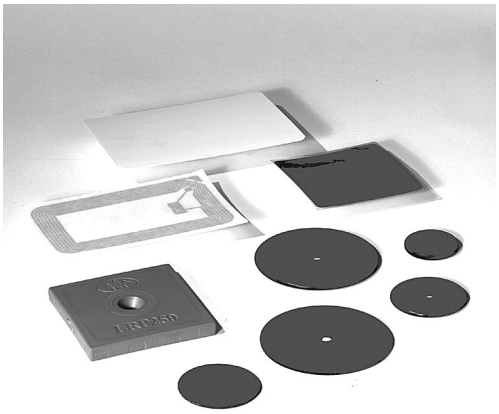
en 13-2011/01 50105005



RFID

ISO 15693

- Suitable for read-write units of the RFM series

Disc transponder
TFM 02 **1**…/TFM 03 **1**…/TFM 04 **1**…/
TFM 05 **1**…

- Universal robust disc transponder for industrial environments

Self-adhesive transponder
TFM 02 **2**…/TFM 05 **2**…/TFM 08 **2**…

- Self-adhesive smart label transponder
- Cost-effective and easy to use

High temperature transponder
TFM 05 x**6**…/TFM 06 x**7**…/TFM 08 x**6**…

- High temperature-proof transponders up to 250/300 °C

Keyring transponder TFM TFM 03 **5**…

- Practical transponder for use as a tag or for personal access control

Spacer for disc transponder TFM 03…/TFM 05…

- 10 mm thick spacer for disc transponder Ø 30 mm and Ø 50 mm
- 30 mm thick spacer for high temperature disc transponder Ø 85 mm
- Mounting set for load carrier/skids, 60 mm distance

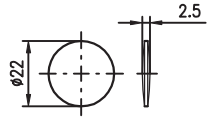
The TFM … transponders are not provided with a name plate.

Transponder for explosion-hazard zones, see separate data sheet.

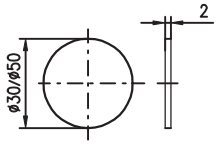
Dimensioned drawing

Transponder

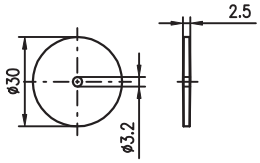
TFM 02 1125.220 Part no. 50102915



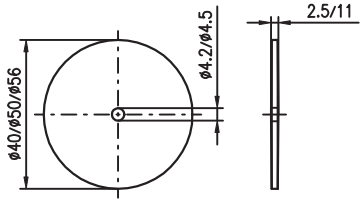
TFM 03 1910.219 Part no. 50104960
TFM 05 1910.219 Part no. 50104961



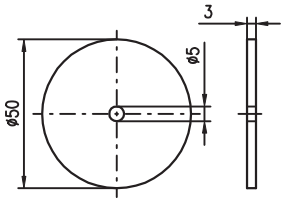
TFM 03 1110.210 Part no. 50102917
TFM 03 1510.210 Part no. 50106412



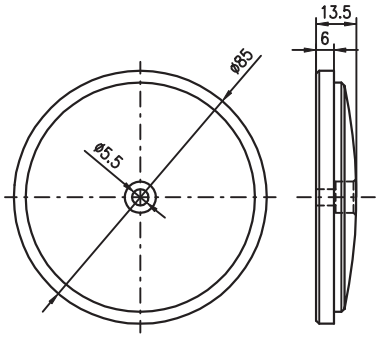
TFM 04 1190.230 Part no. 50108290
TFM 05 1110.210 Part no. 50102916
TFM 06 1710.210 Part no. 50112414 1)



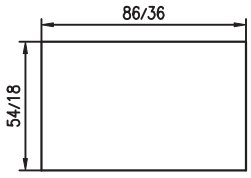
TFM 05 1510.210 Part no. 50106413



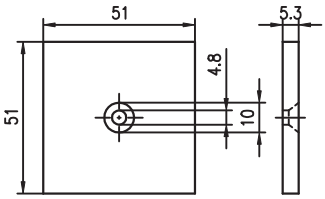
TFM 08 1610.210 Part no. 50114962



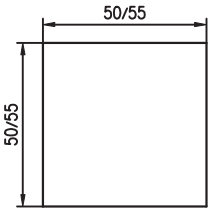
TFM 08 2125.220 Part no. 50109233
TFM 02 2210.210 Part no. 50107790



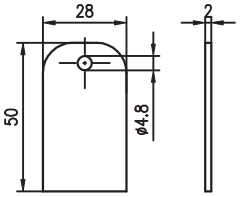
TFM 05 2610.210 Part no. 50109317 1)



TFM 05 2210.210 Part no. 50109232
TFM 06 2225.220 Part no. 50102913



TFM 03 5125.220 Part no. 50102956

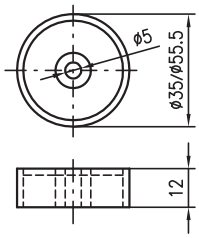


1) **Part being discontinued!**

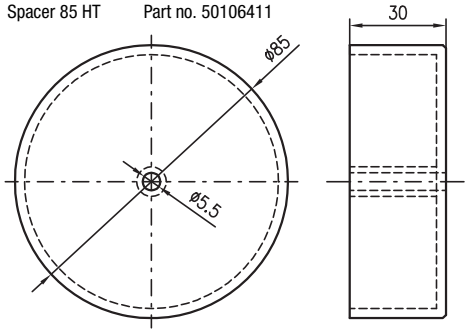
Dimensioned drawing

Spacers and mounting devices

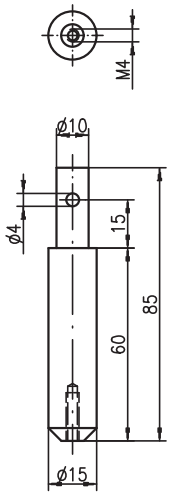
Spacer 30 HT Part no. 50107102
Spacer 50 HT Part no. 50107103



Spacer 85 HT Part no. 50106411



Mounting device BT TFMx26 Part no. 50110631



Remarks

The read-write transponders of the TFM series are robust data carriers with 1024 bytes of memory for a large range of applications in industry.

The specified operating ranges may vary depending on the type of read-write unit selected.

If a larger operating range is required, a read-write device with a larger antenna or larger dimensions must be selected.

Specifications

General specifications

Working frequency	13.56 MHz	
Read distance	see diagrams	
Data carrier speed	max. 6.0 m/s (see diagrams), dependent on reader	
Data storage	see tables	
Memory access	write/read - approx. 50 ms/block min. 100,000 write cycles typical, min. 10 years of data retention	
Material	self-adhesive transponder::	paper/PET foil with pressure-sensitive adhesive
	disc/high-temperature transponder:	Epoxy/Royalplast/PA6/PPS
	keyring/card transponder:	PET/PVC
	spacer:	Ultramid/PPS
Color	self-adhesive transponder:	white
	disc transponder:	black
	high-temperature transponder:	brown/black
	keyring/card transponder:	white
	spacer:	black

Above a transponder temperature of 50°C, the maximum operating range above the transponder decreases. Typical values for the reduction of the operating range are:
- at 60°C:~ 10%
- at 80°C:~ 15%

Please note that transponders with temperatures above the operating temperature cannot be read from or written to.

Order guide

	Designation	Part no.
Disc transponder		
Ø 22mm, 256 byte memory, IP 68, PPS	TFM 02 1125.220	50102915
Ø 30mm, 112 byte memory, IP 67, Epoxy/Royalplast	TFM 03 1110.210	50102917
Ø 30mm, 112 byte memory, IP 68, PA6	TFM 03 1510.210	50106412
Ø 40mm, 1024 byte memory, IP 67, Epoxy/Royalplast	TFM 04 1190.230	50108290
Ø 50mm, 112 byte memory, IP 67, Epoxy/Royalplast	TFM 05 1110.210	50102916
Ø 50mm, 112 byte memory, IP 68, PA6	TFM 05 1510.210	50106413
Self-adhesive transponder		
18x36 mm, 112 byte memory, paper/PET foil	TFM 02 2210.210	50107790
50x50mm, 112 byte memory, paper/PET foil	TFM 05 2210.210	50109232
55x55mm, 256 byte memory, paper/PET foil	TFM 06 2225.220	50102913
High temperature transponder		
51x51x7mm, 112 byte memory, IP 68, PPS	TFM 05 2610.210	50109317 **1)**
Ø 56x11, 112 byte memory, IP 68, Epoxy/Royalplast	TFM 06 1710.210	50112414 **1)**
Ø 85x15mm, 112 byte memory, IP 68, PPS	TFM 08 1610.210	50114962
Keyring transponder		
50x28x2mm, 256 byte memory, PET	TFM 03 5125.220	50102956
Card transponder (laminated)		
Ø 30mm x 2mm, 112 byte memory, IP 65, PVC	TFM 03 1910.219	50114960
Ø 50mm x 2mm, 112 byte memory, IP 65, PVC	TFM 05 1910.219	50114961
86x54mm, 256 byte memory, IP 68, PET	TFM 08 2125.220	50109233
Spacer for disc transponder		
Ø 36mm for TFM 03 1… , Ultramid	Spacer 30 HT	50107102
Ø 56mm for TFM 05 1… , Ultramid	Spacer 50 HT	50107103
Ø 85mm for TFM 08 16… , PPS	Spacer 85 HT	50106411
Ø 15mm, 60mm long with spring connector, aluminum	BT TFMx26	50110631

1) **Part being discontinued!**

Tables

Memory organization / mechanical data

Model	Part no.	Memory					Protection class	Dimensions [1]	Weight
		Size	Block size	Block range	Model	Chip			
Disc transponder									
TFM 02 1125.220	50102915	256byte	8byte	00h … 1Fh(32)	07	Tag-IT HFI	IP 68	Ø 22x3.0mm	2g
TFM 03 1110.210	50102917	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 67	Ø 30x2.5 mm	5g
TFM 04 1190.230	50108290	1024byte	8byte	00h … 1Fh(32)	05	MyD 10P	IP 67	Ø 40x2.5mm	4g
TFM 05 1110.210	50102916	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 67	Ø 50x2.5mm	10g
TFM 03 1510.210	50106412	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 68	Ø 30x2.5mm	3g
TFM 05 1510.210	50106413	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 68	Ø 50x2.5mm	4g
Self-adhesive transponder									
TFM 02 2210.210	50107790	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 54	18x36x0.3mm	2g
TFM 05 2210.210	50109232	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 54	50x50x0.3mm	2g
TFM 06 2225.220	50102913	256byte	8byte	00h … 1Fh(32)	07	Tag-IT HFI	IP 54	55x55x0.3mm	~ 2g
High temperature transponder									
TFM 05 2610.210	50109317 [2]	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 68	51x51x7mm	50g
TFM 06 1710.210	50112414 [2]	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 68	Ø 56x11mm	50g
TFM 08 1610.210	50114962	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 68	Ø 85x15mm	50g
Keyring transponder									
TFM 03 5125.220	50102956	256byte	8byte	00h … 1Fh(32)	07	Tag-IT HFI	IP 65	50x28x2.5mm	~ 4g
Card transponder									
TFM 03 1910.219	50114960	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 65	Ø 30x2 mm	~ 3g
TFM 05 1910.219	50114961	112byte	4byte	00h … 1Bh(28)	04	I-Code 2 (SLI)	IP 65	Ø 50x2 mm	~ 4g
TFM 08 2125.220	50109233	256byte	4byte	00h … 1Fh(32)	07	Tag-IT HFI	IP 68	86x54x1mm	~ 5g
Spacer									
Spacer 30 HT	50107102	–					–	Ø 36x10mm	3g
Spacer 50 HT	50107103	–					–	Ø 56x10mm	4g
Spacer 85 HT	50106411	–					–	Ø 85x30mm	20g
BT TFMx26	50110631	–					–	Ø 15x60mm	50g

1) Due to tolerances and product updates, dimensions may change. Tolerances for disc transponders: on average ±0.5mm.
2) **Part being discontinued!**

Temperatures

Transponder	Part no.	Operating temperature [1]						Storage temperature						Storage temperature, for limited time			
		0 °C ... +50 °C	-20 °C ... +50 °C	-20 °C ... +70 °C	-25 °C ... +85 °C	-25 °C ... +100 °C	-40 °C ... +85 °C	-20 °C ... +50 °C	-20 °C ... +70 °C	-25 °C ... +85 °C	-40 °C ... +85 °C	-25 °C ... +120 °C	-25 °C ... +200 °C	up to +140 °C	up to +200 °C	up to +210 °C	up to +250 °C
TFM 02 1125.220	50102915				●							●		● 100h			
TFM 03 1110.210	50102917			●								●					
TFM 04 1190.230	50108290			●								●					
TFM 05 1110.210	50102916			●								●					
TFM 03 1510.210	50106412				●						●			● 1000h			
TFM 05 1510.210	50106413				●						●			● 1000h			
TFM 02 2210.210	50107790		●						●								
TFM 05 2210.210	50109232		●						●								
TFM 06 2225.220	50102913		●						●								
TFM 03 5125.220	50102956			●								●					
TFM 03 1910.219	50114960			●					●								
TFM 05 1910.219	50114961			●					●								
TFM 08 2125.220	50109233			●						●							
Spacer 30 HT	50107102												●				●
Spacer 50 HT	50107103												●				●
Spacer 85 HT	50106411												●				
BT TFMx26	50110631												●				●

1) Operating temperature:
temperature range in which the data to/from the transponder are written and read

2) **Part being discontinued!**

Temperatures in high temperature range

Transponder	Part no.	Operation temperature [1]						Storage temperature						Storage temperature, for limited time			
		0 °C ... +50 °C	-20 °C ... +50 °C	-20 °C ... +70 °C	-25 °C ... +85 °C	-25 °C ... +100 °C	-40 °C ... +85 °C	-20 °C ... +50 °C	-20 °C ... +70 °C	-25 °C ... +85 °C	-40 °C ... +85 °C	-25 °C ... +120 °C	-25 °C ... +200 °C	up to +200 °C	up to +210 °C	up to +220 °C	up to +250 °C
TFM 05 2610.210 up to 220 °C	50109317 [2]						●				●			● 1000h or ● 2000 cycles (of 45 min and > 1.5 h cooling (passive)	● 400h or ● 1000 cycles (of 30 min and > 2 h cooling (passive)	● 100h or ● 500 cycles (of 15 min and > 2 h cooling (passive)	
TFM 06 1710.210 up to 250 °C, briefly (10h) up to 300 °C	50112414 [2]				●							●			● 500h or ● 1000 cycles (of 45 min and > 1.5 h cooling (passive)	● 200h or ● 700 cycles (of 45 min and > 1.5 h cooling (passive)	● 100h or ● 100 cycles (of 45 min and > 1.5 h cooling (passive)
TFM 08 1610.210 up to 220 °C	50114962					●						●		● 4000h or ● 3000 cycles (of 40 min and > 1.5 h cooling (passive)		● 1000h or ● 1500 cycles (of 30 min and > 2 h cooling (passive)	

1) Operating temperature:
temperature range in which the data to/from the transponder are written and read

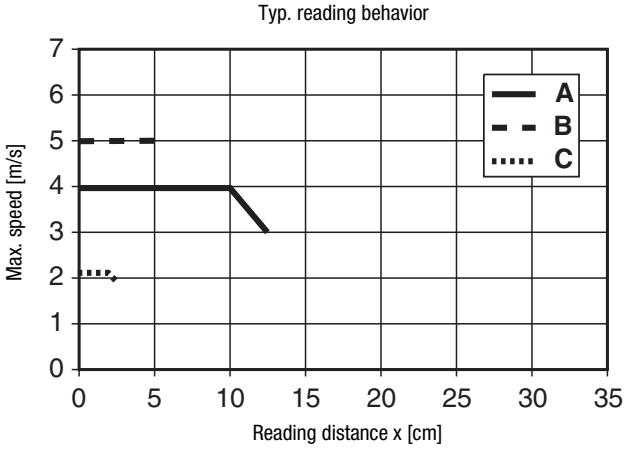
2) **Part being discontinued!**

Cycles of +20 °C up to the specified value, without quick heating

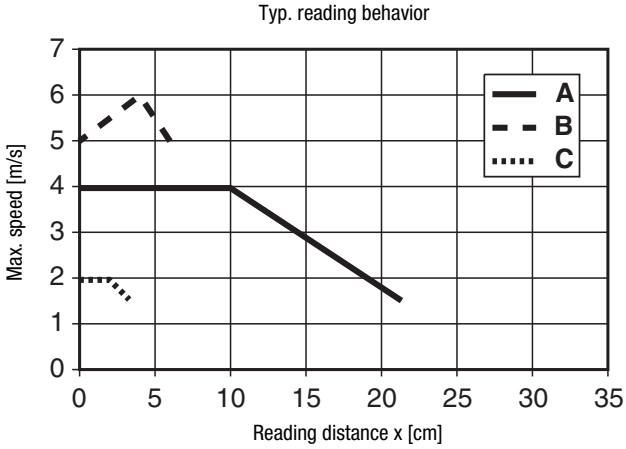
Diagrams

Typical reading behavior

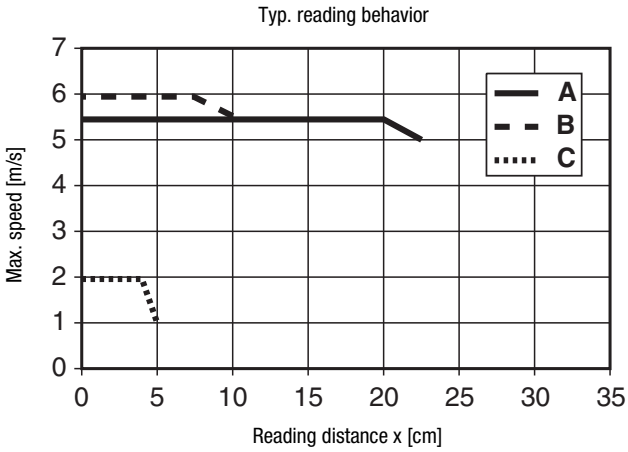
TFM 02…



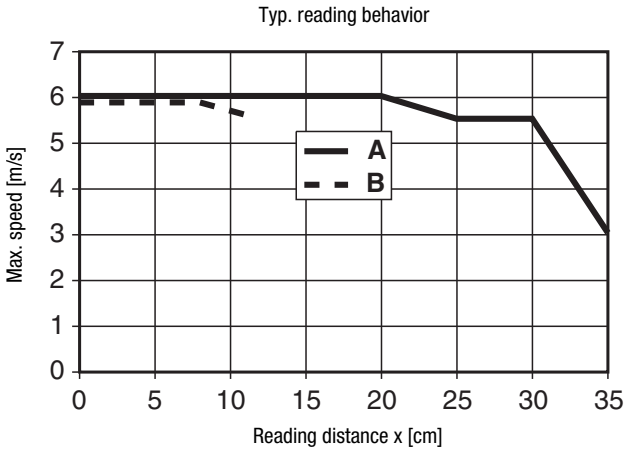
TFM 03/04…



TFM 05/06…



TFM 08…



A With read-write unit RFM 62
B With read-write unit RFM 32
C With read-write unit RFM 12

The values specified may deviate as a result of temperature influences, installation site, read angle, etc.

Mounting/fastening information

- **Self-adhesive transponders**:
  When fastening, the mounting surface must be dry, free of grease and clean in order to ensure secure bonding. In the vicinity of the chip, the self-adhesive transponders must not be mounted around corners or edges as damages could result. Recommended distance to metal/metal foils: > 5mm. Intended for use in mechanically protected environments.
- **Disc transponders**:
  Screw connection of the disc transponder only with sufficient play. Excessive tightening of the fastening screw may result in damage to the transponder. Recommended distance to metal/metal foils: > 5mm. Also suitable for areas with slight mechanical loading.
- **High temperature transponder**:
  High material expansions are possible due to high temperature differences that may occur by using these transponders. The fastening of these transponders must, thus, absolutely be loose.