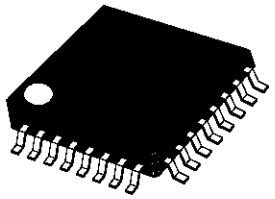
SGS-THOMSON MICROELECTRONICS

STV1389AQ

CABLE DRIVER FOR DIGITAL TRANSFER

- 1 DIFFERENTIAL INPUT, 3 DIFFERENTIAL OUTPUTS
- SUFFICIENT DRIVE CAPABILITY FOR A 300m LENGTH COAXIAL CABLE
- STABILITY DUE TO MINIMAL WAVEFORM DISTORTION
- BIPOLAR SILICON MONOLITHIC IC



QFP32
(Plastic Package)

ORDER CODE : STV1389AQ

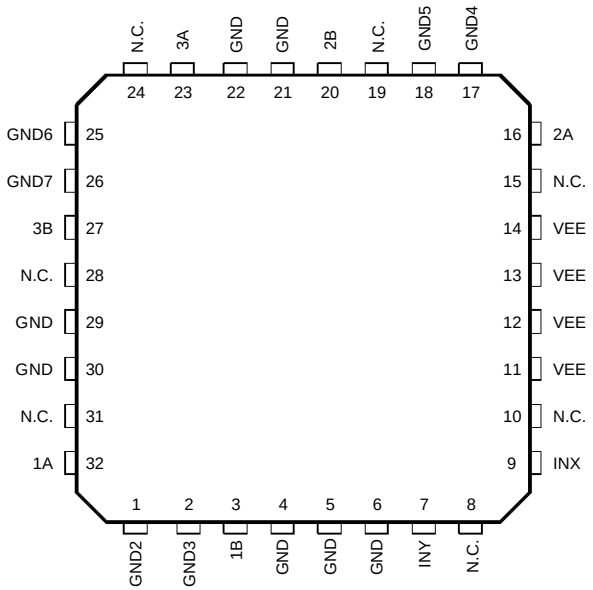
APPLICATIONS

- DATA TRANSFER BETWEEN DIGITAL SIGNAL PROCESSING EQUIPMENT

DESCRIPTION

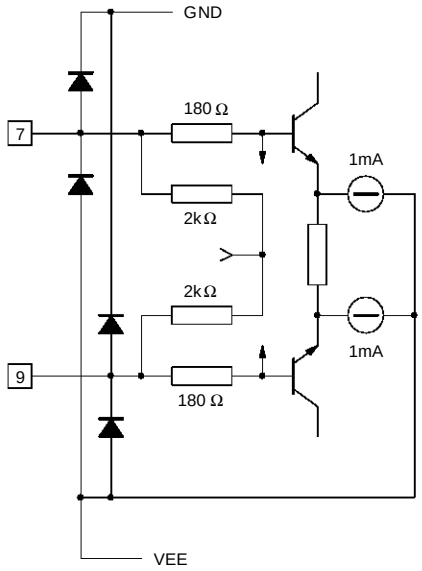
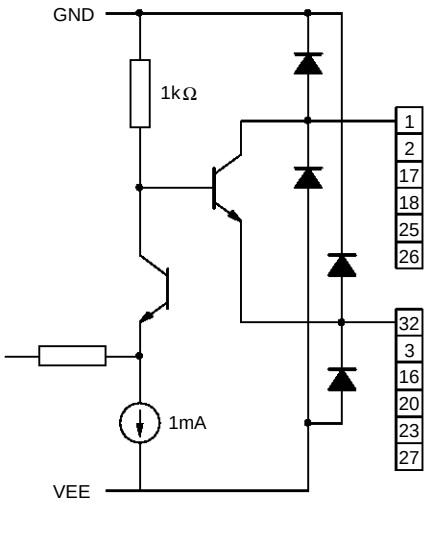
The STV1389AQ offers in a single-chip a complete IC driver for digital data transfer.

PIN CONNECTIONS



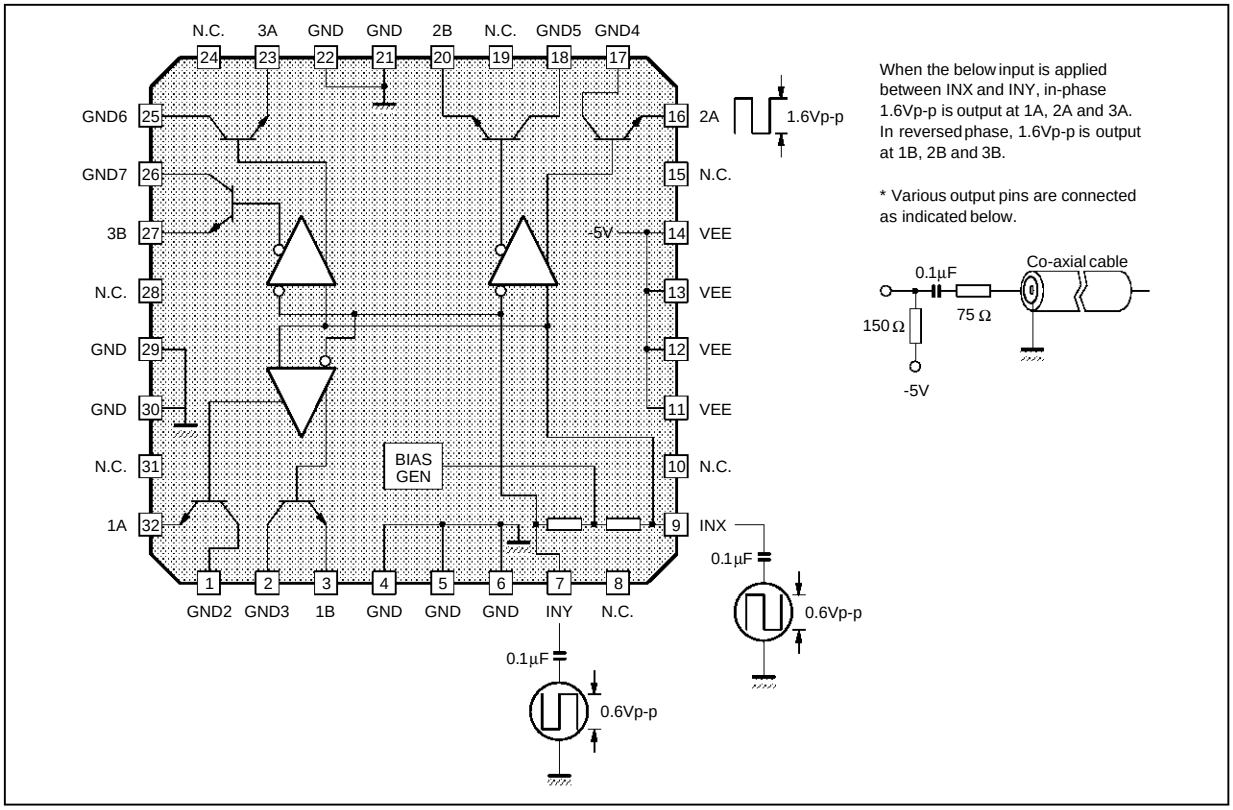
1389-01.EPS

PIN DESCRIPTION

Pin Number	Symbol	Standard DC Voltage	Equivalent Circuit	Description
7 9	INY INX	- 2.7V		Input pin of the differential amplifier. Input executed after DC portion is cut off.
1 2 17 18 25 26	GND2 GND3 GND4 GND5 GND6 GND7	-		Collector of the emitter follower output Tr. Connect to GND.
32 3 16 20 23 27	1A 1B 2A 2B 3A 3B	- 2.7V		Emitter of emitter follower output Tr. To use, connect pull-down resistor. (Even when only 1 side is used pull-down is executed In pairs.) Pairs 32 16 23 3 20 27

1389-01.TBL

BLOCK DIAGRAM



1389-04.EPS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	7.0	V
T_{stg}	Storage Temperature	- 65, + 150	°C
P_D	Allowable Power Dissipation	500	mW

1389-02.TBL

OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	4.8 to 5.2	V
T_{opr}	Operating Temperature	- 20, + 75	°C

1389-03.TBL

ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Bias Conditions		SW ON	Test Point	Test	Min.	Typ.	Max.	Unit
		V INY	V INX							
V1	Pin Voltage INY	-	-	-	Pin 7	Test of pin voltage	- 2.9	- 2.7	- 2.5	V
V2	Pin Voltage INX	-	-	-	PIn 9		- 2.9	- 2.7	- 2.5	V
A1-1	PIn Voltage 1A	-	-	-	Pin 32		- 3.1	- 2.7	- 2.5	V
B1-1	Pin Voltage 1B	-	-	-	Pin 3		- 3.1	- 2.7	- 2.5	V
A2-1	PIn Voltage 2A	-	-	-	Pin 16		- 3.1	- 2.7	- 2.5	V
B2-1	Pin Voltage 2B	-	-	-	Pin 3		- 3.1	- 2.7	- 2.5	V

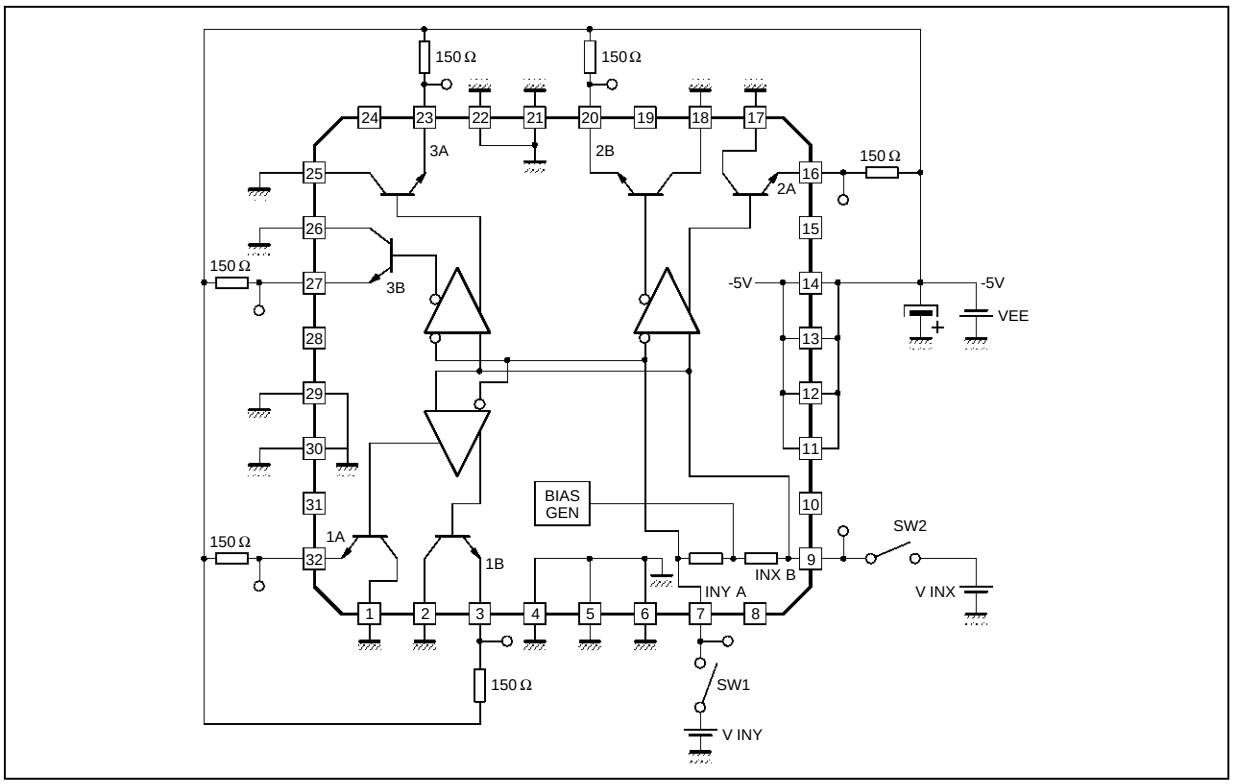
1389-04.TBL

ELECTRICAL CHARACTERISTICS ($T_A = 25^oC$)

Symbol	Parameter	Bias Conditions		SW ON	Test Point	Test	Min.	Typ.	Max.	Unit
		V INY	V INX							
A3-1	PIn Voltage 3A	-	-	-	Pin 23	Test of pin voltage	- 3.1	- 2.7	- 2.5	V
B3-1	Pin Voltage 3B	-	-	-	Pin 27		- 3.1	- 2.7	- 2.5	V
IEE	Current Power Supply	-	-	-	VEE	Current power supply at VEE	- 143		- 77	mA
A1-2	DC applied 1A	V1 + 0.2	V2 - 0.2	SW1 SW2	Pin 32	Output DC voltage is tested when +0.2V is applied to INY and - 0.2V to INX. (A1-2) = Test value - (A1-1) (B1-2) = Test value - (B1-1) The difference with the previous pin voltage is recorded. Same for A2-2, B2-2, A3-2, B3-2	0.31	0.39	0.47	V
B1-2	DC applied 1B	↓	↓		Pin 3		- 0.47	- 0.39	- 0.31	V
A2-2	DC applied 2A	↓	↓		Pin 16		0.31	0.39	0.47	V
B2-2	DC applied 2B	↓	↓		Pin 20		- 0.47	- 0.39	- 0.31	V
A3-2	DC applied 3A	↓	↓		Pin 23		0.31	0.39	0.47	V
B3-2	DC applied 3B	↓	↓		Pin 27		- 0.47	- 0.39	- 0.31	V
V1-1	Amplitude 1A + 1B	Calculation				(V1-1) = (A1-2) - (B1-2) Amplitude calculated from T10 with T15 as base, same for V2-1, V3-1.	0.65	0.75	0.85	V
V2-1	Amplitude 2A + 2B	Calculation					0.65	0.75	0.85	V
V3-1	Amplitude 3A + 3B	Calculation					0.65	0.75	0.85	V
-	Amplitude 1A/1B	Calculation				(A1-2) / (B1-2)	0.85	1.0	1.15	-
-	Amplitude 2A/2B	Calculation					0.85	1.0	1.15	-
-	Amplitude 3A/3B	Calculation					0.85	1.0	1.15	-
A1-3	DC applied 1A'	V1 - 0.4	V1 + 0.4	SW1 SW2	Pin 32	Output DC voltage is tested when - 0.4V is applied to INY and + 0.4V to INX. (A1-3) = Test value - (A1-1) (B1-3) = Test value - (B1-1) The difference with the previous pin voltage is recorded. Same for A2-3, B2-3, A3-3, B3-3	- 0.9	- 0.75	- 0.6	V
B1-3	DC applied 1B'	↓	↓		Pin 3		0.6	0.75	0.9	V
A2-3	DC applied 2A'	↓	↓		Pin 16		- 0.9	- 0.75	- 0.6	V
B2-3	DC applied 2B'	↓	↓		Pin 20		0.6	0.75	0.9	V
A3-3	DC applied 3A'	↓	↓		Pin 23		- 0.9	- 0.75	- 0.6	V
B3-3	DC applied 3B'	↓	↓		Pin 27		0.6	0.75	0.9	V
V1-2	Amplitud'e 1A' + 1B	Calculation				(V1-2) = (A1-3) + (B1-3) Amplitude calculated from T22 with T27 as base, same for V2-2, V3-2.	1.3	1.5	1.7	V
V2-2	Amplitude 2A' + 2B'	Calculation					1.3	1.5	1.7	V
V3-2	Amplitude 3A' + 3B'	Calculation					1.3	1.5	1.7	V
-	Amplitude 1A' + 1B'	Calculation				(A1-3) / (B1-3)	0.85	1.0	1.15	V
-	Amplitude 2A' + 2B'	Calculation				(A2-3) / (B2-3)	0.85	1.0	1.15	V
-	Amplitude 3A' + 3B'	Calculation				(A3-3) / (B3-3)	0.85	1.0	1.15	V
V1-3	Linearity 1	Calculation				(V1-2) / (V1-1)	1.7	1.9	2.1	V
V2-3	Linearity 2	Calculation				(V2-2) / (V1-1)	1.7	1.9	2.1	V
V3-3	Linearity 3	Calculation				(V3-2) / (V1-1)	1.7	1.9	2.1	V

1389-05.TBL

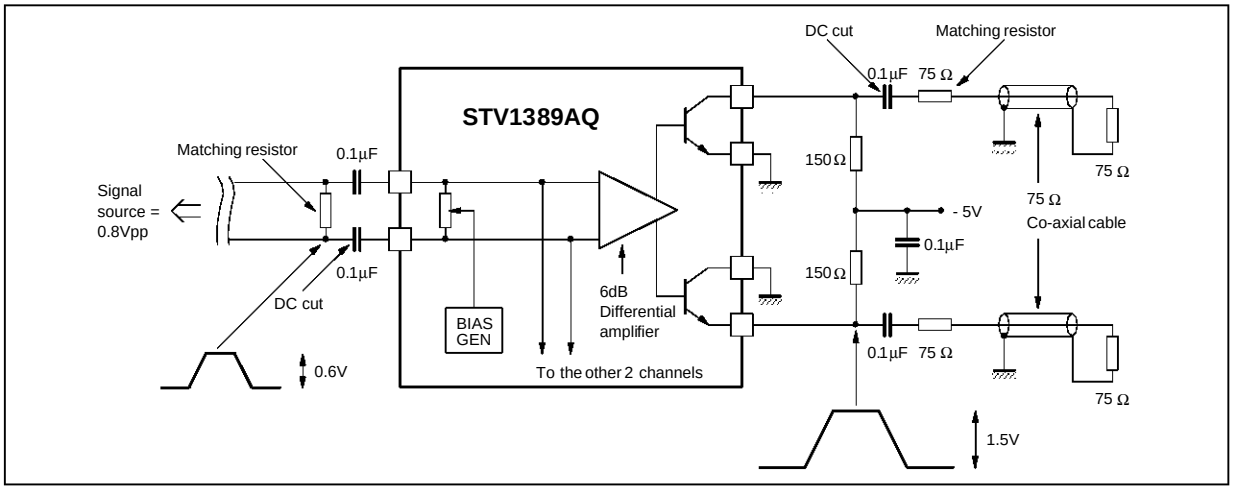
TEST CIRCUIT



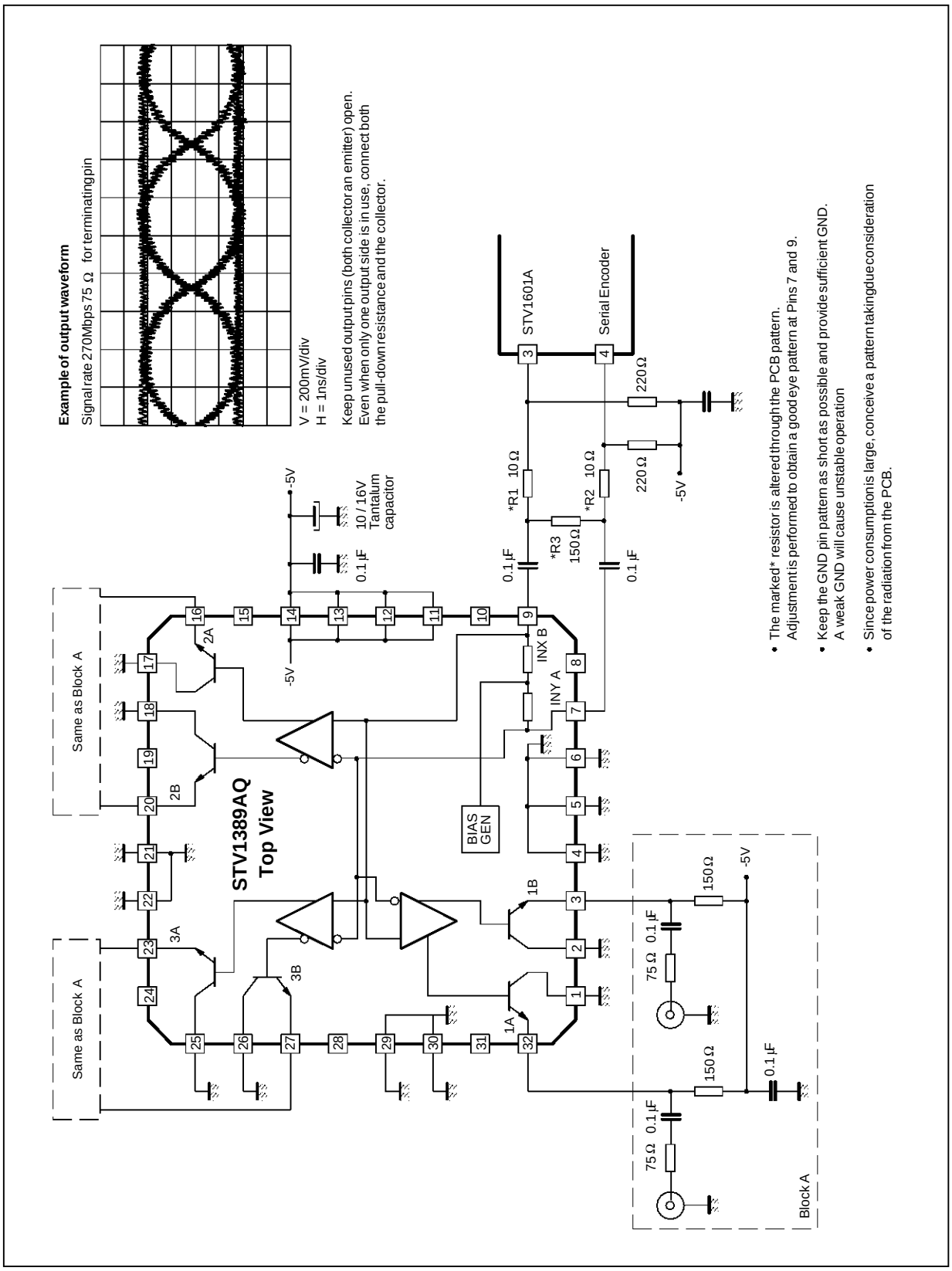
DESCRIPTION OF OPERATION

The STV1389AQ consists of 3 differential amplifier with a common input and a bias generator, and three differential outputs. Each amplifiers provides a 6dB gain and is configured as a differential output feeding the bases of a pair of current boosting on-chip emitter follower transistors. The differential input pins are internally biased and the input signal is ac-coupled to remove the D.C. component.
Between the output pins of each differential amplifier and the coaxial cable, an R-C network is connected to remove D.C. component from the output and for impedance matching. The series resistor has a value of 68 to 75Ω to match a 75Ω coaxial cable. In this manner a signal almost identitical in level to the input signal is transferred to the coaxial cable.

Optimum PCB layout and matching resistor value are chosen to obtain good eye pattern design at the input pins. This is necessary because the waveform distortion at the input pins is directly transferred to the output waveform.



TEST CIRCUIT



PACKAGE MECHANICAL DATA

32 PINS - PLASTIC QUAD FLAT PACK

Dimensions in mm