

# FCC part 68 Conducted immunity tests for telecommunication equipment



# FCC part 68

Manufacturers of telecom terminal equipment have to make sure their new products meet the appropriate EMC immunity requirements. One such widely-used compliance standard is FCC part 68. The latest revision (October 1999) specifies five surge pulses to be applied to the power and telecom lines.

## A compact test solution

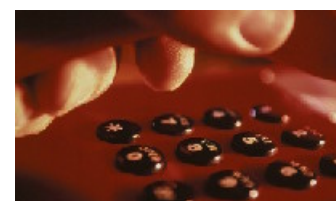
A new test configuration developed by Schaffner offers a complete, compact and cost-effective solution for the EMC immunity surge tests to FCC part 68. A single plug-in unit for the NSG 2050 mainframe generates all five surge pulses required by the standard. A dedicated coupling unit provides straight forward coupling and routing of the pulses. The system is controlled from the instruments' front panel, or via a PC running WIN 2050 software.



## Four pulse generators in one

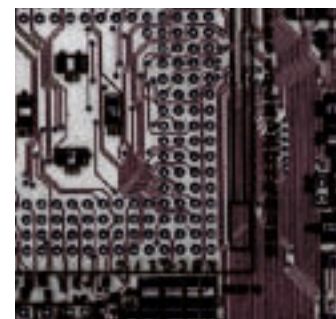
PNW 2053B plug-in network for System 2050 is four pulse generators in a single unit. It provides test pulses 10/160 $\mu$ s, 10/560 $\mu$ s, 2/10 $\mu$ s and type-B longitudinal and metallic versions of pulse 9/720 $\mu$ s, as demanded by the standard. FCC part 68 parameter settings are pre-programmed for quick and easy test set-up and the appropriate number of test pulses in each polarity is run automatically.

For more detailed product characterization or for testing to more stringent in-house standards, settings can be modified via the front panel keypad and display or via WIN 2050 software.



## PNW 2053B technical data

Complies to:	CFR Title 47, Part 68.302 (FCC) Rev. October 1999
Pulse specifications	see table below
Polarity (all pulses)	Positive, negative, alternate
Phasing (all pulses)	Asynchronous or synchronous ...0 – 359°
Pulse repetition	10sec to 27hrs (depends on amplitude settings)
Peak current measurement	For all telecom line surge pulses
Pre-programmed settings	Correspond to FCC nominal values
Weight	18kg (approx)
Dimensions	Fits in NSG 2050 mainframe
Safety	Complies with VDE1010
CE mark	Yes



## Pulse specifications

Pulse	Voltage range	Repetition	Short-circuit current			Open-circuit voltage		
			Front ( $\mu$ s)	Peak (A)	Duration ( $\mu$ s)	Front ( $\mu$ s)	Peak (V)	Duration ( $\mu$ s)
	( $\pm$ V)	(s)						
10/160	200 - 2500	20 @1.5kV setting	5-10	200-240A @1.5kV setting	160-200	5-10	1.5-1.65kV @1.5kv setting	160-220
10/560	200 - 950	60 @800V setting	5-10	100-120A @800V setting	560-730	5-10	800-880V @800v setting	560-730
9/720 Longitudinal	200 - 2500	20 @1.5kV setting	4.25-5.75	37.5-41.25A @1.5kV setting	272-368	7.65-10.35	1.5-1.65kV @1.5kV setting	612-828
9/720 Metallic	200 - 2500	10 @1kV setting	4.25-5.75	25-27.5A @1.5kV setting	272-368	7.65-10.35	1.0-1.1kV @1kV setting	612-828
2/10	200 - 2600	50 @2.5kV setting	1.7- 2.0	1000-1150A @2.5kV setting	10-15	1-2	2.5-2.75kV @2.5kV setting	10-17



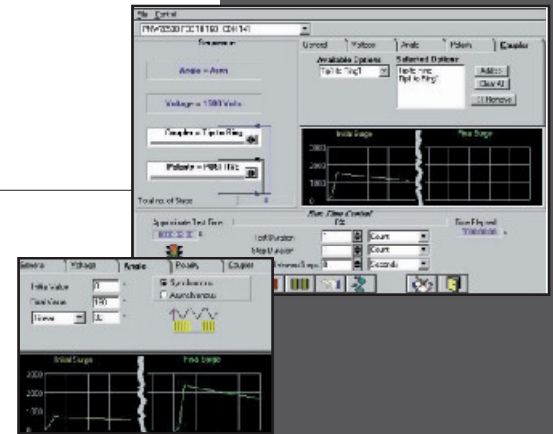
## Test management software

### A dedicated coupling unit

CDN 141 coupling network for System 2050, provides safe, high-integrity coupling for all the FCC part 68 surge tests on the power and telecom lines. The unit is designed to sit on the test bench next to the equipment-under-test, or in a rack configuration.

There are European Schuko and USA 5-20R power sockets on the front panel, so that the equipment-under-test can be connected using its own power cable. The correct differential coupling to the power line terminals of the equipment-under-test is set automatically. Appropriate filters and power-path protection devices are built-in.

Surge pulses to the telecom lines are routed via a connector field using safety laboratory connectors. The system logs the peak current values of each telecom surge applied.



### CDN 141 technical data

EUT power line path	up to 240V / 16Aac
Protection	16A trip switch
EUT power status	LED indicator
Power line coupling mode	Differential L1 to N
Telecom line coupling	Manual selection, all coupling modes possible
Dimensions	Stacks under NSG 2050 on workbench, LxWxH 510x450x186mm
Weight	approx. 17kg

### Optional coupling selector box

For even easier selection of coupling modes, an optional coupling selector box INA 142 is available. Cables allow straight-forward selection of any coupling configuration. RJ11 and RJ45 output sockets are provided for connection of the equipment-under-test telecom cable.

### INA 142 technical data

Dimensions	120x65x40mm
Pulse input	includes interconnection cables to CDN 141
Coupling selection	By cables (included)
Pulse output	Accommodates RJ 11 and RJ 45 connector
Pulse voltage	FCC level, 1500V max. (higher pulse voltages may cause flashover in RJ 11 and RJ 45 connectors)

Optional WIN 2050 test management software offers Windows-based control of the pulse generator and access to a range of parameter selection, test sequencing, editing and reporting tools. The equipment-under-test is monitored electronically and repeated tests can be performed automatically. The built-in report generator automatically creates comprehensive files of test parameters and results, including manually selected coupling modes, ready for inclusion in a compliance report.

# FCC part 68 test solution

## System configuration

NSG 2050	System mainframe
PNW 2053B	FCC pulse generator module
CDN 141	FCC coupling network

### Options:

INA 142	Coupling selector box
WIN 2050	Windows test management software

## A versatile system for testing immunity to conducted interference

System 2050 offers a comprehensive range of plug-in pulse generators, coupling networks and extension units for the testing of electronic equipment to EMC and safety standards including IEC, EN, ANSI-IEEE and a range of telecom standards. The modular construction means that each test facility can create its own System 2050 configuration to match its test needs. Additional plug-in generators and coupling networks can be added at any time.

For further information see Schaffner's System 2050 brochure.

**SCHAFFNER**

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