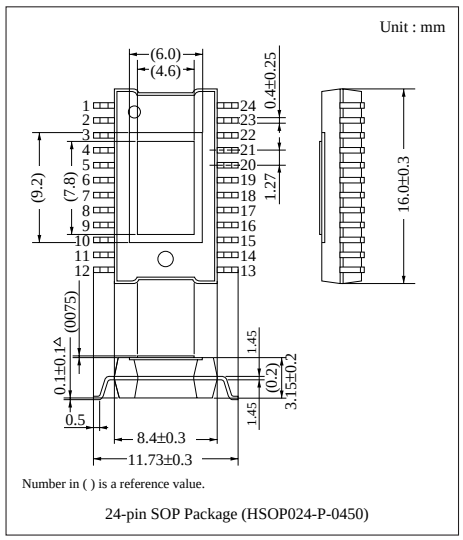
AN8612NSR

SCSI Active Terminator IC

■ Overview

The AN8612NSR is a terminator IC complying with the standard interface standards [SCSI-I/II] for personal computer, work station and various information equipment. Fixed resistor and regulator which are separately provided in conventional ICs are incorporated in single chip for the AN8612NSR. The stand-by function is also built in the AN8612NSR. Moreover, this IC can easily satisfy the maximum terminal capacitance of 25 pF of the SCSI-II standard, because of its small output terminal capacitance. It can support the 10 M byte/s of SCSI-II and 20 M bytes/s of Fast-20.



24-pin SOP Package (HSOP024-P-0450)

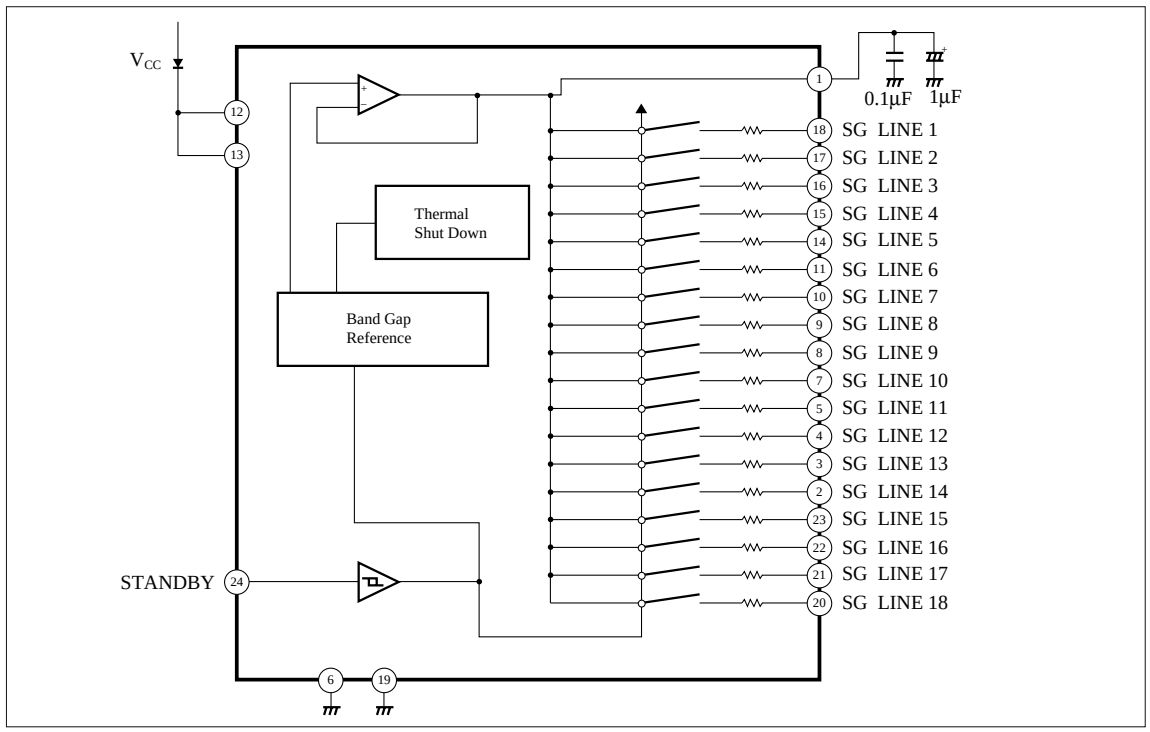
■ Features

- Active termination of 18 signal lines
- Low consumption power owing to stand-by function built-in (100µA in stand-by condition)
- Small output terminal capacitance : 4.5 pF, typ.
- High accuracy regulator : 2.85V±60mV

■ Application

SCSI interface board of PC
SCSI equipment such as CD-ROM, MO, PD and MD printer

■ Block Diagram



■ Absolute Maximum Rating (Ta=25˚C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	– 0.3 to + 7.0	V
Supply current	I_{CC}	500	mA
Power dissipation Note)	P_D	2250	mW
Operating ambient temperature	T_{opr}	–20 to + 60	˚C
Storage temperature	T_{stg}	–55 to + 150	˚C

Note) Ta=60˚C and printed board (80.0 × 80.0 × 1.2mm)

■ Recommended Operation Range (Ta=25˚C)

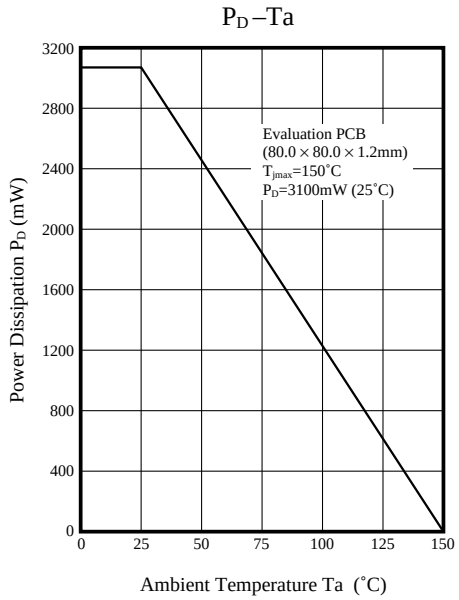
Parameter	Symbol	Range
Operating supply voltage	V_{CC}	4.0V to 5.5V

■ Electrical Characteristics (V_{CC}=5.0V, Ta=25±2˚C)

Parameter	Symbol	Condition	min	typ	max	Unit
Supply current 1	I_{CC1}	STANDBY= “L” All SGLINE=open	—	44	54	mA
Supply current 2	I_{CC2}	STANDBY= “L” All SGLINE=0.2V	—	458	530	mA
Supply current 3	I_{CC3}	STANDBY=open	—	100	200	µA
STANDBY terminal “L” input current	I_{STBYL}	V_{CC}=5.5V, V_I=0V	–150	–50	—	µA
STANDBY terminal “L” input current	I_{STBYH}	V_{CC}=5.5V, V_I=5.5V	—	—	1	µA
STANDBY terminal positive direction Threshold voltage	V_{TH+}		1.3	1.5	1.7	V
STANDBY terminal negative direction Threshold voltage	$V_{TH–}$		1.1	1.3	1.5	V
Maximum output current SGLINE1-18	I_{SG}	V_{SG}=0.2V	19.8	23.0	26.2	mA
Output leak current 1 SGLINE1 to 18	I_{LK1}	V_{CC}=5.5V STANDBY=open, V_{SG}=0V	–1	—	—	µA
Output leak current 2 SGLINE1 to 18	I_{LK2}	V_{CC}=5.5V STANDBY=open, V_{SG}=2.85V	–1	—	1	µA
REG · output voltage	V_{REG1}	V_{CC}=4.0 to 5.5V All SGLINE=open	2.79	2.85	2.91	V
REG · output voltage	V_{REG2}	V_{CC}=3.2V All SGLINE=open	2.00	—	—	V
Termination resistance value SGLINE1 to 18	R_{SG}	I_{SG}=5mA to 15mA	107	115	123	Ω
“H” level output voltage SGLINE1 to 18	V_{SGH}	V_{CC}=4.0 to 5.5V All SGLINE=open	2.78	2.85	2.92	V
STANDBY terminal hysteresis width	V_{HYS}		—	(200)	—	mV
Output terminal capacitance	C_{SG}		—	(4.5)	8	pF
Thermal shut-down temperature	T_{TSD}		—	(170)	—	˚C

Note) Number in ( ) is a design reference value but not guaranteed one.

■ Package Power Dissipation



■ Pin Name

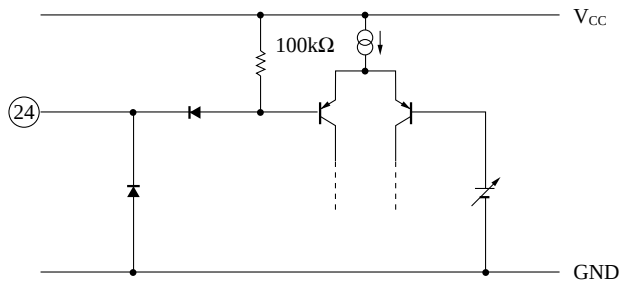
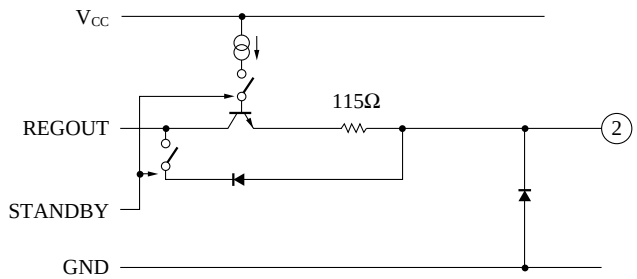
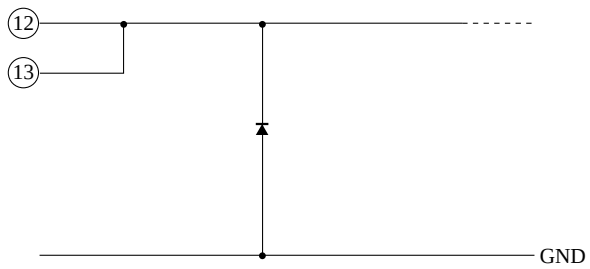
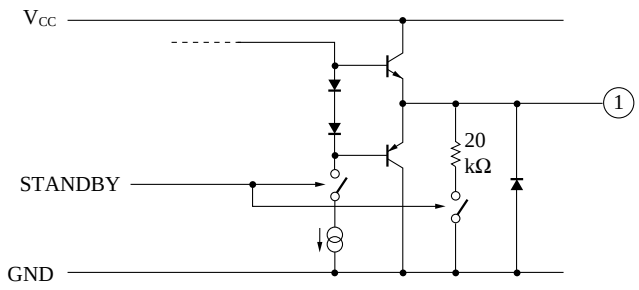
Pin No.	Pin name	Pin No.	Pin name
1	REGOUT	13	V_{CC} (TERMPWR) Note 2)
2	SGLINE14	14	SGLINE5
3	SGLINE13	15	SGLINE4
4	SGLINE12	16	SGLINE3
5	SGLINE11	17	SGLINE2
6	GND Note 1)	18	SGLINE1
7	SGLINE10	19	GND Note 4)
8	SGLINE9	20	SGLINE18
9	SGLINE8	21	SGLINE17
10	SGLINE7	22	SGLINE16
11	SGLINE6	23	SGLINE15
12	V_{CC} (TERMPWR) Note 2)	24	STANDBY Note 3)

Note 1) On PCB, the same wide pattern as Pin6 GND terminal and Pin19GND terminal (One layer one surface GND of multi-layer board is recommended for PCB.)

Note 2) V_{CC} should be connected with SCSI termination resistive power supply TERMPWR.

Note 3) STANDBY terminal input voltage : $V_I < V_{TH-}$ for active mode and $V_I > V_{TH+}$ for stand-by mode Opening the STANDBY terminal also brings the stand-by mode.

■ Pin Descriptions

Pin No.	Pin name	Equivalent circuit
24	STANDBY	
2, 3 4, 5 7, 8 9, 10 11, 14 15, 16 17, 18 20, 21 22, 23	SGLINE 1 | SGLINE 18	
12, 13	V_{CC}	
1	REGOUT	

■ Precautions on Input Capacitance

The Interface Terminal Input Capacitance MAX25pF Standard are added from the SCSI II. This is because large stamp input capacitance may prevent the normal signal transmission. The capacitance value which does not cause the transmission error differs, depending on the connection conditions of SCSI equipment (such as distance between equipment, number of equipment units and cable impedance), so, its proper value for the AN8612NSR can not be identified. However, when the input capacitance value specified in SCSII Standard, MAX25pF is used, transmission error due to input capacitance can hardly occur.

The input capacitance value is determined by the sum of the following capacitances : active terminator (ex. 4.5 pF), printed board (ex. 10 pF), driver receiver incorporated SCSI controller (ex. 10 pF) and connector (ex. 0.5 pF).

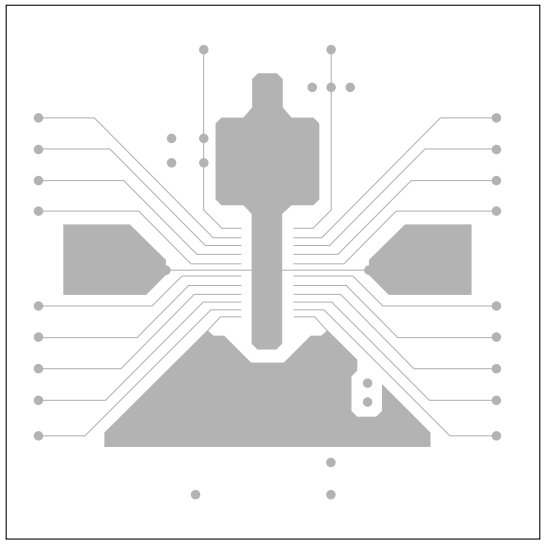
Therefore, particular care should be taken to each device for input capacitance.

For example, on the evaluation printed board of the AN8612NSR, the measured capacitance value per signal line is approx. 2.2 pF and that per unit area is 0.13 pF/mm^2.

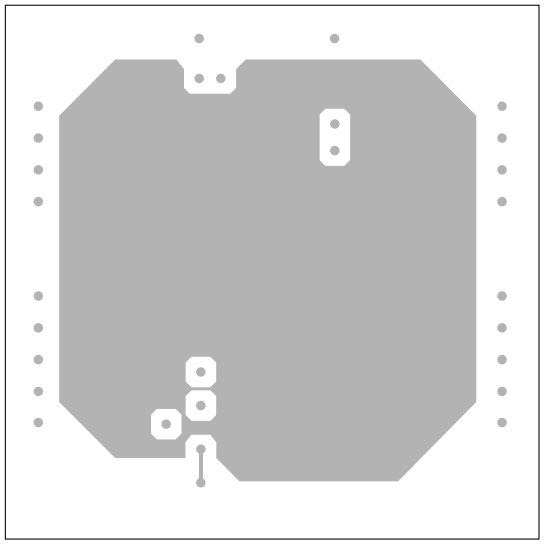
The thickness of printed board is 1 mm and the dielectric constant of glass epoxy is 3.8 to 5.

For printed board, since the capacitance value differs, depending on the thickness between layers and wiring length, it should be measured actually. Also, it should be measured by using the capacitance meter which can measure the capacitance value of semiconductor.

[Evaluation Printed Board]

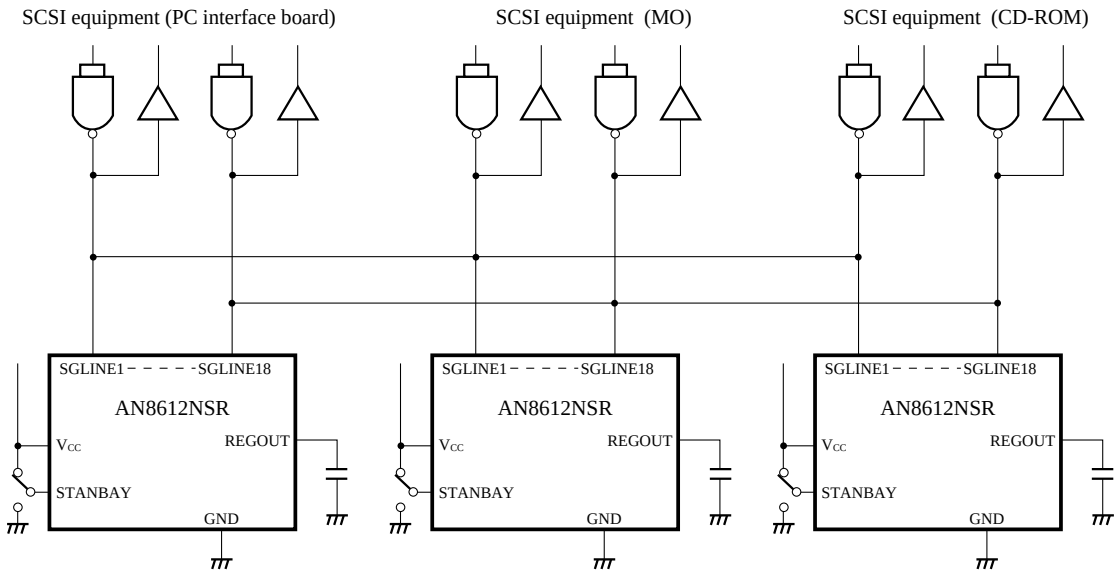


Front



Back

■ Application Circuit



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