STR9000 Series

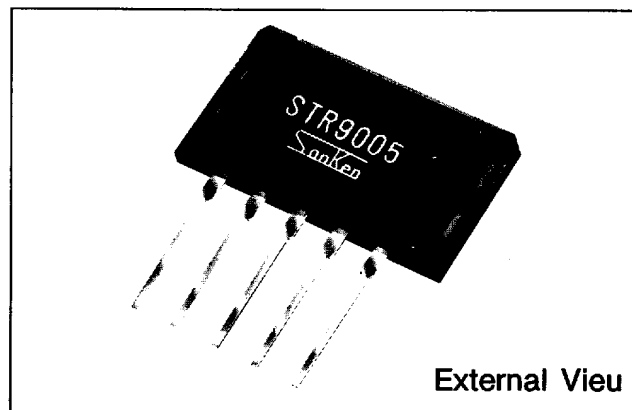## Dropper Type —— Low-Dropout Voltage Type

Features

- ●Input/output voltage difference of less than 1V during operation
- ●Reduces power loss for electronic equipment
- ●Small size with 4 A output
- ●An easy-to-use 5-pin plastic-mold regulator
- ●Capable of remote ON/OFF
- ●Capable of fine adjustment of output voltage
- ●Built-in foldback current protection circuit
- ●High reliability due to use of SANKEN's semiconductor elements

Applications

- ●For battery- operated VTR cameras, 8 mm cameras and automotive appliances
- ●For various types of electronic equipment including micro computers, personal computers, floppy disk drives, CATV sets, VTRs, video disks, and printers
- ●For stabilization of secondary side of multi-output switching regulators

■Absolute maximum Ratings (Ta = 25°C)

Description	Symbol	Ratings			Unit
		STR9005	STR9012	STR9015	
DC Input Voltage	VIN	25	30	30	V
DC Output Current	Io	4.0			A
Power Dissipation	PD	75(Tc = 25°C)			W
		3.2 (no fin)			
Junction Temperature	Tj	−30 to +125			°C
Operating Case Temperature	Tc	−20 to +100			°C
Storage Temperature	Tstg	−30 to +125			°C
Thermal Resistance (between junction and case)	Rth(j-c)	1.25 max.			°C/W

External View

■Electrical Characteristics (Ta = 25°C)

Description	Symbol		Ratings									Unit
			STR9005			STR9012			STR9015			
			min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
DC Input Voltage	VIN		6		15	13		25	16		25	V
Output Voltage	Vo		4.9	5.0	5.1	11.8	12.0	12.2	14.8	15.0	15.2	V
		Condition	VIN = 8.0V, Io = 2.0A			VIN = 16V, Io = 2.0A			VIN = 20V, Io = 2.0A			
Dropout Voltage	VDIF				0.5			0.5			0.5	V
		Condition	Io = 2.0A									
					1.0			1.0			1.0	
		Condition	Io = 4.0A									
Line Regulation	ΔVLINE		10	30			30	80		50	100	mV
		Condition	VIN = 6 to 15V, Io = 2.0A			VIN = 13 to 25V, Io = 2.0A			VIN = 16 to 25V, Io = 2.0A			
Load Regulation	ΔVLOAD		40	100			80	200		100	200	mV
		Condition	VIN = 8.0V, Io = 0 to 3.0A			VIN = 16V, Io = 0 to 3.0A			VIN = 20V, Io = 0 to 3.0A			
Temperature Coefficient of Output Voltage	ΔVo/ΔT			±0.5			±1.5			±1.5		mV/°C
Ripple Rejection	RREJ		54			54			54			dB
		Condition	f = 100 to 120Hz									
Foldback Current	Is1		4.1			4.1			4.1			A
		Condition	VIN = 8.0V			VIN = 16V			VIN = 20V			
Output ON/OFF Control Vtg. * (Vtg. between pin No.3 and 5)	Vo (ON)				0.6			0.6			0.6	V
	Vo (OFF)		2.0			2.0			2.0			V
Voltage with output off	Vo				0.5			0.5			0.5	V
		Condition	VIN = 8.0V, Io = 0A			VIN = 15V, Io = 0A			VIN = 20V, Io = 0A			

* Output is turned on with voltage of less than 0.6 V between pin No.3 and 5, and turned off at more than 2.0 V.

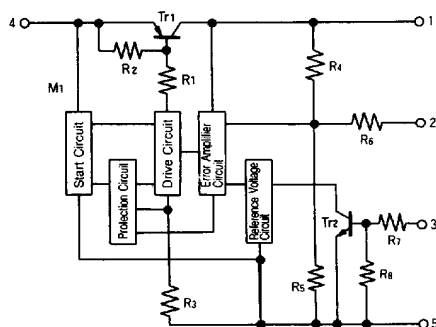# ■Outline Drawing/Pin Connections (unit : mm)
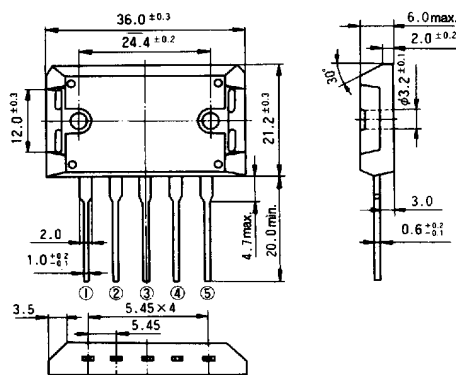
Full Plastic Mold Package Type
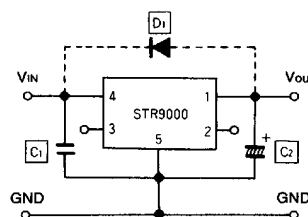**Flammability : UL94V-O or equivalent**

Pin Connections
① Output (backside of case)
② Output Fine Adjustment
③ Output ON/OFF Control
④ Input
⑤ Ground

Weight : Approx. 14.5g

■Equivalent Circuit

■Typical Operating Characteristics

Power Dissipation

Io vs. V_{DIF} Characteristics

■External Circuit

$\boxed{C_1}$: Oscillation Prevention Capacitor (approx. 0.33 μF)
Connection with pin No.4 shall be made as short as possible.

$\boxed{C_2}$: Output Capacitor (47 to 100 μF, 50 V)
Connection with pin No.1 shall be made as short as possible.

$\boxed{D_1}$: Protection Diode (RM1Z)
Required when between input and output is reverse biased. However, it is not required if the output capacitor is less than 100 μF.
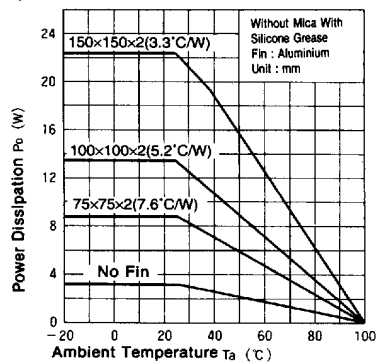
Note 1 : Prevention of oscillation at low temperature
When an output capacitor with smaller tanδ is not used at low temperature, oscillation may happen. Be sure to connect tantalum capacitor (approx. 10 μF) in parallel with output capacitor C_2 .

Note 2 : As an isolation type diode is provided between input ~ ground and output ~ ground, they may be destroyed when reverse biased. In that case, use a diode with low V_F to prevent them.
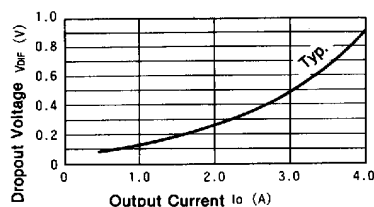
Refer to the 13th page for other precautions.

Output Voltage Adjustable Circuit

1. Adjustment of output voltage by single external resistor

The output voltage of STR9000 series may be decreased by inserting a resistor between the pin No.1 (output pin) and the pin No.2 (output fine adjustment pin). On the other hand, the output voltage may be increased by inserting a resistor between the pin No.2 and 5 (ground pin).

<External Circuit>

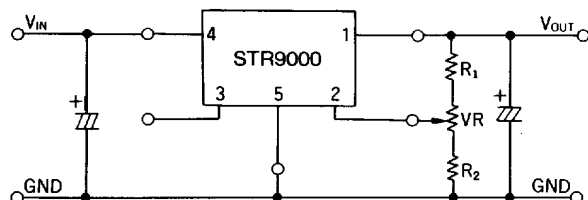Select either one of the external resistors.
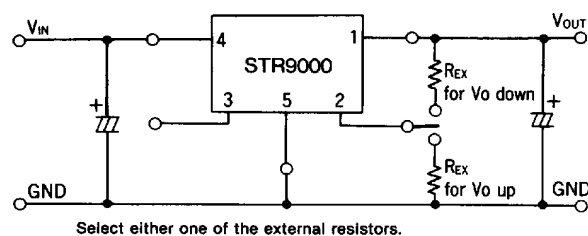
2. Fine adjustment of output voltage

The output voltage may be finely adjusted by using the pins 1, 2 and 5 as shown in the following connections.

<External Circuit>

Note: Fine adjustment of output voltage

The fine adjustment range of output voltage for STR9000 series are max. ±0.2 V for STR9005, ±0.5 V for STR9012 and $+1.0$ V/-2.0 V for STR9015.
Adjustment exceeding these values may cause starting error.

—— ① Typical Characteristics of Output Voltage Adjustment —— $(Ta=25°C)$
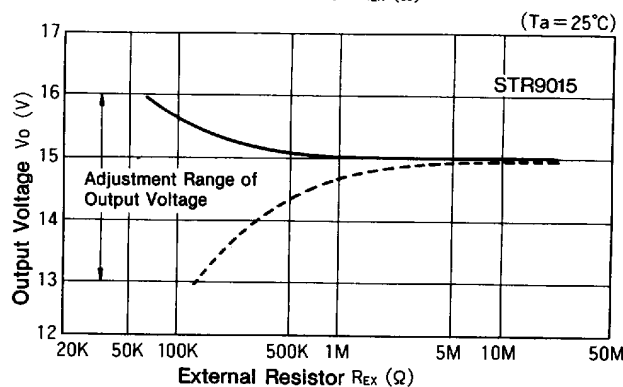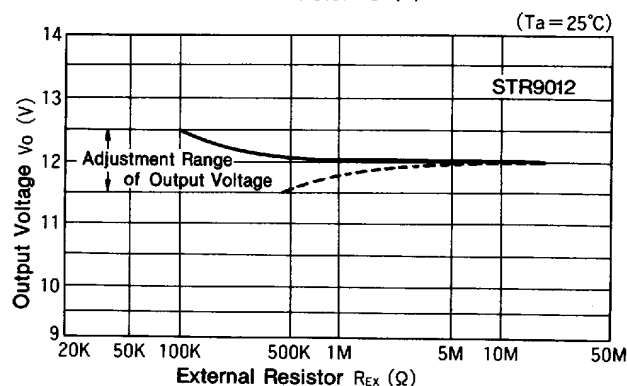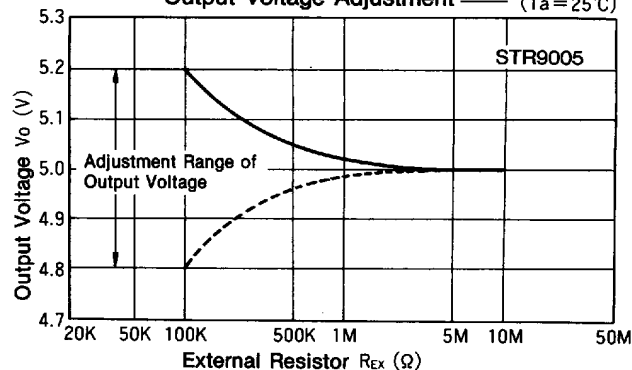
—— : Insertion of resistor between the pins 2 and 5
······ : Insertion of resistor between the pins 2 and 1

—— ② Typical Characteristics of Output Voltage Fine Adjustment ——

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