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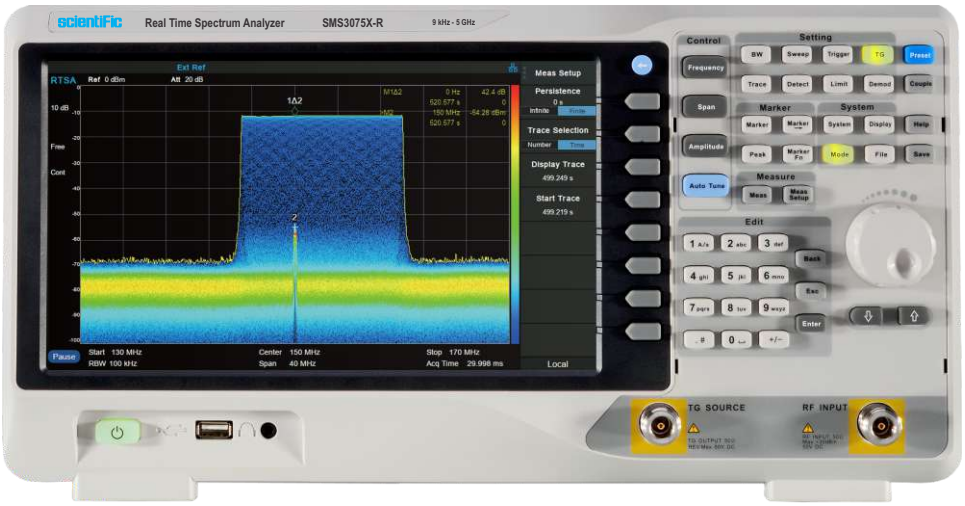
Real Time Spectrum Analyzer
SMS3000X-R



Advance Features

- Frequency Range from 9 kHz up to 5.0 GHz / 7.5 GHz
- -165 dBm / Hz Displayed Average Noise Level (Typ.)
- - 98 dBc / Hz @10 kHz Offset Phase Noise (1 GHz, Typ.)
- Level Measurement Uncertainty < 0.7 dB (Typ.)
- 1 Hz Minimum Resolution Bandwidth (RBW)
- Preamplifier Standard
- Tracking Generator Standard
- Up to 40 MHz Real Time Analysis Bandwidth (Opt.)
- 100% POI 7.20 µs, Dynamic Range 60 dB
- Multi-view for Density, Spectrogram, PvT and 3D
- Advanced Measurement Kit (Opt.)
- Reflection Measurement Kit (Opt.)
- Modulation Analysis Mode (Opt.)
- EMI Measurement Mode (Opt.)
- 10.1 inch Multi-Touch Screen , Mouse and Keyboard supported
- Web Browser Remote Control on PC and Mobile Terminals and File Operation

Technical Specifications	SMS3050X-R	SMS3075X-R
Frequency Range	9 kHz to 5.0 GHz	9 kHz to 7.5 GHz
Resolution Bandwidth	1 Hz to 3 MHz	1 Hz to 3 MHz
Displayed Average Noise Level	- 165 dBm/Hz	- 165 dBm/Hz
SSB Phase Noise	< - 98 dBc/Hz	< - 98 dBc/Hz
Third Order Intercept (TOI)	+ 14 dBm	+ 14 dbm
Total Amplitude Accuracy	< 0.7 dB	< 0.7 dB
Tracking Generator	100 kHz to 5.0 GHz	100 kHz to 7.5 GHz
Real Time Band Width	25 MHz, 40 MHz (Option)	
SFDR	60 dB	
100 % POI	7.20 µs	
RTSA Measurement	Density, Spectrongram, 3D, PvT	
Touch Screen	Multi Touch, Mouse and Keyboard supported	
Advanced Measurement	CHP, ACPR, OBW, CNR, Harmonic, TOI, Monitor	
Modulation Analysis	AM, FM, ASK, FSK, MSK, PSK, QAM	
Reflection Measurement	VSWR measurement using Reflection Bridge	
EMI Measurement	EMI Filter and Quasi-Peak Detector, Log Scale and Limit Line	

Technical Specifications		SMS3050X-R	SMS3075X-R
Spectrum Analyzer Mode			
Frequency and Time Characteristic			
Frequency			
Frequency Range		9 kHz to 5 GHz	9 kHz to 7.5 GHz
Frequency Resolution		1 Hz	
Frequency Span			
Range		0 Hz, 100 Hz to Max Frequency	
Accuracy		± Span /(Number of display points -1)	
Internal Reference Source			
Reference Frequency		10.000000 MHz	
Reference Frequency Accuracy Uncertainty		± [(time since last adjustment x frequency aging rate) + temperature stability + initial calibration accuracy]	
Initial calibration Accuracy		< 1 ppm	
Temperature Stability		< 1 ppm, 0˚C to 50˚C	
Frequency Aging Rate		< 0.5 ppm/first year, 3.0 ppm/20 years	
Marker			
Marker Resolution		Span / (Number of display points - 1)	
Marker Uncertainity		± [Frequency indication x reference frequency uncertainty + 1% x span + 10% x resolution bandwidth + marker resolution]	
Frequency Counter Resoution		0.1 Hz	
Bandwidths			
Resolution Bandwidth (-3dB)		1 Hz to 3 MHz, in 1-3-10 sequence	
Resolution Filter Shape Factor		< 4.8 : 1 (60dB : 3 dB), Gaussian-like	
RBW Uncertainity		< 5%	
Video Bandwidth (-3dB)		1 Hz to 10 MHz, in 1-3-10 sequence	
VBW Uncertainty		< 5%	
Sweep and Trigger			
Sweep Time		1 ms to 7500 s	
Sweep Mode		RBW = 3 kHz to 3 MHz, Sweep	
		RBW = 1 Hz to 10kHz, FFT	
Sweep Type		Single, Continuous	
Trigger Source		Free, Video, External	
External Trigger		5 V TTL level, Rising edge/Falling edge	
Amplitude Accuracy and Range Specifications			
Amplitude and Level			
Measurement Range		DANL to +10 dBm, 100 kHz to 1 MHz, Preamp off DANL to +20 dBm, 1 MHz to 7.5 GHz, Preamp off	
Reference Level		- 200 dBm to + 30 dBm, 1 dB steps	
Preamplifier		20 dB (nom.)	
Input Attenuation		0 to 50 dB, 1 dB step	
Maximum Input DC Voltage		± 50 VDC	
Maximum Average Power		30 dBm, 3 minute, fc ≥ 10 MHz, att > 20 dBm, preamp off	
Maximum Damage Level		33 dBm, fc ≥10 MHz, att > 20 dBm, preamp off	
Level Display			
Logarithmic Level Axis		1 dB to 200 dB	
Linear Level		0 to reference level, 0% to 100%	
Units of Level Axis		dBm, dBmV, dBµV, dBµA, Volt, Watt	
Number of Display Points		751	
Number of Traces		4	
Trace Detectors		Positive-peak, Negative-peak, Sample, Normal, Average (Voltage/RMS/Video)	
Trace Functions		Clear write, Max Hold, Min Hold, View, Blank, Average, Math	
SSB Phase Noise			
Offset		20˚C to 30˚C fc = 1 GHz, Normalized to 1 Hz	
10 kHz		-96 dBc/Hz, -98 dBc/Hz (typ.)	
100 kHz		-95 dBc/Hz, -97 dBc/Hz (typ.)	
1 MHz		-112 dBc/Hz, -114 dBc/Hz (typ.)	
Displayed Average Noise Level (DANL)			
Preamp off	100 kHz to 1 MHz	-105 dBm, -109 dBm (typ.)	
	1 MHz to 10 MHz	-122 dBm, -126 dBm (typ.)	
	10 MHz to 200 MHz	-142 dBm, -146 dBm (typ.)	
	200 MHz to 1.5 GHz	-142 dBm, -147 dBm (typ.)	
	1.5 GHz to 3.2 GHz	-140 dBm, -145 dBm (typ.)	
	3.2 GHz to 5.0 GHz	-137 dBm, -143 dBm (typ.)	
	5.0 GHz to 6.5 GHz	-	-136 dBm, -141 dBm (typ.)
	6.5 GHz to 7.5 GHz	-	-134 dBm, -139 dBm (typ.)

Technical Specifications		SMS3050X-R	SMS3075X-R
Preamp on	100 kHz to 1MHz	-133 dBm, -136 dBm (typ.)	
	1 MHz to 10 MHz	-151 dBm, -154 dBm (typ.)	
	10 MHz to 200 MHz	-161 dBm, -165 dBm (typ.)	
	200 MHz to 1.5 GHz	-159 dBm, -163 dBm (typ.)	
	1.5 GHz to 3.2 GHz	-159 dBm, -162 dBm (typ.)	
	3.2 GHz to 5.0 GHz	-157 dBm, -161 dBm (typ.)	
	5.0 GHz to 6.5 GHz	-	-157 dBm, -160 dBm (typ.)
	6.5 GHz to 7.5 GHz	-	-155 dBm, -159 dBm (typ.)
Frequency Response			
Preamp off		± 0.8 dB, ± 0.4 dB(typ.) (20˚C to 30˚C, 30% to 70% relative humidity, att = 20 dB, relative to 50 MHz)	
Preamp on		± 1.2 dB, ± 0.6 dB (typ.) (20˚C to 30˚C, 30% to 70% relative humidity, att = 20 dB, relative to 50 MHz)	
Error and Accuracy			
Resolution Bandwidth Switching Uncertainity		± 0.2 dB nom. (Logarithmic resolution, relative to RBW =10 kHz)	
Input Attenuation		20˚C to 30˚C, fc = 50 MHz, off, preamp off, relative to att = 20 dB	
Switching Uncertainity		± 0.5 dB	
Absolute Amplitude Accuracy	Preamp off	± 0.4 dB, input signal - 20 dBm (20˚C to 30˚C, fc = 50 MHz, RBW = VBW = 1 kHz, att = 20 dB, peak detector , 95% reliability)	
	Preamp on	± 0.6 dB, input signal - 40 dBm (20˚C to 30˚C, fc = 50 MHz, RBW = VBW = 1 kHz, att = 20 dB, peak detector , 95% reliability)	
Total Amplitude Accuracy		± 0.7 dB (20˚C to 30˚C, fc > 100 kHz, input signal - 50 dBm - 0 dBm, att = 20 dB, RBW = VBW = 1kHz , peak detector)	
RF input VSWR		< 1.5 (nom.) (Att = 10 dB, 1 MHz to 7.5 GHz)	
Distrotion and Spurious Responses			
Second Harmonic Distribution (SHI)		- 65 dBc / + 45 dBm (nom.) (20˚C to 30˚C, fc > 50 MHz, mixer level -20 dBm, att = 0 dB, preamp off)	
Third Order Intercept (TOI)		± 14 dBm (typ.) (20˚C to 30˚C, ≥ 50 MHz, two -20 dBm tones spaced by 100 kHz, att = 0 dB, preamp off)	
1dB Gain Compression		> 0 dBm (nom.) (20˚C to 30˚C, fc ≥ 50 MHz, att = 0 dB, preamp off)	
Residual Response		> 0 dBm (nom.) (20˚C to 30˚C, fc ≥ 50 MHz, att = 0 dB, preamp off)	
Input Related Spurious		< -65 dBc (20˚C to 30˚C, mixer level = -30 dBm)	
Tracking Generator			
Frequency Parameter			
Frequency Range		100 kHz to 5 GHz	100 kHz to 7.5 GHz
Frequency Resolution		1 Hz, Zero Span	
RBW, Sweep Mode		3 kHz to 3 MHz	
Power Paramenter			
Output Level		-40 dBm to 0 dBm	
Output Level Resolution		1 dB	
Output Flatness		± 3 dB (nom.)	
Normalization Trace		Ref A/B/C/D - > Ref trace	
VSWR		< 2 (Nom.)	
Connector and Impedance		N -type female, 50 Ω	
Average Safe Revere Power		Total : 30 dBm (1 W)	
Maximum Safe Reverse Level		Voltage : ± 50 VDC	
Advanced Measurement Kit (Option SMS3000XR-AMK)			
Power Measurement			
CHP, Channel Power		Channel Power, Power Spectral Density	
ACPR, Adjacent Channel Power Ratio		Main CH Power, Left channel power, Right Channel Power	
OBW, Occupied Bandwidth		Occupied Bandwidth, Transmit Frequency Error	
T-Power, Time Domain Power		Zero Span Integrated Power	
CNR, Carrier Noise Ratio		C/N, Noise Power	
Non- Linear Measurement			
Harmonic Measurement		Max Harmonic Number 10	
TOI, Third Order Intercept		Measure the third-order products from two tones	
Spectrum Monitor Measurement			
Spectrogram			
Reflection Measurement Kit (Option SMS3000XR-Refl)			
Stimulus and Measurement			
Frequency Range		100 kHz to 5.0 GHz	100 kHz to 7.5 GHz
RBW		3 kHz to 1MHz	
Stimulus Power		-40 to 0 dBm	
Format		VSWR, Return Loss, Reflection Coefficient	
Calibration		Open, Open + Short, Open + Load	
Marker Function		N dB BW, Q measurement	
Real-Time Spectrum Analyzer Mode			
Frequency and Time			
Real Time Bandwidth		25 MHz (Default)	
		40 MHz (Option SMS3000XR-RT40)	
100% POI Minimum Signal Duration		7.20 µs (Full Span, Kaiser Widow, Frequency Mask,Triggering at Full Amplitude Accuracy)	

Technical Specifications	SMS3050X-R			SMS3075X-R		
Measurement View	Density	30 ms to 50 s				
	3D + Spectrogram	30 ms to 50 s				
	Spectrogram	100 µs to 50 s				
	PvT + Spectrum	100 µs to 50 s				
Points	800					
Max. Sample Rate	51.2 MHz					
FFT	150000 (40 MHz analysis BW)					
Marker	8					
Span Min	5 kHz					
Window	Kaise (Default), Hanning, Flattop, Gaussian, Blackman-Harris, Rectangular					
RBW	Any SPAN, six RBW for every window (only one for Rectangular), default min RBW.					
	Typical RBW for Kaiser					
	Span	RBW min	RBW Max			
	40 MHz	100.43 kHz	3.3142 MHz			
	20 MHz	50.21 kHz	1.657 MHz			
	10 MHZ	25.11 kHz	828.55 kHz			
	1 MHz	2.51 kHz	82.85 kHz			
	100 kHz	251 Hz	8.285 kHz			
Spectrogram /PvT Maximum stored	50000 (Loop store)					
Different RBW and span, 100% POI (µs)						
Analysis BW	RBW1	RBW2	RBW3	RBW4	RBW5	RBW6
40 MHz	26.56	16.56	11.56	9.06	7.81	7.20
20 MHz	46.56	26.56	16.56	11.56	9.06	7.81
10 MHz	86.56	46.56	26.56	16.56	11.56	9.06
1 MHz	806.56	406.56	206.56	106.56	56.56	31.56
Different Window Length for RBW						
Length/Type	1024	512	256	128	64	32
Kaiser (Beta=12)	398.2849	198.9478	99.2793	49.4450	24.5279	12.0693
Hanning	533.4785	266.4785	132.9785	66.2285	32.8535	16.1660
Flattop	212.2447	106.0182	52.9050	26.3483	13.0700	6.4309
Gaussian (Alpha =3.5)	404.8707	202.2399	100.9244	50.2666	24.9376	12.2729
Blackman-Harris	399.2401	199.4250	99.5174	49.5636	24.5868	12.0983
Rectangular	801	400.5000	200.2500	100.1250	50.0625	25.0313
Amplitude Accuracy and Range						
Detector	+ Peak, - Peak, Sample, Average					
Trace	3					
Spectrum Density Display	0 to 100% (Resolution 0.1%)					
Dynamic Range for Spectrogram	200 dB					
Amplitude	Flatness	< 0.4 dB				
	Resolution	0.01 dB				
	Dynamic Range	< 60 dB				
Trigger	Free Run, PvT, External					
Frequency Mask Trigger (FMT)	Source	Traces				
	Type	Greater than, Less than, Outside Mask, Inside Mask				
	Actions	Stop,Beep				
Colour Mode	Warm(Default), Cool, Gray					
Modulation Analyzer Mode						
Common Parameter						
Frequency Range	2 MHz to 5.0 GHz			2 MHz to 7.5 GHz		
Carrier Power Accuracy	± 2 dB (nom.)					
Carrier Power Range	- 30 dBm to +20 dBm (nom.)					
Recording						
Data Packing	I = Q = 4 Byte					
Memory	60 MByte					
Lenght (IQ pairs)	7.5 MSample (60MB/8B)					
Length (Time units)	Samples / (Span x 1.25)					
PC software	Analysis and Playback in Easy VSA Software					
Analog Modulation Analysis (Option SMS3000XR-AMA)						
AM						
Modulation Rate Range	20 Hz to 100 kHz					
Accuracy	1 Hz (nom.)		Modulation rate <1 kHz			
	< 0.1% modulation rate (nom.)		Modulation rate ≥ 1 kHz			
Modulation Depth Range	5% to 95%					
Accuracy	± 4% (nom.)					
FM						
Modulation Rate Range	20 Hz to 200 kHz					
Accuracy	1 Hz (nom.)		Modulation rate <1 kHz			
	< 0.1% modulation rate (nom.)		Modulation rate ≥ 1 kHz			

Technical Specifications	SMS3050X-R	SMS3075X-R
Frequency Deviation	1 kHz to 400 kHz	
Accuracy	± 4% (nom.)	
Digital Modulation Analysis (Option SMS3000XR-WDMA)		
Measurement		
Modulation Type (The Analysis BW is Same with Real Time BW in RTSA Mode)	ASK: 2ASK	
	FSK: 2, 4, 8, 16 level	
	MSK,GMSK	
	PSK: BPSK, QPSK, OQPSK, 8PSK	
	DPSK : DBPSK, DQPSK, D8PSK, π/4-DQPSK, π/8-DQPSK	
	QAM :16, 32, 64,128, 256	
Meas Length	16 to 4096	
Points / Symbol	4, 6, 8, 10,12,14,16,18	
Symbol Rate	1 Ksps to 25 Msps, Symbol Rate* Points / Symbol < = 160 Msps	
Filter		
Meas / Ref. Filter	Nyquist, Squrt, Nyquist, Gauss, Half Sine, Rectangular	
Lenght	2 to 128	
Alpha / BT	Alpha 0.01 to 1, BT 0.01 to 10	
Trace		
Trace Data	IQ Means Time, IQ Meas Spectrum	
	IQ Ref. Time, IQ Ref. Spectrum	
	Time, Spectrum	
	Symbol Error Chart, Err Vector Time, Err Vector Spectrum	
	IQ Mag Err, IQ Phase Err	
Layout	Single, Stacked 2, Grid 1*2, Grid 2*2	
Trace Formats	Log mag, Lin mag, Real, Imag	
	I = Q, Constellation, I-eye, Q-eye	
	Wrap Phase, Unwrap Phase, Trellis eye	
Symbol Error Chart		
PSK/DPSK/MSK/QA	EVM (rms EVM, peak EVM), Magnitude error Phase error, IQ offset, Carrier offset, SNR Quadrature error Gain imbalance (not support for MSK)	
ASK	ASK, Error, ASK depth, arrier offset	
FSK	FSK Error, Magnitude error, FSK deviation, carrier offset	
EMI Measurement Mode (Option SMS3000XR-EMI)		
Measurement		
Measurement View	Frequency scan, Meter, Signal list	
Pre-compliance Sequence	Scan, Search, Meas	
EMI Filter RBW (-6dB)	200 Hz, 9 kHz, 120 kHz, 1 MHz (following CISPR 16-1-1)	
RBW uncertainty	<5%	
Detector	Peak, Voltage Average, Quasi-Peak (following CISPR 16-1-1)	
Dwell time	0 μs to 10 s	
RBW/Steps	0.1, 0.3, 0.5, 1, 2, 3	
Corrections	4	
Limit and Trace	3	
Limit Standards	ENN550xx, GB9254, FCC Part 15, User defined	
Attenuator	0 to 50 dB	
Report	Signal List	
Frequency scale	Linear, Logarithmic	
Inputs and Outputs		
Front Panel		
RF input, Port 2	N-type female, 50 Ω (nom.)	
TG Source, Port 1	N-type female, 50 Ω (nom.)	
USB Host	USB-A plug, Version 2.0	
Ear Phone Jack	3.5 mm	
Rear Panel		
USB Device	USB-B plug, Version 2.0	
LAN	10/100 Base, RJ-45	
10 MHz reference output	10 MHz, >0 dBm, BNC-type female, 50 Ω (nom.)	
10 MHz reference input	10 MHz, -5 to +10 dBm, BNC-type female, 50 Ω (nom.)	
External trigger input	5V TTL level, BNC-type female, 10 kΩ	
Remote Control		
Communication Interface	LAN, USB Device, USB Host (USB-GPIB adaptor)	
Remote Control Capability	SCPI / Labview / IVI based on USB-TMC / VXI-11 / Socket / Talnet	
Remote Controller	NI-MAX, Web Browser, Easy Spectrum Software, File Explorer	
General Specifications		
Input Power	AC Voltage Range : 100-240 V, 50/60 Hz or 100-120 V 400 Hz;	
	Power Consumption : 70 W (MAX)	

Technical Specifications	SMS3050X-R	SMS3075X-R
Temperature	Working Temperature : 0˚C to 40˚C,	
	Storage Temperature : -20˚C to 70˚C	
Humidity	0˚C to 30˚C, ≤ 95% Relative Humidity	
	30˚C to 50˚C, ≤ 75% Relative Humidity	
Dimensions (W×H×D)	W : 393, H : 207, D : 116.5 mm	
Weight	Net: 4.70 kg	
Display	TFT LCD, 1024 × 600, 10.1 inch capacitive multi-touch screen	
Storage	Internal (Flash) 256 MB, External (USB storage device) 32 GB	
Standard Accessories	Power Cod, USB Cable, CD	
Optional Accessories	Description	Option No.
Common Options and Accessories	Advanced Measurement Kit	SMS3000XR-AMK
	Utility Kit: N(M)-SMA(M) cable(6 GHz), N(M)-N(M) cable(6 GHz), N(M)-BNC(F) adaptor x2, N(M)-SMA(F) adaptor x2, 10 dB 1 W attenuator	UKitSSA3XC
	N(M)-SMA(M) cable, 70 cm, 6 GHz	N-SMA-6L
	N(M)-N(M) cable, 70 cm, 6 GHz	N-N-6L
	N(M)-BNC(M) cable, 70 cm, 2 GHz	N-BNC-2L
	N(M)-SMA(M) cable, 100 cm, 18 GHz	N-SMA-18L
	N(M)-N(M) cable, 100 cm, 18 GHz	N-N-18L
	USB-GPIB Adapter	USB-GPIB
Real Time Options	40 MHz Real-Time BandWidth	SMS3000XR-RT40
Reflection Measurement Options	Reflection Measurement	SMS3000-Refl
	Reflection Bridge (1 MHz to 2.5 GHz)	RB3X25
	50 Ω N type Mechanical Calibration Kit: Open(M),Short(M),Match(M),Through Adapter(M-M)	F503ME
EMI Measurement Options	EMI Measurement Mode	SMS3000XR-EMI
	300 kHz to 3 GHz Near Field Probe Kit: 3 H-probes (20/10/5 mm), 1 E-probe (5 mm)	SRF5030T
Modulation Analysis Options	Analog Modulation Analysis: AM, FM	SMS3000XR-AMA
	Digital Modulation Analysis: ASK, FSK, MSK, PSK, QAM. The analysis BW is the Real-Time BW in RTSA mode	SMS3000XR-WDMA
	Easy VSA Software	EasyVSA
Electromagnetic Compatibility		
EN 61326-1 : 2013 EN 61000-3-2 : 2014	Class A (The active input power of the EUT is less than 75 W. According to EN 61000-3-2, no limits are necessary.)	
EN 61000-3-3 : 2013	Plt: 0.65 Pst: 1.00, dmax: 4.00 %, dc: 3.00 %; dt Lim: 3.30 % dt>Lim: 500ms	
IEC 61000-4-2 : 2008	AD ± 8.0 kV, CD ± 4.0 kV	
IEC 61000-4-3 : 2006 + A1: 2007 + A2 : 2010	80 MHz to 1000 MHz : 10V/m, 1.4 GHz to 2.0 GHz : 3 V/m, 2.0 GHz to 2.7 GHz : 1V/m	
IEC 61000-4-4 : 2004 + A1: 2010	AC Line : ± 2.00 kV	
IEC 61000-4-5 : 2005	Line to Line: 1.0 kV, Line to Earth: 2.0 kV	
IEC 61000-4-6 : 2008	0.15-80 MHz :3 V 1 KHz 80% AM	
IEC 61000-4-8 : 2009	30 A/m, 50/60 Hz	
IEC 61000-4-8 : 2004	Voltage Dips : 0%/0.5P; 40%/10P; 70%/25P; Short Interruptions Test Level % UT: 0%/250P	
Safety		
IEC 61010-1:2010/EN 61010-1:2010 CAN/CSA-C22.2 No.61010-1:2012, CAN/CSA-C22.2 No.61010-2-30:2012 UL 61010-1:2012, UL 61010-2-30:2012		
RoHS		
2011/65/EU		

Subject to change

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