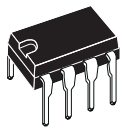
L9820

HIGH SIDE DRIVER

- OPERATING SUPPLY VOLTAGE UP TO 25V
- DC CURRENT 0.3A
- R_{ON} < 800mΩ
- DIAGNOSTIC AND PROTECTION FUNCTIONS
- µP COMPATIBLE
- ENABLE INPUT FOR STAND-BY MODE

MULTIPOWER BCD TECHNOLOGY



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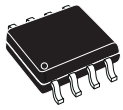


SO8

ORDERING NUMBERS:

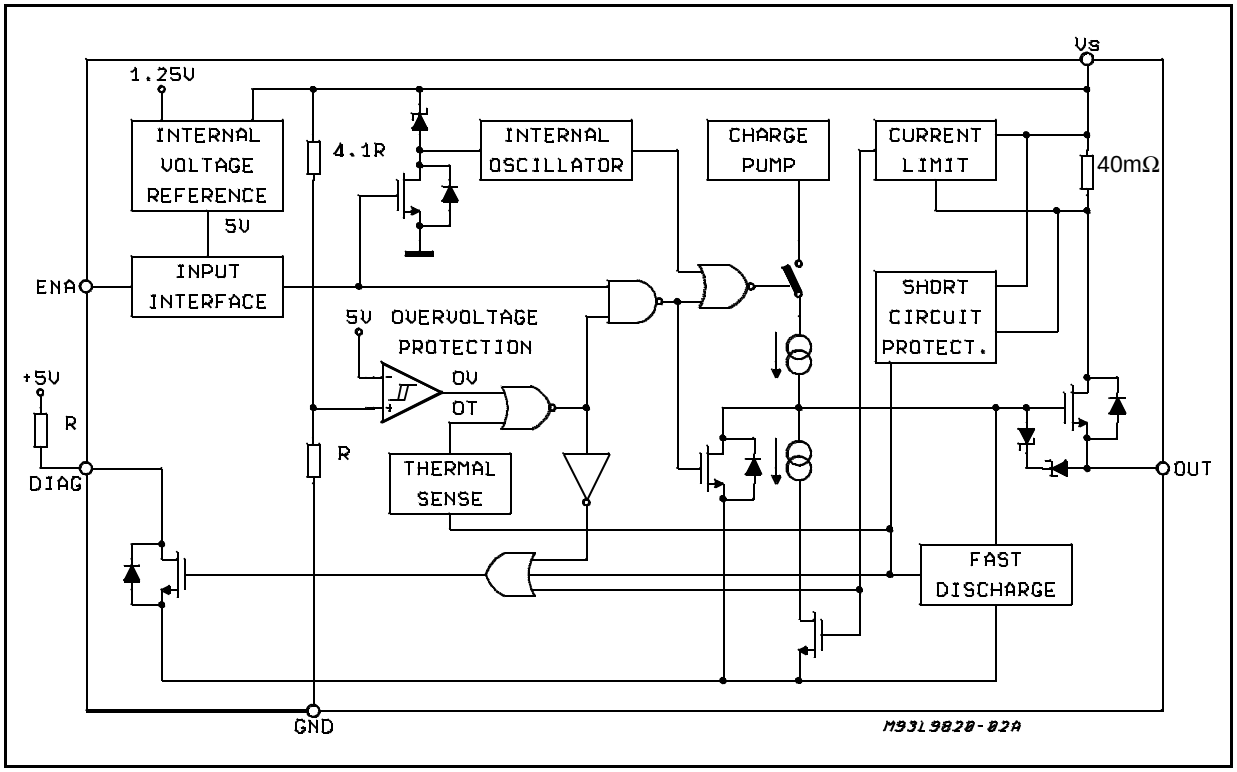
L9820 L9820D

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 shutdown). Onchip thermal protection and short circuit protection are provided.

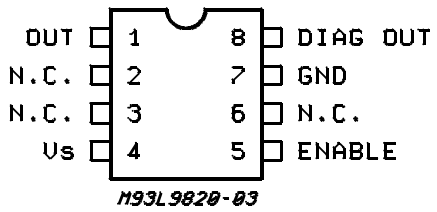
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Max Forward Voltage	50	Vdc
I_R	Reverse Bias Current at -1.3V	–0.46	A
V_5	Input Voltage (to GND)	–0.3 to 20	V
V_8	Diag. Output Voltage (to GND)	–0.3 to 20	V
V_1	Output Voltage (to GND)	–0.3 to 25	V
I_4	Supply Current	Internally limited	
I_5	Enable Input Current	0.5	mA
I_8	Diag. Out Current (sink)	10	mA
I_1	Output Current	Internally limited	
T_{op}	Operation Temperature	–40 to 85	°C
T_j, T_{stg}	Junction and Storage Temperature Range	–55 to 150	°C
T_{jp}	Detecting Temperature	150	°C

PIN CONNECTION (Top views)



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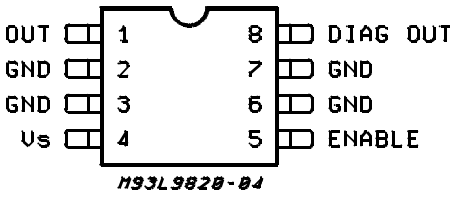

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THERMAL DATA

Symbol	Parameter		Minidip	SO8	Unit
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max.	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 Tipically 50µs delay at T_{amb} = 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 diagnosys(i.e.: turn ON overcurrent, overvoltage spikes etc.).

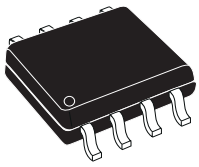
ELECTRICAL CHARACTERISTICS (V_S = 14.4V, –40°C≤ T_j ≤ +85°C, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_S	Operating Supply Voltage		6		25	V
R_{on}	On Resistance	Input > 2V, T_j = 25°C Input > 2V, Full T range		0.6	0.8 1.2	Ω Ω
I_{off}	Off State Supply Current	T_j < 35°C T_j = 85°C			130 300	µA µA
I_{on}	On State Supply Current				4	mA
V_{EL}	Enable Low Level				0.8	V
V_{EH}	Enable High Level		2			V
I_E	Enable Current	0V < Vi <5V			10	µA
I_{leakd}	Diagnostic Output Leakage Current	V_{CC} = 5V Diagnostic Output High			10	µA
V_{satd}	Diagnostic Output Saturated Voltage	Isink < 3.5mA			0.4	V
t_{dd}	Diagnostic Delay Time	T_j = 25°C		30		µs
t_{don}	Output ON Delay Time	T_j = 25°C		30		µs
t_r	Output ON Rise Time	Tj = 25°C		100		µs
t_{doff}	Output OFF Delay Time	Tj = 25°C		80		µs
t_f	Output OFF Fall Time	Tj = 25°C		100		µs
V_{don}	Overvoltage Detection ON		25			V
V_{dh}	Overvoltage Hysteresis		2		5	V
I_{don}	Overcurrent Detection ON		0.5		1.5	A
T_{don}	Overtemperature Detection ON		150			°C
T_{dh}	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.)					

(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



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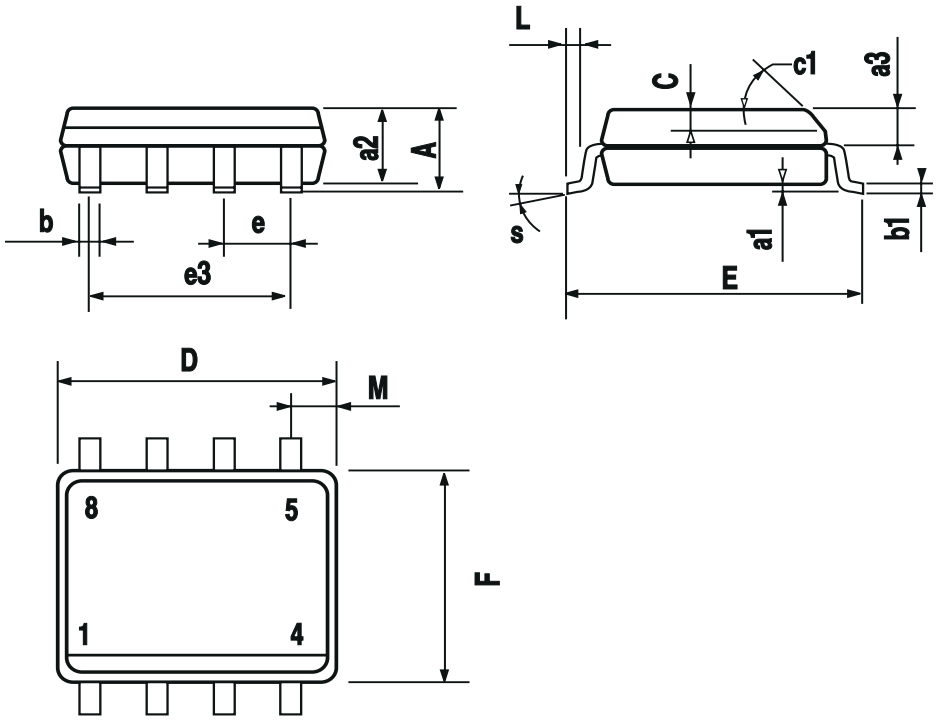
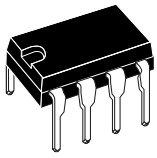


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18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

OUTLINE AND MECHANICAL DATA



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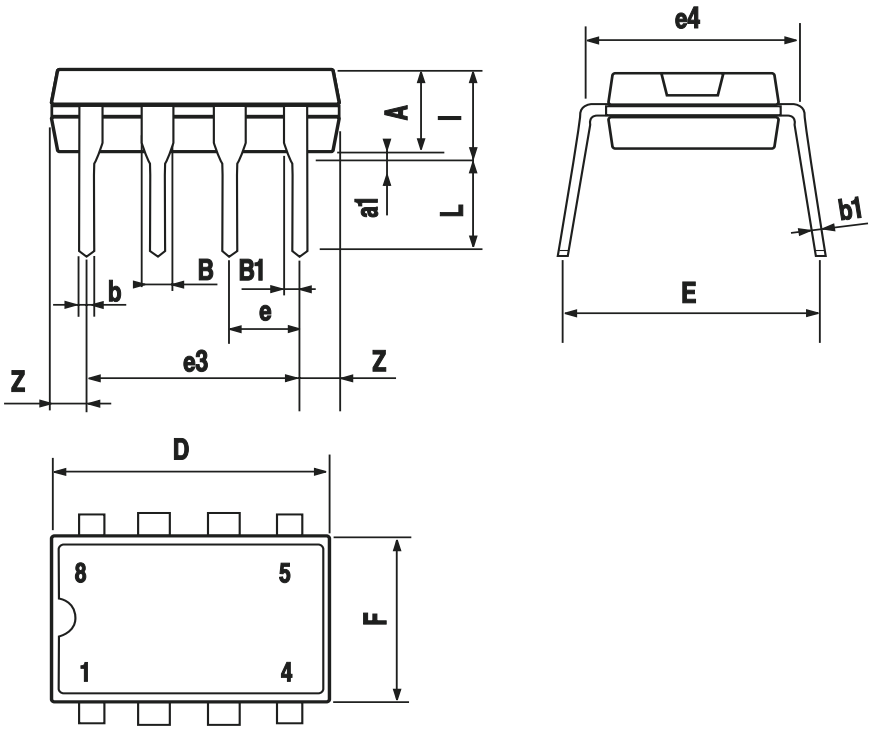

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