



## HIGH SIDE DRIVER

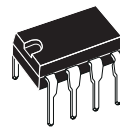
- OPERATING SUPPLY VOLTAGE UP TO 25V
- DC CURRENT 0.3A
- $R_{ON} < 800m\Omega$
- DIAGNOSTIC AND PROTECTION FUNCTIONS
- $\mu P$  COMPATIBLE
- ENABLE INPUT FOR STAND-BY MODE

### DESCRIPTION

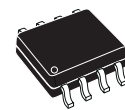
The L9820 High Side Driver realized with Multipower - BCD mixed technology, drives resistive or inductive loads with one side connected to ground.

The ENABLE input is TTL compatible and a diagnostic output provides an indication of short circuit and device status (thermal and overvoltage shut-down). Onchip thermal protection and short circuit protection are provided.

### MULTIPOWER BCD TECHNOLOGY



Minidip



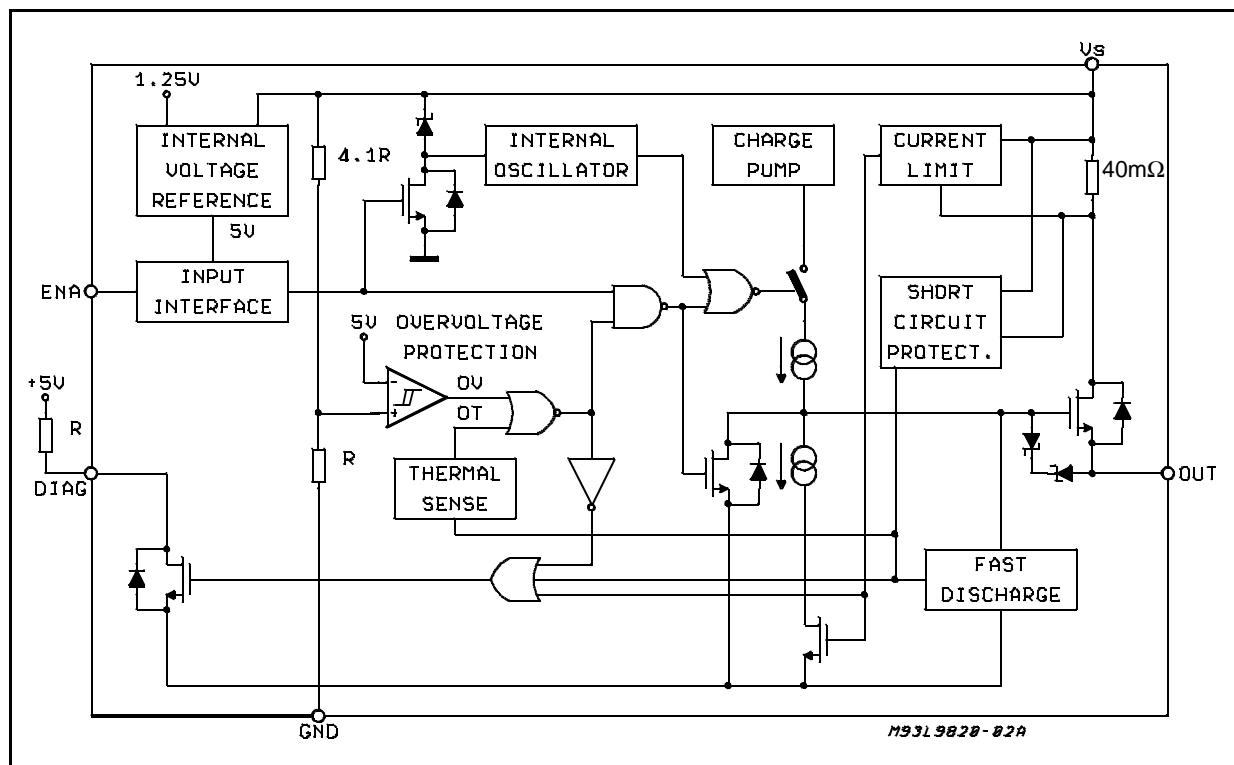
SO8

#### ORDERING NUMBERS:

L9820

L9820D

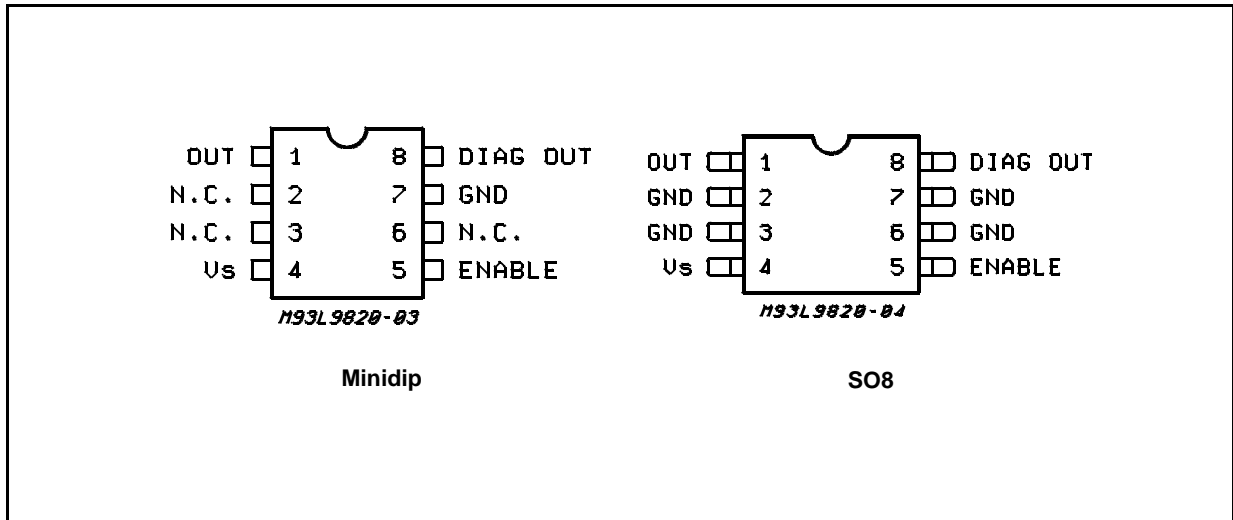
### BLOCK DIAGRAM



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>S</sub>	Max Forward Voltage	50	Vdc
I <sub>R</sub>	Reverse Bias Current at -1.3V	-0.46	A
V <sub>5</sub>	Input Voltage (to GND)	-0.3 to 20	V
V <sub>8</sub>	Diag. Output Voltage (to GND)	-0.3 to 20	V
V <sub>1</sub>	Output Voltage (to GND)	-0.3 to 25	V
I <sub>4</sub>	Supply Current	Internally limited	
I <sub>5</sub>	Enable Input Current	0.5	mA
I <sub>8</sub>	Diag. Out Current (sink)	10	mA
I <sub>1</sub>	Output Current	Internally limited	
T <sub>op</sub>	Operation Temperature	-40 to 85	°C
T <sub>j</sub> , T <sub>stg</sub>	Junction and Storage Temperature Range	-55 to 150	°C
T <sub>jp</sub>	Detecting Temperature	150	°C

**PIN CONNECTION** (Top views)



**THERMAL DATA**

Symbol	Parameter	Max.	Minidip	SO8	Unit
R <sub>th j-amb</sub>	Thermal Resistance Junction-ambient		100	200	°C/W

**TRUTH TABLE**

H: high level  
L: low level

ENABLE	FUNCTION	DIAG. STATUS	POWER STATUS
L	Operating OFF	H	L
H	Normal Operation	H	H
H	Overvoltage Protection ON	L	L
H	Overcurrent Protection ON	L	L
H	Overtemperature Protection ON	L	L

## PIN FUNCTIONS

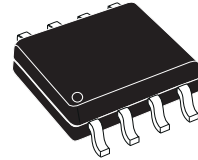
N.	Name	Description
1	POWER OUTPUT	The device is provided with short circuit protection.
4	POWER SUPPLY	Supply voltage input.
5	ENABLE INPUT	TTL compatible input. High level on this pin means output current ON. The low level voltage switches off the charge pump, the power stage and the diagnostic output reducing to the minimum value the quiescent current.
7	GROUND	This pin must be connected to ground.
8	DIAGNOSTIC FEEDBACK	The diagnostic circuit is active in input high level condition. This output detects with Typically 50µs delay at T <sub>amb</sub> = 25°C the following faults: – Overvoltage condition. – Thermal shutdown. – Short circuit. The power stage current is internally limited at 1.5A. The diagnostic output is active low. The diagnostic delay time allows to avoid spurious diagnosis(i.e.: turn ON overcurrent, overvoltage spikes etc.).

ELECTRICAL CHARACTERISTICS (V<sub>S</sub> = 14.4V, -40°C ≤ T<sub>j</sub> ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V <sub>S</sub>	Operating Supply Voltage		6		25	V
R <sub>on</sub>	On Resistance	Input > 2V, T <sub>j</sub> = 25°C Input > 2V, Full T range		0.6	0.8 1.2	Ω Ω
I <sub>off</sub>	Off State Supply Current	T <sub>j</sub> < 35°C T <sub>j</sub> = 85°C			130 300	µA µA
I <sub>on</sub>	On State Supply Current				4	mA
V <sub>EL</sub>	Enable Low Level				0.8	V
V <sub>EH</sub>	Enable High Level		2			V
I <sub>E</sub>	Enable Current	0V < V <sub>i</sub> < 5V			10	µA
I <sub>leakd</sub>	Diagnostic Output Leakage Current	V <sub>CC</sub> = 5V Diagnostic Output High			10	µA
V <sub>satd</sub>	Diagnostic Output Saturated Voltage	I <sub>sink</sub> < 3.5mA			0.4	V
t <sub>dd</sub>	Diagnostic Delay Time	T <sub>j</sub> = 25°C		30		µs
t <sub>don</sub>	Output ON Delay Time	T <sub>j</sub> = 25°C		30		µs
t <sub>r</sub>	Output ON Rise Time	T <sub>j</sub> = 25°C		100		µs
t <sub>doff</sub>	Output OFF Delay Time	T <sub>j</sub> = 25°C		80		µs
t <sub>f</sub>	Output OFF Fall Time	T <sub>j</sub> = 25°C		100		µs
V <sub>don</sub>	Overvoltage Detection ON		25			V
V <sub>dth</sub>	Overvoltage Hysteresis		2		5	V
I <sub>don</sub>	Overcurrent Detection ON		0.5		1.5	A
T <sub>don</sub>	Overtemperature Detection ON		150			°C
T <sub>dth</sub>	Overtemperature Hysteresis			25	50	°C

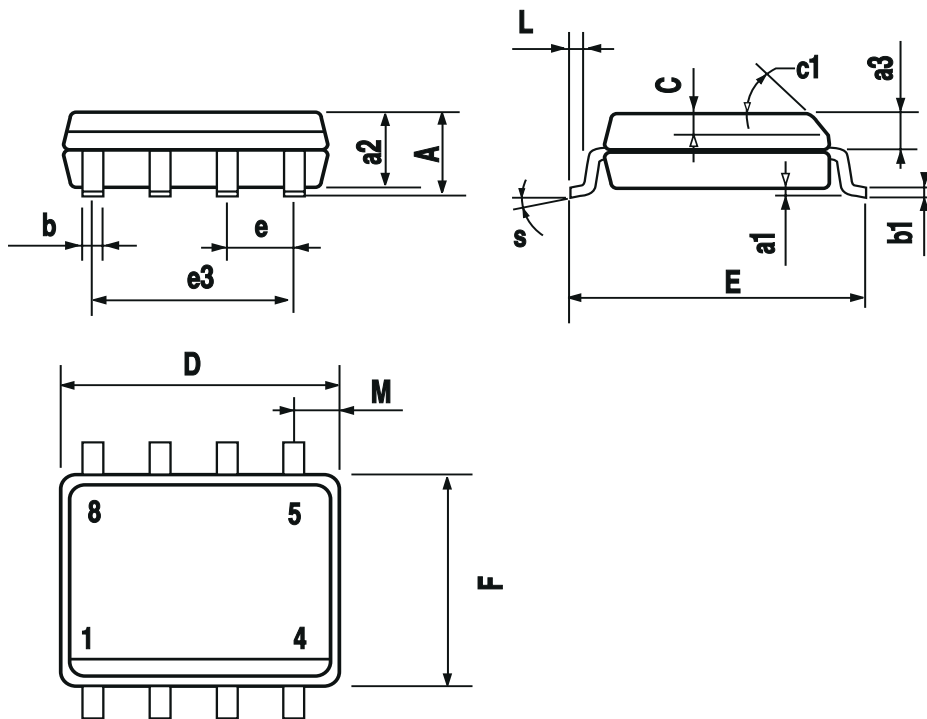
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D (1)	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
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.)					

**OUTLINE AND MECHANICAL DATA**



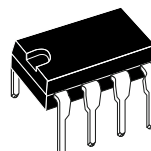
**SO8**

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

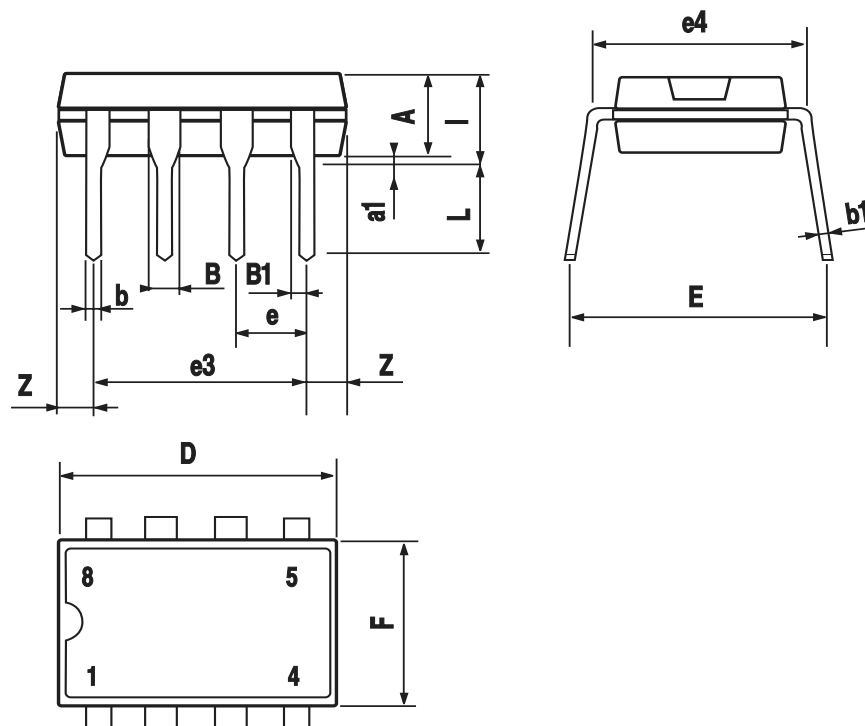


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18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

## OUTLINE AND MECHANICAL DATA



## Minidip



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