客 户 承 认 书

MODEL:TDQ-230V-186

TYPE:FM/AM TUNER FOR CAR

DESCRIPTION:Single-Chip Tuner For Car Radio

MODEL No:TDQ-230V-186 TEF6686 TUNER

客户名称：_____

日　　期：_____

此栏为客户签字栏

确认	批准	承认

SHENZHEN SHI LI XIN ELECTRONICS CO., LTD

ADD:2/F,No.C2 Hongdehui Industrial Zone,NO.128 Kangqiao Road,
Nanwan Street Longgang District ShenZhen City.

TEL:(86 755)28281811-877

FAX:(86 755)28281555

E-Mail: qzg@xfa-module.net

HTTP: //www.xfa-module.net

MESSRS :	FM/MW/LW TUNER MODULE	D A T E :
MODEL : TDQ-230V-186	**SPECIFICATION**	KP CODE : TDQ-230V

This is special specification which differs from our standard specification for customer. Preliminary values, still under evaluation, subject to change.

1. ELECTRICAL CHARACTERISTICS

I T E M	DESCRIPTION

2. THE OTHERS

I T E M	DESCRIPTION

						DRAWN	DESIGN	APPR.
page 1	TDQ-230V-186-1001	page 2	TDQ-230V-186-1002	page 3	TDQ-230V-186-1003	Yanjinjing	Quanzhigang	Zhoutie
page 4	TDQ-230V-186-1004	page 5	TDQ-230V-186-1005	page 6	TDQ-230V-186-1006			
page 7	TDQ-230V-186-1007	page 8	TDQ-230V-186-1008	page 9	TDQ-230V-186-1009			
page 10	TDQ-230V-186-1010							

1. FEATURES

-World wide tuner controlled by software.

-FM/AM mixers with high image rejection.

-High performance PLL for fast RDS system.

-Digital IF signal processing with highperformance and free of drift.

-Integrated IF-filters with high selectivity,dynamic range and adaptive bandwidth control.

-RDS demodulation with group and blocksynchronization.

-High performance stereodecoder with noiseblanker.

2. APPENDED DOCUMENTS

2-1. Dimensions and terminal connection.

Refer to the attached drawing No.

2-2. Schematic diagram.

As show in the attached drawing No.

3. TEST CONDITIONS

Test and Measurement carry out at

1) Temparature : 5~35 ℃

2) Supply Voltage : ±2 %

When occurred an objection on the judgement, It will be decide in both discussion.

1) Temparature : 18~ 35℃

2) Supply Voltage : ±0.2 V

Measure characterisitics after 5 minutes from switch ON.

4. GENERAL SPECIFICATIONS

4-1 FM Tuner

	ITEM	SPEC.	
1	Frequency Range	87.5 ~ 108.0 MHz	
2	Intermediate Frequency	IF 150 kHz	
3	Supply voltage	Standard	5.0[V] LDO:AMS1117-3.3
		Working	4.8[V] ~ 5.2[V]
5	Operating Temperature	-30 ~ +80 ℃	
6	Storage Temperature	-30 ~ 85 ℃	
7	Antenna Input Impedance	75 ΩUnbalance	

4-2 AM Tuner

	ITEM	SPEC.	
1	Frequency Range	522kHz ～1620kHz	
2	Intermediate Frequency	US : 5.0kHz / EU : 4.5kHz	
3	Supply voltage	Standard	5.0[V] LDO:AMS1117-3.3
		Working	4.8[V] ～ 5.2[V]
4	Operating Temperature	-30 ~ +80 ℃	
5	Storage Temperature	-30 ~ 85 ℃	
7	Antenna Input Impedance	75 ΩUnbalance	

5. TEST CONDITION

5-1 Standard input signal

Standard test condition

Temperature : 18~22℃ Relative humidity : 65±5%RH

Tolerance of supply voltage : ±0.1V

Tolerance of tuning voltage : ±0.01V

However, test may be done within the following conditions, when it is considered to no affect test result. Temperature ; 5~35℃. Relative humidity ; 45~85%RH.

5-1-1.FM section : Modulation frequency ; 1kHz

Frequency deviation ; Mono :22.5kHz (30% mod.)

Stereo :67.5kHz＋Pilot 10% (7.5kHz)

Input signal voltage ; 50Ω loaded voltage

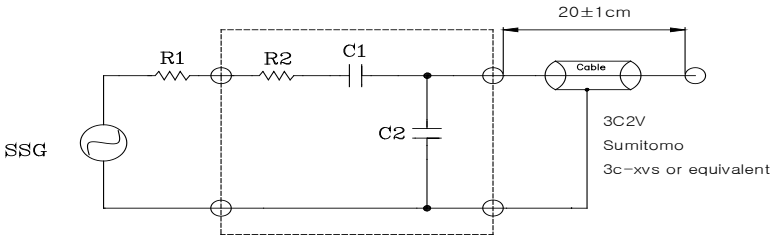
Standard signal level; 60dBμV(1μV=0dBμV)

5-2-1. AM section : Modulation frequency ; 1KHz

Modulation ; 30%

Input signal voltage ; 50Ω open voltage

Standard signal level; 74dBμV(1μV=0dBμV)



S.S.G : Standard Signal Generator

R1 : SSG Output Impedance

R1+R2=80Ω

C1=15pF

C2=65pF

7. ELECTRICAL CHARACTERISTICS

7-1 FM section(87.5MHz~108MHz):

NO	TEST ITEMS	TEST CONDITION	MOD.	C.F.	SPECIFICATION			UNIT
			KHz	MHz	MIN	TYP	MAX	
1	Frequency Range				87.5	--	108	MHz
2	Usable sensitivity	S/N=30dB	22.5kHz	90.1	--	8	12	dBuV
				98.1	--	8	12	
				106.1	--	8	12	
3	Limiting Sens	-3dB Audio	22.5kHz	98.1	--	10	16	dBuV
4	S/N Ratio	Mono Input 60dBuV 19KHz Filter	22.5kHz	98.1	50	55	--	dB
		Stereo Input 60dBuV	75kHz		50	60	--	
5	Distortion	Mono Input 60dBuV	22.5kHz	98.1	--	0.3	0.5	%
		Input 100dBuV	75kHz		--	0.5	1.0	
		Stereo Input 60dBuV	75kHz		--	0.6	1.5	
6	Audio Output Level	Input 60dBuV	22.5kHz	98.1	100	150	200	mV/rms
7	Soft Mute	Input 60dBuV → -20dBuV	22.5kHz	98.1	--	-20	-10	dB
8	Image Rejection	at Usable Sens	22.5kHz	106.1	55	60	--	dB
9	IF Rejection	at Usable Sens	22.5kHz	90.1	60	70	--	dB
10	1/2 IF Rejection	at Usable Sens	22.5kHz	90.1	60	70	--	dB
11	AM Suppression	Input 60dBuV / 400Hz	22.5kHz	98.1	45	50	--	dB
12	SEEK Sensitivity	at 87.5 ~ 108MHz	22.5kHz	98.1	20	25	30	dBuV
13	SEEK Sensitivity Differenc	at 87.5 ~ 108MHz	22.5kHz	-	--	4	6	dBuV
14	Stereo Separation	Input 60dBuV	75kHz	98.1 100Hz	25	30	--	dB
				1kHz	25	30	--	
				10kHz	18	20	--	
15	SNC (10dB Separation)	Input 60dBuV; Pilot=10%	75kHz	98.1 1kHz	35	40	45	dBuV
16	High Cut Control	10kHz Input 60dBuV → 20dBuV	22.5kHz	98.1	-10	-5	-3	dB
17	Frequency Response	Input 60dBuV /75us , -3dB (1kHz = 0dB)	75kHz	98.1	--	60	80	Hz
				10	10	12	--	kHz
18	Alternate Channel	Input 46dBuV △ = ±400 kHz	22.5kHz	98.1	50	80	--	dB
		Input 46dBuV △ = ±200 kHz			30	35	--	

7-2. MW section: (UNIT:dBu)

NO	TEST ITEMS	TEST CONDITION		C.F.	C.L.	MOD.	SPECIFICATION			UNIT
				KHz	dB		MIN	TYP	MAX	
1	Frequency Range			30%	--		522	--	1620	kHz
2	Max. sensitivity	Audio out=30mV		603	--	30	--	15	24	dBuV
				999						
				1404						
3	Usable sensitivity	S/N=20dB		603	--	30	--	25	33	dBuV
				999						
				1404						
4	IF rejection	Input 20dBuV	4.5KHZ	603	--	30	50	70	--	dB
5	Image rejection	Input 20dBuV	4.5KHZ	1404	--	30	50	60	--	dB
6	1 single signal selectivity	Input 30dBuV. ±9kHz		999	--	30	30	50	--	dB
7	Distortion			999	74	30	--	0.4	1.5	%
					100	30	--	0.5	3.0	
					74	80	--	0.5	3.0	
8	Signal to noise ratio	S/N at standard condition		999	74	30	40	50	--	dB
9	AGC FOM	At -10dB from standard output		999	74	30	45	50	--	dB
10	Af output voltage			999	74	30	100	190	250	mV
11	Bandwidth	Input 20dBuV -6 down		999	20	30	5	7	10	kHz
12	SD sensitivity	ST/RQ→5V, SD voltage Lo→Hi		603	--	30	22	30	34	dBuV
				999			22	30	34	
				1404			22	30	34	
13	Frequency response	Input 74dBuV&30% 1kHz=0dB(at-6dB)		999	74	LOW	--	60	80	kHz
						HIGH	1.8	2.2	--	
14	Whistle rejection			900	74	30	40	50	--	dB
				1350			40	50	--	

*Hower, if there is a doubt regarding the measurement, please take the data after 3minutes with power supply "on"

8. OTHER TEST

NO	ITEM	CONDITION	SPEC					
			FM TUNER		AM TUNER			
			Tuning Voltage (V)	Usable Sens. (dB)	Tuning Voltage (V)	Usable Sens. (dB)	Max Sens. (dB)	Stop Level (dB)
1	Vibration Test	15~50Hz, 3G, 5minute Cycles, Up down 4hour Around 2H and 2H	±0.3	±6	±0.6	±6	±6	±6
2	Hot Temp Test	85°C 72 Hour → 20°C 24 Hour →Record	±0.6	±6	±0.6	±6	±8	±8
3	Could Temp Test	-30°C 72 Hour → 20°C 24 Hour →Record	±0.3	±6	±0.6	±6	±8	±8
4	Humidity Test	60°C90~95% RH 72 Hour →20°C 24 Hour →Reco - rd	±0.3	±6	±0.6	±6	±8	±8
5	Heat Shock Test	80°C1 Hour and -30°C 1 Hour 10 Cycles → 20°C 24 Hour →Record	±0.6	±6	±0.6	±6	±6	±6

9. TEMPERATURE TEST

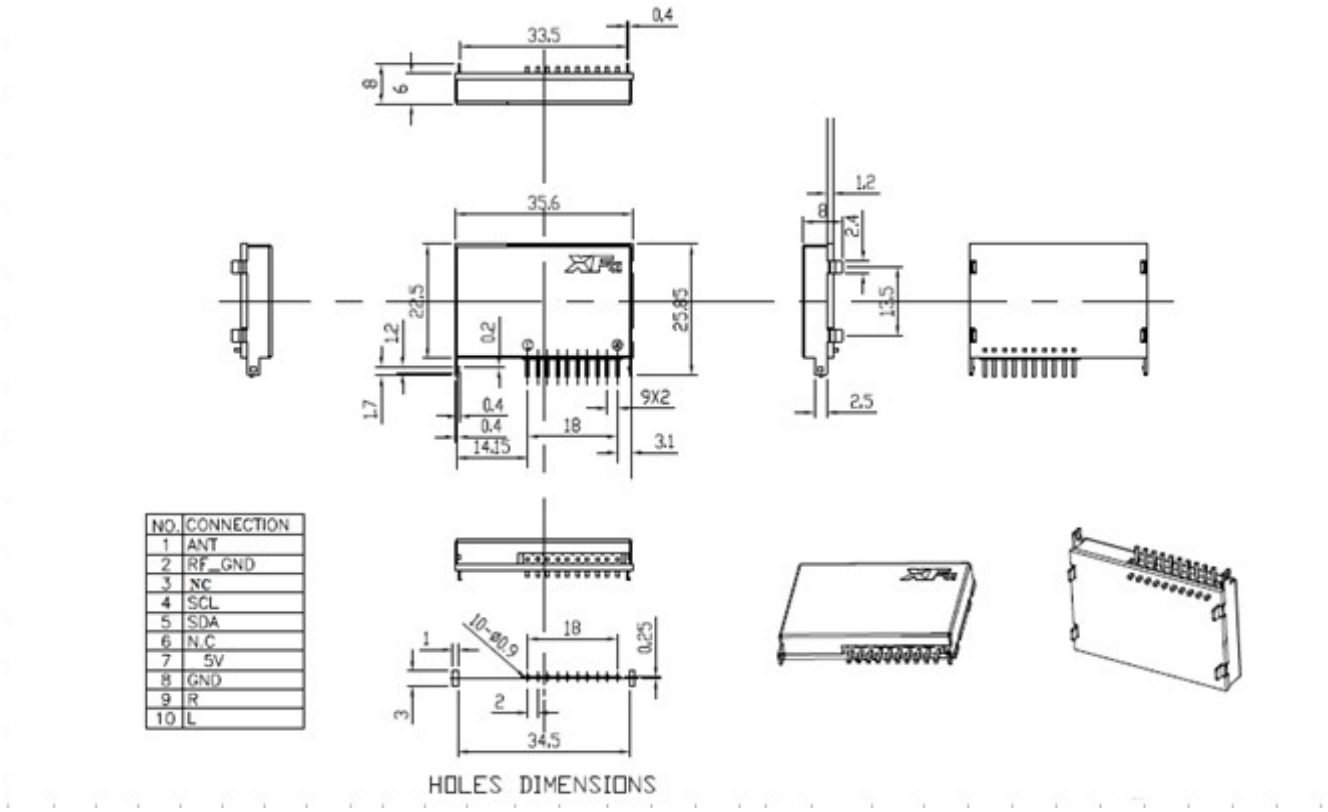
ITEM	CONDITION	SPEC				Absolute value
		Tuning Voltage (V)	Usable Sens. (dB)	Max Sens. (dB)	Stop level (dB)	SD Band Width (kHz)
FM	-20°C~ 70°C	±0.5 MAX (±0.3 TYP)	±8MAX (±4 TYP)	±8 MAX (±6 TYP)	±8 MAX (±6 TYP)	--
	-30°C~ 80°C	--	--	--	--	±10 MIN

ITEM	CONDITION	SPEC			
		Tuning Voltage (V)	Usable Sens. (dB)	Max Sens. (dB)	Stop level (dB)
AM (MW)	-20°C~ 70°C	±1.0	±5 MAX	±12 -8 MAX	±11 -8 MAX
			(±3 TYP)	(±8 -6 TYP)	(±8 -6 TYP)
AM (LW)	-20°C~ 70°C	--	--	±12 -8 MAX	±11 -8 MAX
				(±8 -6 TYP)	(±8 -6 TYP)

结 构 参 考 尺 寸 图

MODEL:TDQ-230V

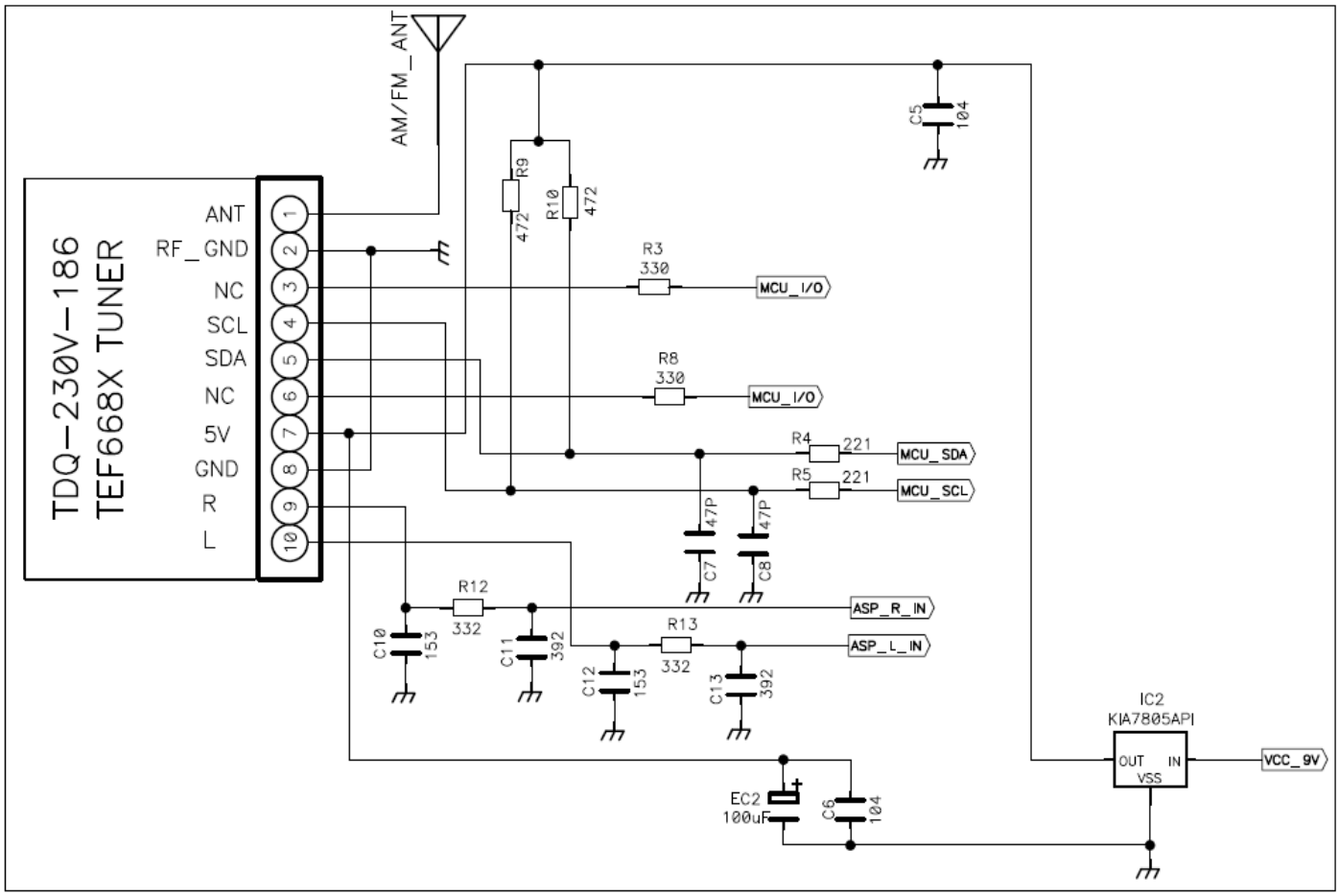
OUTER DIMENSIONS AND TERMINALS FOR CONNECTION



NO.	PIN_NAME	NO.	PIN_NAME
1	FM_AM_ANT	6	N.C
2	RF_GND	7	+5V
3	NC	8	GND
4	SCL	9	R
5	SDA	10	L

TDQ-230V-186外接原理图schematic

TUNER外接原理图schematic。



(1) 天线ANT处,不需外加零器件,天线座与TUNER第1PIN间,用0.25mm线宽信号线,安全间距0.25mm地GND屏蔽.信号线最好从底层BOTTOM层,走至高频头第1脚.(TOP层干扰多).否则,EMC中S1（抗干扰能力）有问题,实用灵敏度差.

(2) 高频头RF_GND与GND及TUNER CASE间用一块地GND,EMC效果好.

(3) 高频头TUNER,最理想供电稳压IC为5V.

(4) TUNER L/R输出接去加重电路de_emphasis,提高信噪比S/N.

(5) 3PIN 6PIN:NC与INTB与MCU I/O口连接，实现复位与中断读取状态数据。方便直接切换TDA7703 TDA7706M TDA7786。

(6) （i）SDA（ii）SCL PIN上需串联101～102电阻，用于MCU与TEF668X IC在数据传输时，如果MCU（3.3V 与5V） 与TEF668X IC直接连接，数据发送 接收因无隔离电阻，数据传输出错! SET外需接2个472上拉电阻，上拉电阻接5V.