

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:

- μ Controller based off-line applications
- Power Supply and Power Management
- Lighting Control

General Description

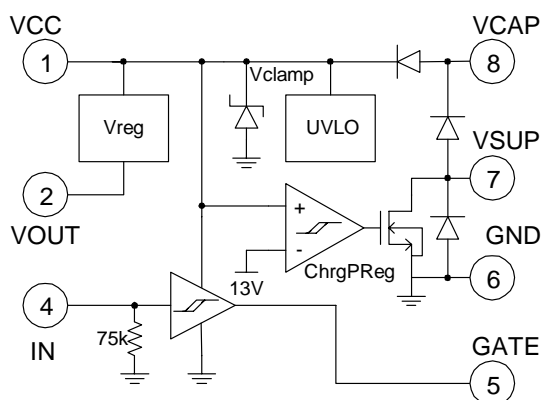
The IXI858 and IXI859 combine a power MOSFET driver, linear voltage regulator, and charge pump regulator for power supply generation in a single SOIC-8 package. The IXI858 features a 5.0V linear voltage regulator, and the IXI859 a 3.3V linear voltage regulator. These three power functions combined on 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 $+125^{\circ}\text{C}$, and are available in an 8 lead SOIC package.

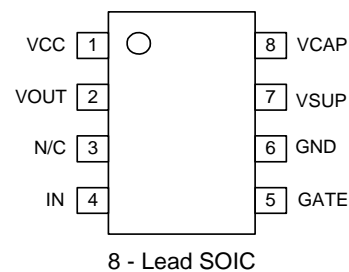
ORDERING INFORMATION

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



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	VOOUT	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	°C
T_{STG}	Storage Temperature	-65	+150	°C

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

$T_A = 25^\circ C$, $V_{CC} = 13V$ unless otherwise specified

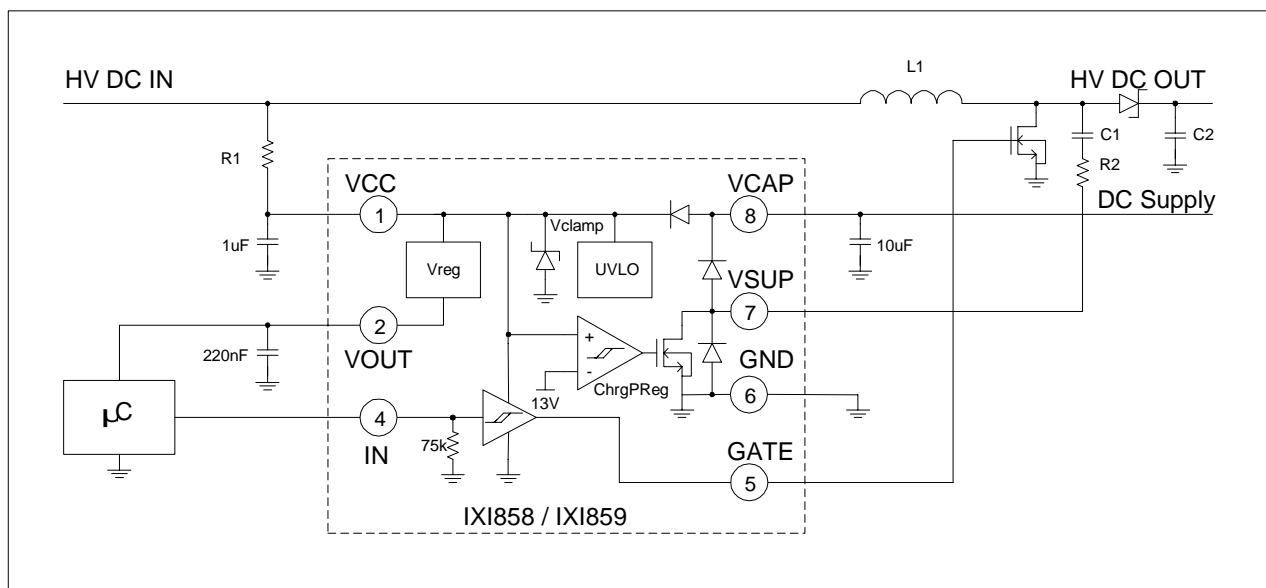
Symbol	Parameter	Condition	Min	Typ	Max	Units
Supply (VCC)						
I_{CC}	Supply Current	$V_{IN} < 1V$, no load any pin		0.7	1.0	mA
I_{CC2}	Supply Current	1nF GATE load, 300kHz IN signal		5		mA
I_{STBY}	Standby Current	Undervoltage Detected		160		μA
V_{CLAMP}	Clamp Voltage	$I_{CC} < 5mA$		17		V
Input (IN)						
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/ $^\circ C$
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 ($V_{OUT} > 3.1V$)	$C_{OUT} = 1\mu F$			0.1	mS
T_{SETTLE}	Settling Time	$C_{OUT} = 1\mu F$		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

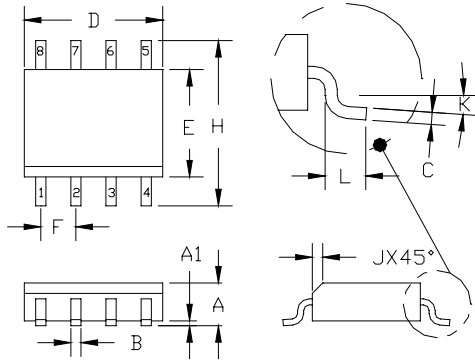
Electrical Characteristics

$T_A=25^{\circ}\text{C}$, $V_{CC}=13\text{V}$ unless otherwise specified

Symbol	Parameter	Condition	Min	Typ	Max	Units
Gate Output (GATE)						
V_{OL}	Output Low Voltage	$I_{GATE} = 10\text{mA}$			0.5	V
V_{OH}	Output High Voltage	$I_{GATE} = -10\text{mA}$	11			V
I_{SINK}	Output Sink Current	$V_{GATE} = 6\text{V}$	120			mA
I_{SRC}	Output Source Current	$V_{GATE} = 3\text{V}$	60			mA
V_{OL2}	Output Low Voltage in UVLO state	$V_{CC} = 6\text{V}$, $I_{GATE} = 1\text{mA}$		0.8		V
t_{MINPW}	Minimum Output Pulse Width	$C_{GATE} = 10\text{pF}$	80			nS
t_{PD}	IN to GATE propagation delay	$C_{GATE} = 10\text{pF}$		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



Package Mechanical Data
8-LEAD SOIC


3. MOLDED PACKAGE SHALL CONFORM TO JEDEC STANDARD CONFIGURATION MS-012 VARIATION AA.

② DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSIONS.

① CONTROLLING DIMENSIONS: MILLIMETERS.

NOTES: <UNLESS OTHERWISE SPECIFIED>

DIM.	DIMENSIONS ①				NOTE
	INCH		MM.		
	MIN.	MAX.	MIN.	MAX.	
A	.0532	.0688	1.35	1.75	----
A1	.0040	.0098	.10	.25	----
B	.013	.020	.33	.51	----
C	.0075	.0098	.19	.25	----
D	.1890	.1968	4.80	5.00	②
E	.1497	.1574	3.80	4.00	②
F	.050	BSC	1.27	BSC	----
H	.2284	.2440	5.80	6.20	----
J	.0099	.0196	.25	.50	----
K	0°	8°	0°	8°	----
L	.016	.050	.40	1.27	----

IXYS Corporation makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to specifications and product descriptions at any time without notice. Neither circuit patent licenses nor indemnity are expressed or implied. Except as set forth in IXYS' Standard Terms and Conditions of Sale, IXYS Corporation assumes no liability whatsoever, and disclaims any expressed or implied warranty, relating to its products including, but not limited to, the implied warranty of merchantability, fitness for a particular purpose, or infringement of any intellectual property right.