

TST Xtal Business Unit

Products by Application

2008Q1_R1

TST Solutions – Mobile Phone

Chipset: Silicon Lab. AERO/I+/ II
System application : GSM, GPRS
Crystal: TZ0174A : 13 MHz, CL=8PF, 5.0x3.2x0.8mm
TZ0495C : 26 MHz, CL=10PF, 3.2x2.5x0.7mm



Chipset: NXP, AeroFONE
System application : GSM, GPRS
Crystal: TZ1083A : 26 MHz, CL=9.5PF, 3.2x2.5x0.7mm



Chipset: Infineon, eGold Radio (ULC1) / eGold Voice (ULC2)
System application : GSM, GPRS
Crystal: TZ0820A : 26 MHz , CL=10PF, 3.2x2.5x0.8mm (ULC1)
TZ1215A : 26 MHz , CL=10PF, 3.2x2.5x0.8 mm (ULC2)



TST Solutions – Mobile Phone

Chipset: TI, Rita Locosto
System application : GSM, GPRS
Crystal: TZ0357C : 26 MHz, CL=8PF, 4.0x2.5mm
TZ0813A : 26MHz, CL=12PF, 3.2x2.5mm



Chipset: Media Tek , MT6139 / MT6129
System application : GSM, GPRS
Crystal: TZ0928A : 26 MHz, CL=8.4PF, 3.2x2.5x0.7mm
TCXO: TX0161A : 26MHz 3.2x2.5x0.7mm



Chipset: Skyworks (sky74117)
System application : GSM, GPRS
Crystal: TZ1091A : 26 MHz, CL=10PF, 3.2x2.5x0.7mm



Chipset: Qualcomm
System application : WCDMA
TCXO: TX0131A : 19.2 MHz 3.2x2.5x0.7mm



Transceiver IC	ULC1 (Infineon)	ULC2 (Infineon)	Aero/ I+ (Silicon Labs)	Aero II (Silicon Labs)	Si4210 (NXP)	Rita (TI)	Locosto (TI)
TST PN	TZ0820C	TZ1215B	TZ0186A	TZ0495C	TZ1083A	TZ0357C	TZ0813A
Package	SMD3225	SMD3225	SMD5032	SMD3225	SMD3225	SMD4025	SMD3225
Frequency (MHz)	26	26	13	26	26	26	26
Crystal CL or XO/TCXO Vcc	10pF	10pF	8.5pF	8pF	9.5pF	8pF	12.5pF
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	4.3 fF typ.	6.3 fF typ.	25.5 ppm/pF ± 10%	27.5 ppm/pF ± 10%	17.5 ppm/pF ± 10%	20 ppm/pF ± 10%	5.5 fF typ.
Make Tolerance @25°C	±10 ppm	±10 ppm	±10 ppm	30±10 ppm	±10 ppm	21±10 ppm	±10 ppm
Operating Temperature Range	-30~+85°C	-20~+75°C	-20~+85°C	-20~+85°C	-20~+75°C	-20~+75°C	-20~+75°C
Frequency Stability over Operating Temperature	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm
Equivalent Series Resistance	50Ω max.	50Ω max.	40Ω max.	50Ω max.	50Ω max.	60Ω max.	34Ω max.

Transceiver IC	PHS (Airoha)	PHS	6600D/ M (Spreadtrum)	WCDMA (Qualcomm)	Bright-V (Renesas)	MT6139 (MTK)	MT6129 (MTK)
TST PN	TX0136C	TX0187A	TZ0495C	TX0131A	TZ0355A	TZ0928A	TX0161A
Package	SMD5032	SMD3225	SMD3225	SMD3225	SMD5032	SMD3225	SMD3225
Frequency (MHz)	19.2	19.2	26	19.2	26	26	26
Crystal CL or XO/TCXO Vcc	2.8V	2.8V	8pF	2.8V	9.5pF	8.4pF	2.8V
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv			27.5 ppm/pF ± 10%	+/-8 ~ +/-14 ppm/V	20 ppm/pF min. (24 ppm/pF typ.)	5.6 fF typ.	+/-8 ~ +/-14 ppm/V
Make Tolerance @25°C	±1.5 ppm	±1.5 ppm	30±10 ppm	±1.5 ppm	26±8 ppm	±10 ppm	±1.5 ppm
Operating Temperature Range	-20~+75°C	-20~+75°C	-20~+85°C	-20~+75°C	-30~+85°C	-20~+75°C	-20~+75°C
Frequency Stability over Operating Temperature	±2.5 ppm	±2.5 ppm	±10 ppm	±2.5 ppm	±11 ppm	±10 ppm	±2.5 ppm
Equivalent Series Resistance	(TCXO)	(TCXO)	50Ω max.	(VCTCXO)	35Ω max.	35Ω max.	(VCTCXO)

TST Solutions – *Bluetooth*

Chipset:

Cambridge Silicon Radio (CSR)

System application :

Bluetooth

Crystal:

TZ0661A : 26MHz CL=9PF 2.5x2.0x0.6mm

TZ0233A : 16MHz CL=9PF 3.2x2.5x0.7mm

TZ0311B : 26MHz CL=9PF 3.2x2.5x0.7mm

TZ0111A : 16MHz CL=9PF 4.0x2.5x0.8mm

TZ0164A : 26MHz CL=9PF 4.0x2.5x0.8mm

TZ0110A : 16MHz CL=9PF 5.0x3.2x0.9mm



Chipset:

Broadcom

System application :

Bluetooth

Crystal:

TZ1187A: 26MHz CL=9PF 2.0x1.6x0.6mm

TZ0260A :26MHz CL=12PF 3.2x2.5x0.7mm

TZ0466A :24MHz CL=12PF 3.2x2.5x0.7mm

TZ0298A :26MHz CL=12PF 4.0x2.5x0.8mm

TZ0184A :15.36MHz CL=10PF 4.0x2.5x0.8mm

TZ0130A :15.36MHz CL=18PF 5.0x3.2x0.9mm



TST Solutions – *Bluetooth*

Chipset: Media Tek (MT6601)
System application : Bluetooth
Crystal: TZ0375A : 32MHz, CL=12PF, 3.2x2.5x0.7mm
TZ0260A : 26MHz, CL=12PF, 3.2x2.5x0.7mm



Chipset: Ti
System application : Bluetooth
Crystal: TZ0387A : 13MHz, CL=10PF, 4.0x2.5x0.8x0.7mm



Chipset: Wisair
System application : UWB
Crystal: TZ0476A : 24MHz, CL=12PF, 3.2x2.5x0.7mm



IC Solution	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (CSR)	Bluetooth (BCM2045)	Bluetooth (BCM2045)	Bluetooth (Broadcom)	Bluetooth (BCM2042)
TST PN	TZ0110A	TZ0399A	TZ0111A	TZ0164A	TZ0435A	TZ0233A	TZ0311B	TZ0661A	TZ0260A	TZ0298A	TZ0466A	TZ0466B	
Package	SMD5032	SMD5032	SMD4025	SMD4025	SMD3225	SMD3225	SMD3225	SMD2520	SMD3225	SMD4025	SMD3225	SMD3225	
Frequency (MHz)	16	26	16	26	13	16	26	26	26	26	24	24	
Crystal CL or XO/TCXO Vcc	9pF	9pF	9pF	9pF	9pF	9pF	9pF	9pF	12pF	12pF	12pF	12pF	
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	20 ppm/pF min.	5.5 fF typ.	17 ppm/pF min.	17 ppm/pF min.	1.7 fF typ.	9 ppm/pF min.	16.5 ppm/pF min.	2.5 fF typ.	3.3 fF typ.	5.8 fF typ.	2.9 fF typ.	2.9 fF typ.	
Make Tolerance @25°C	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±30 ppm	±10 ppm	
Operating Temperature Range	-20~+75°C	-10~+60°C	-20~+75°C	-20~+75°C	-10~+60°C	-20~+75°C	-20~+75°C	-20~+75°C	-20~+70°C	-20~+70°C	-20~+70°C	-10~+60°C	
Frequency Stability over Operating Temperature	±9 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±9 ppm	±10 ppm	±10 ppm	±10 ppm	±50 ppm	±10 ppm	
Equivalent Series Resistance	35Ω max.	40Ω max.	50Ω max.	50Ω max.	100Ω max.	80Ω max.	40Ω max.	100Ω max.	60Ω max.	50Ω max.	50Ω max.	50Ω max.	

IC Solution	Bluetooth (Zeevo)	Bluetooth (Zeevo)	Bluetooth (TI)	Bluetooth (Philips)	Bluetooth (Philips)	Bluetooth (RFMD)	Bluetooth (RFMD)	Bluetooth (ISSC)	Bluetooth (MTK)	Bluetooth (MTK)		
TST PN	TZ0175A	TZ0192A	TZ0387A	TZ0387A	TZ0476A	TZ0189A	TZ0375A	TZ0302A	TZ0260A	TZ0375A		
Package	SMD4025	SMD5032	SMD4025	SMD4025	SMD3225	SMD4025	SMD3225	SMD4025	SMD3225	SMD3225		
Frequency (MHz)	12	12	13	13	24	19.2	32	16	26	32		
Crystal CL or XO/TCXO Vcc	9pF	9pF	10pF	10pF	10pF	10pF	12pF	12pF	12pF	12pF		
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	2fF typ.	4.0 fF ±20%	2.0 fF min.	2.0 fF min.	2.9 fF typ.	4.4 fF typ.	4.2 fF typ.	3.4 fF typ.	3.3 fF typ.	4.2 fF typ.		
Make Tolerance @25°C	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm		
Operating Temperature Range	-10~+60°C	-10~+60°C	-20~+70°C	-20~+70°C	-20~+70°C	-10~+60°C	-20~+70°C	-10~+60°C	-20~+70°C	-20~+70°C		
Frequency Stability over Operating Temperature	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm		
Equivalent Series Resistance	60Ω max.	60Ω max.	100Ω max.	100Ω max.	50Ω max.	50Ω max.	50Ω max.	50Ω max.	50Ω max.	50Ω max.		

TST Solutions – WiFi

Chipset: **Atheros**
System application : WLAN 802.11a/b/g

Crystal : TZ0309C: 40MHz, CL=16PF, 5.0x3.2 mm
TZ0394A/B : 40MHz , CL=12PF, 3.2x2.5mm
TZ1269A: 40MHz, CL=9PF, 2.0x1.6mm



Chipset: **Marvell, Broadcom**
System application : WLAN 802.11g

Crystal : TZ0317A : 20MHz, CL=16PF, 3.2x2.5mm
TZ0909B : 38.4MHz, CL=10PF, 2.5x2.0mm
TZ1188A : 38.4MHz, CL=10PF, 2.0x1.6mm
Oscillator : TW0167A : 40MHz Oscillator, 2.5x2.0mm



Chipset: **Ralink**
System application : WLAN 802.11a/b/g/n

Crystal : TZ0475B: 40MHz, CL=15PF, 3.2x2.5mm
TZ0530C: 40MHz, CL=15PF, 5.0x3.2 mm



IC Solution	WiFi 11bg (Atheros)	WiFi 11bg (Atheros)	WiFi (Atheros)	WiFi (Atheros)	WiFi 11n (Atheros)	WiFi (Atheros)	WiFi (Atheros)	WiFi 11g (BCM4318)	WiFi 11n (BCM4321)	WiFi (Marvell)	WiFi (Marvell)
TST PN	TZ0309C	TZ0530A	TZ0987A	TZ0394B	TZ0608A	TZ0631C	TZ1269A	TZ0817A	TZ0317A	TZ0909A	TZ1188A
Package	SMD5032	SMD5032	SMD3225	SMD3225	SMD2520	SMD2520	SMD2016	SMD6035	SMD3225	SMD2520	SMD2016
Frequency (MHz)	40	40	40	40	40	26	40	20	20	38.4	38.4
Crystal CL or XO/TCXO Vcc	16pF	15pF	12pF	12pF	16pF	10pF	16pF	18pF	16pF	10pF	10pF
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	6.5 fF typ.	6.5 fF typ.	5.8 fF typ.	5.8 fF typ.	4.0 fF typ.	2.5 fF typ.	2.6 fF typ.		2.5 fF typ.	4.1 fF typ.	2.7 fF typ.
Make Tolerance @25°C	±9 ppm	±9 ppm	±10 ppm	25±7 ppm	±10 ppm	±10 ppm	±9 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm
Operating Temperature Range	0~+85°C	-20~+85°C	0~+85°C	0~+85°C	-30~+85°C	-20~+85°C	-20~+70°C	-10~+60°C	-10~+60°C	-10~+60°C	-30~+85°C
Frequency Stability over Operating Temperature	±9 ppm	±10 ppm	±18 ppm	+10~-15 ppm	±15 ppm	±10 ppm	±9 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm
Equivalent Series Resistance	25Ω max.	20Ω max.	30Ω max.	30Ω max.	50Ω max.	60Ω max.	50Ω max.	90Ω max.	80Ω max.	80Ω max.	30Ω max.

IC Solution	UWB (Realtek)	UWB (Realtek)	UWB (Realtek)	WiFi (Ralink)	WiFi 11n (Ralink)	UWB (WiQuest)	UWB (Wisair)	UWB (TZERO)	VDSL (Ikanos)	VDSL (Conexant)	WiFi (TI)
TST PN	TZ1210A	TZ1209A	TZ327E	TZ0530C	TZ0475B	TZ0314B	TZ0476A	TW0208A	TZ0421A	TX0158A	TZ0293A
Package	SMD5032	SMD3225	SMD3225	SMD5032	SMD3225	SMD5032	SMD3225	SMD5032	SMD5032	SMD7050	SMD5032
Frequency (MHz)	66	66	12	40	40	48	24	40	35.328	35.328	40
Crystal CL or XO/TCXO Vcc	16pF	16pF	16pF	15pF	15pF	1pF	10pF	15pF	10pF	15pF	20pF
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	0.4 fF typ.	0.2 fF typ.	1.7 fF typ.	6.5 fF typ.	5.8 fF typ.	12 fF typ.	2.9 fF typ.	3.3V±5%	11 fF typ.	3.3V±5%	11 fF typ.
Make Tolerance @25°C	±10 ppm	±10 ppm	±15 ppm	±20 ppm	±10 ppm	±10 ppm	±10 ppm	±15 ppm	±15 ppm	±50 ppm	±15 ppm
Operating Temperature Range	-20~+70°C	-20~+70°C	-10~+85°C	-20~+70°C	-20~+85°C	-20~+70°C	-20~+70°C	-20~+70°C	-40~+85°C	-10~+70°C	-10~+70°C
Frequency Stability over Operating Temperature	±10 ppm	±10 ppm	±20 ppm	±15 ppm	±10 ppm	±10 ppm	±10 ppm	±15 ppm	±25 ppm	±50 ppm	±15 ppm
Equivalent Series Resistance	80Ω max.	80Ω max.	100Ω max.	40Ω max.	50Ω max.	40Ω max.	50Ω max.	(XO)	30Ω max.	(VCXO)	40Ω max.

TST Solutions – WiMax

Chipset: Intel

System application : WiMax 802.16e

TCXO : TX0249A: 40MHz, 3.2x2.5 mm



Chipset: Sequans

System application : WiMax 802.16e

TCXO : TX0249A: 40MHz 3.2x2.5 mm



Chipset: Beceem

System application : WiMax 802.16e

Crystal TZ0977A: 40MHz, CL=15PF, 3.2x2.5 mm



Chipset: Runcom

System application : WiMax 802.16e

TCXO : TX0269A: 30MHz 3.2x2.5 mm



IC Solution	WiMAX (Sequans)	WiMAX (Runcom)	WiMAX (Beceem)	WiMAX (INTEL)	WiMAX (INTEL)	WiMAX (INTEL)	WiMAX (INTEL)
TST PN	TX0249A	TX0269A	TZ0977A	TX0249A	TZ1194A	TZ0717C	TW0158C
Package	SMD3225	SMD3225	SMD3225	SMD3225	SMD5032	SMD3225	SMD3225
Frequency (MHz)	40	30	40	40	40	24	40
Crystal CL or XO/TCXO Vcc	2.8V	2.8V	15pF	2.8V	10pF	8pF	10pF/2.8V
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv		+/-9 ~ +/-15 ppm/V	5.8 fF typ.		6.5 fF typ.	2.9 fF typ.	
Make Tolerance @25°C	±1.0 ppm	±1.5 ppm	±10 ppm	±1.0 ppm	±15 ppm	±25 ppm	±10 ppm
Operating Temperature Range	-30~+85°C	-30~+80°C	-20~+70°C	-30~+85°C	-0~+85°C	-20~+90°C	-0~+85°C
Frequency Stability over Operating Temperature	±2.0 ppm	±2.0 ppm	±30 ppm	±2.0 ppm	±10 ppm	±25 ppm	±10 ppm
Equivalent Series Resistance	(TCXO)	(VCTCXO)	100Ω max.	(TCXO)	20Ω max.	30Ω max.	(XO)

TST Solutions – GPS

Chipset: SiRF

System application : GPS

TCXO: TX0183A : 16.369MHz +/-2.5ppm 5.0x3.2mm
TX0191C : 16.369MHz +/-0.5ppm 3.2x2.5mm
TX0224A : 24.5535MHz +/-0.5ppm 3.2x2.5mm



Chipset: Sige

System application : GPS

TCXO: TX0182A : 16.368MHz +/-2.0ppm 5.0x3.2mm
TX0275A : 16.368MHz +/-0.5ppm 3.2x2.5mm



Chipset: Nemerix

System application : GPS

TCXO: TX0156A : 16.367667MHz +/-2.5ppm 5.0x3.2mm
TX0156D : 16.367667MHz +/-0.5ppm 5.0x3.2mm
TX0240A : 16.367667MHz +/-0.5ppm 3.2x2.5mm



Chipset: Media Tek (MT1316)

System application : GPS

TCXO: TX0275A : 16.368MHz +/-0.5ppm 3.2x2.5mm



TST Solutions – GPS

Chipset: Atmel
System application : GPS
TCXO/Crystal: TZ0499A : 23.104MHz CL=19pF 5.0x3.2mm
TX0227A : 23.104MHz 3.2x2.5mm



Chipset: u-Blox
System application : GPS
TCXO: TX0203A : 26MHz +/-0.5ppm 3.2x2.5mm



Chipset: Sony
System application : GPS
TCXO/Crystal: TX0174A : 18.414MHz +/-2.0ppm 5.0x3.2mm



Chipset: Global Locate
System application : GPS
TCXO: TX0203A : 26MHz +/-0.5ppm 3.2x2.5mm



Chipset	MTK / Nemerix / M-star / Sige	MTK / Nemerix / M-star / Sige	Nemerix / Skytrake	Nemerix / Skytrake	SiRF / M-star	SiRF / M-star
TST TCXO PN	TX0275A	TX0222G	TX0240G	TX0279A	TX0191H	TX0280A
Package	SMD3225	SMD3225	SMD3225	SMD3225	SMD3225	SMD3225
Frequency (MHz)	16.368	16.368	16.367667	16.367667	16.369	16.369
Vcc (V)	2.85	2.85	2.85	2.85	2.85	2.85
Make Tolerance @25°C	±2 ppm	±1.5 ppm	±2 ppm	±2 ppm	±1.5 ppm	±2 ppm
Operating Temperature Range	-30~+85°C	-30~+85°C	-30~+85°C	-30~+85°C	-30~+85°C	-30~+85°C
Frequency Stability over Operating Temperature	±0.5 ppm	±0.5 ppm	±0.5 ppm	±0.5 ppm	±0.5 ppm	±0.5 ppm
Frequency Slope (Minimum of one measurement every 2°C)	±0.05 ppm/°C @-30~+85°C	±0.1 ppm/°C @-20~+75°C ±0.3 ppm/°C @-30~+85°C	±0.1 ppm/°C @-20~+75°C ±0.3 ppm/°C @-30~+85°C	±0.05 ppm/°C @-30~+85°C	±0.1 ppm/°C @-20~+75°C ±0.3 ppm/°C @-30~+85°C	±0.05 ppm/°C @-30~+85°C
Power Supply Current (mA)	2	2	2	2	2	2
Phase Noise (@1KHz)	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz

Chipset	Global Locate	Atmel	Nemerix	Nemerix	SiRF	
TST TCXO PN	TX0203A	TX0226G	TX0156A	TX0156D	TX0146A	
Package	SMD3225	SMD3225	SMD5032	SMD5032	SMD5032	
Frequency (MHz)	26	23.104	16.367667	16.367667	24.5535	
Vcc (V)	2.775	2.85	3.3	2.85	3	
Make Tolerance @25°C	±1 ppm	±1.5 ppm	±1 ppm	±0.5 ppm	±2 ppm	
Operating Temperature Range	-30~+85°C	-30~+85°C	-40~+85°C	-30~+85°C	-40~+85°C	
Frequency Stability over Operating Temperature	±0.5 ppm	±0.5 ppm	±2.5 ppm	±0.5 ppm	±2.5 ppm	
Frequency Slope (Minimum of one measurement every 2°C)		±0.1 ppm/°C @-20~+75°C ±0.3 ppm/°C @-30~+85°C				
Power Supply Current (mA)	2	2	2	2	2	
Phase Noise (@1KHz)	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz	-130 dBc/Hz	

TST Solutions – RFID

IC Solution	RFID	RFID	RFID	RFID	RFID	RFID	RFID	RFID	RFID
TST Crystal PN	TZ0218A	TZ0491A	TZ0419A	TZ0929A	TZ0930A	TZ0633A	TZ1244A	TZ1311A	TZ1361A
Package	SMD5032	SMD5032	SMD4025	SMD3225	SMD3225	SMD3225	SMD3225	SMD3225	SMD2520
Frequency (MHz)	14.7456	27.12	11.0592	13.56	13.56	27.12	40.22	40.675	18.432
CL	16pF	12pF	16pF	32pF	32pF	10pF	16pF	16pF	8pF
Trim Sensitivity (ppm/pF) or Motional Capacitance (fF)	4.9 fF typ.	5.8 fF typ.	2.1 fF typ.	1.8 fF typ.	1.8 fF typ.	3.6 fF typ.	3.8 fF typ.	4.0 fF typ.	1.4 fF typ.
Make Tolerance @25°C	±10 ppm	±10 ppm	±30 ppm	±30 ppm	±30 ppm	±10 ppm	±10 ppm	±10 ppm	±10 ppm
Operating Temperature Range	-20~+70°C	-10~+60°C	-10~+60°C	-20~+70°C	-40~+85°C	-10~+60°C	-10~+60°C	-10~+60°C	-30~+85°C
Frequency Stability over Operating Temperature	±10 ppm	±10 ppm	±50 ppm	±30 ppm	±30 ppm	±10 ppm	±10 ppm	±10 ppm	±15 ppm
Equivalent Series Resistance	50Ω max.	50Ω max.	100Ω max.	100Ω max.	100Ω max.	100Ω max.	50Ω max.	40Ω max.	100Ω max.

TST Solutions – TPMS

IC Solution	TPMS	TPMS	TPMS	TPMS	TPMS	TPMS	TPMS
TST Crystal PN	TZ0645A	TZ1364A	TZ0646A	TZ0682A	TZ1247A	TZ1099A	TZ0259A
Package	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032
Frequency (MHz)	9.84375	9.84375	9.864375	10	10.178125	12.67917	13.56
Crystal CL or XO/TCXO Vcc	10pF	7pF	10pF	20pF	22pF	3.3pF	20pF
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	4.9 fF typ.	5.8 fF typ.	2.1 fF typ.	1.8 fF typ.	1.8 fF typ.	3.6 fF typ.	3.8 fF typ.
Make Tolerance @25°C	±30 ppm	±10 ppm	±30 ppm	±20 ppm	±20 ppm	±30 ppm	±10 ppm
Operating Temperature Range	-40~+85°C	-40~+125°C	-40~+85°C	-40~+105°C	-40~+105°C	-40~+85°C	-40~+125°C
Frequency Stability over Operating Temperature	±30 ppm	±80 ppm	±30 ppm	±30 ppm	±30 ppm	±30 ppm	±50 ppm
Equivalent Series Resistance	100Ω max.	80Ω max.	100Ω max.	100Ω max.	100Ω max.	80Ω max.	40Ω max.

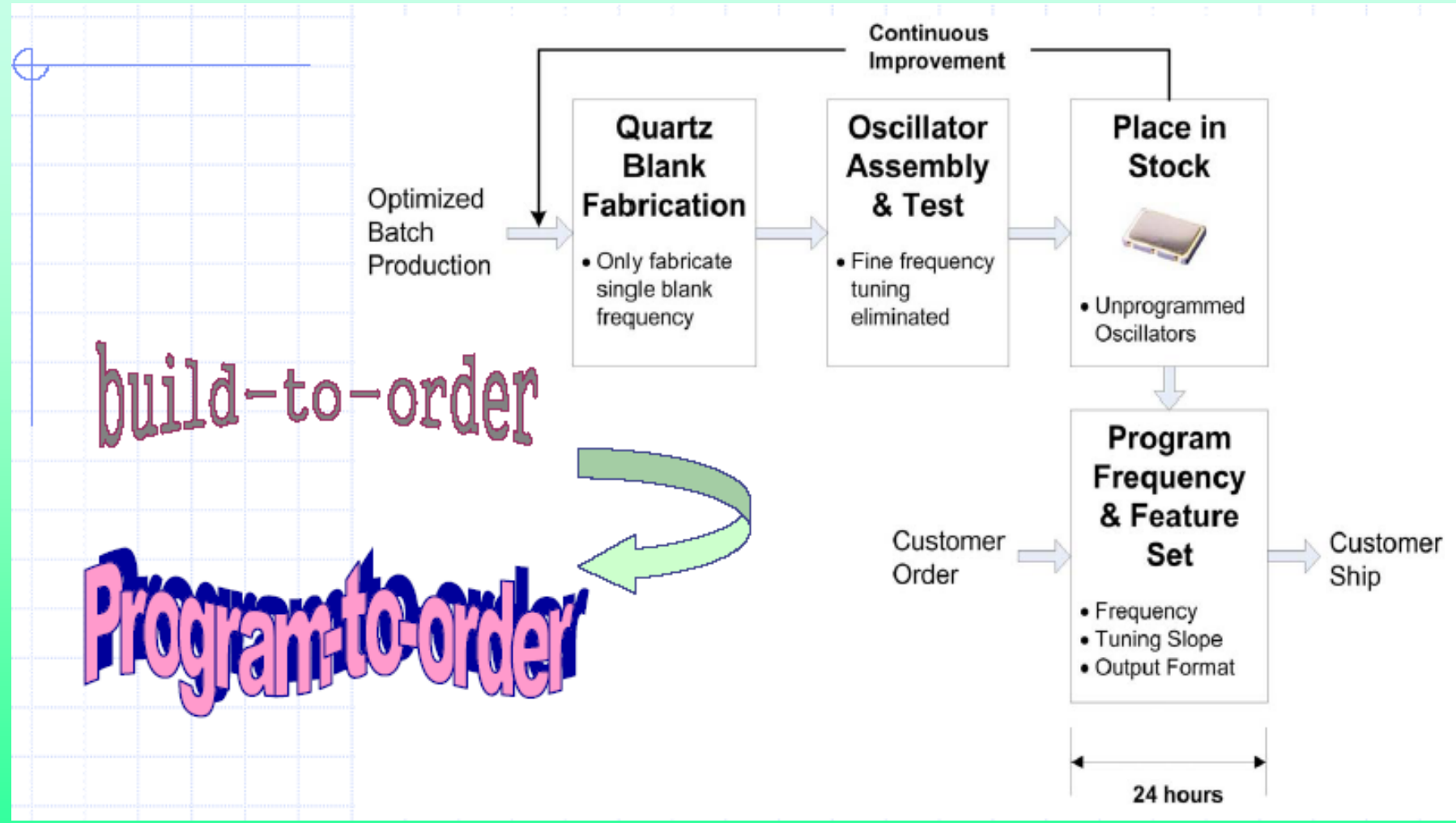
IC Solution	TPMS	TPMS	TPMS	TPMS	TPMS	TPMS	TPMS
TST Crystal PN	TZ0344A	TZ0869B	TZ0131D	TZ0613C	TZ0628A	TZ1386A	TZ1100A
Package	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032
Frequency (MHz)	13.56	13.56	16	16	20	50.7167	70.5367
Crystal CL or XO/TCXO Vcc	12pF	12pF	20pF	16pF	30pF	6pF	6pF
Trim Sensitivity (ppm/pF), Cm (fF) or VCTCXO Kv	4.9 fF typ.	5.8 fF typ.	2.1 fF typ.	1.8 fF typ.	1.8 fF typ.	3.6 fF typ.	3.8 fF typ.
Make Tolerance @25°C	±10 ppm	±10 ppm	±20 ppm	±20 ppm	±50 ppm	±20 ppm	±20 ppm
Operating Temperature Range	-40~+125°C	-40~+125°C	-40~+85°C	-40~+85°C	-40~+125°C	-40~+85°C	-40~+85°C
Frequency Stability over Operating Temperature	±50 ppm	±80 ppm	±20 ppm	±20 ppm	±50 ppm	±50 ppm	±50 ppm
Equivalent Series Resistance	40Ω max.	80Ω max.	40Ω max.	40Ω max.	50Ω max.	80Ω max.	80Ω max.

TST Product – (XO) Crystal Oscillator

Application	WLAN	WLAN	DSC	DSC	DSC	Storage	Storage	Storage
TST PN	TW0146A	TW0196A	TW0159A	TW0174A	TW0168A	TW0234A	TW0235A	TW0236A
Package	SMD5032	SMD5032	SMD5032	SMD5032	SMD5032	SMD7050	SMD7050	SMD7050
Frequency (MHz)	26	40	48	67.5	72	80	100	125
Output Level	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Output Load	15pF	15pF	15pF	15pF	15pF	15pF	15pF	15pF
Vdd (V)	2.85	2.8	3.3	3.3	3.3	3.3	3.3	3.3
Power Supply Current (mA)	20	15	20	20	20	30	30	35
Operating Temperature Range	-10 ~ +70°C	-10 ~ +70°C	-10 ~ +70°C	-10 ~ +70°C	-10 ~ +70°C	-20 ~ +70°C	-20 ~ +70°C	-20 ~ +70°C
Frequency Stability (Overall)	+/-25ppm	+/-25ppm	+/-50ppm	+/-50ppm	+/-50ppm	+/-50ppm	+/-50ppm	+/-50ppm

Application	WLAN	WLAN	Mobile Phone	WLAN	WLAN	VDSL		
TST PN	TW0194C	TW0158C	TW0240B	TW0296A	TW0167B	TW0215A		
Package	SMD3225	SMD3225	SMD3225	SMD2520	SMD2520	SMD7050		
Frequency (MHz)	26	40	19.2	26	40	35.328		
Output Level	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS		
Output Load	15pF	15pF	15pF	15pF	15pF	15pF		
Vdd (V)	3.3	2.8	2.8	1.8	1.8	3.3		
Power Supply Current (mA)	10	10	10	2	4	20		
Operating Temperature Range	-20 ~ +75°C	0 ~ +85°C	-20 ~ +70°C	-20 ~ +70°C	-10 ~ +70°C	-40 ~ +85°C		
Frequency Stability (Overall)	+/-25ppm	+/-25ppm	+/-25ppm	+/-25ppm	+/-25ppm	+/-25ppm (WCD<2ppm over -40~85°C)		

TST Product – PXO (Programmable XO)



TST Product – PXO (Cont.)

Features:

1. Operating Voltage Range: 2.25V ~ 3.63V
2. Operating Temp.: -40 ~ 85°C
3. Output Frequency: Up to 200Mhz
4. HCMOS Output
5. Low Jitter: 30~70ps (PK-PK jitter)
6. Frequency Fine Tuning:
 - 7050 & 5032: provide +/-200ppm frequency tuning range
 - 3225 & 2520: provide +/-50ppm frequency tuning range
7. Same Foot Print with Normal Crystal Oscillator

Available Package Size:

SMD 7.0x5.0x1.5 mm

SMD 5.0x3.2x1.3 mm

SMD 3.2x2.5x1.2 mm

SMD 2.5x2.0x0.9 mm

TST Product – VCXO

Application	Sonet	Sonet	DAB	STB	STB	VDSL
TST PN	TX0139A	TX0141A	TX0144A	TX0147A	TX0148A	TX0158A
Package	SMD7050	SMD7050	SMD7050	SMD7050	SMD7050	SMD7050
Frequency (MHz)	155.52	622.08	24.576	54	27	35.328
Output Level	PECL	PECL	CMOS	CMOS	CMOS	CMOS
Output Load	50 Ohm	50 Ohm	15pF	15pF	15pF	15pF
Vdd	3.3	3.3	3.3	3.3	3.3	3.3
Operating Temperature Range	-5 ~ +85°C	-5 ~ +85°C	-40 ~ +85°C	0 ~ +70°C	-10 ~ +70°C	0 ~ +70°C
Frequency Stability (Overall)	+/-50ppm	+/-50ppm	+/-50ppm	+/-25ppm	+/-50ppm	+/-50ppm

TST Product – Crystal Filter

Application	Power Meter	Power Meter	Security	Security	Security
TST PN	TY0122A	TY0133A	TY0129A	TY0137A	TY0136A
Package	SMD7050	SMD7050	SMD7050	SMD7050	SMD7050
Frequency (MHz)	45	45	21.4	21.4	21.7
	3-pole	3-pole	3-pole	3-pole	2-pole
Termination Impedance (Rp//Cp)	200 ohm//4 pF	650 ohm//3.5 pF	850 ohm//6 pF	850 ohm//2 pF	850 ohm//6 pF
Insertion Loss	3 dB max	3 dB max	3 dB max	3 dB max	3 dB max
3dB Passband	7.5KHz	15KHz	7.5KHz	15KHz	7.5KHz
Ripple	1 dB max	1 dB max	1 dB max	1 dB max	1 dB max
Stopband	10 dB min (+/- 12.5KHz)	15 dB min (+/- 25KHz)	23 dB min (+/- 12.5KHz)	18 dB min (+/- 25KHz)	20 dB min (+/- 20KHz)

Application	TD-SCDMA	Security	Security	Security	
TST PN	TY0147A	TY0151A	TY0148A	TY0160A	
Package	SMD7050	SMD7050	SMD7050	SMD7050	
Frequency (MHz)	76.8	21.4	21.4	21.7	
	2-pole	2-pole	2-pole	2-pole	
Termination Impedance (Rp//Cp)	1500 ohm//1.4 pF	1.5kohm//2.0 pF	1.5kohm//2.5 pF	870 ohm//6 pF	
Insertion Loss	3 dB max	2 dB max	3 dB max	3 dB max	
3dB Passband	80KHz	15KHz	15KHz	7.5KHz	
Ripple	1 dB max	1 dB max	1 dB max	1 dB max	
Stopband	35 dB min (+/- 60KHz)	18 dB min (+/- 25KHz)	18 dB min (+/- 25KHz)	18 dB min (+/- 15KHz)	

TST Product – VCO

Application	GPS	Security	CDMA	Repeater
TST PN	TV0112A	TV0114B	TV0119A	TV0125A
Package	SMD8260	SMD8260	SMD8260	SMD8260
Frequency (MHz)	1684	915	1000	1570
Output Load	50 Ohm	50 Ohm	50 Ohm	50 Ohm
Vdd (V)	3.3	2.85	3	3
Current Consumption (mA)	10 max	50 max	11 max	15 max
Control Voltage Range (V)	0~3.3	0.5~2.5	0.5~2.5	0.7~2.5
Control Voltage Sensitivity (MHz/V)	15~35	15~35	19~29	65~95
Output Power (dBm)	-3~3	1.5~6.5	-3~3	0~6