



Reliability Report

Mean-Time-Between-Failure Prediction

MIL-HDBK-217F, FN2

Airborne Uninhab Cargo, AUC

for

SREGS-400U-02
with Basic Charging Module
and two HV400s

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Revision A

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Description of Equipment

The Mean-Time-Between-Failure Prediction contained herein has been prepared for the SREGS-400U-02. This equipment consists of a multiple printed circuit board assembly, as follows.

Sub-assembly	Quantity
PS, SREGS-400U-02	1
Charging Module	1
HV400 Module	2

Assumptions and Conditions

This calculation relates to operational hours, as opposed to elapsed hours, so this should be reflected in the overall reliability if required.

Models provided by the MIL-HDBK-217F, Field Notice 2 (FN2), Specification for Reliability Prediction were used, except where manufacturer's failure rate data was available.

Ambient temperature = 25 °C

Model = Serial, redundant paths do not exist.

Component Quality Level = Commercial

Calculation Method = Limited Stress, Method I, Case 3

Omitted Items

Assembly	Device	Reason for omission
All	Hardware, shields, straps, overlays, etc.	Stationary mechanical devices with no electrical components.

Summary of Results

1.0 MTBF Predictions

Reliability predictions are presented in the following Table for the SREGS-400U-02 as per MIL-HDBK-217.

Table 1.0
SREGS-400U-02
MTBF & Failure Rate
MIL-HDBK-217, Airborne Uninhab Cargo, AvC

Temperature (°C)	MTBF (hours)	MTBF (years)	Failure Rate (FIT*)
25	29,888	3.4	33,458
40	23,059	2.6	43,368

FIT is Failures in 10⁹ hours.

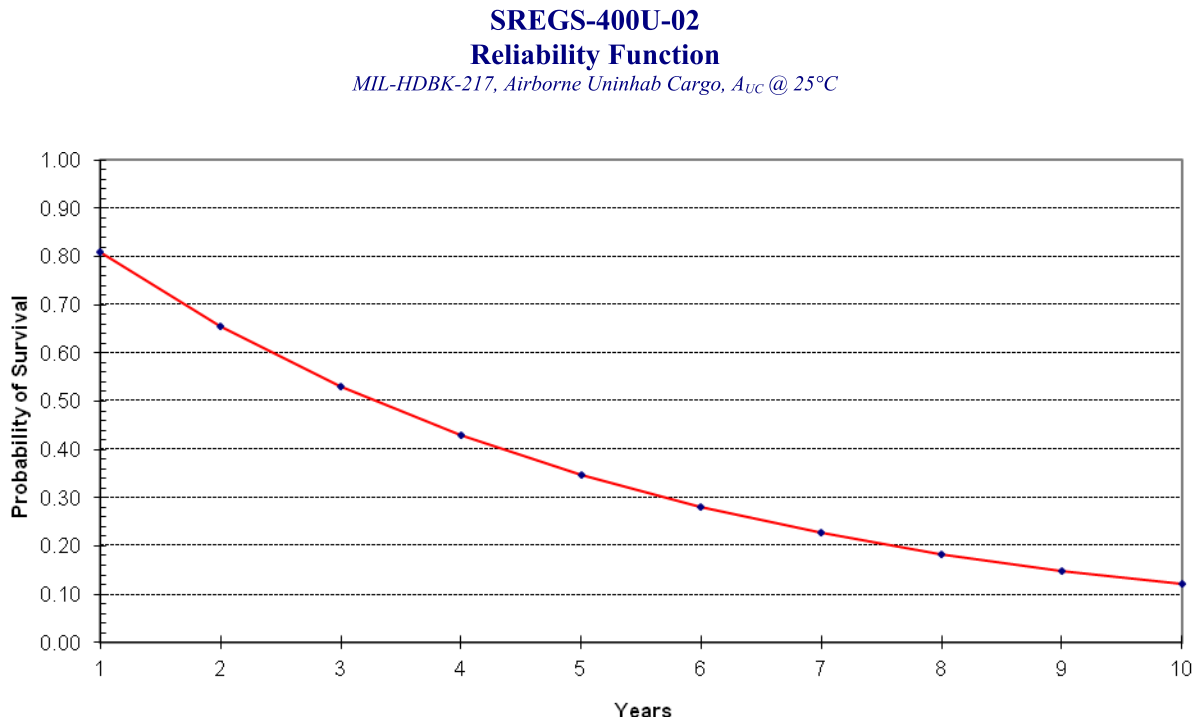
Table 1.1
Sub-assemblies
MTBF & Failure Rate
MIL-HDBK-217, Airborne Uninhab Cargo, AvC

Sub-assembly	Temperature (°C)	MTBF (hours)	MTBF (years)	Failure Rate (FIT*)
SREGS-400U-02	25	54,355	6.2	18,397.6
SREGS-400U-02	40	41,718	4.8	23,970.4
Charging Module	25	116,102	13.3	8,613.1
Charging Module	40	93,580	10.7	10,686.0
HV400 Module	25	155,110	17.7	6,447.1
HV400 Module	40	114,793	13.1	8,711.3

FIT is Failures in 10⁹ hours.

1.1 Reliability Function Plot - Probability of Survival

The following plot shows the Probability of Survival, that is the percentage of Failure Free product, as a function of time.



We can expect that 80.9% of product will survive year one, whereas, 12.0% of the product will survive 10 years without failure.

2.0 Margin Analysis

Margin analysis where operating temperature is varied between low and high limits. MTBF and Failure Rate are presented graphically over the range of temperature.

Table 2.0
SREGS-400U-02
MTBF & Failure Rate

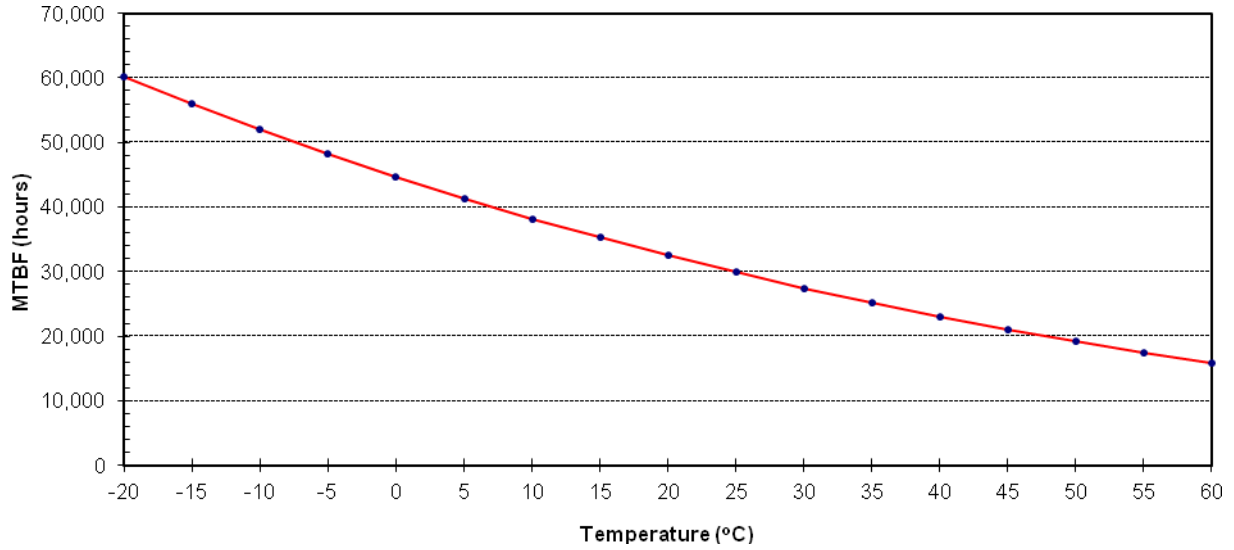
MIL-HDBK-217, Airborne Uninhab Cargo, AUC

Temperature (°C)	MTBF (hours)	MTBF (years)	Failure Rate (FIT)
-20	60,241	6.9	16,600
-15	56,022	6.4	17,850
-10	52,025	5.9	19,222
-5	48,248	5.5	20,726
0	44,688	5.1	22,377
5	41,340	4.7	24,190
10	38,195	4.4	26,182
15	35,245	4.0	28,373
20	32,479	3.7	30,789
25	29,888	3.4	33,458
30	27,462	3.1	36,415
35	25,188	2.9	39,701
40	23,059	2.6	43,368
45	21,063	2.4	47,477
50	19,193	2.2	52,103
55	17,440	2.0	57,339
60	15,798	1.8	63,298

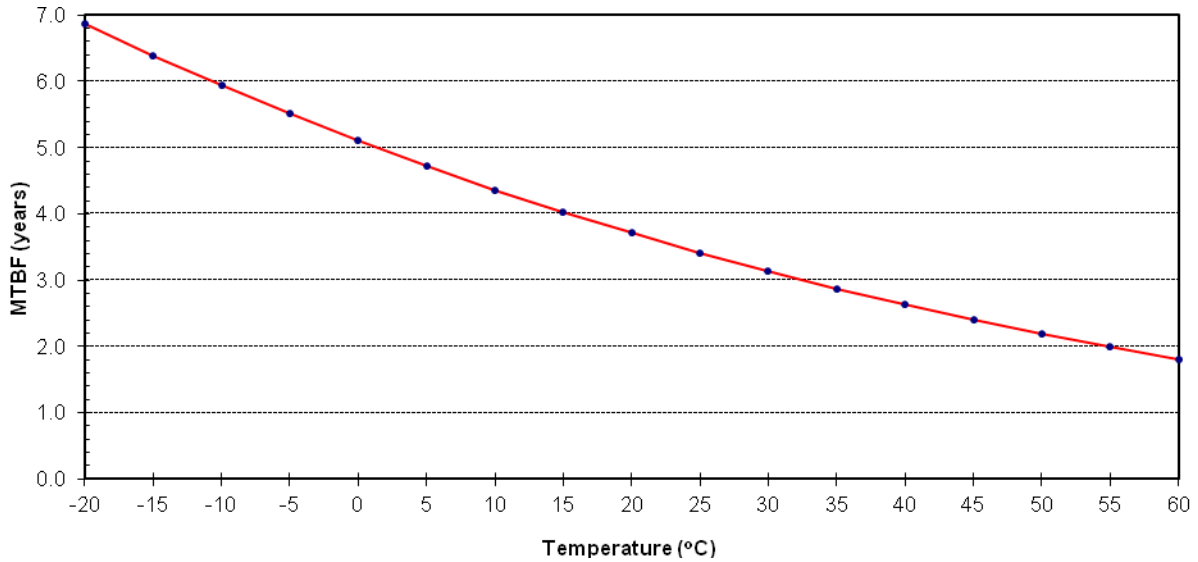
FIT is Failures in 10⁹ hours.

2.1 MTBF vs. Temperature

SREGS-400U-02
MTBF (hours)
MIL-HDBK-217, Airborne Uninhab Cargo, AUC



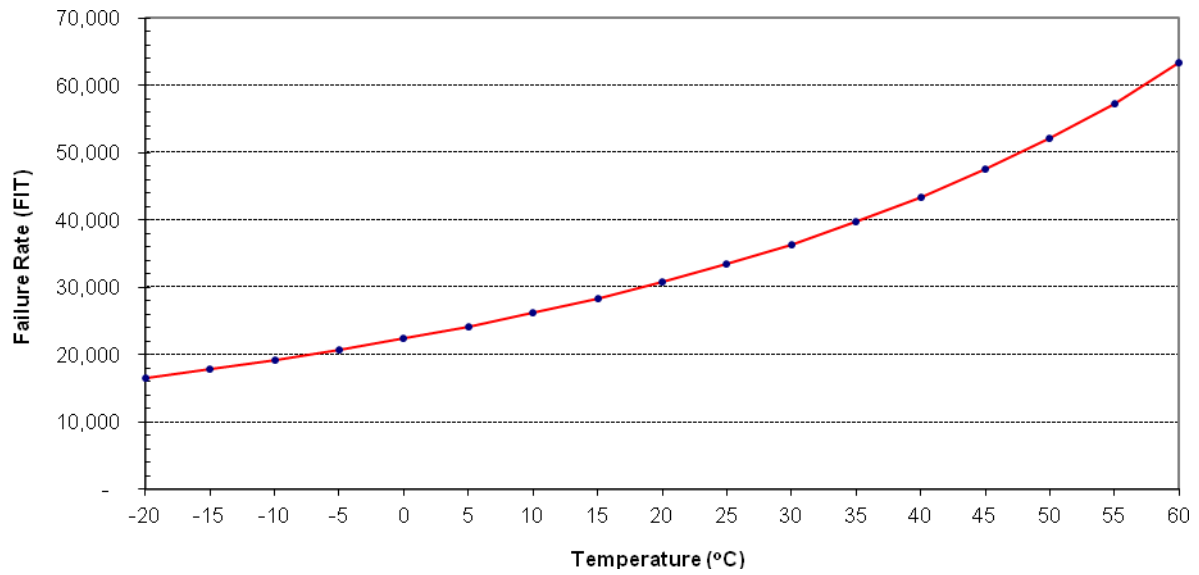
SREGS-400U-02
MTBF (years)
MIL-HDBK-217, Airborne Uninhab Cargo, AUC



2.2 Failure Rate vs. Temperature

SREGS-400U-02 Failure Rate (FIT)

MIL-HDBK-217, Airborne Uninhab Cargo, AUC



3.0 Revision History

- A. Initial release, 2/26/14.