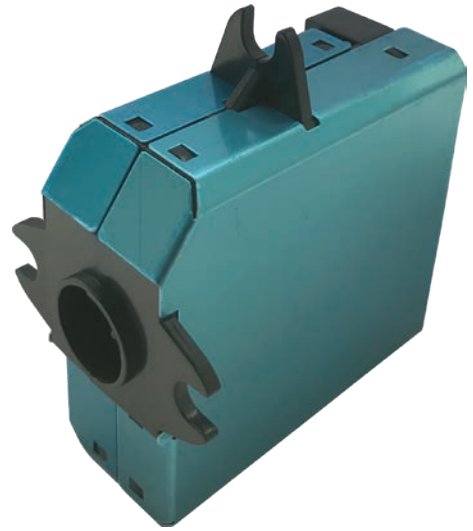




SM-UART-01D

Dual Channel Dust Sensor



Telaire SM-UART-01D Dual Channel Dust Sensor is designed to operate in harsh environments and provides enhanced performance, as well as reliability, compared to traditional single-channel solution. With patented¹ dual optical channel design, it leverages the strengths of both laser

and infrared (IR) solutions, allowing the customer to achieve excellent balance between system performance and reliability. The Dual Channel Dust Sensor is an ideal solution for automotive applications.

Applications

- Automotive
- HVAC
- Air Conditioners
- Air Purifiers
- Air Quality Monitoring Systems

Features

- Dual Optical Channels
- High Accuracy
- Fast Response
- High Reliability
- Programmable Output
- Automotive Grade Design
- Compact Size
- Flexible Mounting Style

Amphenol
Advanced Sensors

Specifications

Pin Configuration

Pin Name	Pin Number	Pin Type
VCC	1	12V Power In
TX	2	Sensor TX
NTC+	3	NTC positive pin
RX	4	Sensor RX
NTC-	5	NTC negative pin
GND	6	12V Power Return

6-pin connector: YAZAKI 7282-8663 Cable Assembly: KET MG651439

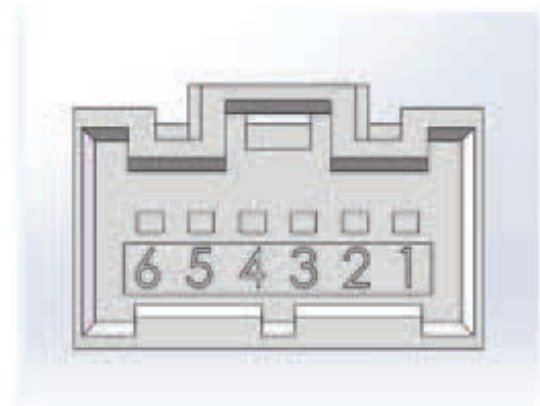
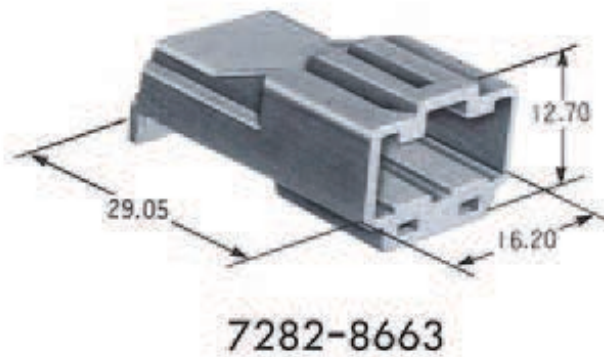


Figure 1

Communication Protocol

Parameter	Value
Baud Rate	9600 bps
Data Bits	8
Stop Bits	1
Parity Check	None

Absolute Maximum Operation Conditions

Symbol	Parameter	Min. Value	Typ. Value	Max. Value	Unit
V_{CC}	Supply Voltage	0	-	24	V
$V_{IN}^{[1]}$	IO Input Voltage	-0.3	-	VCC	V
$IO^{[2]}$	IO Output Current	-	-	1	mA
T_S	Storage Temp	-40	-	+70	°C
T_A	Operating Temp	-10	-	+70	°C
RHS ^[3]	Storage Humid	5	-	95	%
RHA ^[3]	Operating Temp	5	-	95	%

1. RX pin
2. TX pin
3. Non-condensing

Recommended Operation Conditions

Symbol	Parameter	Min. Value	Typ. Value	Max. Value	Unit
V_{CC}	Supply Voltage	9	-	16	V
T_S	Storage Temp.	-	25	-	°C
T_A	Operating Temp.	-	25	-	°C
RHS ^[3]	Storage Humidity	45	-	55	%
RHA ^[3]	Operating Temp.	45	-	55	%

3. Non-condensing

DC Electrical Characteristics

Symbol	Parameter	Test Condition	Min. Value	Typ. Value	Max. Value	Unit
V_{CC}	Supply Voltage		9	12	16	V
PSRR	Supply Noise Rejection Ratio	$V_{CC}=12.0V$, $F_{RIPPLE}=120Hz$	-	75 ^[1]	-	dB
		$V_{CC}=12.0V$, $F_{RIPPLE}=20KHz$	-	65 ^[1]	-	dB
I_{CC_IR}	IR LED Supply Current	$V_{CC}=12.0V$	-	13	-	mA
I_{CC_LA}	Laser LED Supply Current		-	16	-	mA
I_{CC_FAN}	FAN Supply Current		-	16	-	mA
I_{CC_MISC}	Other Circuitry Supply Current		-	11	-	mA
I_{STDBY}	Supply Current (Standby Mode)		-	11	-	mA
V_{OH}	Output High Voltage	$V_{CC}=12.0V$	10.8	-	12	V
V_{OL}	Output Low Voltage	$V_{CC}=12.0V$	0	-	1.2	V
I_{OH}	Output High Source Current	$V_{CC}=12.0V$	-	-	1	mA
I_{OL}	Output Low Sink Current	$V_{CC}=12.0V$	1	-	-	mA
V_{IH}	Input High Voltage	$V_{CC}=12.0V$	10.8	-	12	V
V_{IL}	Input Low Voltage	$V_{CC}=12.0V$	0	-	1.2	V

1. Guaranteed by design

Specifications

AC Electrical Characteristics

Symbol	Parameter	Test Condition	Min. Value	Typ. Value	Max. Value	Unit
T_{PON}	Power On Time	VCC=12.0V	20	-	-	s
T_{MEAS}	Settling Time	VCC=12.0V	5 ^[1] 22 30 ^[2]	-	-	s
DR	Date Rate	-	-	1	-	1/Hz
BR	Baud Rate	-	-	9600	-	bps
E_{BR}	Error of Baud Rate	$T_A=25^{\circ}C$	-1 ^[3]	-	+1 ^[3]	%
		$T_A=-40^{\circ}C \sim +85^{\circ}C$	-5 ^[3]	-	+5 ^[3]	%

1. From Laser settling time
2. From IR settling time
3. Guaranteed by design

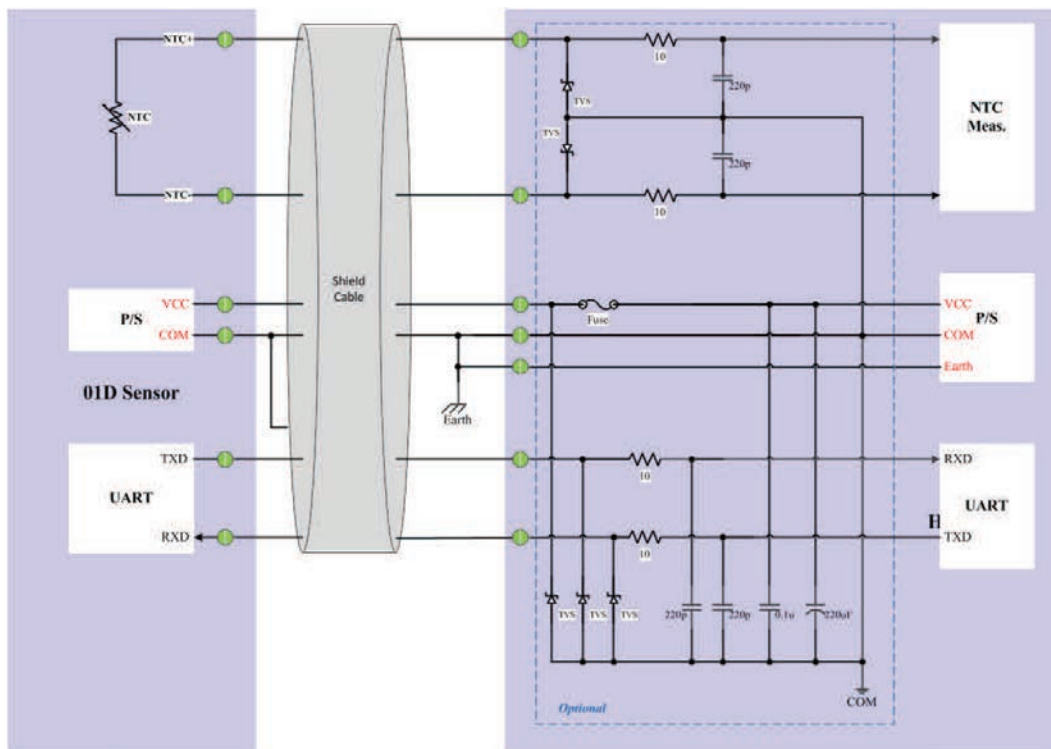


Figure 2

- Shielding cable is recommended in harsh environments. Length of the cable should be kept as short as possible (< 20cm).
- Fuse, TVS, resistors and capacitors are also recommended for better EMI/EMC performance. These are not mandatory, however, in low cost designs.
- +12V power supply shall be well decoupled for better performance.

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