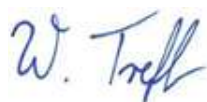


RADIO REPORT FCC 47 CFR Part 15C ISED Canada RSS-247 Digital transmission systems operating within the 2400.0 MHz - 2483.5 MHz band	
Report Reference No	G0M-2406-2604-TFC247DT-V03
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Somnium Space LTD.
Address	159 High Street EN5 5SU Barnet England
Test Specification	47 CFR Part 15C RSS-247, Issue 3, 2023-08 RSS-Gen, Issue 5, Amendment 2, 2021-02
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Head-Mounted Display / VR headset
Model(s)	VR1
Additional Model(s)	None
Brand Name(s)	Somnium
Hardware Version(s)	VR1
Software Version(s)	FW for radio chips: for nrf_fw_rev1 SHA256 hash for nrf_fw_rev1:F33AA5230BEDA4DA5F58087C1A13EEA29AB2300F8 58B75722C4571C297E7600A
FCC ID	2BKF7-VR1BESTHMD
IC	32914-VR1BESTHMD
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	See test sample identification table on page 6	
Report:		
Compiled by	Florian Voigt	
Tested by (+ signature) (Responsible for Test)	Florian Voigt	
Approved by (+ signature) (Test Lab Engineer)	Wilfried Treffke	
Date of Issue	2024-12-10	
Total number of pages	147	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
There are 2 different firmware variants. One firmware is the radio test firmware and the other one is the firmware used in final product (production firmware). Comparison measurements have been made to compare some of the RF-parameters of both firmware variants. Only the operational mode of the production firmware presented by customer was measured by the laboratory, but there could also exist other operational modes. All tests carried out do only confirm compliance of the EUT with the radio test firmware.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2024-10-11	Initial Release	--
02	2024-10-25	Replaced document: G0M-2406-2604-TFC247DT-V01 Replaced by: G0M-2406-2604-TFC247DT-V02 Reason: On page 6, changed antenna type description from SMD to SMT. On page 45, changed in table the erroneously stated column header "EIRP" to "relative". Commented channel selection and power measurement. On page 72, commented delogerithmization of logarithmized gains. On page 118, commented about worst case results selection. On page 145, edited note to "Position 1".	Florian Voigt
03	2024-12-10	Replaced document: G0M-2406-2604-TFC247DT-V02 Replaced by: G0M-2406-2604-TFC247DT-V03 Reasons: Replaced applicant with "Somnium Space LTD." across full document. On page 6, added new sample numbers, changed number of antenna ports, removed duplicated antenna specification. On page 40, added 2 new test modes, description changed for "Production-FW TX" mode, modified for modes Transmit Radio 1 and 2 duty cycle to be in line with new duty cycle measurement. On page 44 to 47, measurement was repeated with peak detector instead RMS detector, new results, descriptions and table. Inserted new section duty cycle measurement. On page 42 and 43, edited operational mode in result plots. On page 112, updated measurement equipment table. On page 113 and 114, edited and split result table, added explanation for "Duty cycle evaluation". Inserted ANNEX B with duty cycle comparison measurements.	Florian Voigt

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

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1 Equipment (Test Item) Under Test

Description	Head-Mounted Display / VR headset			
Model	VR1			
Additional Model(s)	None			
Brand Name(s)	Somnium			
Sample Identification	EUT #	Sample-ID	Serial Number	Date of receipt
	EUT 1	49301 50373	2D02E006	2024-07-08 2024-12-03
	EUT 2	49299 50374	Prototype	2024-07-08 2024-12-03
Hardware Version(s)	VR1			
Software Version(s)	SHA256 hash for nrf_fw_rev1: F33AA5230BEDA4DA5F58087C1A13EEA29AB2300F858B75722C 4571C297E7600A			
PMN	Somnium VR1			
HVIN	VR1			
FVIN	nrf_fw_rev1			
HMN	N/A			
FCC ID	2BKF7-VR1BESTHMD			
IC	32914-VR1BESTHMD			
Equipment type	End Product			
Radio type	Transceiver			
Assigned frequency bands	2400.0 MHz - 2483.5 MHz			
Radio technology	Proprietary Radio			
Modulation	2-GFSK			
Number of antenna ports	2			
Number of radios	2			
Radio SoC 1	Type	Multiprotocol Bluetooth 5.4 SoC		
	Model	NRF52840		
	Manufacturer	Nordic semiconductor		
	PCB position	U32		
Radio SoC 2	Type	Multiprotocol Bluetooth 5.4 SoC		
	Model	NRF52840		
	Manufacturer	Nordic semiconductor		
	PCB position	U31		
Antenna 1 (associated to radio 1) Antenna 2 (associated to radio 2)	Type	Integrated SMT antenna		
	Model	W3008		
	Manufacturer	Pulse Electronics		
	Gain	1.1 dBi (datasheet declaration)		
Supply Voltage	V _{NOM}	12 V DC via external AC/DC adaptor		
Operating Temperature	T _{NOM}	20°C		
Dedicated AC/DC-Adaptor	Model	SDI36-12-DU		
	Vendor	CUI INC		
	Input	100-240 V / 50-60 Hz		
	Output	12 V DC		
Manufacturer	Somnium Space LTD. 159 High Street EN5 5SU Barnet England			

1.1 Photos – Equipment External



Front side view



Back side view



Right side view



Left side view

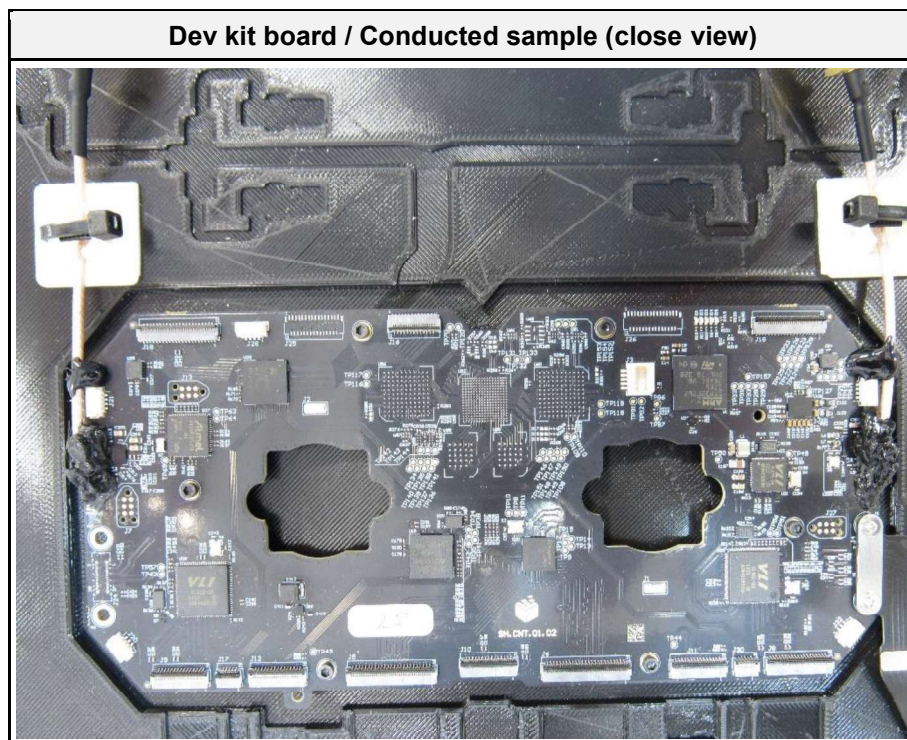
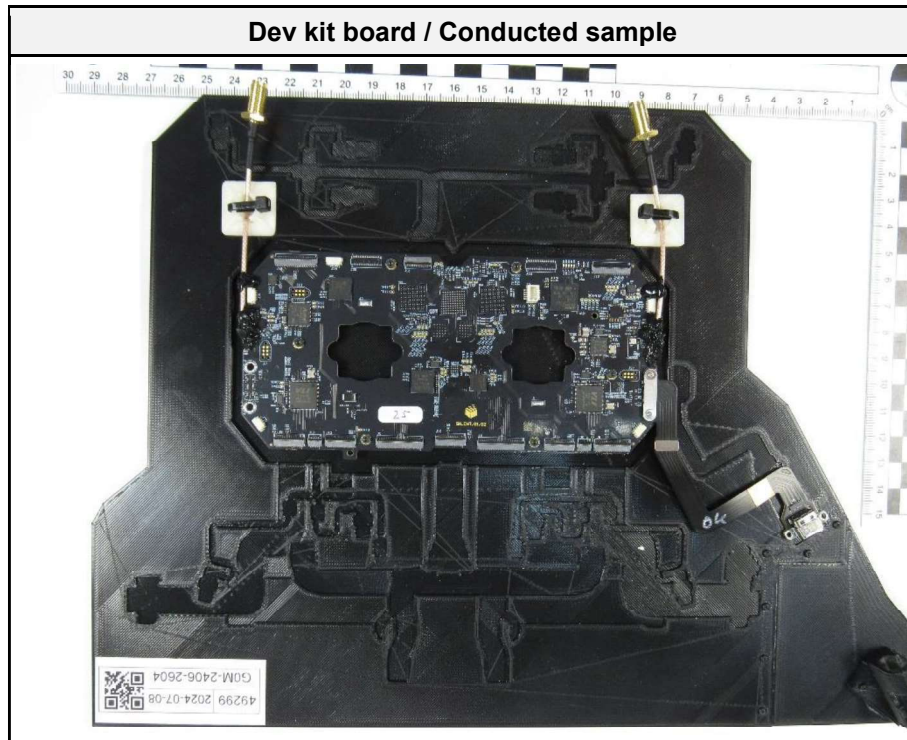


Perspective front side view



Perspective back side view





AC/DC Adaptor



AC/DC Adaptor label



VR1 cable A



VR1 cable B

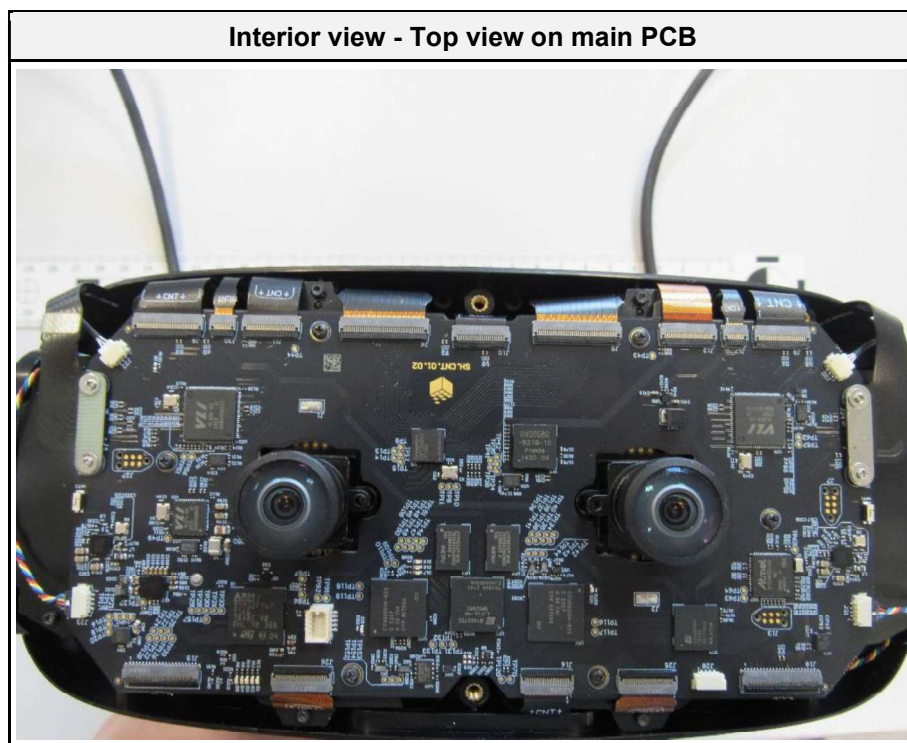
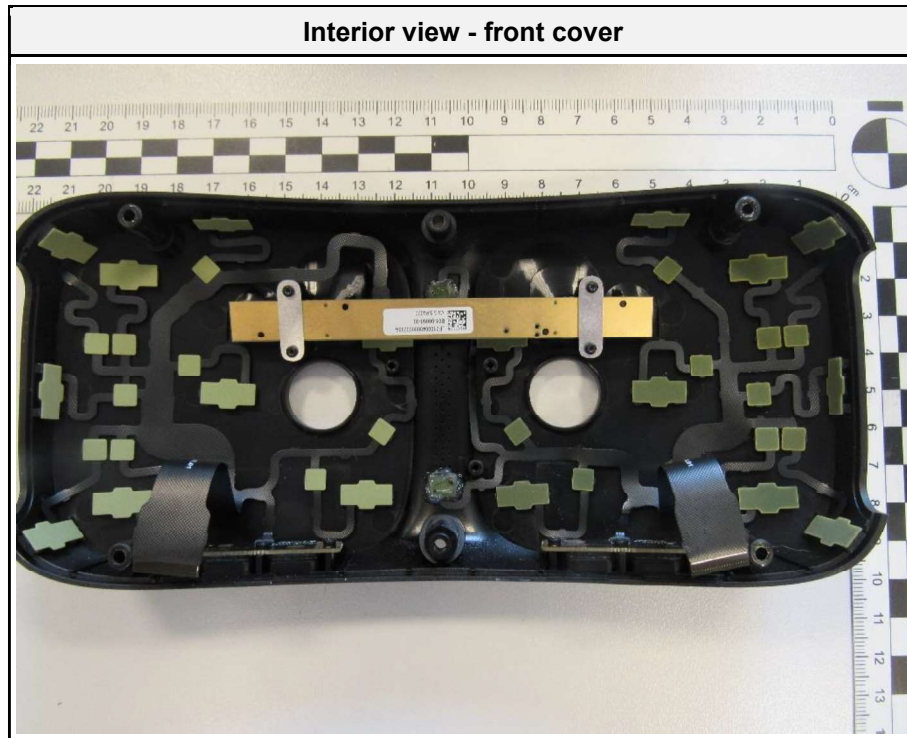


EUT with support equipment

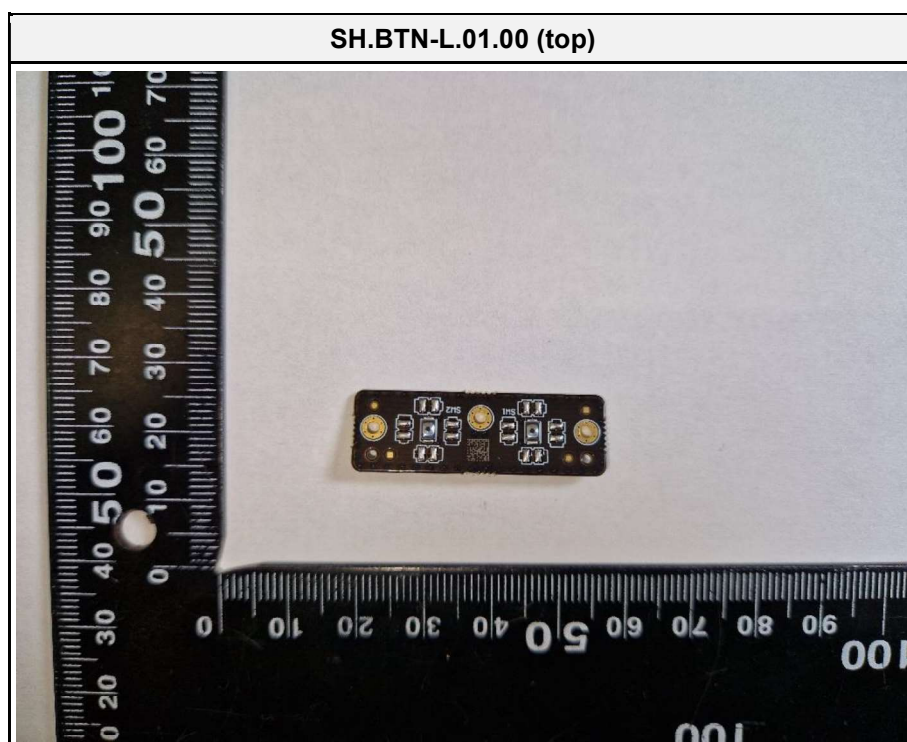
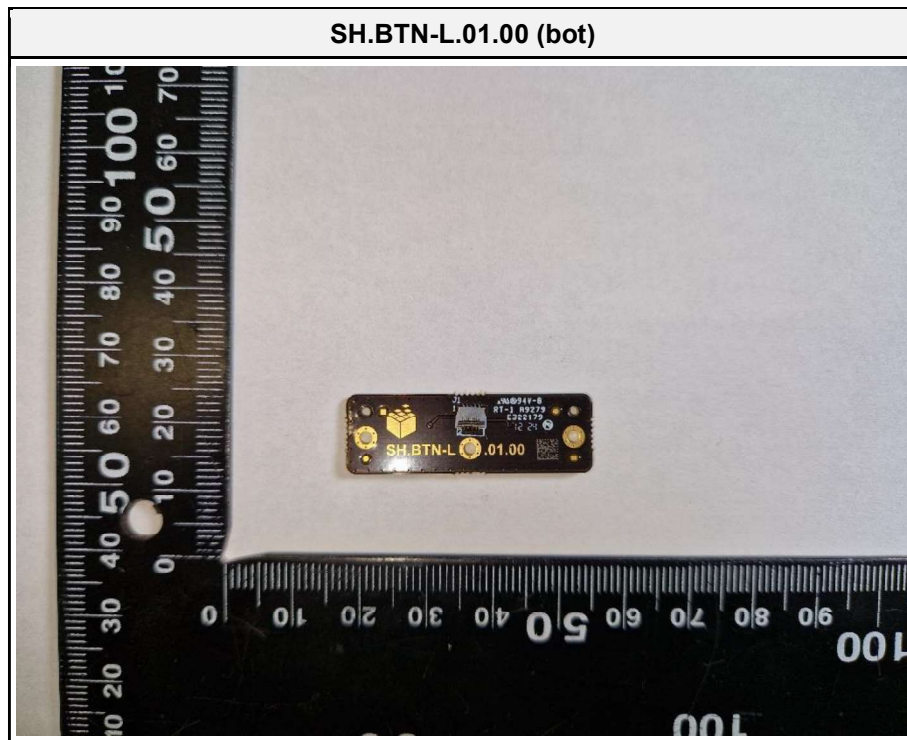


1.2 Photos – Equipment Internal

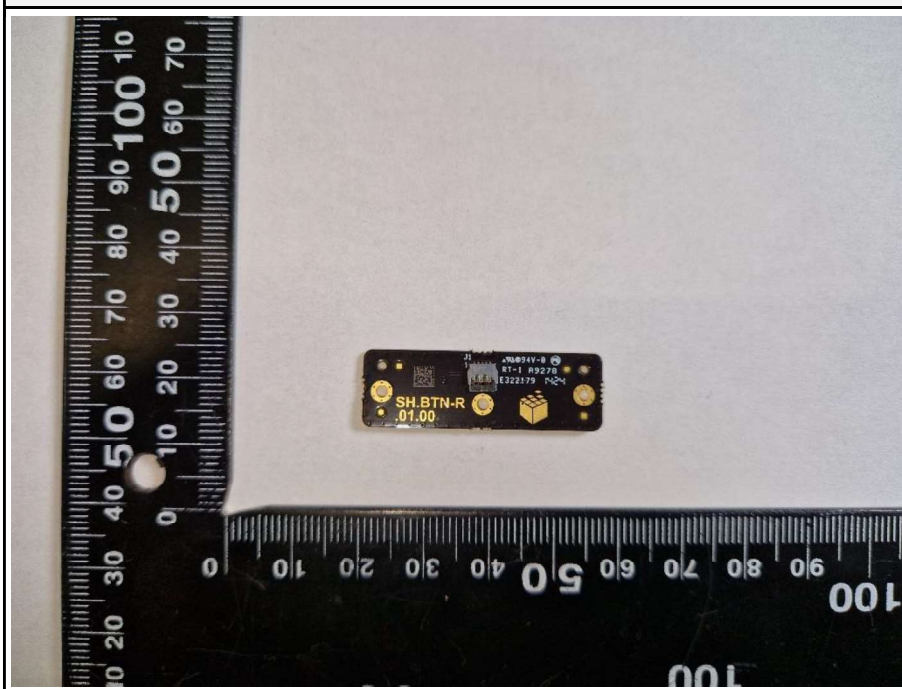
1.2.1 Internal photos made in laboratory



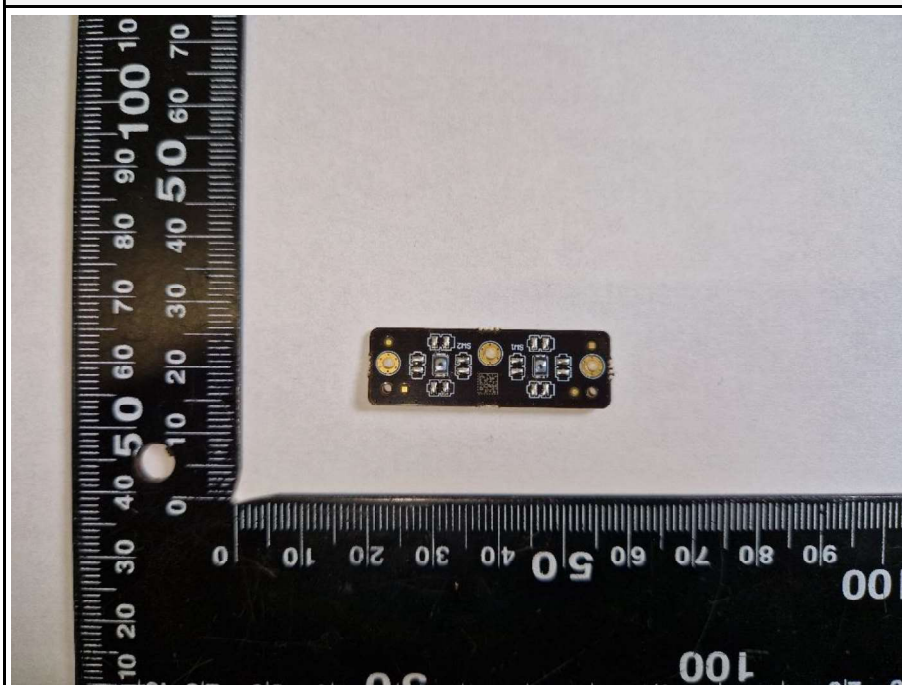
1.2.2 Internal photos provided by customer



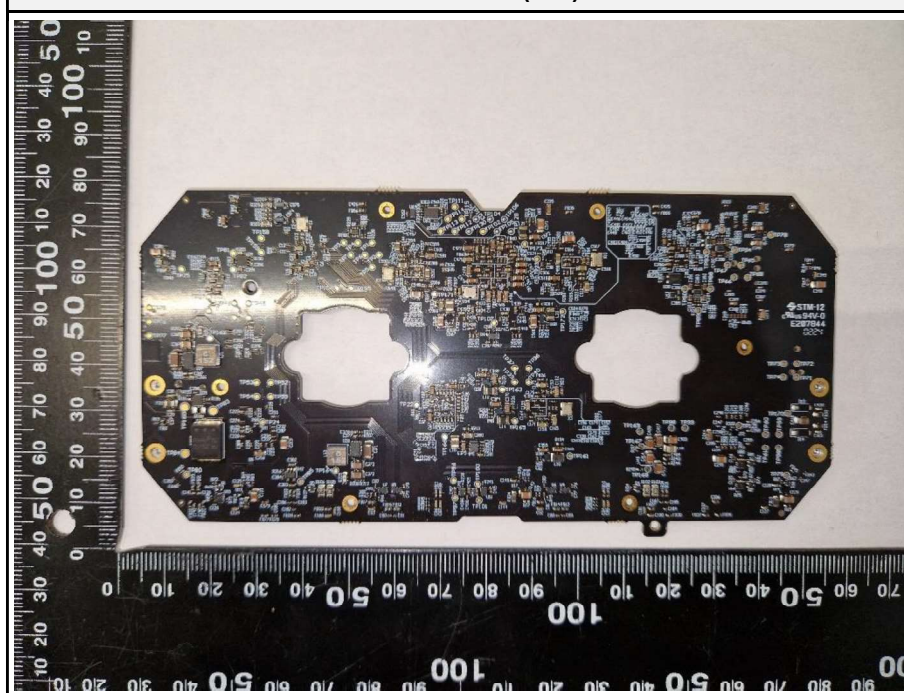
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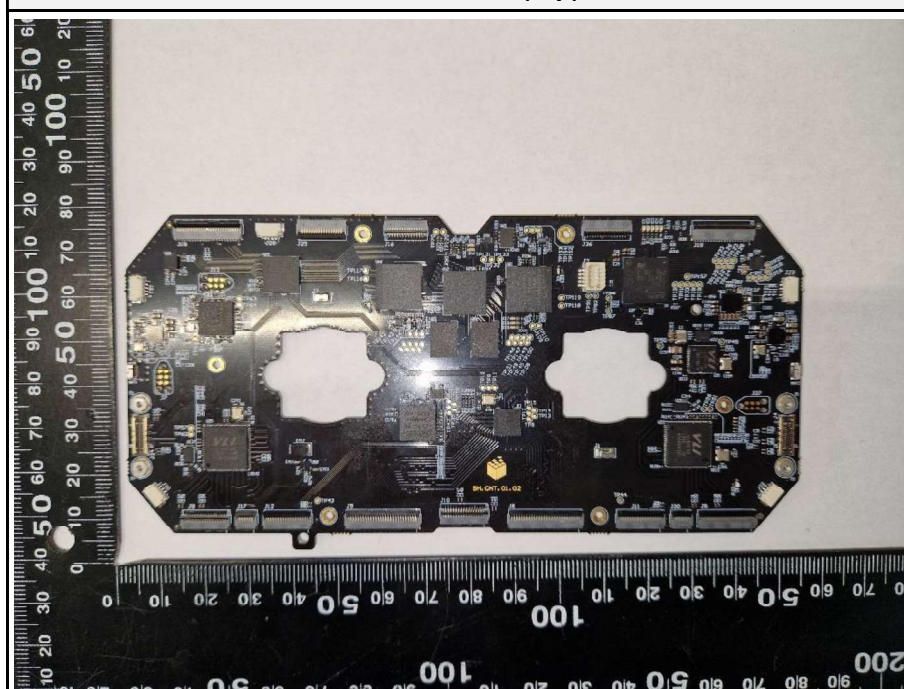
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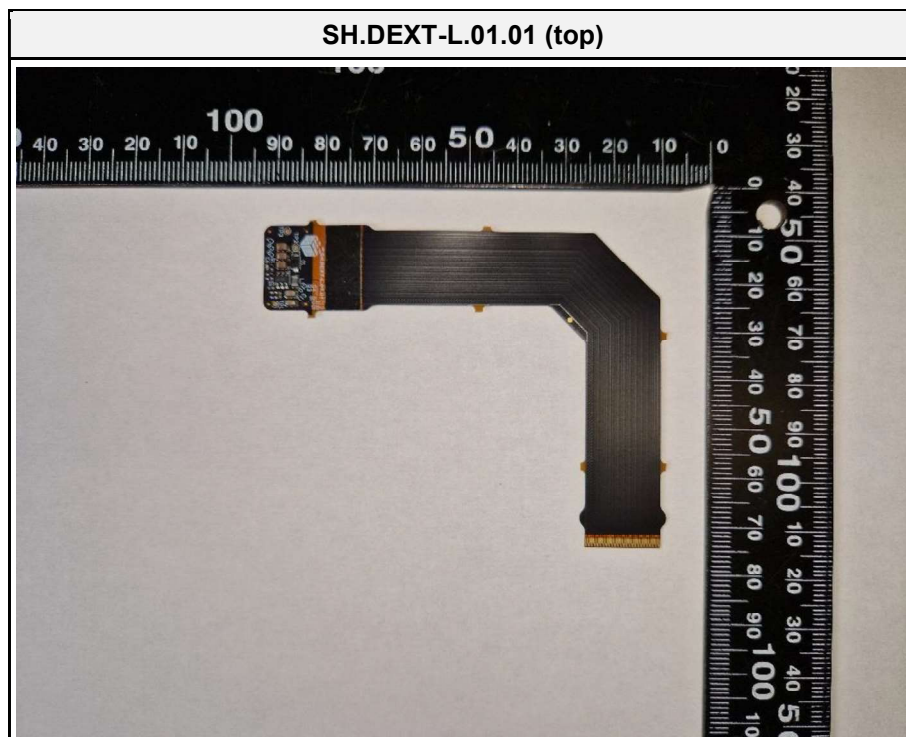
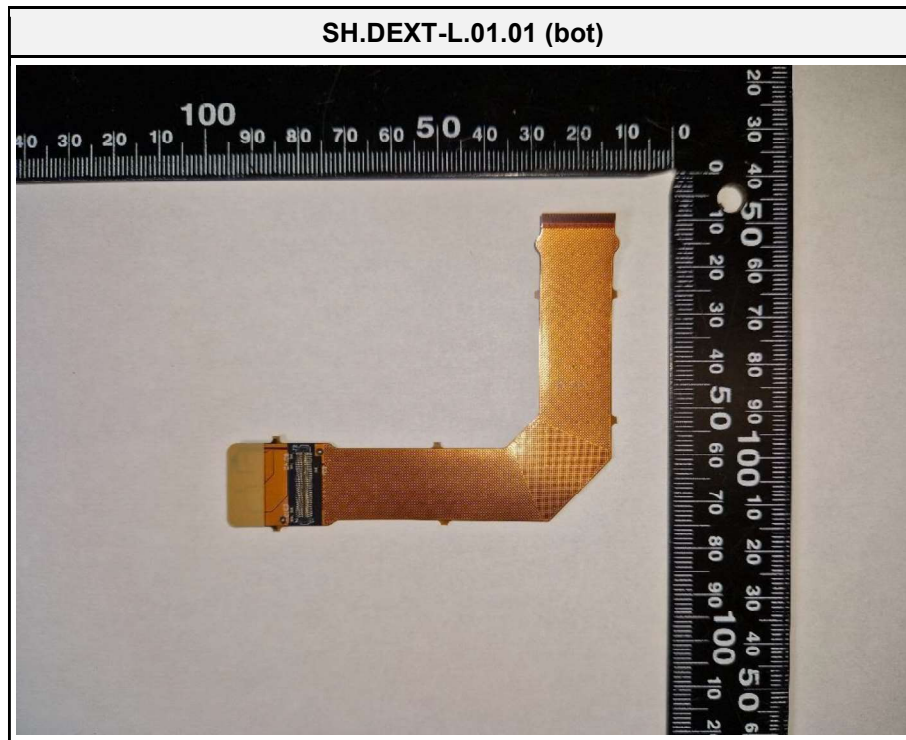


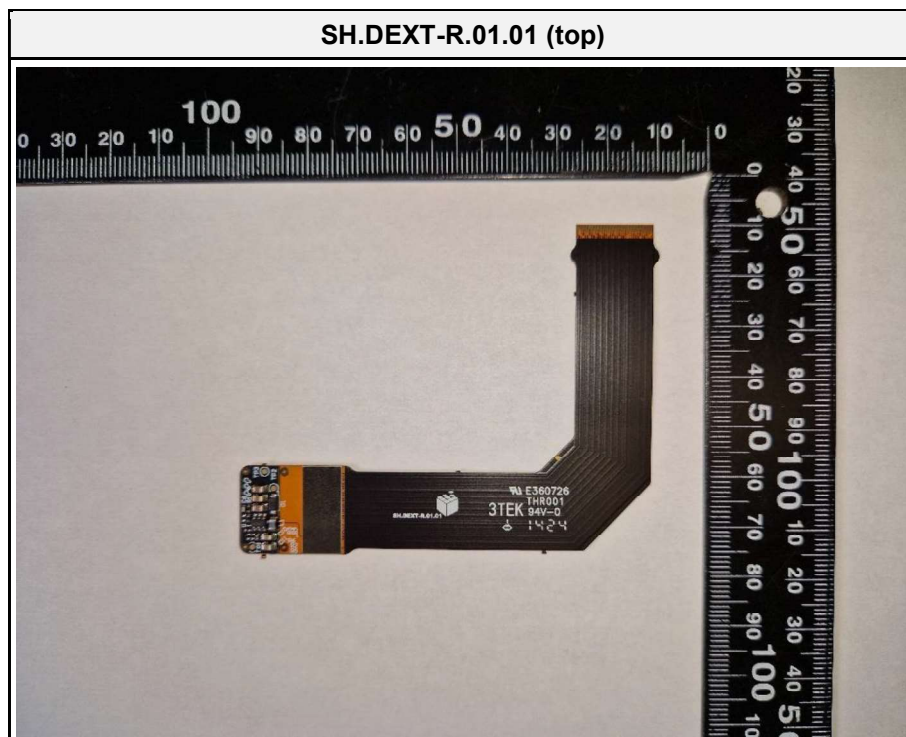
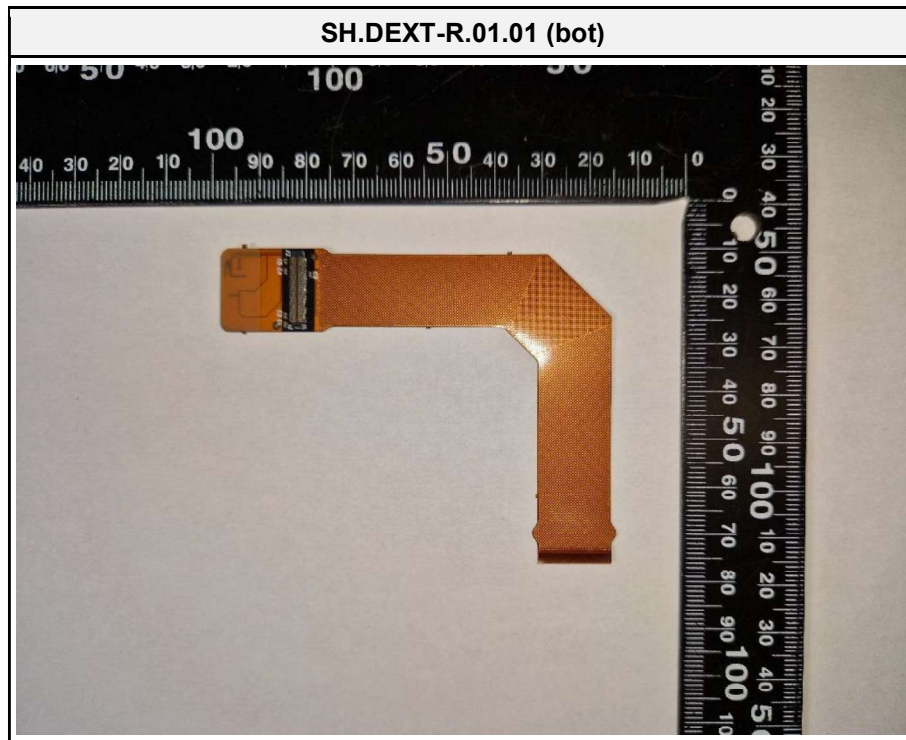
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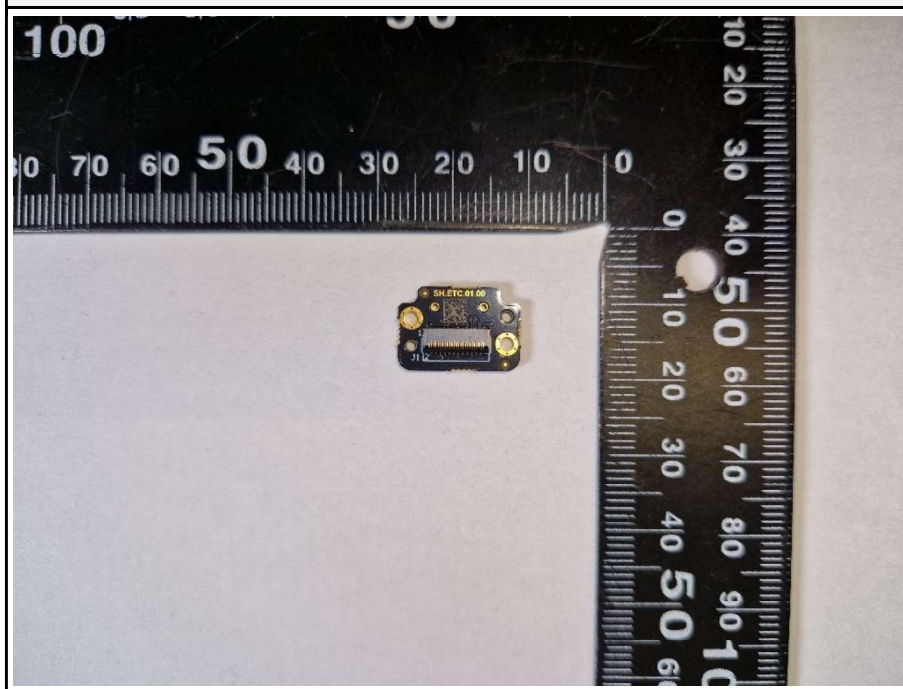
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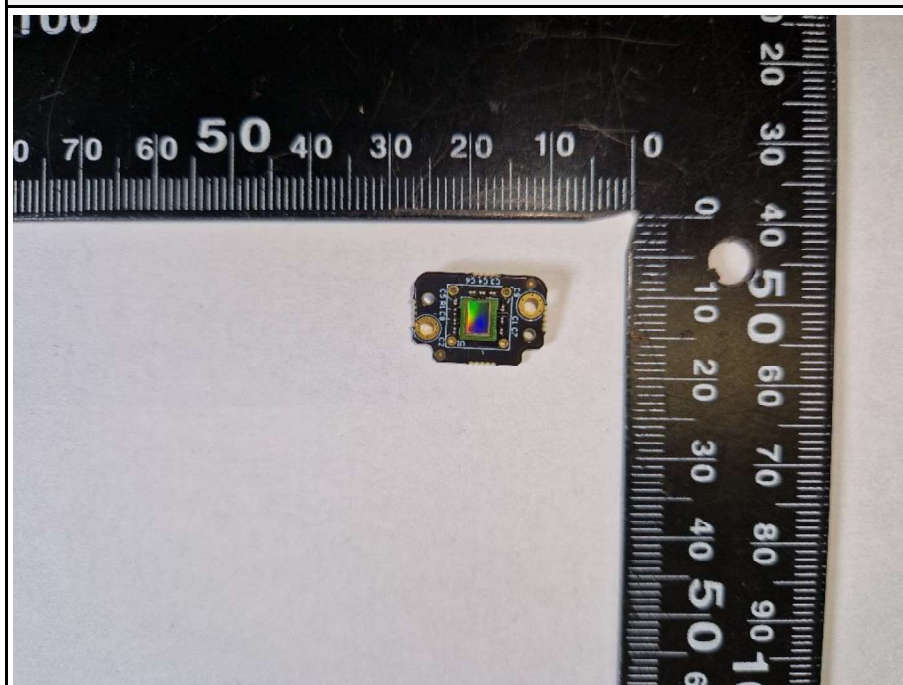


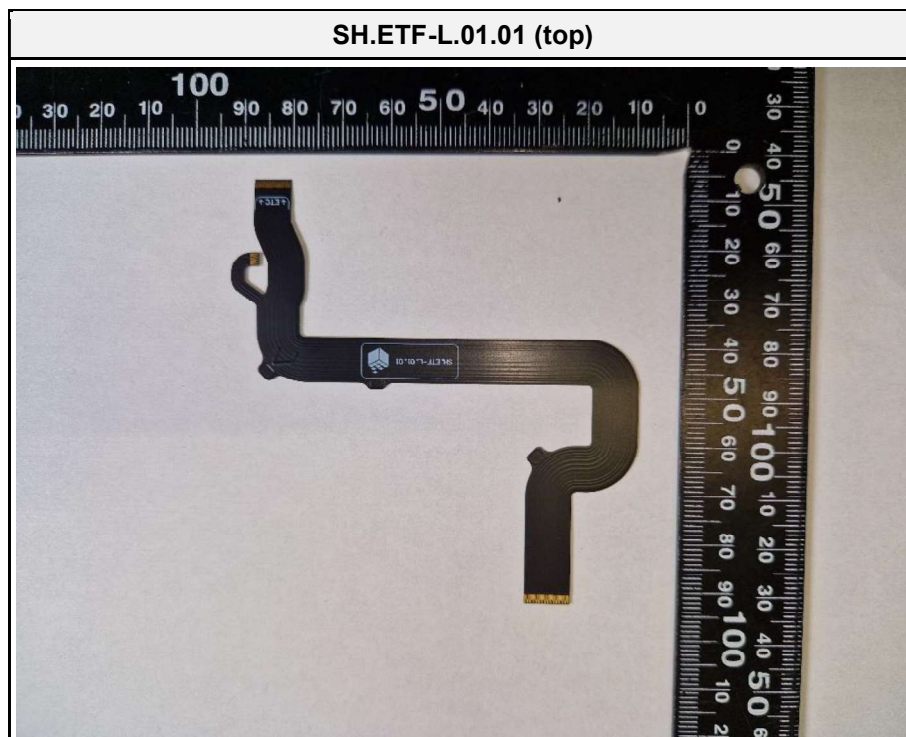
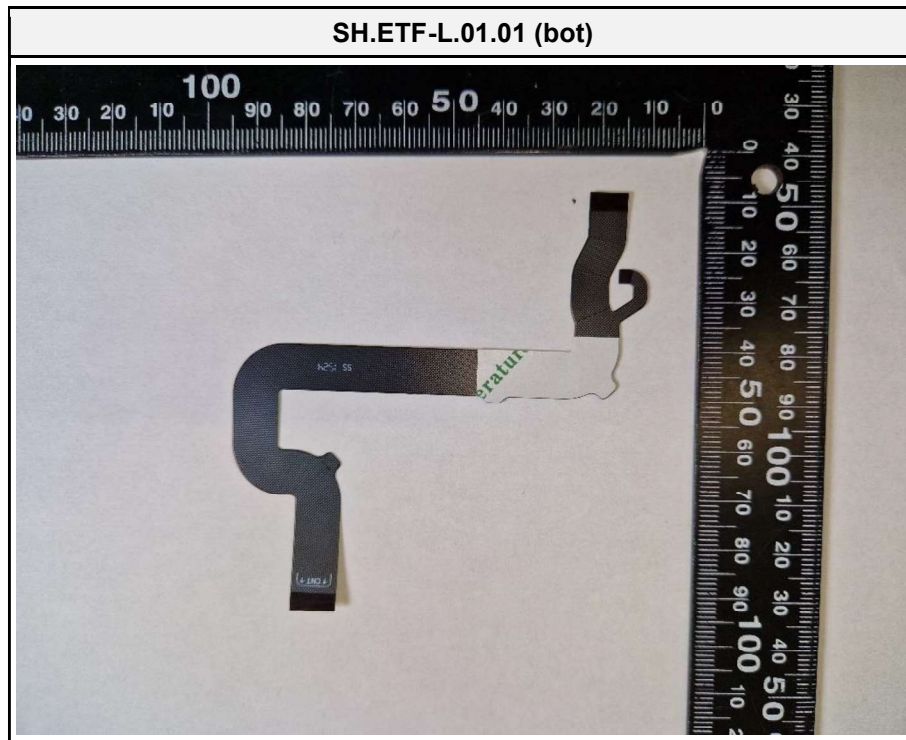


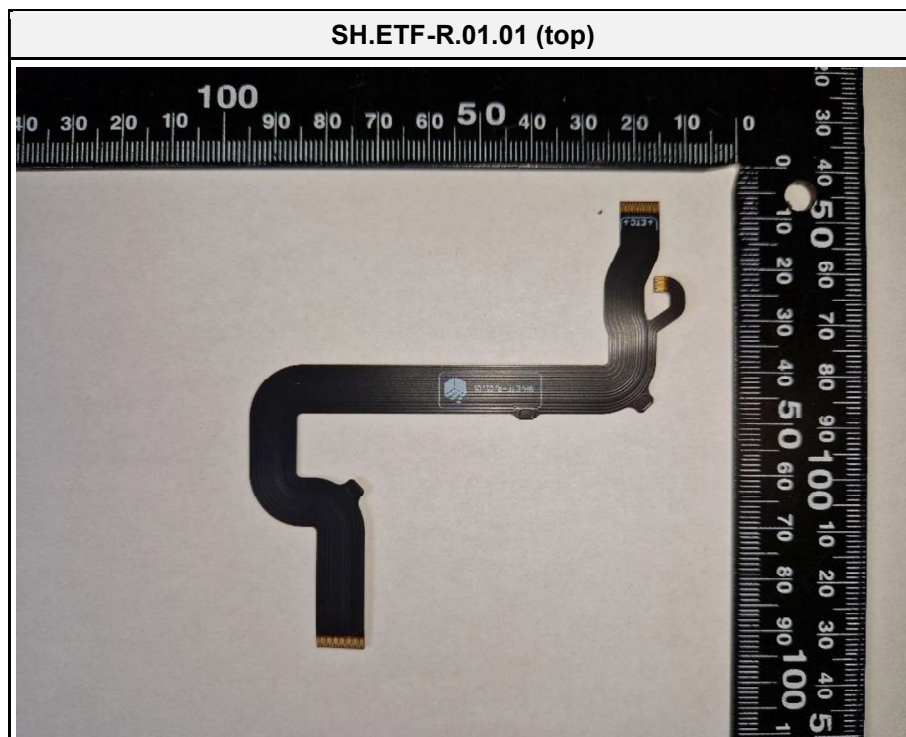
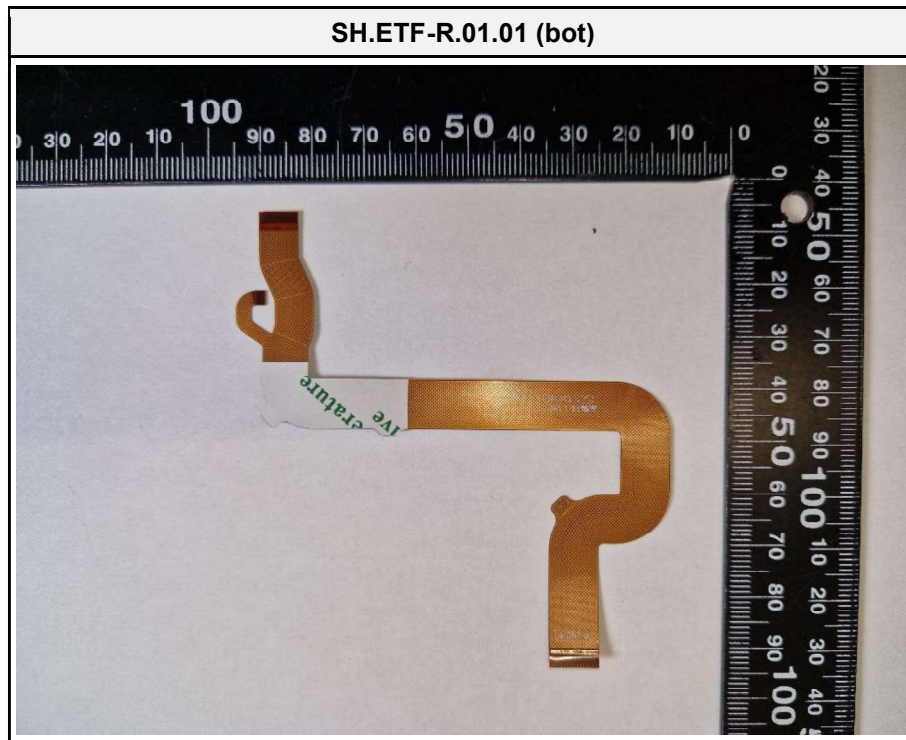
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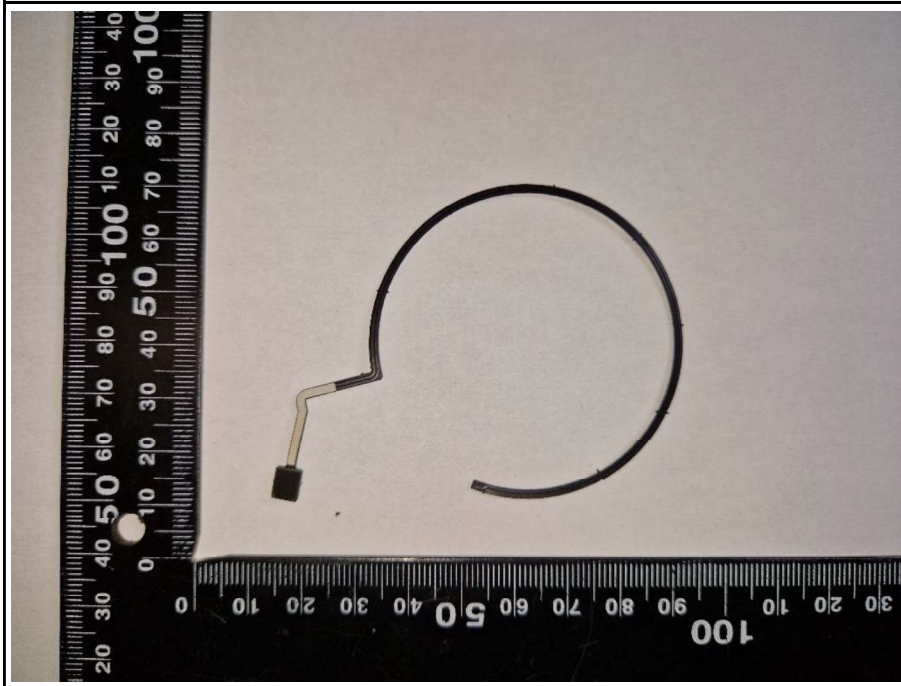
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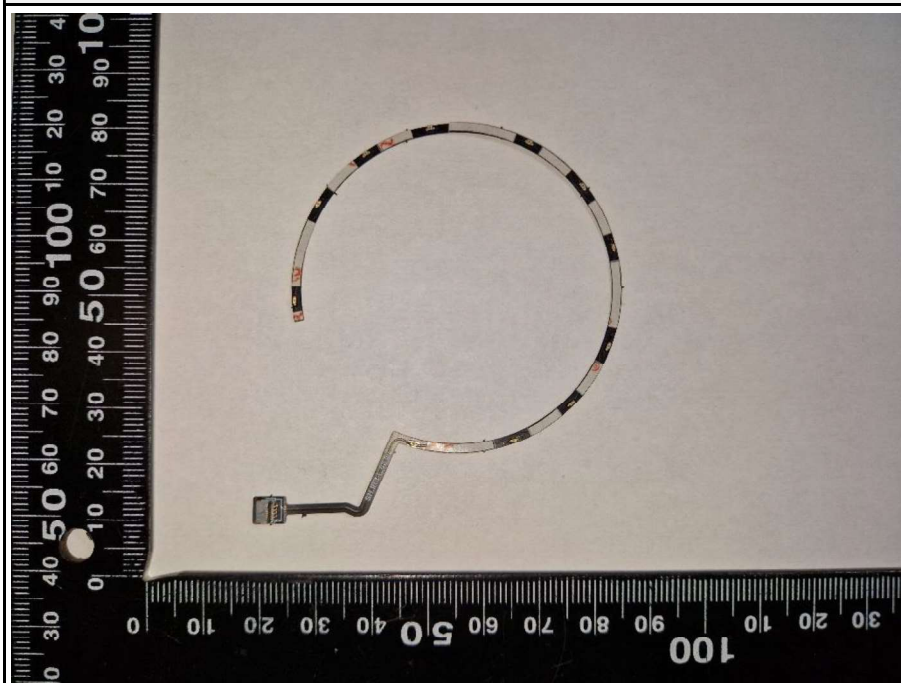


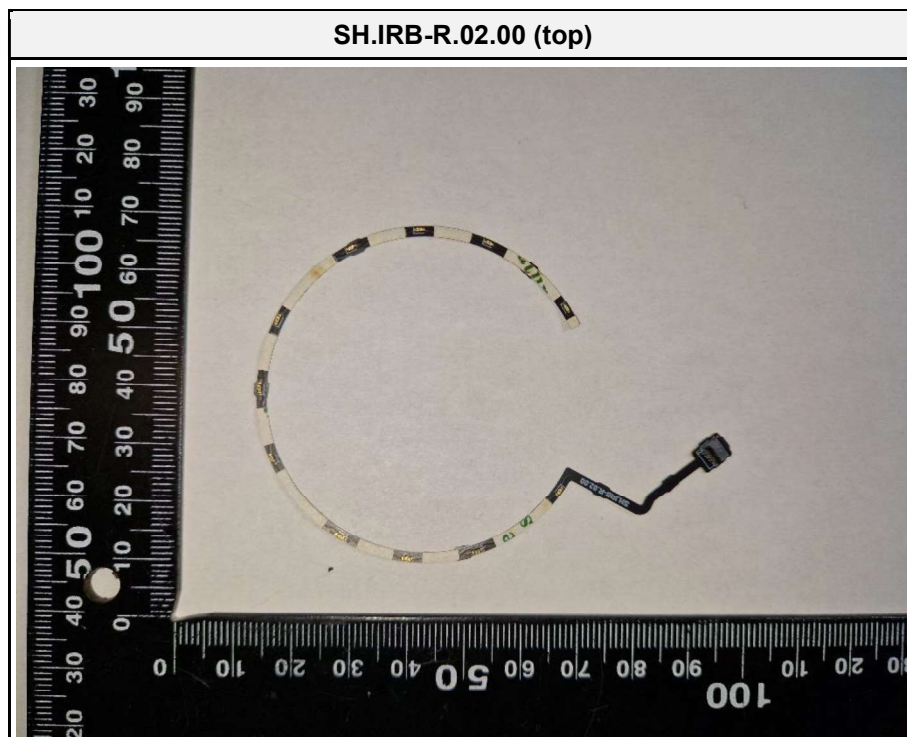
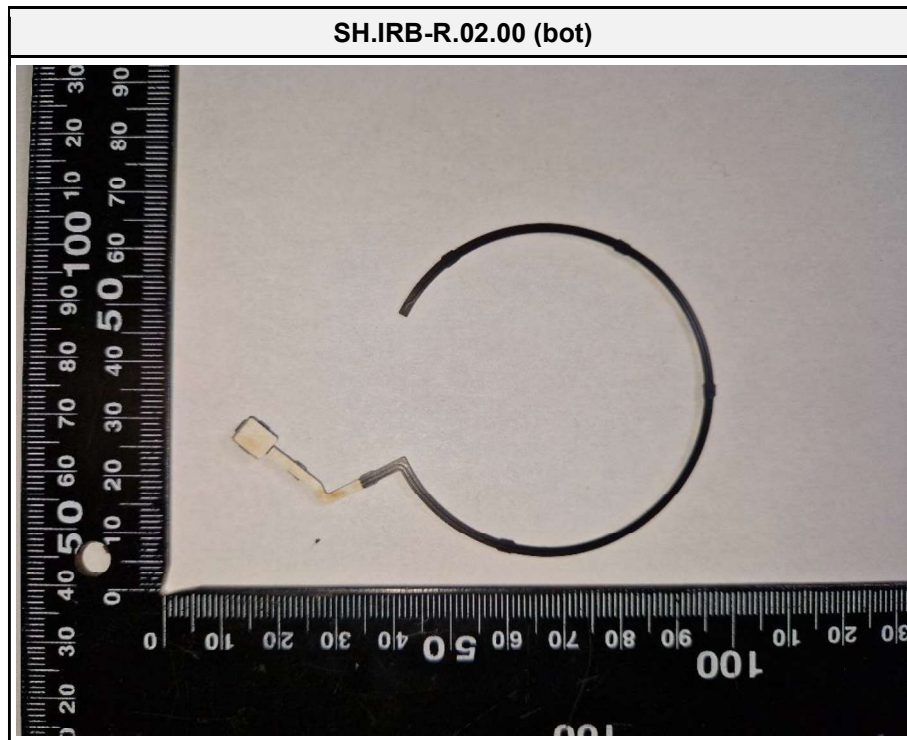


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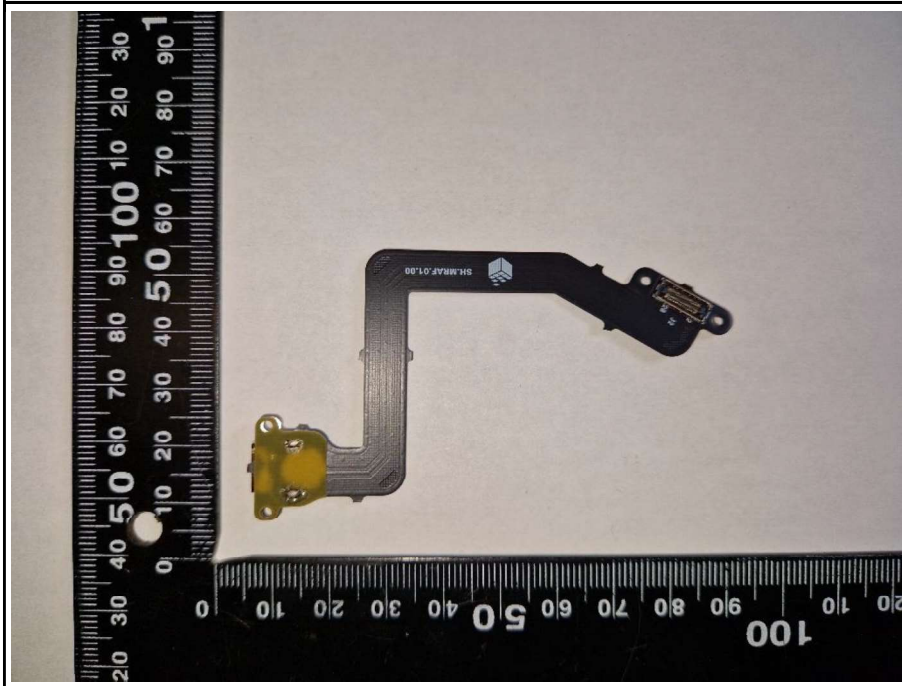


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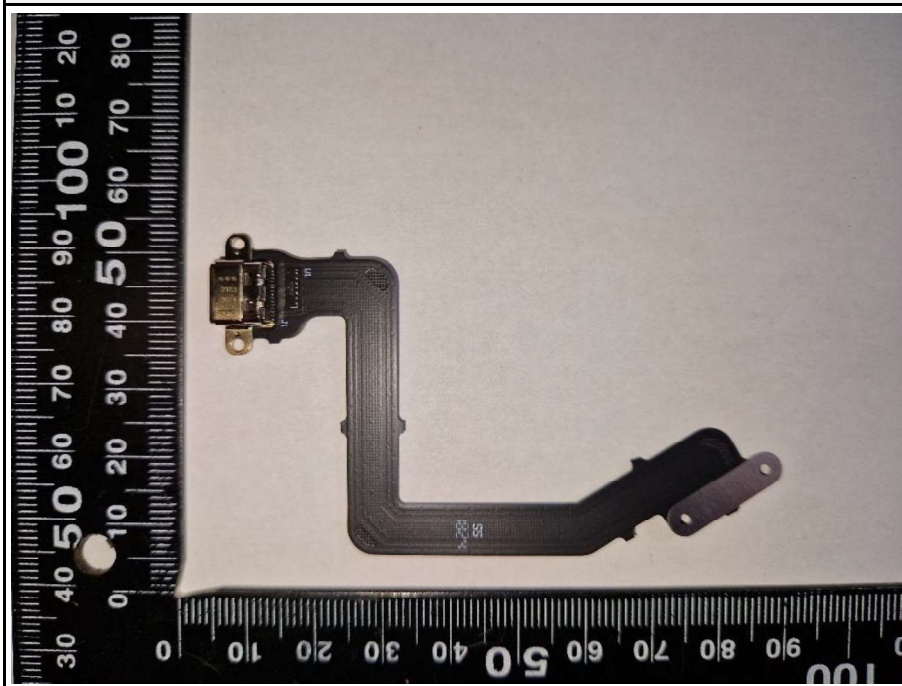




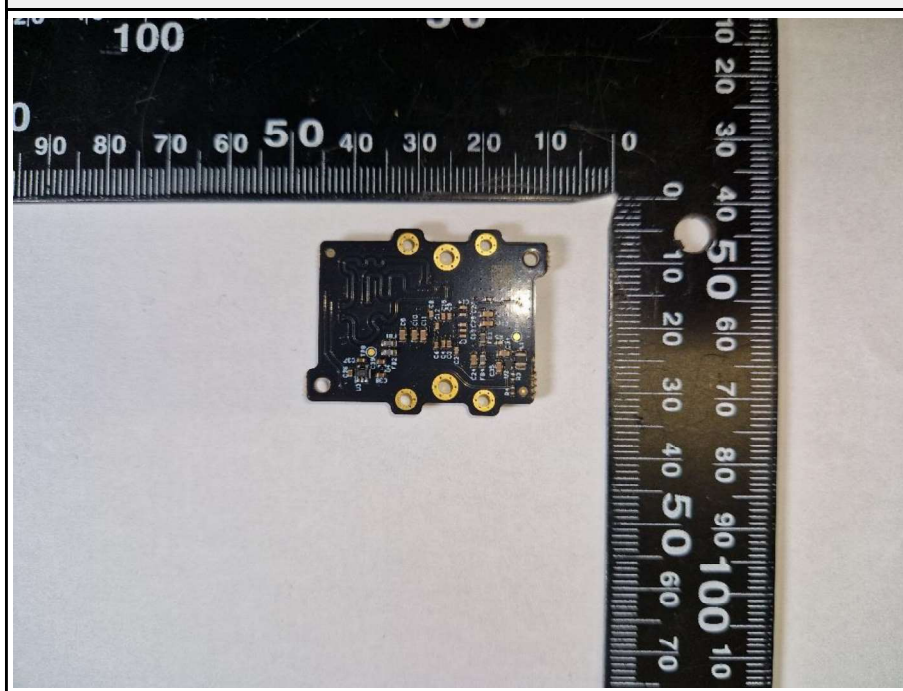
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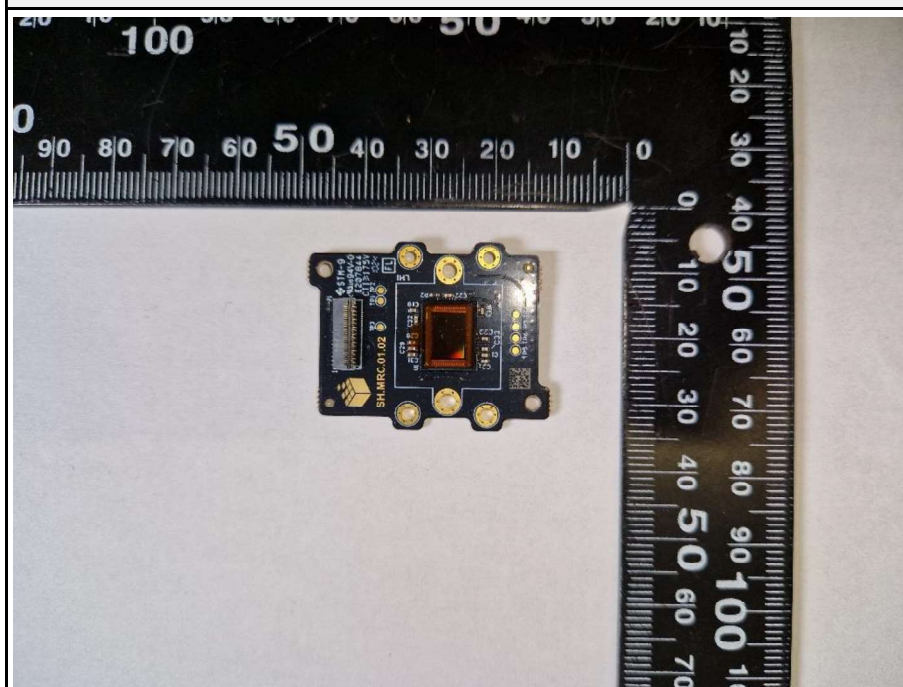
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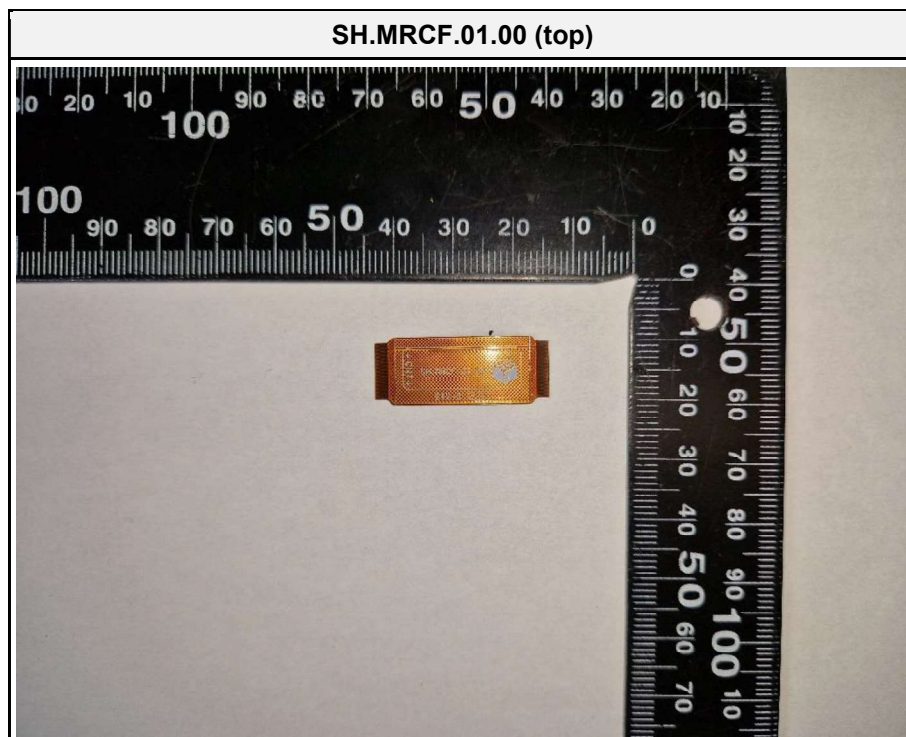
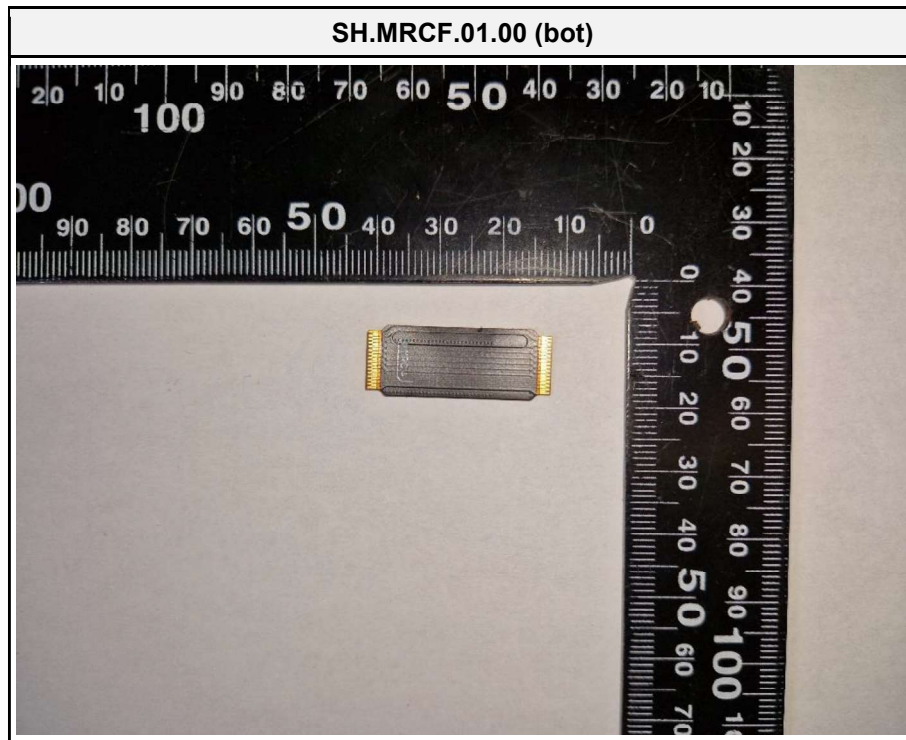


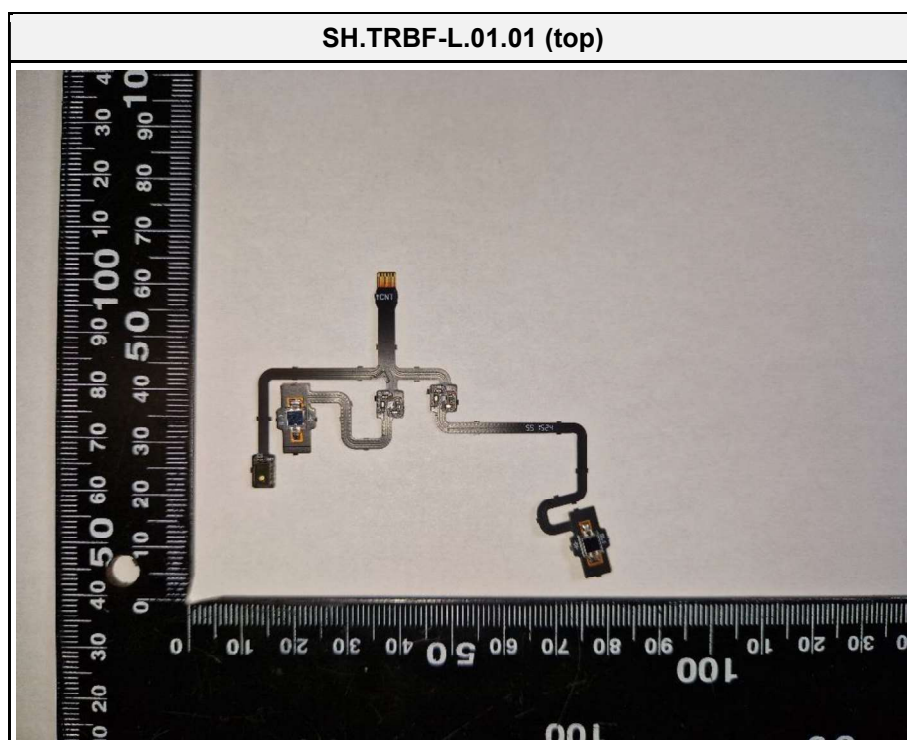
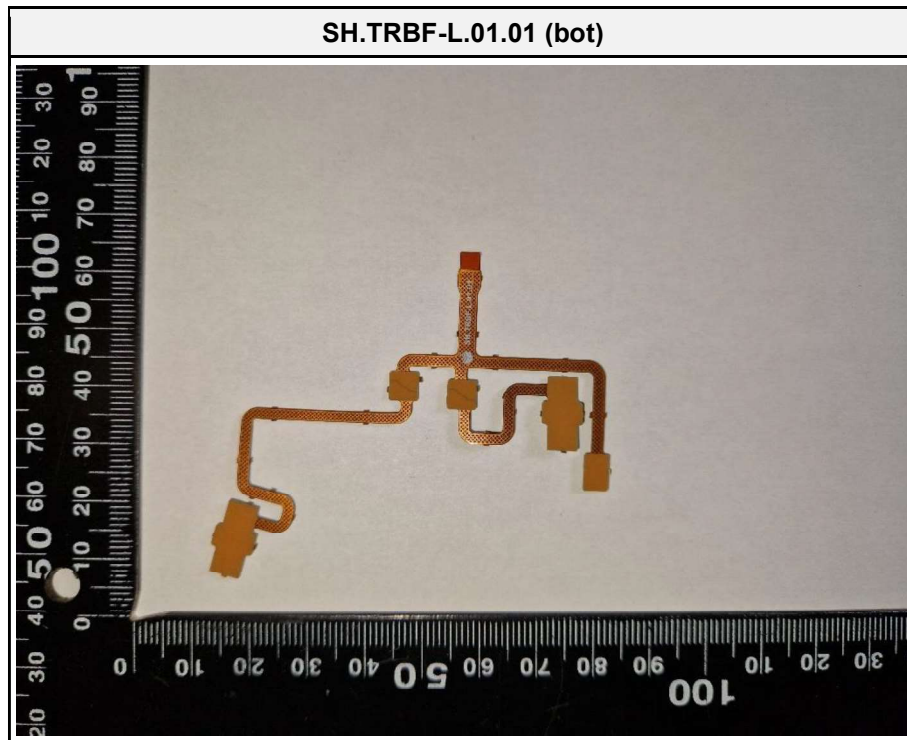
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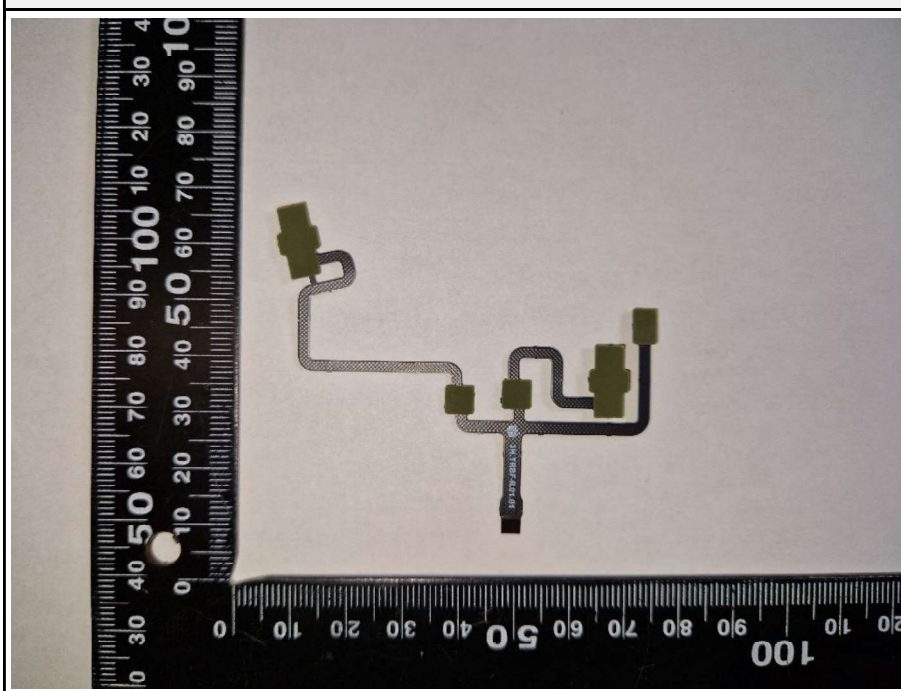
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