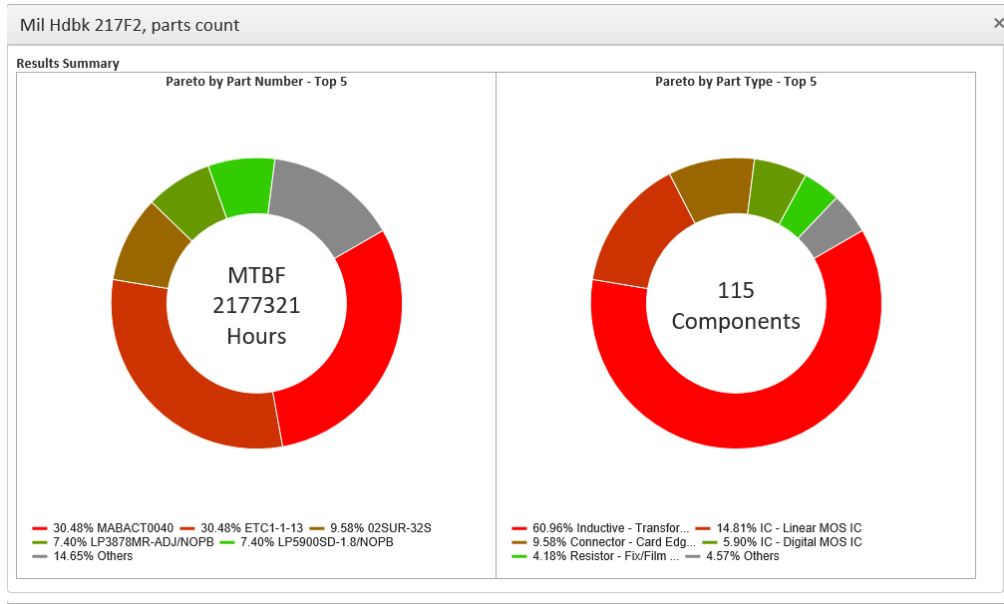


# MTBF prediction report

Produced by BQR web MTBF prediction application



## 1. Summary

<b>Prediction method:</b>	Mil Hdbk 217F2, parts count
<b>Environment:</b>	GB - Ground Benign, T <sub>A</sub> =30°C
<b>Date:</b>	11-Dec-2018
<b>Total Failure Rate:</b>	0.459280 (FPMH)
<b>MTBF:</b>	2177321 (Hours) 248.55 (Years)

## 2. Detailed

#	Reference Designator	Part Number	Qty	Description	Group	Type	Quality Level	# of G/B/T	Product ion Year	Reliability Factor	Failure rate per unit (FPMH)	Failure rate total (FPMH)
1	C1,C4,C52,C56,C58,C60,C71,C73,C76,C8	TAJC106K020R	10	CAP TANT 10UF 20V 10% 2312	Capacitor	CAP/CWR <Tantalum Solid Chip ER MIL-C-55365>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000014	0.000140
2	C10,C19,C27,C31,C33,C36,C39,C41,C45,C46,C6,C62,C63,C65,C66,C67,C69,C72	GRM155R61A104KA01D	18	CAP CER 0.1UF 10V X5R 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.003060
3	C11,C14,C16,C20,C26,C29,C30,C34,C38,C40,C43,C47,C68,C70	GRM155R71H103KA88D	14	CAP CER 10000PF 50V X7R 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.002380
4	C12,C15,C2,C25	GRM033R60J104KE19D	4	CAP CER 0.1UF 6.3V X5R 0201	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000680
5	C13,C7	GRM1555C1H100JZ01D	2	CAP CER 10PF 50V NPO 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000340
6	C17,C18,C22,C23,C24,C28,C32,C37,C48,C49,C5,C9	GRM188R71C104KA01D	12	CAP CER 0.1UF 16V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.002040
7	C21	GRM1555C1H220JZ01D	1	CAP CER 22PF 50V NPO 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000170
8	C3	TAJA106K006R	1	CAP TANT 10UF 6.3V 10% 1206	Capacitor	CAP/CWR <Tantalum Solid Chip ER MIL-C-55365>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000014	0.000014

9	C35	GRM1555C1H330J201D	1	CAP CER 33PF 50V NPO 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000170
10	C50,C53,C74,C77	ECJ-1VB0J475M	4	CAP CER 4.7UF 6.3V X5R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000680
11	C51,C75	ECJ-1VB1H103K	2	CAP CER 10000PF 50V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000340
12	C54,C78	ECJ-1VB1H222K	2	CAP CER 2200PF 50V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000340
13	C55,C61	GRM188R71C105KA12D	2	CAP CER 1UF 16V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000340
14	C57,C59	ECJ-1VB0J474K	2	CAP CER 0.47UF 6.3V X5R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000340
15	C64	F931A106MAA	1	CAP TANT 10UF 10V 20% 1206	Capacitor	CAP/CWR <Tantalum Solid Chip ER MIL-C-55365>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000014	0.000014
16	C79	ECY-29RA105KV	1	CAP CER 1UF 10V X5R 0508	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000170	0.000170
17	L1	EXC-CL4532U1	1	FERRITE BEAD 115 OHM 1812 1LN	Inductive	Coil.Fixed <Coil Fixed Inductor>	MIL <Military Non Established Reliability>	-	-	1.00	0.000032	0.000032
18	P1	02SUR-32S	1	CONN RCPT SUR 2POS .8MM TIN	Connector	PCB <Card Edge (PCB)>	MIL <Military>	-	-	1.00	0.044000	0.044000
19	R10,R3	CRCW0402000OZ0ED	2	RES SMD 0.00HM JUMPER 1/16W 0402	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000370	0.000740
20	R18,R19,R20,R22,R25,R26,R27,R29,R35,R37	CRCW06031K00FKEA	10	RES SMD 1K OHM 1% 1/10W 0603	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000370	0.003700
21	R21	CRCW060310R0FKEA	1	RES SMD 10 OHM 1% 1/10W 0603	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000370	0.000370
22	R28,R34,R36	CRCW06032K00FKEA	3	RES SMD 2K OHM 1% 1/10W 0603	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000370	0.001110
23	R31,R32,R33	CRCW0402100RFKED	3	RES SMD 100 OHM 1% 1/16W 0402	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000370	0.001110
24	R5,R7	CRCW040249R9FKED	2	RES SMD 49.9 OHM 1% 1/16W 0402	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	1.00	0.000370	0.000740
25	RN1,RN2,RN3,RN4	753083101GTR	4	RES ARRAY 4 RES 100 OHM 8SRT	Resistor	FIX/RZ <Fix/Film Network MIL-R-83401 QL=MIL/Lower>	MIL <Military Non-ER>	-	-	1.00	0.004800	0.019200
26	T1	MABACT0040	1	Transformers Audio & Signal 5-1000MHz IL 1.1dB Ctr Tap -40C +85C	Inductive	Trafo.RF <Transformer Radio Frequency>	MIL <Military Non Established Reliability>	-	-	1.00	0.140000	0.140000
27	T3	ETC1-1-13	1	TRANSFORMER	Inductive	Trafo.RF <Transformer Radio Frequency>	MIL <Military Non Established Reliability>	-	-	1.00	0.140000	0.140000
28	U10,U7	LP3878MR-ADJ/NOPB	2	Linear Voltage Regulator IC Positive Adjustable 1 Output 1 V ~ 5.5 V 800mA 8-SO PowerPad	IC	IC/LIN/MOS <Linear MOS IC>	B <MIL-M-38510 Class B PIQ=1>	250 Transistors	Before 2015	1.00	0.017000	0.034000
29	U2	ADC16V130CISQE/NOPB	1	IC ADC 16BIT 130MSPS LVDS 64WQFN	IC	IC/DIG/MOS <Digital MOS IC>	B <MIL-M-38510 Class B PIQ=1>	500 Gates	Before 2015	1.00	0.010000	0.010000
30	U3	AT24C02AN-10SU-2.7	1	EEPROM 2/4/8/16K 2-WIRE BUS	IC	IC/EEPROM/MOS <Electrically Erasable PROM MOS>	B <MIL-M-38510 Class B PIQ=1>	2000 Bits	Before 2015	0.40	0.001960	0.001960
31	U4,U5	FIN1108MTD	2	IC REDRIVER LVDS 8CH 48TSSOP	IC	IC/DIG/MOS <Digital MOS IC>	B <MIL-M-38510 Class B PIQ=1>	100 Gates	Before 2015	1.00	0.005700	0.011400
32	U6	FIN1101K8X	1	IC REDRIVER LVDS 1CH 1.6GBPS US8	IC	IC/DIG/MOS <Digital MOS IC>	B <MIL-M-38510 Class B PIQ=1>	20 Gates	Before 2015	1.00	0.005700	0.005700
33	U8,U9	LP5900SD-1.8/NOPB	2	IC REG LDO 1.8V 0.15A 6WSON	IC	IC/LIN/MOS <Linear MOS IC>	B <MIL-M-38510 Class B PIQ=1>	300 Transistors	Before 2015	1.00	0.017000	0.034000

### 3. Pareto by Part Number

Part Number	Qty	Description	Group	Type	Quality Level	# of G/B/T	Production Year	Failure rate total (FPMH)	Contribution to system failure rate (%)
MABACT0040	1	Transformers Audio & Signal 5-1000MHz IL 1.1dB Ctr Tap - 40C +85C	Inductive	Trafo.RF <Transformer Radio Frequency>	MIL <Military Non Established Reliability>	-	-	0.140000	30.48
ETC1-1-13	1	TRANSFORMER	Inductive	Trafo.RF <Transformer Radio Frequency>	MIL <Military Non Established Reliability>	-	-	0.140000	30.48
02SUR-32S	1	CONN RCPT SUR 2POS .8MM TIN	Connector	PCB <Card Edge (PCB)>	MIL <Military>	-	-	0.044000	9.58
LP3878MR-ADJ/NOPB	2	Linear Voltage Regulator IC Positive Adjustable 1 Output 1 V ~ 5.5 V 800mA 8-SO PowerPad	IC	IC/LIN/MOS <Linear MOS IC>	B <MIL-M-38510 Class B PIQ=1>	250 Transistors	Before 2015	0.034000	7.40
LP5900SD-1.8/NOPB	2	IC REG LDO 1.8V 0.15A 6WSON	IC	IC/LIN/MOS <Linear MOS IC>	B <MIL-M-38510 Class B PIQ=1>	300 Transistors	Before 2015	0.034000	7.40
753083101GTR	4	RES ARRAY 4 RES 100 OHM 8SRT	Resistor	FIX/RZ <Fix/Film Network MIL-R-83401 QL=MIL/Lower>	MIL <Military Non-ER>	-	-	0.019200	4.18
FIN1108MTD	2	IC REDRIVER LVDS 8CH 48TSSOP	IC	IC/DIG/MOS <Digital MOS IC>	B <MIL-M-38510 Class B PIQ=1>	100 Gates	Before 2015	0.011400	2.48
ADC16V130CISQE/NOPB	1	IC ADC 16BIT 130MSPS LVDS 64WQFN	IC	IC/DIG/MOS <Digital MOS IC>	B <MIL-M-38510 Class B PIQ=1>	500 Gates	Before 2015	0.010000	2.18
FIN1101K8X	1	IC REDRIVER LVDS 1CH 1.6GBPS US8	IC	IC/DIG/MOS <Digital MOS IC>	B <MIL-M-38510 Class B PIQ=1>	20 Gates	Before 2015	0.005700	1.24
CRCW06031K00FKEA	10	RES SMD 1K OHM 1% 1/10W 0603	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.003700	0.81
GRM155R61A104KA01D	18	CAP CER 0.1UF 10V X5R 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.003060	0.67
GRM155R71H103KA88D	14	CAP CER 10000PF 50V X7R 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.002380	0.52
GRM188R71C104KA01D	12	CAP CER 0.1UF 16V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.002040	0.44
AT24C02AN-10SU-2.7	1	EEPROM 2/4/8/16K 2-WIRE BUS	IC	IC/EEPROM/MOS <Electrically Erasable PROM MOS>	B <MIL-M-38510 Class B PIQ=1>	2000 Bits	Before 2015	0.001960	0.43
CRCW06032K00FKEA	3	RES SMD 2K OHM 1% 1/10W 0603	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.001110	0.24
CRCW0402100RFKED	3	RES SMD 100 OHM 1% 1/16W 0402	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.001110	0.24
CRCW0402000Z0ED	2	RES SMD 0.0OHM JUMPER 1/16W 0402	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000740	0.16
CRCW040249R9FKED	2	RES SMD 49.9 OHM 1% 1/16W 0402	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000740	0.16
GRM033R60J104KE19D	4	CAP CER 0.1UF 6.3V X5R 0201	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000680	0.15
ECJ-1VB0J475M	4	CAP CER 4.7UF 6.3V X5R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000680	0.15
CRCW060310R0FKEA	1	RES SMD 10 OHM 1% 1/10W 0603	Resistor	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000370	0.08
GRM1555C1H100JZ01D	2	CAP CER 10PF 50V NP0 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000340	0.07
ECJ-1VB1H103K	2	CAP CER 10000PF 50V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000340	0.07

<b>ECJ-1VB1H222K</b>	2	CAP CER 2200PF 50V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000340	0.07
<b>GRM188R71C105KA12D</b>	2	CAP CER 1UF 16V X7R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000340	0.07
<b>ECJ-1VB0J474K</b>	2	CAP CER 0.47UF 6.3V X5R 0603	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000340	0.07
<b>GRM1555C1H220JZ01D</b>	1	CAP CER 22PF 50V NP0 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000170	0.04
<b>GRM1555C1H330JZ01D</b>	1	CAP CER 33PF 50V NP0 0402	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000170	0.04
<b>ECY-29RA105KV</b>	1	CAP CER 1UF 10V X5R 0508	Capacitor	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	R <Fail.Rate 0.011000h>	-	-	0.000170	0.04
<b>TAJ106K020R</b>	10	CAP TANT 10UF 20V 10% 2312	Capacitor	CAP/CWR <Tantalum Solid Chip ER MIL-C- 55365>	R <Fail.Rate 0.011000h>	-	-	0.000140	0.03
<b>EXC-CL4532U1</b>	1	FERRITE BEAD 115 OHM 1812 1LN	Inductive	Coil.Fixed <Coil Fixed Inductor>	MIL <Military Non Established Reliability>	-	-	0.000032	0.01
<b>TAJA106K006R</b>	1	CAP TANT 10UF 6.3V 10% 1206	Capacitor	CAP/CWR <Tantalum Solid Chip ER MIL-C- 55365>	R <Fail.Rate 0.011000h>	-	-	0.000014	0.00
<b>F931A106MAA</b>	1	CAP TANT 10UF 10V 20% 1206	Capacitor	CAP/CWR <Tantalum Solid Chip ER MIL-C- 55365>	R <Fail.Rate 0.011000h>	-	-	0.000014	0.00

#### 4. Pareto by Part Type

Group	Type	Qty	Failure rate per Type (FPMH)	Contribution to system failure rate (%)
<b>Inductive</b>	Trafo.RF <Transformer Radio Frequency>	2	0.280000	60.96
<b>IC</b>	IC/LIN/MOS <Linear MOS IC>	4	0.068000	14.81
<b>Connector</b>	PCB <Card Edge (PCB)>	1	0.044000	9.58
<b>IC</b>	IC/DIG/MOS <Digital MOS IC>	4	0.027100	5.90
<b>Resistor</b>	FIX/RZ <Fix/Film Network MIL-R-83401 QL=MIL/Lower>	4	0.019200	4.18
<b>Capacitor</b>	CAP/CKR <Ceramic General MIL-C-39014 ER QL=S/R/P/M>	65	0.011050	2.41
<b>Resistor</b>	FIX/RM <Fix/Film Chip ER MIL-R-55342 QL=S/R/P/M>	21	0.007770	1.69
<b>IC</b>	IC/EEPROM/MOS <Electrically Erasable PROM MOS>	1	0.001960	0.43
<b>Capacitor</b>	CAP/CWR <Tantalum Solid Chip ER MIL-C-55365>	12	0.000168	0.04
<b>Inductive</b>	Coil.Fixed <Coil Fixed Inductor>	1	0.000032	0.01