

# MS14ISO

## Military Qualified ISO 1x4 GPS Splitter



### Description

The MS14ISO is a military qualified, one-input four-output GPS splitter with a MIL-STD-704 compliant isolated power supply. A typical application involves an input from an active GPS roof antenna that is split evenly between four GPS receiver units. The MS14ISO can be configured to pass DC to the antenna input port to power an active GPS antenna on that port. The RF outputs, J2, J3, J4, and J5, feature a 200 Ω DC load to simulate an antenna DC current draw for any receiver connected to that port.

### Features

- Designed and Manufactured to Military Specifications
- Passes GPS (including M Code), Galileo, GLONASS L1/L2
- Excellent Gain Flatness (Gain | L1 - L2 | < 2 dB)

MIL Standards	
MIL-STD-810	MIL-E-5400
MIL-STD-1472	MIL-HDBK-454
MIL-STD-202	MIL-STD-1587
MIL-STD-883	MIL-STD-461
MIL-STD-704	-

### MS14ISO Specifications

#### Electrical Specifications

Operating Temperature -40°C to 85°C

Parameter		Conditions	Min	Type	Max	Units		
<b>Frequency Range</b>		Ant: Any Port; Unused Ports: 50 Ω	1		1.61	GHz		
<b>Gain</b>	Standard	Amplified	Ant: Any Port; Unused Ports: 50 Ω, L1, L2		3.5	5	6.5	dB
	Custom	Amplified	As Specified (x dB, from 0 to 5 dB), L1, L2		X - 1.5	X	X + 1.5	
<b>Input SWR</b>		All Ports 50 Ω			2.0:1	-		
<b>Output SWR</b>		All Ports 50 Ω			2.0:1	-		
<b>Noise Figure</b>	5 dB Gain	Amplified	Ant: Any Port; Unused Ports: 50 Ω			3	dB	
<b>Gain Flatness</b>		Amplified	[L1 - L2] Ant: Any Port; Unused Ports: 50 Ω			2	dB	
<b>Amp. Balance</b>			(J2 - J5) Ant: Any Port; Unused Ports: 50 Ω			0.5	dB	
<b>Phase Balance</b>			Phase (J2 - J5) Ant: Any Port; Unused Ports: 50 Ω			1.0	Degree	
<b>Group Delay Flatness</b>			T <sub>d,max</sub> - T <sub>d,min</sub> ; J2 - J1 (Ant)			1	ns	
<b>Isolation</b>	Normal	Amplified	Adjacent Ports Ant - 50 Ω		16			dB
	5 dB Gain	Amplified	Opposite Ports: Ant - 50 Ω		24			
<b>Isolation</b>	High	Amplified	Adjacent Ports Ant - 50 Ω		27			dB
	0 dB Gain	Amplified	Opposite Ports: Ant - 50 Ω		31			
<b>Input I<sub>P3</sub></b>		Amplified	Ant: Any Port; Unused Ports 50 Ω			10		dBm
<b>Input P<sub>1dB</sub></b>		Amplified	Ant: Any Port; Unused Ports 50 Ω			-6		dBm
<b>Current (I<sub>Internal</sub>)</b>			Current Consumption of device (28 V DCIN)			55	65	mA
<b>Antenna Current</b>		Powered	Powered MIL-STD-704				100	mA
<b>Max RF Input</b>		Amplified	Max RF Input Without Damage				20	dBm
<b>DC IN</b>		Powered	Military Connector MIL-STD-704 Normal and Emergency Conditions		16	28	32	VDC
<b>DC OUT<sup>(1)</sup></b>		Powered	Amplified	Military Connection; Ant thru Current up to 100 mA		5		VDC

(1) DC output voltage to the antenna port (J1) can be customized to 0 V or 5 V

Power Military Connectors PMS38999-704/XX

Input	Description	PMS38999-704/XX Options <sup>(2)</sup>
A	Positive	
B	Ground	
C	No Connect	

*(2) Image not to scale*

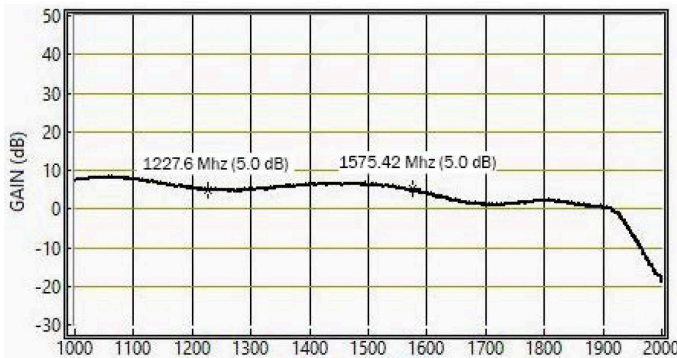
**General Specifications**

Description	Measurement
Weight	0.856 lbs (388.3 g)
Mean Time Between Failure (MTBF) <sup>(3)</sup>	389,029 hours at 29 °C
	316,877 hours at 71 °C

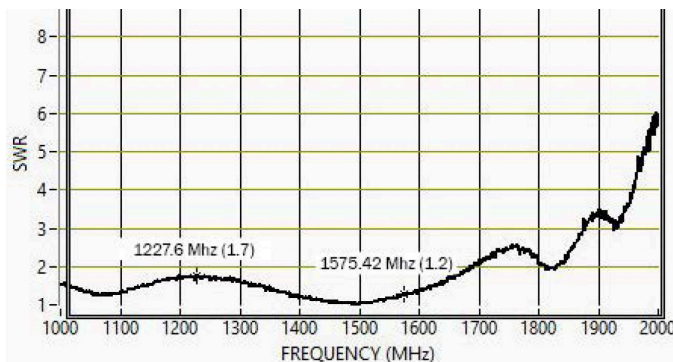
*(3) Calculation derived using Airborne Inhabited Cargo parameters per MIL-STD-217F*

**Performance Data**

MS14ISO Splitter: Gain vs. Frequency



MS14ISO Splitter: SWR vs. Frequency



**Environmental Requirements**

**Temperature and Altitude**

The MS14ISO complies with the temperature-altitude tests per MIL-STD-810C, Method 504, Procedure 1 Equipment Category 5.

**Temperature Shock**

The MS14ISO is designed to withstand without degradation (while not operating) per MIL-STD-810H 503.7, Procedure I-C.

**Explosive Atmosphere**

The MS14ISO 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 -1,800 ft to 50,000 ft. The MS14ISO does not produce surface temperatures or heat in excess of 400 °F. The MS14ISO 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 MS14ISO meets the requirements of MIL-STD-810C, 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 x 10<sup>-7</sup>cc/s are exempt from this requirement.

**Decompression**

The MS14ISO 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 MS14ISO will remain operating for five minutes at 50,000 feet before being returned to normal cabin pressure.

**Overpressure**

The MS14ISO is capable of meeting the performance standards per RTCA-DO-160E para 4.6.3 by withstanding a 12.1 psi chamber pressure for up to 10 minutes with no physical damage or degradation. The MS14ISO will operate with no loss of operational integrity after being returned to normal chamber pressure.

**Salt Fog**

The MS14ISO is designed to meet the requirements of Salt Fog conditions per Paragraph 3.2.24.9 of MIL-E-5400 and MIL-STD-810C Method 509.1. The MS14ISO is designed to withstand a salt concentration of five percent at a temperature of 35 °C for 48 hours without degradation.

**Fungus**

The MS14ISO 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.

**Humidity**

The MS14ISO is capable of meeting the requirements of a ten day humidity test conducted per MIL-STD-810C, Method 507.1; Procedure I. MS14ISO is designed to withstand exposure to 95% relative humidity at a temperature of 30 °C for 28 days.

**Sand and Dust**

The MS14ISO is capable of meeting the requirements of Sand and Dust conditions of method 510 of MIL-STD-810C, for a temperature of 145 °F for a duration of 22 hours.

**Flammability**

The MS14ISO 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.

**Finish and Colors**

All case surfaces of the MS14ISO are treated with chemical film per MIL-DTL-5441, TYPE II, CLASS 3. The MS14ISO bottom contact surface is free of paint or non-conductive finishes. The MS14ISO 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 1 CLASS C and painted per MIL-PRF-85285, TYPE 1 COLOR NUMBER (26231), Military Gray (not lusterless variety) per FED-STD-595 (Exceptions: bottom and connector surfaces are free of paint).

**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.

**Electromagnetic Interference and Compatibility Test**

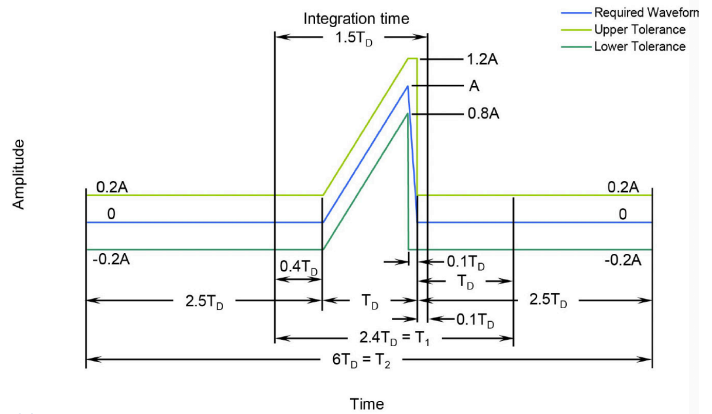
MS14ISO performs its intended function and operation does not degrade the performance of other equipment or subsystems. The following table defines the test requirements and test procedures for conducting the required electromagnetic compatibility testing. The MS14ISO is designed and tested to meet the requirements of MIL-STD-461G.

Test	Description	
CE102	Conducted Emissions Power Leads	10 kHz to 10 MHz
CE106	Conducted Emissions Antenna Terminal	10 kHz to 31.5 GHz
CS101	Conducted Susceptibility Power Leads	30 Hz to 150 kHz
CS103	Conducted Susceptibility Antenna Port	Intermodulation
CS105	Conducted Susceptibility Antenna Port	Cross-Modulation
CS114	Conducted Susceptibility Bulk Cable Injection	10 kHz to 200 MHz
RE102	Radiated Emissions Electric Field	10 kHz to 18 GHz
RS103	Radiated Susceptibility Electric Field	2 MHz to 18 GHz
CS116	Damped Sinusoidal transients	RF Leads, 10 kHz to 100 MHz
		Power Leads, 10 kHz to 100 MHz

**Shock**

The MS14ISO 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-810H 516.8, Procedure I and V.

**Peak Shock Levels <sup>(4)</sup>**



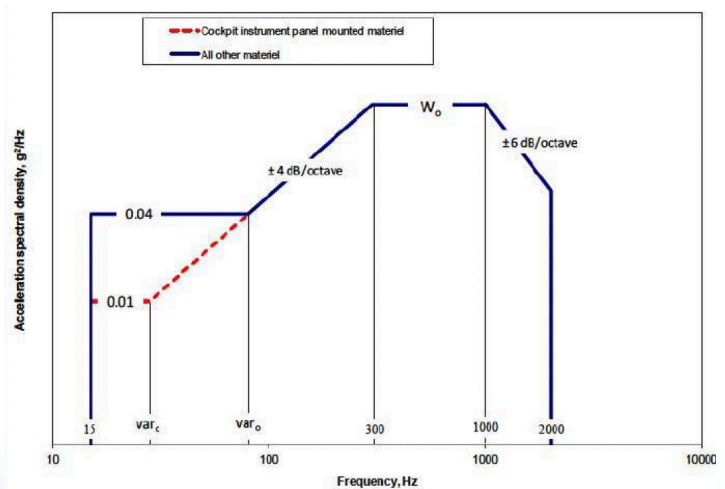
(4) Image from MIL-STD-810H 516.8

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

**Vibration**

The MS14ISO meets the requirements of random vibration per conditions MIL-STD-810H, Method 514.8, Procedure I to the levels defined below. Acceleration Power Spectral Density (PSD) for a Fixed Wing Aircraft with a jet engine is shown in Figure 3.2.

**PSD for Fixed Wing Aircraft with a Jet Engine**



## Product Options

### Electrostatic Sensitive Device (ESD)



Remove electrostatic protection at use or in a protected area.

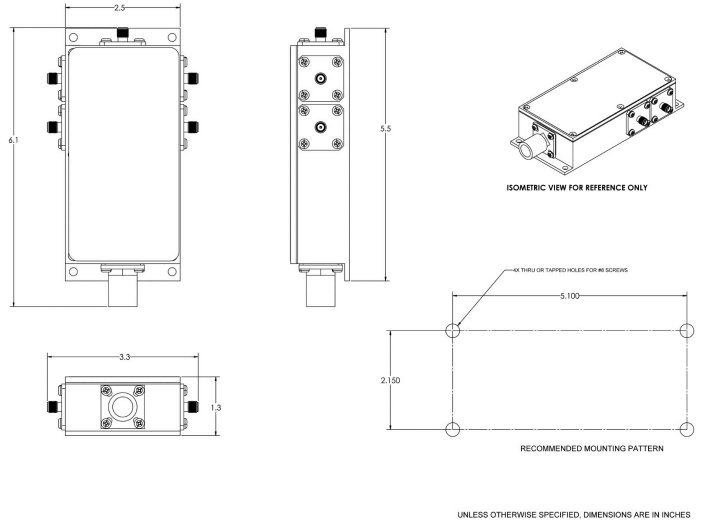
Reuse packaging materials for an unserviceable item. See DOD-HDBK-263 for protective handling or testing measures for this item.

### MS14ISO Available Options

Power Supply		
Source Voltage	Voltage Input	Type
	DC 16-32 VDC	Military Style Connector
Output Voltage	5.0 VDC	
RF Connector		
Connector	Connector Type	Limitations
	N (Female/Male)	N/A
	SMA (Female/Male)	N/A
	TNC (Female/Male)	N/A
Port		
Pass DC	Input Port can Pass DC	
DC Blocked	J2, J3, J4, J5 are DC Blocked with 200 Ω Load	

## Mechanical Drawing

MS14ISO Housing — FSA-ATC-EEY-TXZ



## Product Code Decoder

**MS14ISO - A - PMS38999 - 704 / 5 - SF**

### Military

M = Military Qualified

### Splitter

S14ISO = 1X4 Isolated Power Splitter

### Gain Option

A = Amplified  
AS = Amplified Gain as Specified by Port  
AXX = Custom Gain (XXdB)

### Connector

NF = N Female  
SF = SMA Female  
TF = TNC Female  
NM = N Male  
SM = SMA Male  
TM = TNC Male

### Antenna Output Voltage

5 = 5.0 V  
BDC = INPUT  
BLOCK DC

*Note: To have product/part codes customized to meet exact needs, contact GPS Source at [GPSS-Sales@gd-ms.com](mailto:GPSS-Sales@gd-ms.com) or visit the website at [www.gpssource.com](http://www.gpssource.com).*

## GENERAL DYNAMICS

Mission Systems

2121 Executive Circle, Ste 100, Colorado Springs, CO 80906 • [GPSS-Sales@gd-ms.com](mailto:GPSS-Sales@gd-ms.com) • [www.gpssource.com](http://www.gpssource.com)  
Phone: (+1) (719) 421-7300 • Toll Free: (+1) (866) 289-4777