Technical Data Sheet

BRADY L-2588-31A NFC on-metal temperature label

TDS No. L-2588-31A
Effective Date: 03/01/2022

Description:

NFC on-metal temperature label enables wireless temperature reading and monitoring for a wide range of on-metal devices.

Details:

Material Specifications:

Face Material	B-423 - White Polyester
Adhesive	Permanent modified acrylic adhesive
Finishing	Glossy White
Antenna	Aluminium
IC to antenna construction	Chip bonded to antenna using Anisotropic Conductive Film adhesive
Tag base material	PET

General Specifications:

Applications	NFC on-metal temperature label for use outdoor and indoor, proximity read ranges, UV exposed environment. The label construction is designed for application on metal surfaces.
Print Technology	Thermal transfer print, including RFID encoding.
Recommended Ribbon	Brady Series R6000 Halogen Free
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	NXP NHS3100
Operating Frequency	13.56 MHz
Supported Standard	ISO/IEC 14443A

- 32 kB on-chip flash programming memory
- 4 kB on-chip EEPROM of which 320 bytes are write-protected
- 8 kB SRAM

RFID Regularity:

- ISO14443 NFC interface, fully NFC Forum tag type 2 compliant

  important notice for reader use:

  The reader must support the NFC functionality. Most Android devices will have the interface, however IOS devices below Iphone 7 will not support the measurement.

  To retrieve the temperature - ID - counter, simply tap the label with the NFC enabled device.

Temperature accuracy:

- Temperature range: absolute accuracy of ±0.3 °C in the range of 0 °C to 40°C and ±0.5 °C in the range of −40 °C to +85 °C

Firmware:

- The chip is flashed with Brady standard firmware, which allows the customer to change settings which can personalize the functionality of the label.
    - Website (HTTPS)
    - Hashing - key
    - Temperature offset
    - Resolution (7-12bits)
    - Lock bit
- *IOS and Android App available to support changing the settings in the label*

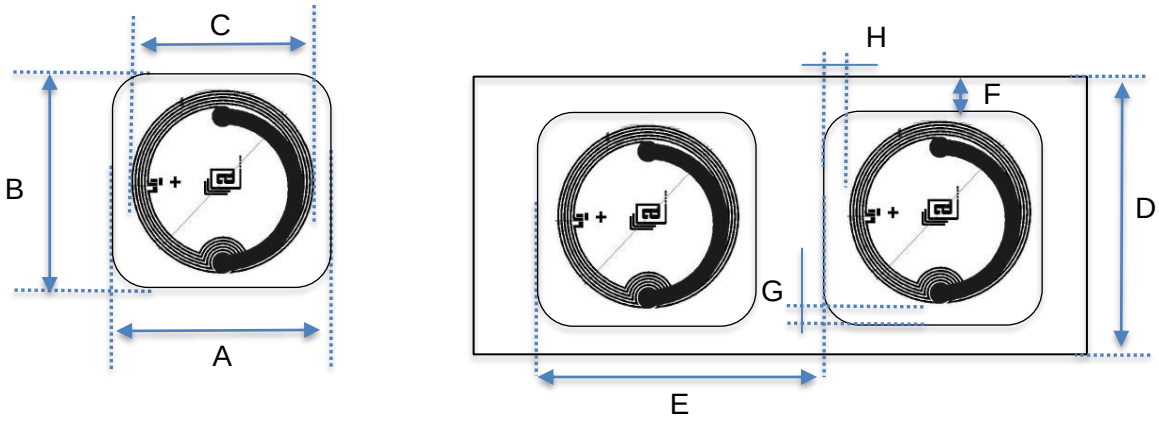
Label Dimensions:

Metric (mm)		
Width	**Length**	**Thickness** Total (with chip)
42.00	42.00	0.46

Label Mass (including antenna and chip)

Label Mass (g)
1.09

Dimensions (mm)



		Length (mm)	Tolerance (mm)
A	Tag Width	42.00	+/- 0.2
B	Tag Length	42.00	+/- 0.2
C	Antenna Diameter	35.00	+/- 0.5
D	Web Width	45.00	+/- 0.5
E	Tag to Tag Pitch	50.00	+/- 1.5
F	Web edge to label	1.50	+/- 1.5
G	Antenna to side label	3.50	+/- 1.5
H	Antenna to top label	3.50	+/- 1.5

Delivery and Packaging Specifications

RFID labels per roll	500
Rolls in package	1
Winding	RFID labels out
Inspection and delivered tags	100% inspected, 500 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)	 0.0181 inch (0.46 mm)
Adhesion to: -Stainless Steel	ASTM D 1000 20 minute dwell 24 hour dwell	 131 N/100mm (120 oz/inch) 132 N/100mm (121 oz/inch)
-Aluminium	20 minute dwell 24 hour dwell	120 N/100mm (110 oz/inch) 128,5 N/100mm (117.4 oz/inch)

Performance properties tested on samples printed with the Brady Series R6000 Halogen Free. Printed samples were laminated to aluminum panels and allowed to dwell 24 hours before exposure to the indicated environments.

PERFORMANCE PROPERTIES		ENVIRONMENTAL RESISTANCE		
PERFORMANCE PROPERTIES	**TEST METHODS**	**EFFECT TO LABEL**	**EFFECT TO PRINT IMAGE**	**EFFECT TO CHIP**
High Service Temperature	30 days at temperatures 85°C, 100°C, and 120°C	No visible effect	No visible effect	Readable
Low Service Temperature	30 days at temperatures -40°C and -80°C	No visible effect	No visible effect	Readable
Short Term High Service Temperature	5 minutes at 180°C	No visible effect	No visible effect	Readable
Humidity Resistance	30 days at 37°C, 95% relative humidity	No visible effect	No visible effect	Readable
UV Light Resistance	30 days in Xenon Test Chamber	No visible effect	No visible effect	Readable
Weatherability	ASTM G155, Cycle 1 30 days in QUV accelerated weathering tester	No visible effect	No visible effect	Readable
Abrasion Resistance	Taber Abraser, CS10 grinding wheels, 250 g/arm (Fed. Std. 191A, Method 5306), 150 cycles	No visible effect	Print still legible after 150 cycles	No effect to chip. Chip still readable after 200 cycles

PERFORMANCE PROPERTIES	CHEMICAL RESISTANCE			
Samples were printed with the Brady Series R6000 Halogen Free. 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/TOPCOAT WITHOUT RUB**	**EFFECT TO PRINT/TOPCOAT WITH RUB**	**EFFECT TO ADHESIVE**	**EFFECT TO CHIPS**
Ethanol	1	1	1	Readable
Toluene	1	5	1	Readable
Isopropyl Alcohol	1	1	1	Readable
DOT 4 Brake Fluid	1	3	1	Readable
Skydrol® 500B-4	1	2	1	Readable
Hydrochloric Acid 37%	1	1	1	Readable
Sodium Hydroxide 10%	1	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:

1) Bond strength can be improved with firm application pressure.
2) Always ensure clean surface for obtaining the maximum bond strength.
3) During attachment to the identified item, please avoid touching the background adhesive. If the location on the asset needs to be changed, please use a new tag instead of re-placing the used one; the adhesion will suffer from the re-placement.
4) Minimum bending diameter is defined to be 50mm. Do not bend the label above the limit. Never touch on the location of the IC. IC chip is sensitive electrical component and can be damaged if unexpected pressure is applied on the chip.

Shelf Life:
Shelf life is two years from the date of receipt for this product as long as this product is stored in its original packaging in an environment below 80° F (27° C) and 60% 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.

Trademarks:
Skydrol® is a registered trademark of the Monsanto Company
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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