IXI858 / IXI859

Gate Driver with VReg and Charge Pump Regulator

Features:

- Logic Level Gate Drive Compatible
- 60mA Source / 120mA Sink Minimum Gate Drive
- 5.0V or 3.3V Voltage Regulator
- Charge Pump Regulator Stabilizes V_{CC} Power Supply at 13V
- UVLO Protection

Applications:

- µController based off-line applications
- Power Supply and Power Management
- Lighting Control

General Description

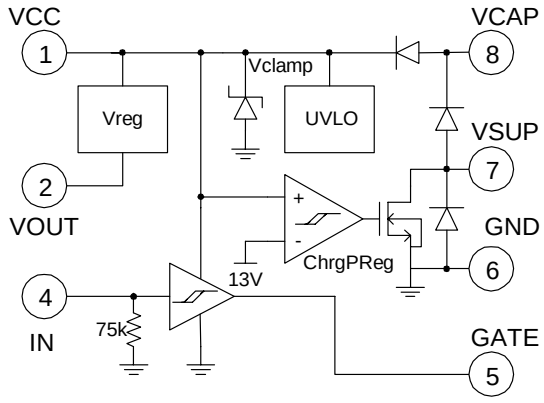
The IXI858 and IXI859 combine a power MOSFET driver, linear voltage regulator, and charge pump regulator for power supply generation in a single SOIC-8 package. The IXI858 features a 5.0V linear voltage regulator, and the IXI859 a 3.3V linear voltage regulator. These three power functions combined on the IXI858/859 target micro-controller based off-line applications.

The IXI858 and IXI859 are designed to operate over a temperature range of -25°C to +125°C, and are available in an 8 lead SOIC package.

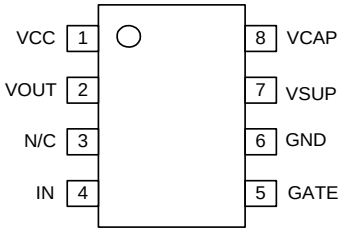
ORDERING INFORMATION

Part No.	Description	Pack Quantity
IXI858S1	5.0V Version	100 (Tube)
IXI858S1T/R		2500 (Tape & Reel)
IXI859S1	3.3V Version	100 (Tube)
IXI859S1T/R		2500 (Tape & Reel)

Functional Block Diagram



SOIC-8 Lead Configuration



8 - Lead SOIC

SOIC-8 Pin Description

Pin No.	Pin Symbol	I/O	Description
1	VCC	Supply	Power input connects to a rectified high voltage source through a current limiting series resistor and filter capacitor to ground. Regulated 13 volt output when the charge pump is active.
2	VOUT	Output	Linear Regulator Output (IXI858 = 5.0V, IXI859 = 3.3V)
3	N/C		No Connect
4	IN	Input	Gate Driver Input
5	GATE	Output	Gate Driver Output. Drives external power MOSFET.
6	GND	Ground	Ground Return
7	VSUP	I/O	Charge Pump Switch Input. Enables / disables the charge pump output. Requires a low ESR capacitor.
8	VCAP	I/O	Charge Pump Switch Output. Rectified charge pump output. Requires a low ESR capacitor.

Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Units
V_{CC}	DC Supply Voltage	-0.4	+20.0	V
V_{OUT}	Logic System Supply Voltage	-0.4	+6.0	V
V_{IN}	Gate Input Voltage	-0.4	+6.0	V
I_{SUP}	Continuous current into V_{SUP} pin	-200	+200	mA
I_{PEAK}	Peak Current into V_{SUP}	-1	+1	A
P_D	Power Dissipation		500	mW
T_J	Maximum Junction Temperature		+150	^oC
T_{STG}	Storage Temperature	-65	+150	^oC

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and affect its reliability.

ESD Warning

ESD (electrostatic discharge) sensitive device. Although the IXI858 / IXI859 feature proprietary ESD protection circuitry, permanent damage may be sustained if subjected to high energy electrostatic discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality.

Operating Range

Symbol	Parameter	Min	Max	Units
V_{CC}	Supply Voltage	UVLO	+17	V
I_{SUP}	Continuous Current in V_{SUP} Pin	0	150	mA
I_{PEAK}	Peak Current in V_{SUP} Pin ($t_P \leq 1\mu S$, $f \leq 150kHz$)	-750	+750	mA

Electrical Characteristics

T_A=25°C, V_{CC}=13V unless otherwise specified

Symbol	Parameter	Condition	Min	Typ	Max	Units
Supply (VCC)						
I_{CC}	Supply Current	V_{IN}<1V, no load any pin		0.7	1.0	mA
I_{CC2}	Supply Current	1nF GATE load, 300kHz IN signal		5		mA
I_{STBY}	Standby Current	Undervoltage Detected		160		µA
V_{CLAMP}	Clamp Voltage	I_{CC} <5mA		17		V
Input (IN)						
V_{TON}	Turn-on Threshold Voltage			1.95		V
V_{TOFF}	Turn-off Threshold Voltage			1.15		V
V_H	Hysteresis		0.5			V
I_{INL}	Input Current Low				20	µA
I_{INH}	Input Current High				100	µA
Voltage Regulator (VOUT)						
V_{OUT}	Voltage Reference	IXI859 I_{OUT} = 10mA	3.20	3.30	3.40	V
		IXI858 I_{OUT} = 10mA	4.85	5	5.15	V
Reg_{LOAD}	Load Regulation	I_{OUT} change from 10mA to 25mA			50	mV
I_{PEAK}	Peak Output Current	V_{OUT} = 1V, IXI859	75			mA
		V_{OUT} = 1V, IXI858	100			
dV_{OUT}	Temp Coefficient	I_{OUT} = 10mA			250	ppm/°C
C_{OUT}	Allowed Capacitive Load	I_{OUT} = 10mA	0.2		2.2	µF
I_{LEAK}	Leakage current in UVLO state	V_{OUT} = 1V			10	µA
$T_{STARTUP}$	Startup Time (V_{OUT} > 3.1V)	C_{OUT} = 1uF			0.1	mS
T_{SETTLE}	Settling Time	C_{OUT} = 1 uF		2		mS
Charge Pump Regulator						
$VCPR_{ON}$	Turn-on Level	Measured at VCC		13.15		V
$VCPR_{OFF}$	Turn-off Level	Measured at VCC		12.85		V
$VCPR_{HYS}$	Hysteresis			0.30		V
$VCPR_{FWD}$	Forward Voltage	I_{FWD} = 150mA (VSUP to VCAP)			1.5	V

Electrical Characteristics

T_A=25°C, V_{CC}=13V unless otherwise specified

Symbol	Parameter	Condition	Min	Typ	Max	Units
Gate Output (GATE)						
V_{OL}	Output Low Voltage	I_{GATE} = 10mA			0.5	V
V_{OH}	Output High Voltage	I_{GATE} = -10mA	11			V
I_{SINK}	Output Sink Current	V_{GATE} = 6V	120			mA
I_{SRC}	Output Source Current	V_{GATE} = 3V	60			mA
V_{OL2}	Output Low Voltage in UVLO state	V_{CC} = 6V, I_{GATE} = 1mA		0.8		V
t_{MINPW}	Minimum Output Pulse Width	C_{GATE} = 10pF	80			nS
t_{PD}	IN to GATE propagation delay	C_{GATE} = 10pF		200		nS
Under Voltage Lockout (VCC)						
$UVLO_H$	UVLO Top Threshold Voltage	VCC Rising		14.1		V
$UVLO_L$	UVLO Bottom Threshold Voltage	VCC Falling		8.2		V
V_{HYS}	UVLO Hysteresis			5.9		V

Typical Application Circuit