Single-Supply High Output Current Single Operational Amplifier

■GENERAL DESCRIPTION

The NJM2743 is a high gain, high output current single operational amplifier capable of driving 70mA.

It is suitable for audio section of portable sets, PCs, DVCs, DSCs and any General-purpose use.

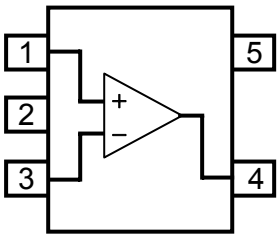
■PACKAGE OUTLINE

NJM2743F

■ FEATURES

- ●Operating Voltage : 3V to 15V
- ●High Output Current : V_{OH} ≥3.2V Typ. (at V^+=5V, I_{SOURCE}=70mA)
  : V_{OL} ≤1V Typ. (at V^+=5V, I_{SINK}=70mA)
- ●Offset Voltage : 2mV Typ
- ●Slew Rate : 0.8V/μs Typ. (at V^+=5V, R_L=2kΩ)
- ●Low THD : 0.0015% Typ. (at V^+=5V, R_L=2kΩ, f=1kHz)
- ●Bipolar Technology
- ●Package Outline : SOT−23−5

■ PIN CONFIGURATION



NJM2743F
(Top View)

PIN FUNCTION
1. +INPUT
2. GND
3. -INPUT
4. OUTPUT
5. V^+

■ ABSOLUTE MAXIMUM RATINGS

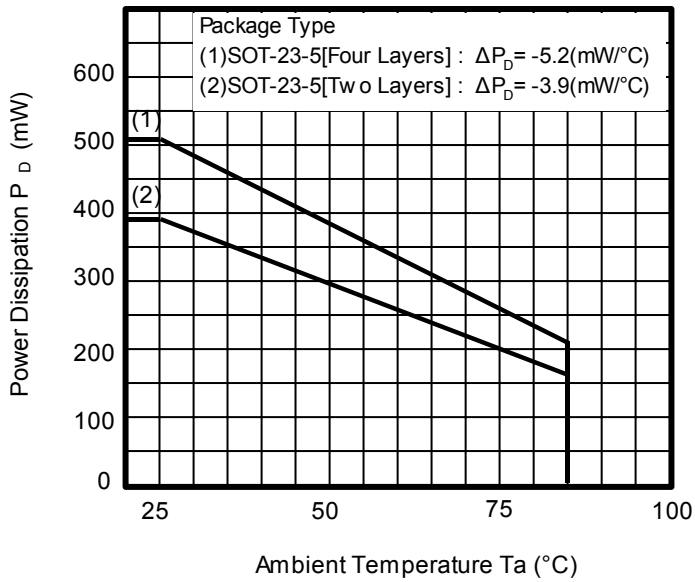
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	18(or ±9)	V
Common Mode Input Voltage Range	V_{ICM}	-0.3 to +18 (Note1)	V
Differential Input Voltage Range	V_{ID}	±18	V
Power Dissipation	P_D	200 [SOT−23−5] 390 [SOT−23−5] (Note 2) 520 [SOT−23−5] (Note 3)	mW
Output Current	I_O	±75[SOT−23−5]	mA
Operating Temperature Range	T_{opr}	-40 to +85	˚C
Storage Temperature Range	T_{stg}	-40 to +125	˚C

(Note 1) For supply voltage less than 18V, the absolute maximum input voltage is equal to the supply voltage.

(Note 2) On the PCB " EIA/JEDEC (76.2x 114.3x 1.6mm, two layers, FR-4) "

(Note 3) On the PCB " EIA/JEDEC (76.2x 114.3x 1.6mm, four layers, FR-4) "

Power Dissipation vs. Ambient Temperature



(Note 4)

Please do not exceed "Power Dissipation (PD)" the power dissipation in IC is absolutely indicated to be in the maximum rating.

See the figure "Power Dissipation vs. Ambient Temperature" for information on temperature derating of this device.

■ OPERATING VOLTAGE (Ta=25˚C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	3 to 15	V

■ ELECTRICAL CHARACTERISTICS

●DC CHARACTERISTICS (V^+=5V,Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	R_L=∞, V_{IN}=2.5V, No Signal Apply	-	2	2.8	mA
Input Offset Voltage	V_{IO}	R_S=0Ω	-	2	5	mV
Input Bias Current	I_B		-	100	500	nA
Input Offset Current	I_{IO}		-	5	100	nA
Large Signal Voltage Gain	A_V	R_L≥2kΩ to 2.5V Vo=1.5V to 3.5V	88	100	-	dB
Common Mode Rejection Ratio	CMR	0V ≤ Vcm ≤ 3V	80	90	-	dB
Supply Voltage Rejection Ratio	SVR	V^+=3V to 15V	80	90	-	dB
Output Voltage1	V_{OH}1	R_L≥2kΩ to 2.5V	3.5	4.3	-	V
	V_{OL}1	R_L≥2kΩ to 2.5V	-	0.65	0.9	V
Output Voltage2	V_{OH}2	I_{SOURCE}=70mA	3.2	4.2	-	V
	V_{OL}2	I_{SINK}=70mA	-	0.85	1	V
Input Common Mode Voltage Range	V_{ICM}	CMR ≥ 80dB	0	-	3	V

●AC CHARACTERISTICS (V^+=5V,Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Unity Gain Bandwidth	GB	R_L=2kΩ to 2.5V	-	0.8	-	MHz
Phase Margin	Φ_M	R_L=2kΩ to 2.5V, C_L=10pF	-	60	-	Deg
Equivalent Input Noise Voltage	V_{NI}	f=1kHz, V_{CM}=2.5V	-	22	-	nV/√Hz
Total Harmonic Distortion	THD	f=1kHz, A_V=+1 R_L=2kΩ to 2.5V, Vo=0.35Vrms	-	0.0015	-	%

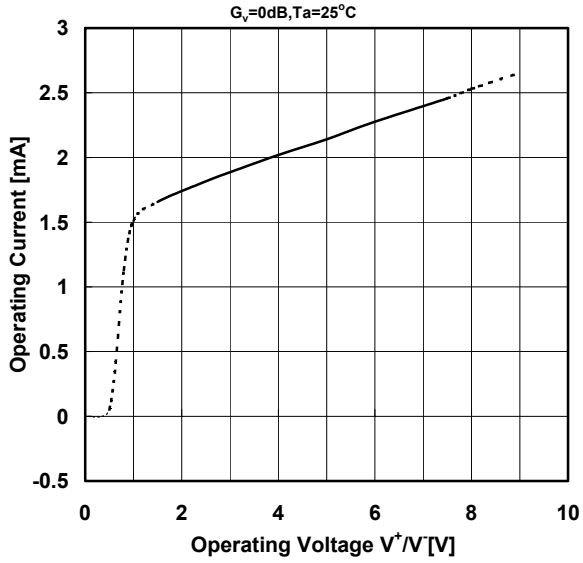
●AC CHARACTERISTICS (V^+=5V,Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate	SR	A_V=1, V_{IN}=1Vpp R_L=2kΩ to 2.5V C_L=10pF	-	0.85	-	V/μs

■ Typical Characteristics

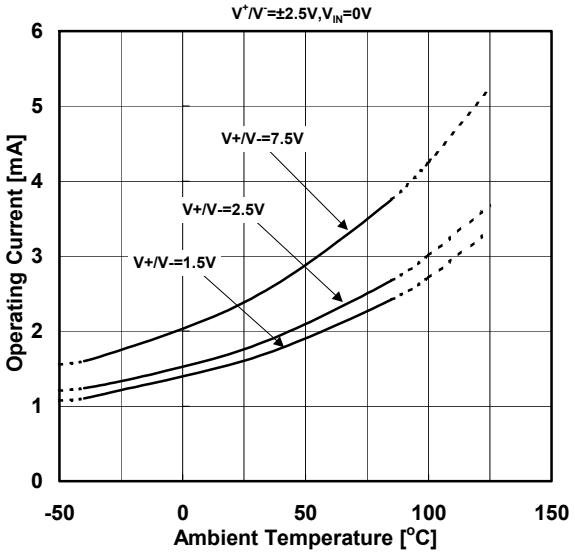
Operating Current vs. Operating Voltage

G_V=0dB,Ta=25°C



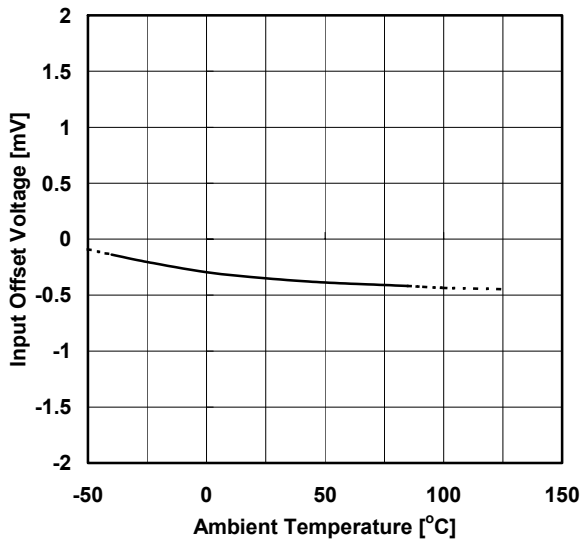
Operating Current vs. Ambient Temperature

V^+/V^-=±2.5V,V_{IN}=0V



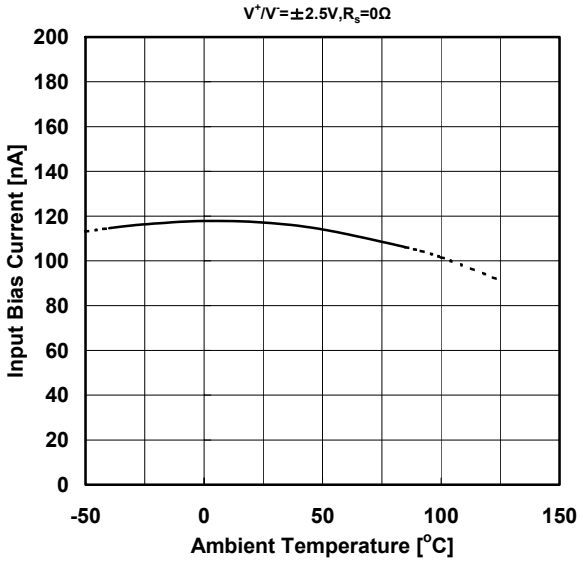
Input Offset Voltage vs. Ambient Temperature

V^+/V^-=±2.5V,R_s=0Ω



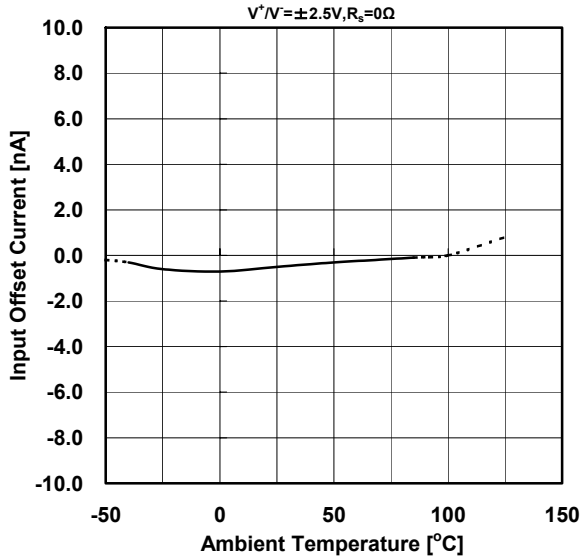
Input Bias Current vs. Ambient Temperature

V^+/V^-=±2.5V,R_s=0Ω



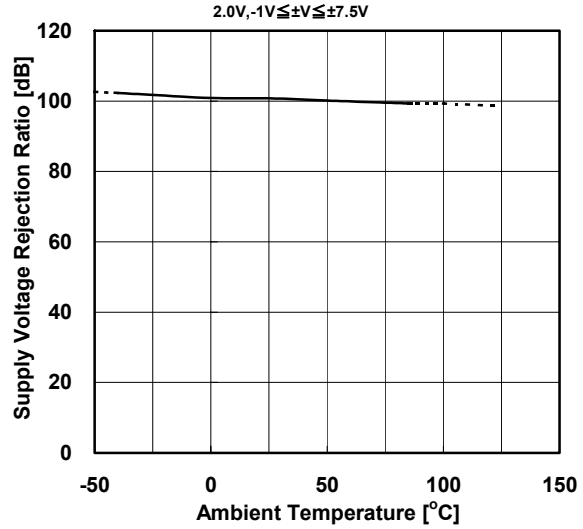
Input Offset Current vs. Ambient Temperature

V^+/V^-=±2.5V,R_s=0Ω



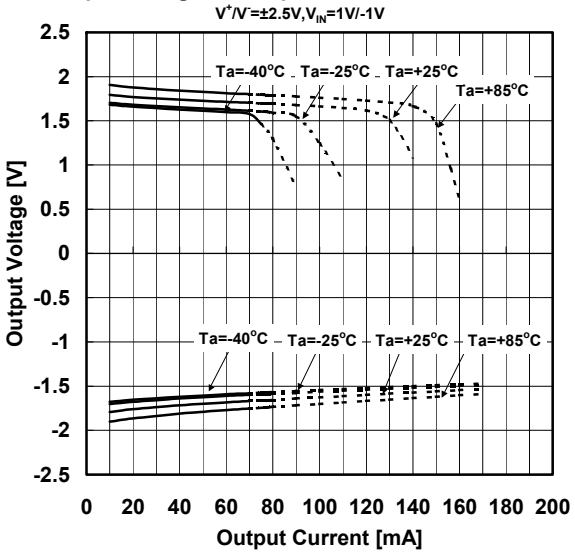
Supply Voltage Rejection Ratio vs. Ambient Temperature

2.0V,-1V≦±V≦±7.5V

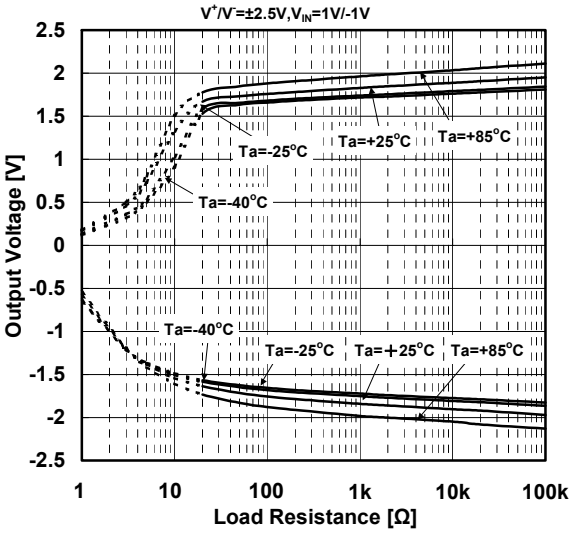


■ Typical Characteristics

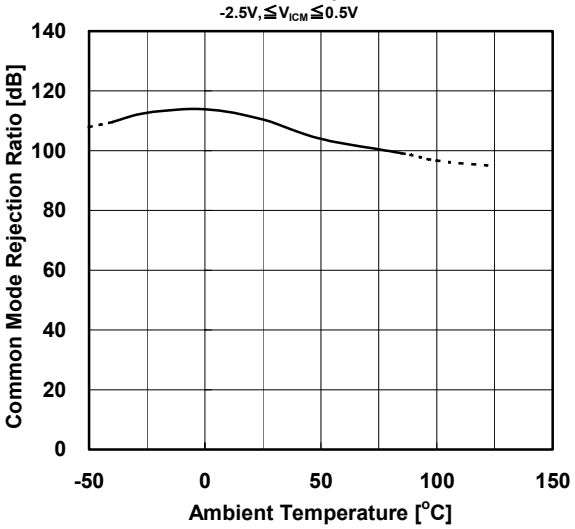
Output Voltage vs. Output Current (Correlation with Ta)
V^+/V^-=±2.5V,V_{IN}=1V/-1V



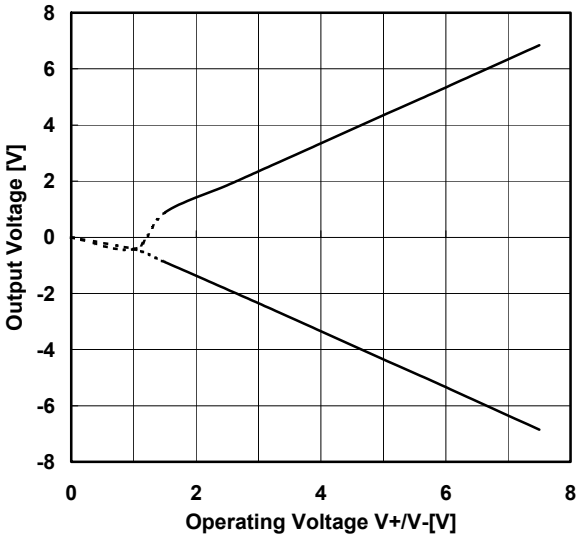
Output Voltage vs. Load Resistance
(Correlation with Ta)
V^+/V^-=±2.5V,V_{IN}=1V/-1V



Common Mode Rejection Ratio vs. Ambient Temperature
-2.5V,≦V_{ICM}≦0.5V



Output Voltage vs. Supply Voltage
R_L=2kΩ,V_{IN}=1V/-1V,Ta=25°C

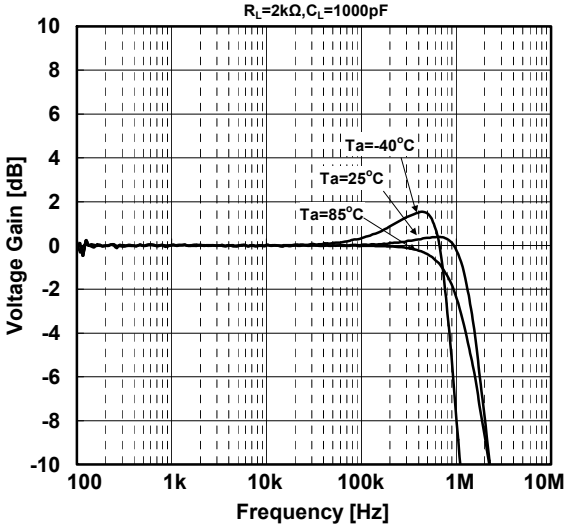


■ Typical Characteristics

V.F.Peak vs. Frequency (correlation with Ta)

V^+/V^-=±2.5V, V_{in}=-20dBm, G_v=0dB, R_T=50Ω

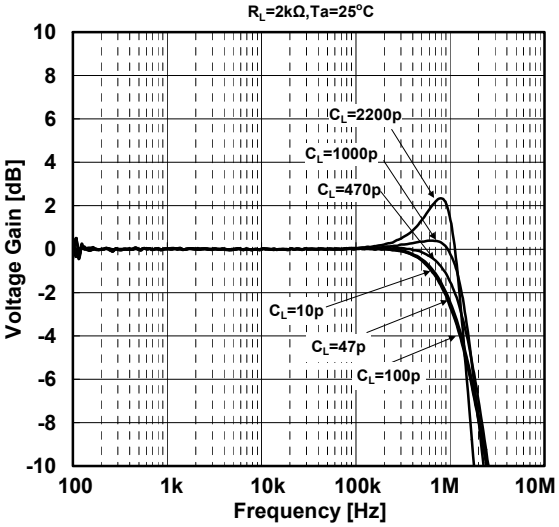
R_L=2kΩ, C_L=1000pF



V.F. Peak vs. Frequency (Load C.)

V^+/V^-=±2.5V, V_{in}=-20dBm, G_v=0dB, R_T=50Ω

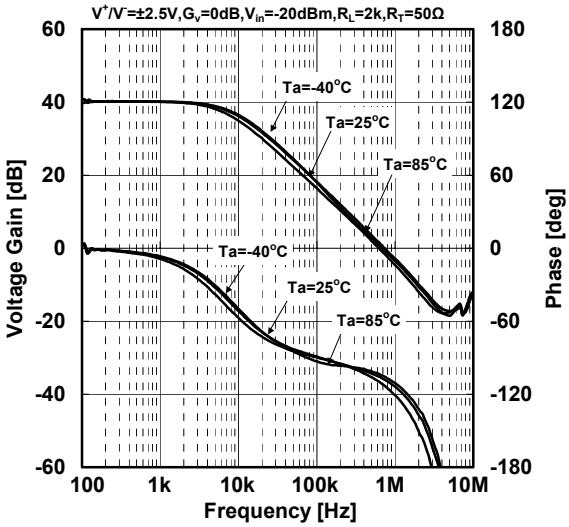
R_L=2kΩ, Ta=25°C



Voltage Gain/Phase vs. Frequency

(40dB, correlation with Ta)

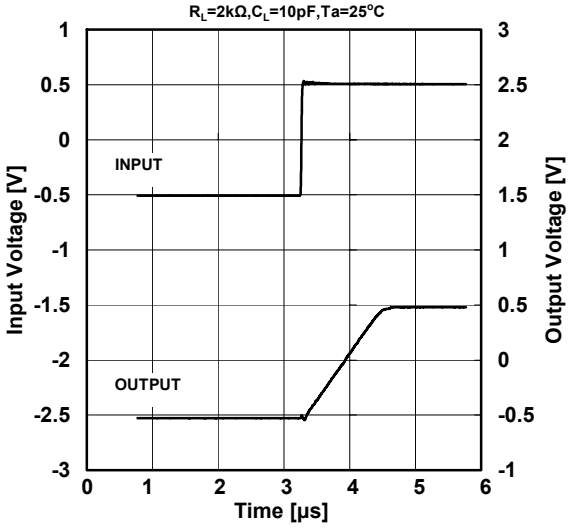
V^+/V^-=±2.5V, G_v=0dB, V_{in}=-20dBm, R_L=2k, R_T=50Ω



■ Typical Characteristics

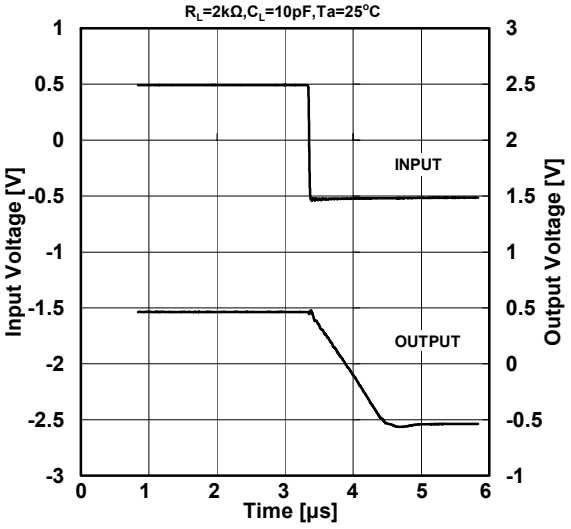
Pulse Response (Rise)

V^+/V^-=±2.5V,f=10kHz,V_{in}=1V_{pp},G_V=0dB,R_T=50Ω
R_L=2kΩ,C_L=10pF,Ta=25°C



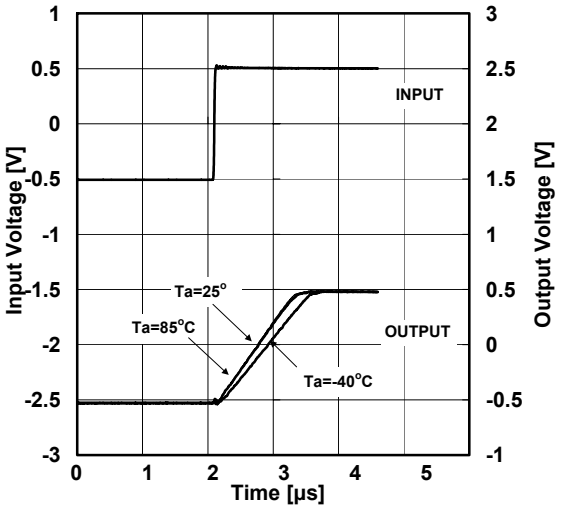
Pulse Response (Fall)

V^+/V^-=±2.5V,f=10kHz,V_{in}=1V_{pp},G_V=0dB,R_T=50Ω
R_L=2kΩ,C_L=10pF,Ta=25°C



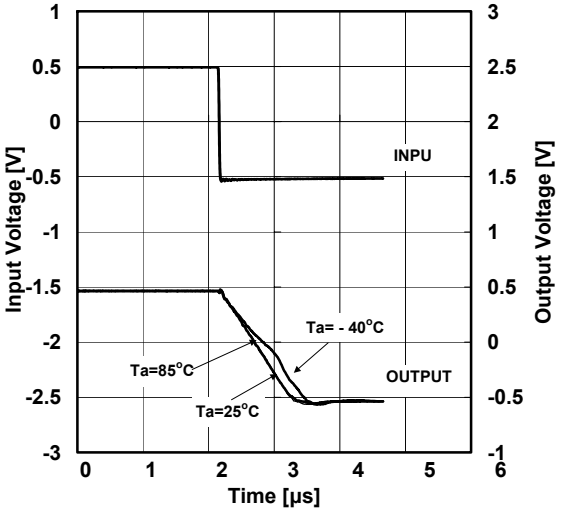
Pulse Response (Rise) (Correlation with Ta)

V^+/V^-=±2.5V,f=10kHz,V_{in}=1V_{pp},G_V=0dB,R_T=50Ω
R_L=2kΩ,C_L=10pF



Puse Response (Fall) (Correlation with Ta)

V^+/V^-=±2.5V,f=10kHz,V_{in}=1V_{pp},G_V=0dB,R_T=50Ω
R_L=2kΩ,C_L=10pF



Total Harmonic Distortion vs. Output Voltage

V^+/V^-=±2.5V,G_V=0dB,R_L=2kΩ,R_s=25Ω,R_T=100kΩ
Ta=25°C