

18th October 2016



Mr. D. Crowder
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1516 Centre Circle Downers Grove
Illinois 60515-1082
United States of America

Dear Dan,

Subject: **TPDK5A FCC 47 CFR Part 27 & 2 Guidance letter for ERP submission.**

This information applies to band 757 – 870 MHz (A Block), an extension of the previous 762 – 870 MHz Tait portable radio band.

As per FCC requirement 27.50 b) (10) the TPDK5A must meet a Maximum ERP of 3 Watts. Compliance to this requirement is presented herein.

Reference

- i) Effective Radiated Power (ERP) is defined by TIA-102-CAAA_C section 2.2.10.2

$$\text{ERP(dBm)} = \text{Max Output Power(dBm)} - \text{Losses(dB)} + \text{Antenna Gain(dBd)}$$

For a portable the losses to the antenna could be considered to be 0dB.

The equation then becomes:

$$\text{ERP(dBm)} = \text{Max Output Power(dBm)} + \text{Antenna Gain(dBd)}$$

- ii) dBd = dB Gain relative to a ½ wave dipole Antenna

$$G_{\text{dBd}} = G_{\text{dBi}} - 2.15\text{dB}$$

$$\text{Therefore } 0\text{dBd} = 2.15\text{dBi}$$

- iii) EMC Technologies SAR test report (FCC ID CASTPDK5A, IC ID 737A-TPDK5A)
Refers to these listed Antennas for TPDK5A

007-00030-01 [v1].pdf	TPA-AN-023	Datasheet Supplied (Not to be published)
007-00042-01 [v1].pdf	TPA-AN-028	Datasheet Supplied (Not to be published)
020851115B3256_RevD_Spec_Jul14.pdf	TPA-AN-022	Datasheet Supplied (Not to be published)

Derivation

Tait TPDK5A radios have a high power setting of 3 Watts (34.77dBm).

ERP can now be derived for all three Antennas sold with this product:

Tait Product code	Datasheet gain (dBi)	Calculated gain (dBd)	Radio power (W)	Radio power (dBm)	ERP (dBm)	ERP (W)
TPA-AN-022	1	-1.15	3	34.77	33.62	2.30
TPA-AN-023	2	-0.15	3	34.77	34.62	2.90
TPA-AN-028	1	-1.15	3	34.77	33.62	2.30

Example for TPA-AN-023:

Datasheet gain = 2dBi
 $G_{dBd} = 2dBi - 2.15dB$
 $G_{dBd} = -0.15$

$ERP = 34.77 (dBm) + -0.15dBd$
= 2.9 Watts

Conclusion

All Tait Antennas sold with TPDK5A meet the 3 Watt ERP requirement as stated by FCC part 27.50 b) (10).

Yours sincerely

Mark Cotton
Principal RF Designer

