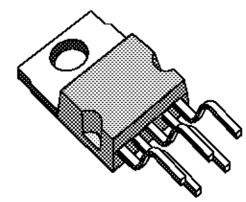
SGS-THOMSON MICROELECTRONICS

L9351

HIGH SIDE DRIVER

ADVANCE DATA

- LOW SATURATION VOLTAGE
- TTL COMPATIBLE INPUT
- WIDE SUPPLY VOLTAGE
- VERY LOW QUIESCENT CURRENT (30mA max)
- NO EXTERNAL COMPONENTS
- INTERNAL RECIRCULATION PATH FOR FAST DECAY OF INDUCTIVE LOAD CURRENT
- SHORT CIRCUIT PROTECTION
- FAILSAFE OPERATION : OUTPUT IS OFF IF THE LOGIC INPUT IS LEFT OPEN



Pentawatt

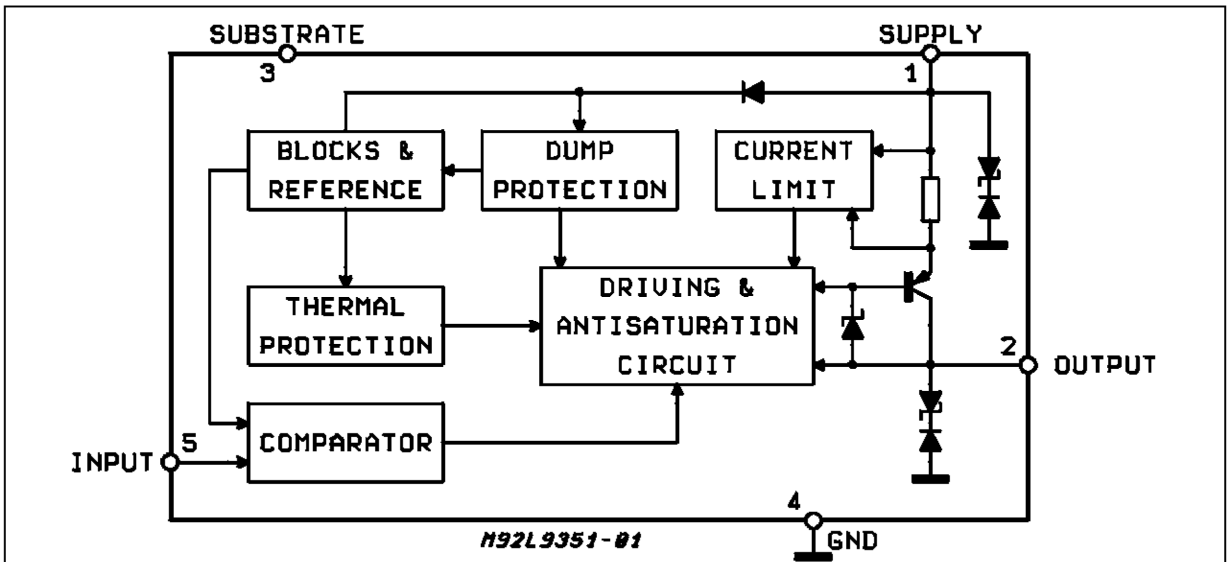
ORDERING NUMBER : L9351

DESCRIPTION

The L9351 is a monolithic integrated circuit designed to drive grounded resistive, inductive or mixed loads from the power supply positive side. Very low standby current (30mA max.) and internally implemented protections against load dump and reverse voltages make the device very useful in automotive applications. No external components are required because the output recirculation clamping zener is included in the chip. This zener can withstand a recirculation peak current of 550mA on a 80mH/25Ω load.

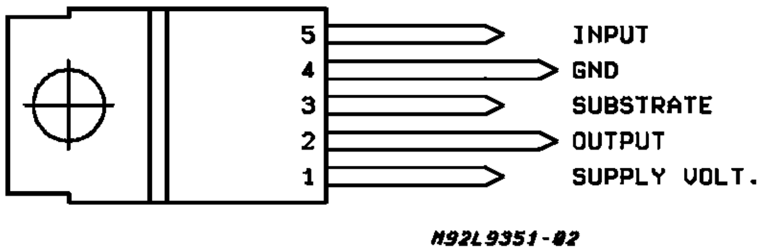
The device is self-protected against overtemperature, overvoltage and overcurrent conditions. The L9351 operates over the full battery voltage range, from 4.5V (cold cranking) up to 24V (jump starting). The L9351 withstands revers battery conditions (-13V) and supply voltage transients up to 80V limiting the maximum output transistor V_{EC} to 70V by an internal zener. ON and OFF delay times of 25µs max in any output status, including recirculating situation, allow PWM use of L9351.

BLOCK DIAGRAM



This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice.

PIN CONNECTION (top view)



Note : Pin 3 must be left open or connected to ground.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	D.C. Supply Voltage D.C. Reverse Supply Voltage Load Dump: 5ms ≤ trise ≤ 10ms τf Fall Time Constant = 100ms, Rsource ≥ 0.5Ω Low Energy Spikes: Rsource ≥ 10Ω, t_{rise} = 1µs, tf = 2ms, fr Repetition Frequency = 0.2Hz	24 –13 60 ±85	V V V V
V_i	Input Voltage	–0.3 to 7	V
I_O	Output Current	Internally Limited	
P_{tot}	Total Power Dissipation at T_{case} = 90°C	17.1	W
T_j, T_{stg}	Junction and Storage Temperature	–55 to 150	°C

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max.	80	°C/W
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	Max.	3.5	°C/W

ELECTRICAL CHARACTERISTICS
(V_S = 14.4V, – 40°C ≤ Tj ≤ + 125°C unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Operating Supply Voltage		4.5		24	V
V_{IH}	Input Voltage High	4.5 < V_S < 24	2.0			V
V_{IL}	Input Voltage Low			1	0.8	V
I_I	Input Current	0.8 < V_I < 5.5V			40	µA
I_{PL}	Output Leakage Current	V_O = 0V V_S = 24V V_I < 0.8V			140	µA
V_{sat}	Output Saturation Voltage	I_O = 125mAV_S = 4.5V			0.5	V
		I_O = 225mAV_S = 14.4V			0.5	V
		I_O = 550mAV_S = 14.4V			0.7	V
I_{SC}	Output Short Circuit Current		0.6	1.5		A
I_Q	Quiescent Current	V_I > 2V			30	mA
		V_I < 0.8V Stand-by Condition		100	150	µA
V_{ZO}	Negative Output Zener Voltage	R_L = 25Ω L = 80mH on V_I Transition from ”1” to ”0”	– 36	– 30	– 24	V
T_{on}	Turn ON Delay	Resistive Load R_L = 25Ω, T_j = 25°C (fig.2)			20	µs
T_{off}	Turn OFF Delay				25	µs

Figure 1 : Typical Automotive Application Circuit.

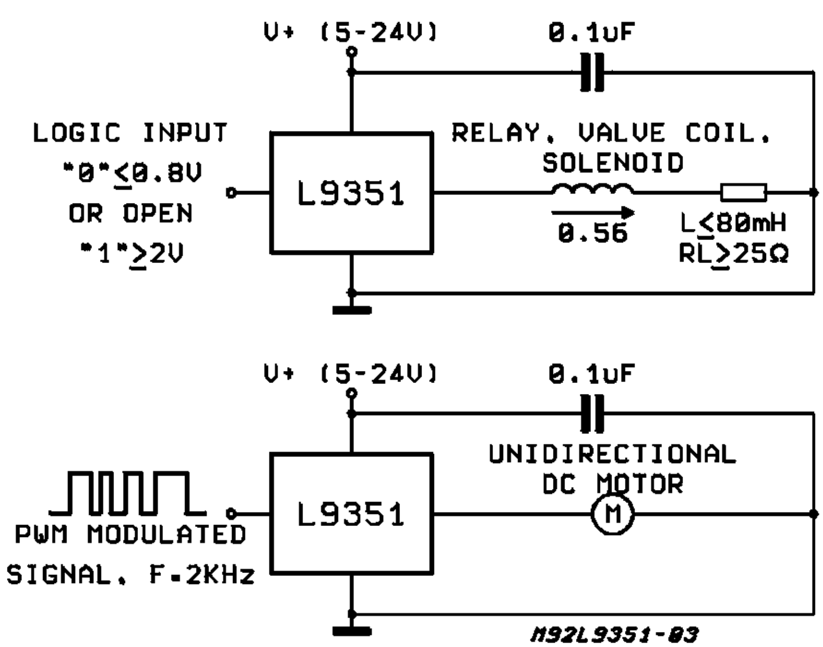


Figure 2 : Resistive Load.

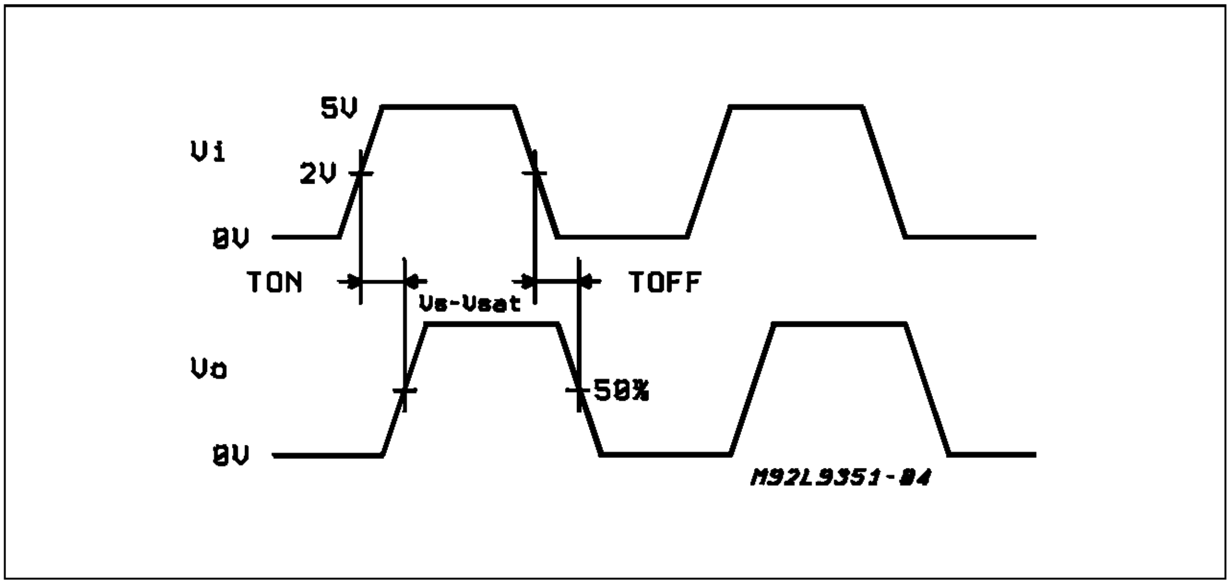
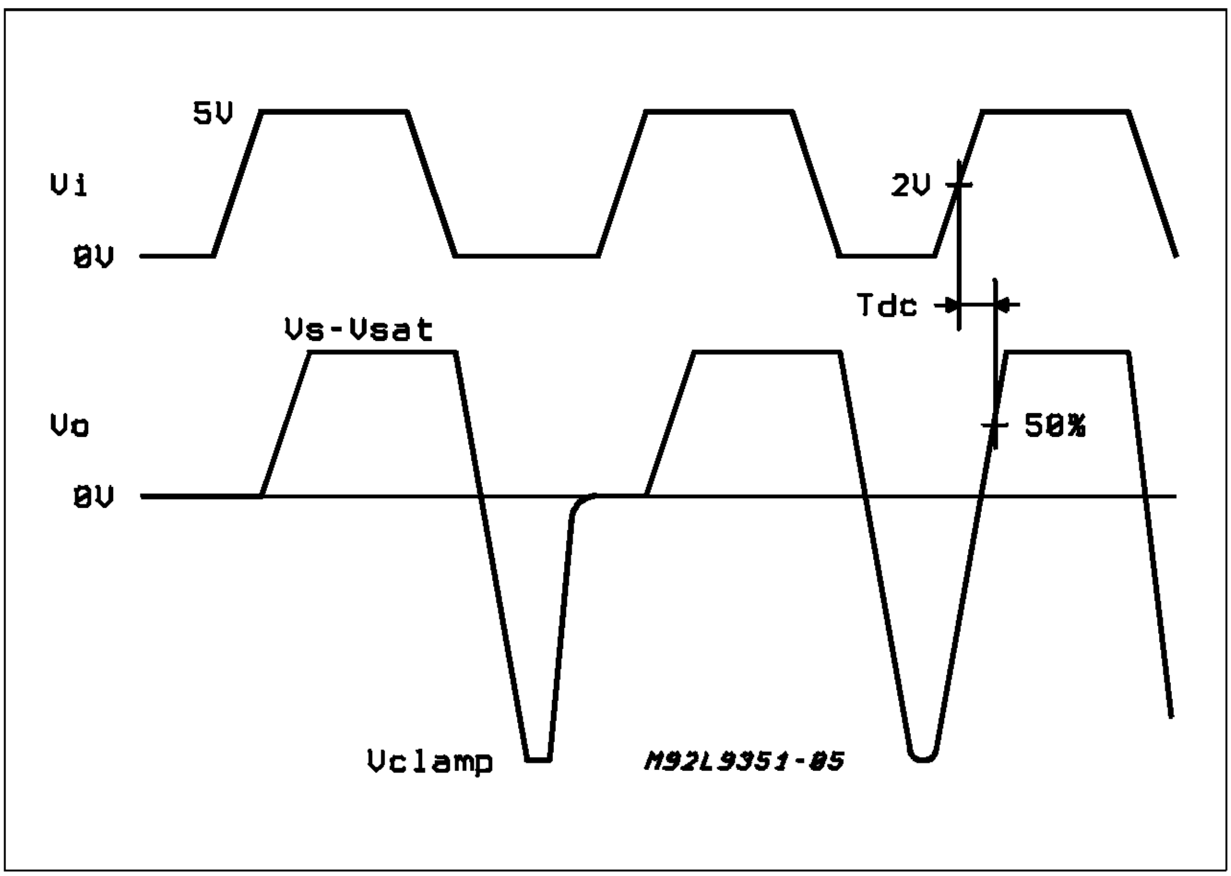


Figure 3 : Inductive Load.



PENTAWATT PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			4.8			0.189
C			1.37			0.054
D	2.4		2.8	0.094		0.110
D1	1.2		1.35	0.047		0.053
E	0.35		0.55	0.014		0.022
F	0.8		1.05	0.031		0.041
F1	1		1.4	0.039		0.055
G		3.4		0.126	0.134	0.142
G1		6.8		0.260	0.268	0.276
H2			10.4			0.409
H3	10.05		10.4	0.396		0.409
L		17.85			0.703	
L1		15.75			0.620	
L2		21.4			0.843	
L3		22.5			0.886	
L5	2.6		3	0.102		0.118
L6	15.1		15.8	0.594		0.622
L7	6		6.6	0.236		0.260
M		4.5			0.177	
M1		4			0.157	
Dia	3.65		3.85	0.144		0.152