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NTE7242
Integrated Circuit 12 Watt Low Power Off Line SMPS Primary Switcher 8–Lead DIP

Description:

The NTE7242 combines a dedicated current mode PWM controller with a high voltage Power MOSFET on the same silicon chip. Typical applications cover off line power supplies for battery charger adapters, standby power supplies for TV or monitors, auxiliary supplies for motor control, etc. The internal control circuit offers the following benefits:

- Large input voltage range on the V_{DD} pin accommodates changes in auxiliary supply voltage. This feature is well adapted to battery charger adapter configurations.
- Automatic burst mode in low load condition.
- Overvoltage protection in hiccup mode.

Features:

- Fixed 60 KHZ Switching Frequency
- 9V to 38V Wide Range V_{DD} Voltage
- Current Mode Control
- Auxiliary Undervoltage Lockout with Hysteresis
- High Voltage Start Up Current Source
- Overtemperature, Overcurrent and Overvoltage Protection with Autorestart

Absolute Maximum Ratings:

Supply Voltage, V_{DD} 50V
Switching Drain Source Voltage (T_J = +25 to +125°C, Note 1), $V_{DS(sw)}$ . . . . . –0.3 to 730V
Start Up Drain Source Voltage (T_J = +25 to +125°C, Note 2), $V_{DS(st)}$ . . . . . –0.3 to 400V
Continuous Drain Current, I_D . . . . . Internally limited
Feedback Current, I_{FB} 3mA
Operating Junction Temperature Range, T_J . . . . . Internally limited
Case Operating Temperature Range, T_C . . . . . –40 to +150°C
Storage Temperature Range, T_{stg} . . . . . –55 to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . +15°C/W
Thermal Resistance, Junction–to–Ambient (Note 3), R_{thJA} . . . . . +45°C/W
Electrostatic Discharge, $V_{(ESD}$
Machine Model (R=0Ω; C=200pF)$_{)}$ 200V
Charged Device Model 1.5kV

Note 1. This parameter applies when the start up current source is off. This is the case when the V_{DD} voltage has reached V_{DDon} and remains above V_{DDoff}.

Note 2. This parameter applies when the start up current source is on. This is the case when the V_{DD} voltage has not yet reached V_{DDon} or has fallen below V_{DDoff}.

Note 3. When mounted on a standard single–sided FR4 board with 200mm^2 of Cu (at least 35μm thick) connected to all DRAIN pins.

RoHS 2002/95/EC

Electrical Characteristics: (T_J=+25°C, V_{DD}=18V, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Power						
Drain−Source Voltage	BV_{DSS}	I_D=1mA, V_{FB}=2V	730	–	–	V
Off State Drain Current	I_{DSS}	V_{DS}=500V, V_{FB}=2V, T_J=+125°C	–	–	0.1	mA
Static Drain−Source On State Resistance	R_{DSon}	I_D=0.4A	–	15	17	Ω
		T_J=+100°C	–	–	31	Ω
Fall Time	t_f	I_D=0.2A, V_{IN}=300V, Note 4	–	100	–	ns
Rise Time	t_r	I_D=0.4A, V_{IN}=300V, Note 4	–	50	–	ns
Drain Capacitance	C_{oss}	V_{DS}=25V	–	40	–	pF
Supply						
Start Up Charging Current	I_{DDch}	V_{DS}=100V, V_{DD}=0V to V_{DDon}	–	–1	–	mA
Start Up Charging Current in Thermal Shutdown	I_{DDoff}	V_{DD}=5V, V_{DS}=100V, $T_J > T_{SD} - T_{HYST}$	0	–	–	mA
Operating Supply Current Not Switching	I_{DD0}	I_{FB}=2mA	–	3	5	mA
Operating Supply Current Switching	I_{DD1}	I_{FB}=0.5mA, I_D=50mA, Note 5	–	4.5	–	mA
Restart Duty Cycle	D_{RST}		–	16	–	%
V_{DD} Undervoltage Shutdown Threshold	V_{DDoff}		7	8	9	V
V_{DD} Start Up Threshold	V_{DDon}		13	14.5	16	V
V_{DD} Threshold Hysteresis	V_{DDhyst}		5.8	6.5	7.2	V
V_{DD} Overvoltage Hysteresis	V_{DDovp}		38	42	46	V
Oscillator						
Oscillator Frequency Total Variation	F_{OSC}	V_{DD}=V_{DDoff} to 35V, T_J=0 to +100°C	54	60	66	kHz
PWM Comparator						
I_{FB} to I_D Current Gain	G_{ID}		–	560	–	–
Peak Current Limitation	I_{Dlim}	V_{FB}=0V	0.56	0.7	0.84	A
I_{FB} Shutdown Current	I_{FBsd}		–	0.9	–	mA
FB Pin Input Impedance	R_{FB}	I_D=0mA	–	1.2	–	kΩ
Current Sense Delay to Turn−Off	t_d	I_D=0.4A	–	200	–	ns
Blanking Time	t_b		–	500	–	ns
Minimum Turn On Time	t_{ONmin}		–	700	–	ns
Overtemperature						
Thermal Shutdown Temperature	T_{SD}		140	170	–	°C
Thermal Shutdown Hysteresis	T_{HYST}		–	40	–	°C

Note 4. On clamped inductive load.

Note 5. These test conditions obtained with a resistive load are leading to the maximum conduction time of the device.

Pin Connection Diagram