

Single-phase DC Brushless Motor Driver IC

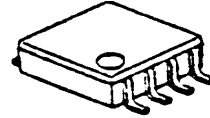
■ GENERAL DESCRIPTION

The NJU7367 is a single-phase motor driver IC. It features lock detect, FG output and thermal shutdown circuit functions.

The motor rotational speed is controlled by PWM input pulse.

The NJU7367 is available in a small and thin 8-lead MSOP(TVSP) package.

■ PACKAGE OUTLINE



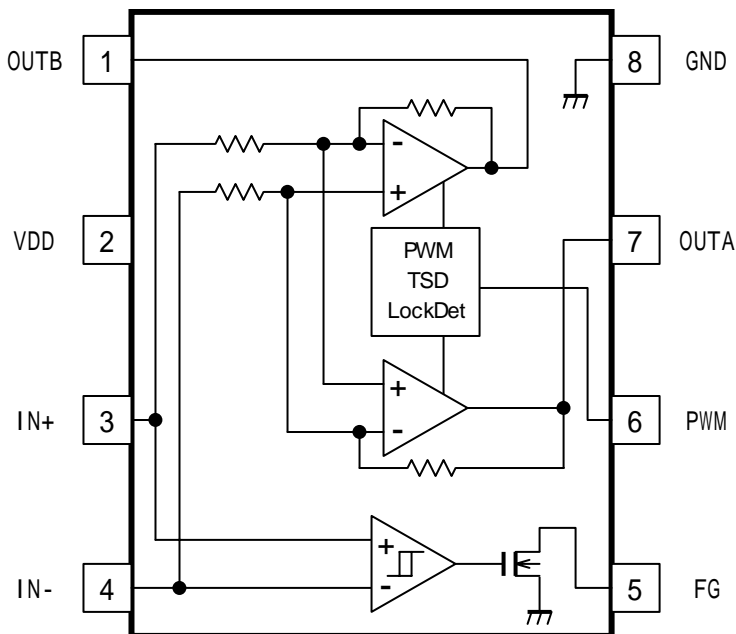
NJU7367RB1
(MSOP8 (TVSP8))

■ FEATURES

- Supply Voltage $V_{DD}=2.0$ to $5.5V$
- Low Quiescent Current $I_{DD}=1.0mA$ typ.
- Maximum Output Voltage $V_{OH}=4.8V$ typ. @ $I_o=+350mA$, $V_{OL}=0.2V$ typ. @ $I_o=-350mA$
- Input Offset Voltage $V_{IO}=\pm 10mV$
- 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

NJU7367

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS		UNIT
Supply Voltage	V _{DD}	+7.0		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}	700		mA
FG Output Current	I _{FG}	10		mA
FG Output Voltage	V _{FG}	+7.0		V
Power Dissipation	P _D	Device itself	400	mW
		Mounted on 2Layer Board (*1)	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

($V_{DD}=5V$, $T_a=25^{\circ}C$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
■ GENERAL						
Quiescent Current	I_{DD}	$I_{N+}=3.9V$, $I_{N-}=0.4V$	-	1.0	1.5	mA
Thermal Shutdown Operating Temperature	T_{TSD}	-	-	170	-	$^{\circ}C$
Thermal Shutdown Hysteresis	T_{HYS}	-	-	20	-	$^{\circ}C$
■ 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	-	-	44.5	-	dB
■ OUTPUT BLOCK						
Output Voltage	V_{OH}	$I_{O+}=+350mA$	4.7	4.8	-	V
	V_{OL}	$I_{O-}=-350mA$	-	0.2	0.3	V
FG L Output Voltage	V_{FG}	$I_{FG}=5mA$	-	-	0.2	V
FG H Leak Current	$I_{FG-LEAK}$	$V_{FG}=5V$	-	-	1.0	μA
■ PWM INPUT BLOCK						
PWM Input Frequency	f_{PWM}	-	2	-	50	kHz
Pullup resistance	R_{PWM}	-	-	200	-	k Ω
Input H Level Voltage1	V_{IHP}	-	2.4	-	5	V
Input L Level Voltage1	V_{ILP}	-	0	-	1.4	V
Input H Level Voltage2	V_{IHP}	$V_{DD}=2V$	1.1	-	2	V
Input L Level Voltage2	V_{ILP}	$V_{DD}=2V$	0	-	0.5	V
■ LOCK DETECT BLOCK						
Lock Detect ON Time	t_{ON}	-	-	0.5	-	s
Lock Detect OFF Time	t_{OFF}	-	-	5.0	-	s
Lock Detect Ratio	t_{RATIO}	-	-	1:10	-	-

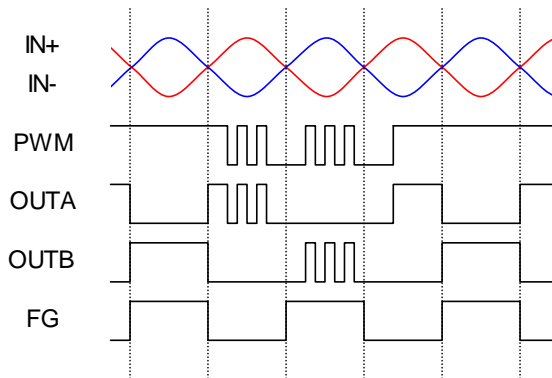
NJU7367

TRUTH TABLE

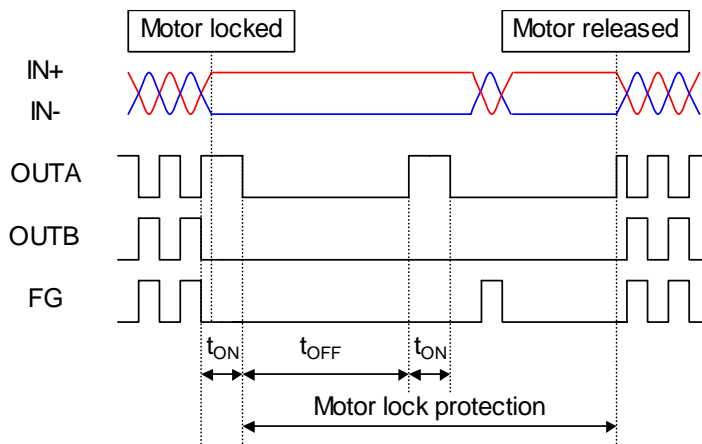
No.	IN+	IN -	PWM	TSD	LD	OUTA	OUTB	FG
1	H	L	H	OFF	OFF	H	L	L
2	L	H	H	OFF	OFF	L	H	Z
3	H	L	L	OFF	OFF	L	L	L
4	L	H	L	OFF	OFF	L	L	Z
5	H	L	H	ON	OFF	L	L	L
6	L	H	H	ON	OFF	L	L	Z
7	H	L	L	ON	OFF	L	L	L
8	L	H	L	ON	OFF	L	L	Z
9	H	L	H	OFF	ON	L	L	L
10	L	H	H	OFF	ON	L	L	Z
11	H	L	L	OFF	ON	L	L	L
12	L	H	L	OFF	ON	L	L	Z
13	H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

Z : High Impedance

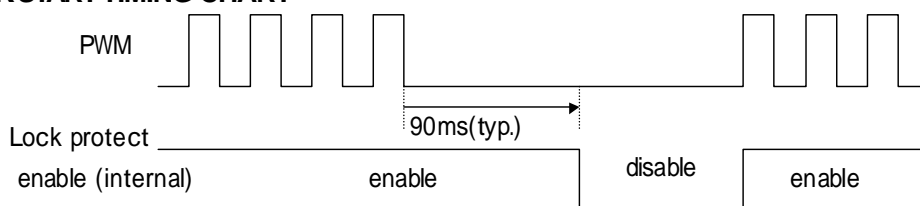
TIMING CHART at PWM



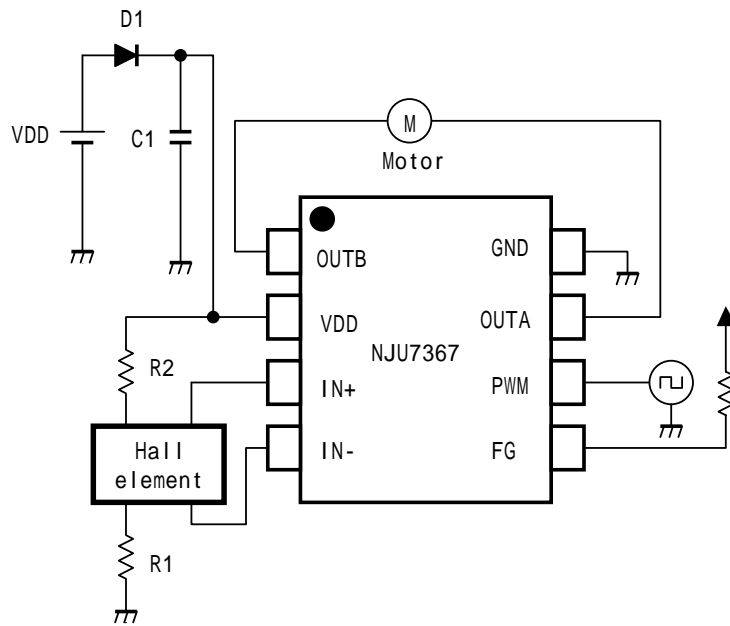
TIMING CHART at LOCK DETECT



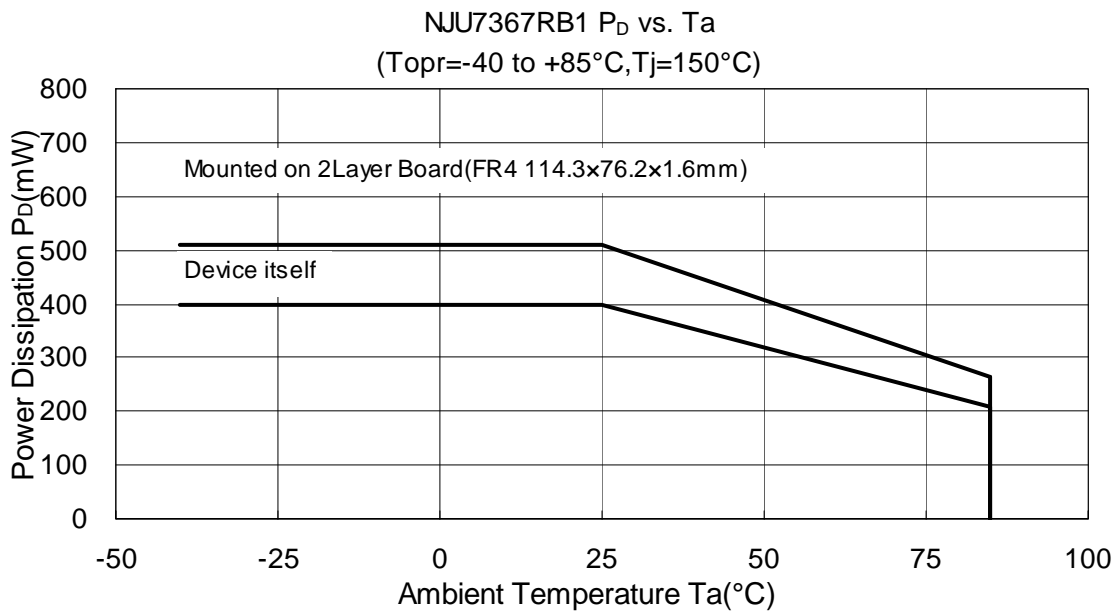
QUICK START TIMING CHART



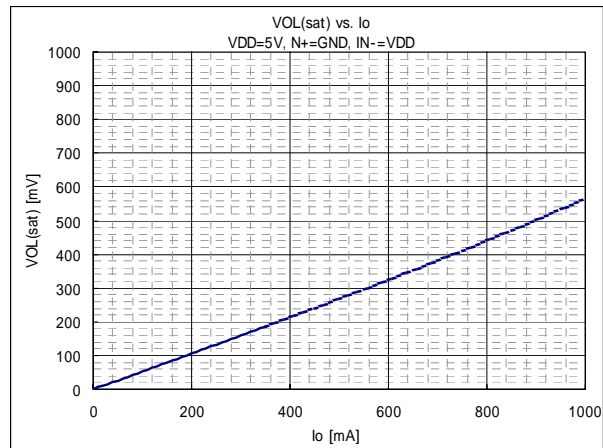
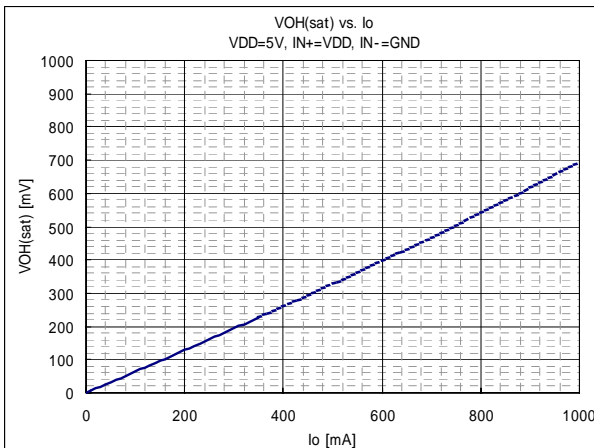
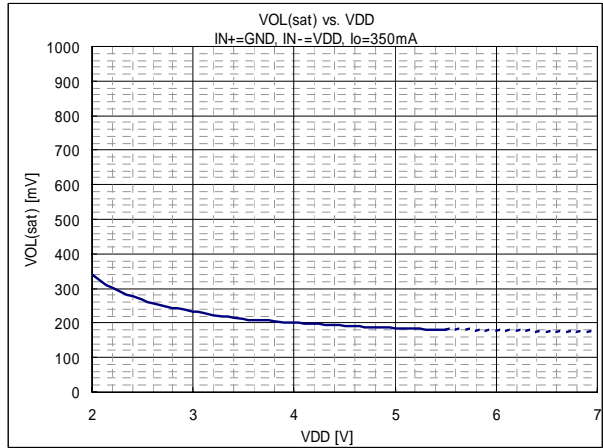
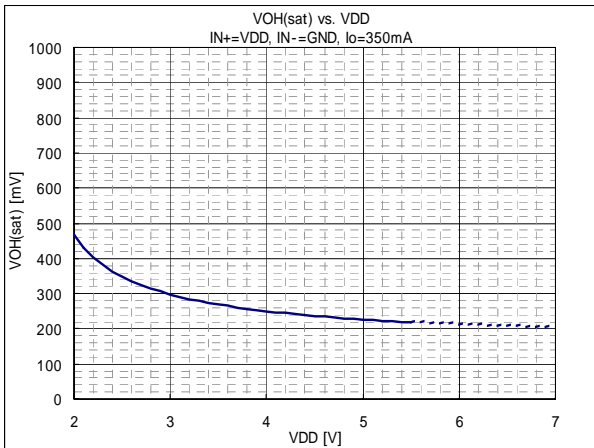
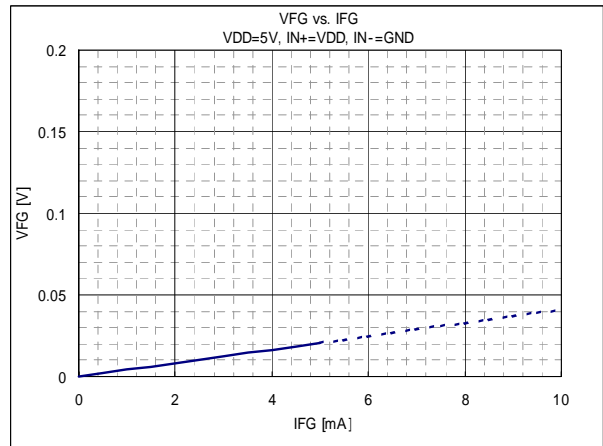
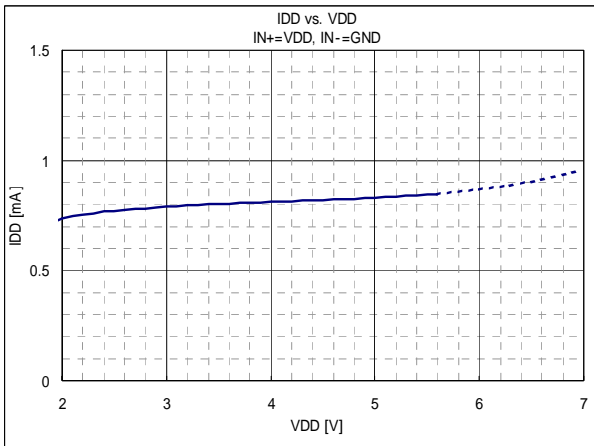
■ TYPICAL APPLICATION CIRCUIT



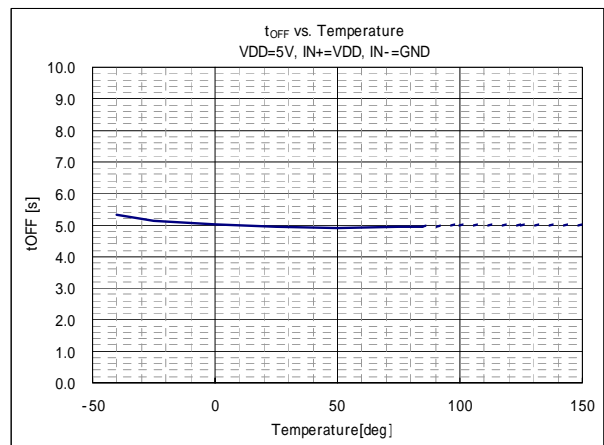
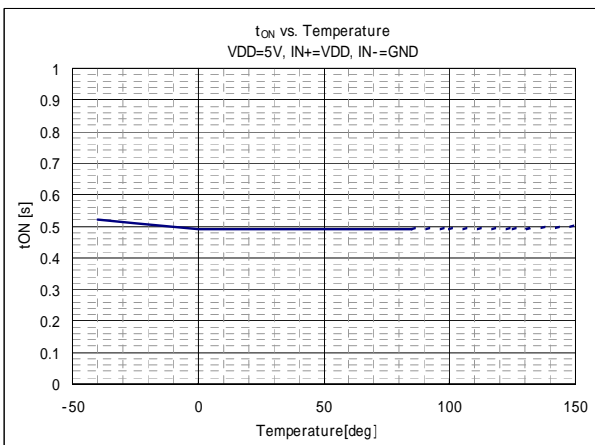
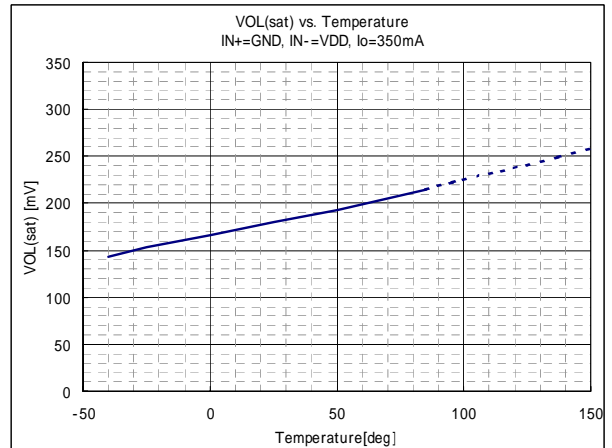
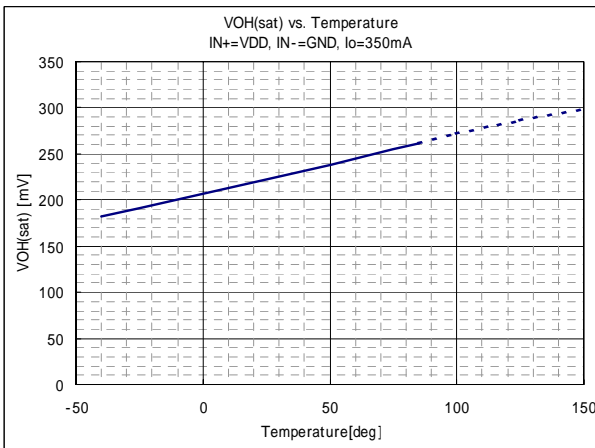
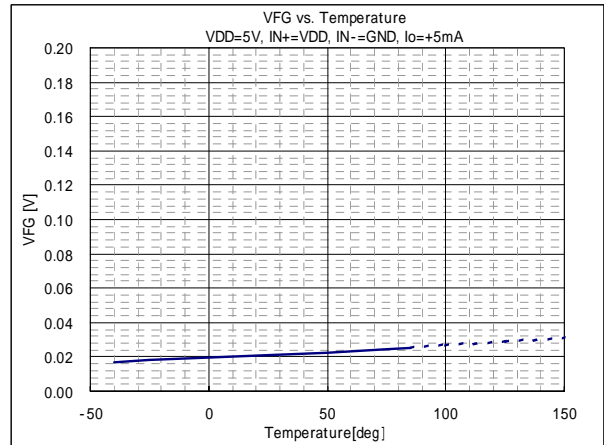
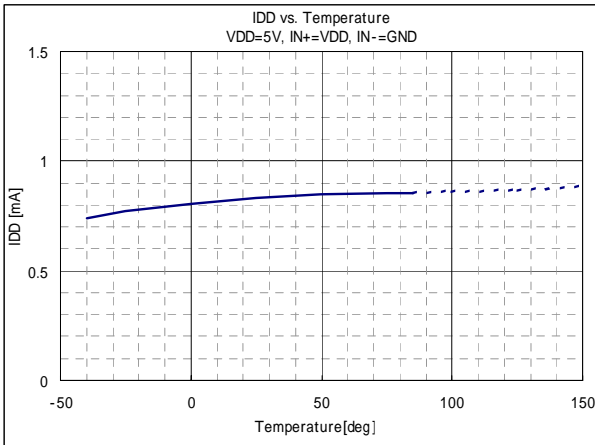
■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



[CAUTION]
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