

PRELIMINARY DATA SHEET

WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

- Wiegand Wire Sensor for energy harvesting multiturn encoders using the Wiegand effect to generate energy from a rotating magnetic field*
- Optimized for operation with the multiturn counter module iC-PMZ and iC-PMX from iC-Haus
- In surface mounted technology suitable for reflow process, RoHS 2 compatible
- 2,53mm or 4,68mm wire distance from top of seating plane
- High Pulse energy with typical 170 nJ average pulse energy
- Machine readable serial number provides perfect traceability

* The use of Wiegand Sensors, especially in rotary encoders, may be protected by worldwide patents of third parties and therefore may require licensing. For more information, please contact our support.



1. Signal Characteristics

Item No.	Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
101	Pulse peak-voltage	U_P	5,3				Valid for each trigger configuration (Figure 4) with $U_{P, Average} - 4\sigma > U_{P, min}$, analysis over 4*1000 pulses @20–27°C @6.8 ± 1% nF*
102	Pulse slew rate	S_R	200			V/ms	@20–27°C, 30% - 70% U_P
103	Pulse energy	E_P		170		nJ	@6.8 ± 1% nF*
104	Temperature drift V_{peak}	T_D		-0,008		V/K	

* Whilst other capacitor values are possible, use with 6.8nF capacitance is recommended for optimal pulse performance.

2. Electrical Characteristics

Item No.	Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
201	Coil resistance	R	340	365	390	Ω	@20–27°C, DC
202	Temp. Coefficient of Resistor	TC_R		$3,9 \cdot 10^{-3}$		1/K	
203	Inductance	L	10	11,3	12,5	mH	@1 kHz, magnet parallel to wire axis

PRELIMINARY DATA SHEET
WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

3. Environmental

Item No.	Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
301	Ambient operating temperature range	T_a	-40		+125	°C	
302	Relative humidity	rF			90%		No condensation
303	Shock Resistance	S_r			100	g	half sine 6 ms, EN 60068-2-27
304	Permanent shock resistance	S_{rp}			10	g	half sine 16 ms, EN 60068-2-29
305	Vibration Resistance	V_r			10	g	30 Hz-3000 Hz, EN 60068-2-6
306	Insulation Resistance	R_{ISO}	600			MΩ	Insulation resistance between pin and housing @ 1KV, Fluke 1577 isolation multimeter
307	Contact discharge	D_c			6	kV	IEC 61000-4-2
308	Air charge	D_A			8	kV	IEC 61000-4-2
309	Max. allowed external magnetic field to be applied to sensor not in operation	B_{exmax}			5	mT	e.g. important for storage and handling
310	Storage temperature	T_s	-40		+85	°C	

4. Measurement Conditions

Item No.	Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
401	Magnetic flux density at Wire	Bw	8.75		9.15	mT	Measured from wire to magnet surface
402	Distance magnet to wire	Wd	8.4	8.5	8.6	mm	Measured from wire to magnet surface, magnet positioned parallel to wire, pin-side of sensor. (FRABA magnet only)
403	Radial Assembly tolerance		-0.15		0.15		Measured from sensor centre – rotational axis
404	Magnet eccentricity				0.1	mm	
405	Load capacitor	C_L	6.7	6.8	6.9	nF	In parallel with IC-PM-Z (Figure 2)
406	Input resistance	R_M		10		MΩ	Measurement device
407	Input capacitance	C_M		12		pF	Measurement device
Remarks							
Magnet: Diametral magnet, SmCo, dimensions $\varnothing 8 \times 2.5$ mm (Figure 1), Type WS-Magnet-SmCo-DIA-8x2.5-A2, 10034032							
Data measured under ideal measuring conditions @2500rpm. Test setup is isolated from the external magnetic fields or other ferromagnetic components.							

PRELIMINARY DATA SHEET
WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

5. Magnet System

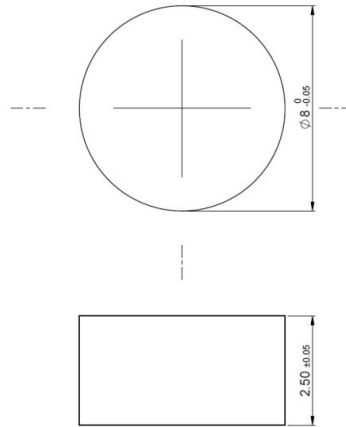


Figure 1

6. Test Circuit

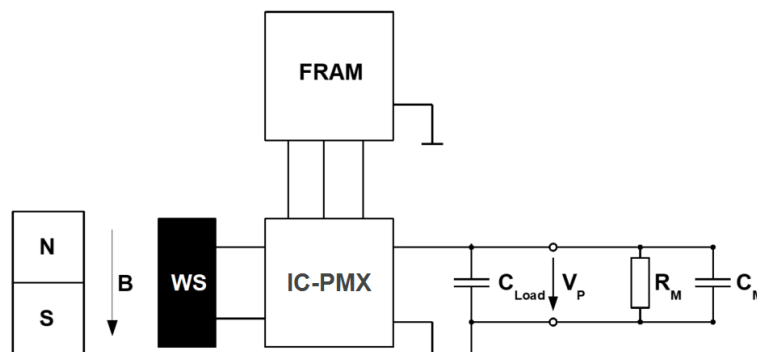


Figure 2

7. Typical Signal Wave

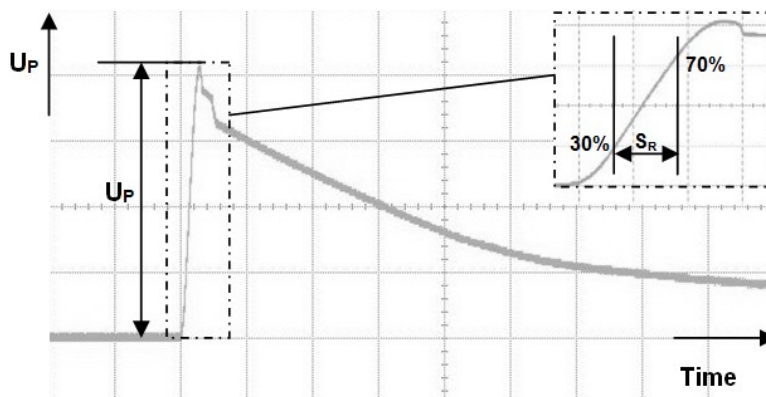


Figure 3

PRELIMINARY DATA SHEET
WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

8. Declaration Trigger Point

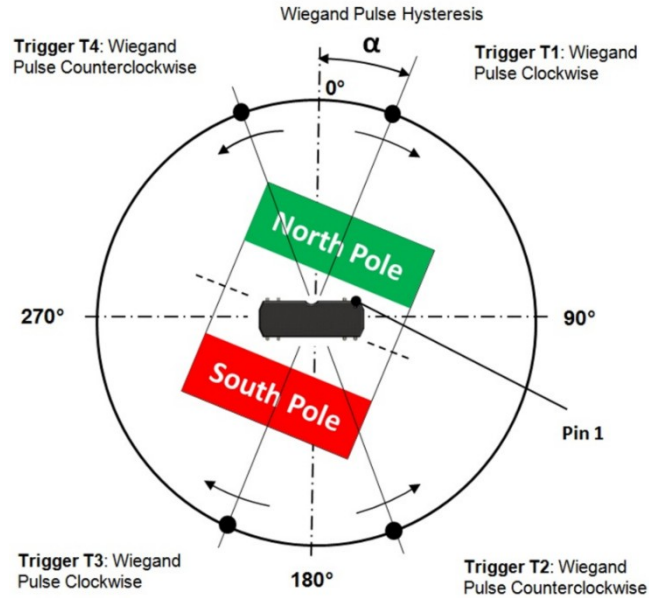
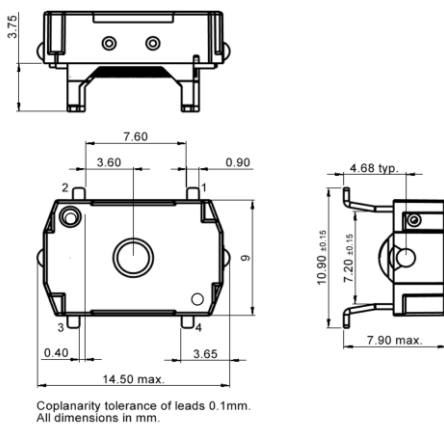


Figure 4

Wiegand Pulse Hysteresis can differ between Wiegand sensor models and should be evaluated again in their respective use cases.

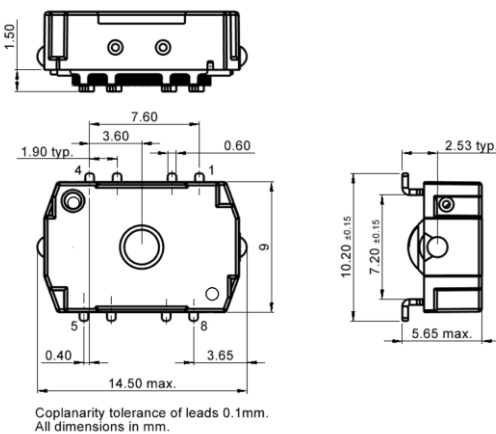
9. Component Dimension

WS-CTS



Note, Pin 1..2 and Pin 3..4 are electrically connected

WS-CFS



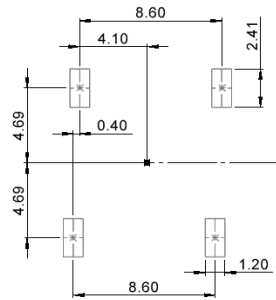
Note, Pin 1...4 and Pin 5..8 are electrically connected



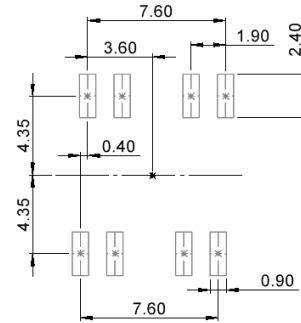
PRELIMINARY DATA SHEET

WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

10. Land Pattern Dimension

WS-CTS

All dimensions in mm.

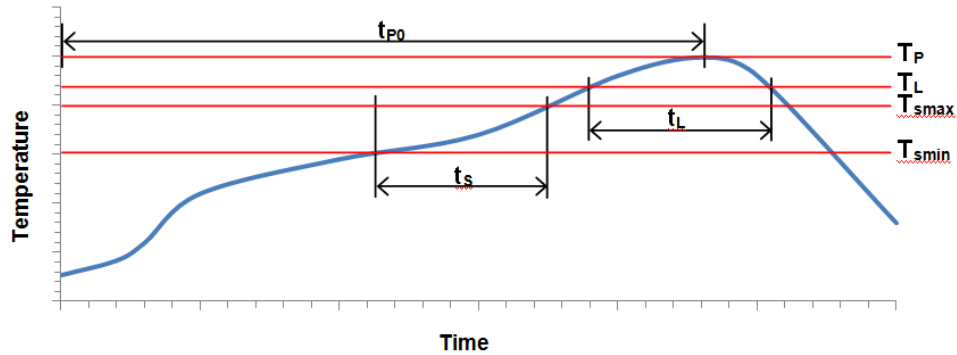
WS-CFS

All dimensions in mm.

Remarks
SMD package, suitable for reflow process
RoHS 2 Compatible

PRELIMINARY DATA SHEET
WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

11. Reflow Profile



Item No.	Parameter	Symbol	Min.	Typ.	Max	Unit	Conditions
1101	Liquidous temperature	T_L		217		°C	Soldering paste material: Sn95.5Ag4Cu0.5
1102	Time maintained above T_L	t_L		60		s	
1103	Peak package body temperature	T_P		249		°C	
1104	Time 25 °C to T_P	t_{PO}		230		s	
1105	Preheat / Soak temperature min	T_{smin}		150		°C	
1106	Preheat / Soak temperature max	T_{smax}		200		°C	
1107	Time from T_{smin} to T_{smax}	t_s		70		s	
1108	Ramp-up rate (T_L to T_P)			0.9	3	K / s	
1109	Ramp-down rate (T_P to T_L)			1.3	6	K / s	
1110	Reflow soldering speed	v_s		1000.0		mm / min	reflow soldering machine: Linie VX-nitro-3500 (Type 734)

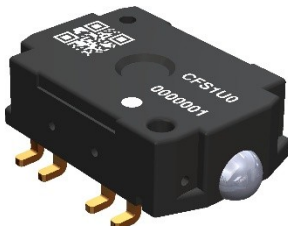


PRELIMINARY DATA SHEET

12. Labeling and Ordering Information

Laser-marked on top surface in human and machine-readable **QR** code format

Encoding: Type [space] 7-digit serial number
i.e. CFS0U0 0000001



Laser-marked on top surface in human and machine-readable **QR** code format

Encoding: Type [space] 7-digit serial number
i.e. CTS0U0 0000001

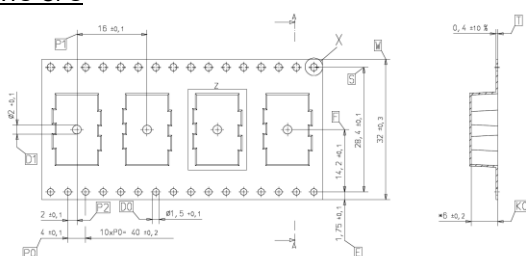


Article Name	Article No.	Article Name	Article No.
WS-Sensor-WS-CFS-1-U0 on reel	10074703	WS-Sensor-WS-CTS-1-U0 on reel	10069425

13. Packaging Information

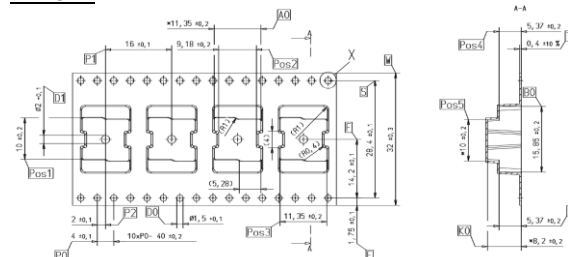
32mm wide carrier tape on 13-inch Klik reel (10034118), in vacuum-sealed ESD bag

Standard packing quantity 550 pcs/reel

WS-CFS

Carrier tape article no.: 10069152

WS-CTS



Carrier tape article no.: 10067845

The packaging method may be different for non-standard quantities.

PRELIMINARY DATA SHEET
WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

14. Revision History

Rev.:	Date	BY	Remarks
1.0	28.08.2022	BBA	First draft
1.1	28.4.2023	MLO	Resistance Spec changed
1.2	17.11.2023	EKE	Combined for CTS and CFS U0 version.
1.3	17.01.2025	EKE	Removed item 406 and re-numbered. Combined section 14 into section 12. Updated section 15 contact information. Updated end of document disclaimer.
1.4	12.02.2025	EKE	Additional remarks to section 4 & 8. Corrected section 12.
2.0a	14.03.2025	EKE	Updated licensing note on Pg. 1 Changes for up-revision to CXS-1-U0. Updated graphic renders and section 9 images. Updated article information in section 12.

Editor: EKE
Reviewer: TBE
Date: 14 Apr 2025
Module Type: WS-CTS/CFS-1-U0



PRELIMINARY DATA SHEET
WIEGAND WIRE SENSOR WS-CTS/CFS-1-U0

15. Technical Information

For technical support, information about prices and terms of delivery please go to

<https://www.posital.com/>

<https://ubito.com/>

✉ support@fraba.com

All dimensions in [inch] mm. The information and figures contained are for general presentation purposes only. Please refer to <https://ubito.com/en/resources> for detailed technical drawings.

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