Item No.	Designator	Quantity	Value	Part Number	Manufacturer	Description	Package name	Standard dimensions mm (inch)	Not Mounted
1	CN1	1	−	XG8W-1431	Omron	Terminal, 300V, 3A	−	−	
2	CN2	1	−	XG4C-1631	Omron	Terminal, 250V, 1A	−	−	
3	CN3	1	−	WR-60P-HF-HD-A1E	JAE	Terminal, 200V, 0.3A	−	−	
4	CN4	1	−	SM03B-PASS-TBT(LF)(SN)	JST	Terminal, 250V, 3A	−	−	
5	CN5	1	−	SM02B-PASS-TBT(LF)(SN)	JST	Terminal, 250V, 3A	−	−	
6	CN6	1	−	SM04B-PASS-TBT(LF)(SN)	JST	Terminal, 250V, 3A	−	−	
7	CN7	1	−	SM10B-PASS-TBT(LF)(SN)	JST	Terminal, 250V, 3A	−	−	
8	C1, C5, C6, C7, C17, C83	6	0.1µF			Ceramic, 6.3V, ±15 %	1005	1.0 x 0.5 (0402)	
9	C2, C4	2	1000pF			Ceramic, 16V, ±15%	1608	1.6 x 0.8 (0603)	
10	C8, C9, C10, C11, C12, C13, C14, C15, C16, C18, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C85, C86, C89, C90, C96, C97	50	1µF			Ceramic, 10V, ±10%	1608	1.6 x 0.8 (0603)	
11	C19, C79, C81, C82, C84, C87, C88, C92, C93, C94	10	10µF			Ceramic, 10V, ±10%	1608	1.6 x 0.8 (0603)	
12	C54, C55, C56, C57, C60, C69, C76, C77, C78, C80, C91, C95	12	0.1µF			Ceramic, 50V, ±10%	1608	1.6 x 0.8 (0603)	
13	C58, C59, C61, C62, C67, C68, C70, C71	8	470pF			Ceramic, 50V, ±5%	1608	1.6 x 0.8 (0603)	

2025-6-24
Rev.1

Item No.	Designator	Quantity	Value	Part Number	Manufacturer	Description	Package name	Standard dimensions mm (inch)	Not Mounted
14	C63, C64, C65, C66, C72, C73, C74, C75	8	0.015 µF			Ceramic, 50V, ±10%	1608	1.6 x 0.8 (0603)	
15	D1, D2, D3, D4, D5, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24	23	45V	1SS396	TOSHIBA	Schottky Barrier Diode	SOT-346	2.9 x 2.5	
16	D6	1	30V	CUS05F30	TOSHIBA	Schottky Barrier Diode	SOD-323	2.5 x 1.25	
17	FU1, FU2	2	1.6A			Fuse	−	6.0 x 2.5	
18	IC1, IC2	2	−	TPS3897ADRY	Texas Instruments	Adjustable Voltage Monitor	SON	1.2 x 1.65	
19	IC3	1	−	TMS320F28377SPTP	Texas Instruments	32-bit Microcontrollers-MCU Soprano	HLQFP	24 x 24	
20	IC4	1	512Kbit	24LC512-I/SM	Atmel	EEPROM	SOIJ	5.21 x 5.28	
21	IC5, IC6, IC7	3	−	74VHCT540AFT	TOSHIBA	Buffer	TSSOP 20B	6.5 x 6.4	
22	IC8, IC13, IC14	3	−	TC7SH17F	TOSHIBA	Single Schmitt Buffer	SOT-25	2.9×2.8	
23	IC9, IC10	2	−	OPA4322AIPWR	Texas Instruments	Operational amplifier	TSSOP-14	6.9×5.6	
24	IC11	1	−	TC74VHC540FT	TOSHIBA	Buffer	TSSOP	6.9 x 4.4	
25	IC12	1	−	TCAN332D	Texas Instruments	CAN Transceivers	SOIC	5.0 x 3.9	
26	IC15	1	−	REF2030AIDDCT	Texas Instruments	Voltage References	SOT-23-THIN	3.05 x 3.05	
27	LED1	1	−	VCDG1111C-4BY3C-TR	STANLEY	LED	TSSOP 20B	6.5 x 6.4	
28	L1	1	−	MMZ2012S601AT000	TDK	Chip beads	2012	2.0 x 1.2 (0805)	
29	PS1	1	3.3V 1.5A	TCR15AG33	TOSHIBA	Regulator	WCSP6F	1.2 x 0.8	
30	PS2	1	1.2V 1.5A	TCR15AG12	TOSHIBA	Regulator	WCSP6F	1.2 x 0.8	
31	R1 ,R12, R13, R20, R21	5	4.7kΩ			100mW, ±1%	1608	1.6 x 0.8 (0603)	
32	R2	1	300kΩ			100mW, ±0.1%	1608	1.6 x 0.8 (0603)	
33	R3, R17, R22, R23, R24, R25, R26	7	100kΩ			100mW, ±1%	1608	1.6 x 0.8 (0603)	
34	R4	1	56kΩ			100mW, ±0.1%	1608	1.6 x 0.8 (0603)	

Item No.	Designator	Quantity	Value	Part Number	Manufacturer	Description	Package name	Standard dimensions mm (inch)	Not Mounted
35	R5, R7, R15, R16, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R54, R55, R62, R63, R66, R67, R74, R75, R76, R77, R78, R79, R80, R82, R83, R84, R86, R88, R89, R90, R91, R92, R93, R94, R95	51	10kΩ			100mW, ±1%	1608	1.6 x 0.8 (0603)	
36	R6	1	130kΩ			100mW, ±1%	1608	1.6 x 0.8 (0603)	
37	R11, R85, R87, R96, R97, R98, R99, R100, R101, R102, R103	11	100Ω			100mW, ±1%	1608	1.6 x 0.8 (0603)	
38	R14, R28, R29	3	2.2kΩ			100mW, ±1%	1608	1.6 x 0.8 (0603)	
39	R18	1	0Ω			1A	1608	1.6 x 0.8 (0603)	
40	R52, R53, R56, R57, R64, R65, R68, R69	8	15kΩ			100mW, ±1%	1608	1.6 x 0.8 (0603)	
41	R58, R59, R60, R61, R70, R71, R72, R73	8	33Ω			100mW, ±1%	1608	1.6 x 0.8 (0603)	
42	R81	1	470Ω			100mW, ±1%	1608	1.6 x 0.8 (0603)	
43	SW1	1	—	SKRKAEE010	ALPS	Tact Switch	-	4.8 x 2.9	
44	SW2	1	—	A6H-2102	Omron	Slide DIP Switch	-	3.77 x 4.5	
45	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP24, TP25	16	—	HK-3-G	MAC8	Test Pin	-	2.0 x 1.3	

Item No.	Designator	Quantity	Value	Part Number	Manufacturer	Description	Package name	Standard dimensions mm (inch)	Not Mounted
46	X1	1	–	ASEMB-20.000MHZ-XY-T	Abracon	Clock Oscillators	QFN	3.2 x 2.5	
901	C3	1	–	–	–	–	1608	1.6 x 0.8 (0603)	Not Mounted
902	R8, R9, R10, R19	4	–	–	–	–	1608	1.6 x 0.8 (0603)	Not Mounted

Terms of Use

This terms of use is made between Toshiba Electronic Devices and Storage Corporation ("We") and Customer who downloads or uses this Reference Design. Customer shall comply with this terms of use. This Reference Design means all documents and data in order to design electronics applications on which our semiconductor device is embedded.

Section 1. Restrictions on usage
1. This Reference Design is provided solely as reference data for designing electronics applications. Customer shall not use this Reference Design for any other purpose, including without limitation, verification of reliability.
2. Customer shall not use this Reference Design for sale, lease or other transfer.
3. Customer shall not use this Reference Design for evaluation in high or low temperature, high humidity, or high electromagnetic environments.
4. This Reference Design shall not be used for or incorporated into any product or system whose manufacture, use, or sale is prohibited under any applicable laws or regulations.

Section 2. Limitations
1. We reserve the right to make changes to this Reference Design without notice.
2. This Reference Design should be treated as a reference only. WE ARE NOT RESPONSIBLE FOR ANY INCORRECT OR INCOMPLETE DATA AND INFORMATION.
3. Semiconductor devices can malfunction or fail. When designing electronics applications by referring to this Reference Design, Customer is responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of semiconductor devices could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Customer must also refer to and comply with the latest versions of all relevant our information, including without limitation, specifications, data sheets and application notes for semiconductor devices, as well as the precautions and conditions set forth in the "Semiconductor Reliability Handbook".
4. Designing electronics applications by referring to this Reference Design, Customer must evaluate the whole system sufficiently. Customer is solely responsible for applying this Reference Design to Customer's own product design or applications. WE ASSUME NO LIABILITY FOR CUSTOMER'S PRODUCT DESIGN OR APPLICATIONS.
5. WE SHALL NOT BE RESPONSIBLE FOR ANY INFRINGEMENT OF PATENTS OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES THAT MAY RESULT FROM THE USE OF THIS REFERENCE DESIGN. NO LICENSE TO ANY INTELLECTUAL PROPERTY RIGHT IS GRANTED BY THIS TERMS OF USE, WHETHER EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE.
6. THIS REFERENCE DESIGN IS PROVIDED "AS IS". WE (a) ASSUME NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (b) DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO THIS REFERENCE DESIGN, INCLUDING WITHOUT LIMITATION, WARRANTIES OR CONDITIONS OF FUNCTION AND WORKING, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.

Section 3. Terms and Termination
It is assumed that Customer agrees to any and all this terms of use if Customer downloads or uses this Reference Design. We may, at its sole and exclusive discretion, change, alter, modify, add, and/or remove any part of this terms of use at any time without any prior notice. We may terminate this terms of use at any time and without any cause. Upon termination of this terms of use, Customer shall eliminate this Reference Design. Furthermore, upon our request, Customer shall submit to us a written confirmation to prove elimination of this Reference Design.

Section 4. Export Control
Customer shall not use or otherwise make available this Reference Design for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). This Reference Design may be controlled under the applicable export laws and regulations including, without limitation, the Japanese Foreign Exchange and Foreign Trade Act and the U.S. Export Administration Regulations. Export and re-export of this Reference Design is strictly prohibited except in compliance with all applicable export laws and regulations.

Section 5. Governing Laws
This terms of use shall be governed and construed by laws of Japan, without reference to conflict of law principle.

Section 6. Jurisdiction
Unless otherwise specified, Tokyo District Court in Tokyo, Japan shall be exclusively the court of first jurisdiction for all disputes under this terms of use.

ご利用規約

本規約は、お客様と東芝デバイス＆ストレージ株式会社（以下「当社」といいます）との間で、当社半導体製品を搭載した機器を設計する際に参考となるドキュメント及びデータ（以下「本リファレンスデザイン」といいます）の使用に関する条件を定めるものです。お客様は本規約を遵守しなければなりません。

第１条 禁止事項

お客様の禁止事項は、以下の通りです。

１．本リファレンスデザインは、機器設計の参考データとして使用されることを意図しています。信頼性検証など、それ以外の目的には使用しないでください。

２．本リファレンスデザインを販売、譲渡、貸与等しないでください。

３．本リファレンスデザインは、高低温・多湿・強電磁界などの対環境評価には使用できません。

４．本リファレンスデザインを、国内外の法令、規則及び命令により、製造、使用、販売を禁止されている製品に使用しないでください。

第２条 保証制限等

１．本リファレンスデザインは、技術の進歩などにより予告なしに変更されることがあります。

２．本リファレンスデザインは参考用のデータです。当社は、データ及び情報の正確性、完全性に関して一切の保証をいたしません。

３．半導体素子は誤作動したり故障したりすることがあります。本リファレンスデザインを参考に機器設計を行う場合は、誤作動や故障により生命・身体・財産が侵害されることのないように、お客様の責任において、お客様のハードウェア・ソフトウェア・システムに必要な安全設計を行うことをお願いします。また、使用されている半導体素子に関する最新の情報（半導体信頼性ハンドブック、仕様書、データシート、アプリケーションノートなど）をご確認の上、これに従ってください。

４．本リファレンスデザインを参考に機器設計を行う場合は、システム全体で十分に評価し、お客様の責任において適用可否を判断して下さい。当社は、適用可否に対する責任は負いません。

５．本リファレンスデザインは、その使用に際して当社及び第三者の知的財産権その他の権利に対する保証又は実施権の許諾を行うものではありません。

６．当社は、本リファレンスデザインに関して、明示的にも黙示的にも一切の保証（機能動作の保証、商品性の保証、特定目的への合致の保証、情報の正確性の保証、第三者の権利の非侵害保証を含むがこれに限らない。）をせず、また当社は、本リファレンスデザインに関する一切の損害（間接損害、結果的損害、特別損害、付随的損害、逸失利益、機会損失、休業損害、データ喪失等を含むがこれに限らない。）につき一切の責任を負いません。

第３条 契約期間

本リファレンスデザインをダウンロード又は使用することをもって、お客様は本規約に同意したものとみなされます。本規約は予告なしに変更される場合があります。当社は、理由の如何を問わずいつでも本規約を解除することができます。本規約が解除された場合は、お客様は本リファレンスデザインを破棄しなければなりません。さらに当社が要求した場合には、お客様は破棄したことを証する書面を当社に提出しなければなりません。

第４条 輸出管理

お客様は本リファレンスデザインを、大量破壊兵器の開発等の目的、軍事利用の目的、あるいはその他軍事用途の目的で使用してはなりません。また、お客様は「外国為替及び外国貿易法」、「米国輸出管理規則」等、適用ある輸出関連法令を遵守しなければなりません。

第５条 準拠法

本規約の準拠法は日本法とします。

第６条 管轄裁判所

本リファレンスデザインに関する全ての紛争については、別段の定めがない限り東京地方裁判所を第一審の専属管轄裁判所とします。