

RD Number: RD094

RD Title: TC78S121FTG Evaluation circuit

Item No.	Designator	Quantity	Value	Part Number	Manufacturer	Description	Package	Not Mount
1	C_OSCM	1	270pF	GRM31A7U3A271JW31D	murata	Chip capacitor		
2	C_VCC	1	0.1uF	GRM319R72A104KA01D	murata	Chip capacitor		
3	C_VDD	1	10uF	EKMG500ELL100ME11D	NIPPON CHEMI-CON	Electrolytic capacitor		
4	C_VM1	1	100uF	EKMG500ELL101MHB5D	NIPPON CHEMI-CON	Electrolytic capacitor		
5	R_MO_AB	0	100kΩ	RK73B2BTTD104J	KOA	Chip resistor		✓
6	R_MO_CD	0	100kΩ	RK73B2BTTD104J	KOA	Chip resistor		✓
7	R_ALERT	1	10kΩ	RK73B2BTTD103J	KOA	Chip resistor		
8	R_OSCM	1	120kΩ	RK73B2BTTD124J	KOA	Chip resistor		
9	R_VRFA	0		GF063U	toscos			✓
10	R_VRFB	0		GF063U	toscos			✓
11	R_VRFC	0		GF063U	toscos			✓
12	R_VRFD	0		GF063U	toscos			✓
13	R_RSA	1	0.22Ω	ERJ-12ZQJR22U	Panasonic	Chip resistor		
14	R_RSB	1	0.22Ω	ERJ-12ZQJR22U	Panasonic	Chip resistor		
15	R_RSC	1	0.22Ω	ERJ-12ZQJR22U	Panasonic	Chip resistor		
16	R_RSD	1	0.22Ω	ERJ-12ZQJR22U	Panasonic	Chip resistor		
17	C_VM2	1	0.1uF	GRM319R72A104KA01D	murata	Chip capacitor		
18	C_VRFA	1	0.1uF	GRM319R72A104KA01D	murata	Chip capacitor		
19	C_VRFB	1	0.1uF	GRM319R72A104KA01D	murata	Chip capacitor		
20	C_VRFC	1	0.1uF	GRM319R72A104KA01D	murata	Chip capacitor		
21	C_VRFD	1	0.1uF	GRM319R72A104KA01D	murata	Chip capacitor		
22	IN_C1	1		ST-1-3	MAC8			
23	IN_D2	1		ST-1-3	MAC8			
24	IN_D1	1		ST-1-3	MAC8			
25	VDD	1		ST-1-3	MAC8			
26	GND	10		ST-1-3	MAC8			

27	VREF_A	1	ST-1-3	MAC8			
28	VREF_B	1	ST-1-3	MAC8			
29	VREF_C	1	ST-1-3	MAC8			
30	VREF_D	1	ST-1-3	MAC8			
31	OSCM	1	ST-1-3	MAC8			
32	VCC	1	ST-1-3	MAC8			
33	SLEEP	1	ST-1-3	MAC8			
34	ALERT	1	ST-1-3	MAC8			
35	PHASE_A	1	ST-1-3	MAC8			
36	PHASE_B	1	ST-1-3	MAC8			
37	PHASE_C	1	ST-1-3	MAC8			
38	PHASE_D	1	ST-1-3	MAC8			
39	D_TBLANK_AB	1	ST-1-3	MAC8			
40	D_TBLANK_CD	1	ST-1-3	MAC8			
41	MODE2	1	ST-1-3	MAC8			
42	MODE1	1	ST-1-3	MAC8			
43	MODE0	1	ST-1-3	MAC8			
44	IN_A2	1	ST-1-3	MAC8			
45	IN_C2	1	ST-1-3	MAC8			
46	VM	1	ST-1-3	MAC8			
47	IN_A1	1	ST-1-3	MAC8			
48	IN_B2	1	ST-1-3	MAC8			
49	IN_B1	1	ST-1-3	MAC8			
50	SW1	1	2130S1*3GSE	linkman	Jumper		
51		1	2180BBA	linkman	Jumper Short		
52	SW2	1	2130S1*3GSE	linkman	Jumper		
53		1	2180BBA	linkman	Jumper Short		
54	SW3	1	2130S1*3GSE	linkman	Jumper		
55		1	2180BBA	linkman	Jumper Short		
56	SW4	1	2130S1*3GSE	linkman	Jumper		
57		1	2180BBA	linkman	Jumper Short		
58	SW5	0	2130S1*3GSE	linkman	Jumper		✓
59		0	2180BBA	linkman	Jumper Short		✓
60	SW6	0	2130S1*3GSE	linkman	Jumper		✓

61		0		2180BBA	linkman	Jumper Short		✓
62	SW7	0		2130S1*3GSE	linkman	Jumper		✓
63		0		2180BBA	linkman	Jumper Short		✓
64	SW8	0		2130S1*3GSE	linkman	Jumper		✓
65		0		2180BBA	linkman	Jumper Short		✓
66	SW9	1		2130S1*3GSE	linkman	Jumper		
67		1		2180BBA	linkman	Jumper Short		
68	SW10	1		2130S1*3GSE	linkman	Jumper		
69		1		2180BBA	linkman	Jumper Short		
70	SW11	1		2130S1*3GSE	linkman	Jumper		
71		1		2180BBA	linkman	Jumper Short		
72	SW12	1		2130S1*3GSE	linkman	Jumper		
73		1		2180BBA	linkman	Jumper Short		
74	SW13	1		2130S1*3GSE	linkman	Jumper		
75		1		2180BBA	linkman	Jumper Short		
76	SW14	1		2130S1*3GSE	linkman	Jumper		
77		1		2180BBA	linkman	Jumper Short		
78	SW15	1		2130S1*3GSE	linkman	Jumper		
79		1		2180BBA	linkman	Jumper Short		
80	SW16	1		2130S1*3GSE	linkman	Jumper		
81		1		2180BBA	linkman	Jumper Short		
82	SW17	1		2130S1*3GSE	linkman	Jumper		
83		1		2180BBA	linkman	Jumper Short		
84	SW18	1		2130S1*3GSE	linkman	Jumper		
85		1		2180BBA	linkman	Jumper Short		
86	JP1	1		2130S1*2GSE	Linkman	Jumper		
87		1		2180BBA	Linkman	Jumper Short		
88	CON1	1		DF1BZ-4P-2.5DSA	Hirose Electric	Socket		
89	CON2	1		DF1BZ-4P-2.5DSA	Hirose Electric	Socket		
90	IC1	1		TC78S121FTG	toshiba			
91								
92								
93								
94								

95								
96								
97								
98								
99								
100								

## Terms of Use

This terms of use is made between Toshiba Electronic Devices and Storage Corporation ("We") and customers who use documents and data that are consulted to design electronics applications on which our semiconductor devices are mounted ("this Reference Design"). Customers shall comply with this terms of use. Please note that it is assumed that customers agree to any and all this terms of use if customers download 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 for any reason. Upon termination of this terms of use, customers shall destroy this Reference Design. In the event of any breach thereof by customers, customers shall destroy this Reference Design, and furnish us a written confirmation to prove such destruction.

### 1. Restrictions on usage

1. This Reference Design is provided solely as reference data for designing electronics applications. Customers shall not use this Reference Design for any other purpose, including without limitation, verification of reliability.
2. This Reference Design is for customer's own use and not for sale, lease or other transfer.
3. Customers 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 products or systems whose manufacture, use, or sale is prohibited under any applicable laws or regulations.

### 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, customers are 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. Customers 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. When designing electronics applications by referring to this Reference Design, customers must evaluate the whole system adequately. Customers are solely responsible for all aspects of their own product design or applications. WE ASSUME NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.
5. No responsibility is assumed by us 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 WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.

### 3. Export Control

Customers 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 Law and the U.S. Export Administration Regulations. Export and re-export of this Reference Design are strictly prohibited except in compliance with all applicable export laws and regulations.

### 4. Governing Laws

This terms of use shall be governed and construed by laws of Japan.