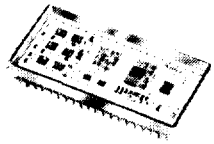
DSC-10510®

7VA D/S CONVERTER



FEATURES

- *7VA DRIVE CAPABILITY FOR CT, CDX, OR TR LOADS*
- *Z_{ss} = 2 OHMS FOR TR LOADS*
- *DOUBLE BUFFERED TRANSPARENT INPUT LATCH*
- *16 BIT RESOLUTION*
- *UP TO 1 MINUTE ACCURACY*
- *POWER AMPLIFIER USES PULSATING OR DC SUPPLIES*
- *BUILT-IN-TEST (BIT) OUTPUT*
- *S2 GROUNDED, 5VA DRIVE CONFIGURATION AVAILABLE*

DESCRIPTION

With 16 bit resolution and up to ±1 minute accuracy, the DSC-10510 is a high power digital to synchro converter capable of driving multiple Control Transformer (CT) and Control Differential Transmitter (CDX) loads up to 7VA and Torque Receiver (TR) loads up to Z_{ss} = 2 Ohms.

The DSC-10510 contains a high accuracy D/R converter, a triple power amplifier stage, a walk around circuit (to prevent torque receiver hangups), and thermal and over-current protection circuits. The hybrid is protected against short circuits, overloads, load transients, over-temperature, loss of reference, and power amplifier or DC power supply shutdown, making it virtually indestructible.

Microprocessor compatibility is provided through a 16 bit/2 byte double buffered input latch. Data input is natural binary angle in TTL compatible parallel positive logic format.

Packaged in a 40 pin TDIP, the DSC-10510 features a power stage that may be driven by either a standard ±15VDC supply or by a pulsating reference supply when used with an optional power transformer. When powered by the reference source, heat dissipation is reduced by 50%.

APPLICATIONS

The DSC-10510 can be used where digitized shaft angle data must be converted to an analog format for driving CTs, CDXs, and TRs loads. With its double buffered input latches, the DSC-10510 easily interfaces with microprocessor based systems such as flight simulators, flight instrumentation, fire control systems, and air data computers. For aircraft applications requiring S2 grounded, 5VA drive configurations, the DSC-10511 is available.

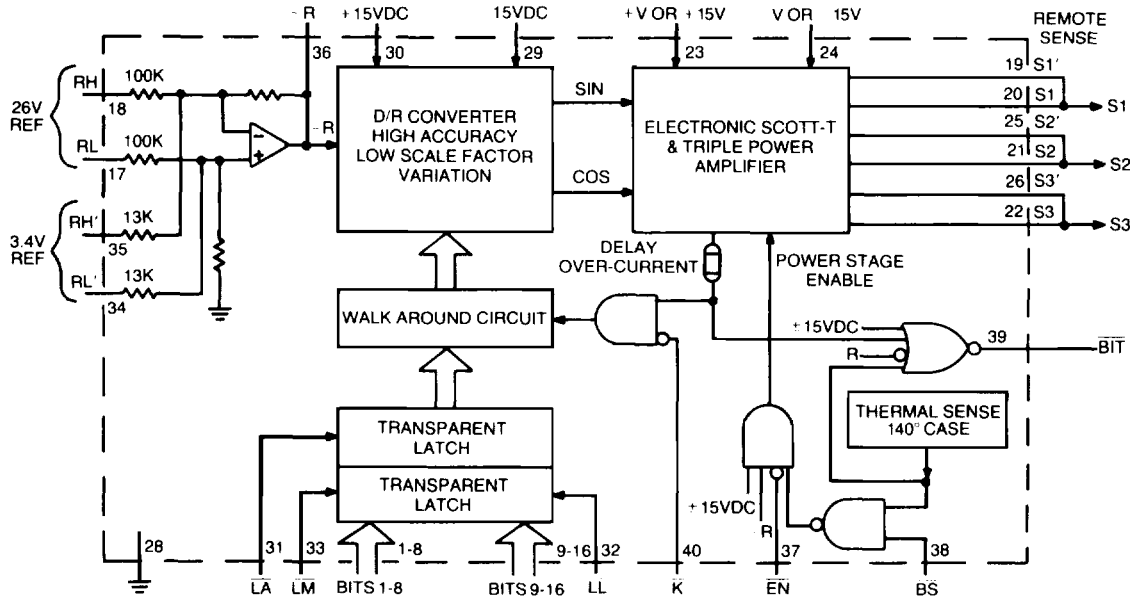


FIGURE 1. DSC-10510 BLOCK DIAGRAM

TABLE 1. DSC-10510 SPECIFICATIONS

PARAMETER	VALUE	DESCRIPTION
RESOLUTION	16 bits	Bit 1 = MSB, Bit 16 = LSB
ACCURACY	±1, 2, or 4 minutes	
DIFFERENTIAL LINEARITY	1 LSB max in the 16th bit	
OUTPUT SETTLING TIME	40μs max	For any digital input step change (passive loads).
DIGITAL INPUT/OUTPUT		
Logic Type		TTL/CMOS compatible
Digital Inputs	Logic 0 = 0.8V max Logic 1 = 2.0V min	All inputs except $\overline{K}$ (Kick, pin 40).
Loading	20 μA max to GND // 5pf max 20 μA max to +5V // 5pf max	Bits 1-16, $\overline{BS}$, and $\overline{EN}$. $\overline{LL}$, $\overline{LM}$, and $\overline{LA}$ (CMOS transient protected)
$\overline{K}$	20 μA max	Ground to enable Kick circuit, open to disable; pulls self up to +15V.
Digital Outputs $\overline{BIT}$		Logic 0 for BIT condition (see BIT pin function)
Drive Capability	Logic 0 = 1 TTL Load Logic 1 = 10 TTL Loads	1.6mA at 0.4V max 0.4mA at 2.8V min
REFERENCE INPUT		
Type	26Vrms differential 3.4Vrms differential	RH-RL RH'-RL'
Max Voltage w/o Damage	72.8Vrms for RH-RL 9.52Vrms for RH'-RL'	
Frequency	DC to 1 KHz	
Input Impedance		
Single Ended	100K Ohms ±0.5% 13K Ohms ±0.5%	RH-RL RH'-RL'
Differential	200K Ohms ±0.5% 26K Ohms ±0.5%	RH-RL RH'-RL'

TABLE 1. DSC-10510 SPECIFICATIONS (Continued)

PARAMETER	VALUE	DESCRIPTION
SYNCHRO OUTPUT		DSC-10510 (S2 Not Grounded) DSC-10511 S2 Grounded
Voltage L-L	11.8Vrms ±0.5% for nom Ref V	
Scale Factor Variation	±0.1% max	Simultaneous amplitude variation on all output lines as a function of digital angle.
Current	700mA rms max	
CT or CDX Load	7VA max	5VA for DSC-10511
TR Load	Z_{ss} = 2 Ohm min	
DC Offset	±15mV max	Each line to ground. Varies with angle.
Protection	Yes	Output protected from overcurrent, short circuit, voltage feedback transient, and overtemperature, loss of reference, loss of power amplifier, and loss of ±DC supply voltage.
POWER SUPPLY CHARACTERISTICS		
Nominal Voltage	±15V / ±V	
Voltage Range	±5%, / 20V peak max 3V above output min	
Max Voltage w/o Damage	18V / 25V	
Current	25mA max / load dependent	
TEMPERATURE RANGES		
Operating, Case		
-3XX	0°C to +70°C	
-1XX	-55°C to +125°C	
Storage	-65°C to +150°C	
PHYSICAL CHARACTERISTICS		
Size	2.0 x 1.1 x 0.2 inches (50.8 x 27.9 x 5.1 mm)	40 Pin Triple DIP
Weight	0.9 oz	

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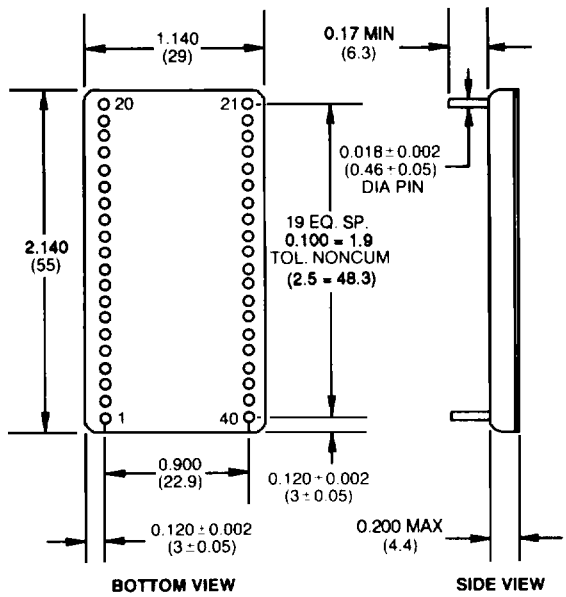
TABLE 2. DSC-10510 PIN FUNCTIONS

PIN	NAME	FUNCTION
1	D01	Digital Input 01 (MSB) Logic "1" enables.
2	D02	Digital Input 02
3	D03	Digital Input 03
4	D04	Digital Input 04
5	D05	Digital Input 05
6	D06	Digital Input 06
7	D07	Digital Input 07
8	D08	Digital Input 08
9	D09	Digital Input 09
10	D010	Digital Input 10
11	D011	Digital Input 11
12	D012	Digital Input 12
13	D013	Digital Input 13
14	D014	Digital Input 14
15	D015	Digital Input 15
16	D016	Digital Input 16 (LSB)
17	RL	26Vrms Reference Low Input
18	RH	26Vrms Reference High Input
19	S1'	Synchro S1 Remote Sense Output
20	S1	Synchro S1 Output
21	S2	Synchro S2 Output. Remotely grounded on DSC-10511
22	S3	Synchro S3 Output
23	+V	Power Stage +V
24	−V	Power Stage −V
25	S2'	Synchro S2 Remote Sense Output
26	S3'	Synchro S3 Remote Sense Output
27	NC	No connection.
28	GND	Ground
29	−15V	Power Supply
30	+15V	Power Supply
31	$\overline{LA}$	2nd Latch All Enable. Input enables dual latch.
32	$\overline{LL}$	1st Latch LSBs Enable. Enables bits 9-16.
33	$\overline{LM}$	1st Latch MSBs Enable. Enables bits 1-8.
34	RL'	3.4Vrms Reference Low Input
35	RH'	3.4Vrms Reference High Input
36	−R (TP)	No connection. Factory test point.
37	$\overline{EN}$	Enable. Power stage enable input allows for digital shutdown of power stage. Gives complete control of converter to digital system.
38	$\overline{BS}$	Battle Short Input. Logic "0" overrides over-temperature protection.
39	$\overline{BIT}$	Built-In-Test Output. Logic "0" when loss of reference, loss of ±15VDC supply, case temperature of +140°C, EN input signal, an output over-current or short circuit has been detected. Power output stage is turned off unless $\overline{BS}$ is at "0".
40	$\overline{K}$	Kick. Input used for reducing continual short-circuit current flow in torque receiver loads at false null.



Notes:

1. Dimensions are in inches (millimeters).
2. Lead identification numbers for reference only.
3. Lead cluster shall be centered within ±0.10 of outline dimensions. Lead spacing dimensions apply only at seating plane.
4. Pin material meets solderability requirements of MIL-STD-883, Method 2003.

FIGURE 2. DSC-10510 AND DSC-10511 MECHANICAL OUTLINE 40 PIN (TDIP)

ORDERING INFORMATION

DSC-10510-30X

- Accuracy:
  - 3 = ±4 minutes
  - 4 = ±2 minutes
- Reliability Grade:
  - 0 = Standard DDC procedures.
  - 1 = Fully compliant with MIL-STD-883
  - 2 = Screened to MIL-STD-883 but without QCI testing
- Operating Case Temperature:
  - 3XX = 0° C to +70° C
  - 1XX = -55° C to +125° C
- Configuration:
  - 0 = Standard
  - 1 = S2 Grounded (Consult factory before ordering)

For DSC-10510 use optional Power Transformer, DDC P/N 42359.

For DSC-10511 use optional Power Transformer, DDC P/N 42360.

For DSC-10510 use Output Transformer. DDC P/N 42929 for S2 Grounded Application.

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