Advanced Satellite Link Emulator

for Geostationary Satellites

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❖ Description

Polaris' ASLE series is an advanced satellite link emulator designed to extend the propagation time delay of the PSLE series from 265ms to 530ms. The ASLE-L series operates in L-band and supports Doppler shift of up to -6MHz to 6MHz and operating bandwidth of up to 200MHz. The ASLE series provides an ideal solution for satellite modem testing, satellite to earth station RF link testing, spacecraft payload testing, and general testing systems using satellite communications.

The ASLE series is categorized into an IF band series and a L band series. The IF-band series operates at 70 MHz or 140 MHz, and the L-band series operates from 950 MHz to 1450 MHz (950 MHz to 1950 MHz optional). The ASLE series provides reproductions for three types of satellite links.

- Time Delay:

  Reproduction for propagation time delay due to distance between satellite and earth station terminals

- Doppler Effect:

  Reproduction for doppler frequency shifts between satellite and moving earth station terminals

- Attenuation:

  Reproduction for radio path loss due to heavy rain or heavy snow

❖ Features

- Built-in L-band frequency converter (ASLE-L series)
- Operating bandwidth: 200 MHz (ASLE-L-200D)
- Time delay range: 0 to 530 ms (1 us steps)
- Doppler shift range: -6 MHz to 6 MHz (1 Hz steps)
- Spurious: -50 dBc typ.
- Remote interfaces: USB, RS-232, or RS-422/485

❖ Applications

- Satellite Modem Test
- VSAT Test
- Satellite Payload Test
- UAV Test
- Earth Terminal Test
- Satellite System Integration Test Beds
- Mobile Transceiver Test

❖ Product Family

- L-band, Ultra-wide Bandwidth

ASLE-L-200D:
- L: L-band
- 200D: 200 MHz Bandwidth, Doppler

ASLE-L-100D:
- L: L-band
- 100D: 100 MHz Bandwidth, Doppler

- L-band, Narrow bandwidth

ASLE-L-36D:
- L: L-band
- 36D: 36 MHz Bandwidth, Doppler

❖ Product Family

- IF-band

ASLE-140-36D:

- 140: 140 MHz
- 36D: 36 MHz Bandwidth, Doppler

ASLE-70-10D:

- 70: 70 MHz
- 10D: 10 MHz Bandwidth, Doppler

Data Sheet

- ASLE-L-200D
- ASEL-L-100D
- ASLE-L-36D
- ASLE-140-36D
- ASLE-70-10D

Features

- Built-in L-band frequency converter
- Operating bandwidth: 200 MHz
- Time delay range: 0 to 530 ms (1 us steps)
- Doppler shift range: -6 MHz to 6 MHz (1 Hz steps)
- Spurious: -50 dBc typ.
- Remote interfaces: USB, RS-232, or RS-422/485

Options

- Option F: Extended Frequency Range
  (950 MHz to 1950 MHz)

Applications

- Satellite Modem Test
- VSAT Test
- Satellite Payload Test
- UAV Test
- Earth Terminal Test
- Satellite System Integration Test Beds
- Mobile Transceiver Test

Specifications

- ASLE-L-200D

Parameters		Specifications	Remarks
Operating Frequency	Range (MHz)	950 to 1450	Option F: 950 to 1950
	Step (MHz)	0.1	
RF Input Power (dBm)		≤ -10	
Maximun Gain (dB)		0±1 at 0dB attenuation & 1200MHz	
Operating Bandwidth (MHz)		≥ 200	
Gain Flatness (dBp-p)		≤ 3	
Time Delay	Range (ms)	0 (Bypass), 0.01 to 530	
	Step (us)	1	
	Accuracy (us)	≤ ±0.1	
Attenuation	Range (dB)	0 to -40	
	Step (dB)	0.5	
	Accuracy (dB)	≤ ±0.5	
Doppler Shift	Range (MHz)	-6 to 6	
	Step (Hz)	1	
	Accuracy (Hz)	Based on 10MHz reference	
Spurious (dBc)		≤ -45 at in-band (≤ -50dBc typical)	
V.S.W.R. (: 1)		≤ 1.5 at 50Ω	
Control and Interface	Local	Front Panel (VFD & Keypad)	
	Remote	USB, RS-232, or RS-422/485	
Primary Power	Voltage (Vac)	90 to 240	
	Frequency (Hz)	47 to 63	
Operating Temperature (℃)		+10 to +40	
Size (Width x Height x Depth) (inch)		19" x 5.25" x 21"	
External Reference Switching		Automatic (Switching Time: 5 sec)	10MHz, 0±2dBm, 50Ω

Features

- Built-in L-band frequency converter
- Operating bandwidth: 100 MHz
- Time delay range: 0 to 530 ms (1 us steps)
- Doppler shift range: -6 MHz to 6 MHz (1 Hz steps)
- Spurious: -50 dBc typ.
- Remote interfaces: USB, RS-232, or RS-422/485

Options

- Option F: Extended Frequency Range
  (950 MHz to 1950 MHz)

Applications

- Satellite Modem Test
- VSAT Test
- Satellite Payload Test
- UAV Test
- Earth Terminal Test
- Satellite System Integration Test Beds
- Mobile Transceiver Test

Specifications

- ASLE-L-100D

Parameters		Specifications	Remarks
Operating Frequency	Range (MHz)	950 to 1450	Option F: 950 to 1950
	Step (MHz)	0.1	
RF Input Power (dBm)		≤ -10	
Maximun Gain (dB)		0±1 at 0dB attenuation & 1200MHz	
Operating Bandwidth (MHz)		≥ 100	
Gain Flatness (dBp-p)		≤ 3	
Time Delay	Range (ms)	0 (Bypass), 0.01 to 530	
	Step (us)	1	
	Accuracy (us)	≤ ±0.1	
Attenuation	Range (dB)	0 to -40	
	Step (dB)	0.5	
	Accuracy (dB)	≤ ±0.5	
Doppler Shift	Range (MHz)	-6 to 6	
	Step (Hz)	1	
	Accuracy (Hz)	Based on 10MHz reference	
Spurious (dBc)		≤ -45 at in-band (≤ -50dBc typical)	
V.S.W.R. (: 1)		≤ 1.5 at 50Ω	
Control and Interface	Local	Front Panel (VFD & Keypad)	
	Remote	USB, RS-232, or RS-422/485	
Primary Power	Voltage (Vac)	90 to 240	
	Frequency (Hz)	47 to 63	
Operating Temperature (℃)		+10 to +40	
Size (Width x Height x Depth) (inch)		19" x 5.25" x 21"	
External Reference Switching		Automatic (Switching Time: 5 sec)	10MHz, 0±2dBm, 50Ω

Features

- Built-in L-band frequency converter
- Operating bandwidth: 36 MHz
- Time delay range: 0 to 530 ms (1 us steps)
- Doppler shift range: -3 MHz to 3 MHz (1 Hz steps)
- Spurious: -50 dBc typ.
- Remote interfaces: USB, RS-232, or RS-422/485

Options

- Option F: Extended Frequency Range
  (950 MHz to 1950 MHz)

Applications

- Satellite Modem Test
- VSAT Test
- Satellite Payload Test
- UAV Test
- Earth Terminal Test
- Satellite System Integration Test Beds
- Mobile Transceiver Test

Specifications

- ASLE-L-36D

Parameters		Specifications	Remarks
Operating Frequency	Range (MHz)	950 to 1450	Option F: 950 to 1950
	Step (MHz)	0.1	
RF Input Power (dBm)		≤ -10	
Maximun Gain (dB)		0±1 at 0dB attenuation & 1200MHz	
Operating Bandwidth (MHz)		≥ 36	
Gain Flatness (dBp-p)		≤ 2	
Time Delay	Range (ms)	0 (Bypass), 0.01 to 530	
	Step (us)	1	
	Accuracy (us)	≤ ±0.1	
Attenuation	Range (dB)	0 to -40	
	Step (dB)	0.5	
	Accuracy (dB)	≤ ±0.5	
Doppler Shift	Range (MHz)	-3 to 3	
	Step (Hz)	1	
	Accuracy (Hz)	Based on 10MHz reference	
Spurious (dBc)		≤ -50 at in-band (≤ -55dBc typical)	
V.S.W.R. (: 1)		≤ 1.5 at 50Ω	
Control and Interface	Local	Front Panel (VFD & Keypad)	
	Remote	USB, RS-232, or RS-422/485	
Primary Power	Voltage (Vac)	90 to 240	
	Frequency (Hz)	47 to 63	
Operating Temperature (℃)		+10 to +40	
Size (Width x Height x Depth) (inch)		19" x 5.25" x 21"	
External Reference Switching		Automatic (Switching Time: 5 sec)	10MHz, 0±2dBm, 50Ω

Features

- Operating frequency: 140 MHz
- Operating bandwidth: 36 MHz
- Time delay range: 0 to 530 ms (1 us steps)
- Doppler shift range: -3 MHz to 3 MHz (1 Hz steps)
- Noise Floor: < -125 dBc/Hz
- Remote interfaces: USB, RS-232, or RS-422/485

Applications

- Satellite Modem Test
- VSAT Test
- Satellite Payload Test
- UAV Test
- Earth Terminal Test
- Satellite System Integration Test Beds
- Mobile Transceiver Test

Specifications

- ASLE-140-36D

Parameters		Specifications	Remarks
Operating Frequency		140	
RF Input Power (dBm)		≤ -10	
Maximun Gain (dB)		0±1 at 0dB attenuation & 140MHz	
Operating Bandwidth (MHz)		≥ 36	
Gain Flatness (dBp-p)		≤ 1.5	
Time Delay	Range (ms)	0 (Bypass), 0.01 to 530	
	Step (us)	1	
	Accuracy (us)	≤ ±0.1	
Attenuation	Range (dB)	0 to -40	
	Step (dB)	0.5	
	Accuracy (dB)	≤ ±0.5	
Doppler Shift	Range (MHz)	-3 to 3	
	Step (Hz)	1	
	Accuracy (Hz)	Based on 10MHz reference	
Spurious (dBc)		≤ -45 at in-band (≤ -50dBc typical)	
Noise Floor (dBc/Hz)		≤ -125	
V.S.W.R. (: 1)		≤ 1.5 at 50Ω	
Control and Interface	Local	Front Panel (VFD & Keypad)	
	Remote	USB, RS-232, or RS-422/485	
Primary Power	Voltage (Vac)	90 to 240	
	Frequency (Hz)	47 to 63	
Operating Temperature (℃)		+10 to +40	
Size (Width x Height x Depth) (inch)		19" x 5.25" x 21"	
External Reference Switching		Automatic (Switching Time: 5 sec)	10MHz, 0±2dBm, 50Ω

Features

- Operating frequency: 70 MHz
- Operating bandwidth: 10 MHz
- Time delay range: 0 to 530 ms (1 us steps)
- Doppler shift range: -1 MHz to 1 MHz (1 Hz steps)
- Noise Floor: < -125 dBc/Hz
- Remote interfaces: USB, RS-232, or RS-422/485

Applications

- Satellite Modem Test
- VSAT Test
- Satellite Payload Test
- UAV Test
- Earth Terminal Test
- Satellite System Integration Test Beds
- Mobile Transceiver Test

Specifications

- ASLE-70-10D

Parameters		Specifications	Remarks
Operating Frequency		70	
RF Input Power (dBm)		≤ -10	
Maximun Gain (dB)		0±1 at 0dB attenuation & 140MHz	
Operating Bandwidth (MHz)		≥ 10	
Gain Flatness (dBp-p)		≤ 1	
Time Delay	Range (ms)	0 (Bypass), 0.01 to 530	
	Step (us)	1	
	Accuracy (us)	≤ ±0.1	
Attenuation	Range (dB)	0 to -40	
	Step (dB)	0.5	
	Accuracy (dB)	≤ ±0.5	
Doppler Shift	Range (MHz)	-1 to 1	
	Step (Hz)	1	
	Accuracy (Hz)	Based on 10MHz reference	
Spurious (dBc)		≤ -50 at in-band (≤ -55dBc typical)	
Noise Floor (dBc/Hz)		≤ -125	
V.S.W.R. (: 1)		≤ 1.5 at 50Ω	
Control and Interface	Local	Front Panel (VFD & Keypad)	
	Remote	USB, RS-232, or RS-422/485	
Primary Power	Voltage (Vac)	90 to 240	
	Frequency (Hz)	47 to 63	
Operating Temperature (℃)		+10 to +40	
Size (Width x Height x Depth) (inch)		19" x 5.25" x 21"	
External Reference Switching		Automatic (Switching Time: 5 sec)	10MHz, 0±2dBm, 50Ω