

Table of Contents[®]

Chapter 1 Preface	1-1
1.1 NFC Development History	1-1
1.2 NFC Operating Modes	1-3
1.3 NFC Communications	1-4
1.4 Difference between NFC and RFID	1-5
1.5 NFC Features	1-6
1.6 NFC Applications	1-7
1.7 Other wireless communication technologies	1-9
1.8 Conclusion	1-10
Chapter 2 NFC Trainer	2-1
2.1 Course Introduction	2-1
2.2 Product Introduction	2-2
2.3 Software Installation	2-14
Part I: NFC Principle of Transmission	
Chapter 3 Electromagnetic Inductive Coupling Transmission	3-1
3.1 Objective	3-2
3.2 Experiment Principle	3-2
3.3 Experimental Equipment Layout	3-3
3.4 Experiment and Results	3-8
Experiment (1) Electromagnetic Inductive Coupling Transmission	3-8
Experiment (2) RF DC Converter	3-21
3.5 Conclusion	3-33
3.6 Extended Experiment	3-34
Chapter 4 Resonant Frequency Characteristics	4-1
4.1 Objective	4-2
4.2 Experiment Principle	4-2
4.3 Experimental Equipment Layout	4-3

4.4	Experiment and Results	4-7
	Experiment (3) Resonant Frequencies.....	4-7
	Experiment (4) Resonant Frequency Characteristics Curve	4-22
4.5	Conclusion.....	4-25
Chapter 5 Load Modulation		5-1
5.1	Objective.....	5-1
5.2	Experiment Principle	5-1
5.3	Experimental Equipment Layout	5-2
5.4	Experiment and Results	5-7
	Experiment (5) Resistive Load Modulation.....	5-7
	Experiment (6) Carrier Load Modulation	5-18
5.5	Conclusion.....	5-28
 Part II: NFC and Contactless Smart Cards		
Chapter 6 NFC ASK Modulation		6-1
6.1	Objective	6-2
6.2	Experiment Principle.....	6-2
6.3	Experimental Equipment Layout	6-3
6.4	Experiment and Results	6-8
	Experiment (7) NFC-A Signal Waveform Measurement.....	6-8
	Experiment (8) NFC-B/F Signal Waveform Measurement	6-19
6.5	Conclusion.....	6-29
 Chapter 7 NFC Data Rate		7-1
7.1	Objective	7-1
7.2	Experiment Principle	7-1
7.3	Experimental Equipment Layout	7-2
7.4	Experiment and Results	7-7
	Experiment (9) NFC-A Data Rate Experiment.....	7-7
	Experiment (10) NFC-B/F Data Rate Experiment	7-17
7.5	Conclusion.....	7-26

Chapter 8 NFC Read Card ID	8-1
8.1 Objective.....	8-3
8.2 Experiment Principle.....	8-3
8.3 Experimental Equipment Layout.....	8-4
8.4 Experiment and Results.....	8-9
Experiment (11) NFC-A Read ID	8-9
Experiment (12) NFC-F Read ID	8-19
8.5 Conclusion.....	8-29
8.6 Extended Experiment	8-31

Chapter 9 NFC Read / Write Data Block.....	9-1
9.1 Objective.....	9-3
9.2 Experiment Principle.....	9-3
9.3 Experimental Equipment layout.....	9-4
9.4 Experiment and Results.....	9-8
Experiment (13) Mifare S50 Card Read/Write Data Block.....	9-8
Experiment (14) Ultralight Card Read/Write Data Block.....	9-25
9.5 Conclusion.....	9-36

Part III: NFC Appliance Integration

Chapter 10 NFC Data Exchange Format	10-1
10.1 NDEF Message	10-1
10.2 NDEF Record	10-2
10.3 RTD Specifications	10-4
10.4 RTD Text Specifications.....	10-5
10.5 RTD URI specifications.....	10-6
10.6 RTD Smart Poster Specifications	10-7
10.7 Objective.....	10-9
10.8 Experiment Principle.....	10-9
10.9 Experimental Equipment Layout.....	10-10
10.10 Experiment and Results.....	10-14
Experiment (15) NFC Data Exchange Format.....	10-14
Experiment (16) NDEF vCard.....	10-38
10.11 Conclusion.....	10-49
10.12 Extended Experiment	10-49

Chapter 11 NFC P2P Appliance	11-1
11.1 NFC-DEP	11-1
11.2 Objective	11-2
11.3 Experiment Principle	11-2
11.4 Experimental Equipment Layout	11-2
11.5 Experiment and Results	11-7
Experiment (17) P2P Message Transmission	11-7
Experiment (18) P2P File Transmission	11-13
11.6 Conclusion.....	11-19

