


HV9100
HV9101

Preliminary

High-Voltage Switchmode Controllers with MOSFET

Ordering Information

T-58-11-31

+V _{IN}		Feedback Voltage	Package Options		
Min	Max		14-Pin Plastic DIP	14-Pin Ceramic DIP	20-Pin Plastic PLCC
10V	70V	±1%	HV9100P	HV9100C	HV9100PJ
		±10%	HV9101P	HV9101C	HV9101PJ

Features

- ☐ 10 to 70V Input range
- ☐ 150V, 5Ω output MOSFET
- ☐ Current-Mode Control
- ☐ High Efficiency
- ☐ Up to 1MHz Internal Oscillator
- ☐ Internal Start-up Circuit

Applications

- ☐ DC/DC Converters
- ☐ Distributed Power Systems
- ☐ ISDN Equipment
- ☐ PBX Systems
- ☐ Modems

General Description

The Supertex HV9100 and HV9101 are high voltage switch-mode controllers with an on-board MOSFET, designed to drive inductive loads for high efficient DC to DC conversion. High voltage inputs utilizing HVC MOS technology allow a wide range of input voltage, 10 to 70V regulated or unregulated DC power source.

The internal oscillator frequency can be adjusted via an external resistor or synchronized to an external clock. The low capacitance N-channel MOSFET at the output stage allows fast switching. Maximum rated sink current is 2.5A. Other features are current mode PWM, pre-regulator/start-up, error amplifier, shut down during fault, and reset input.

Applications include DC/DC converters, variable speed motor drives, ISDN and PBX equipment, modems, and distributed power systems.

Absolute Maximum Ratings

+V _{IN} , Input Voltage	70V
V _{DS}	150V
V _{CC} , Logic Voltage	15.0V
Logic Input Voltage	-0.3V to V _{CC} +0.3V
Linear Input, FB and Sense	-0.3V to 7.0V
I _D (Peak)	2.5A
Storage Temperature	-65°C to 150°C
Power Dissipation, Plastic	750mW
Power Dissipation, Ceramic	1W

Electrical Characteristics**T-58-11-31**(V_{CC} = 10V, +V_{IN} = 48V, Discharge = -V_{IN} = 0V, R_{BIAS} = 390K Ω , R_{OSC} = 330K Ω , T_A = 25°C, Unless Otherwise Specified)

Symbol	Parameters	Min	Typ	Max	Unit	Conditions
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Reference**SUPERTEX INC**

V _{REF}	Output Voltage	3.92	4.0	4.08	V	R _L = 10M Ω
Z _{OUT}	Output Impedance	15	30	45	K Ω	
I _{SHORT}	Short Circuit Current	70	100	130	μ A	V _{REF} = -V _{IN}
Δ V _{REF}	Change in V _{REF} with Temperature		1		mV/°C	

Oscillator

f _{OSC}	Oscillator Frequency	1	3		MHz	R _{OSC} = 0 Ω
Δ f _{OSC}	Initial Accuracy	80	100	120	KHz	
V _{OSC}	Voltage Stability		$\pm$ 3		%	9.5V < V _{CC} < 13.5V
K	Temperature Coefficient		500		ppm/°C	

Error Amplifier

V _{FB}	Feedback Voltage	HV9100	3.96	4.00	4.04	V	V _{FB} Shorted to Comp
		HV9101	3.60	4.00	4.40		
I _{IN}	Input Bias Current			25	500	nA	V _{FB} = 4.0V
V _{OS}	Input Offset Voltage			15	40	mV	
A _{VOL}	Open Loop Voltage Gain	60	80			dB	
GB	Unity Gain Bandwidth		1.0			MHz	
Z _{OUT}	Output Impedance		500			Ω	
I _{SOURCE}	Output Source Current	1.4	2.0			mA	V _{FB} = 3.4V
I _{SINK}	Output Sink Current	0.12	0.15			mA	V _{FB} = 4.5V
PSRR	Power Supply Rejection		70			dB	9.5V < V _{CC} < 13.5V

Current Limit

V _{SOURCE}	Threshold Voltage	1.0	1.2	1.4	V	V _{FB} = 0V, R _L = 100 Ω
t _d	Delay to Output		150	200	ns	V _{SOURCE} = 1.4V, R _L = 100 Ω

11

Pre-Regulator/Startup

+V _{IN}	Input Voltage			70	V	I _{IN} = 10 μ A
+I _{IN}	Input Leakage Current			10	μ A	V _{CC} > 9.4V
V _{TH}	VCC Pre-regulator Turn-off Threshold Voltage	7.8	8.6	9.4	V	I _{PREREG} = 10 μ A
V _{LOCK}	Undervoltage Lockout	7.0	8.1	8.9	V	R _L = 100 Ω

Supply

I _{CC}	Supply Current		0.60	1.0	mA	
I _{BIAS}	Bias Current		15		μ A	

Electrical Characteristics (Continued)(V_{CC} = 10V, +V_{IN} = 48V, Discharge = -V_{IN} = 0V, R_{BIAS} = 390K Ω , R_{OSC} = 330K Ω , T_A = 25°C, unless otherwise specified)

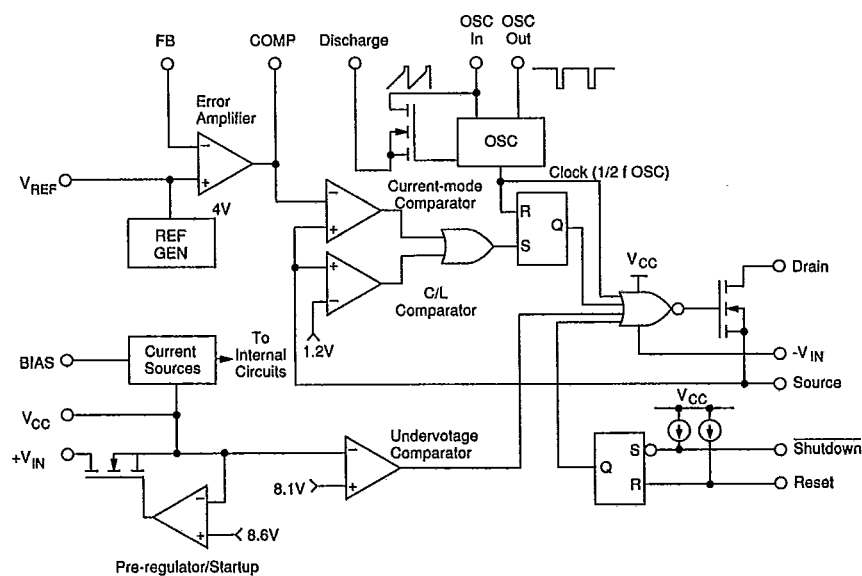
Symbol	Parameters	Min	Typ	Max	Unit	Conditions
t _{SD}	Shutdown Delay		50	100	ns	V _{SOURCE} = -V _{IN}
t _{SW}	Shutdown Pulse Width	50			ns	
t _{RW}	RESET Pulse Width	50			ns	
t _{LW}	Latching Pulse Width	25			ns	
V _{IL}	Input Low Voltage			2.0	V	
V _{IH}	Input High Voltage	8.0			V	
I _{IH}	Input High Current		1	5	μ A	V _{IN} = 10V
I _{IL}	Input Low Current		-25	-35	μ A	V _{IN} = 0V

Logic

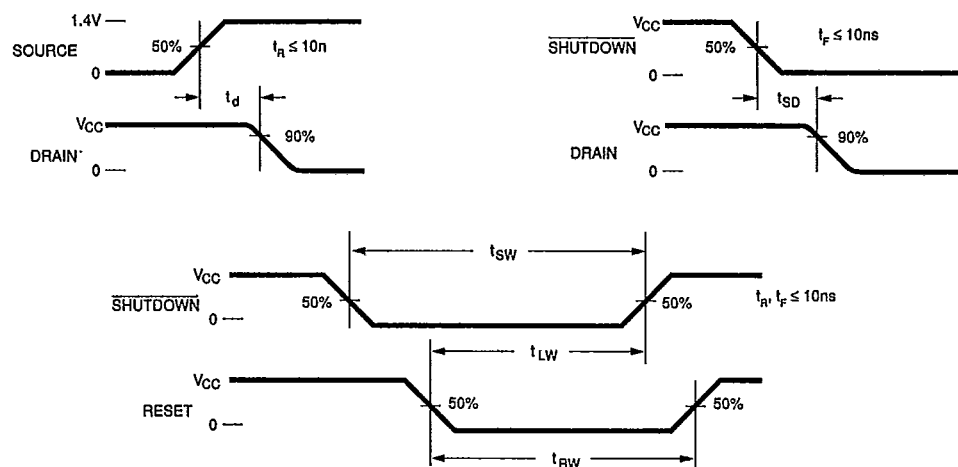
T-58-11-31

MOSFET Switch

BV _{DSS}	Breakdown Voltage	150	180		V	V _{SOURCE} = Shutdown = 0V, I _D = 100 μ A
R _{ON}	Drain-to-Source On-resistance		3.0	5.0	Ω	V _{SOURCE} = 0V, I _D = 100mA
I _{DSS}	Drain Off Leakage Current			10	μ A	V _{SOURCE} = Shutdown = 0V, V _{DRAIN} = 100V
C _{DS}	Drain Capacitance		250		pF	

Functional Block Diagram

*Consult factory



Truth Table

Shutdown	Reset	Output
H	H	Normal Operation
H	H → L	Normal Operation, No Change
L	H	Off, Not Latched
L	L	Off, Latched
L → H	L	Off, Latched, No Change

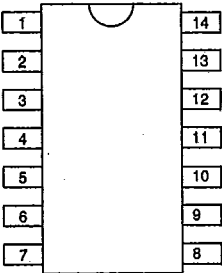
Pin Configuration

Package Outline

T-58-11-31

14-Pin SOIC/DIP Package

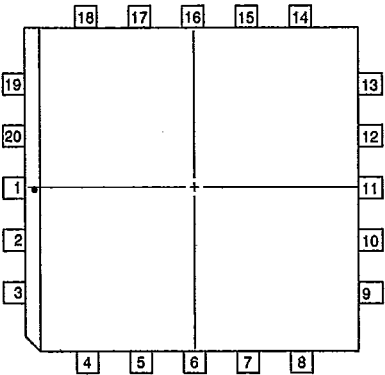
Pin	Function	Pin	Function
1	BIAS	8	OSC In
2	+V _{IN}	9	Discharge
3	Drain	10	V _{REF}
4	Source	11	Shutdown
5	-V _{IN}	12	Reset
6	V _{CC}	13	COMP
7	OSC Out	14	FB



14 Pin SOIC/DIP Package

20-Pin J-Lead Package

Pin	Function	Pin	Function
1	NC	11	OSC In
2	BIAS	12	Discharge
3	+V _{IN}	13	NC
4	NC	14	V _{REF}
5	Drain	15	NC
6	NC	16	Shutdown
7	Source	17	Reset
8	-V _{IN}	18	COMP
9	V _{CC}	19	NC
10	OSC Out	20	FB



top view

20-pin PJ Package