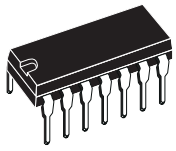
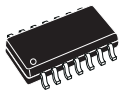
TD300

15V TRIPLE IGBT/MOS DRIVER

- THREE POWER IGBT/MOS OR PULSE TRANSFORMER DRIVERS
- CURRENT SENSE COMPARATOR WITH 1ms INHIBITION TIME FUNCTION
- INSTANTANEOUS SIGNAL TRANSMISSION
- 0.6 Amp PER CHANNEL PEAK OUTPUT CURRENT CAPABILITY
- LOW OUTPUT IMPEDANCE TYP : 7Ω at 200mA
- CMOS/LSTTL COMPATIBLE INVERTING INPUT WITH HYSTERESIS
- 13V TO 16V SINGLE SUPPLY OPERATION
- UNDER VOLTAGE LOCKOUT (12.5V)
- CURRENT AMPLIFIER
- LOW BIAS CURRENT TYP : 1.5mA
- DURING POWER UP NO RANDOM OUTPUT STATE
- ENHANCED LATCH-UP IMMUNITY
- CHANNEL PARALLELING CAPABILITY



N
DIP14
(Plastic Package)

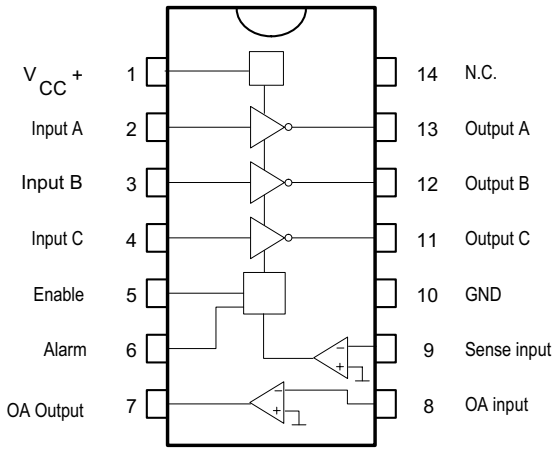


D
SO14
(Plastic Micropackage)

ORDER CODES

Part Number	Temperature Range	Package	
		N	D
TD300I	-40°C, +105°C	•	•

PIN CONNECTIONS



DESCRIPTION

The TD300 is designed to drive one, two or three Power IGBT/MOS and has driving capability for pulse transformer. So it is perfectly suited to interface control IC with Power Switches in low side or half-bridge configuration.

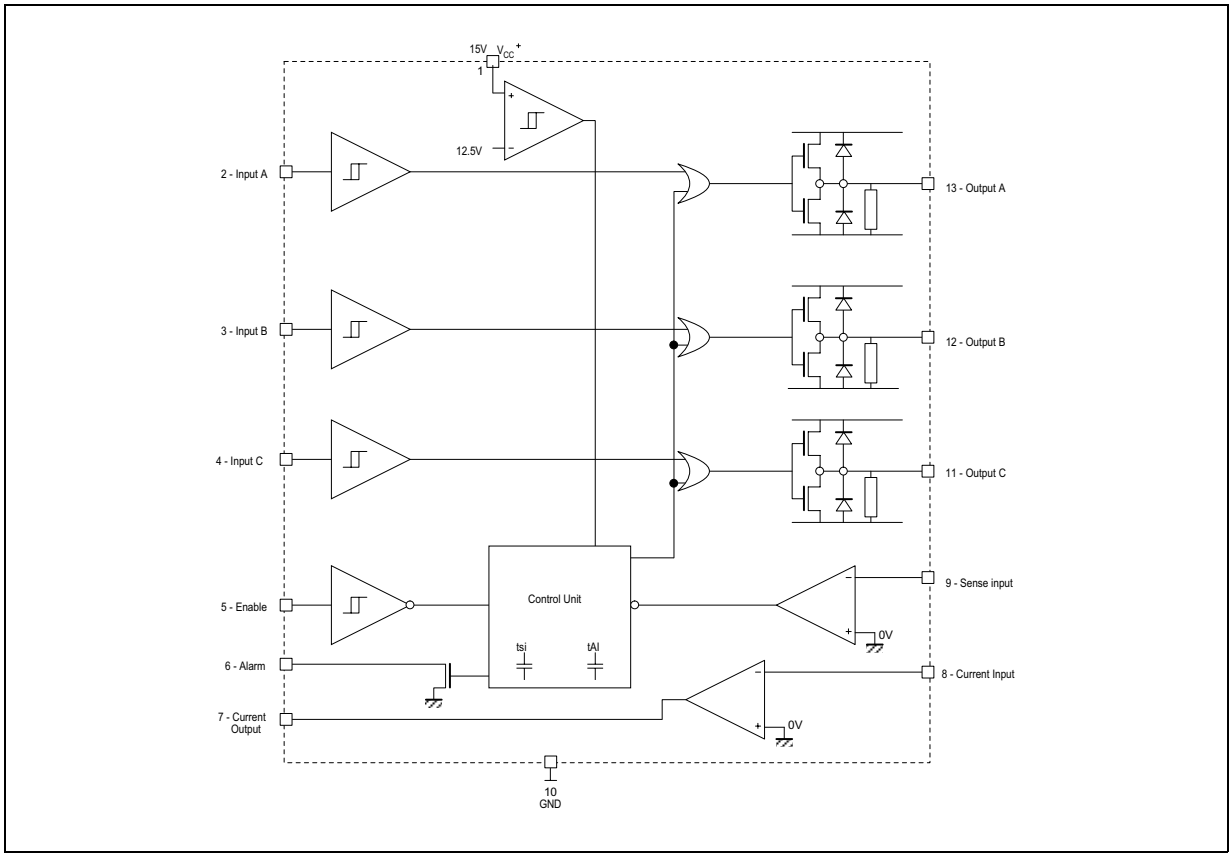
The typical application shown figure 1 implements the TD300 in a pulse controlled half-bridge drive. Positive and negative pulses are applied to the pulse transformer to charge and discharge the IGBT/MOS gate capacitance. More sophisticated secondary circuits provide low impedance gate drive and short-circuit protection as shown in application note AN461.

On Figure 2, TD300 is implemented as a low side driver in a typical 3 phase motor drive.

Figure 3 presents a general purpose low side gate drive.

In both case, the current amplifier provides interfacing between a sense resistor and an A/D converter.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	18	V
V_i	Input Voltage	0 to V_{CC}	V
V_{is}	Sense Input Voltage	-0.3 to V_{CC}	V
T_j	Operating Junction Temperature	-40 to 150	^oC
T_{amb}	Operating Ambient Temperature	-40 to 105	^oC
T_{stg}	Storage Temperature Range	-65 to 150	^oC

OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	13 to 16	V

INSTRUCTIONS FOR USE

1 - The TD300 supply voltage must be decoupled with a 1µF min. capacitor.

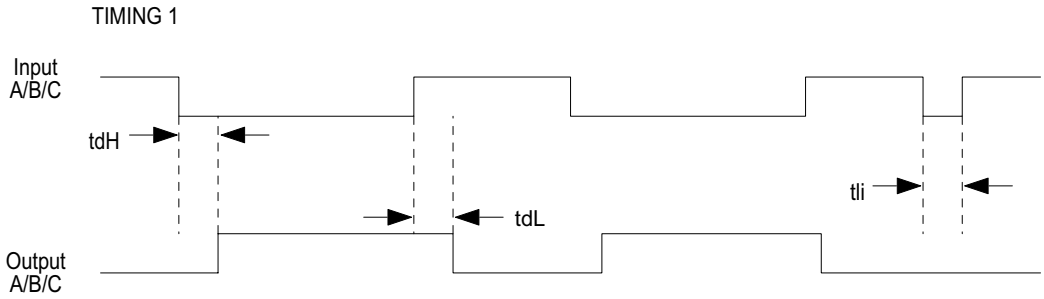
2 - If the application involving TD300 requires maximum output current capability, this current must be pulsed : pulse width 1µsec, duty cycle 1% at T_{amb}.

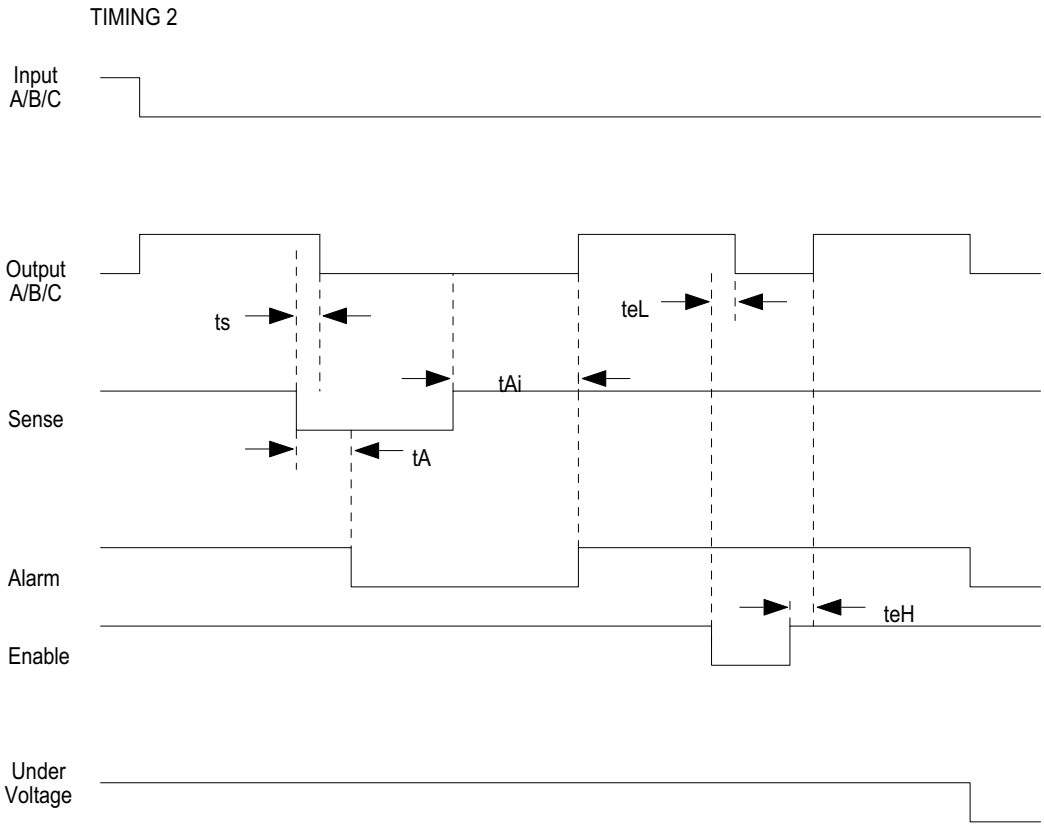
ELECTRICAL CHARACTERISTICS

V_{CC} = 15V, T_{amb} = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
I_{CC}	Supply Current with Inputs in High State		1.5	2	mA
	LOGIC INPUT (all inputs)				
V_{IH}	High Input Voltage	2			V
V_{IL}	Low Input Voltage			0.8	V
I_{IH}	High Input Current		10		pA
I_{IL}	Low Input Current		10		pA
t_{dH},t_{eL} t_{dL},t_{eH}	Propagation Delay (10% input to 10% output) Output Delay Output Delay $T_{min.} \le T_{amb} \le T_{max.}$		 200 60	 400 400	ns
t_{Ii}	Input Inhibiting Time		100		ns
t_{dd}	Differential Delay Time Between Channels		20		ns
	OUTPUT DRIVERS				
V_{sod}	Sourcing Drop Voltage (A/B/C outputs) I_{source} = 200mA			3	V
V_{sid}	Sinking Drop Voltage (A/B/C outputs) I_{sink} = 200mA			5	V
V_{dem}	Demagnetising Drop Voltage (A/B/C outputs) $I_{demag.}$ = 100mA			2	V
R_{opd}	Output Pull Down Resistor		47		kΩ
	UNDERVOLTAGE LOCKOUT				
V_{hys}	Threshold Hysteresis		0.8		V
V_{st}	Internal Start Threshold	11.7		13.3	V
	ALARM OUTPUT				
I_s	Low Level Sinking Current V_O = 0.8V	5	35		mA
I_{sh}	High Level Sinking Current			500	nA
t_A	Alarm Output : Delay Time to Alarm Fall if Sense Input Triggered			500	ns
	SENSE INPUT				
V_{ios}	Input Offset Voltage			20	mV
t_{Ai}	Inhibition Time if Sense Input Triggered		1		ms
t_s	Delay Time to Output Fall if Sense Input Triggered All outputs inhibited			600	ns
t_{si}	Inhibition Time of Sense Input		300		ns
V_{shys}	Sense Hysteresis		40		mV
	OPERATIONAL AMPLIFIER				
V_{icm}	Common Mode Input Voltage Range	0 to V_{CC}^+ - 1.5			V
V_{io}	Input Offset Voltage			10	mV
I_{io}	Input Offset Current		1		pA
I_o	Output Short Circuit Current (V_{id} = 100mV, V_o = 0V)		60		mA
V_{OL}	Low Level Output Voltage (V_{id} = -100mV)		20		mV
V_{OH}	High Level Output Voltage (V_{id} = 100mV, R_L = 100kΩ)		8.9		V
GBP	Gain Bandwidth Product		1		MHz
A_{vd}	Open Loop Gain	60			dB
SR	Slew Rate at Unity Gain (R_L = 100kΩ, C_L = 100pF, V_i = 3 to 7V)		0.6		V/µs

TIMING DIAGRAM





TYPICAL APPLICATIONS

Figure 1 : THREE PHASE MOTOR HIGH AND LOW SIDE DRIVE

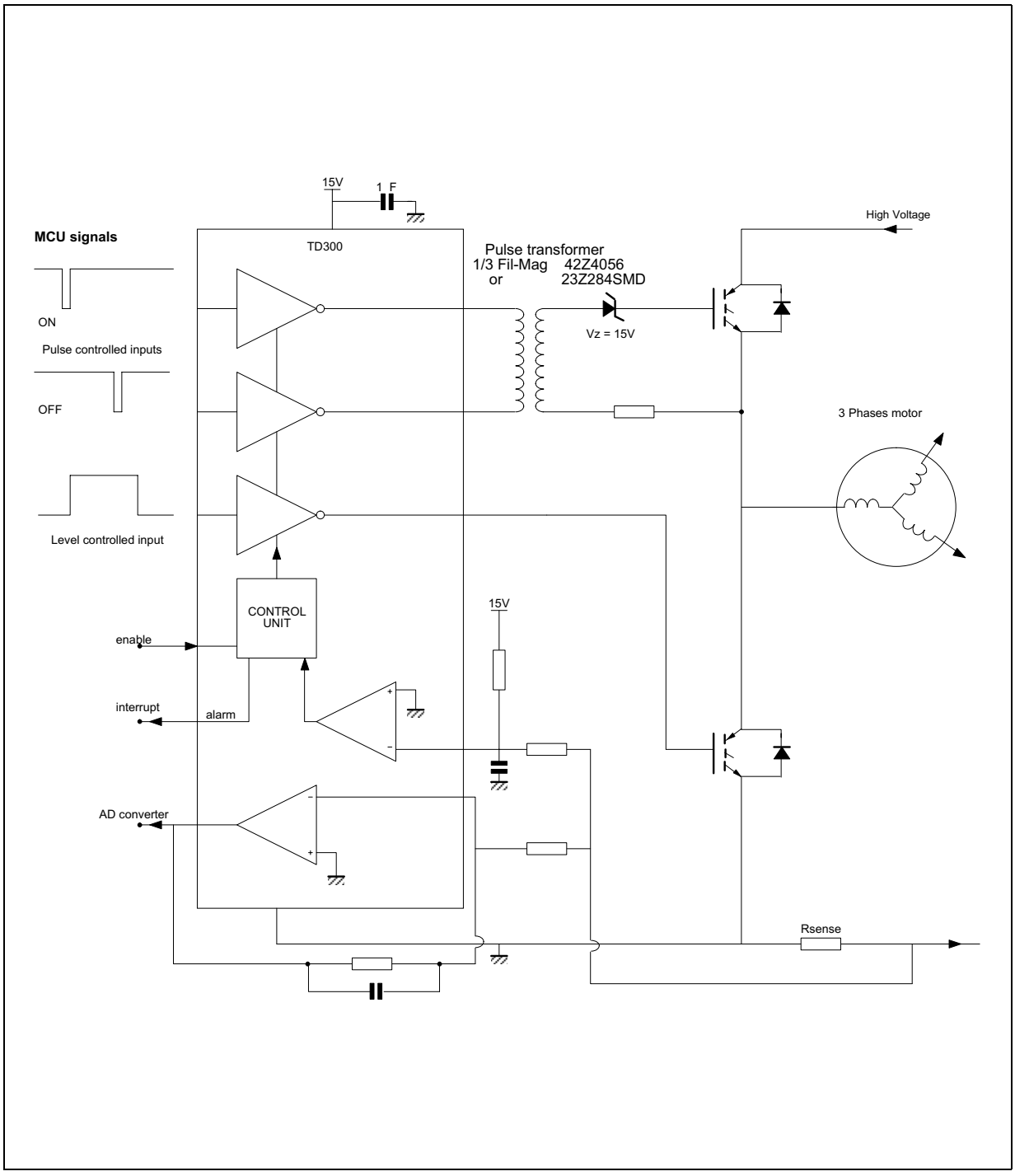


Figure 2 : THREE PHASE MOTOR LOW SIDE DRIVE

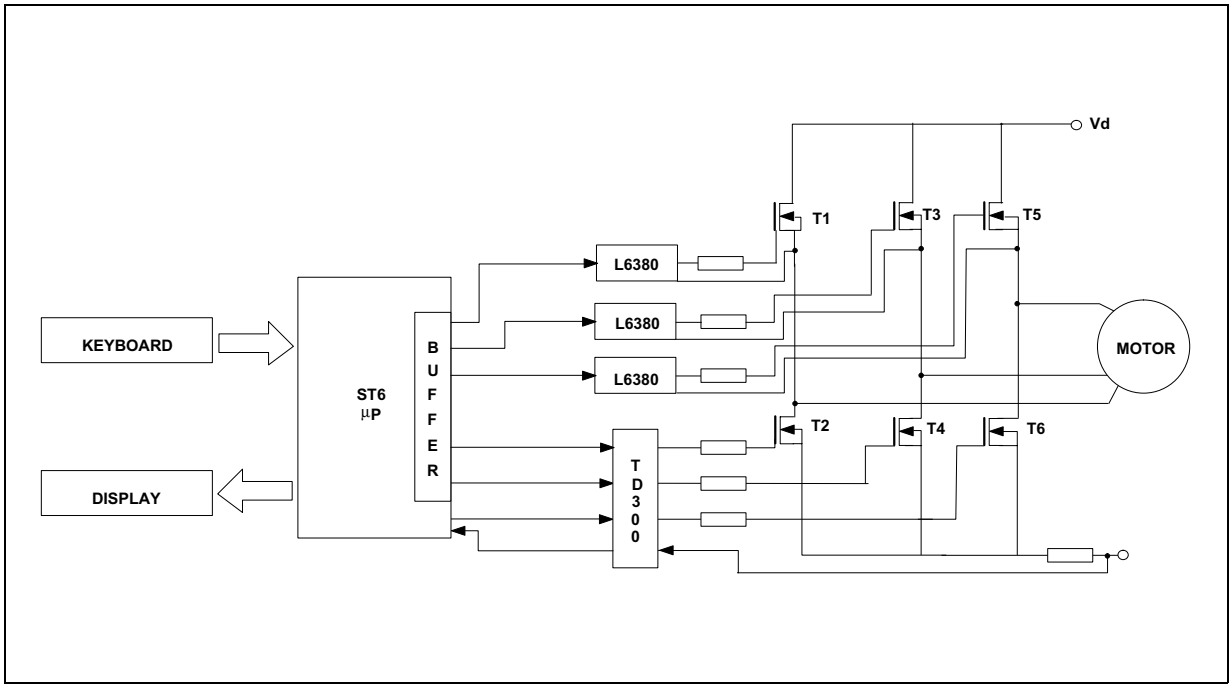
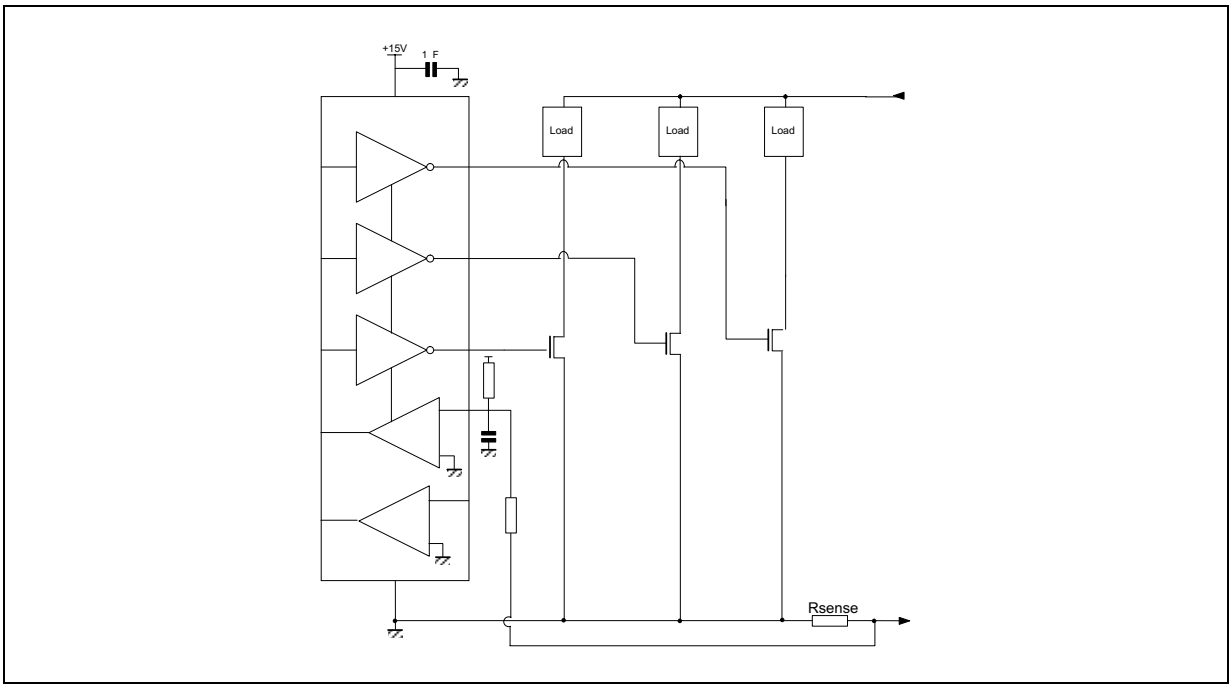
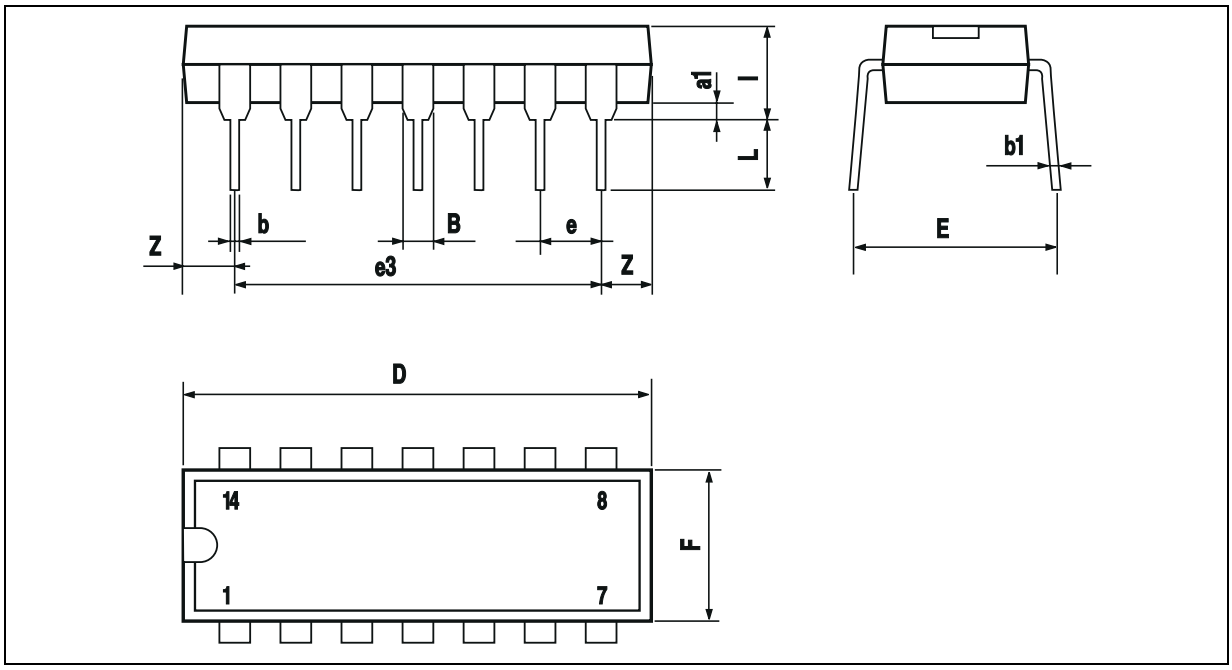


Figure 3 : LOW SIDE DRIVE



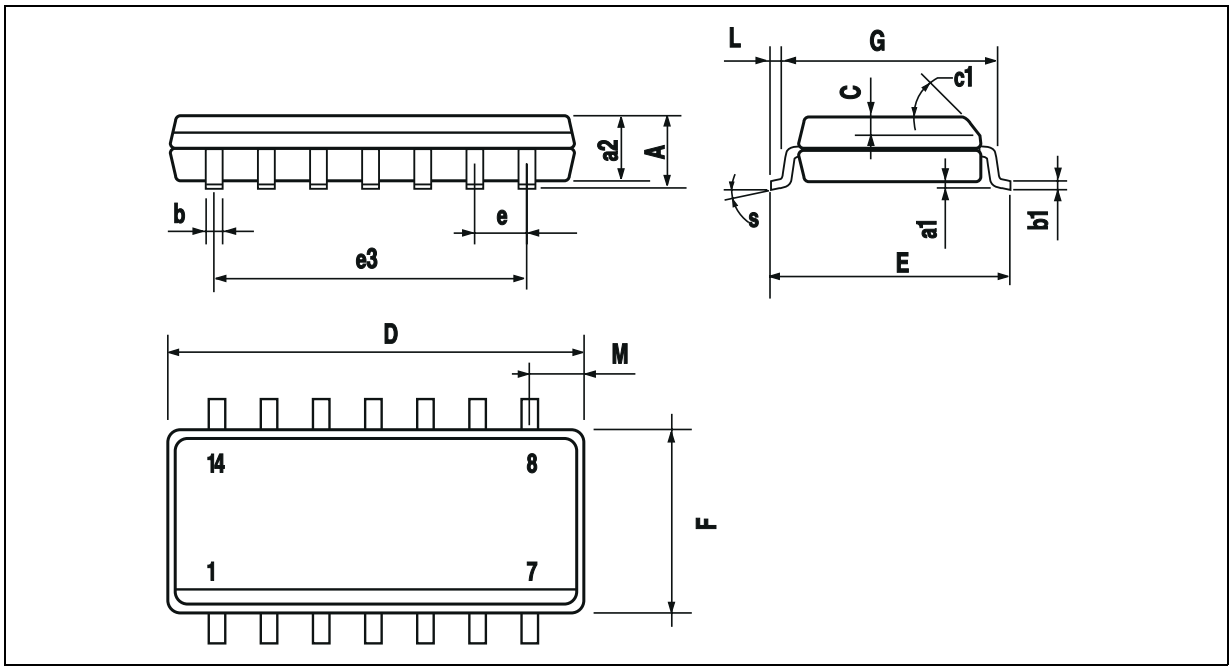
PACKAGE MECHANICAL DATA
14 PINS - PLASTIC DIP



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	1.39		1.65	0.055		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		15.24			0.600	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z	1.27		2.54	0.050		0.100

PACKAGE MECHANICAL DATA

14 PINS - PLASTIC MICROPACKAGE (SO)



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.2	0.004		0.008
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45^o (typ.)					
D	8.55		8.75	0.336		0.334
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.150		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.020		0.050
M			0.68			0.027
S	8^o (max.)					