5T1x
3.2 V ± 1.0%	2.7 V ± 1.0%	S-1701V3227-M5T1x	—
3.3 V ± 1.0%	2.5 V ± 1.0%	S-1701V3325-M5T1x	—
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701V3326-M5T1x	S-1701V3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701V3327-M5T1x	S-1701V3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701V3328-M5T1x	S-1701V3328-U5T1x
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701V3430-M5T1x	S-1701V3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701V5040-M5T1x	S-1701V5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701V5041-M5T1x	S-1701V5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701V5042-M5T1x	S-1701V5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701V5043-M5T1x	S-1701V5043-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4. 18 S-1701 Series W type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : VOUT connection Release delay time : 100 ms

Table 19

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.6 V ± 1.0%	2.6 V ± 1.0%	S-1701W1626-M5T1x	–
1.8 V ± 1.0%	1.5 V ± 1.0%	S-1701W1815-M5T1x	S-1701W1815-U5T1x
2.5 V ± 1.0%	2.0 V ± 1.0%	S-1701W2520-M5T1x	S-1701W2520-U5T1x
2.5 V ± 1.0%	2.1 V ± 1.0%	S-1701W2521-M5T1x	S-1701W2521-U5T1x
2.5 V ± 1.0%	2.2 V ± 1.0%	S-1701W2522-M5T1x	S-1701W2522-U5T1x
3.0 V ± 1.0%	2.4 V ± 1.0%	S-1701W3024-M5T1x	S-1701W3024-U5T1x
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701W3025-M5T1x	S-1701W3025-U5T1x
3.0 V ± 1.0%	2.6 V ± 1.0%	S-1701W3026-M5T1x	S-1701W3026-U5T1x
3.2 V ± 1.0%	2.7 V ± 1.0%	S-1701W3227-M5T1x	–
3.3 V ± 1.0%	2.4 V ± 1.0%	–	S-1701W3324-U5T1x
3.3 V ± 1.0%	2.6 V ± 1.0%	S-1701W3326-M5T1x	S-1701W3326-U5T1x
3.3 V ± 1.0%	2.7 V ± 1.0%	S-1701W3327-M5T1x	S-1701W3327-U5T1x
3.3 V ± 1.0%	2.8 V ± 1.0%	S-1701W3328-M5T1x	S-1701W3328-U5T1x
3.4 V ± 1.0%	3.0 V ± 1.0%	S-1701W3430-M5T1x	S-1701W3430-U5T1x
5.0 V ± 1.0%	4.0 V ± 1.0%	S-1701W5040-M5T1x	S-1701W5040-U5T1x
5.0 V ± 1.0%	4.1 V ± 1.0%	S-1701W5041-M5T1x	S-1701W5041-U5T1x
5.0 V ± 1.0%	4.2 V ± 1.0%	S-1701W5042-M5T1x	S-1701W5042-U5T1x
5.0 V ± 1.0%	4.3 V ± 1.0%	S-1701W5043-M5T1x	S-1701W5043-U5T1x

4. 19 S-1701 Series X type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : VIN connection Release delay time : No delay (60 μs)

Table 20

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.5 V ± 1.0%	2.5 V ± 1.0%	S-1701X1525-M5T1x	–
1.8 V ± 1.0%	2.5 V ± 1.0%	S-1701X1825-M5T1x	–
2.2 V ± 1.0%	1.9 V ± 1.0%	S-1701X2219-M5T1x	–
3.0 V ± 1.0%	2.5 V ± 1.0%	S-1701X3025-M5T1x	–
3.2 V ± 1.0%	2.8 V ± 1.0%	S-1701X3228-M5T1x	S-1701X3228-U5T1x
3.3 V ± 1.0%	1.5 V ± 1.0%	S-1701X3315-M5T1x	–
3.3 V ± 1.0%	3.0 V ± 1.0%	–	S-1701X3330-U5T1x
3.3 V ± 1.0%	4.2 V ± 1.0%	–	S-1701X3342-U5T1x

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U

3. Please select products of environmental code = U for Sn 100%, halogen-free products.

4. 20 S-1701 Series Y type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : VIN connection Release delay time : 50 ms

Table 21

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
3.2 V ± 1.0%	2.8 V ± 1.0%	S-1701Y3228-M5T1x	S-1701Y3228-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	–	S-1701Y3330-U5T1x
3.3 V ± 1.0%	4.0 V ± 1.0%	–	S-1701Y3340-U5T1x
3.3 V ± 1.0%	4.2 V ± 1.0%	S-1701Y3342-M5T1x	S-1701Y3342-U5T1x

4. 21 S-1701 Series Z type

ON/OFF pin : VIN connection ON/OFF logic : None
 SENSE pin : VIN connection Release delay time : 100 ms

Table 22

Output Voltage	Detection Voltage	SOT-23-5	SOT-89-5
1.6 V ± 1.0%	2.6 V ± 1.0%	S-1701Z1626-M5T1x	–
1.8 V ± 1.0%	2.6 V ± 1.0%	S-1701Z1826-M5T1x	–
3.2 V ± 1.0%	2.8 V ± 1.0%	S-1701Z3228-M5T1x	S-1701Z3228-U5T1x
3.3 V ± 1.0%	3.0 V ± 1.0%	S-1701Z3330-M5T1x	–

Remark 1. Please contact our sales office for products with an output voltage or detection voltage other than those specified above.

2. x: G or U
3. Please select products of environmental code = U for Sn 100%, halogen-free products.

■ Pin Configurations

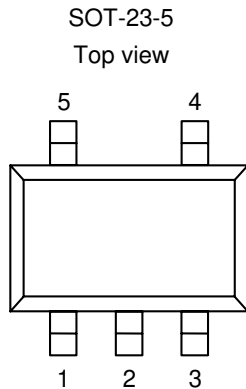


Figure 7

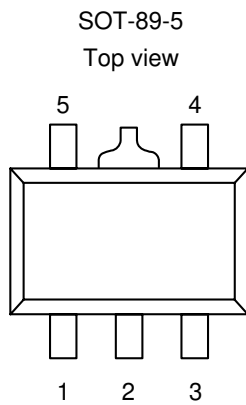


Figure 8

Table 23

Pin No.	Symbol	Description
1	VIN	Input voltage pin
2	VSS	GND pin
3	ON/OFF	Shutdown pin (A, B, C, D, E, F, G, H, J, K, L, M types)
3	SENSE	Detector SENSE pin (N, P, Q, R, S, T types)
3	NC*1	No connection (U, V, W, X, Y, Z types)
4	VDOUT	Detector output voltage pin*2
5	VOUT	Regulator output voltage pin

*1. The NC pin is electrically open.

The NC pin can be connected to VIN or VSS.

*2. Due to Nch open drain products, please use the pull-up resistor.

Table 24

Pin No.	Symbol	Description
1	VIN	Input voltage pin
2	VSS	GND pin
3	VOUT	Regulator output voltage pin
4	VDOUT	Detector output voltage pin*2
5	ON/OFF	Shutdown pin (A, B, C, D, E, F, G, H, J, K, L, M types)
5	SENSE	Detector SENSE pin (N, P, Q, R, S, T types)
5	NC*1	No connection (U, V, W, X, Y, Z types)

*1. The NC pin is electrically open.

The NC pin can be connected to VIN or VSS.

*2. Due to Nch open drain products, please use the pull-up resistor.

■ Absolute Maximum Ratings

Table 25

(Ta = 25°C unless otherwise specified)

Item	Symbol	Absolute Maximum Rating	Unit
Input voltage	V_{IN}	$V_{SS} - 0.3$ to $V_{SS} + 7$	V
	$V_{ON/OFF}$	$V_{SS} - 0.3$ to $V_{IN} + 0.3$	V
	V_{SENSE}	$V_{SS} - 0.3$ to $V_{SS} + 7$	V
Regulator output voltage	V_{OUT}	$V_{SS} - 0.3$ to $V_{IN} + 0.3$	V
Detector output voltage	V_{DOUT}	$V_{SS} - 0.3$ to $V_{SS} + 7$	V
		$V_{SS} - 0.3$ to $V_{IN} + 0.3$	V
Power dissipation	P_D	300 (When not mounted on board)	mW
		600*1	mW
		500 (When not mounted on board)	mW
		1000*1	mW
Operating ambient temperature	T_{opr}	-40 to +85	°C
Storage temperature	T_{stg}	-40 to +125	°C

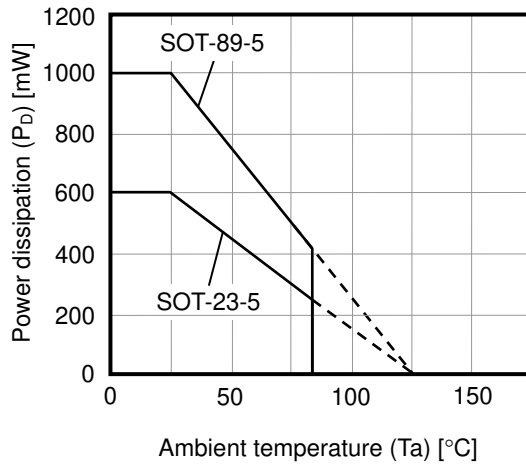
*1. When mounted on board

[Mounted board]

- (1) Board size : 114.3 mm × 76.2 mm × t1.6 mm
- (2) Board name : JEDEC STANDARD51-7

Caution The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

(1) When mounted on board



(2) When not mounted on board

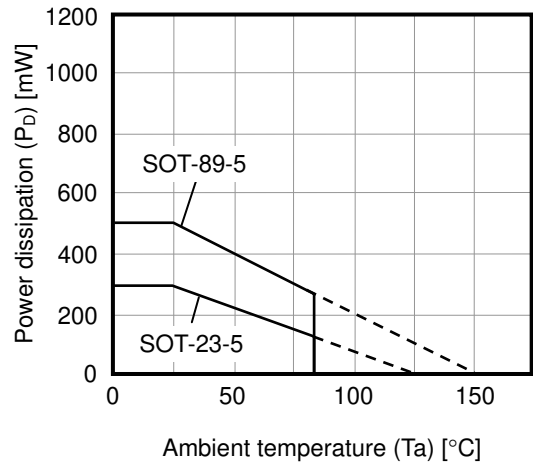


Figure 9 Power Dissipation of Package

■ Electrical Characteristics

1. S-1701 Series A/B/C/G/H/J types

Table 26 (1 / 2)

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit
Current consumption	I _{SS}	V _{IN} = V _{OUT(S)} + 1.0 V, no load	–	85	110	μA	3

Regulator block

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Output voltage ^{*1}	V _{OUT(E)}	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA	V _{OUT(S)} × 0.99	V _{OUT(S)}	V _{OUT(S)} × 1.01	V	1	
Output current ^{*2}	I _{OUT}	V _{IN} ≥ V _{OUT(S)} + 2.0 V When V _{OUT(S)} = 4.5 V or higher, V _{IN} = 6.5 V	400 ^{*7}	–	–	mA	2	
Dropout voltage ^{*3}	V _{drop}	I _{OUT} = 100 mA	1.5 V ≤ V _{OUT(S)} ≤ 1.6 V	0.50	0.54	0.58	V	1
			1.7 V ≤ V _{OUT(S)} ≤ 1.8 V	–	0.34	0.38	V	1
			1.9 V ≤ V _{OUT(S)} ≤ 2.3 V	–	0.19	0.29	V	1
			2.4 V ≤ V _{OUT(S)} ≤ 2.7 V	–	0.16	0.25	V	1
			2.8 V ≤ V _{OUT(S)} ≤ 5.0 V	–	0.14	0.21	V	1
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	V _{OUT(S)} + 0.5 V ≤ V _{IN} ≤ 6.5 V, I _{OUT} = 30 mA	–	0.05	0.2	%/V	1	
Load regulation	ΔV _{OUT2}	V _{IN} = V _{OUT(S)} + 1.0 V, 1.0 mA ≤ I _{OUT} ≤ 100 mA	–	20	40	mV	1	
Output voltage temperature coefficient ^{*4}	$\frac{\Delta V_{OUT}}{\Delta T_a \cdot V_{OUT}}$	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA –40°C ≤ Ta ≤ +85°C ^{*8}	–	±100	±350	ppm/°C	1	
Current consumption during operation	I _{SSR}	V _{IN} = V _{OUT(S)} + 1.0 V, ON/OFF pin = ON, no load	–	80	103	μA	3	
Input voltage	V _{IN}	–	2	–	6.5	V	–	
ON/OFF pin input voltage “H”	V _{SH}	V _{IN} = V _{OUT(S)} + 1.0 V, R _L = 1.0 kΩ	1.5	–	–	V	4	
ON/OFF pin input voltage “L”	V _{SL}	V _{IN} = V _{OUT(S)} + 1.0 V, R _L = 1.0 kΩ	–	–	0.3	V	4	
ON/OFF pin input current “H”	I _{SH}	V _{IN} = 6.5 V, V _{ON/OFF} = 6.5 V	–0.1	–	0.1	μA	4	
ON/OFF pin input current “L”	I _{SL}	V _{IN} = 6.5 V, V _{ON/OFF} = 0 V	–0.1	–	0.1	μA	4	
Ripple rejection	RR	V _{IN} = V _{OUT(S)} + 1.0 V, f = 1.0 kHz, ΔV _{rip} = 0.5 V _{rms} , I _{OUT} = 30 mA	–	70	–	dB	5	
Short-circuit current	I _{short}	V _{IN} = V _{OUT(S)} + 1.0 V, ON/OFF pin = ON, V _{OUT} = 0 V	–	160	–	mA	2	

Table 26 (2 / 2)

Detector block

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Detection voltage*5	-V _{DET}	-	-V _{DET(S)} × 0.99	-V _{DET(S)}	-V _{DET(S)} × 1.01	V	6	
Hysteresis width	V _{HYS}	-	3	5	7	%	6	
Output current	I _{DOUT}	Nch, V _{DOUT} = 0.5 V	V _{IN} = 1.4 V (1.5 V ≤ -V _{DET(S)} ≤ 5.5 V)	1.0	3.0	-	mA	7
			V _{IN} = 2.0 V (2.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	2.0	4.5	-	mA	7
			V _{IN} = 3.0 V (3.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	3.0	5.5	-	mA	7
			V _{IN} = 4.0 V (4.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	4.0	6.0	-	mA	7
			V _{IN} = 5.0 V (5.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	5.0	6.5	-	mA	7
Detection voltage temperature coefficient*6	$\frac{\Delta - V_{DET}}{\Delta T_a \bullet -V_{DET}}$	-40°C ≤ Ta ≤ +85°C*8	-	±140	±550	ppm/°C	6	
Delay time	t _D	No delay (t _D = 60 μs)	-	60	100	μs	6	
		t _D = 50 ms	t _D × 0.65	t _D	t _D × 1.35	ms	6	
		t _D = 100 ms	t _D × 0.65	t _D	t _D × 1.35	ms	6	
Current consumption during operation	I _{SSD}	V _{IN} = V _{OUT(S)} + 1.0 V, ON/OFF pin = OFF, no load	-	5	7	μA	8	
Input voltage	V _{IN}	-	0.8	-	6.5	V	-	
Current leakage of output transistor	I _{LEAK}	V _{IN} = 6.5 V, V _{DOUT} = 6.5 V	-	-	0.1	μA	7	

- *1. V_{OUT(S)}: Specified output voltage
V_{OUT(E)}: Actual output voltage at the fixed load
The output voltage when fixing I_{OUT} (= 30 mA) and inputting V_{OUT(S)} + 1.0 V
- *2. The output current at which the output voltage becomes lower than 95% of V_{OUT(E)} after gradually increasing the output current.
- *3. V_{drop} = V_{IN1} - (V_{OUT3} × 0.98)
V_{OUT3} is the output voltage when V_{IN} = V_{OUT(S)} + 1.0 V and I_{OUT} = 100 mA.
V_{IN1} is the input voltage at which the output voltage becomes 98% of V_{OUT3} after gradually decreasing the input voltage.
- *4. The change in temperature [mV/°C] of the regulator output voltage is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta T_a} [mV/°C]^{*1} = V_{OUT(S)} [V]^{*2} \times \frac{\Delta V_{OUT}}{\Delta T_a \bullet V_{OUT}} [ppm/°C]^{*3} \div 1000$$
 - *1. The change in temperature of the output voltage
 - *2. Specified output voltage
 - *3. Output voltage temperature coefficient
- *5. -V_{DET}: Actual detection voltage, -V_{DET(S)}: Specified detection voltage
- *6. The change in temperature [mV/°C] of the detector detection voltage is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta T_a} [mV/°C]^{*1} = -V_{DET(S)} (typ.) [V]^{*2} \times \frac{\Delta - V_{DET}}{\Delta T_a \bullet -V_{DET}} [ppm/°C]^{*3} \div 1000$$
 - *1. The change in temperature of the detection voltage
 - *2. Specified detection voltage
 - *3. Detection voltage temperature coefficient
- *7. The output current can be at least this value.
Due to restrictions on the package power dissipation, this value may not be satisfied. Attention should be paid to the power dissipation of the package when the output current is large. This specification is guaranteed by design.
- *8. Since products are not screened at high and low temperatures, the specification for this temperature range is guaranteed by design, not tested in production.

HIGH RIPPLE-REJECTION LOW DROPOUT CMOS VOLTAGE REGULATOR WITH RESET FUNCTION
Rev.3.0_00 **S-1701 Series**

2. S-1701 Series D/E/F/K/L/M types

Table 27 (1 / 2)

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit
Current consumption	I _{SS}	V _{IN} = V _{OUT(S)} + 1.0 V, no load	–	85	110	μA	3

Regulator block

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Output voltage ^{*1}	V _{OUT(E)}	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA	V _{OUT(S)} × 0.99	V _{OUT(S)}	V _{OUT(S)} × 1.01	V	1	
Output current ^{*2}	I _{OUT}	V _{IN} ≥ V _{OUT(S)} + 2.0 V When V _{OUT(S)} = 4.5 V or higher, V _{IN} = 6.5 V	400 ^{*7}	–	–	mA	2	
Dropout voltage ^{*3}	V _{drop}	I _{OUT} = 100 mA	1.5 V ≤ V _{OUT(S)} ≤ 1.6 V	0.50	0.54	0.58	V	1
			1.7 V ≤ V _{OUT(S)} ≤ 1.8 V	–	0.34	0.38	V	1
			1.9 V ≤ V _{OUT(S)} ≤ 2.3 V	–	0.19	0.29	V	1
			2.4 V ≤ V _{OUT(S)} ≤ 2.7 V	–	0.16	0.25	V	1
			2.8 V ≤ V _{OUT(S)} ≤ 5.0 V	–	0.14	0.21	V	1
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	V _{OUT(S)} + 0.5 V ≤ V _{IN} ≤ 6.5 V, I _{OUT} = 30 mA	–	0.05	0.2	%/V	1	
Load regulation	ΔV _{OUT2}	V _{IN} = V _{OUT(S)} + 1.0 V, 1.0 mA ≤ I _{OUT} ≤ 100 mA	–	20	40	mV	1	
Output voltage temperature coefficient ^{*4}	$\frac{\Delta V_{OUT}}{\Delta T_a \cdot V_{OUT}}$	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA –40°C ≤ Ta ≤ +85°C ^{*8}	–	±100	±350	ppm/°C	1	
Current consumption during operation	I _{SSR}	V _{IN} = V _{OUT(S)} + 1.0 V, ON/OFF pin = ON, no load	–	80	103	μA	3	
Input voltage	V _{IN}	–	2	–	6.5	V	–	
ON/OFF pin input voltage “H”	V _{SH}	V _{IN} = V _{OUT(S)} + 1.0 V, R _L = 1.0 kΩ	1.5	–	–	V	4	
ON/OFF pin input voltage “L”	V _{SL}	V _{IN} = V _{OUT(S)} + 1.0 V, R _L = 1.0 kΩ	–	–	0.3	V	4	
ON/OFF pin input current “H”	I _{SH}	V _{IN} = 6.5 V, V _{ON/OFF} = 6.5 V	–0.1	–	0.1	μA	4	
ON/OFF pin input current “L”	I _{SL}	V _{IN} = 6.5 V, V _{ON/OFF} = 0 V	–0.1	–	0.1	μA	4	
Ripple rejection	RR	V _{IN} = V _{OUT(S)} + 1.0 V, f = 1.0 kHz, ΔV _{rip} = 0.5 V _{rms} , I _{OUT} = 30 mA	–	70	–	dB	5	
Short-circuit current	I _{short}	V _{IN} = V _{OUT(S)} + 1.0 V, ON/OFF pin = ON, V _{OUT} = 0 V	–	160	–	mA	2	

Table 27 (2 / 2)

Detector block

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Detection voltage*5	-V _{DET}	-	-V _{DET(S)} × 0.99	-V _{DET(S)}	-V _{DET(S)} × 1.01	V	9	
Hysteresis width	V _{HYS}	-	3	5	7	%	9	
Output current	I _{DOUT}	Nch, V _{DOUT} = 0.5 V	V _{IN} = 1.4 V (1.5 V ≤ -V _{DET(S)} ≤ 5.5 V)	1.0	3.0	-	mA	7
			V _{IN} = 2.0 V (2.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	2.0	4.5	-	mA	7
			V _{IN} = 3.0 V (3.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	3.0	5.5	-	mA	7
			V _{IN} = 4.0 V (4.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	4.0	6.0	-	mA	7
			V _{IN} = 5.0 V (5.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	5.0	6.5	-	mA	7
Detection voltage temperature coefficient*6	$\frac{\Delta - V_{DET}}{\Delta T_a \bullet -V_{DET}}$	-40°C ≤ Ta ≤ +85°C*8	-	±140	±550	ppm/°C	9	
Delay time	t _D	No delay (t _D = 60 μs)	-	60	100	μs	9	
		t _D = 50 ms	t _D × 0.65	t _D	t _D × 1.35	ms	9	
		t _D = 100 ms	t _D × 0.65	t _D	t _D × 1.35	ms	9	
Current consumption during operation	I _{SSD}	V _{IN} = V _{OUT(S)} + 1.0 V, ON/OFF pin = OFF, no load	-	5	7	μA	8	
Input voltage	V _{IN}	-	0.8	-	6.5	V	-	
Current leakage of output transistor	I _{LEAK}	V _{IN} = 6.5 V, V _{DOUT} = 6.5 V	-	-	0.1	μA	7	

- *1. V_{OUT(S)}: Specified output voltage
V_{OUT(E)}: Actual output voltage at the fixed load
The output voltage when fixing I_{OUT} (= 30 mA) and inputting V_{OUT(S)} + 1.0 V
- *2. The output current at which the output voltage becomes lower than 95% of V_{OUT(E)} after gradually increasing the output current.
- *3. V_{drop} = V_{IN1} - (V_{OUT3} × 0.98)
V_{OUT3} is the output voltage when V_{IN} = V_{OUT(S)} + 1.0 V and I_{OUT} = 100 mA.
V_{IN1} is the input voltage at which the output voltage becomes 98% of V_{OUT3} after gradually decreasing the input voltage.
- *4. The change in temperature [mV/°C] of the regulator output voltage is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta T_a} [mV/°C]^{*1} = V_{OUT(S)} [V]^{*2} \times \frac{\Delta V_{OUT}}{\Delta T_a \bullet V_{OUT}} [ppm/°C]^{*3} \div 1000$$
 - *1. The change in temperature of the output voltage
 - *2. Specified output voltage
 - *3. Output voltage temperature coefficient
- *5. -V_{DET}: Actual detection voltage, -V_{DET(S)}: Specified detection voltage
- *6. The change in temperature [mV/°C] of the detector detection voltage is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta T_a} [mV/°C]^{*1} = -V_{DET(S)} (typ.) [V]^{*2} \times \frac{\Delta - V_{DET}}{\Delta T_a \bullet -V_{DET}} [ppm/°C]^{*3} \div 1000$$
 - *1. The change in temperature of the detection voltage
 - *2. Specified detection voltage
 - *3. Detection voltage temperature coefficient
- *7. The output current can be at least this value.
Due to restrictions on the package power dissipation, this value may not be satisfied. Attention should be paid to the power dissipation of the package when the output current is large. This specification is guaranteed by design.
- *8. Since products are not screened at high and low temperatures, the specification for this temperature range is guaranteed by design, not tested in production.

3. S-1701 Series N/P/Q types

Table 28 (1 / 2)

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit
Current consumption	I _{SS}	V _{IN} = V _{OUT(S)} + 1.0 V, no load	–	85	110	μA	12

Regulator block

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Output voltage ^{*1}	V _{OUT(E)}	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA	V _{OUT(S)} × 0.99	V _{OUT(S)}	V _{OUT(S)} × 1.01	V	10	
Output current ^{*2}	I _{OUT}	V _{IN} ≥ V _{OUT(S)} + 2.0 V When V _{OUT(S)} = 4.5 V or higher, V _{IN} = 6.5 V	400 ^{*7}	–	–	mA	11	
Dropout voltage ^{*3}	V _{drop}	I _{OUT} = 100 mA	1.5 V ≤ V _{OUT(S)} ≤ 1.6 V	0.50	0.54	0.58	V	10
			1.7 V ≤ V _{OUT(S)} ≤ 1.8 V	–	0.34	0.38	V	10
			1.9 V ≤ V _{OUT(S)} ≤ 2.3 V	–	0.19	0.29	V	10
			2.4 V ≤ V _{OUT(S)} ≤ 2.7 V	–	0.16	0.25	V	10
			2.8 V ≤ V _{OUT(S)} ≤ 5.0 V	–	0.14	0.21	V	10
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	V _{OUT(S)} + 0.5 V ≤ V _{IN} ≤ 6.5 V, I _{OUT} = 30 mA	–	0.05	0.2	%/V	10	
Load regulation	ΔV _{OUT2}	V _{IN} = V _{OUT(S)} + 1.0 V, 1.0 mA ≤ I _{OUT} ≤ 100 mA	–	20	40	mV	10	
Output voltage temperature coefficient ^{*4}	$\frac{\Delta V_{OUT}}{\Delta T_a \cdot V_{OUT}}$	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA –40°C ≤ Ta ≤ +85°C ^{*8}	–	±100	±350	ppm/°C	10	
Input voltage	V _{IN}	–	2	–	6.5	V	–	
Ripple rejection	RR	V _{IN} = V _{OUT(S)} + 1.0 V, f = 1.0 kHz, ΔV _{rip} = 0.5 V _{rms} , I _{OUT} = 30 mA	–	70	–	dB	13	
Short-circuit current	I _{short}	V _{IN} = V _{OUT(S)} + 1.0 V, V _{OUT} = 0 V	–	160	–	mA	11	

Table 28 (2 / 2)

Detector block

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Detection voltage*5	-V _{DET}	-	-V _{DET(S)} × 0.99	-V _{DET(S)}	-V _{DET(S)} × 1.01	V	14	
Hysteresis width	V _{HYS}	-	3	5	7	%	14	
Output current	I _{DOUT}	Nch, V _{DOUT} = 0.5 V	V _{IN} = 1.4 V (1.5 V ≤ -V _{DET(S)} ≤ 5.5 V)	1.0	3.0	-	mA	15
			V _{IN} = 2.0 V (2.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	2.0	4.5	-	mA	15
			V _{IN} = 3.0 V (3.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	3.0	5.5	-	mA	15
			V _{IN} = 4.0 V (4.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	4.0	6.0	-	mA	15
			V _{IN} = 5.0 V (5.1 V ≤ -V _{DET(S)} ≤ 5.5 V)	5.0	6.5	-	mA	15
Detection voltage temperature coefficient*6	$\frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}$	-40°C ≤ Ta ≤ +85°C*8	-	±140	±550	ppm/°C	14	
Delay time	t _D	No delay (t _D = 60 μs)	-	60	100	μs	14	
		t _D = 50 ms	t _D × 0.65	t _D	t _D × 1.35	ms	14	
		t _D = 100 ms	t _D × 0.65	t _D	t _D × 1.35	ms	14	
Input voltage	V _{IN}	-	0.8	-	6.5	V	-	
Current leakage of output transistor	I _{LEAK}	V _{IN} = 6.5 V, V _{DOUT} = 6.5 V	-	-	0.1	μA	15	

- *1. V_{OUT(S)}: Specified output voltage
V_{OUT(E)}: Actual output voltage at the fixed load
The output voltage when fixing I_{OUT} (= 30 mA) and inputting V_{OUT(S)} + 1.0 V
- *2. The output current at which the output voltage becomes lower than 95% of V_{OUT(E)} after gradually increasing the output current.
- *3. V_{drop} = V_{IN1} - (V_{OUT3} × 0.98)
V_{OUT3} is the output voltage when V_{IN} = V_{OUT(S)} + 1.0 V and I_{OUT} = 100 mA.
V_{IN1} is the input voltage at which the output voltage becomes 98% of V_{OUT3} after gradually decreasing the input voltage.
- *4. The change in temperature [mV/°C] of the regulator output voltage is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta} [mV/°C]^*1 = V_{OUT(S)} [V]^*2 \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}} [ppm/°C]^*3 \div 1000$$
 - *1. The change in temperature of the output voltage
 - *2. Specified output voltage
 - *3. Output voltage temperature coefficient
- *5. -V_{DET}: Actual detection voltage, -V_{DET(S)}: Specified detection voltage
- *6. The change in temperature [mV/°C] of the detector detection voltage is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta} [mV/°C]^*1 = -V_{DET(S)} (typ.) [V]^*2 \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}} [ppm/°C]^*3 \div 1000$$
 - *1. The change in temperature of the detection voltage
 - *2. Specified detection voltage
 - *3. Detection voltage temperature coefficient
- *7. The output current can be at least this value.
Due to restrictions on the package power dissipation, this value may not be satisfied. Attention should be paid to the power dissipation of the package when the output current is large. This specification is guaranteed by design.
- *8. Since products are not screened at high and low temperatures, the specification for this temperature range is guaranteed by design, not tested in production.

4. S-1701 Series R/S/T types

Table 29 (1 / 2)

(Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit
Current consumption	I _{SS}	V _{IN} = V _{OUT(S)} + 1.0 V, no load	–	85	110	μA	12

Regulator block

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Test Circuit	
Output voltage* ¹	V _{OUT(E)}	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA	V _{OUT(S)} × 0.99	V _{OUT(S)}	V _{OUT(S)} × 1.01	V	10	
Output current* ²	I _{OUT}	V _{IN} ≥ V _{OUT(S)} + 2.0 V When V _{OUT(S)} = 4.5 V or higher, V _{IN} = 6.5 V	400* ⁷	–	–	mA	11	
Dropout voltage* ³	V _{drop}	I _{OUT} = 100 mA	1.5 V ≤ V _{OUT(S)} ≤ 1.6 V	0.50	0.54	0.58	V	10
			1.7 V ≤ V _{OUT(S)} ≤ 1.8 V	–	0.34	0.38	V	10
			1.9 V ≤ V _{OUT(S)} ≤ 2.3 V	–	0.19	0.29	V	10
			2.4 V ≤ V _{OUT(S)} ≤ 2.7 V	–	0.16	0.25	V	10
			2.8 V ≤ V _{OUT(S)} ≤ 5.0 V	–	0.14	0.21	V	10
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \cdot V_{OUT}}$	V _{OUT(S)} + 0.5 V ≤ V _{IN} ≤ 6.5 V, I _{OUT} = 30 mA	–	0.05	0.2	%/V	10	
Load regulation	ΔV _{OUT2}	V _{IN} = V _{OUT(S)} + 1.0 V, 1.0 mA ≤ I _{OUT} ≤ 100 mA	–	20	40	mV	10	
Output voltage temperature coefficient* ⁴	$\frac{\Delta V_{OUT}}{\Delta T_a \cdot V_{OUT}}$	V _{IN} = V _{OUT(S)} + 1.0 V, I _{OUT} = 30 mA –40°C ≤ Ta ≤ +85°C* ⁸	–	±100	±350	ppm/°C	10	
Input voltage	V _{IN}	–	2	–	6.5	V	–	
Ripple rejection	RR	V _{IN} = V _{OUT(S)} + 1.0 V, f = 1.0 kHz, ΔV _{rip} = 0.5 V _{rms} , I _{OUT} = 30 mA	–	70	–	dB	13	
Short-circuit current	I _{short}	V _{IN} = V _{OUT(S)} + 1.0 V, V _{OUT} = 0 V	–	160	–	mA	11	