

General Description

The 2901L is a quad channel voltage comparators with very low input offset voltage specification. They are designed to operate from a single power supply over a wide range of voltages, however operation from split power supplies is also possible. They offer low power supply current independent of the magnitude of the power supply voltage. This comparator is designed to directly interface with TTL and CMOS. When operating from both plus and minus power supplies, the comparator could directly interface with MOS logic where their low power drain is a distinct advantage over standard comparator. The quad of LTA2901L is offered in SOIC-14L and TSSOP-14L packages.

Features and Benefits

- Wide Supply: 3.0V to 36V
- Faster Response Time: 0.9 μ s (typical)
- Low Offset Voltage: ± 2 mV (typical)
- Low Input Bias Current: 23nA (typical)
- Large Voltage Gain: 100 dB (typical)
- Open Collector Output
- Input Common-Mode Voltage Range Includes Ground
- Differential Input Voltage Range Equal To Power Supply
- Extended Temperature Range: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

Applications

- Industrial Application
- Solar Inverter
- White Goods
- Battery Management
- System Medical Equipment

Pin Configuration (Top View)

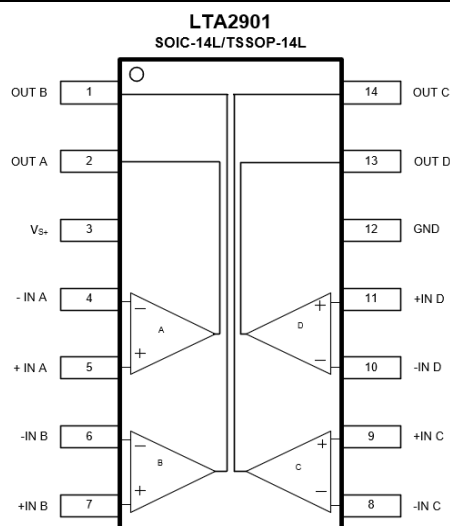


Table of Content

General Description 1

Features and Benefits 1

Applications 1

Pin Configuration (Top View)..... 1

Table of Content 2

Ordering Information..... 3

PIN Configuration 4

Limiting Value 5

ESD Ratings 5

Thermal Information 5

Electrical Characteristics 6

Typical Characteristics 7

Tape and Reel Information 8

Package Outlines 9

Important Notice 11

Ordering Information

Type Number	Package Name	Package Quantity	Eco Class
LTA2901LXS14/R5	SOIC-14L	Tape and Reel, 2500	Green (RoHS & no Sb/Br)
LTA2901LXT14/R6	TSSOP-14L	Tape and Reel, 3000	Green (RoHS & no Sb/Br)

(1) Please contact to your Linearin representative for the latest availability information and product content details.

(2) Eco Class - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & Halogen Free).

(3) There may be multiple device markings, or additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

PIN Configuration

PIN Name	LTA2901L	Description
-IN B	6	Inverting input, channel B
+IN B	7	Noninverting input, channel B
-IN A	4	Inverting input, channel A
+IN A	5	Noninverting input, channel A
-IN C	8	Inverting input, channel C
+IN C	9	Noninverting input, channel C
-IN D	10	Inverting input, channel D
+IN D	11	Noninverting input, channel D
OUT B	1	Output, channel B
OUT A	2	Output, channel A
OUT C	14	Output, channel C
OUT D	13	Output, channel D
V _{S+}	3	Positive (highest) power supply
GND	12	Ground

Limiting Value

In accordance with the Absolute Maximum Rating System (IEC60134).

Parameter	Absolute Maximum Rating
Supply Voltage, V_{S+} to V_{S-}	36 V
Signal Input Terminals: Voltage	$V_{S-} - 0.3V$ to V_{S+}
Output Short-Circuit	Continuous
Storage Temperature Range, T_{stg}	-65 °C to +150 °C
Junction Temperature, T_j	150 °C
Lead Temperature Range (Soldering 10 sec)	260 °C

ESD Ratings

Parameter	Level	UNIT
Human body model (HBM), per ANSI/ESDA/JEDEC JS-001	700	V
Charged device model (CDM), per ANSI/ESDA/JEDEC JS-002	2000	V

Thermal Information

Thermal Metric	Package	Level	Unit
θ_{JA} Package Thermal Resistance	SOIC-14L	160	°C/W
	TSSOP-14L	180	

Electrical Characteristics

$V_S = +5.0\text{ V}$, $T_A = 25^\circ\text{C}$, unless otherwise noted.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
DC PERFORMANCE						
Input Offset Voltage	V _{OS}	V _{IC} = V _{CM} Min, V _{OUT} = 1.4V, V _{cc} = 5V to Max, R _S = 0 Ω		±2	±7	mV
		V _{IC} = V _{CM} Min, V _{OUT} = 1.4V, V _{cc} = 5V to Max, R _S = 0 Ω, T _A = -40°C to +125°C			±10	
Input Bias Current	I _B	V _{CM} = 0		-23	-200	nA
		V _{CM} = 0, T _A = -40°C to 125°C			-500	
Input Offset Current	I _{OS}	V _{CM} = 0		2	100	nA
		V _{CM} = 0, T _A = -40°C to 125°C			200	
Open-loop voltage gain	A _{VOL}	V _S = 15V, V _{OUT} = 1.0V to 11V R _L ≥ 2kΩ	90	100		dB
		V _S = 15V, V _{OUT} = 1.0V to 11V R _L ≥ 2kΩ, T _A = -40°C to +125°C	90			
INPUT CHARACTERISTICS						
Input Common Mode Voltage Range	V _{CM}	V _S = 30V, T _A = -40°C to +125°C (Note 1)	V _{S-}		V _{S+} - 2	V
OUTPUT CHARACTERISTICS						
Low Output Voltage Swing	V _{OL}	V _{ID} = -1V, I _{OL} = 4mA		90	200	mV
Output Current	I _{source}	V _{ID} = 1V, V _{OH} = 5V		0.001		mA
	I _{sink}	V _{ID} = -1V, V _{OL} = 1.5V	9	18		
POWER SUPPLY						
Operating Supply Voltage	V _S	T _A = -40 to +125 °C	3		36	V
Quiescent Current (Per amplifier)	I _q	V _S = 5.0 V, V _{OUT} = 0.5V _{CC} , No Load		220	330	μA
		V _S = 36 V, V _{OUT} = 0.5V _{CC} , No Load		260	400	
Propagation delay time	T _(pd)	V _{RL} = 5V, R _L = 5.1k Ω		0.9		μs
		V _{IN} = TTL Logic Swing, V _{REF} = 1.4V		160		ns

Note 1: The input common-mode voltage of either input signal voltage should not be allowed to go negative by more than 0.3V (@ $+25^\circ\text{C}$). The upper end of the common-mode voltage range is $V_{CC} - 1.5\text{ V}$ (@ $+25^\circ\text{C}$), but either or both inputs can go to $+36\text{ V}$ without damage, independent of the magnitude of V_{CC} .

Typical Characteristics

$V_S = 5.0\text{ V to }36\text{ V}$, $T_A = +25^\circ\text{C}$, $V_{CM} = V_{OUT} = V_S/2$, and $R_L = 10\text{ k}\Omega$ connected to $V_S/2$, unless otherwise noted.

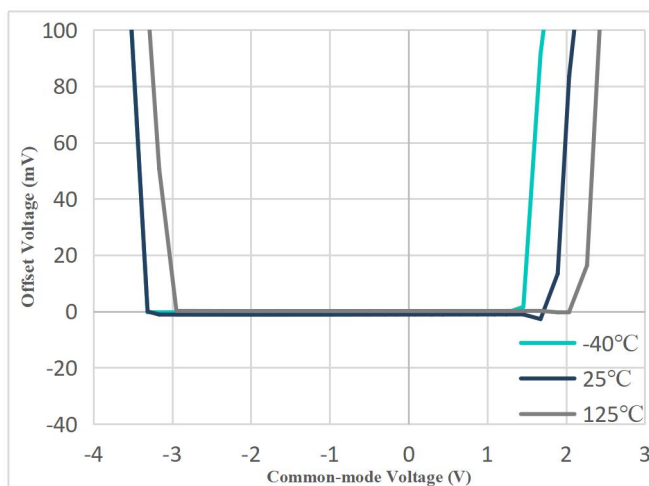
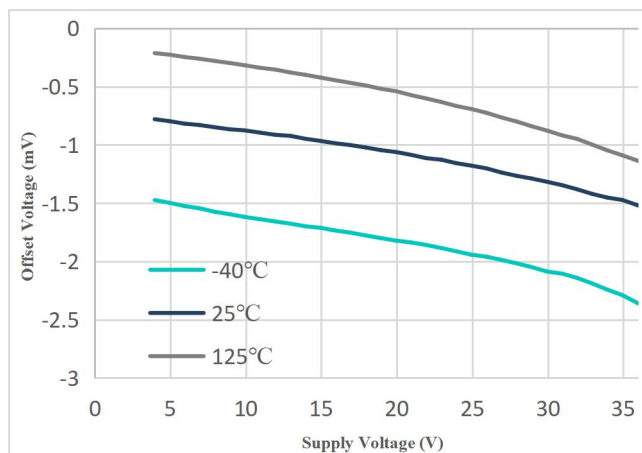
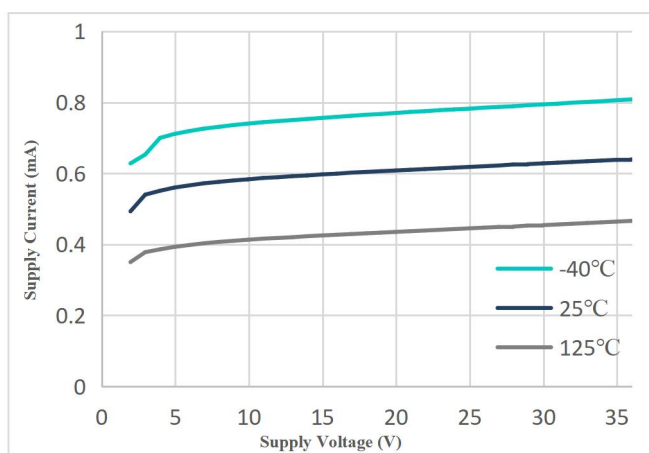


Figure 3. Offset voltage vs Common-mode Voltage

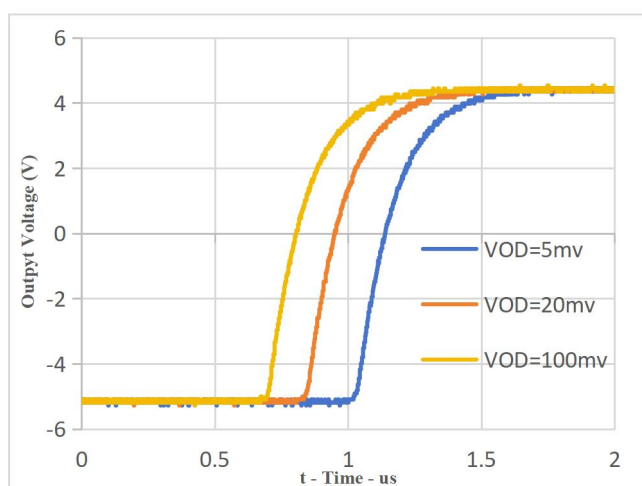


Figure 4. Propagation Delay Falling Edge

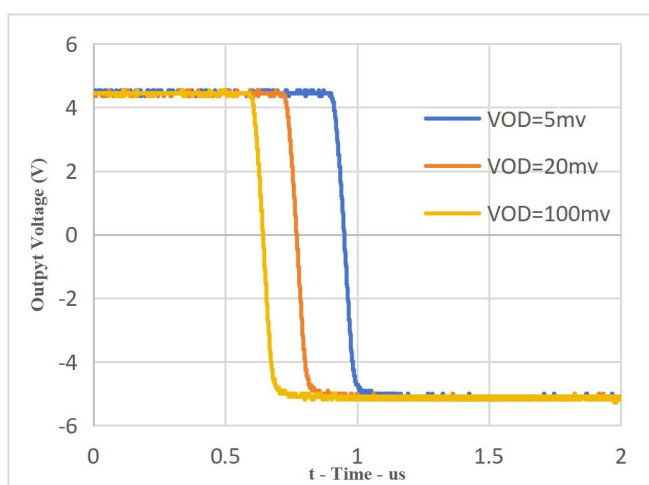
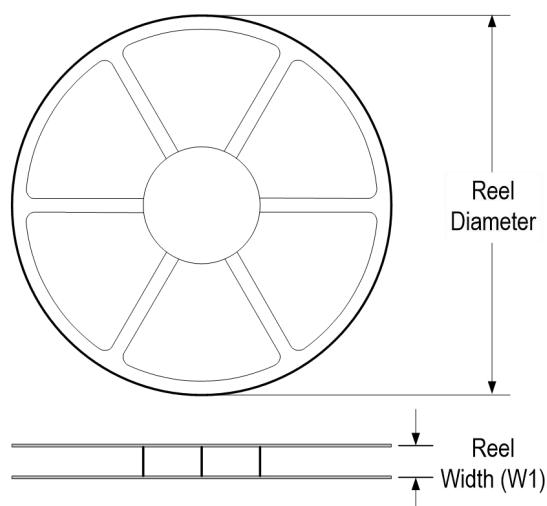


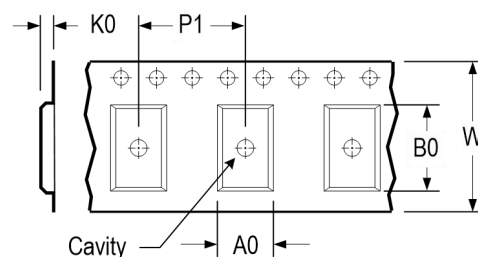
Figure 5. Propagation Delay Rising Edge

Tape and Reel Information

REEL DIMENSIONS

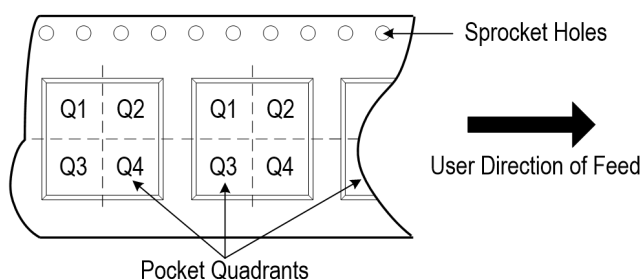


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

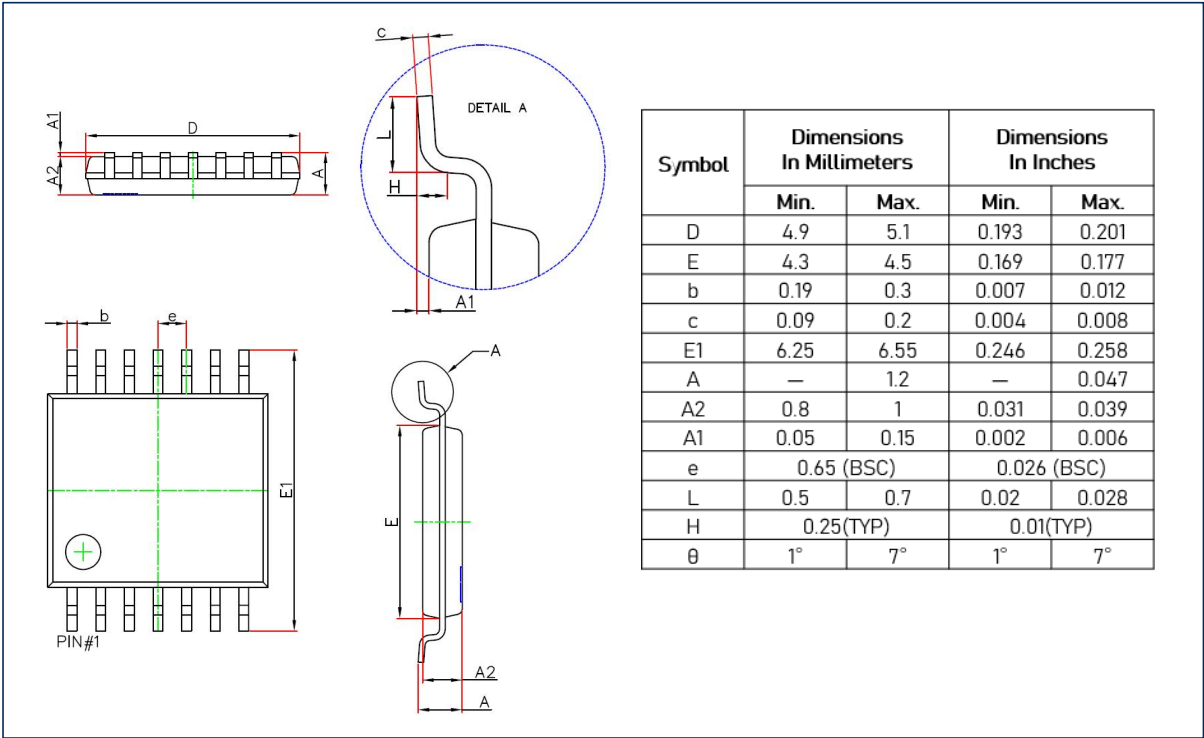


* All dimensions are nominal

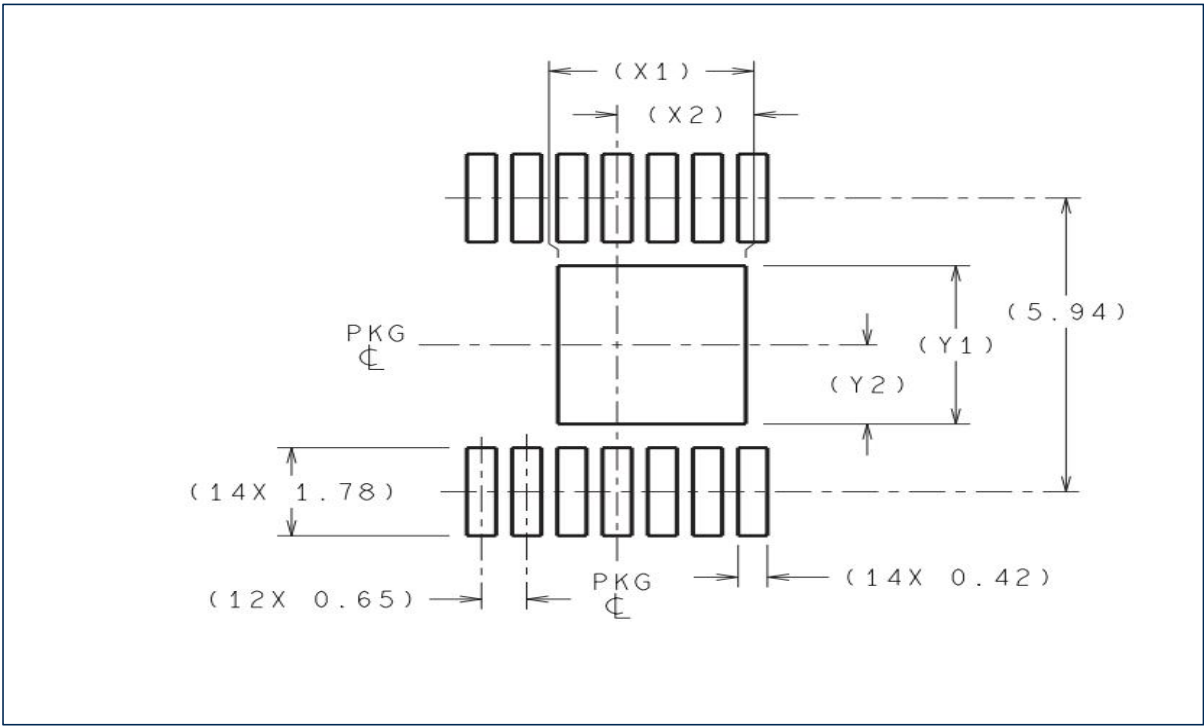
Device	Package Type	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin 1 Quadrant
LTA2901LXS14/R5	SOIC	14	2 500	330	16.5	6.5	9.5	2.0	8.0	16.0	Q1
LTA2901LXT14/R6	TSSOP	14	3 000	330	16.5	6.9	5.5	1.2	8.0	16.0	Q1

Package Outlines

DIMENSIONS, TSSOP-14L

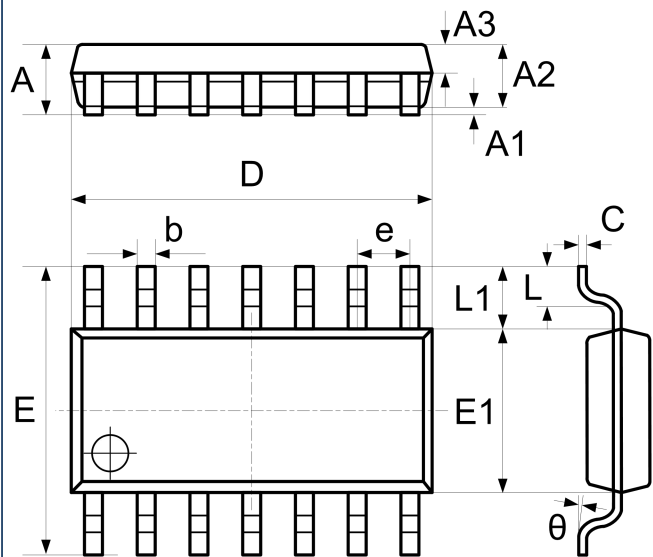


RECOMMENDED SOLDERING FOOTPRINT, TSSOP-14L



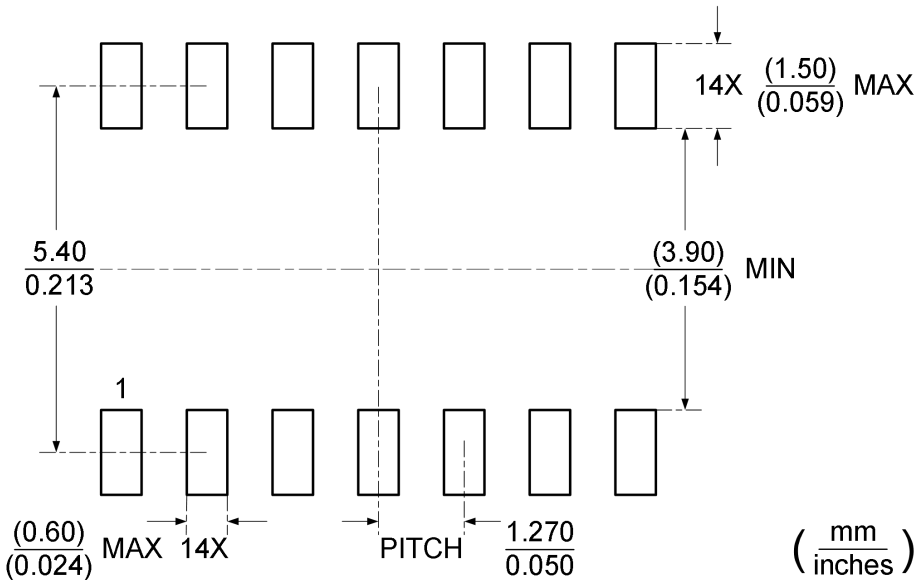
Package Outlines (cont.)

DIMENSIONS, SOIC-14L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	1.850	0.057	0.073
A1	0.100	0.300	0.004	0.012
A2	1.350	1.550	0.053	0.061
A3	0.550	0.750	0.022	0.030
b	0.406 TYP.		0.016 TYP.	
C	0.203 TYP.		0.008 TYP.	
D	8.630	8.830	0.340	0.348
E	5.840	6.240	0.230	0.246
E1	3.850	4.050	0.152	0.159
e	1.270 TYP.		0.050 TYP.	
L1	1.040 REF.		0.041 REF.	
L	0.350	0.750	0.014	0.030
θ	2°	8°	2°	8°

RECOMMENDED SOLDERING FOOTPRINT, SOIC-14L



Important Notice

Linearin is a global fabless semiconductor company specializing in advanced high-performance high-quality analog/mixed-signal IC products and sensor solutions. The company is devoted to the innovation of high performance, analog-intensive sensor front-end products and modular sensor solutions, applied in multi-market of medical & wearable devices, smart home, sensing of IoT, intelligent industrial & smart factory (industry 4.0), and automotives. Linearin's product families include widely-used standard catalog products, solution-based application specific standard products (ASSPs) and sensor modules that help customers achieve faster time-to-market products. Go to <http://www.linearin.com> for a complete list of Linearin product families.

For additional product information, or full datasheet, please contact with the Linearin's Sales Department or Representatives.