

Surge Waveforms for Various Standards

TIA-968-A Telecommunications - Telephone Terminal Equipment - Technical Requirements for Connection of Terminal Equipment to the Telephone Network, is valid for approvals until March 22, 2011 when it will be superseded by TIA-968-B. Until March 22, 2011, users may cite either TIA-968-A, along with its addenda, or TIA-968-B.

TIA-968-A replaced FCC Part 68 with the exception of hearing aid compatibility (HAC), volume control, and indoor cabling. TIA-968-B now in turn replaces TIA-968-A and its A1, A2, A3, and A4 addenda. This new version is closely harmonized with the Canadian CS03 requirements. Continued efforts between TIA TR41 and Industry Canada will continue these harmonization efforts. Various countries around the world also recognize this USA standard and use it either wholly or in part for their telephone terminal equipment programs.

GR 1089 is a standard generally supported by the US Regional Bell Operating Companies (RBOCs). It is updated by Telcordia Technology (formerly Bellcore). The RBOCs typically require compliance with GR 1089 for any of their telecom purchases. GR-1089 Issue 6 is the most recent update as is expected to be published March 2011.

The ITU is a specialized agency of the UN devoted to international harmonization. Most European countries recognize the ITU standards.

CNET is the Centre National d'études de Telecommunications, a French organization.

VDE is the Verband Deutscher Elektrotechniker, a Federation of German electrical engineers. VDE is very similar to the IEEE (Institute of Electrical and Electronics Engineers) but is national in scope rather than global.

ANSI is the American National Standards Institute, which is a non-government organization. The British equivalent to this is BSI.

IEC is the International Electrotechnical Commission, a result of Europe's move toward a single market structure and its drive to formalize and harmonize member countries' requirements.

FTZ R12 is a German specification.

Mainland China publishes various technical requirements and test methods for protection of telecommunication equipment, terminal equipment, and access network equipment. Some of these standards are based on ITU-T Recommendations. Type testing, factory inspection and follow-up factory inspection procedures similar to those imposed by UL within the USA, are also required in China.

The following page contains Table 3.1, which shows in its far right most column the recommended SIDACtor® device surge rating (A, B, or C) that is required to comply with each specific waveshape definition without the need of additional limiting resistors.

Table 3.1 Surge Waveforms for Various Standards

Standard			Peak Voltage	Rise/Decay time	Peak current	Rise/Decay time	SIDACTor® Device
			Volts	µs	Amps	µs	w/o series R
TIA-968-B	Surge A Metallic		800 - 880	6-10/560-860	100 - 115	5-10/560-760	C
	Surge A Longitudinal		1500 - 1650	6-10 /160-260	200 - 230	5-10/160-210	C
	Surge B Metallic		1000 - 1100	9±2.7/720±144	25 - 27.5	5±1.5/320±64	A, B or C
	Surge B Longitudinal		1500 - 1650	9±2.7/720±144	37.5 - 41.3	5±1.5/320±64	A, B or C
GR 1089	Test 1		600	10x1000	100	10x1000	C
	Test 2		1000	10x360	100	10x360	B or C
	Test 3		1000	10x1000	100	10x1000	C
	Test 4		2500	2x10	500	2x10	C
	Test 5		1000	10x360	25	10x360	A, B or C
CNET 131-24			1000	0.5x700	25	0.8x310	A, B or C
VDE 0433			2000	10x700	50	5x310	A, B or C
VDE 0878			2000	1.2x50	50	1x20	A, B or C
IEC 61000-4-5	Metallic	Class 2	500	1.2x50	12	8x20	A, B or C
		Class 3	1000	1.2x50	24	8x20	A, B or C
		Class 4 & 5	2000	10x700	48	5x310	B or C
	Longitudinal	Class 2*	1000	1.2x50	24	8x20	A, B or C
		Class 3*	2000	1.2x50	48	8x20	A, B or C
		Class 4* & 5*	4000	1.2x50	96	8x20	A, B or C
		Class 5* long-distance circuits	4000	10x700	100	5x310	A, B or C
FTZ R12			2000	10x700	50	5x310	A, B or C
YD/T 993-1998	Without Primary Protection Metallic, Single Tip and Ring Pair		1500	10x700	37.5	5x310	A, B or C
			1500	10x700	37.5	5x310	A, B or C
	Without Primary Protection Longitudinal, Single Tip and Ring Pair		1500	10x700	37.5	5x310	A, B or C
			1500	10x700	37.5	5x310	A, B or C
	Without Primary Protection Longitudinal, All Tip and Ring Pair		1000	10x700	25	5x310	A, B or C
			1000	10x700	25	5x310	A, B or C
	With Primary Protection Metallic, Single Tip and Ring Pair		4000	10x700	100	5x310	C
			4000	10x700	100	5x310	C
	With Primary Protection Longitudinal, Single Tip and Ring Pair		4000	10x700	100	5x310	C
			4000	10x700	100	5x310	C
	With Primary Protection Longitudinal, All Tip and Ring Pair		4000	10x700	100	5x310	C
			4000	10x700	100	5x310	C
			Without Primary Protector /With Primary Protector				
ITU K.20	Basic single port		1000 / 4000	10x700	25 / 100	5x310	A, B, C / B, C
	Enhanced single		1500 / 4000	10x700	37.5 / 100	5x310	A, B, C / B, C
	Basic multiple ports		1500 / 4000	10x700	37.5 / 100	5x310	A, B, C / B, C
	Enhanced multiple		1500 / 6000	10x700	37.5 / 150	5x310	A, B, C / C
	Basic power fault		600	50 Hz, 60 Hz	1	0.2 s	04611.25
	Enhanced power fault		600 / 1500	50 Hz, 60 Hz	1 / 7.5	0.2 s / 2 s	04611.25
ITU K.21	Basic single port		1500 / 4000	10x700	37.5 / 100	5x310	A, B, C / B, C
	Enhanced single		6000 / 6000	10x700	37.5 / 150	5x310	A, B, C / C
	Basic multiple ports		1500 / 4000	10x700	37.5 / 100	5x310	A, B, C / B, C
	Enhanced multiple		1500 / 6000	10x700	37.5 / 150	5x310	A, B, C / C
	Basic power fault		600	50 Hz, 60Hz	1	0.2 s	04611.25
	Enhanced power fault		600 / 1500	50 Hz, 60Hz	1 / 7.5	0.2 s / 2 s	04611.25

* Tested with Primary Protection