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

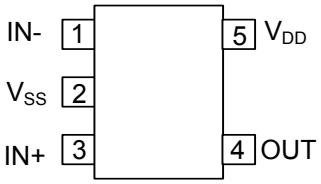
NJU7119F3

■FEATURES

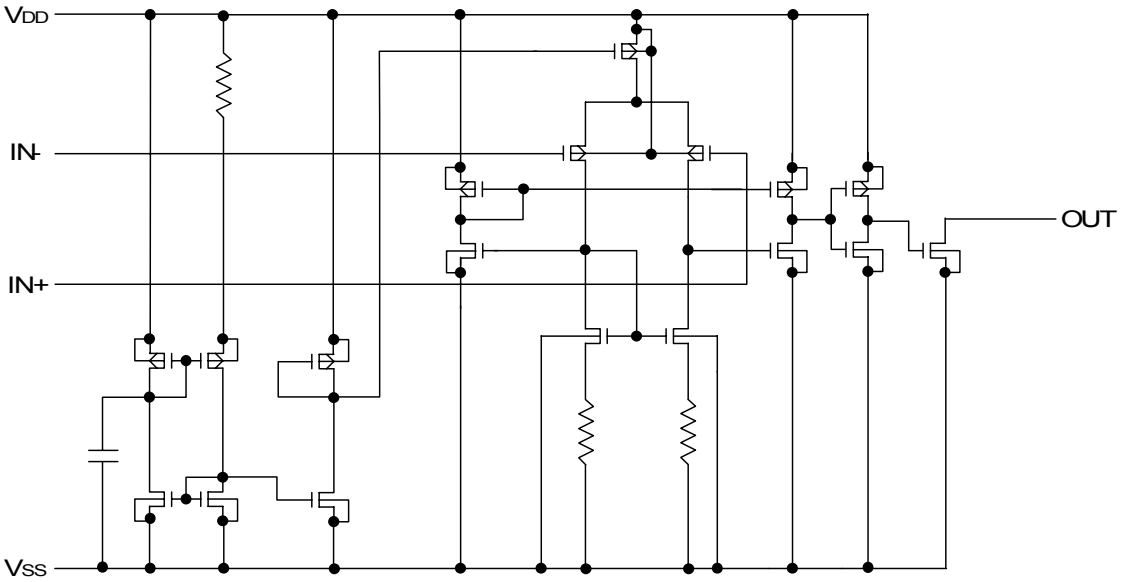
●Single Low Power Supply	V_{DD}=1.8~5.5V
●Low Offset Voltage	V_{IO}=7mV (max.)
●Low Operating Current	I_{DD}=100μA(typ.)
●Propagation Delay(t_{PLH}/t_{PHL})	160/70ns(typ.)
●Output Signal Falling Time(t_{THL})	4ns(typ.)
●Open Drain Output	
●Package Outline	SC88A
●C-MOS Technology	

■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	Topr	-40~+85	°C
Storage Temperature	Tstg	-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)

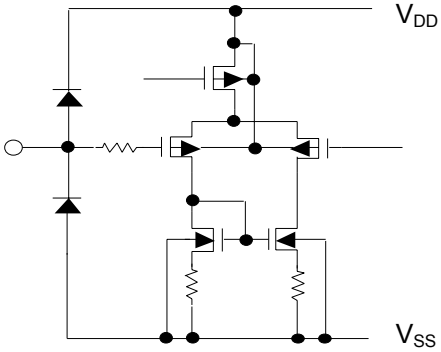
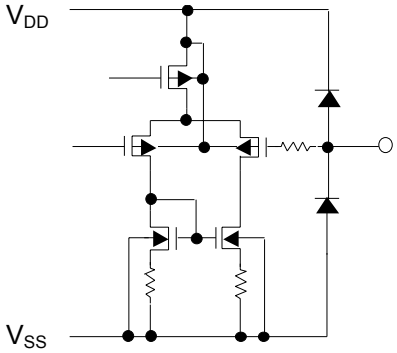
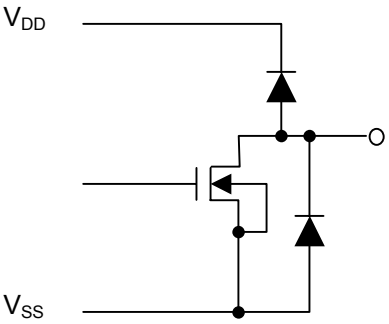
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{IO}	V_{IN}=V_{DD}/2	-	-	7	mV
Input Offset Current	I_{IO}		-	1	-	pA
Input Bias Current	I_{IB}		-	1	-	pA
Input Common Mode Voltage Range	V_{ICM}		0~2.4	-	-	V
Low Level Output Voltage	V_{OL}	I_{OL}=+5mA	-	-	0.3	V
Operating Current	I_{DD}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

●TRANSIENT CHARACTERISTICS

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

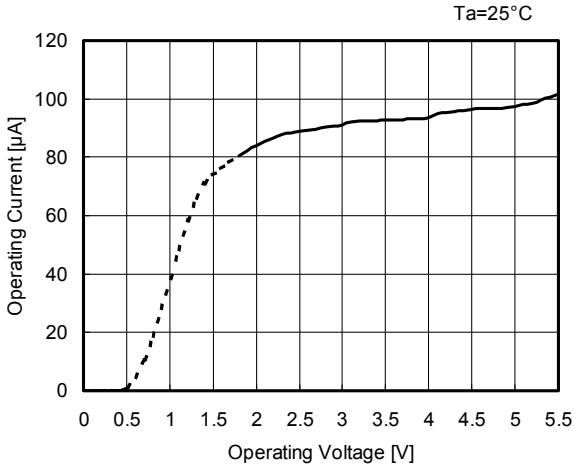
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Low to High	t_{PLH}	Over Drive=100mV	-	160	-	ns
Propagation Delay High to Low	t_{PHL}	Over Drive=100mV	-	70	-	ns
Output Signal Falling Time	t_{THL}	Over Drive=100mV	-	4	-	ns

■TERMINAL EQUIVALENT CIRCUIT

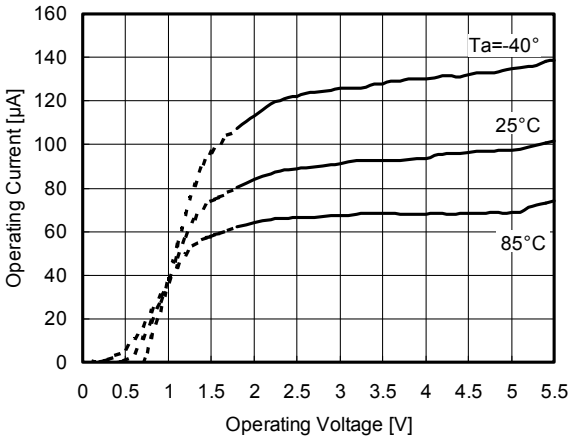
No.	Symbol	Equivalent Circuit	Typ. DC Voltage(V)	Function
1	IN-		-	inverting input
3	IN+		-	non-inverting input
4	OUT		-	output

■TYPICAL CHARACTERISTICS

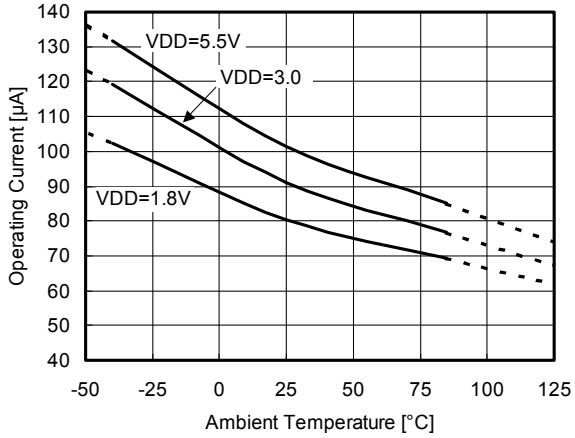
Operating Current vs. Operating Voltage



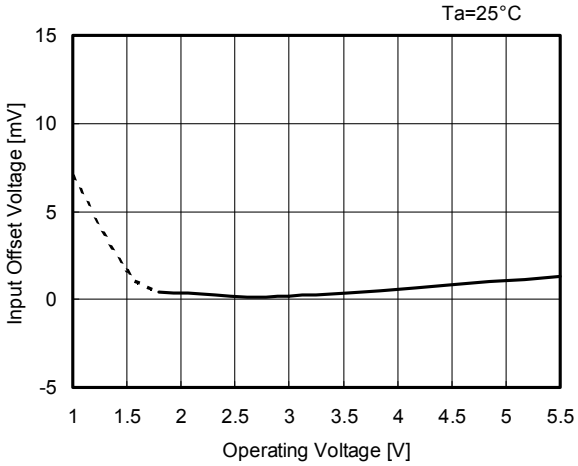
Operating Current vs. Operating Voltage



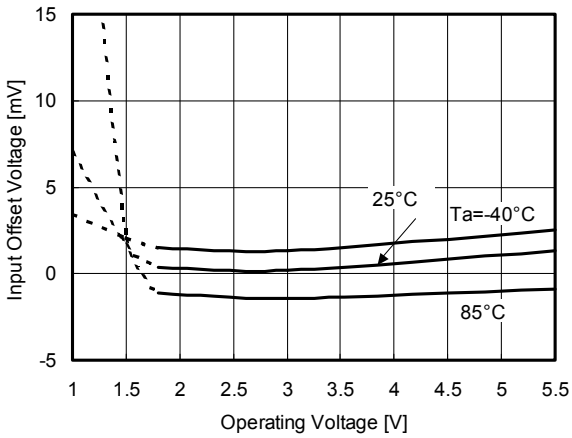
Operating Current vs. Ambient Temperature



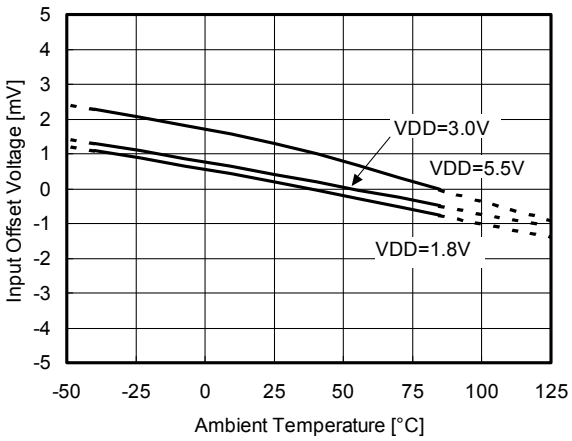
Input Offset Voltage vs. Operating Voltage



Input Offset Voltage vs. Operating Voltage

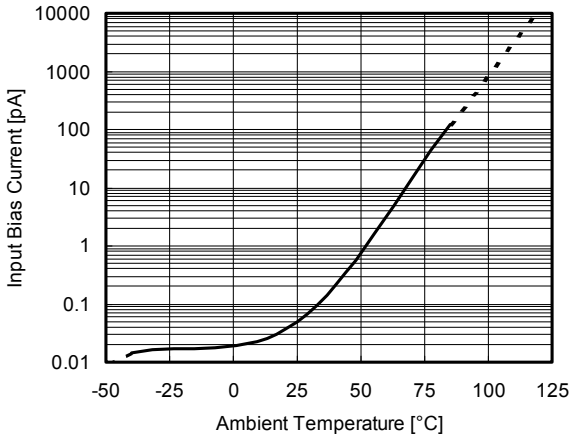


Input Offset Voltage vs. Ambient Temperature



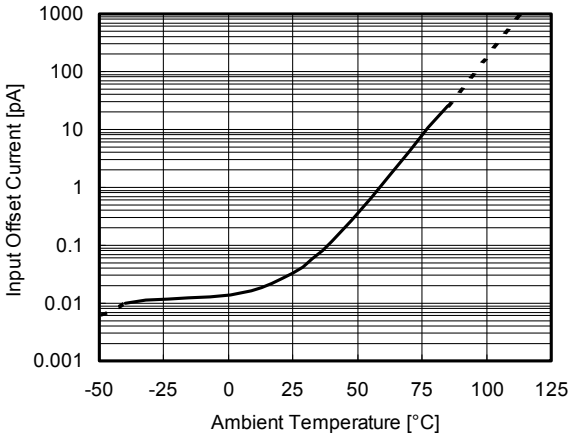
Input Bias Current vs. Ambient Temperature

VDD/VSS=±1.5V



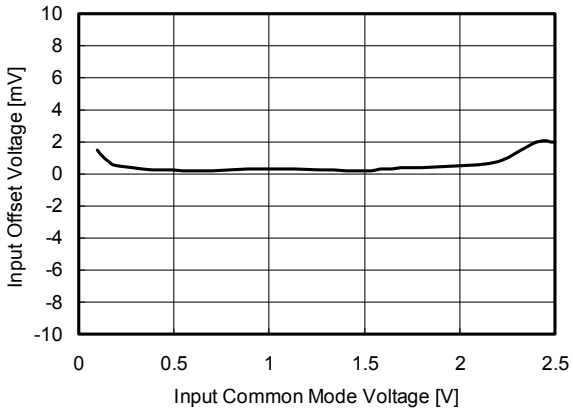
Input Offset Current vs. Ambient Temperature

VDD/VSS=±1.5V



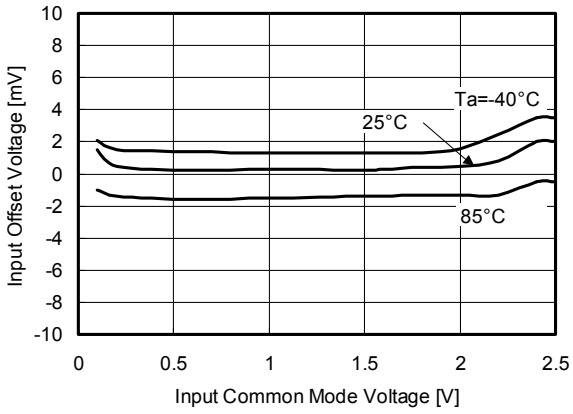
Input Offset Voltage vs.
Input Common Mode Voltage

VDD/VSS=±1.5V, Ta=25°C

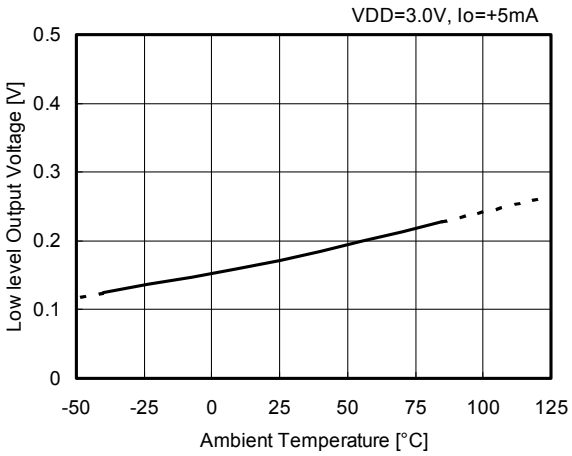


Input Offset Voltage vs.
Input Common Mode Voltage (correlation with Ta)

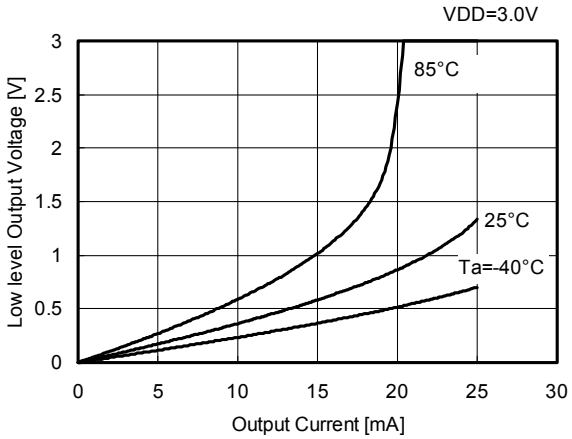
VDD/VSS=±1.5V



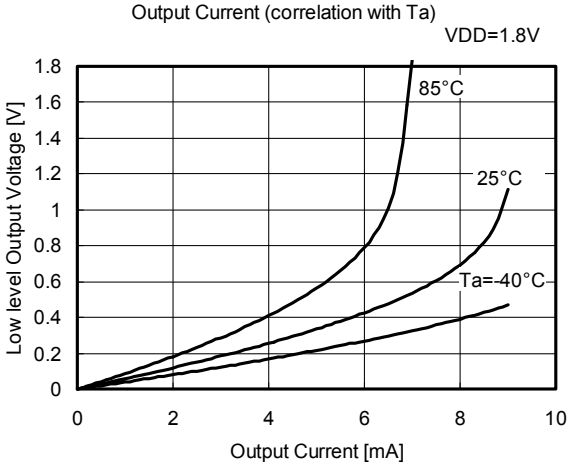
Low level Output Voltage vs. Ambient Temperature



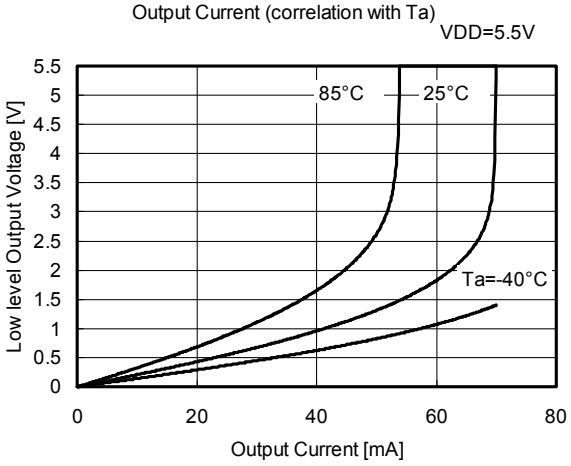
Low level Output Voltage vs.
Output Current (correlation with Ta)



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

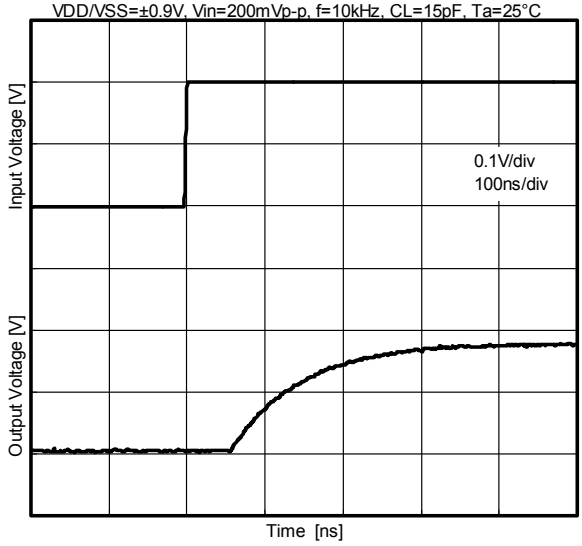


Low level Output Voltage vs.
Output Current (correlation with Ta)



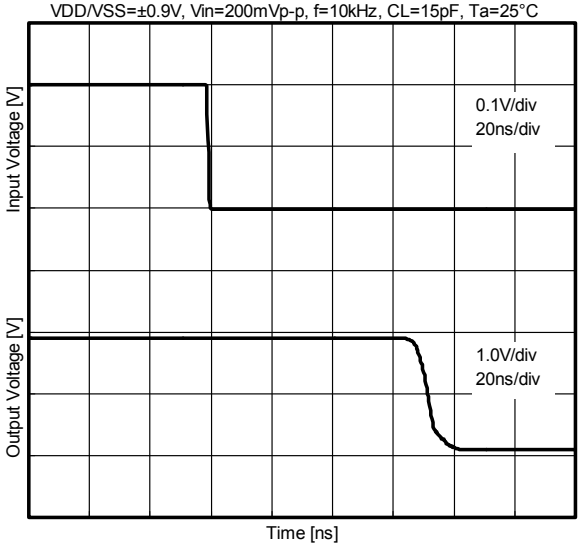
Response Time - Positive Transition

VDD/VSS=±0.9V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



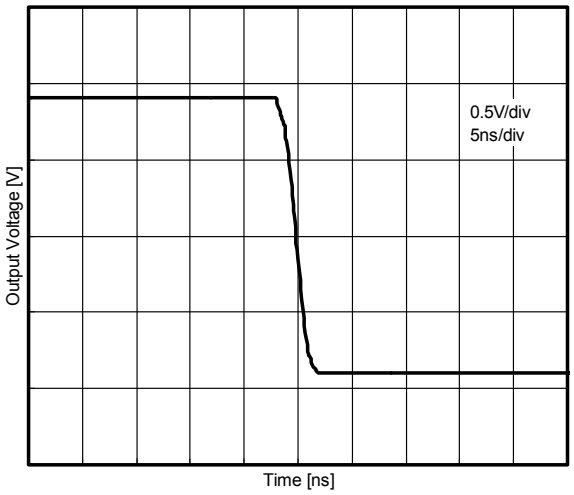
Response Time - Negative Transition

VDD/VSS=±0.9V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



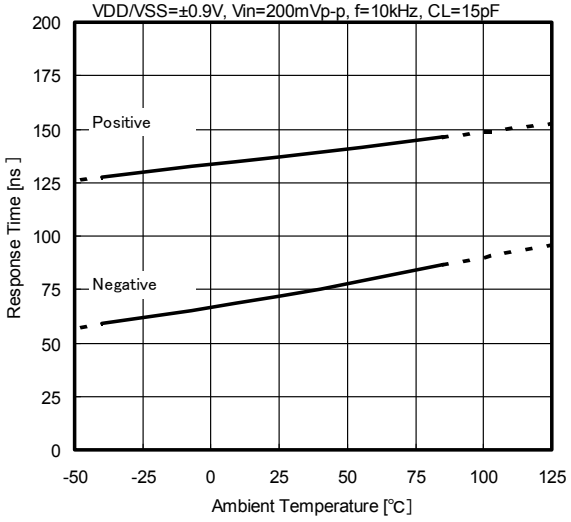
Output Voltage Wave Form
- Negative Transition

VDD/VSS=±0.9V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



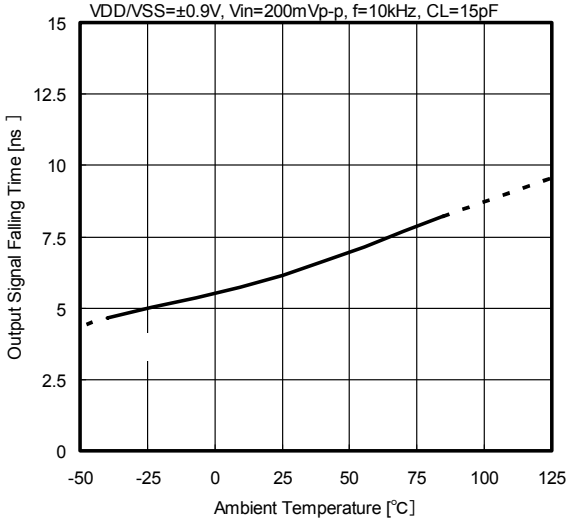
Response Time vs. Ambient Temperature

VDD/VSS=±0.9V, Vin=200mVp-p, f=10kHz, CL=15pF



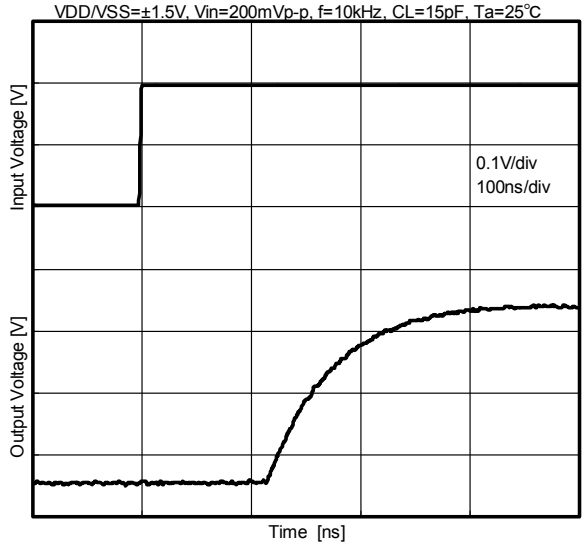
Output Signal Falling Time vs. Ambient Temperature

VDD/VSS=±0.9V, Vin=200mVp-p, f=10kHz, CL=15pF



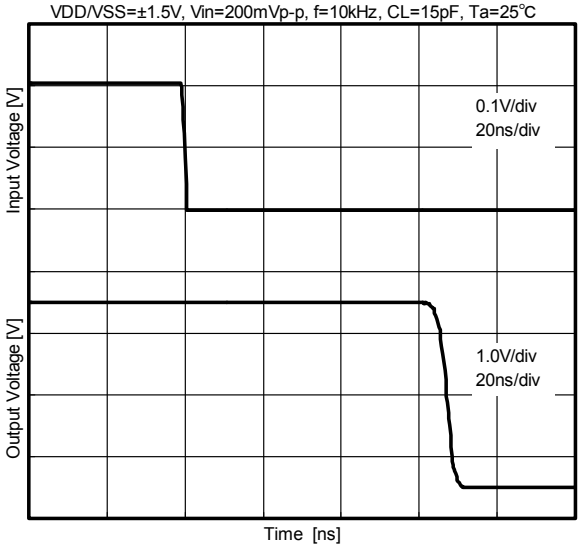
Response Time - Positive Transition

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



Response Time - Negative Transition

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



Output Voltage Wave Form

- Negative Transition

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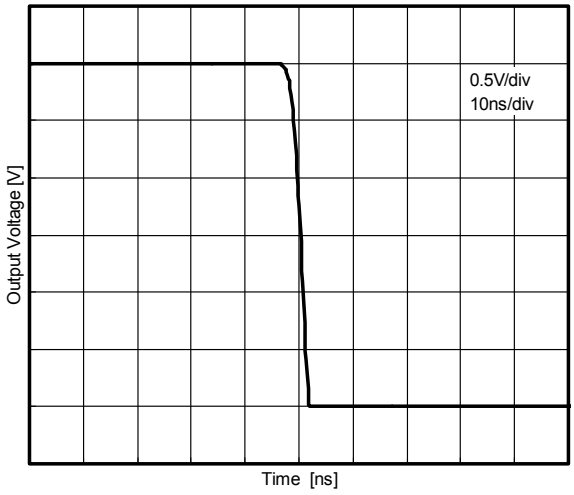
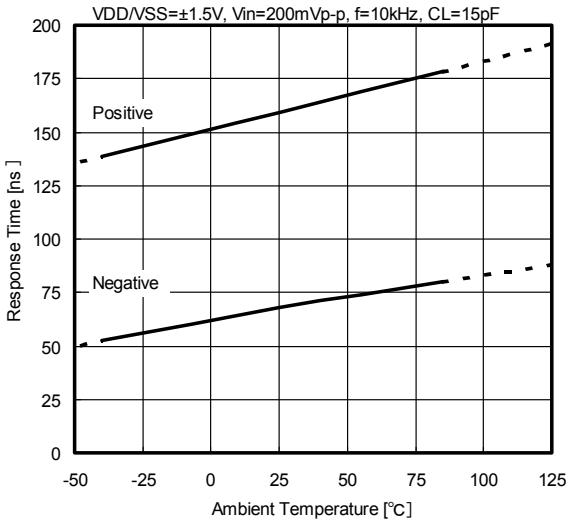


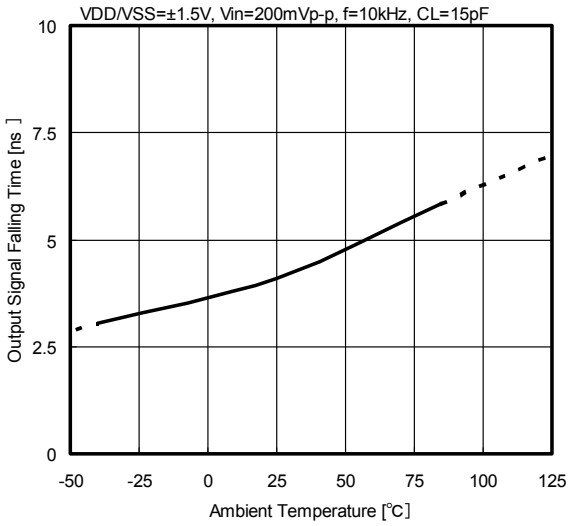
Response Time vs. Ambient Temperature

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



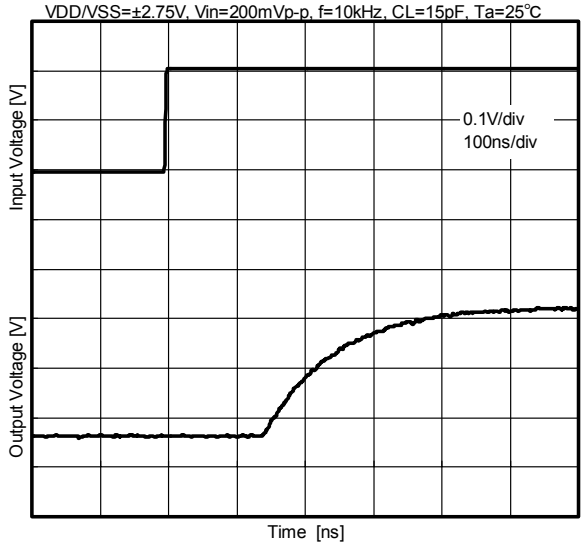
Output Signal Falling Time vs. Ambient Temperature

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



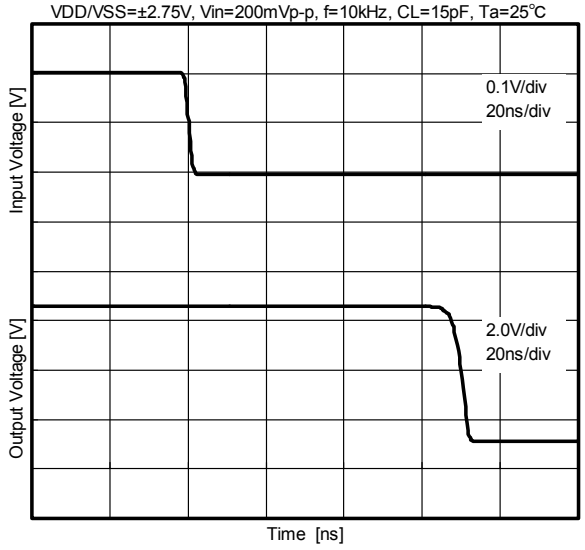
Response Time - Positive Transition

VDD/VSS=±2.75V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25℃



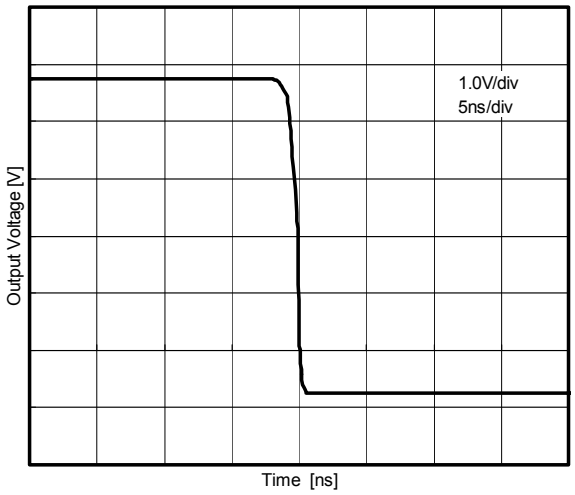
Response Time - Negative Transition

VDD/VSS=±2.75V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25℃



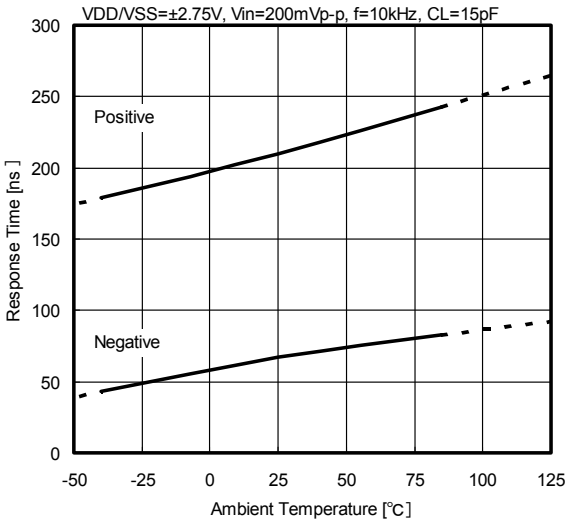
Output Voltage Wave Form
- Negative Transition

VDD/VSS=±2.75V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25℃



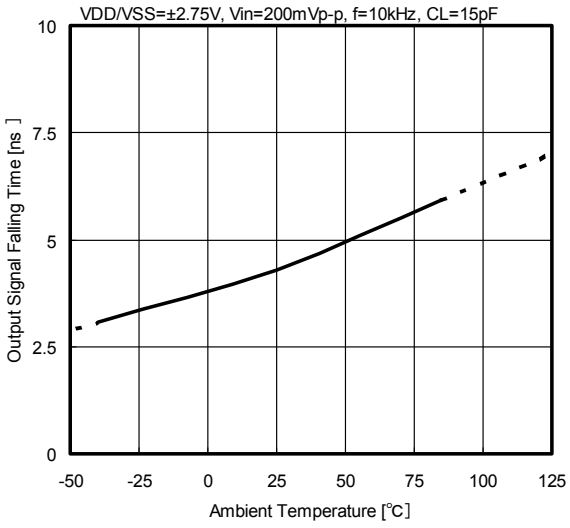
Response Time vs. Ambient Temperature

VDD/VSS=±2.75V, Vin=200mVp-p, f=10kHz, CL=15pF

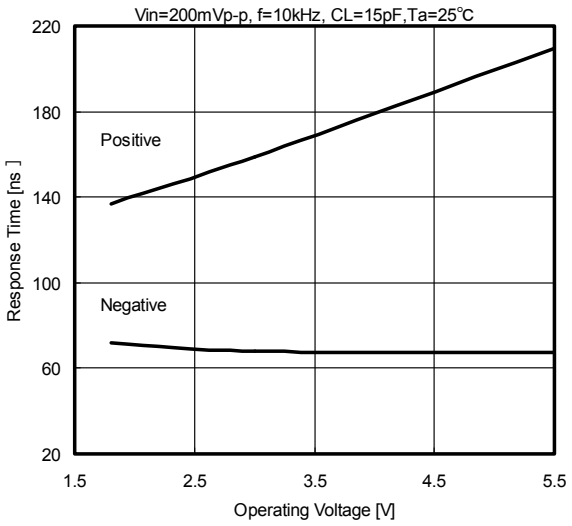


Output Signal Falling Time vs. Ambient Temperature

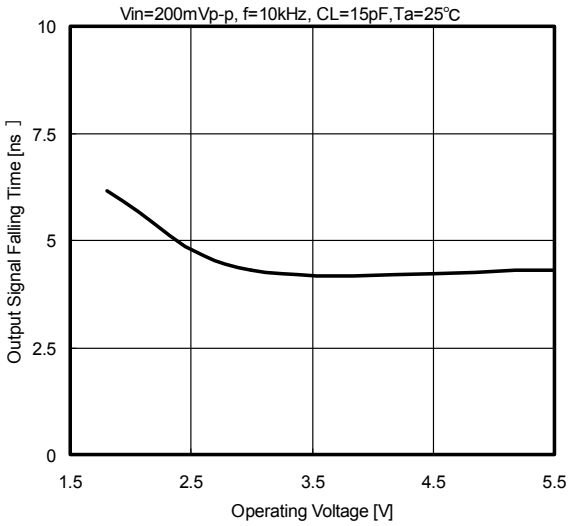
VDD/VSS=±2.75V, Vin=200mVp-p, f=10kHz, CL=15pF



Response Time vs. Operating Voltage



Output Signal Falling Time vs. Operating Voltage



■SWITCHING CHARACTERISTICS MEASUREMENT CIRCUIT