

JEDEC STANDARD

JEDEC® Memory Module Label – for Compute Express Link® (CXL®)

JESD405-1B

Release 1.1

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JEDEC SOLD STATE TECHNOLOGY ASSOCIATION



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JEDEC® MEMORY MODULE LABEL – FOR COMPUTE EXPRESS LINK® (CXL®)**Contents**

	Pages
1 Scope.....	1
1.1 Section: Module Type	1
1.2 Section: Serial Number	2
1.3 Section: Part Number.....	2
1.4 Section: Security Identifier	2
1.5 Section: Machine Readable	3
2 ASCII Table.....	3
3 Examples.....	5
4 External References	6
Annex A — (Informative) Differences between Revisions	6
A.1 Differences between JESD405-1A and JESD405-1, March 2023.....	6
A.2 Differences between JESD405-1B and JESD405-1A, January 2024.....	6

JEDEC® MEMORY MODULE LABEL – FOR COMPUTE EXPRESS LINK® (CXL®)

Contents (cont'd)

List of Tables

	Pages
Table 1 — Module Type Format	1
Table 2 — Serial Number Format	2
Table 3 — Part Number Format	2
Table 4 — Security Identifier Format	2
Table 5 — Machine Readable Format	3
Table 6 — Country Code Examples	3
Table 7 — ASCII Table	4

List of Figures

	Pages
Figure 1 — Bar Code Example	5

JEDEC® Memory Module Label – for Compute Express Link® (CXL®)

(From JEDEC Board Ballot JCB-24-11, formulated under the cognizance of the JC-45 Committee on DRAM Modules, item number 2286.08A).

1 Scope

The following labels shall be applied to all CXL memory modules to fully describe the key attributes of the module. The label can be in the form of a stick-on label, silk screened onto the assembly, or marked using an alternate customer-readable format. A readable point size should be used, and the information can be printed in one or more rows on the label. Hyphens may be dropped when lines are split, or when font changes sufficiently separate fields. Unused letters or numbers in each field are to be omitted when not needed.

Each label shall include the following sections, which may share lines on the label or may occupy separate lines.

- Module type
- Serial number
- Part number
- Security identifier
- Machine readable

1.1 Section: Module Type

Format:

<media>**b**CXL<cxlrev>-**PCIE**<pcierv>-<iface>**b**<capacity>**b**<form>-<conn>-<portcfg>

Where:

Table 1 — Module Type Format

Field	Description	Examples
<media>	Data media type	DDR4, DDR5, NV5, MRAM, PCM5, HBM3, HBM4, LP5, LP5X
<cxlrev>	CXL base specification revision	2.0, 3.0, 3.1
<pcierv>	PCIe revision	5.0, 6.0
<iface>	CXL interface type	MEM3 (CXL.mem type 3)
<capacity>	Module capacity in GB or TB	128GB, 4TB
<form>	Module form factor and thickness	E3.S-1T, E3.S-2T, E1.S-15
<conn>	Connector count	1C, 2C, 4C, 2x1C
<portcfg>	Port configuration and I/O width	1Px4, 2Px4, 1Px8, 2Px8, 1Px16
b	Space character	0x20
CXL	“CXL” text	0x43 0x58 0x4C
PCIE	“PCIE” text	0x50 0x58 0x49 0x45
-	Hyphen character	0x5F

Note: all characters may be uppercase or lowercase

1.2 Section: Serial Number

Format:

SN:<vid><mfgloc><mfgdate><serial>
%02x%02x%02x%02x%02x%02x%02x%02x%02x

Where:

Table 2 — Serial Number Format

Field	Description	Examples
<vid>	Vendor identifier per JEP106, 4 hex characters %02x: Number of continuation codes with odd parity %02x: Module manufacturer code	8004 04A8
<mfgloc>	Vendor specific manufacturing location, 2 hex characters	01
<mfgdate>	Manufacturing date, yyww (year and week), 4 BCD characters	2509
<serial>	Unique serial number, 8 BCD characters	12345678
SN:	“SN:” text	0x53 0x4E 0x3A

1.3 Section: Part Number

Format:

PN:<mpn>

Where:

Table 3 — Part Number Format

Field	Description	Examples
<mpn>	Manufacturer part number, 28 characters maximum	MTA12ASF2G72PA-4H4A0
PN:	“PN:” text	0x50 0x4E 0x3A

1.4 Section: Security Identifier

Format:

PSID:<psid>

Where:

Table 4 — Security Identifier Format

Field	Description	Examples
<psid>	Physical security identifier, exactly 32 hex characters	1A2B3C4D0918273600112233FFEEDDCC
PSID:	“PSID:” text	0x50 0x53 0x49 0x44 0x3A

1.5 Section: Machine Readable

Format:

2d_barcode

Where:

2d_barcode follows DataMatrix ECC 200; see ISO/IEC 16022 for details; characters coded per ISO 8859-1.

The size of the DataMatrix is not specified, but must contain sufficient data encoding space for at least the following textual information:

(L)<Module Type>**(S)**<Serial Number>**(P)**<Part Number>**(K)**<Security Identifier>**(C)**<Country of Origin>

where <Module Type>, <Serial Number>, <Part Number>, and <Security Identifier> are as defined in clauses 1.1 through 1.4 of this standard.

Table 5 — Machine Readable Format

Field	Description	Examples
(L)	“(L)” text	0x28 0x4C 0x28
(S)	“(S)” text	0x28 0x53 0x28
(P)	“(P)” text	0x28 0x50 0x28
(K)	“(K)” text	0x28 0x4B 0x28
(C)	“(C)”text	0x28 0x43 0x28

The <Serial Number> field is exactly 21 characters long, including hyphens. The <Part Number> field comes from tbd.

The <Country of Origin> field is exactly two alphabetic characters as defined in ISO 3166. This field is optional until September 2024, and mandatory thereafter. Some example country codes:

Table 6 — Country Code Examples

Country	Code
China	CN
Japan	JP
Republic of Korea	KR
Taiwan	TW
United States of America	US

Other fields are permitted in the machine readable 2D barcode, and each section must start with (x), where x is a single section delineation character. Upper case characters (A-Z) in section delineation are reserved for JEDEC definition; lower case characters (a-z) may be used for supplier specific information. Delineated sections of the barcode may be in any order.

2 ASCII Table

Table 7 — ASCII Table

Character	Hex	Decimal	Character	Hex	Decimal	Character	Hex	Decimal
<space>	20	32	@	40	64	`	60	96
!	21	33	A	41	65	a	61	97
"	22	34	B	42	66	b	62	98
#	23	35	C	43	67	c	63	99
\$	24	36	D	44	68	d	64	100
%	25	37	E	45	69	e	65	101
&	26	38	F	46	70	f	66	102
'	27	39	G	47	71	g	67	103
(	28	40	H	48	72	h	68	104
)	29	41	I	49	73	i	69	105
*	2A	42	J	4A	74	j	6A	106
+	2B	43	K	4B	75	k	6B	107
,	2C	44	L	4C	76	l	6C	108
—	2D	45	M	4D	77	m	6D	109
.	2E	46	N	4E	78	n	6E	110
/	2F	47	O	4F	79	o	6F	111
0	30	48	P	50	80	p	70	112
1	31	49	Q	51	81	q	71	113
2	32	50	R	52	82	r	72	114
3	33	51	S	53	83	s	73	115
4	34	52	T	54	84	t	74	116
5	35	53	U	55	85	u	75	117
6	36	54	V	56	86	v	76	118
7	37	55	W	57	87	w	77	119
8	38	56	X	58	88	x	78	120
9	39	57	Y	59	89	y	79	121
:	3A	58	Z	5A	90	z	7A	122
;	3B	59	[	5B	91	{	7B	123
<	3C	60	\	5C	92	|	7C	124
=	3D	61	]	5D	93	}	7D	125
>	3E	62	^	5E	94	~	7E	126
?	3F	63	-	5F	95	Delete	7F	127

3 Examples



DDR5 CXL20-PCIE50-MEM3
256GB E3.S-2T-2C-1Px8
SN:802C26230112345678
PN:MTA12ASF2G72PA-4H4A0
PSID:1A2B3C4D0918273600112233FFEEDDCC

Figure 1 — Bar Code Example

DDR5 SDRAM media type
CXL 2.0, PCIe 5.0 operating at 32Gbps per lane
Type 3 controller supporting CXL.MEM protocol
256GB total capacity
E3.S-2T form factor with 2 connectors supported as one port of x8
Serial Number = 802C26230112345678
Part number = MTA12ASF2G72PA-4H4A0
Physical Security Identifier = 1A2B3C4D0918273600112233FFEEDDCC

2D Barcode: (L)DDR5 CXL20-PCIE50-MEM3 256GB E3.S-2T-2C-
1Px8(S)802C26230112345678(P)MTA12ASF2G72PA-
4H4A0(K)1A2B3C4D0918273600112233FFEEDDCC(C)KR

4 External References

DataMatrix ECC 200; ISO/IEC 16022

<https://www.iso.org/standard/44230.html>

Character codes ISO 8859-1

<https://www.iso.org/standard/28245.html>

Annex A — (Informative) Differences between Revisions

A.1 Differences between JESD405-1A and JESD405-1, March 2023

1. Title page: Document name change
2. TOC page -i-: Document name change
3. Main body page 1: Document name change

A.2 Differences between JESD405-1B and JESD405-1A, January 2024

1. Sec. 1.1: Modified Table 1 “Module Type Format”
2. Sec. 1.5: Added country of origin code “C” to the 2d Bar Code
3. Table 5 “Machine Readable Format”: Added code “C” for Country of Origin field
4. Added new Table 6 “Country Code Examples”
5. Modified Figure 1 “Bar Code Example” and the 2D Barcode text below it to add “(C)KR”
6. Editorial update of the wording in the “Notice” and “Do Not Violate” pages



Standard Improvement Form

JEDEC Standard **JESD405-1B**

The purpose of this form is to provide the Technical Committees of JEDEC with input from the industry regarding usage of the subject standard. Individuals or companies are invited to submit comments to JEDEC. All comments will be collected and dispersed to the appropriate committee(s).

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1. I recommend changes to the following:

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☐ Test method number _____ Clause number _____

The referenced clause number has proven to be:

☐ Unclear ☐ Too Rigid ☐ In Error

☐ Other _____

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