

Loopback Detector

GENERAL DESCRIPTION

The XR-T2713 is designed to be used with 4 wire maintenance terminating units in conjunction with manual or automatic testing systems in loopback mode to verify network performance.

Utilizing switch capacitor technology, the IC detects the 2713 or 2813Hz signal and performs a loopback function in accordance with BELL PUB 43004.

FEATURES

- Bell Pub 43004 Compliant
- Uses standard color TV crystal (3.58MHz)
- Detection band 2713 or 2813 +/- 15Hz
- Detection level -32 dbm
- Complementary output signals
- Low power (4 mA @ 12 Volts)
- CMOS process
- Pin Selectable 4/20 Minutes Time-out

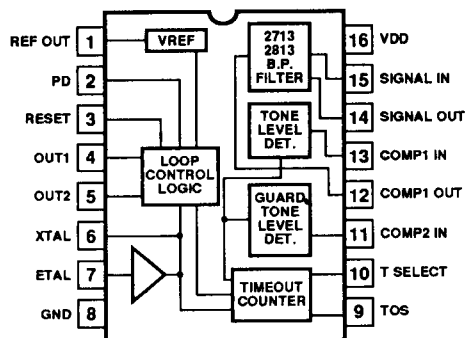
APPLICATION

4 wire maintenance terminating units

ABSOLUTE MAXIMUM RATINGS

DC Supply voltage	16 V
Voltage at any pin	GND -0.3V to $V_{DD} + 0.3V$
Storage temperature range	-55°C to 150°C
Operating temperature range	0°C to 70°C
Power Dissipation	100 mW

PIN ASSIGNMENT



ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-T2713CP	Plastic DIP	0°C to 70°C

SYSTEM DESCRIPTION

The XR-T2713 contains the necessary band pass filters to meet the BELL PUB 43004 requirements on minimum and maximum detection levels and frequency rejection band. For the specified frequency detection band, a digital filter is used to maintain narrow band-width and decision making.

The tone detection output will be activated when a continuous tone of 2713/2813 +/- 15Hz is present for 1.8 seconds. Deactivation of the loopback signal will take place when a continuous tone of 2713/2813 +/- 15Hz is present for 0.45 seconds. If the deactivation tone is not received for 4 or 20 minutes (pin selectable), the XR-T2713 will reset automatically. The output signal is TTL compatible with a maximum output current capability of 1.5mA.

PIN DESCRIPTIONS

2

Pin #	Symbol	Description
1	REF OUT	Voltage reference output pin
2	PD	The T2713 will be in power down mode when this pin is held high.
3	RESET	External power-up reset or manual loop back.(Figure 3).
4	OUT-1	Upon detection of the 2713/2813 tone for a minimum of 1.8 seconds, pin 4 will go high to indicate that the system has entered the test mode. These outputs will be deactivated when a 2713/2813 tone is present for a minimum of 450 msec. If no deactivation tone is received within 4 or 20 minutes(depending on the time out selection), the outputs will reset automatically OUT-1(see pin 4).
5	OUT-2	Complimentary output of OUT-1 (see pin 4).
6	X $\overline$ TAL	Crystal output pin.
7	ETAL	Crystal or external clock input pin.(Uses a standard color TVcrystal at 3.58MHz).
8	GND	Most negative supply pin or ground.
9	TOS	Time Out selection pin. A low at this pin selects a 4 minute time out. A high level extends the time-out to 20 minutes.
10	T-SELECT	A high level at this pin selects the 2813Hz detection band and a low level selects the 2713Hz band.
11	COMP2 IN	Guardtone input coupled from pin 12.
12	COMP1 OUT	Guardtone output.
13	COMP1 IN	2713/2813 AC coupled frequency to tone and level detect circuitry.
14	SIGNAL OUT	2713/2813 Band pass filter output.
15	SIGNAL IN	Input of analog band pass filter.
16	VDD	Most positive supply.

XR-T2713

ELECTRICAL CHARACTERISTICS

Test Conditions: $T_A = 25^\circ\text{C}$, $V_{DD} = 12\text{V} \pm 5\%$ unless specified otherwise.

SYMBOL	PARAMETERS	MIN	TYP	MAX	UNIT	CONDITIONS
V_{DD}	Supply Voltage		12		V	
I_{DD}	Supply Current		2	3	mA	
I_P	Output Sink Current	1.5			mA	
T_{DD}	Tone Detection Time (on)		1.8		sec	Figure 1
T_{DF}	Tone Deactivation Time		.45		sec	Figure 1
T_{DO}	Detection on Time	20			msec	Figure 1
	Detection off Time	20			msec	Figure 1
T_{AB}	Tone Break			4	msec	Figure 1
T_F	Time Out		20		min	PIN 9 high, Figure 2
			4		min	PIN 9 low, Figure 2
V_T	Detection Level	-32		0	dBm	
T	Detection Frequency	2698 2798	2713 2813	2728 2828	Hz Hz	PIN 10 high PIN 10 low
V_R	Tone Rejection Level	-38			dBm	
V_G	Signal to Guard Ratio	6	8	12	dB	

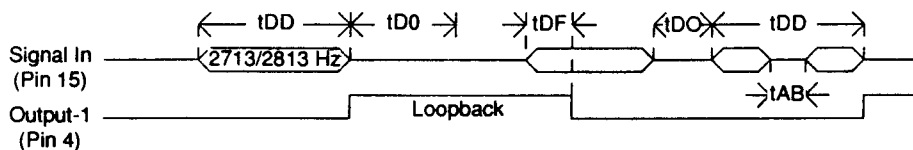


Figure 1. Timing Diagram with Activation and Deactivation Tones

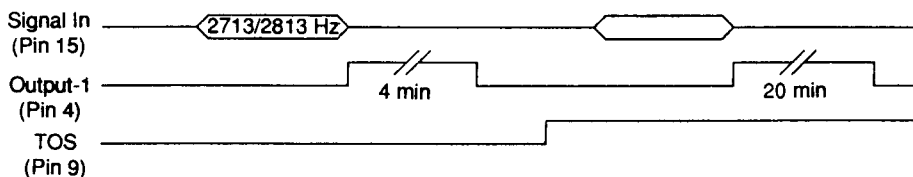


Figure 2. Timing Diagram without Deactivation Tone

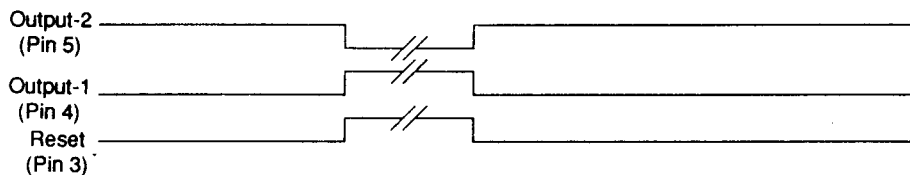
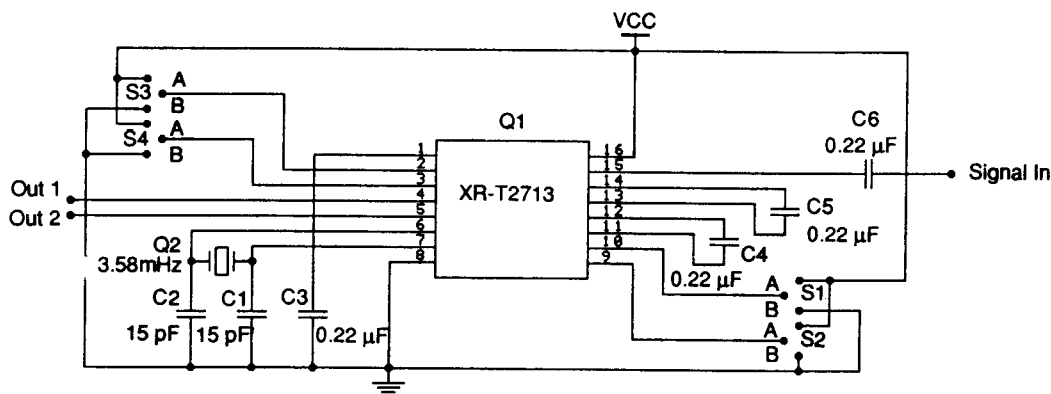


Figure 3. Manual Loopback Mode



	S4A	S4B
S3A	Factory Test	Power Down
S3B	Reset	Normal Op.

	A	B
S1	2813 Hz	2713 Hz
S2	20 min	4 min

Figure 4. Typical Application Circuitry