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MT7986 IPI of 5th RX application note

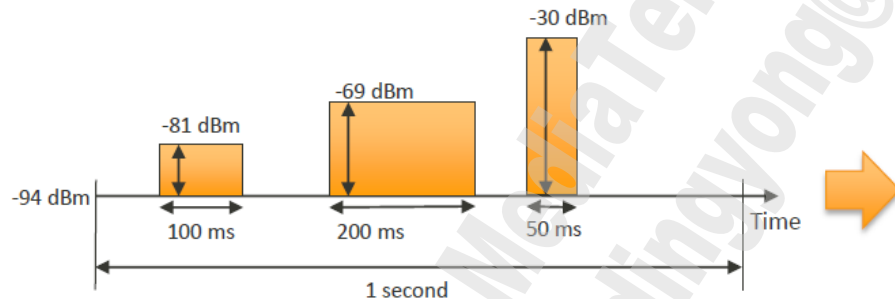
— 2021.08.23
— Phil Lin

Version History

Version	Date	Author (Optional)	Description
1.0	2021/08/17	Initial version for MT7986	1.0

IPI of ANT RX introduction

- Calculate average RSSI every 8us
- Update the occurrence time or the corresponding received power in the following table



IPI Index X	Ant. Power (dbm) Power[X]	Count IPI_cnt[X]	Ratio IPI_r[X]
0	Power \leq -92	650 ms = 81,250	65%
1	-92 < Power \leq -89	0	0
2	-89 < Power \leq -86	0	0
3	-86 < Power \leq -83	0	0
4	-83 < Power \leq -80	100 ms = 12,500	10%
5	-80 < Power \leq -75	0	0
6	-75 < Power \leq -70	0	0
7	-70 < Power \leq -65	200 ms = 25,000	20%
8	-65 < Power \leq -60	0	0
9	-60 < Power \leq -55	0	0
10	-55 < Power	50 ms = 6,250	5%

■ IEEE Spec

IPI	Ant. Power (dbm)
0	Power ≤ -92
1	$-92 < \text{Power} \leq -89$
2	$-89 < \text{Power} \leq -86$
3	$-86 < \text{Power} \leq -83$
4	$-83 < \text{Power} \leq -80$
5	$-80 < \text{Power} \leq -75$
6	$-75 < \text{Power} \leq -70$
7	$-70 < \text{Power} \leq -65$
8	$-65 < \text{Power} \leq -60$
9	$-60 < \text{Power} \leq -55$
10	$-55 < \text{Power}$

RPI	Ant. Power (dbm)
0	Power ≤ -87
1	$-87 < \text{Power} \leq -82$
2	$-82 < \text{Power} \leq -77$
3	$-77 < \text{Power} \leq -72$
4	$-72 < \text{Power} \leq -67$
5	$-67 < \text{Power} \leq -62$
6	$-62 < \text{Power} \leq -57$
7	$-57 < \text{Power}$

RCPI	Ant. Power (dbm)
0	Power ≤ -110
1	$-110 < \text{Power} \leq -109.5$
2	$-109.5 < \text{Power} \leq -109$
Powerx2+ 220	$-109 < \text{Power} \leq 0$
220	$0 \leq \text{Power}$
221-254	Reserved
255	Measurement not available

Command

IPI Scan Function on Panther.

- Set channel & bandwidth for IPI Scan
 - Command Format: `iwpriv rai0 set IPIScanCtrl=[CH]:[BW]`
 - CH: "36, 40, ..."
 - BW: "0: 20MHz, 1: 40MHz, 2: 80MHz, 3: 160MHz"
- Read IPI histogram
 - Command Format: `iwpriv rai0 set IPIScanHist= [IPI_threshold]: [Period]: [Target-Antenna-Idx]`
 - IPI_threshold: IPI index (0 - 10)
 - Period: ms
 - Target-Antenna-Idx: "0: WF0, 1: WF1, 2: WF2, 3: WF3"
- User scenarios:
- Get IPI scan result by average IPI value of WF0+WF1+WF2+WF3
 - Command with parameters CH and BW to set CH & BW
 - `iwpriv rai0 set IPIScanCtrl=[CH]:[BW]`
 - Command with parameters with IPI_threshold & Period to get IPI scan average result
 - `iwpriv rai0 set IPIScanHist= [IPI_threshold]: [Period]`
- Get IPI scan result by IPI value of targeted antenna WFx
 - Command with parameters CH and BW to set CH & BW
 - `iwpriv rai0 set IPIScanCtrl=[CH]:[BW]`
 - Command with parameters with IPI_threshold & Period to get targeted antenna IPI scan result
 - `iwpriv rai0 set IPIScanHist= [IPI_threshold]: [Period]: [Target-Antenna-Idx]`

[200.833831]	-95	-97	-97	-97
[201.832590]	Average Power			
[201.835234]	WF0	WF1	WF2	WF3
[201.838289]	-95	-98	-98	-98
[202.838429]	Average Power			
[202.841084]	WF0	WF1	WF2	WF3
[202.844141]	-97	-98	-98	-98
[203.843412]	Average Power			
[203.846056]	WF0	WF1	WF2	WF3
[203.849111]	-93	-96	-96	-96
[204.848274]	Average Power			
[204.850925]	WF0	WF1	WF2	WF3
[204.853981]	-95	-96	-96	-96
[205.854170]	Average Power			
[205.856813]	WF0	WF1	WF2	WF3
[205.859877]	-97	-98	-98	-98

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