

General Purpose, Low Voltage Dual Comparators

Features

- Guaranteed 1.2V to 5.5V Performance
- G1362 for Open Drain Output
- G1362A for Push Pull Output
- Input Common Mode Voltage Range Includes Ground
- Low Supply Current 26 μ A at 3V Power Supply
- Package available in both TDFN2X2-8 and AQFN1.5X1.5-8

General Description

The G1362 consists of two independent low voltage comparators with open-drain outputs. The G1362A consists of two independent low voltage comparators with push-pull outputs. They are guaranteed to operate from 1.2V to 5.5V power supply. The current consumption is as low as 26 μ A at 3V supply voltage. So it is very suitable for portable electronic devices applications.

G1362/G1362A is available in the both TDFN2X2-8 and AQFN1.5X1.5-8 package.

Applications

- Mobile communications
- Notebooks and PDA's
- Battery powered electronics
- General purpose portable device
- General purpose low voltage applications

Ordering Information

ORDER NUMBER	MARKING	TEMP. RANGE	PACKAGE (Green)
G1362RC1U	1362	-40°C~ +85°C	TDFN2X2-8
G1362AA71G	13 Ax	-40°C~ +85°C	AQFN1.5X1.5-8

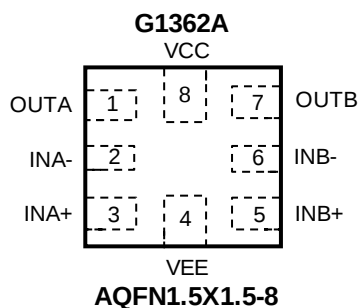
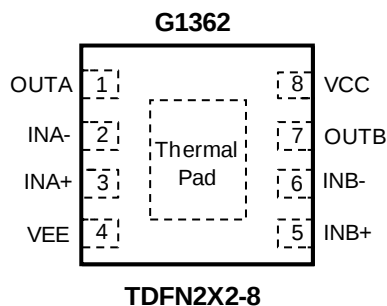
Note: RC: TDFN2X2-8 A7: AQFN1.5X1.5-8

1: Bonding Code

U & G: Tape & Reel

Green: Lead Free / Halogen Free

Pin Configuration



Absolute Maximum Ratings

Differential Input Voltage. $\pm$ Supply Voltage
 Voltage on any pin (referred to VEE pin) 7V
 Continuous Power Dissipation ($T_A = +25^\circ\text{C}$)
 TDFN2X2-8 0.5W
 AQFN1.5X1.5-8 0.4W
 Thermal Resistance Junction to Ambient, (θ_{JA})
 TDFN2X2-8 250°C/W
 AQFN1.5X1.5-8 310°C/W
 Thermal Resistance Junction to case, (θ_{JC})
 TDFN2X2-8 100°C/W
 AQFN1.5X1.5-8 124°C/W

Reflow Temperature (soldering, 10 sec) 260°C
 Storage Temperature Range -65°C to $+150^\circ\text{C}$
 Junction Temperature 150°C
 ESD Tolerance (HBM) 2000V
 ESD Tolerance (CDM) $\pm 1000\text{V}$

Operating Ratings

Supply Voltage 1.2V to 5.5V
 Temperature Range $-40^\circ\text{C} \leq T_J \leq +85^\circ\text{C}$

Electrical Characteristics

1.2V DC Electrical Characteristics

Unless otherwise specified, all limits guaranteed for $T_J = 25^\circ\text{C}$, $V_{CC} = 1.2\text{V}$, $V_{EE} = 0\text{V}$.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{OS}		-10	0.5	10	mV
Input Voltage Range	V_{CM}		---	V_{EE} to V_{CC}	---	V
Input current	I_B		---	10	150	nA
Output voltage G1362A	V_{OH}	$I_{SOURCE} = 0.5\text{mA}$	---	$V_{CC} - 0.15$	$V_{CC} - 0.2$	V
Output Voltage	V_{OL}	$I_{SINK} = 0.5\text{mA}$	---	$V_{EE} + 0.1$	$V_{EE} + 0.2$	V
Output Short-Circuit Sourcing or Sinking	I_O	$V_O \leq 1.5\text{V}$	---	60	---	mA
Supply Current	I_S		---	24	40	μA

1.2V AC Electrical Characteristics

$T_J = 25^\circ\text{C}$, $V_{CC} = 1.2\text{V}$, $V_{EE} = 0\text{V}$, $R_L = 100\text{k}\Omega$.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Propagation Delay (High to Low)	t_{PHL}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns
Propagation Delay (Low to High)	t_{PLH}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns

3V DC Electrical Characteristics

Unless otherwise specified, all limits guaranteed for $T_J = 25^\circ\text{C}$, $V_{CC} = 3\text{V}$, $V_{EE} = 0\text{V}$.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{OS}		-8	0.5	8	mV
Input Voltage Range	V_{CM}		---	V_{EE} to V_{CC}	---	V
Input current	I_B		---	10	150	nA
Output voltage G1362A	V_{OH}	$I_{SOURCE} = 3\text{mA}$	---	$V_{CC} - 0.15$	$V_{CC} - 0.2$	V
Output Voltage	V_{OL}	$I_{SINK} = 3\text{mA}$	---	$V_{EE} + 0.12$	$V_{EE} + 0.2$	V
Output Short-Circuit Sourcing or Sinking	I_O	$V_O \leq 1.5\text{V}$	---	60	---	mA
Supply Current	I_S		---	26	44	μA

3V AC Electrical Characteristics

$T_J = 25^\circ\text{C}$, $V_{CC} = 3\text{V}$, $V_{EE} = 0\text{V}$, $R_L = 5.1\text{k}\Omega$.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Propagation Delay (High to Low)	t_{PHL}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns
Propagation Delay (Low to High)	t_{PLH}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns

5.5V DC Electrical Characteristics

 Unless otherwise specified, all limits guaranteed for $T_J=25^{\circ}\text{C}$, $V_{CC}=5.5\text{V}$, $V_{EE}=0\text{V}$.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{OS}		-7	0.5	7	mV
Input Voltage Range	V_{CM}		---	V_{EE} to V_{CC}	---	V
Input current	I_B		---	10	150	nA
Output voltage G1362A	V_{OH}	$I_{Source}=3\text{mA}$	---	$V_{CC}-0.15$	$V_{CC}-0.2$	V
Output Voltage	V_{OL}	$I_{Sink}=3\text{mA}$	---	$V_{EE}+0.12$	$V_{EE}+0.2$	V
Output Short-Circuit Sourcing or Sinking	I_O	$V_O \leq 1.5\text{V}$	---	60	---	mA
Supply Current	I_S		---	30	46	μA

5.5V AC Electrical Characteristics
 $T_J=25^{\circ}\text{C}$, $V_{CC}=5.5\text{V}$, $V_{EE}=0\text{V}$, $R_L=5.1\text{k}\Omega$.

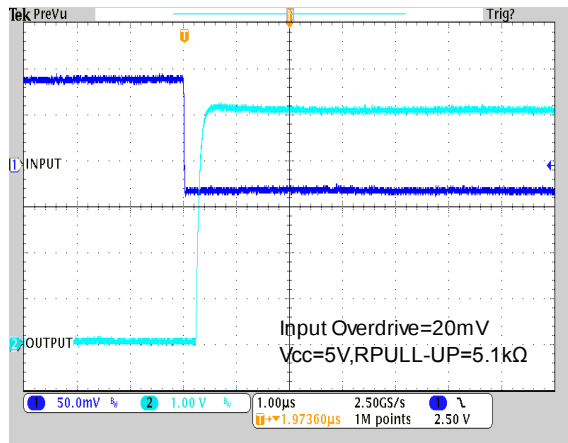
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Propagation Delay (High to Low)	t_{PHL}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns
Propagation Delay (Low to High)	t_{PLH}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns

Typical Performance Characteristics

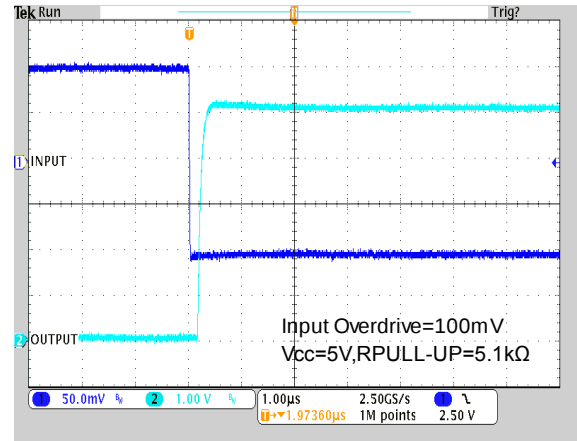
V_{CC}=5V, T_A=25°C, unless otherwise noted.

G1362 for Open Drain Output

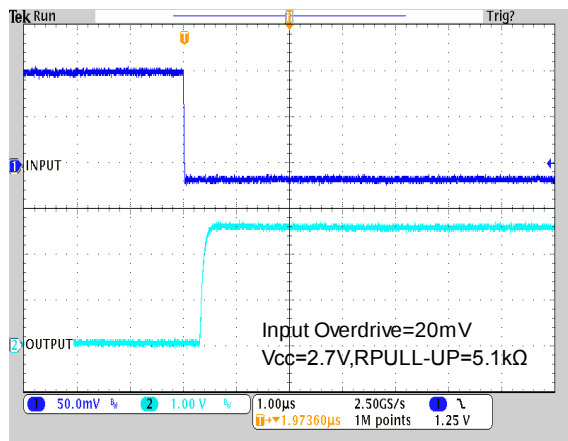
Propagation Delay(Low to High)



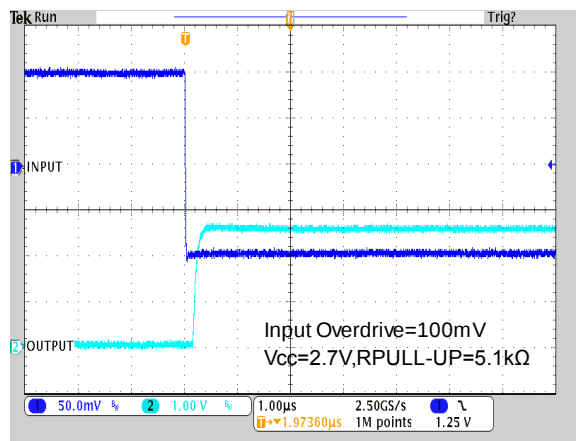
Propagation Delay(Low to High)



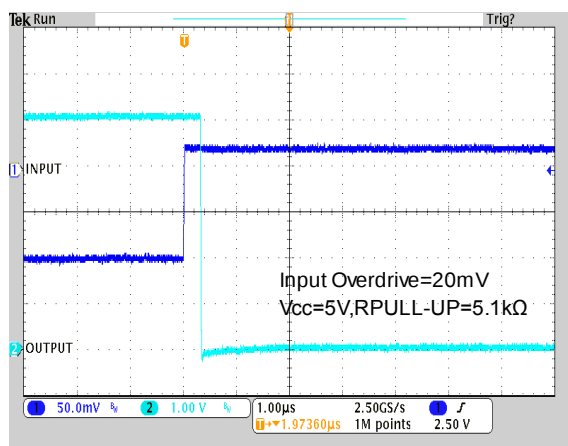
Propagation Delay(Low to High)



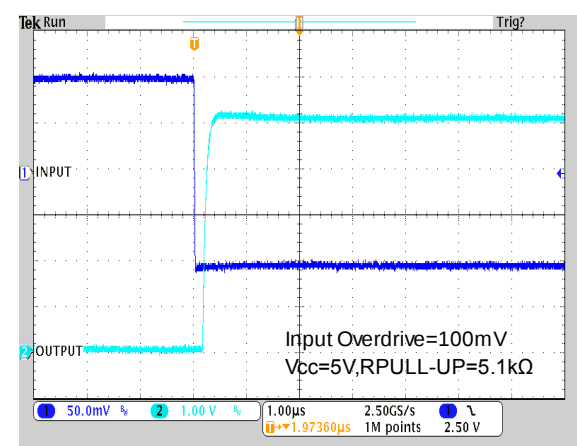
Propagation Delay(Low to High)



Propagation Delay(High to Low)

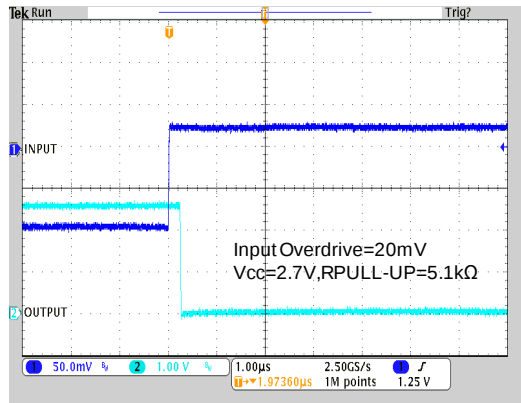


Propagation Delay(High to Low)

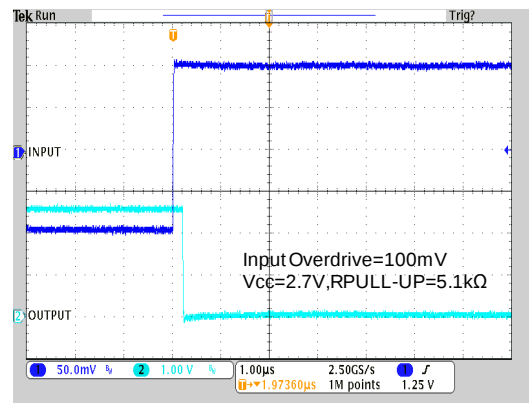


Typical Performance Characteristics (continued)

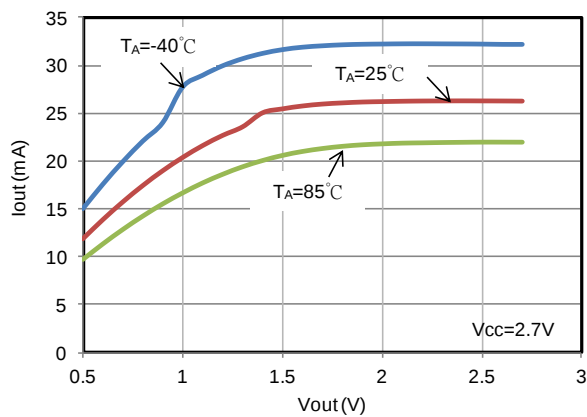
Propagation Delay(High to Low)



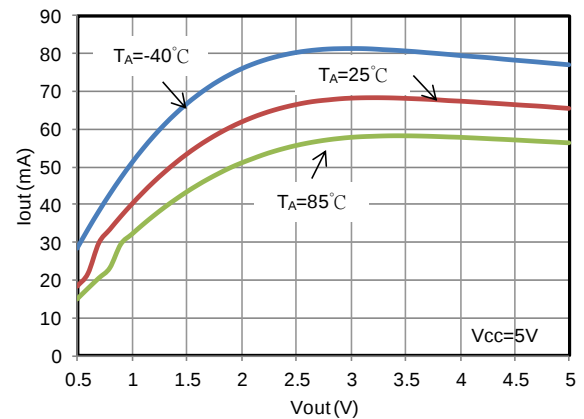
Propagation Delay(High to Low)



Iout vs. Vout



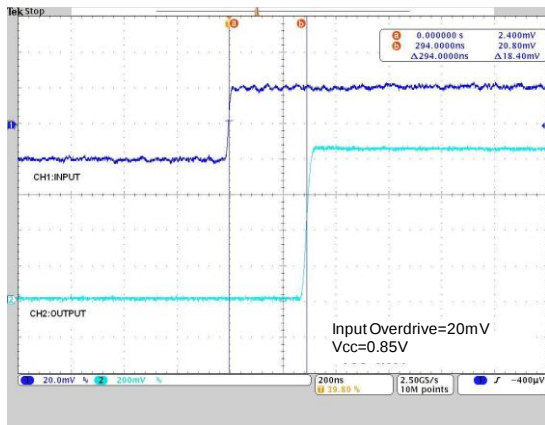
Iout vs. Vout



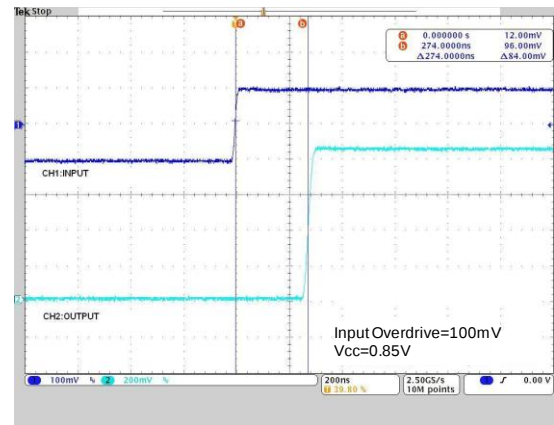
Typical Performance Characteristics (continued)

G1362A for Push Pull Output

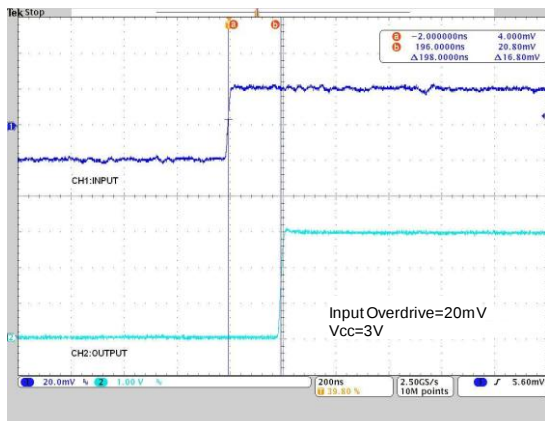
Propagation Delay (Low to High)



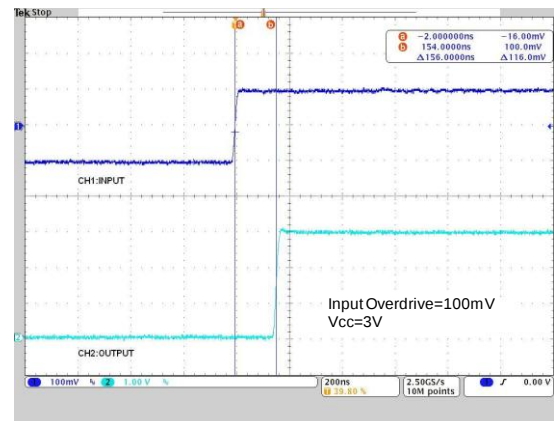
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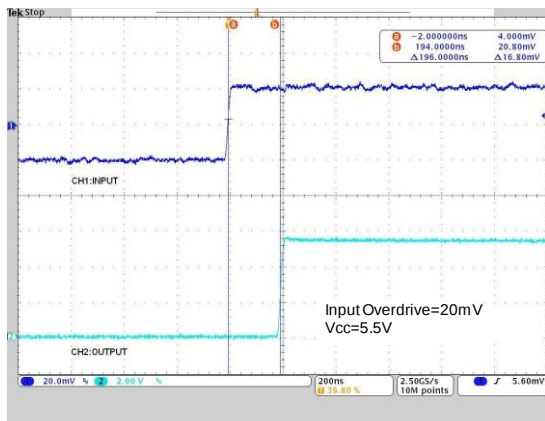
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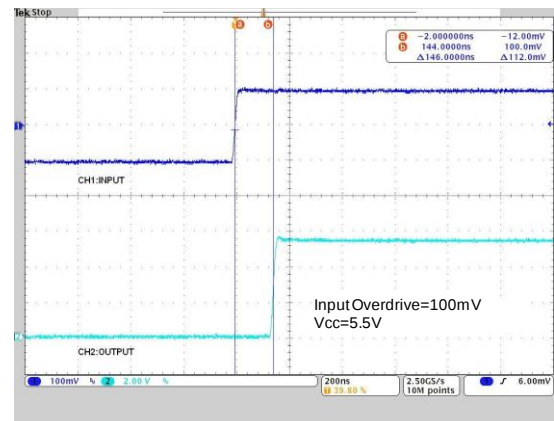
Propagation Delay (Low to High)



Propagation Delay (Low to High)

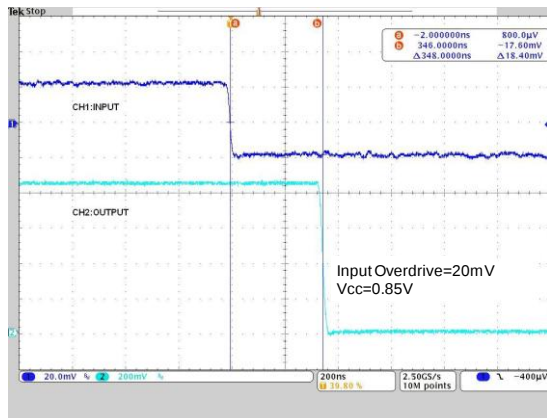


Propagation Delay (Low to High)

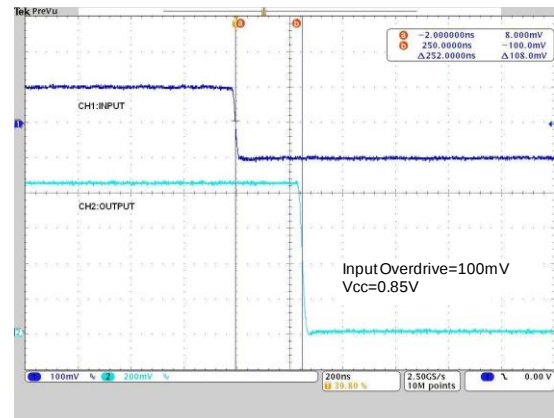


Typical Performance Characteristics (continued)

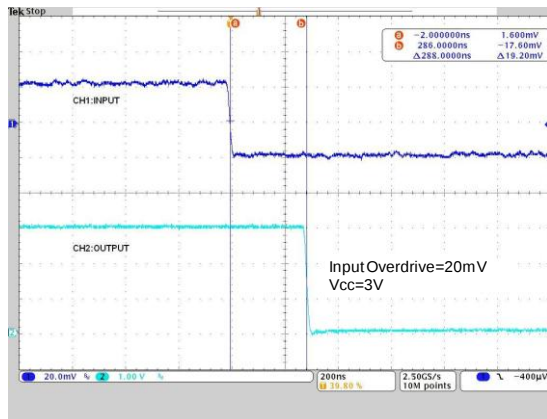
Propagation Delay (High to Low)



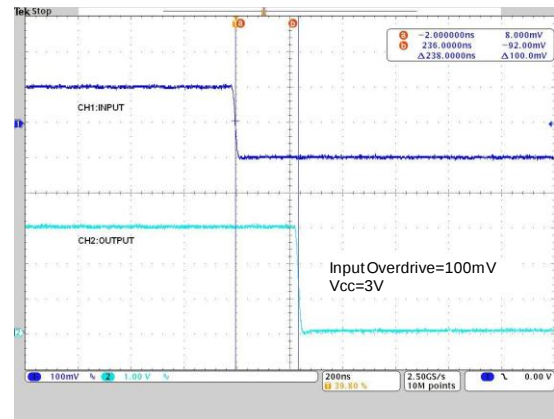
Propagation Delay (High to Low)



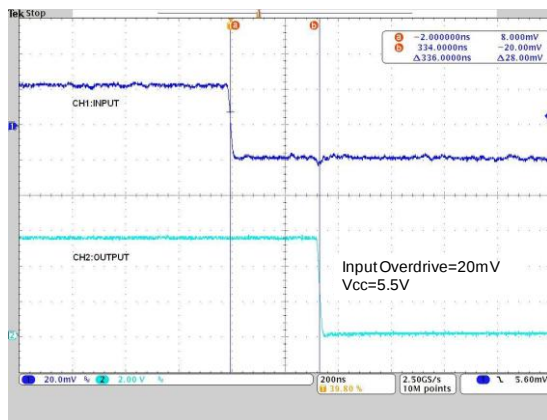
Propagation Delay (High to Low)



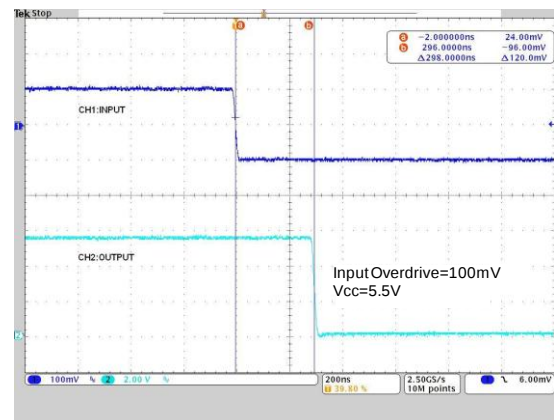
Propagation Delay (High to Low)



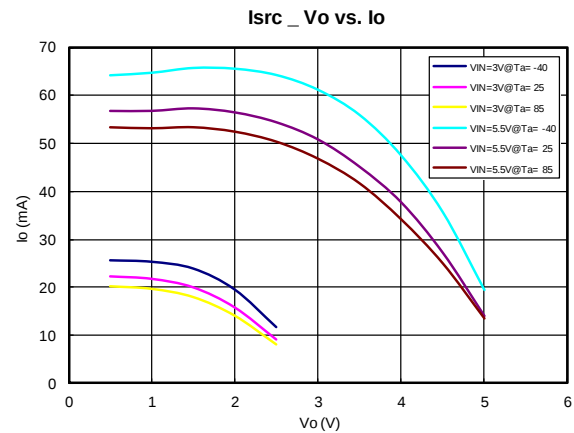
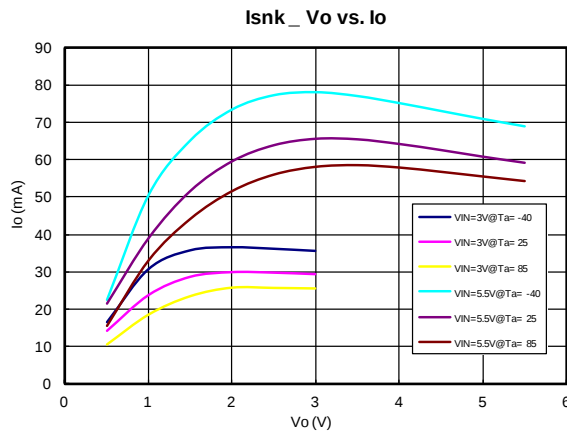
Propagation Delay (High to Low)



Propagation Delay (High to Low)

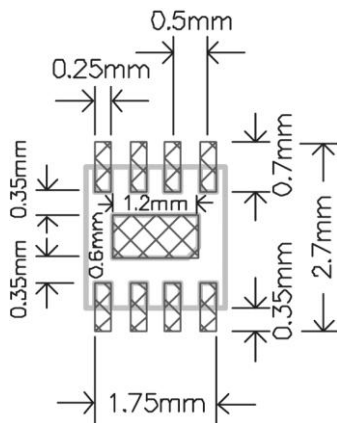


Typical Performance Characteristics (continued)

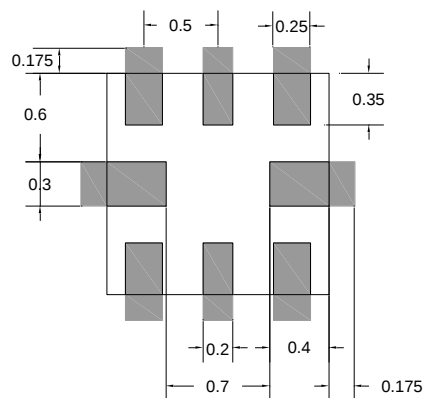


Minimum Footprint PCB Layout Section

TDFN2X2-8

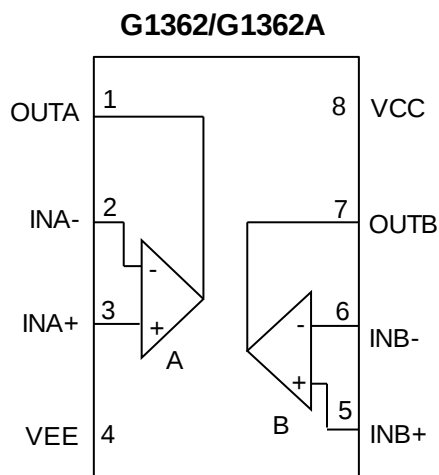


AQFN1.5X1.5-8



Pin Description

PIN	NAME	I/O	FUNCTION
1	OUTA	O	Comparator A Output terminal
2	INA-	I	Comparator A Negative differential input
3	INA+	I	Comparator A Positive differential input
4	VEE	I	Negative supply voltage terminal or ground connection
5	INB+	I	Comparator B Positive differential input
6	INB-	I	Comparator B Negative differential input
7	OUTB	O	Comparator B Output terminal
8	VCC	I	Positive supply voltage terminal

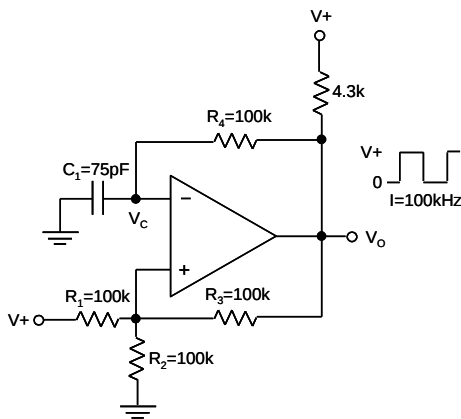
Block Diagram


Function Description

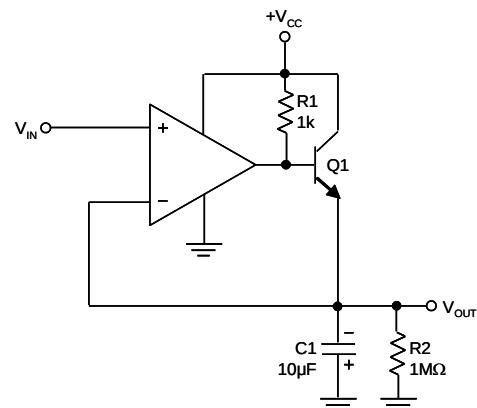
The G1362 is a basic comparator used for converting analog signals to a digital output. Because of having an open-drain output stage, it requires a pull-up resistor connected to VCC for switching the output level properly. The output pull-up resistor should be chosen high enough to avoid excessive power dissipation but low enough to drive different load conditions on the output. It is suggested the pull-up resistor to be ranged from 1k to 10k Ω .

G1362A is a dual low-voltage, low-power push-pull output comparators which a complementary P- and N-Channel output stage. It also is designed for rail-to-rail input and output. When the output switches, there is a direct patch between VCC and VEE, causing increased output sinking or sourcing current during the transition.

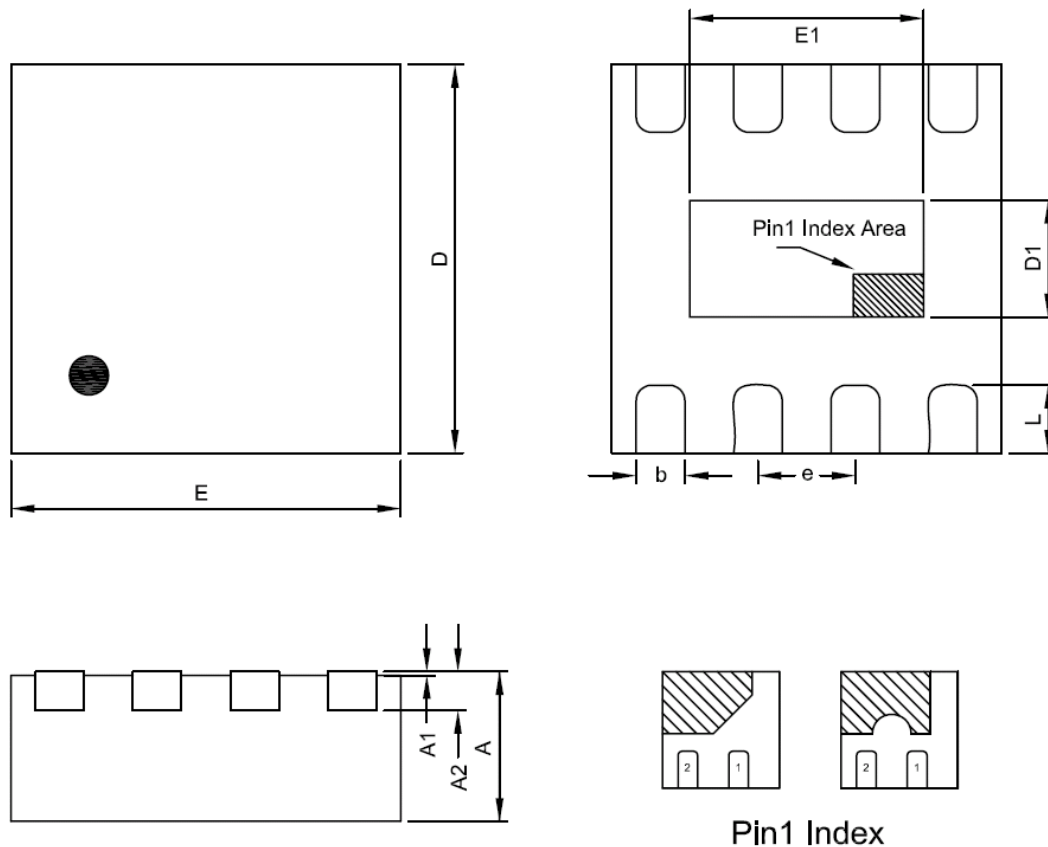
Typical Application Circuits



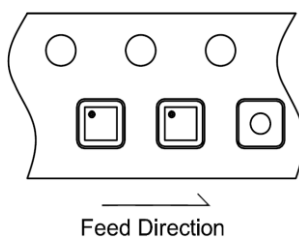
Squarewave Oscillator



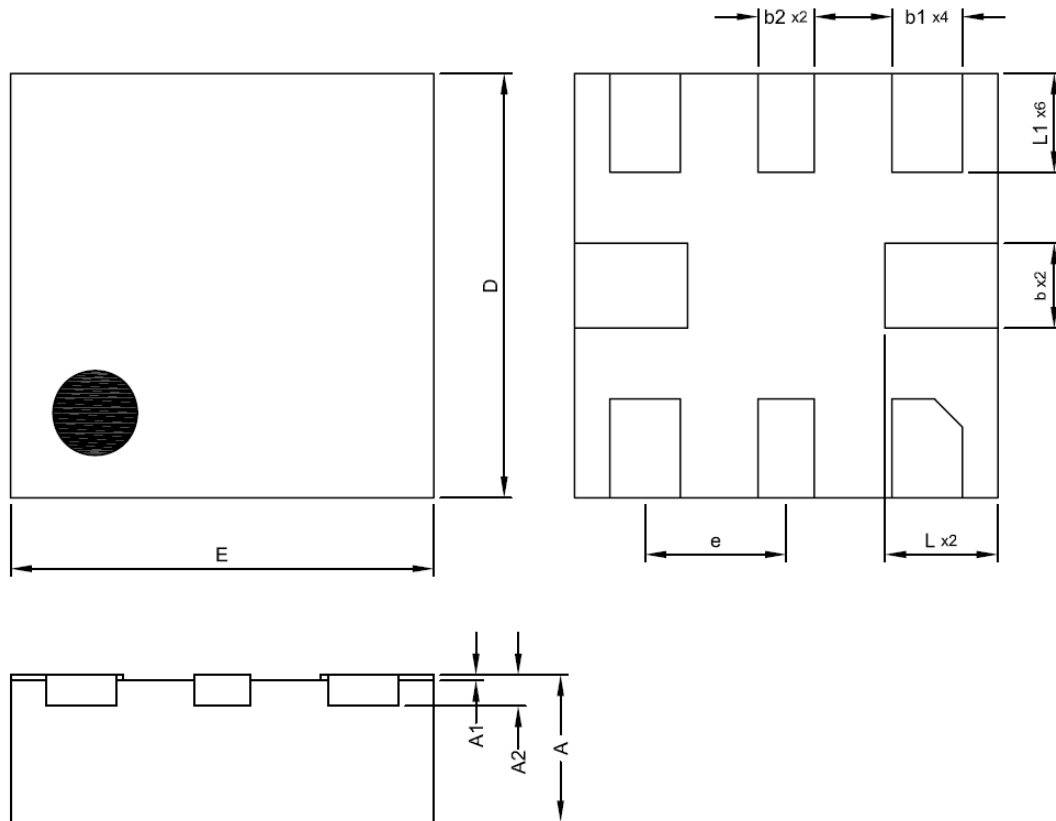
Positive Peak Detector

Package Information

TDFN2X2-8 Package

Symbol	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.0276	0.0295	0.0315
A1	0.00	---	0.05	0.0000	---	0.0020
A2	0.20 REF			0.0079 REF		
D	1.95	2.00	2.05	0.0768	0.0787	0.0807
E	1.95	2.00	2.05	0.0768	0.0787	0.0807
D1	0.55	0.65	0.75	0.0217	0.0256	0.0295
E1	1.15	1.25	1.35	0.0453	0.0492	0.0531
b	0.18	0.25	0.30	0.0071	0.0098	0.0118
e	0.50 BSC			0.0197 BSC		
L	0.30	0.35	0.40	0.0118	0.0138	0.0157

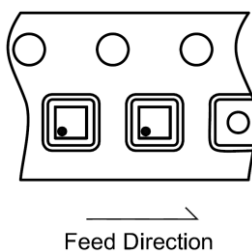
Taping Specification


PACKAGE	Q'TY/REEL
TDFN2X2-8	3,000 ea


AQFN1.5X1.5-8 Package

Symbol	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.50	0.55	0.60	0.0197	0.0217	0.0236
A1	0.00	---	0.05	0.0000	---	0.0020
A2	0.11 REF			0.0043 REF		
D	1.45	1.50	1.55	0.0570	0.0590	0.0610
E	1.45	1.50	1.55	0.0570	0.0590	0.0610
b	0.25	0.30	0.35	0.0098	0.0118	0.0138
b1	0.20	0.25	0.30	0.0079	0.0098	0.0118
b2	0.15	0.20	0.25	0.0059	0.0079	0.0098
e	0.50 BSC			0.0197 BSC		
L	0.35	0.40	0.45	0.0138	0.0157	0.0177
L1	0.30	0.35	0.40	0.0118	0.0138	0.0157

Taping Specification



PACKAGE	Q'TY/REEL
AQFN1.5X1.5-8	3,000 ea

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