



## STK73907

### Self-Excitation Type Feedback Control (World Spec.) Switching Regulator (180W Output)

#### Overview

The STK73907 incorporates on-chip all the power switching, amplifier, overcurrent protection and driver circuits required in a self-excitation type feedback control off-line switching regulator. As a result, it can be used in the design of switching power supplies with minimal number of external components. Furthermore, the adoption of MOSFET power switching elements supports a higher oscillator frequency than that possible with bipolar transistors. This allows smaller pulse transformers and capacitors to be used, making it possible to construct miniature power supply systems.

#### Applications

- CRT/CTV power supplies.
- Office automation equipment power supplies.

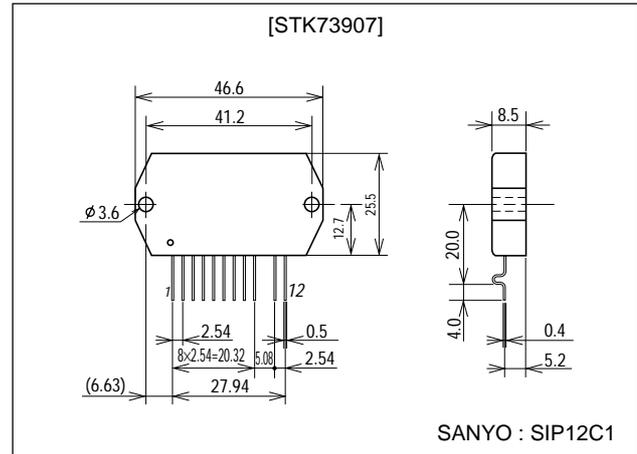
#### Features

- Power MOSFET devices.
- Feedback control for high output voltage precision.
- Driver circuit on-chip.
- Overcurrent protection circuit on-chip.
- Pin compatible with all other devices in the same series of devices with 110 to 280W power ratings.
- Higher oscillator frequency allows the use of smaller pulse transformers.
- IMST substrate acts as an electromagnetic shield, making low-noise designs possible.

#### Package Dimensions

unit:mm

4121



■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

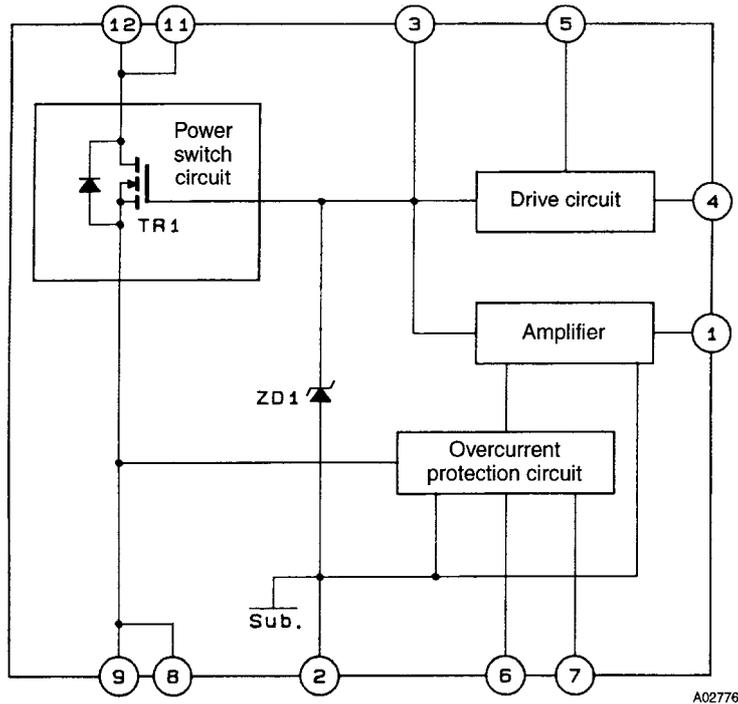
■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

**SANYO Electric Co., Ltd. Semiconductor Company**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

N0199TH (KT)/21995TH (ID) No.4935-1/7

Block Diagram



A02776

The back surface of the IC is not an insulator, and is effectively at pin 2 potentials

Pin Functions

Pin No.	Function
1	Amplifier circuit control
2	Ground
3	TR1 gate
4	Drive voltage input
5	Starting voltage input
6	OCP setting level input
7	OCP input-voltage dependency detection input
8	TR1 source
9	
11	TR1 drain
12	

Specifications

Maximum Ratings at Ta = 25°C, Tc = 25°C unless otherwise specified

Parameter	Symbol	Conditions	Ratings	Unit
Operating substrate temperature	Tc max	Recommended value is 105°C	115	°C
AC input voltage	V <sub>AC</sub>	Specified test circuit	280	Vrms
Operating temperature	Topr		-10 to +85	°C
Storage temperature	Tstg		-30 to +115	°C
Maximum output power	Wo max	Specified test circuit, V <sub>O</sub> =115V	180	W
[TR1]				
Drain current	I <sub>D</sub>	Refer to ASO characteristics for overcurrent condition	5	A
Pulse drain current	I <sub>D(pulse)</sub>		12	A
Drain reverse current	I <sub>DR</sub>		5	A
Gate-source voltage	V <sub>GSS</sub>		±30	V
Allowable power dissipation	P <sub>D</sub>		89.3	W
Chip junction temperature	Tj max		150	°C
[ZD1]				
Allowable power dissipation	P <sub>ZD1</sub>		500	mW
Chip junction temperature	tj(ZD1) max		125	°C

# STK73907

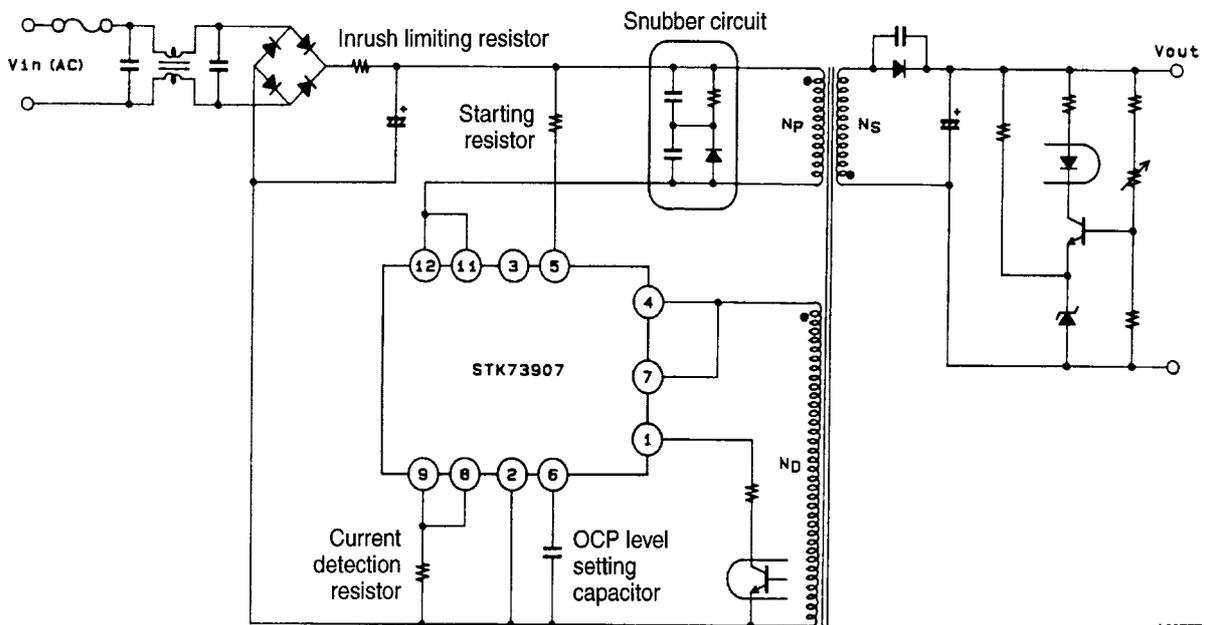
## Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Pin 4 input voltage	$V_4$		$\pm 8$ to $\pm 24$	V
Oscillator frequency	$f_{\text{OSC}}$		20 to 100	kHz

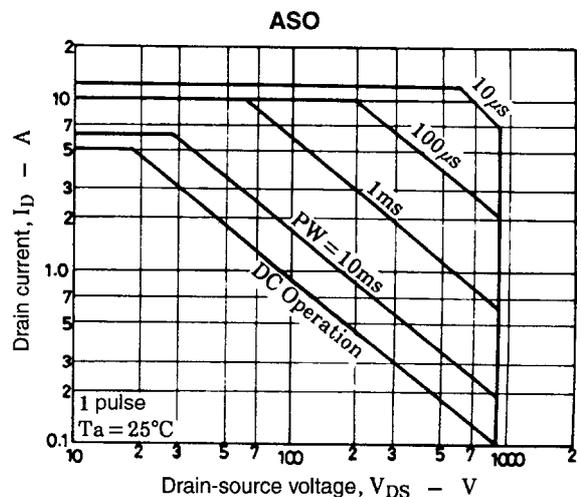
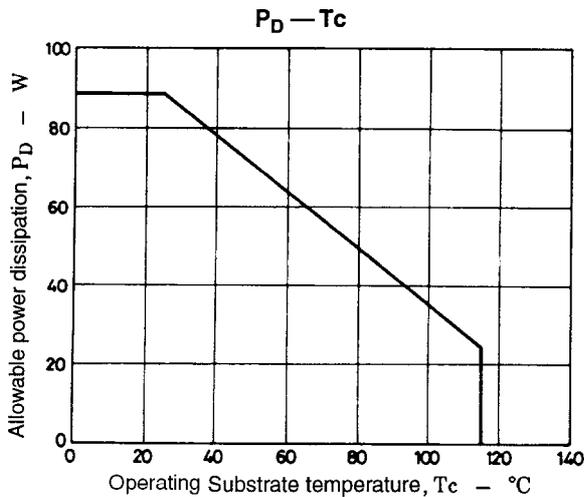
## Electrical Characteristics at $T_a = 25^\circ\text{C}$ , $T_c = 25^\circ\text{C}$ , unless otherwise specified, specified test circuit

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR1]						
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$I_D=10\text{mA}$ , $V_{\text{GS}}=0\text{V}$	900			V
Cutoff voltage	$V_{\text{GS}(\text{off})}$	$I_D=1\text{mA}$ , $V_{\text{DS}}=10\text{V}$	2.0		3.0	V
Drain-to-source ON resistance	$R_{\text{DS}(\text{on})}$	$I_D=3\text{A}$ , $V_{\text{GS}}=10\text{V}$		3.0	4.0	$\Omega$
Input capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=10\text{V}$ , $V_{\text{GS}}=0\text{V}$ , $f=1\text{MHz}$	800			pF
[ZD1]						
Zener voltage	$V_Z$	$I_Z=5\text{mA}$	23.7		26.3	V

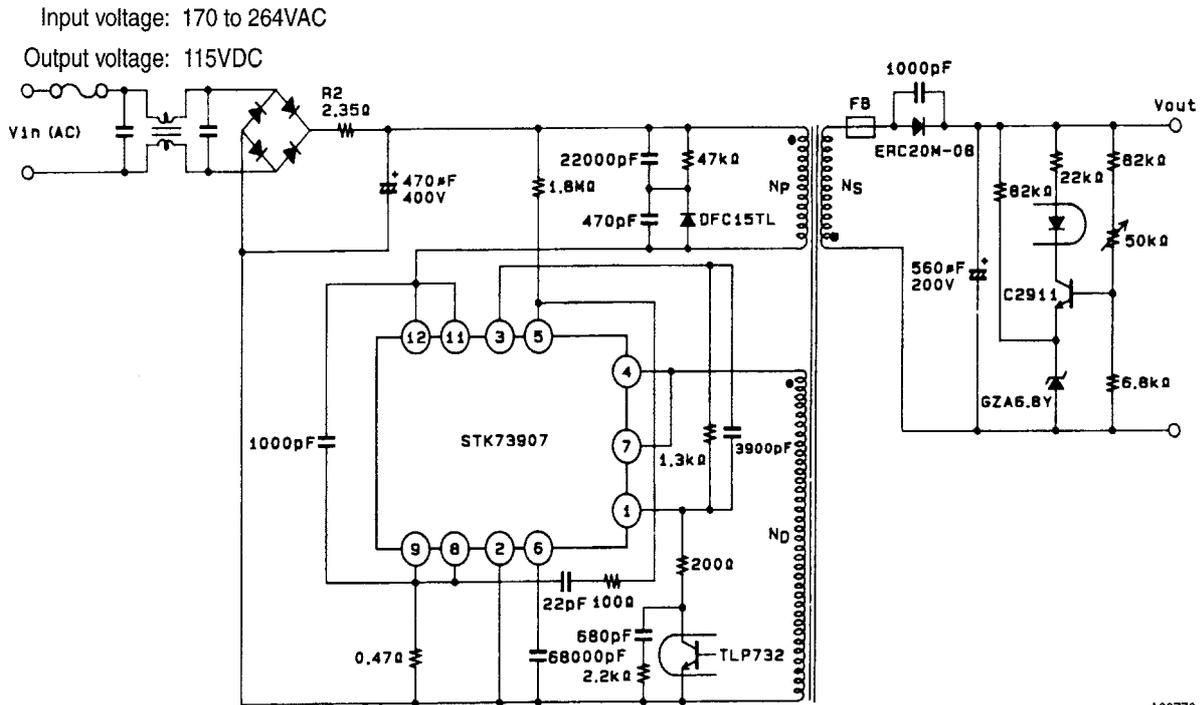
## Circuit Function Diagram



A02777

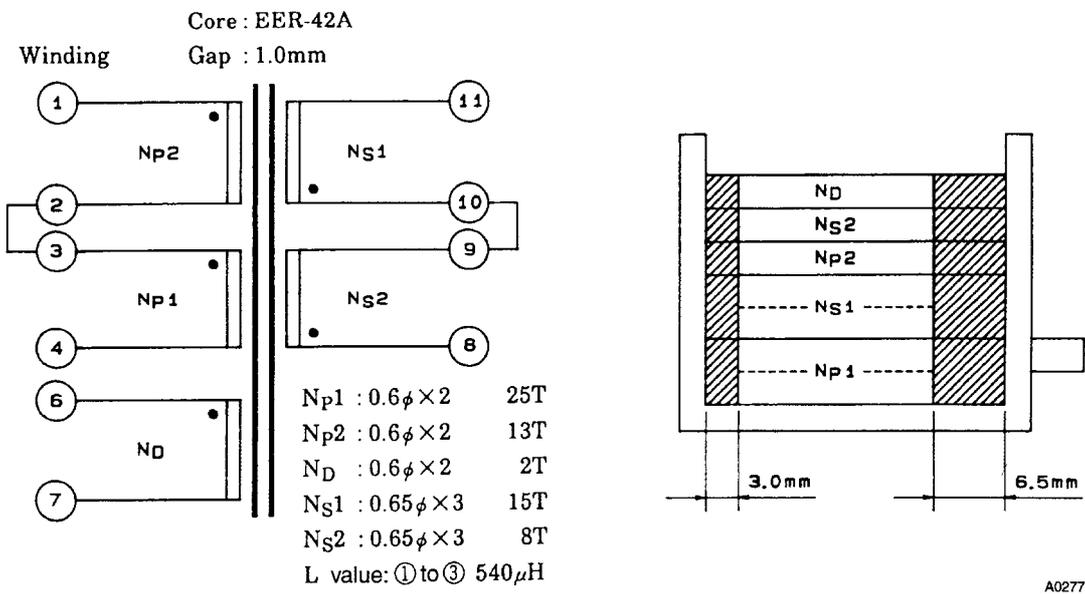


Sample Application Circuit (200V System)

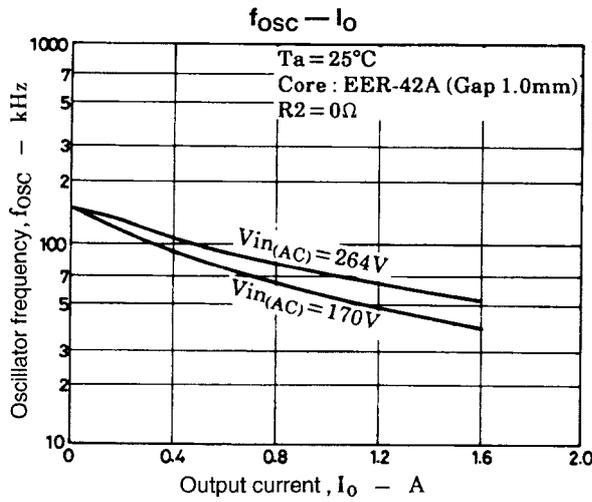
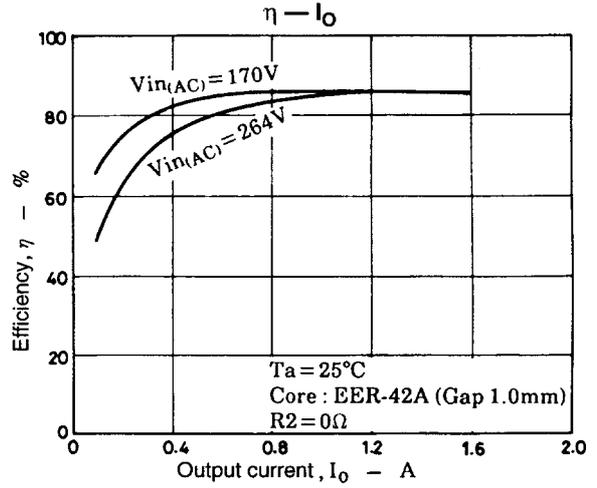
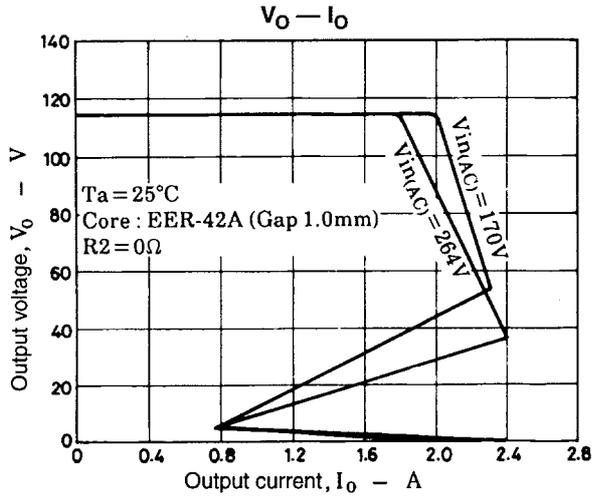


A02778

Pulse Transformer Specifications

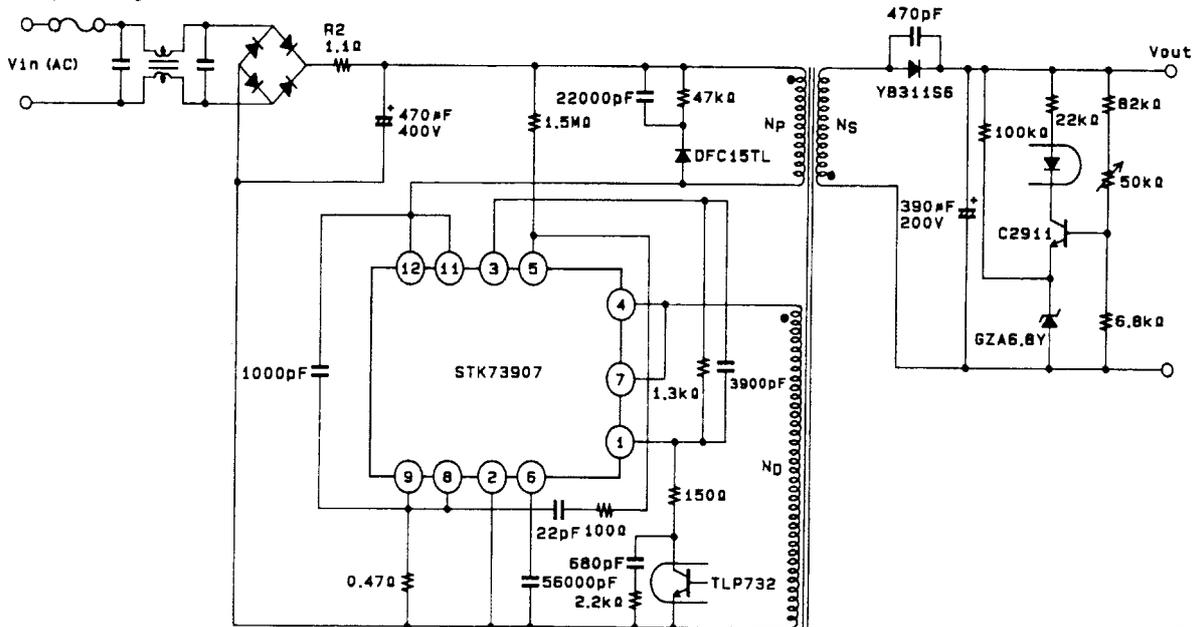


A02779



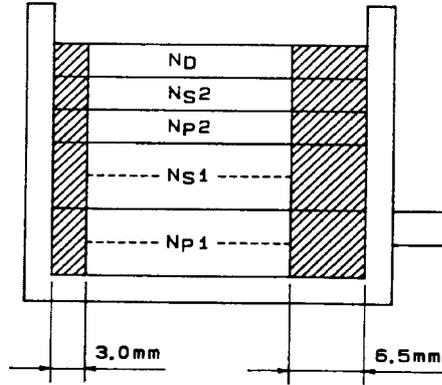
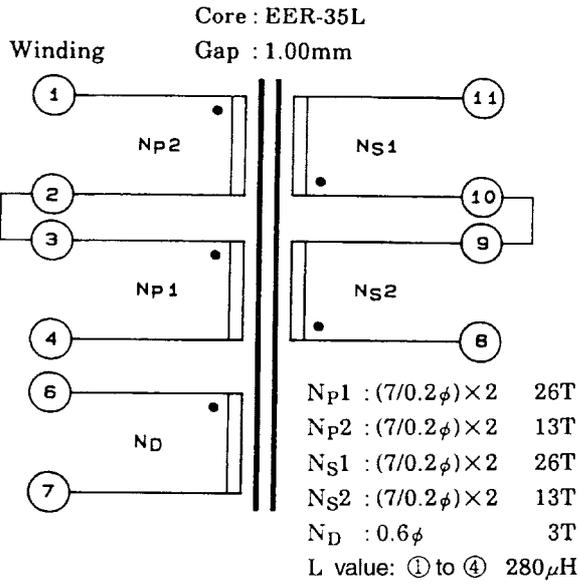
### Sample Application Circuit (World Input System)

Input voltage: 85 to 264VAC  
Output voltage: 115VDC

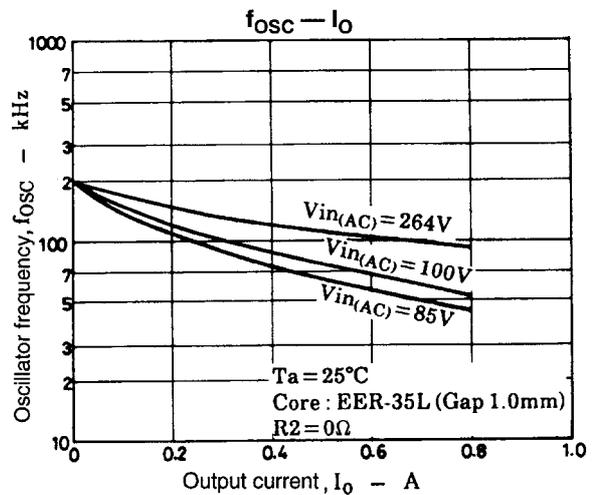
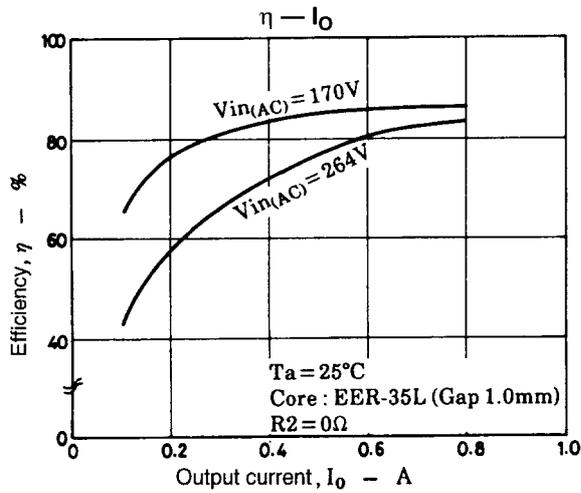
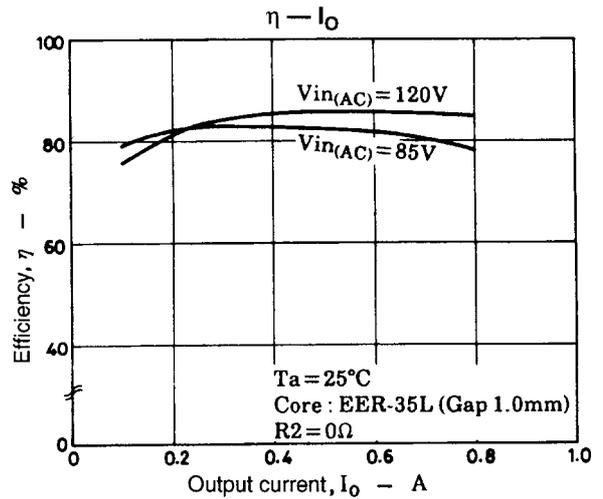
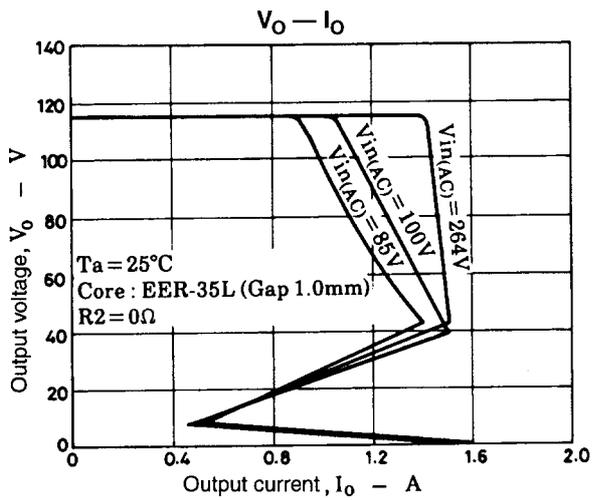


A02780

Pulse Transformer Specifications



A02781



## Series Organization

These devices form a series with varying output power ratings.

Type No.	Maximum ratings					Operating characteristics		
	V <sub>DSS</sub> [V]	T <sub>stg</sub> [°C]	T <sub>c max</sub> [°C]	T <sub>j max</sub> [°C]	I <sub>D</sub> [A]	Input voltage [V]	Output power [W]	ON resistance [Ω]
STK73902	500	-30 to +115	+115	+150	6.0	85 to 132	110	1.4
STK73903					10.0		180	0.6
STK73904					12.0		210	0.55
STK73905					15.0		280	0.3
STK73906					3.0		110	5.0
STK73907	900				5.0	170 to 264	180	3.0
STK73908					6.0		210	2.0
STK73909					8.0		280	1.2

- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products (including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of November, 1999. Specifications and information herein are subject to change without notice.