

# Shielded Surface Mount Inductors

## Model HM78



### Features:

- Operating temperature range  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Temperature rise, maximum  $40^{\circ}\text{C}$
- Operating frequency up to 3MHz
- RoHS compliant



### Specifications at $25^{\circ}\text{C}$

| Part Number  | Inductance<br>$\mu\text{H} \pm 20\%$ | DC resistance $\Omega$ max. | Rated current amps | Figure |
|--------------|--------------------------------------|-----------------------------|--------------------|--------|
| HM78-10100LF | 10                                   | 0.080                       | 1.00               | 1      |
| HM78-10120LF | 12                                   | 0.090                       | 0.94               | 1      |
| HM78-10150LF | 15                                   | 0.120                       | 0.86               | 1      |
| HM78-10180LF | 18                                   | 0.130                       | 0.78               | 1      |
| HM78-10220LF | 22                                   | 0.150                       | 0.76               | 1      |
| HM78-10270LF | 27                                   | 0.210                       | 0.64               | 1      |
| HM78-10330LF | 33                                   | 0.250                       | 0.61               | 1      |
| HM78-10390LF | 39                                   | 0.310                       | 0.53               | 1      |
| HM78-10470LF | 47                                   | 0.350                       | 0.50               | 1      |
| HM78-10560LF | 56                                   | 0.430                       | 0.46               | 1      |
| HM78-10680LF | 68                                   | 0.520                       | 0.42               | 1      |
| HM78-20100LF | 10                                   | 0.055                       | 1.65               | 1      |
| HM78-20120LF | 12                                   | 0.073                       | 1.50               | 1      |
| HM78-20150LF | 15                                   | 0.081                       | 1.34               | 1      |
| HM78-20180LF | 18                                   | 0.102                       | 1.22               | 1      |
| HM78-20220LF | 22                                   | 0.115                       | 1.10               | 1      |
| HM78-20270LF | 27                                   | 0.159                       | 1.00               | 1      |
| HM78-20330LF | 33                                   | 0.182                       | 0.90               | 1      |
| HM78-20390LF | 39                                   | 0.199                       | 0.83               | 1      |
| HM78-20470LF | 47                                   | 0.221                       | 0.75               | 1      |
| HM78-20560LF | 56                                   | 0.306                       | 0.69               | 1      |
| HM78-20680LF | 68                                   | 0.345                       | 0.63               | 1      |

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|--------------|--------------------------------------|-----------------------------|--------------------|--------|
| HM78-20820LF | 82                                   | 0.390                       | 0.57               | 1      |
| HM78-20101LF | 100                                  | 0.432                       | 0.52               | 1      |
| HM78-20121LF | 120                                  | 0.440                       | 0.47               | 1      |
| HM78-20151LF | 150                                  | 0.730                       | 0.42               | 1      |
| HM78-20181LF | 180                                  | 0.780                       | 0.38               | 1      |
| HM78-20221LF | 220                                  | 0.940                       | 0.35               | 1      |
| HM78-20271LF | 270                                  | 1.250                       | 0.31               | 1      |
| HM78-30100LF | 10                                   | 0.072                       | 1.68               | 2      |
| HM78-30120LF | 12                                   | 0.098                       | 1.52               | 2      |
| HM78-30150LF | 15                                   | 0.130                       | 1.33               | 2      |
| HM78-30180LF | 18                                   | 0.140                       | 1.20               | 2      |
| HM78-30220LF | 22                                   | 0.190                       | 1.07               | 2      |
| HM78-30270LF | 27                                   | 0.210                       | 0.96               | 2      |
| HM78-30330LF | 33                                   | 0.240                       | 0.91               | 2      |
| HM78-30390LF | 39                                   | 0.320                       | 0.77               | 2      |
| HM78-30470LF | 47                                   | 0.360                       | 0.76               | 2      |
| HM78-30560LF | 56                                   | 0.470                       | 0.68               | 2      |
| HM78-30680LF | 68                                   | 0.520                       | 0.61               | 2      |
| HM78-30820LF | 82                                   | 0.690                       | 0.57               | 2      |
| HM78-30101LF | 100                                  | 0.790                       | 0.50               | 2      |
| HM78-30121LF | 120                                  | 0.890                       | 0.49               | 2      |
| HM78-30151LF | 150                                  | 1.270                       | 0.43               | 2      |
| HM78-30181LF | 180                                  | 1.450                       | 0.39               | 2      |
| HM78-30221LF | 220                                  | 1.650                       | 0.35               | 2      |
| HM78-30271LF | 270                                  | 2.310                       | 0.32               | 2      |
| HM78-30331LF | 330                                  | 2.620                       | 0.28               | 2      |
| HM78-30391LF | 390                                  | 2.940                       | 0.26               | 2      |
| HM78-30471LF | 470                                  | 4.180                       | 0.24               | 2      |
| HM78-30102LF | 1000                                 | 6.500                       | 0.16               | 2      |

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| Part Number  | Inductance<br>$\mu\text{H} \pm 20\%$ | DC resistance $\Omega$ max. | Rated current amps | Figure |
|--------------|--------------------------------------|-----------------------------|--------------------|--------|
| HM78-402R2LF | 2.2                                  | 0.027                       | 3.20               | 2      |
| HM78-403R3LF | 3.3                                  | 0.026                       | 3.94               | 2      |
| HM78-40100LF | 10                                   | 0.055                       | 2.00               | 2      |
| HM78-40120LF | 12                                   | 0.058                       | 1.71               | 2      |
| HM78-40150LF | 15                                   | 0.081                       | 1.47               | 2      |
| HM78-40180LF | 18                                   | 0.091                       | 1.31               | 2      |
| HM78-40220LF | 22                                   | 0.110                       | 1.23               | 2      |
| HM78-40270LF | 27                                   | 0.150                       | 1.12               | 2      |
| HM78-40330LF | 33                                   | 0.170                       | 1.00               | 2      |
| HM78-40390LF | 39                                   | 0.230                       | 0.91               | 2      |
| HM78-40470LF | 47                                   | 0.260                       | 0.88               | 2      |
| HM78-40560LF | 56                                   | 0.350                       | 0.75               | 2      |
| HM78-40680LF | 68                                   | 0.380                       | 0.69               | 2      |
| HM78-40820LF | 82                                   | 0.430                       | 0.61               | 2      |
| HM78-40101LF | 100                                  | 0.610                       | 0.60               | 2      |
| HM78-40121LF | 120                                  | 0.660                       | 0.52               | 2      |
| HM78-40151LF | 150                                  | 0.880                       | 0.46               | 2      |
| HM78-40181LF | 180                                  | 0.980                       | 0.42               | 2      |
| HM78-40221LF | 220                                  | 1.170                       | 0.36               | 2      |
| HM78-40271LF | 270                                  | 1.640                       | 0.24               | 2      |
| HM78-40331LF | 330                                  | 1.860                       | 0.32               | 2      |
| HM78-40391LF | 390                                  | 2.850                       | 0.29               | 2      |
| HM78-40471LF | 470                                  | 3.010                       | 0.26               | 2      |
| HM78-40561LF | 560                                  | 3.620                       | 0.23               | 2      |
| HM78-40681LF | 680                                  | 4.630                       | 0.22               | 2      |
| HM78-40821LF | 820                                  | 5.200                       | 0.20               | 3      |
| HM78-453R9LF | 3.9                                  | 0.015                       | 6.50               | 3      |
| HM78-454R7LF | 4.7                                  | 0.018                       | 5.70               | 3      |
| HM78-456R8LF | 6.8                                  | 0.023                       | 4.90               | 3      |

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| Part Number  | Inductance<br>$\mu\text{H} \pm 20\%$ | DC resistance $\Omega$ max. | Rated current amps | Figure |
|--------------|--------------------------------------|-----------------------------|--------------------|--------|
| HM78-45100LF | 10                                   | 0.028                       | 4.50               | 3      |
| HM78-45120LF | 12                                   | 0.038                       | 4.00               | 3      |
| HM78-45150LF | 15                                   | 0.050                       | 3.20               | 3      |
| HM78-45180LF | 18                                   | 0.057                       | 3.10               | 3      |
| HM78-45220LF | 22                                   | 0.066                       | 2.90               | 3      |
| HM78-45270LF | 27                                   | 0.080                       | 2.80               | 3      |
| HM78-45330LF | 33                                   | 0.097                       | 2.70               | 3      |
| HM78-45390LF | 39                                   | 0.132                       | 2.10               | 3      |
| HM78-45470LF | 47                                   | 0.150                       | 1.90               | 3      |
| HM78-45560LF | 56                                   | 0.190                       | 1.80               | 3      |
| HM78-45680LF | 68                                   | 0.220                       | 1.50               | 3      |
| HM78-45820LF | 82                                   | 0.260                       | 1.30               | 3      |
| HM78-45101LF | 100                                  | 0.308                       | 1.20               | 3      |
| HM78-45121LF | 120                                  | 0.380                       | 1.10               | 3      |
| HM78-45151LF | 150                                  | 0.530                       | 0.95               | 3      |
| HM78-45181LF | 180                                  | 0.620                       | 0.85               | 3      |
| HM78-45221LF | 220                                  | 0.700                       | 0.80               | 3      |
| HM78-45271LF | 270                                  | 0.876                       | 0.60               | 3      |
| HM78-45331LF | 330                                  | 0.990                       | 0.50               | 3      |
| HM78-501R5LF | 1.5 $\pm 25\%$                       | 0.012                       | 13.00              | 3      |
| HM78-502R2LF | 2.2 $\pm 25\%$                       | 0.014                       | 7.00               | 3      |
| HM78-503R1LF | 3.1 $\pm 25\%$                       | 0.017                       | 6.00               | 3      |
| HM78-504R4LF | 4.4 $\pm 25\%$                       | 0.020                       | 5.00               | 3      |
| HM78-505R2LF | 5.2 $\pm 25\%$                       | 0.021                       | 4.40               | 3      |
| HM78-507R5LF | 7.5 $\pm 25\%$                       | 0.024                       | 4.20               | 3      |
| HM78-50100LF | 10                                   | 0.025                       | 4.00               | 3      |
| HM78-50120LF | 12                                   | 0.027                       | 3.50               | 3      |
| HM78-50150LF | 15                                   | 0.030                       | 3.30               | 3      |
| HM78-50180LF | 18                                   | 0.034                       | 3.00               | 3      |

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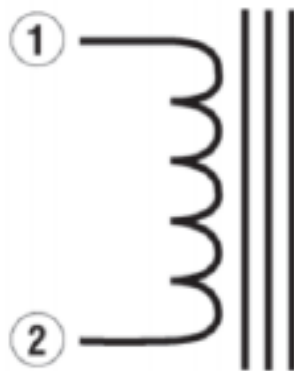


### Specifications at 25° C

| Part Number  | Inductance<br>$\mu\text{H} \pm 20\%$ | DC resistance $\Omega$ max. | Rated current amps | Figure |
|--------------|--------------------------------------|-----------------------------|--------------------|--------|
| HM78-605R6LF | 5.6 $\pm 30\%$                       | 0.018                       | 6.60               | 3      |
| HM78-607R6LF | 7.6 $\pm 30\%$                       | 0.020                       | 5.90               | 3      |
| HM78-60100LF | 10                                   | 0.022                       | 5.40               | 3      |
| HM78-60120LF | 12                                   | 0.025                       | 4.90               | 3      |
| HM78-60150LF | 15                                   | 0.027                       | 4.50               | 3      |
| HM78-60180LF | 18                                   | 0.039                       | 3.90               | 3      |
| HM78-60220LF | 22                                   | 0.043                       | 3.60               | 3      |
| HM78-60270LF | 27                                   | 0.046                       | 3.40               | 3      |
| HM78-60330LF | 33                                   | 0.065                       | 3.00               | 3      |
| HM78-60390LF | 39                                   | 0.073                       | 2.75               | 3      |
| HM78-60470LF | 47                                   | 0.085                       | 2.50               | 3      |
| HM78-60101LF | 100                                  | 0.220                       | 1.70               | 3      |
| HM78-60221LF | 220                                  | 0.370                       | 1.20               | 3      |
| HM78-60271LF | 270                                  | 0.560                       | 1.06               | 3      |

- Notes: 1) Inductance is measured at 1.0kHz without DC current.  
2) Rated DC current is the approximate current at which inductance will be decreased by 10% from its initial (zero DC) value or the DC current at which  $\Delta T = 40^\circ\text{C}$ , whichever is lower.

### Schematic



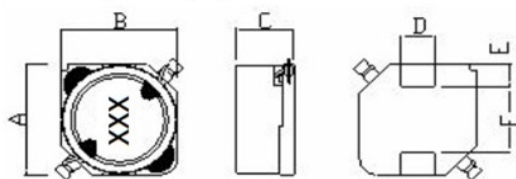
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### Outline Dimensions (inch/mm)

FIGURE 1( CASE 10, 20)



Recommended Solder Pad Layout

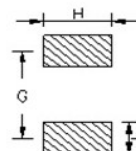


FIGURE 2 (CASE 30, 40)

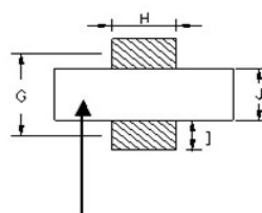
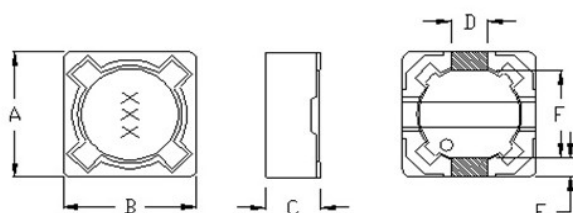
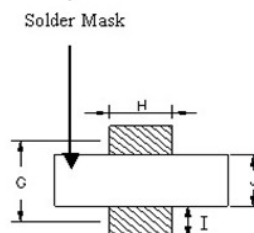
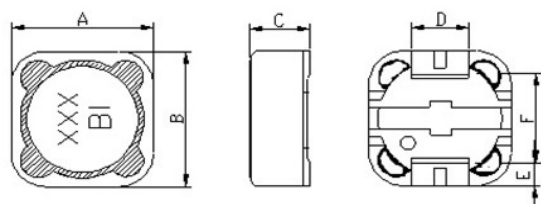


FIGURE 3 (CASE 45, 50, 60)



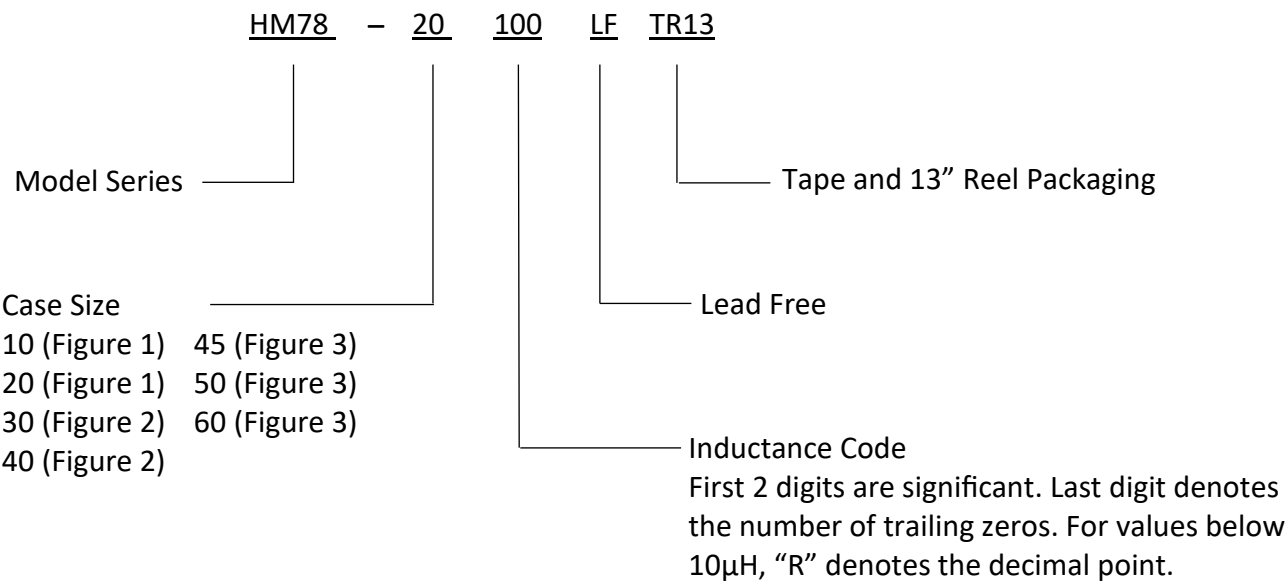
| Case Size | Figure | A (Max)             | B (Max)             | C (Max)             | D                   | E                   | F                   | G                   | H                   | I                   | J                   |
|-----------|--------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 10        | 1      | <u>.291</u><br>7.40 | <u>.291</u><br>7.40 | <u>.150</u><br>3.80 | <u>.079</u><br>2.00 | <u>.035</u><br>0.85 | <u>.220</u><br>5.60 | <u>.256</u><br>6.50 | <u>.118</u><br>3.00 | <u>.075</u><br>1.91 | -                   |
| 20        | 1      | <u>.291</u><br>7.40 | <u>.291</u><br>7.40 | <u>.205</u><br>5.20 | <u>.079</u><br>2.00 | <u>.035</u><br>0.85 | <u>.220</u><br>5.60 | <u>.256</u><br>6.50 | <u>.118</u><br>3.00 | <u>.075</u><br>1.91 | -                   |
| 30        | 2      | <u>.295</u><br>7.50 | <u>.295</u><br>7.50 | <u>.138</u><br>3.50 | <u>.079</u><br>2.00 | <u>.055</u><br>1.40 | <u>.173</u><br>4.40 | <u>.248</u><br>6.30 | <u>.118</u><br>3.00 | <u>.075</u><br>1.91 | <u>.177</u><br>4.50 |
| 40        | 2      | <u>.295</u><br>7.50 | <u>.295</u><br>7.50 | <u>.177</u><br>4.50 | <u>.079</u><br>2.00 | <u>.043</u><br>1.10 | <u>.200</u><br>5.08 | <u>.248</u><br>6.30 | <u>.118</u><br>3.00 | <u>.075</u><br>1.91 | <u>.177</u><br>4.50 |
| 45        | 3      | <u>.492</u><br>12.5 | <u>.492</u><br>12.5 | <u>.177</u><br>4.50 | <u>.197</u><br>5.00 | <u>.079</u><br>2.00 | <u>.299</u><br>7.60 | <u>.394</u><br>10.0 | <u>.236</u><br>6.00 | <u>.118</u><br>3.0  | <u>.276</u><br>7.00 |
| 50        | 3      | <u>.492</u><br>12.5 | <u>.492</u><br>12.5 | <u>.244</u><br>6.20 | <u>.193</u><br>4.90 | <u>.079</u><br>2.00 | <u>.297</u><br>7.55 | <u>.394</u><br>10.0 | <u>.236</u><br>6.00 | <u>.118</u><br>3.0  | <u>.276</u><br>7.00 |
| 60        | 3      | <u>.492</u><br>12.5 | <u>.492</u><br>12.5 | <u>.315</u><br>8.00 | <u>.193</u><br>4.90 | <u>.079</u><br>2.00 | <u>.297</u><br>7.55 | <u>.394</u><br>10.0 | <u>.236</u><br>6.00 | <u>.118</u><br>3.0  | <u>.276</u><br>7.00 |

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Ordering Information



Packaging

|          |                        |                          |                 |
|----------|------------------------|--------------------------|-----------------|
| Standard | Embossed Tape and Reel |                          |                 |
|          | Reel:                  | Diameter:                | = 13" (330.2mm) |
|          | Capacity:              | Case size 10, 30, 40     | = 1,000 units   |
|          |                        | Case size 20, 45, 50, 60 | = 500 Units     |