



GCFTM
Global Certification Forum

GCF: The Future of Device Certification around the World

Bruce Jolly: GCF Business Development
LTE Africa, November 2015

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What is GCF Certification?

- Standards-based scheme providing an assurance of **interoperability** between wireless devices & mobile networks driving economies of scale
- **Complementary** to regulatory schemes
- Recognised & accepted by major Operators worldwide
- Supported by the world's leading test equipment vendors & test laboratories
- Harmonized test requirements **reduce duplication** of testing

GCF Certification delivers cost savings to the wireless industry



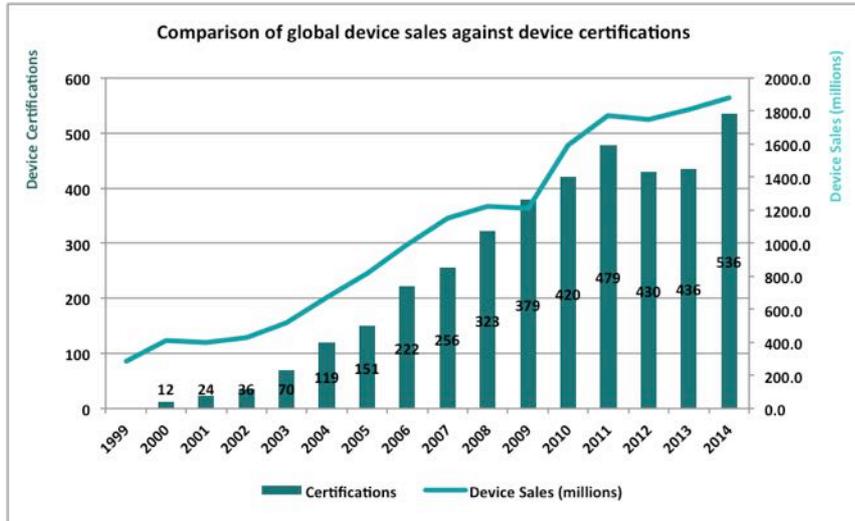
How does GCF demonstrate interoperability?

- Common Certification Criteria
 - Promote industry alignment, focus and scale
- Common device certification to known requirements
 - Reduce overheads for operator acceptance testing
- Co-ordinated cross-industry effort
 - Aligns a robust certification scheme to the real needs of industry
- Independently validated GCF test cases & ISO17025-accredited test labs
 - High confidence in test requirements and results
- Extensive GCF Field Trials
 - Increase confidence in real-world device performance on live networks
- Common Performance Metrics
 - Improve visibility of device Performance



Choice of certified devices helps drive the global market

Latest device
Certifications



495 GCF-Certified devices in first 10 months of 2015. -29 included 3GPP2

What kinds of device can be certified?

Any wireless device
Mobile/smartphone
Embedded module
USB modem
Data card
Laptop
Tablet
M2M device
Mobile gateway / hotspot
Any device incorporating 3GPP or 3GPP2 connectivity

incorporating

Any 3GPP or 3GPP2 wireless technology
GSM
GPRS
EDGE
3G (UMTS/WCDMA)
HSPA
LTE (FDD, TDD)
LTE-Advanced
CDMA2000

GCF Certification evolves in step with 3GPP and 3GPP2



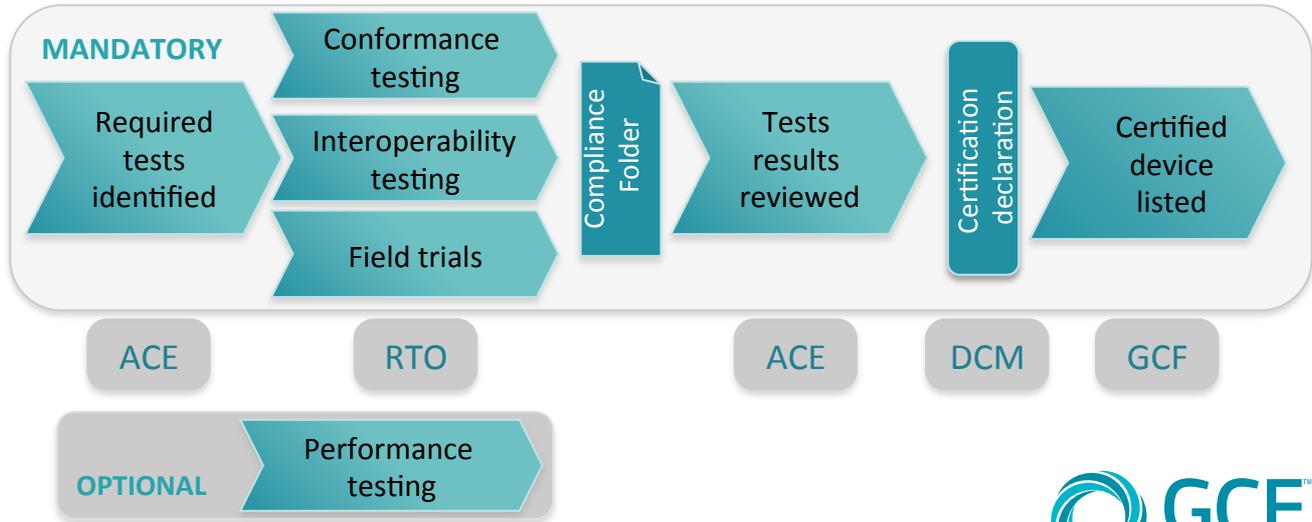
How does GCF Certification work?

Integrity ensured through six distinct processes:

1. **Qualification:** Manufacturers are required to demonstrate they have the skills, working practices and resources to participate in the scheme
2. **Definition:** Certification Criteria for new features and requirements are agreed jointly by Operators and Manufacturers
3. **Validation:** Conformance Certification Criteria are independently validated
4. **Assessment:** Each new device tested to demonstrate that all relevant Certification Criteria have been met. Testing includes:
 - Conformance Tests
 - Interoperability tests
 - Field Trials
5. **Declaration:** All GCF Operator members are automatically notified of every new GCF-Certified device
6. **Contest:** Pre-defined process exists which allows operators to challenge a device's certification



The GCF Certification Process



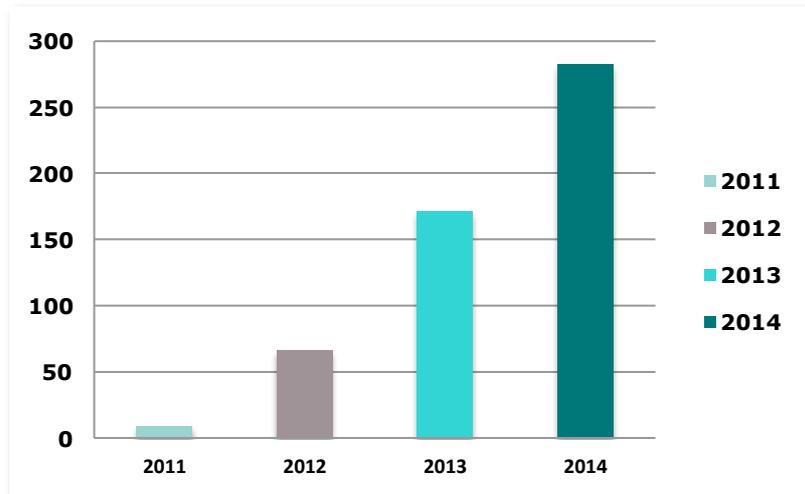
LTE bands currently within GCF certification

3GPP Band		Activated	1 st Certified Device
1	FDD	Apr 2011*	Sep 2011
2	FDD	Apr 2014*	Apr 2014
3	FDD	Feb 2012*	May 2012
4	FDD	Feb 2012*	Sep 2012
5	FDD	Oct 2011*	Jan 2013
7	FDD	Apr 2011*	Sep 2011
8	FDD	Jan 2013*	Oct 2013
11	FDD	Apr 2012*	Oct 2012
12	FDD	Jan 2015	May 2015
13	FDD	Dec 2010*	Aug 2011
14	FDD	Apr 2014	May 2015
18	FDD	Apr 2012*	Oct 2012

3GPP Band		Activated	1 st Certified Device
19	FDD	Jan 2013*	Aug 2013
20	FDD	Dec 2010*	Mar 2012
21	FDD	Jan 2013*	Aug 2013
25	FDD	Jun 2012*	Feb 2013
26	FDD	Apr 2013*	Feb 2014
27	FDD	Work in Progress	
28	FDD	Jan 2015*	
38	TDD	Jul 2011*	Sep 2011
39	TDD	Jun 2012*	Sep 2014
40	TDD	Oct 2011*	Oct 2012
41	TDD	Apr 2012*	May 2013

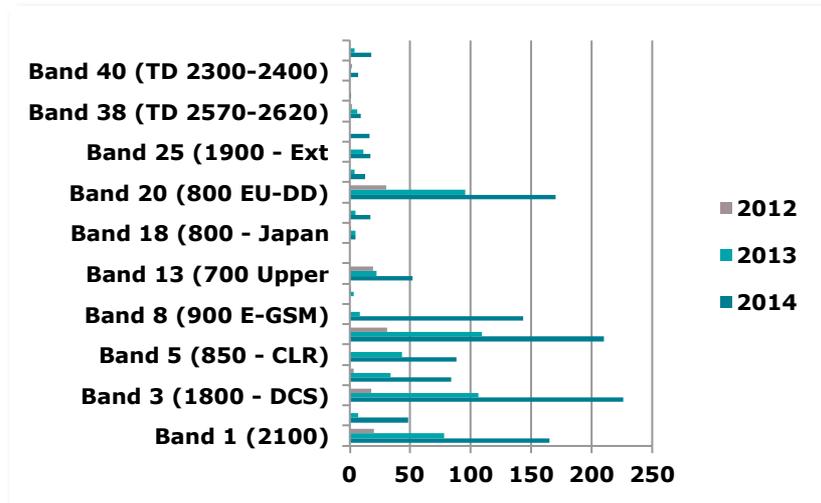
Activation date relates to 3GPP Rel-8. *Certification subsequently extended to 3GPP Rel-9

Strong growth in LTE device certifications



53% of 2014 certified devices incorporated LTE

Devices certified in 20 LTE bands in 2014



Number of certified devices incorporating each LTE band

What types of companies join GCF?

- Manufacturers (Full & Associate) 88
 - Device & M2M Manufacturers
 - 536 devices certified in 2014
- Observers 75
 - Component manufacturers, software/app developers
 - Numerous test companies offering ACE & RTO support to Associate Manufacturer Members
- Operators (Full & Associate) 127
 - Members include 23 largest operator groups
- Application developers
 - New Client Vendor membership category for certification of standards-based client applications

Members include companies from all key regions of the world



GCF Industry Partners



Groups within GCF

- Board of Directors (BoD): Runs the GCF company
 - Comprises elected directors (and specific invitees) from the membership on 2 year elected periods
- Steering Group (SG): Concerned with the day-today functionality of the GCF, new work items
 - Elected Chair and Vice-Chair: alternating Operator/Manufacturer
 - Comprises all members (operators, manufacturers, observers)
- CAG/CAG2/FTAG: Conformance and Interoperability/Field Trial Agreement Groups
 - All interested members convert work items into Certification Criteria
- PAG: Performance Agreement Group
 - Optional scheme for Performance measurement complementing, but separate from, GCF certification
- Various TaskForces and Groups dependent on need



3GPP Conformance Testing Focus Areas

- **E-UTRA and its evolutions continues to be a major focus of CAG's work.**
 - Carrier Aggregation is a major present focus.
 - Other features
 - Features in support of Single Radio Voice Call Continuity and VoLTE.
 - Network improvements for Machine Type Communication.
 - Minimisation of Drive Test.
 - Positioning / location technologies.
 - Inter-band and Inter-RAT tests continue to be updated to support new 3GPP releases and band/technology combinations.
- **New applications are also forming an important part of CAG's on-going work**
 - UICC Based NFC services (based on GSMA TS.27).
 - RCS 5.1 (RCS 1.2 terminated due to lack of commercial deployment)
- **CAG has an on-going program of test case optimisation**
 - Seeking to optimise test case coverage in particular for older technologies.

Features added to certification in 2015

Feature / Topic	3GPP Release	Bands	Added to certification
E-UTRA RF, RRM, Protocol	Rel-8 Rel-9 Rel-10	12, 28 12 Various CA bands	Q1-2015 Q1-2015 Q1-Q3 2015
E-UTRA Inter-mode (FDD-TDD)	Rel-9	3 - 40 28 - 41	Q1-2015
E-UTRA Inter-RAT (TDD to CDMA2000)	Rel-9	E-UTRA 41 CDMA C00	Q3-2015
E-UTRA Inter-band	Rel-9	1, 5, 7	Q1-2015
Single Radio Voice Call Continuity in alerting phase (aSRVCC)	Rel-10	1,3,19,21,38,39, 40,41	Between Q4-2015 and Q1-2015.
E-UTRA MBMS E-UTRA MBMS Service Continuity enhancements	Rel-9 Rel-11	1, 3, 13 4	Q2 and Q3-2015 Q1-2015
E-UTRA Service Specific Access Control	Rel-9	N/A	Q2-2015
E-UTRA Network Improvements for Machine Type Communications	Rel-10	Various	Q2-2015
E-UTRA special sub-frame configuration	Rel-11	N/A	Q3-2015
E-UTRA Minimisation of Drive Test	Rel-10	38, 40 and 41	Q3-2015
E-UTRA security test case	Rel-8	Various	Q3-2015
E-UTRA RRM Release 8 and Release 9 enhancements for inter-RAT	Rel-8 Rel-9	Various	Q3-2015
UTRA FDD enhancements	Rel-10	UTRA FDD I	Q1-2015
UTRA absolute priority based reselection	Rel-8	UTRA FDD I	Q3-2015
Evolution of UICC based NFC services	N/A	N/A	1H2015
VAMOS-2 (Voice channels over adaptive multi-user channels on one slot)	Rel-9	GSM900 GSM1800	Q2-2015

Work in progress (1 of 2)

Feature / Topic	3GPP Release	Bands	Planned activation date
E-UTRA Carrier Aggregation 18A-28A, CA_3C, 4A-5A	Rel-10	18A-28A 3C 4A-5A	Q2-2015 Q2-2015 Q4-2015
E-UTRA enhanced inter-cell interference co-ordination (ICIC)	Rel-10	Various	Q3-2015
E-UTRA Further enhancements to ICIC	Rel-11	Various	Q3-2015
E-UTRA System Improvements for Machine Type Communication	Rel-11	Various	Q3-2015
E-UTRA Minimisation of Drive Route	Rel10/Rel-11	Various	Various – starting Q3-2015.
E-UTRA Co-ordinated Multi-point operation	Rel-11	Various	Q4-2015
E-UTRA Network-requested CA Band Combination Capability Signalling	Rel-11	Various	Q1-2016
Single Radio Voice Call Continuity (BSRVCC) in the pre-alerting (before ringing) phase	Rel-12	Various	Q1-2016
E-UTRA Enhanced Downlink Multiple Antenna Transmission	Rel-10	Various	Q2-2016
VoLTE Voice Quality Test	Rel-12	N/A	Q3-2015
Service Specific Access Control in connected mode.	Rel-12	N/A	Q1-2016
E-UTRA Improved Minimum Performance Requirements: Interference Rejection	Rel-11	Various	Q2-2015
RCS 5.1 conformance testing	N/A	N/A	Q2-2015

Work in progress (2 of 2)

Feature / Topic	3GPP Release	Bands	Planned activation date
EPS TDD – CDMA2000 Inter-RAT Protocol Rel-8	Rel-8	N/A	Q3-2015
E-UTRA MBMS Service Continuity	Rel-11	Various	Q3-2015 /Q1-2016
E-UTRA MBMS	Rel-10	Various	Q3-2015/Q1-2016
E-UTRA Positioning (various technologies)	Rel-9, 10, 11 & 12	Various	Q4-2015
WCDMA Positioning (various technologies)	Rel-12	UTRA FDD I	Q4-2015
Further Continued evolution of UICC based NFC (WI-228)	N/A	N/A	Q4-2015
E-UTRA Release 8 Band 42	Rel-8	42	Q2-2016

Field Trials Focus Areas

Work Item updates

- VoLTE – continued work to develop and maintain field trials for this new feature.
 - Thus far 2 Field Trial Qualified Networks have declared support for VoLTE.
- RCS: RCS 1.2 field trials removed. Focus now is on RCS 5.1
- A5/4 field trials added to GERAN and UTRAN.
- 2G WB-AMR: Devices supporting both GERAN and UTRAN will now have WB-AMR T2T tests conducted in GERAN and UTRAN (rather than just UTRAN).

New Work Items

- CDMA2000 Field Trials – initial work item description noted.
- IMS Voice over WiFi – initial work item description noted.
- This work will be progressed further in the Q4 meeting.

Process updates

- FTAG confirmed that E-UTRA devices supporting TDD must be field trialled in TDD networks.
- Improved documentation: Field trials now documented in 2 annexes – 'All RAT' and 'IMS' rather than 6 annexes.

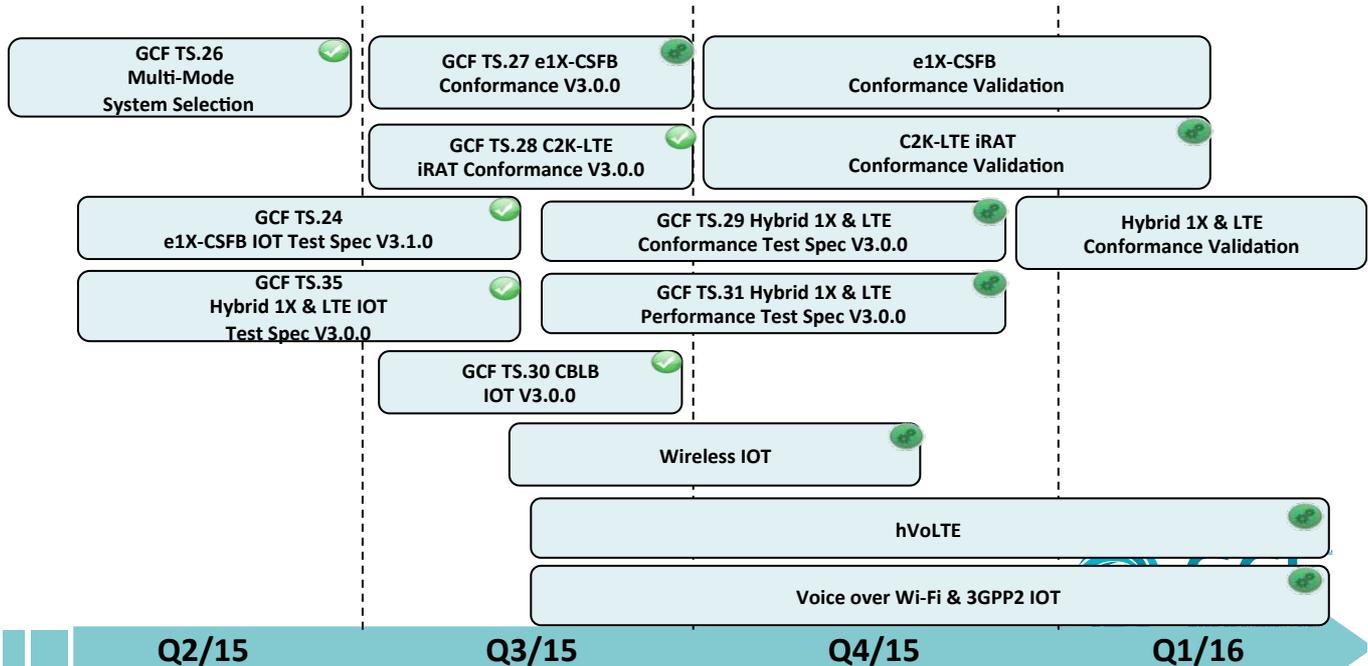
GCF Field Trial work items

Status	Document ID.	Title
Ongoing & Active	GCF-WI-018	Video Telephony
Ongoing & Active	GCF-WI-066	Field Trial requirements for UTRA
Ongoing & Active	GCF-WI-071	Steering of Roaming (Quad Reject) Field Trials
Ongoing & Active	GCF-WI-075	WB-AMR Field Trials
Ongoing & Active	GCF-WI-108	Field Trial requirements for GSM/GPRS/EGPRS
Ongoing & Active	GCF-WI-121	Field Trial requirements for E-UTRA/EPC
Completed & Active	GCF-WI-122	A5/3 Ciphering Field Trials
Ongoing & Active	GCF-WI-143	Ciphering Indicator Field Trials
Ongoing & Active	GCF-WI-145	Field Trial Requirements for IPv6
Ongoing & Active	GCF-WI-192	RCS 5.1 Field Trials
Ongoing & Active (Tolerance Period)	GCF-WI-193	IMS/VoLTE Field Trials
Draft	GCF-WI-194	UICC based Near Field Communication (NFC) Services – IOP Testing
Draft	GCF-WI-215	IMS/VoWiFi Field Trials
Draft	GCF-WI-216	A5/4 Ciphering Field Trial Testing
Draft	GCF-WI-217	GEA4 Field Trial Testing
Draft	GCF-WI-232	Field Trial Requirements for CDMA2000

3GPP2 2015 Roadmap Items

- ✔ Multi-Mode System Selection V3.0.0
- ✔ e1XCSFB Cabled IOT V3.1.0
- e1XCSFB Conformance V2.0.0
- ✔ Hybrid 1X & LTE (SR-LTE) IOT V3.0.0
- Hybrid 1X & LTE Conformance V1.0.0
- Hybrid 1X & LTE Performance V1.0.0
- ✔ Cross Band Load Balancing V1.0.0
- ✔ iRAT Conformance V3.0.0
- Hybrid VoLTE (hVoLTE)
- cdma2000 Wireless IOT
- Voice over Wi-Fi & 3GPP2 IOT

2015 3GPP2 Roadmap Snapshot





- Quarterly summary of the activities within GCF
- Register on the GCF website to receive copies by email
- Downloadable from the GCF website:

GCF extends coverage of advanced device capabilities

Carrier aggregation, incremental enhancements to LTE introduced through successive 3GPP releases, and positioning capabilities all featured prominently in GCF's work plan since the last edition of Certification News at the end of April. Work to bring CDMA device certification in even closer alignment with GCF's tried-and-tested processes for 3GPP devices continues to make good progress.

As the development of 5G gains momentum worldwide, the GCF Board is discussing the challenges that the next generation mobile technology will create for the industry, device certification and GCF.

With 5G anticipated to incorporate multiple radio access technologies (RATs) capable of operating simultaneously, mobile devices will become even more complex than today's most sophisticated multimode smartphones. Expanding the scope and enhancing GCF certification to demonstrate interoperability between next generation devices and networks would be the logical way ahead for operators, device manufacturers and test

Engaging with industry worldwide

GCF continues to reach out to operators, manufacturers and other stakeholders with interests in mobile devices worldwide.

The second annual GCF China Workshop will take place in Xi'an on Tuesday 8 September 2015. With the generous support of China Unicom, the workshop is designed to explain the relevance and benefits of GCF mobile device Certification to China's manufacturers - whether targeting the domestic Chinese or export markets.



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use anywhere

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CDMA2000 device certification starts

CDMA2000

Manufacturer	Device	Date
Huawei Technologies Co., Ltd.	E3372	2015-01-06
Samsung Electronics Co Ltd	SM-A300FU(MoLTE)	2015-01-06
Huawei Technologies Co., Ltd.	E5180s-610	2015-01-05
BlackBerry Ltd	BlackBerry Classic SQC100-5	2015-01-05
TCL Communication Ltd	ALCATEL ONETOUCH PIXI 3(8)	2014-12-31
Samsung Electronics Co Ltd	SM-G360P	2014-12-31
Huawei Technologies Co., Ltd.	F317	2014-12-31

More Certified Devices

Welcome to the Global Certification Forum

Drawing together leading players from across the mobile industry, the Global Certification Forum (GCF) is an independent certification scheme for mobile phones and wireless devices that are based on 3GPP and - since 1 December 2014 - 3GPP2 standards.

With a philosophy of 'test once, use anywhere', and an industry agreed set of Certification Criteria that includes conformance, field trial & IOT requirements, GCF aims to ensure that a mobile device will work effectively on mobile networks anywhere in the world.

GCF members include leading mobile network operators representing all the key markets worldwide, over 70 device manufacturers and other stakeholders such as test system suppliers and test laboratories.

Sign-up to receive news updates from GCF

Enter your email address here

Website look and feel being updated in 2016



GCF Members' Portal



New framework
over the next
two years

Whether you are a regular visitor or have recently joined the GCF Certification Scheme, please read the tips below to ensure you maximise the benefits of your membership.

- If you have not already done so, please place your member log in details in a safe place for future reference
- Please make sure the membership details of yourself and your organization are always kept up-to-date
- To ensure you receive all appropriate GCF communications please visit [Mailing List](#) and join the relevant email Reflector lists
- To access the certification criteria for conformance testing click on the [DCC](#) button here or on the navigation bar above.
- To review the latest certified terminals and their certification details, or in the case of Manufacturers, to declare your certification online, please visit [Devices](#)
- To view any GCF documents (and use the search function to help you find what you need quickly) please go to [Documents](#)
- To register for GCF meetings or view documents presented at a specific meeting, go to [Meetings](#)

We regularly update and improve this site and value your comments. If you have any feedback on the GCF Website, or are interested in providing input to the DC other GCF related question, please contact secretariat@globalcertificationforum.org.



GCF Objectives

- **Assure the interoperability of wireless products and their compliance to agreed standards by offering:**
 - global industry accepted test plans; and
 - a global industry recognized certification scheme
- 1. Promote adoption of GCF certification in markets (regions or channels) where it is currently less widely used**
 - Increase penetration among Chinese manufacturers
 - Expand participation among Indian manufacturers and operators
 - Raise awareness of role and benefits of Certification to mobile industry in Latin America, Middle East and Africa
- 2. Support global growth and success of wireless M2M/IoT by promoting certification of 3GPP/3GPP2 connectivity**
 - Facilitate module and device platform certification
 - Investigate certification models appropriate for start-up M2M / IoT device manufacturers
- 3. Increase the use of GCF Certification in its current markets**
 - Enable the certification of all devices that incorporate 3GPP & 3GPP2 radio technologies
 - Promote the certification of all devices irrespective of distribution channel

5G

- Likely to incorporate multiple RATs
- Increased complexity
- Efficient & effective certification will be critical to timely commercialisation

GCF

- Monitoring developments
- Extensive expertise in testing of multi-RAT devices



Engaging with industry worldwide

- Actively working with stakeholders in regions where GCF less widely used to understand local testing and certification requirements
 - India
 - Cooperation between GCF, government, local manufacturers and regional operators
 - Latin America
 - Holding and attending local industry events
 - Middle East
 - 3 new Operator members this year
 - Africa
 - LTE Africa 2015 – launch pad for GCF to develop contacts in the continent

***Meet GCF again at
Mobile World Congress 2016***



What can GCF Certification do for Africa?

- Certifications being done globally can be used locally (and vice-versa)
 - Identify proven devices for use in Africa
 - Timely access to market
 - Facilitate access to global markets for African manufacturers
- Participation in GCF Meetings allows:
 - Sharing of experiences and issues with multiple operators, manufacturers, labs and test equipment suppliers
 - Remaining up-to-date with latest developments
 - Influencing the evolutions of the Certification process to meet local needs



Website



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