

Precision Microdrives Motor Case Study

Vibration Motor For Emergency Services Ruggedised Radio

THE APPLICATION & SOLUTION

Vibration alerting is a key feature for many applications. This is especially true when communication can mean life or death, such as an emergency services radio. But vibration alerting in this application is very different from a consumer cell phone. Firstly, the application is ruggedised to withstand high temperatures, and impacts such as being dropped. Secondly, the vibration needs to be very strong to pass through protective clothing (e.g. fire services suits and gloves).

An earlier version of this radio, used a motor from a different supplier, but the customer found that the motor would fail prematurely. With a new revision under design, the customer asked us to bid as a new supplier. Following a design evaluation, we made changes to the motor's eccentric mass, uprated the shaft, designed a rubber suspension cover, and worked with their manufacturing engineers to implement a spring connection method to simplify end assembly.

TECHNICAL SPECIFICS

The first area to look at was optimising the vibration performance so that the alert would penetrate protective clothing. We designed a new Tungsten weight with raw material sourced in compliance with Dodd-Frank anti-conflict minerals regulations. The vibration performance was great, but our testing validation revealed that a strengthened shaft was required for ruggedisation. A rubber suspension was introduced to further support drop-test specifications, and eliminate audible harmonics from the vibration alert. This required specific features to be moulded to assist with location mating into the radio chassis. Finally, we replaced leads and connectors with a PCB back-pack carrying gold plated surface mounted springs. This reduced the radio assembly time by 20 seconds per radio. It also eliminated a failure mode that we identified at the start of our design review – vibration fatigued wire joints.

HOW PRECISION MICRODRIVES CAN HELP YOU

Modern motor / mechanism design and manufacturing, is a highly challenging multi-discipline engineering activity.

Precision Microdrives can save you time, money and stress. With so many applications engineered successfully, we have a huge amount of experience and know-how. We also have a first class manufacturing infrastructure, and an industry leading testing and validation capability.

[Call](#) or [email](#) today and our engineers will set-up a call to review your application.

