

CUSTOMER : \_\_\_\_\_

DATE : 2017.03.06

SPECIFICATIONS FOR APPROVAL

PRODUCT : CSR1010 BLE (Bluetooth Low Energy) Module

MODEL NAME : DBC10-11STX

CUSTOMER P/N :

APPROVAL	REMARK

Revision
0.1 (16/11/17) - Initial release. 0.2 (17/03/06) – Application Circuit Updated

Designed	Checked	Approved	DeviceDesign Co., Ltd.	
			DOCUMENT No.	DBC10-11STX SA
Hwang K.L	Choi Y.L	Cho Y.K	PAGE	REV 0.2 ( 1 / 20)



TITLE : Specifications for approval (DBC10-11STX)	REV 0.2 (3 / 20)
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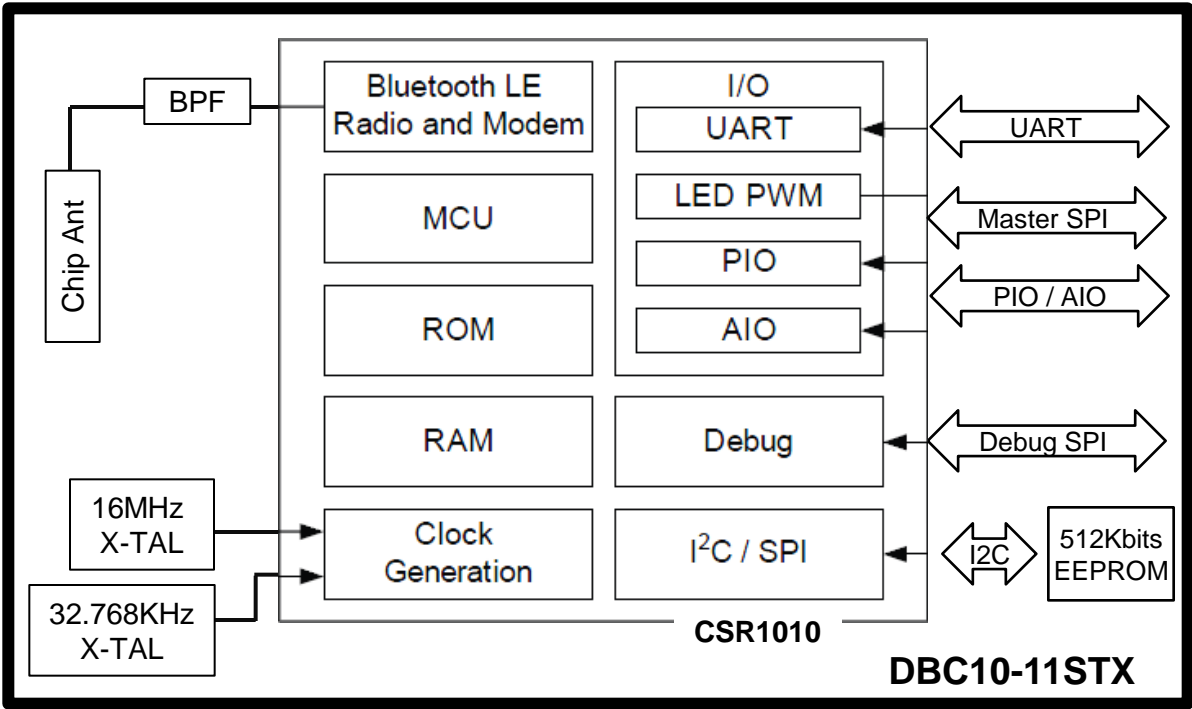
### 6. Absolute Maximum Rating

Parameter		Min.	Max.	Unit
Storage Temperature		-40	85	deg.C
Supply Voltage	VBAT	1.8	3.6	V

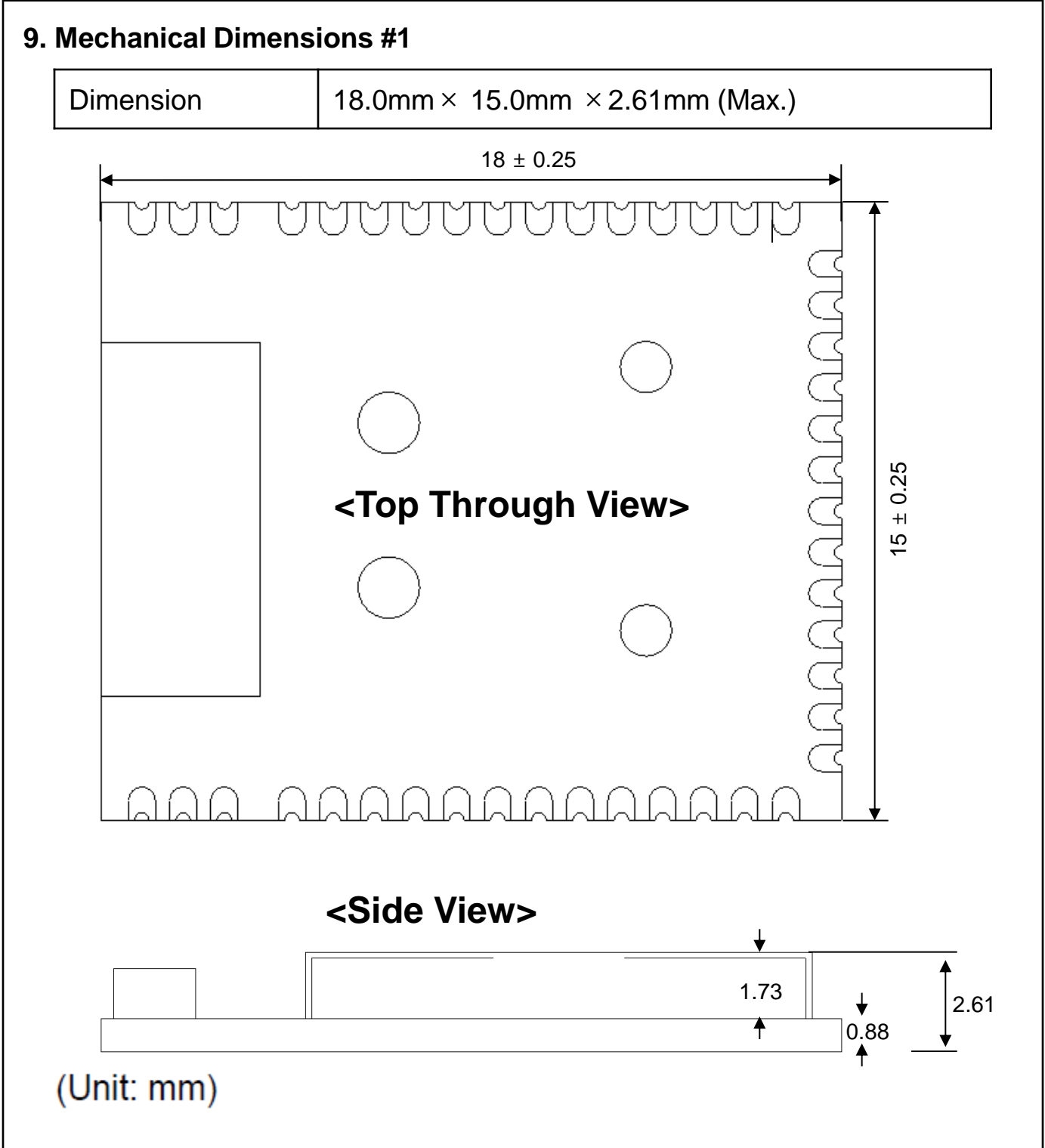
### 7. Test

Electrical characteristics are tested for every products. However, if there are any objection in judgment, it should be treated with agreements of both companies.

### 8. Block Diagram

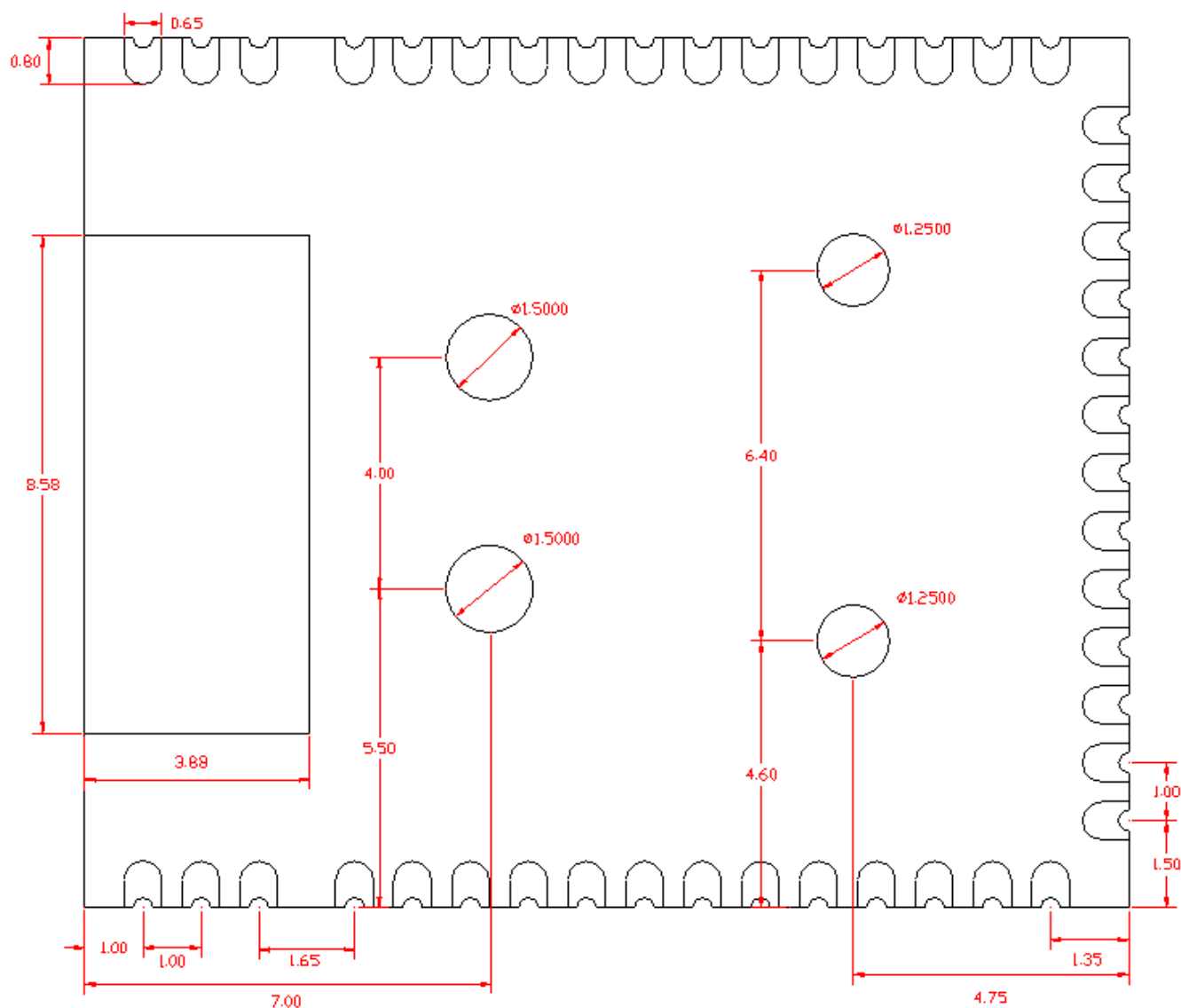


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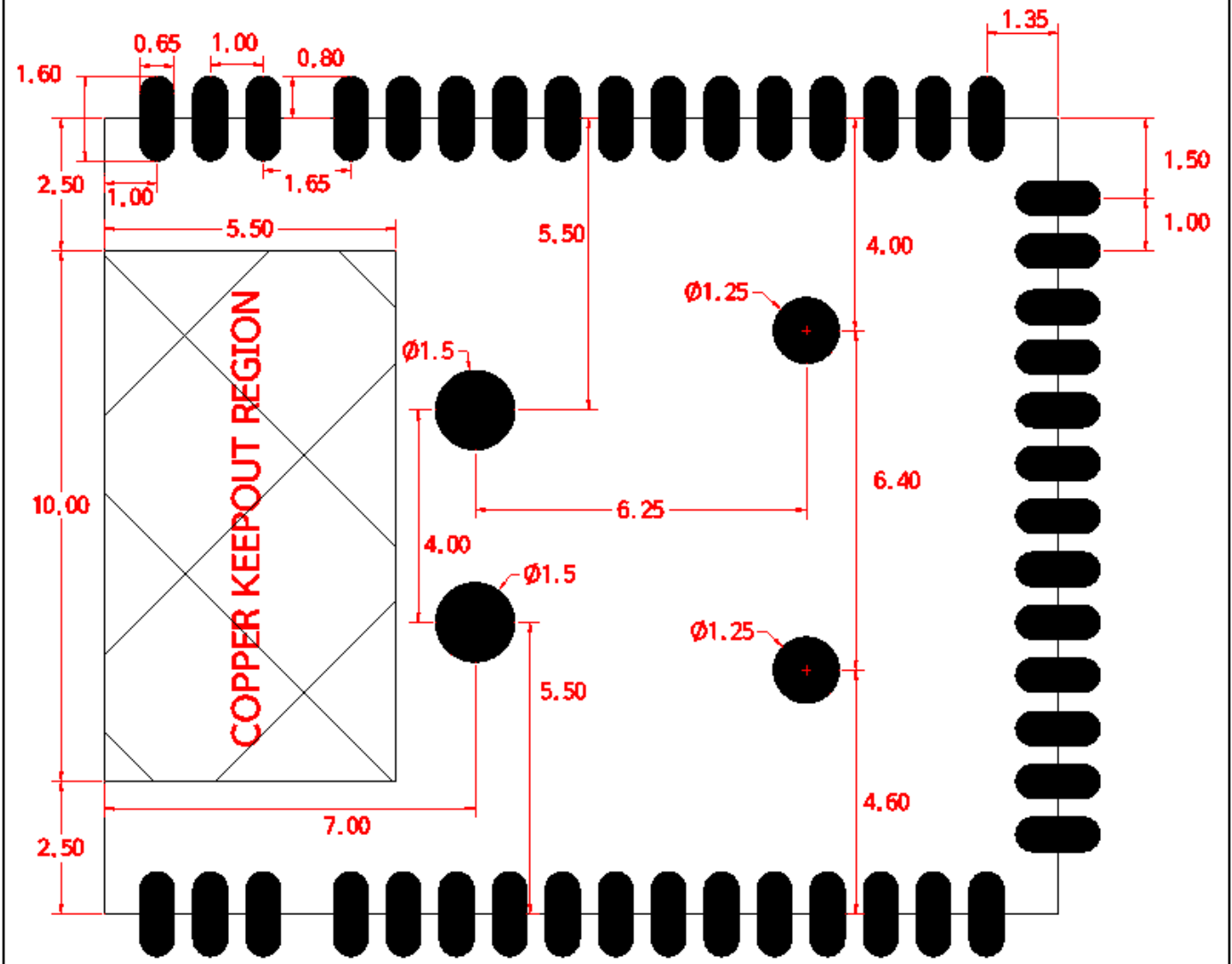
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## 9. Mechanical Dimensions #2



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10. Recommended PCB pattern



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11. General Description

- Bluetooth 4.0 specification
- Support for Bluetooth v4.0 specification host stack including ATT, GATT, SMP, L2CAP, GAP
- RSSI monitoring for proximity applications
- 32kHz and 16MHz crystal embedded
- PCB pattern Antenna embedded
- 512Kbits serial EEPROM embedded

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## 1) Recommended Operating Rating

Parameter		Min.	Typ.	Max.	Unit
Operating Temperature		-30	20	85	deg.C
Supply Voltage	VBAT	1.8	-	3.6	V
	VDD_PADS	1.2	-	3.6	

Mode	Description	Total Typ. Current at 3V
Dormant	All functions are shut down. To wake them up, toggle the WAKE pin.	< 600nA
Hibernate	VDD_PADS = ON, REFCLK = OFF, SLEEPCLK = ON, VDD_BAT = ON	< 1.5uA
Deep sleep	VDD_PADS = ON, REFCLK = OFF, SLEEPCLK = ON, VDD_BAT = ON, RAM = ON, digital circuits = ON, SMPS = ON (low-power mode), 1ms wake-up time	< 5uA
Idle	VDD_PADS = ON, REFCLK = ON, SLEEPCLK = ON, VDD_BAT = ON, RAM = ON, digital circuits = ON, MCU = IDLE, <1μs wake-up time	~1mA
Rx / Tx activate	-	~16mA at 3V peak current

Note) This performance is CSR1010 Datasheet Specification.

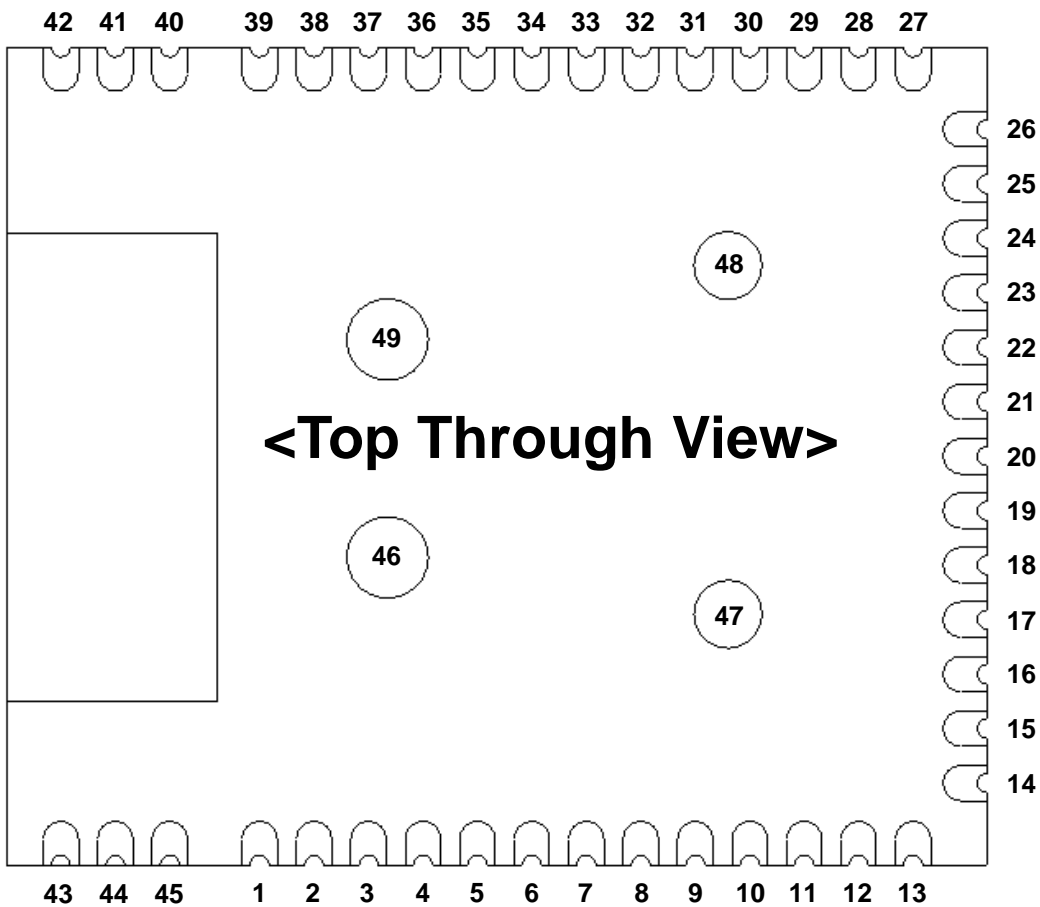
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3) RF Characteristics						
No.	Test case	Condition	Unit	Min.	Typ.	Max.
1	TRM-LE/CA/01/C (Output power)	PAVG	dBm	-20	6	10
		PPK-PAVE	dBm		0.4	3
2	TRM-LE/CA/03/C (In-band emissions)	PTX@fTX±2MHz	dBm		-40	-20
		PTX@fTX±3MHz	dBm		-40	-30
3	TRM-LE/CA/05/C (Modulation characteristics)	Δf1avg	kHz	225	250	275
		Δf2max	%	99.9	100	
		Δf2avg/Δf1avg	-	0.8	0.87	
4	TRM-LE/CA/06/C (Carrier frequency offset and drift)	fTX-fn	kHz		10	150
		f0-fn	kHz		8	50
		f1-f0	kHz		6	20
		fn-f(n-5)	kHz		5	20
5	RCV-LE/CA/01/C (Receiver sensitivity)	1500packet@-70dBm	%		0	30.8
6	RCV-LE/CA/06/C (Maximum input signal level)	1500packet@-10dBm	%		0	30.8

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13. Pin Assignment (Top View, Bottom Layout)



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14. Pin Description #1

No.	Pin Name	Description
1	AIO[2]	Analog programmable I/O line
2	AIO[1]	Analog programmable I/O line
3	AIO[0]	Analog programmable I/O line
4	N.C	Not Connected
5	N.C	Not Connected
6	GND	Ground
7	GND	Ground
8	WAKE	Ground
9	DB_SPI_CLK	Debug SPI Clock
10	N.C	Not Connected
11	DB_SPI_CSB	Debug SPI CSB
12	VBAT	Positive supply for all digital I/O ports PIOs
13	GND	Ground
14	PIO[0]/UART_TX	Programmable I/O line or UART TX
15	PIO[1]/UART_RX	Programmable I/O line or UART RX
16	PIO[3]	Programmable I/O line
17	N.C	Not Connected
18	N.C	Not Connected
19	N.C	Not Connected
20	DB_SPI_MOSI	Debug SPI MOSI
21	DB_SPI_MISO	Debug SPI MISO
22	PIO[4]/SPI_CSB	Programmable I/O line or Master SPI CSB
23	PIO[9]/SPI_CLK	Programmable I/O line or Master SPI Clock
24	PIO[10]/SPI_MOSI	Programmable I/O line or Master SPI MOSI
25	PIO[11]/SPI_MISO	Programmable I/O line or Master SPI MISO
26	N.C	Not Connected
27	N.C	Not Connected
28	N.C	Not Connected
29	N.C	Not Connected
30	GND	Ground
31	N.C	Not Connected
32	N.C	Not Connected
33	N.C	Not Connected
34	N.C	Not Connected
35	N.C	Not Connected
36	N.C	Not Connected
37	N.C	Not Connected
38	N.C	Not Connected
39	N.C	Not Connected

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14. Pin Description #2

No.	Pin Name	Description
40	GND	Ground
41	GND	Ground
42	GND	Ground
43	GND	Ground
44	GND	Ground
45	GND	Ground
46	GND	Ground
47	GND	Ground
48	GND	Ground
49	GND	Ground

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15. Reliability Test

1) Environment Test

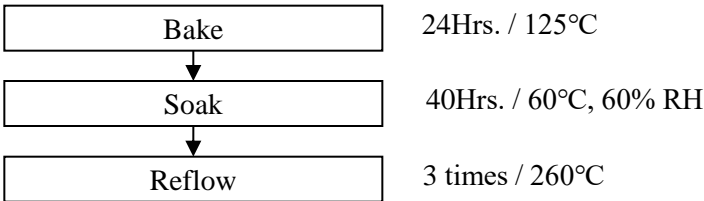
NO	ITEM	Condition	Characteristics
1	High Temperature and Humidity Load Test	Initial value measured at standard test condition. <b>Test Conditions:</b> 35℃, 90%RH, 50hr <b>Supply Voltage Condition:</b> standard ± 5% In standard test condition, take measurements within 3hr.	- No electrical problem
2	High Temp. Load Test	Initial value measured at standard test condition. <b>Test Conditions:</b> 85℃, 50hr <b>Supply Voltage Condition:</b> standard ± 5% In standard test condition, take measurements within 3hr.	- No electrical problem
3	Low Temp. Load Test	Initial value measured at standard test condition. <b>Test Conditions:</b> -30℃, 50hr <b>Supply Voltage Condition:</b> standard ± 5% In standard test condition, take measurements within 3hr.	- No electrical problem
4	High Temp. Storage Test	Initial value measured at standard test condition. <b>Test Conditions:</b> 85℃, 100hr In standard test condition, take measurements within 3hr.	- No electrical problem
5	Low Temp. Storage Test	Initial value measured at standard test condition. <b>Test Conditions:</b> -40, 100hr In standard test condition, take measurements within 3hr.	- No electrical problem
6	Temperature Cycling	Initial value measured at standard test condition. <b>Test Conditions:</b> 20℃ → 85℃ (1hr) 85℃ → 20℃ (1hr) 20℃ → -35℃ (1hr) -35℃ → 20℃ (1hr) - Test cycle : 25 cycles, Test Times : 100 Hr In standard test condition, take measurements within 3hr.	- No electrical problem
7	Drop Test	Initial value measured at standard test condition. <b>Test Conditions:</b> - Test height: 100 cm - Test times: 10 times Drop the module onto a 2mm metal plate. In standard test condition, take measurements within 3hr.	- No mechanical damage - No electrical problem

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2) JEDEC MSL(Moisture Sensitivity Level) Test

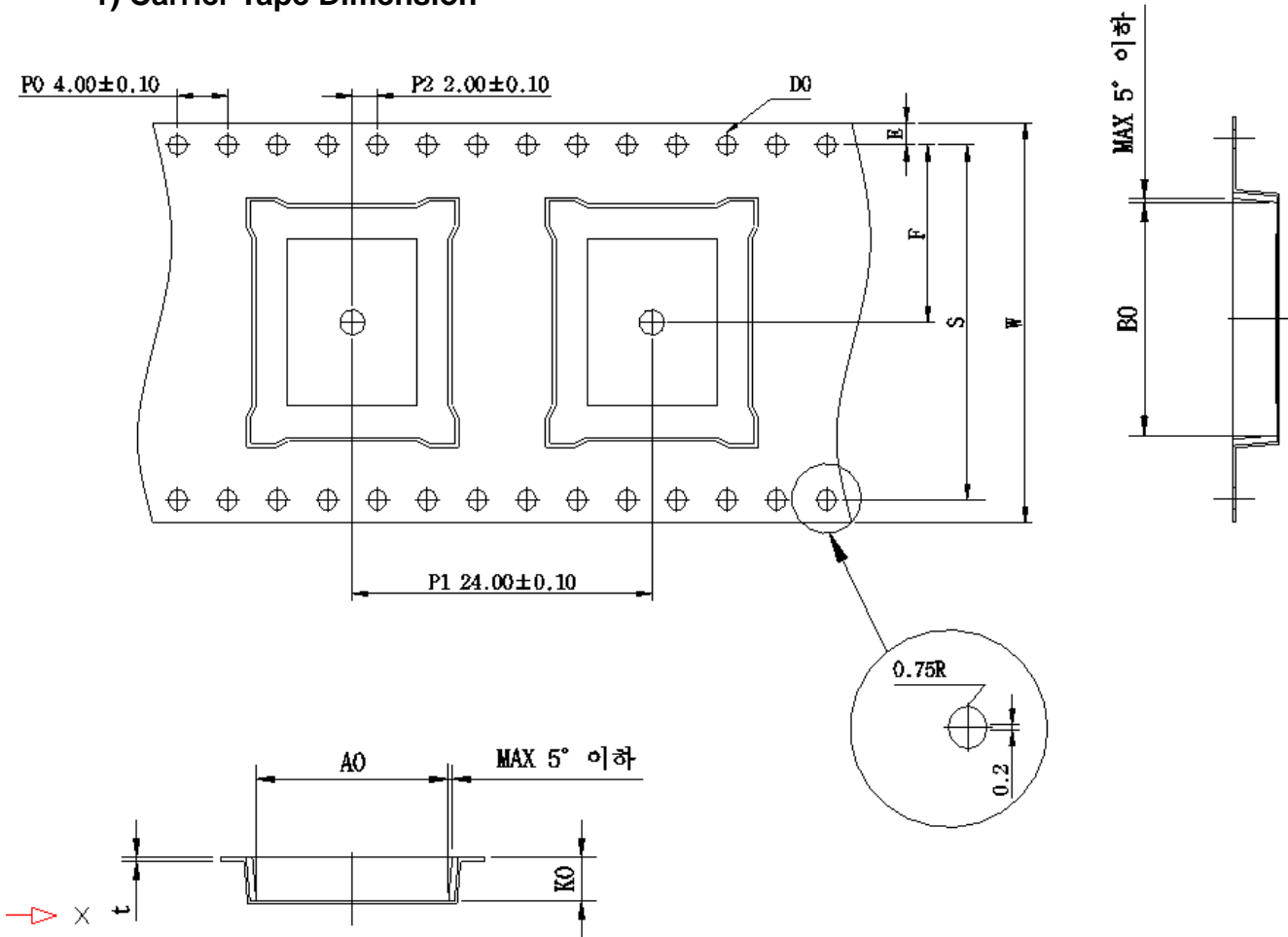
- MSL 3 Level (Floor Life Time : 168Hrs. / Condition : ≤30℃ , 60% RH)
- Standard : IPC / JEDEC J-STD-020C



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16. Packing Information

1) Carrier Tape Dimension



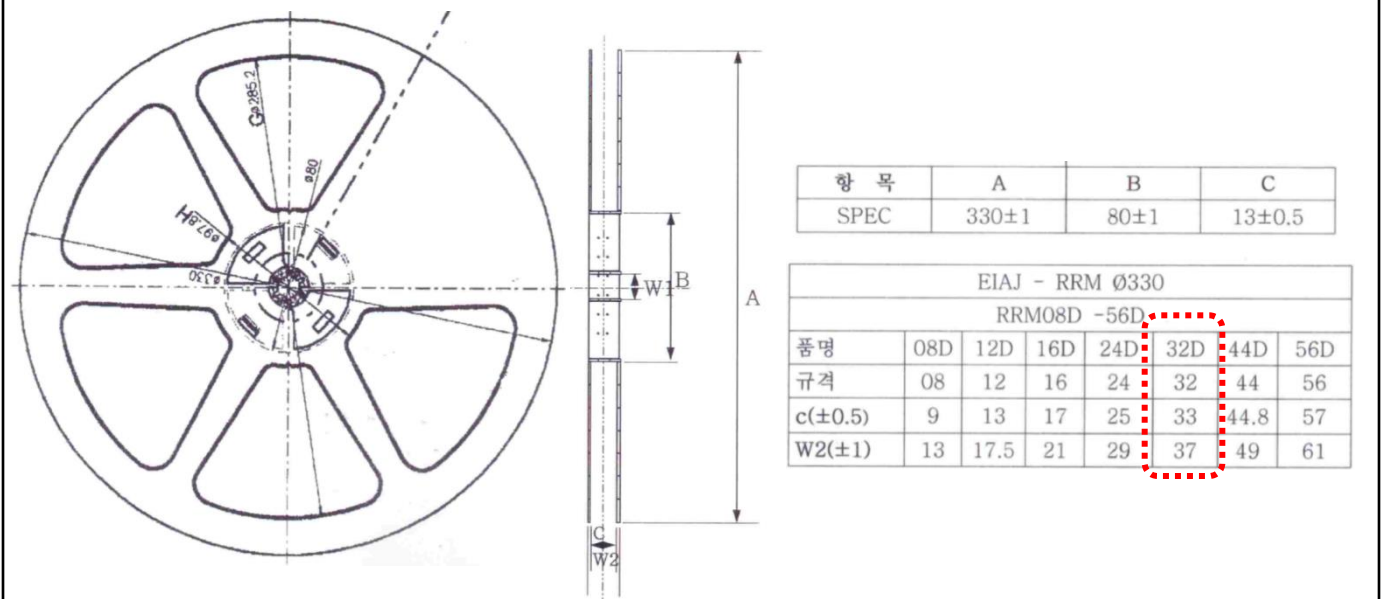
Unit : mm

A0	15.40±0.20	E	1.75±0.10
B0	18.40±0.20	F	14.20±0.10
K0	3.50±0.20	t	0.30±0.05
S	28.40±0.10	w	32.00±0.30

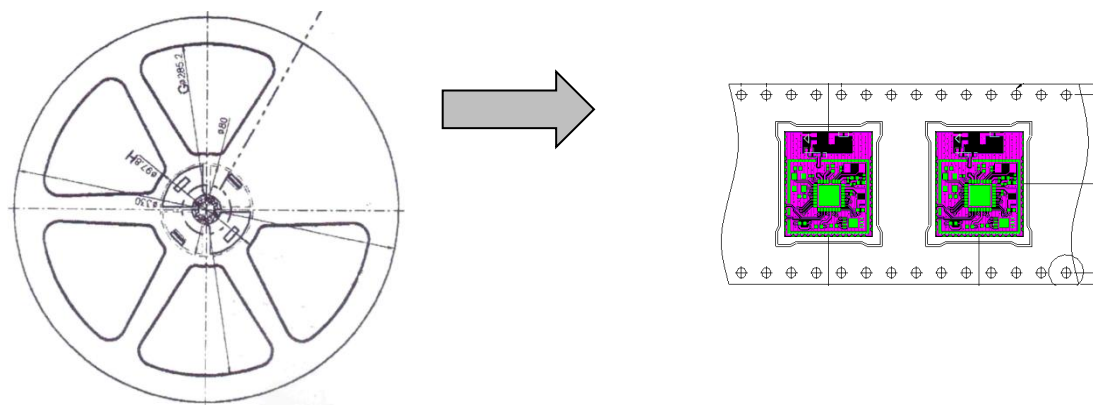
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2) Carrier Tape Dimension

Unit : mm



3) User direction of feed



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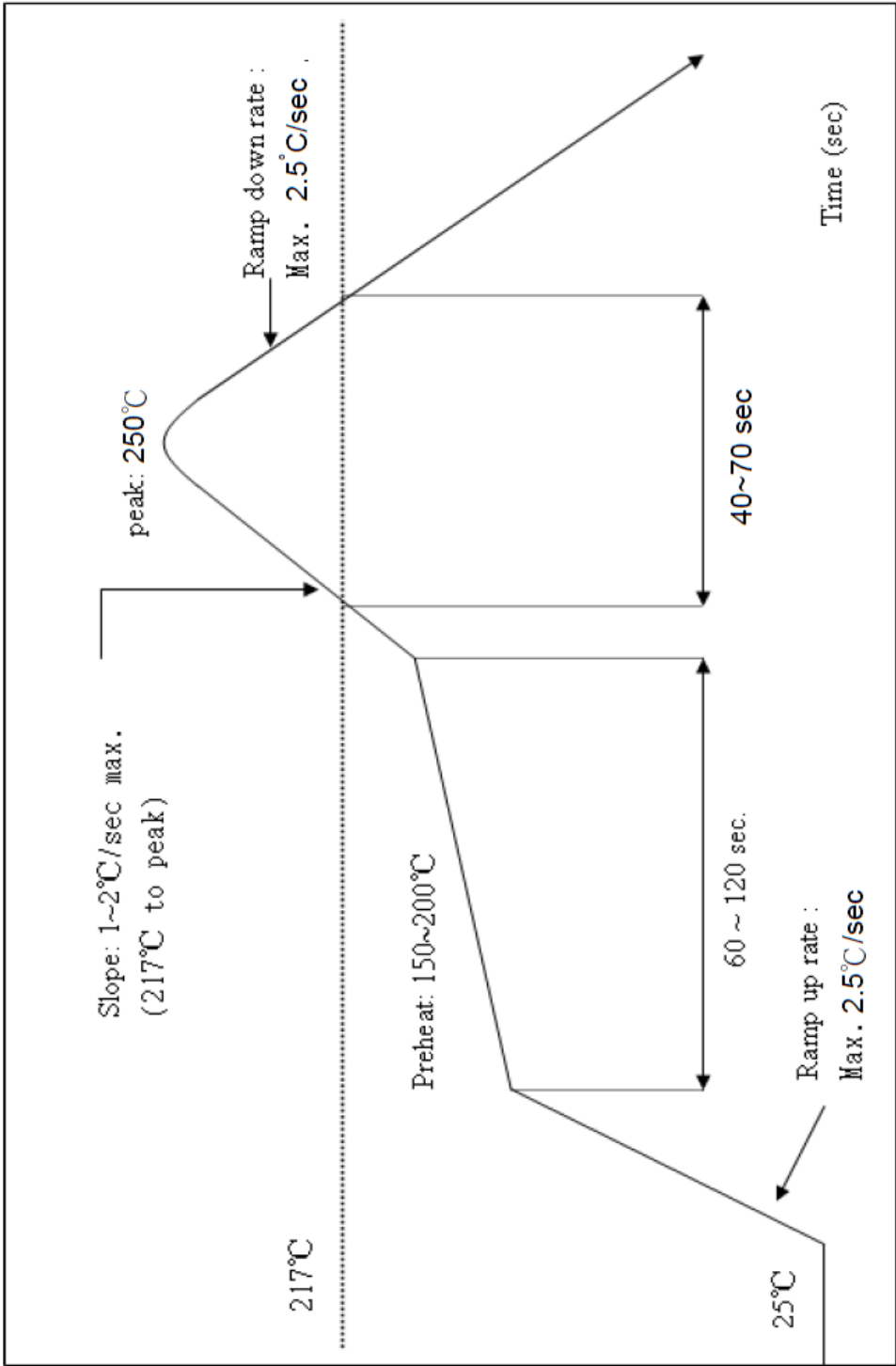
### 1) Inner Box

Note2) Recommendation: The time between opening and Chip Mount should be within 72 hours.

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18. Reflow Profile

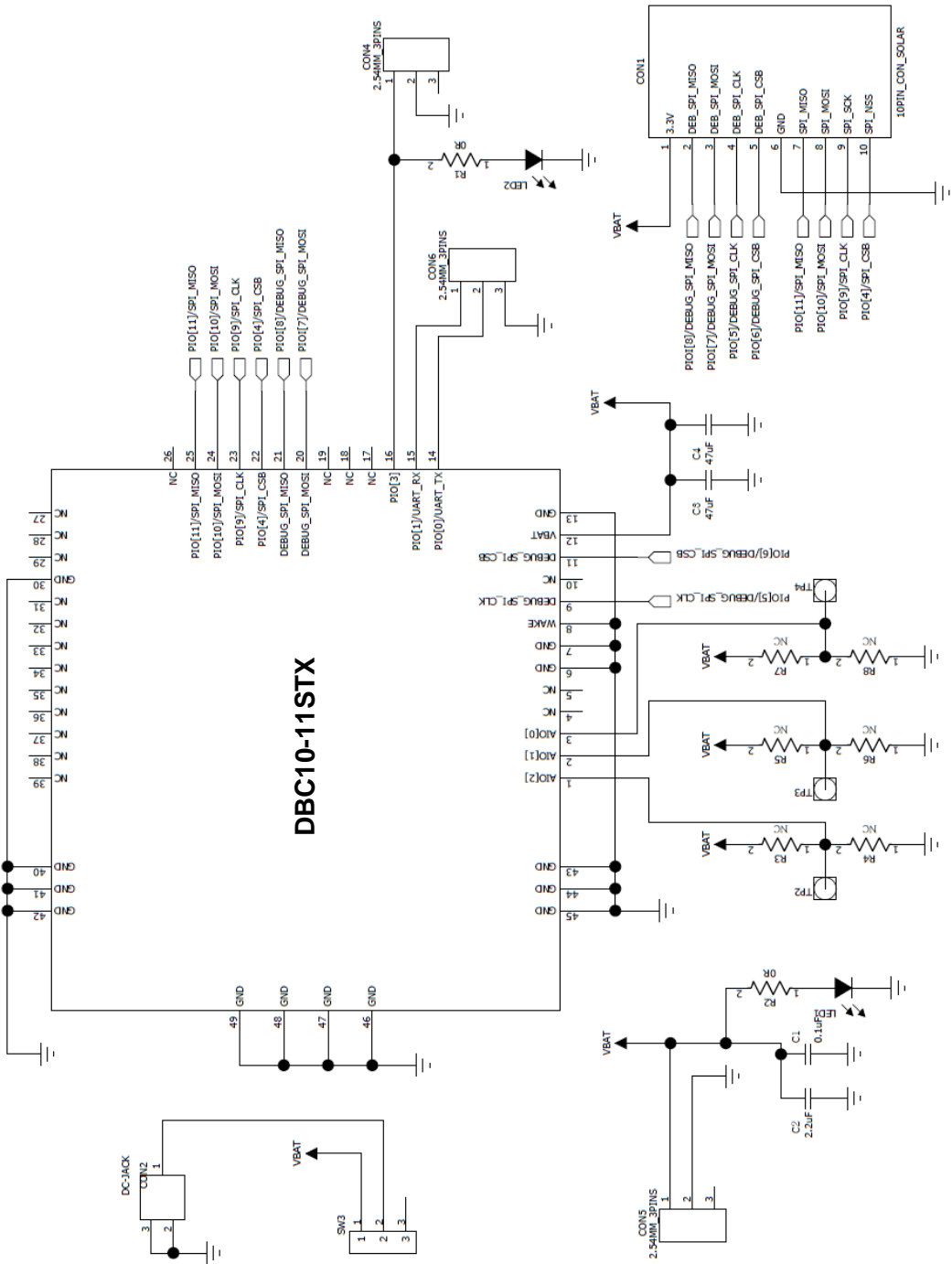
Referred to IPC/JEDEC standard.  
Peak Temperature : <250°C  
Number of Times : ≤2 times



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19. Application Circuit



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## 20.Odering Information

모델명	CHIPSET	메모리
DBC10-11ST0	CSR1010(CSR)	256Kb
DBC10-11ST1	CSR1010(CSR)	512Kb

