Ordering number : EN4740

Thick Film Hybrid IC

STK730-080

Self-Excitation Type Semi-Regulated Switching Regulator (210 W Output)

Overview

The STK730-080 provides on-chip the power switching, error detection, amplifier, and overcurrent protection circuits required in a self-excitation type semi-regulated switching regulator. As a result, it can be used to construct a switching power supply with a minimal number of external components. Furthermore, due to the adoption of MOSFETs as the power switching elements, an oscillator frequency higher than that possible with bipolar transistors can be used. This allows miniaturized power supply systems to be constructed by reducing the size of the pulse transformer and capacitors.

Applications

- Power supplies in CRT and CTV products
- Power supplies in office automation products
- Switching power supplies in general

Features

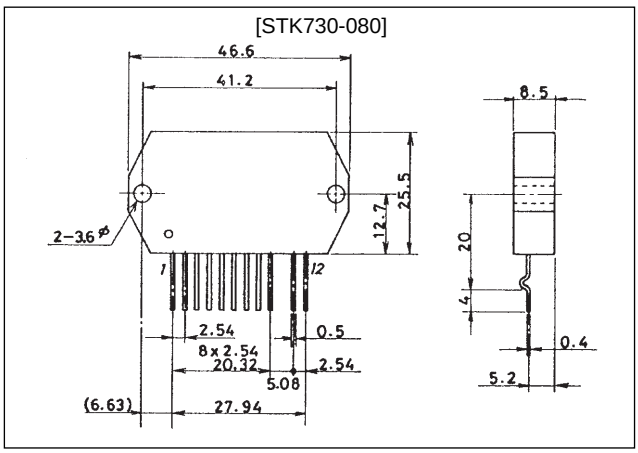
- Power MOSFETs adopted
- Built-in error detection circuit
- Built-in overcurrent protection circuit
- Product series differentiated by output capacity (110 to 280 W)
- Few external components required
- Since the STK730-080 supports higher oscillator frequencies, smaller pulse transformers can be used.
- Takes all major national stability standards and EMF hazard standards into consideration.
- The IMST (insulated metal substrate technology) substrate functions as an EMF shield plate and supports low noise design.

Package Dimensions

unit: mm

4121

[STK730-080]



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SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquarters

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Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Operating substrate temperature	Tc max	*1	115	°C
AC input voltage	V_{AC}	*2	280	Vrms
Operating temperature	Topr		–10 to +85	°C
Storage temperature	Tstg		–30 to +115	°C
Maximum output power	Wo max	*2 When V_O = 135 V	210	W
[TR1]				
Drain current	I_D	*3	6	A
Pulse drain current	I_D (puls)	*3	15	A
Drain reverse current	I_{DR}		6	A
Gate-source voltage	V_{GSS}		±30	V
Allowable power dissipation	Pd		100	W
Chip junction temperature	Tj max		150	°C
Thermal resistance	θj-c		1.25	°C/W
[ZD1]				
Allowable power dissipation	P_{ZD1}		500	mW
Chip junction temperature	$Tj_{(ZD1)}$ max		125	°C
Thermal resistance	$θj\text{-}c_{(ZD1)}$		0.2	°C/mW

Note: 1. The recommended substrate temperature is 105°C (maximum).
2. In the specified test circuit
3. See the ASO characteristics for these values in overcurrent states.

Recommended Operating Conditions at Ta = 25°C

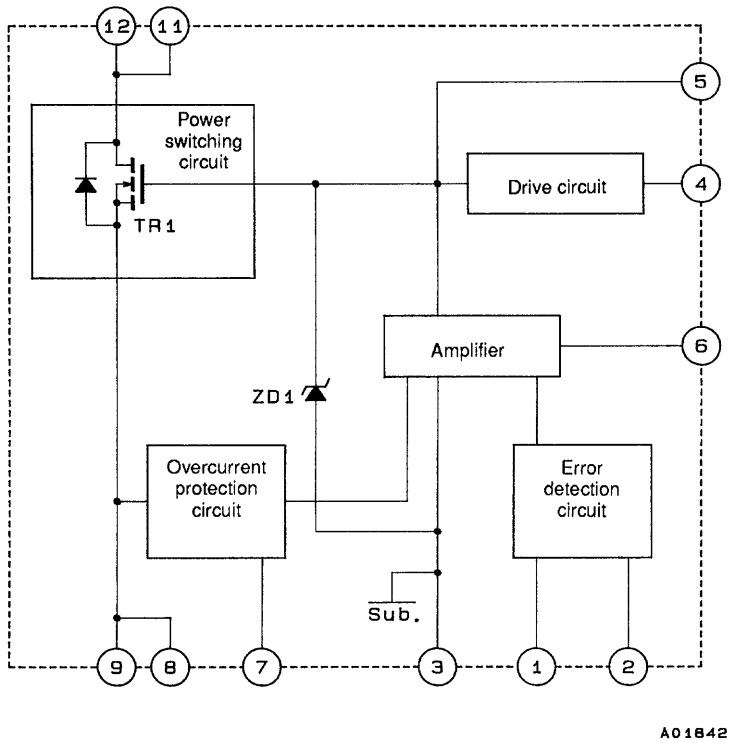
Parameter	Symbol	Conditions	Ratings	Unit
Pin 4 input voltage	V4		±8 to ±24	V
Oscillator frequency	f_{OSC}		20 to 120	kHz

Operating Characteristics at Ta = 25°C (Tc = 25°C unless specified otherwise)

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage setting		* Iin = 8 mA	40.0	40.5	41.0	V
Output voltage temperature coefficient		* Tc = 0 to + 105°C, Iin = 8 mA		7		mV/°C
[TR1]						
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	I_D = 10 mA, V_{GS} = 0 V	900			V
Gate-source cutoff voltage	V_{GS} (off)	I_D = 1 mA, V_{DS} = 10 V	2.0		3.0	V
On resistance	R_{DS} (on)	I_D = 3 A, V_{GS} = 10 V		2.0	3.0	Ω
Input capacitance	Ciss	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz		1200		pF
[ZD1]						
Zener voltage	V_Z	I_Z = 5 mA	23.7		26.3	V

Note: * In the specified test circuit

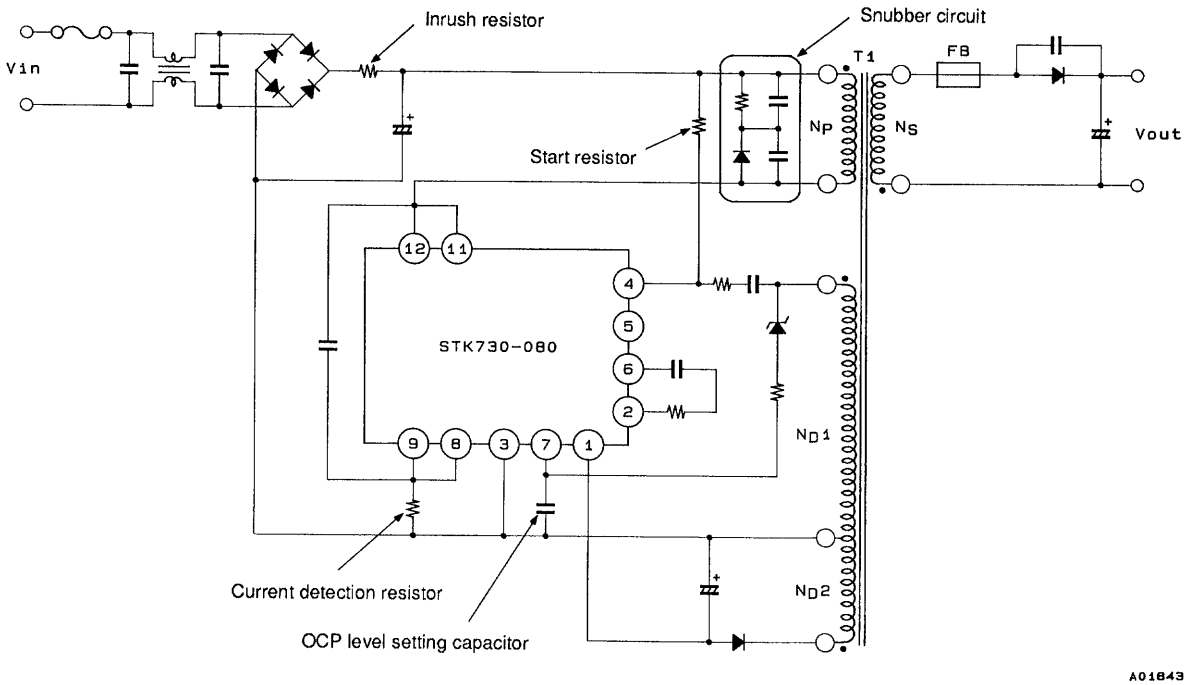
Equivalent Circuit Block Diagram



Pin No.	Description
1	Vref (40.5 V typical) input
2	Error detection level
3	Ground
4	Drive voltage input
5	TR1 gate
6	Amplifier circuit control
7	OCP setting level input
8 9	TR1 source
11 12	TR1 drain

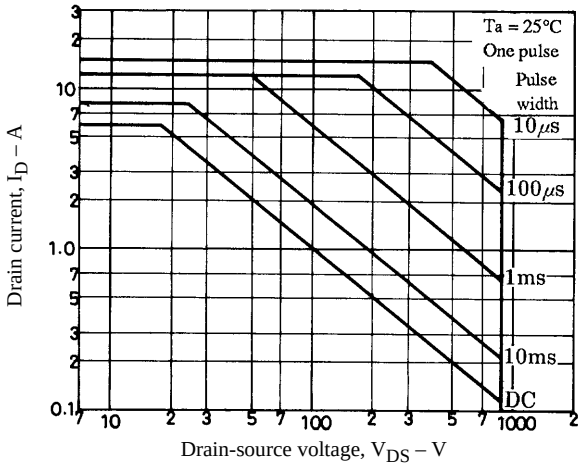
Note: The back surface of the IC is not an insulator, and may be shorted to pin 3.

Sample Application Circuit

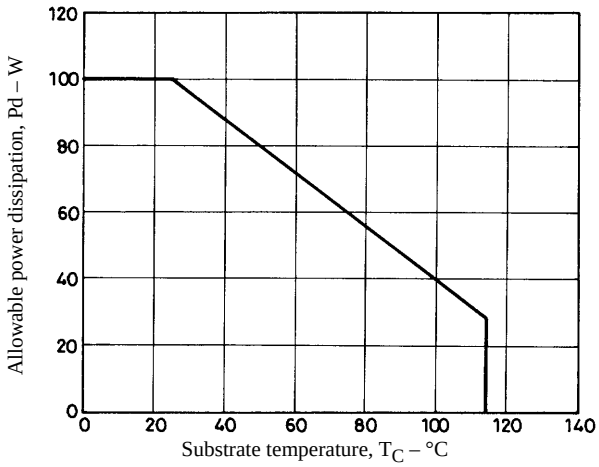


Characteristics Data

ASO



Pd – T_C



Series Organization

These products are provided as a product series whose members differ mainly in their power capacity.
Note that the following table includes products that are under development. Contact your Sanyo sales representative for information on product availability.

Product No.	Maximum Rating					Operating Characteristic		
	V_{DSS}	Tstg*	Tc max	Tj max	I_D	AC input range	Wo max	Ron typ.
	V	°C	°C	°C	A	V	W	Ω
STK730-010	500	–30 to +115	+115	+150	6.0	85 to 132	110	1.4
STK730-020					8.0		145	0.8
STK730-030					10.0		180	0.7
STK730-040					12.0		210	0.55
STK730-050					15.0		280	0.3
STK730-060	900				3.0	170 to 264	110	5.0
STK730-070					5.0		180	3.0
STK730-080					6.0		210	2.0
STK730-090					8.0		280	1.2

Note: * The recommended substrate temperature is 105°C (maximum).

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