YOTADEVICES

YOTA-TITANIUM FCC WWAN OUTPUT POWER+TUNNING TOLERANCE

Tuning tolerance for maximum TX power level:			+1 dB /	-1.5dB		
Protocol	GMSK (Highest PCL output power configuration)					
	Power class	Power level	1 Tx	2 Tx	3 Tx	4 Tx
GSM850	4	33	33	31	29	27
GSM900	4	33	33	31	29	27
GSM1800	1	30	30	28	26	24
GSM1900	1	30	30	28	26	24

Tuning tolerance for maximum TX power level:			+1.5 dB /	-1.5 dB		
Protocol	8-PSK (Highest PCL output power configuration)					
	Power class	Power level	1 Tx	2 Tx	3 Tx	4 Tx
EGSM850	E2	26,5	26,5	24,5	22,5	20,5
EGSM900	E2	26,5	26,5	24,5	22,5	20,5
EGSM1800	E2	25,5	25,5	23,5	21,5	19,5
EGSM1900	E2	25,5	25,5	23,5	21,5	19,5

Tuning tolerance for maximum TX power level:			+0.5 dB /	-1.5 dB
Protocol	Power class	Power level		
WCDMA 2	3	24		
WCDMA 5	3	24		

Tuning tolerance for maximum TX power level:			+1 dB /	-1dB
Protocol	Power class	Max Power level		
LTE 2	3	23		
LTE 4	3	23		
LTE 5	3	23		
LTE 7	3	23		
LTE 12	3	23		

Cellular Calibration Procedures

A new multifrequency Envelope Tracking (ET) technology was implemented in this platform which makes use of power control IC QFE1100 to dynamic change the VCC to the Power Amplifier for reducing thermal effect and improving power consumption. The characterization and factory calibration flows are shown in Figure 19.2

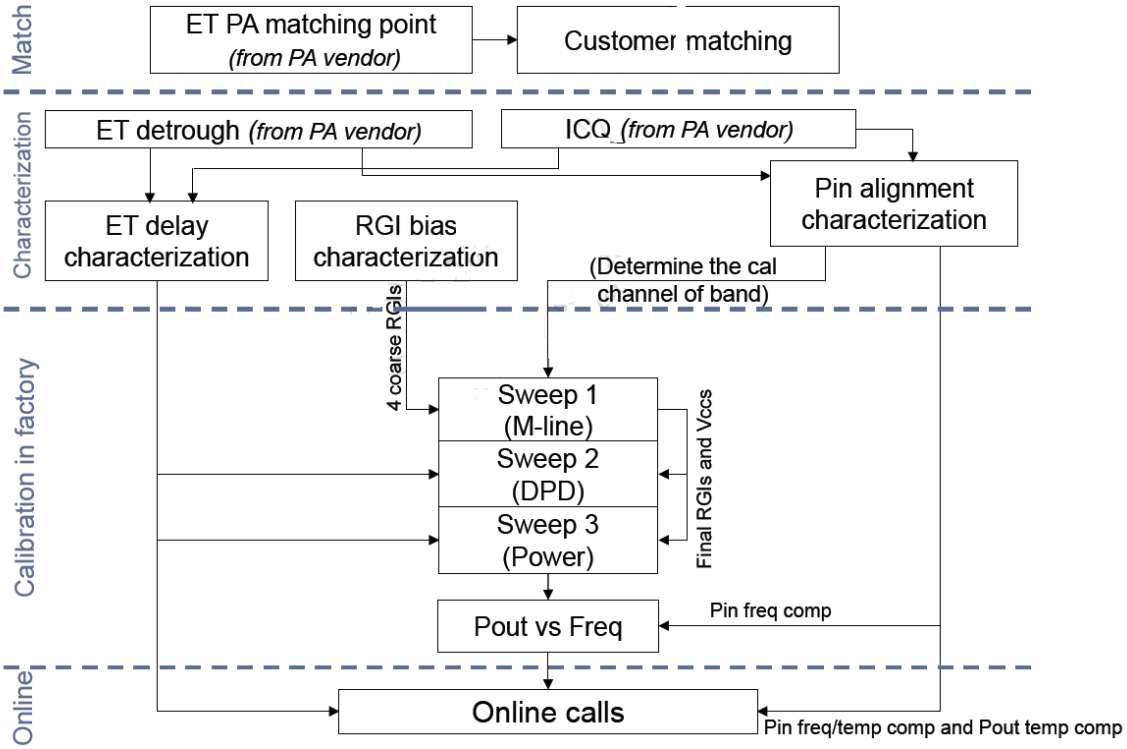

Figure 19.2: ET Characterization and Calibration Process.

In order to maintain consistency of Tx output power, in factory, every board has to go through 4 calibration sweeps.

1) Sweep 1: Alignment of M-line
   Finding the relationship between Pin, Pout and Vcc at 3dB compression points
2) Sweep 2: DPD
   Based on output power on M-line, system choice, and calibration algorithm will adjust and find the optimize value of pre-distortion parameters at 4 target power data point.
3) Sweep: Power
   Measure the TX power by applying all the characterization and calibration parameters. All the calibration will be stored in NV
4) Pout vs Frequency
   Compensate the power flatness across the band frequency at 4 target power points from sweep 2.

YOTADEVICES

Cellular Production Specifications

Band	Channel	LSL	USL
WCDMA B1	9612	22	24.5
	9750	22	24.5
	9888	22	24.5
WCDMA B2	9262	22	24.5
	9400	22	24.5
	9538	22	24.5
WCDMA B4	1312	22	24.5
	1450	22	24.5
	1513	22	24.5
WCDMA B5	4132	22	24.5
	4182	22	24.5
	4233	22	24.5
WCDMA B8	2712	22	24.5
	2788	22	24.5
	2863	22	24.5
LTE B2	18650	22	24
	18900	22	24
	19150	22	24
LTE B3	19250	22	24
	19575	22	24
	19900	22	24
LTE B4	20000	22	24
	20175	22	24
	20350	22	24
LTE B5	20450	22	24
	20525	22	24
	20600	22	24
LTE B7	20800	22	24
	21100	22	24
	21400	22	24
LTE B12	23060	22	24
	23095	22	24
	23130	22	24
LTE B20	24200	22	24
	24300	22	24
	24400	22	24
GSM850	128	31.5	34
	189	31.5	34
	251	31.5	34
GSM900	975	31.5	34
	37	31.5	34
	124	31.5	34
DCS1800	512	28.5	31
	699	28.5	31
	885	28.5	31
PCS1900	512	28.5	31
	661	28.5	31
	810	28.5	31

YOTADEVICES

WLAN Tune up

Channels/Frequency Supported

Bluetooth: 79 channels, Frequency Range **2.402 - 2.480 GHz**
All Channels having 1MHz Bandwidth.

WLAN: 2.4 GHz Band,
Channels 1-11, Frequency Range **2.412 - 2.462 GHz**
All channels operate with 20MHz Bandwidth.

5GHz Band,
Channels 36-134, Frequency Range **5.18 – 5.67 GHz**
Device won't operate in the frequency range **5.6 – 5.65 GHz**
For 802.11 a/ac, all channels operate with 20 MHz Bandwidth
For 802.11 n, channels operate with 20 MHz and 40 MHz Bandwidth.

Power Table (WLAN) (tolerance : +/- 1 dB)

Below are the power tables for 2.4 GHz & 5GHz band channels of WLAN.

Mode	Rate (Mbps)	All Channels Power (dBm)
802.11b 20 MHz	1	15
	2	15
	5.5	15
	11	15
802.11g 20 MHz	6	16
	9	16
	12	16
	18	16
	24	16
	36	15.5
	48	15.5
	54	15
802.11n 20 MHz	6.5/7.2	15
	13/14.4	15
	19.5/21.7	15
	26/28.9	15
	39/43.3	15
	52/57.8	15
	58.5/65	14
	65/72.2	13

Channels in 2.4GHz Band

YOTADEVICES

Mode	Rate (Mbps)	Low Power (dBm)	Mid Power (dBm)
802.11a 20 MHz	6	15	15
	9	15	15
	12	15	15
	18	15	15
	24	15	15
	36	14	14
	48	14	13
	54	12	12
802.11n 20 MHz	6.5/7.2	15	14
	13/14.4	15	14
	19.5/21.7	15	14
	26/28.9	15	14
	39/43.3	14	14
	52/57.8	14	13
	58.5/65	12	12
	65/72.2	11	11

Mode	Rate (Mbps)	Low Power (dBm)	Mid Power (dBm)
802.11n 40 MHz	13.5/15	15	15
	27/30	15	15
	40.5/45	15	15
	54/60	15	15
	81/90	14	14
	108/120	14	14
	121.5/135	13	13
	135/150	11	11
802.11ac 20 MHz	6.5/7.2	14	14
	13/14.4	14	14
	19.5/21.7	13	13
	26/28.9	13	13
	39/43.3	12	12
	52/57.8	12	12
	58.5/65	11	11
	65/72.2	9	9
	78/86.6	8	8

Channel		
	Low	5180 - 5320 MHz
	Mid	5500 - 5700 MHz

Channels in 5GHz Band