Maximum Permissible Exposure (MPE)

Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

According to RSS 102 issue 5.

2.5.2 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz[6] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $22.48/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Maximum Permissible Exposure (MPE) Evaluation

Model: BM832 & BM832A

Maximum output power at antenna input terminal:	4.05	(dBm)
Maximum output power at antenna input terminal:	2.540972706	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	3.19889511	(mW)
Antenna gain (typical):	0.24	(dBi)
Maximum antenna gain:	1.056817509	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0006729	(mW/cm^2)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Measurement Result:

The predicted power density level at 20 cm is 0.006729 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

Maximum Permissible Exposure (MPE) Evaluation

Model: BM832E

Maximum output power at antenna input terminal:	4.05	(dBm)
Maximum output power at antenna input terminal:	2.540972706	(mW)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Maximum Pav :	3.19889511	(mW)
Antenna gain (typical):	0.54	(dBi)
Maximum antenna gain:	1.132400363	(numeric)
Prediction distance:	20	(cm)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm^2)
Power density at predication frequency at 20 (cm)	0.0007210	(mW/cm^2)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Measurement Result:

The predicted power density level at 20 cm is 0.0007210 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2.

Power measurement:

IC EIRP level

Model: BM832 & BM832A

Frequency:	2480	MHz
Maximum output power at antenna input terminal:	4.05	(dBm)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Antenna gain (typical):	0.24	(dBi)
EIRP:	3.381	mW
EIRP:	0.00338	W
EIRP Limit	2.736	W

Measurement Result:

The EIRP level is 0.00338W which less than RSS102 section 2.5.2 Exemption Limits above 300 MHz and below 6 GHz condition.

IC EIRP level

Model: BM832E

Frequency:	2480	MHz
Maximum output power at antenna input terminal:	4.05	(dBm)
Tune-Up power Tolerance:	1	dB
Duty cycle:	100	(%)
Antenna gain (typical):	0.54	(dBi)
EIRP:	3.622	mW
EIRP:	0.00362	W
EIRP Limit	2.736	W

Measurement Result:

The EIRP level is 0.00362W which less than RSS102 section 2.5.2 Exemption Limits above 300 MHz and below 6 GHz condition.

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