

TD62915F

Intelligent Stepping Motor Driver

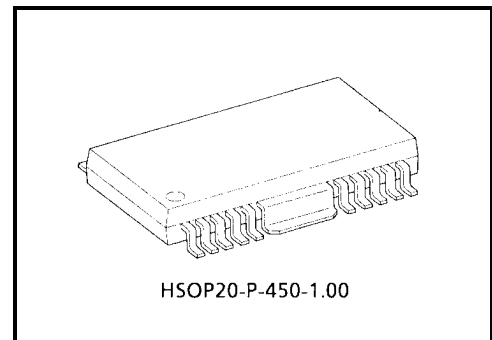
The TD62915F is a stepping motor driver with a current capacity of 1.5 A. Inputs INA and INB are combined to control the four outputs.

Since the inputs are TTL-compatible, this IC can be controlled directly from a CPU or other control system.

The IC also incorporates various protective functions as well as a self-diagnostic function for diagnostic output.

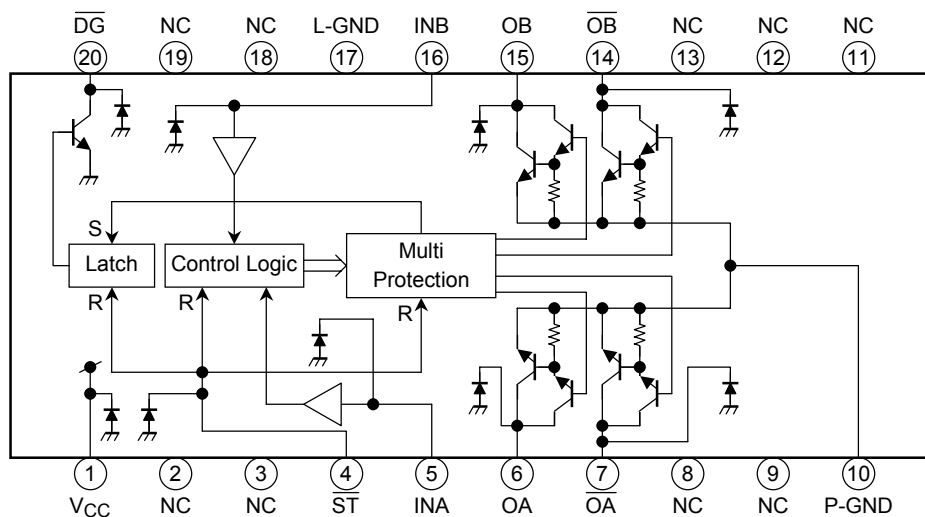
Features

- Output current capacity: 1.5 A (max)
- Low standby current: 0.1 mA (max)
- Built-in protective functions: Short-circuit protection (latch) / Thermal shutdown
- Self-diagnostic output: On short-circuit detection
- Separate GND for output and logic control sections
- Package: 20-pin HSOP



Weight: 0.79 g (typ.)

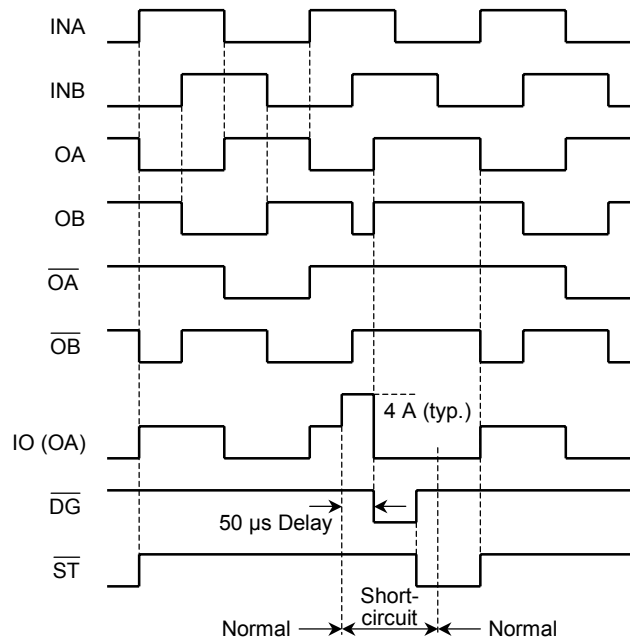
Block Diagram and Pin Assignment



Pin Description

Pin No.	Symbol	Description
1	V _{CC}	Power supply pin.
4	\overline{ST}	When this pin is opened or grounded, the output turns off, thus reducing the current consumption to 100 μ A or less. If standby mode is not needed, the pin is connected to V _{CC} .
5	INA	This is input terminal which controls output condition of pin 6 and pin 7. PNP-type voltage comparator is built in.
6	OA	PNP-type complementary output pin with a current capacity of 1.5 A. This pin is controlled by the input from pin 5. When the output is supplied with a current exceeding the detection current (4 A typ.) because of load shortcircuit, the output is latched to the OFF state after a 50 μ s (typ.) delay in order to protect the IC.
7	\overline{OA}	Output pin of the inversion of pin 6. This terminal has the same function as pin 6 and is controlled by pin 5.
10	P-GND	Ground terminal of output section which is usually connected with pin 17.
2, 3, 8, 9, 11, 12, 13, 18, 19	NC	Not connected. (electrically, this pin is completely open.)
14	\overline{OB}	Output pin of the inversion of pin 15. This terminal has the same function as pin 6 and is controlled by pin 16.
15	OB	This terminal has the same function as pin 6 and is controlled by pin 16.
16	INB	This is input terminal which controls output condition of pin 14 and pin 15. PNP-type voltage comparator is built in.
17	L-GND	Ground terminal of logic control section which is usually connected with pin 10.
20	\overline{DG}	Self-diagnostic output pin. This signal goes low when the output is short-circuited while the input is on (high). The output will be latched after a 50 μ s (typ.) delay when the load is short-circuited. This pin supplies an NPN open-collector output.

Timing Chart



Truth Table Input/Output

Input			Output				
INA	INB	\overline{ST}	OA	\overline{OA}	OB	\overline{OB}	\overline{DG}
L	L	H	OFF	ON	OFF	ON	OFF
L	H	H	OFF	ON	ON	OFF	OFF
H	L	H	ON	OFF	OFF	ON	OFF
H	H	H	ON	OFF	ON	OFF	OFF
—	—	L	OFF	OFF	OFF	OFF	OFF
—	—	OPEN	OFF	OFF	OFF	OFF	OFF

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	V _{CC}	7~30	V
Input voltage	V _{IN}	-0.3~7	V
Output voltage	V _{CC}	-0.3~V _{CC}	V
Output current	I _O	1.5 (Note 1)	A
Power dissipation	P _D	2.0 (Note 2)	W
Operation temperature	T _{opr}	-40~85	°C
Storage temperature	T _{stg}	-55~150	°C
Lead temperature mounted on PCB	T _{sol}	260 (10 s)	°C

Note 1: Maximum current value when using infinite heatsink

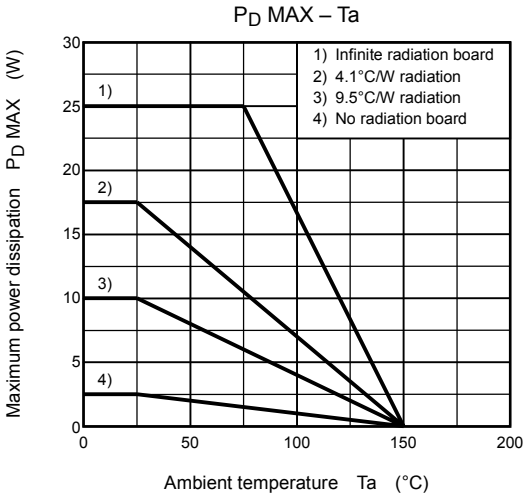
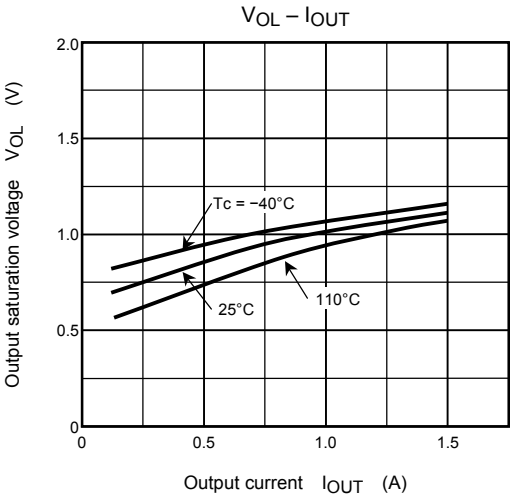
Note 2: When mounted on PCB (50 mm × 50 mm × 1.6 mm, copper foil area: 50%)

HSOP20-P-450 Thermal Resistance Data (Ta = 25°C)

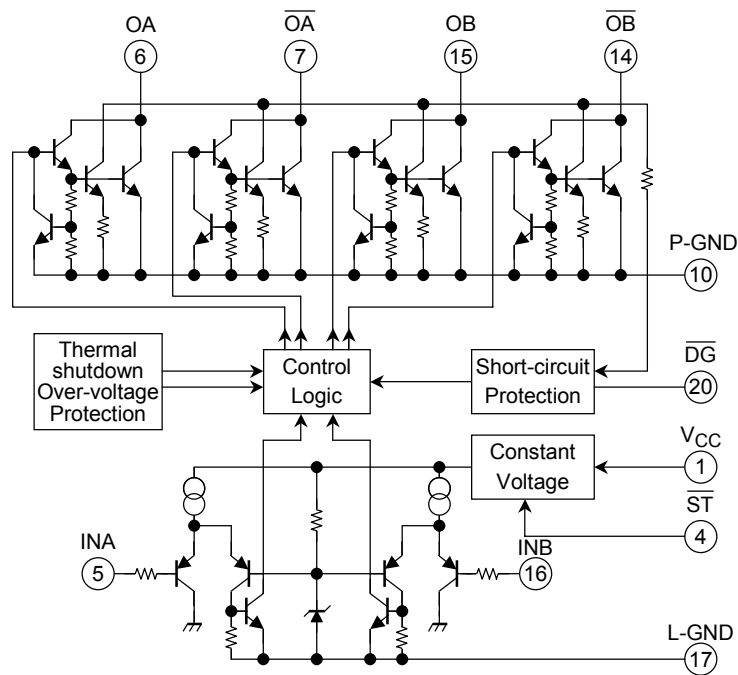
Characteristics	Test Condition	Rating	Unit
R _{θj-a}	—	125	°C/W
R _{θj-c}	—	13	°C/W
P _{D1}	When using infinite heatsink	9.6	W
P _{D2}	When mounted on iron sheet (50 mm × 50 mm × 1.6 mm)	3.2	W
P _{D3}	When mounted on PCB (50 mm × 50 mm × 1.6 mm, copper foil area: 50%)	2.0	W
P _{D4}	Without a board	1.0	W

Electrical Characteristics ($V_{CC} = 24\text{ V}$, $T_a = 25^\circ\text{C}$)

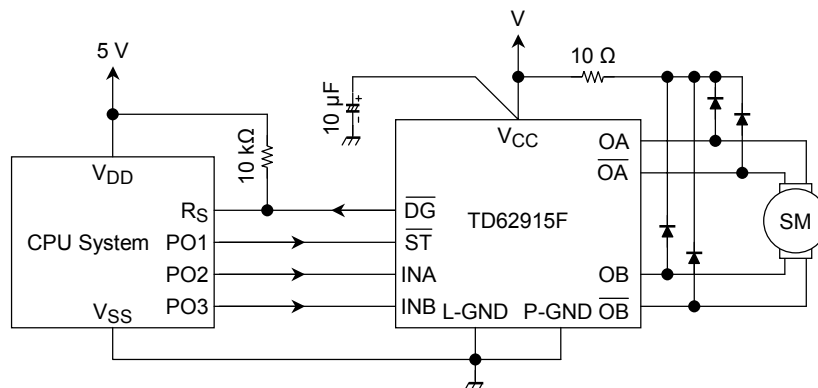
Characteristics	Symbol	Pin	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Current consumption	I_{CC}	V_{CC}	—	—	12	25	40	mA
Input voltage	V_{IL}	INA/INB	—	—	—	—	0.8	V
	V_{IH}			—	2.4	—	—	
Input current	I_{IL}	INA/INB	—	$V_{IN} = 0.4\text{ V}$	-50	—	—	μA
	I_{IH}			$V_{IN} = 5\text{ V}$	—	—	10	
Input voltage	V_{IL}	\overline{ST}	—	—	—	—	0.8	V
	V_{IH}			—	3.0	—	—	
Output saturation voltage	V_{SAT}	OA, \overline{OA} OB, \overline{OB}	—	$I_O = 1.5\text{ A}$, $T_c = 25^\circ\text{C}$	—	1.25	1.5	V
Output leakage current	I_{LEAK}	OA, \overline{OA} OB, \overline{OB}	—	$V_O = V_{CC}$	—	—	± 10	μA
Output voltage	V_{OL}	\overline{DG}	—	$I_{OL} = 3\text{ mA}$	—	—	0.3	V
Output leakage current	I_{LEAK}	\overline{DG}	—	$V_O = V_{CC}$	—	—	10	μA
Overcurrent detection	I_{SD}	—	—	—	1.8	4	6	A
Shutdown temperature	T_{SD-H}	—	—	OUT = ON \rightarrow OFF	—	160	—	$^\circ\text{C}$
	T_{SD-L}	—		OUT = OFF \rightarrow ON	—	130	—	
Standby current	I_{ST}	$V_{CC} + V_S$	—	$\overline{ST} = \text{GND}$	—	—	100	μA
Propagation delay time	t_{pLH}	—	—	—	—	1	10	μs
	t_{pHL}	—		—	—	—	1	



Equivalent Circuit



Application Circuit



Precautions when Using the Device in Application

The IC may degrade or break down due to overvoltage or overcurrent.

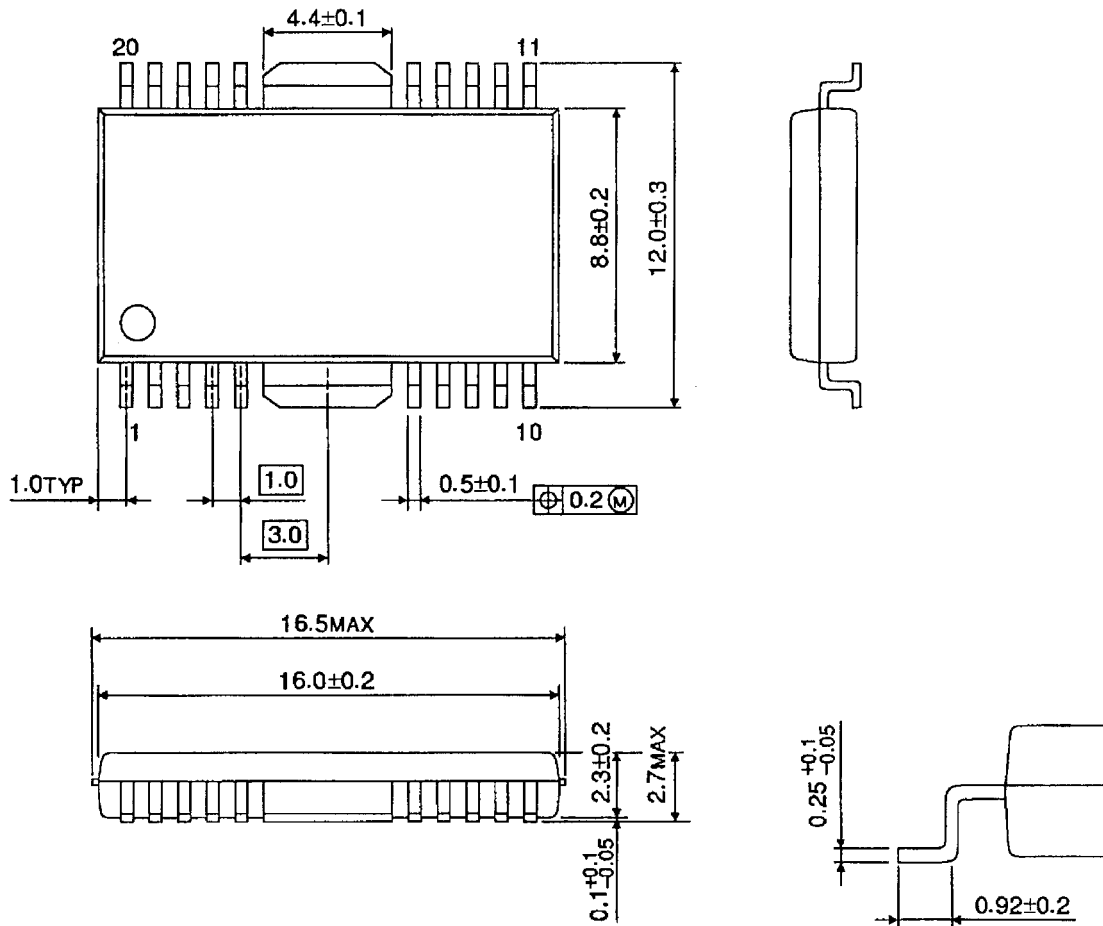
Also the IC may break down due to short circuit between output pins, an output pin and the VCC pin, or an output pin and the GND pin.

Design an output line, VCC line and GND line with great care.

Package Dimensions

HSOP20-P-450-1.00

Unit : mm



Weight: 0.79 g (typ.)

RESTRICTIONS ON PRODUCT USE

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