



SANKEN ELECTRIC COMPANY, LTD.

S P E C I F I C A T I O N S

Sanken Hybrid Voltage Regulator Module, Series STR40090

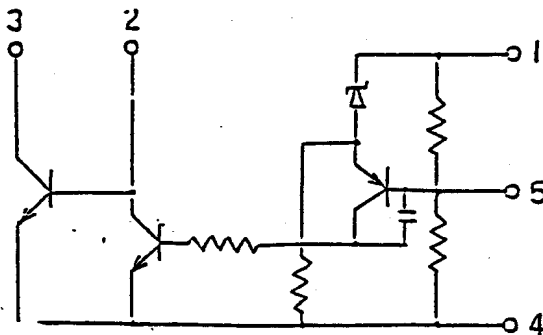
Date: February 22, 1985

Specification No.: ES85006 (SSE14996)

1. Features:

- a. Hybrid Voltage Regulator Module incorporated triple diffused transistor chips
- b. Plastic molded package (similar to TO-3)^P
- c. For TV Switch Mode Power Supply
- d. Fixed Detecting Voltage

2. Equivalent Circuit



- 1. V_{out} SENSE
- 2. BASE DRIVE (B)
- 3. IN PUT (C)
- 4. EARTH (E)
- 5. SOFT START

3. Outline Drawing, Marking and Pin Connections

Refer to Figure 1

- 4. The type number and lot number shall be legitimately marked by white color.



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5. Absolute Maximum Ratings

Description	Symbol	Unit	Rating
Maximum Peak Input Voltage	V_{IN}	V	950
Input Current	I_{IN}	A	6
Maximum Power Dissipation	P_D	W	2.8 ($T_C=100^\circ\text{C}$)
Operating Temperature	T_{OP}	$^\circ\text{C}$	-20--+125 (T_C)
Storage Temperature	T_{stg}	$^\circ\text{C}$	-30--+125
Power Transistor Junction Temperature	T_j	$^\circ\text{C}$	+150 max.

Suggested Silicone Grease

- C746: SHIN-ETSU CHEMICAL INDUSTRY CO., LTD.
- C747: SHIN-ETSU CHEMICAL INDUSTRY CO., LTD.
- YG6260: TOSHIBA SILICONE CO., LTD.
- SC102: TORAY SILICONE CO., LTD.



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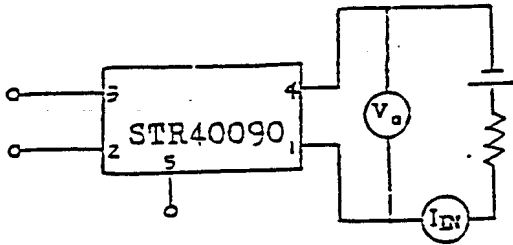
6. Electrical Characteristics

Description		Conditions	Ratings
Fixed Detecting Voltage		$I_{IN} = 6\text{mA}$ Measurement Circuit 1.	$89.5 \pm 0.7\text{V}$
Detecting Voltage Temperature Coefficient		$T_C = -20 \sim +100^\circ\text{C}$, $I_{IN} = 6\text{mA}$ Measurement Circuit 1.	$+4.0\text{mV}/^\circ\text{C}$
Power Transistor Characteristics	$V_{CE}(\text{sat})$	$I_C = 2\text{A}$, $I_B = 0.4\text{A}$	1.0V Max.
	f_{FE}	$V_{CE} = 4\text{V}$, $I_C = 1\text{A}$	Min. 10 Max. 30
	I_{CEX}	$V_{CE} = 1000\text{V}$, $V_{BE} = -1.5\text{V}$	1.0mA Max.
	V_{EBO}	$I_E = 1\text{mA}$ $V_{EBO} = 5.8\text{V}$	1.0mA Max.
	$V_{BE}(\text{sat})$	$I_C = 2\text{A}$, $I_B = 0.4\text{A}$	1.5V Max.
	θ_{j-c}	Between Junction and Stem Upper Surface	$1.8^\circ\text{C}/\text{W}$
	Switching Time	Measurement Circuit 2.	t_s
t_f			1.0μsec. Max.



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Measurement Circuit 1.



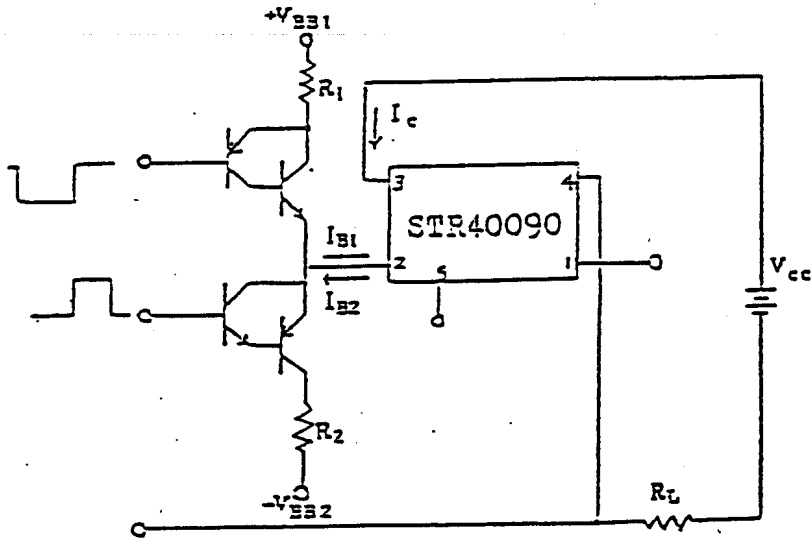
7. Electrical Characteristics 2.

Description	Condition	Ratings
Output Voltage	$V_{IN}=220V, I_O=0.40A$ Actual Working Circuit 1.	$115.0 \pm 1.6V$
Line Regulation	$V_{IN}=180 \sim 280V$ Actual Working Circuit 1.	$\pm 1V$
Load Regulation	$V_{IN}=220V, I_O=0.40A$ Actual Working Circuit 1	$\pm 1.6V$
Ripple Characteristics	$V_{IN}=180V, I_O=0.40A$ Actual Working Circuit 1.	1.3%Typ



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Measurement Circuit 2.

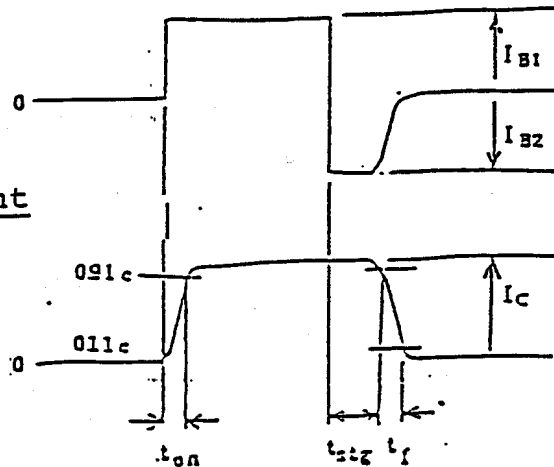


$I_c = 1A$, $V_{cc} = 100V$
 $I_{B1} = 0.13A$, $I_{B2} = 0.5A$

Switching Wave Form

Base Current

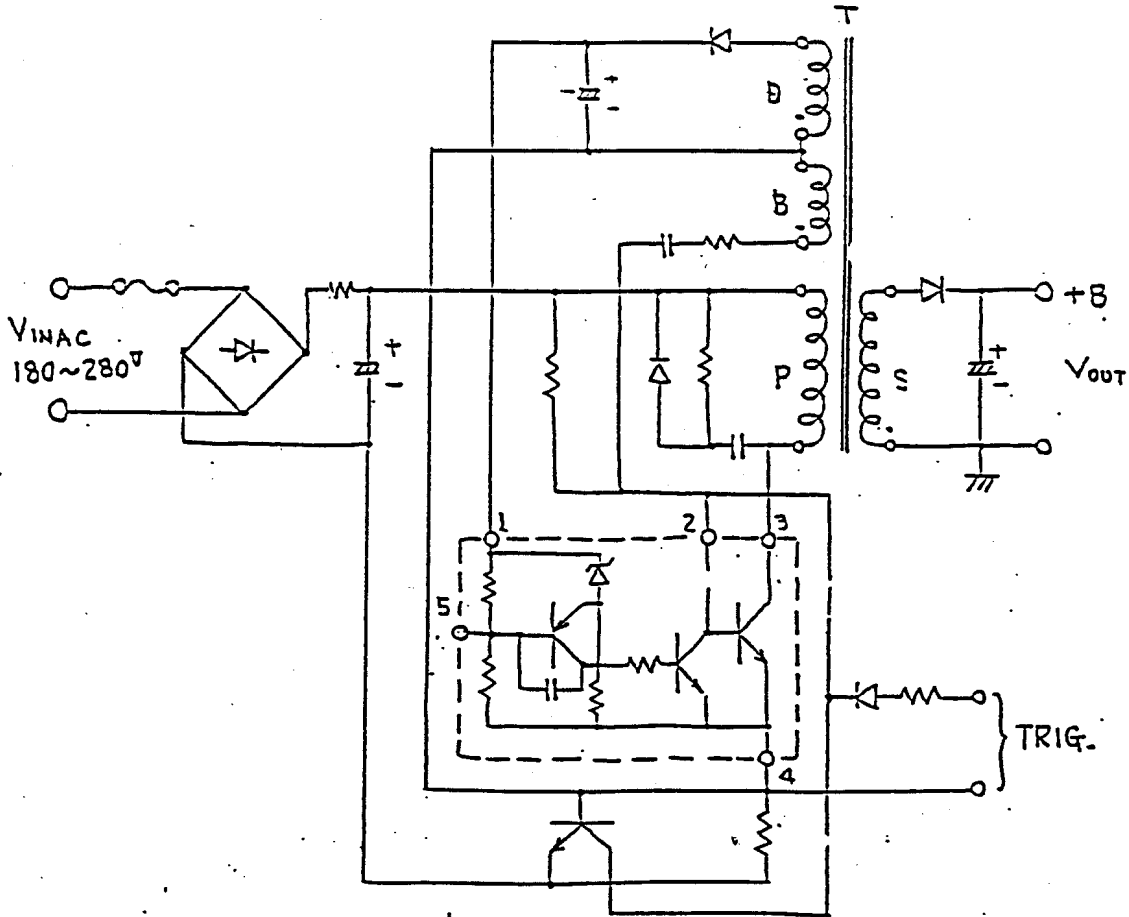
Collector Current





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Actual Working Circuit 1.



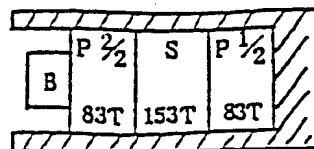
T1 Core EE48

Numbers of Windings

P	: 166T (0.6 ϕ)
S	: 153T (0.55 ϕ)
B	: 11T (0.55 ϕ)

Gap \approx 0.5mm

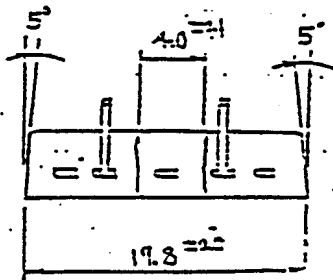
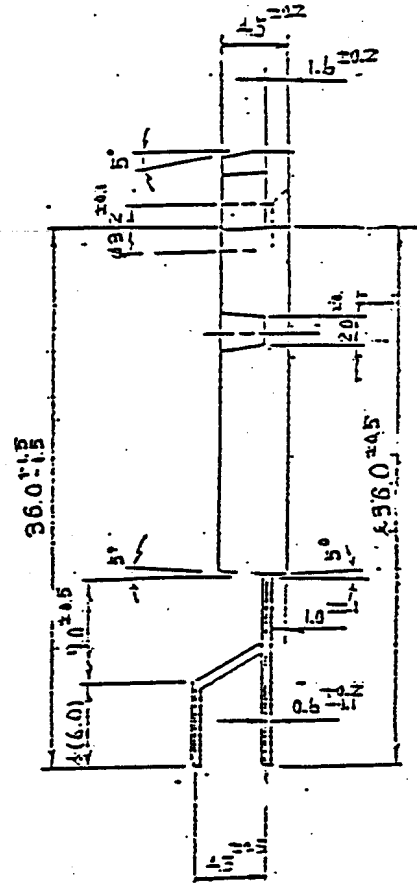
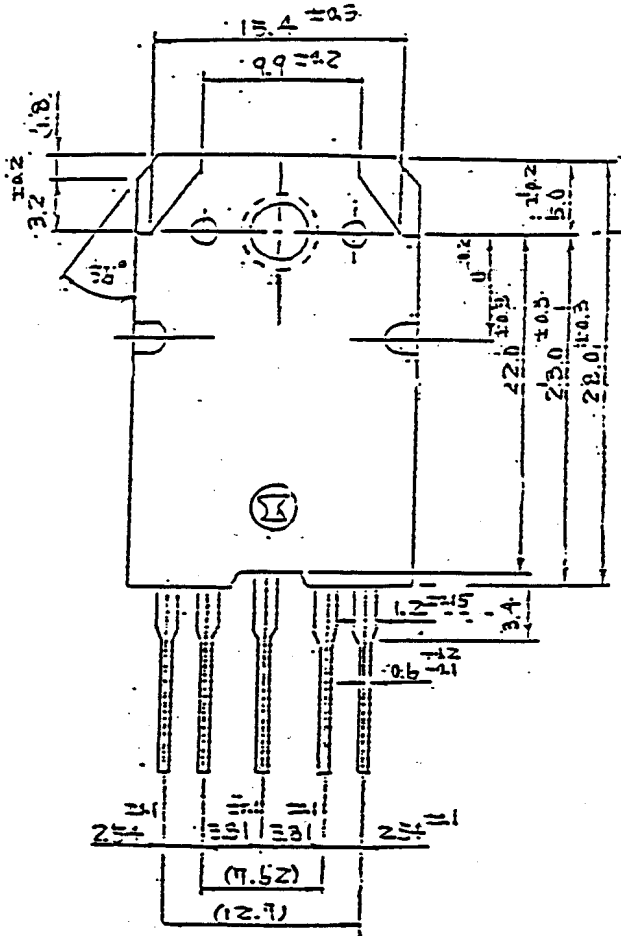
Winding Construction



Inductance

$P \approx 9.8$ mH

Fig. 1



1. VOLT SENSE
2. BASE DRIVE (B)
3. INPUT (C)
4. EARTH (E)
5. SOFT START