TWO-WIRE TRANSMITTER "SMART" PROGRAMMABLE WITH SIGNAL CONDITIONING

FEATURES

- **Complete Transmitter + RTD Linearization**
- **Two-Wire Output**
- **Eliminates Potentiometers and Trimming**
- **Digitally Calibrated**
- **Serial SPI Bus Interface**

APPLICATIONS

- **Remote RTD Transmitters**
- **Pressure Bridge Transmitters**
- **Strain Gate Transmitters**
- **SCADA Remote Data Acquisition**
- **Weighing Systems**
- **Industrial Process Control**

DESCRIPTION

The XTR108 is a “smart” programmable, two-wire transmitter designed for temperature and bridge sensors. Zero, span, and linearization errors in the analog signal path can be calibrated via a standard digital serial interface, eliminating manual trimming. Non-volatile external EEPROM stores calibration settings.

The all-analog signal path contains an input multiplexer, autozeroed programmable-gain instrumentation amplifier, dual programmable current sources, linearization circuit, voltage reference, sub-regulator, internal oscillator, control logic, and an output current amplifier. Programmable level shifting compensates for sensor DC offsets. Selectable up- and down-scale output indicates out-of-range and burnout per NAMUR NE43. Automatic reset is initiated when supply is lost.

Current sources, steered through the multiplexer, can be used to directly excite RTD temperature sensors, pressure bridges, or other transducers. An uncommitted operational amplifier can be used to convert current into a voltage.

ORDERING INFORMATION(1)

PRODUCT	PACKAGE DESIGNATOR	PACKAGE(2)	ORDERABLE PART NUMBER	PACKAGE QUANTITY
XTR108	TD	Bare die in waffle pack	XTR108TDD1	130
			XTR108TDD2	10

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.

(2) Processing is per the Texas Instruments commercial production baseline and is in compliance with the Texas Instruments Quality Control System in effect at the time of manufacture. Electrical screening consists of DC parametric and functional testing at room temperature only. Unless otherwise specified by Texas Instruments AC performance and performance over temperature is not warranted. Visual Inspection is performed in accordance with MIL-STD-883 Test Method 2010 Condition B at 75X minimum.

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

BARE DIE INFORMATION

DIE THICKNESS	BACKSIDE FINISH	BACKSIDE POTENTIAL	BOND PAD METALLIZATION COMPOSITION	BOND PAD THICKNESS
15.5 mils.	Silicon with backgrind	Floating	Ti/AlSiCu/TiN	800 nm

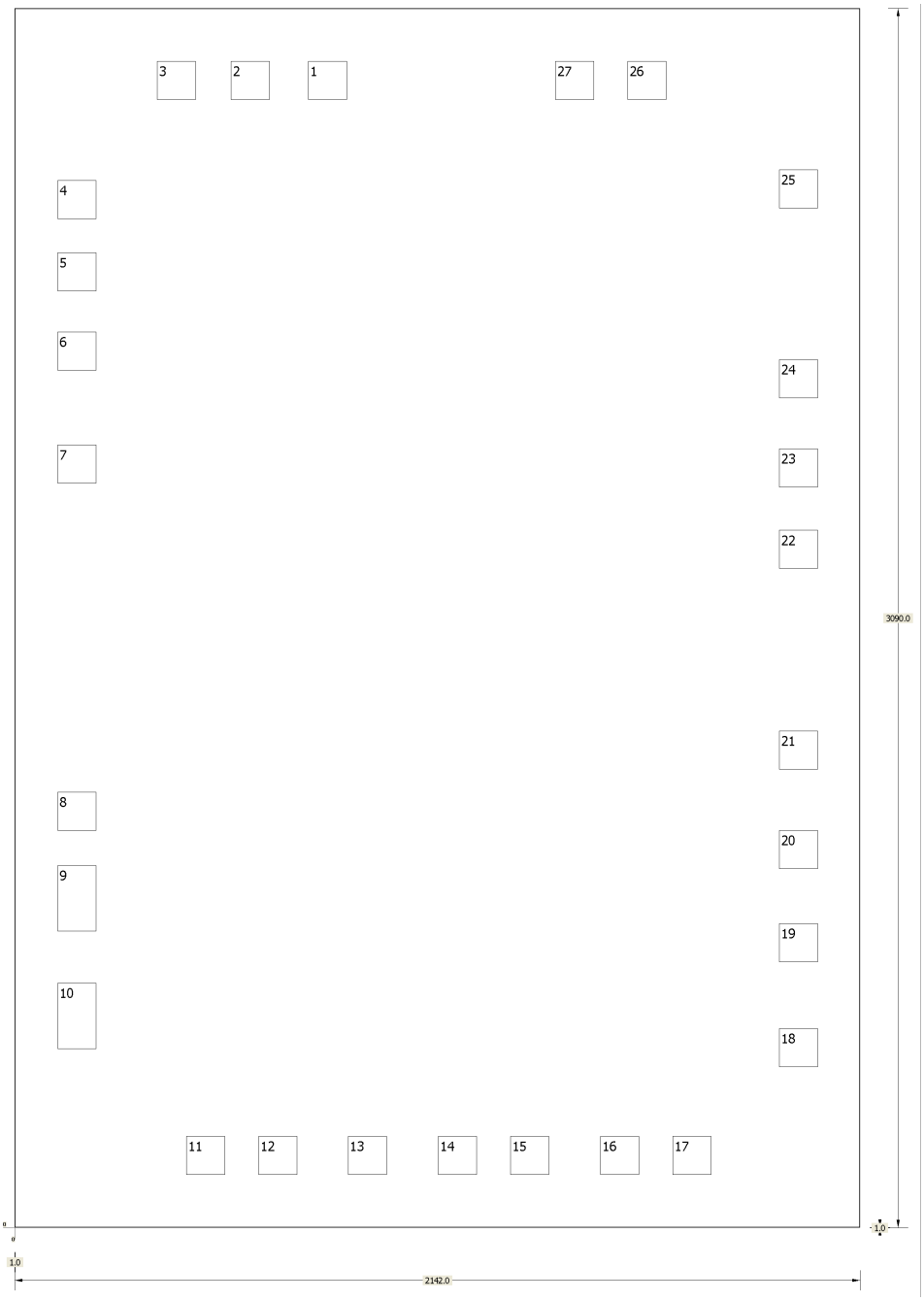

Table 1. Bond Pad Coordinates in Microns(1)

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
V/I-0	1	643.35	2732.35	741.35	2830.35
V/I-1	2	447.05	2732.35	545.05	2830.35
V/I-2	3	259.85	2732.35	357.85	2830.35
V/I-3	4	7.8	2430.35	105.8	2528.35
V/I-4	5	7.8	2247.2	105.8	2345.2
V/I-5	6	7.8	2045.55	105.8	2143.55
C_{FILTER}	7	7.8	1760.25	105.8	1858.25
R_{LIN}	8	7.8	879.7	105.8	977.7
V_O	9	7.8	625.35	105.8	791.85
I_{IN}	10	7.8	327.4	105.8	493.9
I_O	11	333.7	7.65	431.7	105.65
I_{RET}	12	516.7	7.65	614.7	105.65
I_{RET}	13	743.5	7.65	841.5	105.65
I_{RET}	14	971.7	7.65	1069.7	105.65
V_S	15	1154.7	7.65	1252.7	105.65
V_S	16	1382.9	7.65	1480.9	105.65
V_{GATE}	17	1565.9	7.65	1663.9	105.65
$\overline{CS2}$	18	1835.6	281	1933.6	379
SDIO	19	1835.6	547.35	1933.6	645.35
SCLK	20	1835.6	782.9	1933.6	880.9
$\overline{CS1}$	21	1835.6	1035	1933.6	1133
R_{SET}	22	1835.6	1543.5	1933.6	1641.5
REF_{IN}	23	1835.6	1749.75	1933.6	1847.75
REF_{OUT}	24	1835.6	1976.25	1933.6	2074.25
OPA OUT	25	1835.6	2457.25	1933.6	2555.25
OPA -IN	26	1451.8	2732.35	1549.8	2830.35
OPA +IN	27	1268.8	2732.35	1366.8	2830.35

(1) Substrate is N/C.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/ Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
XTR108TDD1	ACTIVE			0	130	TBD	Call TI	N / A for Pkg Type	
XTR108TDD2	ACTIVE			0	10	TBD	Call TI	N / A for Pkg Type	

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
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Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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