Technical Data Sheet

BRADY L-2588-52A SMALL UHF RFID ON-METAL LABEL

TDS No. L-2588-52A
Effective Date: 19/11/2024

Description:
Small UHF RFID on-metal label with small footprint is a high performing and incredibly versatile label recommended for tagging on-metal, liquids, plastic, and other typically hard to read products and surfaces.

Details:

Material Specifications:

Face Material	Polyester
Adhesive	Acrylic adhesive optimized for metallic and painted metal surfaces
Finishing	White
Antenna	Aluminium
IC to antenna construction	Chip bonded to antenna using Anisotropic Conductive Film adhesive
Tag base material	Clear PET

General Specifications:

Applications	Small UHF RFID on-metal label is recommended for tagging on-metal, liquids, plastic, and other typically hard to read products and surfaces. Common applications include health and beauty, beverages and snacks, miscellaneous item level consumables, and on-metal applications.
Print Technology	Thermal transfer print, including RFID encoding.
Recommended Ribbon	Brady Series R7961
Operating Temperature	-40 °C to 85 °C
Regulatory/Agency Approvals	For information on the Weee-RoHS compliance status for a Brady Product go to one of the following websites: In Canada: www.bradycanada.ca/weee-rohs In Europe: www.bradyeurope.com/rohs In Japan: www.brady.co.jp/products/labelsuse/rohs All other regions: www.bradyid.com/weee-rohs

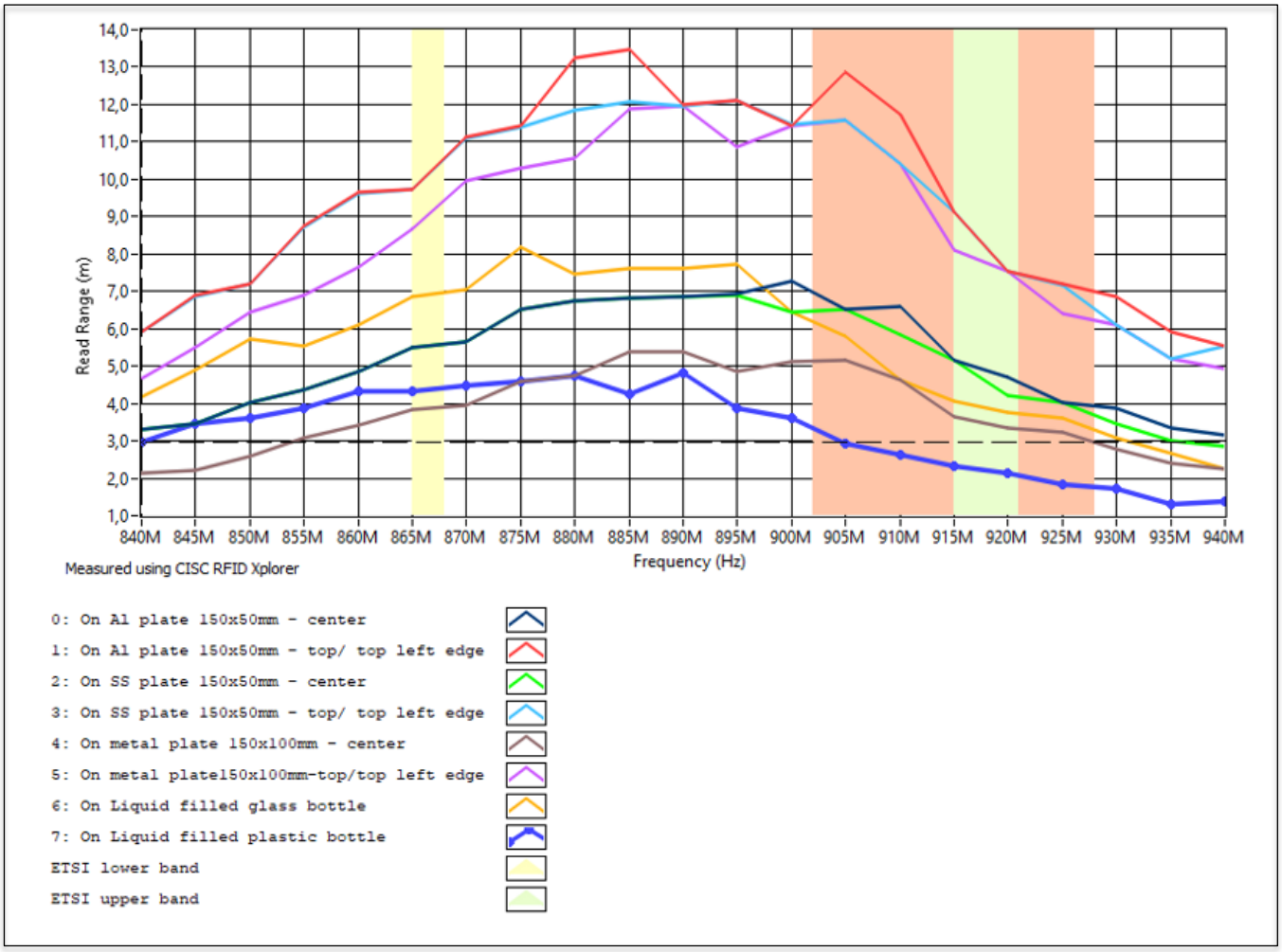
Electronic Specifications:

IC / Chip	Impinj M730
Operating Frequency	Global 860 - 960 MHz (ETSI band)
Supported Standard	ISO/IEC 18000-63 Type C
EPC Memory	128 bits

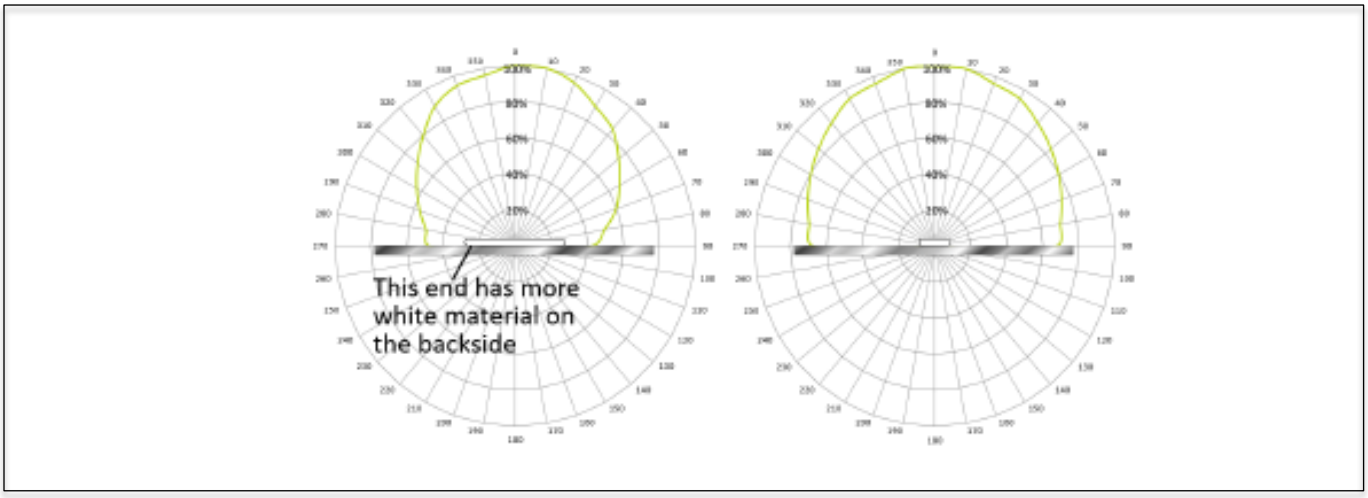
Read Range:

Details RFID performance in ETSI lower bandwidth:

PERFORMANCE PROPERTIES	REGULATION	TYPICAL RESULTS
RFID Read range on Al plate 150x50mm Center	ETSI	up to 5.5m
RFID Read range on Al plate 150x50mm Top/ Top Left Edge	ETSI	up to 10.0m
RFID Read range on SS plate 150x50mm Center	ETSI	up to 5.5m
RFID Read range on SS plate 150x50mm Top/ Top Left Edge	ETSI	up to 10.0m
RFID Read range on Metal plate 150x100mm Center	ETSI	up to 4.0m
RFID Read range on Metal plate 150x100mm Top/ Top Left Edge	ETSI	up to 9.0m
RFID Read range on Liquid filled Glass Bottle	ETSI	up to 7.0m
RFID Read range on Liquid filled Plastic Bottle	ETSI	up to 4.5m



Radiation Patterns:



All graphs are indicative: performance in real life applications may vary.

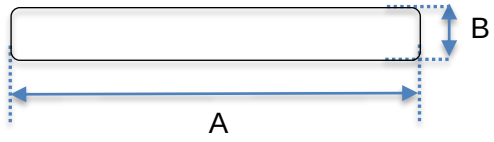
Label Dimensions:

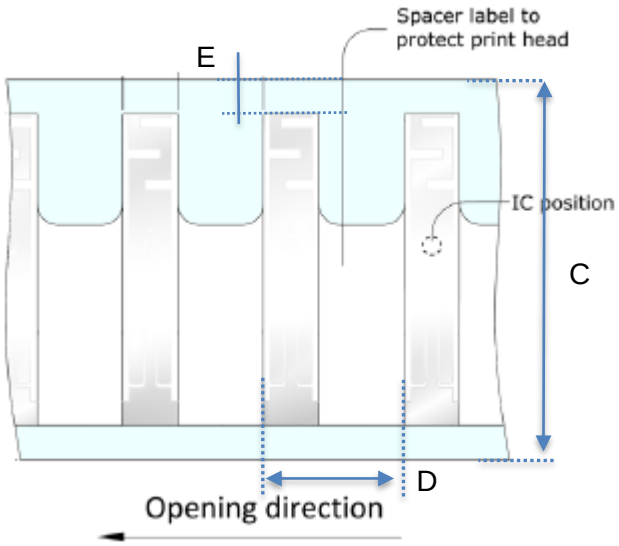
Metric (mm)		
Width	**Length**	**Thickness** Total (with chip)
45.00	8.00	1.50

Label Mass (including antenna and chip)

Label Mass (g)
0.25

Dimensions (mm)





		Length (mm)
A	Tag Width	45.00
B	Tag Length	8.00
C	Web Width	55.00
D	Tag to Tag Pitch	20.32
E	Web edge to label	5.00

Delivery and Packaging Specifications:

RFID labels per roll	800
Rolls in package	1
Winding	RFID labels out
Inspection and delivered tags	100% inspected, 800 good RFID labels per roll
Bad Tags Marked	Yes

Label Performance:

Details:

PHYSICAL PROPERTIES	TEST METHODS	AVERAGE RESULTS
Thickness	ASTM D 1000 -Total (excluding liner)	 1,5 mm (0.0591 inch)
Adhesion to: -Stainless Steel	FTM 2 20 minute dwell 24 hour dwell	 59 N/100mm (54 oz/inch) 79 N/100mm (72 oz/inch)

Performance properties tested on samples printed with the Brady Series R7961 ribbons. Printed samples were laminated to aluminum panels and allowed to dwell 24 hours before exposure to the indicated environments.

ENVIRONMENTAL RESISTANCE			
PERFORMANCE PROPERTIES	**TEST METHODS**	**EFFECT TO PRINT IMAGE**	**EFFECT TO CHIP (tested at room temperature)**
High Service Temperature	30 days at 100°C	Face material tends to curl up	Readable
Low Service Temperature	30 days at -40°C and -80°C	No visible effect	Readable
Short Term High Service Temperature	5 minutes at 140°C and 160°C	No visible effect at 140°C, at 160°C print remains intact - face material 'curls' up	Readable
Humidity Resistance	30 days at 37°C, 95% relative humidity	No visible effect	Readable
UV Light Resistance	30 days in Xenon Test Chamber	No visible effect	Readable
Weatherability	ASTM G155, Cycle 1 30 days in QUV accelerated weathering tester	Slight yellowing	Readable
Abrasion Resistance	Taber Abraser, CS10 grinding wheels, 250 g/arm (Fed. Std. 191A, Method 5306), 150 cycles	Print still legible after 50 cycles, hardly legible after 100 cycles, and not legible after 150 cycles	No effect to chip. Chip still readable after 150 cycles

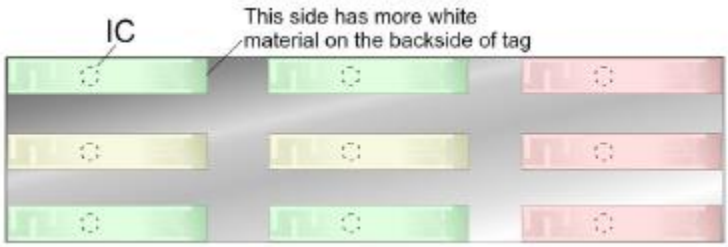
PERFORMANCE PROPERTIES	**CHEMICAL RESISTANCE**		
Samples were printed with the Brady Series R7961. Samples were laminated to aluminum panels and allowed to dwell 24 hours prior to testing. Testing was conducted at room temperature and consisted of 30 minutes immersions in the specified test fluid. After immersion, the samples were removed from the test fluid and the printed image rubbed 10 times with a cotton swab saturated with the test fluid. The rating scale below shows the effect to the quality of the print for each sample.			
CHEMICAL REAGENT	**EFFECT TO PRINT WITHOUT RUB**	**EFFECT TO PRINT WITH RUB**	**EFFECT TO CHIPS**
Ethanol	1	1	Readable
Toluene	1	5	Readable
Isopropyl Alcohol	1	1	Readable
DOT 4 Brake Fluid	1	3	Readable
Skydrol® 500B-4	1	5	Readable
Hydrochloric Acid 37%	1	1	Readable
Sodium Hydroxide 10%	1	1	Readable

Rating Scale:
1= no visible effect
2= slight smear or print removal, detectable but minimal smear
3= moderate smear or print removal (print still legible)
4= severe smear or print removal (print illegible or just barely legible)
5= complete print and/or topcoat removal
NP= print removed prior to rub

Installation Instructions:

Attachment on curved surface is highly recommended to be done along the asset, as shown in below drawing. This orientation would ensure better performance and adhesion.

For optimal read range, below positioning on a metal item is recommended. The label works in all positions and has the specified read range also on the yellow marked locations, but the read range can be enhanced using green positions.



Shelf Life:
Shelf life is one year from the date of receipt for this product as long as this product is stored in its original packaging in an environment below 23 ± 2°C and 50 ± 5% RH. It remains the responsibility of the user to assess the risk of using this product. We encourage customers to develop testing protocols that will qualify a product's fitness for use in their actual application.

References:
ASTM: American Society for Testing and Materials (U.S.A.)
All S.I. Units (metric) are mathematically derived from the U.S. Conventional Units

Note: All values shown are averages and should not be used for specification purposes.

Test data and test results contained in this document are for general information only and shall not be relied upon by Brady customers for designs and specifications, or be relied on as meeting specified performance criteria. Customers desiring to develop specifications or performance criteria for specific product applications should contact Brady for further information.

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