# **Mobile Device Trends**

An analysis of GCF device certifications in 2012

By combining conformance and interoperability tests undertaken in laboratories with field trials on multiple live commercial networks, GCF Certification verifies the interoperability of a mobile phone or wireless device across different network elements and infrastructure equipment from different suppliers.

Hundreds of different devices are certified each year. An analysis of GCF's certification listings provides insights into current trends within the mobile device market.

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# **Introduction to GCF**

# Founded in 1999, the Global Certification Forum (GCF) has established and continues to develop a certification scheme for mobile phones and wireless devices.

Defined collectively by operators, manufacturers, the test industry and other interested parties, GCF Certification comprises interoperability and conformance testing complimented by field trials on live networks.

GCF operator members serve billions of customers in markets all over the world. Around 50 companies participate in GCF as manufacturer members.

Common, rigorous and trusted certification criteria provide a platform for the harmonization of operator acceptance testing: by minimising unnecessary duplication, GCF Certification has prevented acceptance testing overheads from running out-of-control and contributes to improved economies of scale for device manufacturers. A certified, multimode, multiband device is recognised as being relevant to a wide pool of operators across diverse national markets. The scheme also underpins international roaming.

Originally developed for GSM, GCF Certification has been extended to 3G (WCDMA/UMTS), its successive HSPA enhancements and, since December 2010, to LTE.

Key GCF milestones

Date	Event
1999	GCF Founded
May 2000	Certification of first device – GSM
Oct 2003	First device incorporating a US band
Feb 2006	First 3G device
Jun 2008	First HSDPA device
Aug 2008	First HSUPA device
March 2011	First LTE FDD device
September 2011	First LTE TDD device
October 2012	First dual-mode FDD/TDD LTE device

## **GCF Device Certifications**

#### Certified devices are listed on the GCF website at

http://www.globalcertificationforum.org/Application/onlinecertification/terminallist/



Note: data used in this report are based on <u>published</u> certifications during the relevant calendar year. Where certification testing is completed in advance of the planned launch date for the device, GCF procedures allow the manufacturer to defer publication by up to 90 days. As a result, some devices that were certified in one calendar year may be counted in the subsequent year.

### **Executive Summary**

This second annual Mobile Device Trends is based on an analysis of Global Certification Forum device certifications published during 2012. The analysis provides insights into the mobile devices being requested by operators and end-users across markets worldwide.

While overall device certifications declined by 10 per cent to 430 during 2012, there was a more than seven-fold increase in the number of LTE device certifications, rising from 9 in 2011 to 66 in 2012. The proportion of GCF-Certified devices incorporating LTE rose from just under two per cent in 2011 to more than 15 per cent in 2012.

Across all 3GPP mobile technologies there was a continuing trend towards more highly integrated multi-mode, multi-band devices. Even devices incorporating LTE, the newest technology, are following this trend: of the 65 device incorporating FDD LTE, 32 (49 per cent) incorporated two or more LTE bands. The most extreme examples of this trend were four devices incorporating quad-band GSM/EDGE, quad-band 3G/HSPA and quad-band LTE, one of which also featured HSPA+DC.

Demand for data capability across-the-board was highlighted by the incorporation of 3G in 362 devices. This is equivalent to 84 per cent of all devices certified in 2012, up from 67 per cent in 2011.

Penetration of HSDPA also rose significantly - from 64 per cent of certified devices in 2011 to nearly 83 per cent in 2012. Enhanced Uplink (HSUPA) was a feature of two-thirds of 2012 certified devices compared with just under half the year before.

GSM featured in nearly 97 per cent of devices certified in 2012. Again, emphasising the importance of data, penetration of EDGE increased from 35 per cent of all devices in 2011 to 82 per cent in 2012.

The availability of increasingly highly integrated wireless components may have contributed to the slight decline in total certifications by allowing manufacturers to improve economies-of-scale by focussing their development resources on fewer devices that can be marketed to particular demographics across multiple territories.

# **GCF** Certifications by year

430 mobile phone and wireless device models from 39 manufacturers were certified in 2012. (Fig 1)



Total certifications in 2012 were ten percent lower than in 2011 but were higher than the total of 420 in 2010.

Factors affecting the volume of certifications include:

- The success of globally promoted flagship smartphones from a number of manufacturers which may have displaced diverse high-tier devices developed for specific operators or markets.
- The availability of increasingly highly integrated wireless components may be allowing manufacturers to improve economies-of-scale by focussing their development resources on fewer devices that can be marketed to particular demographics across multiple territories.
- The simultaneously deployment of LTE, which is still a relatively new technology, across an unprecedented number of frequency bands. Devices incorporating new technologies often require more development support than devices based on more mature technologies.

Comparing the "Worldwide Manufacturer Sales to End Users of Mobile Terminal Devices", reported each year by Gartner with the total volume of certifications suggests that increasing choice of devices has contributed to overall market growth (Fig 2).



<sup>†</sup> Device sales source: "Gartner Worldwide Manufacturer Sales to End Users of Mobile Terminal Devices"

Gartner put the pause in the growth of sales in 2008/09 to the collapse in consumer confidence in many developed economies in the wake of the 2008 financial crisis.

# LTE gaining momentum

#### 66 LTE devices were certified in 2012, a seven-fold increase compared with the 2011 total of 9 (Fig 3).

The proportion of GCF-Certified devices incorporating LTE rose from just under two per cent in 2011 to more than 15 per cent in 2012.



Certification of LTE devices was first activated, in two bands, in December 2010. The first LTE device was certified at the end of March 2011. By the end of 2011, five FDD bands and two TDD bands had been activated within the GCF scheme and a total of nine LTE devices had been certified. Eight of the devices incorporated FDD and one TDD. During 2012, GCF Certification was extended to a total of 10 FDD and four TDD bands, reflecting the release of further spectrum bands around the world. Devices were certified in eight of the FDD bands and two TDD bands (Fig 4).



The 2600 MHz band and the 800 MHz European Digital Dividend band were the most frequently implemented LTE bands – in 31 and 30 devices respectively.

The 2100 MHz band, which is being allocated to LTE in Japan and Korea, was the third most frequently implemented LTE band – in 20 devices.

The 750 MHz band (US Upper SMH C band) was implemented in 19 devices while the 1800 MHz band, widely allocated to GSM operators across Europe, Africa, the Middle East and Asia and increasingly being re-farmed to LTE, was implemented in 18 devices.

### LTE goes multi-band

Alongside the extension of LTE to new bands, multi-band LTE devices have developed rapidly during 2012. Of the 65 device incorporating FDD LTE, 32 (nearly 50 per cent) incorporated two or more LTE bands (Fig 5).



The first of seven quad-band FDD LTE devices was certified in July 2012 while the first dual-band TDD LTE device was certified in October, shortly before the appearance of the first dual-mode FDD/TDD LTE devices.

Of the multi-band FDD LTE devices, 31 devices featured two or more bands being used for LTE in Europe, 22 incorporated multiple US bands and 21 incorporated multiple Japanese bands.

51 of the 65 FDD LTE devices also incorporated HSPA and EDGE.

### **Penetration of HSPA increases**

More than 84 per cent of all devices certified in 2012 (362 devices) incorporated 3G – up from 67 per cent in 2011 (Fig 6).



Penetration of HSDPA continues to rise - from 64 per cent of certified devices in 2011 to nearly 83 per cent in 2012.

HSPA was a feature of two thirds of 2012 certified devices compared with just under half the year before.

360 of the 430 certified devices (nearly 84 per cent or more than 99 per cent of 3G-capable devices) incorporated the 2100 MHz band which has been the primary 3G band across Europe, Africa and much of Asia since the introduction of the technology (Fig 7).



The US 850 MHz band was incorporated in 167 devices (nearly 40 per cent of all devices or 46% of 3G devices)

The 900 MHz was the second most widely implemented 3G band - in 259 devices (60 per cent of all devices, nearly 72 per cent of 3G). Incorporation of 3G in the 900 MHz band has been an increasing trend since the EU's decision to amend the GSM Directive in 2009 (Fig 8).



### Multi-band 3G is the norm

Nearly 92 per cent of 3G devices (332 devices or 77 per cent of all certifications) incorporated two or more 3G bands (Fig 9).



259 devices (60 per cent of all certifications or 72 per cent of 3G devices) combined 3G in the 2100 MHz and 900 MHz bands.

At least one US 3G band featured in 181 devices (42 per cent of all certifications, 50 per cent of 3G)

A quarter of all devices (30 per cent of 3G) incorporated two US bands. The most common dual-US band combination was 1900 MHz and 850 MHz.

The US AWS band was implemented in 15 devices, including all the devices incorporating five-band 3G capability.

### **GSM remains ubiquitous**

Reflecting its maturity and global economies-of-scale, GSM remained a feature of nearly 97 per cent of devices certified in 2012 (Fig 10). Penetration of GSM fell by just under two per cent (equivalent to 15 devices) compared with 2011. Devices that didn't incorporate GSM were predominantly USB modems, portable Wi-Fi routers or other LTE devices designed for US bands mainly occupied by CDMA operators.



The incidence of quad-band GSM continues to increase - from 70 per cent in 2011 to 78 per cent of all devices in 2012.

The imperative to provide enhanced data capability within devices is illustrated by the fact that 82 per cent of all devices (352 devices) incorporated EDGE. The corresponding figure for 2011 was 167 devices, equivalent to 35 per cent of total certifications in that year.

## 2012 certified devices by type

As mobile connectivity is incorporated into an ever-wider range of products, GFC Certification is evolving to meet the needs of new applications and market segments. To monitor the changing landscape, GCF has introduced a new system to categorise certified products by type (Fig 11).

Modules, which are a fundamental building block for a wide variety of interoperable industrial, consumer, business and M2M devices accounted for one in eight of 2012 Certified devices.



With the exception of M2M, LTE was incorporated across all device types in 2012. Gateway devices, netbooks & tablets that can take full advantage of the improved bandwidth, account for a bigger share of LTE devices than the universe of certified devices (Fig 12).



#### MORE INFORMATION

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