ABLIC

S-1701 Series

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

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Rev.3.1_02

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 step
- Input voltage: 2.0 V to 6.5 V
- Output voltage accuracy: ±1.0%
- Current consumption During power-off: 0.1 μA typ., 1.0 μA max.
- Output current: Possible to output 400 mA ($V_{IN} \geq V_{OUT(S)} + 2.0$ V)*1
- Input and output capacitors: A ceramic capacitor of 1.0 μF or more can be used.
- Ripple rejection: 70 dB typ. (f = 1.0 kHz)
- Built-in overcurrent protection circuit: Limits overcurrent of output transistor.
- Built-in ON/OFF circuit: Ensures long battery life.

Detector block

- Detection voltage: 1.5 V to 5.5 V, selectable in 0.1 V step
- Detection voltage accuracy: ±1.0%
- Input voltage: 0.8 V to 6.5 V
- 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

Whole regulator

- Current consumption During operation: 85 μA typ.
- Operation temperature range: Ta = −40°C to +85°C
- 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

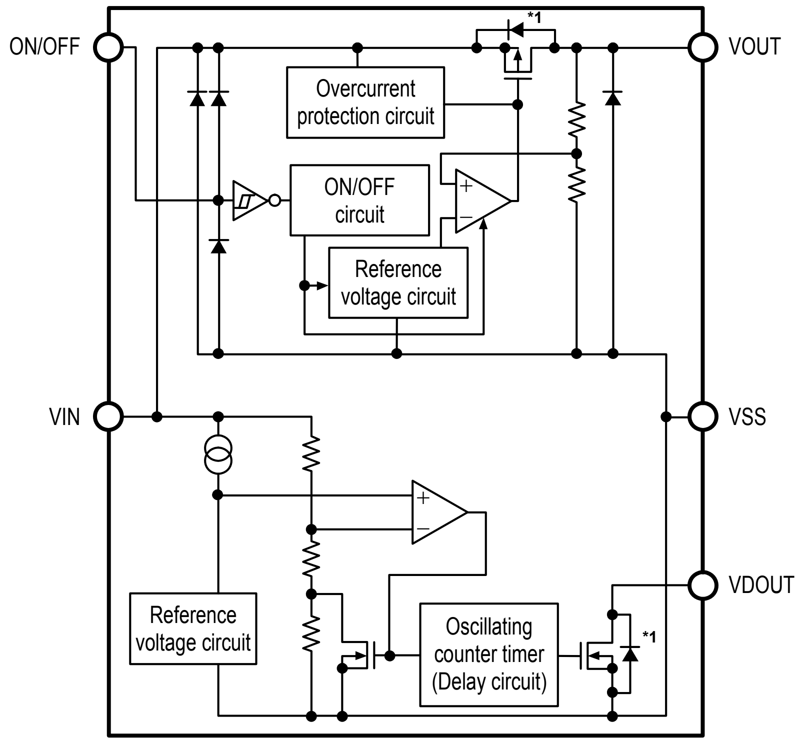
- Constant-voltage power supply and reset circuit for battery-powered device
- Constant-voltage power supply for personal communication device
- Constant-voltage power supply for home appliance

■ Packages

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

■ Block Diagrams

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

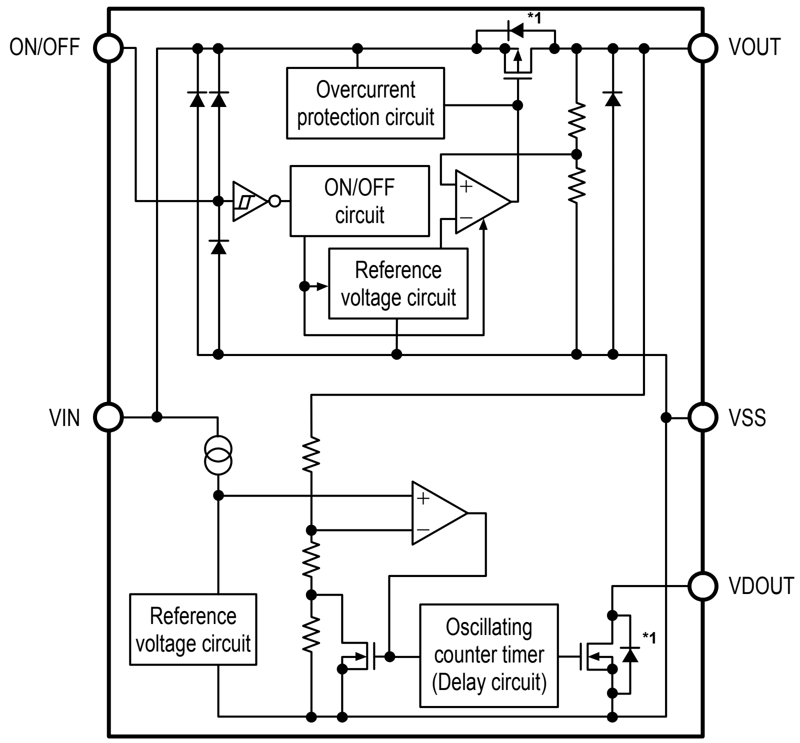


ON/OFF pin :	Provided
SENSE pin :	VIN connection

***1.** Parasitic diode

Figure 1

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

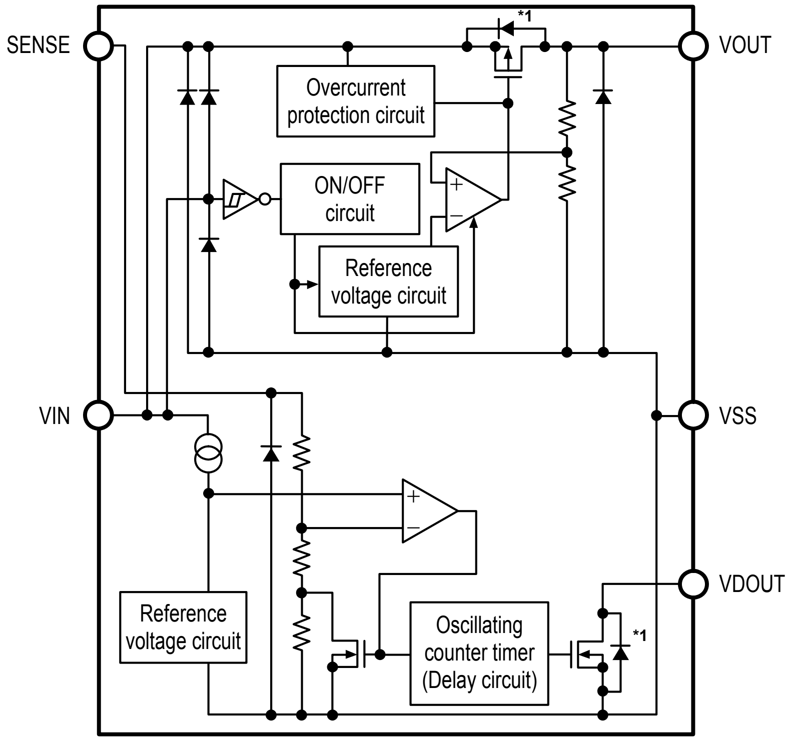


ON/OFF pin :	Provided
SENSE pin :	VOUT connection

***1.** Parasitic diode

Figure 2

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

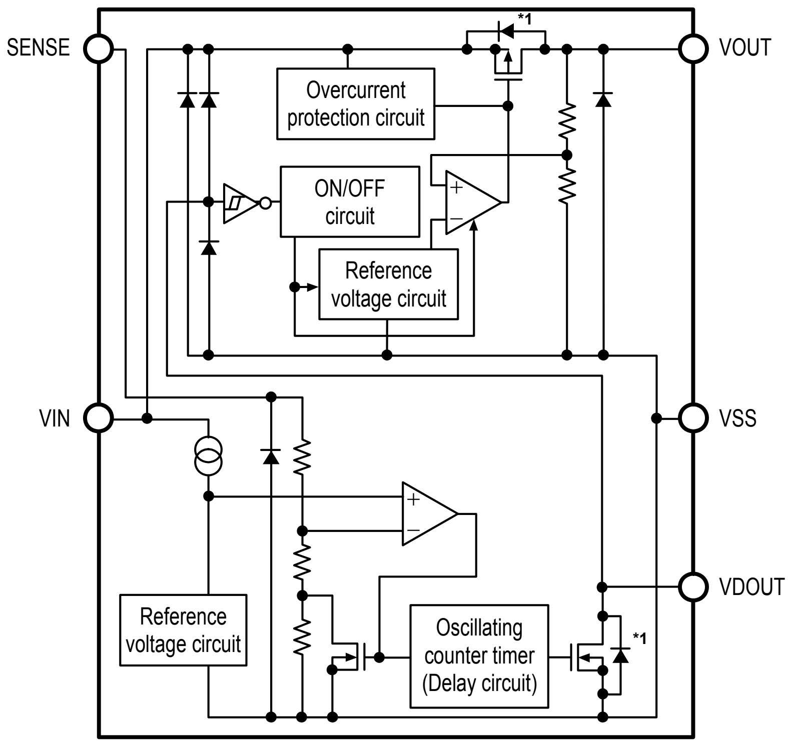


ON/OFF pin :	VIN connection
SENSE pin :	Provided

***1.** Parasitic diode

Figure 3

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

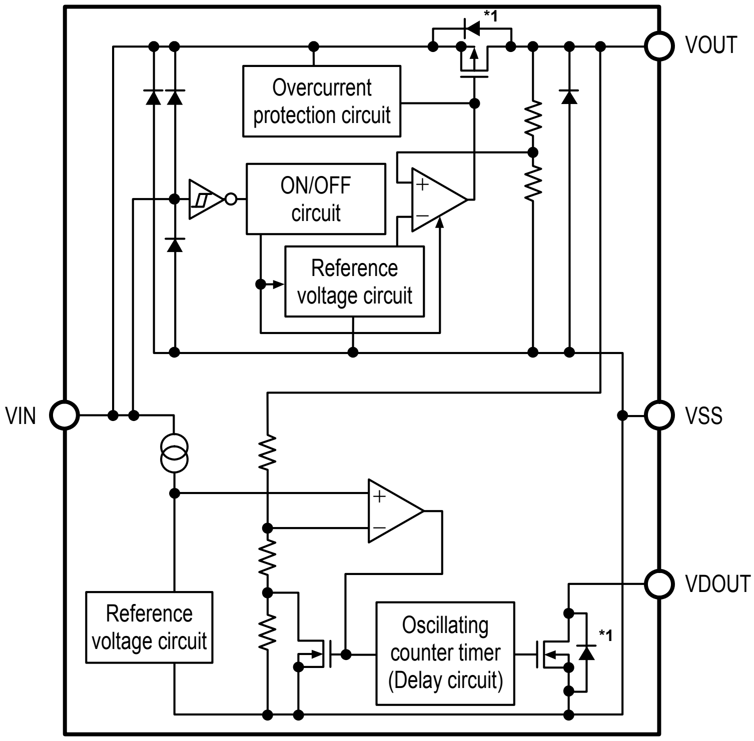


ON/OFF pin :	VDOUT connection
SENSE pin :	Provided

***1.** Parasitic diode

Figure 4

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

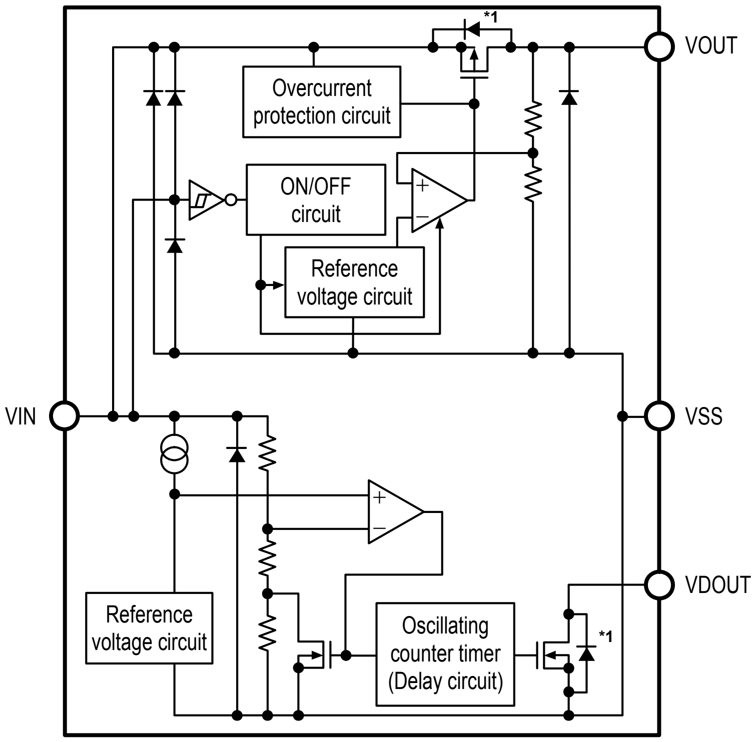


ON/OFF pin :	VIN connection
SENSE pin :	VOUT connection

***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

Users can select the product type, output voltage, detection voltage, and package type for the S-1701 Series. Refer to the "**1. Product name**" regarding the contents of product name, "**2. Function list according to product type**" regarding the product types, "**3. Package**" regarding the package drawings, and "**4. Product name list**" regarding details of the product name.

1. Product name

S-1701 x xx xx - xxxx x

- x (last) — Environmental code
  - U : Lead-free (Sn 100%), halogen-free
  - G : Lead-free (for details, please contact our sales office)
- xxxx — Package name (abbreviation) and packing specifications[*1]
  - M5T1 : SOT-23-5, Tape
  - U5T1 : SOT-89-5, Tape
- xx (second) — Detection voltage[*2]
  - 15 to 55
  - (e.g., when the output voltage is 1.5 V, it is expressed as 15.)
- xx (first) — Output voltage
  - 15 to 50
  - (e.g., when the output voltage is 1.5 V, it is expressed as 15.)
- x (first) — Product type[*3]
  - A to Z (I and O are not provided)

***1.** Refer to the tape drawing.
***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 under shoot 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. Packages

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 ON/OFF logic : Active high
SENSE pin : VOUT connection 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

SOT-23-5
Top view

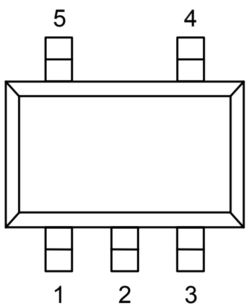


Figure 7

Table 23

Pin No.	Symbol	Description
1	VIN	Input voltage pin
2	VSS	GND pin
3	ON/OFF	ON/OFF 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 pin or VSS pin.
***2.** Due to Nch open drain products, please use the pull-up resistor.

SOT-89-5
Top view

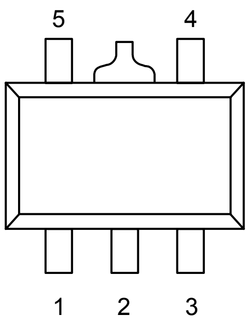


Figure 8

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	ON/OFF 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 pin or VSS pin.
***2.** Due to Nch open drain products, please use the pull-up resistor.

■ Absolute Maximum Ratings

Table 25

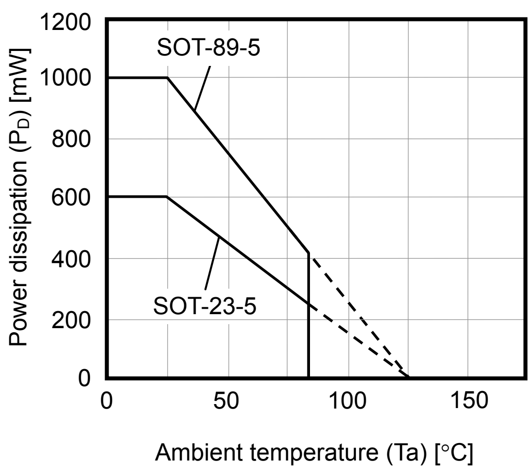
(Ta = 25°C unless otherwise specified)

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
	R,S,T type		V_{SS} − 0.3 to V_{IN} + 0.3	V
Power dissipation	SOT-23-5	P_D	300 (When not mounted on board)	mW
			600*1	mW
	SOT-89-5		500 (When not mounted on board)	mW
			1000*1	mW
Operation 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

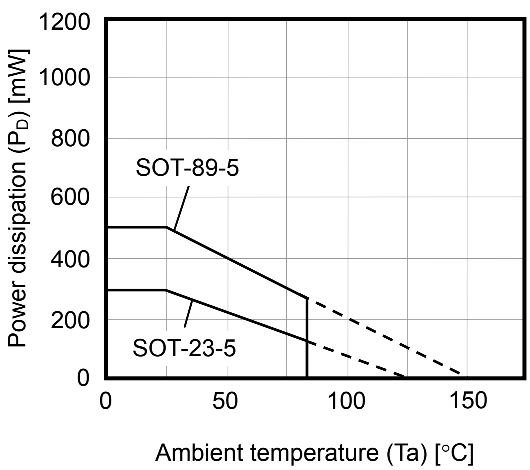


Figure 9 Power Dissipation of Package

■ 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		$V_{OUT(S)} \times 0.99$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.01$	V	1
Output current*2	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 2.0$ 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	$1.5\text{ V} \leq V_{OUT(S)} \leq 1.6\text{ V}$	0.50	0.54	0.58	V	1
			$1.7\text{ V} \leq V_{OUT(S)} \leq 1.8\text{ V}$	−	0.34	0.38	V	1
			$1.9\text{ V} \leq V_{OUT(S)} \leq 2.3\text{ V}$	−	0.19	0.29	V	1
			$2.4\text{ V} \leq V_{OUT(S)} \leq 2.7\text{ V}$	−	0.16	0.25	V	1
			$2.8\text{ V} \leq V_{OUT(S)} \leq 5.0\text{ V}$	−	0.14	0.21	V	1
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5\text{ V} \leq V_{IN} \leq 6.5$ V, $I_{OUT} = 30$ mA		−	0.05	0.2	%/V	1
Load regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0$ V, $1.0\text{ mA} \leq I_{OUT} \leq 100$ mA		−	20	40	mV	1
Output voltage temperature coefficient*4	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0$ V, $I_{OUT} = 30$ mA $-40°C \leq Ta \leq +85°C$*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	$\lvert RR \rvert$	$V_{IN} = V_{OUT(S)} + 1.0$ V, f = 1.0 kHz, $\Delta V_{rip} = 0.5$ Vrms, $I_{OUT} = 30$ 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]	$-V_{DET}$	–		$-V_{DET(S)} \times 0.99$	$-V_{DET(S)}$	$-V_{DET(S)} \times 1.01$	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 $\le -V_{DET(S)} \le$ 5.5 V)	1.0	3.0	–	mA	7
			V_{IN} = 2.0 V (2.1 V $\le -V_{DET(S)} \le$ 5.5 V)	2.0	4.5	–	mA	7
			V_{IN} = 3.0 V (3.1 V $\le -V_{DET(S)} \le$ 5.5 V)	3.0	5.5	–	mA	7
			V_{IN} = 4.0 V (4.1 V $\le -V_{DET(S)} \le$ 5.5 V)	4.0	6.0	–	mA	7
			V_{IN} = 5.0 V (5.1 V $\le -V_{DET(S)} \le$ 5.5 V)	5.0	6.5	–	mA	7
Detection voltage temperature coefficient[*6]	$\frac{\Delta -V_{DET}}{\Delta Ta \bullet -V_{DET}}$	$-40°C \le Ta \le +85°C$[*8]		–	±140	±550	ppm/°C	6
Delay time	t_D	No delay (t_D = 60 μs)		–	60	100	μs	6
		t_D = 50 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	6
		t_D = 100 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	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.** $V_{OUT(S)}$: Set output voltage
$V_{OUT(E)}$: Actual output voltage
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 95% of $V_{OUT(E)}$ after gradually increasing the output current.

***3.** $V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$
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.** A change in the temperature of the regulator output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\text{mV/°C}]^{*1} = V_{OUT(S)}[\text{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

***5.** $-V_{DET}$: Actual detection voltage, $-V_{DET(S)}$: Set detection voltage

***6.** A change in the temperature of the detector detection voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta}[\text{mV/°C}]^{*1} = -V_{DET(S)}\,(\text{typ.})[\text{V}]^{*2} \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of detection voltage
***2.** Set 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.

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		$V_{OUT(S)} \times 0.99$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.01$	V	1
Output current*2	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 2.0$ 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	$1.5\text{ V} \leq V_{OUT(S)} \leq 1.6\text{ V}$	0.50	0.54	0.58	V	1
			$1.7\text{ V} \leq V_{OUT(S)} \leq 1.8\text{ V}$	–	0.34	0.38	V	1
			$1.9\text{ V} \leq V_{OUT(S)} \leq 2.3\text{ V}$	–	0.19	0.29	V	1
			$2.4\text{ V} \leq V_{OUT(S)} \leq 2.7\text{ V}$	–	0.16	0.25	V	1
			$2.8\text{ V} \leq V_{OUT(S)} \leq 5.0\text{ V}$	–	0.14	0.21	V	1
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5\text{ V} \leq V_{IN} \leq 6.5$ V, $I_{OUT} = 30$ mA		–	0.05	0.2	%/V	1
Load regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0$ V, $1.0\text{ mA} \leq I_{OUT} \leq 100$ mA		–	20	40	mV	1
Output voltage temperature coefficient*4	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0$ V, $I_{OUT} = 30$ mA $-40°C \leq Ta \leq +85°C$*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	$\lvert RR \rvert$	$V_{IN} = V_{OUT(S)} + 1.0$ V, f = 1.0 kHz, $\Delta V_{rip} = 0.5$ Vrms, $I_{OUT} = 30$ 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	$-V_{DET}$	–		$-V_{DET(S)} \times 0.99$	$-V_{DET(S)}$	$-V_{DET(S)} \times 1.01$	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 $\leq -V_{DET(S)} \leq$ 5.5 V)	1.0	3.0	–	mA	7
			V_{IN} = 2.0 V (2.1 V $\leq -V_{DET(S)} \leq$ 5.5 V)	2.0	4.5	–	mA	7
			V_{IN} = 3.0 V (3.1 V $\leq -V_{DET(S)} \leq$ 5.5 V)	3.0	5.5	–	mA	7
			V_{IN} = 4.0 V (4.1 V $\leq -V_{DET(S)} \leq$ 5.5 V)	4.0	6.0	–	mA	7
			V_{IN} = 5.0 V (5.1 V $\leq -V_{DET(S)} \leq$ 5.5 V)	5.0	6.5	–	mA	7
Detection voltage temperature coefficient*6	$\frac{\Delta -V_{DET}}{\Delta Ta \bullet -V_{DET}}$	$-40°C \leq Ta \leq +85°C$*8		–	±140	±550	ppm/°C	9
Delay time	t_D	No delay (t_D = 60 μs)		–	60	100	μs	9
		t_D = 50 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	9
		t_D = 100 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	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.** $V_{OUT(S)}$: Set output voltage
$V_{OUT(E)}$: Actual output voltage
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 95% of $V_{OUT(E)}$ after gradually increasing the output current.

***3.** $V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$
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.** A change in the temperature of the regulator output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\text{mV/°C}]^{*1} = V_{OUT(S)}[\text{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

***5.** $-V_{DET}$: Actual detection voltage, $-V_{DET(S)}$: Set detection voltage

***6.** A change in the temperature of the detector detection voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta}[\text{mV/°C}]^{*1} = -V_{DET(S)}\ (\text{typ.})[\text{V}]^{*2} \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of detection voltage
***2.** Set 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		$V_{OUT(S)} \times 0.99$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.01$	V	10
Output current[*2]	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 2.0$ 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	$1.5\ \text{V} \leq V_{OUT(S)} \leq 1.6\ \text{V}$	0.50	0.54	0.58	V	10
			$1.7\ \text{V} \leq V_{OUT(S)} \leq 1.8\ \text{V}$	–	0.34	0.38	V	10
			$1.9\ \text{V} \leq V_{OUT(S)} \leq 2.3\ \text{V}$	–	0.19	0.29	V	10
			$2.4\ \text{V} \leq V_{OUT(S)} \leq 2.7\ \text{V}$	–	0.16	0.25	V	10
			$2.8\ \text{V} \leq V_{OUT(S)} \leq 5.0\ \text{V}$	–	0.14	0.21	V	10
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5\ \text{V} \leq V_{IN} \leq 6.5$ V, $I_{OUT} = 30$ mA		–	0.05	0.2	%/V	10
Load regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0$ V, $1.0\ \text{mA} \leq I_{OUT} \leq 100$ mA		–	20	40	mV	10
Output voltage temperature coefficient[*4]	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0$ V, $I_{OUT} = 30$ mA $-40°C \leq Ta \leq +85°C$[*8]		–	±100	±350	ppm/°C	10
Input voltage	V_{IN}	–		2	–	6.5	V	–
Ripple rejection	$\vert RR \vert$	$V_{IN} = V_{OUT(S)} + 1.0$ V, f = 1.0 kHz, $\Delta V_{rip} = 0.5$ Vrms, $I_{OUT} = 30$ 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	$-V_{DET}$	–		$-V_{DET(S)} \times 0.99$	$-V_{DET(S)}$	$-V_{DET(S)} \times 1.01$	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 ($1.5 V \le -V_{DET(S)} \le 5.5 V$)	1.0	3.0	–	mA	15
			V_{IN} = 2.0 V ($2.1 V \le -V_{DET(S)} \le 5.5 V$)	2.0	4.5	–	mA	15
			V_{IN} = 3.0 V ($3.1 V \le -V_{DET(S)} \le 5.5 V$)	3.0	5.5	–	mA	15
			V_{IN} = 4.0 V ($4.1 V \le -V_{DET(S)} \le 5.5 V$)	4.0	6.0	–	mA	15
			V_{IN} = 5.0 V ($5.1 V \le -V_{DET(S)} \le 5.5 V$)	5.0	6.5	–	mA	15
Detection voltage temperature coefficient*6	$\frac{\Delta -V_{DET}}{\Delta Ta \bullet -V_{DET}}$	$-40°C \le Ta \le +85°C$*8		–	±140	±550	ppm/°C	14
Delay time	t_D	No delay (t_D = 60 μs)		–	60	100	μs	14
		t_D = 50 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	14
		t_D = 100 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	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.** $V_{OUT(S)}$: Set output voltage
$V_{OUT(E)}$: Actual output voltage
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 95% of $V_{OUT(E)}$ after gradually increasing the output current.

***3.** $V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$
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.** A change in the temperature of the regulator output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\text{mV/°C}]^{*1} = V_{OUT(S)}[\text{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

***5.** $-V_{DET}$: Actual detection voltage, $-V_{DET(S)}$: Set detection voltage

***6.** A change in the temperature of the detector detection voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta}[\text{mV/°C}]^{*1} = -V_{DET(S)}\ (\text{typ.})[\text{V}]^{*2} \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of detection voltage
***2.** Set 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		$V_{OUT(S)} \times 0.99$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.01$	V	10
Output current[*2]	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 2.0$ 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	$1.5\ V \leq V_{OUT(S)} \leq 1.6\ V$	0.50	0.54	0.58	V	10
			$1.7\ V \leq V_{OUT(S)} \leq 1.8\ V$	–	0.34	0.38	V	10
			$1.9\ V \leq V_{OUT(S)} \leq 2.3\ V$	–	0.19	0.29	V	10
			$2.4\ V \leq V_{OUT(S)} \leq 2.7\ V$	–	0.16	0.25	V	10
			$2.8\ V \leq V_{OUT(S)} \leq 5.0\ V$	–	0.14	0.21	V	10
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5\ V \leq V_{IN} \leq 6.5$ V, $I_{OUT} = 30$ mA		–	0.05	0.2	%/V	10
Load regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0$ V, $1.0\ mA \leq I_{OUT} \leq 100$ mA		–	20	40	mV	10
Output voltage temperature coefficient[*4]	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0$ V, $I_{OUT} = 30$ mA $-40°C \leq Ta \leq +85°C$[*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, $\Delta V_{rip} = 0.5$ Vrms, $I_{OUT} = 30$ 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 29 (2 / 2)

Detector block (Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit	Test Circuit
Detection voltage*5	$-V_{DET}$	–		$-V_{DET(S)} \times 0.99$	$-V_{DET(S)}$	$-V_{DET(S)} \times 1.01$	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 $\le -V_{DET(S)} \le$ 5.5 V)	1.0	3.0	–	mA	15
			V_{IN} = 2.0 V (2.1 V $\le -V_{DET(S)} \le$ 5.5 V)	2.0	4.5	–	mA	15
			V_{IN} = 3.0 V (3.1 V $\le -V_{DET(S)} \le$ 5.5 V)	3.0	5.5	–	mA	15
			V_{IN} = 4.0 V (4.1 V $\le -V_{DET(S)} \le$ 5.5 V)	4.0	6.0	–	mA	15
			V_{IN} = 5.0 V (5.1 V $\le -V_{DET(S)} \le$ 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		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	14
		t_D = 100 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	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.** $V_{OUT(S)}$: Set output voltage
$V_{OUT(E)}$: Actual output voltage
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 95% of $V_{OUT(E)}$ after gradually increasing the output current.

***3.** $V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$
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.** A change in the temperature of the regulator output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\text{mV/°C}]^{*1} = V_{OUT(S)}[\text{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

***5.** $-V_{DET}$: Actual detection voltage, $-V_{DET(S)}$: Set detection voltage

***6.** A change in the temperature of the detector detection voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta}[\text{mV/°C}]^{*1} = -V_{DET(S)}\ (\text{typ.})[\text{V}]^{*2} \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of detection voltage
***2.** Set 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.

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

Table 30 (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		$V_{OUT(S)} \times 0.99$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.01$	V	10
Output current*2	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 2.0$ 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	$1.5\ V \leq V_{OUT(S)} \leq 1.6\ V$	0.50	0.54	0.58	V	10
			$1.7\ V \leq V_{OUT(S)} \leq 1.8\ V$	–	0.34	0.38	V	10
			$1.9\ V \leq V_{OUT(S)} \leq 2.3\ V$	–	0.19	0.29	V	10
			$2.4\ V \leq V_{OUT(S)} \leq 2.7\ V$	–	0.16	0.25	V	10
			$2.8\ V \leq V_{OUT(S)} \leq 5.0\ V$	–	0.14	0.21	V	10
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5\ V \leq V_{IN} \leq 6.5$ V, $I_{OUT} = 30$ mA		–	0.05	0.2	%/V	10
Load regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0$ V, $1.0\ mA \leq I_{OUT} \leq 100$ mA		–	20	40	mV	10
Output voltage temperature coefficient*4	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0$ V, $I_{OUT} = 30$ mA $-40°C \leq Ta \leq +85°C$*8		–	±100	±350	ppm/°C	10
Input voltage	V_{IN}	–		2	–	6.5	V	–
Ripple rejection	$\lvert RR \rvert$	$V_{IN} = V_{OUT(S)} + 1.0$ V, f = 1.0 kHz, $\Delta V_{rip} = 0.5$ Vrms, $I_{OUT} = 30$ 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 30 (2 / 2)

Detector block (Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit	Test Circuit
Detection voltage*5	$-V_{DET}$	−		$-V_{DET(S)} \times 0.99$	$-V_{DET(S)}$	$-V_{DET(S)} \times 1.01$	V	16
Hysteresis width	V_{HYS}	−		3	5	7	%	16
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	16
Delay time	t_D	No delay (t_D = 60 μs)		−	60	100	μs	16
		t_D = 50 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	16
		t_D = 100 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	16
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.** $V_{OUT(S)}$: Set output voltage
$V_{OUT(E)}$: Actual output voltage
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 95% of $V_{OUT(E)}$ after gradually increasing the output current.

***3.** $V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$
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.** A change in the temperature of the regulator output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\text{mV/°C}]^{*1} = V_{OUT(S)}[\text{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

***5.** $-V_{DET}$: Actual detection voltage, $-V_{DET(S)}$: Set detection voltage

***6.** A change in the temperature of the detector detection voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta}[\text{mV/°C}]^{*1} = -V_{DET(S)}\ (\text{typ.})[\text{V}]^{*2} \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of detection voltage
***2.** Set 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.

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

Table 31 (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		$V_{OUT(S)} \times 0.99$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.01$	V	10
Output current*2	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 2.0$ 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	$1.5 V \leq V_{OUT(S)} \leq 1.6 V$	0.50	0.54	0.58	V	10
			$1.7 V \leq V_{OUT(S)} \leq 1.8 V$	–	0.34	0.38	V	10
			$1.9 V \leq V_{OUT(S)} \leq 2.3 V$	–	0.19	0.29	V	10
			$2.4 V \leq V_{OUT(S)} \leq 2.7 V$	–	0.16	0.25	V	10
			$2.8 V \leq V_{OUT(S)} \leq 5.0 V$	–	0.14	0.21	V	10
Line regulation	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}$	$V_{OUT(S)} + 0.5 V \leq V_{IN} \leq 6.5$ V, I_{OUT} = 30 mA		–	0.05	0.2	%/V	10
Load regulation	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0$ V, $1.0 mA \leq I_{OUT} \leq 100$ mA		–	20	40	mV	10
Output voltage temperature coefficient*4	$\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0$ V, I_{OUT} = 30 mA $-40°C \leq Ta \leq +85°C$*8		–	±100	±350	ppm/°C	10
Input voltage	V_{IN}	–		2	–	6.5	V	–
Ripple rejection	$\lvert RR \rvert$	$V_{IN} = V_{OUT(S)} + 1.0$ V, f = 1.0 kHz, ΔV_{rip} = 0.5 Vrms, 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 31 (2 / 2)

Detector block (Ta = 25°C unless otherwise specified)

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit	Test Circuit
Detection voltage*5	$-V_{DET}$	–		$-V_{DET(S)} \times 0.99$	$-V_{DET(S)}$	$-V_{DET(S)} \times 1.01$	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		$t_D \times 0.65$	t_D	$t_D \times 1.35$	ms	14
		t_D = 100 ms		$t_D \times 0.65$	t_D	$t_D \times 1.35$	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.** $V_{OUT(S)}$: Set output voltage
$V_{OUT(E)}$: Actual output voltage
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 95% of $V_{OUT(E)}$ after gradually increasing the output current.

***3.** $V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$
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.** A change in the temperature of the regulator output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\text{mV/°C}]^{*1} = V_{OUT(S)}[\text{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

***5.** $-V_{DET}$: Actual detection voltage, $-V_{DET(S)}$: Set detection voltage

***6.** A change in the temperature of the detector detection voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta - V_{DET}}{\Delta Ta}[\text{mV/°C}]^{*1} = -V_{DET(S)}\ (\text{typ.})[\text{V}]^{*2} \times \frac{\Delta - V_{DET}}{\Delta Ta \bullet -V_{DET}}[\text{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of detection voltage
***2.** Set 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.

■ Test Circuits

1.

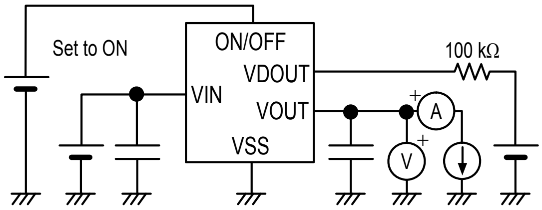


Figure 10

2.

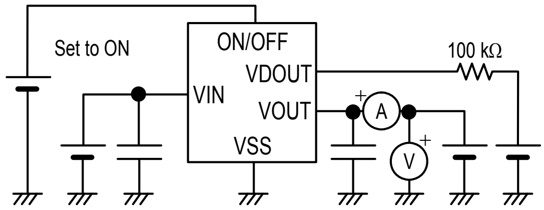


Figure 11

3.

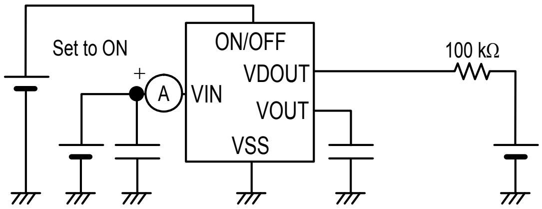


Figure 12

4.

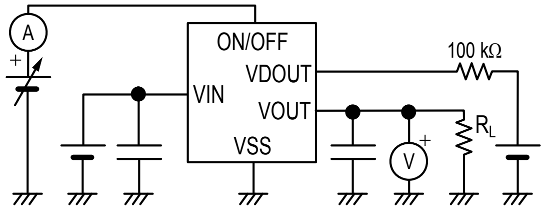


Figure 13

5.

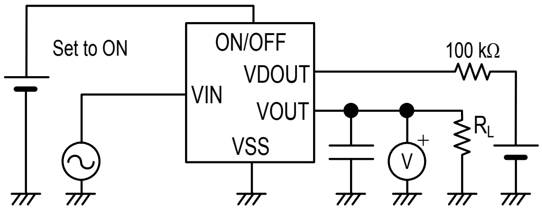


Figure 14

6.

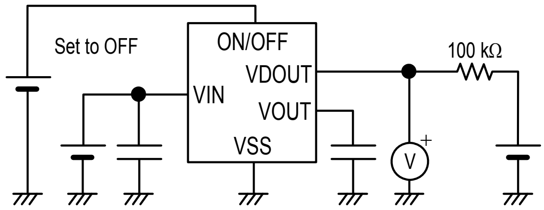


Figure 15

7.

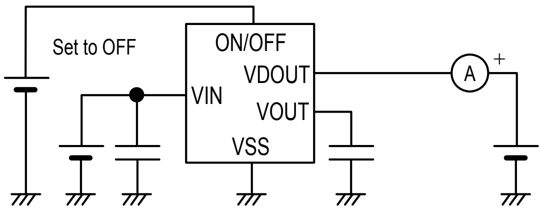


Figure 16

8.

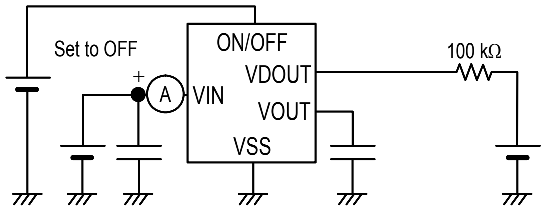


Figure 17

9.

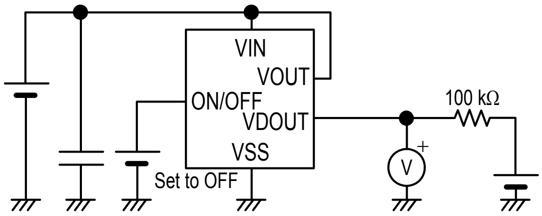


Figure 18

10.

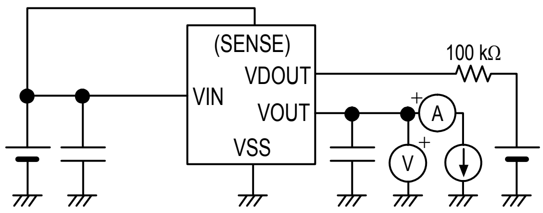


Figure 19

11.

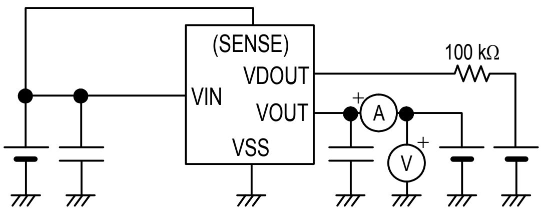


Figure 20

12.

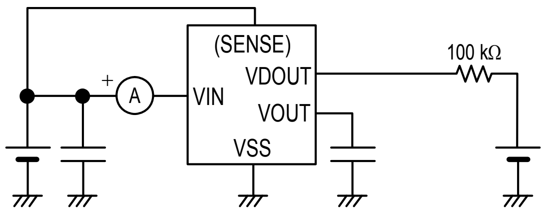


Figure 21

13.

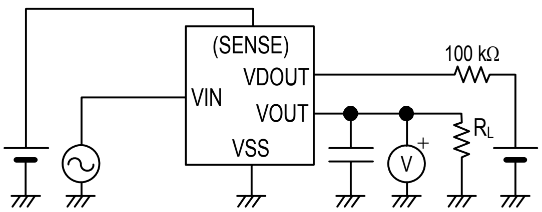


Figure 22

14.

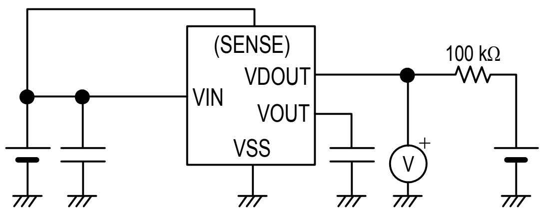


Figure 23

15.

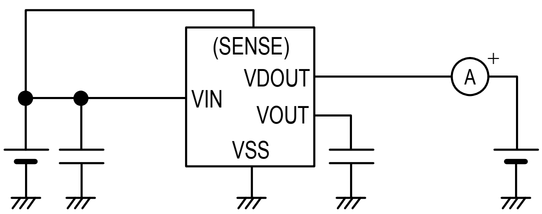


Figure 24

16.

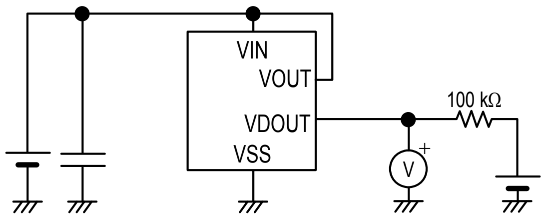
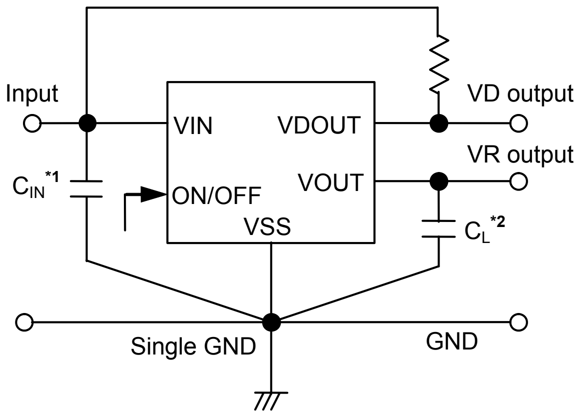


Figure 25

■ Standard Circuit

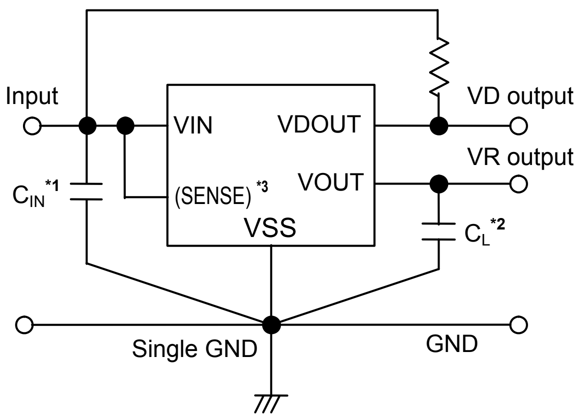
1. S-1701 Series A/B/C/D/E/F/G/H/J/K/L/M types



***1.** C_{IN} is a capacitor for stabilizing the input.
***2.** A ceramic capacitor of 1.0 μF or more can be used for C_L.

Figure 26

2. S-1701 Series N/P/Q/R/S/T/U/V/W/X/Y/Z types



***1.** C_{IN} is a capacitor for stabilizing the input.
***2.** A ceramic capacitor of 1.0 μF or more can be used for C_L.
***3.** U/V/W/X/Y/Z types of S-1701 series are no connection.

Figure 27

Caution The above connection diagrams and constants will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constants.

■ Condition of Application

Input capacitor (C_{IN}): 1.0 μF or more
Output capacitor (C_L): 1.0 μF or more
ESR of output capacitor: 10 Ω or less

Caution Generally a series regulator may cause oscillation, depending on the selection of external parts. Check that no oscillation occurs in an application that uses the above capacitor.

■ Selection of Input and Output Capacitors (C_{IN}, C_L)

The S-1701 Series requires an output capacitor between the VOUT pin and VSS pin for phase compensation. A ceramic capacitor with a capacitance of 1.0 μF or more provides a stable operation in all temperature ranges. When using an OS capacitor, a tantalum capacitor, or an aluminum electrolytic capacitor, the capacitance must be 1.0 μF or more, and the ESR must be 10 Ω or less.
The output overshoot and undershoot values, which are transient response characteristics, vary depending on the output capacitor value. The required capacitance value for the input capacitor differs depending on the application.
The recommended application values are $C_{IN} \geq 1.0$ μF and $C_L \geq 1.0$ μF, however, perform thorough evaluation using the actual device, including evaluation of temperature characteristics.

■ Explanation of Terms

Regulator block

1. Low dropout voltage regulator

This voltage regulator has the low dropout voltage due to its built-in low on-resistance transistor.

2. Low ESR

A capacitor whose ESR (Equivalent Series Resistance) is low. The S-1701 Series enables use of a low ESR capacitor, such as a ceramic capacitor, for the output-side capacitor (C_L). A capacitor whose ESR is 10 Ω or less can be used.

3. Output voltage (V_{OUT})

The accuracy of the output voltage is ensured at ±1.0% under the specified conditions of fixed input voltage*1, fixed output current, and fixed temperature.

***1.** Differs depending on the product.

Caution If the above conditions change, the output voltage value may vary and exceed the accuracy range of the output voltage. Refer to "■ Electrical Characteristics" and "■ Characteristics (Typical Data)" for details.

4. Line regulation $\left(\frac{\Delta V_{OUT1}}{\Delta V_{IN} \bullet V_{OUT}}\right)$

Indicates the dependency of the output voltage on the input voltage. That is, the values show how much the output voltage changes due to a change in the input voltage with the output current remaining unchanged.

5. Load regulation (ΔV_{OUT2})

Indicates the dependency of the output voltage on the output current. That is, the values show how much the output voltage changes due to a change in the output current with the input voltage remaining unchanged.

6. Dropout voltage (V_{drop})

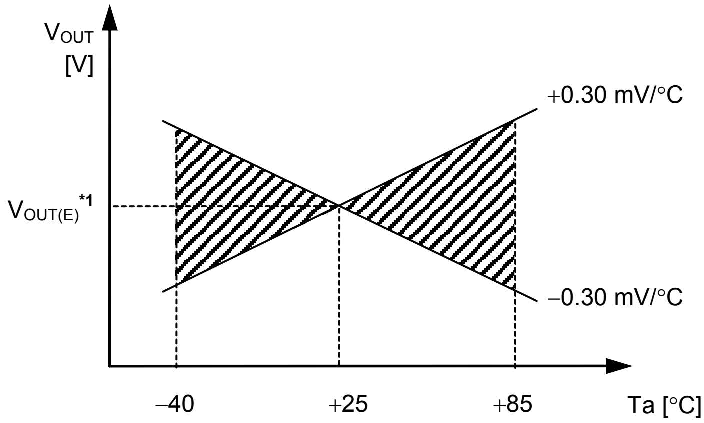
Indicates the difference between input voltage (V_{IN1}) and the output voltage when; decreasing input voltage (V_{IN}) gradually until the output voltage has dropped out to the value of 98% of output voltage (V_{OUT3}), which is at $V_{IN} = V_{OUT(S)} + 1.0$ V.

$V_{drop} = V_{IN1} - (V_{OUT3} \times 0.98)$

7. Output voltage temperature coefficient $\left(\frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}\right)$

The shaded area in **Figure 28** is the range where V_{OUT} varies in the operation temperature range when the output voltage temperature coefficient is ±100 ppm/°C.

Example of V_{OUT} = 3.0 V typ. product



***1.** $V_{OUT(E)}$ is the value of the output voltage measured at Ta = +25°C.

Figure 28

A change in the temperature of the output voltage [mV/°C] is calculated using the following equation.

$$\frac{\Delta V_{OUT}}{\Delta Ta}[\mathrm{mV/°C}]^{*1} = V_{OUT(S)}[\mathrm{V}]^{*2} \times \frac{\Delta V_{OUT}}{\Delta Ta \bullet V_{OUT}}[\mathrm{ppm/°C}]^{*3} \div 1000$$

***1.** Change in temperature of output voltage
***2.** Set output voltage
***3.** Output voltage temperature coefficient

Detector block

1. Detection voltage ($-V_{DET}$), release voltage ($+V_{DET}$)

The detection voltage ($-V_{DET}$) is the voltage at which the output switches to low. The detection voltage varies slightly among products of the same specification. The variation of detection voltage between the specified minimum ($-V_{DET}$) Min. and the maximum ($-V_{DET}$) Max. is called the detection voltage range (refer to **Figure 29**).

e.g. For a product with $-V_{DET}$ = 3.0 V, the detection voltage is a value in the range of 2.97 V ≤ ($-V_{DET}$) ≤ 3.03 V.
This means that some products have 2.97 V for $-V_{DET}$ and some have 3.03 V.

The release voltage ($+V_{DET}$) is the voltage at which the output switches to high. The release voltage varies slightly among products of the same specification. The variation of release voltages between the specified minimum ($+V_{DET}$) Min. and the maximum ($+V_{DET}$) Max. is called the release voltage range (refer to **Figure 30**).

e.g. For a product with $-V_{DET}$ = 3.0 V, the release voltage is a value in the range of 3.059 V ≤ ($+V_{DET}$) ≤ 3.242 V.
This means that some products have 3.059 V for $+V_{DET}$ and some have 3.242 V.

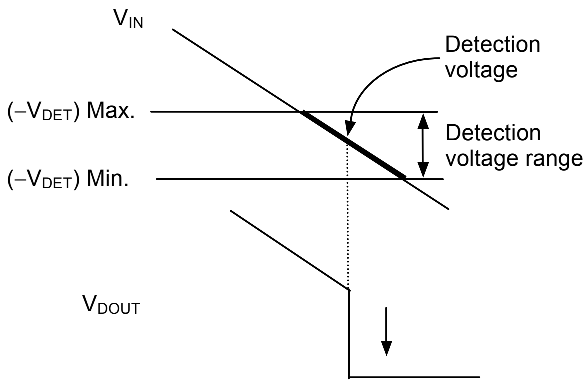


Figure 29 Detection Voltage

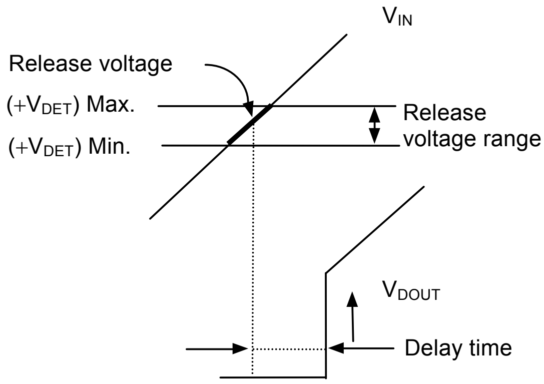


Figure 30 Release Voltage

Remark The above figures show the detection voltage and release voltage when the SENSE pin is connected to VIN.

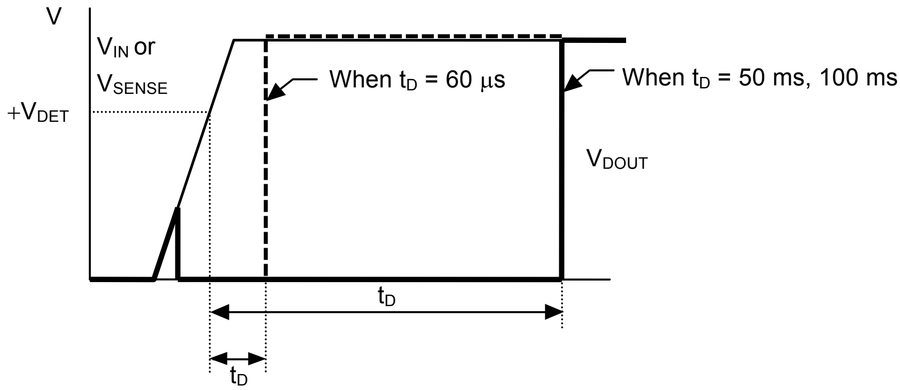
2. Hysteresis width (V_{HYS})

The hysteresis width is the voltage difference between the detection voltage and the release voltage. The existence of the hysteresis width prevents malfunction caused by noise on the input voltage.

3. Delay time (t_D)

The delay time is a time internally measured from the instant at which the voltage input to the VDD pin exceeds the release voltage ($+V_{DET}$) to the point at which the output of the OUT pin inverts.

S-1701 Series A/D/G/K/N/R/U/X types:	No delay (60 μs typ.)
S-1701 Series B/E/H/L/P/S/V/Y types:	50 ms typ.
S-1701 Series C/F/J/M/Q/T/W/Z types:	100 ms typ.



Remark The figure shows the case when the SENSE pin is connected to VIN.

Figure 31

4. Through-type current

The through-type current refers to the current that flows instantaneously when the voltage detector detects and releases a voltage. The through-type current flows at a frequency of 20 kHz during the release delay time since the internal logic circuit operates.

5. Oscillation

In applications where a resistor is connected to the input side (**Figure 32**), the through-type current which is generated when the output goes from low to high (release) causes a voltage drop equal to [through-type current] × [input resistance] across the resistor. When the input voltage drops below the detection voltage as a result, the output voltage goes from high to low. In this state, the through-type current stops, its resultant voltage drop disappears, and the output goes from low to high. The through-type current is then generated again, a voltage drop appears, and repeating the process finally induces oscillation.

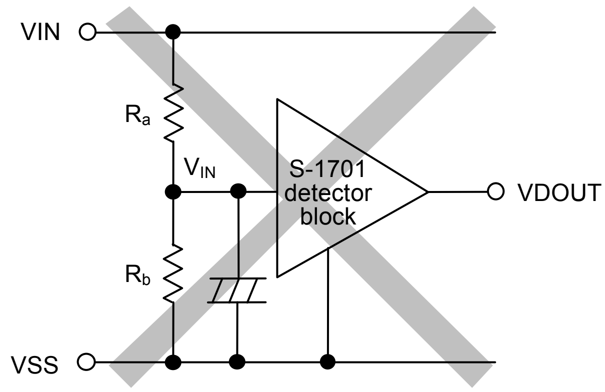


Figure 32 Example of Bad Implementation of Detection Voltage Changer

6. Other characteristics

6. 1 Detection voltage temperature characteristics

The shaded area in **Figure 33** is the range where $-V_{DET}$ varies within the operation temperature range when the output voltage temperature coefficient is ±140 ppm/°C.

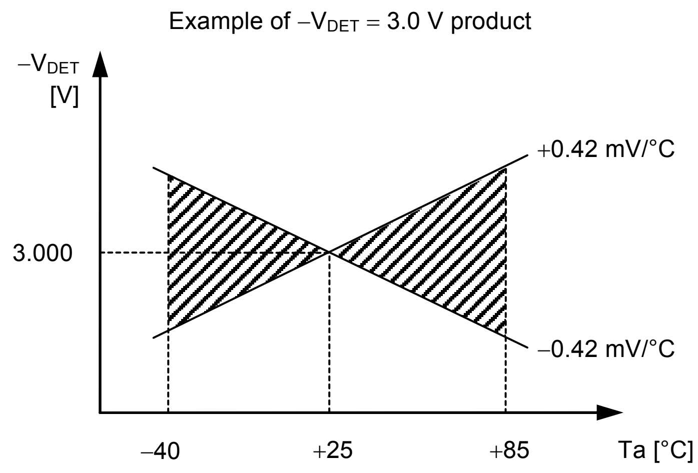


Figure 33

6. 2 Release voltage temperature characteristics

The temperature change $\frac{\Delta{+V_{DET}}}{\Delta Ta}$ of the release voltage is calculated by the temperature change $\frac{\Delta{-V_{DET}}}{\Delta Ta}$ of the detection voltage as follows:

$$\frac{\Delta{+V_{DET}}}{\Delta Ta} = \frac{+V_{DET}}{-V_{DET}} \times \frac{\Delta{-V_{DET}}}{\Delta Ta}$$

The temperature change of the release voltage and the detection voltage consequently have the same sign.

6. 3 Hysteresis voltage temperature characteristics

The temperature change of the hysteresis voltage is expressed as $\frac{\Delta{+V_{DET}}}{\Delta Ta} - \frac{\Delta{-V_{DET}}}{\Delta Ta}$ and is calculated as follows:

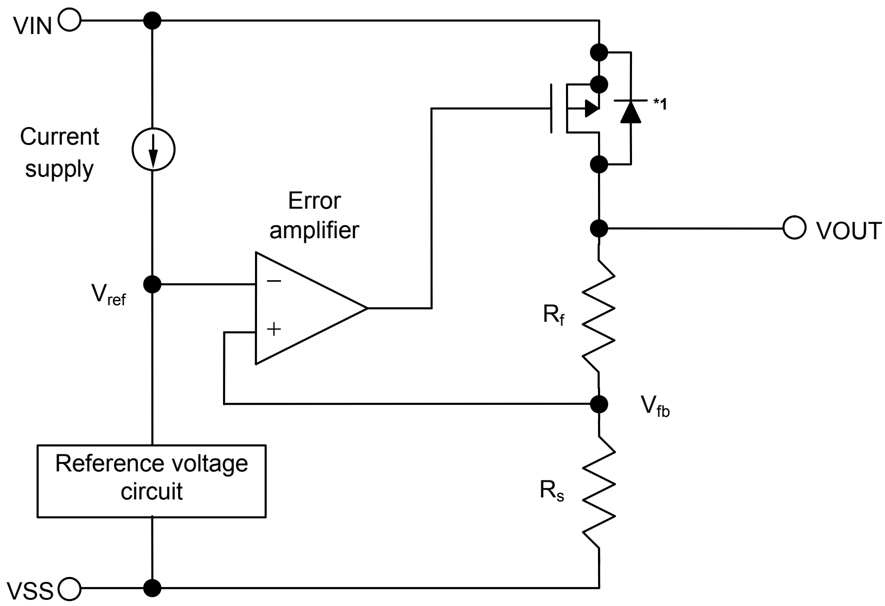
$$\frac{\Delta{+V_{DET}}}{\Delta Ta} - \frac{\Delta - V_{DET}}{\Delta Ta} = \frac{V_{HYS}}{-V_{DET}} \times \frac{\Delta - V_{DET}}{\Delta Ta}$$

■ Operation

Regulator block

1. Basic operation

Figure 34 shows the block diagram of the regulator block.
The error amplifier compares the reference voltage (V_{ref}) with feedback voltage (V_{fb}), which is the output voltage resistance-divided by feedback resistors (R_s and R_f). It supplies the gate voltage necessary to maintain the constant output voltage which is not influenced by the input voltage and temperature change, to the output transistor.
Output voltage is selectable from the range of 1.5 to 5.0 V in the S-1701 Series.



***1**. Parasitic diode

Figure 34 Block Diagram (Regulator Block)

2. Output transistor

In the S-1701 Series, a low on-resistance P-channel MOS FET is used as the output transistor.
Be sure that V_{OUT} does not exceed V_{IN} + 0.3 V to prevent the voltage regulator from being damaged due to reverse current flowing from the VOUT pin through a parasitic diode to the VIN pin, when the potential of V_{OUT} became higher than V_{IN}.

3. ON/OFF pin (S-1701 Series A/B/C/D/E/F/G/H/J/K/L/M types)

This pin starts and stops the regulator.
When the ON/OFF pin is set to OFF level, the entire internal circuit stops operating, and the built-in P-channel MOS FET output transistor between the VIN pin and the VOUT pin is turned off, reducing current consumption significantly. At this time, the current consumption equals that consumed by the detector block, because the internal circuits of the detector are operating. The VOUT pin becomes the V_{SS} level due to the internally divided resistance of several hundreds kΩ between the VOUT pin and the VSS pin.
The structure of the ON/OFF pin is as shown in **Figure 35**. Since the ON/OFF pin is neither pulled down nor pulled up internally, do not use it in the floating status. In addition, note that the current consumption increases if a voltage of 0.3 V to $V_{IN} - 0.3$ V is applied to the ON/OFF pin. When not using the ON/OFF pin, connect it as follows according to the product type.

S-1701 Series A/B/C/D/E/F types: Connect to the VIN pin.
S-1701 Series G/H/J/K/L/M types: Connect to the VSS pin.

Table 32

Product Type	ON/OFF Pin	Internal Circuit	VOUT Pin Voltage	Current Consumption
A/B/C/D/E/F	"H": ON	Operate	Set value	I_{SS}
A/B/C/D/E/F	"L": OFF	Stop	V_{SS} level	I_{SSD}
G/H/J/K/L/M	"H": OFF	Stop	V_{SS} level	I_{SSD}
G/H/J/K/L/M	"L": ON	Operate	Set value	I_{SS}

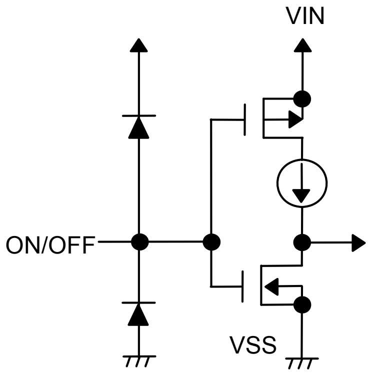
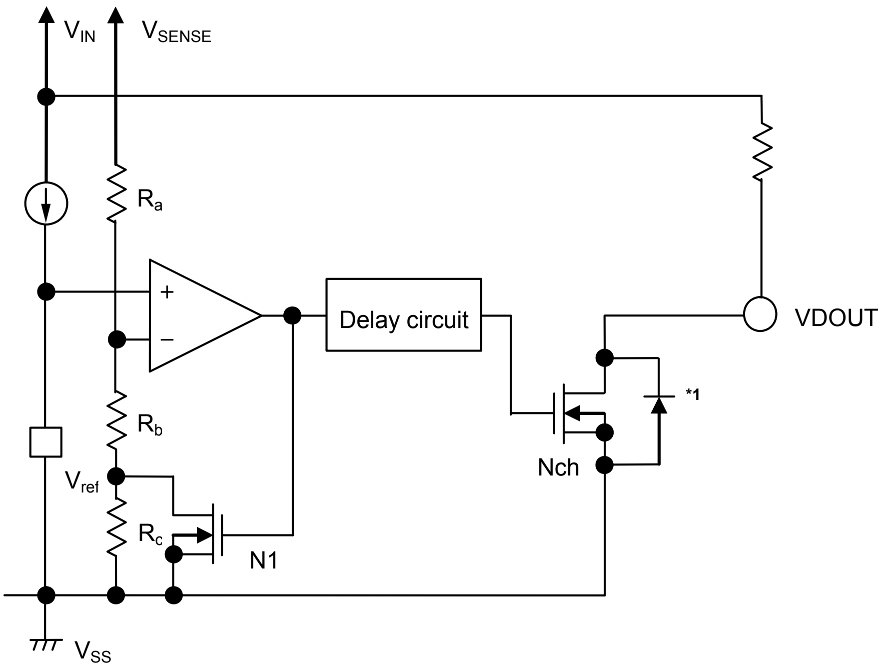


Figure 35

Detector block

1. Basic operation

Figure 36 shows the block diagram of the detector block.



***1.** Parasitic diode

Figure 36 Block Diagram (Detector Block)

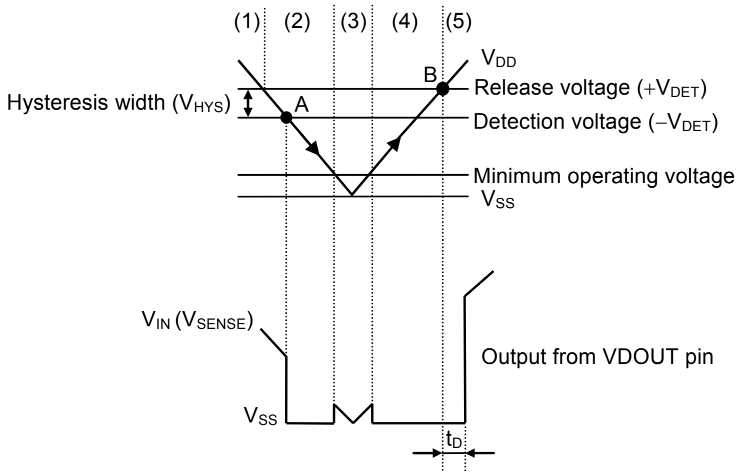
(1) When the SENSE voltage (V_{SENSE}) is higher than the release voltage ($+V_{DET}$), the Nch transistor is OFF and V_{IN} (high) is output. Since the Nch transistor N1 in **Figure 36** is OFF, the comparator input voltage is $\frac{(R_b+R_c) \bullet V_{SENSE}}{R_a+R_b+R_c}$.

(2) When V_{SENSE} goes below $+V_{DET}$, V_{IN} is output, as long as V_{SENSE} remains above the detection voltage ($-V_{DET}$). When the V_{SENSE} falls below $-V_{DET}$, the Nch transistor becomes ON and V_{SS} is output. At this time, the Nch transistor N1 in **Figure 36** becomes ON, and the comparator input voltage is changed to $\frac{R_b \bullet V_{SENSE}}{R_a+R_b}$.

(3) When V_{IN} falls below the minimum operating voltage, the output becomes undefined. In this case the output becomes V_{IN} because it is pulled up.

(4) V_{SS} is output when V_{IN} rises above the minimum operating voltage. The V_{SS} level still appears even when V_{SENSE} surpasses $-V_{DET}$, as long as it does not exceed the release voltage $+V_{DET}$. When V_{SENSE} rises above $+V_{DET}$, the Nch transistor becomes OFF and V_{IN} is output. V_{IN} at the VDOUT pin is delayed for t_D due to the delay circuit.

(5) In the S-1701 Series, the detection voltage can be set within the range of 1.5 V to 5.5 V (operating voltage range: 0.8 V to 6.5 V).



Remark The above figure shows the case when the SENSE pin is connected to VIN.

Figure 37 Operation

2. Delay circuit

The delay circuit delays the output signal from the time when the SENSE voltage (V_{SENSE}) exceeds the release voltage ($+V_{DET}$) when V_{SENSE} is turned on (refer to **point B** in **Figure 37**). The output signal is not delayed when V_{SENSE} goes below the detection voltage ($-V_{DET}$) (refer to **point A** in **Figure 37**).
The delay time (t_D) is a fixed value that is determined by a counter and a built-in clock generator which consists of constant current and a capacitor.

3. Delay circuit output voltage detection type (S-1701 Series D/E/F/K/L/M/U/V/W types)

If the input voltage or load current changes transiently, an undershoot or overshoot occurs in the output voltage of the regulator. In the product types in which the output voltage of the regulator is detected by the detector, if the output voltage is the detection voltage or lower due to the undershoot, the detector operates and a reset signal may be output. To prevent this, set the value of the input-and-output capacitor of a regulator so that the undershoot is the minimum value or set a voltage range that allows the difference between the output voltage and detection voltage to be equal to or greater than the undershoot.

■ Explanation for Each Type

1. S-1701 Series A/B/C types

The S-1701 Series A/B/C types provide a regulator block standby mode realized by an ON/OFF function that is active high. The internal circuit of the detector operates in the standby mode, so only the current that the detector consumes flows.
The SENSE pin is connected to the VIN pin in the internal circuit of the detector block, so the voltage applied to the VIN pin is monitored and a reset signal is output from the VDOUT pin. The built-in counter timer allows selection of the release delay time from three settings (A: No delay (60 μs), B: 50 ms, C: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning VIN pin input impedance*1.

2. S-1701 Series D/E/F types

The S-1701 Series D/E/F types provide a regulator block standby mode realized by an ON/OFF function that is active high. The internal circuit of the detector operates in the standby mode, so only the current that the detector consumes flows.
The SENSE pin is connected to the VOUT pin, which is an output of the regulator, in the internal circuit of the detector block, so the output voltage of the regulator (V_{OUT}) is monitored and a reset signal is output from the VDOUT pin*2. The built-in counter timer allows selection of the release delay time from three settings (D: No delay (60 μs), E: 50 ms, F: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

3. S-1701 Series G/H/J types

The S-1701 Series G/H/J types provide a regulator block standby mode realized by an ON/OFF function that is active low. The internal circuit of the detector operates in the standby mode, so only the current that the detector consumes flows.
The SENSE pin is connected to the VIN pin in the internal circuit of the detector block, so the voltage applied to the VIN pin is monitored and a reset signal is output from the VDOUT pin. The built-in counter timer allows selection of the release delay time from three settings (G: No delay (60 μs), H: 50 ms, J: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

4. S-1701 Series K/L/M types

The S-1701 Series K/L/M types provide a regulator block standby mode realized by an ON/OFF function that is active low. The internal circuit of the detector operates in the standby mode, so only the current that the detector consumes flows.
The SENSE pin is connected to the VOUT pin, which is an output of the regulator in the internal circuit of the detector block, so the output voltage of the regulator (V_{OUT}) is monitored and a reset signal is output from the VDOUT pin*2. The built-in counter timer allows selection of the release delay time from three settings (K: No delay (60 μs), L: 50 ms, M: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

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

The S-1701 Series N/P/Q types do not provide an ON/OFF function because the ON/OFF pin is connected to the VIN pin in the circuit.
The detector block features the external SENSE pin, which allows monitoring of other power supplies. The SENSE pin is configured only by a resistor, so instantaneous current such as through-type current does not flow through this pin. This allows precise monitoring of the input power supply by connecting the SENSE pin to the input power supply even when a resistor (R_{IN}) is connected between the input power supply and the VIN pin. The built-in counter timer allows selection of the release delay time from three settings (N: No delay (60 μs), P: 50 ms, Q: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

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

In the S-1701 Series R/S/T types, the VDOUT pin, which is the output pin of the detector, is connected to the ON/OFF pin of the regulator in the circuit. This allows setting of the regulator to the standby mode at the same time as the VDOUT pin outputs a RESET signal.
The detector block features an external SENSE pin, which allows monitoring of other power supplies. The SENSE pin is configured only by a resistor, so instantaneous current such as through-type current does not flow through this pin. This allows precise monitoring of the input power supply by connecting the SENSE pin to the input power supply even when a resistor (R_{IN}) is connected between the input power supply and the VIN pin. The built-in counter timer allows selection of the release delay time from three settings (R: No delay (60 μs), S: 50 ms, T: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

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

The S-1701 Series U/V/W types do not provide an ON/OFF function because the ON/OFF pin is connected to the VIN pin in the circuit.
The SENSE pin is connected to the VOUT pin, which is an output pin of the regulator, in the internal circuit of the detector block, so the output voltage of the regulator (V_{OUT}) is monitored and a reset signal is output from the VDOUT pin*2. The built-in counter timer allows selection of the release delay time from three settings (U: No delay (60 μs), V: 50 ms, W: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

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

The S-1701 Series X/Y/Z types do not provide an ON/OFF function because the ON/OFF pin is connected to the VIN pin in the circuit.
The SENSE pin is connected to the VIN pin in the internal circuit of the detector block, so the voltage applied to the VIN pin is monitored and a reset signal is output from the VDOUT pin. The built-in counter timer allows selection of the release delay time from three settings (X: No delay (60 μs), Y: 50 ms, Z: 100 ms).
The power supply is shared by the regulator block and detector block and supplied from the VIN pin, so care must be taken concerning the VIN pin input impedance*1.

***1.** In S-1701 series, when connecting the resistance R_{IN} between an input power supply pin and a VIN pin, and defining the current which flows into R_{IN} as I_{IN}, VIN pin voltage falls by $\Delta V_{IN} = I_{IN} \times R_{IN}$ at the time of overload, and changes by $\Delta V_{IN} = I_{IN} \times R_{IN}$ at the time of load change. Thereby, keep in mind that phenomena, such as output voltage falls and an output oscillation, occur.

***2.** If the input voltage or load current changes transiently, an undershoot or overshoot occurs in the output voltage of the regulator. In the product types in which the output voltage of the regulator is detected by the detector, if the output voltage is the detection voltage or lower due to the undershoot, the detector operates and a reset signal may be output. To prevent this, set the value of the input-and-output capacitor of a regulator so that the undershoot is the minimum value or set a voltage range that allows the difference between the output voltage and detection voltage to be equal to or greater than the undershoot.

■ Precautions

- Wiring patterns for the VIN pin, the VOUT pin and GND should be designed so that the impedance is low. When mounting an output capacitor between the VOUT pin and the VSS pin (C_L) and a capacitor for stabilizing the input between the VIN pin and the VSS pin (C_{IN}), the distance from the capacitors to these pins should be as short as possible.

- Note that generally the output voltage may increase when a series regulator is used at low load current (1.0 mA or less).

- Generally a series regulator may cause oscillation, depending on the selection of external parts. The following conditions are recommended for the S-1701 Series. However, be sure to perform sufficient evaluation under the actual usage conditions for selection, including evaluation of temperature characteristics.

  Input capacitor (C_{IN}): 1.0 μF or more
  Output capacitor (C_L): 1.0 μF or more
  Equivalent series resistance (ESR): 10 Ω or less

- The voltage regulator may oscillate when the impedance of the power supply is high and the input capacitance is small or an input capacitor is not connected.

- Overshoot may occur in the output voltage momentarily if the voltage is rapidly raised at power-on or when the power supply fluctuates. Sufficiently evaluate the output voltage at power-on with the actual device.

- The application conditions for the input voltage, the output voltage, and the load current should not exceed the package power dissipation.

- Do not apply an electrostatic discharge to this IC that exceeds the performance ratings of the built-in electrostatic protection circuit.

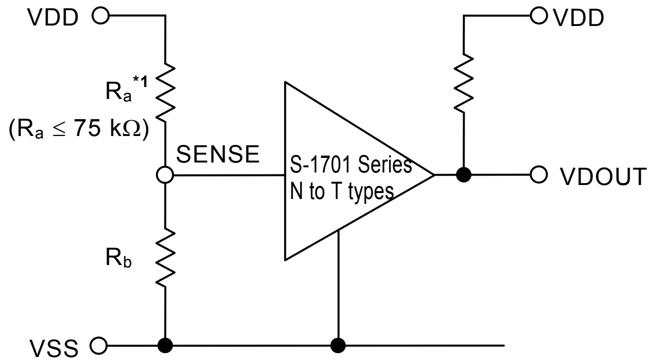
- In determining the output current, attention should be paid to the output current value specified in **Tables 26** to **31** in "■ **Electrical Characteristics**" and footnote ***7** of the table.

- ABLIC Inc. claims no responsibility for any disputes arising out of or in connection with any infringement by products including this IC of patents owned by a third party.

■ Application Circuit

If the desired detection voltage range is other than those provided by the S-1701 Series, the detection voltage can be changed by using a divided resistor or diode in the SENSE pin products (N/P/Q/R/S/T types) as shown in **Figures 38** and **39**.
In the case shown in **Figure 38**, the hysteresis width also changes at the same time.

1. Changing detection voltage using divided resistors



Detection voltage = $\frac{R_a+R_b}{R_b} \bullet -V_{DET}$

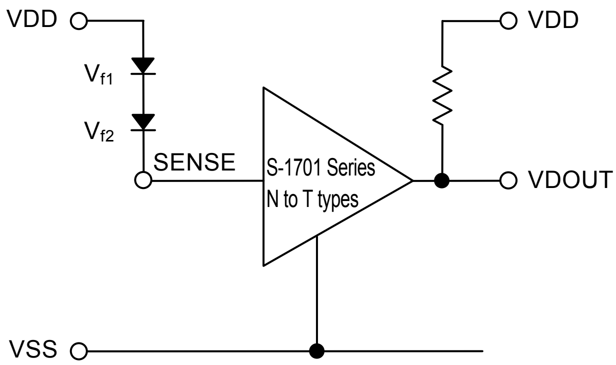
Hysteresis width = $\frac{R_a+R_b}{R_b} \bullet V_{HYS}$

***1.** Set Ra to 75 kΩ or lower to prevent oscillation.

Figure 38

Caution If R_a and R_b are larger, the hysteresis may be greater than the result of the above formula due to the through current of the IC.

2. Changing detection voltage using diode



Detection voltage = $V_{f1} + V_{f2} + (-V_{DET})$

Figure 39

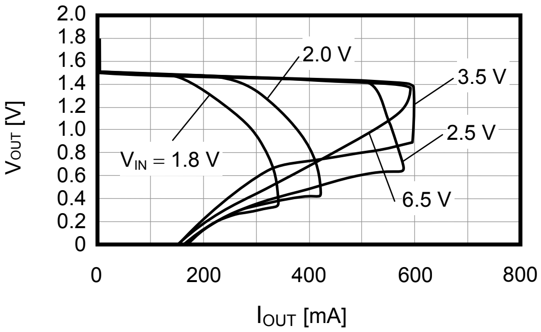
Caution The above connection diagrams (Figures 38 and 39) and constants will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constants.

■ Characteristics (Typical Data)

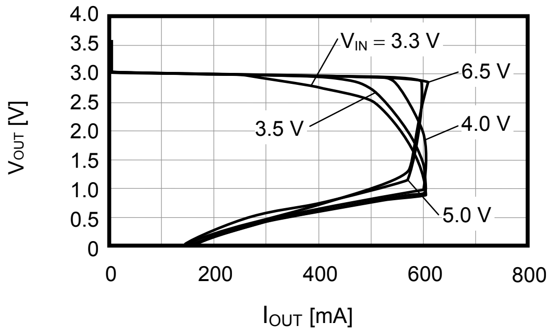
1. Regulator block

(1) Output voltage vs. Output current (when load current increases)

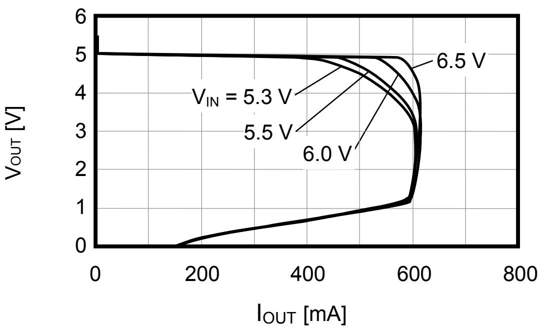
S-1701x15xx (V_{OUT} = 1.5 V, Ta = 25°C)



S-1701x30xx (V_{OUT} = 3.0 V, Ta = 25°C)



S-1701x50xx (V_{OUT} = 5.0 V, Ta = 25°C)

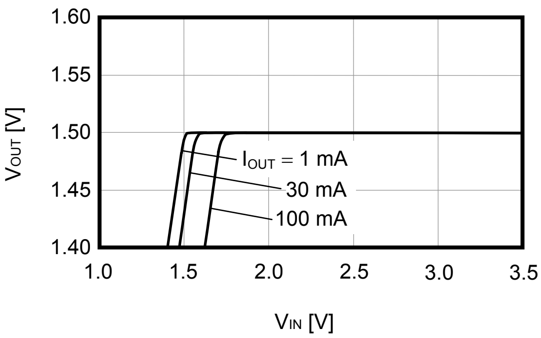


Remark In determining the output current, attention should be paid to the following.

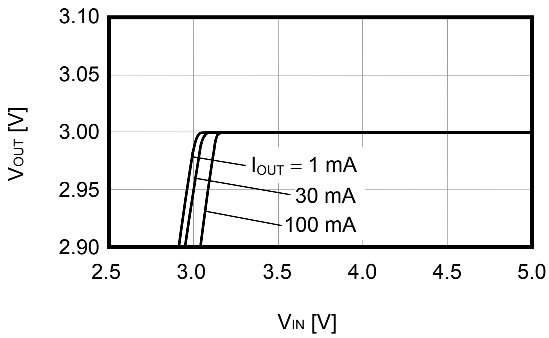
1. The minimum output current value and footnote ***7** in **Table 26** to **31** in the "**■ Electrical Characteristics**".
2. The package power dissipation

(2) Output voltage vs. Input voltage

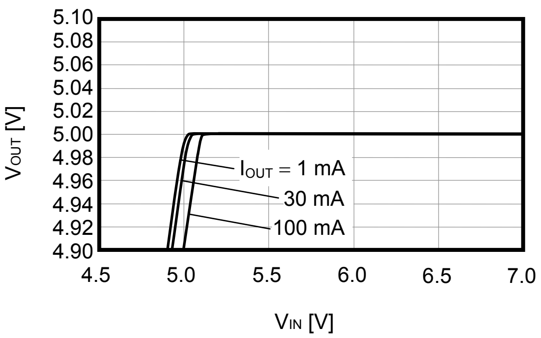
S-1701x15xx (V_{OUT} = 1.5 V, Ta = 25°C)



S-1701x30xx (V_{OUT} = 3.0 V, Ta = 25°C)

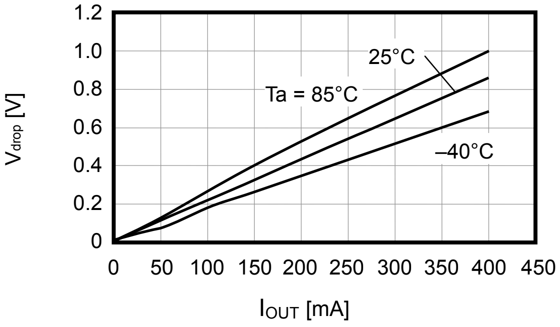


S-1701x50xx (V_{OUT} = 5.0 V, Ta = 25°C)

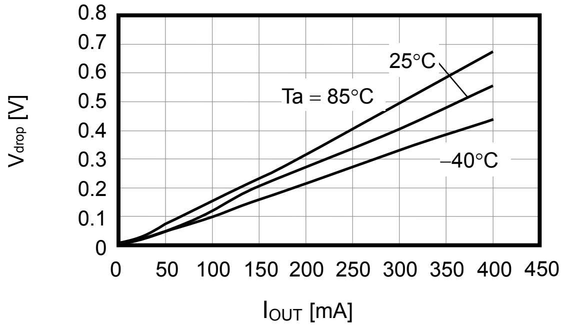


(3) Dropout voltage vs. Output current

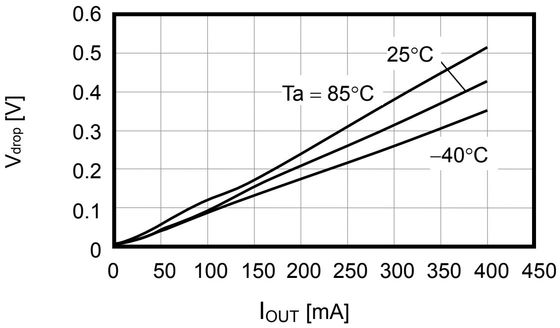
S-1701x15xx (V_{OUT} = 1.5 V)



S-1701x30xx (V_{OUT} = 3.0 V)

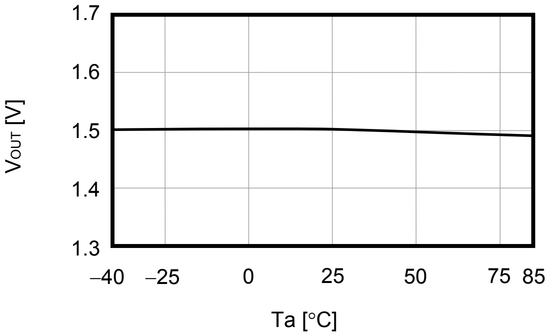


S-1701x50xx (V_{OUT} = 5.0 V)

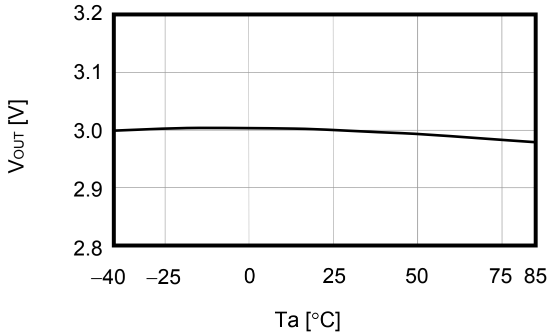


(4) Output voltage vs. Ambient temperature

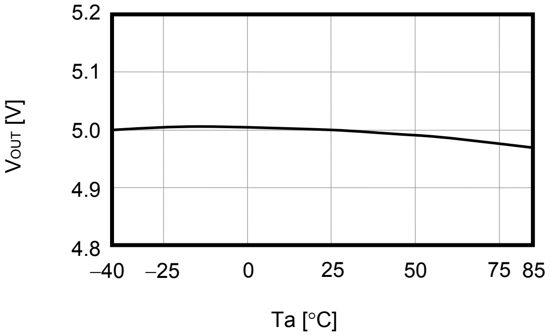
S-1701x15xx (V_{OUT} = 1.5 V, I_{OUT} = 30 mA)



S-1701x30xx (V_{OUT} = 3.0 V, I_{OUT} = 30 mA)

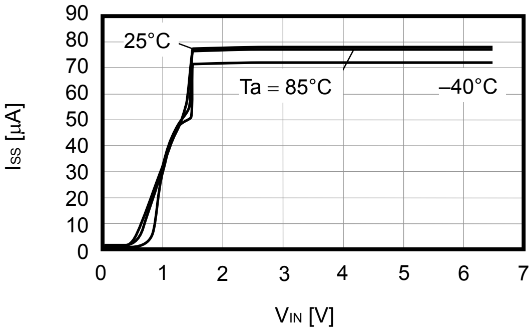


S-1701x50xx (V_{OUT} = 5.0 V, I_{OUT} = 30 mA)

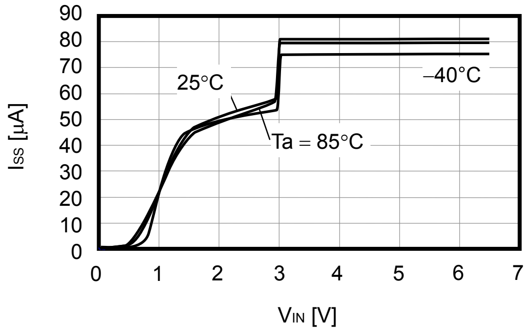


(5) Current consumption vs. Input voltage

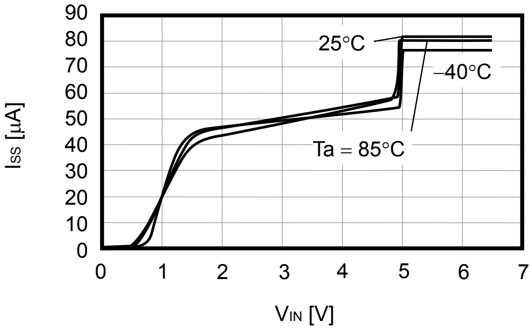
S-1701x15xx (V_{OUT} = 1.5 V)



S-1701x30xx (V_{OUT} = 3.0 V)

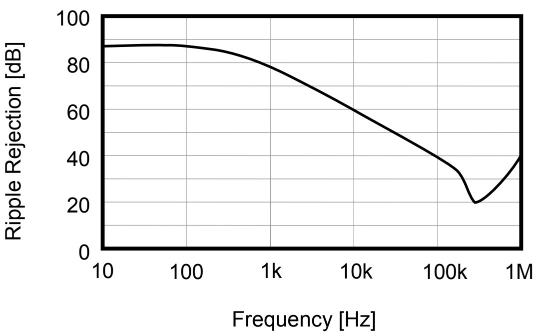


S-1701x50xx (V_{OUT} = 5.0 V)

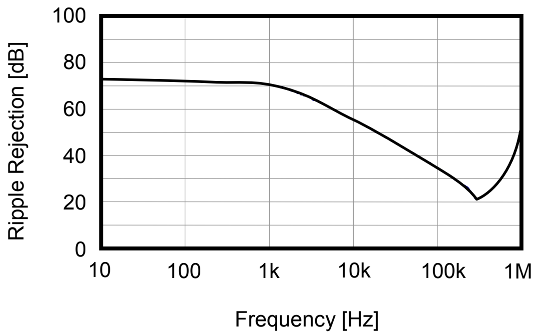


(6) Ripple rejection ratio

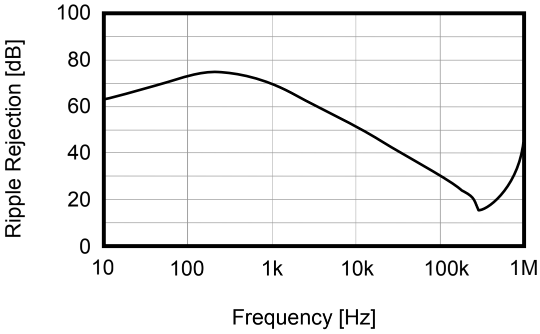
S-1701x15xx (V_{OUT} = 1.5 V, Ta = 25°C)
V_{IN} = 2.5 V, C_L = 1.0 μF, I_{OUT} = 30 mA



S-1701x30xx (V_{OUT} = 3.0 V, Ta = 25°C)
V_{IN} = 4.0 V, C_L = 1.0 μF, I_{OUT} = 30 mA



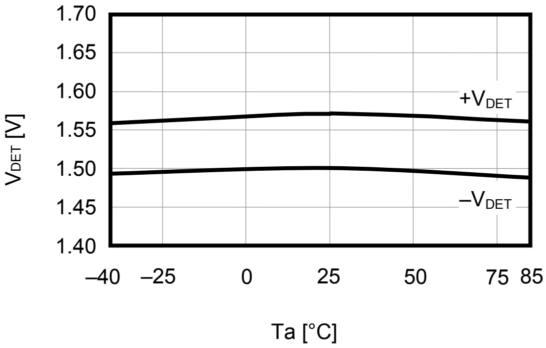
S-1701x50xx (V_{OUT} = 5.0 V, Ta = 25°C)
V_{IN} = 6.0 V, C_L = 1.0 μF, I_{OUT} = 30 mA



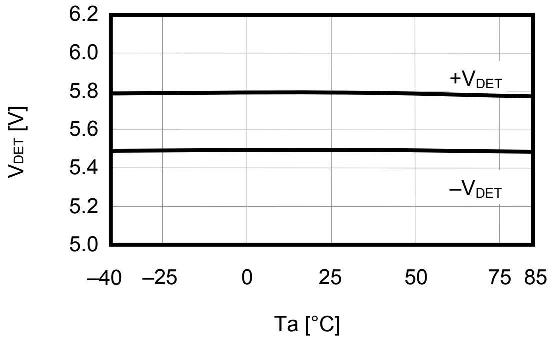
2. Detector block

(1) Detection voltage vs. Ambient temperature

S-1701xxx15 ($-V_{DET}$ = 1.5 V)

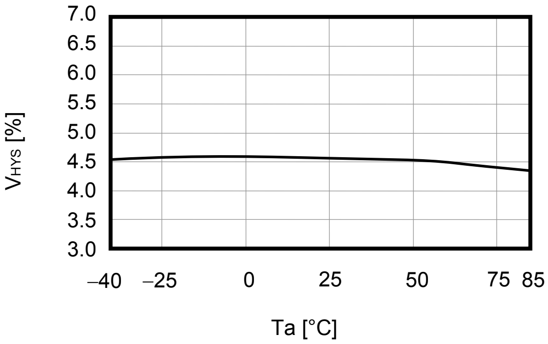


S-1701xxx55 ($-V_{DET}$ = 5.5 V)

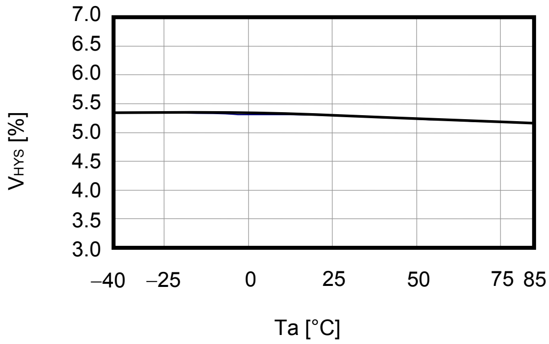


(2) Hysteresis width vs. Ambient temperature

S-1701xxx15 ($-V_{DET}$ = 1.5 V)

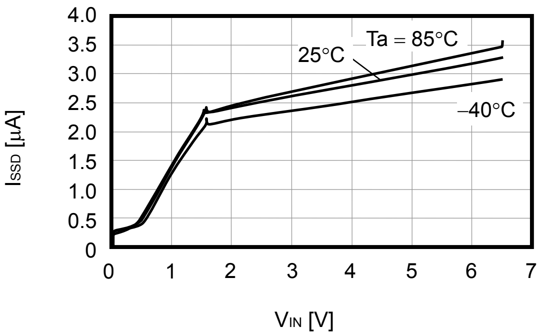


S-1701xxx55 ($-V_{DET}$ = 5.5 V)

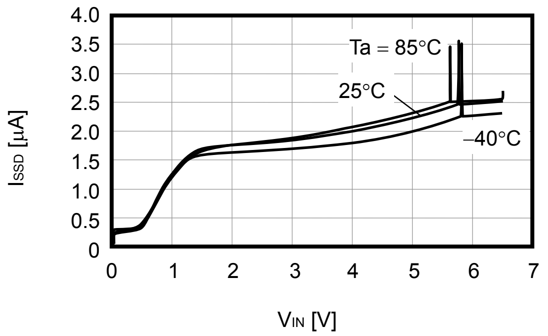


(3) Detector block current consumption vs. Input voltage

S-1701xxx15 ($-V_{DET}$ = 1.5 V)

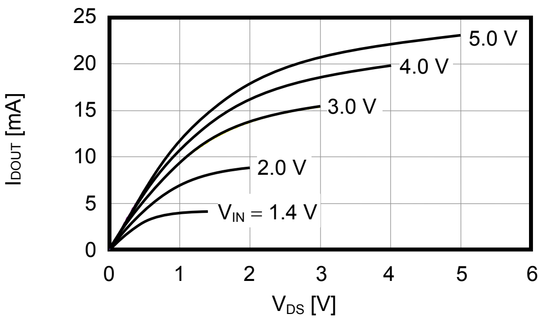


S-1701xxx55 ($-V_{DET}$ = 5.5 V)



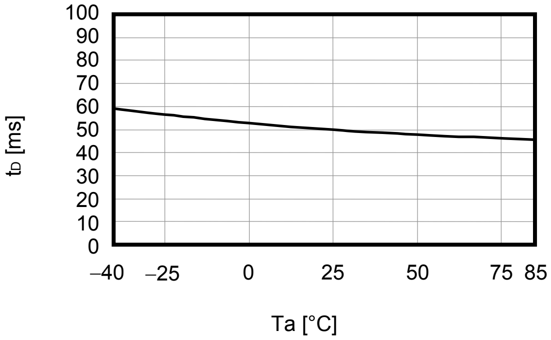
(4) Nch transistor output current vs. V_{DS} characteristics

S-1701xxx55 ($-V_{DET}$ = 5.5 V, Ta = 25°C)

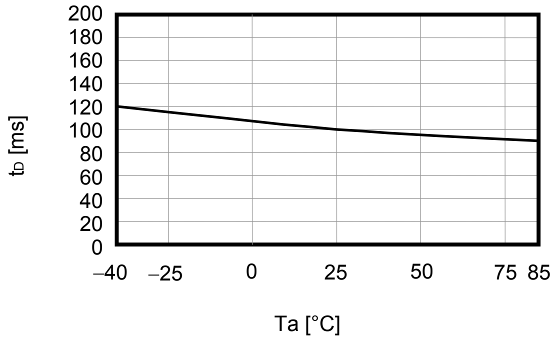


(5) Release delay time vs. Ambient temperature

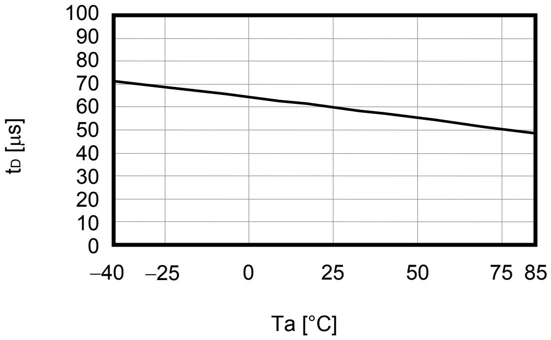
S-1701xxx15 (V_{IN} = 1.5 V, $-V_{DET}$ = 1.5 V, t_D = 50 ms)



S-1701xxx55 (V_{IN} = 5.5 V, $-V_{DET}$ = 5.5 V, t_D = 100 ms)

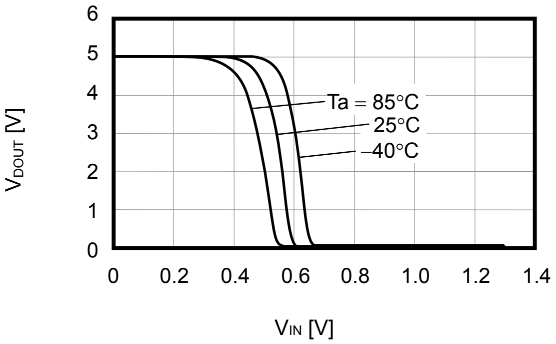


S-1701xxx45 (V_{IN} = 4.5 V, $-V_{DET}$ = 4.5 V, t_D = 60 μs)

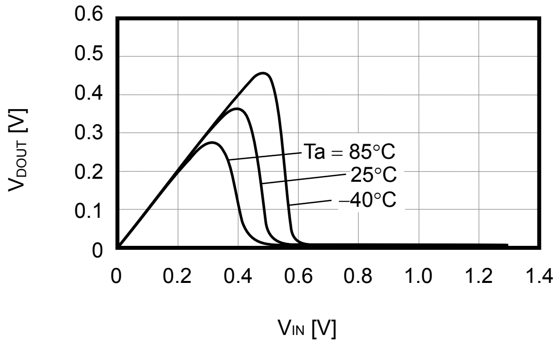


(6) Minimum operating voltage vs. Input voltage

S-1701xxx15 (5 V pull up: 100 kΩ, $-V_{DET}$ = 1.5 V)



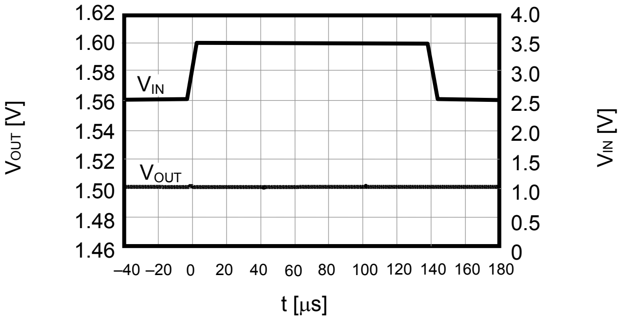
S-1701xxx15 (V_{IN} pull up: 100 kΩ, $-V_{DET}$ = 1.5 V)



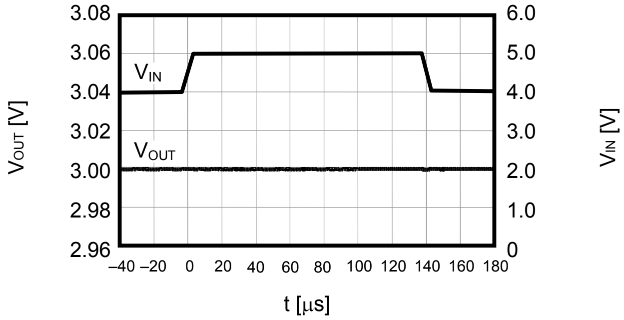
■ Reference Data

(1) Input transient response characteristics

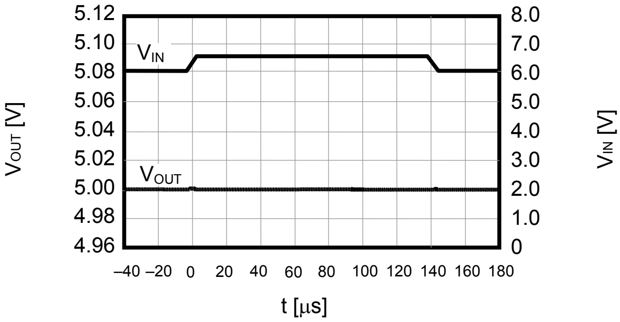
S-1701x15xx (V_{IN} = 2.5 V ↔ 3.5 V, V_{OUT} =1.5 V, Ta = 25°C)
I_{OUT} = 100 mA, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF



S-1701x30xx (V_{IN} = 4.0 V ↔ 5.0 V, V_{OUT} = 3.0 V, Ta = 25°C)
I_{OUT} = 100 mA, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF

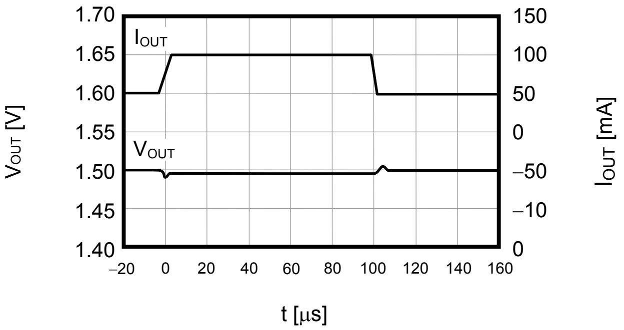


S-1701x50xx (V_{IN} = 6.0 V ↔ 6.5 V, V_{OUT} = 5.0 V, Ta = 25°C)
I_{OUT} = 100 mA, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF

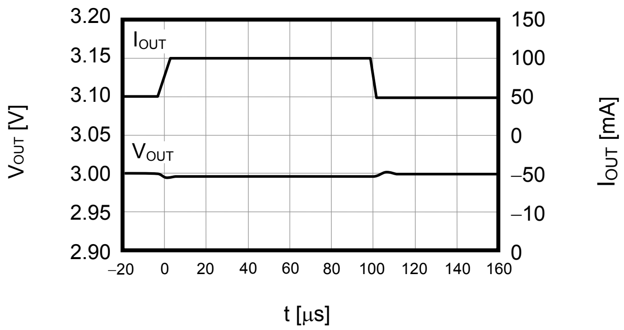


(2) Load transient response characteristics

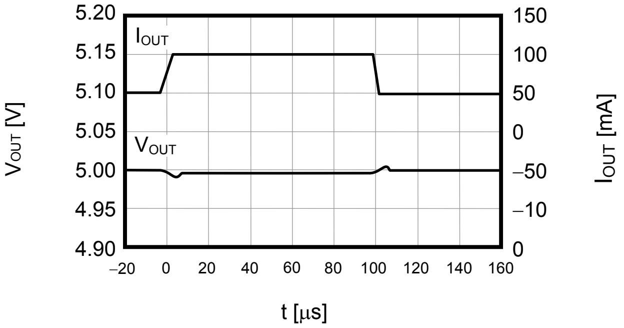
S-1701x15xx (V_{OUT} =1.5 V, Ta = 25°C)
V_{IN} = 2.5 V, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF, I_{OUT} = 50 mA ↔ 100 mA



S-1701x30xx (V_{OUT} = 3.0 V, Ta = 25°C)
V_{IN} = 4.0 V, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF, I_{OUT} = 50 mA ↔ 100 mA

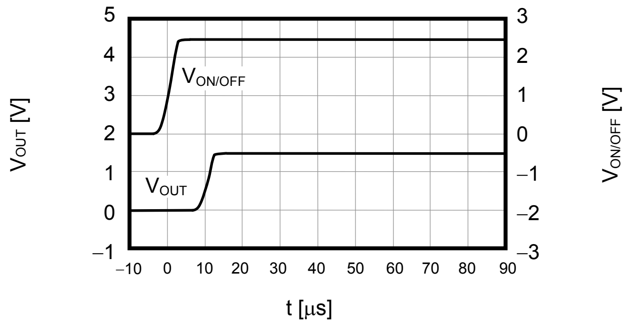


S-1701x50xx (V_{OUT} = 5.0 V, Ta = 25°C)
V_{IN} = 6.0 V, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF, I_{OUT} = 50 mA ↔ 100 mA

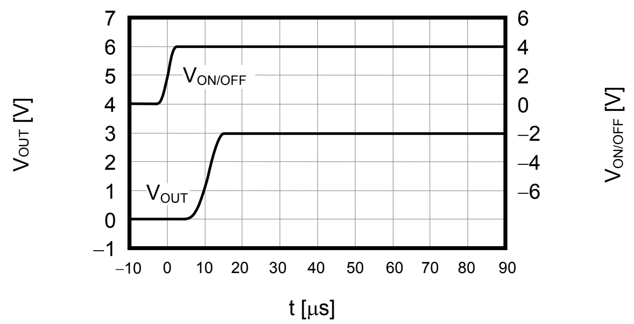


(3) ON/OFF pin transient response characteristics

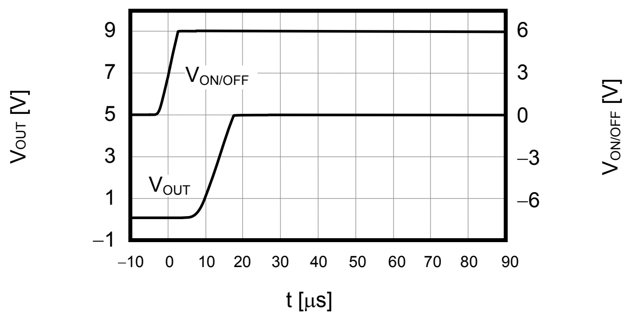
S-1701x15xx (V_{OUT} = 1.5 V, Ta = 25°C)
V_{IN} = 2.5 V, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF, I_{OUT} = 100 mA



S-1701x30xx (V_{OUT} = 3.0 V, Ta = 25°C)
V_{IN} = 4.0 V, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF, I_{OUT} = 100 mA

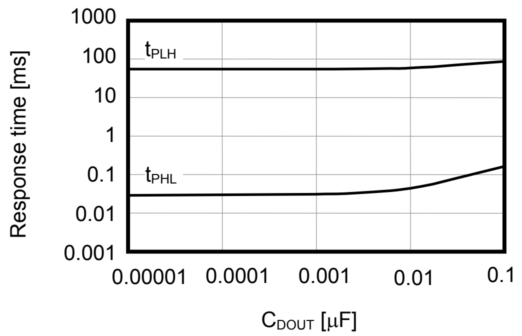


S-1701x50xx (V_{OUT} = 5.0 V, Ta = 25°C)
V_{IN} = 6.0 V, t_r = t_f = 5.0 μs, C_L = 1.0 μF, C_{IN} = 1.0 μF, I_{OUT} = 100 mA

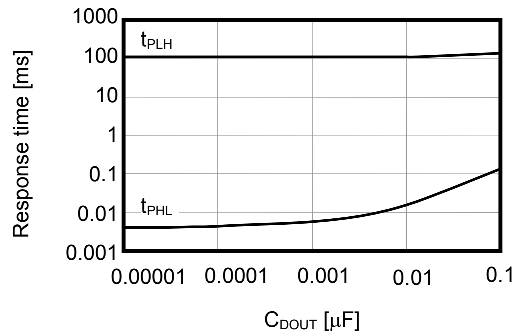


(4) Dynamic response characteristics vs. C_{DOUT}

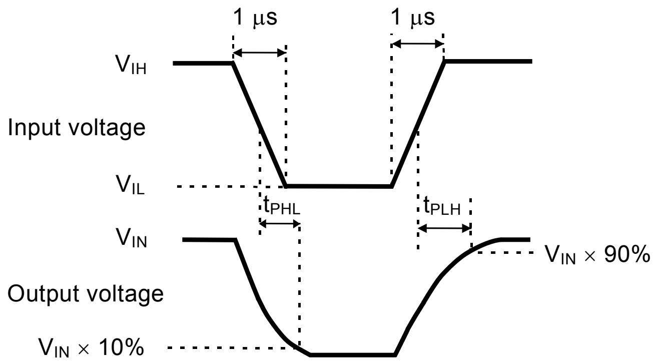
S-1701xxx15 (V_{IN} pull up: 100 kΩ, $-V_{DET}$ = 1.5 V, Ta = 25°C)



S-1701xxx55 (V_{IN} pull up: 100 kΩ, $-V_{DET}$ = 5.5 V, Ta = 25°C)



(a) Measurement conditions of dynamic response vs. C_{DOUT}



V_{IH} = 6.5 V, V_{IL} = 1.3 V

Figure 40

(b) Measurement circuit of the dynamic response for S-1701 Series A/B/C/G/H/J/X/Y/Z types

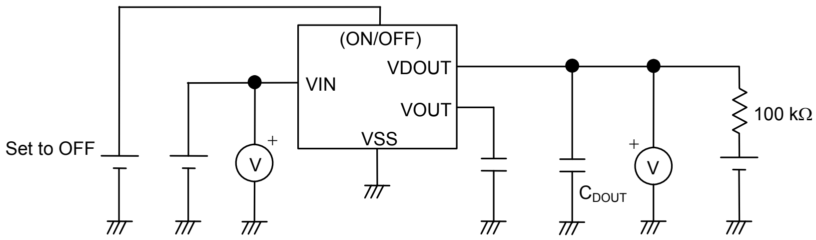


Figure 41

(c) Measurement circuit of the dynamic response for S-1701 Series D/E/F/K/L/M/U/V/W types

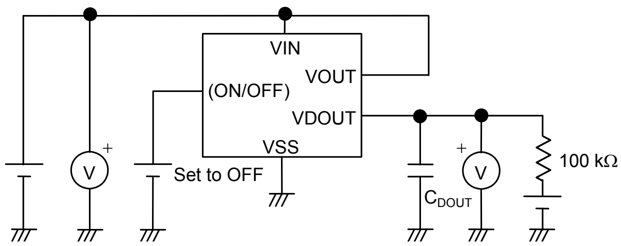


Figure 42

(d) Measurement circuit of the dynamic response for S-1701 Series N/P/Q/R/S/T types

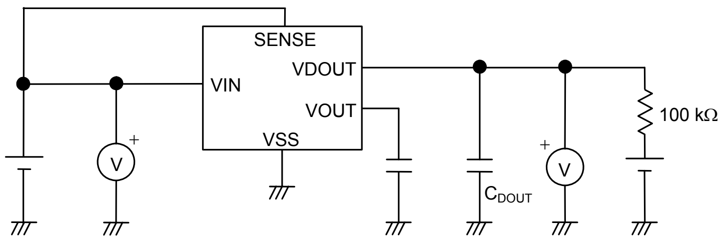
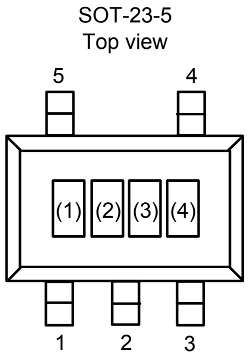


Figure 43

Caution The above connection diagrams will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constants.

■ Marking Specifications

(1) SOT-23-5



(1) to (3): Product code (Refer to **Product name vs. Product code**)
(4): Lot number

Product name vs. Product code

(a) S-1701 Series A Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701A1541-M5T1x	T	B	E
S-1701A1815-M5T1x	P	6	A
S-1701A2520-M5T1x	P	6	B
S-1701A2521-M5T1x	P	6	C
S-1701A2522-M5T1x	P	6	D
S-1701A2728-M5T1x	P	6	Q
S-1701A2825-M5T1x	T	B	A
S-1701A2833-M5T1x	T	B	D
S-1701A3024-M5T1x	P	6	E
S-1701A3025-M5T1x	P	6	F
S-1701A3026-M5T1x	P	6	G
S-1701A3326-M5T1x	P	6	H
S-1701A3327-M5T1x	P	6	I
S-1701A3328-M5T1x	P	6	J
S-1701A3330-M5T1x	P	6	P
S-1701A3331-M5T1x	T	B	C
S-1701A3430-M5T1x	P	6	K
S-1701A5040-M5T1x	P	6	L
S-1701A5041-M5T1x	P	6	M
S-1701A5042-M5T1x	P	6	N
S-1701A5043-M5T1x	P	6	O

(b) S-1701 Series B Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701B1815-M5T1x	P	6	R
S-1701B1823-M5T1x	P	6	9
S-1701B1828-M5T1x	T	E	A
S-1701B2520-M5T1x	P	6	S
S-1701B2521-M5T1x	P	6	T
S-1701B2522-M5T1x	P	6	U
S-1701B3024-M5T1x	P	6	V
S-1701B3025-M5T1x	P	6	W
S-1701B3026-M5T1x	P	6	X
S-1701B3326-M5T1x	P	6	Y
S-1701B3327-M5T1x	P	6	Z
S-1701B3328-M5T1x	P	6	3
S-1701B3430-M5T1x	P	8	Y
S-1701B5040-M5T1x	P	6	4
S-1701B5041-M5T1x	P	6	5
S-1701B5042-M5T1x	P	6	6
S-1701B5043-M5T1x	P	6	7

Remark 1. x: G or U
2. Please select products of environmental code = U for Sn 100%, halogen-free products.

(c) S-1701 Series C Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701C1815-M5T1x	P	9	A
S-1701C2520-M5T1x	P	9	B
S-1701C2521-M5T1x	P	9	C
S-1701C2522-M5T1x	P	9	D
S-1701C3024-M5T1x	P	9	E
S-1701C3025-M5T1x	P	9	F
S-1701C3026-M5T1x	P	9	G
S-1701C3326-M5T1x	P	9	H
S-1701C3327-M5T1x	P	9	I
S-1701C3328-M5T1x	P	9	J
S-1701C3330-M5T1x	P	9	P
S-1701C3430-M5T1x	P	9	K
S-1701C5040-M5T1x	P	9	L
S-1701C5041-M5T1x	P	9	M
S-1701C5042-M5T1x	P	9	N
S-1701C5043-M5T1x	P	9	O

(d) S-1701 Series D Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701D1815-M5T1x	P	V	A
S-1701D1816-M5T1x	T	C	C
S-1701D1817-M5T1x	T	C	B
S-1701D2520-M5T1x	P	V	B
S-1701D2521-M5T1x	P	V	C
S-1701D2522-M5T1x	P	V	D
S-1701D2523-M5T1x	P	V	P
S-1701D2524-M5T1x	P	V	Q
S-1701D2526-M5T1x	P	V	R
S-1701D2722-M5T1x	P	V	S
S-1701D3024-M5T1x	P	V	E
S-1701D3025-M5T1x	P	V	F
S-1701D3026-M5T1x	P	V	G
S-1701D3326-M5T1x	P	V	H
S-1701D3327-M5T1x	P	V	I
S-1701D3328-M5T1x	P	V	J
S-1701D3330-M5T1x	T	C	A
S-1701D3430-M5T1x	P	V	O
S-1701D5040-M5T1x	P	V	K
S-1701D5041-M5T1x	P	V	L
S-1701D5042-M5T1x	P	V	M
S-1701D5043-M5T1x	P	V	N

(e) S-1701 Series E Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701E1815-M5T1x	P	V	T
S-1701E2520-M5T1x	P	V	U
S-1701E2521-M5T1x	P	V	V
S-1701E2522-M5T1x	P	V	W
S-1701E2722-M5T1x	P	W	C
S-1701E3024-M5T1x	P	V	X
S-1701E3025-M5T1x	P	V	Y
S-1701E3026-M5T1x	P	V	Z
S-1701E3326-M5T1x	P	V	3
S-1701E3327-M5T1x	P	V	4
S-1701E3328-M5T1x	P	V	5
S-1701E3330-M5T1x	P	W	B
S-1701E3430-M5T1x	P	W	A
S-1701E5040-M5T1x	P	V	6
S-1701E5041-M5T1x	P	V	7
S-1701E5042-M5T1x	P	V	8
S-1701E5043-M5T1x	P	V	9

(f) S-1701 Series F Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701F1815-M5T1x	P	W	F
S-1701F2520-M5T1x	P	W	G
S-1701F2521-M5T1x	P	W	H
S-1701F2522-M5T1x	P	W	I
S-1701F2722-M5T1x	P	W	U
S-1701F3024-M5T1x	P	W	J
S-1701F3025-M5T1x	P	W	K
S-1701F3026-M5T1x	P	W	L
S-1701F3326-M5T1x	P	W	M
S-1701F3327-M5T1x	P	W	N
S-1701F3328-M5T1x	P	W	O
S-1701F3430-M5T1x	P	W	T
S-1701F5040-M5T1x	P	W	P
S-1701F5041-M5T1x	P	W	Q
S-1701F5042-M5T1x	P	W	R
S-1701F5043-M5T1x	P	W	S

Remark 1. x: G or U
2. Please select products of environmental code = U for Sn 100%, halogen-free products.

(g) S-1701 Series G Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701G2524-M5T1x	T	A	N
S-1701G3331-M5T1x	T	A	O

(h) S-1701 Series M Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701M1815-M5T1x	T	D	A

(i) S-1701 Series N Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701N1515-M5T1x	P	W	Y
S-1701N1815-M5T1x	P	W	Z
S-1701N1827-M5T1x	P	W	9
S-1701N2515-M5T1x	P	W	3
S-1701N2715-M5T1x	P	W	4
S-1701N2724-M5T1x	P	X	D
S-1701N3015-M5T1x	P	W	5
S-1701N3315-M5T1x	P	W	6
S-1701N3330-M5T1x	P	X	F
S-1701N5015-M5T1x	P	W	7

(j) S-1701 Series P Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701P1515-M5T1x	P	X	I
S-1701P1527-M5T1x	P	X	P
S-1701P1815-M5T1x	P	X	J
S-1701P2515-M5T1x	P	X	K
S-1701P2715-M5T1x	P	X	L
S-1701P3015-M5T1x	P	X	M
S-1701P3315-M5T1x	P	X	N
S-1701P5015-M5T1x	P	X	O

(k) S-1701 Series Q Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701Q1515-M5T1x	P	X	Z
S-1701Q1815-M5T1x	P	X	3
S-1701Q2515-M5T1x	P	X	4
S-1701Q2715-M5T1x	P	X	5
S-1701Q3015-M5T1x	P	X	6
S-1701Q3315-M5T1x	P	X	7
S-1701Q5015-M5T1x	P	X	8

(l) S-1701 Series R Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701R1515-M5T1x	P	Y	E
S-1701R1815-M5T1x	P	Y	F
S-1701R2515-M5T1x	P	Y	G
S-1701R2715-M5T1x	P	Y	H
S-1701R3015-M5T1x	P	Y	I
S-1701R3315-M5T1x	P	Y	J
S-1701R5015-M5T1x	P	Y	K

(m) S-1701 Series S Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701S1515-M5T1x	P	Y	Q
S-1701S1815-M5T1x	P	Y	R
S-1701S2515-M5T1x	P	Y	S
S-1701S2715-M5T1x	P	Y	T
S-1701S3015-M5T1x	P	Y	U
S-1701S3315-M5T1x	P	Y	V
S-1701S5015-M5T1x	P	Y	W

(n) S-1701 Series T Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701T1515-M5T1x	P	Z	A
S-1701T1815-M5T1x	P	Z	B
S-1701T2515-M5T1x	P	Z	C
S-1701T2715-M5T1x	P	Z	D
S-1701T3015-M5T1x	P	Z	E
S-1701T3315-M5T1x	P	Z	F
S-1701T3325-M5T1x	P	Z	H
S-1701T5015-M5T1x	P	Z	G

Remark 1. x: G or U
2. Please select products of environmental code = U for Sn 100%, halogen-free products.

(o) S-1701 Series U Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701U1815-M5T1x	P	Z	R
S-1701U2520-M5T1x	P	Z	S
S-1701U2521-M5T1x	P	Z	T
S-1701U2522-M5T1x	P	Z	U
S-1701U3024-M5T1x	P	Z	V
S-1701U3025-M5T1x	P	Z	W
S-1701U3026-M5T1x	P	Z	X
S-1701U3326-M5T1x	P	Z	Y
S-1701U3327-M5T1x	P	Z	Z
S-1701U3328-M5T1x	P	Z	3
S-1701U3430-M5T1x	P	Z	8
S-1701U5040-M5T1x	P	Z	4
S-1701U5041-M5T1x	P	Z	5
S-1701U5042-M5T1x	P	Z	6
S-1701U5043-M5T1x	P	Z	7

(p) S-1701 Series V Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701V1815-M5T1x	P	7	E
S-1701V2520-M5T1x	P	7	F
S-1701V2521-M5T1x	P	7	G
S-1701V2522-M5T1x	P	7	H
S-1701V3024-M5T1x	P	7	I
S-1701V3025-M5T1x	P	7	J
S-1701V3026-M5T1x	P	7	K
S-1701V3227-M5T1x	P	7	U
S-1701V3325-M5T1x	P	7	T
S-1701V3326-M5T1x	P	7	L
S-1701V3327-M5T1x	P	7	M
S-1701V3328-M5T1x	P	7	N
S-1701V3430-M5T1x	P	7	S
S-1701V5040-M5T1x	P	7	O
S-1701V5041-M5T1x	P	7	P
S-1701V5042-M5T1x	P	7	Q
S-1701V5043-M5T1x	P	7	R

(q) S-1701 Series W Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701W1626-M5T1x	P	8	H
S-1701W1815-M5T1x	P	7	X
S-1701W2520-M5T1x	P	7	Y
S-1701W2521-M5T1x	P	7	Z
S-1701W2522-M5T1x	P	7	3
S-1701W3024-M5T1x	P	7	4
S-1701W3025-M5T1x	P	7	5
S-1701W3026-M5T1x	P	7	6
S-1701W3227-M5T1x	P	8	G
S-1701W3326-M5T1x	P	7	7
S-1701W3327-M5T1x	P	7	8
S-1701W3328-M5T1x	P	7	9
S-1701W3430-M5T1x	P	8	E
S-1701W5040-M5T1x	P	8	A
S-1701W5041-M5T1x	P	8	B
S-1701W5042-M5T1x	P	8	C
S-1701W5043-M5T1x	P	8	D

(r) S-1701 Series X Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701X1525-M5T1x	P	8	M
S-1701X1825-M5T1x	P	8	3
S-1701X2219-M5T1x	P	8	K
S-1701X3025-M5T1x	P	8	4
S-1701X3228-M5T1x	P	8	J
S-1701X3315-M5T1x	P	8	N

(s) S-1701 Series Y Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701Y3228-M5T1x	P	8	O
S-1701Y3342-M5T1x	P	8	Q

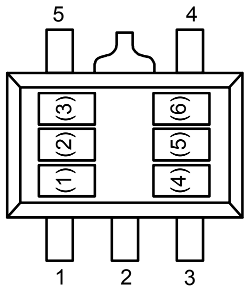
(t) S-1701 Series Z Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701Z1626-M5T1x	P	8	U
S-1701Z1826-M5T1x	P	8	V
S-1701Z3228-M5T1x	P	8	T
S-1701Z3330-M5T1x	P	8	W

Remark 1. x: G or U
2. Please select products of environmental code = U for Sn 100%, halogen-free products.

(2) SOT-89-5

SOT-89-5
Top view



(1) to (3): Product code (Refer to **Product name vs. Product code**)
(4) to (6): Lot number

Product name vs. Product code

(a) S-1701 Series A Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701A1815-U5T1x	P	6	A
S-1701A2520-U5T1x	P	6	B
S-1701A2521-U5T1x	P	6	C
S-1701A2522-U5T1x	P	6	D
S-1701A3024-U5T1x	P	6	E
S-1701A3025-U5T1x	P	6	F
S-1701A3026-U5T1x	P	6	G
S-1701A3326-U5T1x	P	6	H
S-1701A3327-U5T1x	P	6	I
S-1701A3328-U5T1x	P	6	J
S-1701A3430-U5T1x	P	6	K
S-1701A5040-U5T1x	P	6	L
S-1701A5041-U5T1x	P	6	M
S-1701A5042-U5T1x	P	6	N
S-1701A5043-U5T1x	P	6	O

(b) S-1701 Series B Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701B1815-U5T1x	P	6	R
S-1701B2520-U5T1x	P	6	S
S-1701B2521-U5T1x	P	6	T
S-1701B2522-U5T1x	P	6	U
S-1701B3024-U5T1x	P	6	V
S-1701B3025-U5T1x	P	6	W
S-1701B3026-U5T1x	P	6	X
S-1701B3326-U5T1x	P	6	Y
S-1701B3327-U5T1x	P	6	Z
S-1701B3328-U5T1x	P	6	3
S-1701B3342-U5T1x	P	6	8
S-1701B3430-U5T1x	P	8	Y
S-1701B5040-U5T1x	P	6	4
S-1701B5041-U5T1x	P	6	5
S-1701B5042-U5T1x	P	6	6
S-1701B5043-U5T1x	P	6	7

(c) S-1701 Series C Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701C1815-U5T1x	P	9	A
S-1701C1830-U5T1x	P	9	Q
S-1701C2520-U5T1x	P	9	B
S-1701C2521-U5T1x	P	9	C
S-1701C2522-U5T1x	P	9	D
S-1701C3024-U5T1x	P	9	E
S-1701C3025-U5T1x	P	9	F
S-1701C3026-U5T1x	P	9	G
S-1701C3326-U5T1x	P	9	H
S-1701C3327-U5T1x	P	9	I
S-1701C3328-U5T1x	P	9	J
S-1701C3430-U5T1x	P	9	K
S-1701C5040-U5T1x	P	9	L
S-1701C5041-U5T1x	P	9	M
S-1701C5042-U5T1x	P	9	N
S-1701C5043-U5T1x	P	9	O

(d) S-1701 Series D Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701D1815-U5T1x	P	V	A
S-1701D2520-U5T1x	P	V	B
S-1701D2521-U5T1x	P	V	C
S-1701D2522-U5T1x	P	V	D
S-1701D3024-U5T1x	P	V	E
S-1701D3025-U5T1x	P	V	F
S-1701D3026-U5T1x	P	V	G
S-1701D3326-U5T1x	P	V	H
S-1701D3327-U5T1x	P	V	I
S-1701D3328-U5T1x	P	V	J
S-1701D3430-U5T1x	P	V	O
S-1701D5040-U5T1x	P	V	K
S-1701D5041-U5T1x	P	V	L
S-1701D5042-U5T1x	P	V	M
S-1701D5043-U5T1x	P	V	N

Remark 1. x: G or U
2. Please select products of environmental code = U for Sn 100%, halogen-free products.

(e) S-1701 Series E Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701E1815-U5T1x	P	V	T
S-1701E2520-U5T1x	P	V	U
S-1701E2521-U5T1x	P	V	V
S-1701E2522-U5T1x	P	V	W
S-1701E3024-U5T1x	P	V	X
S-1701E3025-U5T1x	P	V	Y
S-1701E3026-U5T1x	P	V	Z
S-1701E3326-U5T1x	P	V	3
S-1701E3327-U5T1x	P	V	4
S-1701E3328-U5T1x	P	V	5
S-1701E3430-U5T1x	P	W	A
S-1701E5040-U5T1x	P	V	6
S-1701E5041-U5T1x	P	V	7
S-1701E5042-U5T1x	P	V	8
S-1701E5043-U5T1x	P	V	9

(f) S-1701 Series F Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701F1815-U5T1x	P	W	F
S-1701F2520-U5T1x	P	W	G
S-1701F2521-U5T1x	P	W	H
S-1701F2522-U5T1x	P	W	I
S-1701F3024-U5T1x	P	W	J
S-1701F3025-U5T1x	P	W	K
S-1701F3026-U5T1x	P	W	L
S-1701F3326-U5T1x	P	W	M
S-1701F3327-U5T1x	P	W	N
S-1701F3328-U5T1x	P	W	O
S-1701F3430-U5T1x	P	W	T
S-1701F5040-U5T1x	P	W	P
S-1701F5041-U5T1x	P	W	Q
S-1701F5042-U5T1x	P	W	R
S-1701F5043-U5T1x	P	W	S

(g) S-1701 Series H Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701H5045-U5T1x	T	A	A

(h) S-1701 Series N Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701N1515-U5T1x	P	W	Y
S-1701N1815-U5T1x	P	W	Z
S-1701N1824-U5T1x	P	X	C
S-1701N2515-U5T1x	P	W	3
S-1701N2715-U5T1x	P	W	4
S-1701N2724-U5T1x	P	X	D
S-1701N3015-U5T1x	P	W	5
S-1701N3315-U5T1x	P	W	6
S-1701N3330-U5T1x	P	X	F
S-1701N5015-U5T1x	P	W	7

(i) S-1701 Series P Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701P1515-U5T1x	P	X	I
S-1701P1815-U5T1x	P	X	J
S-1701P2515-U5T1x	P	X	K
S-1701P2715-U5T1x	P	X	L
S-1701P2843-U5T1x	P	X	Q
S-1701P2844-U5T1x	P	X	R
S-1701P3015-U5T1x	P	X	M
S-1701P3315-U5T1x	P	X	N
S-1701P5015-U5T1x	P	X	O

(j) S-1701 Series Q Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701Q1515-U5T1x	P	X	Z
S-1701Q1815-U5T1x	P	X	3
S-1701Q2515-U5T1x	P	X	4
S-1701Q2715-U5T1x	P	X	5
S-1701Q3015-U5T1x	P	X	6
S-1701Q3227-U5T1x	P	X	9
S-1701Q3242-U5T1x	P	Y	A
S-1701Q3315-U5T1x	P	X	7
S-1701Q5015-U5T1x	P	X	8

Remark 1. x: G or U

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

(k) S-1701 Series R Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701R1515-U5T1x	P	Y	E
S-1701R1815-U5T1x	P	Y	F
S-1701R2515-U5T1x	P	Y	G
S-1701R2715-U5T1x	P	Y	H
S-1701R3015-U5T1x	P	Y	I
S-1701R3315-U5T1x	P	Y	J
S-1701R5015-U5T1x	P	Y	K

(l) S-1701 Series S Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701S1515-U5T1x	P	Y	Q
S-1701S1815-U5T1x	P	Y	R
S-1701S2515-U5T1x	P	Y	S
S-1701S2715-U5T1x	P	Y	T
S-1701S3015-U5T1x	P	Y	U
S-1701S3315-U5T1x	P	Y	V
S-1701S5015-U5T1x	P	Y	W

(m) S-1701 Series T Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701T1515-U5T1x	P	Z	A
S-1701T1815-U5T1x	P	Z	B
S-1701T2515-U5T1x	P	Z	C
S-1701T2715-U5T1x	P	Z	D
S-1701T3015-U5T1x	P	Z	E
S-1701T3315-U5T1x	P	Z	F
S-1701T5015-U5T1x	P	Z	G

(n) S-1701 Series U Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701U1815-U5T1x	P	Z	R
S-1701U2520-U5T1x	P	Z	S
S-1701U2521-U5T1x	P	Z	T
S-1701U2522-U5T1x	P	Z	U
S-1701U3024-U5T1x	P	Z	V
S-1701U3025-U5T1x	P	Z	W
S-1701U3026-U5T1x	P	Z	X
S-1701U3326-U5T1x	P	Z	Y
S-1701U3327-U5T1x	P	Z	Z
S-1701U3328-U5T1x	P	Z	3
S-1701U3430-U5T1x	P	Z	8
S-1701U5040-U5T1x	P	Z	4
S-1701U5041-U5T1x	P	Z	5
S-1701U5042-U5T1x	P	Z	6
S-1701U5043-U5T1x	P	Z	7

(o) S-1701 Series V Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701V1815-U5T1x	P	7	E
S-1701V2520-U5T1x	P	7	F
S-1701V2521-U5T1x	P	7	G
S-1701V2522-U5T1x	P	7	H
S-1701V3024-U5T1x	P	7	I
S-1701V3025-U5T1x	P	7	J
S-1701V3026-U5T1x	P	7	K
S-1701V3326-U5T1x	P	7	L
S-1701V3327-U5T1x	P	7	M
S-1701V3328-U5T1x	P	7	N
S-1701V3430-U5T1x	P	7	S
S-1701V5040-U5T1x	P	7	O
S-1701V5041-U5T1x	P	7	P
S-1701V5042-U5T1x	P	7	Q
S-1701V5043-U5T1x	P	7	R

(p) S-1701 Series W Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701W1815-U5T1x	P	7	X
S-1701W2520-U5T1x	P	7	Y
S-1701W2521-U5T1x	P	7	Z
S-1701W2522-U5T1x	P	7	3
S-1701W3024-U5T1x	P	7	4
S-1701W3025-U5T1x	P	7	5
S-1701W3026-U5T1x	P	7	6
S-1701W3324-U5T1x	P	8	F
S-1701W3326-U5T1x	P	7	7
S-1701W3327-U5T1x	P	7	8
S-1701W3328-U5T1x	P	7	9
S-1701W3430-U5T1x	P	8	E
S-1701W5040-U5T1x	P	8	A
S-1701W5041-U5T1x	P	8	B
S-1701W5042-U5T1x	P	8	C
S-1701W5043-U5T1x	P	8	D

Remark 1. x: G or U

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

(q) S-1701 Series X Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701X3228-U5T1x	P	8	J
S-1701X3330-U5T1x	P	8	L
S-1701X3342-U5T1x	P	8	5

(r) S-1701 Series Y Type

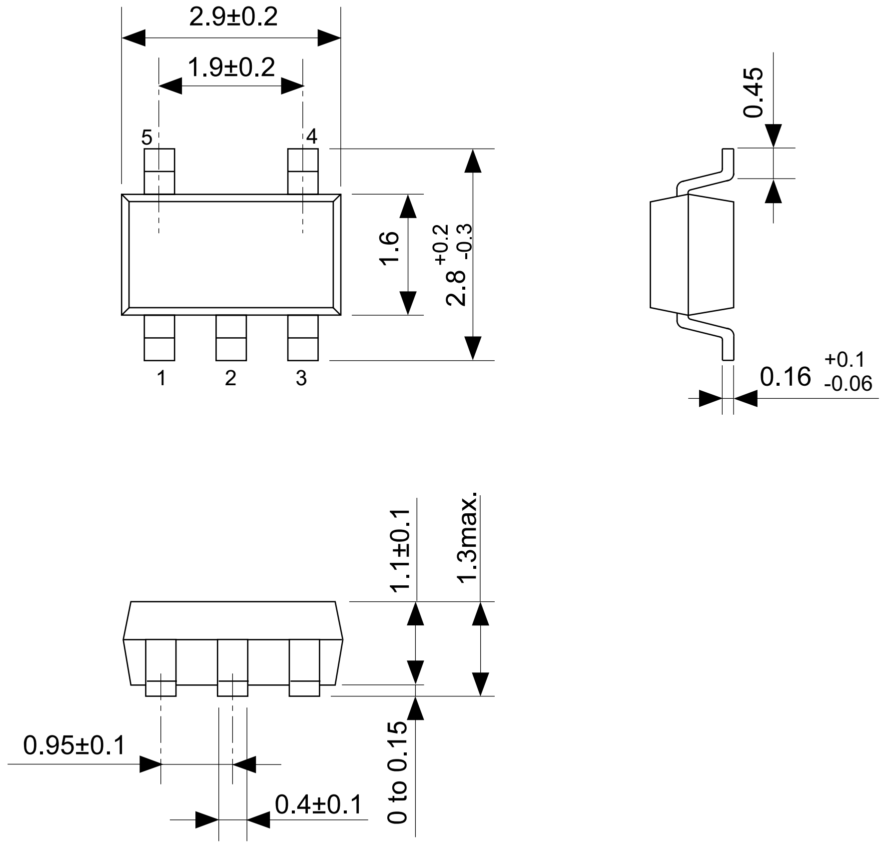
Product Name	Product Code		
	(1)	(2)	(3)
S-1701Y3228-U5T1x	P	8	O
S-1701Y3330-U5T1x	P	8	S
S-1701Y3340-U5T1x	P	8	P
S-1701Y3342-U5T1x	P	8	Q

(s) S-1701 Series Z Type

Product Name	Product Code		
	(1)	(2)	(3)
S-1701Z3228-U5T1x	P	8	T

Remark 1. x: G or U

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



No. MP005-A-P-SD-1.3

TITLE	SOT235-A-PKG Dimensions
No.	MP005-A-P-SD-1.3
ANGLE	
UNIT	mm

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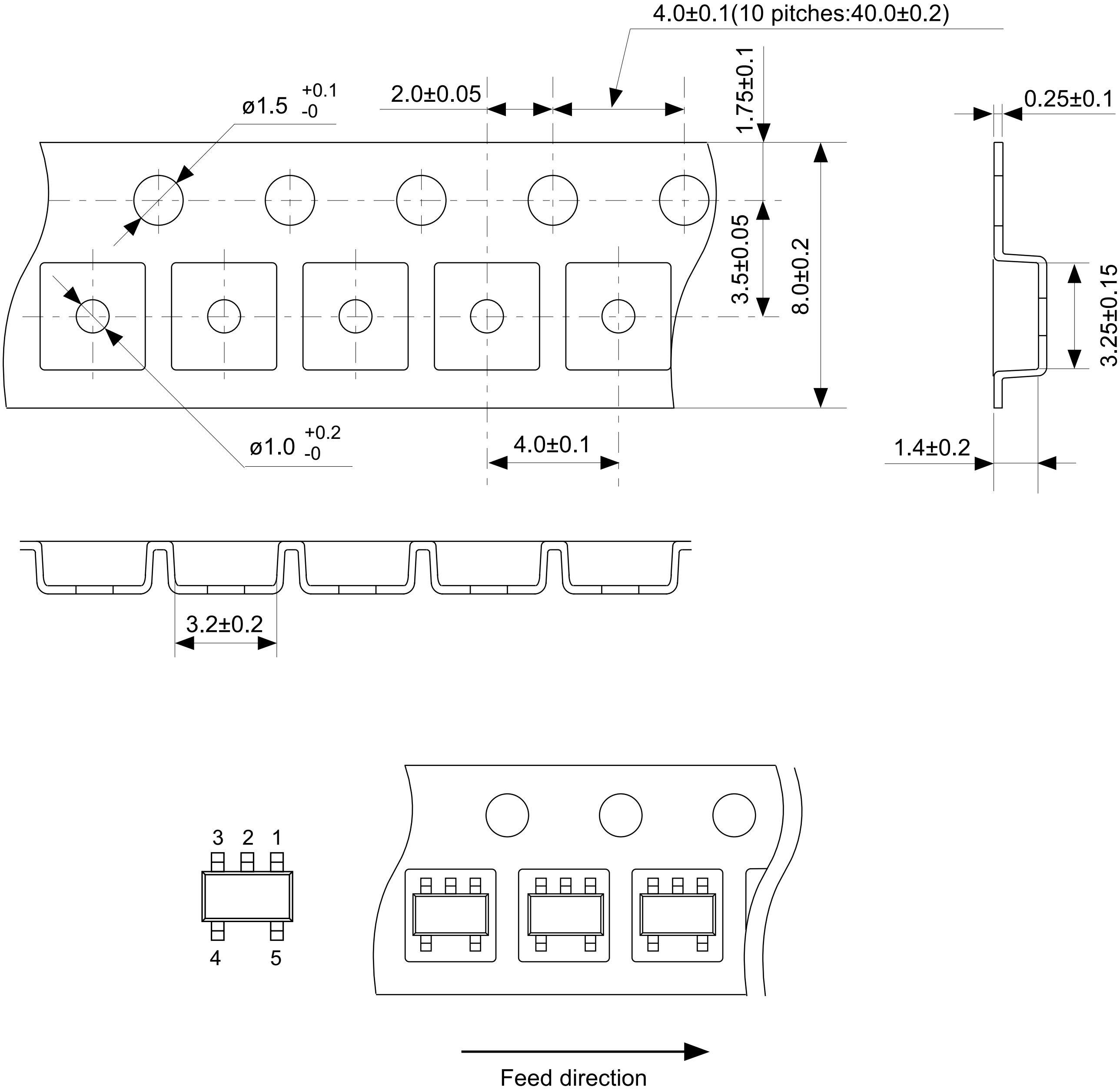
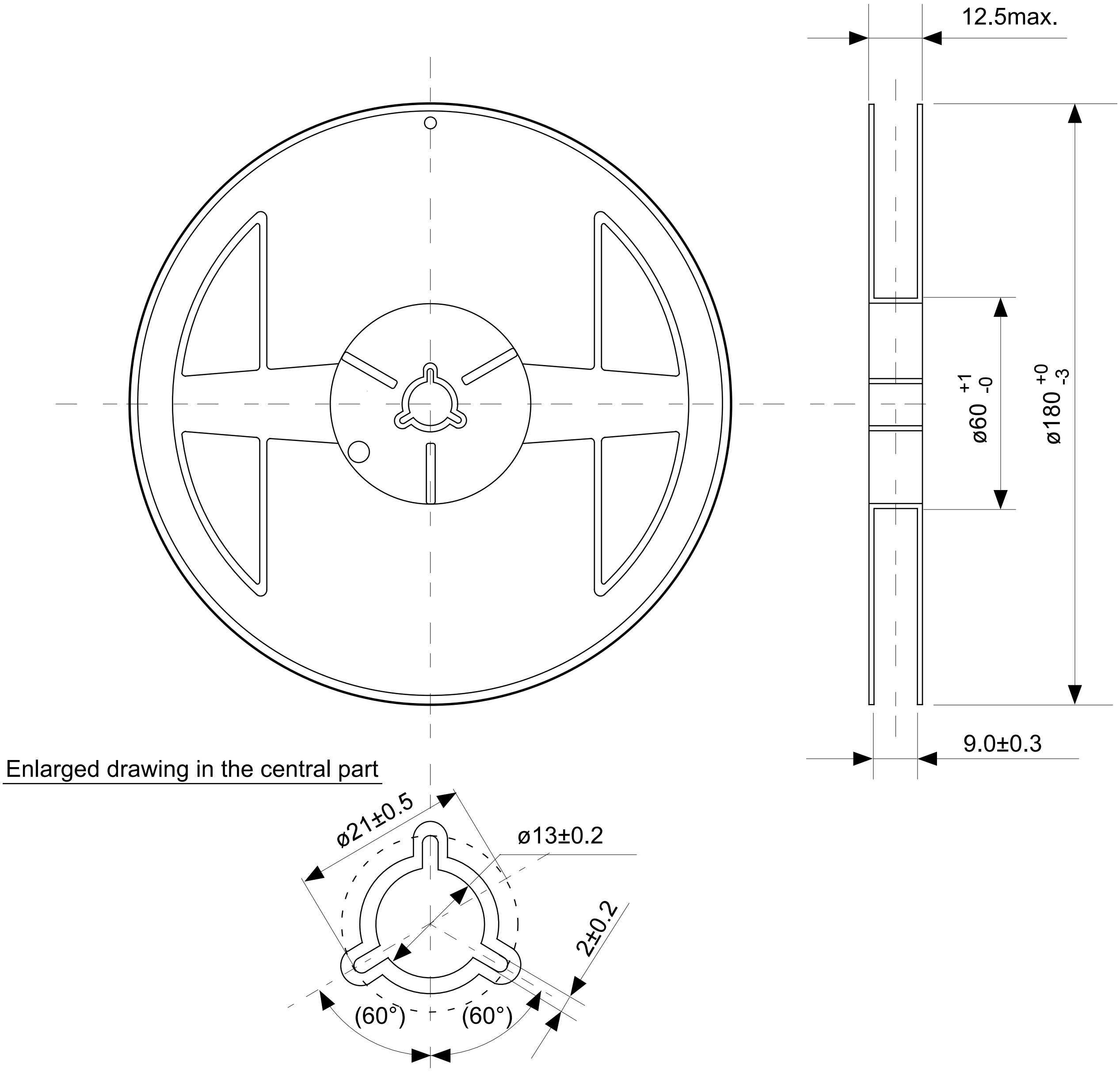


No. MP005-A-C-SD-2.1

TITLE	SOT235-A-Carrier Tape
No.	MP005-A-C-SD-2.1
ANGLE	
UNIT	mm

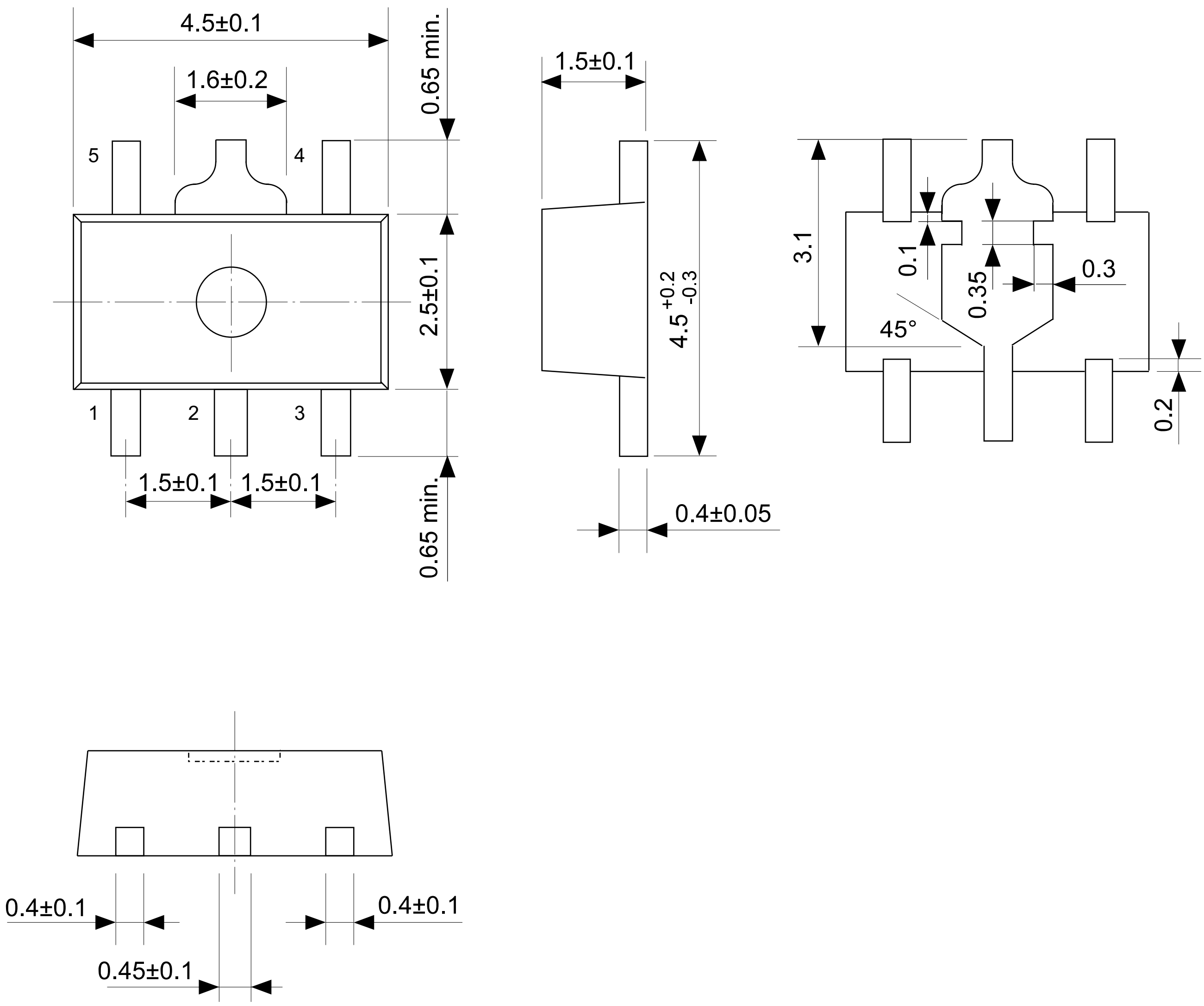
ABLIC Inc.



No. MP005-A-R-SD-1.1

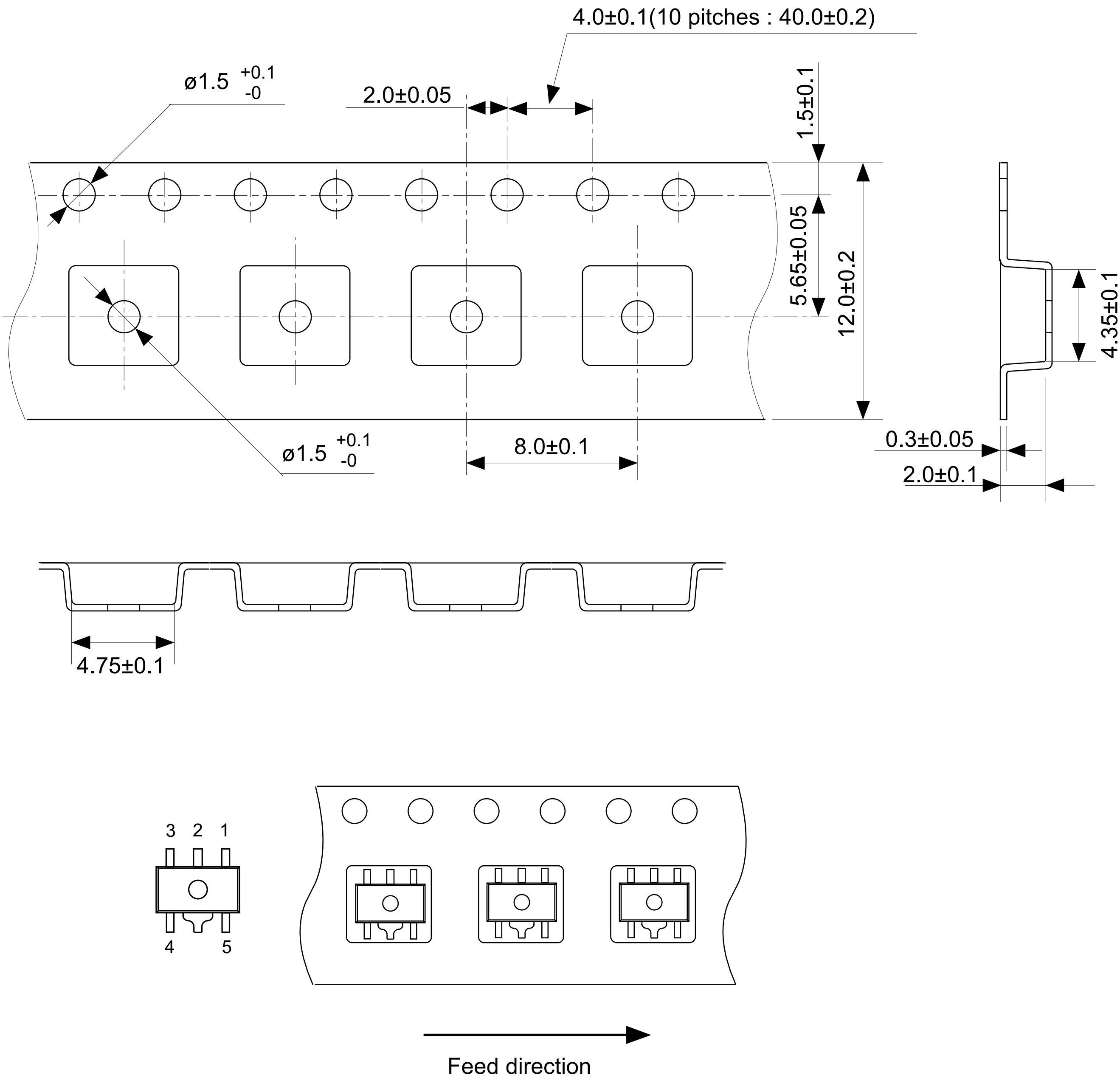
TITLE	SOT235-A-Reel		
No.	MP005-A-R-SD-1.1		
ANGLE		QTY.	3,000
UNIT	mm		

ABLIC Inc.



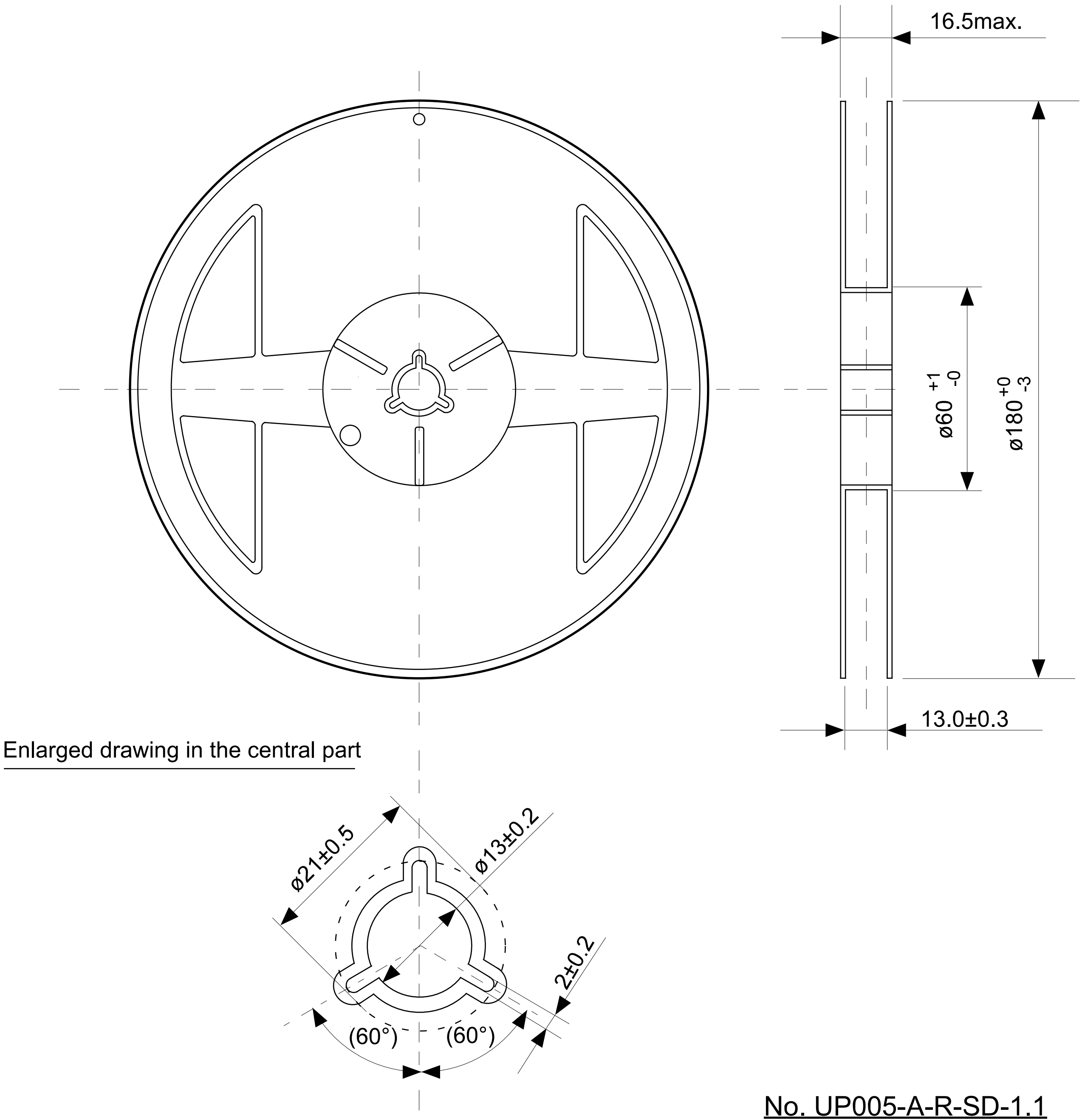
No. UP005-A-P-SD-2.0

TITLE	SOT895-A-PKG Dimensions
No.	UP005-A-P-SD-2.0
ANGLE	
UNIT	mm
ABLIC Inc.	



No. UP005-A-C-SD-2.0

TITLE	SOT895-A-Carrier Tape
No.	UP005-A-C-SD-2.0
ANGLE	
UNIT	mm
ABLIC Inc.	



No. UP005-A-R-SD-1.1

TITLE	SOT895-A-Reel		
No.	UP005-A-R-SD-1.1		
ANGLE		QTY.	1,000
UNIT	mm		

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