

APPLICATIONS

- > Actuators position control
- > Active control of vibrations
- > Space environment (LEO orbit)

KEY FEATURES

- > All-in-one piezo-driver and controller
- > 2 Channels with push-pull capability
- > PID control with stabilizing filters
- > Integrated SG conditioner
- > 3 space grades
- > Compliant CEDRAT TECHNOLOGIES push-pull FSM, DTT, XY mechanisms

RELATED PRODUCTS

- > Piezo actuators
- > Piezo mechanisms



NON CONTRACTUAL PICTURE

PARAMETER	TYPICAL VALUE	UNIT
> General		
Function	All-in-one piezo-driver and controller	
Number of control channels	2	
Integrated sensor conditioning	Strain Gages	
Digital communication protocol	HDLC protocol over SPI Differential LVDS	
> Digital control		
Control strategy	Tunable PID + Stabilizing filters	
Stabilising filters	Tunable lowpass or notch	
List of stabilising filters configurations	No filter 2nd order lowpass filter 2nd order notch filter 2 × 2nd order notch filters 4th order notch filter	
Sampling rate	20	kSps
Digital resolution	16	bits
> Piezo driver		
Number of channels	2 push-pull	
Push-pull rail nominal voltage	130	V
Nominal output voltage range	On customer request	V
Peak output current	0.15	A
RMS output current	0.035	Arms
Small signals bandwidth (-1 dB)	3.5 ⁽¹⁾	kHz

PARAMETER	TYPICAL VALUE	UNIT
> Strain gages (SG) conditioner		
Number of channels	2	
Reference output voltage	2.5	Vdc
Maximum reference output current	2 x 7.5	mA
Typical bridge impedance	350	Ohm
SG amplifier gain	1 000	V/V
Small signals bandwidth (- 3dB)	5	kHz
> Telecommands/Telemeasures		
Discrete TM: ON/OFF Status, Operating Status	Logic [0;15]	V
Discrete TC: Shutdown	Logic [0;15]	V
Analogue Power supply thermistor and Mechanism thermistor	Analog NTC	
Digital TC	Order #channel 1 , #channel 2, Mode1 open loop, Mode 2 closed loop	
> Protections		
Overtemperature	Yes	
Overload	Yes	
> Power supply		
Recommended supply voltage	+28 ⁽²⁾	Vdc
Supply voltage range	+20 ... +30	Vdc
Supply current	0.2 ... 2.25 ⁽²⁾	Arms
Power consumption	5 ... 28	W

ENVIRONMENT ⁽³⁾

> Operating temperature range	-15 ... +60 °C
> Storage temperature range	-40 ... +85 °C
> Conducted emissions on input power lines	See figure (a) - On customer request
> Conducted susceptibility	See figure (b) - On customer request
> Radiations - SEL	No latch-up events @LET ≤ 43MeV.cm ² /mg
> Radiations - SEE	No critical effect
> Radiations - TID	10 k rad (design dose @ EEE level (die) with standard aluminum mechanical housing) Up to 30 k rad possible with additional shielding at satellite level by customizing housing
> Mechanical: Levels of sinus, random vibrations, quasi-static load and shocks	See environment table below - On customer request

ANNOTATIONS

(1) - 1 dB, 1 driver total load 8 µF

(2) @28 V transient inrush current 4 A max _ input voltage slope less than 10 V/ms

(3) By design & heritage

(4) Opposite external connector recommended: D222 S16 D53 C

(5) Opposite external connector recommended: D221 S16 D53 C

MISCELLANEOUS

PARAMETER	TYPICAL VALUE	UNIT
Mass	0.8	kg
Dimensions	150 × 100 × 50 see MICD below	mm
Cooling	Conduction via base plate	
Maximum dissipated power (DRIVE Mode)	13	W
Warm up time	15	min

INTERFACES

- > **Power connector (Socket)** DF221S16D55D ⁽⁴⁾
- > **COM connector (Plug)** DF222S16D55D ⁽⁵⁾

VERSIONS

PARAMETER	CCBU20-NS-V0	CCBU20-NS-V1	CCBU20-NS-V2
Lifetime in LEO	> 1 year	> 3 years	> 5 years
Manufacturing	IPC class 3	IPC class 3 + IPC 6 012	ECSS
EEE	COTS (standard)	COTS (standard) + Rad Tolerant	COTS (Qualified) + Rad Tolerant
Documentation Datapack	CoC / ATR	CoC / ATR	On request

ENVIRONMENT

SINE VIBRATION		
frequency (Hz)	Dispenser ring Sinusoidal vibration qualification (g)	time (s)
5	5	Swept at 2 oct / min
70	5	
11	2.5	
125	2.5	
QUASI-STATIC LOADS		
frequency (Hz)	QSL vibration qualification (g)	time (s)
5	5	> 1 sec
RANDOM VIBRATION		
frequency (Hz)	Random vibration qualif (g²/Hz) (6)	time (s)
20	0.032	120
50	0.032	
200	0.160	
500	0.160	
800	0.120	
925	0.120	
2 000	0.032	
	13.6 g RMS	
SHOCK		
frequency (Hz)	SRS qualif (g) [Q=10]	number /axis
100	50	3
1 000	1 000	
2 000	1 500	
10000	1 500	

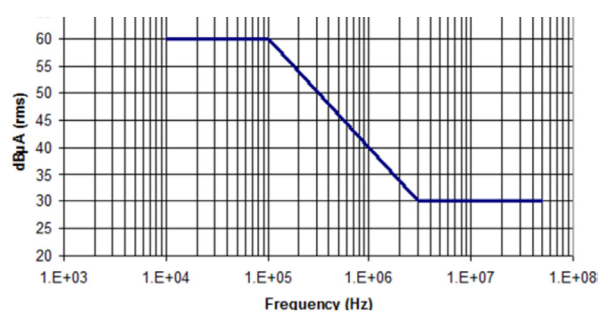


Figure (a): Narrowband conducted emissions
[common mode]

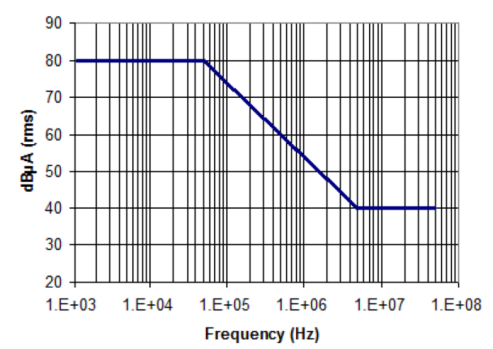


Figure (b): Narrowband conducted emissions
[differential mode]

