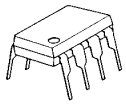
Input/Output Full-Swing
High Output Current Dual C-MOS Operational Amplifier

■GNERAL DESCRIPTION

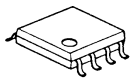
The NJU7043 is a dual C-MOS operational amplifier permitting a full-swing input and output in under high load.

Based on C-MOS technology, there are excellent features such as high output current, low current consumption, and low operating voltage.

■PACKAGE OUTLINE



NJU7043D



NJU7043M

NJU7043V

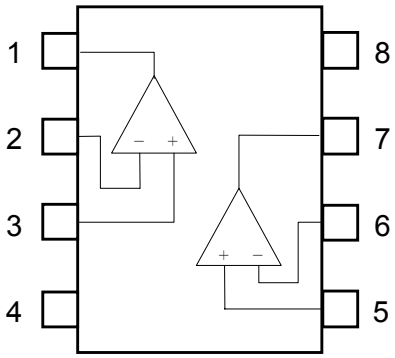
NJU7043RB1

■FEATURES

● Operating Voltage	V_{DD}=1.8 to 5.0V
● Input/Output Full-Swing	
● High Output Current	I_{sourse}>40mA typ. I_{sink}<-40mA typ.
● Input Offset Voltage	V_{IO}=10mV max.
● Wide Input Common Mode Voltage Range	V_{SS} to V_{DD}
● Operating Current	I_{DD}=300μA typ. (per Amplifier)
● High Input Impedance	1TΩ typ.
● Low Input Bias Current	I_{IB}=1pA typ.
● Ground Sensing	
● Package	DIP8, DMP8, SSOP8, TVSP8

■PIN CONFIGURATION

(Top View)



PIN FUNCTION

1.OUTPUT1
2.-INPUT1
3.+INPUT1
4.V_{SS}
5.+INPUT2
6.-INPUT2
7.OUTPUT2
8.V_{DD}

Ver. 4

■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	5.5	V
Power Dissipation	P_D	500 (DIP8) 250 (SSOP8) 300 (DMP8) 320 (TVSP8)	mW
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-55 ~ +125	°C

(note1) When supply voltage is less than 5.5.V, the absolute maximum input voltage is equal to the voltage.
(note2) Decoupling capacitor should be connected between V_{DD} and V_{SS} due to the stabilized operation for the circuit.

■RECOMMENDED OPERATION CONDITION (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V_{DD}	1.8 ~ 5.0	V

■ELECTRICAL CHARACTERISTICS

● DC CHARACTERISTICS (V_{DD}=3.0V, Ta=25°C)

PARAMETER	SYMBOL	RATING	MIN	TYP	MAX	UNIT
Operating Current	I_{DD}	No Signal, Dual Circuits	-	600	1,000	μA
Input Offset Voltage	V_{IO}		-	-	10	mV
Input Bias Current	I_B		-	1	-	pA
Input Offset Current	I_{IO}		-	1	-	pA
Voltage Gain	A_V	R_L=10kΩ	70	90	-	dB
Common Mode Rejection Ratio	CMR	0≤ V_{CM} ≤1.5V, 1.5≤V_{CM} ≤3.0V (note3)	42	60	-	dB
Supply Voltage Rejection Ratio	SVR	2.0V≤ V_{DD}≤ 5.0V, V_{CM}= V_{DD}/2	61	80	-	dB
H Level Output Voltage 1	V_{OH1}	R_L=10kΩ	2.95	-	-	V
L Level Output Voltage 1	V_{OL1}	R_L=10kΩ	-	-	0.05	V
H Level Output Voltage 2	V_{OH2}	R_L=600Ω	2.90	-	-	V
L Level Output Voltage 2	V_{OL2}	R_L=600Ω	-	-	0.10	V
Input Common Mode Voltage Range	V_{ICM}	CMR>45dB	0	-	3	V

(note3) CMR is represented by either CMR+ or CMR- which has lower value.
CMR+ is measured with 1.5V≤V_{CM}≤3V and CMR- is measured with 0V≤V_{CM}≤1.5V.

● AC CHARACTERISTICS (V_{DD}=3.0V, Ta=25°C)

PARAMETER	SYMBOL	RATING	MIN	TYP	MAX	UNIT
Unity Gain Bandwidth	GB	R_L=10kΩ	-	0.8	-	MHz
Total Harmonic Distortion	THD	f=1kHz, Vin=1Vpp, A_V=0dB	-	0.05	-	%
Equivalent Input Noise Voltage	e_n	f=1kHz	-	40	-	nV/√Hz

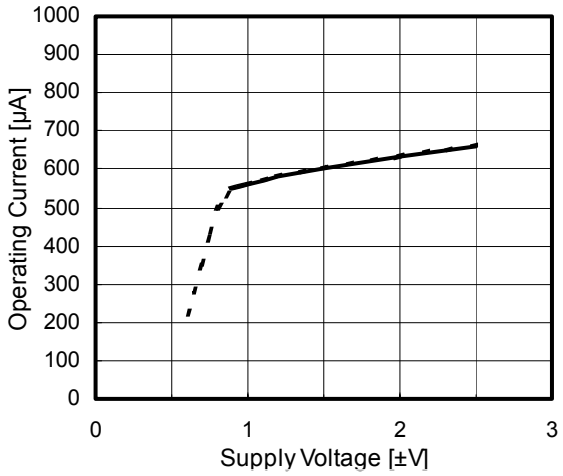
● TRANSIENT CHARACTERISTICS (V_{DD}=3.0V, Ta=25°C)

PARAMETER	SYMBOL	RATING	MIN	TYP	MAX	UNIT
Slew Rate	SR	R_L=10kΩ	-	0.7	-	V/μs

■TYPICAL CHARACTERISTICS

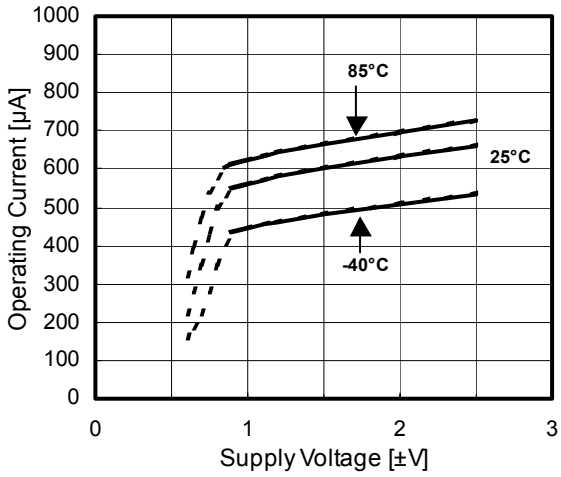
Operating Current vs. Supply Voltage

Gv=0dB,Ta=25°C



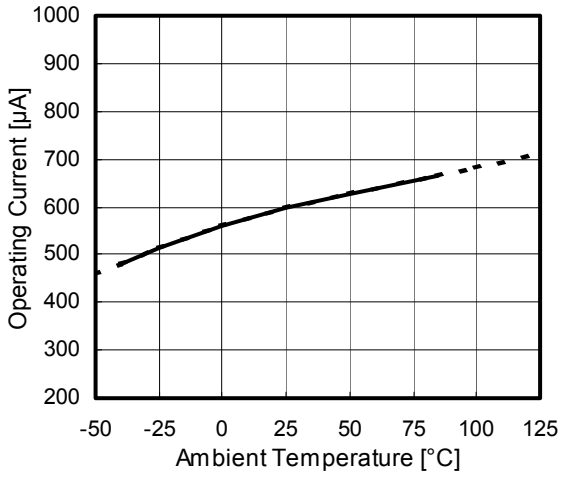
Operating Current vs. Supply Voltage (TEMP.)

Gv = 0dB



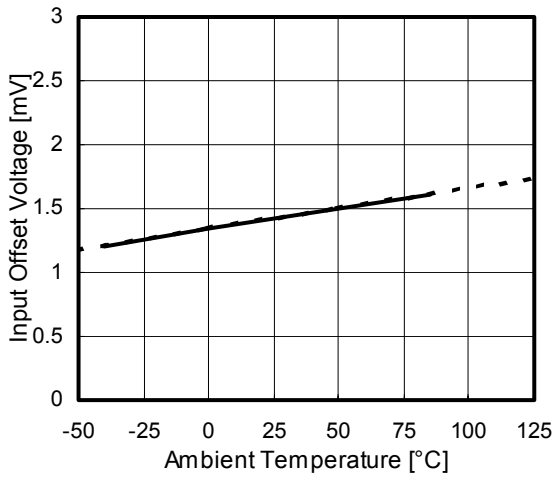
Operating Current vs. Temperature

V+/V-=±1.5V , Gv = 0dB



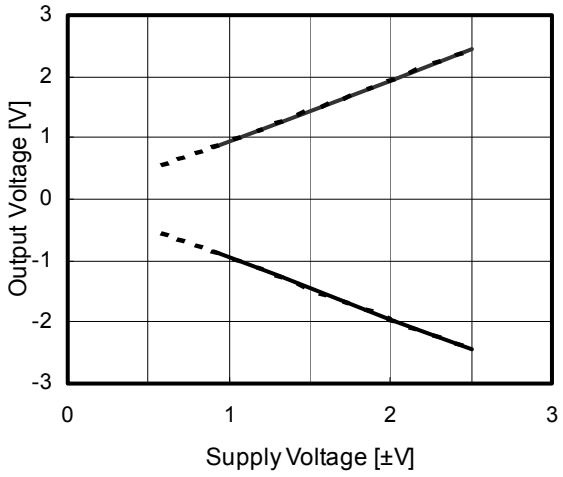
Input Offset Voltage vs. Temperature

V+/V-=±1.5V



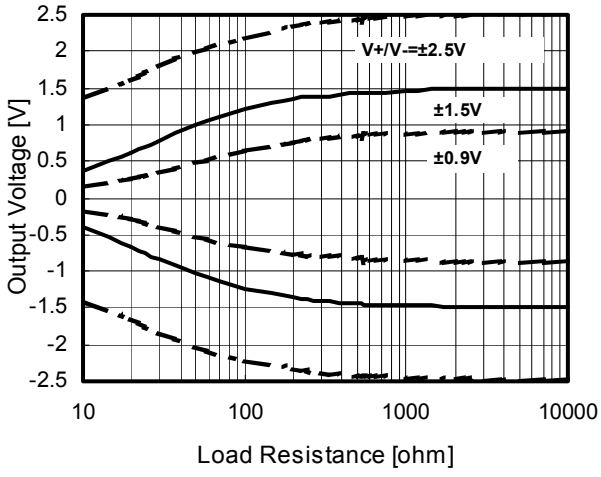
Output Voltage vs. Supply Voltage

RL=600ohm , Ta=25°C



Output Voltage vs. Load Resistance

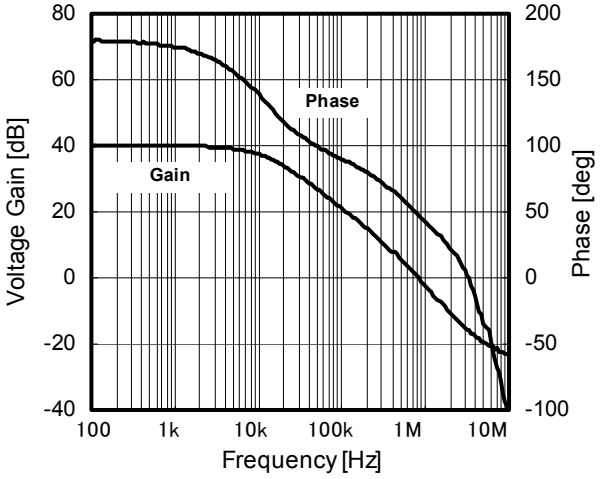
Ta=25°C



■TYPICAL CHARACTERISTICS

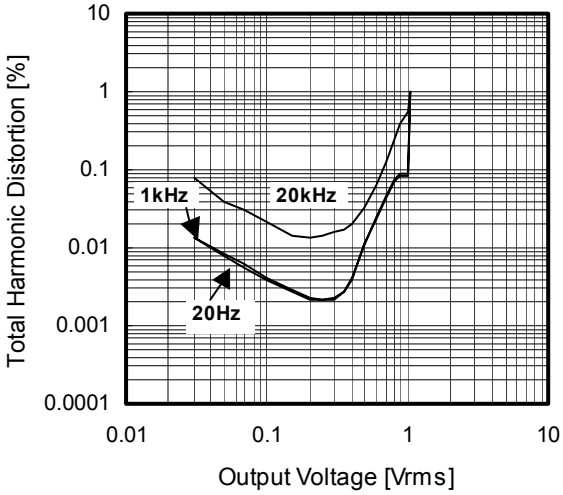
Voltage Gain,Phase vs. Frequency

V+/V-=±1.5V , Gv=40dB , Rf=100k , Rg=1k , CL=0



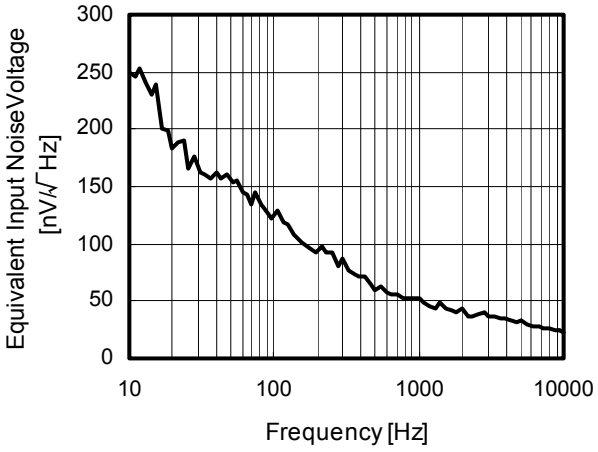
THD vs. Output Voltage

V+/V-=±1.5V , Gv=0dB , Rf=10k , Ta=25°C



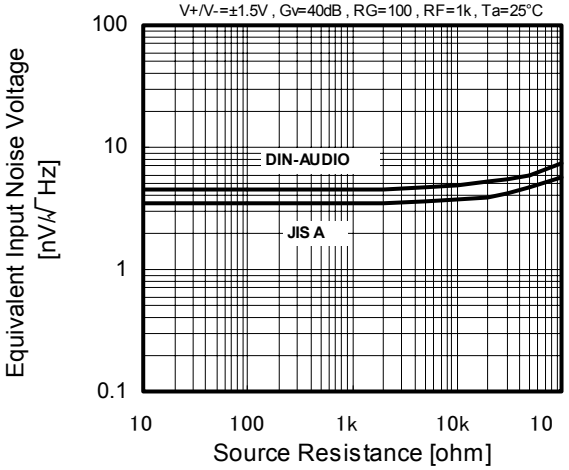
Equivalent Input Noise Voltage vs. Frequency

V+/V-=±1.5V , Gv=40dB , Rs=600 , RG=100 , RF=10k , Ta=25°C



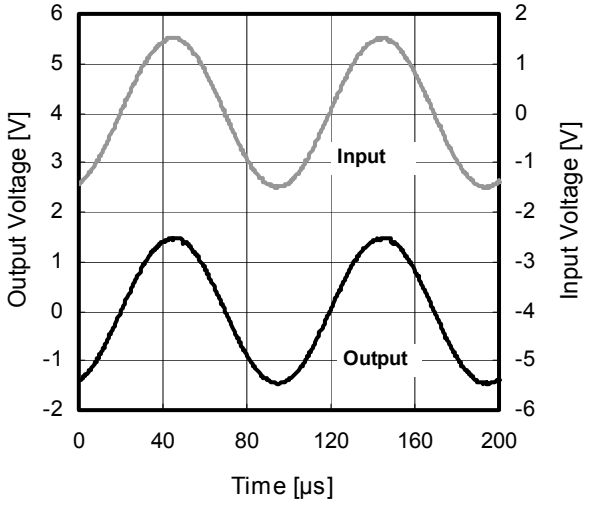
Equivalent Input Noise Voltage vs. Source Resistance

V+/V-=±1.5V , Gv=40dB , RG=100 , RF=1k , Ta=25°C



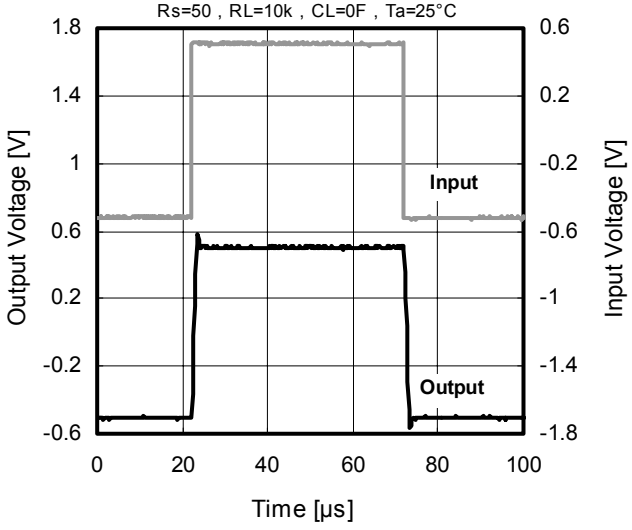
Sin Wave Response

V+/V-=±1.5V , Vin=3Vp-p , f=10kHz , Gv=0dB
Rs=50 , RL=10k , CL=0F , Ta=25°C



Pulse Response

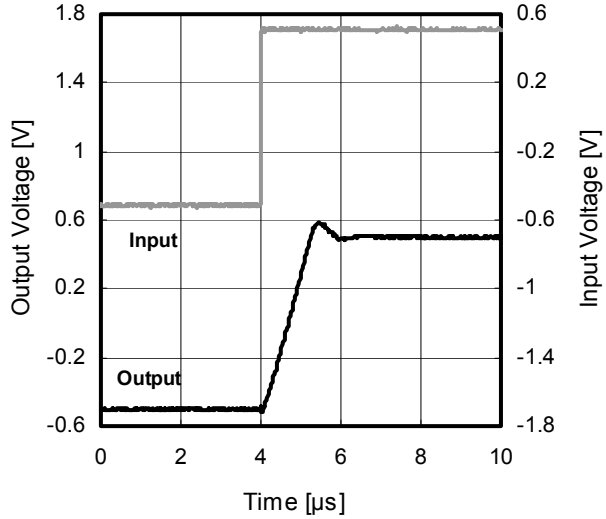
V+/V-=±1.5V , Vin=1Vp-p , f=10kHz , Gv=0dB
Rs=50 , RL=10k , CL=0F , Ta=25°C



■TYPICAL CHARACTERISTICS

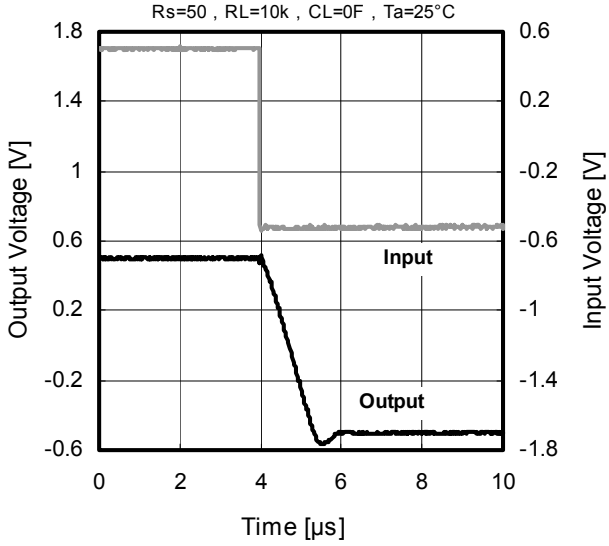
Pulse Response(Rise)

V+/V-=±1.5V , Vin=1Vp-p , f=10kHz , Gv=0dB
Rs=50 , RL=10k , CL=0F , Ta=25°C



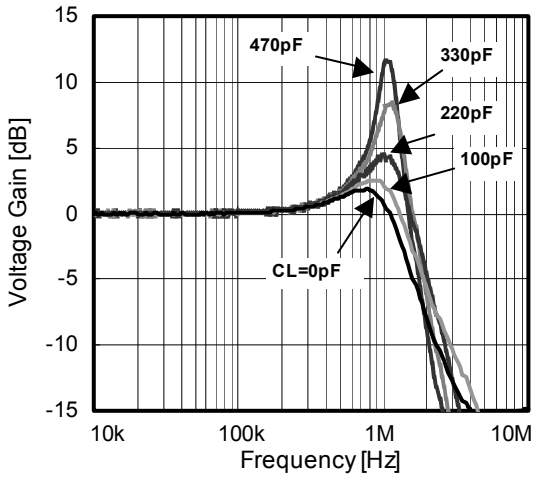
Pulse Response(Fall)

V+/V-=±1.5V , Vin=1Vp-p , f=10kHz , Gv=0dB
Rs=50 , RL=10k , CL=0F , Ta=25°C



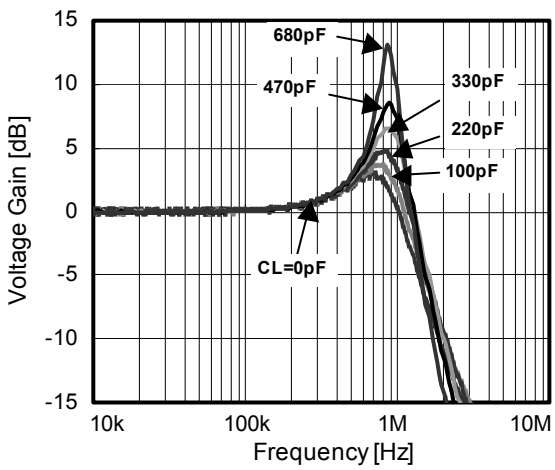
Voltage Gain vs. Frequency(Load C.)

V+/V-=±1.5V , Vin=-20dBm , Gv=0dB , RL=10k , Ta=25°C



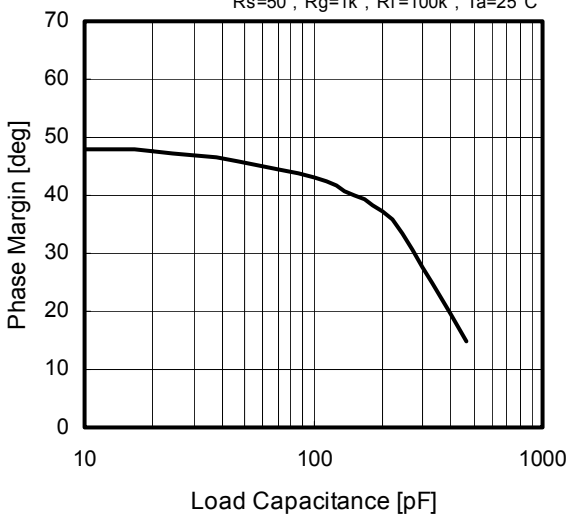
Voltage Gain vs. Frequency(Load C.)

V+/V-=±1.5V , Vin=-20dBm , Gv=0dB , RL=600 , Ta=25°C



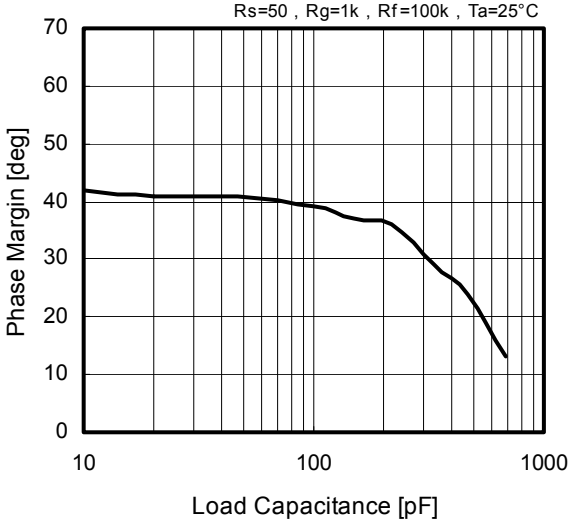
Phase Margine vs. Load Capacitance

V+/V-=±1.5V , Vin=-30dBm , Gv=40dB , RL=10k
Rs=50 , Rg=1k , Rf=100k , Ta=25°C



Phase Margine vs. Load Capacitance

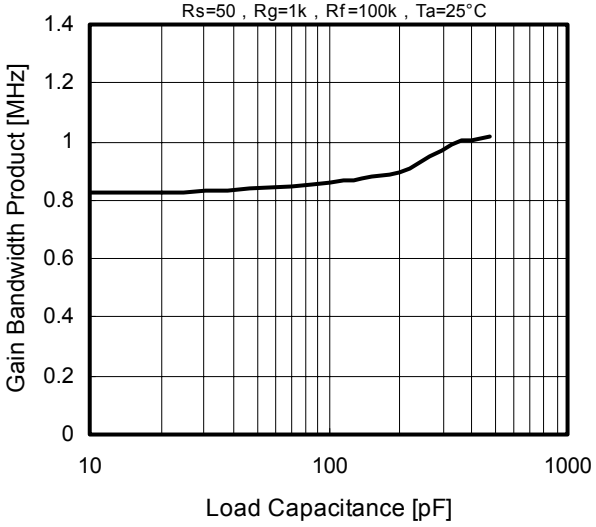
V+/V-=±1.5V , Vin=-30dBm , Gv=40dB , RL=600
Rs=50 , Rg=1k , Rf=100k , Ta=25°C



■TYPICAL CHARACTERISTICS

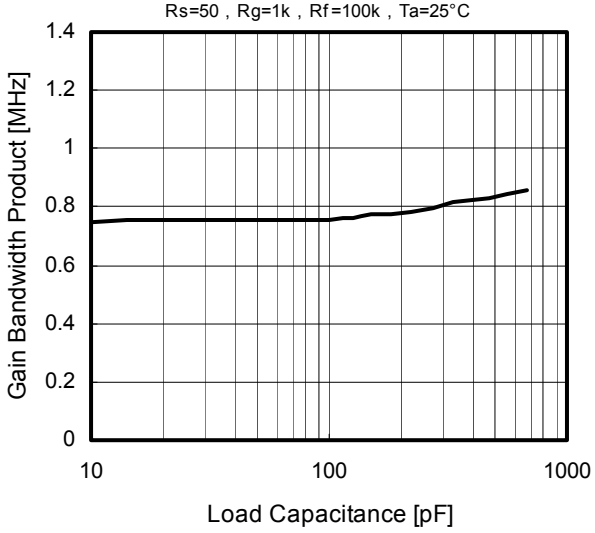
Gain Bandwidth Product vs. Load Capacitance

V+/V-=±1.5V , Vin=-30dBm , Gv=40dB , RL=10k
Rs=50 , Rg=1k , Rf=100k , Ta=25°C



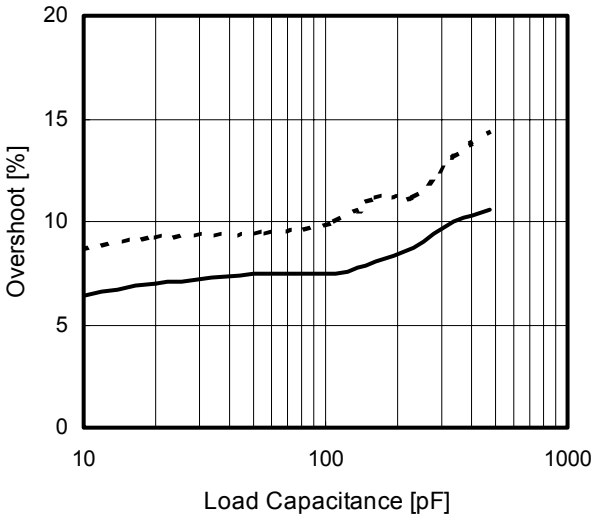
Gain Bandwidth Product vs. Load Capacitance

V+/V-=±1.5V , Vin=-30dBm , Gv=40dB , RL=10k
Rs=50 , Rg=1k , Rf=100k , Ta=25°C



Overshoot vs. Load Capacitance

V+/V-=±1.5V , Vin=1Vp-p , f=10kHz , Gv=0dB
RL=10k , Rs=50 , Ta=25°C



Overshoot vs. Load Capacitance

V+/V-=±1.5V , Vin=1Vp-p , f=10kHz , Gv=0dB
RL=600 , Rs=50 , Ta=25°C