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NTE7071
Integrated Circuit
Dual, Full–Bridge Driver

Description:

The NTE7071 is a high voltage, high current, dual, full–bridge driver in a 15–Lead Staggered SIP type package designed to accept standard TTL logic levels and drive inductive loads such as relays, solenoids, DC, and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the logic works at a lower voltage.

Features:

- Operating Supply Voltage up to 46V
- Total DC Current up to 4A
- Low Saturation Voltage
- Overtemperature Protection
- Logical “0” Input Voltage up to 1.5V (High Noise Immunity)

Absolute Maximum Ratings:

Power Supply, V_S 50V
Logical Supply Voltage, V_{SS} 7V
Input and Enable Voltage, V_I, V_{en} . . . . . –0.3 to +7.0V
Peak Output Current (Each Channel), I_O
  Non–Repetitive (t = 100μs) 3A
  Repetitive (80% ON; 20% OFF, t_{on} = 10ms) 2.5A
  DC Operation 2A
Sensing Voltage, V_{sens} . . . . . –1 to +2.3V
Total Power Dissipation (T_C = +75°C), P_{tot} 25W
Operating Junction Temperature Range, T_J . . . . . –40° to +150°C
Storage Temperature Range, T_{stg} . . . . . –40° to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 3°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 35°C/W

Electrical Characteristics: (V_S = 42V, V_{SS} = 5V, T_J = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Supplu Voltage (Pin4)	V_S	Operative Condition		V_{IH}+2.5	–	46	V
Logic Supply Voltage (Pin9)	V_{SS}			4.5	5.0	7.0	V
Quiescent Supply Current (Pin4)	I_S	V_{en} = H, I_L = 0	V_i = L	–	13	22	mA
			V_i = H	–	50	70	mA
		V_{en} = L, V_i = X		–	–	4	mA
Quiescent Current from V_{SS} (Pin9)	I_{SS}	V_{en} = H, I_L = 0	V_i = L	–	24	36	mA
			V_i = H	–	7	12	mA
		V_{en} = L, V_i = X		–	–	6	mA
Input Low Voltage (Pin5, Pin7, Pin10, Pin12)	V_{iL}			–0.3	–	1.5	V
Input High Voltage (Pin5, Pin7, Pin10, Pin12)	V_{iH}			2.3	–	V_{SS}	V
Low Voltage Input Current (Pin5, Pin7, Pin10, Pin12)	I_{iL}	V_i = L		–	–	–10	μA
High Voltage Input Current (Pin5, Pin7, Pin10, Pin12)	I_{iH}	V_i = H ≤ V_{SS} – 0.6V		–	30	100	μA
Enable Low Voltage (Pin6, Pin11)	V_{en} = L			–0.3	–	1.5	V
Enable High Voltage (Pin6, Pin11)	V_{en} = H			2.3	–	V_{SS}	V
Low Voltage Enable Current (Pin6, Pin11)	I_{en} = L	V_{en} = L		–	–	–10	μA
High Voltage Enable Current (Pin6, Pin11)	I_{en} = H	V_{en} = H ≤ V_{SS} – 0.6V		–	30	100	μA
Source Saturation Voltage	$V_{CE(sat)\ (H)}$	I_L = 1A		–	1.35	1.70	V
		I_L = 2A		–	2.0	2.7	V
Sink Saturation Voltage	$V_{CE(sat)\ (L)}$	I_L = 1A, Note 3		–	1.2	1.6	V
		I_L = 2A, Note 3		–	1.7	2.3	V
Total Drop	$V_{CE(sat)}$	I_L = 1A, Note 3		–	–	3.2	V
		I_L = 2A, Note 3		–	–	4.9	V
Sensing Voltage (Pin1, Pin15)	V_{sens}	Note 1		–1	–	2	V
Source Current Turn–Off Delay	T_1 (V_i)	0.5 V_i to 0.9 I_L, Note 2		–	1.5	–	μs
Fall Time	T_2 (V_i)	0.9 I_L to 0.1 I_L, Note 2		–	0.2	–	μs
Turn–On Delay	T_3 (V_i)	0.5 V_i to 0.1 I_L, Note 2		–	2	–	μs
Rise Time	T_4 (V_i)	0.1 I_L to 0.9 I_L, Note 2		–	0.7	–	μs
Sink Current Turn–Off Delay	T_5 (V_i)	0.5 V_i to 0.9 I_L, Note 2		–	0.7	–	μs
Fall Time	T_6 (V_i)	0.9 I_L to 0.1 I_L, Note 2		–	0.25	–	μs
Turn–On Delay	T_7 (V_i)	0.5 V_i to 0.9 I_L, Note 2		–	1.6	–	μs
Rise Time	T_8 (V_i)	0.1 I_L to 0.9 I_L, Note 2		–	0.2	–	μs

Note 1. Sensing voltage can be –1V for t ≤ 50μs; in steady state V_{sens}min ≥ –0.5V.

Note 2. The load must be a pure resistor.

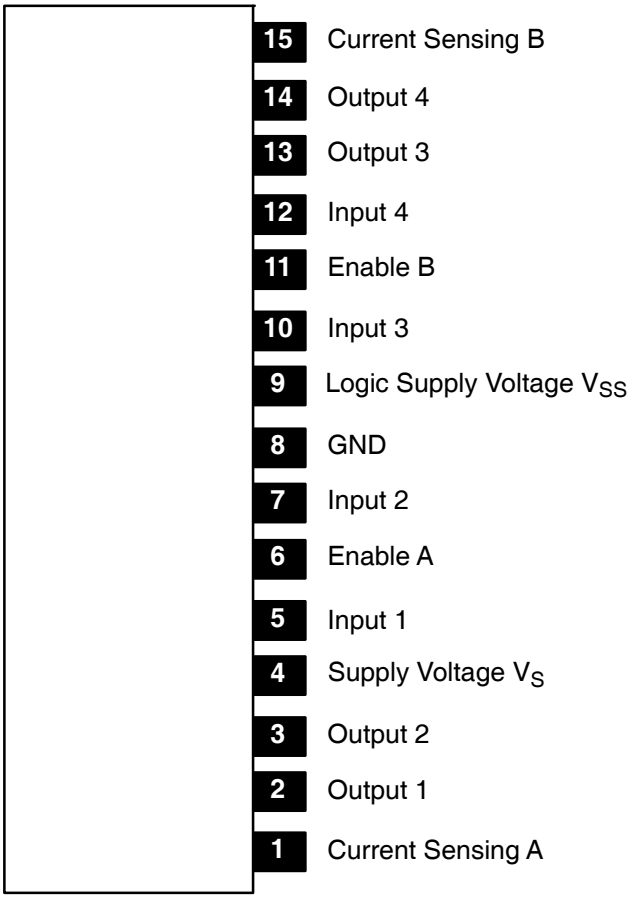
Note 3. Pin1 and Pin15 connected to GND.

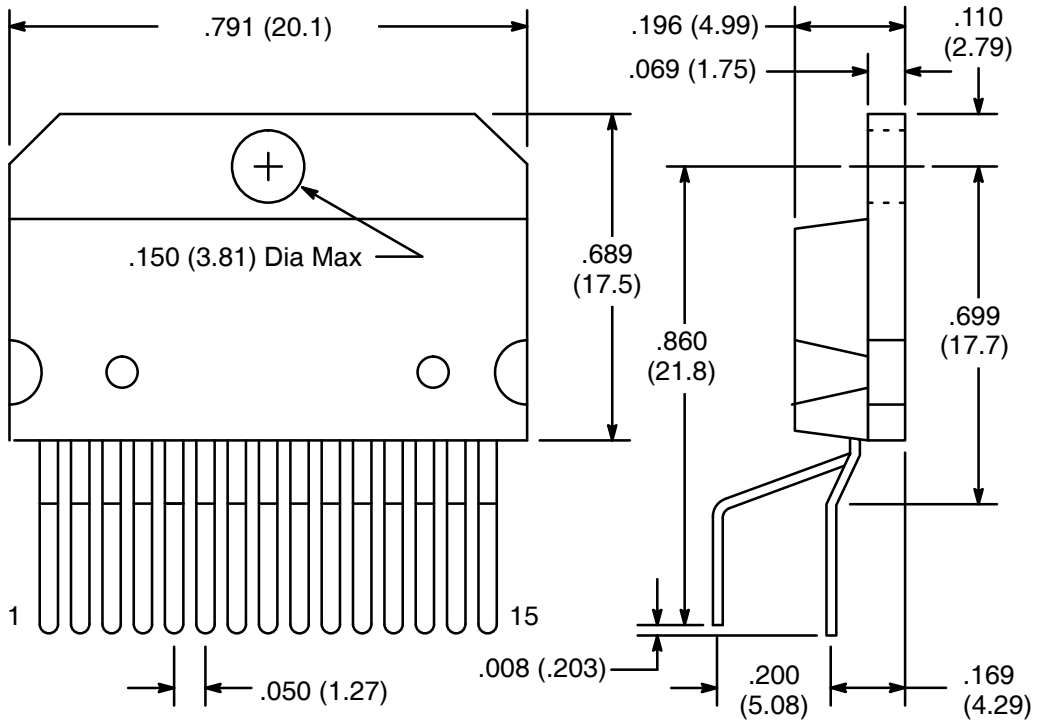
Electrical Characteristics (Cont'd): (V_S = 42V, V_{SS} = 5V, T_J = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Commutation Frequency	f_c (V_i)	I_L = 2A	–	25	40	kHz
Source Current Turn–Off Delay	T_1 (V_{en})	0.5 V_{en} to 0.9 I_L, Note 2	–	3	–	μs
Fall Time	T_2 (V_{en})	0.9 I_L to 0.1 I_L, Note 2	–	1	–	μs
Turn–On Delay	T_3 (V_{en})	0.5 V_{en} to 0.1 I_L, Note 2	–	o.3	–	μs
Rise Time	T_4 (V_{en})	0.1 I_L to 0.9 I_L, Note 2	–	0.4	–	μs
Sink Current Turn–Off Delay	T_5 (V_{en})	0.5 V_{en} to 0.9 I_L, Note 2	–	2.2	–	μs
Fall Time	T_6 (V_{en})	0.9 I_L to 0.1 I_L, Note 2	–	0.35	–	μs
Turn–On Delay	T_7 (V_{en})	0.5 V_{en} to 0.1 I_L, Note 2	–	0.25	–	μs
Rise Time	T_8 (V_{en})	0.1 I_L to 0.9 I_L, Note 2	–	0.1	–	μs
Commutation Frequency	f_c (V_{en})	I_L = 2A	–	1	–	kHz

Note 1. Sensing voltage can be –1V for t ≤ 50μs; in steady state V_{sens}min ≥ –0.5V.
Note 2. The load must be a pure resistor.
Note 3. Pin1 and Pin15 connected to GND.

Pin Connection Diagram
(Front View)




.791 (20.1)
.196 (4.99)
.110
(2.79)
.069 (1.75)
.150 (3.81) Dia Max
.689
(17.5)
.860
(21.8)
.699
(17.7)
1
15
.008 (.203)
.050 (1.27)
.200
(5.08)
.169
(4.29)