

Page 1 of 21

TEST REPORT No.: 03001590

Date: 2003.05.20

EQUIPMENT UNDER TEST:

Trade Name: Siemens VDO
Model: Key 5WY 8404
Serial No: none Prototype
Equipment Category: Transmitter

Manufacturer: Siemens VDO Automotive AG

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RELEVANT STANDARD: 47 CFR Part 15C - Intentional Radiators

USED: ANSI C63.4-2002

#### TEST REPORT PREPARED

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Test Report: 03001590

Page 2 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# **CONTENTS**

1.4 Manufacturer		GENERAL INFORMATION	
1.3 Test Location			
1.4 Manufacturer			
1.5 Dates			
2 PRODUCT DESCRIPTION			
2.1 Equipment Under Test (EUT)       5.2         2.2 EUT Peripherals       5.2         2.4 Modifications Required for Compliance       5.2         4.1 Regulation       7.3         4.2 Result       7.5         5.8 ADIATED EMISSIONS       5.7         5.1 Regulation       5.7         5.2 Test Equipment       5.2         5.3 Test Procedures       6.5         5.4 Calculation of Field Strength Limits       11         5.5 Calculation of Average Correction Factor       11         5.6 Field Strength Calculation       16         5.7 Test Results       17         6.1 Regulation       16         6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7.1 Sets Procedures       15         6.4 Test Results       15         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.1.2 Result       14         7.1.3 Regulation       15         7.2.4 Regulation       16         7.2.5 Result       11         7.3 Automatically Operated Transmitter Deactivation       15         7.2.1 Regulation       15			
2.1 Equipment Under Test (EUT)       9.2 EUT Peripherals         2.2 EUT Peripherals       9.2         4.1 Regulation       9.2         4.2 Result       9.2         5.2 Result       9.2         5.3 Result Strength Calculation       9.2         5.4 Calculation of Field Strength Limits       9.3         5.4 Calculation of Field Strength Limits       9.3         5.5 Calculation of Average Correction Factor       9.3         5.6 Field Strength Calculation       9.3         5.7 Test Results       9.3         5.7.1 Model Key SWY 8404       9.3         6 CONDUCTED EMISSIONS TESTS       9.3         6.1 Regulation       9.3         6.2 Test Equipment       9.3         6.3 Test Procedures       9.3         6.4 Test Results       9.3         7 PERIODIC OPERATION CHARACTERISTICS       9.3         7.1 Regulation       9.3         7.2.1 Regulation       9.3         7.2.2 Result       9.3         7.3 Automatically Operated Transmitter Deactivation       9.3         7.4.1 Regulation       9.4         7.4.2 Result       9.3         7.4.3 Regulation       9.3         7.4.4 Regulation       9.3         7.5.	2	PRODUCT DESCRIPTION	5
2.4 Modifications Required for Compliance       5.4         4. ANTENNA REQUIREMENT       7.         4. 1. Regulation       7.         4. 2. Result       7.         5. RADIATED EMISSIONS       9.         5. 1. Regulation       5.         5. 2. Test Equipment       5.         5. 3. Test Procedures       9.         5. 4. Calculation of Average Correction Factor       11         5. 5. Calculation of Average Correction Factor       11         5. 7. Test Results       11         5. 7. Test Results       11         6. CONDUCTED EMISSIONS TESTS       11         6. 1. Regulation       1.         6. 2 Test Equipment       1.         6. 3 Test Procedures       1.         6. 4 Test Results       1.         7 PERIODIC OPERATION CHARACTERISTICS       14         7. 1. Periodic Operation       14         7. 1. Regulation       14         7. 1. Regulation       14         7. 2. Result       14         7. 2. Regulation       14         7. 3. 1 Regulation       14         7. 4. 1 Regulation       15         7. 4. 1 Regulation       15         7. 4. 1 Regulation       15		1 Equipment Under Test (EUT)	5
4.1 Regulation	2.2	2 EUT Peripherals	5
4.1 Regulation	2.4	4 Modifications Required for Compliance	5
4.1 Regulation	4 A	NTENNA REQUIREMENT	7
4.2 Result 5. RADIATED EMISSIONS 5.1 Regulation 5.2 Test Equipment 5.3 Test Procedures 5.4 Calculation of Field Strength Limits 5.5 Calculation of Field Strength Limits 5.6 Field Strength Calculation 5.7 Test Results 5.7.1 Model Key 5WY 8404 6 CONDUCTED EMISSIONS TESTS 6.1 Regulation 6.2 Test Equipment 6.3 Test Procedures 6.1 Test Results 7.1 Periodic Operation 7.1 Periodic Operation 7.1 Regulation 7.2 Result 7.3 Automatically Operated Transmitter Deactivation 7.3 Regulation 7.4 Prohibition of Periodic Transmission 1.7 Regulation 7.5 Regulation 1.7 Regulation 7.7 Regulation 1.7 Regula	4.1	1 Regulation	7
5 RADIATED EMISSIONS          5.1 Regulation          5.2 Test Equipment          5.3 Test Procedures          5.4 Calculation of Field Strength Limits          5.5 Calculation of Average Correction Factor          1.5 Field Strength Calculation          5.7 Test Results          5.7.1 Model Key 5WY 8404          6.1 Regulation          6.2 Test Equipment          6.3 Test Procedures          6.4 Test Results          7 PERIODIC OPERATION CHARACTERISTICS          7.1.1 Regulation          7.1.2 Result          7.1.2 Result          7.2.2 Result          7.3 Automatically Operated Transmitter Deactivation          7.3.1 Regulation          7.3.2 Result          7.4 Prohibition of Periodic Transmission          7.4.2 Result          7.4.3 Regulation          7.4.4 Regulation          7.5.7 Regulation          7.5.8 Result       <			
5.1 Regulation       5.2 Test Equipment         5.2 Test Procedures       5.3 Test Procedures         5.4 Calculation of Field Strength Limits       11         5.5 Calculation of Average Correction Factor       11         5.6 Field Strength Calculation       16         5.7 Test Results       1         5.7.1 Model Key SWY 8404       11         6 CONDUCTED EMISSIONS TESTS       12         6.1 Regulation       11         6.2 Test Equipment       11         6.3 Test Procedures       11         6.4 Test Results       11         7 PERIODIC OPERATION CHARACTERISTICS       12         7.1.1 Regulation       14         7.1.2 Result       14         7.2 Regulation       14         7.2.1 Regulation       14         7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4.1 Regulation       15         7.3.2 Result       15         7.4.4 Regulation       15         7.5.2 Result       15         7.5.4 Regulation       16         7.5.2 Result       16         8.	5 RA	ADIATED EMISSIONS	8
5.2 Test Equipment			
5.3 Test Procedures       15         5.4 Calculation of Field Strength Limits       16         5.5 Calculation of Average Correction Factor       11         5.6 Field Strength Calculation       11         5.7 Test Results       11         5.7.1 Model Key 5WY 8404       11         6 CONDUCTED EMISSIONS TESTS       12         6.1 Regulation       15         6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.2 Result       14         7.1.2 Result       14         7.2 Regulation       14         7.2 Regulation       14         7.3 Automatically Operated Transmitter Deactivation       14         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Regulation       15         7.4.2 Regulation       16         7.5.1 Regulation       16         7.5.2 Result       16         7.5.2 Result       16         7.5.3 Regulation       16         7.5.4 Regulation       16         7.5.2 Result <t< td=""><td></td><td></td><td></td></t<>			
5.4 Calculation of Field Strength Limits.       11         5.5 Calculation of Average Correction Factor       16         5.6 Field Strength Calculation       16         5.7 Test Results.       11         5.7.1 Model Key SWY 8404.       11         6 CONDUCTED EMISSIONS TESTS       13         6.1 Regulation       15         6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.1.2 Result       14         7.2 Manually Operated Transmitter Deactivation       14         7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       14         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.5.2 Result       15         7.5.1 Regulation       16         7.5.2 Result       16         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.2 Test Resu			
5.5 Calculation of Average Correction Factor       11         5.6 Field Strength Calculation       10         5.7 Test Results       11         5.7.1 Model Key SWY 8404       11         6 CONDUCTED EMISSIONS TESTS       12         6.1 Regulation       13         6.2 Test Equipment       11         6.3 Test Procedures       11         6.4 Test Results       13         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.1.2 Result       14         7.2.1 Regulation       14         7.2.2 Result       14         7.3.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5.2 Result       15         8.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       15         7.5.2 Result       16         8.3 Test Equipment       16         8.4 Test Procedure       <			
5.6 Field Strength Calculation       11         5.7 Test Results       11         5.7.1 Model Key SWY 8404       11         6 CONDUCTED EMISSIONS TESTS       12         6.1 Regulation       15         6.2 Test Equipment       11         6.3 Test Procedures       13         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1.1 Regulation       14         7.1.2 Result       14         7.2.1 Regulation       14         7.2.1 Regulation       14         7.3 Automatically Operated Transmitter Deactivation       14         7.3.1 Regulation       15         7.3.1 Regulation       15         7.4.1 Regulation       15         7.4.2 Result       15         7.4.1 Regulation       16         7.5.1 Regulation       16         7.5.2 Result       16         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5 Test Result       16         8.5 Test Result       16	5.5	5 Calculation of Average Correction Factor	. 10
5.7       Test Results.       11         5.7.1       Model Key 5WY 8404       11         6 CONDUCTED EMISSIONS TESTS       13         6.1 Regulation       15         6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.1.2 Result       14         7.2 Result       14         7.2.1 Regulation       14         7.2.2 Result       14         7.3.1 Regulation       15         7.3.2 Result       15         7.4.1 Regulation       15         7.4.2 Result       15         7.4.3 Regulation of Periodic Transmission       16         7.4.2 Result       15         7.5.2 Result       15         7.5.3 Regulation       16         7.5.4 Regulation       16         7.5.5 Result       16         8.5 Test Result       16         8.5 Test Result       16         8.5 Test Result       16         8.5 Test Result       16         8.5.1 Model Key 5	5.6	6 Field Strength Calculation	. 10
6 CONDUCTED EMISSIONS TESTS       13         6.1 Regulation       15         6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.1.2 Result       14         7.2 Manually Operated Transmitter Deactivation       14         7.2.1 Regulation       14         7.3.2 Result       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4.1 Regulation       16         7.4.2 Result       15         7.5.2 Result       15         7.5.2 Result       15         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16	5.7		
6.1 Regulation       13         6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.1.2 Result       14         7.2 Manually Operated Transmitter Deactivation       14         7.2.1 Regulation       14         7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       16         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       16         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.1 Test Equipment       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       19         9.2 Conducted Emission Tests       15	į.	5.7.1 Model Key 5WY 8404	. 11
6.2 Test Equipment       15         6.3 Test Procedures       15         6.4 Test Results       15         7 PERIODIC OPERATION CHARACTERISTICS         14       7.1 Periodic Operation         7.1.1 Regulation       14         7.1.2 Result       14         7.2 Manually Operated Transmitter Deactivation       14         7.2.1 Regulation       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.2 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Emissions Tests       19         9.1.2 Photograph: EUT in vertical polarization on the turntable       19         9.2 Conducted Emission Tests       15 <td>6 C(</td> <td>ONDUCTED EMISSIONS TESTS</td> <td>.13</td>	6 C(	ONDUCTED EMISSIONS TESTS	.13
6.3 Test Procedures       13         6.4 Test Results       13         7 PERIODIC OPERATION CHARACTERISTICS       14         7.1 Periodic Operation       14         7.1.1 Regulation       14         7.2.2 Result       14         7.2.1 Regulation       14         7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       15         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       16         9.1 Radiated Emissions Tests       16         9.1.2 Photograph: EUT in vertical polarization on the turntable       17         9.1 Conducted Emission Tests       15	6.1	1 Regulation	. 13
6.4 Test Results	6.2	2 Test Equipment	. 13
7 PERIODIC OPERATION CHARACTERISTICS.       14         7.1 Periodic Operation.       14         7.1.1 Regulation.       14         7.2 Result.       14         7.2 Manually Operated Transmitter Deactivation.       14         7.2.1 Regulation.       14         7.3 Automatically Operated Transmitter Deactivation.       15         7.3.1 Regulation.       15         7.3.2 Result.       15         7.4 Prohibition of Periodic Transmission.       15         7.4.1 Regulation.       15         7.4.2 Result.       15         7.5 Continuous Transmission During an Alarm Condition.       15         7.5.1 Regulation.       16         7.5.2 Result.       15         8.1 Regulation.       16         8.2 Calculation of 20 dB Bandwidth Limit.       16         8.3 Test Equipment.       16         8.5 Test Result.       16         8.7 Potocedure.       16 </td <td>6.3</td> <td>3 Test Procedures</td> <td>. 13</td>	6.3	3 Test Procedures	. 13
7.1 Periodic Operation       14         7.1.1 Regulation       12         7.1.2 Result       14         7.2 Manually Operated Transmitter Deactivation       14         7.2.1 Regulation       14         7.3.2 Result       14         7.3.1 Regulation       15         7.3.2 Result       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       15         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       16         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19	6.4	4 Test Results	. 13
7.1.1 Regulation       14         7.1.2 Result       12         7.2 Manually Operated Transmitter Deactivation       14         7.2.1 Regulation       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.2 Result       15         8.1 Regulation       15         8.2 Calculation of 20 dB Bandwidth Limit       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Emissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19	<b>7 PE</b>	ERIODIC OPERATION CHARACTERISTICS	.14
7.1.2 Result       14         7.2 Manually Operated Transmitter Deactivation       12         7.2.1 Regulation       14         7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       16         8.1 Regulation of 20 dB Bandwidth Limit       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19	7.1	1 Periodic Operation	. 14
7.2 Manually Operated Transmitter Deactivation       14         7.2.1 Regulation       12         7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.2 Result       15         8.1 Regulation       15         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5 Test Result       16         8.5 Test Result       16         9 PHOTOGRAPHS OF THE TEST SETUP       16         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19	-	7.1.1 Regulation	. 14
7.2.1 Regulation       14         7.2.2 Result       12         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation of 20 dB Bandwidth Limit       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       15         9.2 Conducted Emission Tests       15			
7.2.2 Result       14         7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Emissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19	7.2	2 Manually Operated Transmitter Deactivation	. 14
7.3 Automatically Operated Transmitter Deactivation       15         7.3.1 Regulation       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
7.3.1 Regulation       15         7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       16         9.1 Radiated Ernissions Tests       16         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
7.3.2 Result       15         7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
7.4 Prohibition of Periodic Transmission       15         7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       18			
7.4.1 Regulation       15         7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
7.4.2 Result       15         7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
7.5 Continuous Transmission During an Alarm Condition       15         7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
7.5.1 Regulation       15         7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19	7.5	7.4.2 Result	. 15
7.5.2 Result       15         8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
8.1 Regulation       16         8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
8.2 Calculation of 20 dB Bandwidth Limit       16         8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
8.3 Test Equipment       16         8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
8.4 Test Procedure       16         8.5 Test Result       16         8.5.1 Model Key 5WY 8404       16         9 PHOTOGRAPHS OF THE TEST SETUP       18         9.1 Radiated Ernissions Tests       18         9.1.2 Photograph: EUT in vertical polarization on the turntable       18         9.2 Conducted Emission Tests       19			
8.5 Test Result		· ·	
8.5.1 Model Key 5WY 8404			
9 PHOTOGRAPHS OF THE TEST SETUP			
9.1 Radiated Ernissions Tests		9 PHOTOGRAPHS OF THE TEST SETUP	. 18
9.1.2 Photograph: EUT in vertical polarization on the turntable			
9.2 Conducted Emission Tests19			
	10		



Test Report : 03001590

Page 3 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

11 LIST OF ANNEXES.....21



Test Report: 03001590

Page 4 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

## 1 GENERAL INFORMATION

# 1.1 Purpose

The purpose of this report is to show compliance to the FCC regulations for unlicensed devices operating under section 15.231 of the Code of Federal Regulations title 47.

## 1.2 Limits and Reservations

The test results in this report apply only to the particular Equipment Under Test (EUT) as declared in this report. This test report shall not be reproduced except in full without the written permission of m.dudde hochfrequenz-technik.

### 1.3 Test Location

Company Name: m.dudde high frequency technology

Street: Rottland 5a

City: 51429 Bergisch Gladbach

Country: Germany

Laboratory:

FCC Registration Number: 699717

This site has been fully described in a report submitted to the FCC, and

accepted in the letter dated Registration Number 699717.

Phone: +49-2207-9689-0 Fax: +49-2207-9689-20

Mail: manfred.dudde@t-online.de Web: http://www.dudde.com

### 1.4 Manufacturer

Company Name: Siemens VDO Automotive AG

Street: Siemensstraße 12 City: D-93055 Regensburg

Country: Germany

Name for contact purposes: Regina Quegwer

Phone: +49-941-790-3554 Fax: +49-941-790-133554

Mail: regina.quegwer@siemens.com

1.5 Dates

Date of receipt of EUT: 2003 May 09 Test date: 2003 May 15 - 16



Test Report: 03001590

Page 5 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

### 2 PRODUCT DESCRIPTION

# 2.1 Equipment Under Test (EUT)

Device: Transmitter
Trade Name: Siemens VDO
Model: Key 5WY 8404
Serial Number: none (Prototype)
FCC ID: KR55WY8404

Power: 3V DC
Transmit Frequency: 315 MHz
Type of modulation: ASK
Interface: none

Variants:

Highest frequency generated or used

in the device: Ceramic Resonator 315MHz

# 2.2 EUT Peripherals

The EUT were tested as stand-alone device.

# 2.3 Mode of Operation During Testing

The transmitter were tested in a typical fashion. During preliminary emission tests all 4 transmitter codes activated by the 4 different buttons ("Lock", "Release", "Tailgate remote release" and "Panic") were investigated for worst case emission mode. Pressing the "Lock" button was found to be the worst case emission mode. Therefore, final qualification testing was completed with transmitters activated with the "Lock" button.

## 2.4 Modifications Required for Compliance

None.

### **3 TEST RESULTS SUMMARY**

Summary of Test Results Transmitter

Requirement Antenna Requirement	CFR Section 15.203	Report Section 4	Test Result Pass
Radiated Spurious Emissions	15.209, 15.205(b)	5	Pass
Conducted Emissions	15.207	6	*
Periodic Operation Characteristics	15.231 (a)	7	Pass
Field Strength Limits (Fundamental)	15.231 (b)	5	Pass
20 dB Bandwidth * Not required, the EUT is battery powered	15.231 (c) I.	9	Pass



Test Report: 03001590 Page 6 of 21

Issue Date: 20.05.2003 EUT: **Kev 5WY 8404** 

The client has made the determination that EUT Condition, Characterization, and Mode of Operation are representative of production units, and meet the requirem'ents of the specifications referenced herein.

Consistent with Industry practice, measurement and test equipment not directly involved in obtaining measurement results but having an impact on measurements (such as cable loss, antenna factors, etc.) are factored into the "Correction Factor" documented in certain test results. Instrumentation employed for testing meets tolerances consistent with known Industry Standards and Regulations.

The measurements contained in this report were made in accordance with the procedure ANSI C63.4 1992 and all applicable Public Notices received prior to the date of testing. All emissions from the device were found to be within the limits outlined in this report. The test results in this report apply only to the particular Equipment Under Test (EUT) as declared in this report.

Test Personnel: Ralf Trepper Issuance Date: 2003 May 20



Test Report: 03001590 Page 7 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# **4 ANTENNA REQUIREMENT**

Test Requirement: FCC CFR47, Part 15C

## 4.1 Regulation

15.203 An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of Part 15C. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31 (d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### 4.2 Result

Device: Remote Control (RF) for Car Locking / Unlocking

Transmitter Model: Key 5WY 8404

Antenna is a trace on the PCB.

The EUT meets the requirements of this section.



Test Report: 03001590 Page 8 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

### **5 RADIATED EMISSIONS**

Test Requirement: FCC CFR47, Part 15C Test Procedure: ANSI C63.4:1992

## 5.1 Regulation

15.231 (b) In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency	Field Strength of Fundamental	Field Strength of Spurious Emissions
(MHz)	(microvolts/meter)	(microvolts/meter)
40.66 - 40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

<sup>\*\*</sup> Linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz,  $\mu$ V/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz,  $\mu$ V/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

- (1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.
- (2) Intentional radiators operating under the provisions of this Section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in Section 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of Section 15.205 shall be demonstrated using the measurement instrumentation specified in that section.
- (3) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits a higher field strength

Section 15.33 Frequency range of radiated measurements: (a) Unless otherwise noted in the specific rule section under which the equipment operates for an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph: (1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.



Test Report: 03001590 Page 9 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# 5.2 Test Equipment

Type	Manufacturer/	Serial No.	Last Calibration	Next Calibration
	Model No.			
Receiver	Hewlett Packard	3528U00990	2002/02	2004/02
	Spectrum Analyzer			
(9 kHz –26.5 GHz)	8593E (171)			
Pre Amplifier	Hewlett Packard	1726A00705	2002/04	2006/04
(100kHz - 1.3GHz)	8447 E (166a)			
Bilog Antenna	CHASE	1517	2002/04	2008/04
(30- 1000 MHz)	CBL611A (167)			
Hornantenna	Schwarzbeck	236	1998/01	2008/01
(0,86-8,5 GHz)	BBHA 9120 A (284)			

### **5.3 Test Procedures**

For tabletop equipment, the EUT is placed on a 1 meter by 1.5 meters wide and 0.8 meter high nonconductive table that sits on a flush mounted metal turntable. Floor standing equipment is placed directly on the flush mounted metal turntable [Remark: Not applicable]. The EUT is connected to its associated peripherals with any excess I/0 cabling bundled to approximately 1 meter [Remark: Not applicable].

Preview tests are performed to determine the "worst case" mode of operation. With the EUT operating in "worst case" mode, emissions from the unit are maximized by adjusting the polarization and height of the receive antenna and rotating the EUT on the turntable. Manipulating the system cables also maximizes EUT emissions [Remark.Not applicable]. All tests performed with the EUT placed in two polarizations on the nonconductive table: horizontal and vertical. Refer to the photographs'section.

<b>Radiated Emissions Test Characteristics</b>	
Frequency range	30 MHz - 4,000 MHz
Test distance	3 m*
Test instrumentation resolution bandwidth	120 kHz (30 MHz - 1,000 MHz)
	1 MHz (1000 MHz - 4,000 MHz)
Receive antenna scan height	1 m - 4 m
Receive antenna polarization	Vertical/Horizontal

<sup>\*</sup> According to Section 15.31 (f)(1): At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).



Test Report: 03001590 Page 10 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# 5.4 Calculation of Field Strength Limits

Fundamental field strength limits for the band 260 - 470 MHz:  $\mu$ V/m at 3 meters = 41.6667(F[MHz]) - 7083.3333 = 41.6667\* 315 - 7083.3333 = 6,041.68 6,041.68  $\mu$ V/m corresponds with 75.6 dB $\mu$ V/m. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level, i.e. 55.6 dB $\mu$ V/m.

## 5.5 Calculation of Average Correction Factor

The average correction factor is computed by analyzing the "worst case" on time in any 100 msec time period and using the formula: Corrections Factor (c113) + 20\*Iog (worst case on time/100 msec) Analysis of the remote transmitter worst case on time in any 100 msec time period is an on time of 50 msec, therefor the correction factor is 20\*Iog (50/100) = -6 dB. The maximum correction factor to be applied is 20 dB per section 15.35 of the FCC rules. The relationship between average and peak mode reading has been confirmed also by direct measurement using the receiver's average and peak detectors. All emission measurements performed using the test receiver's average detector and the max. hold facility; i. e. the average value measured directly without the necessity of additional correction factor.

## 5.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor. The basic equation with a sample calculation is as follows:

FS=RA+ AF+CF where FS Field Strength in  $dB\mu V/m$  RA Receiver Amplitude in  $dB\mu V$  AF Antenna Factor in dB(1/m) CF Cable Attenuation Factor in dB

Assume a receiver reading of 23.5 dB $\mu$ V is obtained. The Antenna Factor of 7.4 dB(1/m) and a Cable Factor of 1.1 dB are added, giving a field strength of 32 dB $\mu$ V/m. The 32 dB $\mu$ V/m value can be mathematically converted to its corresponding level in  $\mu$ V/m.

$$FS = 23.5 + 7.4 + 1.1 = 32 [dB\mu V/m]$$

Level in  $\mu V/m = Common Antilogarithm (32/20) = 39.8$ 

For test distance other than what is specified, but fulfilling the requirements of Section 15.31 (f)(1) the field strength is calculated by adding additionally an extrapolation factor of 20 dB/decade (inverse lineardistance for field strength measurements). The basic equation with a sample calculation is as follows:

 $FS=RA+AF+CF+DF \text{ or } FS=RA+AF+CF+DF-PA \quad \{(100kHz-1,000MHz)(PA \text{ amplify Factor}=22dB)\}$  where

FS Field Strength in dBµV/m

**RA** Receiver Amplitude in dB $\mu$ V **AF** Antenna Factor in dB(1/m) **CF** Cable Attenuation Factor in dB **DF** Distance Extrapolation Factor in dB **PA** Linear Pre Amplifier amplify Factor in dB, where DF = 20 log (Dtest/Dspec) where Dtest = Test Distance and Dspec = Specified Distance



Test Report: 03001590 Page 11 of 21

Issue Date: 20.05.2003 EUT: Key 5WY 8404

Assume the tests performed at a reduced Test Distance of 1,5 m instead of the Specified Distance of 3 m giving a Distance Extrapolation Factor of DF = 20 log(1,5m/3m) = -6 dB. Assuming a receiver reading of 23.5 dBμV is obtained. The Antenna Factor of 7.4 dB(1/m), the Cable Factor of 1.1 dB and the Distance Factor of -6 dB are added, giving a field strength of 26 dBµV/m. The 26 dBµV/m value can be mathematically converted to its corresponding level in  $\mu V/m$ .

$$FS = 23.5 + 7.4 + 1.1 - 6 = 26 [dB\mu V/m]$$

Level in  $\mu V/m = Common Antilogarithm (26/20) = 20$ 

#### 5.7 **Test Results**

#### 5.7.1 **Model Key 5WY 8404**

	PRODUCT EMISSIONS PEAK DATA 15.231 BANDS										
No	Emission	Receiver	Test	Receiver	Correction	Distance	Result =	Spec	Antenna	Polarization	Margin
	Frequency	Mode and	Distance	Reading	Factor	Extrapola-	Corrected	Limit	Height	Eut/Ant	
		Bandwidth		RA	AF+CF (-PA* <sup>4</sup> )	tion Factor DF	Reading FS				
	[MHz]	[kHz]	[m]	[dBµV]	[dB(1/m)]	[dB]	[dBµV/m]	[dBµV/m]	[m]		[dB]
1	315.0854	120, <i>QPK</i>	3	76.57	-8.35	0	68.22	75.6	180	V / V	7.36
		120, AV	3	76.25	-8.35	0	67.90	75.6	180	V/H	7.70
2	630.1708	120, <i>QPK</i>	3	54.07	-2.86	0	51.21	55.6	200	V/H	4.39
		120, AV	3	53.84	-2.86	0	50.98	55.6	200	V/H	4.62
3	945.2562	120, <i>QPK</i>	3	32.27	+2.30	0	34.57	55.6	380	V/H	21.03
		120, AV	3	32.00	+2.30	0	34.30	55.6	380	V/H	21.30
4	1,260.3416	1000, AV	3	< 10	+24.35	0	34.35* <sup>2</sup>	55.6	100-400	H, V/H, V	21.25
5	1,575.4270	1000, AV	3	< 10	+25.63	0	35.63* <sup>2</sup>	55.6	100-400	H, V/H, V	19.97
6	1,890.5124	1000, AV	3	< 10	+26.57	0	36.57* <sup>2</sup>	55.6	100-400	H, V/H, V	19.03
7	2,205.5978	1000, AV	3	< 17	+27.27	0	44.27* <sup>3</sup>	54.0	100-400	H, V/H, V	9.73
8	2,520.6832	1000, AV	3	< 17	+27.82	0	44.82* <sup>3</sup>	55.6	100-400	H, V/H, V	10.78
9	2,835.7686	1000, AV	3	< 17	+28.07	0	45.07* <sup>3</sup>	54.0	100-400	H, V/H, V	8.93
10	3,150.8540	1000, AV	3	< 17	+28.59	0	45.59* <sup>3</sup>	55.6	100-400	H, V/H, V	10.01
11	3,465.9394	1000, AV	3	< 17	+29.41	0	46.41* <sup>3</sup>	55.6	100-400	H, V/H, V	9.19

Remark: \*\(^1\) noise floor noise level of the measuring instrument  $\leq 6.5 dB\mu V$  @ 3m distance (30 - 1,000 MHz) Remark: \*\(^2\) noise floor noise level of the measuring instrument  $\leq 10 dB\mu V$  @ 3m distance (1,000 - 2,000 MHz)

Remark: \*3 noise floor noise level of the measuring instrument  $\leq 17 \text{ dBuV} \ \widehat{\omega} \ 3\text{m} \ \text{distance} \ (2,000 - 5,500 \ \text{MHz})$ 

Remark: \*4 for using an Pre Amplifier in the range between 100kHz and 1,000MHz



Test Report: 03001590

Page 12 of 21

Issue Date: 20.05.2003 EUT: Key 5WY 8404

	PRODUCT EMISSIONS PEAK DATA 15.205 BANDS										
No	Emission	Receiver	Test	Receiver	Correction	Distance	Result =	Spec	Antenna	Polarization	Margin
	Frequency	Mode and	Distance	Reading	Factor	Extrapola-	Con-ected	Limit	Height	Eut/Ant	
		Bandwidth		RA	AF+CF	tion Factor	Reading				
					(-PA*4)	DF	FS				
	[MHz]	[kHz]	[m]	[dBµV]	[dB(1/m)]	[dB]	$[dB\mu V/m]$	$[dB\mu V/m]$	[cm]		[dB]
1	30	QP, 120	3	< 6.5	-3.45	0	3.05* <sup>1</sup>	40.0	100-400	V, H/V, H	36.95
2	88	QP, 120	3	< 6.5	-12.86	0	-6.36* <sup>1</sup>	40.0	100-400	V, H/V, H	46.36
3	216	QP, 120	3	< 6.5	-12.71	0	-6.21* <sup>1</sup>	43.5	100-400	V, H/V, H	49.71
4	960	QP, 120	3	< 6.5	+2.70	0	9.70* <sup>1</sup>	46.0	100-400	V, H/V, H	55.70
5	1000	AV, 1000	3	< 10	+2.93	0	12.93* <sup>2</sup>	54.0	100-400	V, H/V, H	33.61
6	1500	AV, 1000	3	< 10	+25.40	0	35.40* <sup>2</sup>	54.0	100-400	V, H/V, H	18.60
7	2000	AV, 1000	3	< 10	+26,90	0	36.90* <sup>2</sup>	54.0	100-400	V, H/V, H	17.10
	In this band no emissions detected										

Remark: \*\(^1\) noise floor noise level of the measuring instrument \(^2\) 6.5dB\(\mu\V\) @ 3m distance (30 - 1000 MHz) Remark: \*\(^2\) noise floor noise level of the measuring instrument \(^2\) 10 dB\(\mu\V\) @ 3m distance (1000 - 2000 MHz) Remark: \* $^3$  noise floor noise level of the measuring instrument  $\leq$  17 dB $\mu$ V @ 3m distance (2000 – 5500 MHz) Remark: \* $^4$  for using an Pre Amplifier in the range between 100kHz and 1,000MHz

# The EUT meets the requirements of this section.

Ralf Trepper Test Personnel: 2003 February 14 Issuance Date:



Test Report: 03001590 Page 13 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

### 6 CONDUCTED EMISSIONS TESTS

Test Requirement: FCC CFR47, Part 15C Test Procedure: ANSI C63.4:1992

# 6.1 Regulation

Section 15.207 (a) For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line

and ground at the power terminals.

Section 15.207 (d) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which-do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or

battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the

conducted limits.

### **6.2 Test Equipment**

Not applicable.

### **6.3 Test Procedures**

Not applicable.

#### **6.4 Test Results**

Device: Remote Control (RF) for Car Locking / Unlocking Transmitter Model: Key 5WY 8404

The EUT is battery powered only. Therefore - according to Section 15.207

(d) - conducted emissions measurements to demonstrate compliance with the conducted limits are not required.



Test Report: 03001590 Page 14 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

## 7 PERIODIC OPERATION CHARACTERISTICS

Test Requirement: FCC CFR47, Part 15C

## 7.1 Periodic Operation

## 7.1.1 Regulation

15.231 (a) The provisions of this Section are restricted to periodic operation within the band 40.66 40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

## **7.1.2 Result**

Device: Remote Control (RF) for Car Locking / Unlocking

Transmitter Model: Key 5WY 8404

The EUT meets the requirements of this section.

## 7.2 Manually Operated Transmitter Deactivation

## 7.2.1 Regulation

15.231 (a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

### **7.2.2 Result**

Device: Remote Control (RF) for Car Locking / Unlocking

Transmitter Model: Key 5WY 8404

Transmitter ceases immediately after being released.

The EUT meets the requirements of this section.



Test Report: 03001590 Page 15 of 21

Issue Date: 20.05.2003 EUT: **Kev 5WY 8404** 

# 7.3 Automatically Operated Transmitter Deactivation

# 7.3.1 Regulation

15.231 (a2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

#### **7.3.2** Result

Device: Remote Control (RF) for Car Locking / Unlocking

Transmitter Model: Key 5WY 8404

The EUT does not have automatic transmission.

### 7.4 Prohibition of Periodic Transmission

## 7.4.1 Regulation

15.231 (a3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter

#### **7.4.2 Result**

Device: Remote Control (RF) for Car Locking / Unlocking

Transmitter Model: Key 5WY 8404

The EUT does not employ periodic transmission.

## 7.5 Continuous Transmission During an Alarm Condition

## 7.5.1 Regulation

15.231 (a4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

#### **7.5.2 Result**

Device: Remote Control (RF) for Car Locking / Unlocking

Transmitter Model: Key 5WY 8404

This section is not applicable to the EUT.



Test Report: 03001590 Page 16 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

#### **8 BANDWIDTH**

Test Requirement: FCC CFR47, Part 15C

Test Procedure: ANSI C63.4:1992 Section 13.1.7

## 8.1 Regulation

15.231 (c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

#### 8.2 Calculation of 20 dB Bandwidth Limit

The 20 dB bandwidth limit = 0.0025 \* 315 MHz = 0.7875 MHz = 787.5 kHz

## 8.3 Test Equipment

Туре	Manufacturer/ Model No.	Serial No.	Last Calibration	Next Calibration
Receiver	Hewlett Packard Spectrum Analyzer (171)	3528U00990	02/2002	02/2004
(30MHz - 1GHz)	8593 E			
Pre-Amplifiere	Hewlett Packard			
(30MHz - 1GHz	8447 E (166a)	1726°00705	04/2002	04/2006
Antenna	Chase (Bilog)	1517	04/2002	04/2008
(30 MHz - 1 GHz)	CBL 611A			
Receiver (1 GHz - 26.5	Hewlett Packard Spectrum Analyzer (171)	3528U00990	02/2002	02/2004
GHz)	8593 E			
Antenna	Schwarzbeck			

## 8.4 Test Procedure

ANSI C63.4-1992 Section 13.1.7 Occupied Bandwidth Measurements. The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce worst-case (i.e., the widest) bandwidth. In order to measure the modulated signal properly, a resolution bandwidth that is small compared to the bandwidth required by the procuring or regulatory agency shall be used on the measuring instrument. However, the 6 dB resolution bandwidth of the measuring instrument shall be set to a value greater than 5% of the bandwidth requirements.

#### 8.5 Test Result

8.5.1 Model: Key 5WY 8404



Test Report: 03001590 Page 17 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

Bandwidth setting of the analyzer: ......30 kHz [3 dB] corresponds with 46 kHz [6 dB]

The measured 20 dB bandwidth is: ...... 11.0 kHz

The EUT meets the requirements of this section.

Test Personnel: Ralf Trepper Issuance Date: 2003 May 16



Test Report: 03001590 Page 18 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# 9 PHOTOGRAPHS OF THE TEST SETUP

- 9.1 Radiated Emissions Tests
- 9.1.2 Photograph: EUT in vertical polarization on the turntable





9.2 **Conducted Emission Tests** 

**FCC ID: KR55WY8404** 

Test Report: 03001590 Page 19 of 21

Issue Date: 20.05.2003 EUT: Key 5WY 8404

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Test Report: 03001590 Page 20 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# 10 MISCELLANEOUS COMMENTS AND NOTES

The radio key 5WY 8404 is a part of the HMC GH System. See hereto Annex 5 (User Manual / Functional Description).



Test Report : 03001590 Page 21 of 21

Issue Date: 20.05.2003 EUT: **Key 5WY 8404** 

# 11 LIST OF ANNEXES

The following Exhibits are separated annexes to this test report.

Annex No.	Exhibit	Pages
1	External Photographs of the Equipment Under Test	2
2	Internal Photographs of the Equipment Under Test	2
3	Occupied Bandwith Plot	1
4	FCC ID Label Sample	2
5	Technical Description /Operational Description	5
6	Test Setup Foto	1
7	Block Diagram	1
8	Schematics / Layouts	10