

INTRODUCTION

The S1A2271B01 is a monolithic integrated circuit designed for use in Dolby®B-type noise reduction systems.

FEATURES

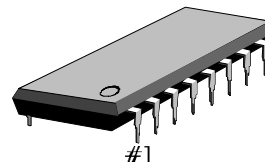
- Few external components
- Low quiescent circuit current (Typ ICCQ = 5.3mA)
- High crosstalk rejection ratio
- Builtin NR-switch, REC/PB-switch
- Recommended supply voltage: $V_{CC} = 8V - 16V$

ORDERING INFORMATION

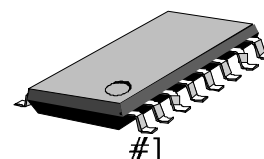
| Device | Package | Operating Temperature |
|-----------------|-------------|-----------------------|
| S1A2271B01-D0B0 | 16-DIP-300A | - 30°C - + 85°C |
| S1A2271B01-S0B0 | 16-SOP-225A | |

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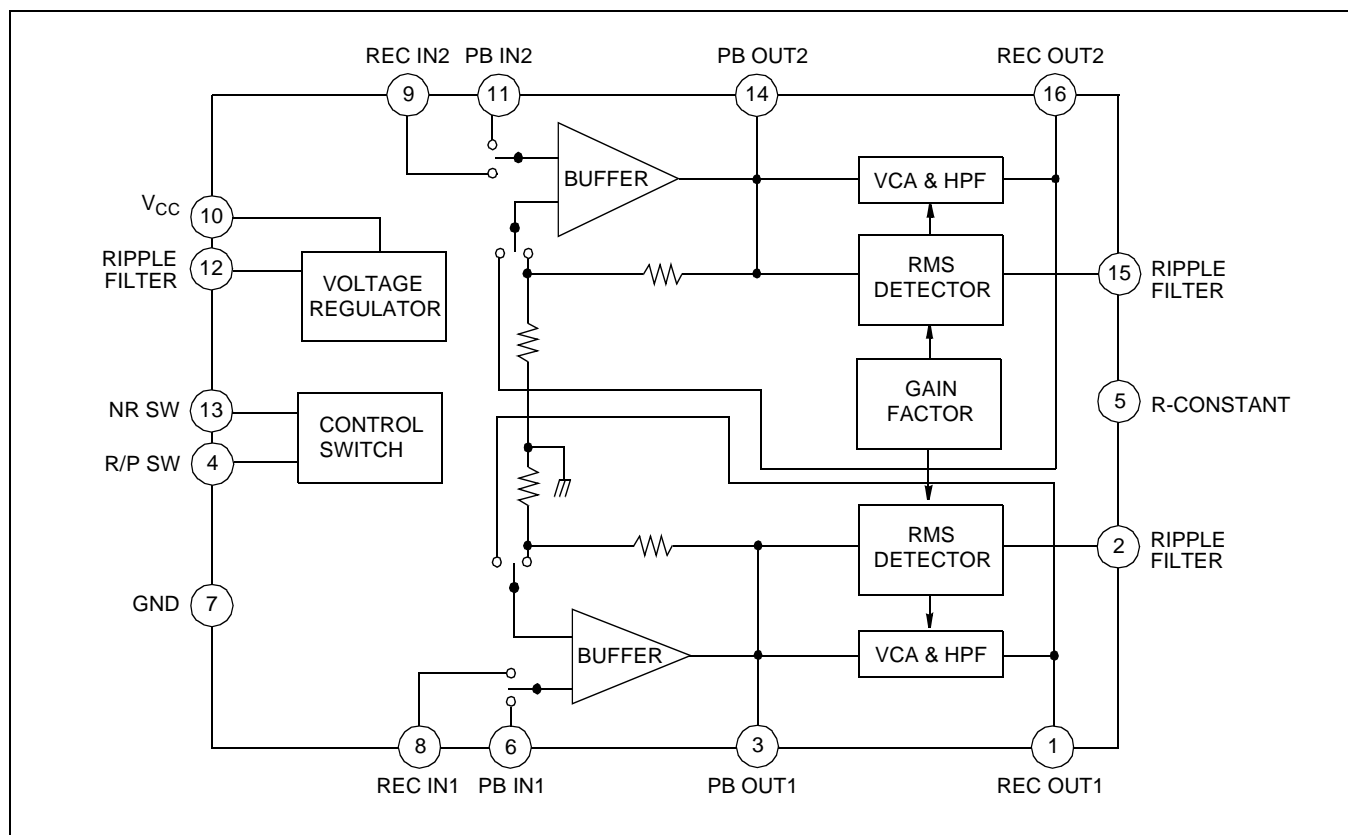
16-DIP-300A



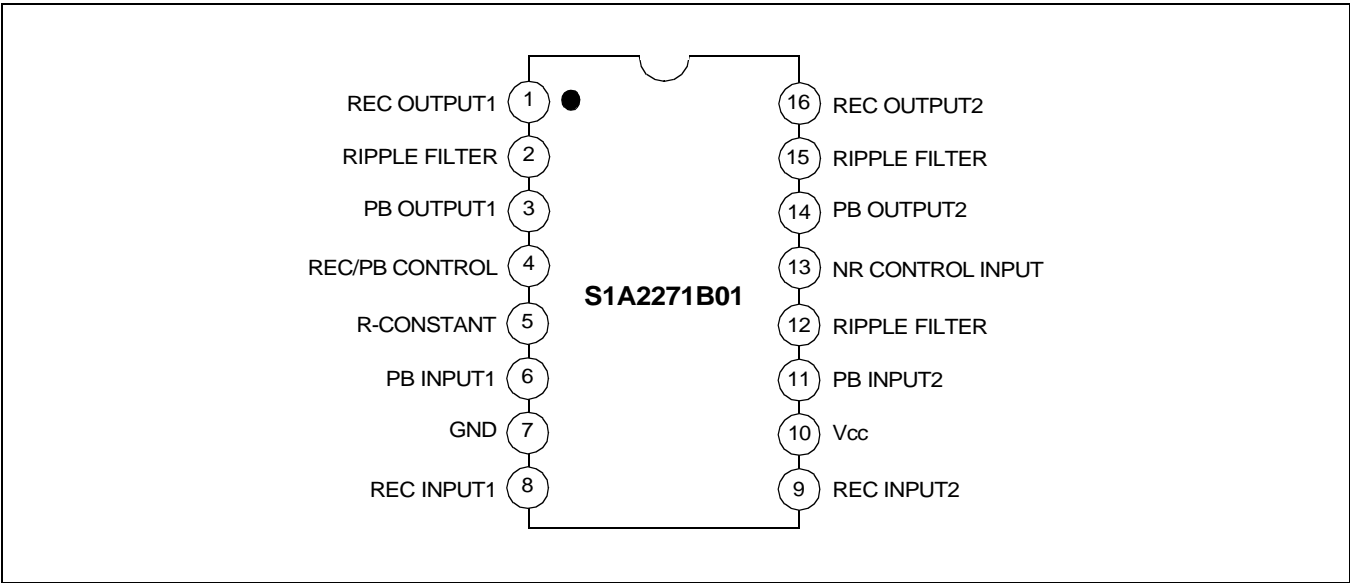
16-SOP-225A



BLOCK DIAGRAM



PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Characteristic | Symbol | Value | Unit |
|-----------------------|------------------|------------|------|
| Supply Voltage | V _{CC} | 16 | V |
| Power Dissipation | P _D | 750 | mW |
| Operating Temperature | T _{OPR} | -30 – +85 | °C |
| Storage Temperature | T _{STG} | -40 – +125 | °C |

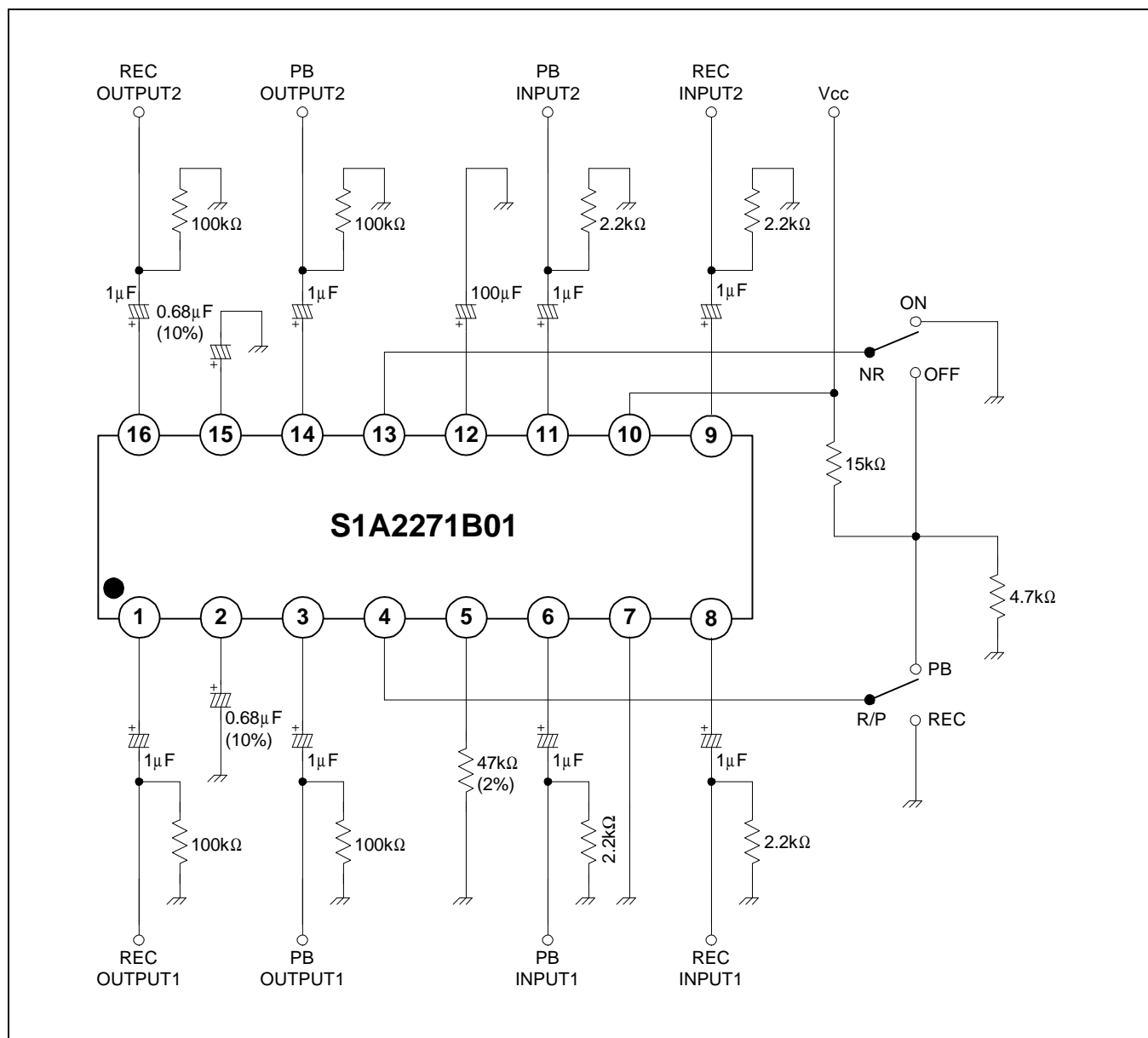
NOTE: Derated above Ta = 25°C in the proportion of 10mW/°C

ELECTRICAL CHARACTERISTICS

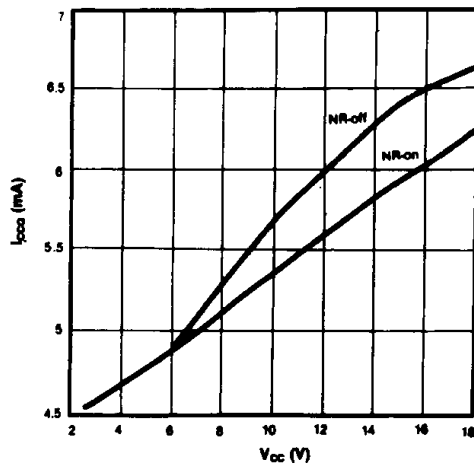
(Ta = 25°C, Vcc = 12V, f = 1kHz, 0dB = 245mW (−10dBm) at REC OUT, unless otherwise specified)

| Characteristic | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---------------------------|----------------------|---|------|------|------|------|
| Quiescent Circuit Current | I _{CCQ} | REC mode, NR-off, V _I = 0 | 3.5 | 5.6 | 7 | mA |
| Buffer Voltage Gain | G _V | REC mode, PB out = 0dB | 25 | 27 | 29 | dB |
| NR-REC Boost | G _{V(BST)} | RECOut = −25dB, f = 500Hz | 1.4 | 2.9 | 4.4 | dB |
| | | RECOut = −25dB, f = 2kHz | 5.5 | 7.0 | 8.5 | dB |
| | | RECOut = −25dB, f = 5kHz | 3.9 | 5.4 | 6.9 | dB |
| | | RECOut = −40dB, f = 10kHz | 9.0 | 10.4 | 11.9 | dB |
| | | RECOut = 0dB, f = 10kHz | −1.1 | 0.4 | 1.9 | dB |
| NR-Boost Balance | CB | NR-REC boost CH to ratio | − | 0 | 1 | dB |
| MAX.RECOut level | V _{O (MAX)} | REC mode, NR-off THD = 1% | 14 | 15.9 | − | dB |
| REC Output Voltage | THD | REC mode, NR-off RECOut = 10dB | − | 0.04 | 0.2 | % |
| | | REC mode, NR-on RECOut = 10dB | − | 0.04 | 0.3 | % |
| NR-effect S/N | S/N | REC mode, R _G = 2.2K Filter = CCIR/ARM | 65 | 69 | − | dB |
| Crosstalk | CT | NR-off, OUTPUT = 0dB PB to REC | − | −70 | −60 | dB |
| | | CH to CH, NR-off OUTPUT = 0 dB | − | −70 | −60 | dB |
| Input Impedance | Z _I | − | 30 | 47 | 60 | KΩ |
| Switch Control Voltage | V _{CTL} | High mode | 2.4 | − | − | V |
| | | Low mode | 0 | − | 0.4 | V |
| Input Level | REC V _I | REC mode, NR-off RECOut = 0dB | −32 | −30 | −28 | dBm |
| | PB V _I | PB mode, NR-off RECOut = 0dB | −32 | −30 | −28 | dBm |
| Output Level | V _O | REC mode, NR-off RECOut = 0dB Testpoint = PB output | 489 | 549 | 616 | m V |

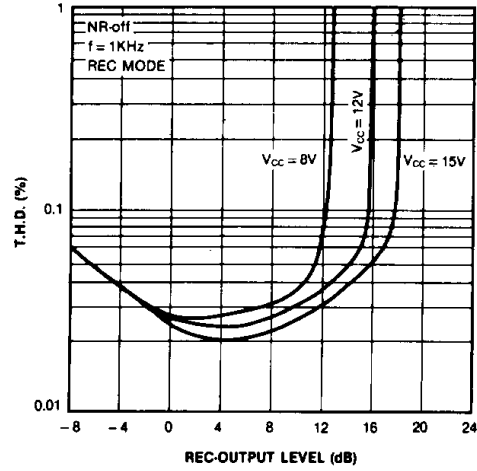
TEST CIRCUIT



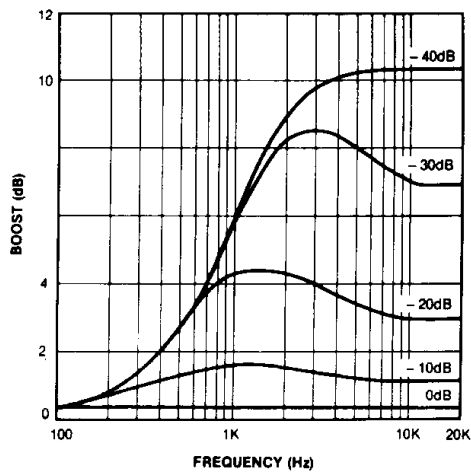
QUIESCENT CIRCUIT CURRENT-SUPPLY VOLTAGE



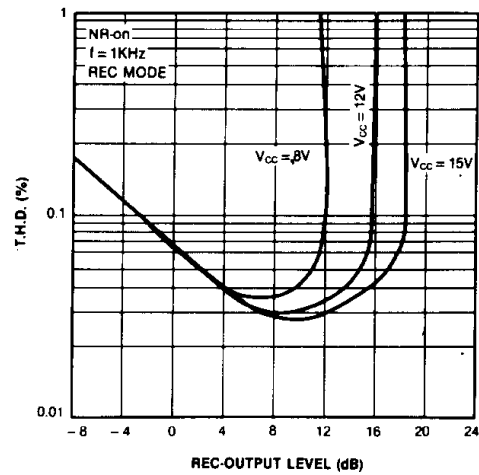
TOTAL HARMONIC DISTORTION (REC)



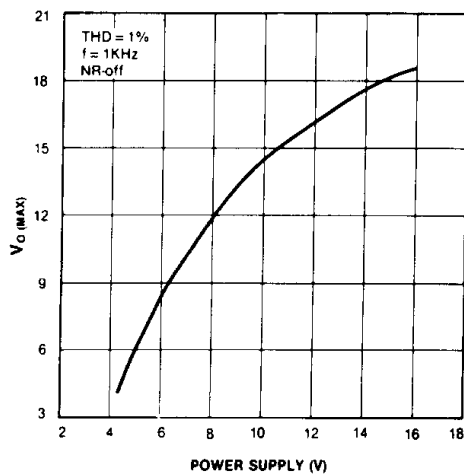
REC (ENCODE) CHARACTERISTIC



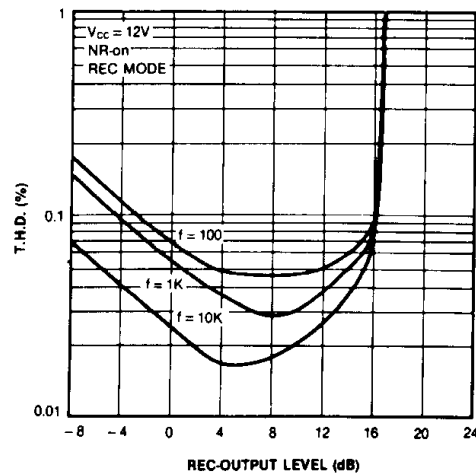
TOTAL HARMONIC DISTORTION (REC)



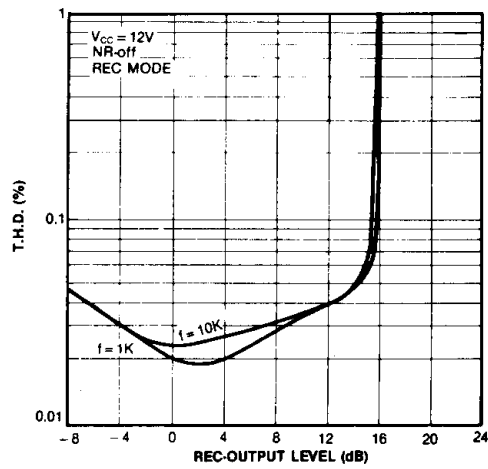
MAX REC-OUTPUT LEVEL



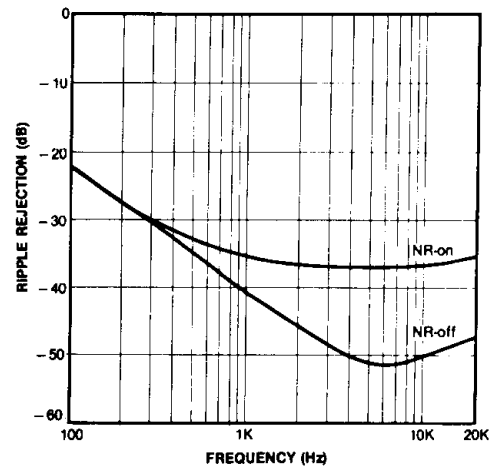
TOTAL HARMONIC DISTORTION (REC)



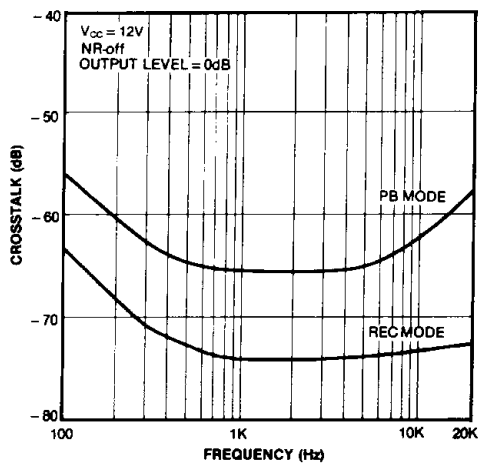
TOTAL HARMONIC DISTORTION (REC)



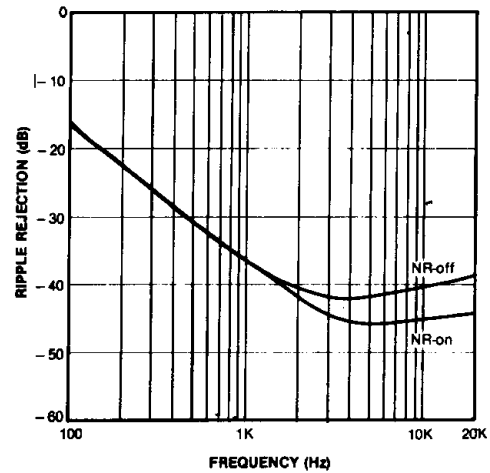
RIPPLE REJECTION (REC)



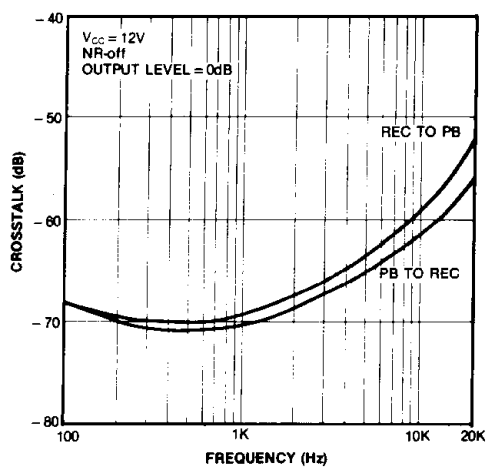
CROSSTALK (CH TO CH)



RIPPLE REJECTION (PB)



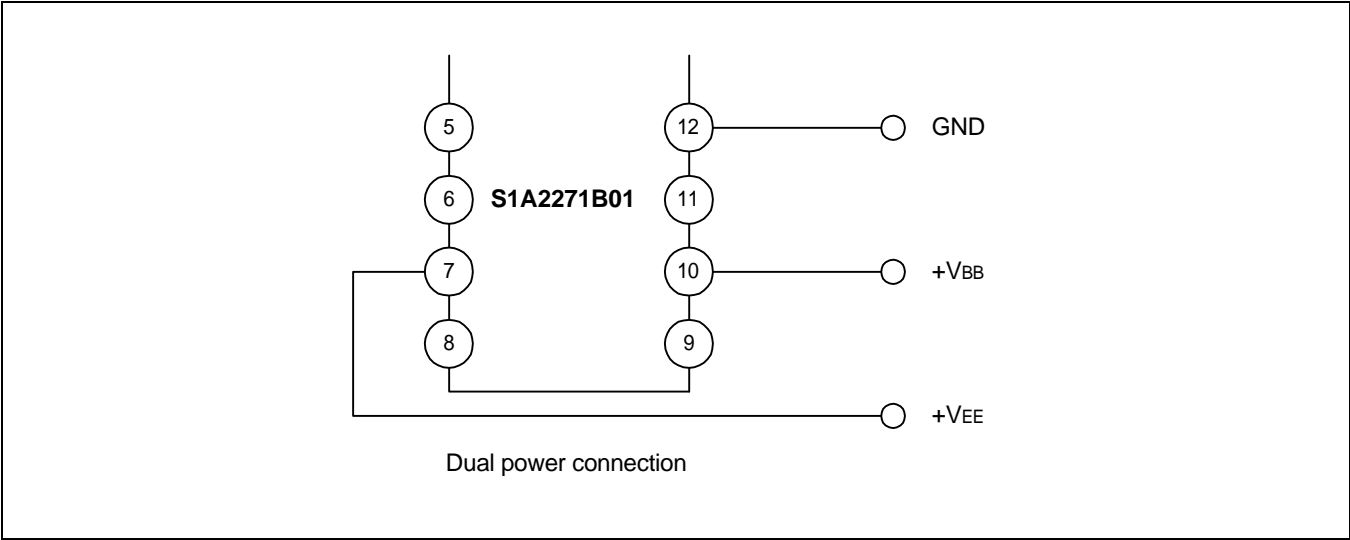
CROSSTALK (BETWEEN REC TO PB)



APPLICATION INFORMATION

Power Supply

The S1A2271B01 can be operated at 8V - 16V with a single power supply, and 4V - 8V with a dual power supply.



Switch Control Voltage

All functions of S1A2271B01 are controlled by internal electronic switches. The function switch is operated by the DC voltage of NR and R/P control pins.

| NR, R/P | V _H | V _L |
|-----------|----------------|----------------|
| Condition | PB | REC |
| | NR-off | NR-on |

| Single | Dual Power |
|-----------------------|---|
| V _H ≥ 2.4V | V _H ≥ V _{EE} + 2.4V |
| V _L ≤ 0.4V | V _L ≤ V _{EE} + 0.4V |

Reference Level

The reference output level of the Dolby noise reduction system is defined as Dolby level. The Dolby level of S1A2271B01 is 245mV (−10dBm) at f = 400Hz.