

**MGS3 Series EMI/EMS Test results**Approved : Takayuki Fukuda  
Takayuki FukudaPrepared : Satoshi Kinoshita  
Satoshi Kinoshita

No.	Test item	Conditions	Conditions of Acceptability	Result
1	Line conduction	(1) Rated input (2) Rated load (3) Ambient temp. $25 \pm 10^{\circ}\text{C}$ (4) Testing circuitry Fig.1	(1)Meets the undermentioned standard. FCC Part15 classA , VCCI classA CISPR22 classA , EN55022-A	OK
2	Radiated emission	(1) Rated input (2) Rated load (3) Ambient temp. $25 \pm 10^{\circ}\text{C}$ (4) Testing circuitry Fig.1	(1)Meets the under mentioned standard. FCC Part15 classA , VCCI classA CISPR22 classA , EN55022-A	OK
3	Static electricity immunity test (EN61000-4-2)	(1) Rated input (2) Rated load (3) Ambient temp. $25 \pm 10^{\circ}\text{C}$ (4) Contact discharge voltage 4[kV] (EN61000-4-2 Level 2) (5) Testing circuitry Fig.2	(1)No protection circuit failure. (2)No output voltage drop with control circuit failure. (3)No any other function failure.	OK
4	Radiated, radio-frequency, electromagnetic field immunity test (EN61000-4-3)	(1) Rated input (2) Rated load (3) Ambient temp. $25 \pm 10^{\circ}\text{C}$ (4)Testing field strength (Level 3) ① 10 [V/m] (80MHz to 1.0GHz) ② 3 [V/m] (1.4GHz to 2.0GHz) ③ 1 [V/m] (2.0GHz to 2.7GHz) (5) Testing circuitry Fig.1	(1)No protection circuit failure. (2)No output voltage drop with control circuit failure. (3)No any other function failure.	OK
5	Electrical fast transient/ burst immunity test (EN61000-4-4)	(1) Rated input (2) Rated load (3) Ambient temp. $25 \pm 10^{\circ}\text{C}$ (4) Test peak voltage 4[kV] (IEC61000-4-4 Level 4) (5) Testing circuitry Fig.2	(1)No protection circuit failure. (2)No output voltage drop with control circuit failure. (3)No any other function failure.	OK
6	Surge immunity test (EN61000-4-5)	(1) Rated input (2) Rated load (3) Ambient temp. $25 \pm 10^{\circ}\text{C}$ (4) Test voltage Line to line 2[kV] (Level 3) (5) Testing circuitry Fig.3	(1)The power supply is not stop. (2)Circuit does not malfunction. (3)No abnormality of the insulation destruction etc. (4)Parts are no damaged.	OK

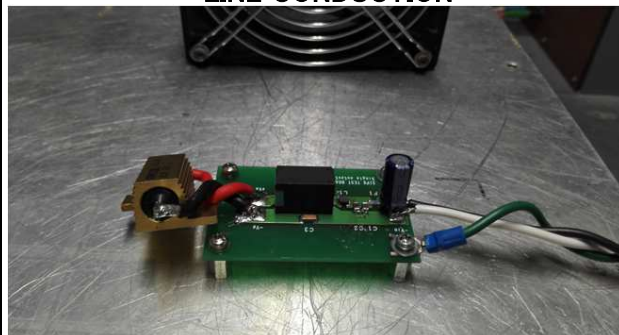


## Conditions

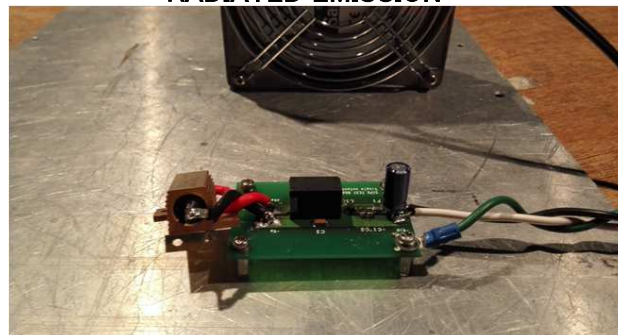
Test : Line conduction , Radiated emission  
Radiated, radio-frequency, electromagnetic field immunity test  
Model Name : MGS3□□

○Photographs of Test Set-Up

### LINE CONDUCTION



### RADIATED EMISSION



○Testing circuitry

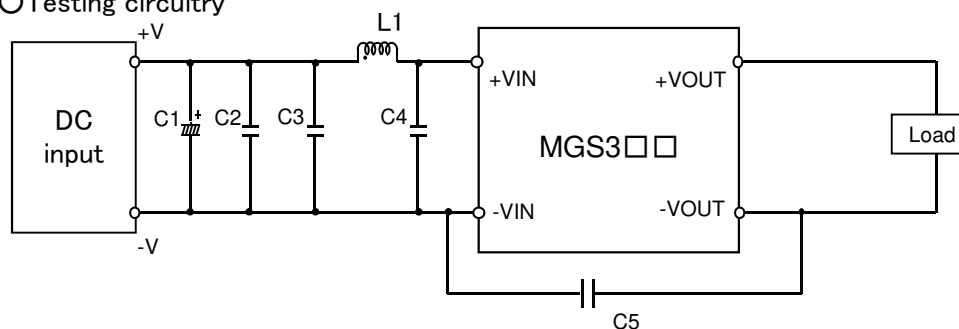


Fig.1 Testing circuitry 1

C1	:	MGS305□□	25V 100 $\mu$ F Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
		MGS312□□	-
		MGS324□□	-
		MGS348□□	-
C2,C3,C4	:	MGS305□□	16V 22 $\mu$ F Ceramic capacitor (GRM31CC71C226K MURATA MANUFACTURING)
		MGS312□□	25V 10 $\mu$ F Ceramic capacitor (GRM31CR71E106K MURATA MANUFACTURING)
		MGS324□□	50V 4.7 $\mu$ F Ceramic capacitor (GRM31CR71H475K MURATA MANUFACTURING)
		MGS348□□	100V 2.2 $\mu$ F Ceramic capacitor (GRM31CR72A225K MURATA MANUFACTURING)
C5	:	MGS305□□	2kV 470pF Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
		MGS312□□	2kV 470pF Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
		MGS324□□	2kV 470pF Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
		MGS348□□	2kV 470pF Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
L1	:	MGS305□□	1550mA 3.3 $\mu$ H Inductor(LQH32PN3R3NNCL MURATA MANUFACTURING)
		MGS312□□	1200mA 4.7 $\mu$ H Inductor(LQH32PN4R7NNCL MURATA MANUFACTURING)
		MGS324□□	900mA 10 $\mu$ H Inductor(LQH32PN100MNCL MURATA MANUFACTURING)
		MGS348□□	550mA 22 $\mu$ H Inductor(LQH32PN220MNCL MURATA MANUFACTURING)



## Conditions

Test : Static electricity immunity test  
Electrical fast transient / burst immunity test  
Model Name : MGS1R5□□ / MGS3□□

### ○Testing circuitry

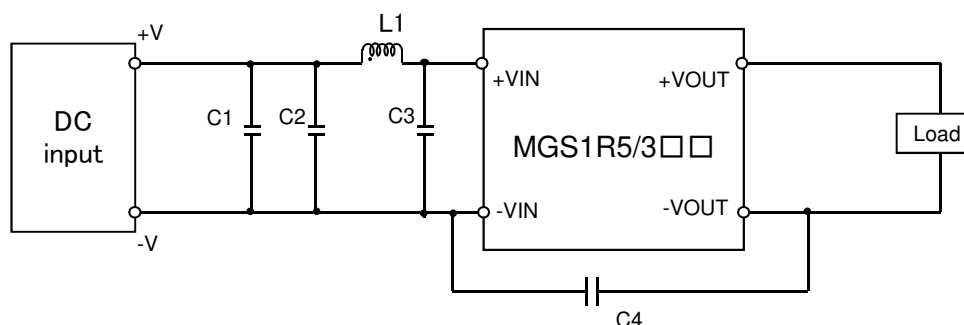


Fig.2 Testing circuitry 2

C1 :	MGS1R5/305□□	16V 22 $\mu$ F	Ceramic capacitor (GRM31CC71C226K MURATA MANUFACTURING)
	MGS1R5/312□□	25V 10 $\mu$ F	Ceramic capacitor (GRM31CR71E106K MURATA MANUFACTURING)
	MGS1R5/324□□	50V 4.7 $\mu$ F	Ceramic capacitor (GRM31CR71H475K MURATA MANUFACTURING)
	MGS1R5/348□□	100V 2.2 $\mu$ F	Ceramic capacitor (GRM31CR72A225K MURATA MANUFACTURING)
C2 :	MGS1R5/305□□	16V 22 $\mu$ F	Ceramic capacitor (GRM31CC71C226K MURATA MANUFACTURING)
	MGS1R5/312□□	25V 10 $\mu$ F	Ceramic capacitor (GRM31CR71E106K MURATA MANUFACTURING)
	MGS1R5/324□□	50V 4.7 $\mu$ F	Ceramic capacitor (GRM31CR71H475K MURATA MANUFACTURING)
	MGS1R5/348□□	100V 2.2 $\mu$ F	Ceramic capacitor (GRM31CR72A225K MURATA MANUFACTURING)
C3 :	MGS1R5/305□□	16V 22 $\mu$ F	Ceramic capacitor (GRM31CC71C226K MURATA MANUFACTURING)
	MGS1R5/312□□	25V 10 $\mu$ F	Ceramic capacitor (GRM31CR71E106K MURATA MANUFACTURING)
	MGS1R5/324□□	50V 4.7 $\mu$ F	Ceramic capacitor (GRM31CR71H475K MURATA MANUFACTURING)
	MGS1R5/348□□	100V 2.2 $\mu$ F	Ceramic capacitor (GRM31CR72A225K MURATA MANUFACTURING)
C4 :	MGS1R5/305□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
	MGS1R5/312□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
	MGS1R5/324□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
	MGS1R5/348□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
L1 :	MGS1R5/305□□	1550mA 3.3 $\mu$ H	Inductor(LQH32PN3R3NNCL MURATA MANUFACTURING)
	MGS1R5/312□□	1200mA 4.7 $\mu$ H	Inductor(LQH32PN4R7NNCL MURATA MANUFACTURING)
	MGS1R5/324□□	900mA 10 $\mu$ H	Inductor(LQH32PN100MNCL MURATA MANUFACTURING)
	MGS1R5/348□□	550mA 22 $\mu$ H	Inductor(LQH32PN220MNCL MURATA MANUFACTURING)



## Conditions

Test : Surge immunity test

Model Name : MGS1R5□□ / MGS3□□

○Testing circuitry

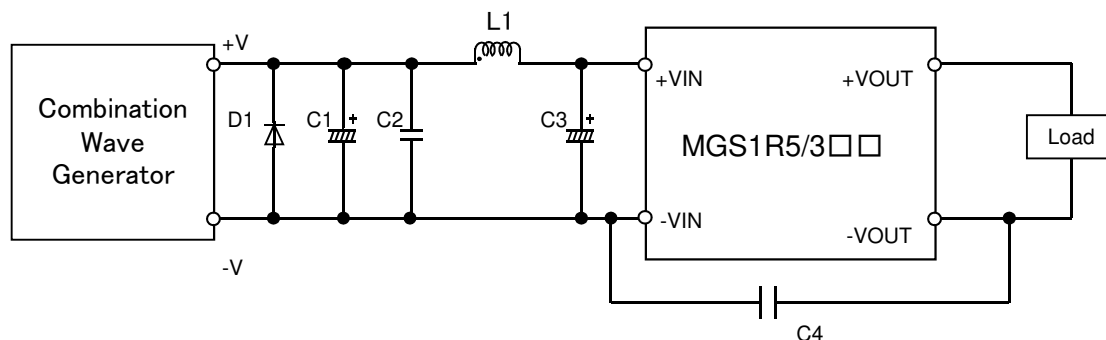


Fig.3 Testing circuitry 3

C1 :	MGS1R5/305□□	25V 1000 $\mu$ F	Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
	MGS1R5/312□□	50V 470 $\mu$ F	Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
	MGS1R5/324□□	63V 220 $\mu$ F	Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
	MGS1R5/348□□	100V 100 $\mu$ F	Electrolytic capacitor (LXVseries NIPPON CHEMI-CON)
C2 :	MGS1R5/305□□	16V 22 $\mu$ F	Ceramic capacitor (GRM31CC71C226K MURATA MANUFACTURING)
	MGS1R5/312□□	25V 10 $\mu$ F	Ceramic capacitor (GRM31CR71E106K MURATA MANUFACTURING)
	MGS1R5/324□□	50V 4.7 $\mu$ F	Ceramic capacitor (GRM31CR71H475K MURATA MANUFACTURING)
	MGS1R5/348□□	100V 2.2 $\mu$ F	Ceramic capacitor (GRM31CR72A225K MURATA MANUFACTURING)
C3 :	MGS1R5/305□□	25V 1000 $\mu$ F	Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
	MGS1R5/312□□	50V 470 $\mu$ F	Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
	MGS1R5/324□□	63V 220 $\mu$ F	Electrolytic capacitor (LXZseries NIPPON CHEMI-CON)
	MGS1R5/348□□	100V 100 $\mu$ F	Electrolytic capacitor (LXVseries NIPPON CHEMI-CON)
C4 :	MGS1R5/305□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
	MGS1R5/312□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
	MGS1R5/324□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
	MGS1R5/348□□	2kV 470pF	Ceramic capacitor (GR442QR73D471K MURATA MANUFACTURING)
L1	MGS1R5/305□□	1550mA 3.3 $\mu$ H	Inductor (LQH32PN3R3NNCL MURATA MANUFACTURING)
	MGS1R5/312□□	1200mA 4.7 $\mu$ H	Inductor (LQH32PN4R7NNCL MURATA MANUFACTURING)
	MGS1R5/324□□	900mA 10 $\mu$ H	Inductor (LQH32PN100MNCL MURATA MANUFACTURING)
	MGS1R5/348□□	550mA 22 $\mu$ H	Inductor (LQH32PN220MNCL MURATA MANUFACTURING)
D1 :	MGS1R5/305□□	400V 3A Diode	(S3L40U SHINDENGEN)
	MGS1R5/312□□	400V 3A Diode	(S3L40U SHINDENGEN)
	MGS1R5/324□□	400V 3A Diode	(S3L40U SHINDENGEN)
	MGS1R5/348□□	400V 3A Diode	(S3L40U SHINDENGEN)