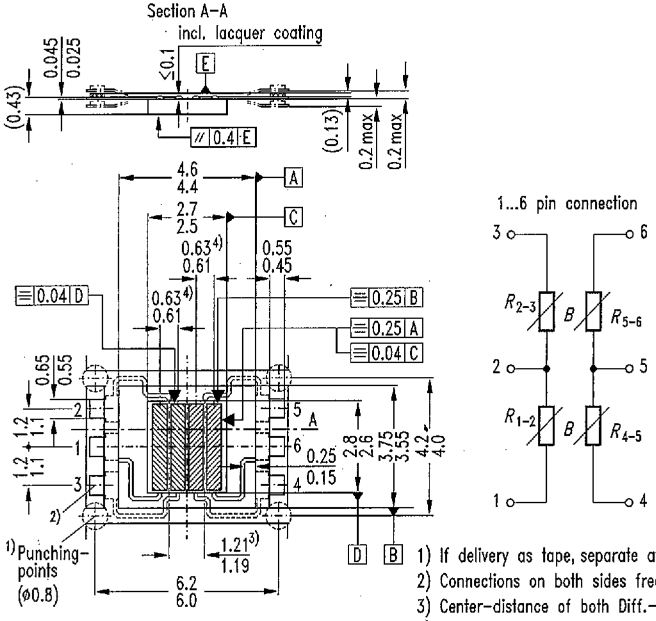
Double Differential Magneto Resistor

FP 410 L (4 x 80) FM

Version 2.0



1) If delivery as tape, separate at punching-points
2) Connections on both sides free of lacquer
3) Center-distance of both Diff.-Systems
4) Center-distance of one Diff.-System
Approx. weight 0.2 g

GPX06776

Dimensions in mm

Features

- Double differential magneto resistor on same carrier
- Accurate intercenter spacing
- High operating temperature range
- High output voltage
- Compact construction
- Available in strip form for automatic assembly

Typical Applications

- Incremental angular encoders
- Detection of sense of rotation
- Detection of speed
- Detection of position

Type	Ordering Code
FP 410 L (4 × 80) FM	Q65410-L80E (taped)
FP 410 L (4 × 80) FM	Q65110-L80F (singular)

The double differential magneto resistor assembly consists of two pairs of magneto resistors, (L-type InSb/NiSb semiconductor resistors whose resistance value can be magnetically controlled), which are fixed to a ferrite substrate. Contact to the magneto resistors is achieved using a copper/polyimide carrier film known as Micropack.

The basic resistance of each of the magnetic resistors is 80 Ω. The two series coupled pairs of magnetic resistors are actuated by an external magnetic field or can be biased by a permanent magnet and actuated by a soft iron target.

Absolute Maximum Ratings

Parameter	Symbol	Limit Values	Unit
Operating temperature	T_A	– 40 / + 175	°C
Storage temperature	T_{stg}	– 40 / + 185	°C
Power dissipation[1]	P_{tot}	1000	mW
Supply voltage[2] (B = 0.3 T)	V_{IN}	8	V
Thermal conductivity –attached to heatsink –in still air	 $G_{th\ case}$ $G_{th\ A}$	 ≥ 20 2	mW/K

Electrical Characteristics (T_A = 25 °C)

Basic resistance (I ≤ 1 mA; B = 0 T)	$R_{01\text{-}3}$ $R_{04\text{-}6}$	110...220	Ω
Center symmetry[3]	M	≤ 6	%
Relative resistance change ($R = R_{01\text{-}3}$, $R_{04\text{-}6}$ at B = 0 T) B = ± 0.3 T[4] B = ± 1 T	R_B/R_0	 > 1.7 > 7	–
Temperature coefficient B = 0 T B = ± 0.3 T B = ± 1 T	TC_R	 – 0.16 – 0.38 – 0.54	 %/K %/K %/K

1) Corresponding to diagram $P_{tot} = f(T_{case})$
2) Corresponding to diagram $V_{IN} = f(T_{case})$

3)

$$M = \frac{R_{01-2} - R_{02-3}}{R_{01-2}} \times 100\% \text{ for } R_{01\text{-}2} > R_{02\text{-}3}$$

$$M = \frac{R_{04-5} - R_{05-6}}{R_{04-5}} \times 100\% \text{ for } R_{04\text{-}5} > R_{05\text{-}6}$$

4) 1 T = 1 Tesla = 10^4 Gauss

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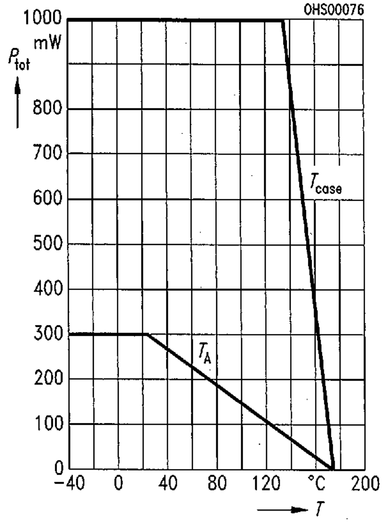
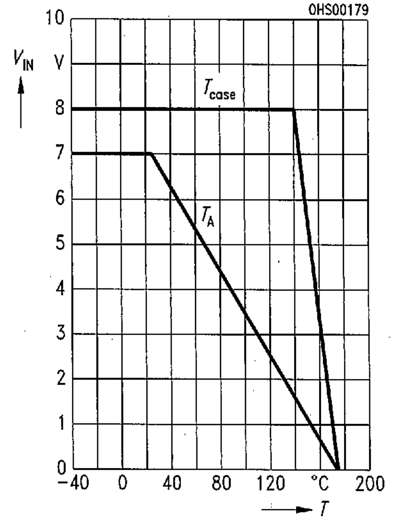
Max. power dissipation versus temperature

$P_{tot} = f(T)$, $T = T_{case}$, T_A



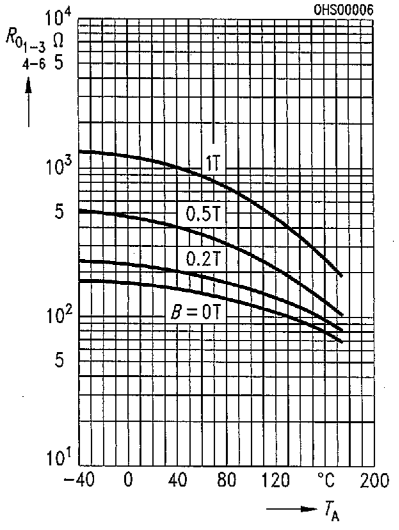
Maximum supply voltage versus temperature

$V_{IN\,1\text{-}3,\,4\text{-}6} = f(T)$, $B = 0.3$ T



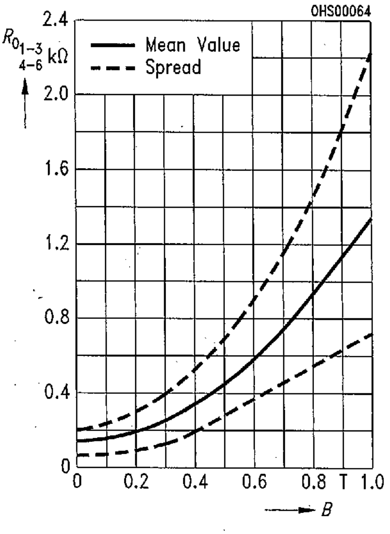
Typical MR resistance versus temperature

$R_{01\text{-}3,\,4\text{-}6} = f(T_A)$, B = Parameter



Typical MR resistance versus magnetic induction *B*

$R_{01\text{-}3,\,4\text{-}6} = f(B)$, $T_A = 25$ °C



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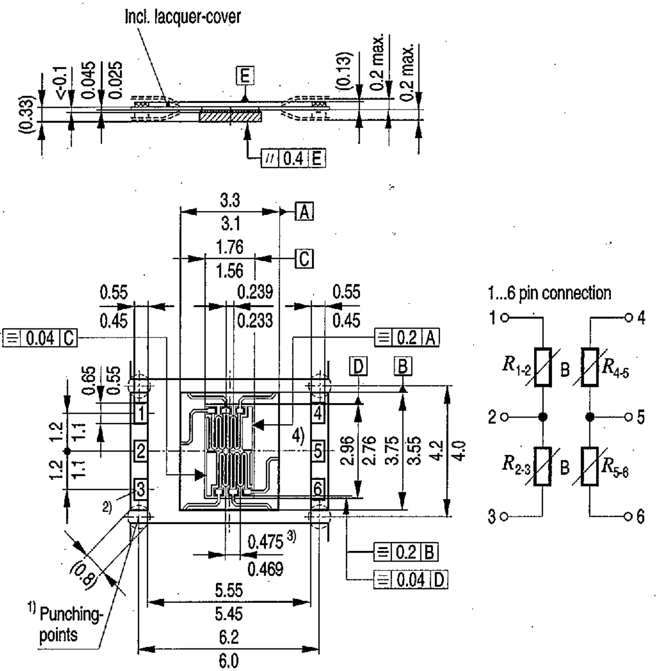
Double Differential Magneto Resistor

FP 420 L 90 B

Version 2.0



[1] If delivery as tape, seperate at punching-points.
[2] 6 fingers on both sides free of lacquer
[3] Center-distance between the Diff.-Systems.
Approx. weight 0.2 g

GPX06896

Dimensions in mm

Features

- Double differential magneto resistor on one carrier
- Accurate intercenter spacing
- High operating temperature range
- High output voltage
- Compact construction
- Available in strip form for automatic assembly
- Optimized intercenter spacing on modules $m = 0.3$ mm
- Reduced temperature dependence of offset voltage

Typical Applications

- Incremental angular encoders
- Detection of sense of rotation
- Detection of speed
- Detection of position

Type	Ordering Code
FP 420 L 90 B	Q65420-L90-B (singular)
FP 420 L 90 B	Q65420-L90-B1 (taped)

The double differential magneto resistor assembly consists of two pairs of magneto resistors, (L-type InSb/NiSb semiconductor resistors whose resistance value can be magnetically controlled), which are fixed to a silicon substrate. Contact to the magneto resistors is achieved using a copper/polyimide carrier film known as TAB.

The basic resistance of each of the magneto resistors is 90 Ω. The two series coupled pairs of magneto resistors are actuated by an external magnetic field or can be biased by a permanent magnet and actuated by a soft iron target.

Absolute Maximum Ratings

Parameter	Symbol	Limit Values	Unit
Operating temperature	T_A	– 40 / + 175	°C
Storage temperature	T_{stg}	– 40 / + 185	°C
Power dissipation[1)]	P_{tot}	800	mW
Supply voltage (B = 0.2 T, T_A = 25 °C)	V_{IN}	8	V
Thermal conductivity –attached to heatsink –in still air	 G_{thcase} G_{thA}	 20 1.5	 mW/K mW/K

Electrical Characteristics (T_A = 25 °C)

Nominal supply voltage (B = 0.2 T)[2)]	V_{INN}	5	V
Basic resistance (I < 1 mA, B = 0 T)	R_{01-3}	160…280	Ω
Center symmetry[3)]	M	≤ 3	%
Relative resistance change ($R_0 = R_{01-3}$, R_{04-6} at B = 0 T) B = ± 0.3 T[4)] B = ± 1 T	R_B/R_0	 > 1.7 > 7	–
Temperature coefficient B = 0 T B = ± 0.3 T B = ± 1 T	TC_R	 – 0.16 – 0.38 – 0.54	 %/K %/K %/K

1) $T = T_{case}$
2) $T = T_{case}$, T < 80 °C
3)

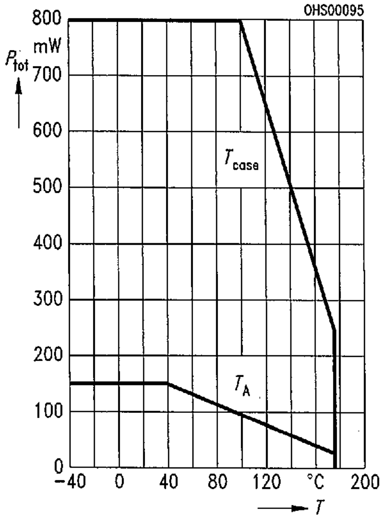
$$M = \frac{R_{01-2} - R_{02-3}}{R_{01-2}} \times 100\% \text{ for } R_{01-2} > R_{02-3}$$

$$M = \frac{R_{04-5} - R_{05-6}}{R_{04-5}} \times 100\% \text{ for } R_{04-5} > R_{05-6}$$

4) 1 T = 1 Tesla = 10^4 Gauss

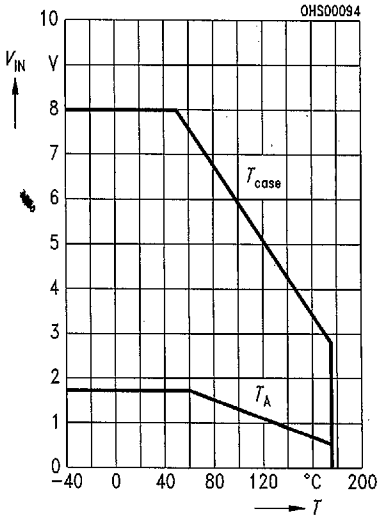
Max. power dissipation versus temperature

$P_{tot} = f(T)$, $T = T_{case}$, T_A



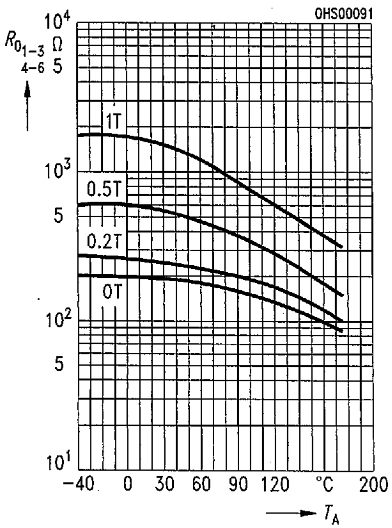
Maximum supply voltage versus temperature

$V_{IN} = f(T)$, B = 0.2 T



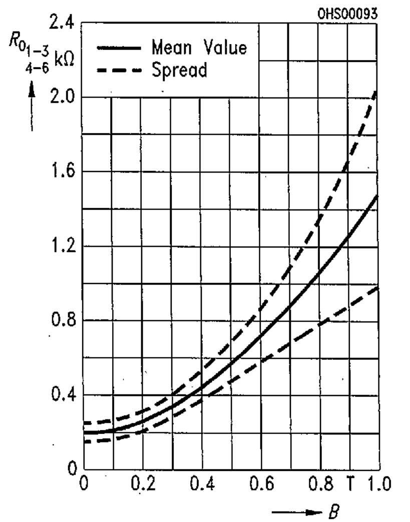
Typical MR resistance versus temperature

$R_{01\text{-}3,\,4\text{-}6} = f(T_A)$, B = Parameter



Typical MR resistance versus magnetic induction B

$R_{01\text{-}3,\,4\text{-}6} = f(B)$, T_A = 25 °C



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