



***Society of Cable
Telecommunications
Engineers***

**ENGINEERING COMMITTEE
Interface Practices Subcommittee**

AMERICAN NATIONAL STANDARD

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Preparing a Line Extender Specification

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1.0 SCOPE

This document provides guidance for preparing a Line Extender requirement specification independent of manufacturer and type.

2.0 INFORMATIVE REFERENCES

Test Procedures used to establish, verify or characterize line extenders should conform to established SCTE requirements. The following test procedures apply when specifying line extender performance.

ANSI/SCTE 06 2009	Composite Distortion Measurements (CSO & CTB)
ANSI/SCTE 16 2012	Test Procedure for Hum Modulation
ANSI/SCTE 17 2007	Test Procedure for Carrier to Noise (C/N, CCN, CIN, CTN)
ANSI/SCTE 45 2012	Test Method for Group Delay
ANSI/SCTE 46 2007	Test Method for AC to DC Power Supplies
ANSI/SCTE 58 2012	AM Cross Modulation Measurements
ANSI/SCTE 62 2012	Measurement Procedure for Noise Figure
ANSI/SCTE 75 2012	Test Point Accuracy
ANSI/SCTE 81 2012	Surge Withstand Test Procedure
ANSI/SCTE 82 2012	Test Method for Low Frequency and Spurious Disturbances
ANSI/SCTE 119 2011	Measurement Procedure for Noise Power Ratio
ANSI/SCTE 121 2011	Test Method for Downstream Bit Error Rate
ANSI/SCTE 144 2012	Test Procedure for Measuring Transmission and Reflection

3.0 DATA FORMAT

Amplifier performance information should specify units and tolerances presented in a clear tabulated format. Ambiguous specification should include explanation notes. Notes should clarify deviation from SCTE test procedures and configuration.

Specification data should include a statement outlining manufacturer's recommended operating settings.

4.0 LINE EXTENDER SPECIFICATION NOTES

1. All specifications should include a brief overview of the technology and features incorporated in the product.
2. Unless otherwise specified, this specification represents worst-case performance for all parameters within the stated operating conditions.
3. Gain and distortion specifications should clearly outline setup and description of specific accessories used in product qualification.
4. Noise figure (NF) specifications are within the specified amplifier operating pass-band with specified accessory (pads and equalizers) values and at operational gain as specified in section 5.0.
5. Distortion characteristics should apply to all channels, covering the specified operational temperature range with the amplifier configured for normal operation.
6. Line Extender Specification should include but are not limited to the SCTE requirements. Product specification may include additional information over and above SCTE minimum requirements.
7. All test points should be labeled directional or non-directional and referenced to a port or other location (input/output).

5.0 DATA TEMPLATE

PRODUCT MODEL #					
PARAMETER		Notes	Units	Forward	Reverse
Technology					
Passband			MHz		
Flatness			+/-dB		
Minimum Full Gain			dB		
Operational Gain			dB		
Manual Control Range	Gain		dB		
	Slope		dB		
Pilot Operating Frequency			MHz		
Pilot Operating Levels	AGC		dBmV		
AGC Range (for +/- 0.5dB hold)			+/-dB		
Noise Figure			dB		
Channel Loading	Analog		#		
	Digital		#		
Rated Output Level	F_{min}/F_{max}		dBmV		
Distortion (@ Rated Output Level)	CTB		dBc		N/A
	XM		dB		N/A
	CSO		dBc		N/A
	CIN		dBc		N/A
Forward BER					N/A
Dynamic Range @ 54dB C/N+IM			dB	N/A	

PARAMETER	Notes	Units	Forward	Reverse
Forward Group Delay (Channel Carrier to Chroma)				
1st Analog above bandedge		nSec		
2nd Analog above bandedge		nSec		
3rd Analog above bandedge		nSec		
Reverse Group Delay				
Lower bandedge to 1.5 MHz above		ns/MHz		
1.5 MHz above to 3.0 MHz above		ns/MHz		
3.0 MHz above to 4.5 MHz above		ns/MHz		
4.5 MHz below Upper bandedge to 3.0MHz below		ns/MHz		
3.0 MHz below to 1.5 MHz below		ns/MHz		
1.5 MHz below to upper bandedge.		ns/MHz		
Test Point	Accuracy	+/-dB		
Directional Yes? No	Input	dBc		
Directional Yes? No	Output	dBc		
Return Loss	Input	dB		
	Output	dB		
Return Loss	Input	dB		
	Output	dB		

PARAMETER		Notes	Units		
Hum Modulation			dBc		
DC Voltage (B+)			Vdc		
Current DC			mA		
DC Ripple			mV		
Power Consumption			W		
AC Input Voltage			V		
AC Current @ 87 VAC			A		
@ 60 VAC			A		
Rated Low Voltage Limit @ VAC			A		
AC Bypass Current			A		
Operating Temperature Range			° F (° C)		
Operating Humidity Range			%		
Operating Altitude			f(m)		
Weight			lb(kg)		
Dimensions			in(mm)		