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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Mechanical standardization of semiconductor devices – Part 4: Coding system and classification into forms of package outlines for semiconductor device packages

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Normalisation mécanique des dispositifs à semiconducteurs – Partie 4: Système de codification et classification en formes des structures des boîtiers pour dispositifs à semiconducteurs

IEC 60191-4:2013-10/AMD1:2018-03(en-fr)

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FOREWORD

This amendment has been prepared by subcommittee 47D: Semiconductor devices packaging, of IEC technical committee 47: Semiconductor devices.

The text of this amendment is based on the following documents:

CDV	Report on voting
47D/897/CDV	47D/904/RVC

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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Add, after Annexes A and B, the following new Annex C:

Annex C
(informative)

Terminology of semiconductor package outlines

To prevent misuse, misunderstanding and confusion of terminology of semiconductor package outline, correct terms and descriptions are required to be indicated in the international standards.

Correct terms and descriptions of semiconductor package outline including package code variations are listed in Table C.1.

Table C.1 – Package name and parts name

Classification	Term	Description
Package name	Ball Grid Array Package (BGA)	A package with the balls or bumps placed in a row of 3 x 3 or more, or in grid, on the upper or lower side of its body
Package name	Low Profile Ball Grid Array Package (LBGA)	BGA with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Ball Grid Array Package (TBGA)	BGA with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Ball Grid Array Package (VBGA)	BGA with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Ball Grid Array Package (WBGA)	BGA with the seated height of over 0,65 mm and up to 0,8 mm
Package name	Ultra-thin Ball Grid Array Package (UBGA)	BGA with the seated height of over 0,5 mm and up to 0,65 mm
Package name	Extra Thin Ball Grid Array Package (XBGA)	BGA with the seated height of up to 0,5 mm
Package name	Heat Sink Ball Grid Array Package (HBGA)	BGA with a heat sink
Package name	Heat Sink Low Profile Ball Grid Array Package (HLBGA)	LBGA with a heat sink
Package name	Heat Sink Thin Ball Grid Array Package (HTBGA)	TBGA with a heat sink
Package name	Heat Sink Very Thin Ball Grid Array Package (HVBGA)	VBGA with a heat sink
Package name	Heat Sink Very-very Thin Ball Grid Array Package (HWBGA)	WBGA with a heat sink
Package name	Heat Sink Ultra-thin Ball Grid Array Package (HUBGA)	UBGA with a heat sink
Package name	Heat Sink Extra Thin Ball Grid Array Package (HXBGA)	XBGA with a heat sink
Package name	Fine Pitch Ball Grid Array Package (FBGA)	BGA with the terminal pitch of up to 0,8 mm
Package name	Low Profile Fine Pitch Ball Grid Array Package (LFBGA)	FBGA with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Fine Pitch Ball Grid Array Package (TFBGA)	FBGA with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Fine Pitch Ball Grid Array Package (VFBGA)	FBGA with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Fine Pitch Ball Grid Array Package (WFBGA)	FBGA with the seated height of over 0,65 mm and up to 0,8 mm

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Classification	Term	Description
Package name	Ultra-thin Fine Pitch Ball Grid Array Package (UFBGA)	FBGA with the seated height of over 0,5 mm and up to 0,65 mm
Package name	Extra Thin Fine Pitch Ball Grid Array Package (XFBGA)	FBGA with the seated height of up to 0,5 mm
Package name	Terminal for stack Fine Pitch Ball Grid Array Package (PFBGA)	FBGA with the terminals for layer stack
Package name	Terminal for stack Low Profile Fine Pitch Ball Grid Array Package (PLFBGA)	LFBGA with the terminals for layer stack
Package name	Terminal for stack Thin Fine Pitch Ball Grid Array Package (PTFBGA)	TFBGA with the terminals for layer stack
Package name	Terminal for stack Very Thin Fine Pitch Ball Grid Array Package (PVFBGA)	VFBGA with the terminals for layer stack
Package name	Terminal for stack Very-very Thin Fine Pitch Ball Grid Array Package (PWFBGA)	WFBGA with the terminals for layer stack
Package name	Terminal for stack Ultra-thin Fine Pitch Ball Grid Array Package (PUFBGA)	UFBGA with the terminals for layer stack
Package name	Terminal for stack Extra Thin Fine Pitch Ball Grid Array Package (PXFBGA)	XFBGA with the terminals for layer stack
Package name	Interstitial Ball Grid Array Package (IBGA)	Interstitial BGA
Package name	Plastic Ball Grid Array Package (P-BGA)	Plastic BGA
Package name	Ceramic Ball Grid Array Package (C-BGA)	Ceramic BGA
Package name	Silicon Fine Pitch Ball Grid Array Package (S-FBGA)	Silicon FBGA
Package name	Dual Inline Package (DIP)	A package with the leads extended from the two sides of its body and used for through-hole mounting
Package name	Shrink Dual Inline Package (SDIP)	Shrink DIP
Package name	Heat Sink Dual Inline Package (HDIP)	DIP with a heat sink
Package name	Heat Sink Shrink Dual Inline Package (HSDIP)	SDIP with a heat sink
Package name	Piggyback Dual Inline Package (PDIP)	Piggyback DIP
Package name	Plastic Dual Inline Package (P-DIP)	Plastic DIP

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Classification	Term	Description
Package name	Ceramic Dual Inline Package (C-DIP)	Ceramic DIP
Package name	Glass-Sealed Ceramic Dual Inline Package (G-DIP)	Glass-sealed ceramic DIP
Package name	Glass-Sealed Ceramic Window Dual Inline Package (G-DDIP)	Glass-sealed ceramic DIP with a window
Package name	Dual Tape Carrier Package (DTP)	A package with the leads extended from the two sides of its body and consisting of the tapes
Package name	Dual Tape Carrier Package Type 1 (DTP(1))	DTP Type-1
Package name	Dual Tape Carrier Package Type 2 (DTP(2))	DTP Type-2
Package name	Land Grid Array Package (LGA)	A package without pins and with the lands placed in a row of 3 x 3 or more, or in grid, on the upper or lower side of its body
Package name	Low Profile Land Grid Array Package (LLGA)	LGA with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Land Grid Array Package (TLGA)	LGA with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Land Grid Array Package (VLGA)	LGA with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Land Grid Array Package (WLGA)	LGA with the seated height of over 0,65 mm and up to 0,8 mm
Package name	Ultra-thin Land Grid Array Package (ULGA)	LGA with the seated height of over 0,5 mm and up to 0,65 mm
Package name	Extra Thin Land Grid Array Package (XLGA)	LGA with the seated height of up to 0,5 mm
Package name	Heat Sink Land Grid Array Package (HLGA)	LGA with a heat sink
Package name	Heat Sink Low Profile Land Grid Array Package (HLLGA)	LLGA with a heat sink
Package name	Heat Sink Thin Land Grid Array Package (HTLGA)	TLGA with a heat sink
Package name	Heat Sink Very Thin Land Grid Array Package (HVLGA)	VLGA with a heat sink
Package name	Heat Sink Very-very Thin Land Grid Array Package (HWLGA)	WLGA with a heat sink
Package name	Heat Sink Ultra-thin Land Grid Array Package (HULGA)	ULGA with a heat sink
Package name	Heat Sink Extra Thin Land Grid Array Package (HXLGA)	XLGA with a heat sink

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Classification	Term	Description
Package name	Fine Pitch Land Grid Array Package (FLGA)	LGA with the terminal pitch of up to 0,8 mm
Package name	Low Profile Fine Pitch Land Grid Array Package (LFLGA)	FLGA with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Fine Pitch Land Grid Array Package (TFLGA)	FLGA with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Fine Pitch Land Grid Array Package (VFLGA)	FLGA with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Fine Pitch Land Grid Array Package (WFLGA)	FLGA with the seated height of over 0,65 mm and up to 0,8 mm
Package name	Ultra-thin Fine Pitch Land Grid Array Package (UFLGA)	FLGA with the seated height of over 0,5 mm and up to 0,65 mm
Package name	Extra Thin Fine Pitch Land Grid Array Package (XFLGA)	FLGA with the seated height of up to 0,5 mm
Package name	Interstitial Land Grid Array Package (ILGA)	Interstitial LGA
Package name	Plastic Land Grid Array Package (P-LGA)	Plastic LGA
Package name	Ceramic Land Grid Array Package (C-LGA)	Ceramic LGA
Package name	Silicon Fine Pitch Land Grid Array Package (S-FLGA)	Silicon FLGA
Package name	Pin Grid Array Package (PGA)	A package with the pins placed in a row of 3 x 3 or more, or in grid, on the upper or lower side of its body
Package name	Shrink Pin Grid Array Package (SPGA)	Shrink PGA
Package name	Interstitial Pin Grid Array Package (IPGA)	Interstitial PGA
Package name	Heat Sink Pin Grid Array Package (HPGA)	PGA with a heat sink
Package name	Ceramic Pin Grid Array Package (C-PGA)	Ceramic PGA
Package name	Glass-Sealed Ceramic Pin Grid Array Package (G-PGA)	Glass-sealed ceramic PGA
Package name	Plastic Pin Grid Array Package (P-PGA)	Plastic PGA
Package name	Quad Flat F-Leaded Package (QFF)	A package with non-formed leads extended from the four sides of its body
Package name	Plastic Quad Flat F-Leaded Package (P-QFF)	Plastic QFF

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Classification	Term	Description
Package name	Glass-Sealed Ceramic Quad Flat F-Leaded Package (G-QFF)	Glass-sealed ceramic QFF
Package name	Quad Flat I-Leaded Package (QFI)	A package with leads formed like the letter “I” and extended from the four sides of its body
Package name	Plastic Quad Flat I-Leaded Package (P-QFI)	Plastic QFI
Package name	Quad Flat J-Leaded Package (QFJ)	A package with leads formed like the letter “J” and extended from the four sides of its body
Package name	Plastic Quad Flat J-Leaded Package (P-QFJ)	Plastic QFJ
Package name	Ceramic Quad Flat J-Leaded Package (C-QFJ)	Ceramic QFJ
Package name	Glass-Sealed Ceramic Quad Flat J-Leaded Package (G-QFJ)	Glass-sealed ceramic QFJ
Package name	Glass-Sealed Ceramic Window Quad Flat J-Leaded Package (G-DQFJ)	Glass-sealed ceramic QFJ with a window
Package name	Quad Flat No Lead Package (QFN)	A package with only one row of terminals on each side of the four sides and on the bottom
Package name	Low Profile Quad Flat No Lead Package (LQFN)	QFN with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Quad Flat No Lead Package (TQFN)	QFN with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Quad Flat No Lead Package (VQFN)	QFN with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Quad Flat No Lead Package (WQFN)	QFN with the seated height of over 0,65 mm and up to 0,8 mm
Package name	Ultra-thin Quad Flat No Lead Package (UQFN)	QFN with the seated height of over 0,5 mm and up to 0,65 mm
Package name	Extra Thin Quad Flat No Lead Package (XQFN)	QFN with the seated height up to 0,5 mm
Package name	Heat Sink Quad Flat No Lead Package (HQFN)	QFN with a heat sink
Package name	Heat Sink Low Profile Quad Flat No Lead Package (HLQFN)	LQFN with a heat sink
Package name	Heat Sink Thin Quad Flat No Lead Package (HTQFN)	TQFN with a heat sink
Package name	Heat Sink Very Thin Quad Flat No Lead Package (HVQFN)	VQFN with a heat sink

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Classification	Term	Description
Package name	Heat Sink Very-very Thin Quad Flat No Lead Package (HWQFN)	WQFN with a heat sink
Package name	Heat Sink Ultra-thin Quad Flat No Lead Package (HUQFN)	UQFN with a heat sink
Package name	Heat Sink Extra Thin Quad Flat No Lead Package (HXQFN)	XQFN with a heat sink
Package name	Interstitial Quad Flat No Lead Package (IQFN)	QFN with the terminals arranged in a zigzag alignment (the zigzag alignment is considered as one row)
Package name	Plastic Quad Flat No Lead Package (P-QFN)	Plastic QFN
Package name	Ceramic Quad Flat No Lead Package (C-QFN)	Ceramic QFN
Package name	Silicon Quad Flat No Lead Package (S-QFN)	Silicon QFN
Package name	Quad Flat Package (QFP)	A package with leads formed in gull-wing shape and extended from the four sides of its body
Package name	Low Profile Quad Flat Package (LQFP)	QFP with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Quad Flat Package (TQFP)	QFP with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Quad Flat Package (VQFP)	QFP with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Quad Flat Package (WQFP)	QFP with the seated height of over 0,65 mm and up to 0,8 mm
Package name	Heat Sink Quad Flat Package (HQFP)	QFP with a heat sink
Package name	Heat Sink Low Profile Quad Flat Package (HLQFP)	LQFP with a heat sink
Package name	Heat Sink Thin Quad Flat Package (HTQFP)	TQFP with a heat sink
Package name	Fine-pitch Quad Flat Package (FQFP)	QFP with the terminal pitch of up to 0,5 mm
Package name	Plastic Quad Flat Package (P-QFP)	Plastic QFP
Package name	Ceramic Quad Flat Package (C-QFP)	Ceramic QFP
Package name	Glass-Sealed Ceramic Quad Flat Package (G-QFP)	Glass-sealed ceramic QFP
Package name	Quad Tape Carrier Package (QTP)	A package with the leads extended from the four sides of its body and consisting of the tapes

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Classification	Term	Description
Package name	Single Inline Package (SIP)	A package with the a row of leads extended from one side of its body
Package name	Heat Sink Single Inline Package (HSIP)	SIP with a heat sink
Package name	Plastic Single Inline Package (P-SIP)	Plastic SIP
Package name	Small Outline F-Leaded Package (SOF)	A package with non-formed leads extended from the two sides of its body
Package name	Small Outline I-Leaded Package (SOI)	A package with leads formed like the letter “I” and extended from the two sides of its body
Package name	Small Outline J-Leaded Package (SOJ)	A package with leads formed like the letter “J” and extended from the two sides of its body
Package name	Plastic Small Outline J-Leaded Package (P-SOJ)	Plastic SOJ
Package name	Ceramic Small Outline J-Leaded Package (C-SOJ)	Ceramic SOJ
Package name	Glass-Sealed Ceramic Small Outline J-Leaded Package (G-SOJ)	Glass-sealed ceramic SOJ
Package name	Glass-Sealed Ceramic Window Small Outline J-Leaded Package (G-DSOJ)	Glass-sealed ceramic SOJ with a window
Package name	Small Outline No Lead Package (SON)	A package with only one row of terminals on each side of the two sides and on the bottom
Package name	Low Profile Small Outline No Lead Package (LSON)	SON with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Small Outline No Lead Package (TSON)	SON with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Very Thin Small Outline No Lead Package (VSON)	SON with the seated height of over 0,8 mm and up to 1,0 mm
Package name	Very-very Thin Small Outline No Lead Package (WSON)	SON with the seated height of over 0,65 mm and up to 0,8 mm
Package name	Ultra-thin Small Outline No Lead Package (USON)	SON with the seated height of over 0,5 mm and up to 0,65 mm
Package name	Extra Thin Small Outline No Lead Package (XSON)	SON with the seated height of up to 0,5 mm
Package name	Heat Sink Small Outline No Lead Package (HSON)	SON with a heat sink
Package name	Heat Sink Low Profile Small Outline No Lead Package (HLSON)	LSON with a heat sink

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Classification	Term	Description
Package name	Heat Sink Thin Small Outline No Lead Package (HTSON)	TSON with a heat sink
Package name	Heat Sink Very Thin Small Outline No Lead Package (HVSON)	VSON with a heat sink
Package name	Heat Sink Very-very Thin Small Outline No Lead Package (HWSON)	WSON with a heat sink
Package name	Heat Sink Ultra-thin Small Outline No Lead Package (HUSON)	USON with a heat sink
Package name	Heat Sink Extra Thin Small Outline No Lead Package (HXSON)	XSON with a heat sink
Package name	Plastic Small Outline No Lead Package (P-SON)	Plastic SON
Package name	Ceramic Small Outline No Lead Package (C-SON)	Ceramic SON
Package name	Small Outline Package (SOP)	A package with leads formed in gull-wing shape and extended from the two sides of its body
Package name	Low Profile Small Outline Package (LSOP)	SOP with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Small Outline Package Type 1 (TSOP(1))	Type-1 SOP with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Thin Small Outline Package Type 2 (TSOP(2))	Type-2 SOP with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Shrink Small Outline Package (SSOP)	Shrink SOP
Package name	Low Profile Shrink Small Outline Package (LSSOP)	SSOP with the seated height of over 1,2 mm and up to 1,7 mm
Package name	Thin Shrink Small Outline Package (TSSOP)	SSOP with the seated height of over 1,0 mm and up to 1,2 mm
Package name	Heat Sink Small Outline Package HSOP	SOP with a heat sink
Package name	Heat Sink Low Profile Small Outline Package (HLSOP)	LSOP with a heat sink
Package name	Heat Sink Thin Shrink Small Outline Package (HTSSOP)	TSSOP with a heat sink
Package name	Plastic Small Outline Package (P-SOP)	Plastic SOP
Package name	Ceramic Small Outline Package (C-SOP)	Ceramic SOP
Package name	Glass-Sealed Ceramic Small Outline Package (G-SOP)	Glass-sealed ceramic SOP

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