

High Power, DC Pass

# Power Splitter/Combiner

ZX10-2-183-S+

2 Way-0° 50Ω 30W 1500 to 18000 MHz

## The Big Deal

- Ultra-Wideband, 1500 to 18000 MHz
- Low insertion loss, 0.8 dB
- High power handling, up to 30W as a splitter
- Low unbalance, 0.1 dB, 2°
- Rugged unibody case, 1.90 x 0.96 x 0.46"



CASE STYLE: KB1450

## Product Overview

Mini-Circuits' ZX10-2-183-S+ is a coaxial, ultra-wideband 2-way 0° splitter combiner providing RF input power handling up to 30W as a splitter (from 1500 to 8000 MHz) and 0.8 dB insertion loss for an extremely wide range of applications from 1500 to 18000 MHz. Its outstanding combination of high power handling and low loss make this model an excellent choice for distributing signals in systems where efficient transmission of signal power is needed. The splitter/combiner comes housed in a rugged, compact case (1.90 x 0.96 x 0.46") with SMA connectors.

## Key Features

Feature	Advantages
Ultra-wideband, 1500 to 18000 MHz	ZX10-2-183-S+ supports bandwidth requirements for a wide variety of applications including broadband applications such as instrumentation and defense.
High power handling: <ul style="list-style-type: none"><li>• 30W to 8000 MHz</li><li>• 10W to 18000 MHz</li></ul>	Supports a wide variety of system power requirements.
Low insertion loss, 0.8 dB	Provides excellent transmission of signal power, making this model an excellent candidate for signal distribution applications where low loss is a requirement.
Low unbalance: <ul style="list-style-type: none"><li>• Phase unbalance, 2°</li><li>• Amplitude unbalance, 0.1 dB</li></ul>	Produces nearly equal output signals, ideal for parallel path / multichannel systems.
DC passing up to 600mA (300mA each port)	Supports applications where DC power is needed through the RF line.
Rugged, unibody construction	Mini-Circuits' unibody construction integrates the RF connector into the case body, providing high reliability and excellent survivability in critical applications.

### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# Power Splitter/Combiner

## ZX10-2-183-S+

2 Way-0° 50Ω 30W 1500 to 18000 MHz

### Maximum Ratings

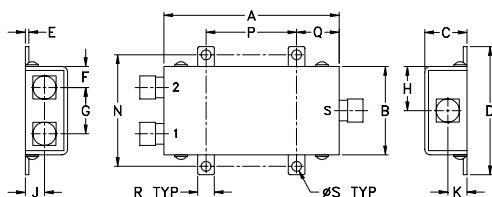
Operating Temperature(@<30W)	-55°C to 60°C
Operating Temperature(@<10W)	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	600 mA (300mA for each port)

Permanent damage may occur if any of these limits are exceeded.

### Coaxial Connections

SUM PORT	S
PORT 1	1
PORT 2	2

### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J
1.90	.96	.46	1.39	.04	.23	.50	.48	.21
48.26	24.38	11.68	35.31	1.02	5.84	12.70	12.19	5.33
K	L	M	N	P	Q	R	S	wt
.21	--	--	1.205	.980	.46	.18	.106	grams
5.33	--	--	30.61	24.89	11.68	4.57	2.69	50

### Features

- very wideband, 1500 to 18000 MHz
- low insertion loss, 0.8 dB typ.
- good isolation, 22 dB typ.
- up to 30W power input as splitter
- excellent amplitude unbalance, 0.1 dB typ.
- excellent phase unbalance, 2 deg. typ.
- rugged shielded case

### Applications

- PCS/DCS
- defense & federal communications
- instrumentation



Generic photo used for illustration purposes only

CASE STYLE: KB1450

Connectors Model  
SMA ZX10-2-183-S+

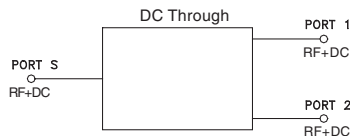
+RoHS Compliant  
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit	
<b>Frequency</b>		1500		18000	MHz	
<b>Insertion Loss (above theoretical 3.0 dB)</b>	1500 - 8000	—	0.4	0.8	dB	
	8000 - 13000	—	0.8	1.2		
	13000 - 17000	—	1.0	1.5		
	17000 - 18000	—	1.7	2.5		
<b>Isolation</b>	1500 - 8000	18	22	—	dB	
	8000 - 13000	16	20	—		
	13000 - 17000	16	20	—		
	17000 - 18000	—	14	—		
<b>Phase Unbalance</b>	1500 - 8000	—	1.0	4	Degree	
	8000 - 13000	—	2.0	5		
	13000 - 17000	—	4.0	9		
	17000 - 18000	—	4.0	9		
<b>Amplitude Unbalance</b>	1500 - 8000	—	0.1	0.3	dB	
	8000 - 13000	—	0.15	0.4		
	13000 - 17000	—	0.2	0.6		
	17000 - 18000	—	0.4	0.9		
<b>VSWR (Port S)</b>	1500 - 8000	—	1.22	1.5	:1	
	8000 - 13000	—	1.43	1.7		
	13000 - 17000	—	1.60	—		
	17000 - 18000	—	2.00	—		
<b>VSWR (Port 1-2)</b>	1500 - 8000	—	1.25	1.6	:1	
	8000 - 13000	—	1.50	1.7		
	13000 - 17000	—	1.50	—		
	17000 - 18000	—	1.70	—		
<b>Power Handling<sup>3</sup></b>	<b>As Splitter<sup>1</sup></b>	1500 - 8000	—	—	30	W
		8000 - 13000	—	—	16	
		13000 - 17000	—	—	12.5	
		17000 - 18000	—	—	10	
	<b>As Combiner<sup>2</sup></b>	1500-18000	—	—	1.0	

1. All outputs must terminate 50 ohm (VSWR 1.5:1 or better)
2. As a combiner of non-coherent signals, max. power per port is 1.0 watt power rating divided by number of ports.
3. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 60°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 10°C/W.

### Electrical Schematic



### Notes

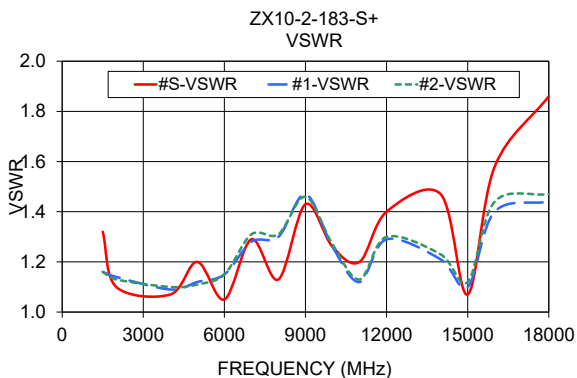
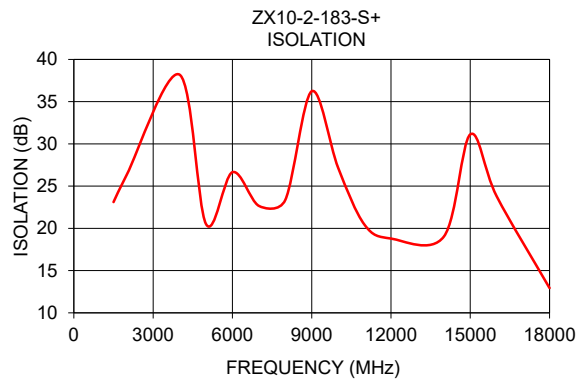
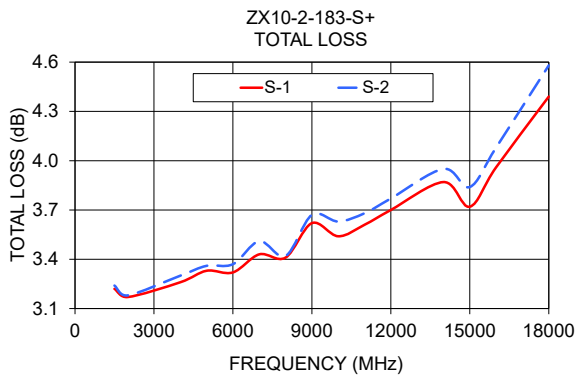
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### Typical Performance Data

Frequency (MHz)	Total Loss <sup>1</sup> (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
1500	3.22	3.24	0.02	23.11	0.07	1.32	1.16	1.16
2000	3.17	3.18	0.01	26.34	0.09	1.10	1.14	1.13
4000	3.26	3.30	0.04	38.19	0.33	1.07	1.09	1.10
5000	3.33	3.36	0.03	20.51	0.31	1.20	1.12	1.11
6000	3.32	3.37	0.05	26.65	0.28	1.05	1.15	1.15
7000	3.43	3.51	0.08	22.66	0.59	1.29	1.28	1.31
8000	3.41	3.42	0.01	23.36	0.76	1.13	1.30	1.31
9000	3.62	3.67	0.05	36.23	0.34	1.43	1.47	1.46
10000	3.54	3.63	0.09	27.17	0.66	1.26	1.26	1.27
11000	3.61	3.68	0.06	20.42	0.88	1.20	1.12	1.13
12000	3.70	3.77	0.07	18.79	1.37	1.40	1.29	1.30
14000	3.87	3.95	0.08	19.02	1.33	1.47	1.21	1.23
15000	3.72	3.84	0.12	31.12	1.27	1.07	1.10	1.12
16000	3.96	4.08	0.12	23.79	1.25	1.58	1.40	1.44
18000	4.39	4.58	0.19	12.93	1.24	1.86	1.44	1.47

1. Total Loss = Insertion Loss + 3dB splitter loss.



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# 2 Way-0° Power Splitter/Combiner

# ZX10-2-183-S+

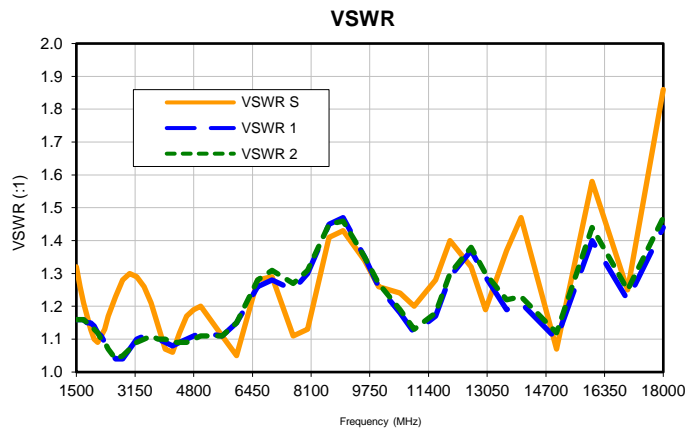
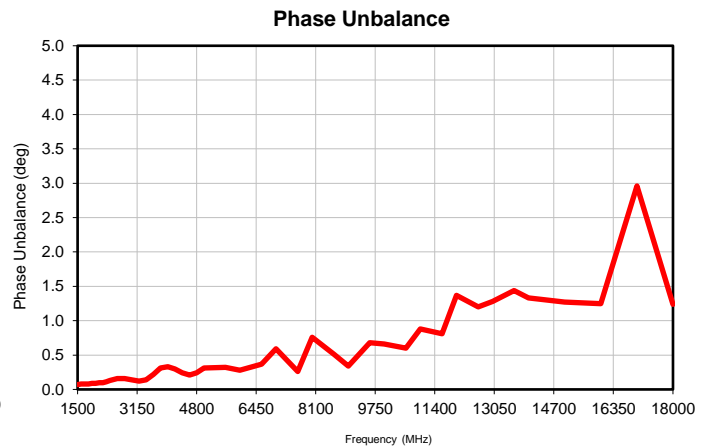
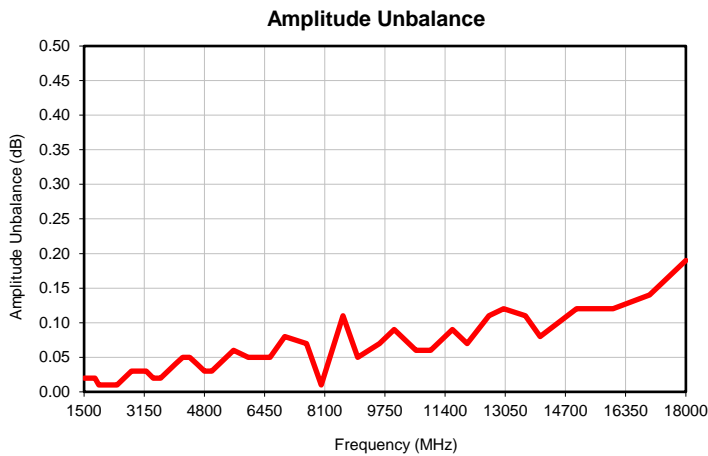
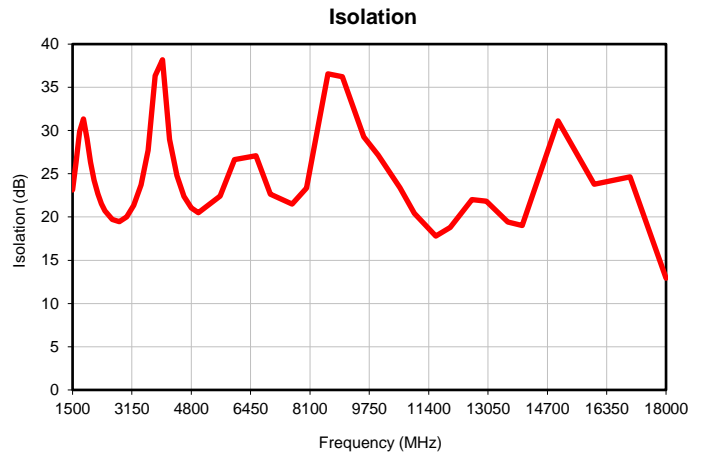
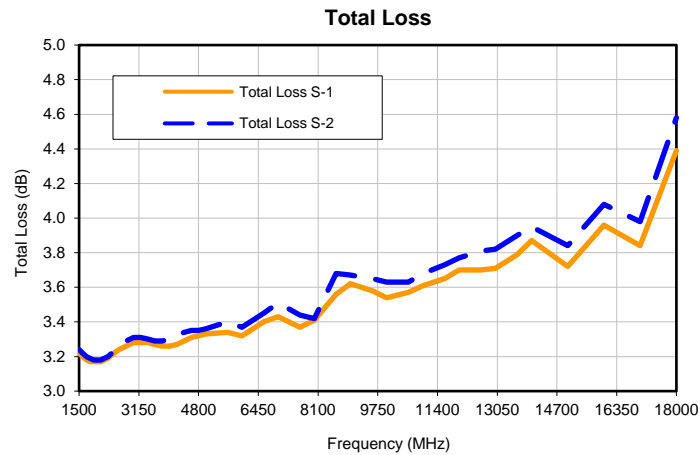
## Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS <sup>1</sup> (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB)	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2					S	1	2
1500	3.22	3.24	0.02	23.11	0.07	1500	1.32	1.16	1.16
1600	3.20	3.22	0.02	26.37	0.08	1600	1.26	1.16	1.16
1700	3.18	3.20	0.02	29.91	0.08	1700	1.21	1.16	1.16
1800	3.17	3.19	0.02	31.34	0.08	1800	1.17	1.15	1.15
1900	3.17	3.18	0.01	29.08	0.09	1900	1.13	1.15	1.14
2000	3.17	3.18	0.01	26.34	0.09	2000	1.10	1.14	1.13
2100	3.17	3.18	0.01	24.26	0.10	2100	1.09	1.12	1.12
2200	3.18	3.19	0.01	22.70	0.10	2200	1.11	1.11	1.10
2300	3.19	3.20	0.01	21.55	0.11	2300	1.13	1.09	1.09
2400	3.21	3.22	0.01	20.73	0.13	2400	1.17	1.07	1.07
2600	3.24	3.25	0.02	19.72	0.16	2600	1.23	1.04	1.04
2800	3.26	3.29	0.03	19.48	0.16	2800	1.28	1.04	1.05
3000	3.28	3.31	0.03	20.01	0.14	3000	1.30	1.07	1.07
3200	3.28	3.31	0.03	21.36	0.12	3200	1.29	1.10	1.09
3400	3.28	3.30	0.02	23.71	0.14	3400	1.26	1.11	1.10
3600	3.27	3.29	0.02	27.71	0.22	3600	1.21	1.11	1.11
3800	3.26	3.29	0.03	36.33	0.31	3800	1.14	1.10	1.10
4000	3.26	3.30	0.04	38.19	0.33	4000	1.07	1.09	1.10
4200	3.27	3.32	0.05	28.96	0.30	4200	1.06	1.08	1.09
4400	3.29	3.34	0.05	24.79	0.24	4400	1.12	1.09	1.09
4600	3.31	3.35	0.04	22.39	0.21	4600	1.17	1.10	1.09
4800	3.32	3.35	0.03	21.07	0.24	4800	1.19	1.11	1.10
5000	3.33	3.36	0.03	20.51	0.31	5000	1.20	1.12	1.11
5600	3.34	3.40	0.06	22.42	0.32	5600	1.11	1.11	1.11
6000	3.32	3.37	0.05	26.65	0.28	6000	1.05	1.15	1.15
6600	3.40	3.45	0.05	27.08	0.37	6600	1.28	1.26	1.28
7000	3.43	3.51	0.08	22.66	0.59	7000	1.29	1.28	1.31
7600	3.37	3.44	0.07	21.50	0.26	7600	1.11	1.25	1.27
8000	3.41	3.42	0.01	23.36	0.76	8000	1.13	1.30	1.31
8600	3.56	3.68	0.11	36.55	0.51	8600	1.41	1.45	1.45
9000	3.62	3.67	0.05	36.23	0.34	9000	1.43	1.47	1.46
9600	3.58	3.65	0.07	29.26	0.68	9600	1.34	1.35	1.35
10000	3.54	3.63	0.09	27.17	0.66	10000	1.26	1.26	1.27
10600	3.57	3.63	0.06	23.40	0.60	10600	1.24	1.18	1.19
11000	3.61	3.68	0.06	20.42	0.88	11000	1.20	1.12	1.13
11600	3.65	3.73	0.09	17.79	0.81	11600	1.28	1.17	1.18
12000	3.70	3.77	0.07	18.79	1.37	12000	1.40	1.29	1.30
12600	3.70	3.81	0.11	22.03	1.20	12600	1.32	1.37	1.38
13000	3.71	3.82	0.12	21.82	1.28	13000	1.19	1.29	1.30
13600	3.79	3.90	0.11	19.41	1.44	13600	1.37	1.19	1.22
14000	3.87	3.95	0.08	19.02	1.33	14000	1.47	1.21	1.23
15000	3.72	3.84	0.12	31.12	1.27	15000	1.07	1.10	1.12
16000	3.96	4.08	0.12	23.79	1.25	16000	1.58	1.40	1.44
17000	3.84	3.98	0.14	24.63	2.96	17000	1.25	1.22	1.25
18000	4.39	4.58	0.19	12.93	1.24	18000	1.86	1.44	1.47

<sup>1</sup>Total Loss = Insertion Loss + 3dB Splitter Loss



## Typical Performance Curves

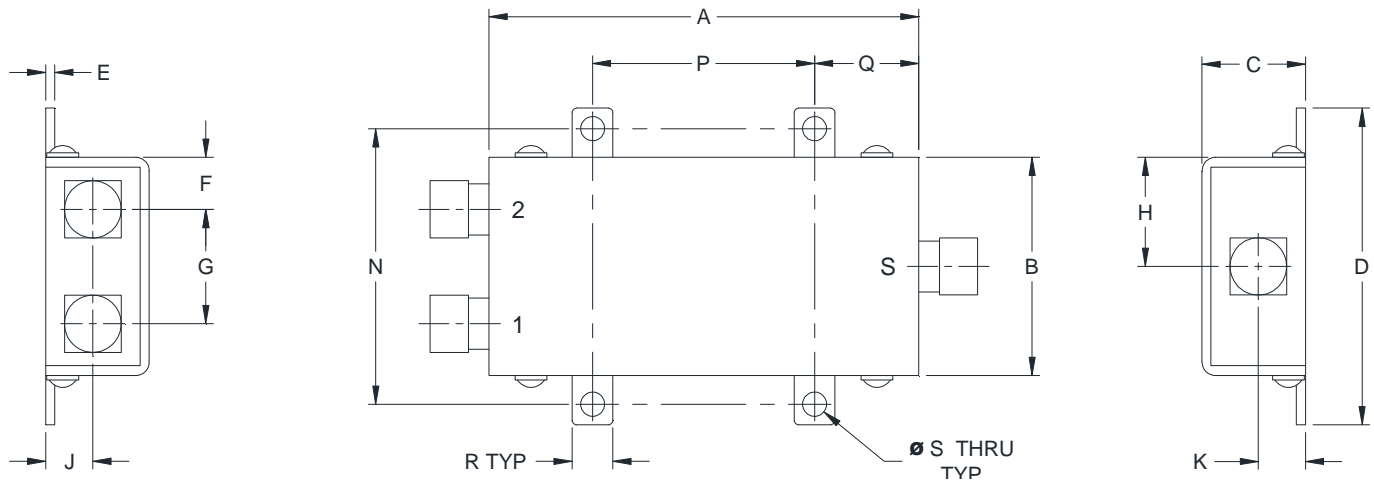


# Case Style

# KB

## KB1450

### Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
KB1450	1.90 (48.26)	.96 (24.38)	.46 (11.68)	1.39 (35.31)	.04 (1.02)	.23 (5.84)	.50 (12.70)	.48 (12.19)	.21 (5.33)	.21 (5.33)	-	-	1.205 (30.61)

CASE#	P	Q	R	S	WT, GRAM
KB1450	.980 (24.89)	.46 (11.68)	.18 (4.57)	.106 (2.69)	50

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$   
Tolerance on hole size and interaxes dimensions to be  $\pm .005$

#### Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.

**Mini-Circuits®**

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I