

**Essential Requirements**  
**for**  
**Softswitch of NGS Division**

## Scope

This document lays down the essential requirements for **Softswitch** under Mandatory Testing & Certification of Telecommunication Equipment (MTCTE) notified by Government of India vide Gazette Notification no. G.S.R. 113 (E) dated 5th September 2017. Softswitch is also known as Media Gateway Controller, (MGC), Call Server (CS) or Call Agent (CA). The Softswitch is located in the service provider's network and handles call control and signaling functions, typically maintaining call state for every call in the network.

The document also defines the necessary testing requirements for certification under the MT&CTE framework.

Following are the variants under **Softswitch**.

Name of Equipment	Variant 1
<b>Softswitch</b>	Only one variants named " <b>Softswitch</b> "

## History

Sno.	Name of ER	ER Number	Remark
1.	<b>Softswitch</b>	TEC/ER/NGS/SSW-001/01/APR-2018	<b>ISSUE 01</b>

## SECTION I

### (A) Electromagnetic Compatibility (EMC) Requirements

The equipment shall conform to the EMC requirements as per the following standards and limits indicated therein. (Category -Class : A)

Sr. No	Requirements	Testing requirements
i.	<p><b>Conducted and radiated emission (applicable to telecom equipment):</b>  <b>Name of EMC Standard:</b> "CISPR 22 (2008) or CISPR 32 (2015) - Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment".  <b>Limits:-</b></p> <ul style="list-style-type: none"> <li>i. To comply with Class A of CISPR 22 (2008) or CISPR 32 (2015).</li> <li>ii. The values of limits shall be as per TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</li> <li>iii. For Radiated Emission tests, limits below 1 GHz shall be as per Table 4 (a) or 5 (a) for measuring distance of 10m or Table 4(a1) or 5(a1) for measuring distance of 3m.</li> </ul>	<p>Test results from Designated CAB of TEC to be submitted for compliance.</p>
ii.	<p><b>Immunity to Electrostatic discharge:</b>  <b>Name of EMC Standard:</b> IEC 61000-4-2 {2008} "Testing and measurement techniques of Electrostatic discharge immunity test".  <b>Limits: -</b></p> <ul style="list-style-type: none"> <li>i. Contact discharge level 2 {± 4 kV} or higher voltage;</li> <li>ii. Air discharge level 3 {± 8 kV} or higher voltage;</li> </ul> <p>Performance Criteria shall be as per Table 1 under Clause 6 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p> <p>Applicable Performance Criteria shall be as per Table 3 under Clause 7.2 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p>	<p>Test results from Designated CAB of TEC to be submitted for compliance.</p>

<p>iii.</p>	<p><b>Immunity to radiated RF:</b>  <b>Name of EMC Standard:</b> IEC 61000-4-3 (2010) "Testing and measurement techniques-Radiated RF Electromagnetic Field Immunity test".  <b>Limits:-</b>  <b>For Telecom Equipment and Telecom Terminal Equipment with Voice interface (s)</b>  i. Under Test level 2 {Test field strength of 3 V/m} for general purposes in frequency range 80 MHz to 1000 MHz and  ii. Under test level 3 (10 V/m) for protection against digital radio telephones and other RF devices in frequency ranges 800 MHz to 960 MHz and 1.4 GHz to 6.0 GHz.  <b>For Telecom Terminal Equipment without Voice interface (s)</b>  Under Test level 2 {Test field strength of 3 V/m} for general purposes in frequency range 80 MHz to 1000 MHz and for protection against digital radio telephones and other RF devices in frequency ranges 800 MHz to 960 MHz and 1.4 GHz to 6.0 GHz.</p> <p>Performance Criteria shall be as per Table 1 under Clause 6 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p> <p>Applicable Performance Criteria shall be as per Table 3 under Clause 7.2 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p>	<p>Test results from Designated CAB of TEC to be submitted for compliance.</p>
<p>iv.</p>	<p><b>Immunity to fast transients (burst):</b>  Name of EMC Standard: IEC 61000- 4- 4 {2012) "Testing and measurement techniques of electrical fast transients/burst immunity test"  <b>Limits:-</b>  Test Level 2 i.e. a) 1 kV for AC/DC power lines; b) 0.5 kV for signal / control / data / telecom lines;  Performance Criteria shall be as per Table 1 under Clause 6 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p>	<p>Test results from Designated CAB of TEC to be submitted for compliance.</p>

	Applicable Performance Criteria shall be as per Table 3 under Clause 7.2 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.	
v.	<p><b>Immunity to surges:</b>  <b>Name of EMC Standard:</b> IEC 61000-4-5 (2014) "Testing &amp; Measurement techniques for Surge immunity test"  <b>Limits:-</b>  i. For mains power input ports: (a) 2 kV peak open circuit voltage for line to ground coupling (b) 1 kV peak open circuit voltage for line to line coupling  ii. For telecom ports: (a) 2 kV peak open circuit voltage for line to ground (b) 2 kV peak open circuit voltage for line to line coupling.</p> <p>Performance Criteria shall be as per Table 1 under Clause 6 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p> <p>Applicable Performance Criteria shall be as per Table 3 under Clause 7.2 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p>	Test results from Designated CAB of TEC to be submitted for compliance.
vi.	<p><b>Immunity to conducted disturbance induced by Radio frequency fields:</b>  <b>Name of EMC Standard:</b> IEC 61000-4-6 (2013) "Testing &amp; measurement techniques-Immunity to conducted disturbances induced by radio- frequency fields"  <b>Limits:-</b>  Under the test level 2 {3 V r.m.s.} in the frequency range 150 kHz-80 MHz for AC / DC lines and Signal /Control/telecom lines.  Performance Criteria shall be as per Table 1 under Clause 6 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p> <p>Applicable Performance Criteria shall be as per Table 3 under Clause 7.2 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p>	Test results from Designated CAB of TEC to be submitted for compliance.
vii.	<p><b>Immunity to voltage dips &amp; short interruptions (applicable to only ac mains power input ports, if any):</b>  <b>Name of EMC Standard:</b> IEC 61000-4-11 (2004) "Testing &amp; measurement techniques-voltage dips, short interruptions and voltage variations immunity tests"</p>	Test results from Designated CAB of TEC to be submitted for compliance.

	<p><b>Limits:-</b></p> <ul style="list-style-type: none"> <li>i. a voltage dip corresponding to a reduction of the supply voltage of 30% for 500ms (i.e. 70 % supply voltage for 500ms)</li> <li>ii. a voltage dip corresponding to a reduction of the supply voltage of 60% for 200ms; (i.e. 40% supply voltage for 200ms)</li> <li>iii. a voltage interruption corresponding to a reduction of supply voltage of &gt; 95% for 5s.</li> <li>iv. a voltage interruption corresponding to a reduction of supply voltage of &gt;95% for 10ms.</li> </ul> <p>Performance Criteria shall be as per Table 1 under Clause 6 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p> <p>Applicable Performance Criteria shall be as per Table 3 under Clause 7.2 of TEC Standard No. TEC/SD/DD/EMC-221/05/OCT-16.</p>	
viii.	<p><b>Immunity to voltage dips &amp; short interruptions (applicable to only DC power input ports, if any):</b></p> <p><b>Name of EMC Standard:</b> IEC 61000-4-29:2000: Electromagnetic compatibility (EMC)-PART 4-29: Testing &amp; measurement techniques- voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests.</p> <p><b>Limits:-</b></p> <ul style="list-style-type: none"> <li>i. voltage Interruption with 0% of supply for 10ms. Applicable Performance Criterion shall be B.</li> <li>ii. voltage Interruption with 0% of supply for 30ms, 100ms, 300ms and 1000ms. Applicable Performance Criterion shall be C.</li> <li>iii. voltage dip corresponding to 40% &amp; 70% of supply for 10ms, 30ms. Applicable Performance Criterion shall be B.</li> <li>iv. voltage dip corresponding to 40% &amp; 70% of supply for 100ms, 300ms and 1000ms. Applicable Performance Criterion shall be C.</li> </ul>	Test results from Designated CAB of TEC to be submitted for compliance.

	v. voltage variations corresponding to 80% & 120% of supply for 100ms to 10s as per table 1c of IEC 61000-4-29. Applicable Performance Criterion shall be B.	
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**Note-1:** For checking compliance with the above EMC requirements, the method of measurements shall be in accordance with TEC Standard No. TEC/SD/RD/EMC-002/02.OCT.2016 and the references mentioned therein.

**Note-2:** Amendment if any will be incorporated as and when notified by Radio Division

**SECTION II**

**(B) Safety Requirements**

<b>Sr. No</b>	<b>Requirements</b>	<b>Testing requirements</b>
<b>i.</b>	The equipment shall conform to IS 13252 part 1: 2010 "Information Technology Equipment – Safety- Part 1: General Requirements" [equivalent to IEC 60950-1 {2005} "Information Technology Equipment –Safety- Part 1: General Requirements" or IEC 62368]	Test results from Designated CAB of TEC to be submitted for compliance.

**Note-1:** Amendment if any will be incorporated as and when notified by Radio Division



**SECTION III**

**(C) Technical Requirements**

Technical Requirements of “Softswitch” are mentioned in the tables as below.

Remark

- 1) For all RFC mentioned in this ER Conformance testing report is must for the all clauses of that RFC mentioned in this ER.

**Table 1: List of Interfaces for products and their variants(OPTIONAL)**

Applicable to→ Interface↓	Softswitch
10/100/1000 BASE-T Ethernet Electrical Interface	Y
1 GE optical Ethernet Interface	Y
10 GE optical Ethernet Interface	Y

**Table 2: List of Test Parameters Applicable to Interfaces and their international standards**

Applicable to→ Test Parameter↓	Standard	10/100/1000 BASE-T Ethernet Electrical Interface	1 GE optical Ethernet Interface	10 GE optical Ethernet Interface
Optical output power	802.3		Y	Y
Operating Wavelength	802.3		Y	Y
Receiver Sensitivity	802.3		Y	Y
Link speed test	802.3	Y*		
Duplex(Full or Half)	802.3	Y*		
Auto Negotiation	802.3	Y*		

**\*will be modified as per IT division inputs**

**Table 3: List of Test Parameters Applicable to product variants and their international standards**

Applicable to→ Test Parameter↓	Standard	Softswitch
Addressing IPv4	RFC 791	Y
SIP	RFC 3261	Y
DTMF	RFC 4733	Y
UDP	RFC 768	Y
SCTP	RFC 4960	Y
SIP-I	Q.1912.5	Y
CDR*	-	Y
M3UA	RFC 3332	Y
Control protocol	H.248	Y

Note: \* only functional Test

<b>Addressing IPv4</b>	<b>RFC 791</b>
Functional Description	RFC 791 (Clause no. 2.3)
Gateways	RFC 791 (Clause no. 2.4)
Interfaces	RFC 791 (Clause no. 3.3)
<b>SIP</b>	<b>RFC 3261</b>
Responses (only for SIP URI not SIPs URI)	RFC 3261 (Clause no. 7.2)
Message Body Length (only for SIP URI not SIPs URI)	RFC 3261 (Clause no.7.4.2)
Max-Forwards (only for SIP URI not SIPs URI)	RFC 3261 (Clause no.8.1.1.6)
Canceling a Request	RFC 3261 (Clause no.9)
Client Behavior (only for SIP URI not SIPs URI)	RFC 3261 (Clause no. 9.1)
<b>UDP</b>	<b>RFC 768</b>
UDP Format	RFC 768
User Terminology	RFC 768
Sequence numbers	RFC 768
<b>SCTP</b>	<b>RFC 4960</b>
User Data Fragmentation	RFC 4960 (Clause no. 1.5.3)
Path Management	RFC 4960 (Clause no. 1.5.7)
Transmission of DATA Chunks	RFC 4960 (Clause no. 6.1)
Path Failure Detection	RFC 4960 (Clause no. 8.2)
<b>DTMF</b>	<b>RFC 4733</b>
RTP payload format for named telephones events	RFC 4733 (Clause no.2)
Use of RTP header fields	RFC 4733 (Clause no.2.2)
Payload Format	RFC 4733 (Clause no.2.3)
Specification of Events codes for DTMF events	RFC 4733 (Clause no.3)
DTMF Applications	RFC 4733 (Clause no.3.1)
DTMF Events	RFC 4733 (Clause no.3.2)
Congestion Consideration	RFC 4733 (Clause no.3.3)
<b>M3UA</b>	<b>RFC 3332</b>
Procedures to Support the M3UA-User	RFC 3332 (Clause no. 4.1)
Establishment of Association and Traffic Between SGs and ASPs	RFC 3332 (Clause no. 5.1)
M3UA Port Number	RFC 3332 (Clause no. 7.2)
<b>Control Protocol</b>	<b>H.248</b>
Connection Model	Clause no. 6 (all sub clause of 6.1 & 6.2)
<b>SIP-I</b>	<b>Q.1912.5</b>
Conventions for representation of ISUP PDU	Clause 5.1
Conventions for representation of SIP/SDP information	Clause 5.2
ISUP encapsulation – detailed procedures	Clause 5.4
Sending of Initial Address Message (IAM)	Clause 6.1
INVITE received without an SDP offer	Clause 6.1.1
INVITE received with an SDP offer	Clause 6.1.2
IAM parameters	Clause 6.1.3

**SECTION IV**

**(D) Other Requirements**

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**SECTION V**

**(E) Security Requirements**

As per Security Requirements finalized by Security Wing of DoT HQ.