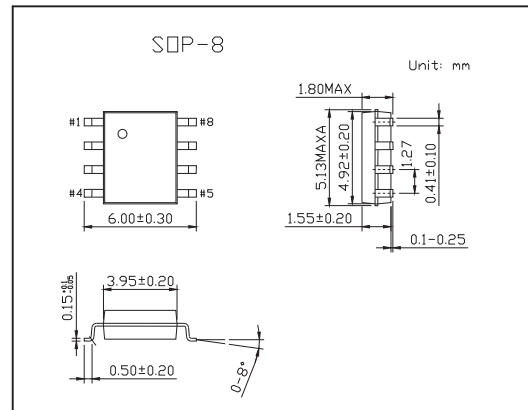


Low Power Off Line SMPS Primary Switcher

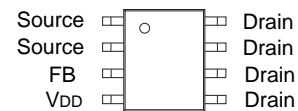
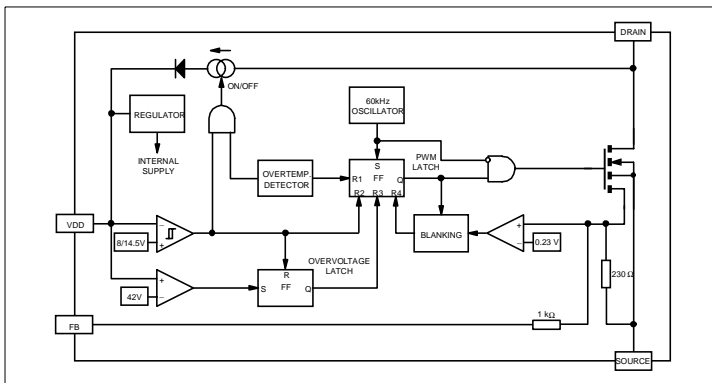
VIPER12A

■ 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 AUTORESTAR



■ Functional Block Diagram



■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{DD}	0 to 50	V
Continuous Drain Current	I_D	Internally limited	A
Switching Drain Source Voltage ($T_j=25 \dots 125^\circ\text{C}$)	$V_{DS(sw)}$	-0.3 ~ 730	V
Start Up Drain Source Voltage ($T_j=25 \dots 125^\circ\text{C}$)	$V_{DS(st)}$	-0.3 ~ 400	V
Feedback Current	I_{FB}	3	mA
Electrostatic Discharge: Machine Model ($R=0\Omega$; $C=200\text{pF}$) Charged Device Model	V_{ESD}	200 1.5	V KV
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	55	$^\circ\text{C}/\text{W}$
Junction Operating Temperature	T_j	Internally limited	$^\circ\text{C}$
Case Operating Temperature	T_c	-40 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to 150	$^\circ\text{C}$

VIPER12A

■ Electrical Characteristics (Ta = 25°C, VDD = 18V, unless otherwise specified)

Parameter	Symbol	Test conditons	Min	Typ	Max	Unit
Drain-Source Voltage	BVDSS	ID=1mA; VFB=2V	730			V
Off State Drain Current	IDSS	VDS=500V; VFB=2V; Tj=125°C			0.1	mA
Static Drain-Source	RDSon	ID=0.2A		27	30	Ω
On State Resistance		ID=0.2A; Tj=100°C			54	Ω
Fall Time	tr	ID=0.1A; VIN=300V		100		ns
Rise Time	tr	ID=0.2A; VIN=300V		50		ns
Drain Capacitance	Coss	VDS=25V		40		pF
Start Up Charging Current	IDDch	VDS=100V; VDD=5V ... VDDon		-1		mA
Start Up Charging Current in Thermal Shutdown	IDDoff	VDD=5V; VDS=100V, Tj > TSD - THYST	0			mA
Operating Supply Current Not Switching	IDD0	I _{FB} =2mA		3	5	mA
Operating Supply Current Switching (Note 1)	IDD1	I _{FB} =0.5mA; ID=50mA		4.5		mA
Restart Duty Cycle	DRST	(See fig. 3)		16		%
VDD Undervoltage Shutdown Threshold	VDDoff		7	8	9	V
VDD Start Up Threshold	VDDon		13	14.5	16	V
VDD Threshold Hysteresis	VDDhyst		5.8	6.5	7.2	V
VDD Overvoltage Threshold	VDDovp		38	42	46	V
Oscillator Frequency Total Variation	FOSC	VDD=VDDoff ... 35V; Tj=0 ... 100°C	54	60	66	kHz
I _{FB} to I _D Current Gain	GID	(See fig. 4)		320		
Peak Current Limitation	IDlim	V _{FB} =0V (See fig. 4)	0.32	0.4	0.48	A
I _{FB} Shutdown Current	I _{FBsd}	(See fig. 4)		0.9		mA
FB Pin Input Impedance	R _{FB}	ID=0mA (See fig. 4)		1.2		kΩ
Current Sense Delay to Turn-Off	td	ID=0.2A		200		ns
Blanking Time	tb			500		ns
Minimum Turn On Time	tONmin			700		ns
Thermal Shutdown Temperature	TSD	(See fig. 5)	140	170		°C
Thermal Shutdown Hysteresis	THYST	(See fig. 5)		40		°C

Note: 1. These test conditions obtained with a resistive load are leading to the maximum conduction time of the device.

■ Marking

Marking	VIPER12A
---------	----------

VIPER12A

■ Typical Application Circuit

Figure 1 : Rise and Fall Time

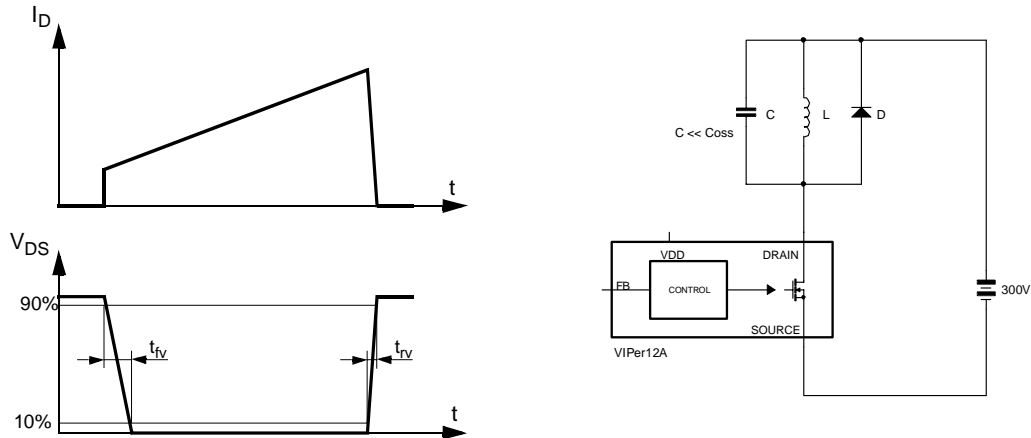


Figure 2 : Start Up VDD Current

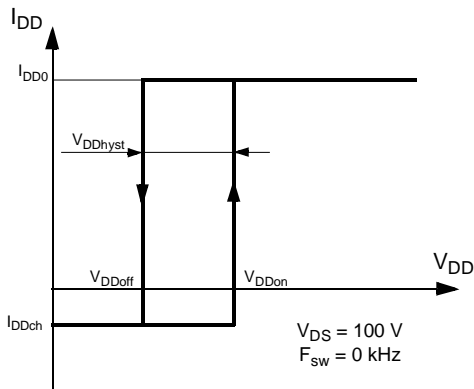
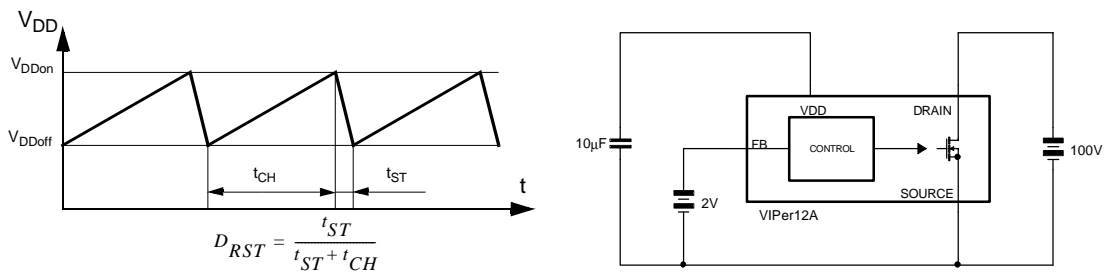


Figure 3 : Restart Duty Cycle



VIPER12A

Figure 4 : Peak Drain Current Vs. Feedback Current

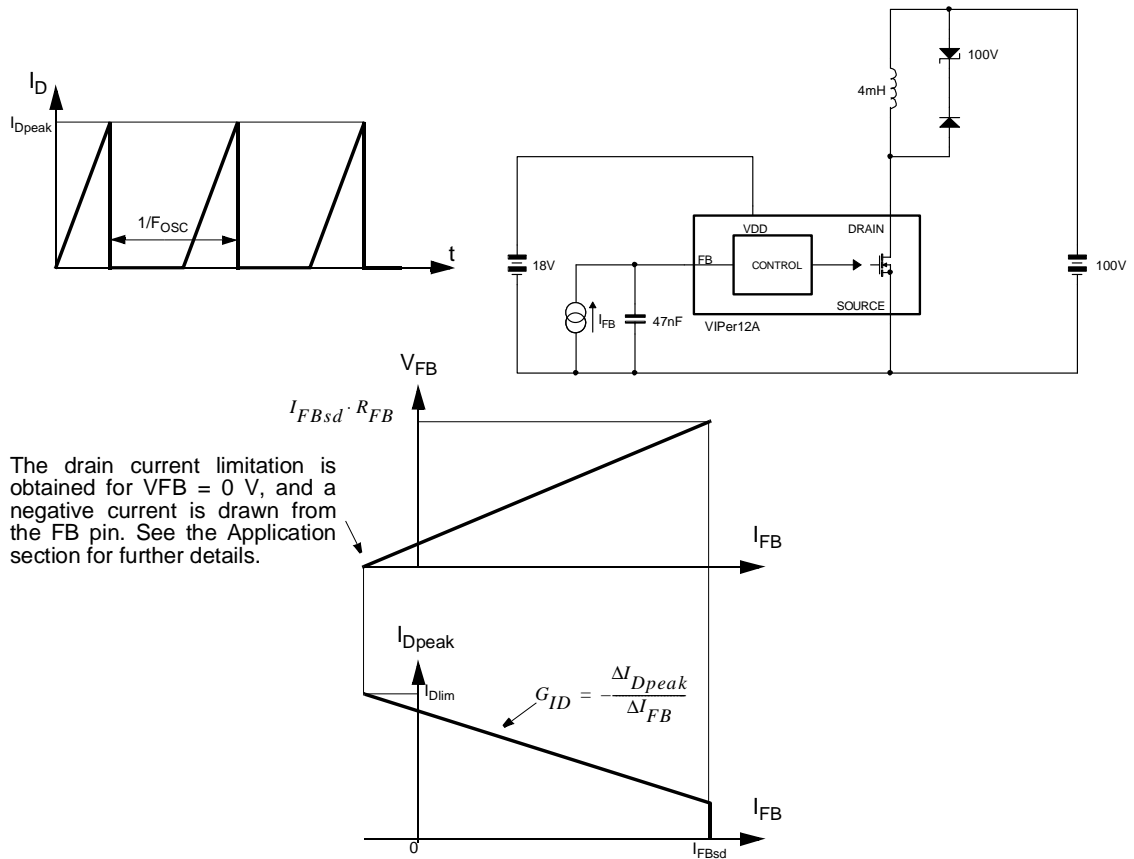
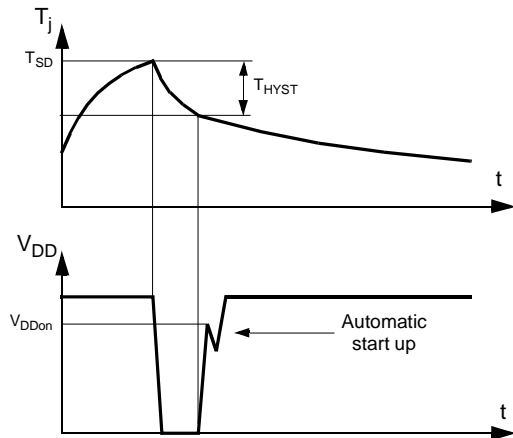
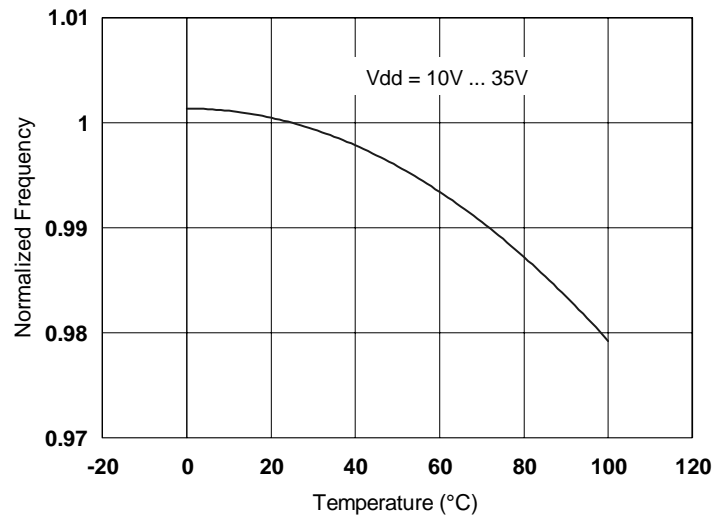


Figure 5 : Thermal Shutdown



VIPER12A**Figure 6** : Switching Frequency vs Temperature**Figure 7** : Current Limitation vs Temperature