PSTN
MEASUREMENT REPORT

Report No.: **TW14070286**
Model No.: **BX700UI, BX700U-AZ**
Report Issued Date: **Aug. 08, 2014**

Applicant: **AMERICAN POWER CONVERSION HOLDINGS INC.**
3F, No. 205, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 23143, Taiwan

Test Method/ Standard: **AS/CA S002:2010**

Test By: **Intertek Testing Services Taiwan Ltd.,**
Hsinchu Laboratory
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
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Testing Laboratory
0597

The test report was prepared by: Sign on File
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These measurements were taken by: Sign on File
Eric Fan/ Engineer

The test report was reviewed by:

Name Alpha Liu
Title Senior Chief Engineer

INTRODUCTION

Client Name	AMERICAN POWER CONVERSION HOLDINGS INC.
Product Name	Uninterruptible Power Systems
Description of test item	Uninterruptible Power Systems
Model No. or Part No.	BX700U-AZ
Serial No.	Not Labeled
Date of Receipt of Test Item	Jul. 21, 2014
Date of Test (Start/Finish)	Jul. 23, 2014 ~ Aug. 01, 2014
Condition of Test Item at Time of Receipt	Product Sample
Date of report issue	Aug. 08, 2014
Test Site Location	Intertek Testing Services Taiwan Ltd., Hsinchu Laboratory No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan

Note 2: When determining the test conclusion, the Measurement Uncertainty of test has been considered.

SUMMARY OF COMPLICANE WITH
Australian Standard AS/CA S002: 2010

The Equipment Under Test (EUT) was a Uninterruptible Power Systems for connection to the 2-wire analogue PSTN. The EUT has one modular socket for connection to the PSTN and one RJ11 port for connection to a phone.

The customer confirmed the models listed as below were series model to model BX700U-AZ (EUT), the difference between main model and series model are listed as below.

Trade Name	Model Number	Difference
APC	BX700U-AZ	Australia outlet
	BX700UI	IEC outlet

Uninterruptible Power Systems, Model No: BX700U-AZ, **COMPLIES** with all relevant mandatory tested clauses of AS/CA S002: 2010.

5.1.3. The requirement is specified in AS/NZS 60950.1. The test result does not include in this report.

The product under test does comply with all mandatory requirements. The test results only relate to the mandatory items tested.

Remark:
The meaning of abbreviation characters through this report was listed as follows

P - test object does meet the requirements.
F - test object does not meet the requirements
N - test case does not apply to the test object.
ND - Noted

Test Result

Section	Requirement	Result
5.1	**GENERAL**	
5.1.1	**Fail-safe operation**	
5.1.1.1	**CE shall not** cause harm or damage to a Telecommunications Network or Facility if any of the following events occur: (a) Failure of any mechanical or electrical component in the CE (b) Failure of any power supplies resulting in total or partial loss of power to the CE. (c) Discharge or partial discharge of any battery supply associated with the CE. (d) Incorrect manual operation of the CE.	 P P P P
5.1.1.2	CE should not cause harm to a Telecommunications Network or Facility when CE is operated outside the range of operating voltage and environmental conditions specified by the manufacturer.	N
5.1.1.3	The power fail mechanism of the CE should cause the CE to revert to the Off-line condition and remain in that condition for the duration of the failure. In addition, the CE may incorporate an automatic line changeover facility as a response to power failure.	ND
5.1.1.4	On restoration of power after a power failure, the CE shall remain in the OFF-LINE condition until another call sequence is commenced. This requirement applies following the first 30 seconds after power is restored.	ND
5.1.2	**Line polarity**	
5.1.2.1	The operation of CE shall be independent of exchange line conductor polarity	P
5.1.2.2	CE shall be unaffected by a fleeting test reversal or any other reversal in line po larity which occurs while the CE is in either the Off-line or the On-line condition.	P
5.1.3	**Transmitted voltages** Voltages transmitted to a Telecommunications Network from CE, in any line condition, are not to exceed the limited for Telecommunication Network Voltages (TNV), as specified in AS/NZS 60950.1.	ND
5.1.4	**Line-powered CE** The current drawn by CE when connected to a source of – (a) 100 V DC; and (b) 50 V DC; **Shall not** exceed that which would be drawn by 1 MΩ resistor replacing the CE, This requirement applied 30 seconds after voltage has been applied	P P
5.1.5	**Line connection** Note: Description of Connector RJ-14 socket was supplied for connection to the PSTN. Approved line cord **should** be supplied for connection to the PSTN.	P
5.1.6	**Keypads and dials**	
5.1.6.1	The requirements of Clause 5.1.6 only apply to CE with a keypad or rotary dial where the keypad or rotary dial has the primary function of dialling for the purposes of call set-up.	N
5.1.6.2	CE intended for connection to a CSS may have other alpha characters or alphanumeric relationships associated with the keypad digits Such CE are also exempt from the requirements of Clause 5.1.6 but the CE shall carry markings which clearly in dicate that the CE may only be connected to the extension or system integral ports of a CSS.	N

Section	Requirement	Result
5.1.6.3	The arrangement of numerals (and/or */#, if used), appearing on keypads or rotary dials, shall be in accordance with the layouts in ITU-T Rec E. 161.	N
5.1.6.4	Where letters, in addition to numerals, appear on a keypad or rotary dial, or its surround, the Letters and numerals **shall-** (a) conform to the associations given in Table 3; (b) be unambiguously associated with the relevant keys; and (c) have a distinct difference in style between the numeric zero and the letter 'O'	 N N N
5.1.7	**Insulation resistance of ring-in/loop-out PSTN lines**	
5.1.7.1	CE in the Off-line state, with the exception of CSS, and those described in Clause 5.1.7.2, shall have an insulation resistance of not less than 1 M Ω between- (a) the two line conductors; (b) each line conductor and TRC terminal, if equipped; and (c) each line conductor and PE terminals, equipped when tested with 250 V d.c. of either polarity, in series with a 600k Ω resistance. Any internal protective devices remain connected for this test.	 P N P
5.1.7.2	The requirements apply to CE incorporating a message wait indicator that is intended for connection to a customer switching system	N
5.1.7.3	CSS are to comply with the requirements of AS/CA S003.	ND
5.1.8	**Emergency services access**	
5.1.8.1	General The following requirements apply to CE used to establish connections for voice communication or to establish TTY communication in accordance with ITU-T Recommendation V.18: (a) CE with a dialling capability and used for voice communication shall support the dialling of emergency service number '000'. (b) CE with a handset and with a dialling capability shall support the dialling of emergency service numbers '000' and '106'. (c) TTY terminals that can be connected to a Telecommunications Network shall support the dialling of emergency service number '106' (d) Data modems that can be used in conjunction with a Data Terminal Equipment to provide the functionality of a TTY terminal shall support the dialling of emergency service number '106'	 N N N N
5.1.8.2	Access Barring CE should not support access barring of emergency service number '000' and '106'	N
5.1.8.3	Loss of Mains Power Mains-powered CE should continue to support the dialing of emergency service numbers for at least 30 minutes following the loss of mains power.	N
5.1.8.4	Provision of Power-fail Advice CE that does not continue to support emergency dialling for at least 30 m inutes after loss of mains power shall have an appropriately worded warming notice included in or with the CE documentation. The warming notice should also be placed on the outside surface of the CE's packaging. A suggested working for the warning notice is as follows: **Warning** **This equipment will be inoperable when Mains power fails.**	N

Section	Requirement	Result
5.1.8.5	Keypad Locks CE for voice communications incorporating a keypad lock for the purpose of minimizing accidental dialling of the emergency number 000 should be provided with clear instruction for the user, either via electronic display or labelling on the CE to unlock the keypad when required to make an emergency call.	N
5.2	**CLASSIFICATION OF CE**	
5.2.1	**General**	
5.2.1.1	CE intended for connection to the PSTN is classified as one or more of the following types: (a) Line terminating equipment. (b) Series equipment. (c) Bridging equipment.	P
5.2.1.2	Line terminating equipment may be used either singularly or in conjunction with series of bridging equipment.	N
5.2.2	**Line terminating equipment**	
5.2.2.1	Line terminating equipment incorporates circuitry that applies an Online condition to the PSTN line. CE with this function may be associated with the line as: (a) the only line terminating equipment connected to a line, to provide the sole termination of that line ; or (b) one or more parallel items of line terminating equipment , one or all of which can be used terminate the line ; or (c) one of a number of items of line terminating equipment, which can be used alternatively to terminate the line, e.g. for alternative voice/data applications.	 N N N
5.2.2.2	The foilowing tandem operation requirements apply to CE operaing in tandem mode with other STS CE that complies with this Standard: (a) If the CE applies ring to the terminating STS CE, then the CE shall meet the requirements for Ring signal of Standard analogue telephone Local Port (On Premises and Off Premises) in AS/CA S003. (b) If the CE provides local DC feed to the terminating STS CE, then the CE shall meet the requirements for Answer/Seizure/Hold signals and Idle/Release signals of Standard analogue telephone Local Port (On Premises and Off Premises) in AS/CA S003. (c) If the CE allows voice frequecny signals to pass from the terminating STS CE to the PSTN port when the PSTN port is in the On-line condtion, then the CE shall meet- (i) the relevant Transmission requirements of AS/CA S003 between the port of the CE, to which the terminating CE connects, and the PS connection of the CE; or (ii) the requirements of Clause 5.2.3.2	 ND P P ND P
5.2.3	**Series equipment**	
5.2.3.1	Series equipment is CE that is connected to the line in series with line-terminating equipment.	P
5.2.3.2	The following requirements apply to series equipment which is connected and operates with another CE which is either in the On-line condition, or which remain in the circuit all times: (a) There shall be DC continuity between the input and output connections of the equipment. (b) CE with linear electrical characteristics **shall** have a maximum total DC resistance of 55 Ω. (c) For CE with non-linear electrical characteristics, the total DC voltage drop across the line connections **shall not** exceed- (i) 3 V with line currents up to 30mA; and (ii) 6 V for all line currents greater than 30mA.	 P P P P P

Section	Requirement	Result
	(d) The insertion loss of the equipment on lines of all lengths shall not exceed 0.5 dBm over the range 300Hz to 3.4 kHz when measured with source and load impedances. Compliance with Clause 5.2.3.2 should be checked by measuring the DC resistance, the DC voltage drop and the insertion loss (see Clause 6.7.4), as appropriate.	P
5.2.3.3	Series equipment which is connected to and operates with another CE which is in the Off-line condition **shall not** reduce ring voltage with frequency in the range 15.3 Hz to 50Hz, to below 50 V r.m.s., for a connection configuration.	P
5.2.4	**Bridging equipment**	
5.2.4.1	Bridging equipment, including line termination equipment in the off-line state, is high impedance equipment connected in parallel with the line terminating equipment. It does not provide an on-line termination. In general, it remains in the circuit irrespective of whether the line terminating equipment is in the On-line or Off-line condition. Usually it does not perform any line control function and is used, for example, for monitoring and detecting incoming calls.	N
5.2.4.2	Bridging equipment shall have a modulus of impedance of greater than 10 k Ω over frequency range 300 Hz to 3400 Hz.	N
5.3	**FUNCTIONAL REQUIREMENTS**	
5.3.1	**Number storage facility**	
5.3.1.1	CE **shall not** be pre-programmed with, or default to, number beginning with either '000' or '106' in any storage location for automatically dialled numbers, unless the functionality associated with that automated dialling is specifically intended for establishing a voice of TTY call as appropriate to an emergency call person.	N
5.3.1.2	CE should not be pre-programmed with, or default to, any network recognisable number in any storage location for automatically dialled numbers, unless the functionality associated with that automated dialling is specifically intended for establishing a call to that particular network number.	N
5.3.2	**Interconnection of PSTN Lines**	
5.3.2.1	The interconnection of PSTN lines **shall** be in accordance with the requirements of AS-CA S003 for conference bridges or Clause 5.7 of this Standard for ACTE.	N
5.3.2.2	Metallic interconnection of PSTN lines **shall not** be used.	N
5.3.3	**Intrusion tones**	
5.3.3.1	Any CE which provides for the connection of a third party into an established conversation should provide to each party either of the intrusion tones specified in Clause 5.3.3.2- (a) as soon as the intrusion facility is enabled; and (b) with the addition of each new party to the connection.	 N N
5.3.3.2	The specifications of the intrusion tone alternatives at the PSTN interface port (+3 dBr relative level point) are- (a) an initial burst of 425 Hz ± 10Hz for 80ms to 800 ms at a level in the range –7dBm to -13dBm, repeated at intervals of 15 s ± 3s; or (b) an initial burst of 425 Hz ± 10 Hz for 800 ms±10% at a level in the range –7dBm to –13dBm.	 N N
5.3.3.3	The return loss requirements of Clause 5.4.3. **shall** be met during intrusion tone connection.	N
5.3.3.4	The intrusion tone facility should not be capable of being disables by the user.	N

Section	Requirement	Result
5.3.4	**Supervisory tones**	
5.3.4.1	**Pre-answer Tones** Pre-answer supervisory tones transmitted to the PSTN at the PSTN interface port (+3 dBr) **shall** be as specified below: (a) Ring Tone A (i) Frequency 425Hz ± 10Hz, amplitude modulated in the range 90% to 99% by a frequency of 25 Hz ± 1 Hz with carrier unsuppressed. (ii) Cadence 0.4 s on, 0.2 s off, 0.4 s on, 2 s off, ±10% (b) Ring Tone B (i) Frequency A combined signal of 450Hz ± 10Hz, and 400Hz ± 10Hz of equal amplitude. (ii) Cadence 0.4 s on, 0.2 s off, 0.4 s on, 2 s off, ±10% (c) Busy Tone (i) Frequency 425 Hz ± 10 Hz. (ii) Cadence 0.375 s on, 0.375 s off, ± 10% (d) Number Unobtainable (NU) Tone (i) Frequency 425 Hz ± 10 Hz. (ii) Cadence 2.5 s on, 0.5 s off, ± 10%	N N N N N N N N N N N N N N
5.3.4.2	**Pre-answer Levels** The level of audible supervisory tone (as specified in Clause 5.3.4.1) measured during the 'on' period of the cadence when terminated in a 600 Ω resistive impedance **shall** be in the range of –7 dBm to 13 dBm, with a zero line length.	N
5.3.4.3	**Post-answer Tones** Tones transmitted after a call has been acknowledged by operator intervention, or in accordance with Clause 5.3.6.3.2, by the CE should be audibly and unambiguously dissimilar from PSTN pre-answer tones, unless the same information is to be conveyed.	N
5.3.4.4	**Return Loss** The return loss requirements of Clauses 5.4.3 **shall** be met when supervisory tones, as specified in Clauses 5.3.4.1 and 5.3.4.2, are applied to the line.	N
5.3.5	**Automatic Operation** The requirements of Clauses 5.3.6.1 to 5.3.6.7 (inclusive) apply to CE designed or intended to perform automatic functions or operations (i.e. functions or operations which are not manually initiated, performed or monitored).	N
5.3.5.1	**Automatically Seizing the Line** CE **shall not** automatically seize the line for any purpose, other than to- (a) originate a call; (b) answer a call; (c) force a line into a busy state; (d) detect the presence or absence of a distinctive dial tone in accordance with the requirements or (e) for automatically detecting the state of the line as detailed under Automatic Guard in AS/CA S003.	 N N N N N
5.3.5.2	**Recognition of Telecommunications Network Service Tones** CE which relies on the detection of specific pre-answer service tones for automatic operation **shall** operate normally on receipt of those service tones as transmitted from the Telecommunications Network over the range –9 dBm to –24dBm and for nominal frequency and cadence. CE for use on international connections should respond to the tones described in the Annex to ITU Operational Bulletin Nr. 781.	N
5.3.5.3	**Answering of Incoming Calls**	

5.3.5.3.1	The following requirements apply to CE incorporating automatic answering facilities which answer an incoming call:	
	(a) For a Ring-in/Loop-out PSTN line interface, CE should apply a loop (Answer) to the line in not less than 2 s from the commencement of the ring signal being applied by the PSTN;	N
	(b) For a Loop-in PSTN line interface (without address digits), CE **shall** apply a reversal (Answer) to the line in not less than 2 s from the commencement of the loop (Seize) applied by the STN.	N
	(c) For a Loop-in PSTN line interface (with address digits), CE **shall** apply a reversal (Answer) to the line in not less than 2 s from the cessation of the last digit received from the PSTN.	N
5.3.5.3.2	CE incorporating automatic answering facilities shall acknowledge the answering of incoming calls from the PSTN by-	
	(a) the transmission of an appropriately worded stored voice or synthesised voice message; or	N
	(b) the transmission of one burst of answering tone of 2100Hz ± 15Hz for a minimum of 2.6 s up to a maximum of 6.0 s, if a calling tone (CNG) as defined in ITU-T Recommendation V.25 has not been received from the originating CE within 2.5 s. The answering tone should be in the range from –7 dBm to –13 dBm; or	N
	(c) a post-answer tone dissimilar from a PSTN dial tone, PSTN ring tone, busy tone, or NU tone.	N

Section	Requirement	Result
5.3.5.4	**Commencement of Dialling**	
5.3.5.4.1	CE which is not able to detect dial tone **shall not** commence dialling earlier than 2.7 seconds after the seizure state as specified in Clause 5.5.1.4 has been established.	N
5.3.5.4.2	CE which is able to detect dial tone may commence dialling after the presence of dial tone has been detected.	N
5.3.5.5	**Automatically Repeated Call Attempts**	
5.3.5.5.1	CE **shall** provide a minimum Off-line period of 5 s following the termination of an unsuccessful call attempt before automatically initiating a subsequent call attempt in a repeated call attempt sequence.	N
5.3.5.5.2	CE **shall not** automatically initiate more than 15 call attempts, including the initial call, in a repeated call attempt sequence.	N
5.3.5.5.3	If the call attempt sequence described in 5.3.6.5.1 and 5.3.6.5.2 is unsuccessful, CE **shall not** automatically re-initiate the call attempt sequence to the same number.	N
5.3.5.5.4	CE should provide a minimum Off-line period of 5 s following the termination of an unsuccessful call attempt sequence before automatically initiating a new call attempt sequence to a different number.	N
5.3.5.6	Call Message If a CE transmits a voice message after an automatically initiated call is answered, then that CE should include, in the voice message itself, a stored or synthesised message which identifies the calling party.	N
5.3.5.7	Call Supervision CE which automatically originates or answers calls should be designed to release the PSTN exchange line in less than 30 s after the conclusion of the transfer of information to or from the other CE in the connection.	N
5.4	**TRANSMISSION REQUIREMENTS**	
5.4.1	Operational interference for transmission other than speech and music CE **shall not** transmit single frequency tones of power greater than –47 dBm and duration greater than 40ms in the frequency range 2450 Hz to 2850Hz (to avoid possible interference with 'in-band' VF signalling).	N
5.4.2	**Power and voltage limits of transmissions other than speech and music**	
5.4.2.1	Clause 5.4.2.2 and 5.4.2.3 do not apply to CE which is a transmission medium for voice frequency signals that are generated by other CE.	N
5.4.2.2	The peak-to – peak level of signals transmitted to line, under all user accessible gain control settings and with all DC line conditions **shall not** exceed 5.0 V when measured across a 600 Ω resistive termination.	N
5.4.2.3	Voiceband transmissions The one-minute mean power level of signals transmitted to line, within the frequency range 300Hz to 3.4 kHz except for DTMF signals, supervisory tones, speech and music **shall not** exceed –10dBm.	N
5.4.2.4	Signals greater than 3.4 kHz.	N
5.4.2.4.1	The power spectral density (PSD) of signals beyond 3.4 kHz **shall not** exceed the limit when measured using a noise power bandwidth of 10kHz. Note: For compatibility with 12 kHz Meter Pulse detector circuitry, any signal components generated in the 11kHz to 13 kHz band should not exceed 10mV rms when measured with a 135 Ohms termination or open circuit.	N

<table>
<tr><th>Section</th><th>Requirement</th><th>Result</th></tr>
<tr><td>5.4.2.4.2</td><td>The PSD of signals between 300kHz and 30.175 MHz shall be either-
(a) less –120dBm/Hz; or
(b) Less than the PSD limit minus 10dB (this is represented in Figure 4 by the dashed line limit).
When measures as the total average power within a 1 MHz sliding window (1 MHz bandwidth) which is described in the following Table:
<table>
<tr><th>Parameter</th><th>Value</th></tr>
<tr><td>Bandwidth of sliding window</td><td>1MHz</td></tr>
<tr><td>Reference frequency</td><td>Lower Edge</td></tr>
<tr><td>Step size</td><td>10kHz</td></tr>
<tr><td>Start frequency</td><td>300kHz</td></tr>
<tr><td>Stop frequency</td><td>30.175 MHz</td></tr>
</table></td><td>
N
N</td></tr>
<tr><td>5.4.3</td><td>Impedance</td><td></td></tr>
<tr><td>5.4.3.1</td><td>Off-line State
The impedance presented by the CE in the off-line state should be greater than 15kΩ over the range 300Hz to 3400Hz.</td><td>P</td></tr>
<tr><td>5.4.3.2</td><td>Hold State
The impedance presented by the CE in the hold state shall have a return loss greater than 10 dB over the range 300 Hz to 600 Hz and greater than 15 dB over the range 600 Hz to 3.4 kHz against the test network.</td><td>N</td></tr>
<tr><td>5.4.4</td><td>Impedance balance
The impedance balance about earth of the CE shall be greater than 46 dB over the frequency range 50Hz to 3.4 kHz. This test is to be applied with respect to the TRC terminal and protective earth termination, separately and connected together when either or both of these terminations are provided.</td><td>N</td></tr>
<tr><td>5.4.5</td><td>Noise Performance
The following requirements for noise generated by STS CE when measure across a 600 Ω port termination (with other equipped ports properly terminated) are to apply when the STS CE is in the On-line state and not transmitting signals:
(a) Mean noise power shall not exceed-
(i) –62 dBmp (Psophometric), measured using a device compliant with ITU-T Rec. O.41; and
(ii) –37 dBm (unweighted), measured using a device with a uniform frequency response over the range 30 Hz to 20 kHz.
(b) Single-frequency noise power. Any signal frequency (in particular the sampling frequency and its submultiples where appropriate) over the range 30Hz to 20kHz, measured selectively with a 30 Hz bandwidth, shall not exceed –47 dBm.
(c) Impulsive noise. The number of noise counts above a threshold level of –32 dBm shall not exceed five counts in 5 mins, measures using an impulsive noise counter compliant with ITUT Rec. O.71, using the 600 Hz to 3 kHz filter described in 3.5 therein.</td><td>

N
N
N
N
N</td></tr>
</table>

Section	Requirement	Result
5.4.6	Longitudinal power limits During the idle, hold, ringing states, the power level of individual spectral components of any longitudinal component of the output signals **shall not** exceed the limits shown in Figure 26.	P
5.5	**SIGNALLING REQUIRMENTS**	
5.5.1	**Two-wire ring-in/loop-out PSTN line interface.**	
5.5.1.1	**Ring signal detection and CE performance during ring**	
5.5.1.1.1	STS CE which is required to recognise ring signals shall respond to terminal voltages in the rang (a) 50 V r.m.s to 90 V r.m.s over the frequency range 15.3 Hz to 25 Hz; and (b) 40 V r.m.s to 90 V r.m.s over the frequency range 25 Hz to 55 Hz The ring signal **shall** have a duration of 200 ms and greater, and **shall** be superimposed on 48 V d.c. of either polarity.	 N N
5.5.1.1.2	CE should not recognise as a ring signal an AC voltage of less than 10 V r.m.s, or a ring signal of less than 100 ms duration.	N
5.5.1.1.3	CE in the Off-line state should withstand 2 min of continuous non-cadence, 90 V r.m.s ring signal at 55 Hz superimposed on 48 V d.c. The ring signal should be applied to the terminals of the CE.	P
5.5.1.1.4	Under fault conditions, ring signal voltage may also be applied to the line terminals of the CE which is in the On-line condition. The CE should remain undamaged if this should occur.	N
5.5.1.1.5	When a ring signal of 25 Hz sine wave at 95 V r.m.s. Superimposed on 56 V d.c. (with a total source impedance of 470 .) is applied to theline terminals of CE, the DC component of the current flowing shall not exceed 600 μA.	P
5.5.1.2	**Ringer Equivalence Number (REN)** CE **shall** have a REN of not greater than 3.	P
5.5.1.3	**Meter Signal detection**	
5.5.1.3.1	General	N
5.5.1.3.1.1	A meter pulse received from the PSTN will be a 12 kHz transverse signal. The availability of this signal is subject to negotiation with the carrier or carriage service provider concerned.	N
5.5.1.3.1.2	The meter signal detector is deemed to have operated when an unambiguous output occurs on the application of an input signal. The CE supplier should state the expected response of the CE to the meter signal.	N
5.5.1.3.1.3	The meter signal detector should recognise; meter signals in the range 100 ms to 380 ms inclusive, at a maximum repetition frequency of 1.25 Hz	N
5.5.1.3.1.4	The meter signal detector should not respond to – (a) meter signals less than 50 ms duration; (b) meter signals greater than 500 ms duration; and (c) signals occurring later than 800 ms after a release signal is initiated for an outgoing call.	 N N N
5.5.1.3.1.5	The meter signal detector should be responsive – (a) after completion of address signalling; (b) during the release condition of the CE (as specified in Clause 5.5.1.11); and (c) until 800 ms after completion of the call.	 N N N

Section	Requirement	Result
5.5.1.3.1.6	Where CE is detecting the Meter Pulse in accordance with the requirements of this Standard and Reversal on Answer in accordance with the requirements of AS/CA S003 [4], 50 ms after the application of a polarity reversal the CE should be able to detect Meter Pulses that occur.	N
5.5.1.3.2	12 kHz Transverse Meter Signal Detection Requirements Where CE is designed to detect 12 kHz transverse meter signals, the following requirements are applicable: (a) The meter signal detector should meet the response limits (b)The transverse input impedance **shall** have a modulus of impedance of greater than 200 Ω with a phase angle of 0° to –30° at 12 kHz.	 N N
5.5.1.4	**Seizure state**	
5.5.1.4.1	During the seizure state the CE acting as a line termination, for a minimum duration of 0.3 s, **shall** have DC characteristics not with the 'Prohibited' Region A and preferably not with the 'Not Recommended' Region B.	N
5.5.1.4.2	Momentary breaks during the seizure state **shall not** exceed 2.5 ms	N
5.5.1.4.3	The duration of the transition from the idle state to the low resistance state (i.e. line current rise time) should not exceed 100 ms.	N
5.5.1.5	**Hold state**	
5.5.1.5.1	During the hold state, the DC characteristics of CE providing a line termination **shall not** be within the 'Prohibited Region A.	N
5.5.1.5.2	Momentary breaks during hold state **shall not** exceed 2.5 ms.	N
5.5.1.5.3	CE designed to work in parallel with other CE should not have DC characteristics within the 'Not Recommended' Region B.	N
5.5.1.5.4	Under fault conditions, it is possible for one side of the line to be grounded close to the CE while it is in the on-line state. The CE should remain undamaged if this occurs.	N
5.5.1.6	**Supervision of outgoing calls** STS CE **shall** remain on-line and not be adversely affected in its normal operation (before a call is established), if it loses its battery feed potential for up to 300 ms – (a) during the pre-dialling hold period; (b) during inter-digital pauses; and (c) after completion of dialling.	 N N N
5.5.1.7	**Dialling digit integrity**	
5.5.1.7.1	If CE has a keypad or rotary dial- (a) the decadic signal or DTMF tones it generates **shall** be consistent with the ITU T Rec. E. 161 layout chosen; (b) the sequence of decadic signal or DTMF tones generated shall correspond to the keys pressed or numbers dialled; and (c) for decadic dialling, the number of pulses transmitted for a digit **shall** correspond to the numerical value of the digit, with 10 pulses being transmitted for the digit '0'	 N N N
5.5.1.7.2	Any digit storage facility **shall** – (a) correctly store the digits; and (b) transmit the digits in the same sequence as originally entered, in accordance with the requirements for decadic or DTMF signalling as defined in this Standard.	 N N

Section	Requirement	Result
5.5.1.8	**Decadic signalling** Decadic signalling functionality may not be implemented in all carrier networks and access technologies. Therefore the implementation of decadic signalling in CE is not recommended. The use of DTMF address signalling is recommended.For the purposes of this Clause, a Break pulse is defined as the DC line condition with less than 2.8 mA of line current flowing and a Make pulse is defined as the DC line condition with greater than 12 mA of line current flowing. CE which generates decadic pulses is to comply with the following: (a)Characteristics of pulses; The following requirements apply for decadic loop-disconnect pulses when the CE is connected in a resistive circuit of 1900 Ω and a feed voltage of 48 V d.c. (i) 'Break' pulse **shall** be in the range 60 ms to 70 ms inclusive. (ii) 'Make' pulse **shall** be in the range 30 ms to 40 ms inclusive. (iii) Contact bounce **shall not** exceed 0.5 ms. (b) During transmission of decadic pulses the steady state DC resistance of the CE (when measured in a resistive circuit of 1900 Ω shown in Figure 11) **shall** be: (i) for the Make period: within the requirements of Clause 5.5.1.5.1.; (ii) for the Break period: greater than 100 kΩ with 100 V d.c. applied; and (iii) for the inter-digital Pause: Within the requirements of Clause 5.5.1.5.1. (c) Inter-digital pause timing The inter-digital pause period separating consecutive decadic pulse trains **shall** be within the range of 750 ms to 3 s unless due to a programmed pause. Note: A pause of 800ms is recommended. (d) Pulse voltage wave shape The voltage when measured in the test circuit **shall** comply with the following: (i) The peak voltage measured across the terminals of the CE shall be less than 230 V. (ii) For at least the latter half of the Break pulse time the peak-to-peak amplitude of any oscillation **shall not** exceed 12 V.	N N N N N N N N N N
5.5.1.9	**DTMF signalling** CE which generates DTMF signals is to comply with the following: Note: The use of DTMF address signals is preferred as the standard method of operation. (a) Signalling frequencies (i) The DTMF signals generated **shall** consist of pairs of frequencies in accordance with ITU-T Rec.Q.23 and shall be allocated to the various digits, symbols and characters as shown in Table 5. (ii) The tolerance of each frequency generated **shall** be less than ± 1.5% (b) Send levels (i) the power level of any fundamental frequency **shall** be between –5 dBm and –22dBm for line lengths between 0 km and 4.2 km using 040 mm conductor cable. (ii) For DC line conditions, provided by DC feed resistances between 400 Ω and 2300 Ω, the power level difference between any two fundamental frequencies **shall** be 2 dB ± 2 dB on a zero line length. The higher frequencies tone **shall** be at the higher level. (iii) Compliance with Clause 5.5.1.9(b) should be checked by using the method described in Clause 6.7.8. (c) Output rise and fall times The output rise and fall times of the envelope of each tone of each digit, measured between 10 % and 90 % of full amplitude, **shall** be within 5 ms with the CE connected to all line lengths between 0 km and 4.2 km using 0.40 mm cable terminated in 600Ω. (d) Distortion The total distortion products (measured as harmonics or inter-modulation) **shall** be at least 20 dB below the level of the lower power fundamental frequency when measured at the line terminals of the CE.	 N N N N N N N

Section	Requirement	Result
5.5.1.9	(e) Timing The timing for automatically and/or repertory dialled DTMF signalling is to be as follows: (i) The minimum duration of the DTMF burst representing each digit **shall** be 50 ms. (ii) The minimum interval between the transmission of digits shall be 70 ms and In no case **shall** it exceed a maximum period of 3 s unless due to a programmed pause. Note: It is recommended for post answering DTMF information signalling that the digit duration should be a minimum of 100 ms. (f) Line termination characteristics During DTMF signalling over the frequency range 600 Hz to 1660 Hz for DC line conditions, provided by DC feed resistances between 400 Ω and 2300 Ω, the source impedance of the CE **shall** have a return loss greater than – (i) 7 dB with respect to 600 Ω; and (ii) 15 dB with respect to the complex impedance as shown in Figure 5.	N N N N
5.5.1.10	**Recall signal** The recall signal used to access enhanced network features, **shall** be a break in the loop holding condition for a duration of 100 ms ± 20 ms. The characteristics of the break **shall** be in accordance with Clause 5.5.1.8(b)(ii)	N
5.5.1.11	**Release signal** The release of a PSTN connection **shall** be indicated by the removal of the DC loop condition on the exchange line.	N
5.6	**CORDLESS TELEPHONES**	
5.6.1	Cordless telephones should comply with the relevant radiofrequency (RF) Standards for the cordless technology used. Note: For the information of manufacturers and suppliers of cordless telephones, a form of advice recommended for inclusion in the equipment's handbook and/or packaging, to advise potential users of radio transmitting equipment of the interference potential, is below. **IMPORTANT NOTICE** **USERS OF THIS EQUIPMENT SHOULD NOTE THAT, AS WITH ANY RADIO TRANSMITTER, THIS EQUIPMENT IS CAPABLE UNDER SOME CIRCUMSTANCES OF CAUSING INTERFERENCE IN OTHER NEARBY ELECTRONIC EQUIPMENT.** **USERS SHOULD BE CONSIDERATE OR OTHERS IN THIS REGARD AND, WHERE APPROPRIATE, MOVE THEIR CORDLESS TELEPHONE AWAY FROM ANY NERBY AFFECTED EQUIPMENT**	N
5.6.2	Cordless telephones should incorporate security measures to protect against unauthorised use of the PSTN line.	N
5.7	**AUTOMATIC CALL TRANSFER EQUIPMENT (ACTE)**	
5.7.1	**General Requirements** Some items of CE, including CSS, provide the facility to automatically transfer calls received from the PSTN, back onto the PSTN.	N
5.7.1.1	The following requirements apply to ACTE: (a) A visual signal should be provided when a call is in progress. (b) Amplifier (i) Where an amplifier is used, the gain of the amplifier **shall not** exceed 20 dB. (ii) The amplifier should incorporate AGC for each direction of speech. (c) Incoming signals received at a level below –48 dBm on each line should not turn on the amplifier, if required, from the quiescent state.	 N N N N

Section	Requirement	Result
5.7.1.1	(d) The configuration shall be stable and not oscillate when the terminating lines have an impedance with a modulus between 200 Ωand 2 kΩat a phase angle between -45° and + 20°.	N
	(e) Individual lines shall be automatically released from the equipment when either Party A or Party B goes Off-line. This may be achieved by the detection of busty tone, congestion tone, dial tone, or NU tone at that port.	N
5.7.1.1	The following requirements apply to ACTE: (f) A visual signal should be provided when a call is in progress. (g) Amplifier (i) Where an amplifier is used, the gain of the amplifier **shall not** exceed 20 dB. (ii) The amplifier should incorporate AGC for each direction of speech. (h) Incoming signals received at a level below –48 dBm on each line should not turn on the amplifier, if required, from the quiescent state. (i) The configuration **shall** be stable and not oscillate when the terminating lines have an impedance with a modulus between 200 Ωand 2 kΩat a phase angle between -45° and + 20°. (j) Individual lines **shall** be automatically released from the equipment when either Party A or Party B goes Off-line. This may be achieved by the detection of busty tone, congestion tone, dial tone, or NU tone at that port.	 N N N N N N
5.7.1.2	Disconnection of the line by the ACTE **shall** be achieved within 6.0 s of Dial Busy, Congestion, or NU Tones being applied to either port of the ACTE.	N
5.7.1.3	ACTE without RVA **shall not** answer an incoming call until Party C has answered the called. Note: As a result, Party A will have no indication if Party C is engaged or does not answer, but will receive ring tone until Party C answers or the call is released by the PSTN.	N
5.7.2	**Recorded Voice Announcement (RVA) option.**	
5.7.2.1	ACTE which incorporates an RVA should comply with the following requirements: (a) On detection of the incoming ring signal the ACTE should answer the call and transmit an RVA. (b) This RVA facility should comply with the requirements of AS/CA S004	 N N
5.7.2.2	The RVA should identify the Party B ACTE and should include a message similar to the following example: 'The number you have called is unattended at present and your call is being directed to another number. Please wait for normal service tones.'	N
5.7.2.3	The ACTE should commence dialling the Party C as soon as the transmission of the RVA is commenced.	N
5.7.2.4	Interconnection of the speech paths between the A–B and B-C parties should be made immediately the three preceding steps have been completed, so that the ring tone or other service tone associated with Party C will be heard by Party A.	N
5.7.3	**Multiple calling option** ACTE may be designed to make one attempt to direct a call to a single telephone number or to automatically make multiple attempts to establish a call if the original attempt is found to be unsuccessful. Multiple attempts may be directed to a signal telephone number or to multiple telephone numbers. Any multiple calling facilities of the ACTE should operate in the manner described in Automatic Operation section of this Standard.	N

Section	Requirement	Result
5.8	**TECHNICAL CONDITIONS FOR RECORDING OF TELEPHONE CONVERSATIONS**	
5.8.1	The requirements in Clauses 5.8.2 to 5.8.6 (inclusive) apply to CE, including CSS, capable of or designed for recording telephone conversations.	N
5.8.2	CE should transmit a tone in accordance with Clause 5.8.6(b) to line while the telephone conversation is being recorded.	N
5.8.3	Interlocking circuitry should be incorporated to ensure that whenever the recorder is in a recording mode, the recording tone generator should send warning tones to line.	N
5.8.4	The recording tone generator should not be capable of being disabled while a conversation is being recorded.	N
5.8.5	The recording tone generator and recording device should be powered from a common power supply and should incorporate as much common circuitry as is practicable so as to ensure that under fault conditions the recording of a telephone conversation is unlikely to occur without the recording tone generator transmitting warning tones to line.	N
5.8.6	CE should comply with the following; (a) Distant Part Notification. Recording tone should be transmitted to the distant party during recording of a conversation. Recording tone may be transmitted to the local telephone, operator's headset and the conversation recording device in use. (b) Recording Tone (i) The recording tone should be a tone of 1400Hz ± 1.5% with a duration of 425 ms ± 75 ms bursts. (ii) The recording tone should be repeated at 15 s ±3 s intervals. (iii) The power level of each tone burst at the point of connection to the PSTN line(Line Port) should be in the range –10 dBm to –24 dBm when measured across a 600 Ω termination connected to the Line Port, and a 600 Ω termination (representing the telephone) connected across the Local Telephone Port, if any.	 N N N N

END OF REPORT BODY

LIST OF ATTACHED APPENDICES

APPENDIX A - 5.4.6 Longitudinal power limits

APPENDIX B - Photo

APPENDIX A
5.4.6 Longitudinal power limits

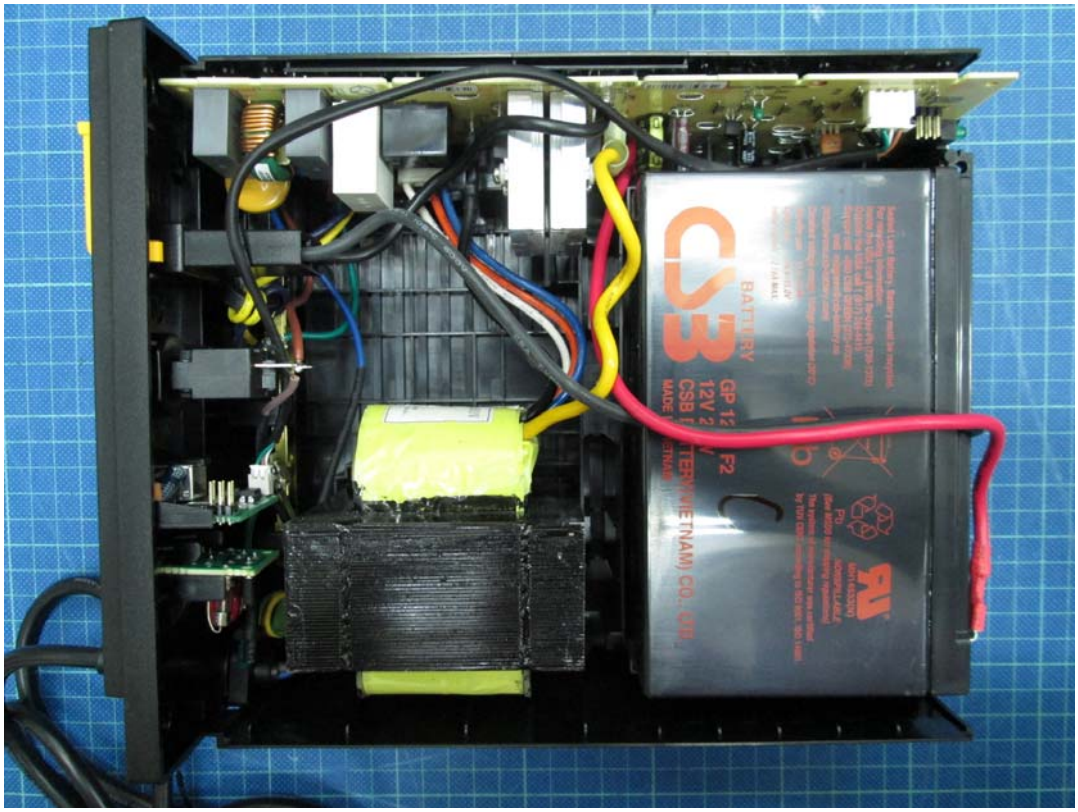
Idle State

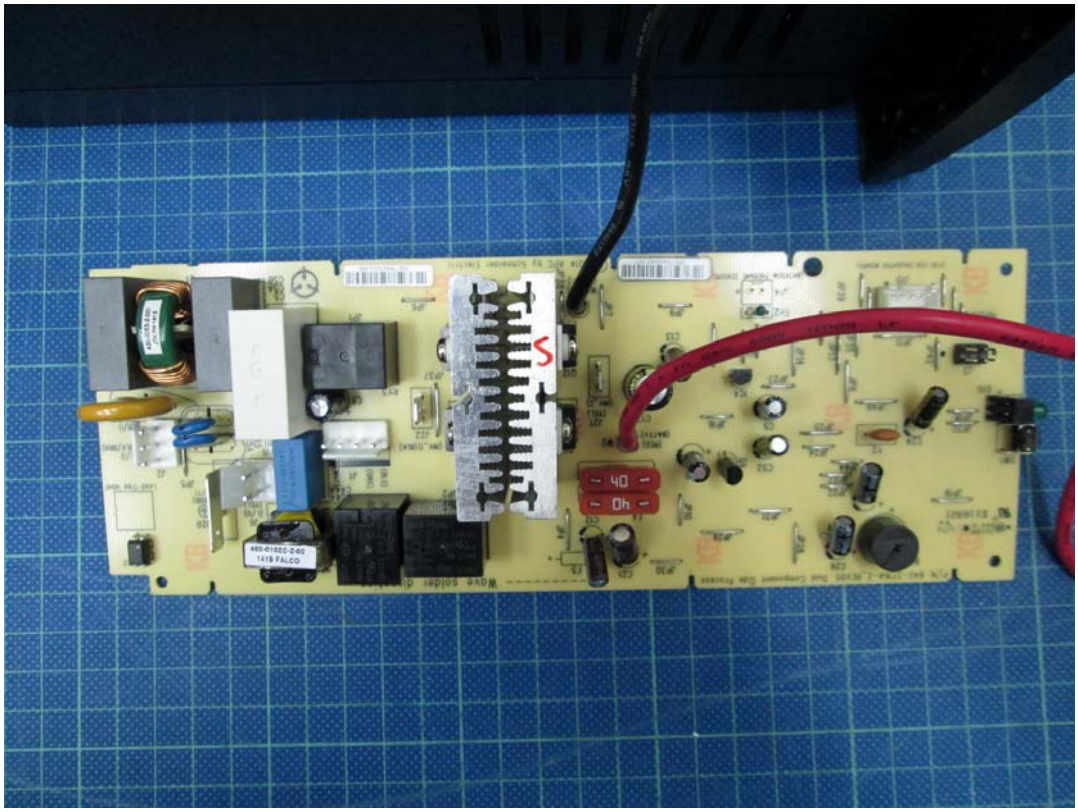
Frequency (Hz)	Result (dBm/Hz)	Limit (Hz)
106.8k	-75.3	-70.0
839.2k	-73.4	-70.0
4.7M	-70.9	-70.0
12.1M	-70.3	-70.0
13.7M	-70.7	-70.0
15.2M	-74.6	-70.0
30.0M	-76.4	-70.0

APPENDIX B
PHOTO
Model:BX700U-AZ

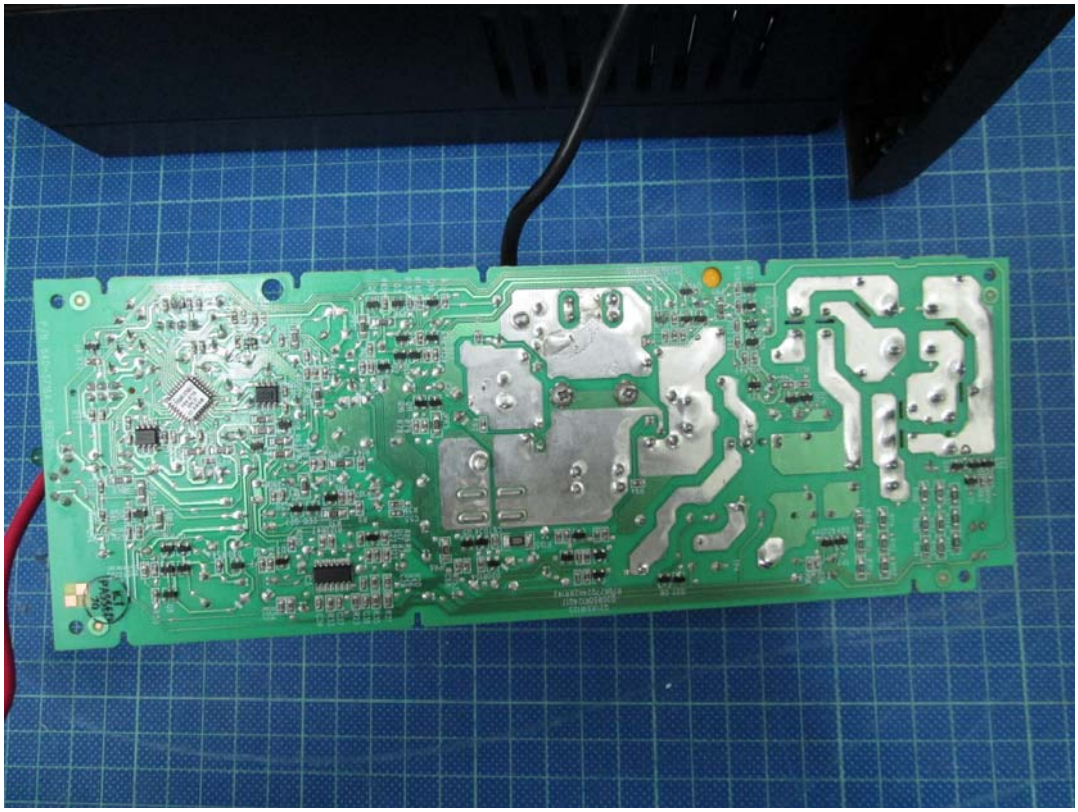
APPENDIX B
Photo
Model: BX700UI

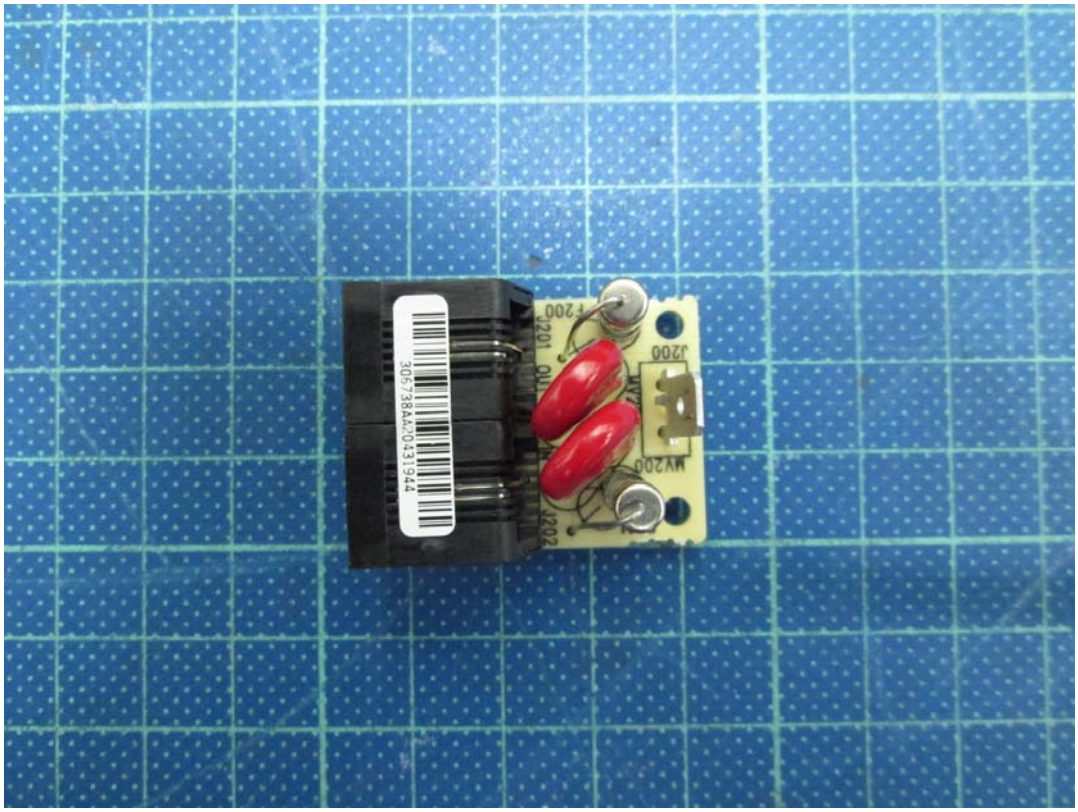
APPENDIX B
Photo





APPENDIX B
Photo





APPENDIX B
Photo