

**Special Feature**

Design technique of microcomputer/digital board in analog sense

**Check lists for making printed circuit board**

Introduction	Engineer support project ... editorial mission 3
<b>60</b>	: Support for making a board with proper operation
Prologue	Electronic parts in smaller size and semiconductors at lower voltage and higher speed
<b>63</b>	Make digital boards operate at once by using the check list
Chapter 1	Understand the behavior of high frequency wave to make sure
<b>64</b>	Wiring technology of digital signal
Chapter 2	Optimize the circuits' size, heat and so on
<b>76</b>	Pre-investigation of DC-DC convertor circuits
Chapter 3	From soldering of chip components to scissors and paste of wires
<b>84</b>	Make a prototype board and modify it with surface mount parts
Chapter 4	To prevent bad design and wiring
<b>97</b>	Fabrication and check of CAD data for PCB
Chapter 5	From how to write the components' list to specify the material of board
<b>104</b>	Documentation of instruction to smoothly proceed to subcontract prototype
Chapter 6	From the soldering status to power on
<b>111</b>	Appearance check of mounted PCB
Chapter 7	Measurement point and test items before evaluation
<b>116</b>	Power on and basic operation check
Appendix A	Oscilloscope to measure high speed signal
<b>123</b>	
Appendix B	Diagnose the short circuit under BGA package and no soldering by using JTAG mounting debugger
<b>128</b>	
Appendix C	Good prototype by using an universal board-Side open land connected wiring conductor
<b>131</b>	
Appendix D	Fabrication process of the mounted board is completed
<b>133</b>	

## Special project

No performance deterioration due to repeated discharge/charge and lower resistance than condenser  
**Next-generation charge-discharge device,  
 electric double layer capacitor**

Chapter 1	Use up 100% of capacity that looks large but actually small
140	Design of charging circuit, current bypass circuit and remaining amount detecting circuit
Chapter 2	Deterioration due to the size of current and repeated charge/discharge
150	Basic performance as charged element
Chapter 3	Leveling heavily variable charging current with capacitor
165	Application to power equilibrium circuit with no deterioration of battery for wind power device
Chapter 4	Intermediate characteristics between secondary battery and capacitor
177	Mechanism of storage and evolutionary process

## General description

193	Easy setup of frequency and duty ratio with digital switch Fabrication of square wave generator
182	Touch panel to detect a push strength by using the pressure sensor "HFD-500L" capable of measuring less than 10N in high accuracy Touch panel detect force level
196	Short memo for electronics Imagine the feeling of others from a brain wave at several tens $\mu\text{V}$

## Serialization

198	Introduction to digital filter without mathematical formula <10> Application to oversampling technology-Sample Rate Converter
208	CMOS analog circuit to the future <final> $\Delta\Sigma$ ADC with good antialiasing characteristics
213	Challenge to CMOS analog IC design <13> Simulation of OP amplifier IC circuits
222	Learn from one's mistakes <6> 12V on 5V ICs ?!
224	Electronics of the universe <3> Large radiation
226	Learn from an expert! Efforts to start a new business <3> Yellow Soft Co., Ltd.
228	Prescription for surge suppression Protect devices from impulse noise and lightning surge
230	Checkmate circuit <Answer to the question No.6> Amplifier satisfying DC offset and frequency range

231	Reader's Forum	232	Information	234	Next issue/Editorial voice
-----	----------------	-----	-------------	-----	----------------------------

CQ Publishing Co., Ltd.  
 1-14-2 Sugamo Toshima ward Tokyo,170-8461 JAPAN  
 Phone : Sales +81-3-5395-2141  
 Advertisement +81-3-5395-2131  
 Editorial +81-3-5395-2123  
 Postal Transfer : 00100-7-10665

Publisher : Sanae Mizoguchi  
 Editor-in-chief : Yuji Teramae  
 Copyright © 2010 by CQ Publishing Co., Ltd.  
 Issue : July 1st, 2010 (Monthly issued on the 1st day)  
 Joint to the Japan Audit Bureau of Circulations (ABC)  
 (Retail price is on the back cover )

Printing : Sanko Printing Co., Ltd. / Dainippon Printing Co., Ltd. /  
 Miwa Printing Co., Ltd. / Sankyo Graphics Co., Ltd. /  
 Kuni-media Co., Ltd.  
 Binding : Hoshino Binding Books Co., Ltd.  
 Printed in Japan

