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, sole- noids, DC, and stepping motors. Two enable inputs are provided to enable or disable the device inde- pendently of the input signals. The emitters of the lower transistors of each bridge are connected to- gether 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)

15	Current Sensing B
14	Output 4
13	Output 3
12	Input 4
11	Enable B
10	Input 3
9	Logic Supply Voltage V_{SS}
8	GND
7	Input 2
6	Enable A
5	Input 1
4	Supply Voltage V_S
3	Output 2
2	Output 1
1	Current Sensing A

.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

.050 (1.27)

.008 (.203)

.200 (5.08)

.169 (4.29)