DIO20871B

Micro-power CMOS input RRIO 1.4V Open Drain Output Comparator

Features

- Ultra Low Power Consumption: 1.35μA (TYP) at V+ = 1.4V
- Wide Supply Voltage Range: 1.4V to 5.5V
- Propagation Delay: 1.3μs (TYP) at V+ = 1.4V
- Open Drain Output Sink Current Drive: 25mA (TYP) at V+ = 5V
- Rail-to-Rail Input
- -40°C to 85°C Operating Temperature Range
- Available in the Green SOT23-5 Package

Applications

- RC Timers
- Window Detectors
- IR Receiver
- Multivibrators
- Alarm and Monitoring Circuits

Descriptions

The DIO20871B is an ultra low-power comparator with a typical power supply current of 1.35μA. It has the best-in-class power supply current versus propagation delay performance. The propagation delay is as low as 1.3μs with 100mV overdrive at 1.4V supply.

Designed to operate over a wide range of supply voltages, from 1.4V to 5.5V, with guaranteed operation at 1.4V, 2.5V and 5.0V, the DIO20871B is ideal for use in a variety of battery-powered applications. With rail-to-rail common mode voltage range, the DIO20871B is well suited for single-supply operation.

Featuring an open drain output stage, the DIO20871B allows for operation with absolute minimum power consumption when driving any capacitive or resistive load.

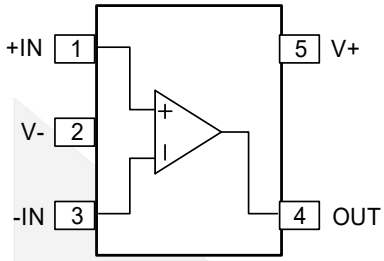
DIO20871B is available in the Green SOT23-5 package. The DIO20871B is ideal for use in handheld electronics and mobile phone applications. It is rated over the -40°C to 85°C temperature range.

Ordering Information

Order Part Number	Top Marking		T_A	Package	
DIO20871BST5	W861	Green	-40 to 85°C	SOT23-5	Tape & Reel, 3000

Pin Assignments

DIO20871B



SOT23-5

Figure 1 Pin Assignment (Top View)

Pin Description

Pin name	Description
OUT	Output
V-	Negative supply
+IN	Positive Input
-IN	Negative Input
V+	Positive supply

Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Rating” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter		Rating	Unit
Supply Voltage (V+ – V-)		7.5	V
Input Voltage		(V-)-0.5V to (V+)+0.5V	V
Differential Input Voltage		±2.5V	V
Operating Temperature Range (T_A)		-40 to 85	°C
Storage Temperature Range (T_{STO})		-55 to 150	°C
Junction Temperature (Tj)		160	°C
Lead Temperature Range		260	°C
ESD	HBM, JEDEC: JESD22-A114	4000	V
	CDM, JEDEC: JESD22-C101	400	

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation to ensure optimal performance to the datasheet specifications. DIOO does not recommend exceeding them or designing to Absolute Maximum Ratings.

Parameter	Rating	Unit
Supply Voltage	1.4 to 5.5	V
Operating Temperature Range	-40 to 85	°C

ELECTRICAL CHARACTERISTICS: V+ = 1.4V

(At T_A = 25°C, V_+ = 1.4V, V- = 0V, V_{CM} = V_+/2 and V_O= V-, unless otherwise noted.)

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Supply Current	I_S	-40°C≤T_A≤85°C, V_{CM} = 0.3V		1.25		μA
		-40°C≤T_A≤85°C , V_{CM} = 1.1V		1.4		
Output Swing High	V_{OH}	R_{PULL} = 5KΩ		1.4		V
		R_{PULL} = 10KΩ		1.4		
Output Swing Low	V_{OL}	R_{PULL} = 5KΩ		62		mV
		R_{PULL} = 10KΩ		31		
Output Current	I_{OUT}	Sink		1.4		mA
Propagation Delay (High to Low)		Overdrive = 10mV		2.6		μs
		Overdrive = 100mV		0.92		
Propagation Delay (Low to High)		Overdrive = 10mV		1.8		μs
		Overdrive = 100mV		1.3		
Rise Time(1)	t_{Rise}	Overdrive = 10mV, C_L= 1pF, R_{PULL} = 10KΩ		1		us
		Overdrive = 100mV,C_L= 1pF, R_{PULL} = 10KΩ		1		
Fall Time	t_{Fall}	Overdrive = 10mV, C_L= 1pF, R_{PULL} = 10KΩ		88		ns
		Overdrive = 100mV, C_L = 1pF, R_{PULL} = 10KΩ		87		

ELECTRICAL CHARACTERISTICS: V+ = 2.5V

(At T_A = 25°C, V_+ = 2.5V, V- = 0V, V_{CM} = V_+/2 and V_O= V-, unless otherwise noted.)

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Supply Current	I_S	-40°C≤T_A≤85°C, V_{CM} = 0.3V		1.35		μA
		-40°C≤T_A≤85°C , V_{CM} = 2.2V		1.45		
Output Swing High	V_{OH}	R_{PULL} = 5KΩ		2.5		V
		R_{PULL} = 10KΩ		2.5		
Output Swing Low	V_{OL}	R_{PULL} = 5KΩ		52		mV
		R_{PULL} = 10KΩ		26		
Output Current	I_{OUT}	Sink		7.1		mA
Propagation Delay (High to Low)		Overdrive = 10mV		2.4		μs
		Overdrive = 100mV		0.8		
Propagation Delay (Low to High)		Overdrive = 10mV		1.9		μs
		Overdrive = 100mV		1.05		
Rise Time(1)	t_{Rise}	Overdrive = 10mV, C_L= 1pF, R_{PULL} = 10KΩ		1		us
		Overdrive = 100mV,C_L= 1pF, R_{PULL} = 10KΩ		1		
Fall Time	t_{Fall}	Overdrive = 10mV, C_L= 1pF, R_{PULL} = 10KΩ		50		ns
		Overdrive = 100mV, C_L = 1pF, R_{PULL} = 10KΩ		40		

ELECTRICAL CHARACTERISTICS: V+ = 5.0V

(At T_A= 25°C, V_+= 5.0V, V- = 0V, V_{CM}= V_+/2 and V_O = V-, unless otherwise noted.)

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Supply Current	I_S	-40°C≤T_A≤85°C, V_{CM} = 0.3V		1.45		µA
		-40°C≤T_A≤85°C, V_{CM} = 4.7V		1.55		
Output Swing High	V_{OH}	R_{PULL} = 5KΩ		5.0		V
		R_{PULL} = 10KΩ		5.0		
Output Swing Low	V_{OL}	R_{PULL} = 5KΩ		60		mV
		R_{PULL} = 10KΩ		30		
Output Current	I_{OUT}	Sink		24.3		mA
Propagation Delay (High to Low)		Overdrive = 10mV		3.0		µs
		Overdrive = 100mV		0.9		
Propagation Delay (Low to High)		Overdrive = 10mV		2.7		µs
		Overdrive = 100mV		1.1		
Rise Time(1)	t_{Rise}	Overdrive = 10mV, C_L = 1pF, R_{PULL} = 10KΩ		1		us
		Overdrive= 100mV, C_L = 1pF, R_{PULL} = 10KΩ		1		
Fall Time	t_{Fall}	Overdrive = 10mV, C_L = 1pF, R_{PULL} = 10KΩ		43		ns
		Overdrive= 50mV, C_L = 1pF, R_{PULL} = 10KΩ		25		

Note:
(1) Rise time depend on R_{PULL} and C_L.

CONTACT US

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