

11-CT211

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FAN TACHOMETER IC



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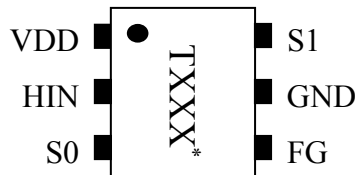
11-CT211

FAN TACHOMETER IC

General Specifications

The fan tachometer IC is designed for dividing a fan driver output frequency by 1.5, 2, 2.5 or 3. The dividing factor (1.5, 2, 2.5 or 3) is determined by the input selection pins, S1 and S0. With suitable output pull up, the fan tachometer output can be used directly with bipolar or MOS logic for motor speed monitoring/control.

Pin Assignment



Pin NO.	Pin Name	Description
1	VDD	Power supply pin
2	HIN	Input pin for a fan driver's output
3	S0	Input selection pin for a dividing factor
4	FG	Digital tachometer output pin (open-drain)
5	GND	Ground pin
6	S1	Input selection pin for a dividing factor

* The "TXXX" is a package marking of 11-CT211 where "T" is the product identification code for fan Tachometer ICs and "XXX" is a lot number, and therefore being subject to change.

Features and Benefits

- Optimized for Brushless DC Motor applications
- Thin, high reliability package (SOT-26)
- Low voltage operation down to 1.5 Volts

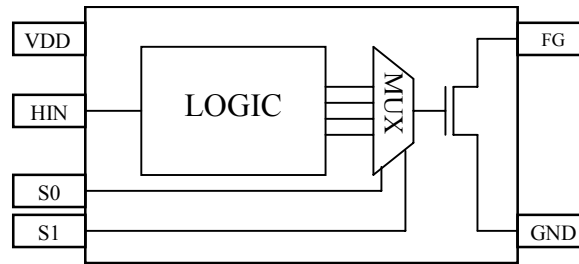
Absolute Maximum Ratings (Unless otherwise noted, $T_A = 25^\circ\text{C}$)

Characteristic	Symbol	Rating	Unit
Output Terminal Breakdown Voltage	V_{BD}	8	V
Supply Voltage	V_{DD}	6.5	V
Input Voltage (S0, S1)	V_{IN}	$V_{DD}+0.4$	V
Output Current (FG)	I_{OUT}	30	mA
Power Dissipation	P_D	15	mW
Operating Temp. Range	T_{OPR}	-25 ~ 100	$^\circ\text{C}$
Storage Temp. Range	T_{STG}	-55 ~ 150	$^\circ\text{C}$

Electrical Characteristic ($T_A = 25^\circ\text{C}$ & $V_{DD} = 5\text{V}$)

Item	Sym.	Conditions	Limits			Units
			Min	Typ	Max	
Supply Voltage	V_{DD}	Operating	2	5	6.5	V
Quiescent Current	I_{DD}	No load, All Inputs = 0V or V_{DD}	-	0.8	1.0	mA
Input : (HIN, S0, S1)						
Input Voltage "H"	V_{IH}	-	$0.8V_{DD}$	-	$V_{DD}+0.4$	V
Input Voltage "L"	V_{IL}	-	-0.4	-	$0.2V_{DD}$	V
Input Current "H"	I_{IH}	$V_{IN} = V_{DD}$	-	-	± 20	μA
Input Current "L"	I_{IL}	$V_{IN} = 0\text{V}$	-	-	± 20	μA
Open-Drain Output : (FG)						
Output Leakage Current	I_{Oleak}	$V_{OUT} = 5\text{V}$	-	-	5	μA
Output Current	I_{OUT}	$V_{OL} = 0.2\text{V}$	15	21	30	mA
Output Voltage High	V_{OH}	-	-	-	$V_{DD}+0.4$	V
Output Voltage Low	V_{OL}	$I_{OUT} = 10\text{ mA}$	-	0.1	0.2	V

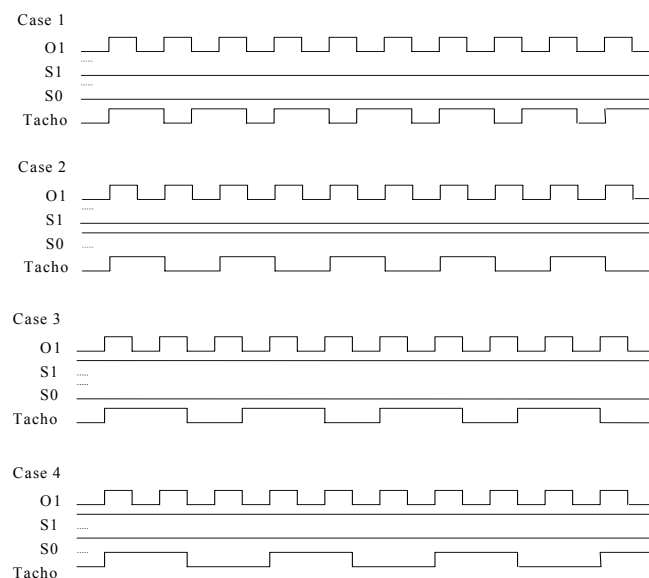
Block Diagram



Truth Table

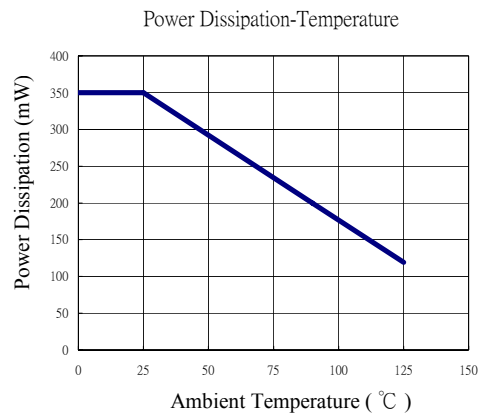
S1	S0	Duty Cycle	Dividing Factor
0	0	66.67%	1.5
0	1	50%	2
1	0	60%	2.5
1	1	50%	3

Time Diagram

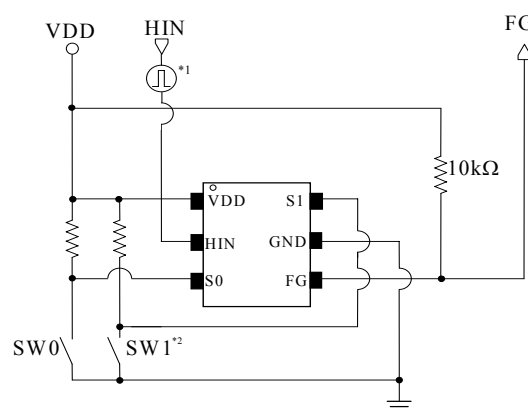


Application Note

1. The S0 and S1 pins of 11-CT211 are connected to either GND or VDD according to the dividing factor.
2. It is advisable to have a bypass capacitor or Zener Diode between VDD and GND as shown in the block diagram. The connection of this capacitor or Zener Diode will increase the maximum operating voltage and enhance the reliability for Brushless DC Motor application.
3. The power dissipated by the IC varies widely with the supply voltage, the output current, and loading. It is important to ensure the application does not exceed the allowable power dissipation of the IC package. The recommended motor driver power dissipation versus temperature is depicted as follows:



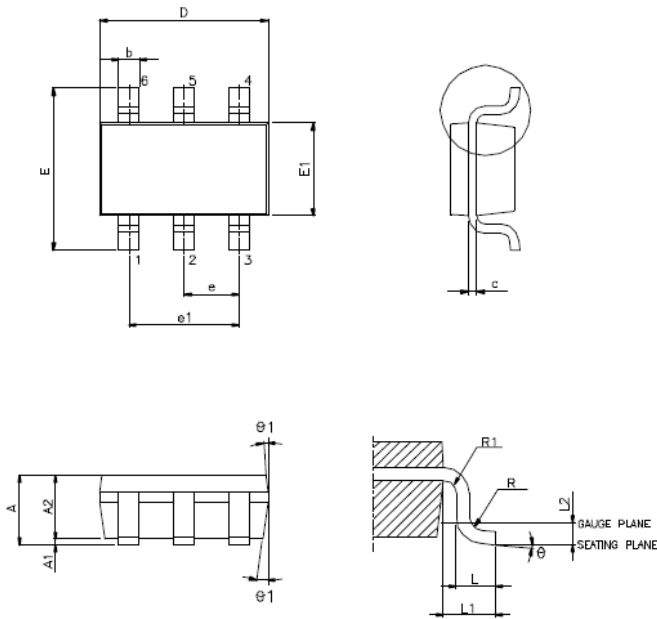
Test Circuit



*1 The input HIN is connected to a square wave signal (100Hz ~ 1KHz) from a function generator.

*2 Switch SW0 and SW1 are used to select a dividing factor.

Package Specifications (SOT-26)



Symbol	Dimension on Millimeter		
	MIN	NOM	MAX
A	1.000	1.225	1.450
A1	0.000	0.075	0.150
A2	0.700	1.000	1.300
b	0.300	0.400	0.500
c	0.080	0.165	0.250
D	2.700	2.900	3.100
E	2.600	2.800	3.000
e	0.950 BSC		
e1	1.900 BSC		
E1	1.400	1.600	1.800
L	0.300	0.450	0.600
L1	0.600 REF		
L2	0.250 BSC		
R	0.100	-	-
R1	0.100	-	0.250
θ°	0	5	9
θ1°	5	10	15

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