

SANYO	No. 4935	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

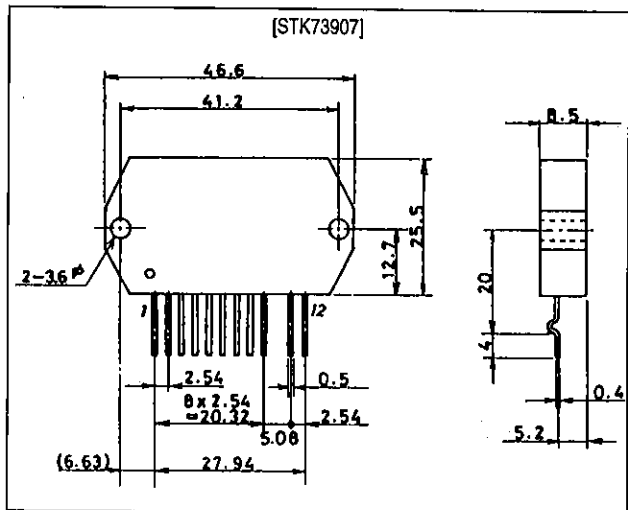
Features

- 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

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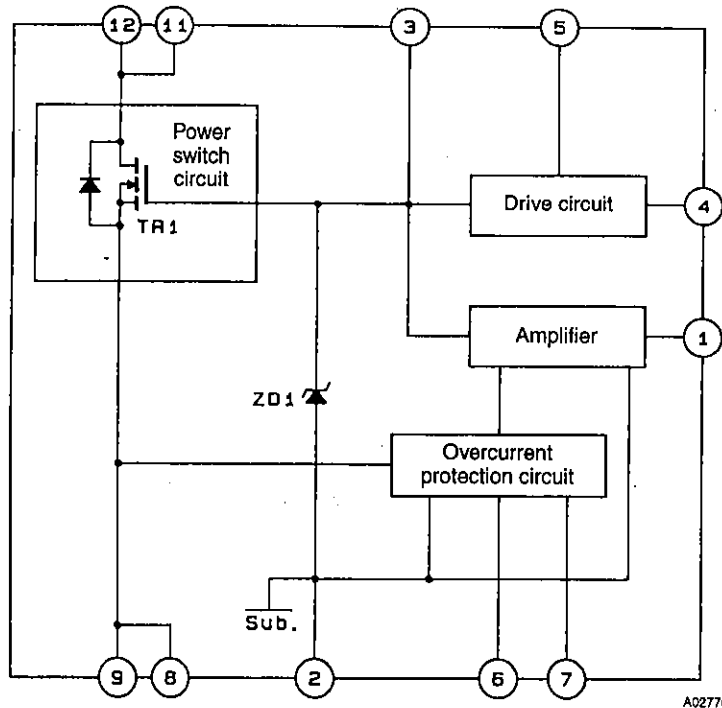
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Block Diagram



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 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 _{AC}	Specified test circuit	280	V _{rms}
Operating temperature	Topg		-10 to +85	°C
Storage temperature	Tstg		-30 to +115	°C
Maximum output power	Wo max	Specified test circuit, V _O = 115V	180	W

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Parameter	Symbol	Conditions	Ratings	Unit
[TR1]				
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}		± 30	V
Allowable power dissipation	P_D		89.3	W
Chip junction temperature	$T_J \text{ max}$		150	$^{\circ}\text{C}$
[ZD1]				
Allowable power dissipation	P_{ZD1}		500	mW
Chip junction temperature	$T_J(ZD1) \text{ max}$		125	$^{\circ}\text{C}$

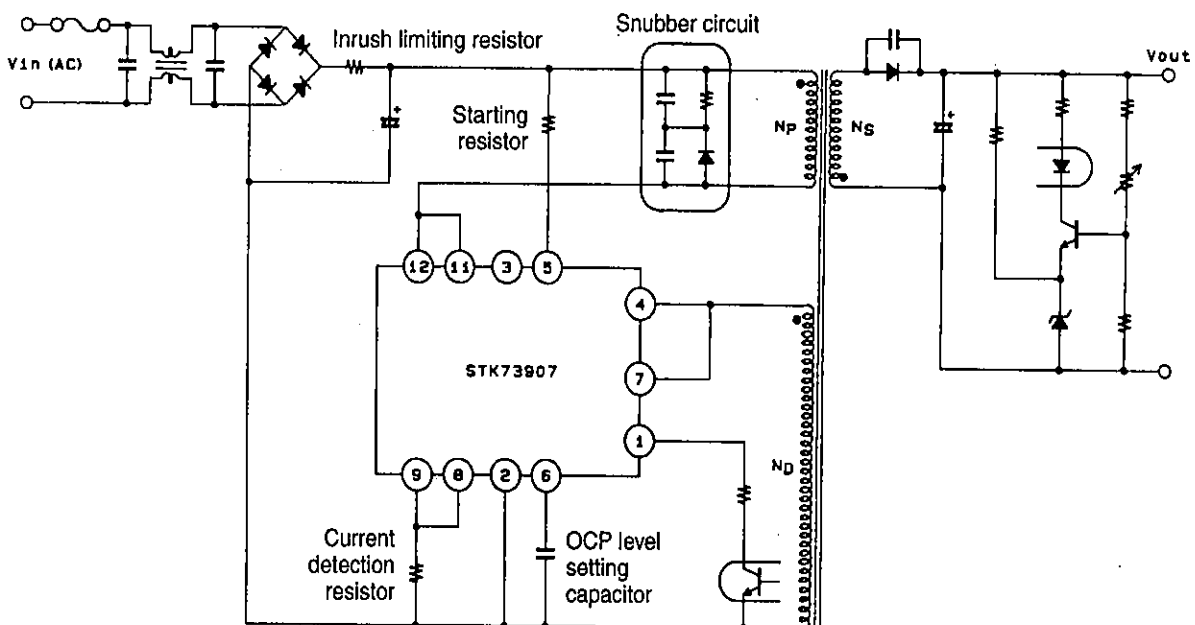
Allowable Operating Ranges at $T_a = 25^{\circ}\text{C}$

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

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

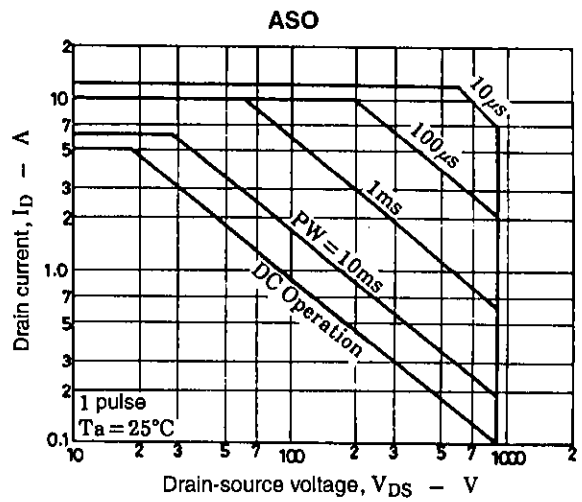
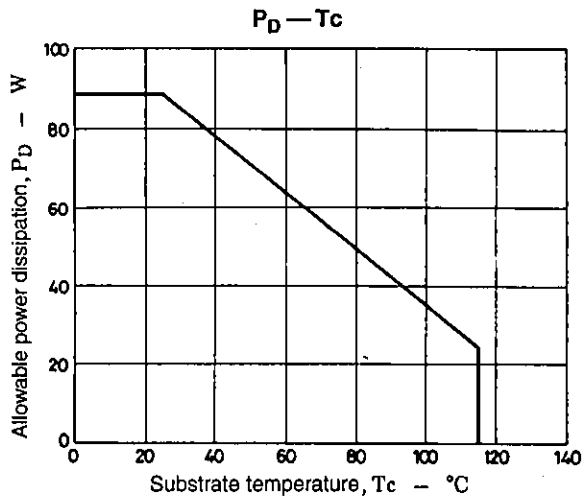
Parameter	Symbol	Conditions	min	typ	max	Unit
[TR1]						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 10\text{mA}$, $V_{GS} = 0\text{V}$	900	-	-	V
Gate-source cutoff voltage	$V_{GS(off)}$	$I_D = 1\text{mA}$, $V_{DS} = 10\text{V}$	2.0	-	3.0	V
ON resistance	$R_{DS(on)}$	$I_D = 3\text{A}$, $V_{GS}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

Circuit Function Diagram

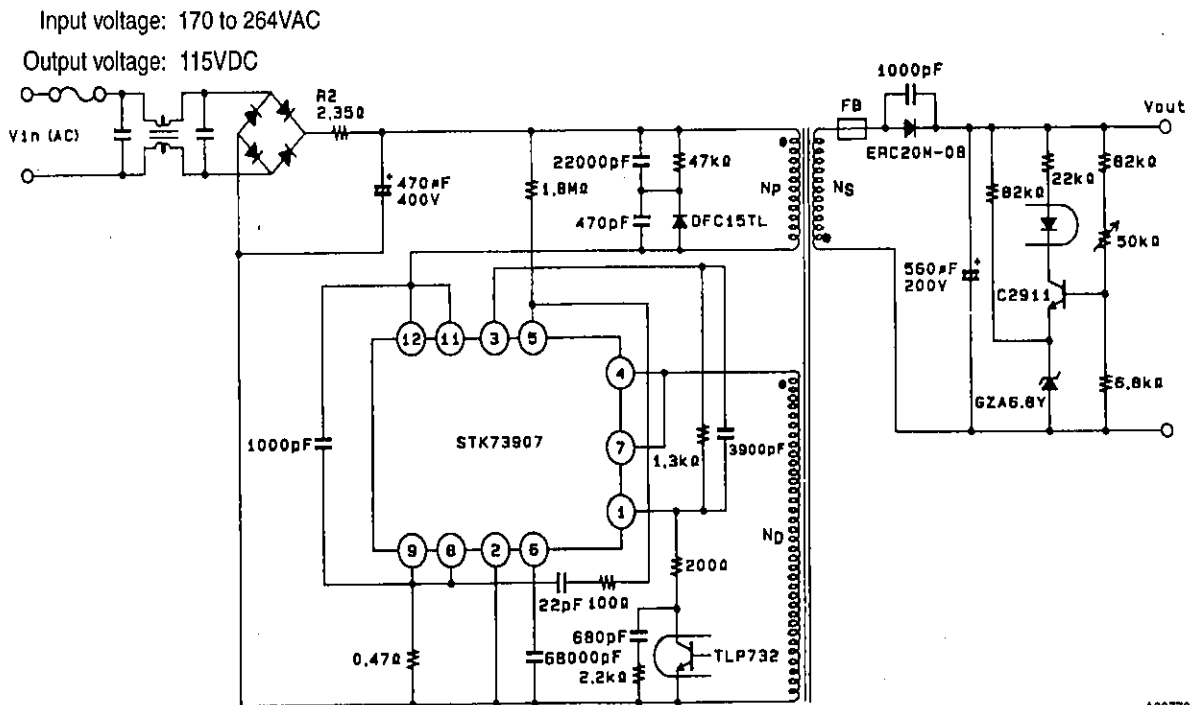


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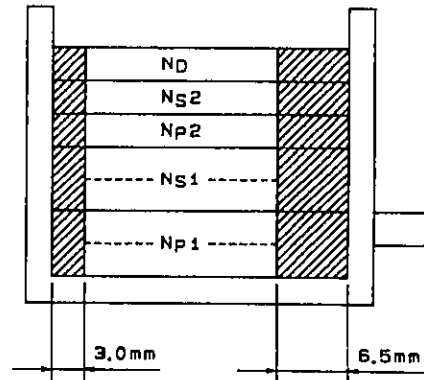
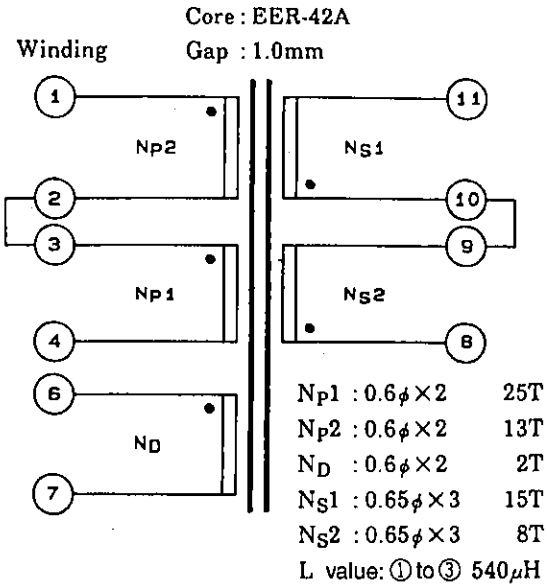


Sample Application Circuit (200V System)

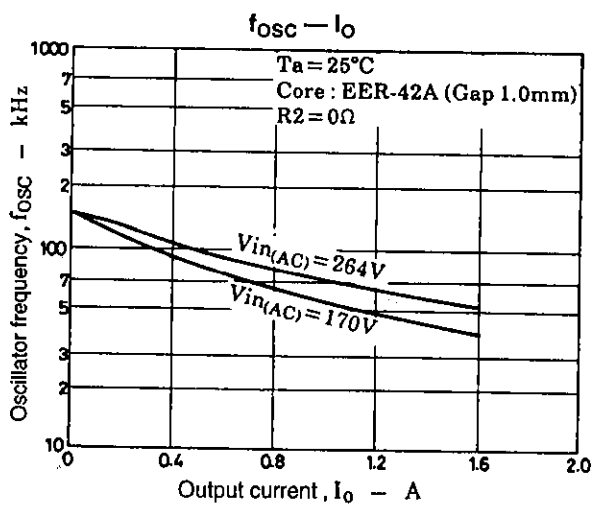
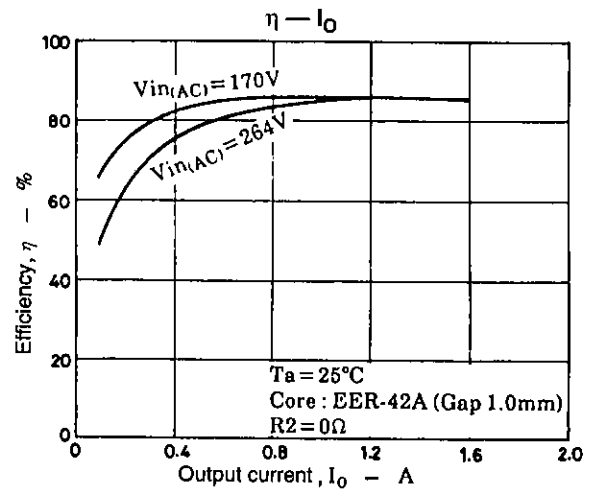
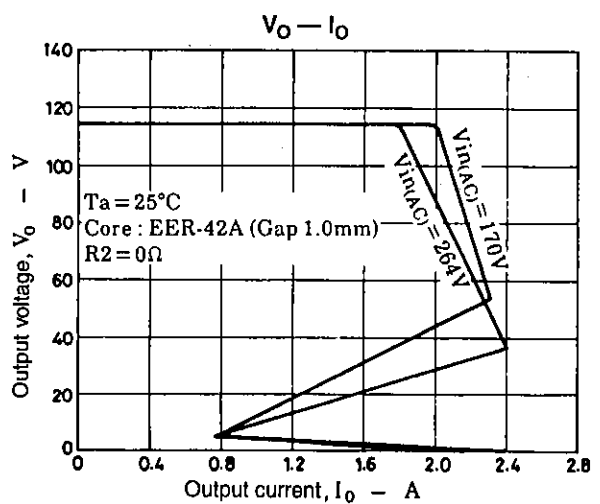


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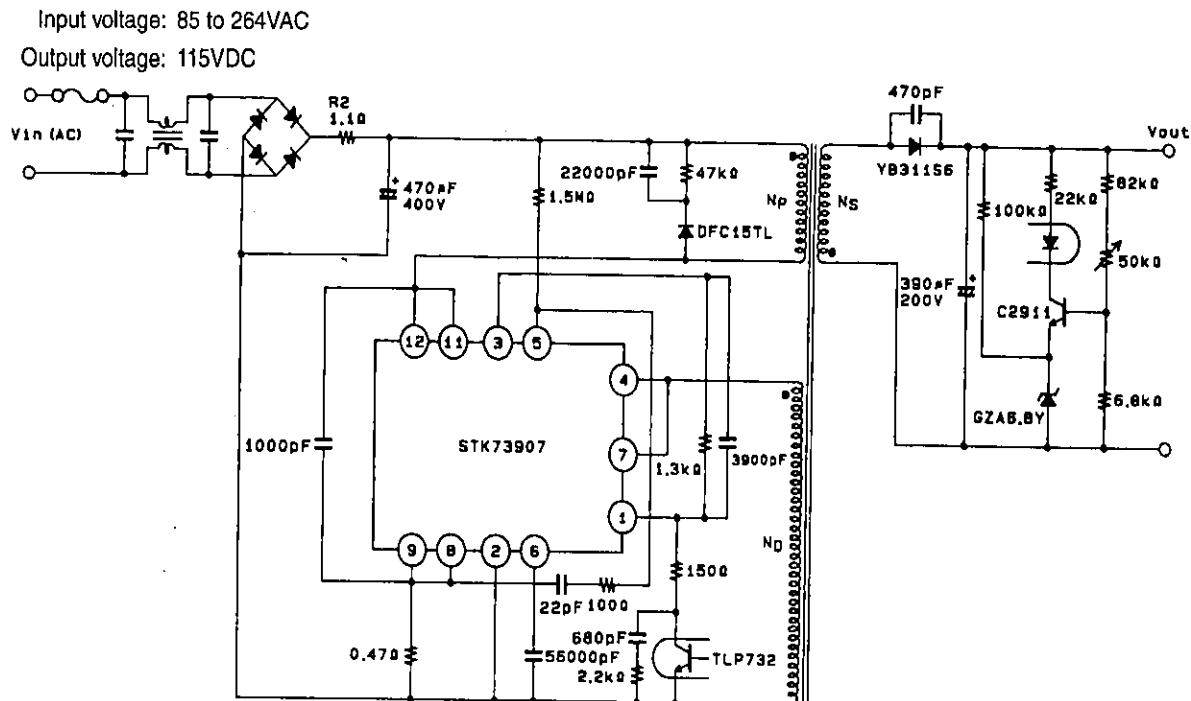
Pulse Transformer Specifications



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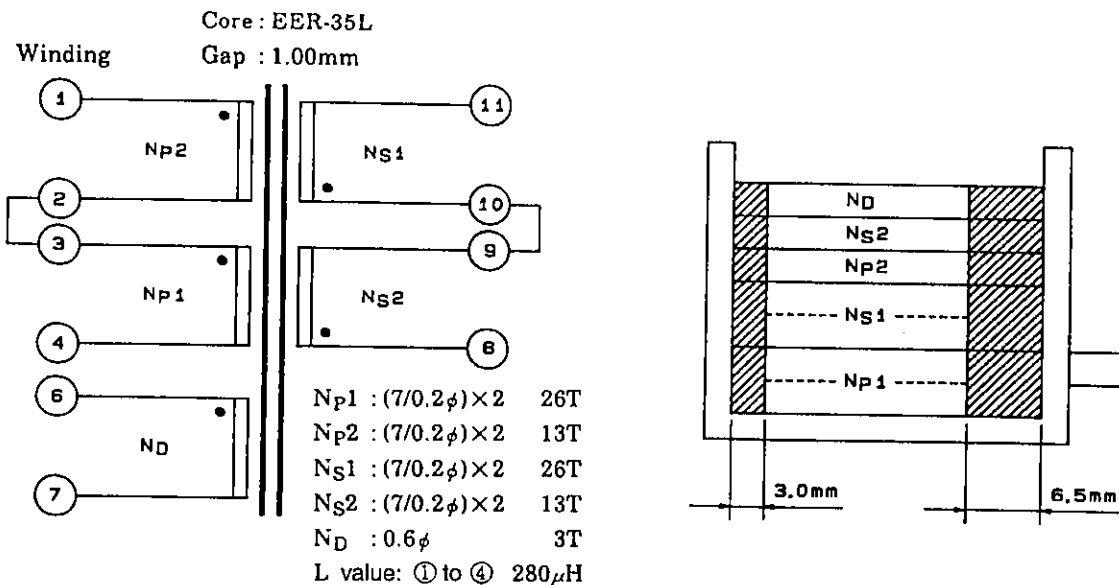


Sample Application Circuit (World Input System)

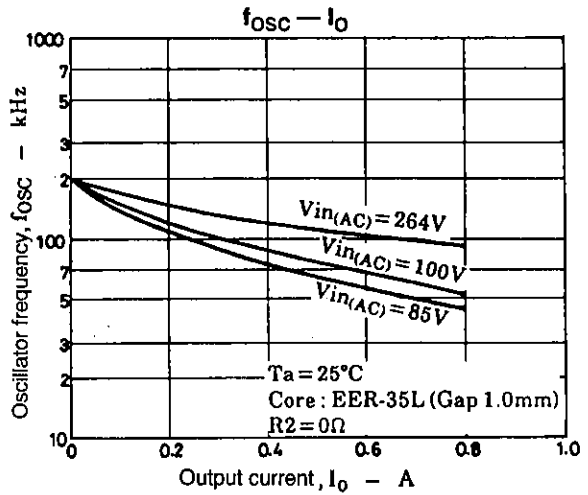
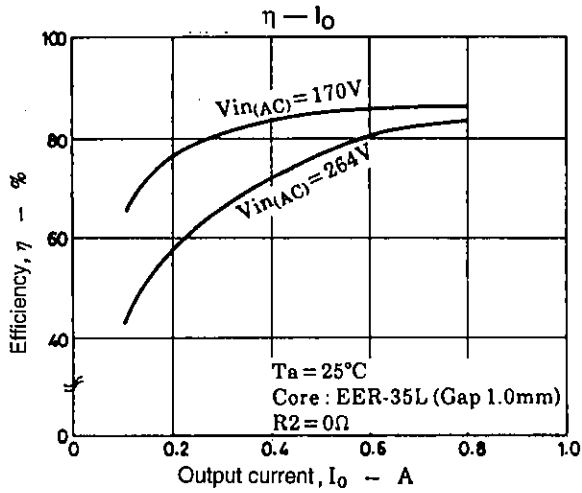
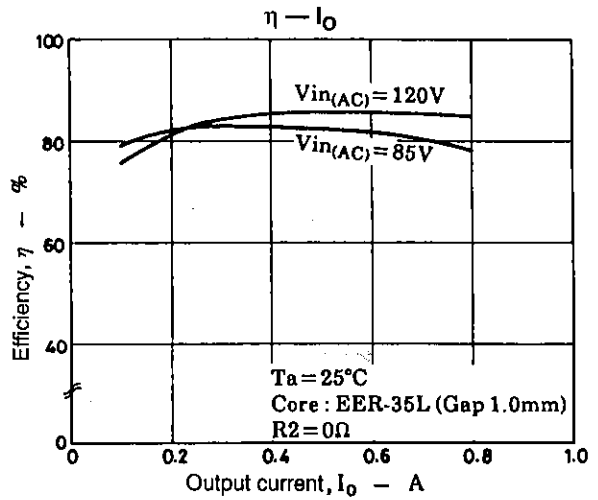
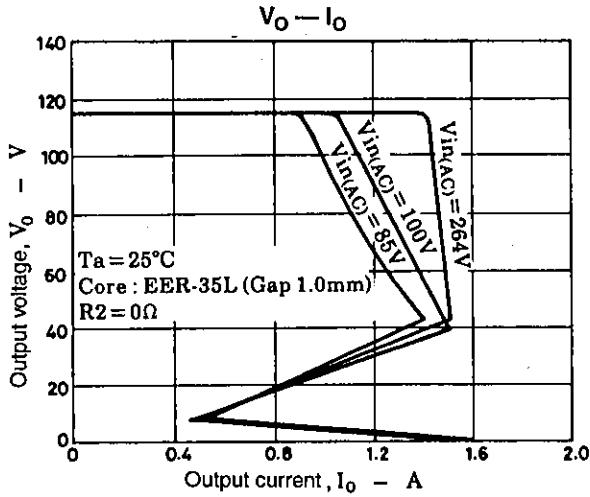


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Pulse Transformer Specifications



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Series Organization

These devices form a series with varying output power ratings.

Device	Maximum ratings				Operating characteristics			
	V_{DSS} [V]	T_{stg} [°C]	T_c max [°C]	T_j max [°C]	I_o [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