

Charge Amplifier for LCA Platform

The Charge Amplifier is an LRU – Line Replaceable Unit. It is a unity Gain amplifier which converts electric charge in Pico coulomb to millivolt output signal. The charge signal input to the charge amplifier comes from a Peizo electric transducer, mounted on a engine frame, and is in differential form. It works in the frequency band 50Hz to 2000Hz. The frequency response is achieved by cascading suitable High pass and Low pass Filters. The Basic purpose of the charge amplifier is to capture the engine vibrations and provide feed to display and warning systems.

The Charge amplifier is compliant with MIL-STD-810H, MIL-STD-461G & MIL-STD-704D Standards.

Brief Technical Specifications:

SI No.	Description	Specification
1	Nominal power supply input voltage	28V DC
2	Operating voltage range	16 to 31.5V DC
3	Power supply current consumption	40mA
4	Reverse polarity protection	28V DC reverse voltage polarity protection will be provided.
5	Input configuration	Differential input
7	Output Coupling	DC coupling and AC coupling
8	Output impedance	50 Ohm Maximum for DC coupled. 50 Ohm maximum in series with at least 5uF for AC coupled.
9	Frequency Response	50Hz (-3db) to 2KHz(-3db)
10	High Pass filter	4 pole Butterworth
11	Low pass filter	2 pole Butterworth
12	Dynamic range/ Max input signal	0 to 5000pC / 5000pC
15	Output bias/offset voltage	2.5 ± 0.075V DC
16	Distortion	Less than 0.1% from 3Hz to 2KHz
17	Minimum Load impedance	1K Ohm
18	Maximum Load capacitance	100 nF
19	Minimum input impedance	50K Ohm

21	Case Isolation /Insulation	Case and signal grounds will be isolated from chassis and resistance between case and signal ground will be 50MΩ or greater at 500V DC.
22	Gain roll rate	40db/decade
24	Transient voltage Protection	Will be provided with Transient spike suppressor in the 28V DC input line to suppress the transient spikes. Refer Fig-2 & Fig-3 in Annexure-1.
25	Material used	Aluminium alloy
27	Environmental protection	The removable side cover will be fitted with a rubber seal which protects the electronics from dirt, oil,

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		humidity and other environmental contamination. Will meet the environmental requirements of MIL STD-810H
29	Shield	Charge amplifier circuit and cable will be protected by a shield for EMI and thermal protection etc,
31	Temperature	Operating: : -40 Deg C to +100Deg C Storage: -55Deg C to +125Deg C



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