

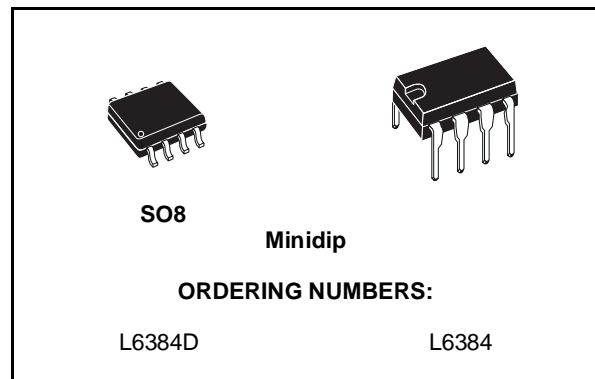


L6384

## HIGH-VOLTAGE HALF BRIDGE DRIVER

PRODUCT PREVIEW

- HIGH VOLTAGE RAIL UP TO 600 V
- $dV/dt$  IMMUNITY  $\pm 50$  V/nsec IN FULL TEMPERATURE RANGE
- DRIVER CURRENT CAPABILITY:  
400 mA SOURCE,  
650 mA SINK
- SWITCHING TIMES 50/30 nsec RISE/FALL WITH 1nF LOAD
- CMOS/TTL SCHMITT TRIGGER INPUTS WITH HYSTERESIS AND PULL DOWN
- SHUT DOWN INPUT
- DEAD TIME SETTING
- UNDER VOLTAGE LOCK OUT
- INTEGRATED BOOTSTRAP DIODE
- CLAMPING ON  $V_{CC}$
- SO8/MINIDIP PACKAGES

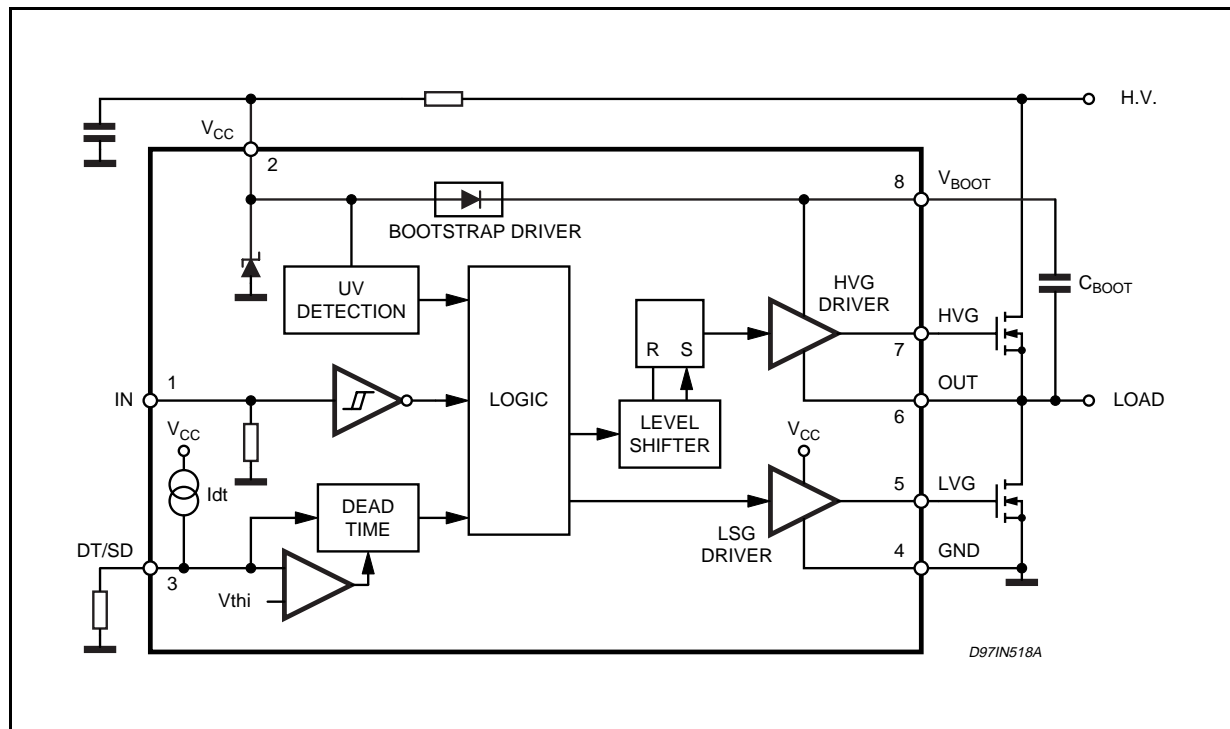


### DESCRIPTION

The L6384 is an high-voltage device, manufactured with the BCD"OFF-LINE" technology. It has

an Half - Bridge Driver structure that enables to drive N Channel Power MOS or IGBT. The Upper (Floating) Section is enabled to work with voltage Rail up to 600V. The Logic Inputs are CMOS/TTL compatible for ease of interfacing with controlling devices. Matched delays between Lower and upper Section simplify high frequency operation. Dead time setting can be readily accomplished by means of an external resistor.

### BLOCK DIAGRAM



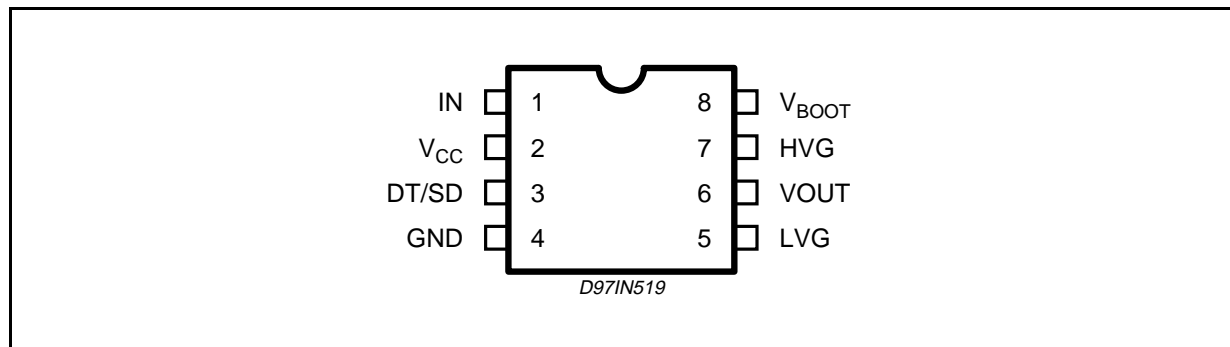
## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vout	Output Voltage	-1 to Vboot -18	V
Vcc	Supply Voltage (*)	-0.3 to 14.6	V
Is	Supply Current (*)	25	mA
Vboot	Floating Supply Voltage	-1 to 618	V
Vhvg	Upper Gate Output Voltage	-1 to Vboot	V
Vlvg	Lower Gate Output Voltage	-0.3 to Vcc +0.3	V
Vi	Logic Input Voltage	-0.3 to Vcc +0.3	V
Vsd	Shut Down/Dead Time Voltage	-0.3 to Vcc +0.3	V
dVout/dt	Allowed Output Slew Rate	50	V/ns
Ptot	Total Power Dissipation (Tj = 85 °C)	800	mW
Tj	Junction Temperature	150	°C
Ts	Storage Temperature	-40 to 150	°C

(\*) The device has an internal Clamping Zener between GND and the Vcc pin, It must not be supplied by a Low Impedance Voltage Source.

**Note:** ESD immunity for pins 6, 7 and 8 is guaranteed up to 900 V (Human Body Model)

## PIN CONNECTION



## THERMAL DATA

Symbol	Parameter	SO8	Minidip	Unit
R <sub>thj-amb</sub>	Thermal Resistance Junction to Ambient	150	100	°C/W

## PIN DESCRIPTION

N.	Name	Type	Function
1	IN	I	High and Low Side Driver Logic Input. In phase with HOUT
2	Vcc	I	Low Voltage Power Supply
3	DT/SD	I	Shut Down/Dead Time Setting
4	GND		Ground
5	LVG	O	Low Side Driver Output
6	Vout	O	Upper Driver Floating Reference
7	HVG	O	High Side Driver Output
8	Vboot		Bootstrap Supply Voltage

## RECOMMENDED OPERATING CONDITIONS

Symbol	Pin	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Vout	6	Output Voltage		Note1		580	V
Vboot - Vout	8	Floating Supply Voltage		Note1		17	V
fsw		Switching Frequency	HVG,LVG load CL = 1nF			400	kHz
Vcc	2	Supply Voltage				Vclamp	V

**Note 1:** If the condition Vboot - Vout < 18V is guaranteed, Vout can range from -3 to 580V.

## ELECTRICAL CHARACTERISTICS

AC Operation (V<sub>CC</sub> = 14.4V; T<sub>j</sub> = 25°C)

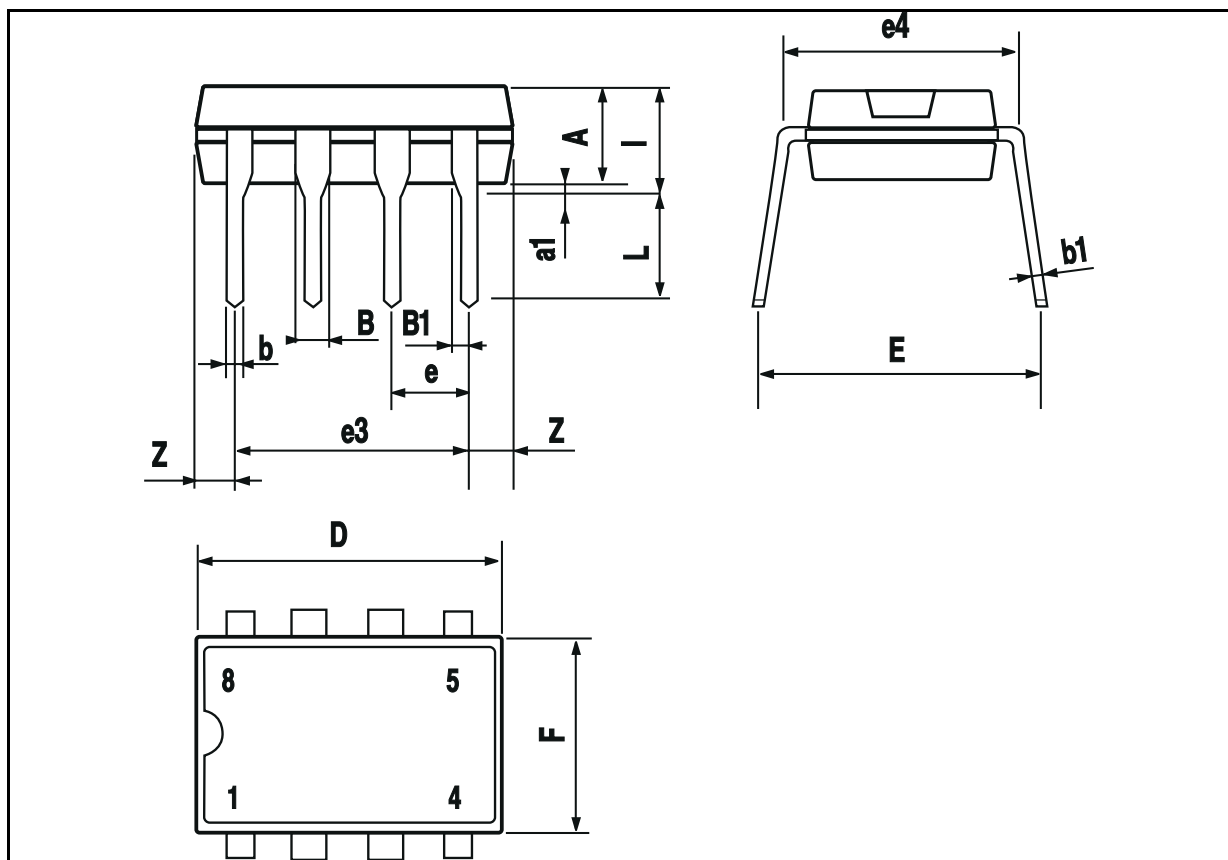
Symbol	Pin	Parameter	Test Condition	Min.	Typ.	Max.	Unit
ton	1 vs 5,7	High/Low Side Driver Turn-On Propagation Delay	Vout = 0V		100 +dt		ns
tonsd	3 vs 5,7	Shut Down Input Propagation Delay			200		ns
toff	1 vs 5,7	High/Low Side Driver Turn-Off Propagation Delay			105		ns
tr	7,5	Rise Time	CL = 1000pF		50		ns
tf	7,5	Fall Time	CL = 1000pF		30		ns

DC Operation (V<sub>CC</sub> = 14.4V; T<sub>j</sub> = 25°C)

Symbol	Pin	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Supply Voltage Section</b>							
Vclamp	2	Supply Voltage Clamping	Is = 5mA	14.6	15.6	16.6	V
Vccth1		Vcc UV Turn On Threshold		11.5	12	12.5	V
Vccth2		Vcc UV Turn Off Threshold		9.5	10	10.5	V
Vcchys		Vcc UV Hysteresis			2		V
Iqccu		Undervoltage Quiescent Supply Current	Vcc ≤ 11V		150		μA
Iqcc		Quiescent Current	Vin = 0		380	500	μA
<b>Bootstrapped supply Voltage Section</b>							
Vboot	8	Bootstrap Supply Voltage				17	V
IQBS		Quiescent Current	Vout = Vboot; IN = HIGH			200	μA
ILK		High Voltage Leakage Current	VHVG = Vout = Vboot = 600V			10	μA
Rdon		Bootstrap Diode on Resistance	Vcc ≥ 12.5V; IN = LOW		200		Ω
<b>High/Low Side Driver</b>							
Iso	5,7	Source Short Circuit Current	VIN = Vih (tp < 10μs)	300	400		mA
Isi		Sink Short Circuit Current	VIN = Vil (tp < 10μs)	500	650		mA
<b>Logic Inputs</b>							
Vil	2,3	Low Level Logic Threshold Voltage				1.5	V
Vih		High Level Logic Threshold Voltage		3.6			V
Iih		High Level Logic Input Current	VIN = 15V		50	70	μA
Iil		Low Level Logic Input Current	VIN = 0V			1	μA
Iref	3	Dead Time Setting Current			28		μA
dt	3 vs 5,7	Dead Time Setting Range	Rdt = 47k Rdt = 146 Rdt = 270k	0.4	1.5	3.1	μs μs μs
Vdt	3	Shutdown Threshold			0.5		V

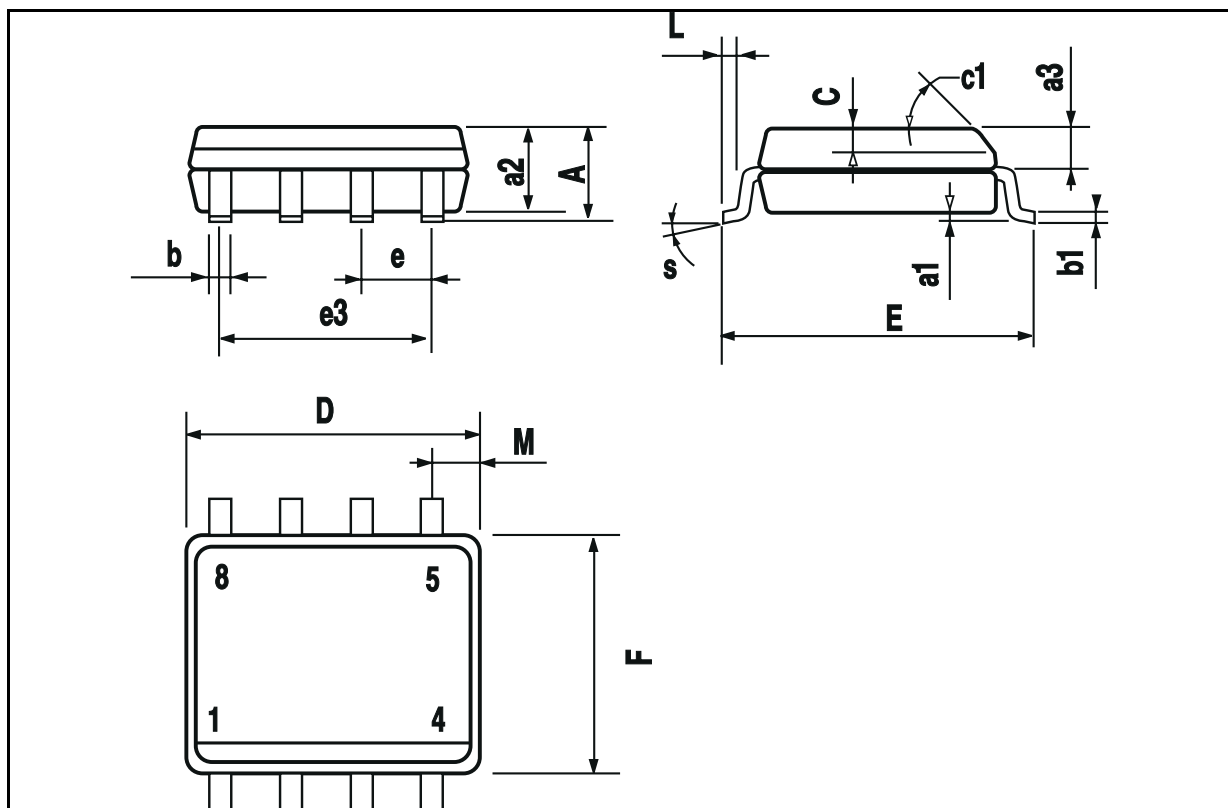
## MINIDIP PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060



## SO8 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					



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