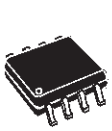
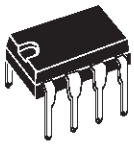
L6385

HIGH-VOLTAGE HIGH AND LOW SIDE DRIVER

PRODUCT PREVIEW

- HIGH VOLTAGE RAIL UP TO 600 V
- dV/dt IMMUNITY +- 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
- UNDER VOLTAGE LOCK OUT ON LOWER AND UPPER DRIVING SECTION
- INTERNAL BOOTSTRAP DIODE





SO8 **Minidip**

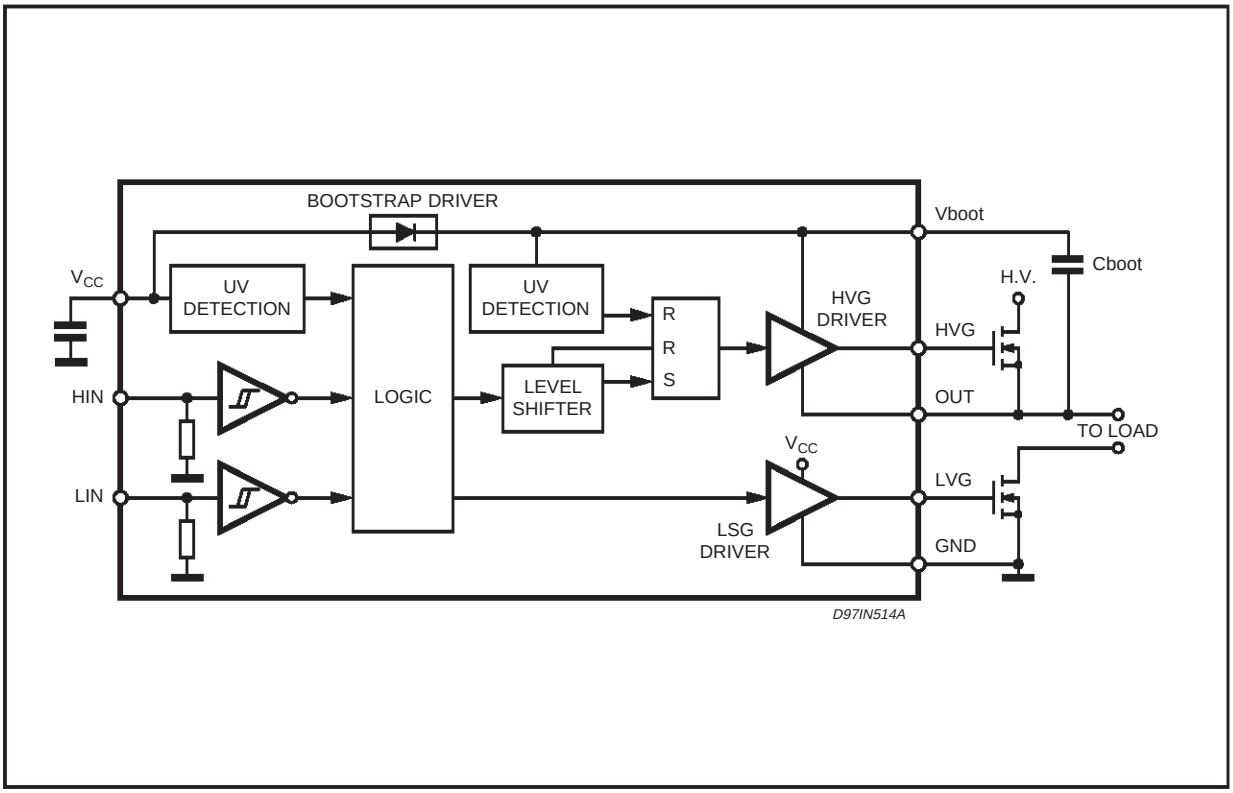
ORDERING NUMBERS:

L6385D L6385

DESCRIPTION

The L6385 is an high-voltage device, manufactured with the BCD"OFF-LINE" technology. It has a 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 simplifie high frequency operation.

BLOCK DIAGRAM

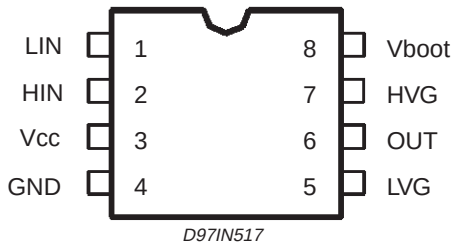


ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vout	Output Voltage	-1 to Vboot - 18	V
Vcc	Supply Voltage	- 0.3 to +18	V
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
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

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

PIN CONNECTION



THERMAL DATA

Symbol	Parameter	SO8	Minidip	Unit
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction to Ambient	150	100	°C/W

PIN DESCRIPTION

N.	Name	Type	Function
1	LIN	I	Lower Driver Logic Input
2	HIN	I	Upper Driver Logic Input
3	Vcc	I	Low Voltage Power Supply
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		Note 1		580	V
Vboot-Vout	8	Floating Supply Voltage		Note 1		17	V
fsw		Switching Frequency	HVG,LVG load CL = 1nF			400	kHz
Vcc	2	Supply Voltage				17	V

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

ELECTRICAL CHARACTERISTICS
AC Operation (Vcc = 15V; Tj = 25°C)

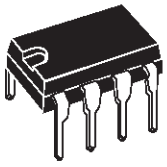
Symbol	Pin	Parameter	Test Condition	Min.	Typ.	Max.	Unit
ton	1 vs 7	High/Low Side Driver Turn-On Propagation Delay	Vout = 0V		100		ns
toff	2 vs 5	High/Low Side Driver Turn-Off Propagation Delay	Vout = 600V		105		ns
tr	7,5	Rise Time	CL = 1000pF		50	65	ns
tf	7,5	Fall Time	CL = 1000pF		30	40	ns

DC OPERATION (Vcc = 15V; Tj = 25°C)

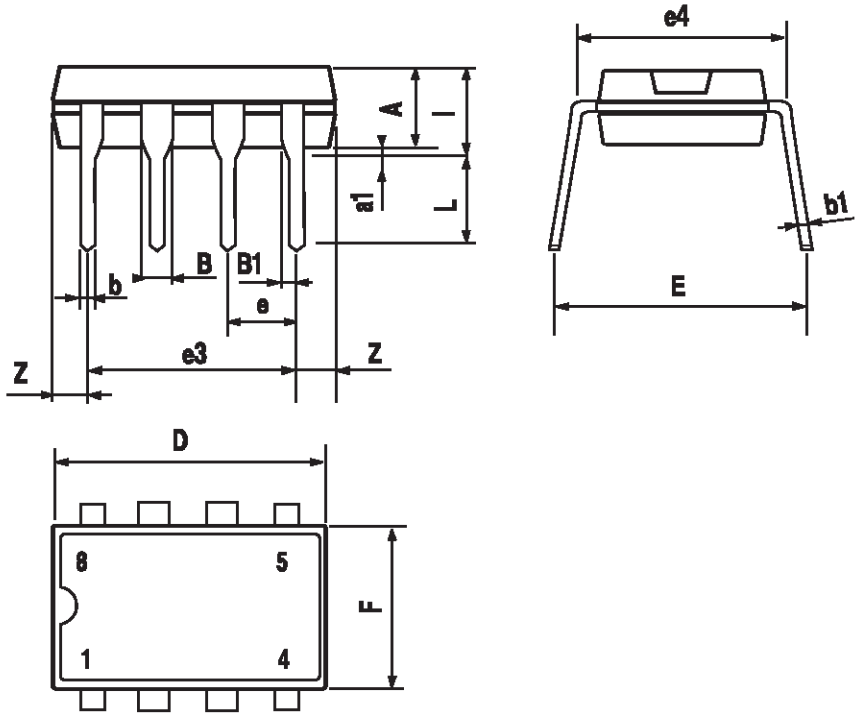
Symbol	Pin	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Low Supply Voltage Section							
Vcc	3	Supply Voltage				17	V
Vccth1		Vcc UV Turn On Threshold		9.1	9.6	10.1	V
Vccth2		Vcc UV Turn Off Threshold		7.9	8.3	8.8	V
Vcchys		Vcc UV Hysteresis			1.3		V
Iqccu		Undervoltage Quiescent Supply Current	Vcc ≤ 9V		150	220	µA
Iqcc		Quiescent Current	Vcc = 15V		250	320	µA
R_{don}		Bootstrap Diode on Resistance	Vcc ≥ 12.5V Vin = 0		200		Ω
Bootstrapped supply Voltage Section							
VBS	8	Bootstrap Supply Voltage				17	V
VBSth1		VBS UV Turn On Threshold		8.5	9.5	10.5	V
VBSth2		VBS UV Turn Off Threshold		7.2	8.2	9.2	V
VBShys		VBS UV Hysteresis			1.3		V
IQBS		VBS Quiescent Current	VHO = VB			200	µA
ILK		High Voltage Leakage Current	VS = VB = 600V			10	µA
High/Low Side Driver							
Iso	5,7	Source Short Circuit Current	VIN = Vih (tp < 10µs)	300	400		mA
Isi		Sink Short Circuit Current	VIN = Vil (tp < 10µs)	450	650		mA
Logic Inputs							
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

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

OUTLINE AND MECHANICAL DATA



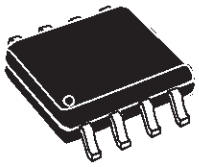
Minidip (0.300”)



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 (1)	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 (1)	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.)					

(1) D and F do not include mold flash or protrusions. Mold flash or potrusions shall not exceed 0.15mm (.006inch).

OUTLINE AND MECHANICAL DATA



SO8