

General Purpose, Low Voltage Comparator with Open-Drain Output

Features

- Guaranteed 0.85V to 5.5V Performance
- Open Drain Output
- Input Common Mode Voltage Range Includes Ground
- Low Supply Current 13 μ A at 3V Power Supply
- Operating Temperature Range -40°C to +85°C
- SOT-23-5 & WDFN1.6X1.6-6 package available

General Description

The G1363 is a low voltage comparator with open-drain output. It is guaranteed to operate from 0.85V to 5.5V power supply. The current consumption is as low as 13 μ A at 3V supply voltage. So it is very suitable for portable electronic devices applications.

G1363 is available in the SOT-23-5 & WDFN1.6X1.6-6 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)
G1363T11U	1363x	-40°C~ +85°C	SOT-23-5
G1363U61U	133	-40°C~ +85°C	WDFN1.6X1.6-6

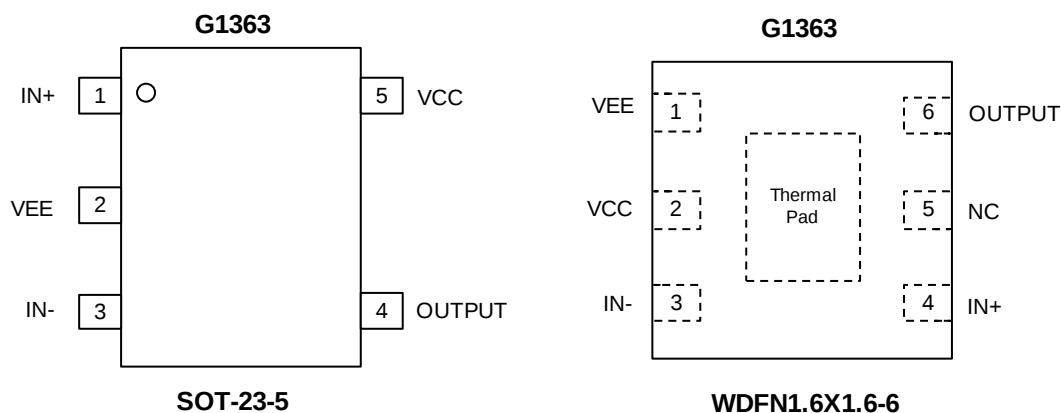
Note: T1: SOT-23-5 U6: WDFN1.6X1.6-6

1: Bonding Code

U: 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 ($T_A = +25^\circ\text{C}$)
 SOT-23-5 0.5W
 WDFN1.6X1.6-6 TBDW
 Thermal Resistance Junction to Ambient, (θ_{JA})
 SOT-23-5 240°C/W
 WDFN1.6X1.6-6 TBD $^\circ\text{C/W}$

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 0.85V to 5.5V
 Temperature Range $-40^\circ\text{C} \leq T_J \leq +85^\circ\text{C}$

Electrical Characteristics

0.85V DC Electrical Characteristics

Unless otherwise specified, all limits guaranteed for $T_J = 25^\circ\text{C}$, $V_{CC} = 0.85\text{V}$, $V_{EE} = 0\text{V}$.

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
Open-Drain Output Voltage	V_{OL}	$I_{sink} = 0.5\text{mA}$	---	$V_{EE} + 0.1$	$V_{EE} + 0.25$	V
Output Short-Circuit Sourcing or Sinking	I_O	$V_O \leq 1.5\text{V}$	---	60	---	mA
Supply Current	I_S		---	12	20	μA

0.85V AC Electrical Characteristics

$T_J = 25^\circ\text{C}$, $V_{CC} = 0.85\text{V}$, $V_{EE} = 0\text{V}$, $R_L = 100\text{k}\Omega$.

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
Open-Drain Output Voltage	V_{OL}	$I_{sink} = 3\text{mA}$	---	$V_{EE} + 0.12$	$V_{EE} + 0.3$	V
Output Short-Circuit Sourcing or Sinking	I_O	$V_O \leq 1.5\text{V}$	---	60	---	mA
Supply Current	I_S		---	13	22	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

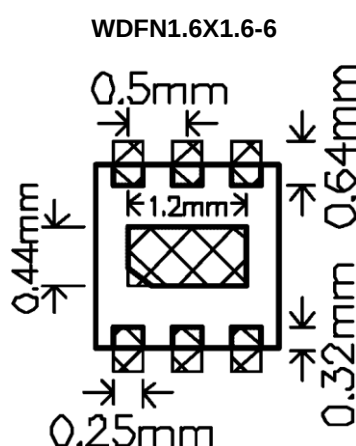
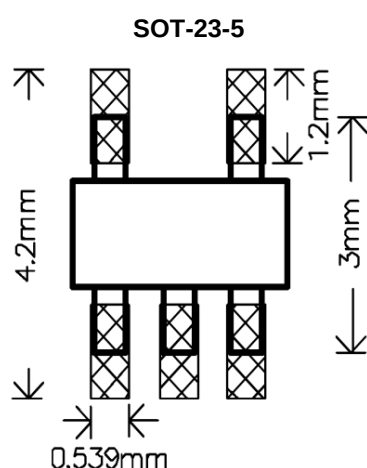
5.5V DC Electrical Characteristics

 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
Open-Drain Output Voltage	V_{OL}	$I_{Sink}=3\text{mA}$	---	$V_{EE}+0.12$	$V_{EE}+0.3$	V
Output Short-Circuit Sourcing or Sinking	I_O	$V_O \leq 1.5\text{V}$	---	60	---	mA
Supply Current	I_S		---	15	24	μA

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

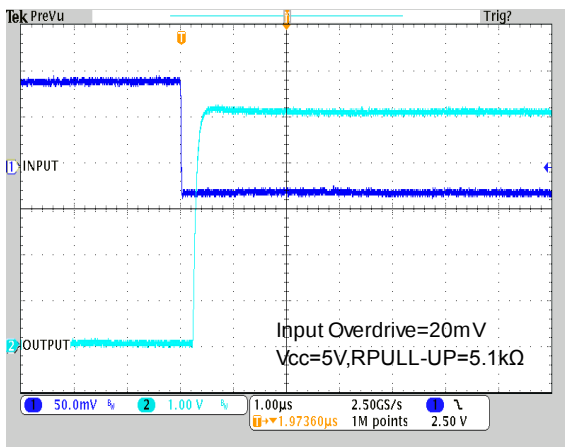
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Propagation Delay (High to Low)	t_{PHL}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns
Propagation Delay (Low to High)	t_{PLH}	Input Overdrive=20mV	---	400	---	ns
		Input Overdrive=100mV	---	300	---	ns

Minimum Footprint PCB Layout Section


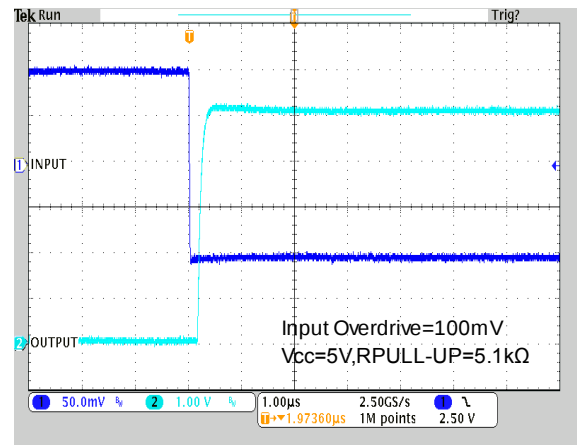
Typical Performance Characteristics

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

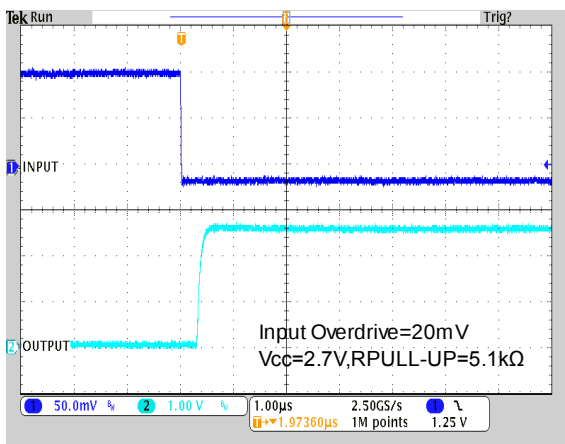
Propagation Delay(Low to High)



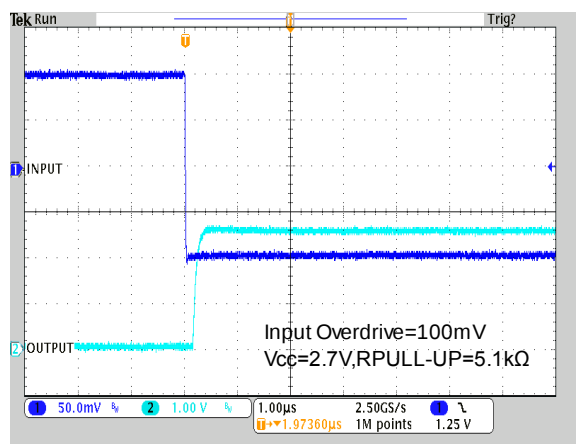
Propagation Delay(Low to High)



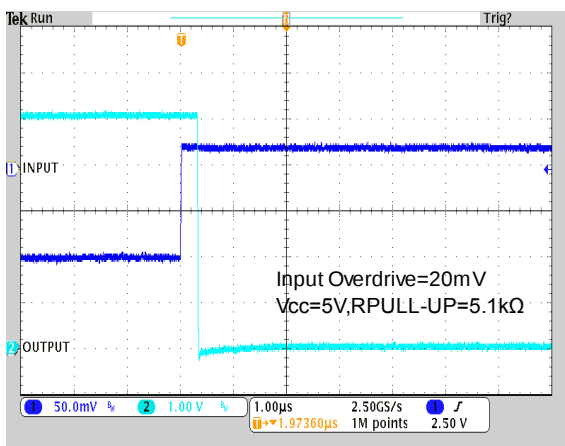
Propagation Delay(Low to High)



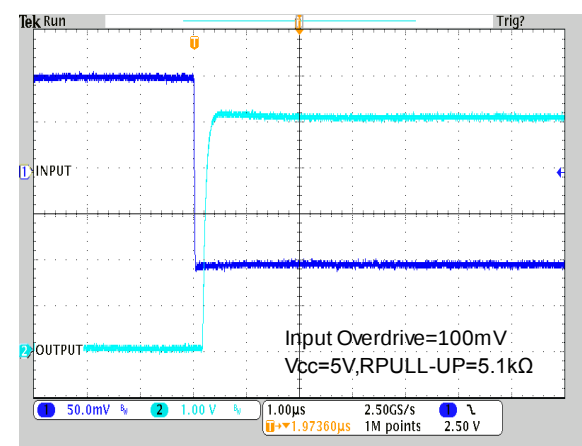
Propagation Delay(Low to High)



Propagation Delay(High to Low)

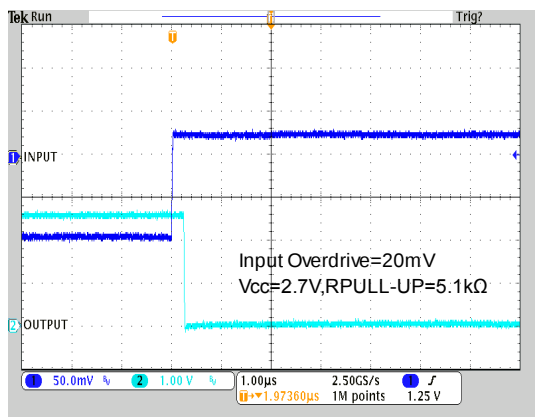


Propagation Delay(High to Low)

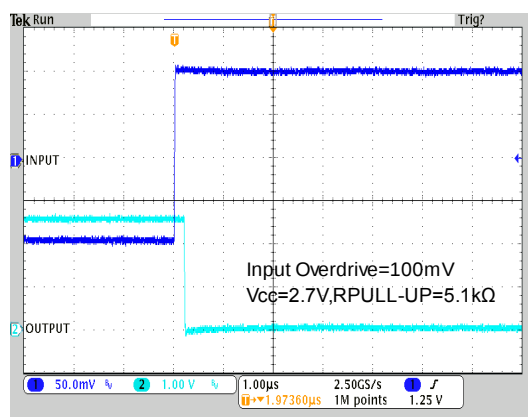


Typical Performance Characteristics (continued)

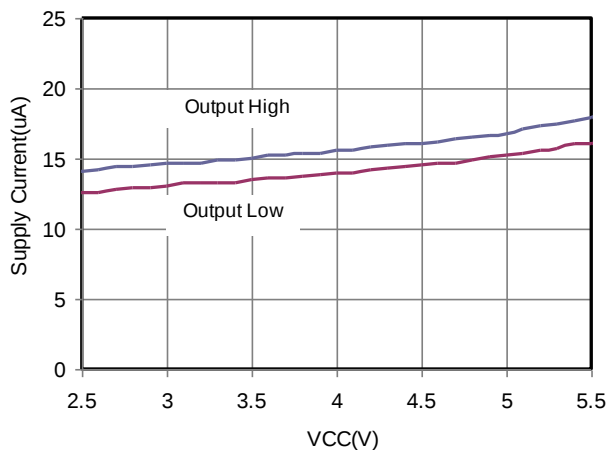
Propagation Delay(High to Low)



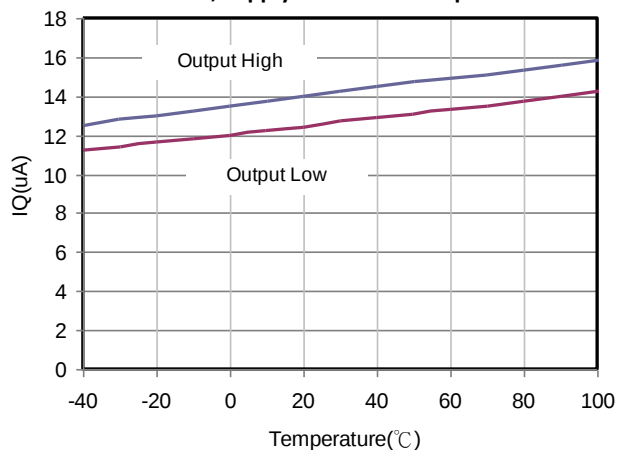
Propagation Delay(High to Low)



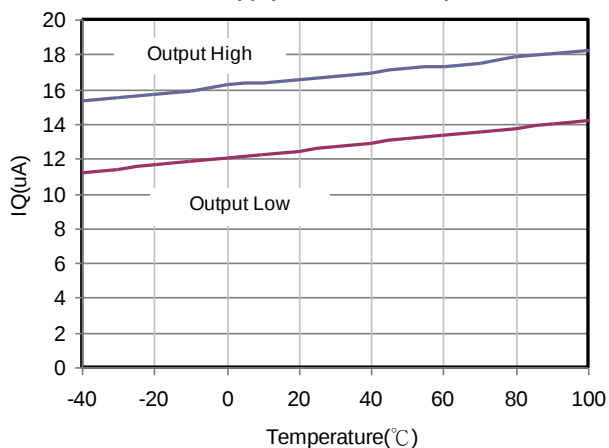
Supply Current vs. Vcc



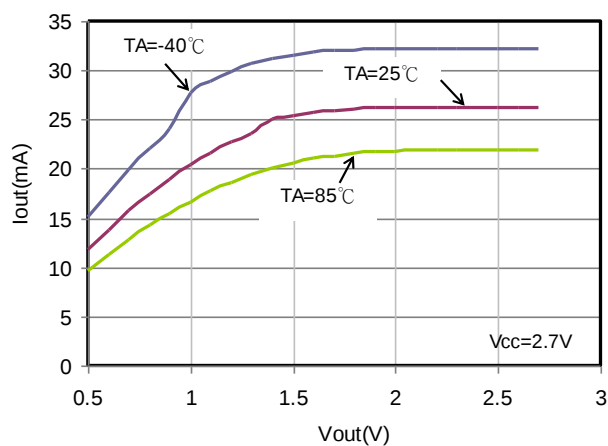
Vcc=2.7V, Supply Current vs. Temperature

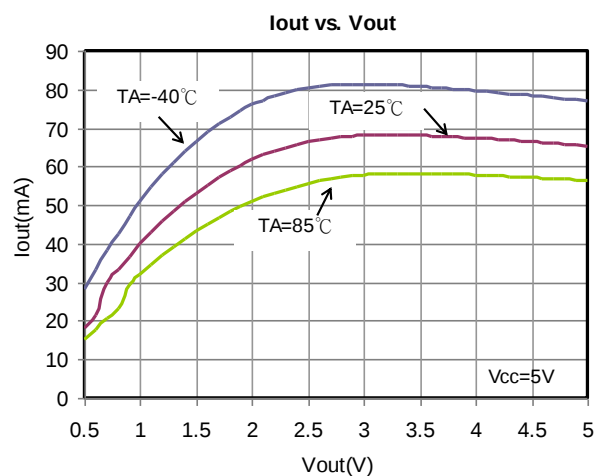


Vcc=5V, Supply Current vs. Temperature

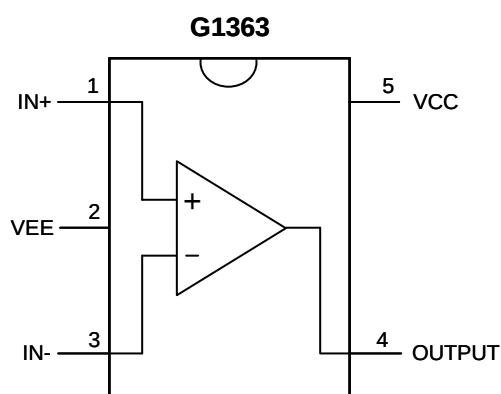


Iout vs. Vout



Typical Performance Characteristics (continued)

Pin Description

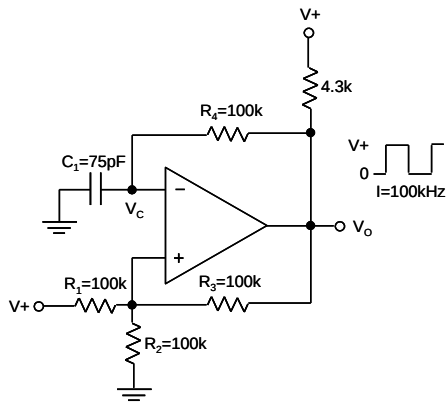
PIN		NAME	I/O	FUNCTION
SOT-23-5	WDFN1.6X1.6-6			
1	4	IN+	I	Positive differential input
2	1	VEE	I	Negative supply voltage terminal or ground connection
3	3	IN-	I	Negative differential input
4	6	OUTPUT	O	Output terminal
5	2	VCC	I	Positive supply voltage terminal
	5	NC		No Connection

Block Diagram


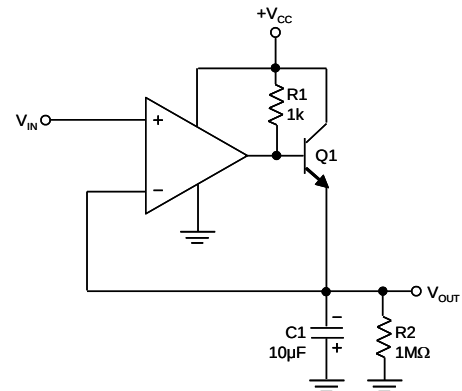
Function Description

The G1363 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 .

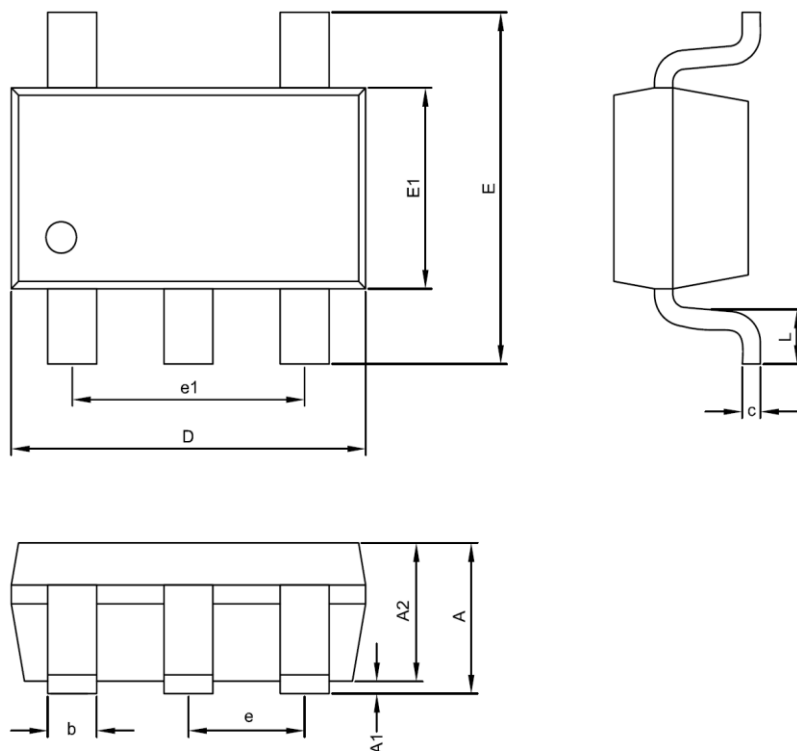
Typical Application Circuits



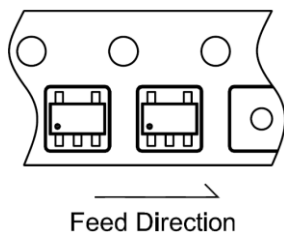
Squarewave Oscillator



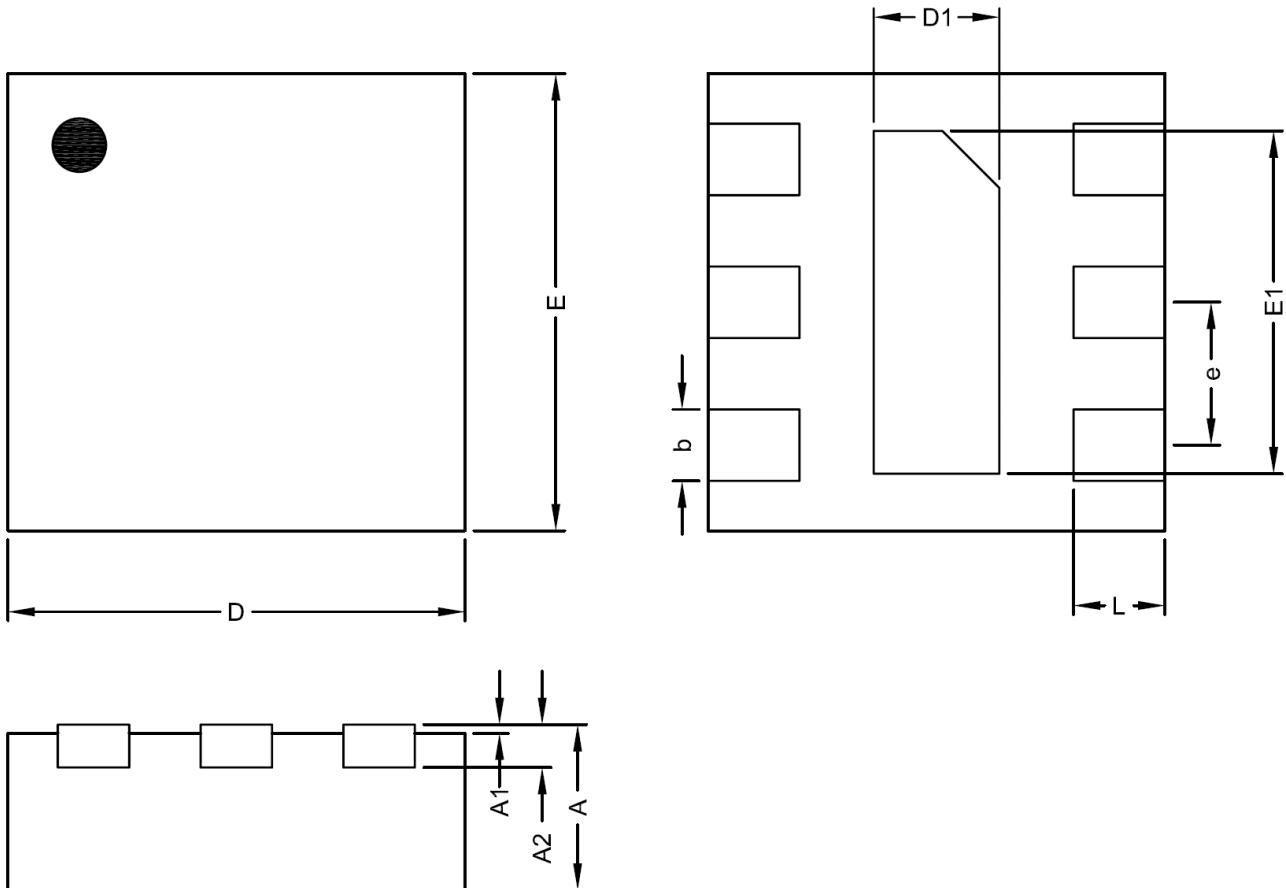
Positive Peak Detector

Package Information

SOT-23-5 Package

Symble	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.00	1.10	1.45	0.039	0.043	0.057
A1	0.00	---	0.10	0.000	---	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
D	2.70	2.90	3.10	0.106	0.114	0.122
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
c	0.08	0.15	0.25	0.003	0.006	0.010
b	0.30	0.40	0.50	0.012	0.016	0.020
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
L	0.30	0.45	0.60	0.012	0.018	0.024

Taping Specification


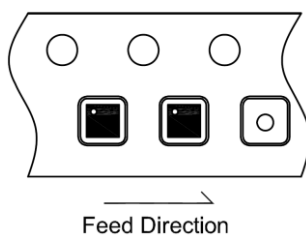
PACKAGE	Q'TY/REEL
SOT-23-5	3,000 ea



WDFN1.6X1.6-6 Package

Symbol	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.45	0.55	0.60	0.0177	0.0217	0.0236
A1	0.00	---	0.05	0.0000	---	0.0020
A2	0.15 REF			0.0059 REF		
D	1.55	1.60	1.65	0.0610	0.0630	0.0650
E	1.55	1.60	1.65	0.0610	0.0630	0.0650
D1	0.39	0.44	0.49	0.0154	0.0173	0.0193
E1	1.15	1.20	1.25	0.0453	0.0472	0.0492
b	0.18	0.25	0.30	0.0071	0.0098	0.0118
e	0.50 BSC			0.0197 BSC		
L	0.27	0.32	0.37	0.0106	0.0126	0.0146

Taping Specification



PACKAGE	Q'TY/REEL
WDFN1.6X1.6-6	3,000 ea

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