

**ZBM20**

**IMMUNITY DATA**

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## Terminology used.

	Definition
FG	..... Frame GND
$\perp$	..... Earth
Ta	..... Ambient temperature

※ Test results are reference data based on our standard measurement condition.

## 1. Summary of Immunity Test Result

### MODEL : ZBM20

Item	Standard	Test level	Criteria	Result	Page	Notes & Conditions
Electrostatic Discharge Immunity Test	IEC61000-4-2	1,2,3,4	A	PASS	R-2	
Radiated Radio-Frequency Electromagnetic Field Immunity Test	IEC61000-4-3	1,2,3	A	PASS	R-3	
Electrical Fast Transient/Burst Immunity Test	IEC61000-4-4	a) 1,2,3 b) 1	A	PASS	R-4	*Note 2
Surge Immunity Test	IEC61000-4-5	a) 1,(2) b) 1	A	PASS	R-5	*Note 1 *Note 2
Conducted Disturbances Induced by Radio-Frequency Field immunity Test	IEC61000-4-6	1,2,3	A	PASS	R-6	

Detail of test condition refer to each test page.

\*Note 1 : a) Level 2, common mode only

\*Note 2 : b) For signal pin to FG only

#### Criteria A :

1. Input/Output voltage regulation not exceed +/- 5% of initial (before test) value during test.
2. Input/Output voltage must be within the regulation specification after the test.
3. No change on signals
4. No blinking on LEDs
5. Smoke and fire are not allowed.

## 2. Electrostatic Discharge Immunity Test (IEC61000-4-2)

### MODEL : ZBM20

**(1) Equipment used:**

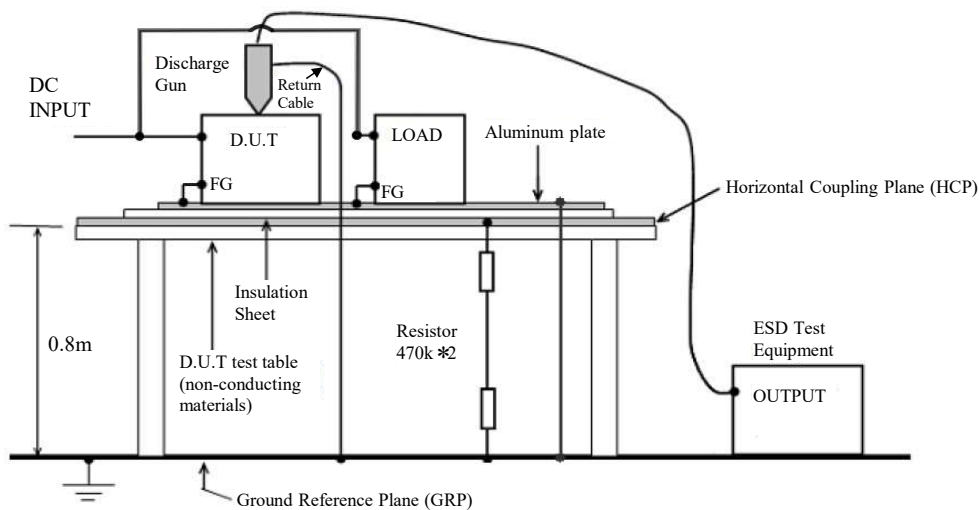
NSG 435 (Schaffner)

**(2) Test Conditions :**

Vin	: 24Vdc	Ready mode		
Load	: 0%, 100%		Polarity	: +, -
Number of Tests	: 10 times at each point		Ambient Temperature	: 25 °C

**(3) Test Method and Device Test Point**

Contact Discharge : FG.  
 Air Discharge : input/output terminal (+V, -V), signal terminal (+, Buffer, Ready, Inhibit, DC OK), LED (GREEN).



**(4) Acceptable Conditions**

1. Input/Output voltage regulation not exceed +/- 5% of initial (before test) value during test.
2. Input/Output voltage must be within the regulation specification after the test.
3. No change on signals
4. No blinking on LEDs
5. Smoke and fire are not allowed.

**(5) Results:**

Contact Discharge (kV)	ZBM20	Air Discharge (kV)	ZBM20
2	PASS	2	PASS
4	PASS	4	PASS
6	PASS	8	PASS
8	PASS	15	PASS

### 3. Radiated Radio Frequency Electromagnetic Field Immunity Test (IEC61000-4-3)

#### MODEL : ZBM20

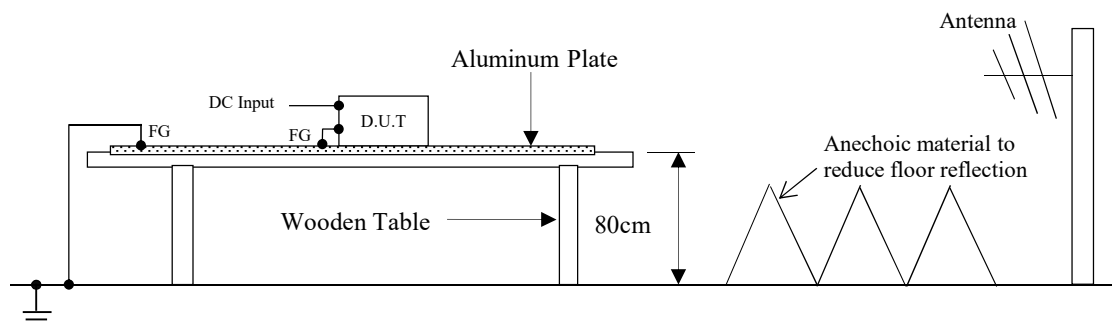
**(1) Equipment used**

- FL7218 AR Laser Probe
- MG3692C Anritsu Signal Generator
- N1913A Keysight EPM Series Power Meter
- E9304A Agilent E-Series Avg Power Sensor, 1nW-100mW (-60 to +20dBm) 9kHz - 6GHz
- STLP-9128E Schwarzbeck Log-Per Antenna
- CBA 1G-1200B Teseq Amplifier (80-1000MHz)
- BBHA-9120E Schwarzbeck Broad-band horn Antenna 450MHz-4GHz
- AS0827-110 Milmega Solid State Amplifier 0.8 - 2.7GHz

**(2) Test Conditions**

Vin	: 24Vdc	Ready mode	Electromagnetic Frequency	: 80 ~ 1000MHz
Load	: 0%			1000Hz ~ 2700MHz
Wave Angle	: Horizontal and Vertical		Distance	: 3m
Frequency step	: 1% of preceding frequency		Test severity Level	: 10V/m, 80% AM 1kHz
Sweep rate	: $\leq 1.5 \times 10^{-3}$ decades/s		Ambient Temperature	: 25 °C
Test Angle	: Top/Bottom, both sides, front/back			

**(3) Test Method**



**(4) Acceptable Conditions**

1. Input/Output voltage regulation not exceed +/- 5% of initial (before test) value during test.
2. Input/Output voltage must be within the regulation specification after the test.
3. No change on signals
4. No blinking on LEDs
5. Smoke and fire are not allowed.

**(5) Results:**

Test Voltage (V)	ZBM20
1	PASS
3	PASS
10	PASS

## 4. Electrical Fast Transient/Burst Immunity Test (IEC61000-4-4)

### MODEL : ZBM20

#### (1) Equipment used

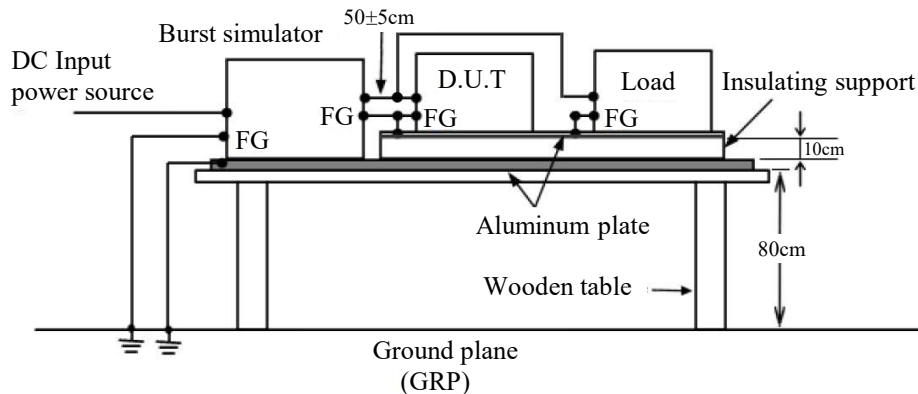
AMETEK Compact NX

#### (2) Test Conditions

Vin	: 24Vdc	Ready mode		
Load	: 0%, 100%		Polarity	: +, -
Coupling	: All coupling combinations		Ambient Temperature	: 25 °C
Number of Tests	: 3 times			

#### (3) Test Method

- a) Apply to (+V, -V, FG)
- b) Apply to each signal & FG (+, Buffer, Ready, Inhibit, DC OK - FG)



#### (4) Acceptable Conditions

1. Input/Output voltage regulation not exceed +/- 5% of initial (before test) value during test.
2. Input/Output voltage must be within the regulation specification after the test.
3. No change on signals
4. No blinking on LEDs
5. Smoke and fire are not allowed.

#### (5) Test Results

##### a) Input Pins : +V, -V, FG

Test Voltage (kV)	Repetition Rate (KHz)	ZBM20
0.5	5	PASS
1.0	5	PASS
2.0	5	PASS

##### b) Signal Pin : +, Buffer, Ready, Inhibit, DC OK - FG

Test Voltage (kV)	Repetition Rate (KHz)	ZBM20
0.5	5	PASS

## 5. Surge Immunity Test (IEC61000-4-5)

### MODEL : ZBM20

#### (1) Equipment used

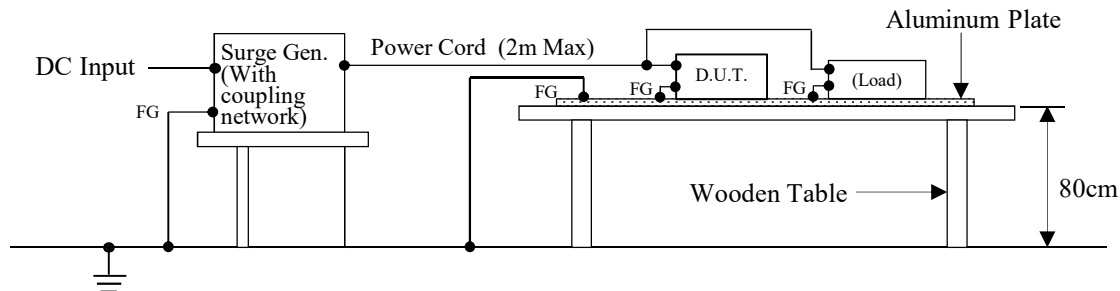
AMETEK Compact NX

#### (2) Test Conditions

Vin	: 24Vdc	Ready mode		
Load	: 0%, 100%		Number of Tests	: 5 times
Polarity	: +, -		Mode	: Common, Normal
Phase	: 0, 90 degree		Ambient Temperature	: 25 °C

#### (3) Test Method

- Apply to Common Mode (+V - FG, -V - FG) and Normal Mode (+V - -V)
- Apply to each signal & FG (+, Buffer, Ready, Inhibit, DC OK - FG)



#### (4) Acceptable Conditions

- Input/Output voltage regulation not exceed +/- 5% of initial (before test) value during test.
- Input/Output voltage must be within the regulation specification after the test.
- No change on signals
- No blinking on LEDs
- Smoke and fire are not allowed.

#### (5) Test Results

##### a) Input Pins : +V, -V & FG

Test Voltage (kV) Common	ZBM20	Test Voltage (kV) Normal	ZBM20
0.5	PASS	0.5	PASS
1.0	PASS	-	

##### b) Signal Pins : +, Buffer, Ready, Inhibit, DC OK - FG

Test Voltage (kV) Normal	ZBM20
0.5	PASS

## 6. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6)

### MODEL : ZBM20

#### (1) Equipment used

NSG-2070 (Schaffner RF Generator)

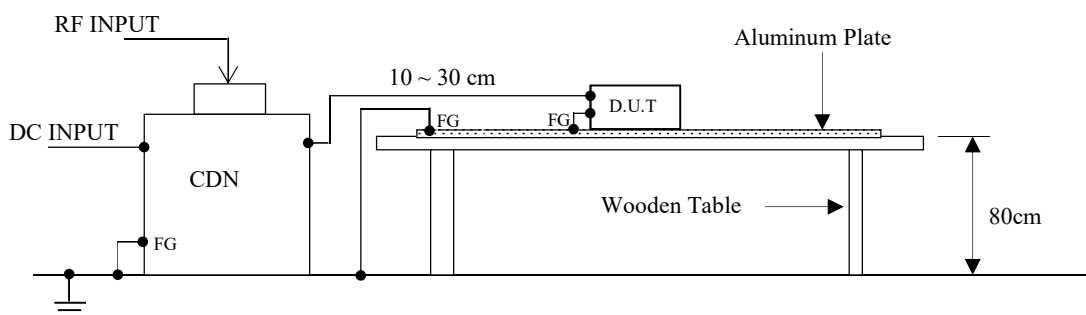
CDN M016 (Teseq Coupling and Decoupling Network (2/3 - pin))

#### (2) Test Conditions

Vin	: 24Vdc	Ready mode	
Load	: 0%		Electromagnetic Frequency : 150kHz~80MHz
Frequency steps	: 1% of fundamental		Modulation : 80% AM, 1 kHz
Sweep rate	: <math>1.5 \times 10^{-3}</math> decades/s		Test severity level : 10V, 80% AM 1kHz
Dwell time	: 3 sec		Ambient Temperature : 25 °C

#### (3) Test Method

Apply to (+V, -V, FG)



#### (4) Acceptable Conditions

1. Input/Output voltage regulation not exceed +/- 5% of initial (before test) value during test.
2. Input/Output voltage must be within the regulation specification after the test.
3. No change on signals
4. No blinking on LEDs
5. Smoke and fire are not allowed.

#### (5) Results

Test Voltage (V)	ZBM20
1	PASS
3	PASS
10	PASS