

Audio Limiter

■ GENERAL DESCRIPTION

The **NJM2761** is the audio limiter for speaker protection.
 The limit level is adjustable by external resistor.
 It is suitable for PC, portable audio and others.

■ PACKAGE OUTLINE



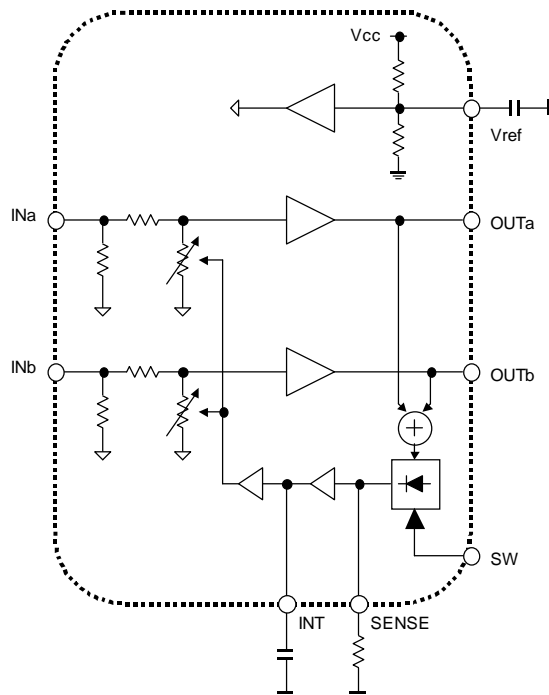
NJM2761RB2

NJM2761V

■ FEATURES

- Wide Operating Voltage +2.7V to +13.0V
- Variable Limit Level by external resistor 0.2 to 1V
- Low Output Noise -90dBV max.
- Bipolar Technology
- Package Outline TVSP10, SSOP14

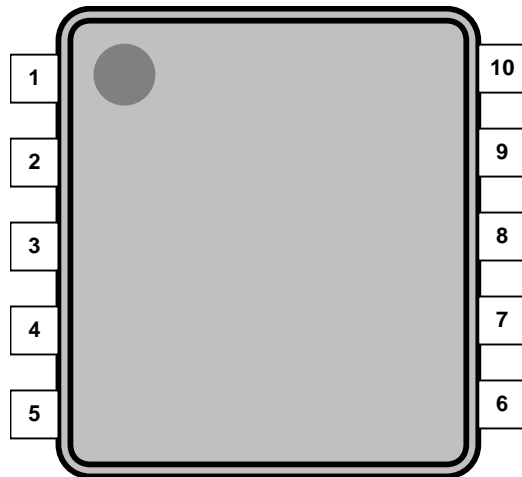
■ BLOCK DIAGRAM



NJM2761

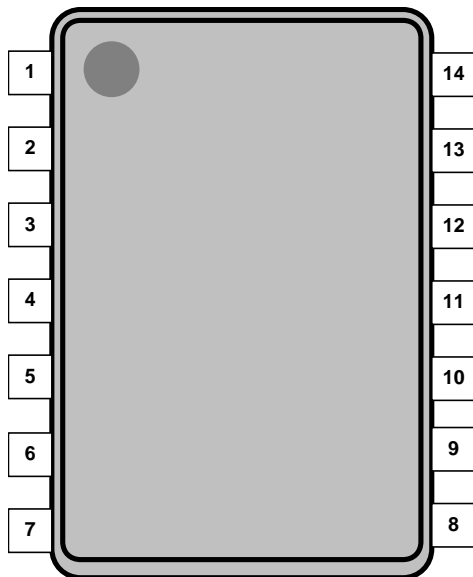
■ PIN CONFIGURATION

TVSP10



1. V+
2. OUTa
3. INa
4. INT
5. VREF
6. SENCE
7. SW
8. INb
9. OUTb
10. GND

SSOP14



1. V+
2. OUTa
3. INa
4. INT
5. VREF
6. NC
7. NC
8. NC
9. NC
10. SENCE
11. SW
12. INb
13. OUTb
14. GND

■ABSOLUTE MAXIMUM RATING (Ta=25°C)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|-----------------------------|------------------|----------------------------|------|
| Supply Voltage | V ⁺ | 14 | V |
| Power Dissipation | P _D | 320(TVSP10) 300(SSOP14) | mW |
| Operating Temperature Range | T _{opr} | -20 to +75 | °C |
| Storage Temperature Range | T _{stg} | -40 to +125 | °C |

■ELECTRICAL CHARACTERISTICS

● POWER SUPPLY (Ta=25°C, V⁺=5V unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------|------------------|----------------|------|------|------|------|
| Operating Voltage | V ⁺ | - | 2.7 | 5.0 | 13.0 | V |
| Operating Current | I _{CC} | No Signal | - | 1.5 | 2.0 | mA |
| Reference Voltage | V _{ref} | No Signal | 2.2 | 2.5 | 2.7 | V |

● AC CHARACTERISTICS

(Ta=25°C, V⁺=5V, V_{IN}=1Vrms/f=1kHz, R_{sense}=20kΩ, BW=400-30kHz unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---------------------------|-------------------|--|------|--------------|---------------|----------------|
| Limit Level 1 | G _{LIM1} | | 150 | 200 | 250 | mVrms |
| Limit Level 2 | G _{LIM2} | V ⁺ =13V, R _{sense} =4kΩ, V _{IN} =2Vrms | 0.7 | 1.0 | 1.3 | Vrms |
| Limit Off | G _{OFF} | SW=2V | 0.9 | 1.0 | 1.1 | Vrms |
| Output Noise | V _{NO} | R _S =0Ω, A-weighting, | - | -100 (10) | -90 (31.6) | dBV (μVrms) |
| Total Harmonic Distortion | THD+N | | - | - | 1 | % |
| Cross Talk | CT | | - | - | -70 | dB |
| Ripple Rejection | RR | V _{ripple} =100mVrms, f=1kHz | - | - | -70 (316) | dBV (μVrms) |

● CONTROL CHARACTERISTICS (Ta=25°C, V⁺=5V unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------|-----------------|----------------|------|------|------|------|
| Low Level Input Voltage | V _{IL} | - | - | - | 0.5 | V |
| High Level Input Voltage | V _{IH} | - | 2.0 | - | - | V |


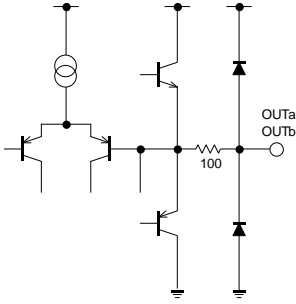
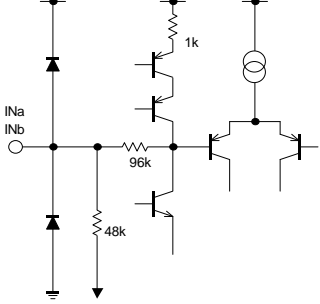
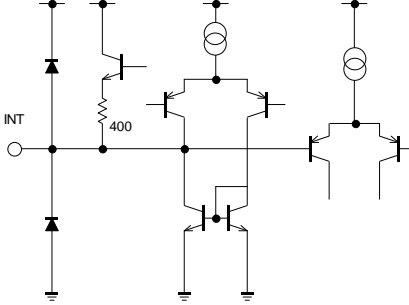
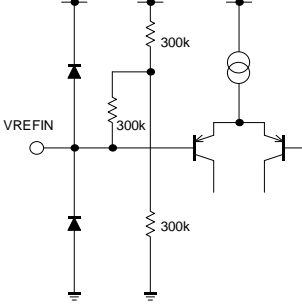
■CONTROL TERMINAL EXPLANATION

SW(TVSP10:7pin, SSOP14:11pin)

| MODE | STATUS | NOTE |
|-------------|--------|------------------------|
| Limiter ON | L | Limiter is active. |
| Limiter OFF | H | Limiter is not active. |

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■ TERMINAL DESCRIPTION

| No. TVSP10(SSOP14) | SYMBOL | FUNCTION | EQUIVALENT CIRCUIT | VOLTAGE |
|-----------------------|--------------|--|--|---------|
| 1 | V+ | Power Supply Terminal |  | - |
| 2 9(13) | OUTa OUTb | Ach Output Terminal Bch Output Terminal |  | V+/2 |
| 3 8(12) | INa INb | Ach Input Terminal Bch Input Terminal |  | V+/2 |
| 4 | INT | Smoothing Capacitor Connection Terminal |  | 0.7V |
| 5 | VREFIN | Reference Voltage Stabilizing Capacitor Connection Terminal |  | V+/2 |

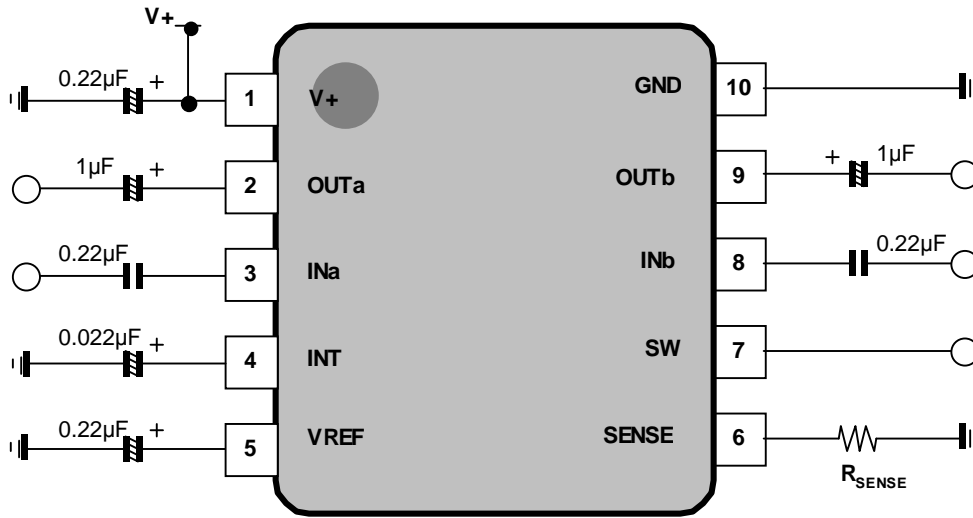
■ TERMINAL DESCRIPTION

| No. TVSP10(SSOP14) | SYMBOL | FUNCTION | EQUIVALENT CIRCUIT | VOLTAGE |
|-----------------------|--------|---|--------------------|---------|
| 6(10) | SENSE | Resister Connection Terminal for Limit Level Setting | | 0V |
| 7(11) | SW | Limiter ON/OFF Switch | | - |
| 10(14) | GND | Ground Terminal | | - |

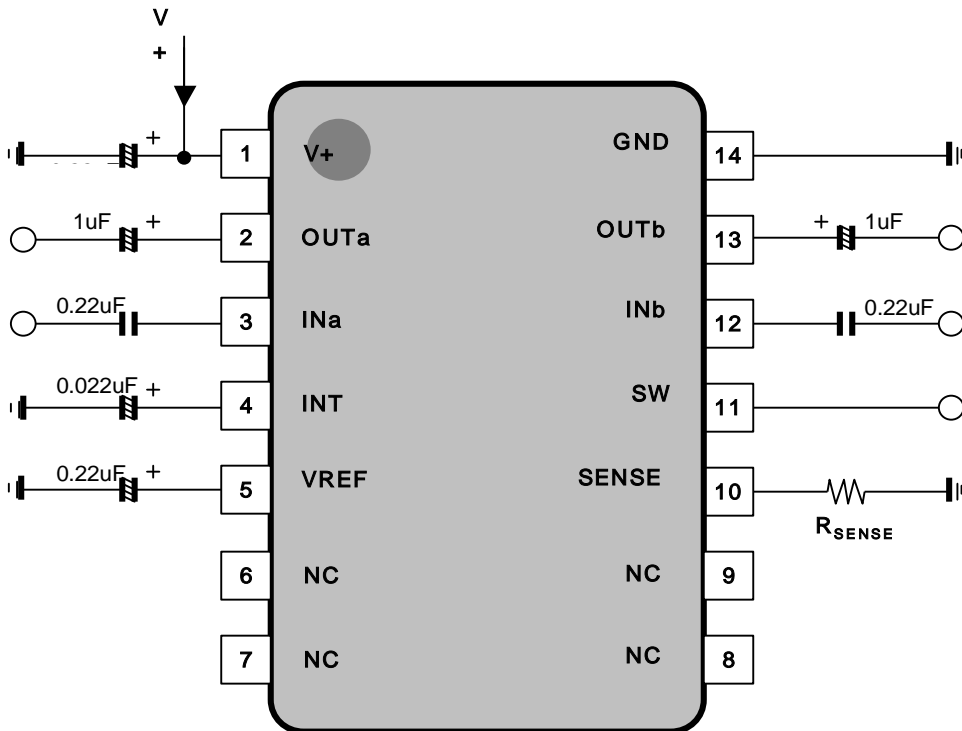
NJM2761

APPLICATION CIRCUIT

TVSP10



SSOP14



* The limit level is twice as much as set point when a signal is input into a either one channel of Ach or Bch.

* For the above reason, monaural signal should input both INa and INb.

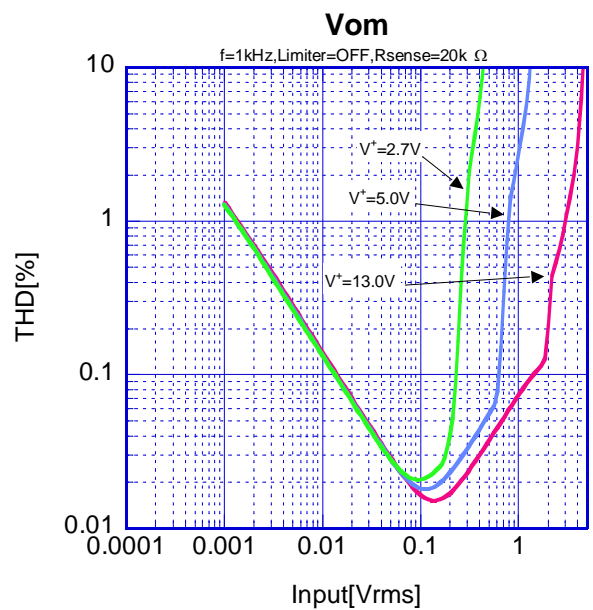
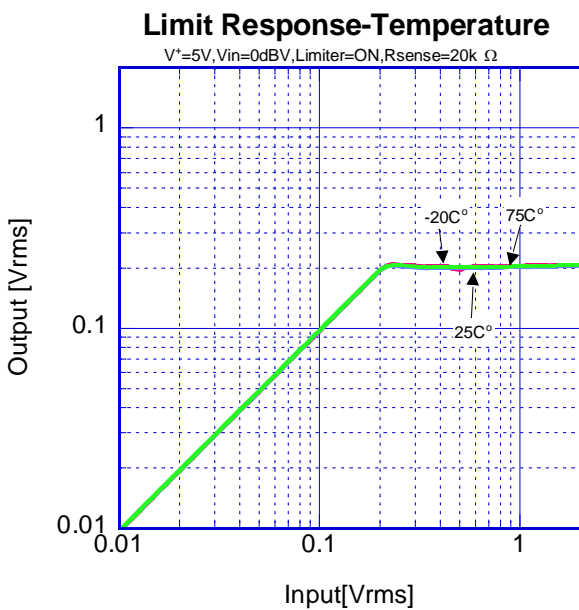
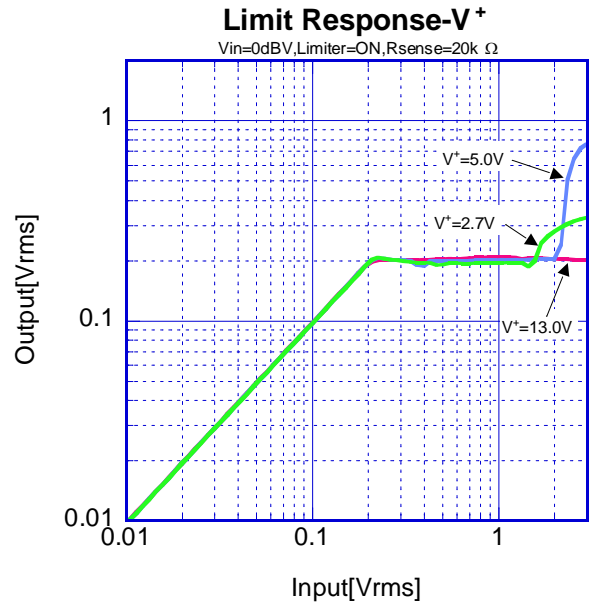
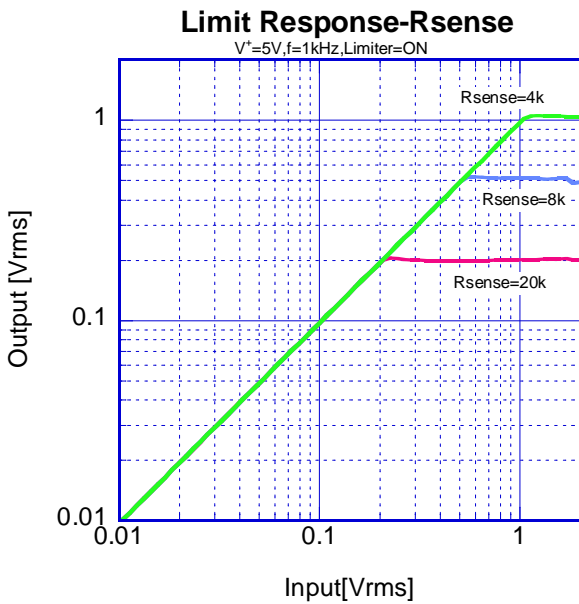
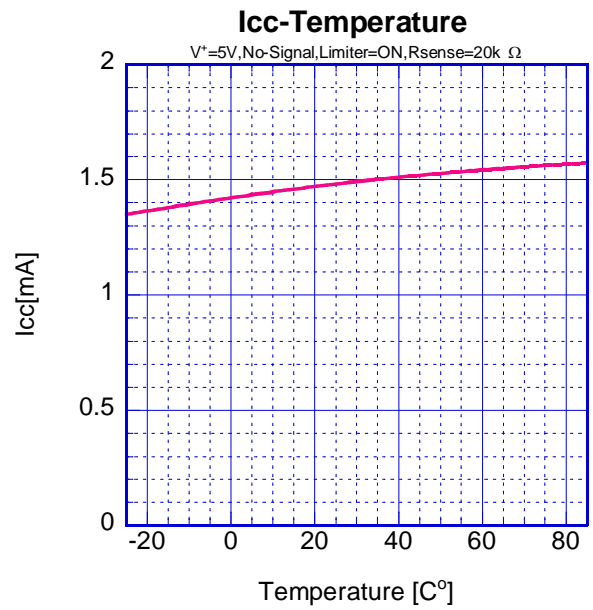
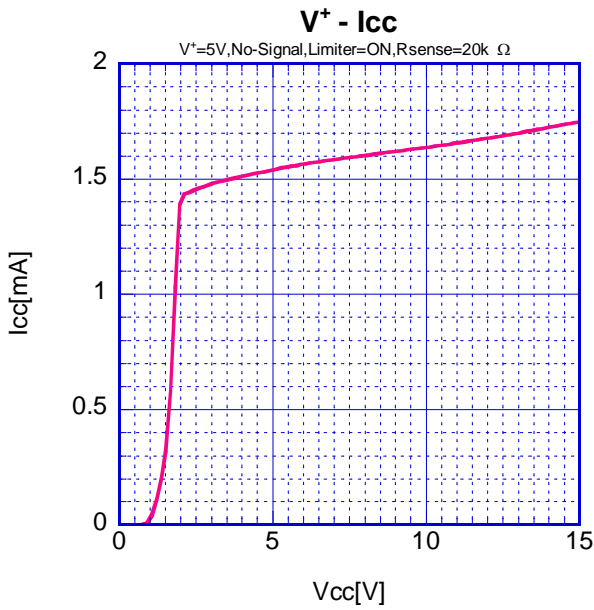
$$R_{SENSE} = 4000 / V_{lim} [\text{Ohm}]$$

V_{lim}: Limit level (V_{rms})

Limit range: 200mV_{rms} to 1V_{rms} (20k to 4kOhm)

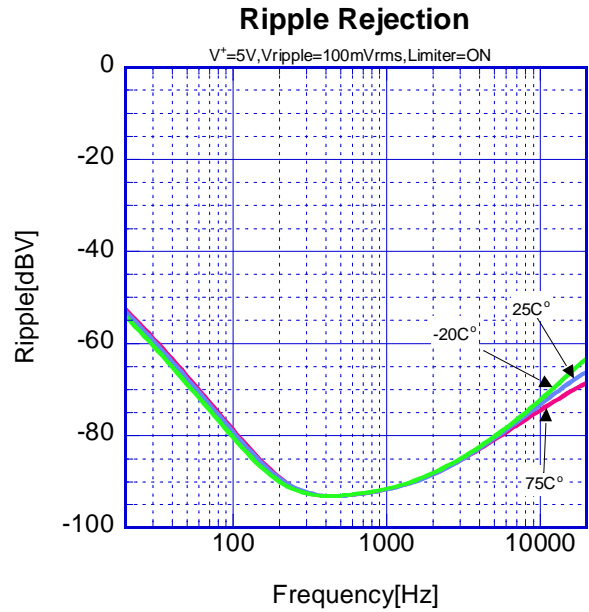
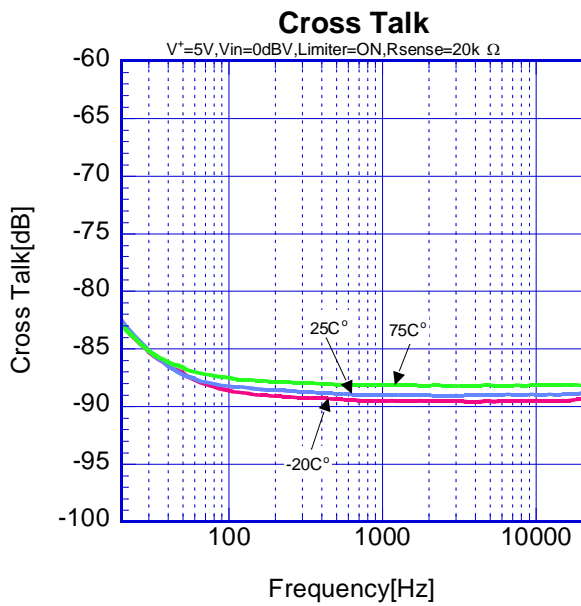
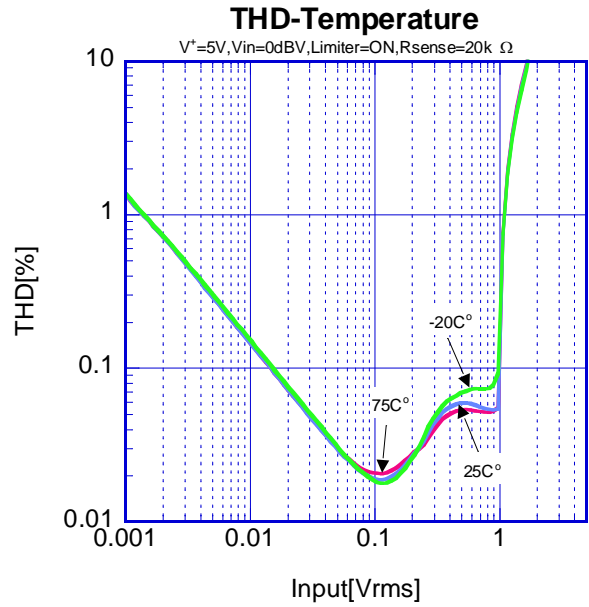
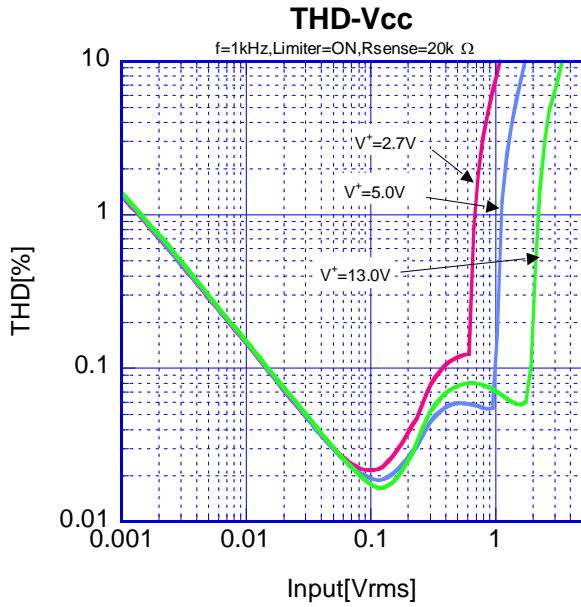
* Please be careful of leakage current from the surrounding wiring because the INT terminal is high impedance.

TYPICAL CHARACTERISTICS



NJM2761

TYPICAL CHARACTERISTICS



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