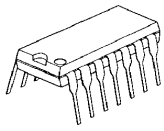
SRS Dialog Clarity Processor

■GENERAL DESCRIPTION

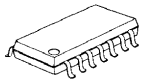
The **NJM2194** is a SRS Dialog Clarity Processor to enhance the dialog in a stereo signal by extracting the dialog information, augmenting it using a proprietary dialog clarity algorithm, and mixing it back in to the final stereo audio signal. When this stereo audio is played, the speech dialog becomes much easier to clearly hear while leaving the ambient information unchanged and the volume at a normal, more comfortable level for others in the room at the time.

The **NJM2194** is suitable for audio applications such as TV, DVD and others.

■PACKAGE OUTLINE



NJM2194D

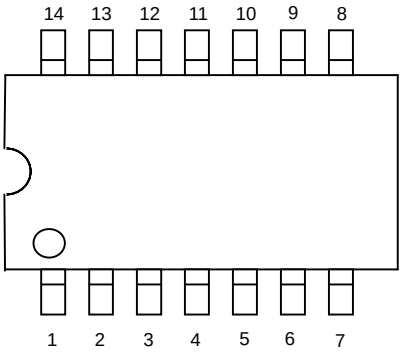


NJM2194M

■FEATURES

- Operating Voltage +4.7 to +13V
- Low Output Noise 10μVrms typ. (Dialog Clarity mode, VR:MAX)
- Adjustable Dialog Clarity Effect
- Internal Mode Control Switch
- Bipolar Technology
- Package Outline DIP14, DMP14

■PIN CONFIGURATION



1.VROUT	8.SW
2.VRIN	9.CIN
3.TP	10.COUT
4.VREFOUT	11.ROUT
5.VREFIN	12.LOUT
6.V+	13.RIN
7.GND	14.LIN

For further information, please contact:
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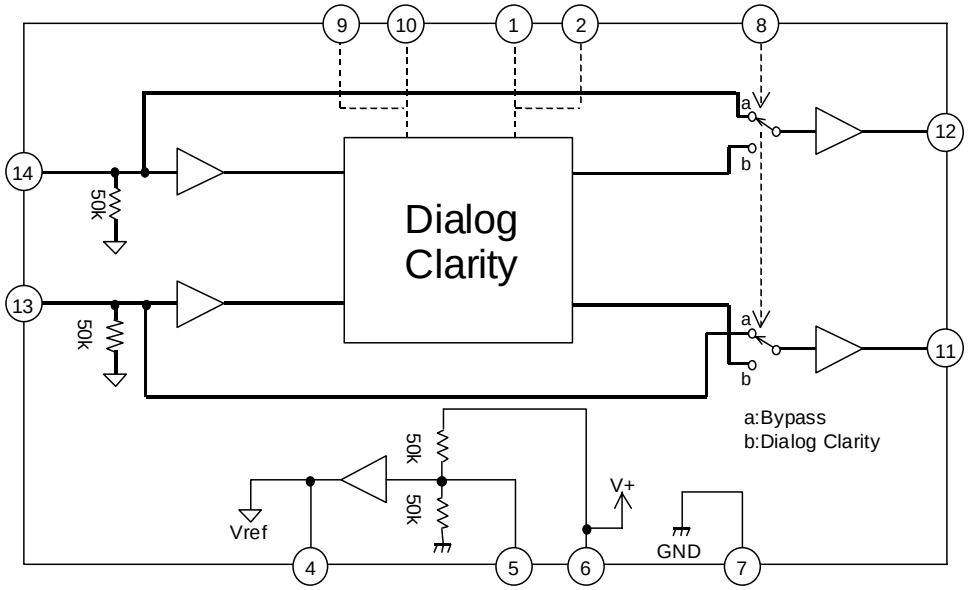
2909 Daimler Street. Santa Ana, CA 92705 USA
Tel: 949-442-1070 Fax: 949-852-1099 http: //www.srslabs.com

■BLOCK DIAGRAM



■ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	14	V
Power Dissipation	P_D	(DIP14) 500 (DMP14) 350	mW
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-40 to +125	°C

■OPERATING VOLTAGE

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V^+	-	4.7	12.0	13.0	V

■ELECTRICAL CHARACTERISTICS (Ta=25°C, V^+=12V unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION						MIN.	TYP.	MAX.	UNIT
			INPUT		OUTPUT	MODE	VR				
			L	R							
Operating Current	I_{CC}	No Signal	0	0	-	Bypass	-	-	5.7	8.6	mA
			0	0	-	DC	MAX	-	5.7	8.6	
Reference Voltage	V_{REF}	No Signal	0	0	-	-	-	5.8	6.0	6.2	V

●AC CHARACTERISTICS

(Ta=25°C, V^+=12V, V_{IN}=-10dBV (=316mVrms), f=1kHz, R_L=4.7kΩ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	INPUT L	INPUT R	OUTPUT	MODE	VR	MIN.	TYP.	MAX.	UNIT
Maximum Input Voltage	V_{IM}	f=1kHz THD=3%	V_{IN} 0	0 V_{IN}	L R	Bypass	-	10.0 (3.1)	12.0 (3.9)	-	dBV (Vrms)
		f=1kHz THD=3%	V_{IN} 0	0 V_{IN}	L R	DC	MAX	3.4 (1.5)	5.4 (1.9)	-	
Output Noise	V_{NO}	Rg=0Ω A-Weighted	0	0	L R	Bypass	-	-	-112 (2.5)	-106 (5.0)	dBV (μVrms)
		Rg=0Ω A-Weighted	0	0	L R	DC	MAX	-	-100 (10)	-94 (20)	
Total Harmonic Distortion	THD	f=1kHz	V_{IN} 0	0 V_{IN}	L R	Bypass	-	-	0.005	0.01	%
		f=1kHz V_{IN}=-20dBV	V_{IN} 0	0 V_{IN}	L R	DC	MAX	-	0.1	0.5	
Bypass Gain	G_{VBYP}	f=1kHz	V_{IN} 0	0 V_{IN}	L R	Bypass	-	-1.0	0.0	1.0	dB
Dialog Clarity Gain	G_{VDC}	f=1kHz V_{IN}=-20dBV	V_{IN} 0	0 V_{IN}	L R	DC	MAX	4.4	6.4	8.4	dB
		f=1kHz V_{IN}=-20dBV	0 V_{IN}	V_{IN} 0	L R	DC	MAX	-0.4	1.6	3.6	
		f=1kHz V_{IN}=-20dBV	V_{IN} 0	0 V_{IN}	L R	DC	MIN	-1.0	0.0	1.0	

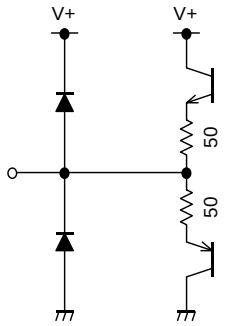
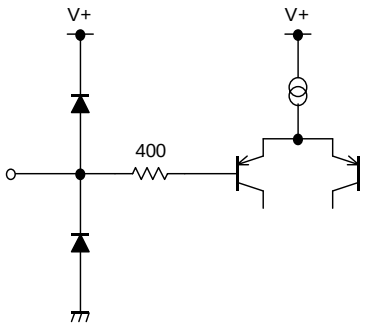
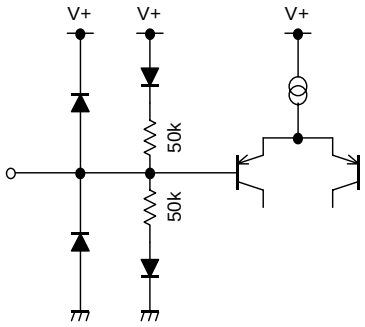
●CONTROL CHARACTERISTICS (Ta=25°C, V^+=12V unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Mode Select Control Voltage	V_{MODE}	V_{IN}=High Level	2.0	-	V^+	V
		V_{IN}=Low Level	0.0	-	0.7	

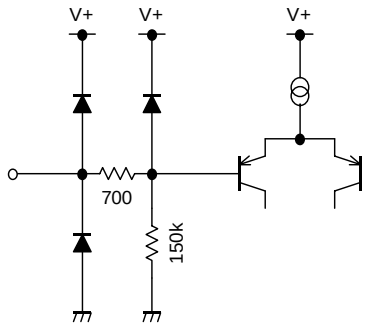
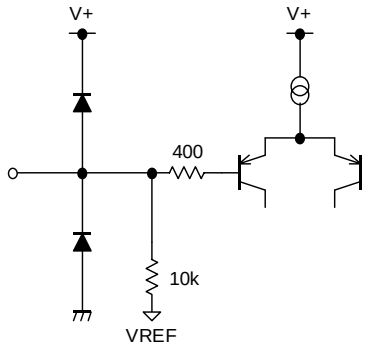
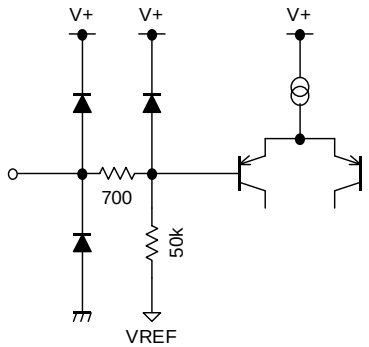
■MODE SWITCH

MODE	SW	NOTES
Bypass	L or Open	Input Through
Dialog Clarity (DC)	H	Dialog Clarity mode

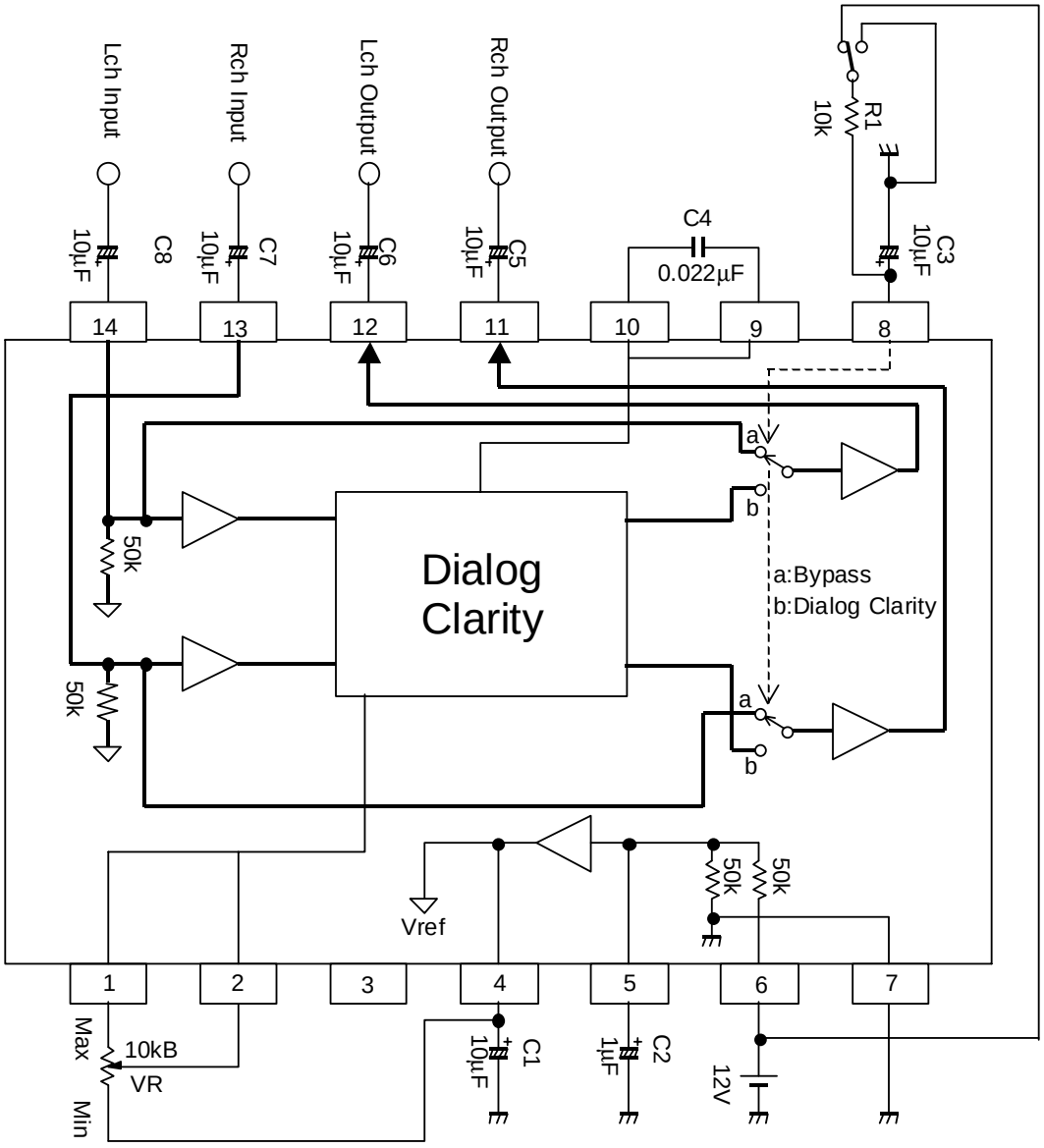
■TERMINAL DESCRIPTION

PIN No.	SYMBOL	EQUIVALENT CIRCUIT	VOLTAGE	NOTE
1 4 10 11 12	VROUT VREFOUT COUT ROUT LOUT		$V^+/2$	
2 3	VRIN TP		$V^+/2$	
5	VREFIN		$V^+/2$	
6	V^+	———	V^+	

■**TERMINAL DESCRIPTION**

PIN No.	SYMBOL	EQUIVALENT CIRCUIT	VOLTAGE	NOTE
7	GND	———	0V	
8	SW		0V	
9	CIN		$V^+/2$	
13 14	RIN LIN		$V^+/2$	

■APPLICATION CIRCUIT

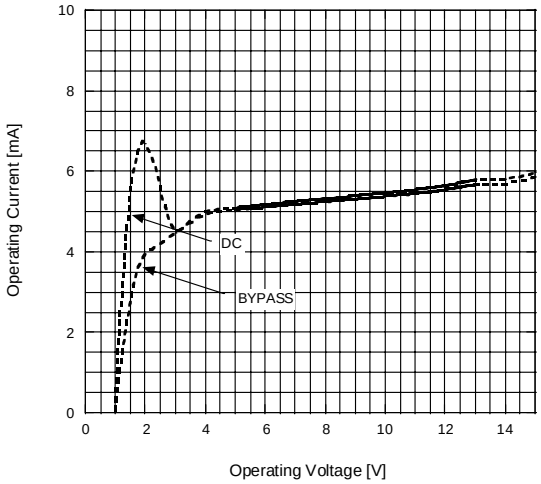


∗) Dialog Clarity Effect is adjustable with the VR

■TYPICAL CHARACTERISTICS

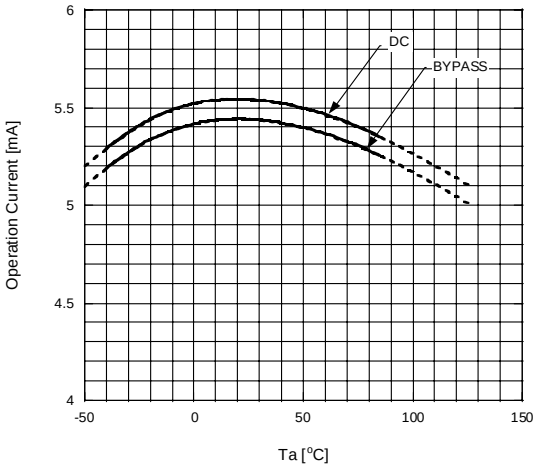
Operating Current vs. Operating Voltage

V+=1 to 15V, Ta=25°C



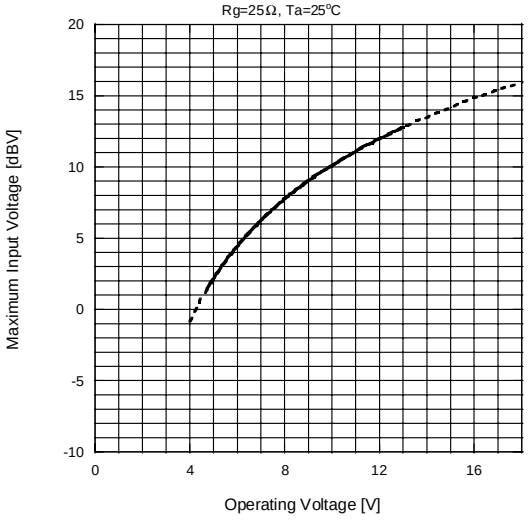
Operating Current vs. Temperature

V+=12V



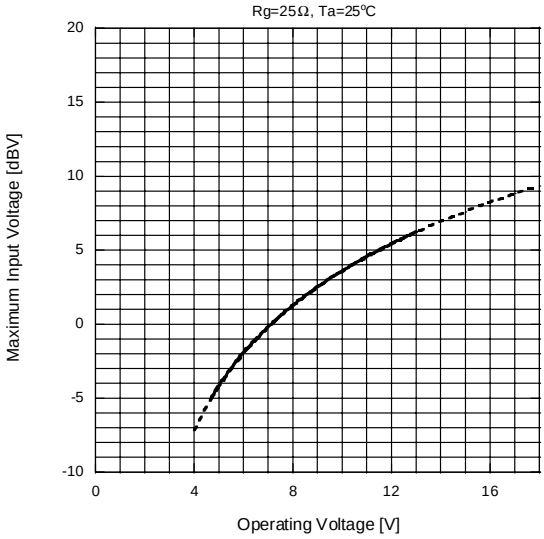
Maximum Input Voltage vs. Operating Voltage (BYPASS)

Vin=Lch, Vout=Lch, f=1KHz, RL=4.7kΩ,
Rg=25Ω, Ta=25°C



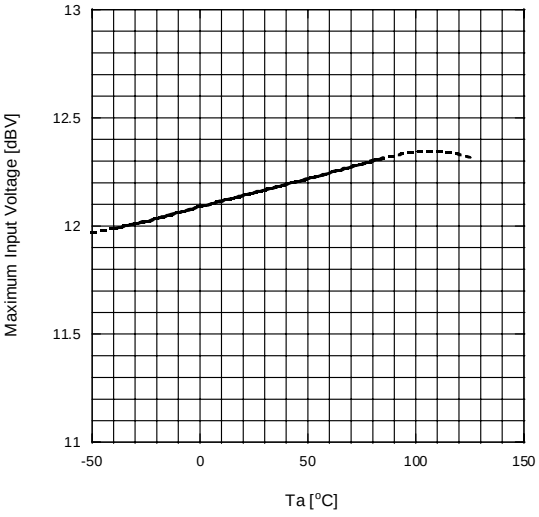
Maximum Input Voltage vs. Operating Voltage (DC)

Vin=Lch, Vout=Lch, f=1kHz, RL=4.7kΩ,
Rg=25Ω, Ta=25°C



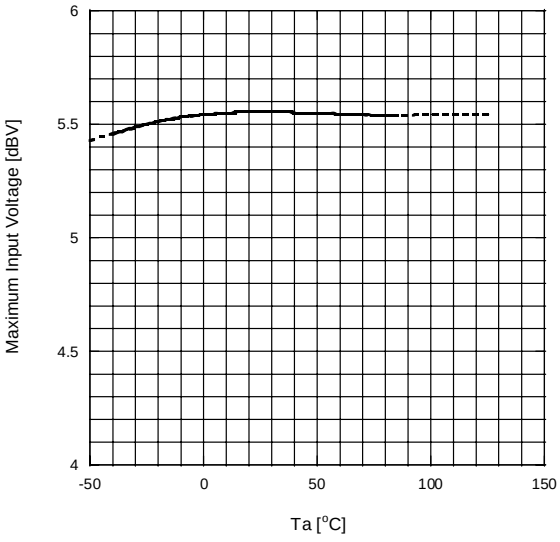
Maximum Input Voltage vs. Temperature (BYPASS)

V+=12V, Vin=Lch, Vout=Lch, f=1kHz, RL=4.7kΩ,
Rg=25Ω



Maximum Input Voltage vs. Temperature (DC)

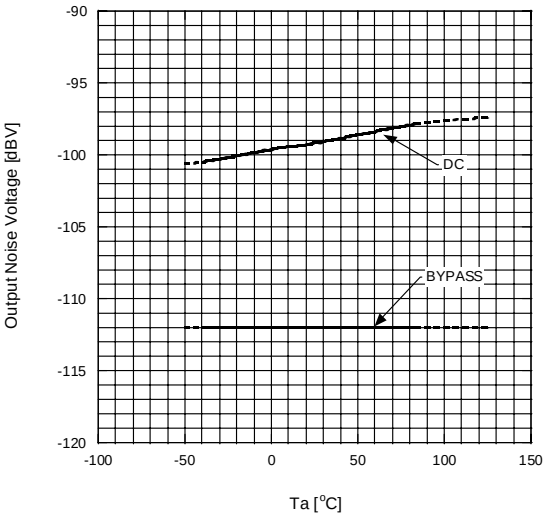
V+=12V, Vin=Lch, Vout=Lch, f=1KHz, RL=4.7kΩ,
Rg=25Ω



■TYPICAL CHARACTERISTICS

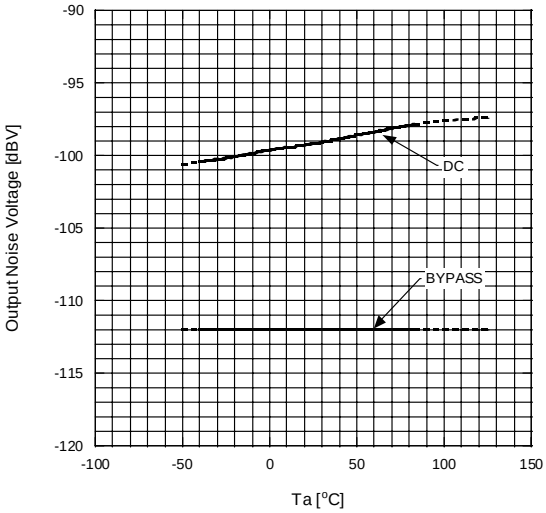
Output vs. Temperature

V+=12V, Vin=GND, Vout=Lch



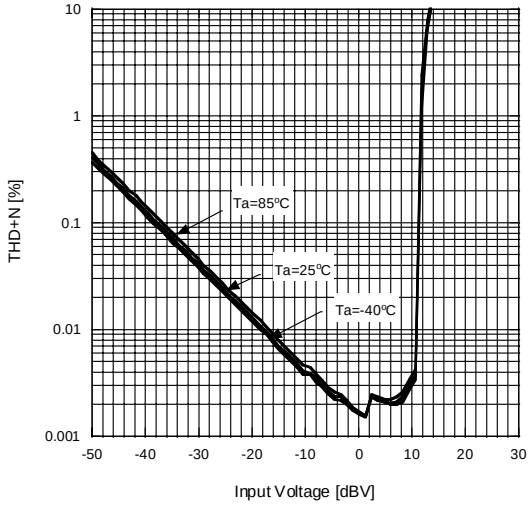
Output Noise Voltage vs. temperature

V+=12V, Vin=GND, Vout=Rch



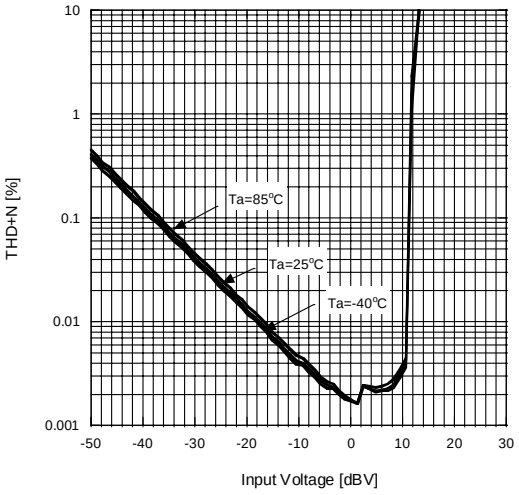
Total Harmonic Distotion vs. Input Voltage (BYPASS)

V+=12V, Vin=Lch, Vout=Lch, f=100Hz, RL=4.7kΩ
Rg=25Ω, BW=10-80kHz



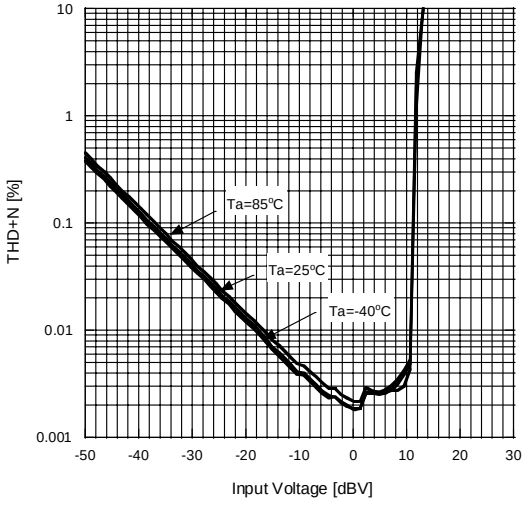
Total Harmonic Distortion vs. Input Voltage (BYPASS)

V+=12V, Vin=Lch, Vout=Lch, f=1kHz, RL=4.7kΩ
Rg=25Ω, BW=10-80kHz



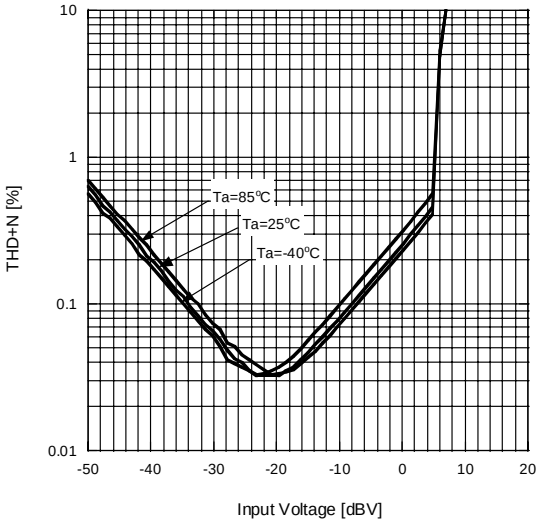
Total Harmonic Distortion vs. Input Voltage (BYPASS)

V+=12V, Vin=Lch, Vout=Lch, f=10kHz, RL=4.7kΩ
Rg=25Ω, BW=10-80kHz



Total Harmonic Distortion vs. Input Voltage (DC)

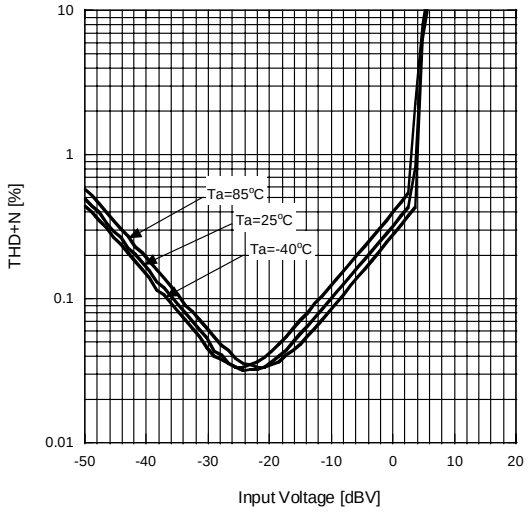
V+=12V, Vin=Lch, Vout=Lch, f=1kHz, RL=4.7kΩ,
Rg=25Ω, BW=10-80kHz



■TYPICAL CHARACTERISTICS

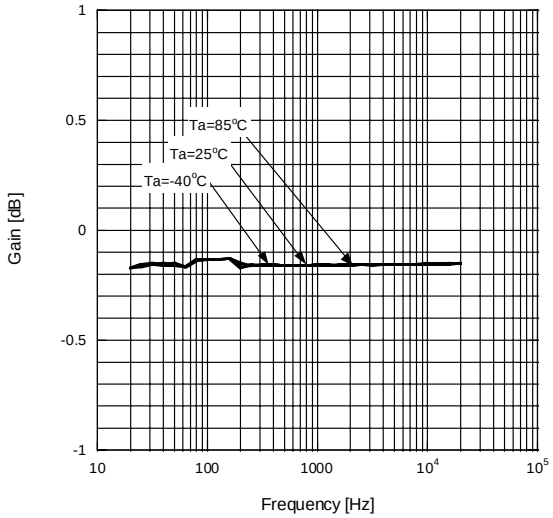
Total Harmonic Distortion vs. Input Voltage (DC)

V+=12V, Vin=Lch, Vout=Lch, f=10kHz, RL=4.7kΩ, Rg=25Ω, BW=10-80kHz



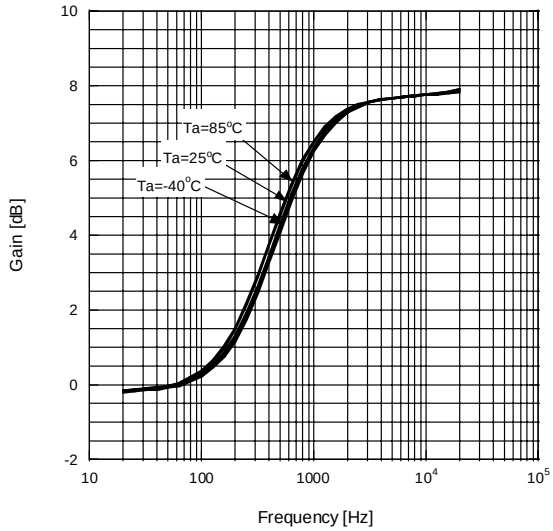
Frequency Responce (BYPASS)

V+=12V, Vin=-10dBV Lch, Vout=Lch, RL=4.7kΩ, Rg=25Ω



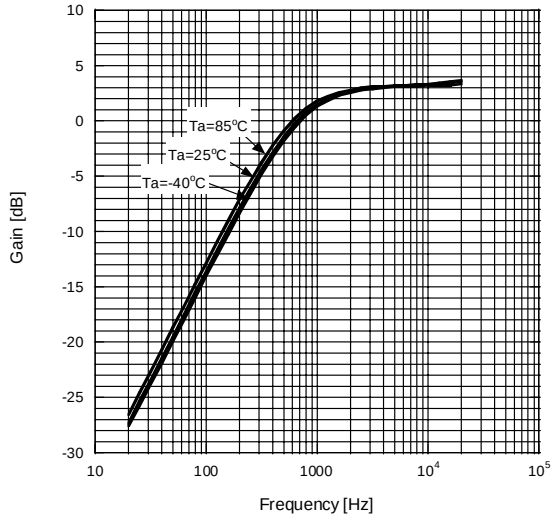
Frequency Responce (DC)

V+=12V, Vin=-20dBV Lch, Vout=Lch, RL=4.7kΩ, Rg=25Ω



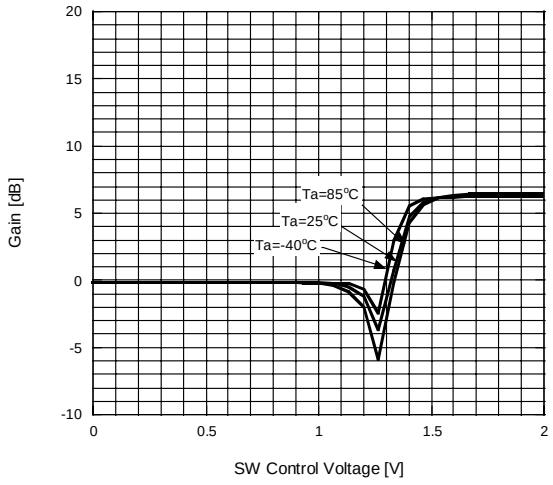
Frequency Responce (DC)

V+=12V, Vin=-20dBV Lch, Vout=Rch, RL=4.7kΩ, Rg=25Ω



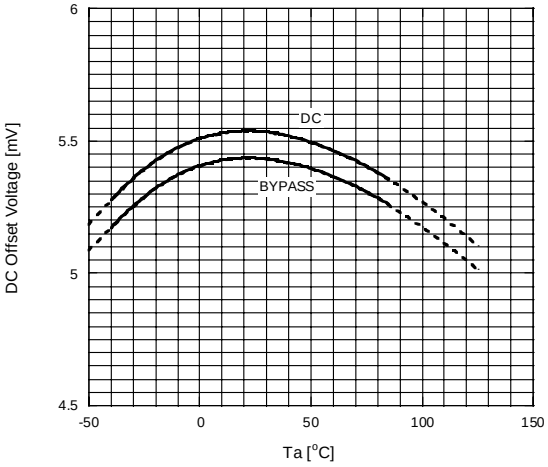
Gain vs. SW Control Voltage

V+=12V, Vin=-20dBV Lch, Vout=Lch, f=1kHz, BYPASS-->DC



DC Offset Voltage vs. Temperature

V+=12V, Vout=Lch



■TYPICAL CHARACTERISTICS

DC Offset Voltage vs. Temperature

V+=12V, Vout=Rch