Mobile Device Trends

An analysis of GCF device certifications in 2014

By combining conformance and interoperability tests undertaken in laboratories with field trials on multiple live commercial networks, GCF Certification verifies the interoperability of mobile phones or other wireless devices 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 now maintains a certification scheme as a benchmark of interoperability of mobile phones and other wireless devices with mobile networks.

Defined collectively by operators, manufacturers and the test industry, 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 70 companies participate in GCF as Manufacturer Members. Another ten companies are Associate Manufacturer Members producing wirelessly connected devices incorporating GCF-certified embedded modules.

Common, rigorous and trusted certification criteria provide a platform for the harmonization of acceptance testing schemes maintained by different operators. By minimising unnecessary duplication, GCF Certification reduces acceptance testing overheads 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 and a larger universe of potential users. The scheme also underpins international roaming.

Originally developed for GSM, GCF Certification has been extended to 3G (WCDMA/UMTS), plus HSPA enhancements, LTE and, most recently, LTE-Advanced functionality. On 1 December 2014, GCF integrated the certification of CDMA2000 devices into the scheme.

Key GCF milestones

Date	Event
1999	GCF Founded
May 2000	Certification of first device – GSM
Feb 2006	First 3G device certified
Jun 2008	First HSDPA device certified
Aug 2008	First HSUPA device certified
March 2011	First LTE FDD device certified
September 2011	First LTE TDD device certified
October 2012	First dual-mode FDD/TDD LTE device certified
October 2013	Certification for client applications introduced
December 2014	First CDMA2000 devices certified.

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 is 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 annual review of Mobile Device Trends is based on an analysis of Global Certification Forum device certifications published during 2014. The analysis provides insights into the mobile devices being requested by operators and end-users across markets worldwide.

Total device certifications increased 23 per cent from 436 in 2013 to 536.

LTE

The proportion of GCF-Certified devices incorporating LTE rose to nearly 53 per cent, up from corresponding figures of 39 per cent in 2013 and 15 per cent in 2012.

If the total number of band/technology combinations are averaged across all devices, in 2014 the hypothetical "average" GCF-Certified device incorporated 3.5 GSM bands, 2.7 3G bands and 2.3 FD LTE bands. While the number of GSM and 3G bands in the average device has remained stable over the last two years, the number of LTE bands has nearly doubled to 2.3.

Number of bands in "average" GCF-certified device (all devices)			
	2012	2013	2014
GSM	3.5	3.5	3.5
3G	2.2	2.6	2.7
FD LTE	0.3	1.2	2.3

When LTE-capable devices are analysed separately, there is a continuing trend towards more highly integrated multi-mode, multi-band LTE devices. Across the 282 LTE devices certified during 2014, the average number of LTE bands per certified device rose to 4.4, up from 3.1 in 2013 and 1.9 in 2012.

Number of LTE bands in "average" GCF-certified LTE device			
	2012	2013	2014
FD LTE	1.9	3.1	4.4

2014 saw the certification of the first category 6 LTE devices capable of supporting carrier aggregation. By the end of 2014, GCF enabled the certification of LTE devices in 16 discrete FDD LTE bands and four TDD LTE bands. As a result, the number of potential carrier aggregation band combinations is enormous. A trusted certification framework will be essential to the successful widespread deployment of this sophisticated functionality. 12 category 6 devices were certified during the year.

3G

451 devices certified in 2014 incorporated 3G. This represented 84 per cent of all devices.

The penetration of HSDPA grew slightly to nearly 83 per cent in 2014 from 81 per cent the year before. Penetration of HSUPA remained stable at 76 per cent.

Dual-Carrier HSDPA was incorporated in 42 per cent of certified devices in 2014, up from just three per cent in 2012 and 17 per cent in 2013.

GSM

Across all certified devices, the penetration of GSM appears to be beginning to slowly decline - from 97 per cent of devices in 2013 to just under 94 per cent in 2014. However, the expectation of all-round data capability has contributed to EDGE penetration increasing to 82.5 per cent of all devices in 2014, up from 81 per cent in 2013.

CDMA

On 1 December 2014, GCF took over as the recognised certification scheme for CDMA2000 (3GPP2) devices. Four CDMA devices were certified following GCF processes during December 2014 and the level of CDMA device certification is expected to increase substantially during 2015.

GCF Certifications by year

536 mobile phone and wireless device models were certified in 2014 compared with 436 in 2013. 53 manufacturers certified devices during the year, up from 40 in 2013. (Fig 1)

Fig 1: GCF Certified devices & certifying manufacturers 2002-2014
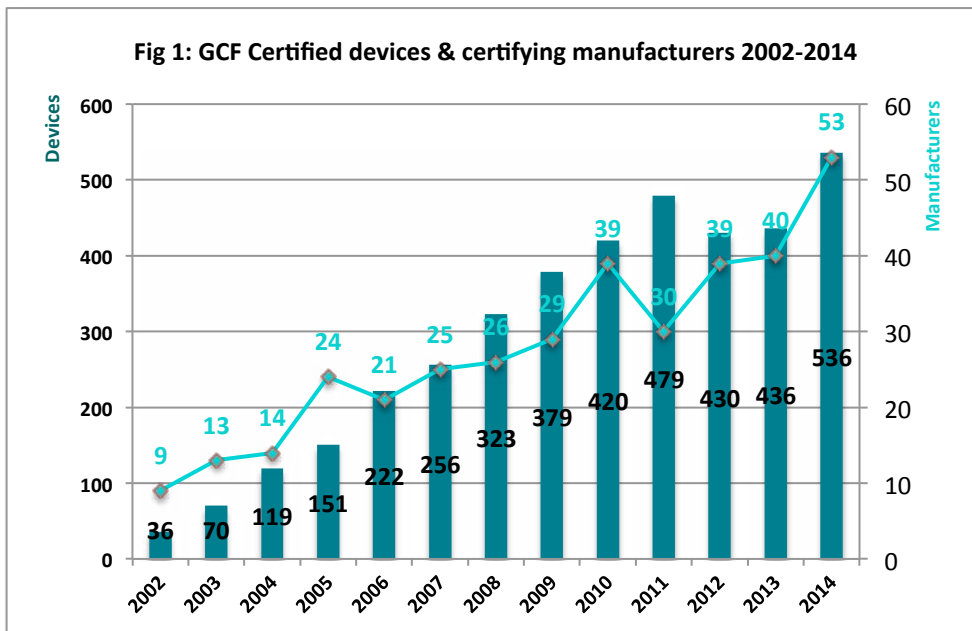
Total certifications were up nearly 23 per cent compared with 2013.

Comparing the "Worldwide Manufacturer Sales to End Users of Mobile Terminal Devices", reported each year by Gartner with the total volume of certifications suggests a relationship between the choice of devices in the global market and overall market size (Fig 2).

Fig 2: Comparison of global device sales against device certifications
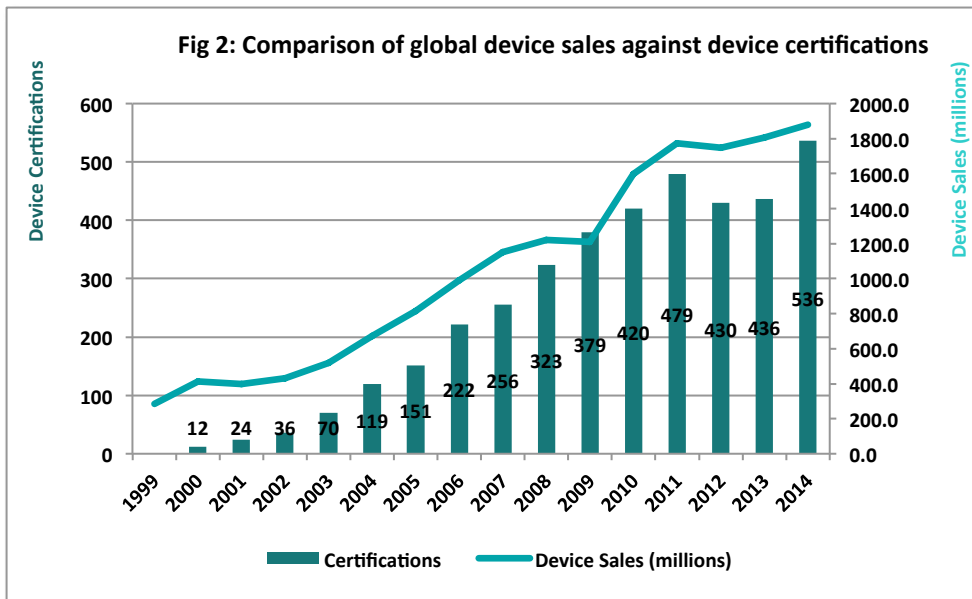
† Device sales source: "Gartner Worldwide Manufacturer Sales to End Users of Mobile Terminal Devices"

[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 momentum continues to build

282 LTE devices were certified in 2014, up 62 per cent compared with the 171 LTE device certified in 2013 (Fig 3).

The proportion of GCF-Certified devices incorporating LTE rose from just under 40 per cent in 2013 to 52 per cent in 2014.

Fig 3: LTE Certifications
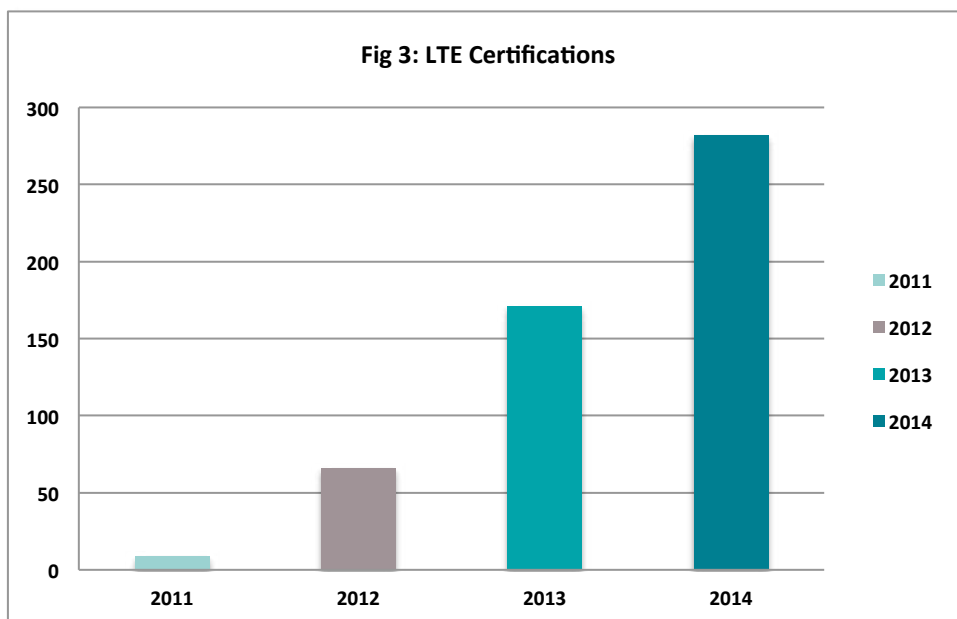
Reflecting the diversity of bands in which LTE is being deployed worldwide, GCF Certification expanded to encompass a total of 16 FDD and four TDD bands by the end of 2014. (The coverage of certification expanded further in January 2015 when FDD LTE bands 12 (700 MHz Lower A/B/C) and 28 (APT700) were activated.)

During 2014, devices were actually certified in 14 FDD bands and four TDD bands (Fig 4).


Fig 4: Number of GCF-Certified devices incorporating each LTE Band
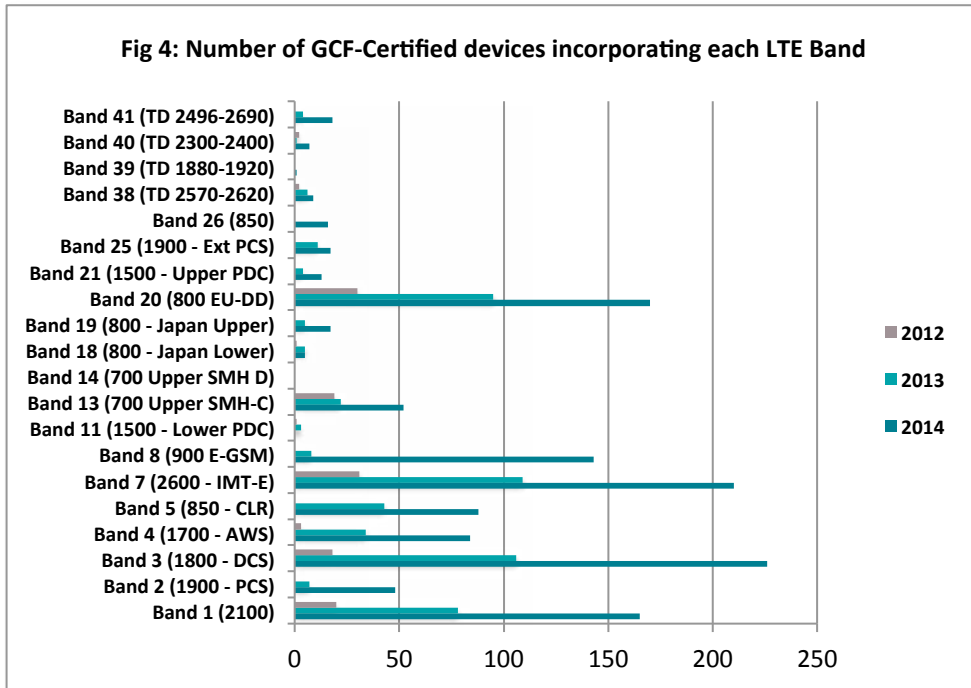
LTE becomes increasingly multi-band

Reflecting the extension of LTE to new bands, multi-band LTE devices continued to become more commonplace during 2014.

Of the 282 devices incorporating FDD LTE, 233 (82.5 per cent) incorporated three or more LTE bands (Fig 5) compared with 65 per cent in 2013. 55 devices incorporated five LTE bands, 38 incorporated six bands and 36 devices incorporated seven or more bands. Three devices incorporated 11 FDD LTE bands.

33 devices supported both FDD and TDD operation.

Fig 5: Growth in multi-band LTE devices
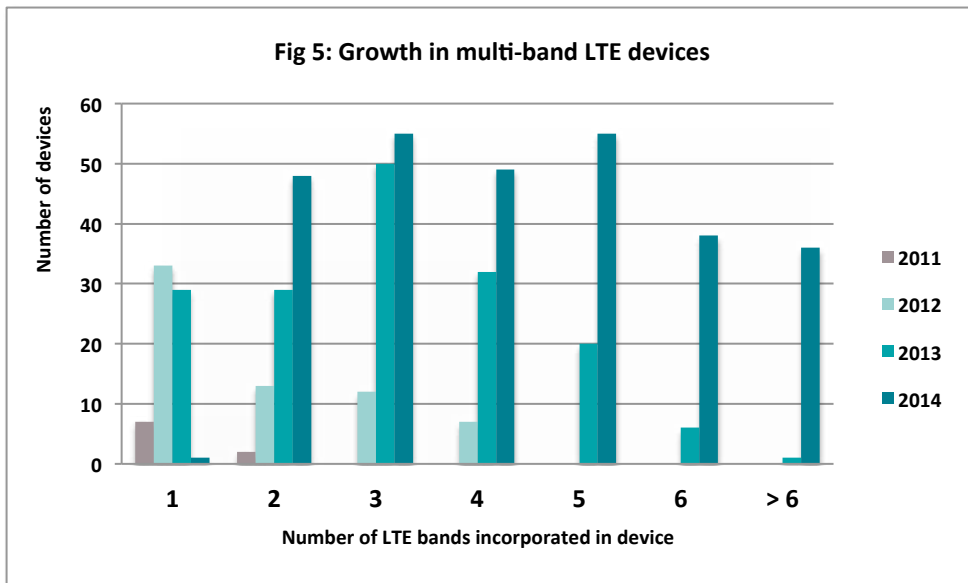
12 category 6 LTE devices, capable of supporting Carrier Aggregation, were certified during the year.

With the implementation of more LTE bands to facilitate LTE roaming and more widespread adoption of Carrier Aggregation, the complexity of higher end smartphones and phablets will continue to increase through 2015. Certification will be invaluable in supporting these devices into the market.

241 of the 282 FDD LTE devices also incorporated HSPA and EDGE.

Penetration of HSPA continues to increase

The penetration of 3G (84 per cent) was broadly in line with the corresponding 2013 figures of 83.5. HSDPA penetration increased slightly from 81 per cent in 2013 to 82.5 per cent in 2014. Implementation of HSUPA was stable at 76 per cent of all devices (Fig 6).

In 2014, 226 devices incorporated Dual Carrier HSPA (or more than 42 per cent of all certified devices) up from 75 (17 per cent) in 2013.

Fig 6: Proportion of certified devices incorporating 3G, HSDPA & HSUPA
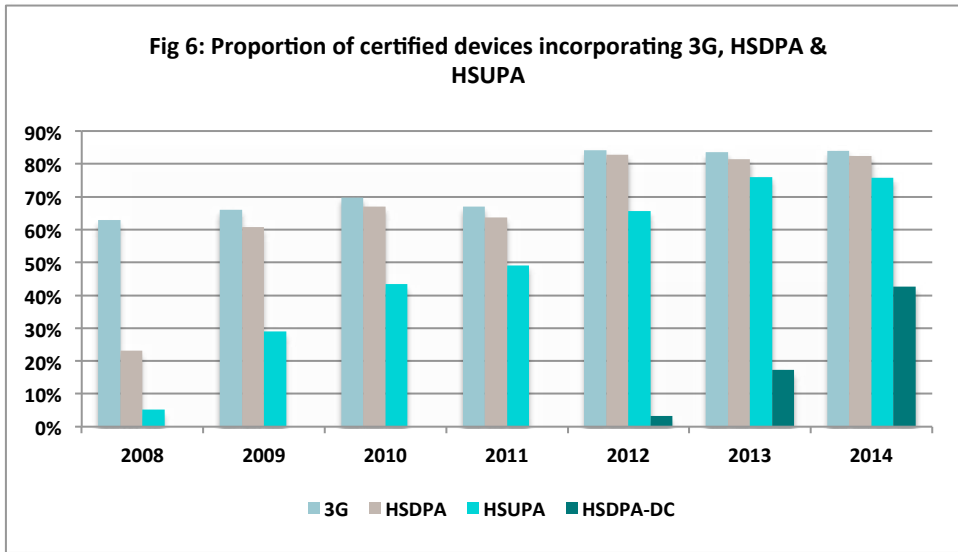
447 of the 536 certified devices (more than 83 per cent of all devices or more than 99 per cent of 3G-capable devices) incorporated the 2100 MHz band (Fig 7).

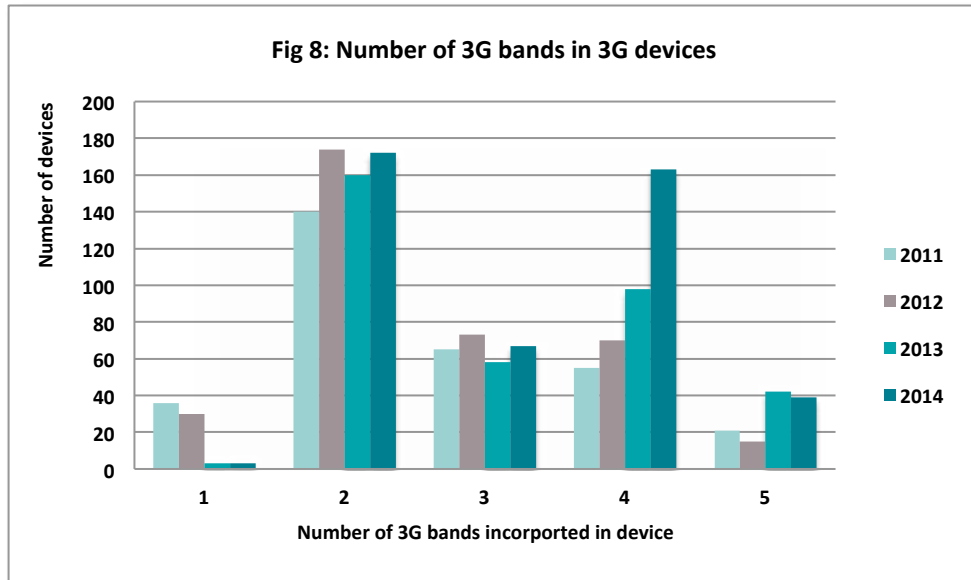Fig 7: Device Certifications by 3G band
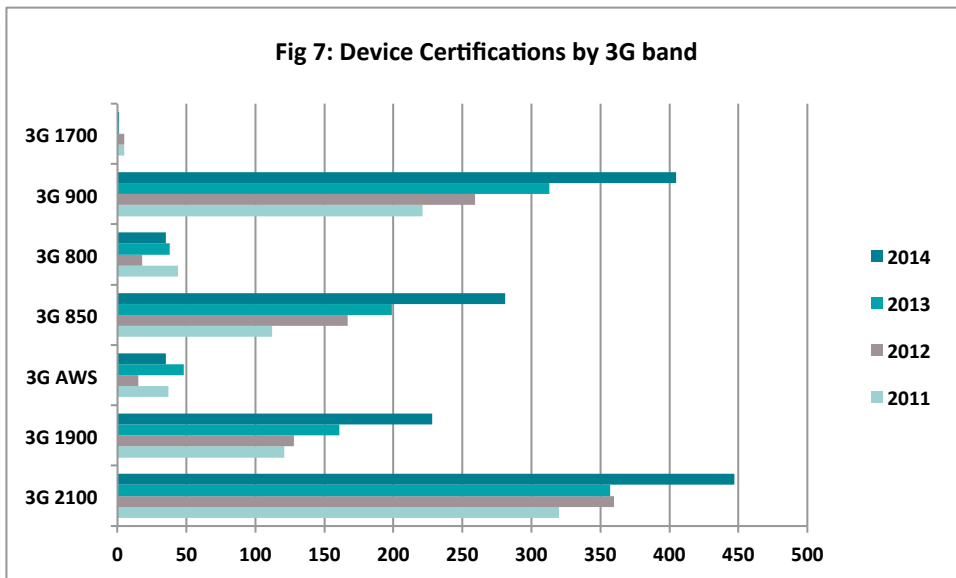
The US 850 MHz band was incorporated in 281 devices (more than 62 per cent of 3G devices).

The 900 MHz band was implemented in 405 devices (nearly 90 per cent of 3G devices).

Multi-band 3G is the norm

99 per cent of 3G devices (or 83 per cent of all certifications) incorporated two or more 3G bands (Fig 8).

Fig 8: Number of 3G bands in 3G devices

405 devices (more than 75 per cent of all certifications or 90 per cent of 3G devices) combined 3G in the 2100 MHz and 900 MHz bands.

At least one US 3G band featured in 291 devices (54 per cent of all certifications, 64.5 per cent of 3G)

Is GSM in decline?

The penetration of GSM declined slightly from 96 per cent of certified devices in 2013 to 94 per cent in 2014. (Fig 9).

Analysis of the 33 devices that didn't incorporate GSM suggests that the relative decline in the penetration of GSM may be due to the increased use of GCF certification for LTE devices destined for the US market: 27 of the devices incorporated one or more US FD LTE bands while 22 of the non-GSM devices didn't support the 3GPP implementation of 3G either. It will be interesting to see what proportion of non-GSM devices in next year's GCF Device Analysis incorporate CDMA2000, now that CDMA devices will be certified through GCF going forward.

However, the incidence of quad-band GSM rose slightly from 76 per cent in 2013 to 79 per cent in 2014 reflecting a fall in the number of devices which only incorporate dual-band GSM. 442 devices incorporated EDGE: 82.5 per cent of all devices and 88 per cent of all GSM-capable devices.

Fig 9: Devices incorporating GSM & quad-band GSM
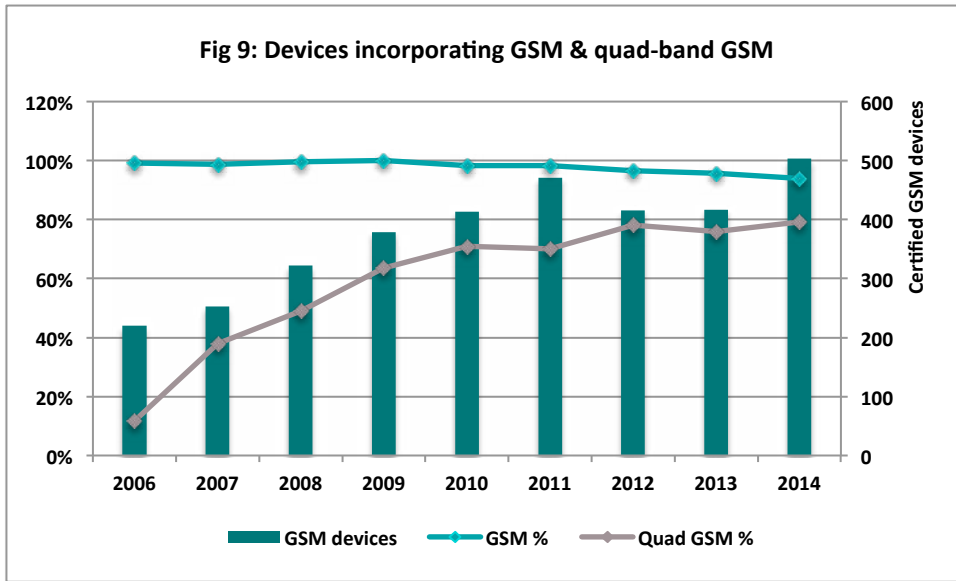
2014 certified devices by type

The incorporation of mobile connectivity into an ever-wider range of products can be seen from an analysis of total certifications against device type (Fig10). In 2014, handsets represented 56 per cent of certified devices with embedded modules being the second largest category of devices at 17 per cent.


Fig 10: 2014 Certified devices by type
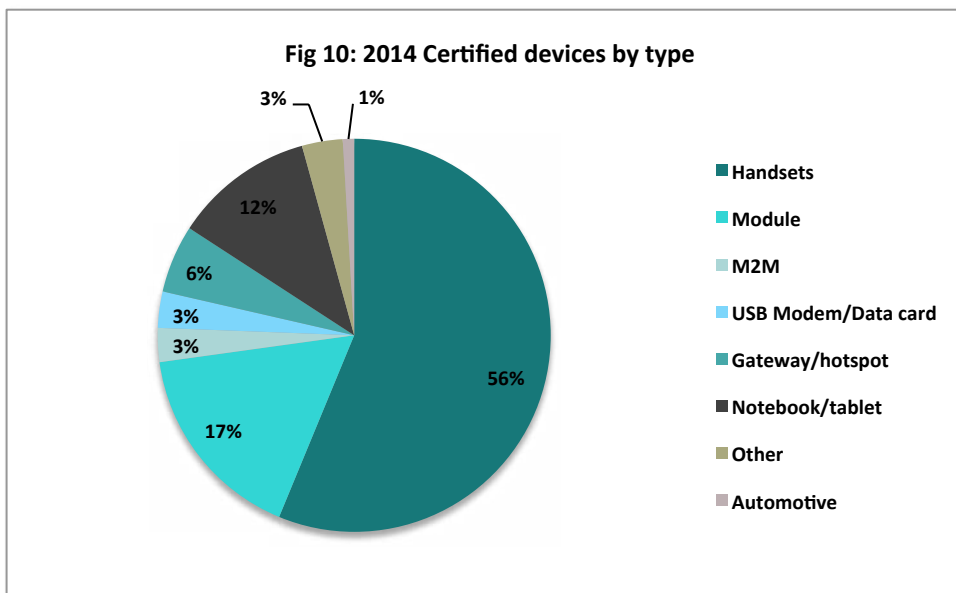
The volume of module and M2M certifications has demonstrated steady growth over the last three years (Fig 11).

Fig 11: Module and M2M device certifications
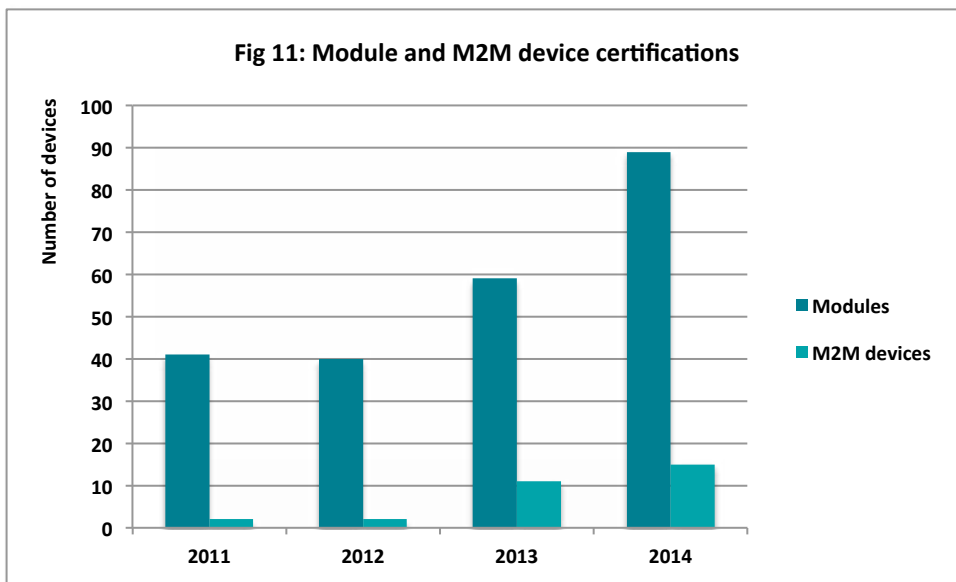
As with certified devices generally, modules and M2M devices are increasingly multi-mode and multi-band. The availability of modules designed to offer specific rather than universal connectivity capabilities is indicated in the slightly lower scores for the penetration of each technology.

In M2M devices, GSM is ubiquitous while 3G/HSPA was incorporated in 80 per cent of certified devices. LTE featured in 40 per cent of the M2M devices certified in 2014,

Fig 12: Penetration of technologies into different device types
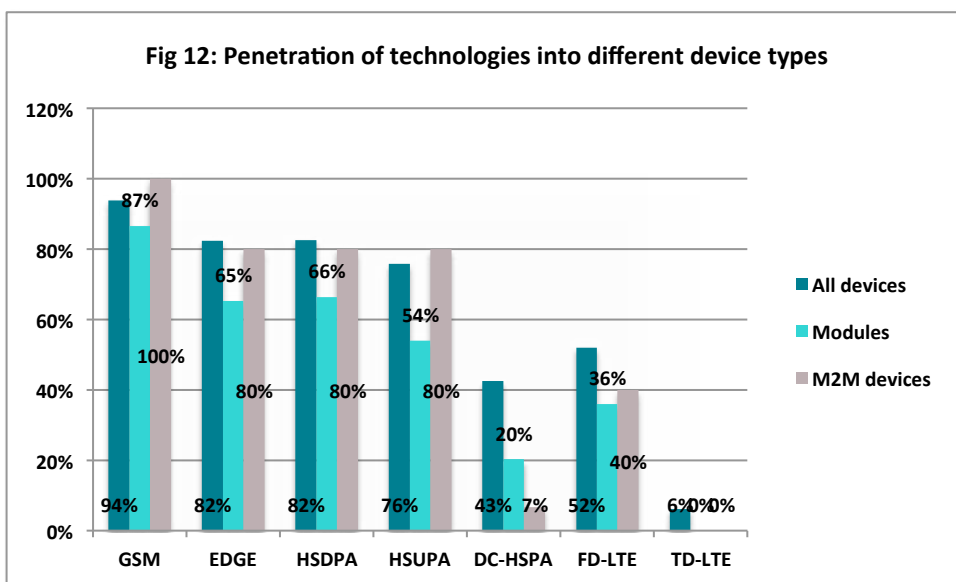
The "average" M2M device incorporated more GSM and 3G bands than the average of all certified devices (Fig 13),

Fig 13: Bands per technology for different device types
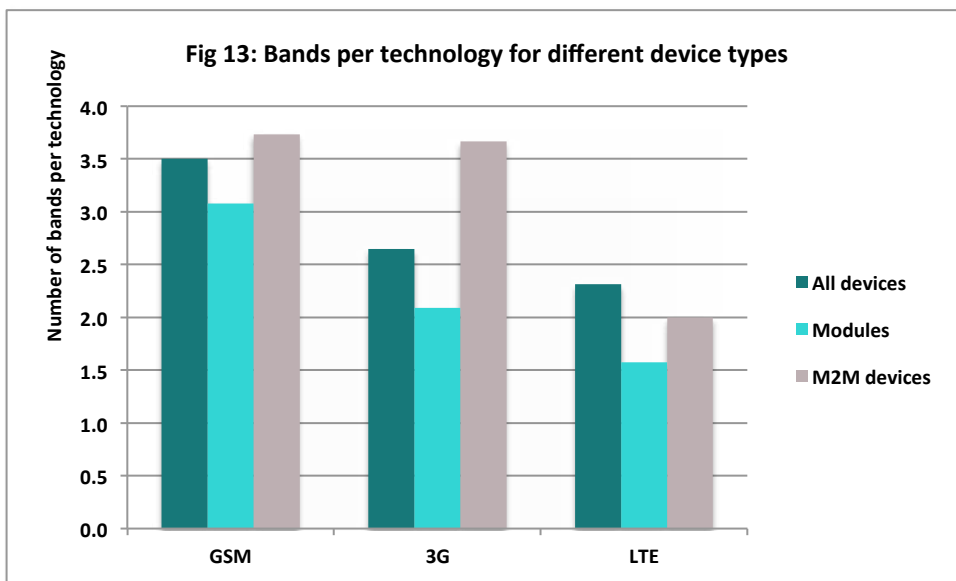
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