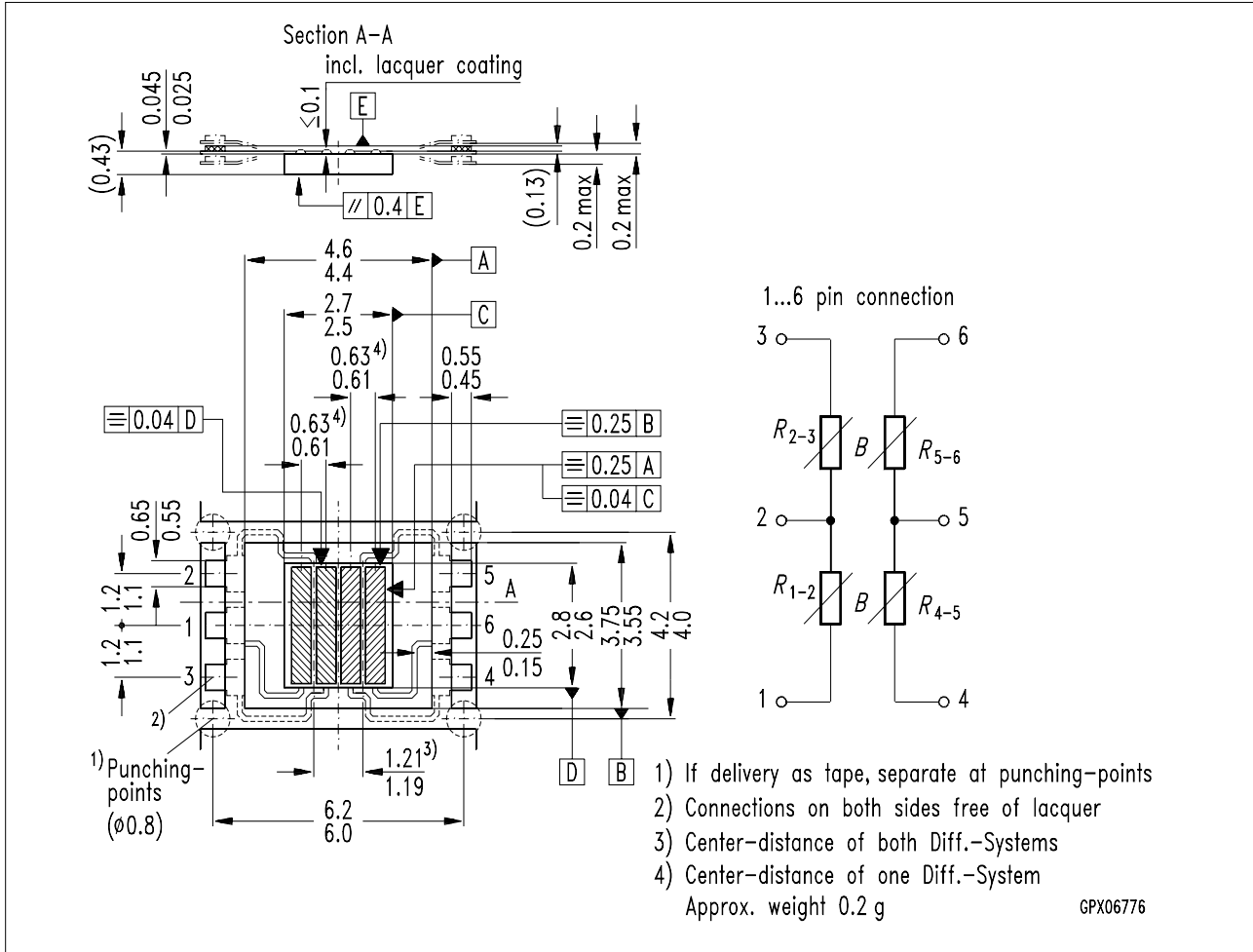


# Double Differential Magneto Resistor

# FP 410 L (4 x 80) FM

## Version 2.0



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 x 80) FM	Q65410-L80E (taped)
FP 410 L (4 x 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  $\Omega$ . 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 <sup>1)</sup>	$P_{tot}$	1000	mW
Supply voltage <sup>2)</sup> ( $B = 0.3$ 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 ( $I \leq 1$ mA; $B = 0$ T)	$R_{01-3}$ $R_{04-6}$	110...220	$\Omega$
Center symmetry <sup>3)</sup>	$M$	≤ 6	%
Relative resistance change ( $R = R_{01-3}, R_{04-6}$ at $B = 0$ T) $B = \pm 0.3$ T <sup>4)</sup> $B = \pm 1$ T	$R_B/R_0$	> 1.7 > 7	–
Temperature coefficient $B = 0$ T $B = \pm 0.3$ T $B = \pm 1$ 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  $V_{IN} = f(T_{case})$

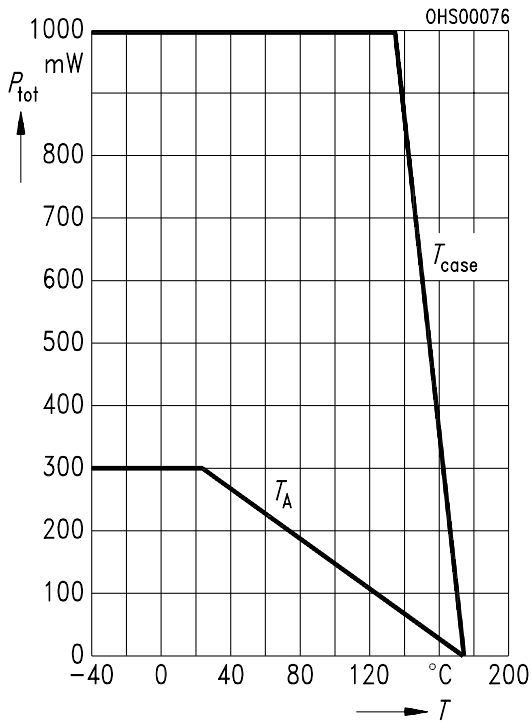
$$3) \quad M = \frac{R_{01-2} - R_{02-3}}{R_{01-2}} \times 100\% \text{ for } R_{01-2} > R_{02-3}$$

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

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

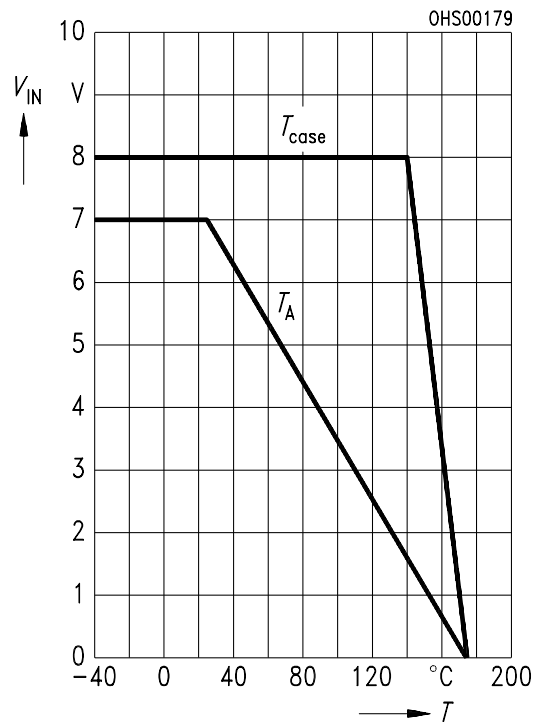
**Max. power dissipation versus temperature**

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



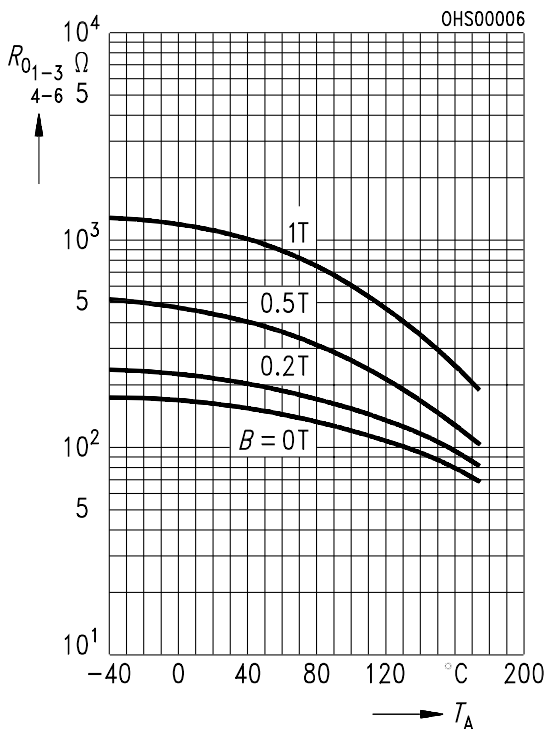
**Maximum supply voltage versus temperature**

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



**Typical MR resistance versus temperature**

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



**Typical MR resistance versus magnetic induction B**

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

