

LOW POWER SUPER SMALL-SIZED SINGLE C-MOS COMPARATOR

■GENERAL DESCRIPTION

The **NJU7119** is super small-sized package single C-MOS comparator with open drain output.

The operating voltage is from 1.8V to 5.5V. The output can drive TTL, C-MOS and various voltage levels.

The input offset voltage is lower than 7mV and the package is super small-sized SC88A. The **NJU7119** is suitable for battery use items and other portable items.

■PACKAGE INFORMATION



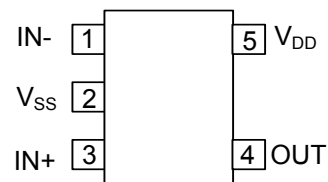
NJU7119F3

■FEATURES

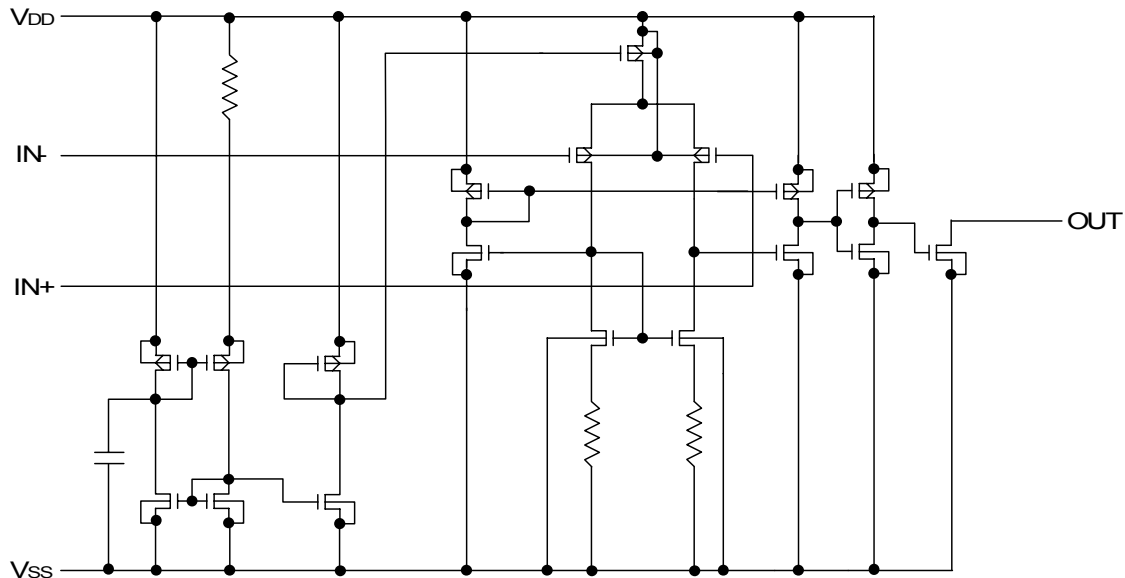
- Single Low Power Supply $V_{DD}=1.8\sim 5.5V$
- Low Offset Voltage $V_{IO}=7mV$ (max.)
- Low Operating Current $I_{DD}=100\mu A$ (typ.)
- Propagation Delay (t_{PLH}/t_{PHL}) 160/70ns (typ.)
- Output Signal Falling Time (t_{THL}) 4ns (typ.)
- Open Drain Output
- Package Outline SC88A
- C-MOS Technology

■PIN CONFIGURATION

(Top View)



■EQUIVALENT CIRCUIT



■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V _{DD}	7.0	V
Differential Input Voltage	V _{ID}	±7.0 (Note1)	V
Common Mode Input Voltage	V _{IC}	-0.3~7.0	V
Power Dissipation	P _D	250 (Note3)	mW
Operating Temperature	T _{opr}	-40~+85	°C
Storage Temperature	T _{stg}	-55~+125	°C

Note1) If the supply voltage (V_{DD}) is less than 7.0V, the input voltage must not exceed the V_{DD} level though 7.0V is limit specified.

Note2) The output pull-up voltage must not over the V_{DD} level.

Note3) The power dissipation is value mounted on a glass epoxy board (FR-4) in size of 50x50x1.6 millimeters square.

Note4) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the circuit.

■RECOMMENDED OPERATING CONDITION

(Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{DD}		1.8	-	5.5	V

■ELECTRICAL CHARACTERISTICS

●DC CHARACTERISTICS

(V_{DD}=3.0V, R_L=∞, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V _{IO}	V _{IN} =V _{DD} /2	-	-	7	mV
Input Offset Current	I _{IO}		-	1	-	pA
Input Bias Current	I _{IB}		-	1	-	pA
Input Common Mode Voltage Range	V _{ICM}		0~2.4	-	-	V
Low Level Output Voltage	V _{OL}	I _{OL} =+5mA	-	-	0.3	V
Operating Current	I _{DD}		-	100	200	μA

●TRANSIENT CHARACTERISTICS

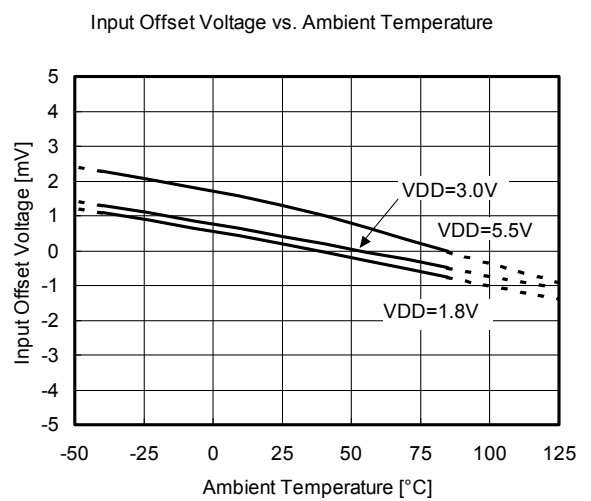
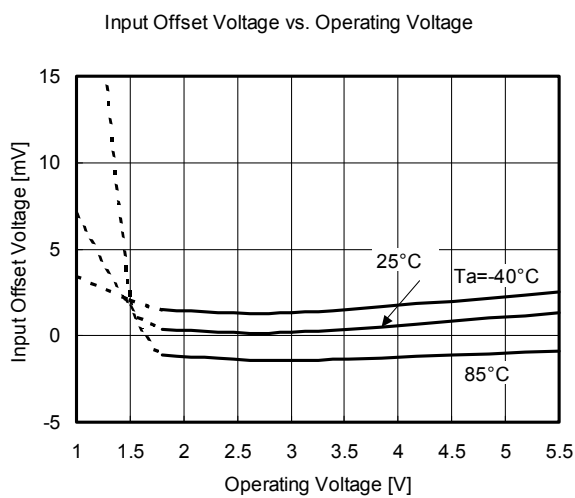
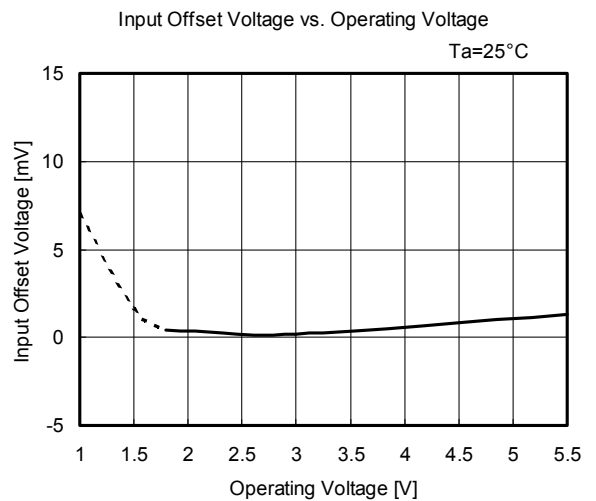
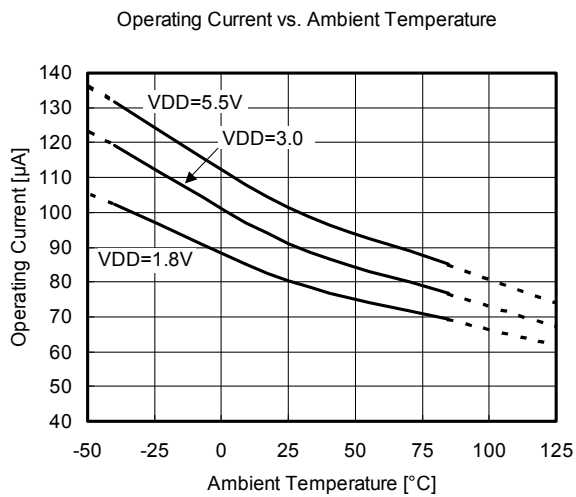
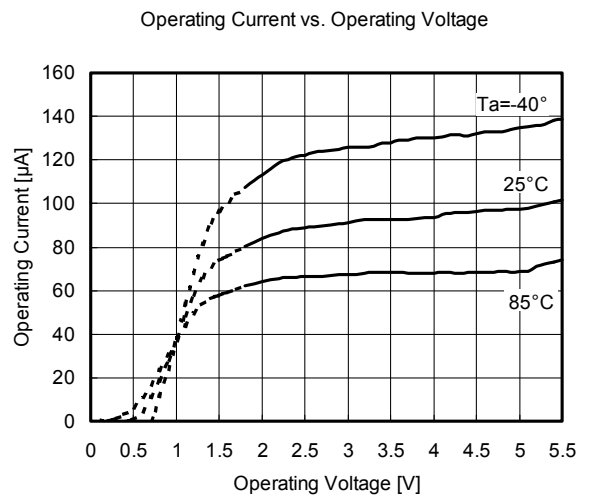
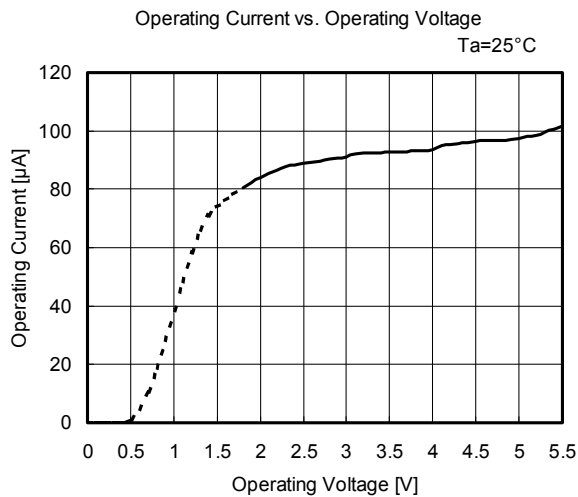
(V_{DD}=3.0V, f=10kHz, C_L=15pF, Ta=25°C)

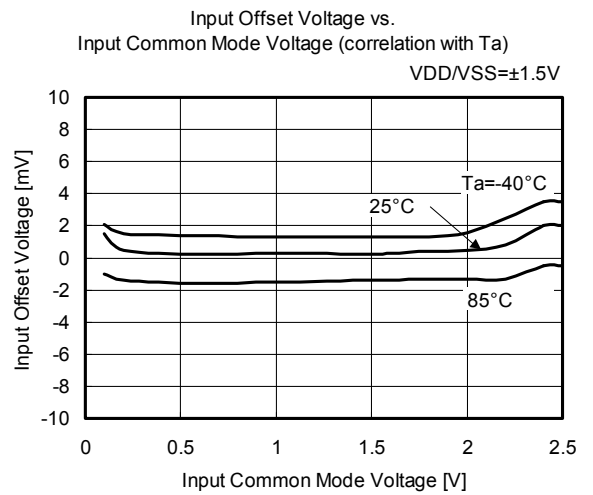
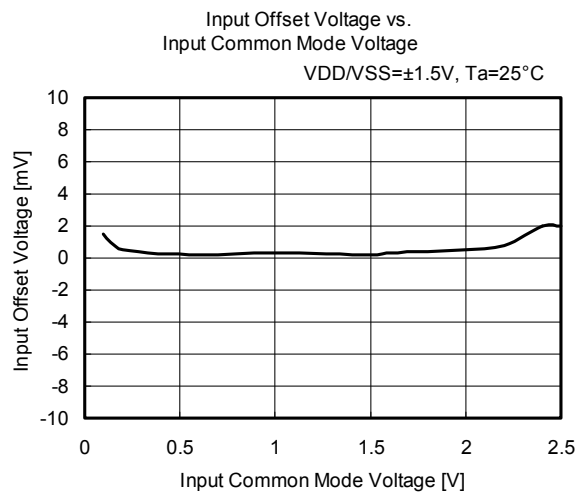
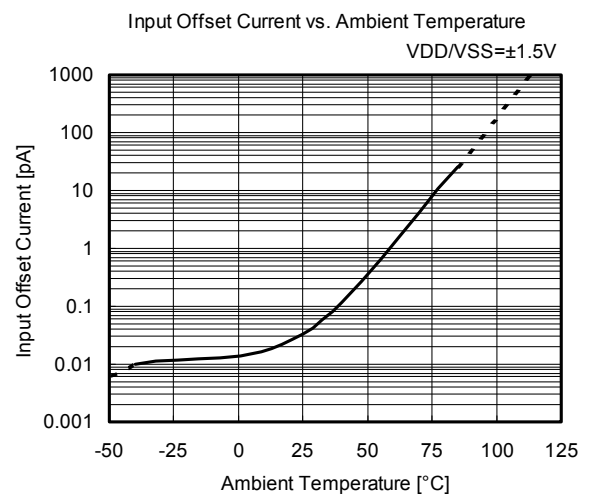
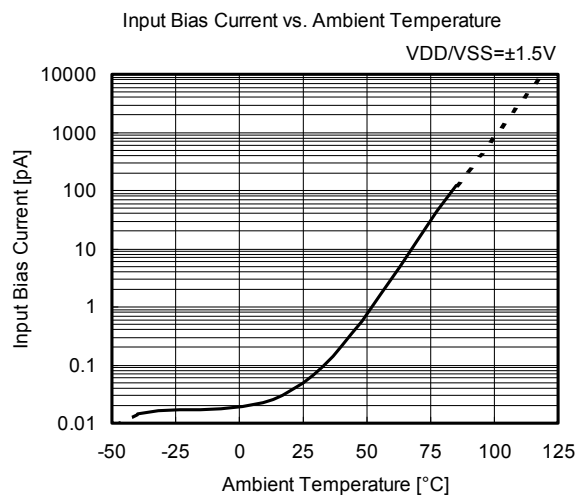
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Low to High	t _{PLH}	Over Drive=100mV	-	160	-	ns
Propagation Delay High to Low	t _{PHL}	Over Drive=100mV	-	70	-	ns
Output Signal Falling Time	t _{THL}	Over Drive=100mV	-	4	-	ns

■ TERMINAL EQUIVALENT CIRCUIT

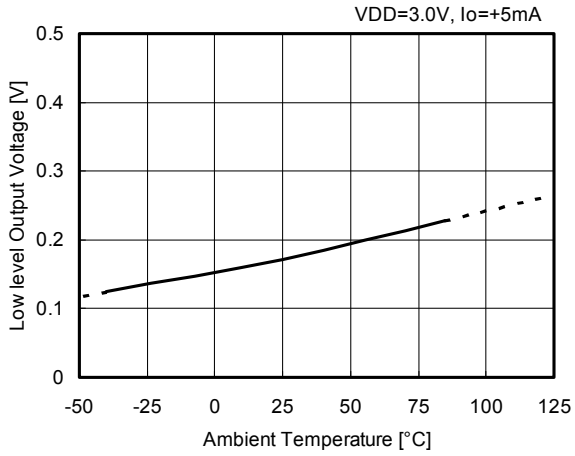
No.	Symbol	Equivalent Circuit	Typ. DC Voltage(V)	Function
1	IN-	<p>The diagram shows a differential pair of transistors. The input terminal is connected to the base of the left transistor through a resistor. The bases of both transistors are biased by a current source connected to V_{DD}. The emitters are connected to V_{SS} through resistors. Diodes are connected from the input terminal to V_{DD} and V_{SS} for protection.</p>	-	inverting input
3	IN+	<p>The diagram shows a differential pair of transistors. The input terminal is connected to the base of the right transistor through a resistor. The bases of both transistors are biased by a current source connected to V_{DD}. The emitters are connected to V_{SS} through resistors. Diodes are connected from the input terminal to V_{DD} and V_{SS} for protection.</p>	-	non-inverting input
4	OUT	<p>The diagram shows a single transistor with its emitter connected to V_{SS} and its base biased by a current source connected to V_{DD}. The output terminal is connected to the collector through a diode. Protection diodes are also connected from the output terminal to V_{DD} and V_{SS}.</p>	-	output

■ TYPICAL CHARACTERISTICS

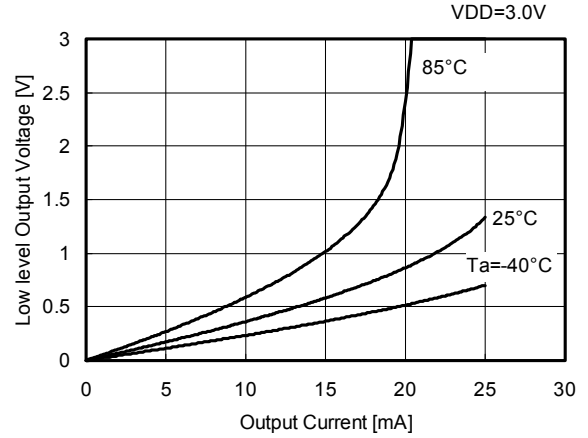




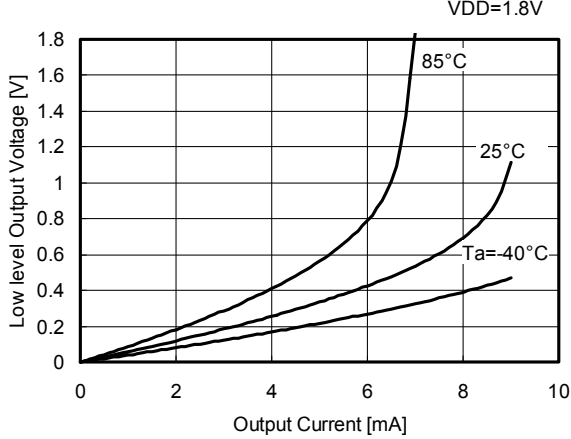
Low level Output Voltage vs. Ambient Temperature



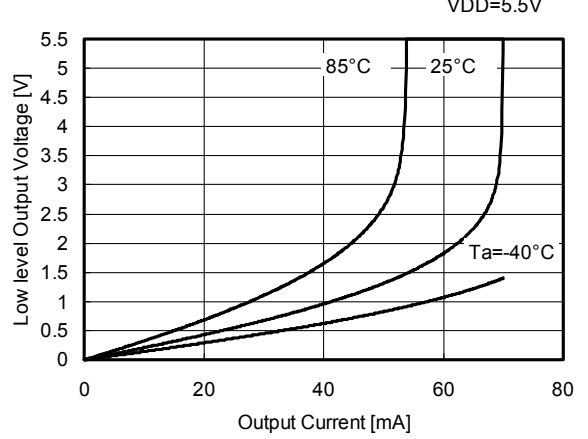
Low level Output Voltage vs. Output Current (correlation with T_a)

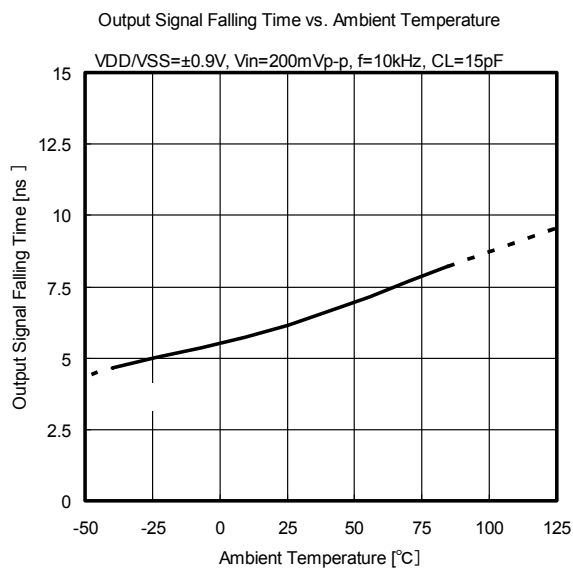
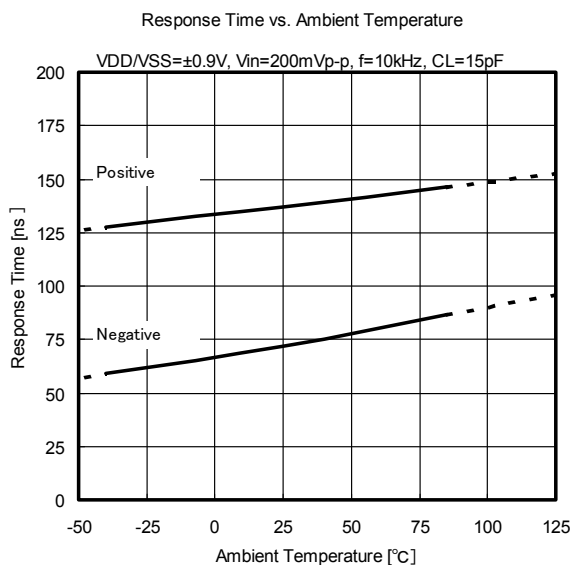
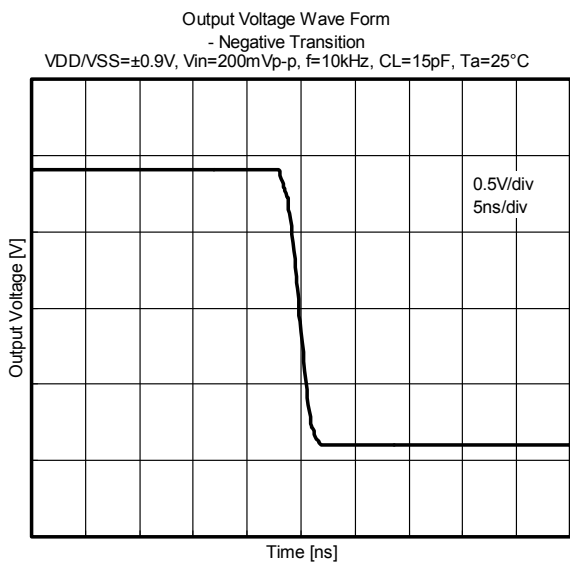
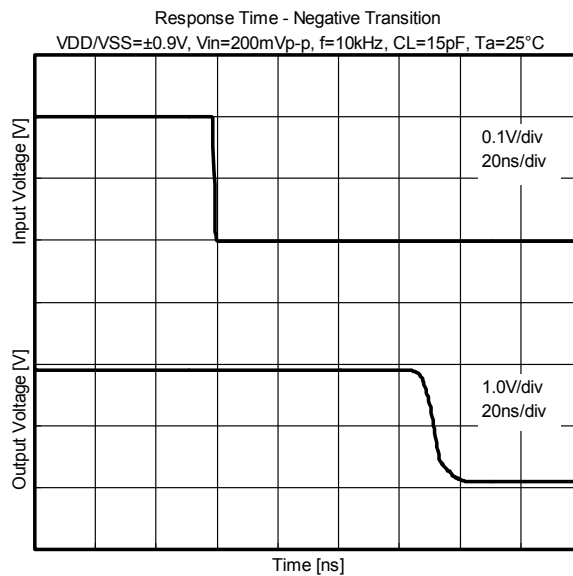
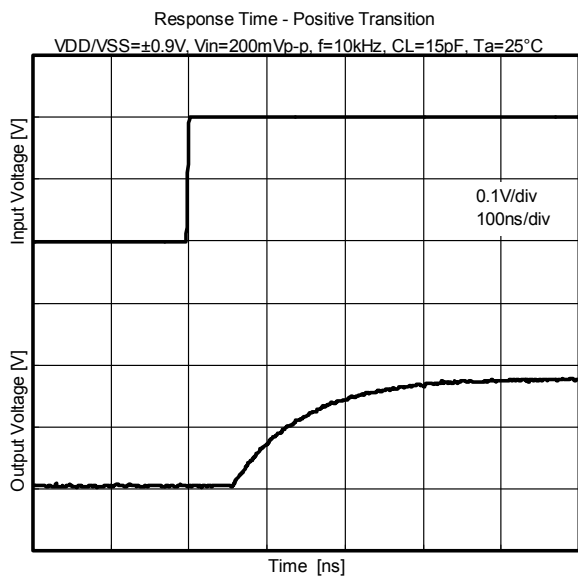


Low level Output Voltage vs. Output Current (correlation with T_a)

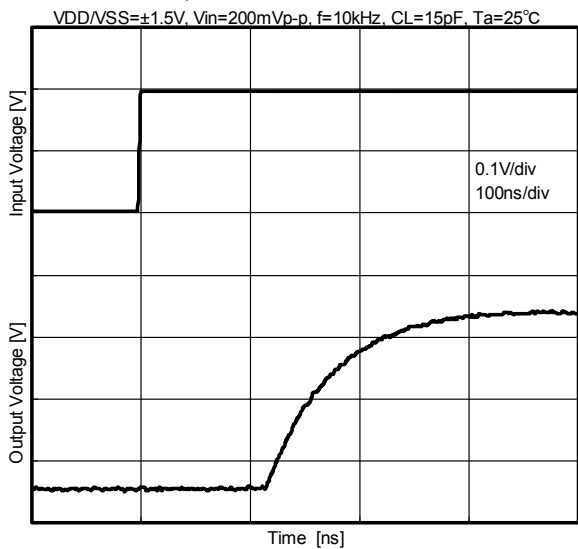


Low level Output Voltage vs. Output Current (correlation with T_a)

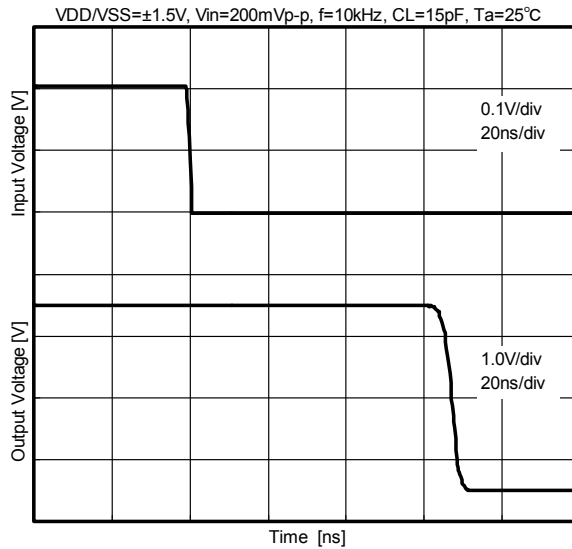




Response Time - Positive Transition



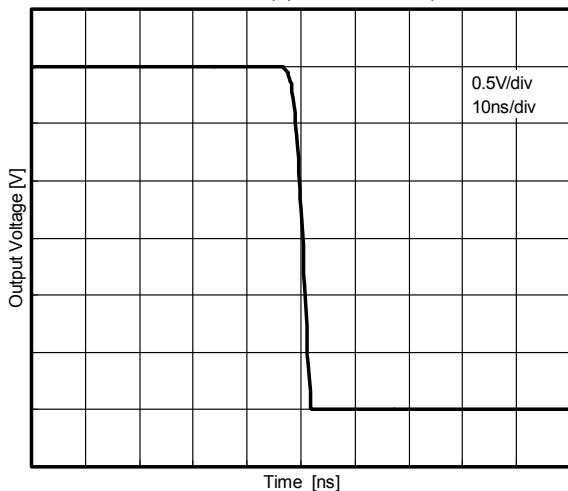
Response Time - Negative Transition



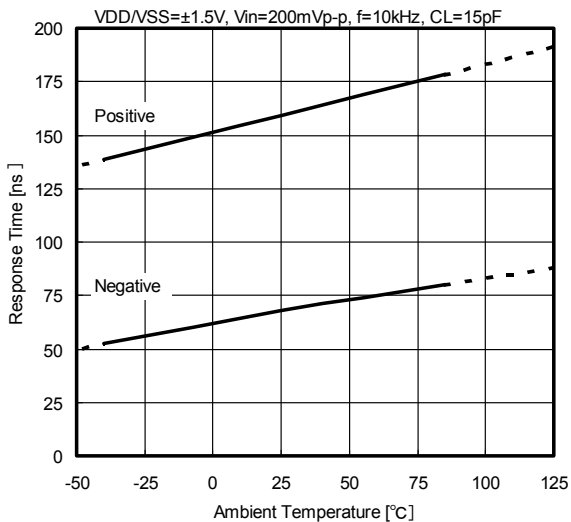
Output Voltage Wave Form

- Negative Transition

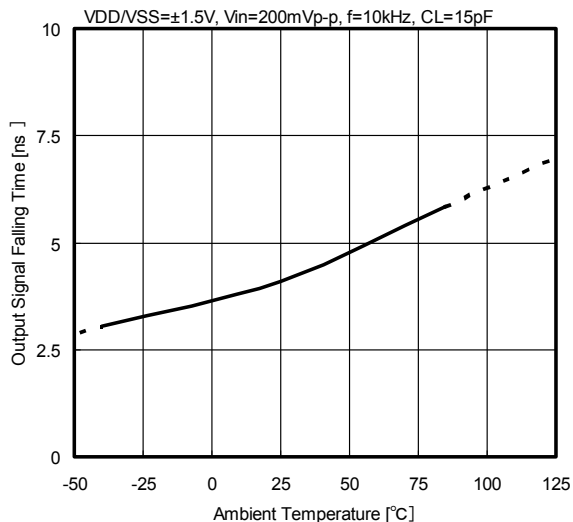
VDD/VSS=±1.5V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C

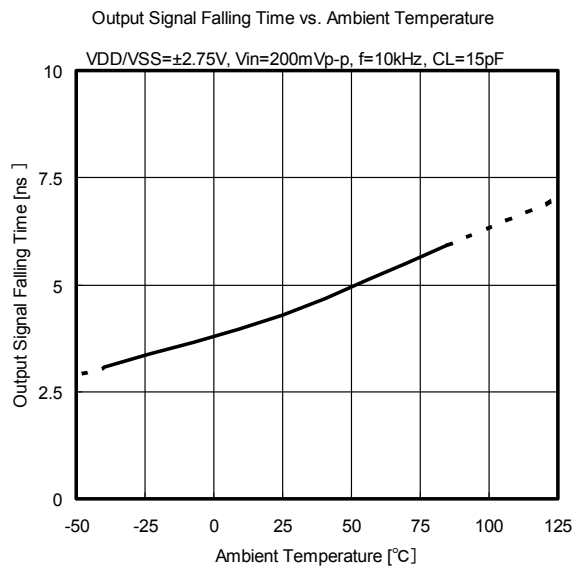
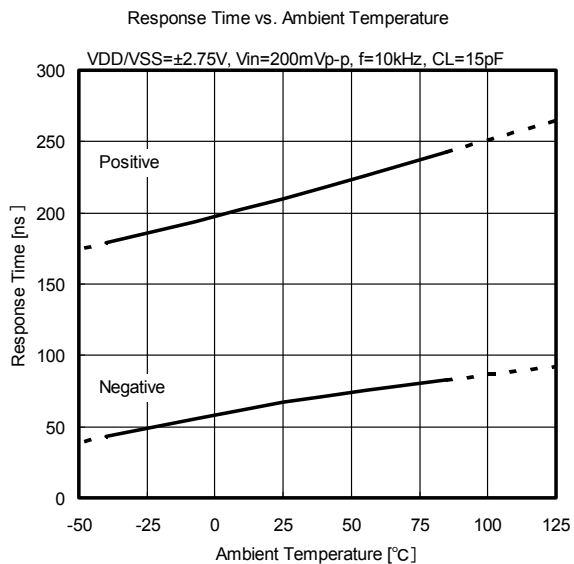
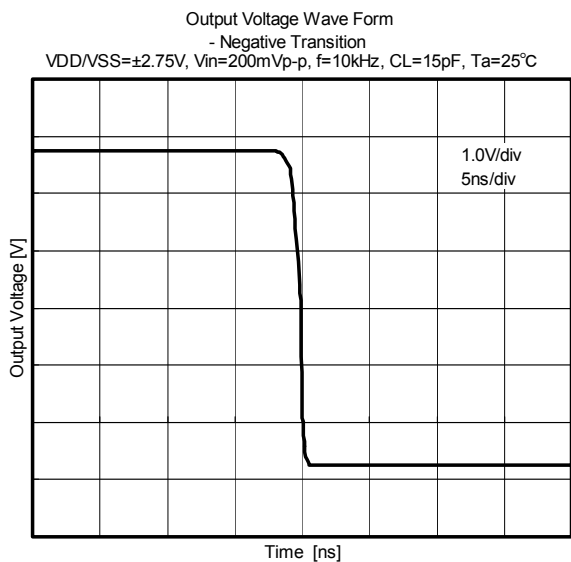
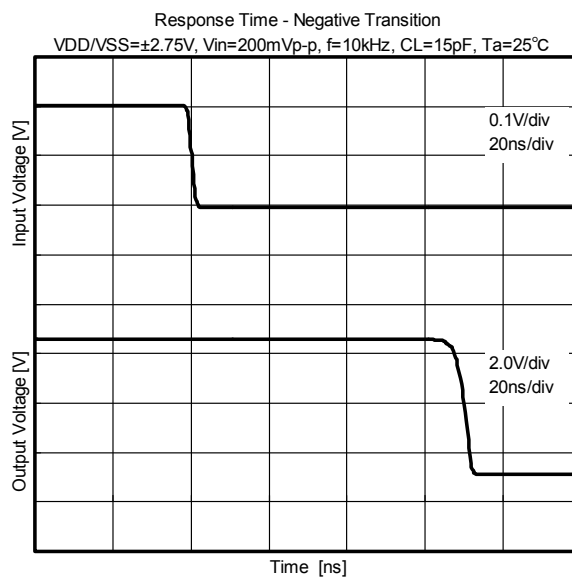
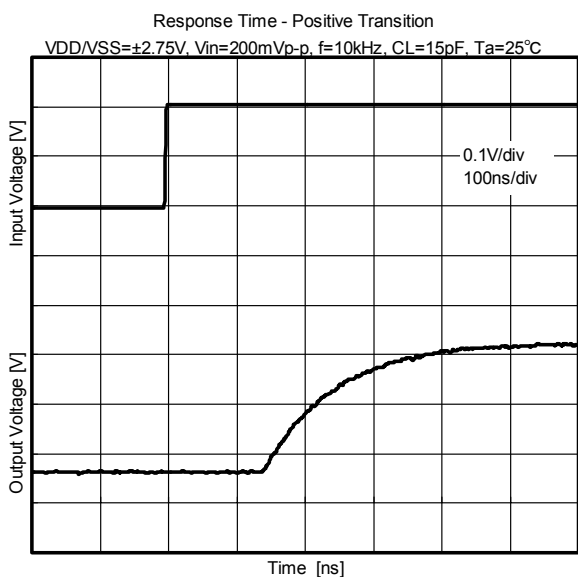


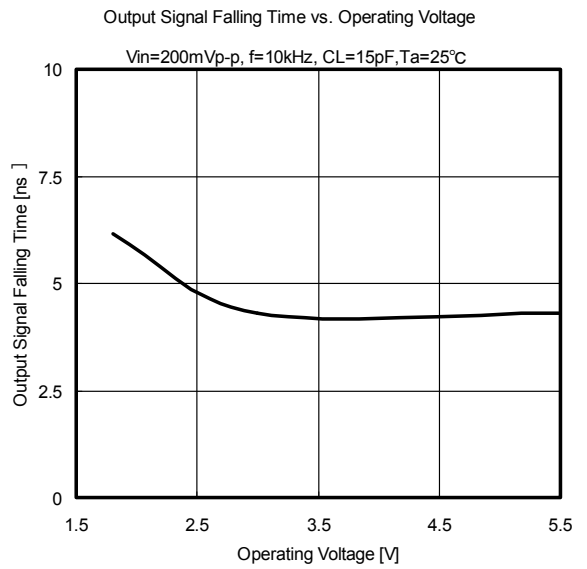
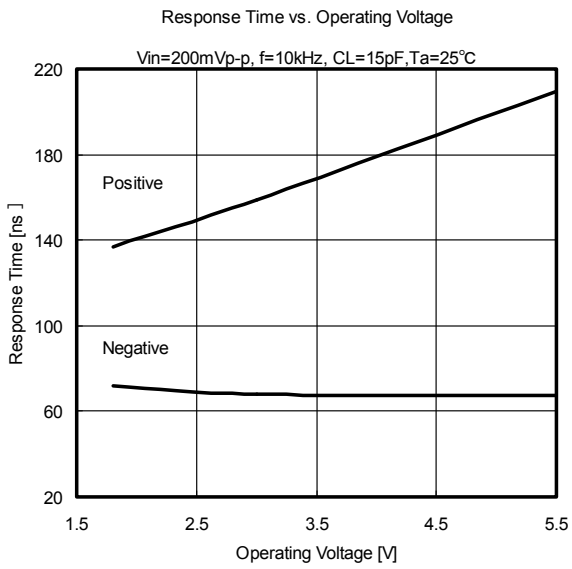
Response Time vs. Ambient Temperature



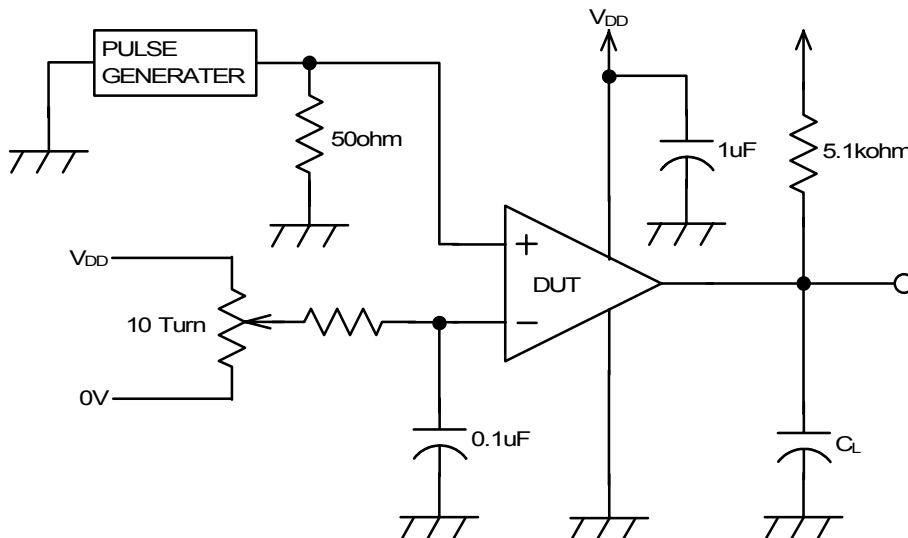
Output Signal Falling Time vs. Ambient Temperature







SWITCHING CHARACTERISTICS MEASUREMENT CIRCUIT



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