SGS-THOMSON MICROELECTRONICS

STV0190

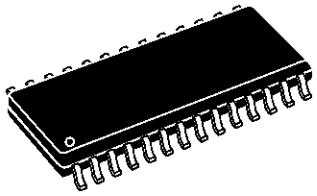
DUAL 40 MSPS 6-BIT ANALOG TO DIGITAL CONVERTER

ADVANCE DATA

- RESOLUTION 6-BIT
- MAX. SAMPLING FREQUENCY : 40 MSPS
- TTL DATA OUTPUTS
- BUILT-IN SAMPLING AND HOLD CIRCUIT
- DUAL ADC ON CHIP TO IMPROVE CHANNEL MATCHING

APPLICATIONS

- QPSK DEMODULATION IN A SATELLITE DECODER



SO28
(Plastic Micropackage)

ORDER CODE : STV0190

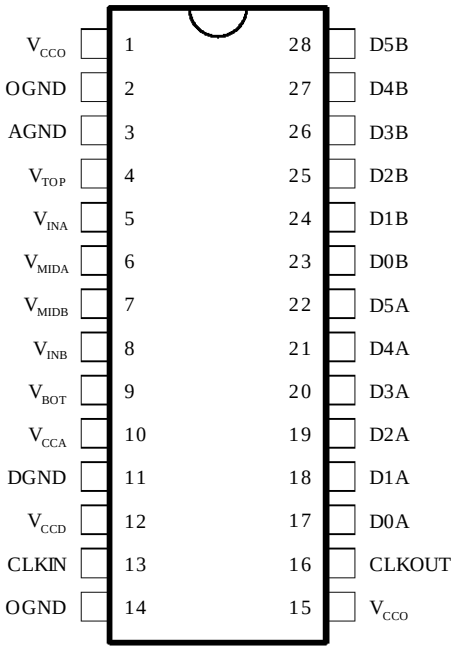
DESCRIPTION

The STV0190 is a dual 40 MSPS 6-bit Analog to Digital converter.

It is dedicated to QPSK demodulation in Satellite receiver.

The Flash architecture combined with interpolation technic gives the best trade off between power consumption and maximum conversion speed.

PIN CONNECTIONS



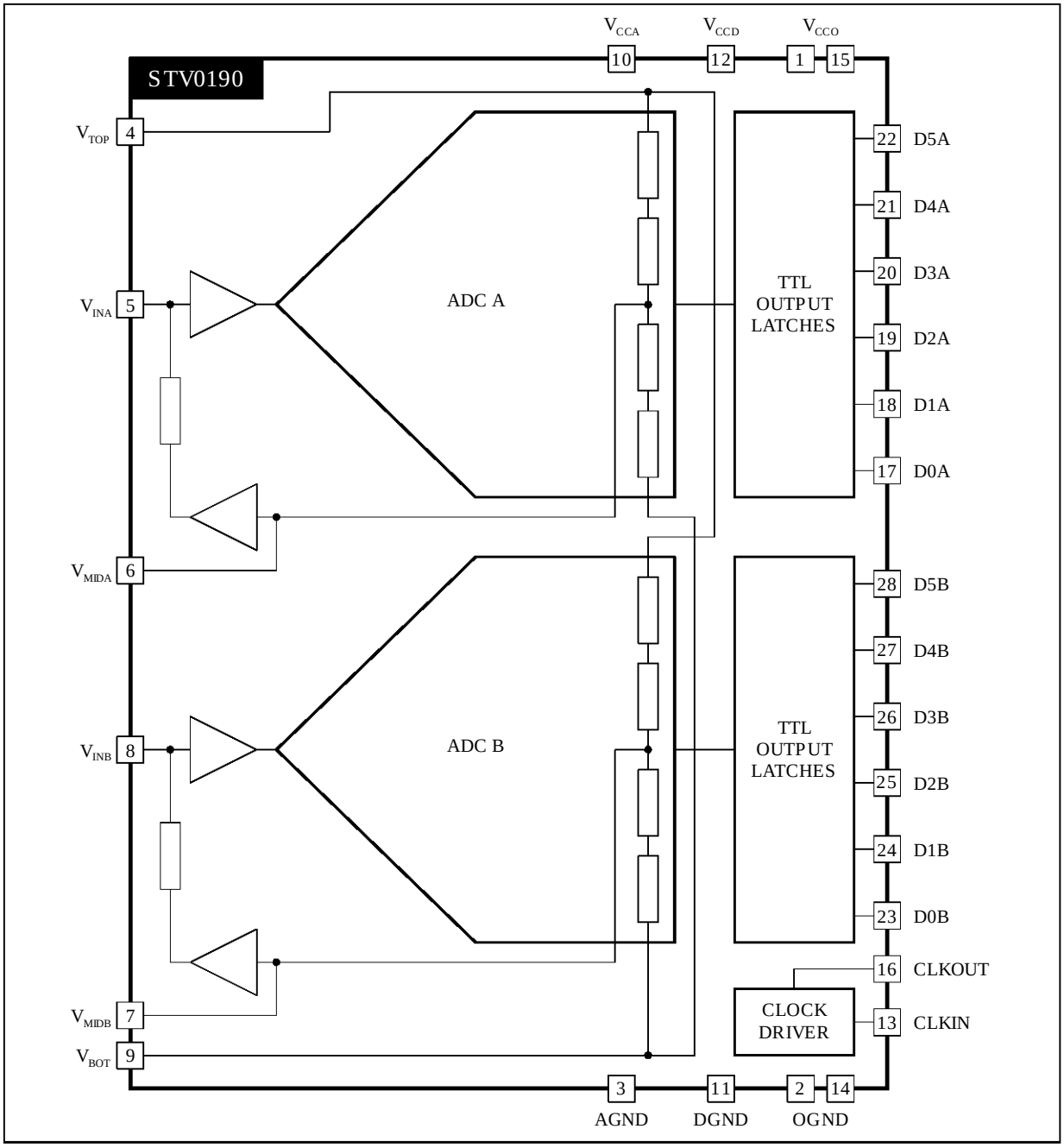
0190-01.EPS

PIN CONFIGURATION

Pin N°	Symbol	Function
1	V_{CCO}	Output Buffer Supply Voltage Channel A + B
2	OGND	Output Buffer Ground Channel A + B
3	AGND	Analog Ground
4	V_{TOP}	Top Reference Voltage
5	V_{INA}	Analog Input Channel A
6	V_{MIDA}	Reference Voltage DC Coupling Channel A
7	V_{MIDB}	Reference Voltage DC Coupling Channel B
8	V_{INB}	Analog Input Channel B
9	V_{BOT}	Bottom Reference Voltage
10	V_{CCA}	Analog Supply Voltage
11	DGND	Digital Ground
12	V_{CCD}	Digital Supply Voltage
13	CLKIN	Clock Input
14	OGND	Output Buffer Ground Channel A + B
15	V_{CCO}	Output Buffer Supply Voltage Channel A + B
16	CLKOUT	Clock Output
17 to 22	D0A to D5A	D0 (LSB) to D5 (MSB) Outputs Channel A
23 to 28	D0B to D5B	D0 (LSB) to D5 (MSB) Outputs Channel B

0190-01.TBL

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
	Analog Supply Voltage	3.1, 3.45	V
	Digital Supply Voltage	3.1, 3.45	V
T_{oper}	Operating Temperature	0, +70	^oC

0190-02.TBL

ELECTRICAL CHARACTERISTICS (V_{CC} = 3.3V, T_{amb} = 0 to 70^{o}C, Full scale 10MHz, 1.5V_{PP} input, 40MSPS, C_L = 20pF, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
ANALOG INPUT						
	Differential Reference Voltage	V_{TOP} - V_{BOT}	1	1.5		V_{PP}
	Variation of Channel A to Channel B (FS)	0.5 LSB			8	mV
R_{IN}	Input Resistance		20			kΩ
	Input Bandwidth 3dB		20			MHz
DIGITAL OUTPUTS						
	High Logic Voltage		2.4		V_{CC}	V
	Low Logic Voltage		0		0.4	V
	High Logic Current		-4			mA
	Low Logic Current				4	mA
	Logic Format					
t_{PD}	Output Timing	See Figure 1			9	ns
t_V	Output Timing	See Figure 1	5			ns
t_{SKEW}	Data Output Skew TSK (all outputs, settled within 20%)	See Figure 1			1	ns
t_{APER}	Aperture Delay relative to Data Clock	See Figure 1			1	ns
t_R, t_F	Data Output Rise and Fall Time				4	ns

Analog Input	Digital Output
most positive input	63 111111
	62 111110
	....
	33 100001
	32 100000
	31 011111
	30 011110
	....
	1 000001
least positive input	0 000000

CLOCK INPUT

V_{IH}	High Input Voltage		2.0		V_{CC}	V
V_{IL}	Low Input Voltage		0		0.8	V
I_{IH}	High Input Current				TBD	µA
I_{IL}	Low Input Current		TBD			µA
	Clock Duty Cycle		40		60	%
t_{CL}	Clock Period	See Figure 1	24			ns

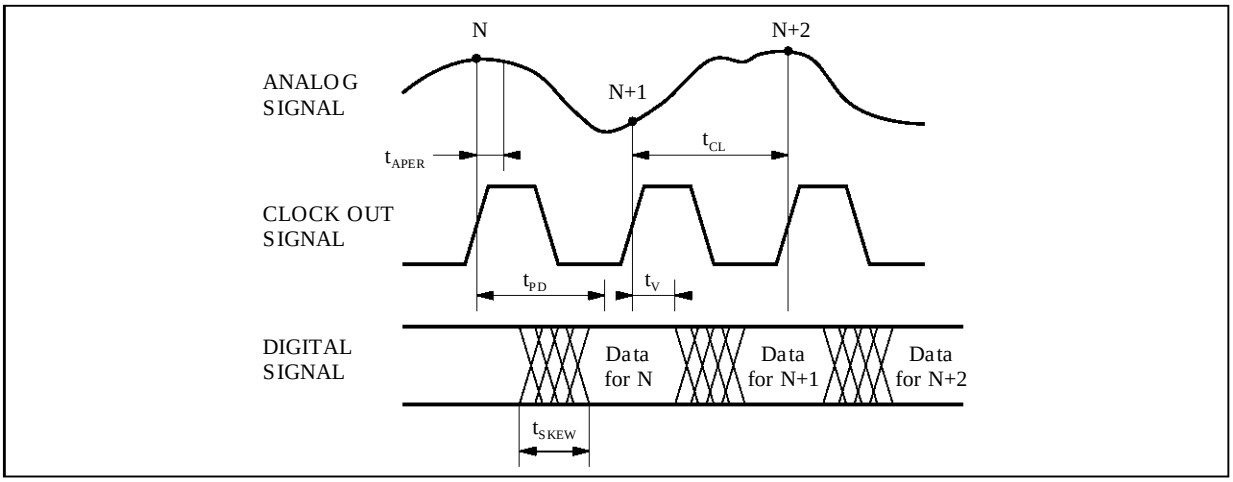
0190-03.TBL

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
CLOCK OUTPUT						
V_{OH}	High Ouput Voltage		2.4		V_{CC}	V
V_{OL}	Low Output Voltage		0		0.4	V
I_{OH}	High Output Current		-4			mA
I_{OL}	Low Output Current				4	mA
	Clock Duty Cycle		40		60	%
t_{CL}	Clock Period		24			ns
REFERENCE LADDER						
	Top Voltage				V_{CC} - 0.5	V
	Bottom Voltage		V_{CC} + 0.5			V
	DC Bias Restoration Error	Open input digital output should be	32/64 011111		33/64 100000	
ZV_{TOP}/V_{BOT}	Input Impedance		90			Ω
CROSSTALK						
	Isolation A/B		37			dB
DC ACCURACY						
	Integral non Lin.		-0.5		+0.5	LSB
	Diff. Non Lin.		-0.5		+0.5	LSB
AC ACCURACY (f_{IN} = 10MHz, FS = 40 MSPS, V_{IN} = 95% FSCALE)						
	Effective Number of Bit		5			bits
SNR			33			dB
THD	THD First 5 Harmony		33			dB
	Integral non Lin.		-1		+1	LSB
	A/D Amplifier Response Mismatching				0.2	dB

0190-04.TBL

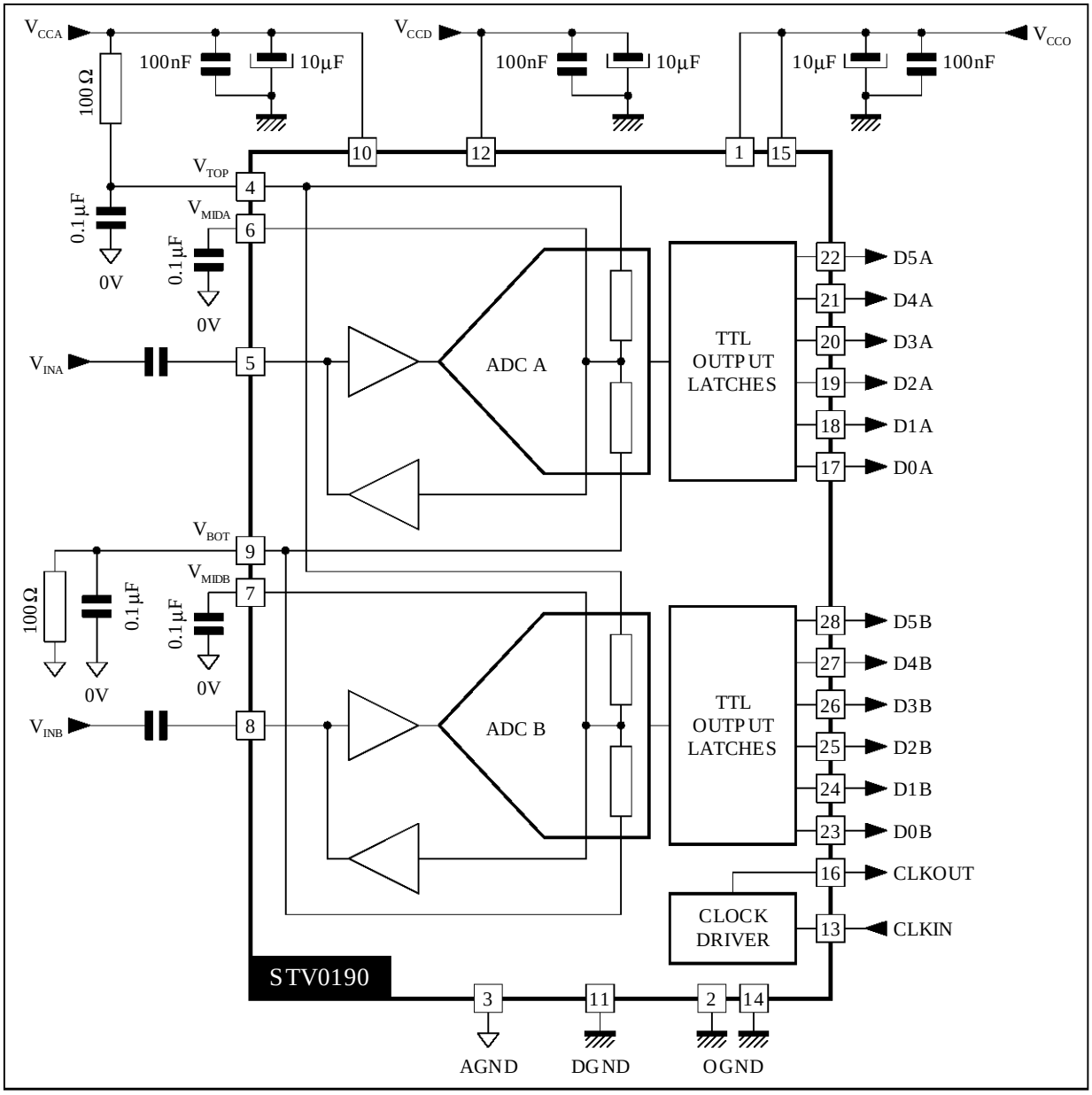
Figure 1 : Timing Diagram



0190-03.EPS

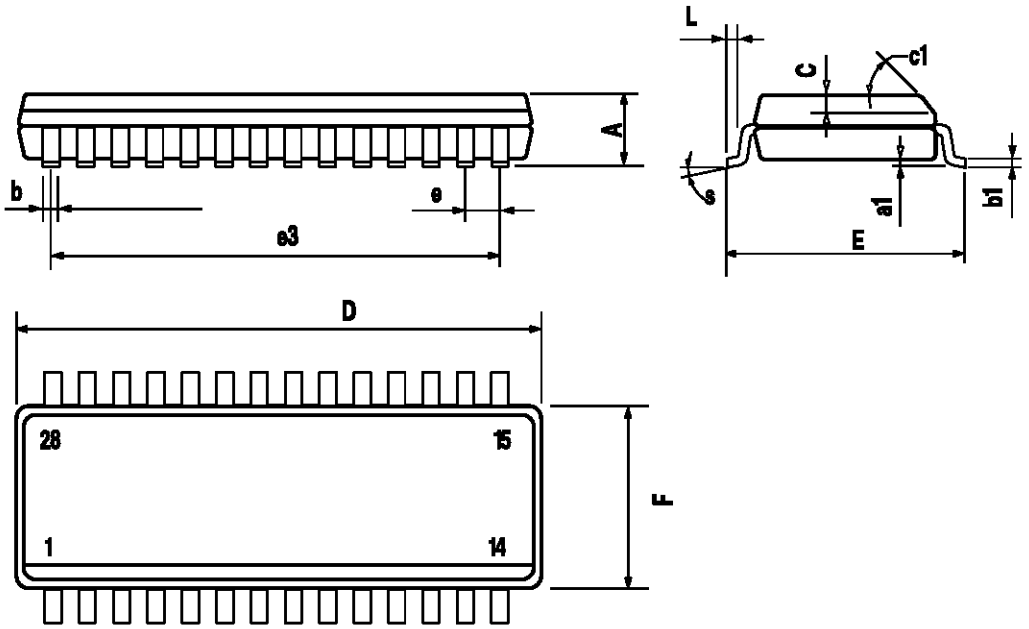
Note : This diagram shows a delay of one clock cycle. Additionnal integer multiple delay periods are acceptable. Output data must be valid on the rising edge of the clock out signal.

TYPICAL APPLICATION



PACKAGE MECHANICAL DATA

28 PINS - PLASTIC MICROPACKAGE (SO)



PM-SO28.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			2.65			0.104
a1	0.1		0.3	0.004		0.012
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.013
C		0.5			0.020	
c1	45° (Typ.)					
D	17.7		18.1	0.697		0.713
E	10		10.65	0.394		0.419
e		1.27			0.050	
e3		16.51			0.65	
F	7.4		7.6	0.291		0.299
L	0.4		1.27	0.016		0.050
S	8° (Max.)					

SO28TBL