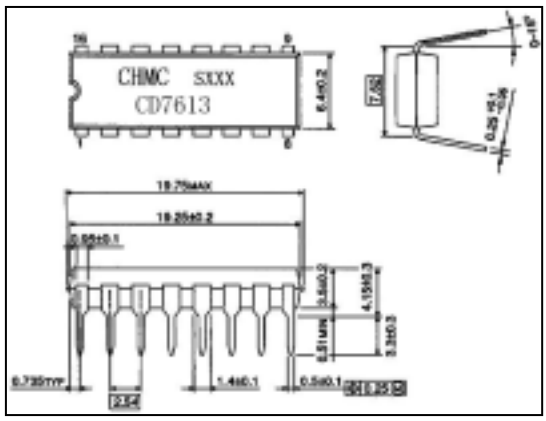
AM/FM 1 CHIP RADIO CD7613

DESCRIPTION

outline drawing

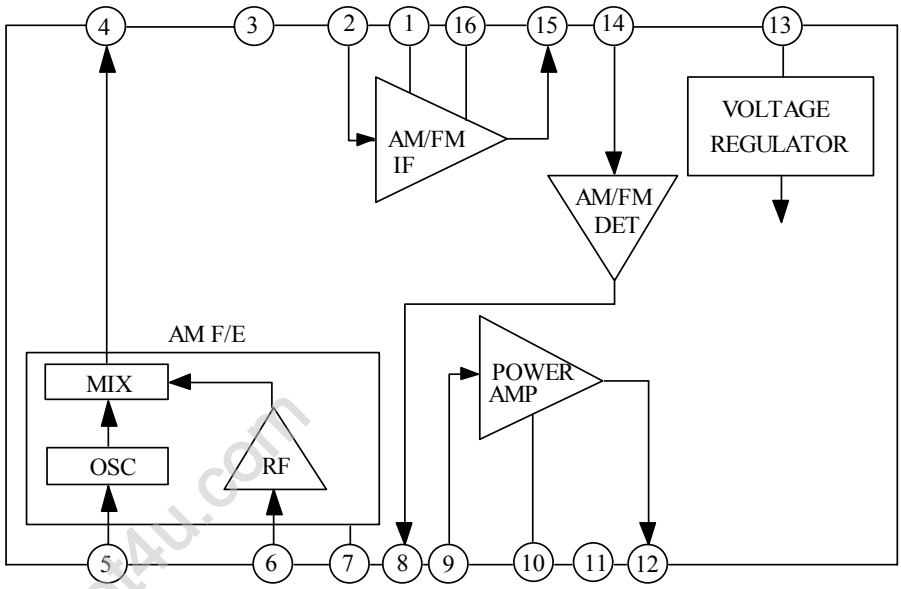


The CD7613 is a monolithic integrated circuit designed for the portable AM/FM radio or AM/FM clock radios.

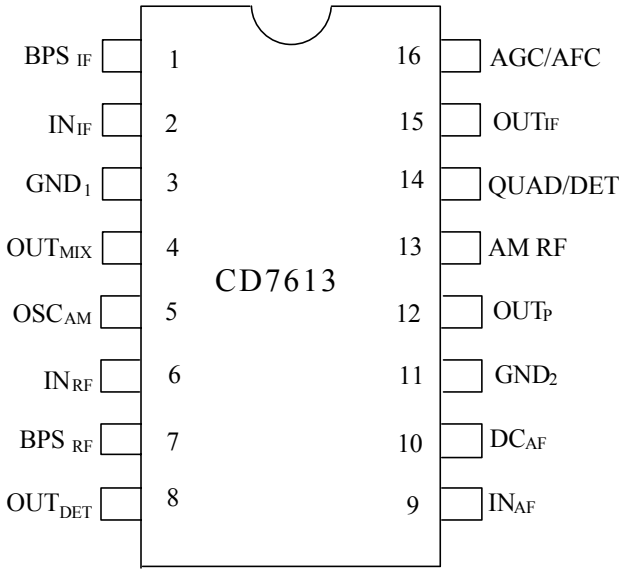
FEATURE

- Portable AM/FM 1-chip radio
- Wide operating supply voltage range: Vcc=3V~12V (Approximately) (Depending on the internal regulator tolerance)
- Recommended operating supply voltage : Vcc=4.5V~9V On using AC line as an internal shunt regulator mode , it is possible to use low cost application without a transformer (approximately 42mA).
- IF AMP gain is determined by DC Voltage appeared at IC Pin16
- Power output: Po=0.28W (Min.) at THD=10% (Vcc=5.5V/8Ω)

BLOCK DIAGRAM



PIN CONNECTION



PIN DESCRIPTION

PIN	DESCRIPTION	SYMBOL	PIN	DESCRIPTION	SYMBOL
1	IF bypass	BPSIF	9	Audio power	INAF
2	AM/FM IF input	INIF	10	Ripple Rejection	DCAF
3	RF ground	GND1	11	Audio ground	GND2
4	AM IF output	OUTMIX	12	Audio power output	OUTP
5	AM OSC	OSCAM	13	Supply voltage	Vcc
6	AM RF input	INRF	14	IF DET input	QUAD/DET
7	RF bypass	BPSRF	15	AM/FM IF output	OUTIF
8	Audio DET output	OUTDET	16	AFC AGC bypass	AGC/AFC

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

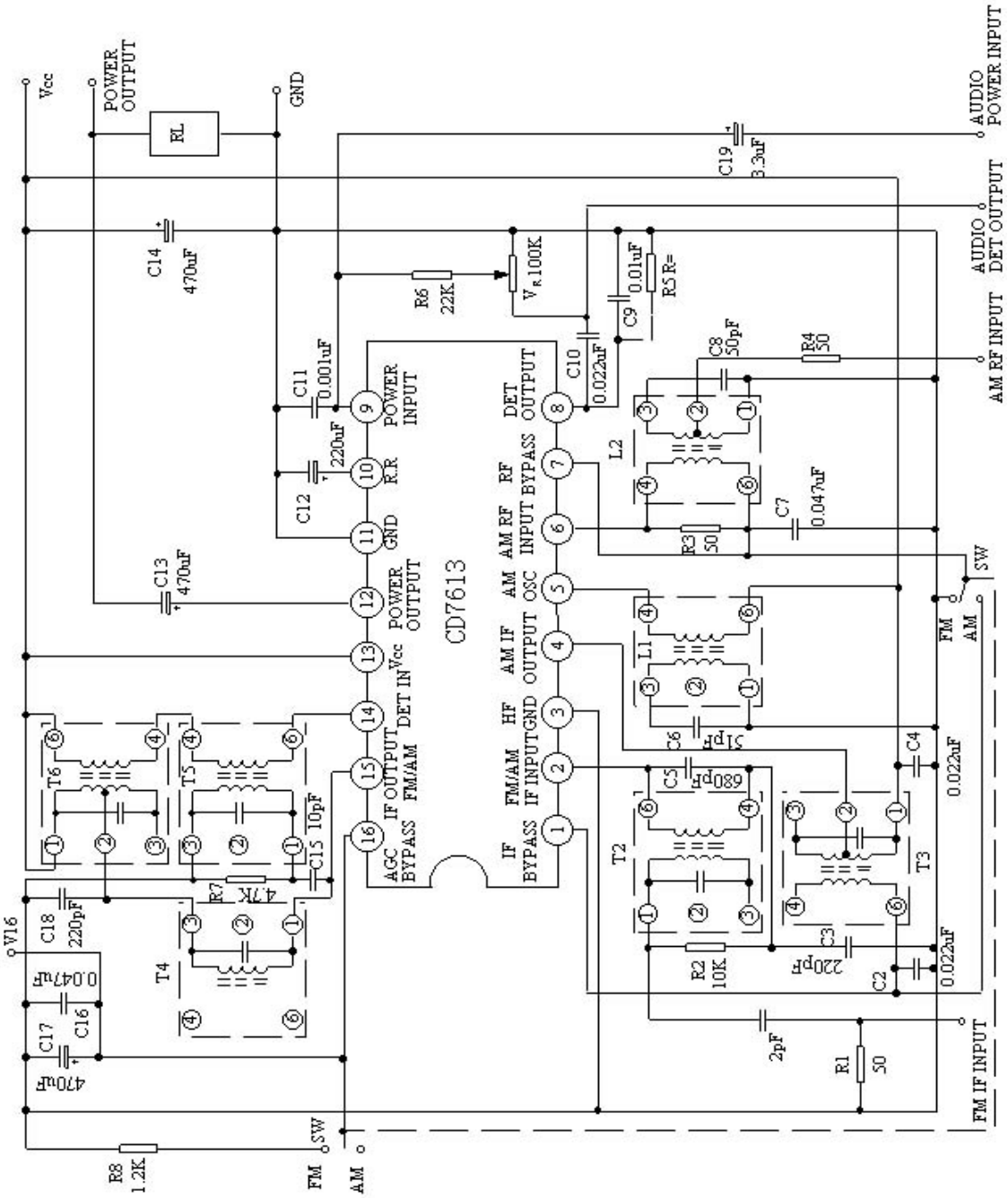
Characteristic	Symbol	Min.	Max.	Unit
Supply Voltage	Vcc		13	V
Supply Current	Icc		44	mA
Power Dissipation	PD		600	mW
Thermal Resistance Junction to Ambient	RJ-A		100	°C/W
Operating Temperature	Topr	-18	65	°C
Storage Temperature	Tstg	-40	125	°C

ELECTRICAL CHARACTERISTICS

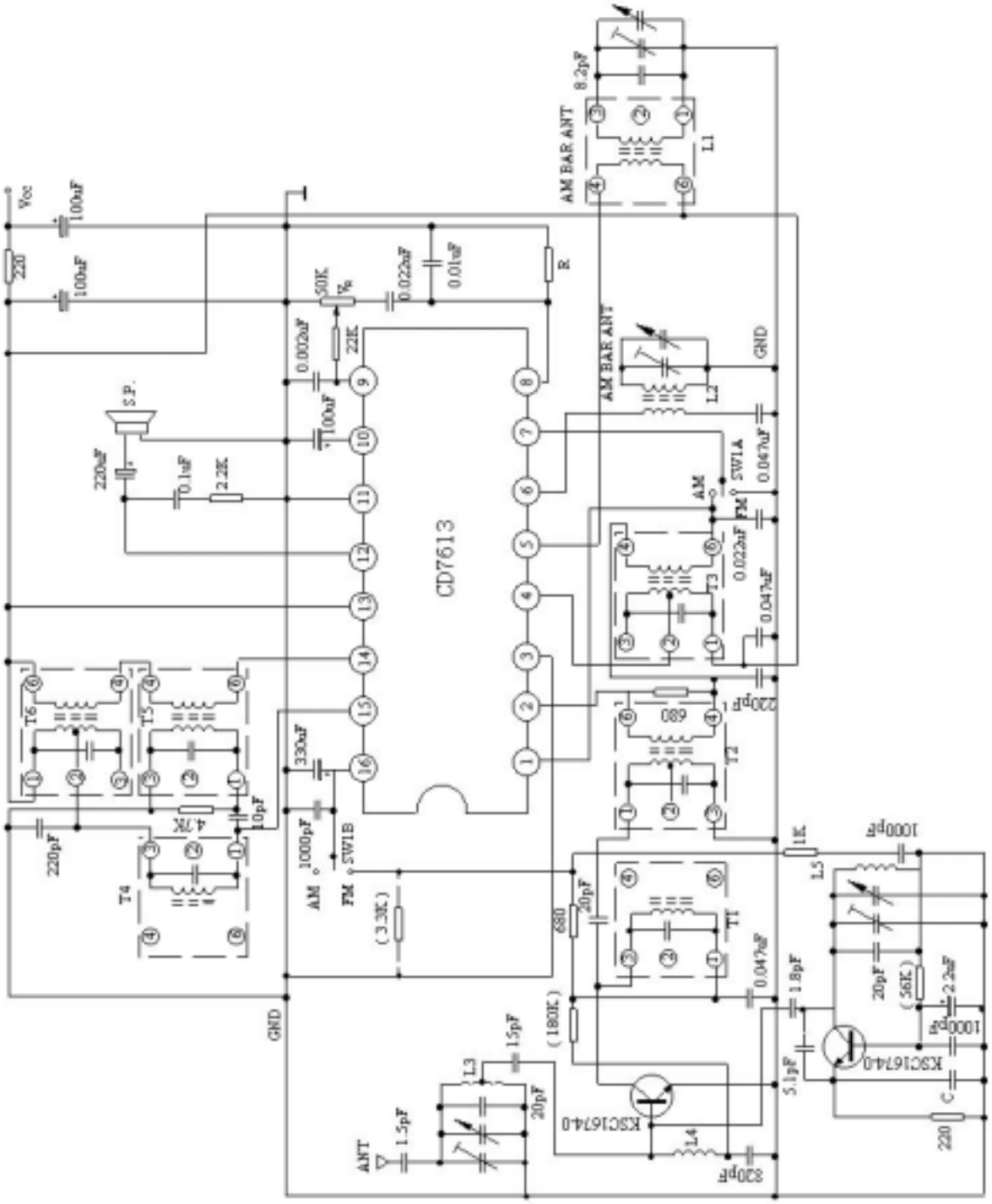
(Unless otherwise specified: Ta=25°C, Vcc=6V; FM: f=10.7MHz, Δf=±75kHz, fm=400Hz; AM: f=1MHz , Mod=30%, fm=400Hz, PWR AMP:f=1kHz,R_L=8Ω)

Characteristic	Test conditions	Symbol	Min.	Typ.	Max.	Unit
Quiescent circuit current	FM: Vcc=3V	Icco	7	12	17	mA
	FM: Vcc=9V		10	17	23	
	AM: Vcc=3V		3		14	
	AM: Vcc=9V		6		20	
Pin 16 voltage	FM : Icc=42mA Vi=0V	V16	2.0	2.4	3.1	V
	AM: Vcc=9V Vi=0V		1.4		1.9	
DEC output voltage	FM: Vi=10mV V_R=0	Vod	170		360	mV
	AM: Vi=1mV V_R=Vod		60		130	
Internal Regulated Voltage	AM: Icc=42mA	Vcc1	12.5	13.2	14.0	V
-3dB Limiting sensitivity	FM: -3dB limiting V_R=0	VLIM			63	μV
Maximum sensitivity	AM: Vod(8)=20mV V_R=Vod	VISM	1.7		8.9	μV
Sensitivity	AM: S/N=20dB, V_R=Vod	VIS			31.6	μV
Output power	PWR AMP: THD=10%	Po	0.28			W
Total harmonic distortion	PWR AMP: Vo=0.63V	THD			5.0	%
Voltage gain	PWR AMP	Gv		40		dB

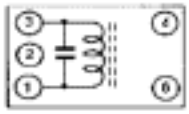
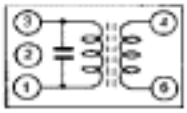
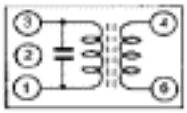
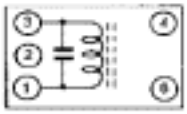
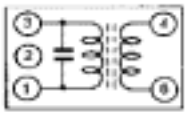
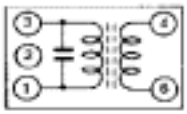
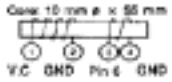
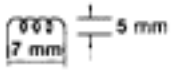
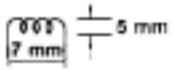
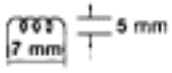
TEST CIRCUIT



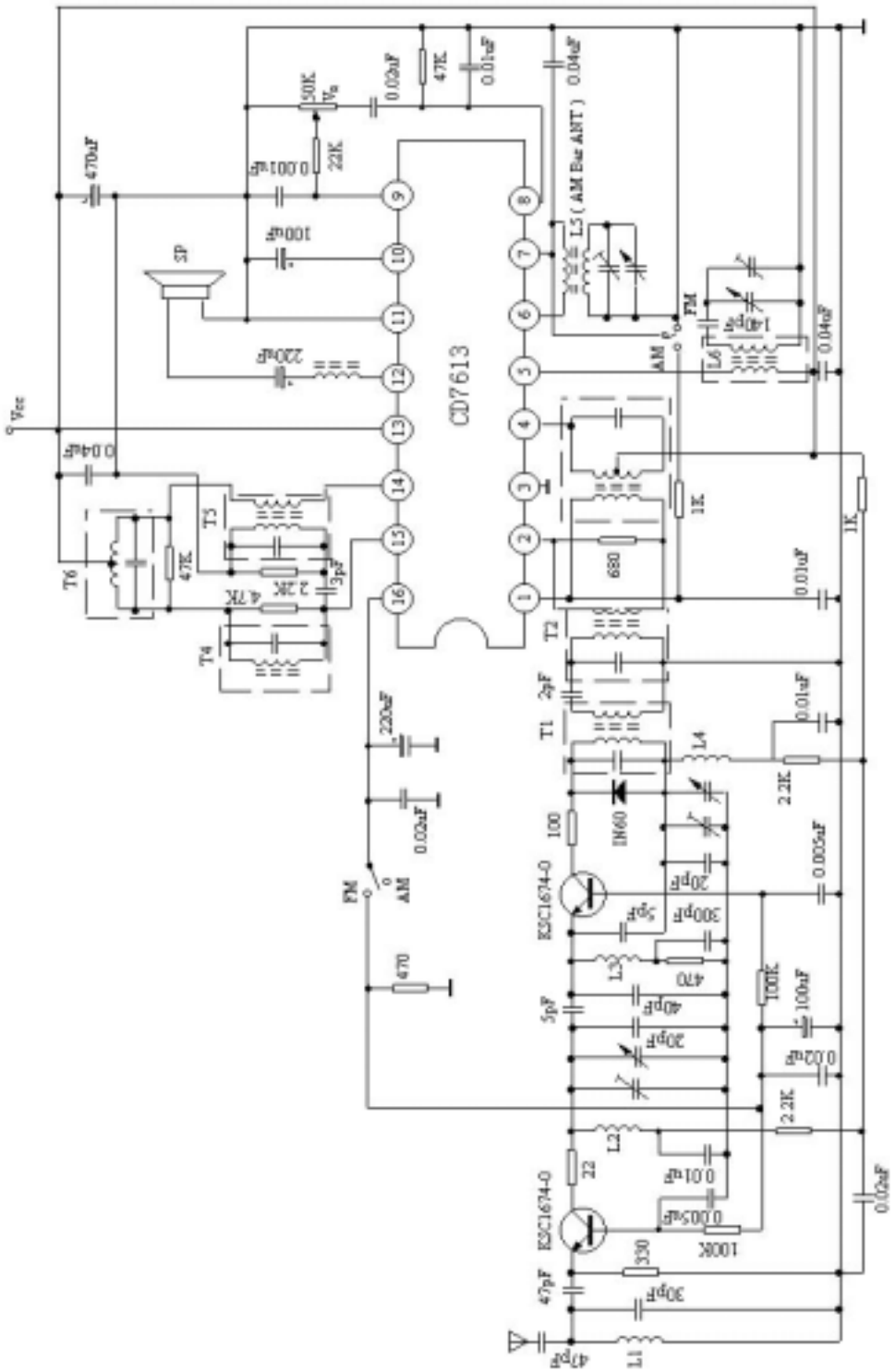
APPLICATION CIRCUIT 1



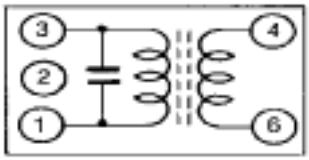
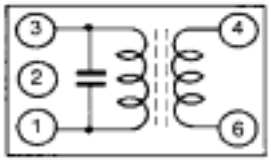
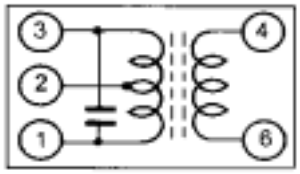
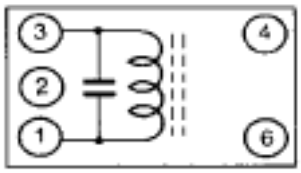
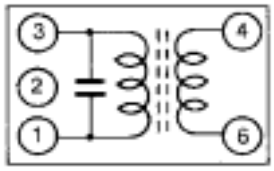
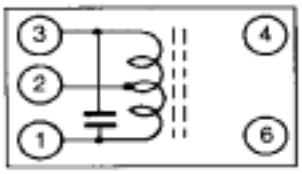
COIL SPECIFICATION 1

Coil No.	f	Q_0	Turns		C_0	Connections
T1	10.7MHz	120	1-3	6T	150pF	
T2	10.7MHz	70min	1-3 4-6	11T 2T	75±5pF	
T3 (T6)	455KHz	80min	1-2 2-3 4-6	91T 55T 6T	180±5pF	
T4	10.7MHz	45min	1-3	11T	82±3pF	
T5	10.7MHz	25min	1-3 4-6	7T 7T	180pF	
L1	AM Local Oscillator	90min	1-3 4-6	86T 7T		
L2	AM ANT	200	1-2 (L = 560 μ)H 3-4	136T 9T		
L3	FM ANT		0.8 mmϕ UEW TAP	5T 0.5T		
L4	Trap		0.32 mmϕ UEW	10T		
L5	FM Oscillator		0.8 mmϕ UEW	4T		

APPLICATION CIRCUIT 2



COIL SPECIFICATION 2

Coll No.	f	Qo	Turns		C.L.	Connections
T1	10.7MHz	90	1-3 4-6	113	82pF	
T2	10.7MHz	60	1-3 4-6	52	390pF	
T3	455kHz	100	1-2 1-3 4-6	127 28 10	180pF	
T4	10.7MHz	45(Min)	1-3	11	82pF	
T5	10.7MHz	25(Min)	1-3 4-6	77	180pF	
T6	455kHz	100	1-2 2-3	50 50	390pF	
L6	796kHz	100	1-3 4-6	100 10	360μH