





# TEST REPORT

**Report No.** : SGS-R17-1663-EN00  
**Order No.** : TON-R17-2734  
**Applicant** : Point Mobile Co.,Ltd.  
**Address** : B-9F Kabul Great Valley, 32, Digital-ro 9-gil, Geumcheon-gu, Seoul, Korea  
**Product** : PM80 (Industrial PDA)  
**Model No.** : PM80 (Industrial PDA)  
**Date of Test** : October 16, 2017 ~ October 24, 2017  
**Standard** : MIL-HDBK-217 FN2  
**Test Result** : Refer to Summary of Test Results  
**Use of Report** : Validation

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This is certified that the above mentioned products have been tested for the sample provided by client.

<b>Affirmation</b>	<b>Tested by</b>	<b>Technical Manager</b>
	Name : Kim, Jun-ho 	Name : Kim, Hyun-jin 

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October 24, 2017.

**SGS Korea Co., Ltd. Dongtan Laboratory**



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## Summary of Test Results

PM80 (Industrial PDA)	
Test Item	Test Result
Reliability Prediction (MTBF : 25 °C )	MTBF : 326 507 h
Reliability Prediction (MTBF : 40 °C )	MTBF : 222 044 h



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## 1. Overview

As requested by the client, this test was conducted on test sample according to the test specification presented by the client.

## 2. Product

### 2.1 Description

Applicant : Point Mobile Co.,Ltd.  
Manufacturer : Point Mobile Co.,Ltd.  
Product : PM80 (Industrial PDA)  
Model : PM80 (Industrial PDA)

## 3. Test condition & Test result

Refer to each test report (5 page)



### 3.1 Reliability Prediction

<b>Applicant</b>	Point Mobile Co.,Ltd.	<b>Dept. in charge</b>	Reliability Test Team
<b>Product</b>	PM80 (Industrial PDA)	<b>Tester</b>	Kim, Jun-ho (+82-31-240-6674)
<b>Model</b>	PM80 (Industrial PDA)	<b>Date</b>	October 24, 2017
<b>Serial No.</b>	N/A		
<b>Standard</b>	MIL-HDBK-217 FN2	<b>No. of pages</b>	4

(1) Purpose of calculation

- a) To predict the failure rate of system, parts, or assembly, and an average life time
- b) To provide the information on the maintenance cycle of assembly level
- c) To provide the information necessary for analysis of life cycle cost of assembly or system
- d) To provide customers or buyers with an index of purchasing by giving an actual level of product's performance

(2) Condition of calculation

- a) TOOL : RELEX SOFTWARE 2009
- b) Spec : MIL-HDBK-217 FN2
- c) Method : Method I Case III
- d) Upper Confidence Level : N/A
- e) Environment : GB, GC - Ground Benign, Controlled, 25 °C & 40 °C
- f) Data : Parts List (BOM)
- g) Laboratory environment : (25 ± 3) °C, (34 ± 5) % R.H.
- h) Quality Level: "1" or MIL-Spec

(3) Calculated parts

Section	No.of parts	Rate	Remark
Object parts	1 161 EA	97.73 %	
Non object parts	27 EA	2.27 %	See page 8
Total	1 188 EA	100 %	



(4) Glossary(Exponential distribution)

Term	Description(Exponential distribution)
MTBF	Mean Time Between Failure. MTBF = 1/(Failure Rate) [Unit: hours]
Failure Rate (λ)	Failure rate [Failure rate multiplier: Telcordia SR-332: 10 <sup>9</sup> , MIL-HDBK-217F: 10 <sup>6</sup> ] [Unit: FITs] 1 FIT = 10 <sup>9</sup> failure/hr
Reliability R(t)	$R(t) = \exp(-\lambda * t)$
Non Reliability F(t)	$F(t) = 1 - R(t) = 1 - \exp(-\lambda * t)$ $= 1 - \exp(-t/MTBF)$
B10 life	Product's life time until 10% defect occurs [Unit: Hours] B10 life time = $-1/\lambda * \ln 0.9$
Total failure rate	$\lambda_{total} = f(\sum_{i=1}^n \lambda_i)$

(5) Prediction result

[ 25 °C ]

Board	MTBF (h)	B10 Life (h)	Failure rate
Set	326 507	34 401	3.062 721

[ 40 °C ]

Board	MTBF (h)	B10 Life (h)	Failure rate
Set	222 044	23 395	4.503 607



(6) Object part MTBF

※ 25 °C

Relex

**Product Name:** PM80  
**Model Name:** PM80  
**Calculation Model:** MIL-HDBK-217 FN2  
**Method:** Method I Case 3  
**Upper Confidence Level:** N/A

**Reliability Prediction Summary**

**Failure Rate:** 3.062721  
**MTBF (hrs):** 326,507  
**Temperature (degree C):** 25  
**Environment:** GB, GC - Ground Benign, Controlled  
**Tester :** Kim, Jun-ho **Test date :** October 24, 2017

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
PM80	System		1161	3.062721	326,507
Gen-Capacitor			533	1.039981	961,556
Resistor			258	0.897354	1,114,387
Diode			81	0.104494	9,569,971
IC			58	0.443699	2,253,778
TR			1	0.001002	998,450,340
FET			9	0.415800	2,405,002
Inductor			167	0.015030	66,533,599
Miscellaneous			3	0.095902	10,427,310
Photo Device			2	0.000460	2,173,913,043
Connection			49	0.049000	20,408,163

※ 40 °C

Relex

**Product Name:** PM80  
**Model Name:** PM80  
**Calculation Model:** MIL-HDBK-217 FN2  
**Method:** Method I Case 3  
**Upper Confidence Level:** N/A

**Reliability Prediction Summary**

**Failure Rate:** 4.503607  
**MTBF (hrs):** 222,044  
**Temperature (degree C):** 40  
**Environment:** GB, GC - Ground Benign, Controlled  
**Tester :** Kim, Jun-ho **Test date :** October 24, 2017

Assembly Name	Part Number	Ref Des	Quantity	Failure Rate	MTBF
PM80	System		1161	4.503607	222,044
Gen-Capacitor			533	1.997742	500,565
Resistor			258	1.041148	960,478
Diode			81	0.171779	5,821,432
IC			58	0.546153	1,830,989
TR			1	0.001407	710,691,398
FET			9	0.566669	1,764,697
Inductor			167	0.018455	54,185,716
Miscellaneous			3	0.095902	10,427,310
Photo Device			2	0.000720	1,387,981,733
Connection			49	0.063631	15,715,652



(7) Non object parts

PM80 EBOM Release Report		BOM Version:		0000081421	
IP Number	MPN	Name	Quantity	MP Name	Manufacturer
SBA37U00000CX		Furnished PCBA,T2-PM80C,BAE		Furnished PCBA,N/A,T2-PMTCT	
AMF0000236	SKY77824-11	RF PA,FDD LTE B7/30,TDD LTE	1.0each	U2702RF PA,FDD LTE B7/30,TDD	SKYWORKS
AMF0000238	SKY77648-11	RF PA,Multimode Multiband,42-F	1.0each	U2701RF PA,Multimode Multiband	SKYWORKS
ARM0000076	TM021-202	Cable can clip,Over PCB,0. PINs	2.0each	P2601Cable can clip,Over PCB,0	FJCONN
AXA0000080	(RTC8612H	Antenna Switch Module,0.7-2.7 C	5.0each	U2801Antenna Switch Module,0.7-	RICHWAVE
AXA0000128	(RF1694TR13-5K	Antenna Switch Module,SP4T,2.4	2.0each	MA31 Antenna Switch Module,SP4	RFMD
AXA0000131	(MDFEGKGD-101	Antenna Switch Module,SP14T M	1.0each	MA31 Antenna Switch Module,SP1	MURATA
BAB37U000C		Main PCB,T2-PM80C,C Version,;	1.0each	Main PCB,T2-PM80C,C Vers	TRIPOD
BKA34J0030		RF_QFE2101,RF_QFE2101 Shie	1.0each	SH10(RF_QFE2101 Shielding,T2-F	ECT
BKA37U0004		RF-SP5T,RF-SP5T shielding fram	1.0each	SH26(RF-SP5T shielding frame,T2-	ECT
BKA37U0005		RF PA,RF PA Shielding,T2-PM8	1.0each	SH27(RF PA Shielding,T2-PM80C,	ECT
BKA37U0006		RF-SP5T,RF-SP5T shielding cov	1.0each	*SH26RF-SP5T shielding cover,T2-	ECT
BKB34J0020		BB,BB Shielding cover,T2-PM80,	1.0each	*SH01BB Shielding cover,T2-PM80	ECT
BKB34J0030		BB,BB Shielding frame,T2-PM80,	1.0each	SH01;BB Shielding frame,T2-PM8	ECT
BKC34J0010		Backlight_shielding,T2-PM80,C7	1.0each	SH10(Backlight_shielding,T2-PM8	ECT
BKC34J0060		GPS shielding,T2-PM80,C7521,0	1.0each	SH10(GPS shielding,T2-PM80,C7	ECT
BKC34J0070		PMU shielding cover,T2-PM80,NT	1.0each	*SH01PMU shielding cover,T2-PM	ECT
BKC34J0080		PMU shielding frame,T2-PM80,C	1.0each	SH01;PMU shielding frame,T2-PM	ECT
BKC34J0090		BT_WIFI shielding cover,T2-PM8	1.0each	*SH01BT_WIFI shielding cover,T2-f	ECT
BKC34J0100		BT_WIFI shielding frame,T2-PM8	1.0each	SH01(BT_WIFI shielding frame,T2-	ECT
BKC37U0001		2D SCANNER DC,2D SCANNER	1.0each	SH18(2D SCANNER DC,2D SCAN	ECT
CPG0000048		PCBA LABEL,Rav4,N/A,N/A,10.(	1.0as needec	PCBA LABEL,Rav4,N/A,N/A	HENGWEI

END.