

Ordering number: EN 4935

Thick Film Hybrid IC

<b>SANYO</b>	No. 4935	<b>STK73907</b>
		<b>Self-Excitation Type Feedback Control (World Spec.) Switching Regulator (180W Output)</b>

### 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

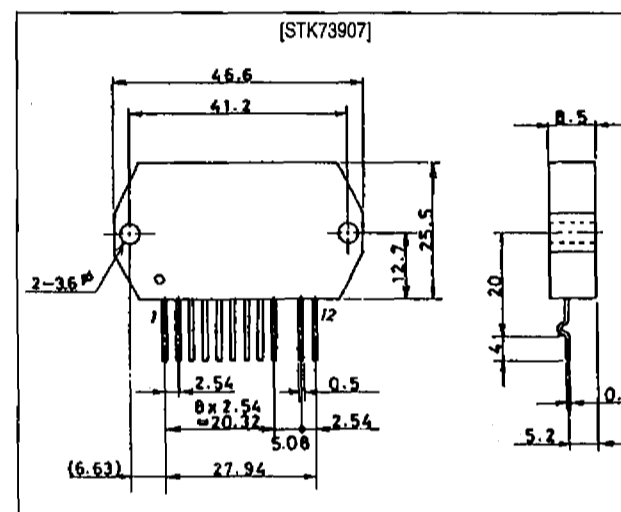
### Features

- 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

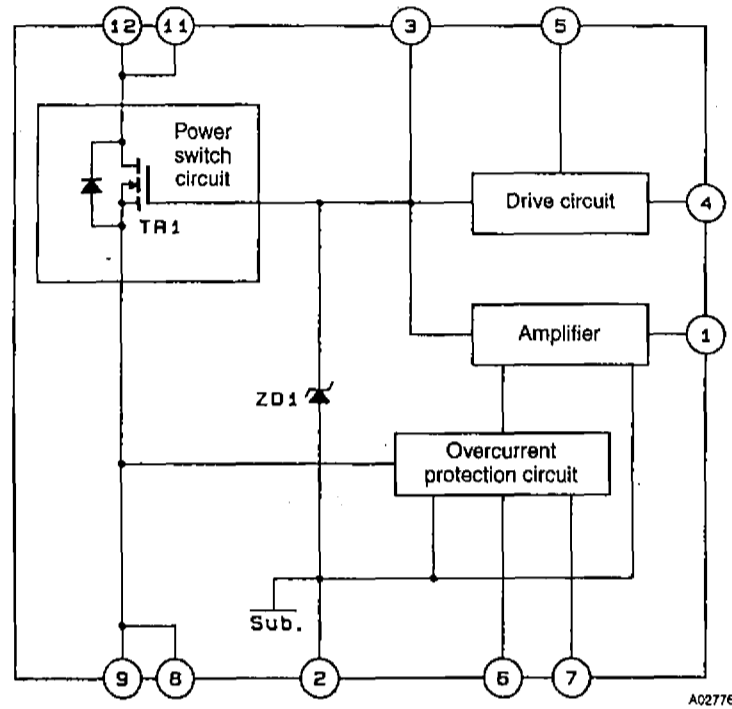


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21995TH (ID) No. 4935-1/7

**Block Diagram**



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

**Pin Functions**

Number	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  $T_a = 25^\circ\text{C}$ ,  $T_c = 25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Conditions	Ratings	Unit
Operating substrate temperature	$T_c \text{ max}$	Recommended value is $105^\circ\text{C}$ .	115	$^\circ\text{C}$
AC input voltage	$V_{AC}$	Specified test circuit	280	Vrms
Operating temperature	$T_{opg}$		-10 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-30 to +115	$^\circ\text{C}$
Maximum output power	$W_o \text{ max}$	Specified test circuit, $V_o = 115\text{V}$	180	W

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Parameter	Symbol	Conditions	Ratings	Unit
<b>[TR1]</b>				
Drain current	$I_D$	Refer to ASO characteristics for overcurrent condition.	5	A
Pulse drain current	$I_{D(pulse)}$		12	A
Drain reverse current	$I_{DR}$		5	A
Gate-source voltage	$V_{GS}$		$\pm 30$	V
Allowable power dissipation	$P_D$		89.3	W
Chip junction temperature	$T_{jmax}$		150	$^{\circ}C$
<b>[ZD1]</b>				
Allowable power dissipation	$P_{ZD1}$		500	mW
Chip junction temperature	$T_{j(ZD1)max}$		125	$^{\circ}C$

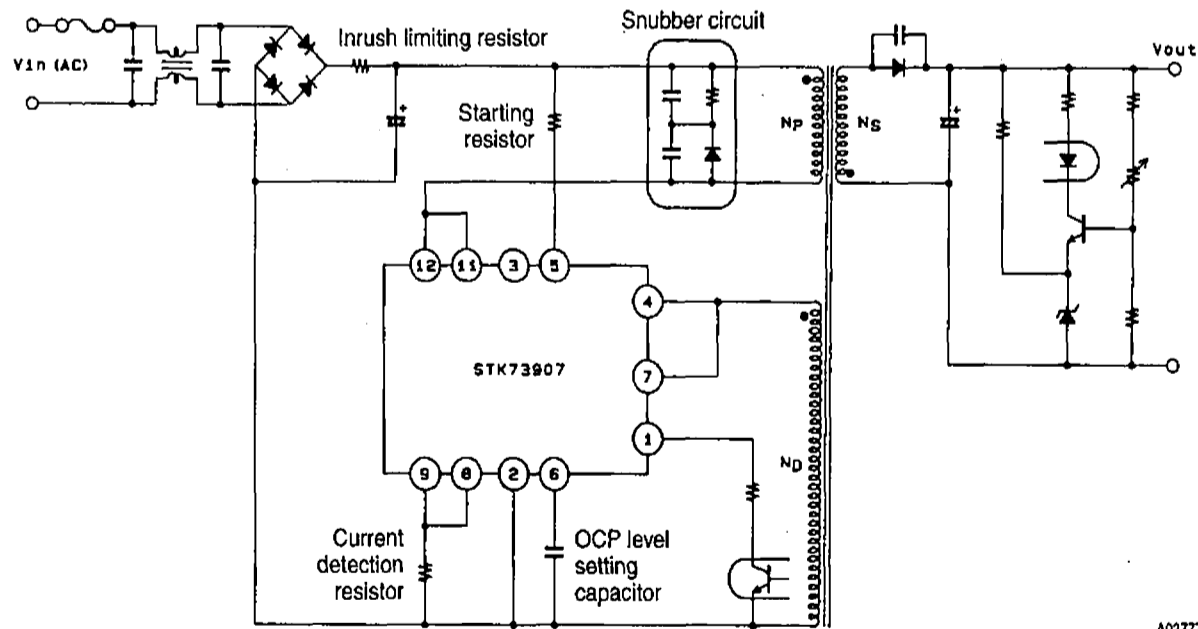
Allowable Operating Ranges at  $T_a = 25^{\circ}C$

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

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

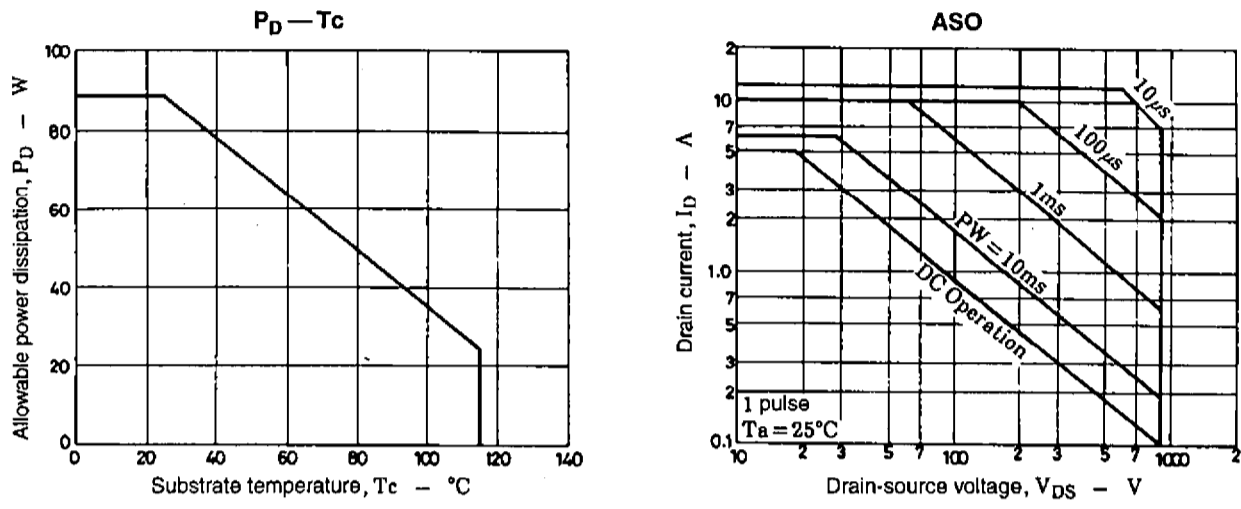
Parameter	Symbol	Conditions	min	typ	max	Unit
<b>[TR1]</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	900	-	-	V
Gate-source cutoff voltage	$V_{GS(off)}$	$I_D = 1mA, V_{DS} = 10V$	2.0	-	3.0	V
ON resistance	$R_{DS(on)}$	$I_D = 3A, V_{GS} = 10V$	-	3.0	4.0	$\Omega$
Input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

Circuit Function Diagram

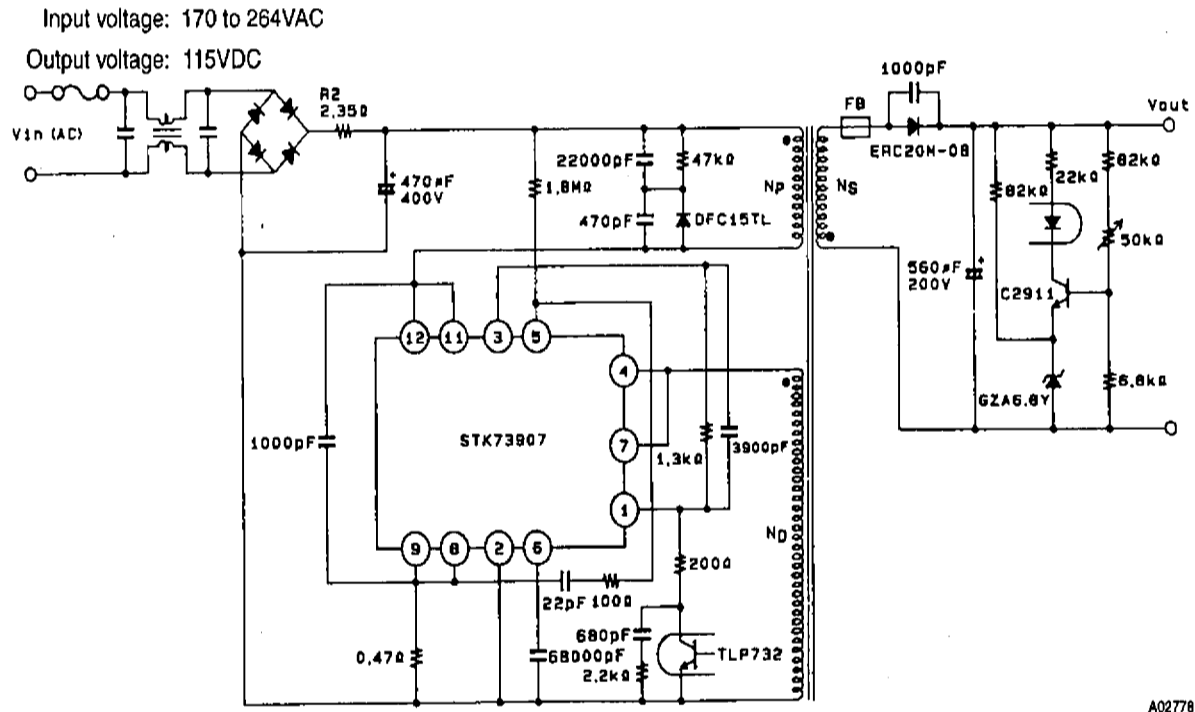


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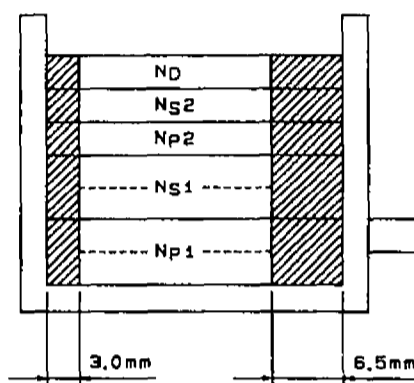
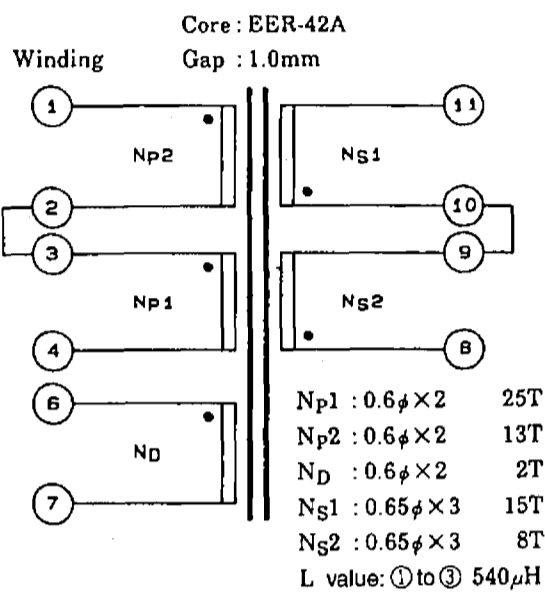


Sample Application Circuit (200V System)

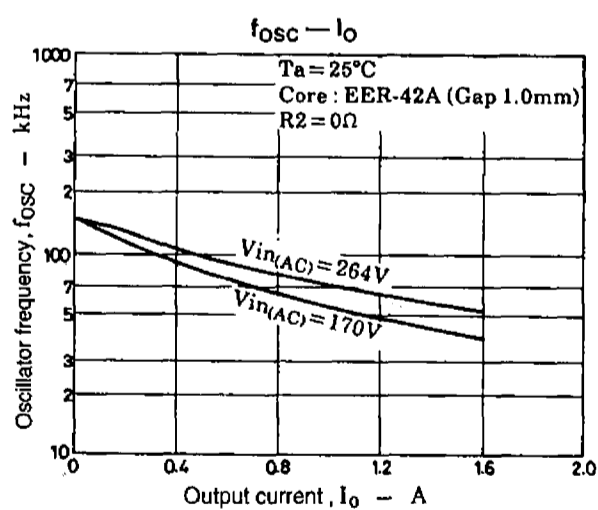
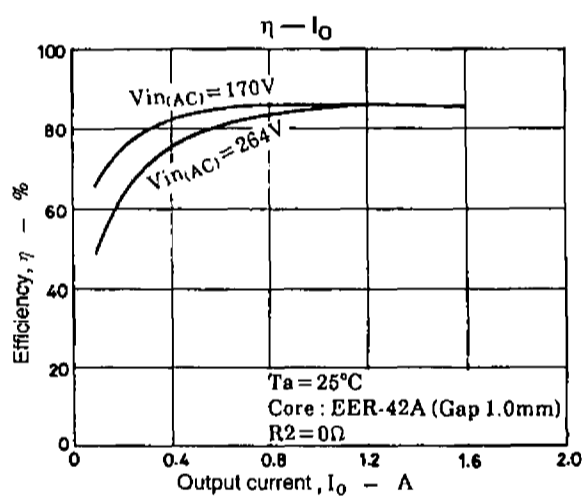
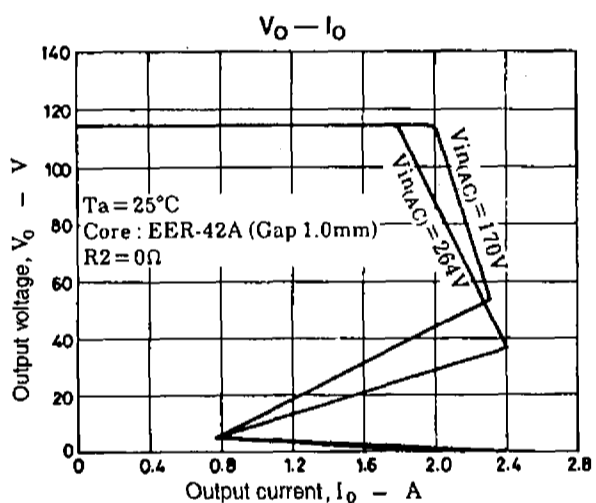


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Pulse Transformer Specifications

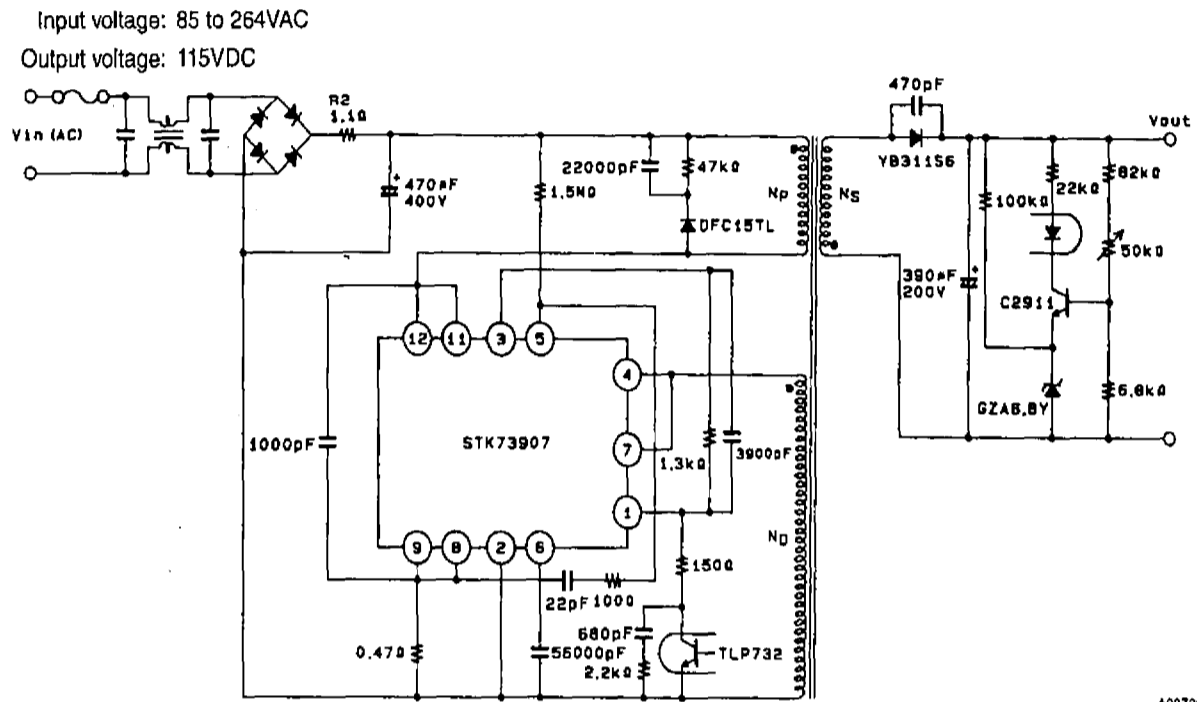


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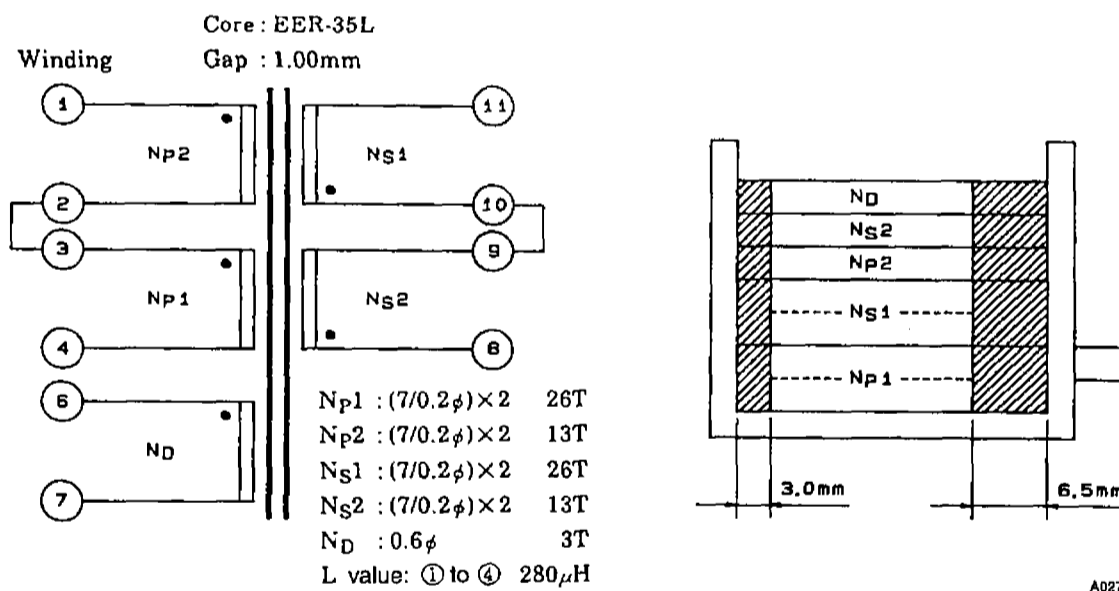
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Sample Application Circuit (World Input System)



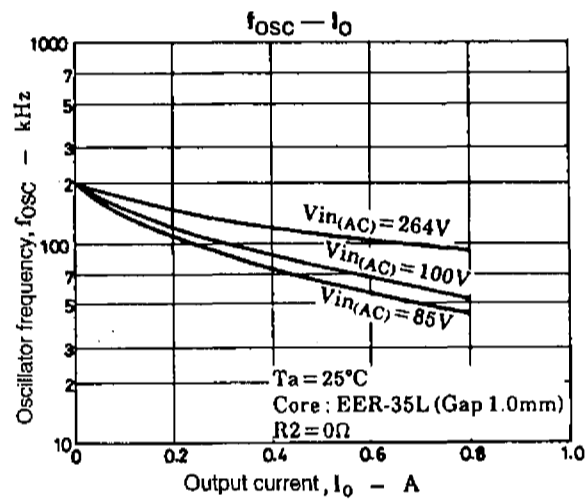
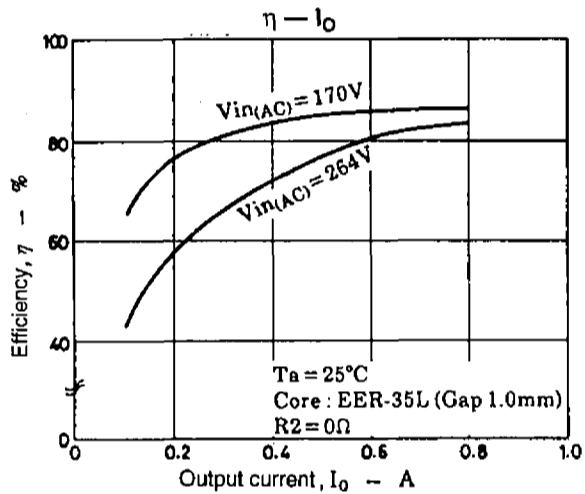
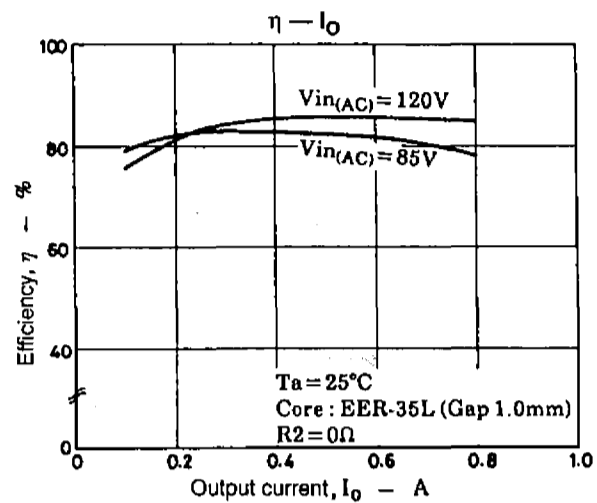
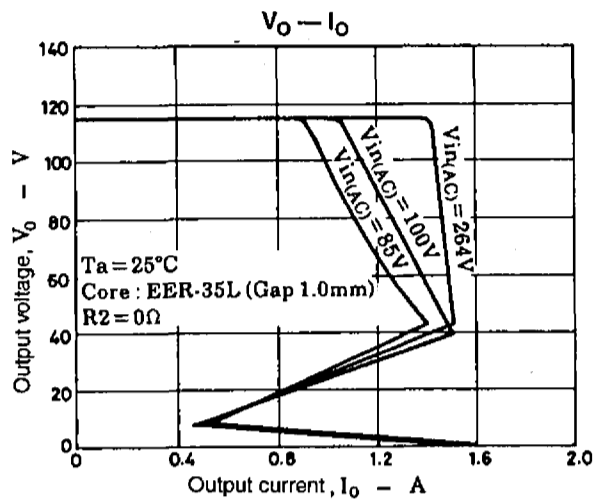
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Pulse Transformer Specifications



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Series Organization

These devices form a series with varying output power ratings.

Device	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	900	-30 to +115	+115	+150	3.0	170 to 264	110	5.0
STK73907					5.0		180	3.0
STK73908					6.0		210	2.0
STK73909					8.0		280	1.2