Sub-parts code	Specification Description	Unit	Dosage	Bit No.
AAA0620FD0C0	Resistance,Resistor,0.62 ohm,±1%,1/4W,0805,RL0805FR-7W0R62L,YAGEO,	PCS	1	R701
ABA560JJB0C2	Capacitor,Capacitor,56pF,±5%,50V,C0G,0402,C0402C0G560J500NT,EYANG,	PCS	1	C439
ABA225KDC0C2	Capacitor,Capacitor,2.2uF,±10%,10V,X5R,0603,C0603X5R225K100NT,EYANG,	PCS	8	C216 C217 C218 C219 C209 C240 C708 C527
ABA475KCC0C2	Capacitor,Capacitor,4.7uF,±10%,6.3V,X5R,0603,C0603X5R475K6R3NT,EYANG,	PCS	4	C201 C203 C514 C515
ABA106MCD0C2	Capacitor,Capacitor,10uF,±20%,6.3V,X5R,0805(T=1.25mm)C0805X5R106M6R3NT,EYANG,	PCS	3	C200 C703 C126
ABA470KJB0C2	Capacitor,Capacitor,47pF,±10%,50V,C0G,0402,C0402C0G470K500NT,EYANG,	PCS	18	C442 C443 C444 C469 C511 C513 C516 C517 C532 C534 C520 C521 C522 C525 C526 C548 C549 C702
ABA104MDB0C2	Capacitor,Capacitor,100nF,±20%,10V,X5R,0402,C0402X5R104M100NT,EYANG,	PCS	3	C205 C104 C701
ABA102MJB0C2	Capacitor,Capacitor,1nF,±20%,50V,X7R,0402,C0402X7R102M500NT,EYANG,	PCS	2	C446 C720
ABA101KJB0C2	Capacitor,Capacitor,100pF,±10%,50V,C0G,0402,C0402C0G101K500NT,EYANG,	PCS	5	C100 C509 C512 C533 C550
ABA220KJB0C2	Capacitor,Capacitor,22pF,±10%,50V,C0G,0402,C0402C0G220K500NT,EYANG,	PCS	1	C440
ABA330KJB0C2	Capacitor,Capacitor,33pF,±10%,50V,C0G,0402,C0402C0G330K500NT,EYANG,	PCS	2	C208 C441
ABA226MCD0C2	Capacitor,Capacitor,22uF,±20%,6.3V,X5R,0805(T=1.25mm),C0805X5R226M6R3NT,EYANG,	PCS	1	C445
TA06-T1000786AAAA	Capacitor,22nF,±10%,10V,X7R,0402,,	PCS	4	C502 C503 C508 C510
ABA103MGB0C2	Capacitor,Capacitor,10nF,±20%,25V,X7R,0402,C0402X7R103M250NT,EYANG,	PCS	1	C204

ARH0120010C1	USB connector,10.9×7.15×H2.0,12pin,MUB01-AK22130,	PCS	1	J505
TA05-T1000241AAAZ	Resistance,47K ohm,±5%,1/16W,0402,,	PCS	2	R300 R526
ADA6010011C1	Chip ferrite beads,600ohm±25%,DCR=0.2ohm,1000mA,0603,MHC1608S601LBP,INPAQ,,	PCS	1	B501
AMM0000039C1	IC,Quad-Band Transmit Module,5.22×4.54mm,,,HS8292,HunterSun,	PCS	1	U402
AHA0000017C1	P-channel MOSFET with schottky diode,DFN 2×2×0.75mm,20V(D-S),MC3117,MegaPower,	PCS	1	U700
AMA0000755C1	IC,GSM/GPRS Baseband Process,integrate RF/BT/FM,233ball,11×10BGAmm,0.5pitch,,SC6531D,SPREADTRUM,	PCS	1	U100
ACA62HJB00C1	Inductor,6.2nH,±5%,300mA,0402,,CLH1005T-6N2J-S-NP,Chilisin,	PCS	2	L428 C461
BAB49J000AC1	PCB,,F017,V1.0,4Layers,92.1×36.0×1.0mm	PCS	1	
BKA48K0000C1	RF shielding cover,F010,T=0.2mm,15.18×13.16×1.75mm,	PCS	1	
AJA2600045C1	Crystal,26MHz,±10ppm,7.3pf,3.2×2.5×0.6mm,,XTL571100-S362-001,SIWARD	PCS	1	X101
AKABL00003C1	LED,blue,20mA,1.60×0.80×0.4mm,(0603),A-SP194B1C-C01-4T,Amicc,	PCS	6	D702 D703 D704 D705 D706 D707
ARJ0080035C1	T-Flash card connector,,8pin,1.1pitch,H=1.5,,,TFS07-8K30010-01,SINGEEN,	PCS	1	J305
ACA24HJB00C1	Inductor,2.4nH,±5%,300mA,0402,,CLH1005T-2N4S-S-NP,Chilisin,	PCS	2	L429 C418
ARE0030120C1	Battery connector,,3pin,3.0pitch,8.40×3.50×H5.40mm,WITHOUT POST,HZBS021-05403GA0	PCS	1	J700
ARD0060066C1	SIM card connector,,6pin,2.54pitch,H=1.8mm,,,SIM04-6K33210,SINGEEN,	PCS	2	J303 J304

AGA0000053C1	Digital transistors,NPN,,DTC143ZM SOT-723,JIANGSU CHANGJIANG,	PCS	1	Q702
ACA39HSB02C1	Inductor,3.9nH,±0.3nH,DCR=0.2ohm,300mA,0402,,SDCL1005C3N9STDF,Sunlord,,	PCS	2	C401 C124
AMY0000098C1	BALUN,10_pin,2×1.2×0.7mm,,,LFB21914MDZ3D384TEMP,Murata,	PCS	1	U404
ACA22FMD01C1	Inductor,2.2uH,±20%,330mA,0805,MPL2012S2R2MHT,SUNLORD,	PCS	1	L200
ACA27HSB01C1	Inductor,2.7nH,±0.3nH,DCR=0.15ohm,300mA,0402,,CLH1005T-2N7S-S-NP,Chilisin,	PCS	2	L435 L436
ACA56HSB00C1	Inductor,5.6nH,±0.3nH,DCR=0.27ohm,400mA,0402,,SDCL1005C5N6ST(f),Sunlord,(MB COST DOWN)	PCS	2	L437 L438
ADA1020006C1	Chip ferrite beads,1000ohm±25%,DCR=1ohm,200mA,0402,MCB1005B102EBP,INPAQ,,	PCS	5	R527 R528 L520 L521 L523
ABA010CJB0C2	Capacitor,Capacitor,1pF,±0.25pF,50V,C0G,0402,C0402C0G1R0C500NT,EYANG,	PCS	2	C415 L411
AEA0000066C1	SAW Filter,2.4GHZ ISM Band RF applications,2450±50MHZ,2.0×1.2×0.8mm³,3pin,RFBPF2012080AM0T62,WALSIN,	PCS	1	U703
ACA39TJB04C1	Inductor,39nH,±5%,DCR=1.0ohm,200mA,0402,,SDCL1005C39NJTDF,Sunlord,,	PCS	1	C121
ABA100KJB0C2	Capacitor,Capacitor,10pF,±10%,50V,C0G,0402,C0402C0G100K500NT,EYANG,	PCS	4	C109 C120 C561 C562
ABA390JJB0C2	Capacitor,Capacitor,39pF,±5%,50V,C0G,0402,C0402C0G390J500NT,EYANG,	PCS	1	C417
TA06-T1000239AAAZ	Capacitor,Capacitor,2.7pF,±0.25pF,50V,C0G,0402,C0402C0G2R7C500NT,EYANG,	PCS	1	C463
TA06-T1000080AAAZ	Capacitor,Capacitor,3.3pF,±0.25pF,50V,C0G,0402,C0402C0G3R3C500NT,EYANG,	PCS	2	C405 C406

Tune-Up Procedure

Turn-Up TX

Content

1.Purpose

This panel gives the possibility to manage the mobile in the transmit mode. This window includes both:

- All the parameters (frequency band, RF channel, RF level to get the desire antenna output power…) The user needs to make the mobile transmitting, - All the parameters needed to define a transmit burst,

- All the compensation table to be able to align the mobile in production. This Tx_commands user guide is describing:

- The characteristics of the transmit burst,

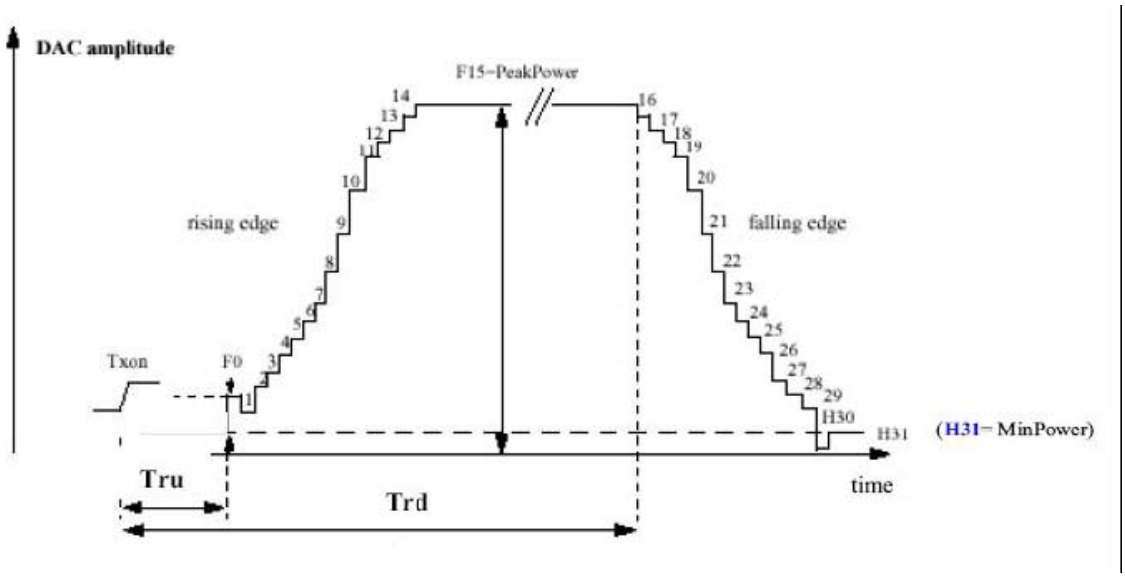
- All the parameters used in the transmit mode, - The operating mode to make the mobile transmitting

2 · General description

2.1 Characteristics of the transmit burst

The power levels and the shape of a transmit burst are controlled by the power amplifier controller integrated in the SC6531. The burst is generated by a 10-bit DAC from SC6531 as shown below:

The ramping shape is referenced with the rising edge of Tx-ON (from the Baseband). There are two types of parameters define the transmit burst: the first one define the shapes of the burst, and the second one define the temporal position of the burst. The rising and the falling edge of the transmit burst are determined by a set of 32 DAC code values n = 0 … 31.



Tru = **TxTRU Default** + △ TRU_P + △ TRU_T
Trd = **TxTRD_NBDefault** + △ TRD_P (for a normal burst).
Trd = **TxTRD_ABDefault** + △ TRD_P (for an access burst).

3.Parameters

F (n) are values coming from the DAC to shape the transmit burst. Some F(n) values have a corresponding Parameter used in the TAT to align the mobiles.
Parameter used in TAT = [F (n)].

3.1 Parameters used to shape the burst

- **H0** = [F (1)] controls the rate at which energy is given to the control loop at the beginning of the ramp. This energy is needed to bring the PA system control in a closed loop. This is the second code coming from the SC6531 DAC.
- **PeakPow** = [F (15)] corresponds to the peak power of the transmit burst.

- **H30** = [F (30)] corresponds to the last ramping coefficients used to shape the ramp.
- **MinPow** = [F (31)] is a fixed parameter and corresponds to the Code Start of the RDA6621 specification. It ensures a fast discharge of accumulated energy during the open loop mode in the summing node.

3.2 Parameters used to define the temporal position of the burst

3.2.1 Optimum position of the burst

This parameter is **TRU** (or △ **TRU_P**) on the panel, in the Optimal Burst. This is the burst starting time correction, which is optimised for each power control level. (Note that **_P** means that the parameter is a power compensation parameter).

3.2.2 Optimum length of the burst

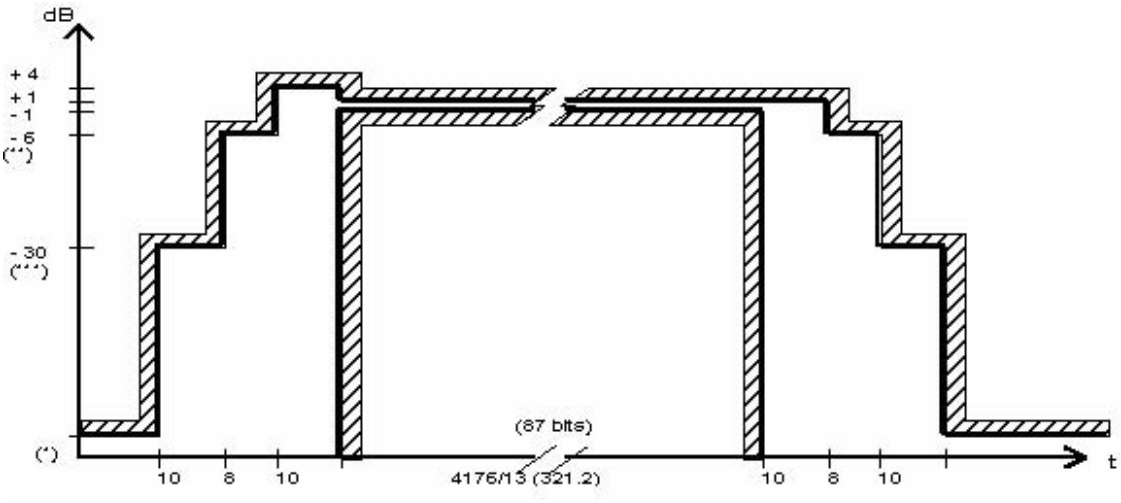
This parameter is **TRD** (or △ **TRD_P**) on the panel, in the Optimal Burst. This is the burst length compensation, which is optimized for each power control level.
(Note that **_P** means that the parameter is a power compensation parameter).

4. Operating mode

4.1 How to transmit a Tch burst (Random data), in GSM850 PCS1900 mode, at power control level max:

GSM850/PCS 1900:
Connect the mobile with special software,(meta phone tool)
Select RF Tool .TX level and profile
- set Band: GSM850/PCS1900,
- set ARFCN Channel: 192/661,
- setPCL: 5/0

Press START ,then you can check the burst with CMU200 or Agilent 8960; it must fit the curve below.



The request of the Power vs. Time.

4.2 How to stop Tx measurements:

Press STOP command to stop the TX.

4.3 How to transmit a burst after modifying parameters

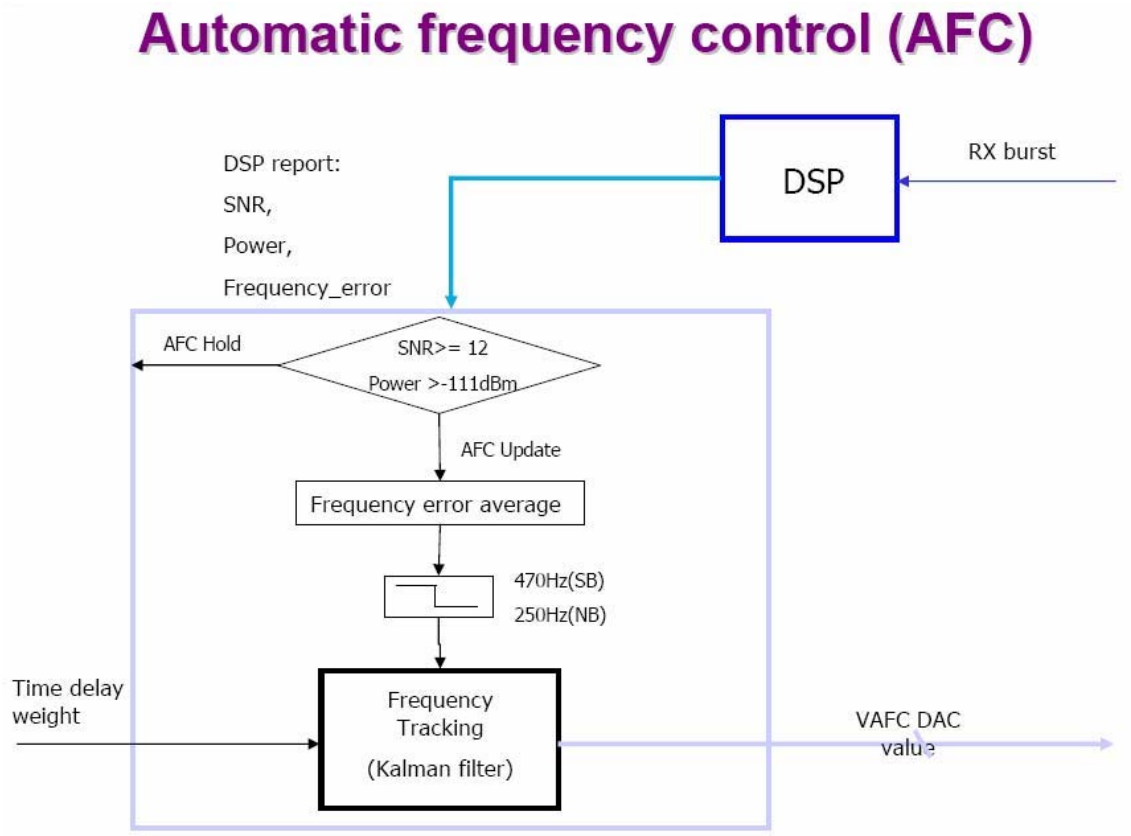
Please note that each time a parameter (such as parameter used to shape the burst) is changed, then the user have to: **download to flash** to validate the parameter modification.
If the command is not performed, the old parameters are taken into account.

5. Purpose

This panel gives the description of the Frequency plan.
This window includes both:
- Automatic frequency control (AFC),
- Static frequency error and range,
- Dynamic frequency error and range

6.Automatic frequency control

Before a handset is allowed to transmit any signals, it needs to first receive the FSB signal from the base station, demodulate and decode it using its own local oscillator, map it to the constellation plane, calculate the frequency offset, and adjust the local oscillator accordingly, until 0.1ppm of frequency accuracy is achieved. This frequency correction loop is called the automatic frequency control (AFC) loop in GSM standard. The process as below:



In SC6531, it uses an AFC signal from baseband (DAC) to finish automatic frequency control.

7.Static frequency error and range

- Factors of static frequency error: manufacturing frequency tolerance in crystal at room temperature, aging,
- Static frequency error is compensated for using 7bits programming capacitor array (CAP ID).
- The static frequency range of capacitor array (CAP ID=0 to128) must larger than 34ppm(+-17ppm).
- The static range depends on crystal‘s TS and CL
- The capacitor array calibration is done in production testing by setting the AFC DAC to mid-scale(4196) and adjusting CAP ID to the setting that give closest to 0 ppm error(finish by test software). This CAP ID value is then stored in Flash memory and rewritten to SC6531 each time the DCXO is initialized.

Output Power

Specific Operation Power Range:

Power Class 1;

1.BAND GSM850

Power Control Level 5	+32dBm+1.0dB/-1.0dB
Power Control Level 6	+31dBm+2.0dB/-2.0dB
Power Control Level 7	+29dBm+2.0dB/-2.0dB
Power Control Level 8	+27dBm+2.0dB/-2.0dB
Power Control Level 9	+25dBm+2.0dB/-2.0dB
Power Control Level 10	+23dBm+2.0dB/-2.0dB
Power Control Level 11	+21dBm+2.0dB/-2.0dB
Power Control Level 12	+19dBm+2.0dB/-2.0dB
Power Control Level 13	+17dBm+2.0dB/-2.0dB
Power Control Level 14	+15dBm+2.0dB/-2.0dB
Power Control Level 15	+13dBm+2.0dB/-2.0dB
Power Control Level 16	+11dBm+2.0dB/-2.0dB
Power Control Level 17	+9dBm+2.0dB/-2.0dB
Power Control Level 18	+7dBm+2.0dB/-2.0dB
Power Control Level 19	+5dBm+2.0dB/-2.0dB

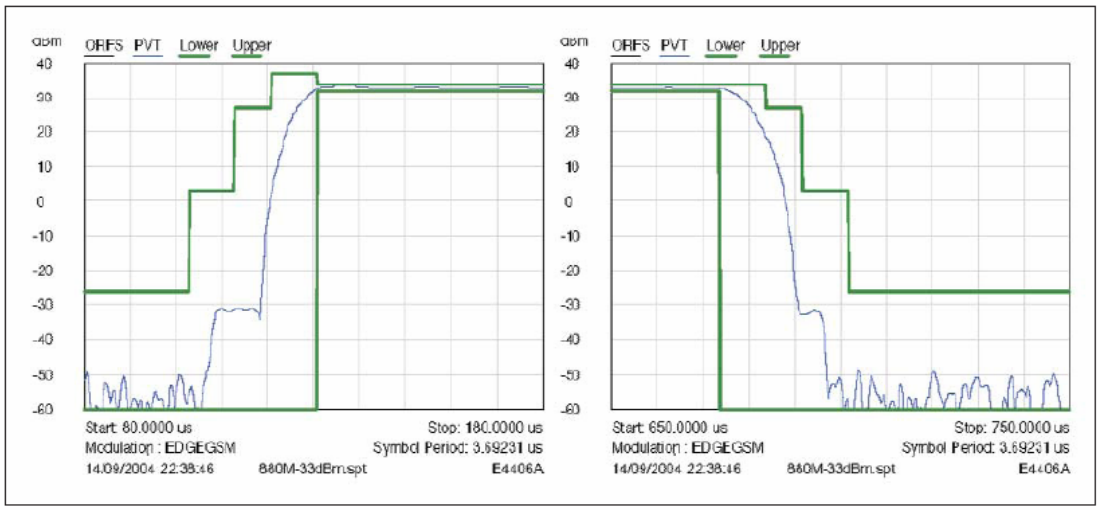
2. BAND PCS1900

Power Control Level 0	+29dBm+0.5dB/-0.5dB
Power Control Level 1	+28dBm+2.0dB/-2.0dB
Power Control Level 2	+26dBm+2.0dB/-2.0dB
Power Control Level 3	+24dBm+2.0dB/-2.0dB
Power Control Level 4	+22dBm+2.0dB/-2.0dB
Power Control Level 5	+20dBm+2.0dB/-2.0dB
Power Control Level 6	+18dBm+2.0dB/-2.0dB
Power Control Level 7	+16dBm+2.0dB/-2.0dB
Power Control Level 8	+14dBm+2.0dB/-2.0dB
Power Control Level 9	+12dBm+2.0dB/-2.0dB
Power Control Level 10	+10dBm+2.0dB/-2.0dB
Power Control Level 11	+8dBm+2.0dB/-2.0dB
Power Control Level 12	+6dBm+2.0dB/-2.0dB
Power Control Level 13	+4dBm+2.0dB/-2.0dB
Power Control Level 14	+2dBm+2.0dB/-2.0dB
Power Control Level 15	0dBm+2.0dB/-2.0dB

8. GPRS Data Transfer

GSM mobile phones use a Time Division Multiple Access (TDMA) scheme to transmit data. The TDMA format contains eight time slots. The handset power amplifier typically transmits in four of these up time slots. To prevent interference between cell phones, the time mask profile as specified is very restricted. To meet the GSM time mask, the output power of the PA needs to ramp up and down very quickly while staying within the time mask and not generating extraneous frequency bursts due to

too abrupt ramp profiles. As described before, the Vramp input value sets the RF output power. By applying a certain ramp profile to the Vramp pin, the power level (Pout) of the PA is set to obtain the required time mask. A time mask of the PA's output power is displayed. The time mask meets the limits (displayed by green lines) over a wide range of temperature, voltage and load variations.



GPRS Output Power
GSM850&PCS1900 allowed maximum output reduction in a multislot Configuration

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