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



NJU7109F



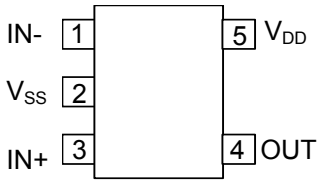
NJU7109F3

■FEATURES

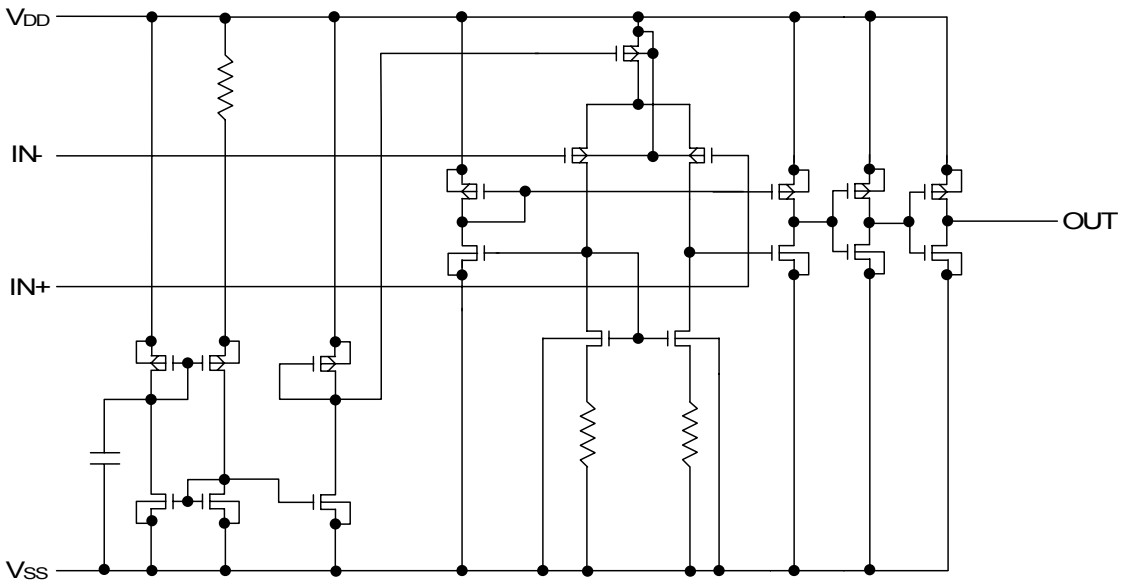
●Single Low Power Supply	V_{DD}=1.8~5.5V
●Low Offset Voltage	V_{IO}=7mV max
●Low Operating Current	I_{DD}=100μA
●Push Pull Output	
●Package Outline	MTP5, SC88A
●C-MOS Technology	

■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	MTP5: 200 SC88A: 250 (Note2)	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 over the V_{DD} level though 7.0V is limit specified.

Note2) The power dissipation is value mounted on aglass 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,Ta=25°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=∞,Ta=25°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

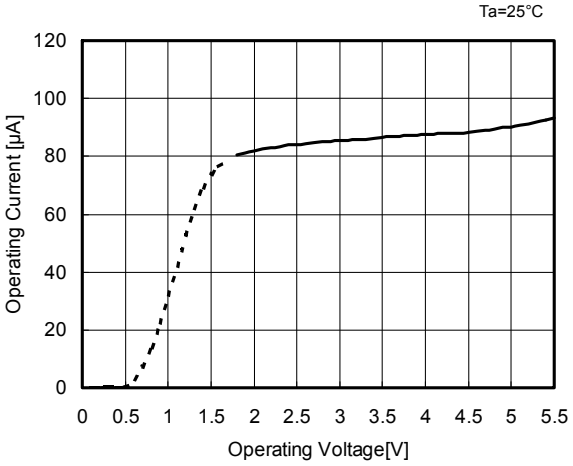
■TRANSIENT CHARACTERISTICS

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

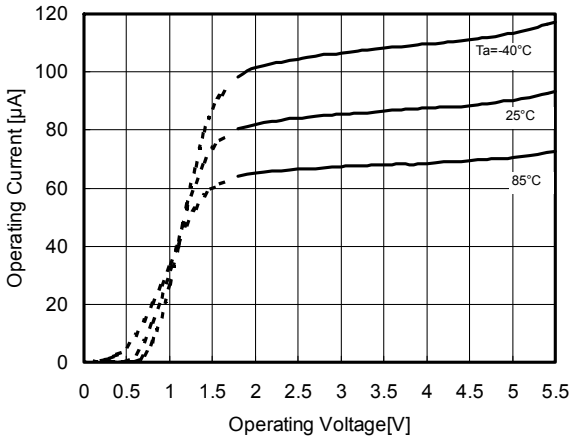
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Low to High	t_{PLH}	Over Drive=100mV	-	110	-	ns
Propagation Delay High to Low	t_{PHL}	Over Drive=100mV	-	70	-	ns
Output Signal Rising Time	t_{TLH}	Over Drive=100mV	-	7	-	ns
Output Signal Falling Time	t_{THL}	Over Drive=100mV	-	6	-	ns

■TYPICAL CHARACTERISTICS

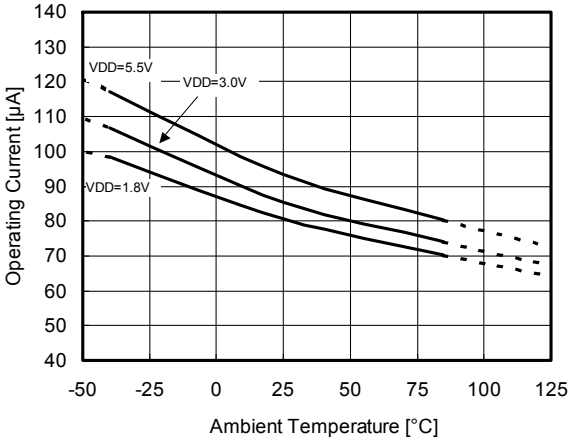
Operating Current vs. Operating Voltage



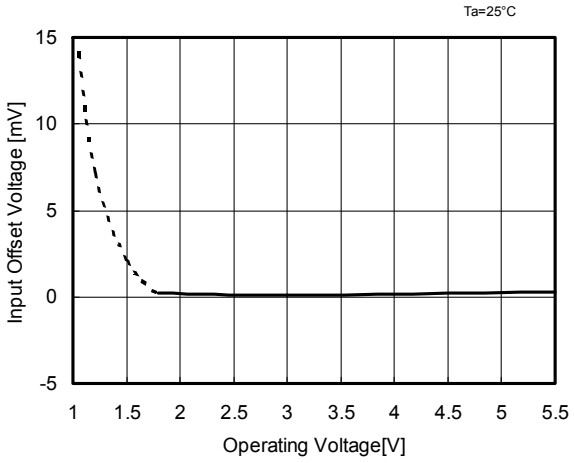
Operating Current vs. Operating Voltage



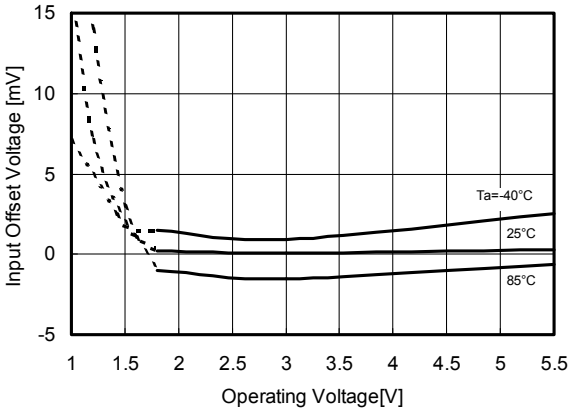
Operating Current vs. Ambient Temperature



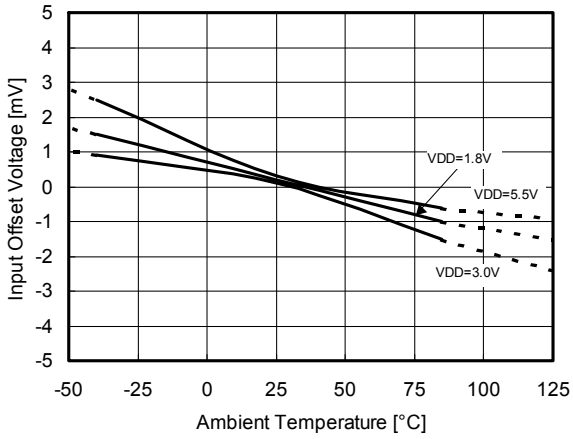
Input Offset Voltage vs. Operating Voltage



Input Offset Voltage vs. Operating Voltage
(correlation with Ta)

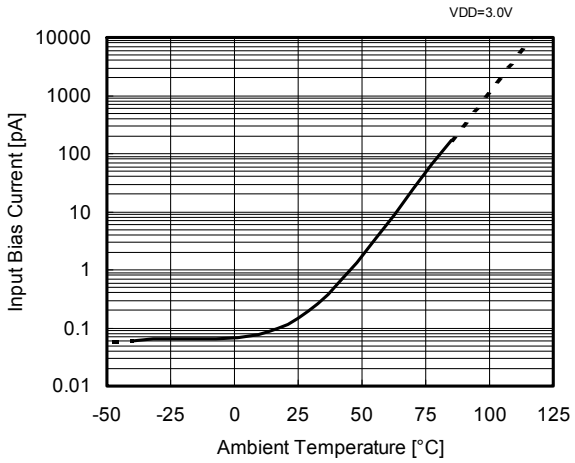


Input Offset Voltage vs. Ambient Temperature

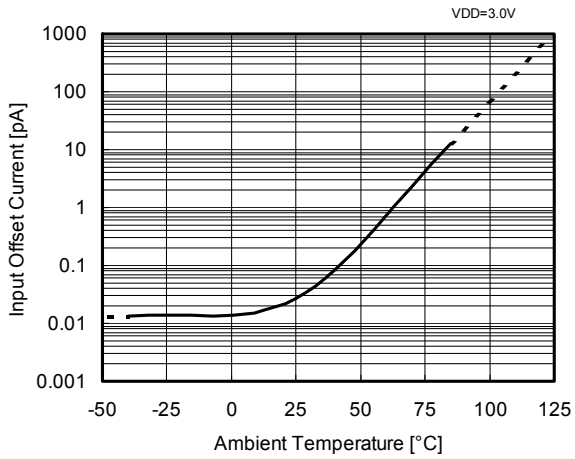


■TYPICAL CHARACTERISTICS

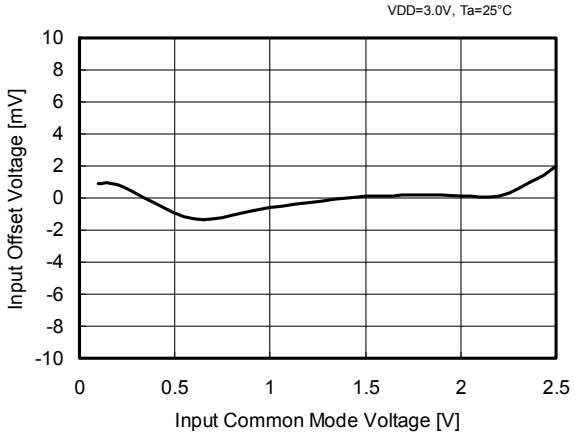
Input Bias Current vs. Ambient Temperature



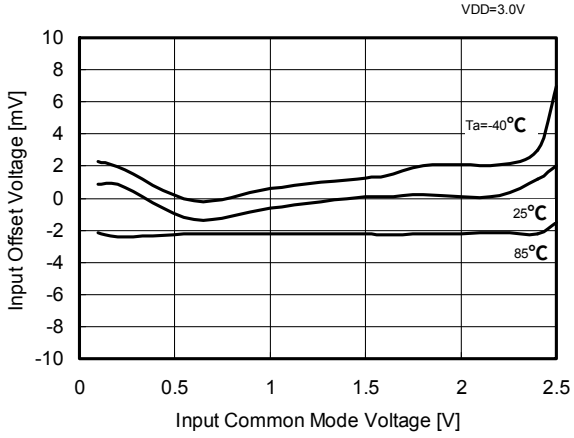
Input Offset Current vs. Ambient Temperature



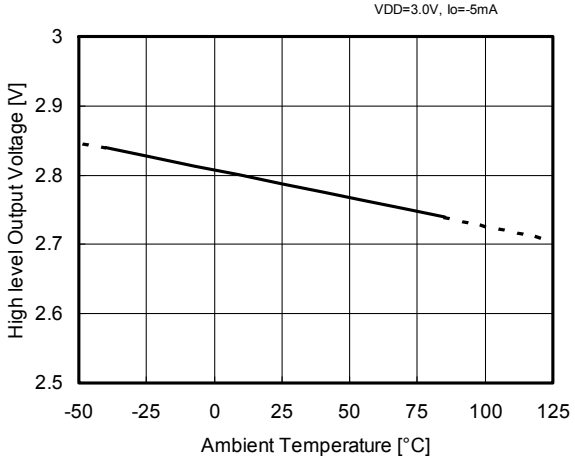
Input Offset Voltage vs.
Input Common Mode Voltage



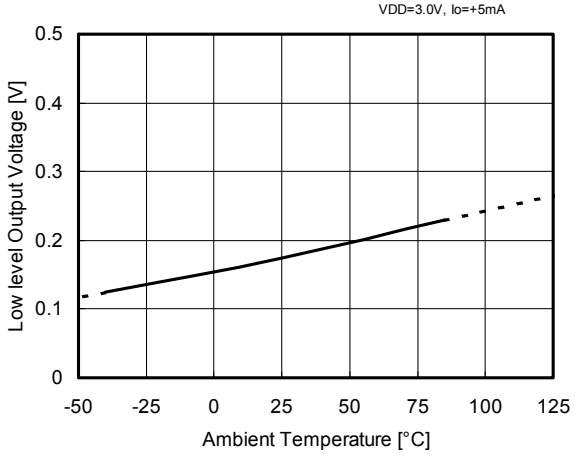
Input Offset Voltage vs.
Input Common Mode Voltage (correlation with Ta)



High level Output Voltage vs. Ambient Temperature

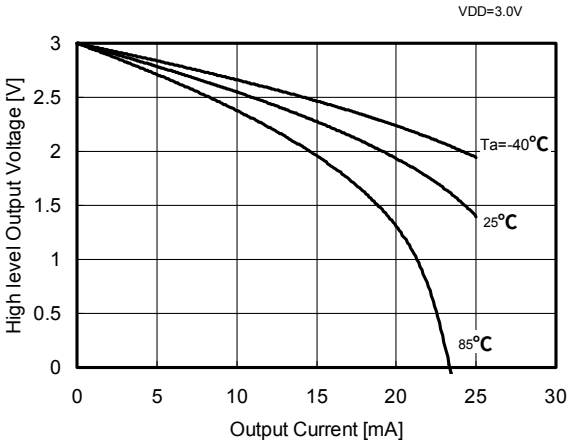


Low level Output Voltage vs. Ambient Temperature

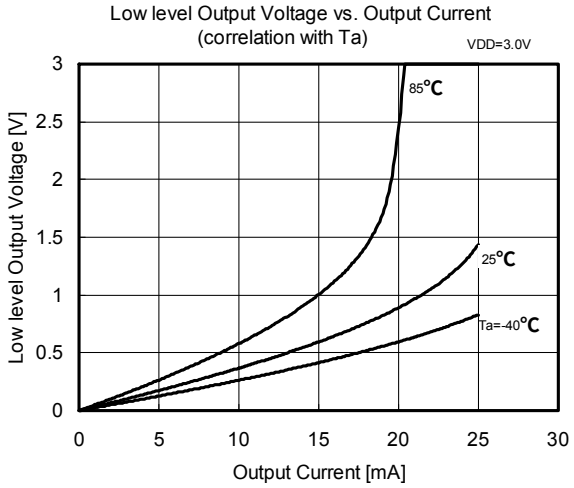


■TYPICAL CHARACTERISTICS

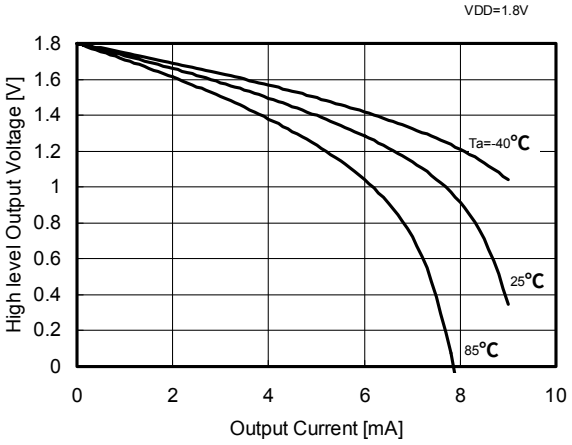
High level Output Voltage vs. Output Current
(correlation with Ta)



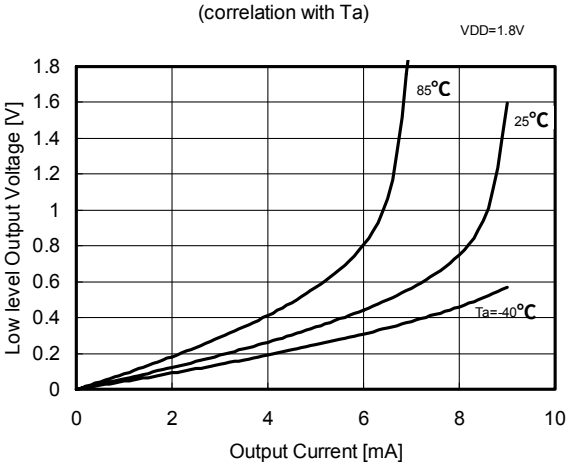
Low level Output Voltage vs. Output Current
(correlation with Ta)



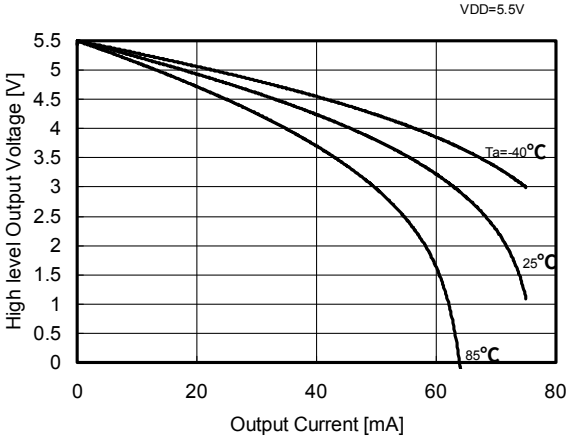
High level Output Voltage vs. Output Current
(correlation with Ta)



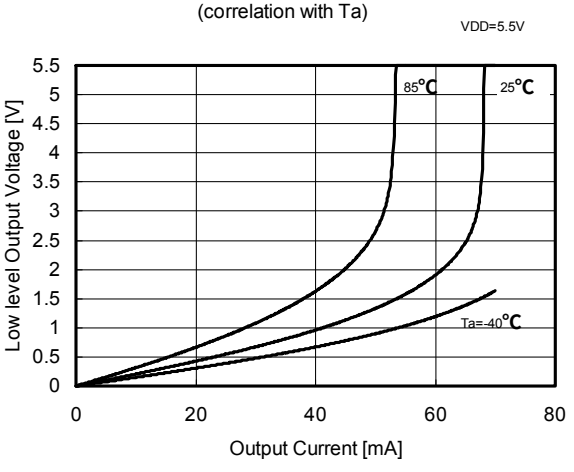
Low level Output Voltage vs. Output Current
(correlation with Ta)



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

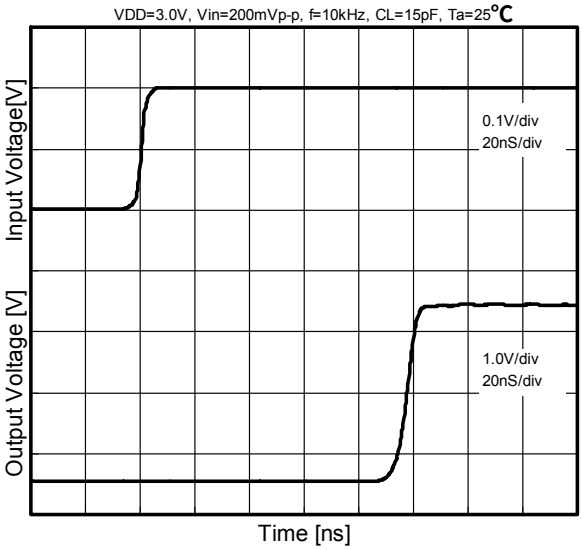


Low level Output Voltage vs. Output Current
(correlation with Ta)

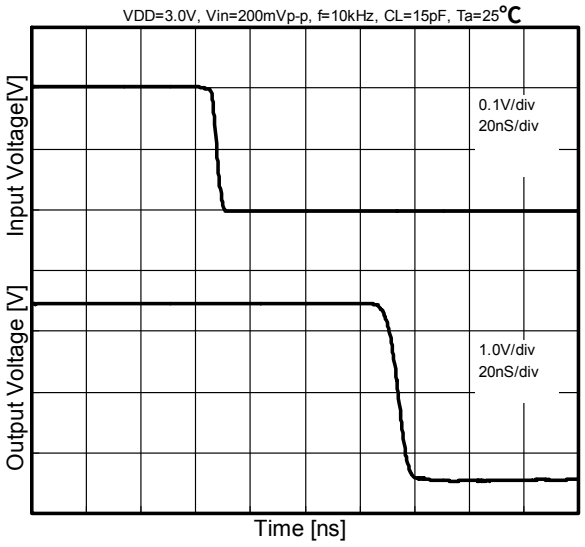


■TYPICAL CHARACTERISTICS

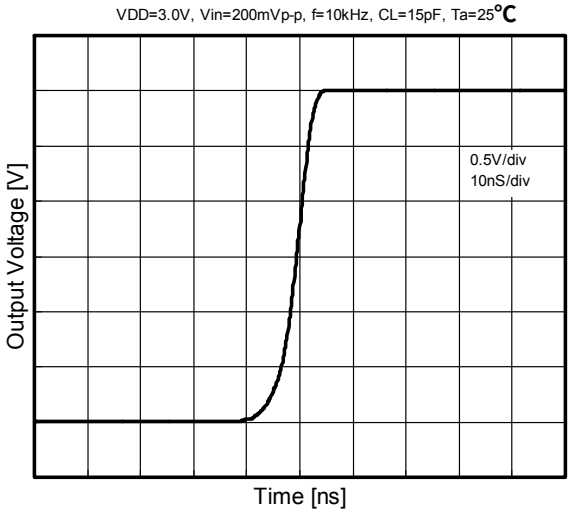
Response Time - Positive Transition



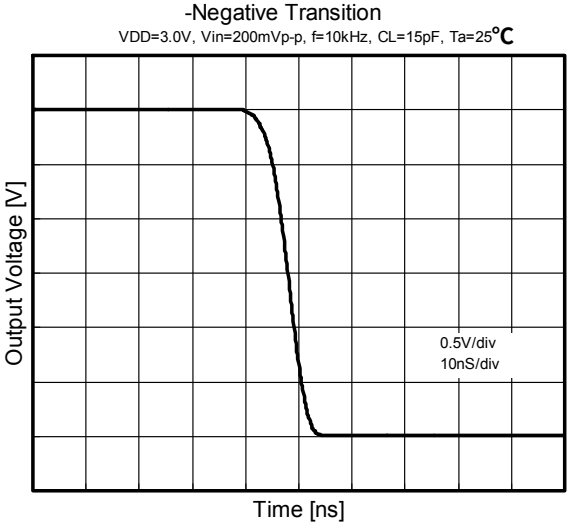
Response Time - Negative Transition



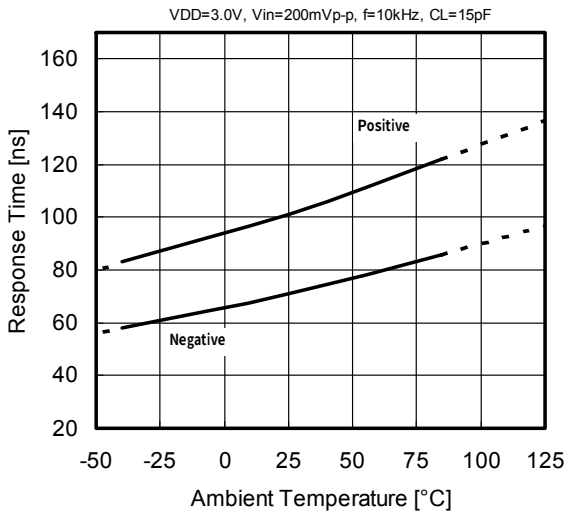
Output Voltage Wave Form
-Positive Transition



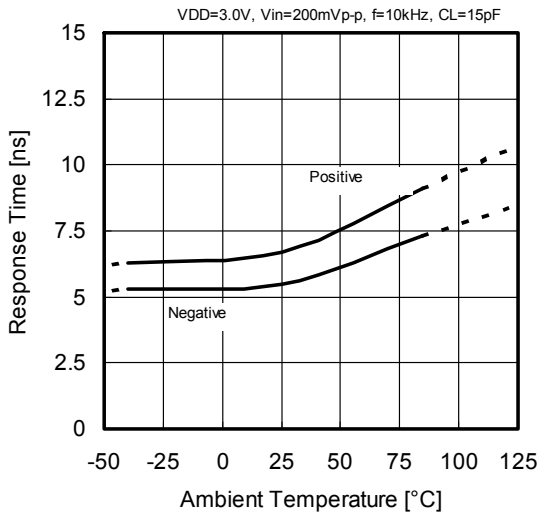
Output Voltage Wave Form
-Negative Transition



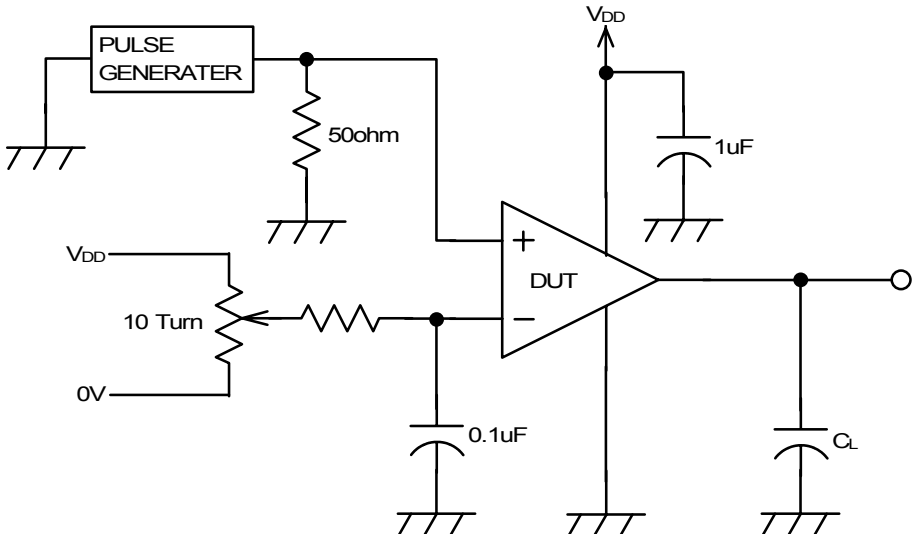
Response Time vs. Ambient Temperature



Response Time vs. Ambient Temperature



■SWITCHING CHARACTERISTICS MEASUREMENT CIRCUIT



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