ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

NTE7002
Integrated Circuit
Switched Mode Power Supply Control

Description:

The NTE7002 is a bipolar integrated circuit in a 9–Lead SIP type package that drives, regulates, and monitors the switching transistor in a power supply based on the ringing choke flyback principle.

Due to the wide regulating range and the high voltage stability during large load changes, SMPS for Hi–Fi equipment and active loudspeakers can be realized as well as applications in TV receivers and video recorders.

Features:

- Wide Operational Range
- High Voltage Stability Even at High Load Changes
- Direct Control of Switching Transistor
- Low Start–Up Current
- Linear Foldback of the Overload Characteristic
- Base Drive Proportional to the Current Through the Power Switching Transistor
- Stand–By Mode 3.5W into the External Load
- Inhibit Capability (TTL Compatible)
- Undervoltage Lockout

Absolute Maximum Ratings:

Supply Voltage, V_9 . . . . 20V
Sink Output Voltage
V_7 . . . . 0 to V_9V
V_7–V_8 . . . . ±6V
Reference Output, I_1 . . . . –10 to +1.0mA
Zero Crossing, I_2 . . . . –3.0 to +3.0mA
Control Amplifier, I_3 . . . . –3.0 to 0mA
Collector Current, I_4 . . . . –2.0 to +5.0mA
Trigger Input, I_5 . . . . –2.0 to +3.0mA
Sink Output, I_7 . . . . –1.5A
Junction Temperature, T_J . . . . +150°C
Storage Temperature Range, T_{stg} . . . . –40° to +125°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . +70°C/W
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . +15°C/W

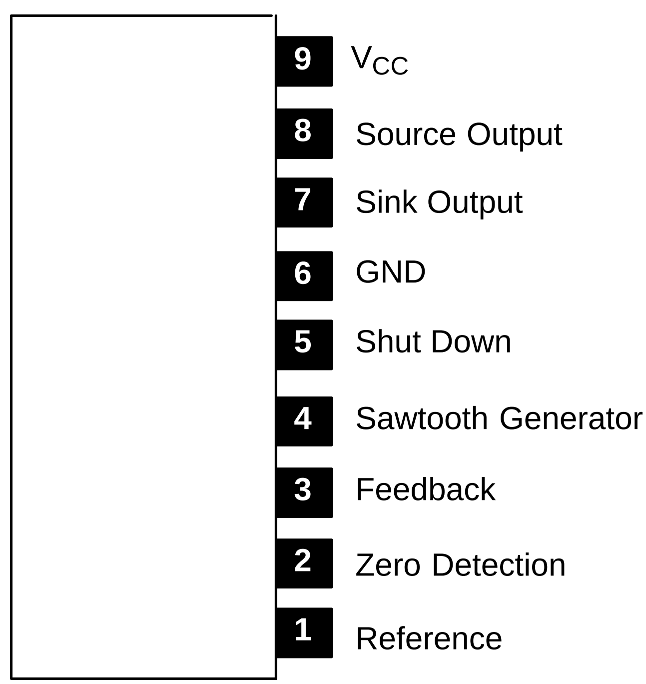
Electrical Characteristics: (T_A = +25°C unless otherwise specified)

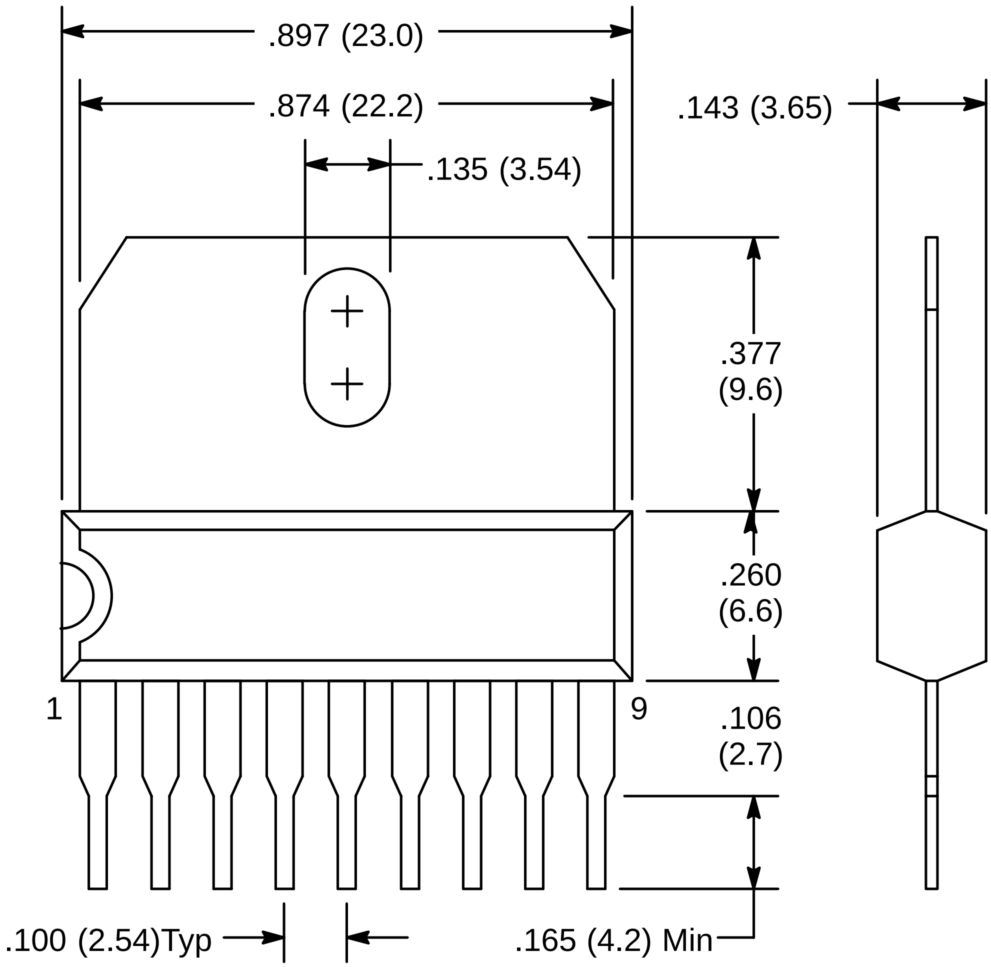
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_9		–	15	18	V
Ambient Temperature	T_A		–15	–	+85	°C
Start Operation (T_A = +25°C)						
Current Consumption (V_1 Not Yet Switched)	I_9	V_9 = 3.0V	–	–	0.5	mA
		V_9 = 5.0V	–	1.5	2.0	
		V_9 = 10V	–	2.0	3.2	
Turn–On Point for V_1	V_9		11.3	11.8	12.3	V
V_4 Before Start–Up (V_9 < 11.8V)	V_4		6.0	6.7	–	V
Regulation Mode (V_9 = 15V, T_A = +25°C)						
Current Consumption	I_9	V_{reg} = –10V	110	135	160	mA
		V_{reg} = 0	55	85	110	
Reference Voltage	V_1	I_1 < 0.1mA	4.0	4.2	4.5	V
		I_1 = 5.0mA	4.0	4.2	4.4	
Reference Voltage Temperature Coefficient	TC_1		–	100	–	ppm/°C
V_{Pin4} Low Static Voltage	V_4		1.8	2.08	2.5	V
V_{Pin4} Regulation Peak Voltage	$V_{4(peak)}$	I_{Pin3} = 5.0µA	4.0	4.2	4.5	V
		I_{Pin3} = 1.3mA	–	2.4	3.0	
V_{Pin3} Full Fold Back	V_3	I_{Pin3} = 1.3mA	–	3.7	4.0	V
V_{Pin3} Fold Back		I_{Pin3} = 0.5mA	–	2.5	3.0	
V_{Pin3} Overload Decision		I_{Pin3} = 1.0µA	–	2.4	2.9	
V_{Pin3} Regulation			–	2.11	–	
V_{Pin3} I_{Pin3} Regulation	I_3		–	1.0	–	µA
V_{Pin3} I_{Pin3} Leakage		V_{Pin3} = 1.5V	–	0.4	–	
V_{Pin7} Peak High	$V_{7(peak)}$	V_R = 0V (Full Fold Back)	–	3.5	–	V
		V_R = –10V (Regulation)	–	4.0	–	
		V_R = –15V (Stand–By)	–	5.0	–	
V_{Pin7} Peak Low	$V_{7(peak)}$	V_R = 0V	–	1.4	–	V
		V_R = –10V	–	1.45	–	
		V_R = –15V	–	1.57	–	
I_{Pin7} Sink Peak	$I_{7(peak)}$	V_R = –15V	–	+0.7	–	A
I_{Pin8} Source Peak	$I_{8(peak)}$	V_R = –15V	–	–0.8	–	A
V_{Pin2}	V_2	I_{Pin2} = –3.0mA	–	–0.3	–	V
		I_{Pin2} = –0.3mA	–	–0.2	–	
		I_{Pin2} = +3.0mA	–	+0.7	–	
		I_{Pin2} = +0.3mA	–	+0.8	–	
Protective Operation (V_9 = 15V, T_A = +25°C)						
Current Consumption	I_9	V_5 < 1.8V	14	20	26	mA
Turn–Off Voltage	V_7	V_5 < 1.8V	1.3	1.5	1.8	V
	V_4		1.8	2.1	2.5	

Electrical Characteristics (Cont'd): (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Protective Operation (Cont'd) (V_9 = 15V, T_A = +25°C)						
External Trigger Input	V_5	Enable Voltage, V_{reg} = 0V	–	2.2	2.4	V
		Disable Voltage, V_{reg} = 0V	2.0	2.2	–	
Supply Voltage Disabling V_8 amd V_1	$V1_9$		6.7	7.4	7.8	V
V_{Pin5} Zener Voltage	V_5	Pin5 Open	6.5	7.3	7.8	V
I_{Pin5}	I_5	V_{Pin5} = 3.0V	–	1.4	–	µA
		V_{Pin5} = 0V	–	–11	–	
Turn–On Time (Secondary Voltages)	t_{on}		–	350	450	ms
Voltage Change	ΔV_2	S_3 = Closed, ΔP_3 = 19W	–	100	500	mV
		S_2 = Closed, ΔP_2 = 15W	–	500	1000	
Stand–By Operation (Minimum Secondary Power: 3W)	ΔV_2	S_1 = Open	–	20	30	V
Switching Frequency During Stand–By Mode	f		70	75	–	kHz
Primary Power Consumption During Stand–By Mode	P_{prim}	The Heat Sink Must Be Optimized, Taking the Maximum Data (T_J, $R_{\Theta JC}$, T_A) into Consideration	–	10	15	VA

Pin Connection Diagram
(Front View)





ALL Dimensions are Max.