RF Conducted Immunity Test System CST 10 Series

In Compliance with

> IEC/EN 61000-4-6
> ISO 11452-4
> ISO 7637-4
> RTCA DO-160 Section 20
> MIL-STD-461 CS114
> GJB 151B
> GB/T 33014.4
> GJB 151B-CS114
> YY 0505

Introduction

The CST 10 series RF conducted immunity testing system adopts an integrated design, with built-in integrated signal generator, RF power amplifier, and RF power meter. Each device can be used independently, with the option of an external power amplifier. The internal broadband amplifier (Class A) drives the coupling/decoupling network (CDN), electromagnetic clamp (EM clamp), and current clamp to achieve the standard required test levels. The CST-10 series is a testing system based on PC software control, which can perform fully automatic calibration and testing, greatly improving the scalability and efficiency of the system. The test results can be saved, printed, and shared internally within the company. The testing frequency range is 4 KHz~400 MHz, which meets the requirements of IEC/EN 61000-4-6, YY 0505, GJB152A-CSI4, ISO 7637-4 and other standard requirements.

Features

> Integrate signal generator, RF power amplifier and RF power meter into one;
> Support bulk current injection; optional current monitoring probe; support closed-loop test method;
> The creation of test templates makes software operation easy;
> USB interface for PC remote control;

Application Areas

> Automotive
> Communication
> Military
> Electrical Power
> Aviation
> Medical
> Automation Equipment
> Household Electrical Appliances

Technical Parameters (Signal Generator)					
Model No.	**CST 1075 CST 10150**	**CST 1075B CST 10150B**	**CST 1075C CST 10150C**	**CST 1075D CST 10150D**	**CST 1075E CST 10150E**
Standard	IEC /EN 61000-4-6	ISO 11452-4	GJB 151B	ISO 7637-4 Pulse A	YY 0505 CS Test
Frequency Range	9 kHz-3 GHz		4 kHz-3 GHz	1 μHz-35 MHz	9 kHz-3 GHz
Frequency Resolution	0.23 Hz		1 μHz (4 KHz-100 KHz) 0.23 Hz (100 kHz-3 GHz)	1 μHz	0.23 Hz
Frequency Stability over Temp.	±0.5 ppm		±1 ppm+10 pHz (4 kHz~100 kHz) ±0.5 ppm (100 kHz ~ 3 GHz)	±1 ppm+10 pHz	±0.5 ppm
Harmonics	≤-30 dBc		<-55 dBc (4 kHz ~100 kHz) ≤-30 dBc (100 kHz ~3 GHz)	<-55 dBc	≤-30 dBc
Non-harmonics	≤-50 dBc		<-60 dBc (4 kHz~100 kHz) ≤-50 dBc (100 kHz~3 GHz)	<-60 dBc	≤-50 dBc
Output Power	—120 dBm~ 0 dBm (9 kHz~500 kHz) —120 dBm~ +10 dBm (500 kHz~3 GHz)		≤100 kHz：1.0 mVpp~10 Vpp >100 kHz：-120d Bm~0 dBm	≤10 MHz： 1.0 mVpp~10 Vpp ≤30 MHz： 1.0 mVpp~5.0 Vpp ≤35 MHz： 1.0 mVpp~2.5 Vpp	-120 dBm~ 0 dBm (9 kHz~500 kHz) -120 dBm~ +10 dBm (500 kHz~3 GHz)
Power Precision	±1.0 dB				
Power Meter Resolution	0.1 dB		≤100 kHz：0.1 mVpp >100 kHz：0.1 dB	0.1 mVpp	0.1 dB
Internal Modulation Source(LF)	Sinusoidal wave 0.1 Hz~500 kHz; Rectangular wave 0.1 Hz~20 kHz; triangular wave/Sawtooth wave 0.1 Hz~100 kHz		≤100 KHz: Sinusoidal wave / Rectangular wave, triangular wave / sawtooth wave 2 mHz ~1 MHz >100KHz: Sinusoidal wave 0.1 Hz~500 kHz; Rectangular wave 0.1 Hz~20 kHz; Triangular wave/sawtooth wave 0.1 Hz~100 kHz	Sinusoidal wave 2 mHz ~1 MHz; Rectangular wave 2 mHz ~1 MHz; triangular wave/sawtooth wave 2mHz ~1MHz	Sinusoidal wave 0.1 Hz~500 kHz; Rectangular wave 0.1 Hz~20 kHz; triangular wave/sawtooth wave 0.1 Hz~100 kHz
Amplitude Modulation (AM)	Modulation depth 0%~100%; Modulated rate 20 Hz-1 MHz		≤100 kHz: Modulation depth 0%~120%; Modulated rate 2 mHz ~1MHz >100KHz: Modulation depth 0% ~100%; Modulated rate 20 Hz-1 MHz	Modulation depth 0%~120%; Modulated rate 2 mHz ~1 MHz	Modulation depth 0%~100%; Modulated rate 1 Hz ~25 kHz

Technical Parameters (Signal Generator)

Model No.	CST 1075 CST 10150	CST 1075B CST 10150B	CST 1075C CST 10150C	CST 1075D CST 10150D	CST 1075E CST 10150E
Frequency Modulation (FM)	Max. frequency offset: 5 MHz Modulated rate: 20 Hz~1 MHz		≤100 kHz: Max. frequency offset: 1 MHz Modulated rate: 2 mHz ~1 MHz ＞100 kHz: Max. frequency offset: 5 MHz Modulated rate 20 Hz~1 MHz	Max. frequency offset: 5 MHz Modulated rate 2 mHz ~1 MHz	Max. frequency offset: 5 MHz Modulated rate 1 Hz ~25 kHz
Phase Modulation (ΦM)	Phase modulation 0°~360°; 20 Hz~1 MHz		≤100 kHz: Phase modulation 0°~360°; 2mHz ~1MHz ＞100 kHz: Phase modulation 0°~360°; 20 Hz~1 MHz	Phase modulation 0°~360°; 2 mHz ~1 MHz	Phase modulation 0°~360°; 1 Hz ~25 kHz
Pulse Repetition	200 ns~160 s		≤100 kHz：1 μs~500 s >100 kHz：200 ns~160 s	1 μs ~ 500 s	200 ns ~160 s
Pulse Width	100 ns~85 s		≤100 kHz：0 ns~100s >100 kHz：200 ns~160 s	0 ns~100 s	100 ns~85 s
Output Interface	N (female)				
VSWR	<1.5:1				
Technical Parameters (Power Meter)					
Frequency Range	9 kHz - 6 GHz		4 kHz - 6 GHz	9 kHz - 6 GHz	
Test Electrical Level	-50 dBm - +20 dBm				
Accuracy	±0.3 dB				
Input Interface	N (female)				
VSWR	<1.1:1				
Technical Parameters (Power Amplifier)					
Frequency Range	100 kHz ~230 MHz	100 kHz ~400 MHz	4 kHz~400 MHz	100 kHz~230 MHz	100 kHz~230 MHz
Gain	Maximum gain 50 dB±2 dB (100 W)				
1dB Gain	48.5 dB±2 dB (75 W)				
VSWR	<1.5:1				
Output Impedance	50 Ω				
Output Interface	N (female)				

General Parameters

Working Power	AC 110 V/220 V ±10%，50 Hz / 60 Hz±5% （AC 220 V 50 Hz in mainland China）
Max. Power	500 W
Dimension	19" / 4U
Weight	Approx. 15 kg
Ambient Temperature	15℃~35℃
Relative Humidity	45%~75%
Atmospheric Pressure	86 kPa~106 kPa

Power Difference

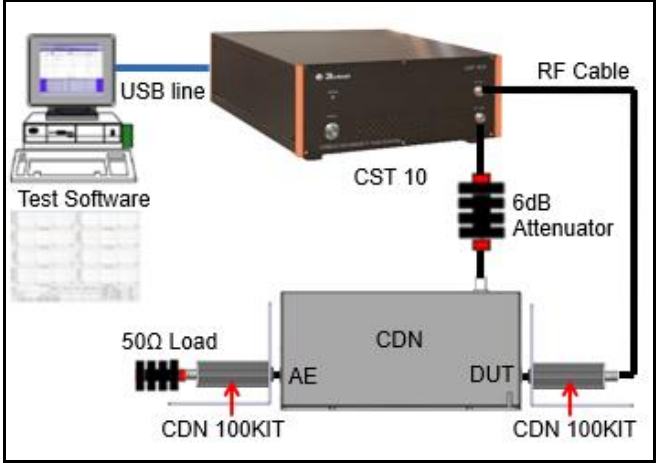
CST 1075	1dB linear power 75 W
CST 10150	1dB linear power 150 W

Accessories

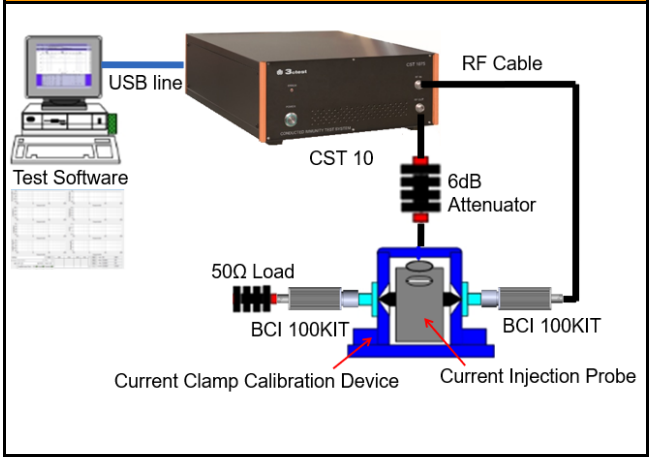
User Manual, Test line, Fuse*2 (spare parts), power line, flat grounded line, attenuator, USB 2.0 printer line, BNC 50 Ω coaxial terminal load, RF cable

IEC/EN 61000-4-6 and YY0505 CS Transient Immunity Test Setup

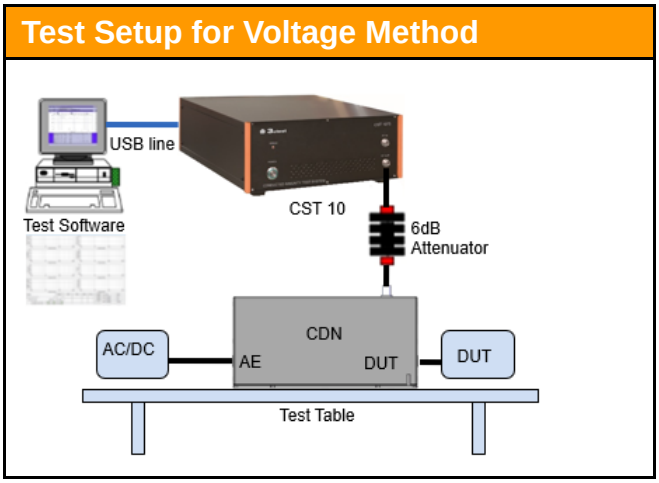
Calibration Setup for Voltage Method



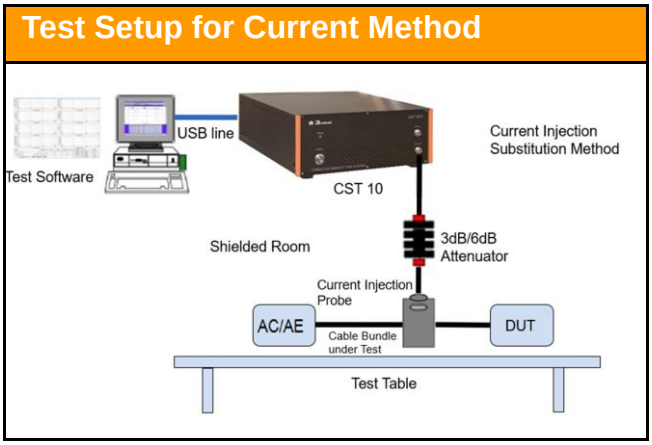
Calibration Setup for Current Method



Test Setup for Voltage Method



Test Setup for Current Method



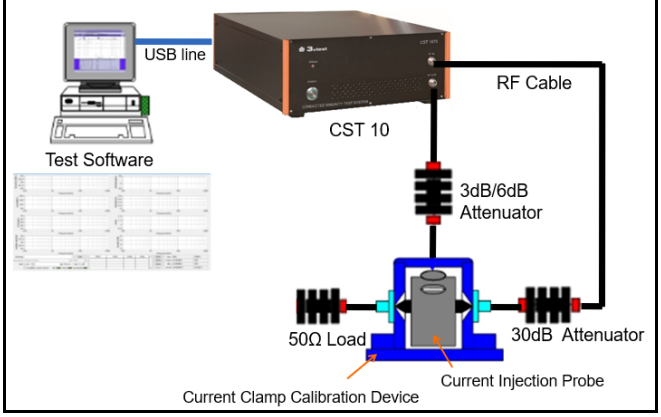
CST 1075 / CST 10150 (CST 1075E/ CST 10150E)	
Test Accessories (Voltage Method)	
CDN (Coupling / decoupling networks)	
Power line (M series)	M1, M2, M3, M2+M3, M4, M5: Conform to the requirement of single-/three-phase power, Max. current reaches 300 A
Unscreened balanced lines (T series)	T2, T4, T8
Unscreened balanced lines (AF series)	AF2, AF4, AF8
Screened cables (S series)	S1, S2, S4, S8, S9, S25
Others	RJ11, RJ11S, RJ45, RJ45S, USB-C, USB-P
Calibration Jig 150 Ω-to-50 Ω	CDN 100KIT
EM Clamp	
EM CL100	frequency range 100 kHz~1GHz, coupling factor < 3 d (150 kHz ~ 500 MHz), inner diameter 23 mm/32 mm calibration device EM CL100 KIT
Attenuator	
Attenuator	6 dB/80 W attenuator (CST 1075/ CST 1075E) 6 dB/200 W attenuator (CST 10150/ CST 10150E)

CST 1075 / CST 10150 (CST 1075E/ CST 10150E)	
Test Accessories (Current Method)	
Current Injection Probe BCIP-400	Frequency range 4 kHz~400 MHz,
Calibration Device 150 Ω-to-50 Ω	BCI 100KIT
Calibration Jig	BCICF-400
Attenuator	
Attenuator	6 dB/80 W attenuator (CST 1075/ CST 1075E) 6 dB/200 W attenuator (CST 10150/ CST 10150E)

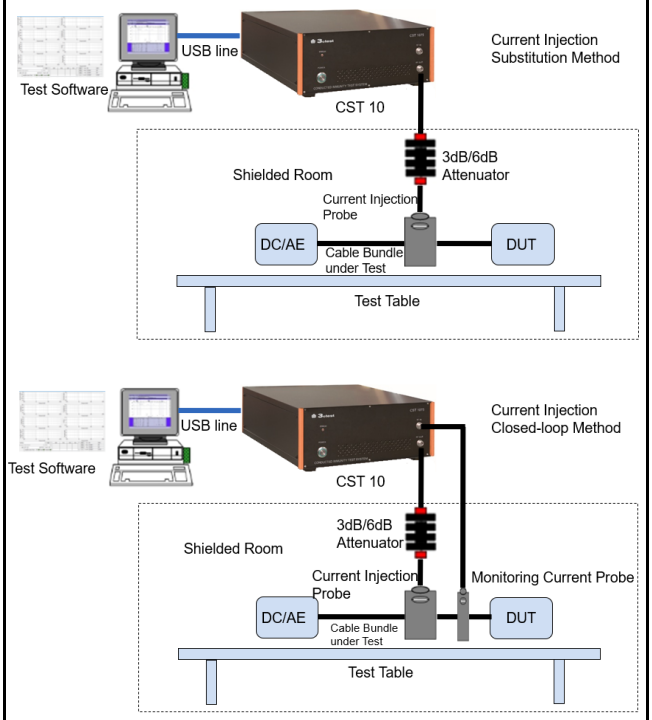
Testing Environment	
Conducted indoors without shielding	Test Table: 1,700 mm *900 mm *800 mm;
	Grounding reference board: 1,600 mm *800 mm *1,200 mm;

ISO 11452-4 BCI Test Setup

ISO11452-4 BCI Calibration Setup



ISO11452-4 BCI Test Setup



CST 1075B / CST 10150B Accessories for ISO 11452-4 BCI Test

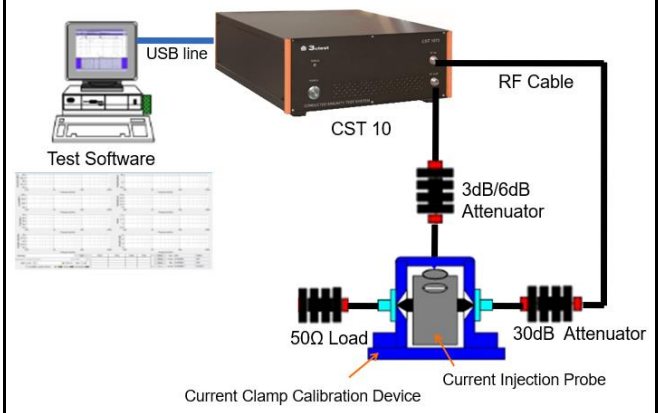
Attenuator	30 dB/80 W Frequency Range DC~1 GHz
Attenuator	3 dB/80 W Frequency Range DC~1 GHz (CST 1075B)
Attenuator	3 dB/200 W Frequency Range DC~1 GHz (CST 10150B)
50 Ω Load	50 Ω/80 W Frequency Range DC~1 GHz
Current Injection Probe	BCIP-400
Calibration Device	BCICF-400 Frequency Range DC~400 MHz
Current Monitor Probe	TWCM-500 Frequency Range 1 kHz~500 MHz
Test Software	EMC-S BCI

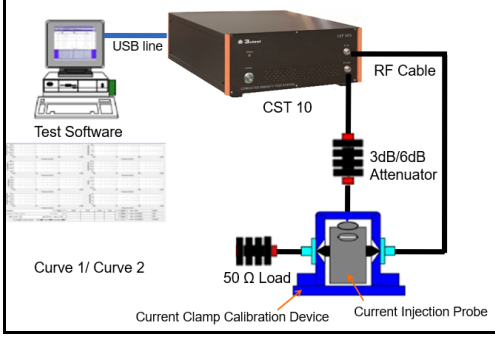
Test Environment

Conducted in a shielded room	Test Table: 2,400 mm *1,000 mm *900 mm
	Ground Reference Plane: 2,400 mm *1,000 mm *1,200 mm

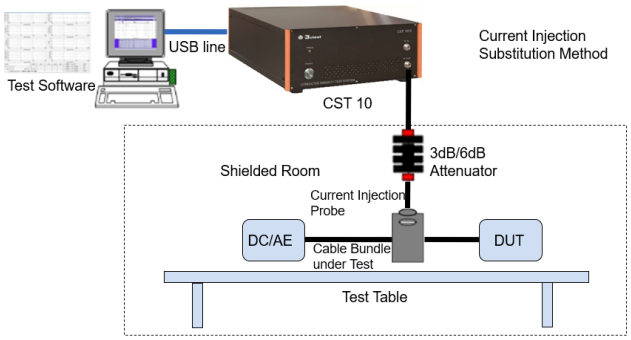
RTCA DO-160 Section 20/ MIL-STD-461 CS114
CS114 Test Setup

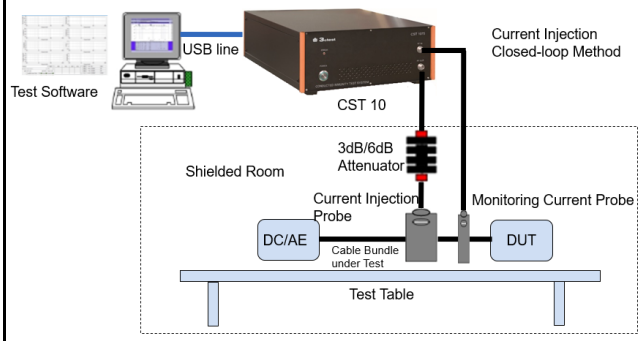
CS 114 Calibration Setup





CS 114 Test Setup





CST 1075C / CST 10150C
Accessories for GJB 151B CS 114 Test

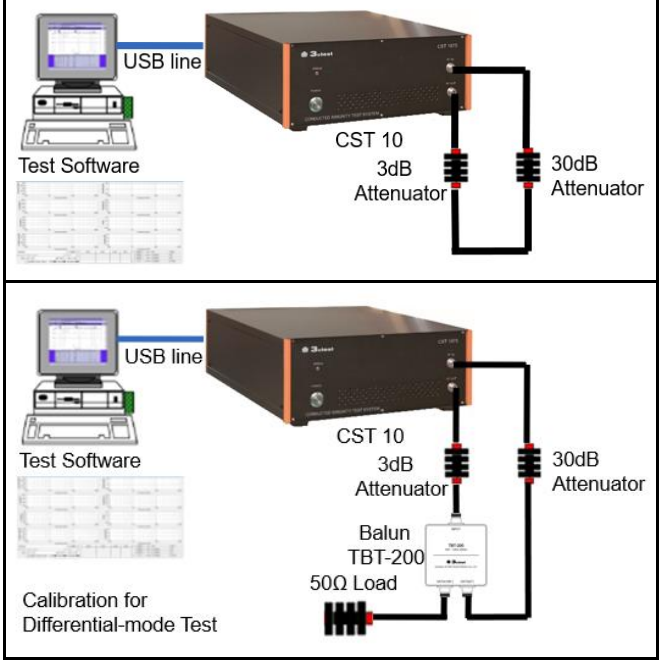
Attenuator	30 dB/80 W Frequency Range DC~1 GHz
Attenuator	3 dB/80 W Frequency Range DC~1 GHz (CST 1075C)
Attenuator	3 dB/200 W Frequency Range DC~1 GHz (CST 10150C)
50 Ω Terminal	50 Ω/80 W Frequency Range DC~1 GHz
Current Injection Probe	BCIP-400
Calibration Device	BCICF-400 Frequency Range DC~400 MHz
Current Monitor Probe	TWCM-500 Frequency Range 1 KHz~500 MHz
Test Software	EMC-S CS114

Test Environment

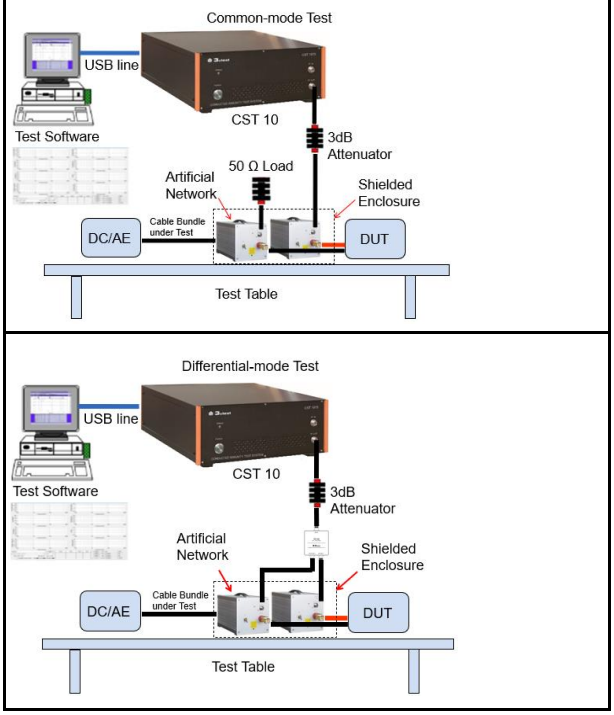
Conducted in a shielded room	Test Table: 2,400 mm *1,000 mm *900 mm
	Ground Reference Plane: 2,400 mm *1,000 mm *1,200 mm

ISO 7637-4 Pulse A Test Setup

ISO 7637-4 Pulse A Calibration Setup



ISO 7637-4 Pulse A Test Setup



CST 1075D / CST 10150D Accessories for ISO 7637-4 Pulse A Test	
Attenuator	30 dB/80 W Frequency Range DC~1 GHz
Attenuator	3 dB/80 W Frequency Range DC~1 GHz (CST 1075C)
Attenuator	3 dB/200 W Frequency Range DC~1 GHz (CST 10150C)
Balanced/ Unbalanced Transformer	TBT-200: 200 V; 1 MHz ~ 10 MHz; -3.3 dB; 50 Ω;
HV Artificial Networks	TANHV 200: 100 kHz ~ 150 MHz; 400 A; AC 700 V, DC 1 kV; 5μH || 50 Ω;
50 Ω Load	50 Ω/80 W Frequency Range DC~1 GHz
HV Shielded Enclosure	HVSE 400
HV Shielded Enclosure	HVSE 200
HV Battery Load	7637-4R500/120 3000 W
Test Software	EMC-S 7637-4

Test Environment	
Conducted in an unshielded room	Test Table： 2,400 mm *1,000 mm *900 mm
	Ground Reference Plane： 2,400 mm *1,000 mm *1,200 mm

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