

MS12T

GPS 1x2 Tiny Qualified Splitter

Description

The MS12T Tiny Qualified Splitter is a one-input, two-output GPS splitter device in which input from an active GPS antenna is split evenly between two receiving GPS units. Ideal for platforms requiring very small, lightweight, and/or low-power equipment such as Unmanned Aerial Vehicles (UAV's). The MS12T can be configured to pass DC from the RF output (J2) to the antenna input port (J1) in order to power an active GPS antenna on that port. The second RF output (J3) is DC blocked and features a 200Ω resistive load to ground to simulate an antenna current draw for any receiver connected to that port.

Features

- Passes all GPS and GNSS frequencies
- Ideal for UAV Applications
- Small, Lightweight, and Low-power (SWaP)
- Small Package: 1.0in x 1.1in (25.4mm x 27.9mm)
- RoHS, REACH, WEEE Compliant
- CE Certified
- UKCA Certified

Options

- Qualified to MIL-STD-810
- Amplified, Passive, or Custom Gain
- Hermetically Sealed, EMI Shielding, and Waterproofing

The MS12T Tiny Qualified Splitter comes with many available options to meet specific needs. Please contact GPS Source via phone, email, or visit the website for further information on product options and specifications.



1 MS12T Specifications

Table 1-1: Electrical Specifications

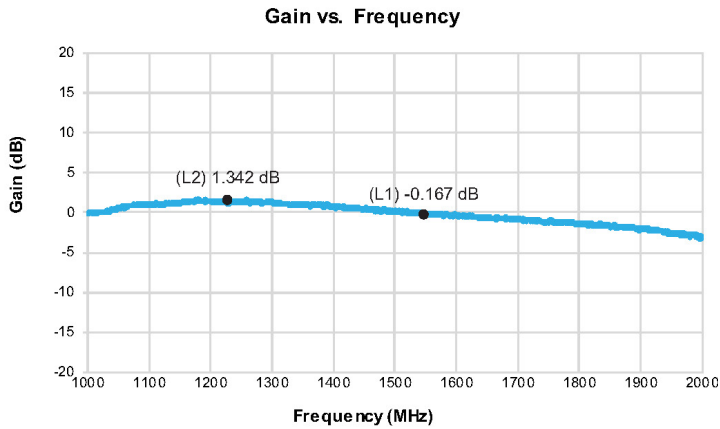
Operating temperature -40°C to 85°C

Parameter			Conditions	Min	Typical	Max	Units
Frequency Range			Ant: Any Port; Unused Ports: 50 Ω	1.1		1.7	GHz
In/Out Impedance			Ant: Any Port; Unused Ports: 50 Ω		50		Ω
Gain ⁽¹⁾	Standard	Amplified	Ant: Any Port; Unused Ports: 50 Ω	6	8	10	dB
	Custom	Amplified	J2 equals J3 (XXdB, from 0 to 7dB)	XX-2	XX	XX+2	
	As Specified	Amplified by port	As Specified (XXdB, from 0 to 7dB)	XX-2	XX	XX+2	
Loss-Passive			Ant: Any Port; Unused Ports: 50 Ω	-3	-4.5	-6	dB
Input SWR			All Ports: 50 Ω			2:1	—
Output SWR			All Ports: 50 Ω			2:1	—
Input P_{1dB}		Amplified	Ant: Any Port, Unused Ports 50 Ω	-20			dBm
Input I_{P3}		Amplified	Ant: Any Port; Unused Ports: 50 Ω 1MHz Tone Spacing	-10			dBm
Noise Figure		Amplified	Ant: Any Port; Unused Ports: 50 Ω			2	dB
Gain Flatness	Amplified		[L1 – L2] Ant: Any Port; Unused Ports: 50 Ω			2.5	dB
	Passive			1			
Amplifier Balance			Phase (J2 - J3) Ant: Any Port; Unused Ports: 50 Ω		.5	1.0	dB
Phase Balance			Phase (J2 - J3) Ant: Any Port; Unused Ports: 50 Ω			1	Degree
Group Delay Flatness			Td,max - Td,min; J2 – J1 (Ant)			1	ns
Isolation⁽¹⁾	Standard	Amp/Passive	Opposite Ports: Ant – 50 Ω 1MHz Tone Spacing	16			dB
	High	Amp 00dB		30			
Inline Voltage		Amplified	(J1) pass DC Standard	3		12	VDC
		Passive	(J1) pass DC Standard	3		12	
Current (I_{Internal})			Current Consumption of device (excludes Draw)			7	
Draw Current		Pass DC	DC Input on (J1)			250	mA
Max RF Input		Amplified	Max RF Input Without Damage			0	mA
		Passive		30	dBm		

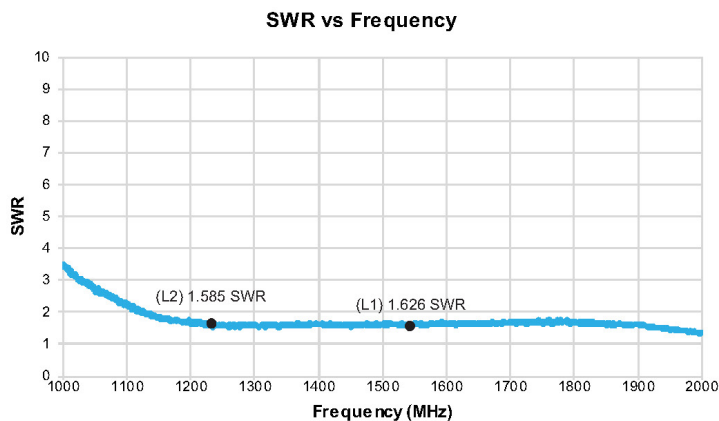
Notes: 1. Decreased gain increases port to port isolation.

2 Performance Data

1. Active: Gain vs. Frequency



2. Active: SWR vs. Frequency



3 Environmental Qualifications

3.1 Temperature and Altitude

The MS12T complies with the temperature-altitude tests per MIL-STD-810G, Method 504.1, Category 5, Temperature and Altitude.

3.2 Temperature Shock

The MS12T is designed to withstand without degradation (while not operating) Method 503.1, Procedure I of MIL-STD-810G.

3.3 Explosive Atmosphere

The MS12T is designed for operation in the presence of explosive mixtures of air and jet fuel without causing explosion or fire at atmospheric pressures corresponding to altitudes from -1,800ft to 50,000ft. The MS12T does not produce surface temperatures or heat in excess of 400°F. The MS12T does not produce electrical discharges at an energy level sufficient to ignite the explosive mixture when the equipment is turned on or off or operated. The MS12T meets the requirements of MIL-STD-810G, Method 511.1, and Procedure II. Hermetically sealed equipment meeting the Requirements of MIL-STD-202, Method 112D, or MIL-STD-883, Method 1014.7 (as applicable), and not exceeding a Helium leakage rate of 1×10^{-7} cc/s are exempt from this requirement.

3.4 Decompression

The MS12T is designed to meet the performance standards per RTCA-DO-160E para 4.6.2 cat D during and following a rapid and complete loss of normal cabin compartment pressurization (10,000 feet) from an airplane flight altitude of 50,000 feet within 15 seconds. The MS12T will remain operating for five minutes at 50,000 feet before being returned to normal cabin pressure.

3.5 Overpressure

MS12T is capable of withstanding for 10 minutes while not operating. A 12.1 PSI compartment pressure with no physical distortion or permanent set RTCA-DO-160E PARA 4.6.3. The MS12T will operate satisfactorily upon return to normal pressure.

3.6 Salt Fog

The MS12T is designed to meet the requirements of Salt Fog conditions per Paragraph 3.2.24.9 of MIL-E-5400 and MIL-STD-810G Method 509.1. The MS12T is designed to withstand a salt concentration of five percent at a temperature of 35° C for 48 hours without degradation.

3.7 Fungus

The MS12T is designed to meet the requirements of Fungus conditions per Paragraph 3.2.24.8 of MIL-E-5400 i.e. fungus inert materials per requirement 4 of MIL-HDBK-454.

3.8 Humidity

The MS12T is capable of meeting the requirements of a ten-day humidity test conducted per MIL-STD-810G, Method 507.1; Procedure I. MS12T is designed to withstand exposure to 95% relative humidity at a temperature of 30°C for 28 days.

3.9 Sand and Dust

The MS12T is capable of meeting the requirements of Sand and Dust conditions of Method 510, MIL-STD-810G, for a temperature of 145°F for a duration of 22 hours.

3.10 Flammability

The MS12T is self-extinguishing or nonflammable and is designed to meet the Requirements of Paragraph 5.2.4 of MIL-STD-1587 and Requirement 3 of MIL-HDBK-454.

3.11 Finish and Colors

All case surfaces of the MS12T are treated with chemical film per MIL-DTL-5441, TYPE II, CLASS 3. The MS12T bottom contact surface is free of paint or non-conductive finishes. The MS12T bottom contact surfaces are protected from corrosion by a conductive coating (MIL-DTL-5541). All other surfaces, except connector mating surfaces are primed per MIL-PRF-23377, TYPE I CLASS N and painted per MIL-PRF-85285, TYPE I, CLASS H COLOR NUMBER (26231), Military Gray (not lusterless variety) per AMS-STD-595 (Exceptions: bottom and connector surfaces are free of paint).

3.12 Human Factors

Human Engineering principles and criteria (including considerations for human capabilities and limitations) using MIL-STD-1472 in all phases of design, development, testing, and procedures development. The design is free of all sharp edges, according to MIL-STD-1472.

3.13 Electromagnetic Interference and Compatibility Test

MS12T performs its intended function and operation does not degrade the performance of other equipment or subsystems. The following table defines the test requirements and test procedures for conducting the required electromagnetic compatibility testing. The MS12T is designed and tested to meet the requirements of MIL-STD-461F:

Table 3-1 Test Requirements & Procedures

Test	Description	
CE106	Conducted Emissions Antenna Terminal	10kHz to 31.5GHz
CS114	Conducted Susceptibility Bulk Cable Injection	10kHz to 200MHz
RE102	Radiated Emissions Electric Field	10kHz to 18GHz
RS103	Radiated Susceptibility Electric Field	2MHz to 40GHz
CE102	Conducted Emissions Power Leads	10kHz to 10MHz
CS101	Conducted Susceptibility Power Leads	30Hz to 150kHz

3.14 Shock

The MS12T is designed to withstand the shock levels specified in the saw tooth shock pulse parameter specified in **Figure 3-1** and **Table 3-2**. It is designed to meet the requirements of MIL-STD-810G Method 516.6 Procedure I, Ground Material, 4.2, MIL-STD-810G Crash Hazard Shock Method 516.6, Procedure V, Ground Material, Hazard shock classic pulse, Flight Vehicle for Functional (20g), Procedure III for Crash (40g) Flight Vehicle, Shock.

Figure 3-1: Peak Shock Levels

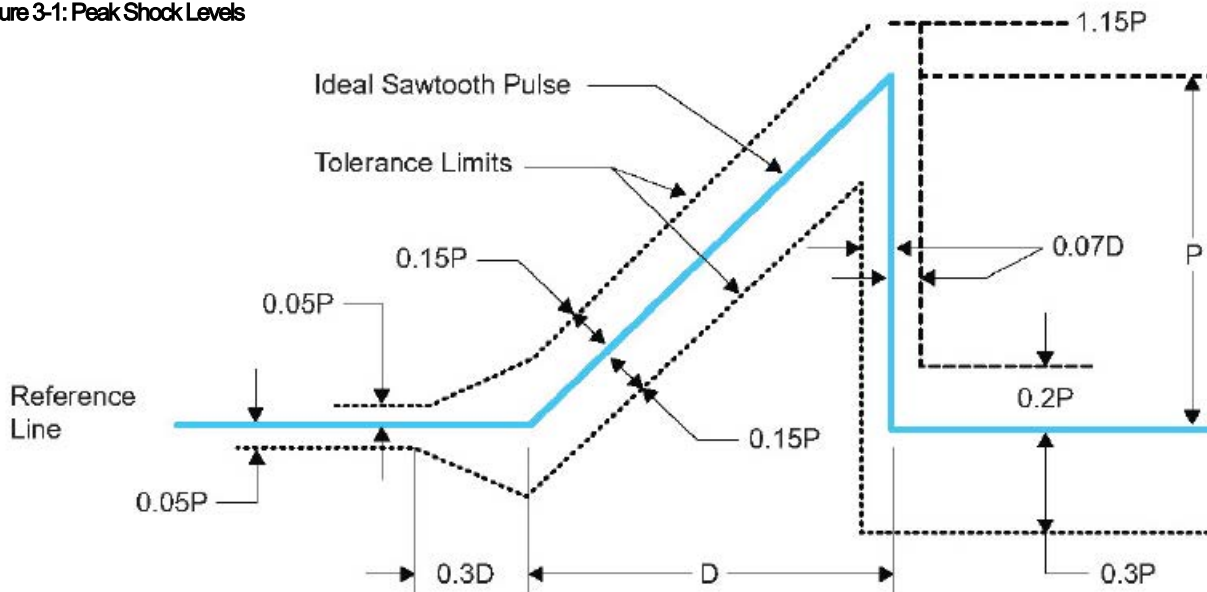


Table 3-2: Peak Shock Levels

Test	Flight Vehicle Equipment	
	Minimum Peak Value (P) g's	Nominal Duration (D) ms
Functional	20 g-force	11ms
Crash Safety	40 g-force	11ms

3.15 Vibration

The MS12T is designed to meet the requirements of random vibration per conditions (MIL-STD-810G, Method 514.6, Annex D, Vibration (Functional & Endurance)) to the levels defined below. Acceleration Power Spectral Density (PSD) for the random vibration envelope is shown in **Figure 3-2**. Amplitudes for the functional levels and endurance level requirements are as shown in **Table 3-3**.

Figure 3-2. Zone 3 and 4 Broadband Random Vibration

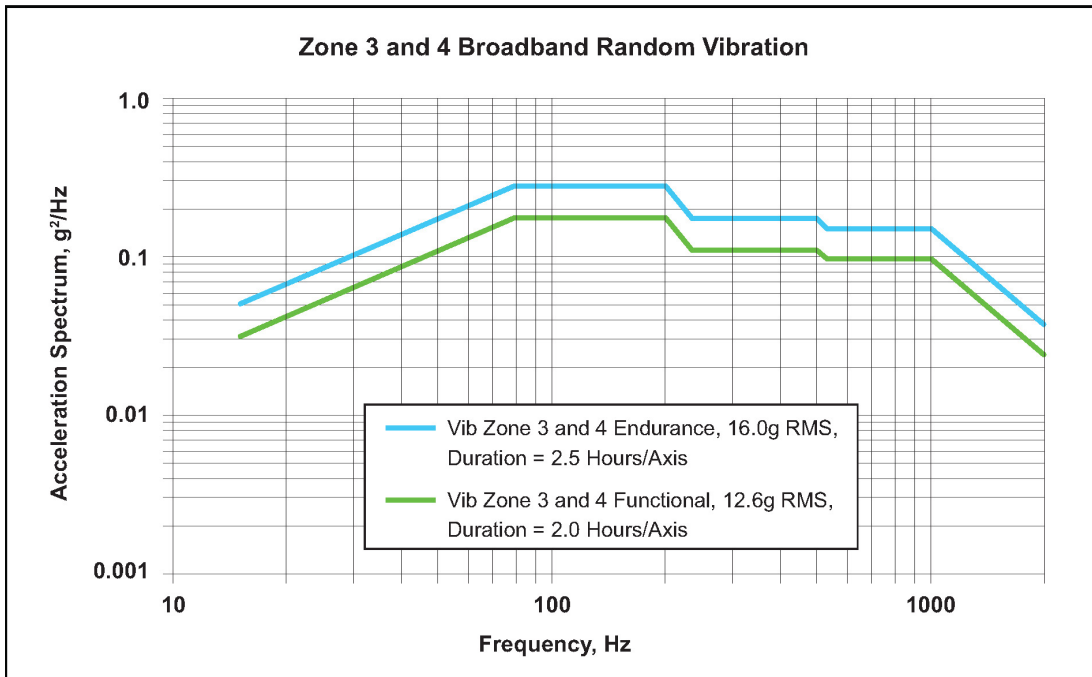


Table 3-3. Vibration Zone 3 and 4

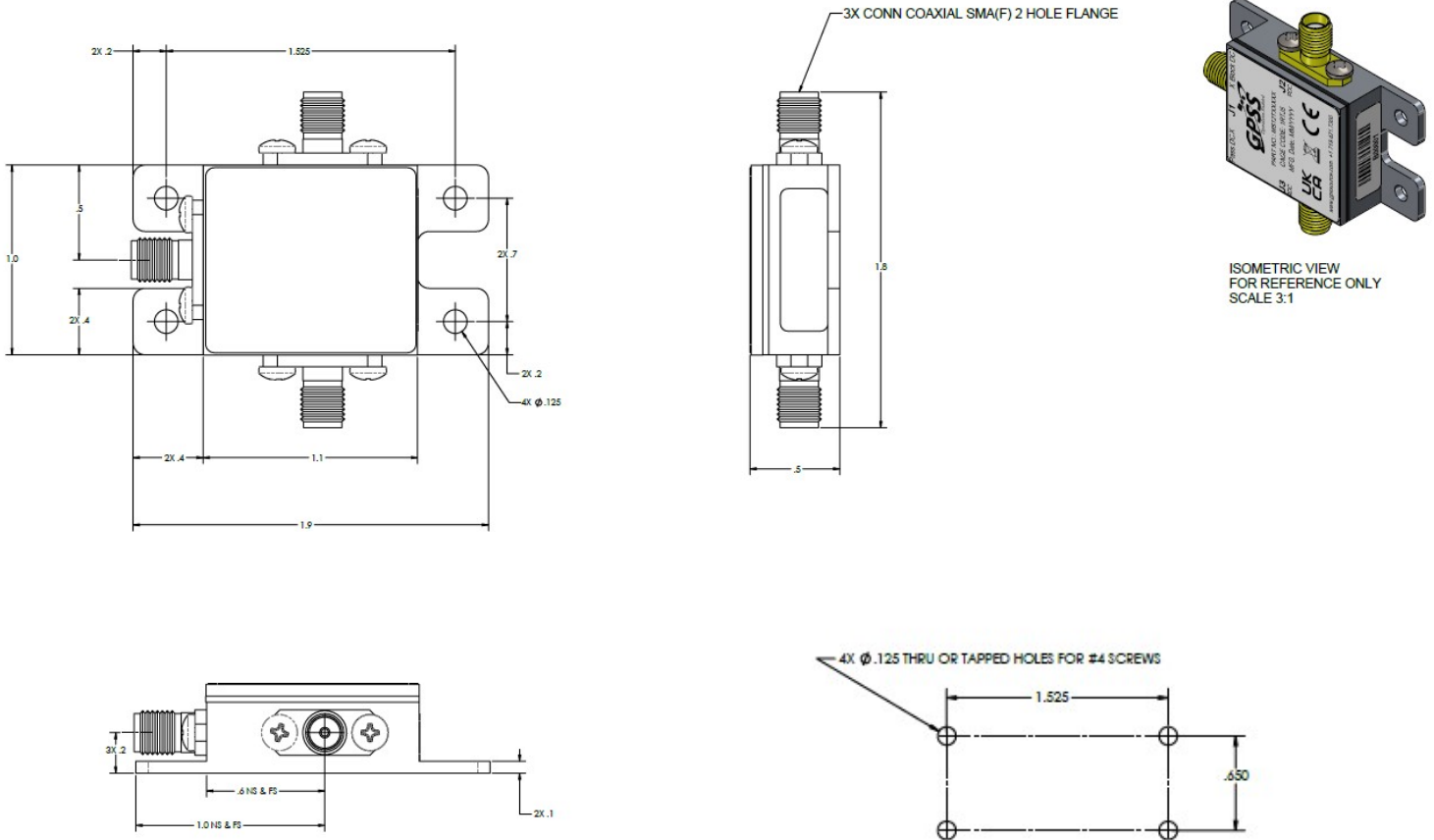
Vibration Zone 3 and 4 Functional, 12.6g RMS Duration = 2 Hours/Axis	
Freq. Hz	g²/Hz
15	.0033
80	0.177
200	0.177
234	0.111
500	0.111
535	0.097
1000	0.097
2000	0.024

4 Product Options

Table 4-1: MS12T Available Options

RF Connector		
Connector	Connector Type	Limitations
	SMA (Female/Male)	N/A
Housings	Housing Type	Limitations
	Tiny	Powered option not available Connectors not available: N, TNC
Output Options (Standard)		
Pass DC	DC is passed (J2) to antenna	10kHz to 200MHz
DC Blocked	(J3) is DC Blocked with 200 Ohm load	10kHz to 18GHz
Gain Options		
Gain	Amplified (-A)	Standard amplification is 8dB
	Custom Gain (-AXX)	Custom gain range is 0 - 7dB
	Amplified as Specified (-AS)	Provide gain for each port
	Passive	

5 Mechanical Drawing



6 Product Decoder

