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NTE7166
Integrated Circuit
Flyback Switching Regulator

Description:

The NTE7166 is an integrated circuit in a 5-Lead Staggered TO3P type package and is specifically designed to satisfy the requirements for increased integration and reliability in off-line quasi-resonant flyback converters. This device incorporates a primary control and drive circuit with discrete avalanche-rated power MOSFETs.

Cycle-by-cycle current limiting, under-voltage lockout with hysteresis, over-voltage protection, and thermal shutdown protects the power supply during th normal overload an fault conditions. Over-voltge protection and thermal shutdown are latched after a short delay. The latch may be reset by cycling the input supply. Low-current startup and a low-power standby mode selected from the secondary circuit completes a comprehensive suite of features.

Features:

- Flyback Operation with Quasi-Resonant Soft Switching for Low Power Dissipation and EMI
- Rugged Avalanche-Rated MOSFET
- Full Over-Current Protection (No Blanking)
- Under-Voltage Lockout with Hysteresis
- Over-Voltage Protection
- Direct Voltage Feedback
- Low Start-Up Current
- Low-Frequency, Low-Power Standby Operation

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Control Supply Voltage, V_{IN} 35V
Drain-Source Voltage, V_{DS} 450V
Drain Switching Current, I_D 16A
Peak Drain Current, I_{DM} 26A
Avalanche Energy, E_{AS} 327mJ
OCP/FB Voltage Range, V_{OCP} . . . . . -0.3V to +6V
Power Dissipation (V_{IN} x $I_{IN(ON)}$), P_D 0.8W
FET Channel Temperature, T_J . . . . . +150°C
Internal Case Temperature, T_C . . . . . +125°C
Operating Temperature Range, T_A . . . . . -20° to +125°C
Storage Temperature Range, T_{stg} . . . . . -40° to +125°C
Thermal Resistance, Junction-to-Case, R_{thJC} . . . . . 1.75°C/W

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

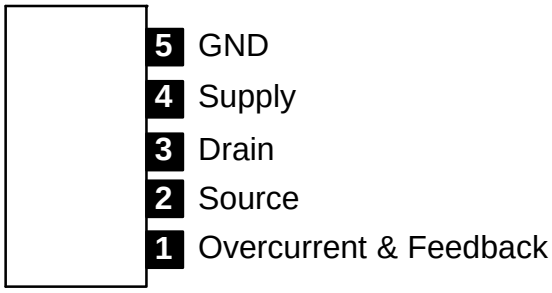
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
On-State Voltage	V_{INT}	Turn-On, Increasing V_{IN}	14.4	16.0	17.6	V
Under-Voltage Lockout	V_{INQ}	Turn-Off, Decreasing V_{IN}	9	10	11	V
Over-Voltage Threshold	$V_{OVP(th)}$	Turn-Off, Increasing V_{IN}	20.5	22.5	24.5	V
Drain-Source Breakdown Voltage	$V_{BR(DSS)}$	I_D = 300µA	V_{DS}max	-	-	V
Drain Leakage Current	I_{DSS}	At V_{DS}max	-	-	300	µA
On-State Resistance	$r_{DS(ON)}$	V_S = 10V, I_D = 0.9A, T_J = +25°C	-	-	0.58	Ω
Output Power	P_{OUT}	V_{IN} = 100V_{rms}	-	-	145	W
		V_{IN} = 120V_{rms}	-	-	190	W
Maximum Off Time	t_{off}	Drain Waveform High	45	-	55	µs
Minimum Pulse Duration for Input of Quasi-Resonant Signals	$t_{w(th)}$	Drain Waveform High, Note 1	-	-	1.0	µs
Minimum Off Time	t_{off}	Drain Waveform High, Note 1	-	-	1.5	µs
Feedback Threshold Voltage	V_{FDBK}	Drain Waveform Low to High, Note 1	0.68	0.73	0.78	V
		Oscillator Synchronized, Note 2	1.30	1.45	1.60	V
Over-Current Protection/Feedback Sink Current	$I_{OCP/FB}$	$V_{OCP/FB}$ = 1.0V	1.20	1.35	1.50	mA
Latch Holding Current	$I_{IN(OVP)}$	V_{IN} Reduced from 24.5V to 8.5V	-	-	400	µA
Latch Release Voltage	V_{IN}	$I_{IN} \leq$ 20µA, V_{IN} Reduced from 24.5V	6.6	-	8.4	V
Switching Time	t_f	V_{DD} = 200V, I_D = 0.9A	-	-	250	ns
Supply Current	$I_{IN(ON)}$	Operating, Note 3	-	-	30	mA
	$I_{IN(OFF)}$	Increasing V_{IN} Prior to Oscillation	-	-	100	µA
Insulation RMS Voltage	$V_{WM(RMS)}$	All Terminals Simultaneous reference to a Metal Plate Against the backside	2000	-	-	V
Thermal Shutdown	T_J		140	-	-	°C

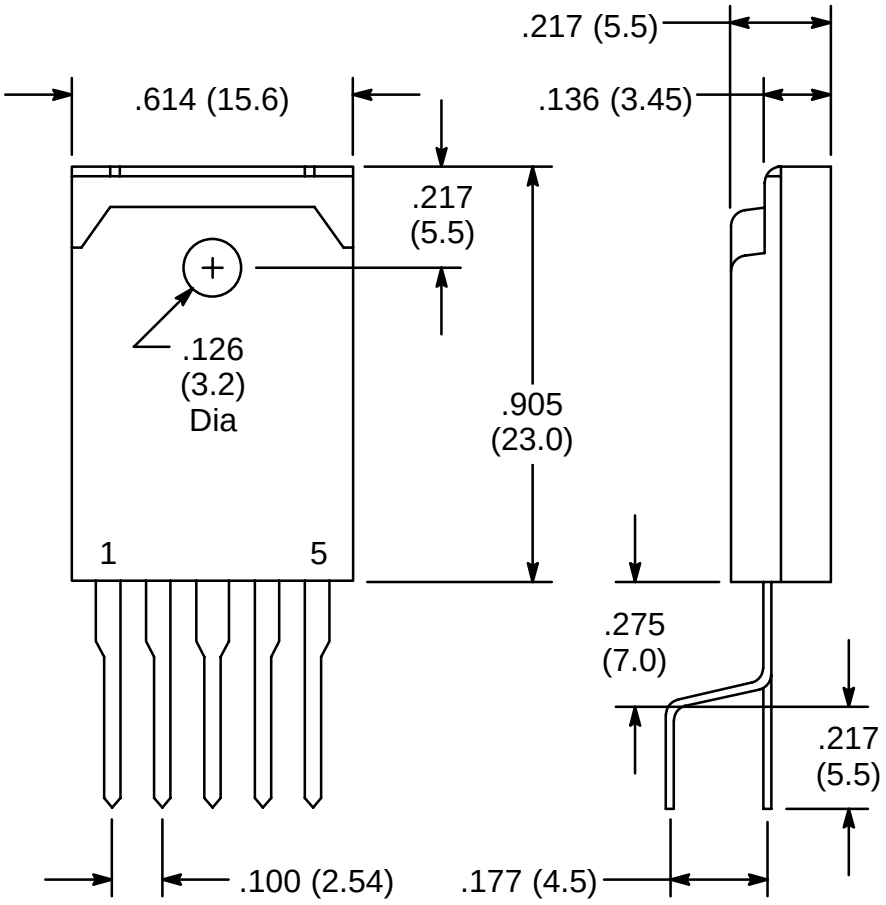
Note 1. Feedback is square wave, V_{IM} = 2.2V, t_h = 1µs, t_l = 35µs.

Note 2. For quasi-resonant operation, the input signal must be longer than $t_{w(th)}$ and greater than V_{FDBK}.

Note 3. Feedback is square wave, V_{IM} = 2.2V, t_h = 4µs, t_l = 1µs.

Pin Connection Diagram
(Front View)

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