

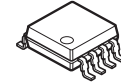
Single-phase DC Brushless Motor Driver IC

■ GENERAL DESCRIPTION

The NJU7365 is a single-phase DC brushless motor driver IC designed for small and high power fan-motor applications. It provides a low operating current of 1.1mA (typ.) and low saturation output voltage at high output current operation, which offers a high efficiency motor driving. It also has a high output current capability of 1000mA (peak) and 350mA (continuous). The NJU7365 has useful functions such as a FG (frequency generator) output useful for various control systems, lock detect, auto-recovery (c-less type), thermal shutdown, linear driving which offers low noise motor driving and direct input of PWM signal for revolution speed control.

The NJU7365 is available in a small and thin package of MSOP8 (TVSP8), which provides downsizing and thinning in motor applications.

■ PACKAGE OUTLINE



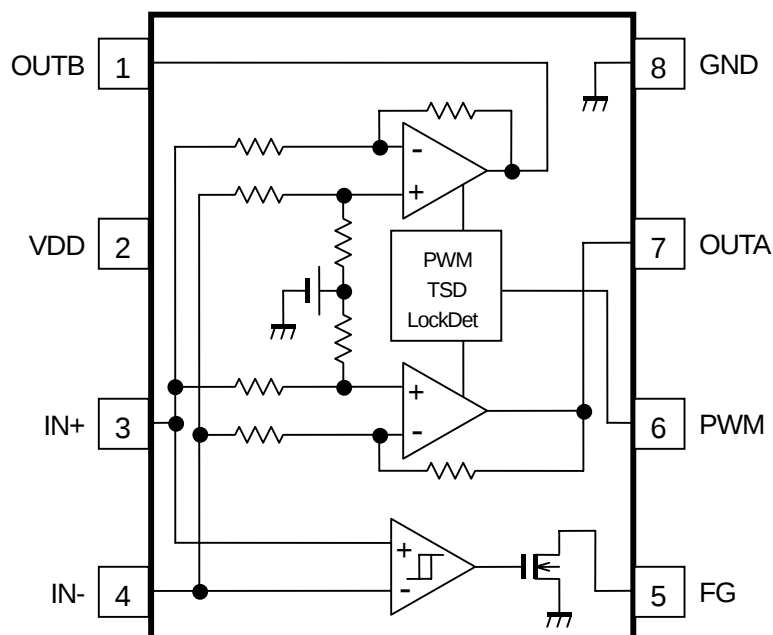
NJU7365RB1
(MSOP8 (TVSP8))

■ FEATURES

- Supply Voltage $V_{DD}=2.0$ to $5.5V$
- Low Quiescent Current $I_{DD}=1mA$ typ.
- Maximum Output Voltage $V_{OH}=4.7V$ typ.@ $I_o=+350mA$, $V_{OL}=0.2V$ typ.@ $I_o=-350mA$
- Direct PWM Input
- Lock Detect
- FG Output
- Thermal Shutdown Circuit
- CMOS Technology
- Package Outline $MSOP8 (TVSP8)^*$

*MEET JEDEC MO-187-DA / THIN TYPE

■ BLOCK DIAGRAM



■ PIN FUNCTION

PIN No.	PIN NAME
1	OUTB
2	VDD
3	IN+
4	IN-
5	FG
6	PWM
7	OUTA
8	GND

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{DD}	+7	V
Input Voltage	V _{ID}	-0.3 to V _{DD}	V
PWM Input Voltage	V _{PWM}	-0.3 to V _{DD}	V
Output Current (Peak)	I _{OPEAK}	1000	mA
FG Output Current	I _{FG}	10	mA
FG Output Voltage	V _{FG}	+7.0	V
Power Dissipation	P _D	Device itself	400
		(*1) Mounted on 2Layer Board	510
Operating Temperature	Topr	-40 to +85	°C
Junction Temperature	Tjmax	150	°C
Storage Temperature	Tstg	-50 to +150	°C

(*1): Mounted on glass epoxy board based on EIA/JEDEC. (76.2 × 114.3 × 1.6mm: 2-Layers FR-4)

■ RECOMMENDED OPERATING CONDITIONS

(Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V _{DD}	-	2.0	5.0	5.5	V

■ ELECTRICAL CHARACTERISTICS

(V_{DD}=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
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■ GENERAL

Quiescent Current	I _{DD}	IN+=3.9V, IN-=0.4V	-	1.1	1.8	mA
Thermal Shutdown Operating Temperature	T _{TSD}	-	-	170	-	°C
Thermal Shutdown Hysteresis	T _{HYS}	-	-	20	-	°C

■ HALL AMP BLOCK

Input Offset Voltage	V _{IO}	-	-10	-	10	mV
Common Mode Input Voltage Range	V _{ICM}	-	0.4	-	3.9	V
Close-loop Gain	A _V	-	-	46.4	-	dB

■ OUTPUT BLOCK

Output Voltage	V _{OH}	I _O = +350mA	4.6	4.7	-	V
	V _{OL}	I _O = -350mA	-	0.2	0.3	V
FGL Output Voltage	V _{FG}	I _{FG} =5mA	-	-	0.2	V
FGH Leak Current	I _{FG-LEAK}	V _{FG} =5V	-	-	1.0	uA

■ PWM INPUT BLOCK

PWM Input Frequency	f _{PWM}	-	2	-	50	kHz
Pullup resistance	R _{PWM}	-	-	200	-	kΩ
Input H Level Voltage1	V _{IHP1}	-	3.0	-	-	V
Input H Level Voltage2	V _{IHP2}	V _{DD} =2V	1.4	-	-	V
Input L Level Voltage1	V _{ILP1}	-	0	-	1.5	V
Input L Level Voltage2	V _{ILP2}	V _{DD} =2V	0	-	0.5	V

■ LOCK DETECT BLOCK

Lock Detect ON Time	t _{ON}	-	-	0.66	-	s
Lock Detect OFF Time	t _{OFF}	-	-	6.6	-	s
Lock Detect Ratio	t _{RATIO}	-	-	1:10	-	-

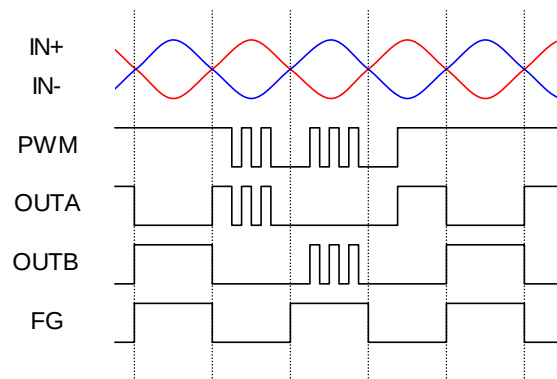
TRUTH TABLE

No.	IN+	IN -	PWM	TSD	LD	OUTA	OUTB	FG
1	H	L	H	OFF	OFF	H	L	L
2	L	H	H	OFF	OFF	L	H	Z
3	H	L	L	OFF	OFF	L	L	L
4	L	H	L	OFF	OFF	L	L	Z
5	H	L	H	ON	OFF	L	L	L
6	L	H	H	ON	OFF	L	L	Z
7	H	L	L	ON	OFF	L	L	L
8	L	H	L	ON	OFF	L	L	Z
9	H	L	H	OFF	ON	L	L	Z
10	L	H	H	OFF	ON	L	L	Z
11	H	L	L	OFF	ON	L	L	Z
12	L	H	L	OFF	ON	L	L	Z
13	H	L	H	ON	ON	L	L	Z
14	L	H	H	ON	ON	L	L	Z
15	H	L	L	ON	ON	L	L	Z
16	L	H	L	ON	ON	L	L	Z

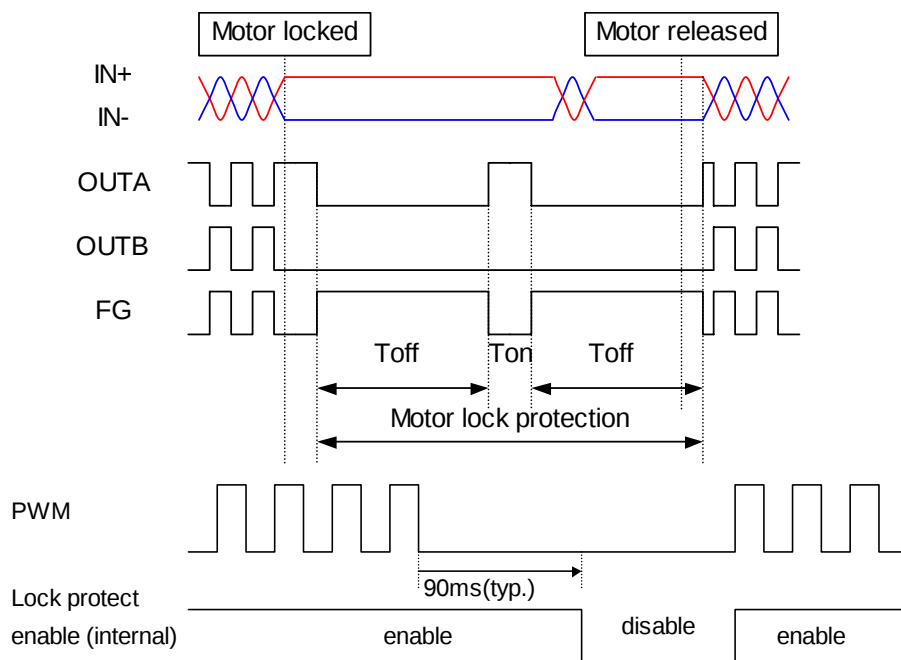
Z : High Impedance

*FG output turns to "L" when PWM "L" state is within fixed time(90ms typ.).

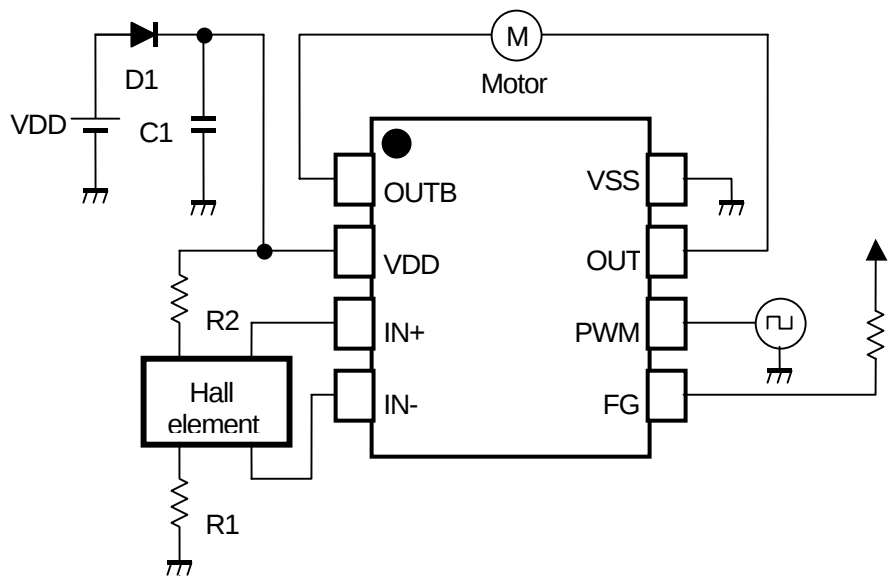
TIMING CHART at PWM



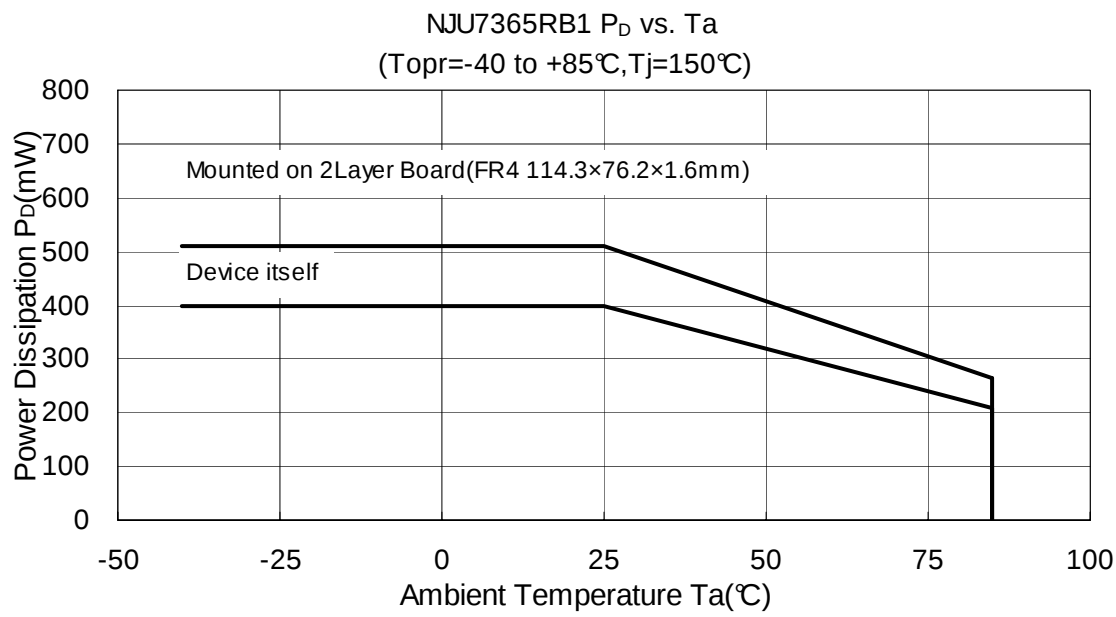
TIMING CHART at LOCK DETECT



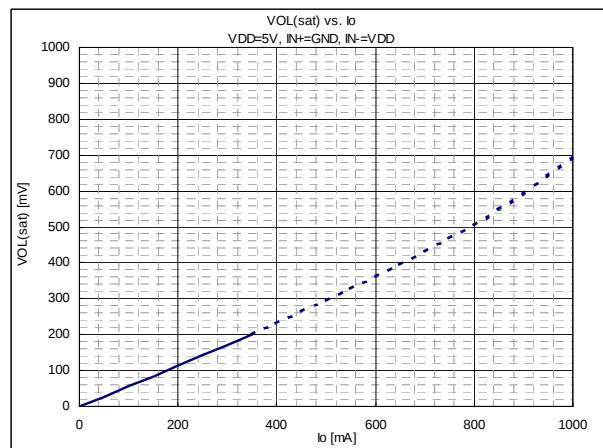
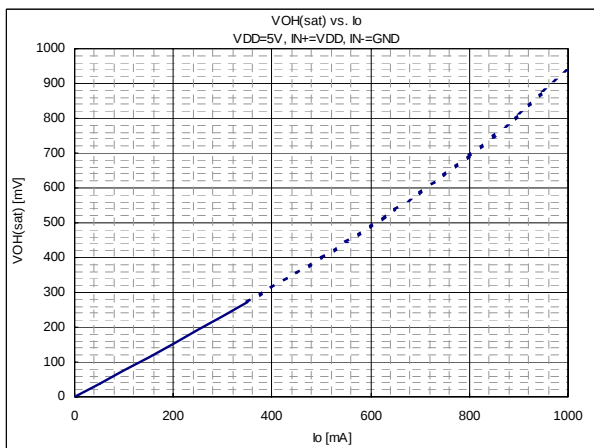
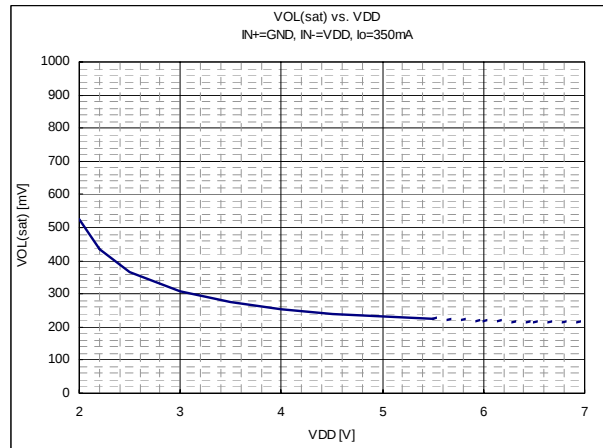
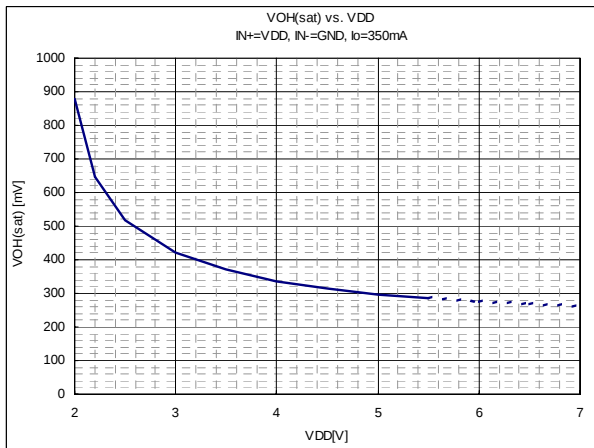
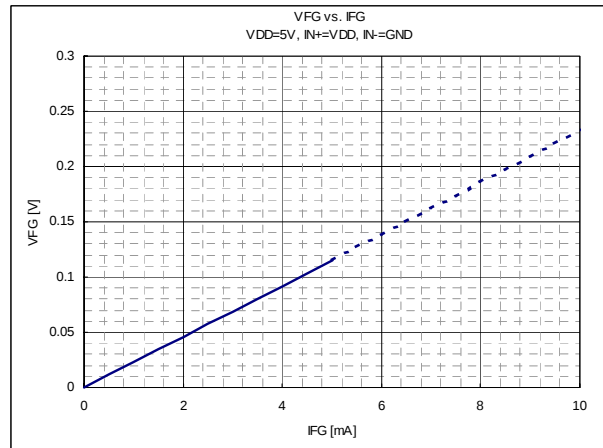
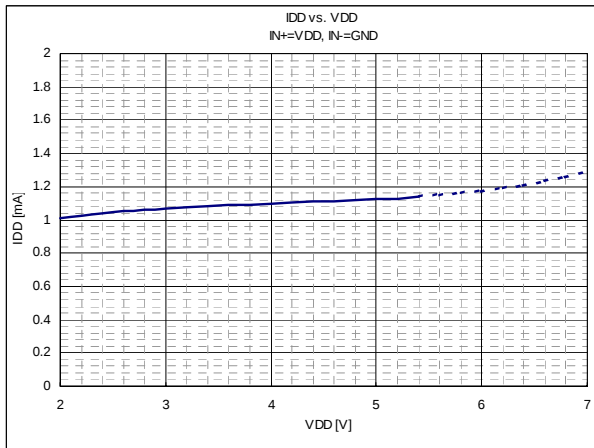
TYPICAL APPLICATION CIRCUIT



POWER DISSIPATION vs. AMBIENT TEMPERATURE



TYPICAL CHARACTERISTICS



[CAUTION]

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