

Satellite Link Emulator

for Geostationary Satellites



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❖ Description

The Polaris' PSLE series is a Satellite Link Emulator for geostationary satellites. The PSLE series provides an ideal solution for satellite modem testing, satellite to earth station RF link testing, spacecraft payload testing, and in general testing systems using satellite communications.

The PSLE series is classified into IF band series and L band series. The IF-band series operates at 70MHz or 140MHz and the L-band series operates from 950MHz to 1,450MHz (950MHz to 1,950MHz optional). In addition, the L-band series is categorized into a models operating in a wide band and a models operating in a narrow band.

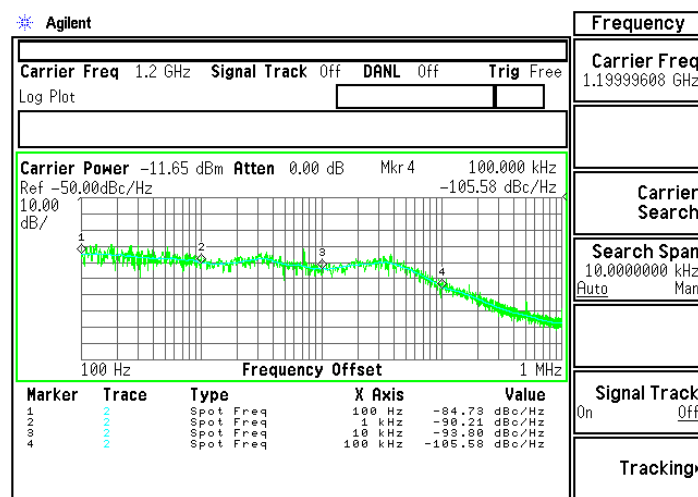
The PSLE series provides three types of simulation.

- **Time Delay:**
Simulation for propagation time delay due to distance between satellite and earth station terminals
- **Doppler Effect:**
Simulation for Doppler frequency shifts between satellite and moving earth station terminals
- **Attenuation:**
Simulation for radio path loss due to heavy rain or heavy snow

❖ Features

- Built-in L-band Frequency Converters (PSLE-L series)
- Ultra-wide Bandwidth up to 200MHz (PSLE-L-200D)
- Complete simulation without BER deterioration for signals with high modulation index.
- Excellent Phase Noise

PSLE-L-100D (L-band, 100MHz Bandwidth)



Frequency Offset	Phase Noise at 1.2GHz
100Hz	-84.73dBc/Hz
1KHz	-90.21dBc/Hz
10KHz	-93.80dBc/Hz
100KHz	-105.58dBc/Hz
1MHz	-127.10dBc/Hz

- Excellent SNR using 14bit ADC
- Spurious suppression higher than 50dBc out of band (40dBc for PSLE-L-200D)
- Superior quality proven by domestic and foreign defense companies

❖ 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



PSLE-L-200D:

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



PSLE-L-100D:

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

- L-band, Narrow bandwidth

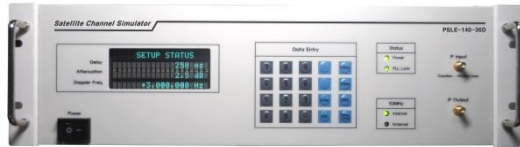


PSLE-L-10D:

- L: L-band
- 10D: 10MHz Bandwidth, Doppler

❖ Product Family

- IF-band



PSLE-140-36D:

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



PSLE-70-10D:

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



PSLE-70-10ND:

- 70: 70MHz
- 10ND: 10MHz Bandwidth, Doppler not provided

Data Sheet

- PSLE-L-200D
- PSEL-L-100D
- PSLE-L-10D
- PSLE-140-36D
- PSLE-70-10D
- PSLE-70-ND

Features

- Built-in L-band Frequency Converter
- Ultra-wide Bandwidth up to 200MHz
- Excellent SNR using 14bit ADC
- Affordable Price

Applications

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

Options

- Option 1: Extended Frequency Range
(950MHz to 1,950MHz)
- Option 2: 64ns Frequency Resolution

Specifications

- PSLE-L-200D



Parameters		Specifications	Remarks
Frequency Range		950MHz to 1,450MHz	Option 1: 950MHz to 1,950MHz
Operating Bandwidth		200MHz	
RF Power	Input	≤-10dBm	
	Output	-10dBm max. at 0dB attenuation	
Gain		0dB max.	
Attenuation	Range	0dB to -40dB	
	Resolution	0.5dB	
	Accuracy	≤ ±0.5dB	
Spurious		≤-35dBc at in-band (≤-40dBc typical)	
Return Loss		≤-14dB at 50Ω	
Doppler	Range	-1MHz to +1MHz	
	Resolution	1Hz	
	Absolute Accuracy	based on 10MHz reference	
Delay	Range	265ms max.	
	Resolution	1ms	Option 2: 64ns
	Accuracy	based on 10MHz Reference	
Control and Interface	Local	Front panel	
	Remote	RS-422/RS-485, RS-232, USB	
Primary Power	Voltage	90VAC to 240VAC	
	Frequency	47Hz to 63Hz	
Operating Temperature		+10°C to +40°C	
Size (Width x Height x Depth)		19" x 7" x 21"	

Features

- Built-in L-band Frequency Converter
- Wide Bandwidth up to 100MHz
- Ultra-low Phase Noise:
 - 84dBc/Hz at 100Hz Offset,
 - 90dBc/Hz at 1KHz Offset,
 - 93dBc/Hz at 10KHz Offset,
 - 105dBc/Hz at 100KHz Offset, and
 - 127dBc/Hz at 1MHz Offset from 1.2GHz
- Excellent SNR using 14bit ADC
- Affordable Price

Applications

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

Options

- Option 1: Extended Frequency Range (950MHz to 1,950MHz)
- Option 2: 64ns Frequency Resolution

Specifications

- PSLE-L-100D



Parameters		Specifications	Remarks
Frequency Range		950MHz to 1,450MHz	Option 1: 950 to 1,950MHz
Operating Bandwidth		100MHz	
Typical Phase Noise		-84dBc/Hz at 100Hz offset, -90dBc/Hz at 1KHz offset, -93dBc/Hz at 10KHz offset, -105dBc/Hz at 100KHz offset, -127dBc/Hz at 1MHz offset from 1.2GHz	
RF Power	Input	≤ -10dBm	
	Output	-10dBm max. at 0dB attenuation	
Gain		0dB max.	
Attenuation	Range	0dB to -40dB	
	Resolution	0.5dB	
	Accuracy	≤ ±0.5dB	
Spurious		≤ -45dBc at in-band (≤ -50dBc typical)	
Return Loss		≤ -14dB at 50Ω	
Doppler	Range	-1MHz to +1MHz	
	Resolution	1Hz	
	Absolute Accuracy	based on 10MHz reference	
Delay	Range	265ms max.	
	Resolution	1ms	Option 2: 64ns
	Accuracy	based on 10MHz Reference	
Control and Interface	Local	Front panel	
	Remote	RS-422/RS-485, RS-232, USB	
Primary Power	Voltage	90VAC to 240VAC	
	Frequency	47Hz to 63Hz	
Operating Temperature		+10°C to +40°C	
Size (Width x Height x Depth)		19" x 7" x 21"	

Features

- Built-in L-band Frequency Converter
- Ultra-low Phase Noise:
 - 84dBc/Hz at 100Hz Offset,
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 - 105dBc/Hz at 100KHz Offset, and
 - 127dBc/Hz at 1MHz Offset from 1.2GHz
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Applications

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- Mobile Transceiver Test

Options

- Option 1: Extended Frequency Range
(950MHz to 1,950MHz)
- Option 2: 64ns Frequency Resolution

Specifications

- PSLE-L-10D



Parameters		Specifications	Remarks
Frequency Range		950MHz to 1,450MHz	Option 1: 950 to 1,950MHz
Operating Bandwidth		10MHz	
Typical Phase Noise		-84dBc/Hz at 100Hz offset, -90dBc/Hz at 1KHz offset, -93dBc/Hz at 10KHz offset, -105dBc/Hz at 100KHz offset, -127dBc/Hz at 1MHz offset from 1.2GHz	
RF Power	Input	≤-10dBm	
	Output	-10dBm max. at 0dB attenuation	
Gain		0dB max.	
Attenuation	Range	0dB to -40dB	
	Resolution	0.5dB	
	Accuracy	≤ ±0.5dB	
Spurious		≤-45dBc at in-band (≤-50dBc typical)	
Return Loss		≤-14dB at 50Ω	
Doppler	Range	-1MHz to +1MHz	
	Resolution	1Hz	
	Absolute Accuracy	based on 10MHz reference	
Delay	Range	265ms max.	
	Resolution	1ms	Option 2: 64ns
	Accuracy	based on 10MHz Reference	
Control and Interface	Local	Front panel	
	Remote	RS-422/RS-485, RS-232, USB	
Primary Power	Voltage	90VAC to 240VAC	
	Frequency	47Hz to 63Hz	
Operating Temperature		+10°C to +40°C	
Size (Width x Height x Depth)		19" x 7" x 21"	

Features

- Excellent SNR using 14bit ADC
- Low Noise Floor below -125dBc/Hz
- Wide Doppler Frequency Shift from -3MHz to +3MHz
- Affordable Price

Options

- Option 2: 64ns Frequency Resolution

Applications

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

Specifications

- PSLE-140-36D



Parameters		Specifications	Remarks
Center Frequency		140MHz	
Operating Bandwidth		36MHz	
RF Power	Input	$\leq -10\text{dBm}$	
	Output	$-10\text{dBm max. at } 0\text{dB attenuation}$	
Gain		0dB max.	
Attenuation	Range	0dB to -40dB	
	Resolution	0.5dB	
	Accuracy	$\leq \pm 0.5\text{dB}$	
Spurious		$\leq -45\text{dBc at in-band } (\leq -50\text{dBc typical})$	
Noise Floor		$\leq -125\text{dBc}$	
Return Loss		$\leq -17.5\text{dB at } 50\Omega$	
Doppler	Range	$-3\text{MHz to } +3\text{MHz}$	
	Resolution	1Hz	
	Absolute Accuracy	based on 10MHz reference	
Delay	Range	265ms max.	
	Resolution	1ms	Option 2: 64ns
	Accuracy	based on 10MHz Reference	
Control and Interface	Local	Front panel	
	Remote	RS-422/RS-485, RS-232, USB	
Primary Power	Voltage	90VAC to 240VAC	
	Frequency	47Hz to 63Hz	
Operating Temperature		$+10^{\circ}\text{C to } +40^{\circ}\text{C}$	
Size (Width x Height x Depth)		19" x 5.25" x 21"	

Features

- Excellent SNR using 14bit ADC
- Low Noise Floor below -125dBc/Hz
- Affordable Price

Applications

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

Options

- Option 2: 64ns Frequency Resolution

Specifications

- PSLE-70-10D



Parameters		Specifications	Remarks
Center Frequency		70MHz	
Operating Bandwidth		10MHz	
RF Power	Input	≤ -10dBm	
	Output	-10dBm max. at 0dB attenuation	
Gain		0dB max.	
Attenuation	Range	0dB to -40dB	
	Resolution	0.5dB	
	Accuracy	≤ ±0.5dB	
Spurious		≤ -50dBc at in-band	
Noise Floor		≤ -125dBc	
Return Loss		≤ -16dB at 50Ω	
Doppler	Range	-1MHz to +1MHz	
	Resolution	1Hz	
	Absolute Accuracy	based on 10MHz reference	
Delay	Range	265ms max.	
	Resolution	1ms	Option 2: 64ns
	Accuracy	based on 10MHz Reference	
Control and Interface	Local	Front panel	
	Remote	RS-422/RS-485, RS-232, USB	
Primary Power	Voltage	90VAC to 240VAC	
	Frequency	47Hz to 63Hz	
Operating Temperature		+10°C to +40°C	
Size (Width x Height x Depth)		19" x 5.25" x 21"	

Features

- Excellent SNR using 14bit ADC
- Low Noise Floor below -125dBc/Hz
- Doppler Simulation not provided
- Affordable Price

Applications

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

Options

- Option 2: 64ns Frequency Resolution

Specifications

- PSLE-70-10ND



Parameters		Specifications	Remarks
Center Frequency		70MHz	
Operating Bandwidth		10MHz	
RF Power	Input	$\leq -10\text{dBm}$	
	Output	$-10\text{dBm max. at } 0\text{dB attenuation}$	
Gain		0dB max.	
Attenuation	Range	0dB to -40dB	
	Resolution	0.5dB	
	Accuracy	$\leq \pm 0.5\text{dB}$	
Spurious		$\leq -50\text{dBc at in-band}$	
Noise Floor		$\leq -125\text{dBc}$	
Return Loss		$\leq -16\text{dB at } 50\Omega$	
Delay	Range	265ms max.	
	Resolution	1ms	Option 2: 64ns
	Accuracy	based on 10MHz Reference	
Control and Interface	Local	Front panel	
	Remote	RS-422/RS-485, RS-232, USB	
Primary Power	Voltage	90VAC to 240VAC	
	Frequency	47Hz to 63Hz	
Operating Temperature		$+10^\circ\text{C to } +40^\circ\text{C}$	
Size (Width x Height x Depth)		19" x 5.25" x 21"	