

LOW POWER SUPER SMALL-SIZED SINGLE C-MOS COMPARATOR

■GENERAL DESCRIPTION

The **NJU7109** is super small-sized package single C-MOS comparator with push pull output.

The operating voltage is from 1.8V to 5.5V, and the interface can be connected with most of TTL and C-MOS type standard logic ICs.

Furthermore, The input offset voltage is lower than 7mV and the package is super small-sized SC88A, therefore they can be suitable for battery use items and other portable items.

■PACKAGE INFORMATION



NJU7109F3

■FEATURES

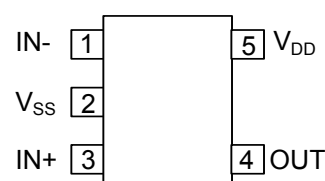
- Single Low Power Supply
- Low Offset Voltage
- Low Operating Current
- Push Pull Output
- Package Outline
- C-MOS Technology

$V_{DD}=1.8\sim5.5V$
 $V_{IO}=7mV$ max
 $I_{DD}=100\mu A$

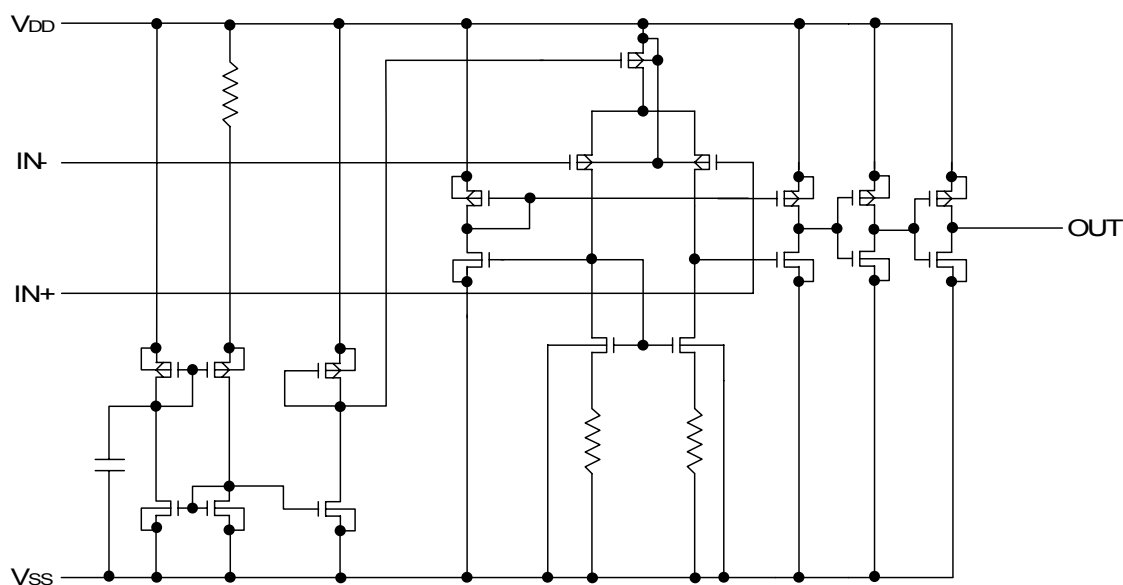
SC88A

■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 (Note2)	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 over the V_{DD} level though 7.0V is limit specified.

Note2) The power dissipation is value mounted on a glass epoxy board (FR-4) in size of 50x50x1.6 millimeters square.

Note3) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the circuit.

■RECOMMENDED OPERATING CONDITION

($V_{DD}=3.0V, T_a=25^\circ C$)

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

■DC CHARACTERISTICS

($V_{DD}=3.0V, R_L=\infty, T_a=25^\circ C$)

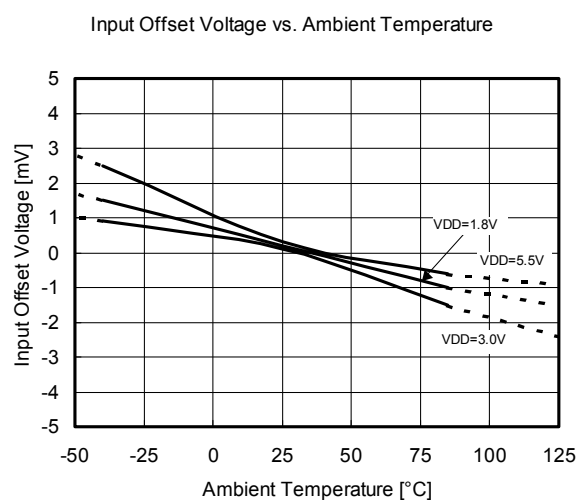
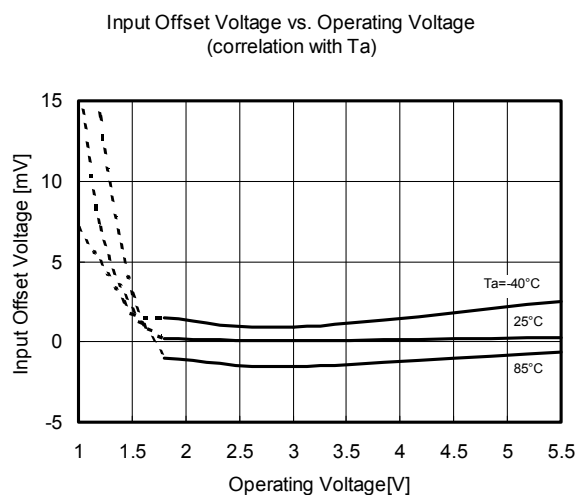
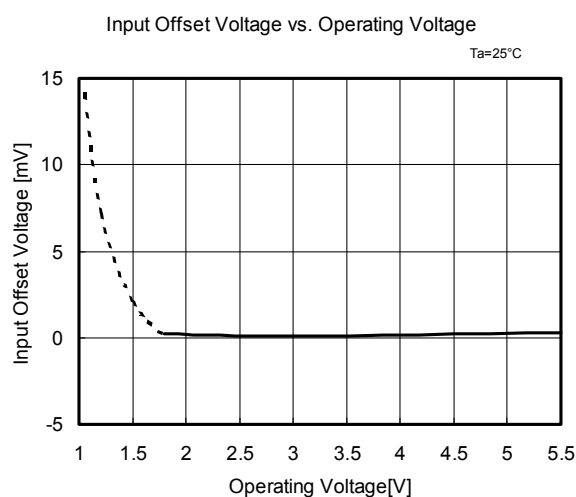
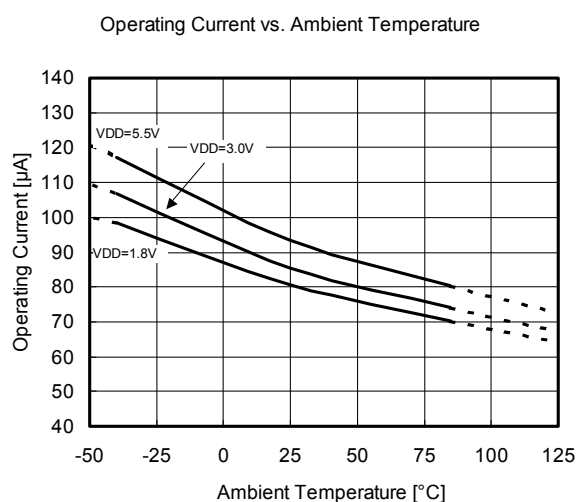
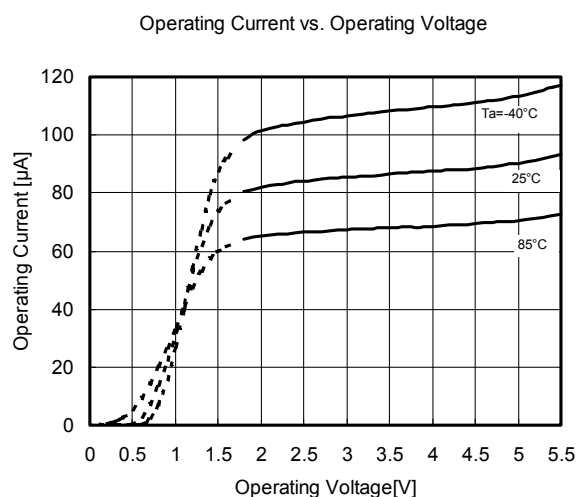
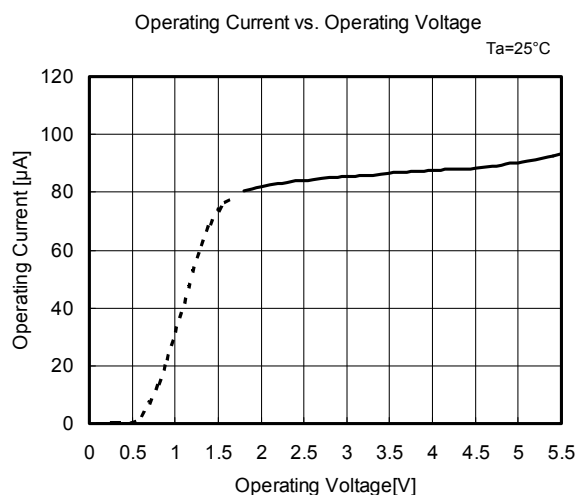
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Current	I_{DD}		-	100	200	μA
Input Offset Voltage	V_{IO}	$V_{IN}=V_{DD}/2$	-	-	7	mV
Input Offset Current	I_{IO}		-	1	-	pA
Input Bias Current	I_{IB}		-	1	-	pA
High Level Output Voltage	V_{OH}	$I_{OH}=-5mA$	2.7	-	-	V
Low Level Output Voltage	V_{OL}	$I_{OL}=+5mA$	-	-	0.3	V
Input Common Mode Voltage Range	V_{ICM}		0~2.4	-	-	V

■TRANSIENT CHARACTERISTICS

($V_{DD}=3.0V, f=10kHz, C_L=15pF, T_a=25^\circ C$)

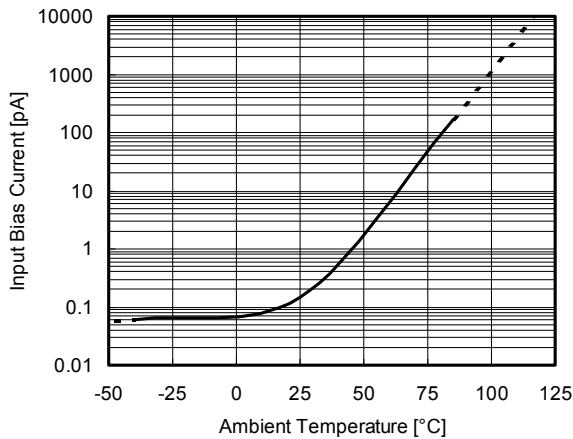
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Low to High	t_{PLH}	Over Drive=100mV	-	110	-	ns
Propagation Delay High to Low	t_{PHL}	Over Drive=100mV	-	70	-	ns
Output Signal Rising Time	t_{TLH}	Over Drive=100mV	-	7	-	ns
Output Signal Falling Time	t_{THL}	Over Drive=100mV	-	6	-	ns

TYPICAL CHARACTERISTICS



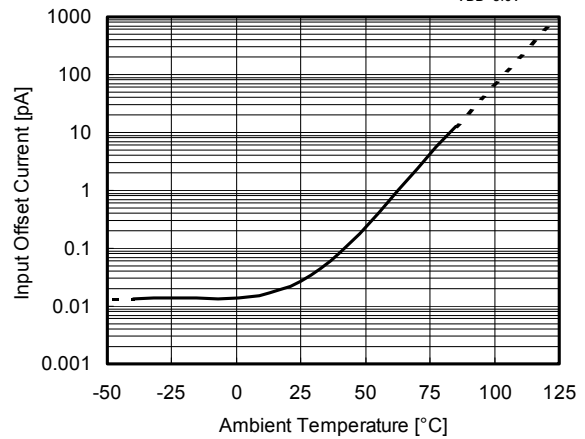
Input Bias Current vs. Ambient Temperature

VDD=3.0V



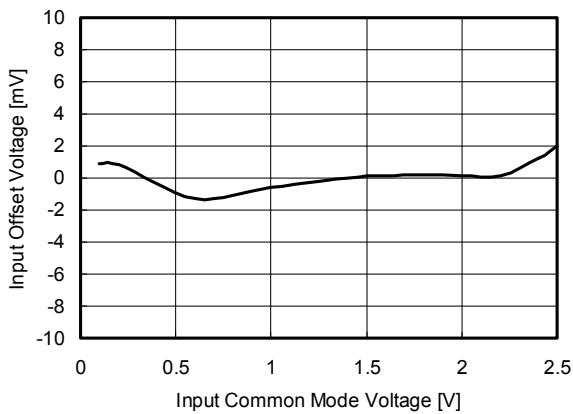
Input Offset Current vs. Ambient Temperature

VDD=3.0V



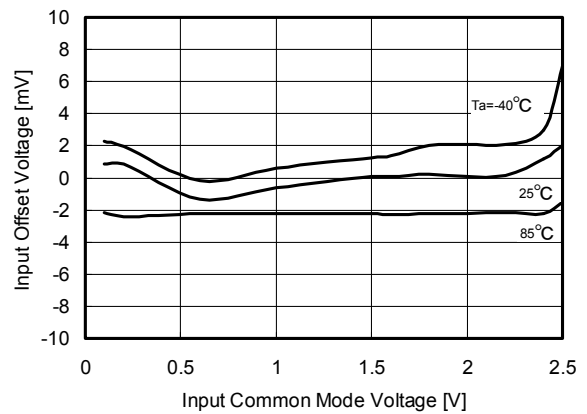
Input Offset Voltage vs.
Input Common Mode Voltage

VDD=3.0V, Ta=25°C



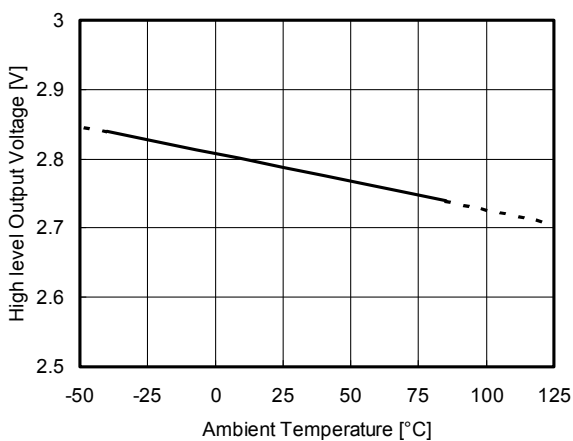
Input Offset Voltage vs.
Input Common Mode Voltage (correlation with Ta)

VDD=3.0V



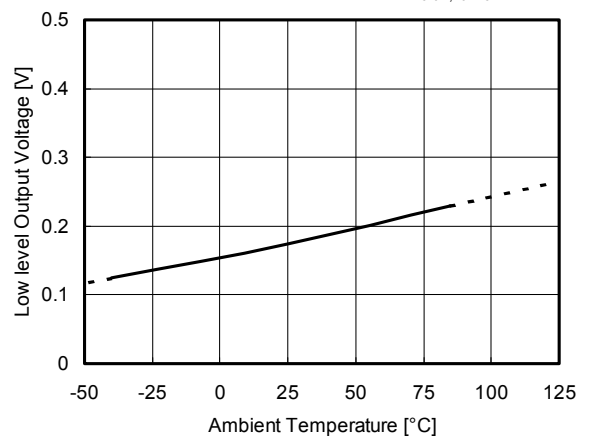
High level Output Voltage vs. Ambient Temperature

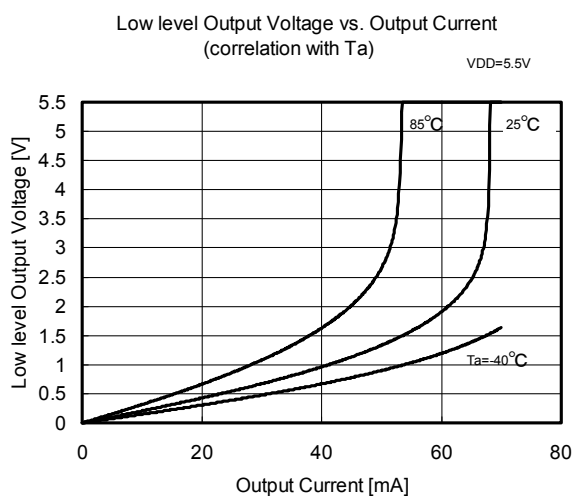
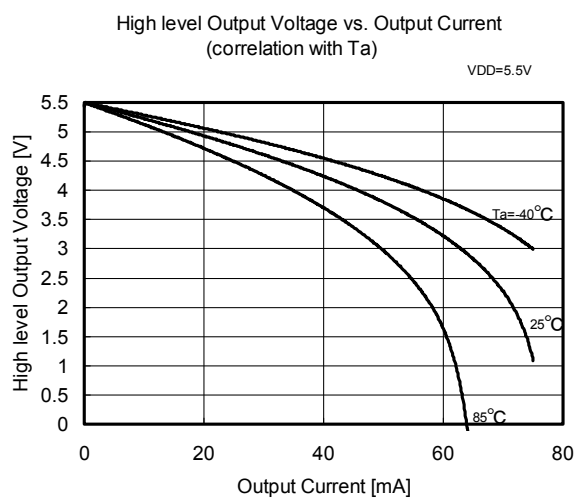
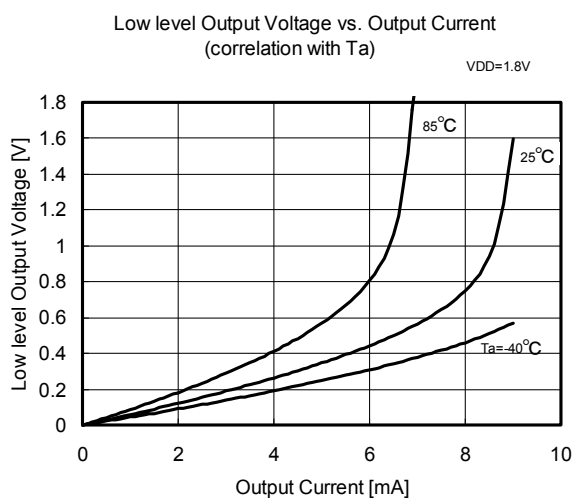
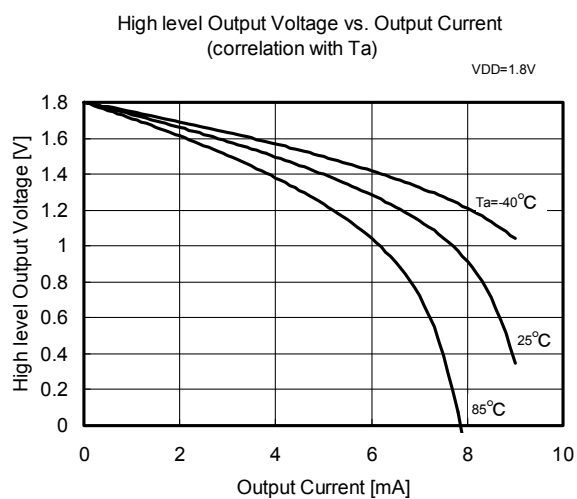
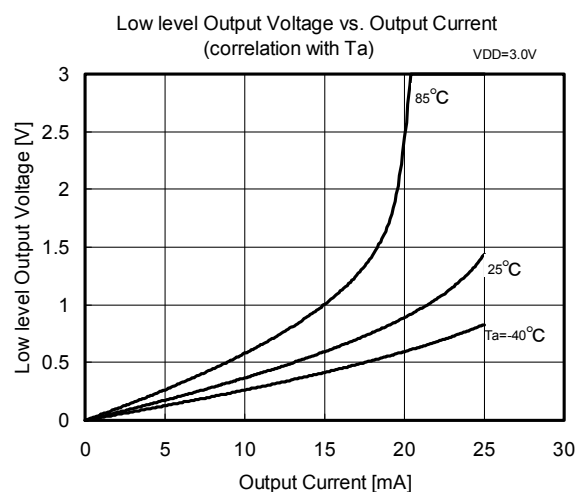
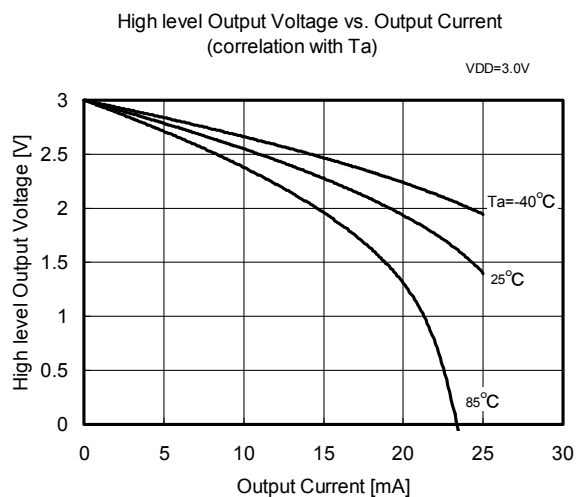
VDD=3.0V, Io=-5mA



Low level Output Voltage vs. Ambient Temperature

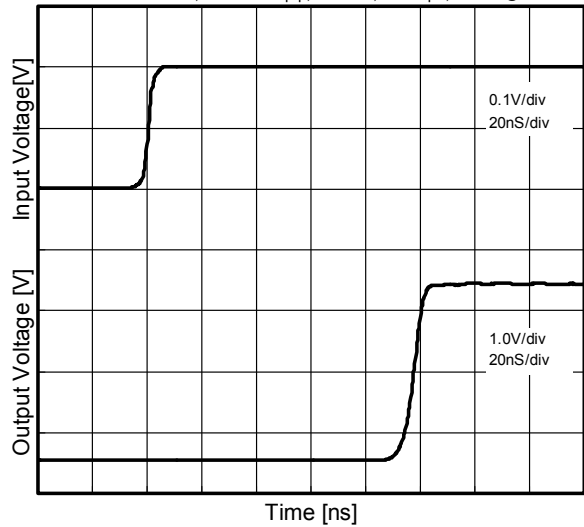
VDD=3.0V, Io=+5mA





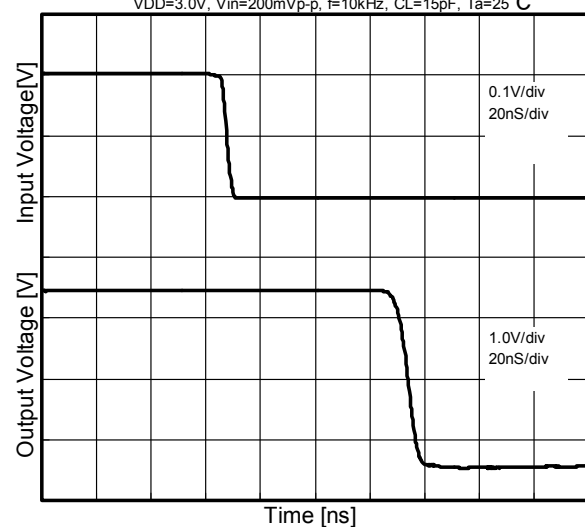
Response Time - Positive Transition

VDD=3.0V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



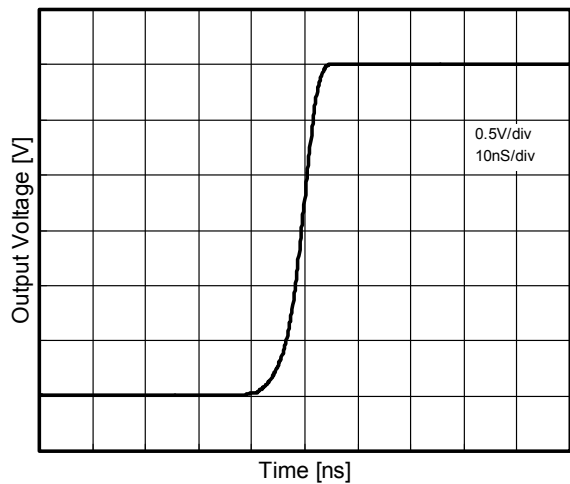
Response Time - Negative Transition

VDD=3.0V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



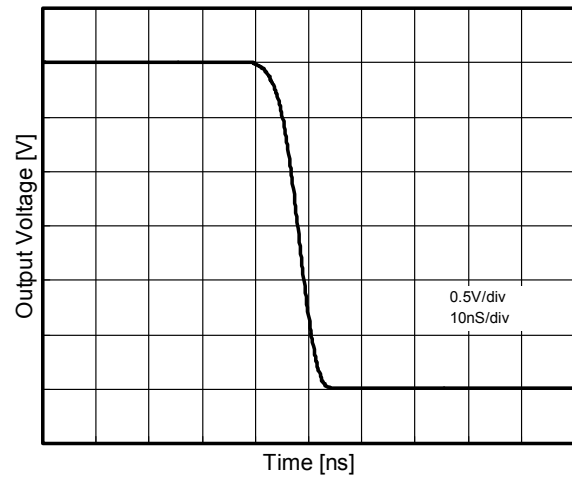
Output Voltage Wave Form
-Positive Transition

VDD=3.0V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



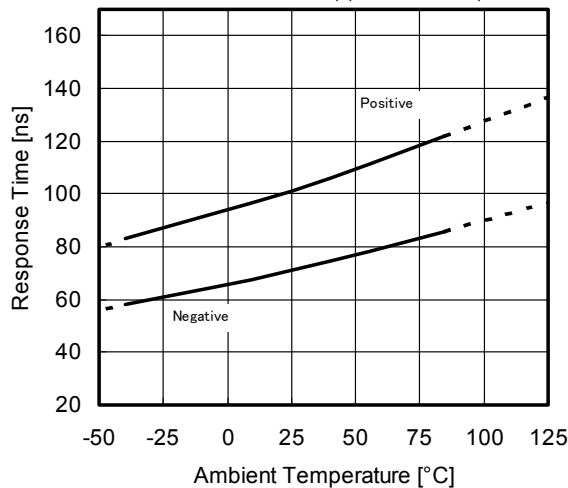
Output Voltage Wave Form
-Negative Transition

VDD=3.0V, Vin=200mVp-p, f=10kHz, CL=15pF, Ta=25°C



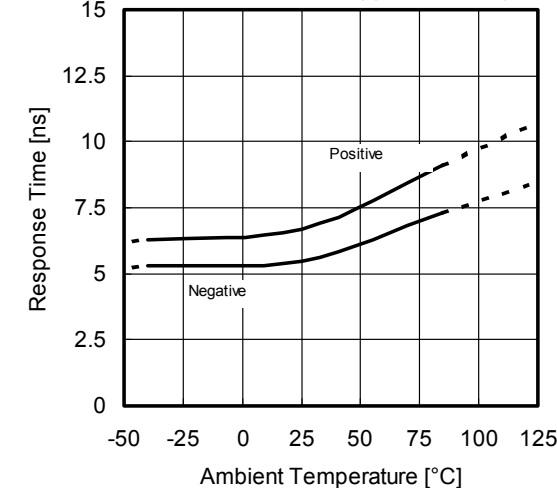
Response Time vs. Ambient Temperature

VDD=3.0V, Vin=200mVp-p, f=10kHz, CL=15pF

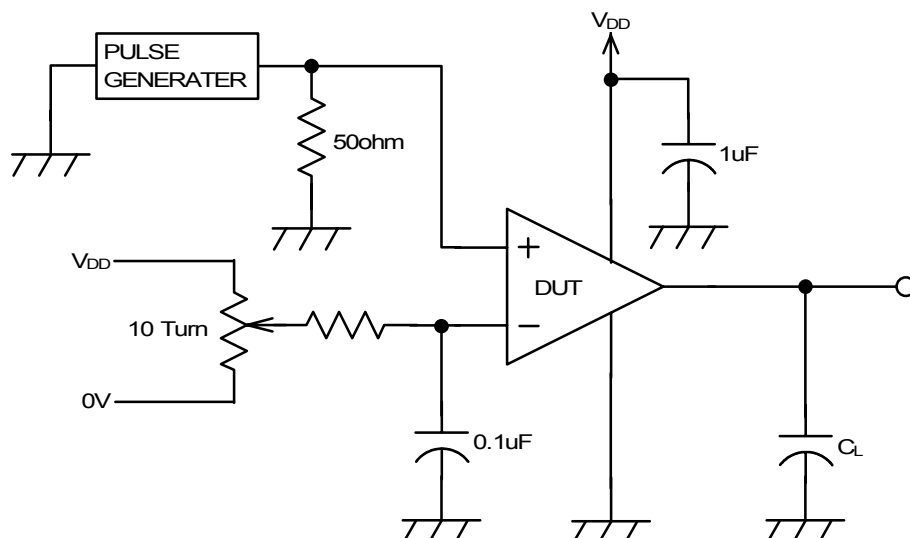


Response Time vs. Ambient Temperature

VDD=3.0V, Vin=200mVp-p, f=10kHz, CL=15pF



■SWITCHING CHARACTERISTICS MEASUREMENT CIRCUIT



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