



Highest output power operation mode

GlobeTrotter 6280 family

Multislot class 12

About this document

Overview and Purpose

This document gives a description on the operation mode that produces the highest GPRS/EDGE output power for the Option GlobeTrotter family based on Qualcomm Chipset 6280 which supports Multislot class 12, from here on called: *GlobeTrotter 6280 family*.

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Version History

Date	Version	Author(s)	Revision(s)	Remarks
Sep 20, 2006	V01 – D1	Thomas Gulinck		Initial version
Jan 07, 2006	V02	Joeri Boeckx		General for 6280 family

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1. INTRODUCTION

The *GlobeTrotter 6280* family supports 850/900/1800/1900 GSM/GPRS/EDGE and FDD1/FDD2/FDD5 UMTS/HSPA.

Because this family supports GPRS/EGPRS multislot class 12, 4 TX slots are possible.

2. CALIBRATION

Confirming the 3GPP specs we have implemented a GPRS power reduction as followed:

Maximum power for 850, GSMK and 8PSK:

2 slots → 32 dBm

3 slots → 30.5 dBm

4 slots → 29 dBm

Maximum power for 1800, GSMK and 8PSK

2 slots → 29 dBm

3 slots → 29 dBm

4 slots → 29 dBm

3. REFERENCES

3GPP TS 51.010-1 version 6.5.0 Release 6

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ETSI TS 151 010-1 V6.5.0 (2005-11)

13.16.2.2 Conformance requirement

- 4a. From R99 onwards, the supported maximum output power for each number of uplink timeslots shall form a monotonic sequence. The maximum reduction of maximum output power from an allocation of n uplink timeslots to an allocation of $n+1$ uplink timeslots shall be equal to the difference of maximum permissible nominal reduction of maximum output power for the corresponding number of timeslots, as defined in 3GPP TS 05.05, subclause 4.1.1, sixth table.

3GPP TS 05.05 version 8.16.0 Release 1999

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ETSI TS 100 910 V8.16.0 (2003-08)

In order to manage mobile terminal heat dissipation resulting from transmission on multiple uplink timeslots, the mobile station shall reduce its maximum output power by the following values on a per-assignment basis:

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

The supported maximum output power for each number of uplink timeslots shall form a monotonic sequence. The maximum reduction of maximum output power from an allocation of n uplink timeslots to an allocation of $n+1$ uplink

3GPP TS 05.05 version 8.16.0 Release 1999

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ETSI TS 100 910 V8.16.0 (2003-08)

timeslots shall be equal to the difference of maximum permissible nominal reduction of maximum output power for the corresponding number of timeslots, as defined in the table above.

As an exception, in case of a multislot uplink assignment, the first power control step down from the maximum output power is allowed to be in the range 0...2 dB.

4. MEASUREMENTS

4.1 Set-up

For the measurement we used a CMU200 from R&S and our *GlobeTrotter 6280* base product GX0201. All other members of the *GlobeTrotter 6280* family will behave in the same way as GX0201 as they are based on the same Qualcomm baseband and same radio.

As we are trying to investigate the operation mode which has the highest averaged output power, the absolute results of this measurement have no meaning and should be interpreted relatively.

4.2 Results

4.2.1 GPRS 850

Lowest channel	Power (dBm)				Power (mW)				Total average power
	n -1	n	n +1	n +2	n -1	n	n +1	n +2	
1TX		32,0				1584,9			1584,9
2TX	31,8	31,7			1513,6	1479,1			2992,7
3TX	30,2	30,1	30,1		1047,1	1023,3	1023,3		3093,7
4TX	28,6	28,5	28,5	28,5	724,4	707,9	707,9	707,9	2848,3

Mid channel	Power (dBm)				Power (mW)				Total average power
	n -1	n	n +1	n +2	n -1	n	n +1	n +2	
1TX		32,0				1584,9			1584,9
2TX	31,8	31,7			1513,6	1479,1			2992,7
3TX	30,1	30,0	30,0		1023,3	1000,0	1000,0		3023,3
4TX	28,6	28,5	28,5	28,5	724,4	707,9	707,9	707,9	2848,3

Highest Channel	Power (dBm)				Power (mW)				Total average power
	n -1	n	n +1	n +2	n -1	n	n +1	n +2	
1TX		31,9				1548,8			1548,8
2TX	31,8	31,7			1513,6	1479,1			2992,7
3TX	30,0	30,0	30,0		1000,0	1000,0	1000,0		3000,0
4TX	28,5	28,5	28,5	28,5	707,9	707,9	707,9	707,9	2831,8

4.2.2 GPRS 1900

Lowest channel	Power (dBm)				Power (mW)				Total average power
	n -1	n	n +1	n +2	n -1	n	n +1	n +2	
1TX		28,7				741,3			741,3
2TX	28,6	29,4			724,4	871,0			1595,4
3TX	28,4	28,4	28,3		691,8	691,8	676,1		2059,7
4TX	28,2	28,13	28,0	28,1	660,7	650,1	631,0	645,7	2587,4

Mid channel	Power (dBm)				Power (mW)				Total average power
	n -1	n	n +1	n +2	n -1	n	n +1	n +2	
1TX		28,6				724,4			724,4
2TX	28,4	28,9			691,8	776,2			1468,1
3TX	28,2	28,2	28,2		660,7	660,7	660,7		1982,1
4TX	28,1	28,0	28,0	28,0	645,7	631,0	631,0	631,0	2538,5

Highest Channel	Power (dBm)				Power (mW)				Total average power
	n -1	n	n +1	n +2	n -1	n	n +1	n +2	
1TX		28,5				707,9			707,9
2TX	28,5	28,4			707,9	691,8			1399,8
3TX	28,3	27,8	27,8		676,1	602,6	602,6		1881,2
4TX	28,1	28,2	28,1	28,1	645,7	660,7	645,7	645,7	2597,7

5. CONCLUSION

We can clearly conclude that due to the GPRS/EGPRS power reduction we have implemented, the worst case condition in GPRS/EGPRS 850 MHz is when we have 3 TX slots active.

For the 1900 MHz, we have not implemented such a reduction and therefore in 1900MHz, the operation mode where we use 4TX slots is the one with the highest average output power.

Consequently SAR measurements on a member of the *GlobeTrotter 6280 family* should be performed with 3TX on 850 band and 4TX slots on 1900 band.